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Environmental Impact Assessment Report EIAR – Volume II

Proposed Extension to the Agall Quarry, Co. Offaly.

Condron Concrete Limited

Arden Road, Tullamore, Co. Offaly

MALONE O'REGAN ENVIRONMENTAL

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Environmental Impact Assessment Report EIAR – Volume II

Proposed Extension to the Agall Quarry, Co. Offaly.

Condron Concrete Limited

Arden Road, Tullamore, Co. Offaly

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1 GENERAL

1.1 Introduction

Malone O'Regan Environmental ('MOR Environmental') was commissioned by Condron Concrete Ltd. ('the Applicant') to prepare an Environmental Impact Assessment Report ('EIAR') in support of a planning application to Offaly County Council ('OCC').

This EIAR assesses the potential likely and significant effects arising from the Applicant's intention to:

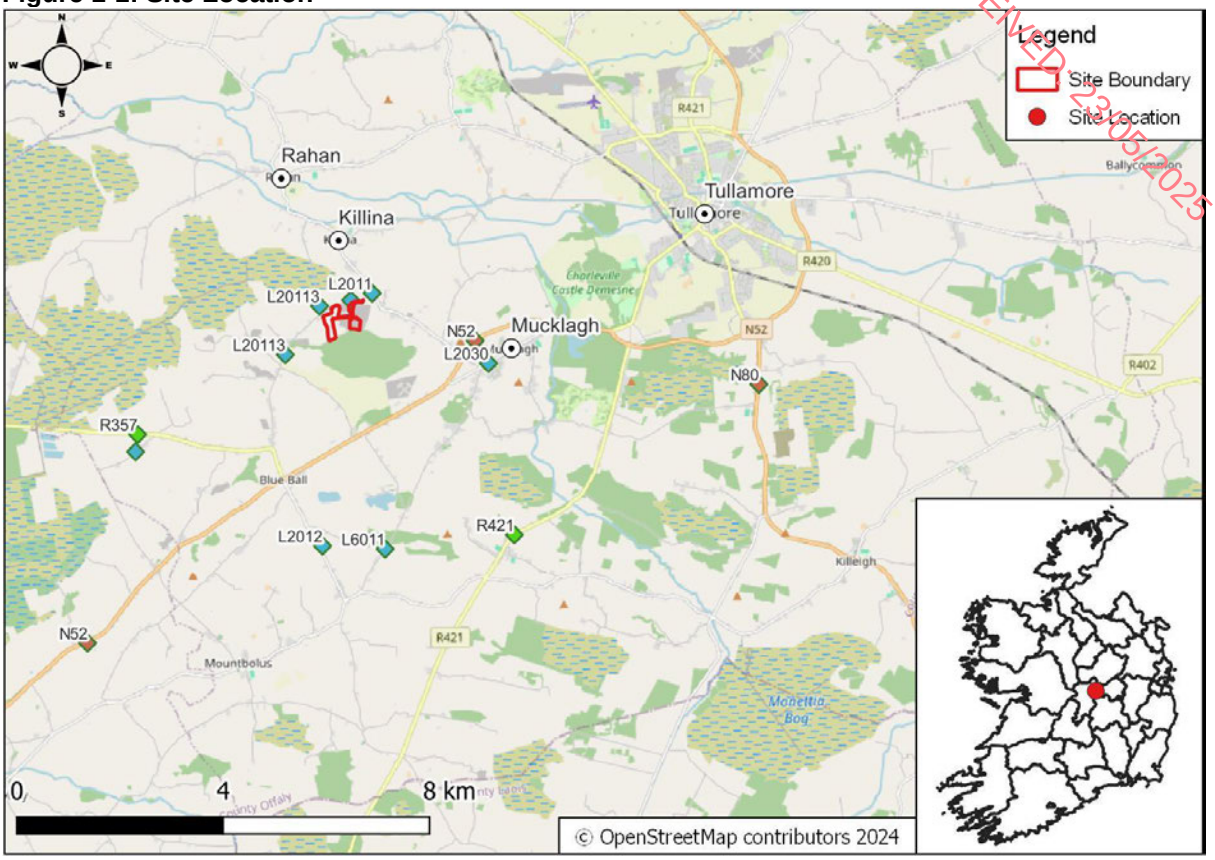
- Extend the current active gravel quarry into agricultural land to the west and north of the existing working face;
- Creation of earthen berms, planting and landscaping;
- Creation of an access route to the new extraction areas;
- The recommencement of extraction of remaining resources within part of the area under Substitute Consent (19.SU.0131), which was historically partially worked out;
- Continued use of the existing onsite infrastructure, including processing plant, wheel wash, site access and office / welfare unit;
- Phased restoration of the Site;
- All ancillary works, including dry screening and short-term stockpiling of aggregates; and
- Obtain a 30-year planning permission for the completion of the proposed development.

The above works are presented in full in Chapter 3 below and collectively in this report as the 'Proposed Development'. All works will occur within the townlands of Agall and Glaskill, Co. Offaly OSI Reference ITM 626611 722998 ('the Site').

Figure 1-1 below shows the Site location.

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Figure 1-1: Site Location



The Applicant operates an authorised sand and gravel extraction quarry known as the Agall Quarry. This encompasses the existing active extraction, onsite dry processing of aggregate and the restoration of historically extracted lands. The land at the Agall Quarry under the control of the Applicant encompasses circa ('ca.') 45 hectares ('ha') of land, including an active working pit, storage and processing areas and the historically worked (and partially restored) pit. The Site lies within this boundary and encompasses an area of ca. 17ha. Planning permission is being sought for 30 years (inclusive of 2 years for the Rehabilitation Phase).

1.2 Existing Development

The majority of the Agall Quarry is authorised under 19.SU0.0131, which has undergone restoration with the agreement of Offaly County Council; refer to Figure 3-3 below.

The current extraction operations at Agall Quarry operate under planning permission granted by An Bord Pleanála in April 2017 (19.QD.0008) for a period of 20 years.

At the time of submitting this planning application, extraction operations are ongoing, and lands permitted for extraction under 19.QD.0008 still remain available for extraction. Refer to Section 2.3 for further details.

Existing activities include the continued extraction of sand and gravel into the remaining reserves present in the site currently being excavated and into the field immediately to the north of the operational north face. These authorised extraction areas are identified in Figure 1-2 below. The operational pit floor is ca. 65mOD. Activities include both mobile dry screening and the use of the fixed plant screener located northeast of the extraction area.

It is planned that existing authorized extraction under 19.QD.0008 will continue during the initial stages of the Proposed Development to ensure a consistent supply of aggregates from the Agall Quarry.

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1.3 Proposed Development

The land at the Agall Quarry under the control of the Applicant covers an area of ca. 45 ha in size. The Site lies within this boundary and is ca. 17ha, distributed as follows:

- Ca. 11ha for proposed greenfield extension, of which ca. 6.96ha is the proposed extraction area;
- Ca. 3.81ha for proposed extraction within the previously authorised substitute consent lands; and,
- Another ca. 2ha. which relates to continued use of the existing onsite infrastructure, including processing plant, wheel wash, site access, office / welfare unit, and continued temporary storage and processing of aggregates.

The layout of the various elements on the Site are presented below in Figure 1-2. A restoration plan for the overall Site is proposed and is outlined in Chapter 3 below. The gravels within the Agall Quarry are glacial till-derived material, which forms part of the Screggan Fan geological feature. Refer to Chapter 7 for further details. As such, the resource is varied. It is this variability that has pre-empted this application for an extension to ensure the future reserve will continue to offer a mix of aggregate material for operations within the Applicant's concrete manufacturing business in Tullamore town.

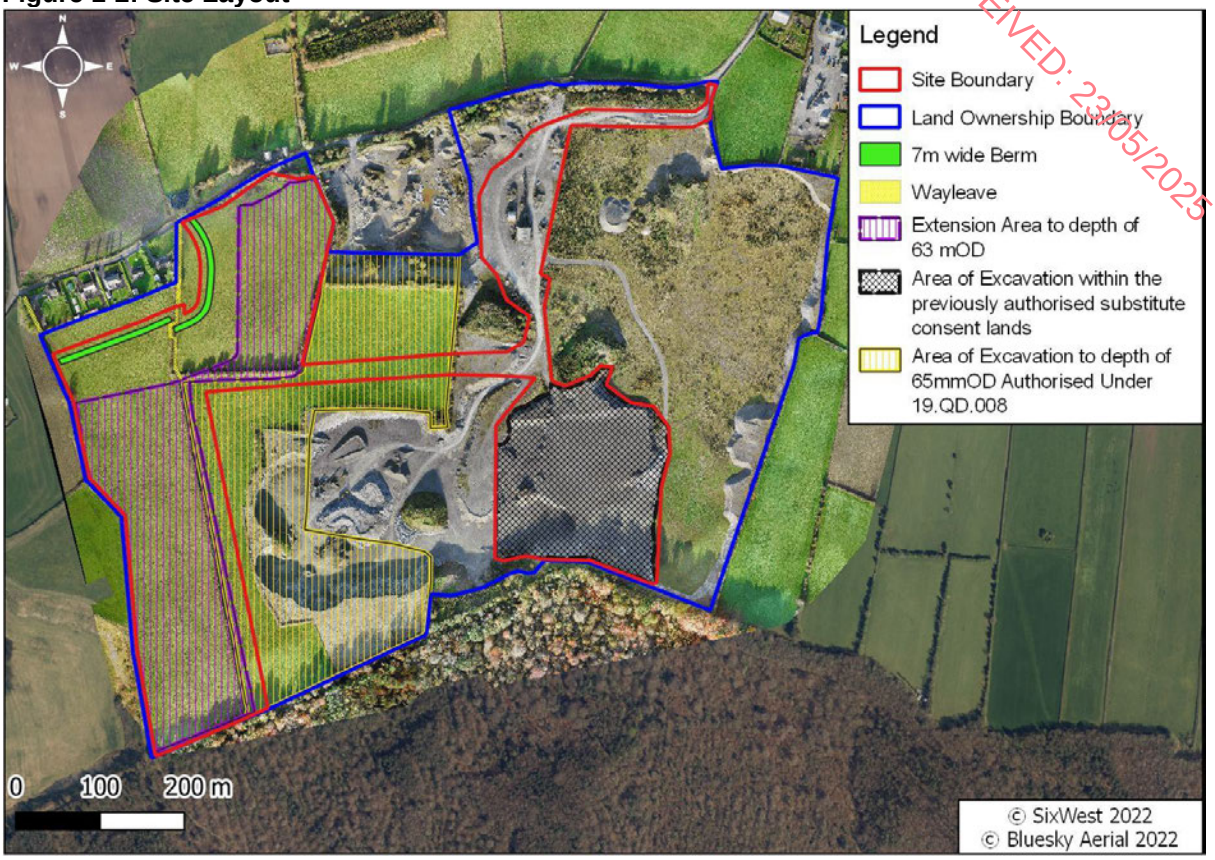
The Proposed Development will enable the continued extraction of key aggregates from the Agall Quarry to supply the Condron Concrete facility in Tullamore, extending the operational life of the quarry by up to 30 years from the date of grant, and is necessitated by the strong economic growth experienced and anticipated by the Applicant since current permission was granted at the quarry in 2017. Refer to Chapter 2 below.

Due to unknown future economic and market needs, it is likely the Proposed Development will extract at lower rates than the peak permitted extraction rate and, therefore, will need a longer operational period. Moreover, the potential scarcity in the midland and eastern region (as highlighted in the Irish Concrete Federation 2018 report [1], refer to section 2.7.1 below) increases the importance of supplies in this region. The Proposed Development presents an opportunity to safeguard valuable resources for future generations and their development goals. As such, planning permission is being sought for 30 years (inclusive of 2 years for the Rehabilitation Phase).

The Proposed Development will see a continuation of existing activities as permitted under 19.QD.0008, with works expanding laterally to the west and north and to a depth of 63mOD within these proposed new extraction areas (2m below the currently permitted depth under the existing permission). The timing of current permitted extraction activities and extraction activities proposed as part of the Proposed Development will overlap due to the variation in aggregate reserves. The site layout is shown in Figure 1-2 below.

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Figure 1-2: Site Layout



1.4 Site Description and Layout

Extraction of sand and gravel at the Site dates back to ca. 1910 and has been operated by the Applicant since 1985. The Site entrance is located to the northwest via the L20113. The original pit area was since expanded into lands to the west and to the east, bringing the quarry to its current size (Refer to Figure 2-1 below).

The greenfield in the west of the Site is owned by the Applicant, while the field in the north of the Site belongs to another proprietor. The Applicant has long standing agreement in place with all landowners to operate an extractive activity. The Site is situated ca. 6km southwest of Tullamore, ca. 3km northwest of Mucklagh, ca. 3km southeast of Rahan and ca. 12km northeast of Kilcormac.

The L20113 local road runs southwest to northeast alongside the northern boundary of the Site and adjoins the L2011 to the east. The L2011 local road runs to the southeast for ca 2.3km and joins the L2030, which runs through Mucklagh Village, prior to joining the N52 national road. The N52 provides the primary transport route for Heavy Goods Vehicles ('HGVs') accessing and egressing the Site.

The land surrounding the Site is primarily agricultural land used for grazing and tillage production. Blackwood, a commercial woodland managed and operated by Coillte, is located to the south of the Site boundary. It is a strategy of Coillte to restore this ca. 70ha woodland to broadleaved forestry under their current 5-year plan [2]. There are several residential buildings in proximity to the Site, with the nearest being ca. 30m from the Site's northern boundary. Residences in the area are generally comprised of farm dwellings and ribbon development along the local road network. Refer to Chapter 5: Population and Human Health.

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This application is seeking to expand the Site into known aggregate reserves to the west and north of current operations. Additionally, the Applicant is seeking the recommencement of quarry works of the lands subject to substitute consent under ABP Ref. 19.SU.0131.

Access to the Site will continue to be via the existing Agall Quarry entrance road off the L-20113-2, which connects to the Mucklagh-Rahan Road (L2011) to the northeast (refer to Chapter 13: Material Assets – Traffic).

The Proposed Development represents an extension of the Agall Quarry into known quality aggregates. It will operate within the permitted outputs under the application to ABP for substitute consent and future works (references: 19.QD.0008), which currently consists of 200,000 tonnes per annum, pending market conditions.

The currently active quarry face presents finer sands on the northern face and larger stone and occasional boulders on the southern face; refer to Plate 1-1 below and to Chapter 7: Land, Soils and Geology.

Plate 1-1: Extraction Face on Existing Pit Face

North Face



West Face



Southwest Face



A non-invasive survey of the extension land was conducted by Apex in July of 2022. This survey identified the likely resource to be in line with the existing operational area, which has been confirmed by intrusive drilling within the extension land, overseen by MOR

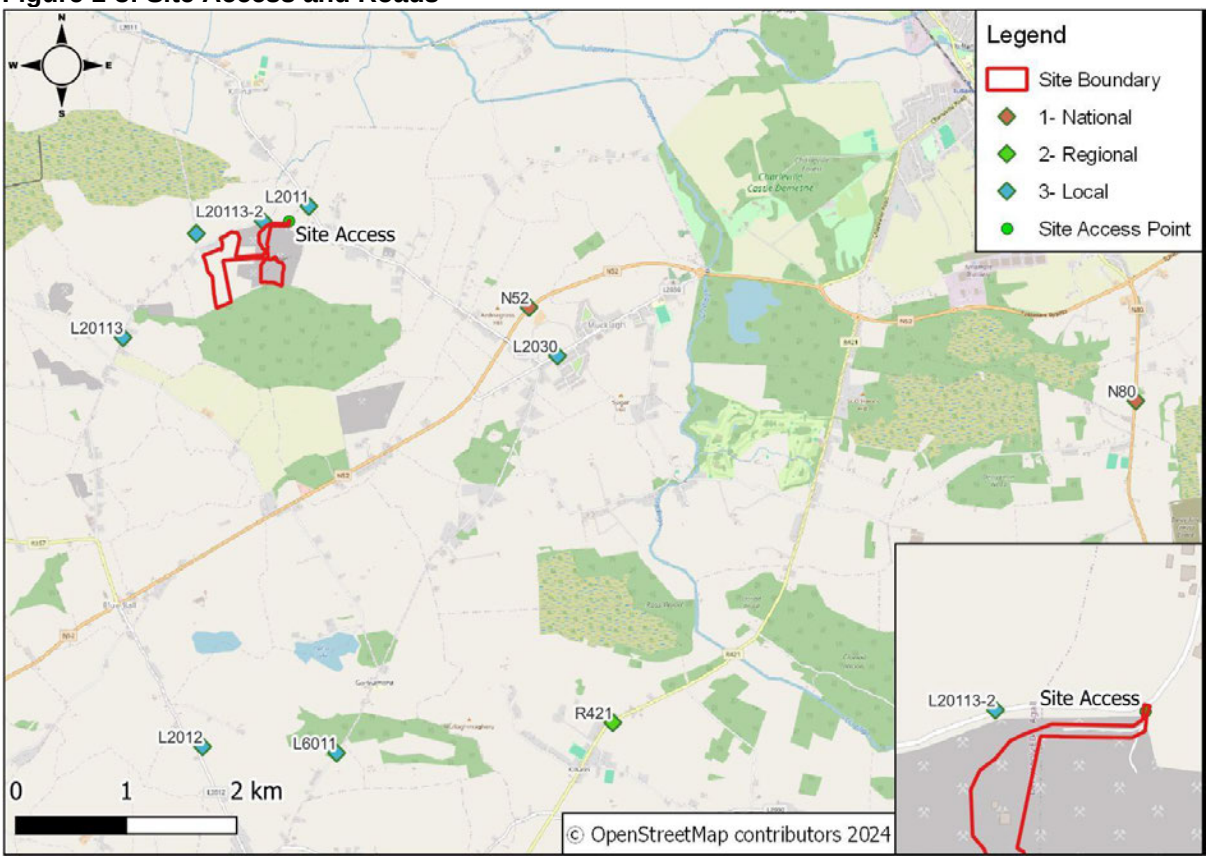
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Environmental in May 2023. Further details are supplied in Chapter 7 (Land, Soils and Geology) and Chapter 8 (Water). Currently, the land is used for livestock and the production of grass for agricultural feed material.

1.5 Description of Local Roads and Infrastructure

Access to the Site will continue to be via the existing Agall Quarry entrance onto the L20113, which connects to the Mucklagh to Rahan Road (L2011) to the northeast, ca. 270m from the quarry entrance, refer to Figure 1-3 below.

Figure 1-3: Site Access and Roads



The Agall Quarry entrance is a modernised industrial access, with a tarmac surface and metal security gate, as shown in Plate 1-2 below.

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Plate 1-2: View of Access Road and Access Gate



1.6 Notable Developments in the Area

A review of the Offaly County Council Planning Portal [3] did not find any notable developments in the vicinity of the Site.

A sand pit was historically operated to the west of the Site. However, this was closed and restored to agricultural grassland following a refusal by Offaly County Council for permission for further extraction (planning reference 10/167). The depression is still visible on publicly available aerial imagery. Another sand pit is located ca. 400 m to the west. This sandpit was registered as EUQY072 and is ca. 2.6ha in area.

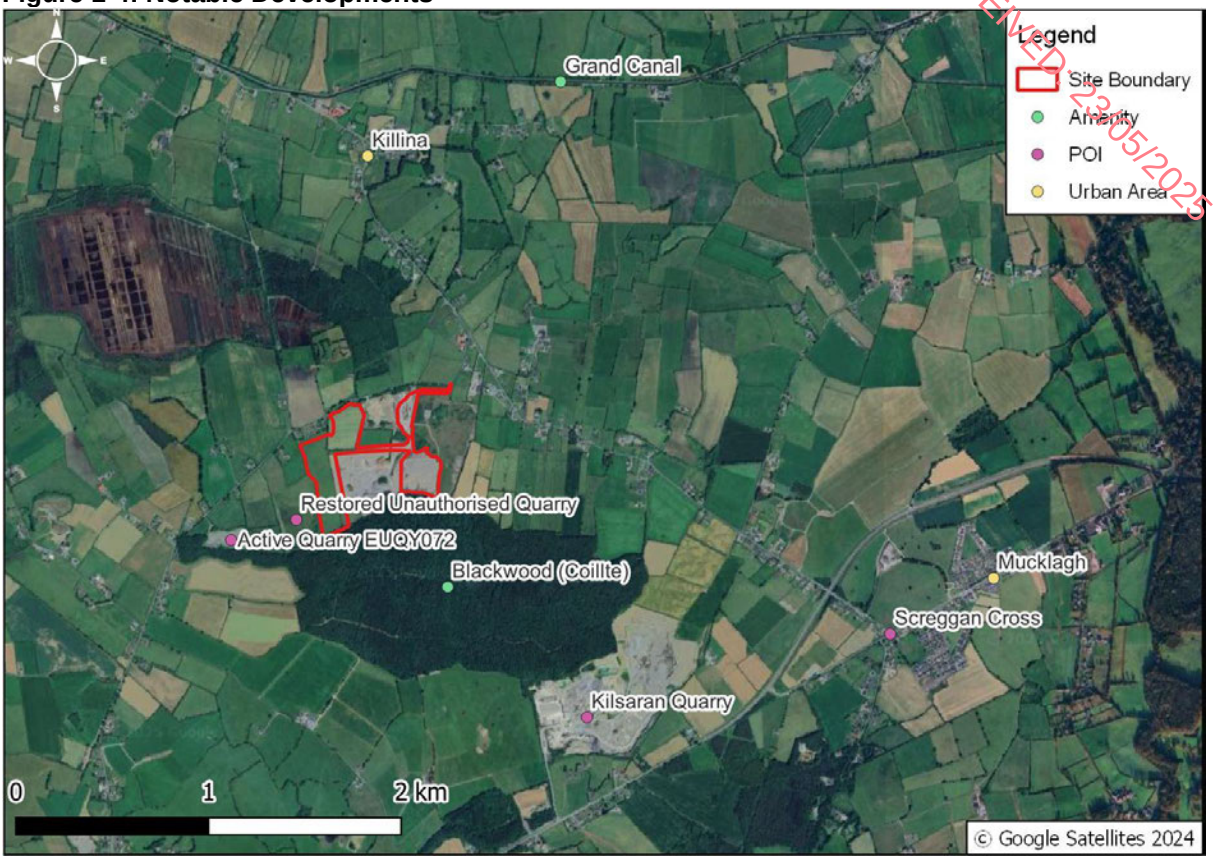
Adjoining the Site to the north, quarrying operations have occurred within an area of ca. 2.8ha. This portion of land was included within the original registration of the substitute consent application area of the Agall Quarry. However, the lands were returned to the landowner in ca. 2008 and have not been under the control of the Applicant since. Cognisance of this operation in terms of in-combination effect have been considered within relevant specialist chapters of this EIAR.

A large-scale quarry to the south of Blackwood is operated by Kilsaran, with an overall area of 68.9 ha. This development was granted planning in 2021 (An Bord Pleanála reference ABP-307797-20). Where relevant, cognisance of this operation in terms of in-combination effect have been considered within relevant specialist chapters of this EIAR.

To the north of the Site is the abstraction well for the local community. This well abstracts water for ca. 2,000 customers and is an identified local sensitive receptor. Notable developments in the vicinity of the Site are shown below (Figure 1-4 below)

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Figure 1-4: Notable Developments



1.7 Applicant

Condron Concrete Ltd is an established business since 1991 and was previously operated by Condron Concrete Works Limited established in 1969. Condron Concrete Ltd is a 100% Irish-owned private company founded by Mr. John Condron as a local business prior to making the firm limited in 1971.

The Applicant manufactures high-quality concrete products used for various applications such as surface water drainage, foul and surface water sewers and bridges. The Applicant's manufacturing plant is situated on the Arden Road on the outskirts of Tullamore. The Applicant is currently the only Irish company manufacturing large, high-quality concrete products for roads, surface water drainage, land drainage and large-scale projects.

1.8 EIA Amendment Directive (2014/52/EU)

On 14th April 2014, the Environmental Impact Assessment ('EIA') Directive (2014/52/EU) (the EIA Amendment Directive) was adopted by the Council of the European Union ('EU') and amended Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment. Article 2 of the EIA Amendment Directive required all Member States to bring the Directive into force by 16th May 2017.

The EIA Amendment Directive clarified aspects of the preceding Directive 2011/92/EU to bring it into line with intervening European Court of Justice ('ECJ') judgments and introduced additional provisions and procedural options. Therefore, compliance with the EIA Amendment Directive (2014/52/EU) will automatically ensure compliance with Directive 2011/92/EU. In Ireland, the EU (Planning and Development) (Environmental Impact Assessment) Regulations

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2018 (S.I. 296 of 2018) came into effect on the 1st September 2018[1] and gave effect to Directive 2011/92/EU as amended by the EIA Amendment Directive.

Article 1 (2)(g) of the Amending EIA Directive provides that an EIA means a process consisting of:

1. The preparation of an environmental impact assessment report by the developer;
2. The carrying out of a consultation;
3. The examination by the competent authority of the information presented in the environmental impact assessment report and any supplementary information provided, where necessary, by the developer and any relevant information received through consultation;
4. The reasoned conclusion by the competent authority on the significant effects of the project on the environment, taking into account the results of the examination referred to in point (c) and, where appropriate, its own supplementary examination; and,
5. The integration of the competent authority's reasoned conclusion into its decision.

An EIAR document is produced as the key component of the EIA process. It provides a description of:

a) A description of the project comprising information on the design, size and baseline environment;

b) Identification of the potential effects (if any - both positive and negative) that are predicted to be incurred as a result of the Proposed Development;

c) A description of any control and mitigation measures required to avoid, reduce or eliminate such potential effects;

d) A description of the reasonable alternatives studied by the persons who prepared the EIAR, which are relevant to the Proposed Development and its specific characteristics; and,

e) A non-technical summary of the information referred to in points (a) to (d).

1.8.1 The Environmental Impact Assessment Report ('EIAR')

This EIAR has been prepared in accordance with the requirements of the following legislation:

- The Planning and Development Act, 2000, as amended [4];
- Part II of the first Schedule of the European Communities (Environmental Impact Assessment ('EIA')) (Amendment) Regulations, 1999 (S.I. No. 93 of 1999) [5];
- The Local Government Planning and Development Regulations 2001 – 2018 (S.I. No. 600 of 2001 and subsequent amending legislation) [6]; and,
- European Union ('EU') (Planning and Development) (Environmental Impact Assessment) Regulations, 2018 [7].

The following existing and draft guidance were also considered:

- European Commission ('EC') *'Interpretation of definitions of project categories of Annex I and II of the EIA Directive'* (2015) [8];
- EC *'Guidance on the preparation of the Environmental Impact Assessment Report'* (2017) [9];

[1] Regulation 21, 67(d) and 69(e) came into effect on the 1st January 2019

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- EC *'Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions' (1999)* [10];
- Department of Housing, Planning and Local Government ('DoHPLG') *'Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment'* (August 2018) [11];
- Department of Environment, Heritage and Local Government ('DoEHLG') *'Quarries and Ancillary Activities – Guidelines for Planning Authorities'* (2004) [12];
- Department of Arts, Heritage and the Gaeltacht ('DoAHG') *'Wildlife, Habitats and the Extractive Industry'* (2007) [13];
- Department of Housing, Planning, Community and Local Government ('DoHPCLG') *'Implementation of Directive 2014/52/EU om the effects of certain public and private projects on the environment (EIA Directive) Circular Letter 1/2017'* (May 2017) [14];
- DoHPCLG *'Transposition of 2014 EIA Directive (2014/52/EU) in the Land-use Planning and EPA Licensing Systems Key Issues Consultation Paper'* (May 2017) [15];
- Environmental Protection Agency ('EPA') *'Advice notes on current practice in the preparation of Environmental Impact Statements'* (2003) [16];
- EPA *'Environmental Management in the Extractive Industry (Non-Scheduled Minerals)' (2006)* [17];
- EPA *'Guidelines on the Information to be contained in Environmental Impact Assessment Reports'* (2022) [18]; and,
- Office of the Planning Regulator ('OPR') *'Practice Note PN02 Environmental Impact Assessment Screening*' (June 2021) [19].

1.8.2 Assessment under Schedule 5

The relevant classes of developments that require EIA are set out in Schedule 5 of the Planning and Development Regulations 2001 (as amended). Schedule 5 transposes Annex I and Annex II of the EU EIA Directive (85/337/ECC as amended) into Irish law under Parts 1 and 2 of the Schedule. There are no new criteria under S.I. No. 296 of 2018.

The Proposed Development involves the extension to and continued operation at the Agall Quarry, which has an overall area of ca. 45ha. The Proposed Development covers an area of ca.17ha, within which the overall extraction area is ca.10.77ha.

Schedule 5 of Part 2 under item 2 b notes an EIA is required for:

> *Extraction of stone, gravel, sand or clay, where the area of extraction would be greater than 5 hectares.*

Furthermore, under Part 2, item 13a point ii, it is noted an EIA is required for:

> *Changes, extensions, development and testing - any change or extension of development already authorised, executed or in the process of being executed (not being a change or extension referred to in Part 1) which would: - result in an increase in size greater than –*
>
> - *25 per cent, or*
> - *an amount equal to 50 per cent of the appropriate threshold, Whichever is the greater.*

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Based on the scale of the Proposed Development, an EIA is required to be undertaken for the principal future use of the Site.

1.8.3 Scope of the EIAR

In accordance with the EPA Guidelines [18], the following attributes of the receiving environment and their interactions are addressed within this EIAR:

- Population and Human Health;
- Biodiversity;
- Land, Soil and Geology;
- Water;
- Acoustics (Noise and Vibration);
- Air Quality;
- Climate Change;
- Landscape and Visual;
- Cultural Heritage; and,
- Material Assets – Traffic & Transport.

As per the guidance for undertaking an EIAR under the 2014 Directive, a key aspect of the process is EIA Scoping to ensure the document is concise and focused on those topics with a clear potential for significant impact.

1.8.4 Structure of the EIAR

Table 1-1 provides a description of the EIAR structure.

Table 1-1: EIAR Structure

Title	Description
Volume 1: Non-Technical Summary ('NTS')	
NTS	The NTS contains an overview of the Proposed Development and the principal findings of the Environmental Impact Assessment ('EIA') in non-technical language.
Volume 2: Main EIAR Report	
Chapters 1-4	Chapters 1-4 introduce the Proposed Development, describe the Proposed Development, the need for the Proposed Development and the alternatives considered.
Chapters 5-14	Chapters 5-14 comprise of the assessment of predicted environmental impacts together with an evaluation of their significance and a description of any mitigation measures proposed to minimise impacts. These chapters also consider the interactions between the various environmental topics. Chapters 5-14 generally follows the structure set out below: • A brief introduction to the chapter; • An outline of the methodology employed; • A description of the existing receiving environment ('baseline') relevant to the environmental topic under consideration; • A description of the characteristics and predicted effects of the Proposed Development on the receiving environment including a description of cumulative effects where relevant;

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Title	Description
	• A description of the reductive or mitigation measures and / or the factors that will reduce or eliminate any significant environmental effects identified; • A description of the residual impact of the Proposed Development. Residual effects are the remaining impacts that will occur after the proposed mitigation measures have been taken into consideration; • A description of the interactions with other environmental attributes; • Details of any monitoring required during Site preparation and operations; • Details of any rehabilitation required; and, • Difficulties encountered in undertaking the assessment.
Chapter 15	Interactions of the Foregoing – provides an overview of the major interactions between the environmental impact topics assessed within Chapters 5-14.
Chapter 16	Chapter 16 outlines the overall Schedule of Commitments agreed by the applicant in the event that the planning application is authorised.
Volume 3: Appendices	
Appendix	Relevant topic-specific technical documentation supporting the EIAR are contained a separate Volume of the EIAR (Volume 3).
Drawings	A3 Drawings of the Proposed Development including: • Site location map; • Site Layout Map; and, • Cross Sections of the Proposed Development.

1.9 Methodology

The assessment of effects has been undertaken in accordance with best practice, legislation and guidance notes, as listed in Section 1.7. The evaluation of significance considers the magnitude of the change and the sensitivity of the resource or receptor. Unless otherwise stated, this approach has been adopted throughout the EIAR.

The criteria for determining the significance of impacts and the effects are set out in Figure 1-5 below, taken from the EPA guidance [18]. Definitions of effect, as outlined by the EPA, are included below and unless otherwise stated within the specific EIAR Chapter these definitions apply throughout this EIAR.

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Figure 1-5: Description of Environmental Effects

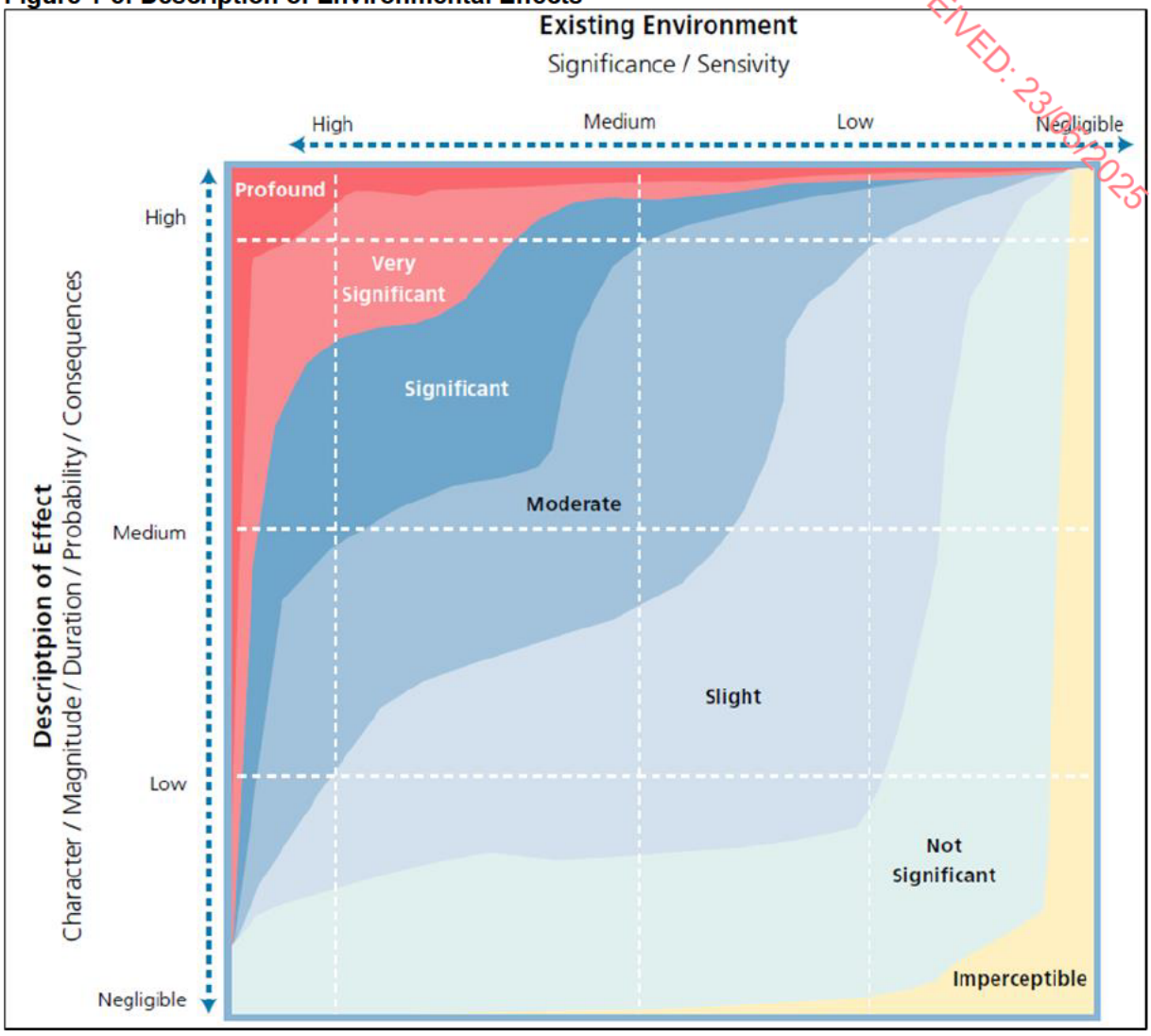


Table 1-2 defines the quality of effect from a planned project on the environment, ranging from positive to negative.

Table 1-2: Quality of Effect

Type of Effect	Quality of Effect
Positive Effects	A change which improves the quality of the environment (for example, by increasing species diversity, or improving the reproductive capacity of an ecosystem, or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
Neutral Effects	No effects or effects that are imperceptible within normal bounds of variation or within the margin of forecasting error.
Negative / Adverse Effects	A change which reduces the quality of the environment (for example lessening species diversity or diminishing the reproductive capacity of an ecosystem, or damaging health or property by causing nuisance).

Table 1-3 outlines the definitions of significance of effect from a planned project on the environment, ranging from imperceptible to profound.

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Table 1-3: Definitions of Significance of Effect

Classification	Criteria
Imperceptible	An effect capable of measurement but without noticeable consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without noticeable consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect which alters the character of the environment in a manner that is consistent with existing and emerging trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment.
Profound Effects	An effect which destroys sensitive characteristics.

Table 1-4 describes the terminology used to discuss the extent and context of an effect from a planned project on the environment.

Table 1-4: Describing the Extent and Context of Effects

Magnitude	Description
Extent	Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?).

Table 1-5 describes the probability of an effect from a planned project.

Table 1-5: Describing the Probability of an Effect

Probability	Description
Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.

Table 1-6 discusses the duration and frequency of effects from a planned project. Momentary effects lasting from seconds to minutes will often be less concerning than a long-term or permanent effect, depending on the severity.

Table 1-6: Describing Duration and Frequency of Effects

Classification	Criteria
Momentary Effects	Effects lasting from seconds to minutes.
Brief Effects	Effects lasting less than a day (<1 day).
Temporary Effects	Effects lasting less than a year (<1 year).

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Classification	Criteria
Short-term Effects	Effects lasting one to seven years (1-7 years).
Medium-term Effects	Effects lasting seven to fifteen years (7-15 years).
Long-term Effects	Effects lasting fifteen to sixty years (15-60 years).
Permanent Effects	Effects lasting over sixty years (>60 years).
Reversible Effects	Effects that can be undone, for example through remediation or restoration.
Frequency of Effects	Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).

Table 1-7 defines the types of effects that can potentially occur as a result of a planned project.

Table 1-7: Describing the Types of Effects

Magnitude	Description
Indirect Effects (a.k.a Secondary or Off-site Effects)	Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
Cumulative Effects	The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
Do Nothing Effects	The environment as it would be in the future should the subject project not be carried out.
'Worst case' Effects	The effects arising from a project in the case where mitigation measures substantially fail.
Indeterminable Effects	When the full consequences of a change in the environment cannot be described.
Irreversible Effects	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
Residual Effects	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
Synergistic Effects	Where the resultant effect is of greater significance than the sum of its constituents, (e.g. combination of SOx and NOx to produce smog).

The above terminology will be used throughout this report unless superseded by an environmental topic best practice in assessing EIA. Where specialist topics defer from these terms, a topic specific methodology will be provided for within the relevant chapter.

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1.10 Non-Statutory Consultation

In accordance with best practice guidelines [11] [18], this EIAR included non-statutory consultation. Table 1-8 below lists the consultees notified about the Proposed Development, whether a response was received, and the topics of interests raised by the consultee (where relevant).

Table 1-8: Consultation and Consultee Responses

Consultee	Date of Response	Response Method	Topics Raised	Relevant Chapter
Gas Networks Ireland	29th August 2023	Email	Gas Networks Ireland has no recorded gas network within your area of interest. Before you start work, you must have a current gas network map (or maps) for the work location. A current gas network map (or maps) must always be kept on site while work is under way.	N/a
Department of Enterprise, Trade and Employment	29th August 2023	Email	No response regarding chapters.	N/a
Department of the Environment, Climate and Communications	29th August 2023	Email	No response regarding chapters.	N/a
Department of Transport	3rd October 2023	Email	The Department had no observations to make at this point in time.	N/a
Environmental Protection Agency	29th August 2023	Email	No response regarding chapters.	N/a
ESB Network Ireland	29th August 2023	Email	No response regarding chapters.	N/a
Fáilte Ireland	7th September 2023	Email	Attached a copy of Fáilte Ireland's Guidelines for the Treatment of Tourism in an EIA for the consideration of tourism in preparation of the EIA.	N/a
Health and Safety Authority ('HSA')	15th September 2023	Email	The Health and Safety Authority (HSA), as the Central Competent Authority under the Chemicals Act, provides technical advice to the Planning Authority on major accident hazards. Since this application falls outside the scope of the relevant regulations, the HSA has no observations to offer.	N/a
Health Service Executive ('HSE')	25th September 2023	Email	Appoint a community liaison officer to facilitate regular communication with the local community.	C1
			Conduct early and meaningful public consultation to address all potentially significant impacts.	C1

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Consultee	Date of Response	Response Method	Topics Raised	Relevant Chapter
			Fully inform all affected parties, including those who may benefit, about the proposal and potential impacts.	C1
			Identify sensitive receptors and stakeholders to ensure appropriate mitigation measures are in place.	C4-15
			Host public consultation events within current government guidance.	C1
			Provide opportunities for the public to express views on the proposed development.	C1
			Demonstrate in the EIAR how public consultations have influenced the decision-making process.	C1
			Develop a dedicated website for the project with all relevant information and updates.	*
			Address length of planning permission, construction time, and potential decommissioning/restoration plans within the EIAR.	C4-C15
			Prepare a Site Restoration Plan with a timeframe and works details, to be submitted as a condition of planning permission if granted.	C3
			Consider alternative restoration plans, such as filling the quarry void and restoring it for agricultural or public amenity use.	C4
			Assess alternatives as part of the EIAR process.	C4
			Identify and address all noise-sensitive locations and potential noise and vibration impacts.	C9
			Assess appropriateness and effectiveness of noise and vibration mitigation measures.	C9
			Conduct a baseline noise monitoring survey to establish existing background noise levels.	C9
			Assess and detail predicted noise impacts during construction and operational phases.	C9
			Include a Construction Environmental Management Plan ('CEMP') in the EIAR with detailed dust control and mitigation measures.	*
			Identify all drinking water sources (surface water, groundwater, public/group schemes, private wells).	C8
			Outline measures to protect all identified water sources and supplies.	C8

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Consultee	Date of Response	Response Method	Topics Raised	Relevant Chapter
			Conduct a walk-over survey and desktop analysis to identify private drinking water wells.	C8
			Consider bedrock, overburden, vulnerability, groundwater flows, etc., when assessing impacts and mitigation measures.	C7
			Address impacts on surface water from underground cable construction.	C8
			Provide details and locations for the site office, construction compound, fuel storage, sanitation, canteen, wheel washing, First Aid facilities, wastewater disposal, and potable water supply.	C3
			Identify all existing and proposed quarries, industries, and housing developments in the vicinity.	C5
			Assess the cumulative impact of the proposed quarry alongside other developments in the area.	C4-C15
Inland Fisheries Ireland	29th August 2023	Email	No response regarding chapters.	N/a
Offaly County Council	31st August 2023	Email	Pre-plan meeting reference number TU2325. Queries on setback distances, HGV numbers, protection of groundwater, public consultation considerations	C3, C14, C8 C1
Office of Public Works ('OPW')	29th August 2023	Email	No response regarding chapters.	N/a
Transport Infrastructure Ireland ('TII')	29th August 2023	Email	No response regarding chapters.	N/a
Uisce Eireann	1st September 2023	Email	Where the development proposal has the potential to impact an Uisce Éireann Drinking Water Source(s), the applicant shall provide details of measures to be taken to ensure that there will be no negative impact to Uisce Éireann's Drinking Water Source(s) during the construction and operational phases of the development. Hydrological / hydrogeological pathways between the applicant's site and receiving waters should be identified as part of the report.	C8
			Where the development proposes the backfilling of materials, the applicant is required to include a waste sampling strategy to ensure the material is inert.	N/a
			Mitigations should be proposed for any potential negative impacts on any water source(s) which may	C8

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Consultee	Date of Response	Response Method	Topics Raised	Relevant Chapter
			be in proximity and included in the environmental management plan and incident response.	
			Any and all potential impacts on the nearby reservoir as public water supply water source(s) are assessed, including any impact on hydrogeology and any groundwater/ surface water interactions.	C8
			Impacts of the development on the capacity of water services (i.e. do existing water services have the capacity to cater for the new development). This is confirmed by Uisce Éireann in the form of a Confirmation of Feasibility ('COF'). If a development requires a connection to either a public water supply or sewage collection system, the developer is advised to submit a Pre-Connection Enquiry ('PCE') enquiry to Uisce Éireann to determine the feasibility of connection to the Uisce Éireann network.	C8
			All pre-connection enquiry forms are available from https://www.water.ie/connections/connection-steps/.	N/a
			The applicant shall identify any upgrading of water services infrastructure that would be required to accommodate the proposed development.	N/a
			In relation to the management of surface water; the potential impact of surface water discharges to combined sewer networks and potential measures to minimise and or / stop surface waters from combined sewers.	C8
			Any physical impact on Uisce Éireann assets – reservoir, drinking water source, treatment works, pipes, pumping stations, discharges outfalls etc. including any relocation of assets.	C8
			When considering a development proposal, the applicant is advised to determine the location of public water services assets, possible connection points from the applicant's site / lands to the public network and any drinking water abstraction catchments to ensure these are included and fully assessed in any pre-planning proposals. Details, where known, can be obtained by emailing an Ordnance Survey map identifying the proposed location of the applicant's intended development to datarequests@water.ie	C8
			Other indicators or methodologies for identifying infrastructure located within the applicant's lands are the presence of registered wayleave agreements, visible manholes, vent stacks, valve chambers, marker posts etc. within the proposed site.	N/a
			Any potential impacts on the assimilative capacity of receiving waters in relation to Uisce Éireann discharge outfalls including changes in dispersion /	C8

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Consultee	Date of Response	Response Method	Topics Raised	Relevant Chapter
			circulation characterises. Hydrological / hydrogeological pathways between the applicant's site and receiving waters should be identified within the report.	
			Any potential impact on the contributing catchment of water sources either in terms of water abstraction for the development (and resultant potential impact on the capacity of the source) or the potential of the development to influence / present a risk to the quality of the water abstracted by Uisce Éireann for public supply should be identified within the report.	C8
			Where a development proposes to connect to an Uisce Éireann network and that network either abstracts water from or discharges wastewater to a "protected"/ sensitive area, consideration as to whether the integrity of the site / conservation objectives of the site would be compromised should be identified within the report.	N/a
			Mitigation measures in relation to any of the above ensuring a zero risk to any Uisce Éireann drinking water sources (Surface and Ground water)	C8

*Due to the long-established nature of the existing quarry, direct communication with the local residents was undertaken prior to planning submission, rather than the use of online websites – all documents will be available online and in print via the planning offices and planning portal upon submission.

A copy of the consultation email content and the attached EIAR Consultation document are presented in Appendix 1-1. Copies of the submissions received from the Consultees are presented in Appendix 1-2. All consultation documents were issued on the 29th August 2023.

A pre-planning meeting was held with Offaly Couty Council on 6th February 2024, detailing the application and proposed development works. Feedback from that meeting was implemented through design improvements.

In September and October 2024, the Applicant consulted with the six residential properties to engage with local residents living to the northwest of the application Site and within 100m of the proposed extension lands. An overview of the design and future intent was presented and feedback was received. Following the concerns raised during this meeting, an area of known aggregate reserves was removed from the application Site to increase the set-back of future operations under this application from residents to a minimum distance of 80m. Appendix 1-3 presents the information shown to the residents at the first meeting, and the follow-up letter sent to residents following the implementation of design changes following their feedback.

1.11 Project Team

The in-house Malone O'Regan Environmental ('MOR Environmental') project team included the following personnel.

Table 1-9: MOR Environmental In-House Project Team

Chapter(s)	Name	Role	Relevant Qualifications
All	Kenneth Goodwin	Associate Director Project Director;	BSc, Full Member IOA, IEMA Practitioner, 15+ years' experience

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Chapter(s)	Name	Role	Relevant Qualifications
Chapter 1-4	Martin Kearns	Environmental Team Lead / Project Manager	BSc, with 10+ years' experience
Chapter 5	David Dwyer	Environmental Team Lead / Project Manager	BA, MSc with 10+ years' experience
Chapter 6	Dyfrig Hubble	Associate Director-Ecology	BSc, MSc, CIEEM Full Member, 18+ years' experience.
Chapter 7	Laura McGrath	Senior Environmental Consultant	BSc., M.Sc., PGeo with 10+ years' experience.
Chapter 8	Mark Day	Environmental Team Lead / Project Manager	BEng(Tech) Env. Studies with 13+ years' experience
Chapter 9	Kenneth Goodwin	Associate Director, Chapter 9: Acoustics (Noise and Vibration);	BSc, Full Member IOA, IEMA Practitioner, 14+ years' experience
Chapter 10-11	Klara Kovacic	Associate Director	MEng, MSc, DiB, Chartered Environmentalist with 15+ years' experience.
Chapter 12	Refer to Table 1-10		
Chapter 13	Refer to Table 1-10		
Chapter 14	Refer to Table 1-10		
Chapter 15-16	Martin Kearns	Environmental Team Lead / Project Manager	BSc, with 10+ years' experience

In addition to the MOR Environmental project team, the team included the following external specialists:

Table 1-10: External Environmental Consultants

Primary Author	Company	Role	Relevant Qualifications
Rory Curtis	Macro Works	Photomontages, Chapter 12: Landscape and Visual.	BSc, H. Dip Env Eng, MSc, 6+ years' experience. Macroworks have specific experience that extends to the assessment of over 20 quarry and restoration projects
Dr. Charles Mount	Not applicable	Archaeology and Chapter 13: Cultural Heritage	M.A. and Ph.D. degrees in Archaeology and a professional diploma in EIA and Strategic Environmental Assessment ('SEA') Management
Richard Frisby	Roadplan	Chapter 14: Traffic Impact Assessment	BA, BAI, MSc, RSA Cert Comp, MIEI,

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Primary Author	Company	Role	Relevant Qualifications
Kenneth Dillon	Malone O'Regan Consulting Engineers	Planning drawings	B.Eng.MIEI

1.12 Abbreviations and Definitions

A list of common abbreviations used within this document are presented below in Table 1-11 below.

Table 1-11: Abbreviations and Definitions

Abbreviation	Definition
µg	Microgram
µm	Micrometre
AADT	Annual Average Daily Traffic
AQS	Air Quality Standard
BAT	Best Available Technology
B.C. / B.C.E.	Before Christ / Before Common Era
B.S.	British Standard
Ca.	Circa
CAFÉ	Clean Air for Europe (European Directive 2008/50/EC)
CDP	County Development Plan
CH4	Methane
CIRIA	Construction Industry Research and Information Association
CO	Carbon Monoxide
CO2	Carbon Dioxide
CO_2e	Carbon Dioxide equivalent
dB(A)	A-weighted decibel
DAFM	Department of Agriculture, Fisheries and the Marine
DAHG(I)	Department of Arts, Heritage, Gaeltacht (and the Islands)
DECLG	Department of the Environment, Community and Local Government
DHHLG	Department of Health, Housing and Local Government
DRA	Dust Risk Assessment

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Abbreviation	Definition
EC	European Community
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
EU	European Union
GHG	Greenhouse Gas(es)
GSI	Geological Survey of Ireland
Hr	Hour
Ha	Hectare
HGV	Heavy Goods Vehicle
LAeq	A-weighted equivalent continuous level
LA90	The A-weighted 90th percentile statistical result from a sound measurement
LAP	Local Area Plan
LEA	Local Electoral Area
LVIA	Landscape and Visual Impact Assessment
mOD	Metres above Ordnance Datum (Malin Head)
NHA	Natural Heritage Area
NIAH	National Inventory of Architectural Heritage
NOx	Oxides of Nitrogen
NO2	Nitrogen Dioxide
NPWS	National Parks and Wildlife Service
NRA	National Roads Authority
NSL	Noise Sensitive Location
NSR	Noise Sensitive Receptor
OD	Ordnance Datum
OPW	Office of Public Works
OS	Ordnance Survey
pNHA	Proposed Natural Heritage Area

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Abbreviation	Definition
PM	Particulate Matter
PM10	Particulate Matter with a diameter of ≤10µm
RMP	Record of Monuments and Places
RWMP	Resource and Waste Management Plan
SAC	Special Area of Conservation
SPA	Special Protection Area
S.I.	Statutory Instrument
SMR	Sites and Monuments Record
SO2	Sulphur Dioxide
TFI	Transport For Ireland
TII	Transport Infrastructure Ireland
UWWTP	Urban Wastewater Treatment Plant
WFD	Water Framework Directive
Yr	Year

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2 PLANNING CONTEXT AND THE NEED FOR THE PROPOSED DEVELOPMENT

2.1 Introduction

This chapter of the EIAR sets out the need for the Proposed Development through analysis of the most recent development plans, planning guidelines, policy frameworks and reports issued by the relevant county, regional, state and semi-state bodies. It also provides a summary of the planning history of the Site and adjoining lands.

2.2 Planning Application History

The Agall Quarry has origins dating back to before the Local Government (Planning and Development) Act 1963 came into force. An overview of the Site's compliance with the amended Planning Act quarry registration process is presented below.

2.2.1 Section 261 Registration

The Agall Quarry was registered under Section 261 of the Planning and Development Act as amended, as QY 28, later reviewed to EUQY028.

2.2.2 Section 261A Review

A notice was issued under the provisions of Section 261A, following a review by An Bord Pleanála, on 22nd August 2014 instructing the owner / operator to apply for substitute consent ('SC') for the works undertaken at the Agall Quarry and that the application for substitute consent be accompanied by a remedial Environmental Impact Statement ('EIS'). An application for substitute consent accompanied by the above document, was lodged with An Bord Pleanála on the 1st of April 2015 and included for ongoing restoration. The application for Substitute Consent was reference number: 19.SU.0131. This application was granted by An Bord Pleanála in April 2017.

2.2.3 Section 37L Application

Under the provisions of the Planning and Development Act, 2000, as amended, and Section 37L, an application was submitted to the Bord, alongside the substitute consent application, to further develop the quarry, including the extension of the area of the quarry by circa 9.8 hectares in line with the existing quarry floor (65 meters above Ordnance Datum ['maOD']). The extension area was to be utilised for dry screening and short-term stockpiling of aggregates. This further development application additionally provided for haul routes, road access, mobile and fixed dry screening plant, stockpiling areas and associated power and water infrastructure in the existing and extended quarry areas. This application was noted as 19.QD.0008 with An Bord Pleanála.

This application was granted by An Bord Pleanála in April 2017 for a period of 20 years and is the current extant extraction permission at the Agall Quarry.

2.3 National Planning Context

Project Ireland 2040 was launched by the Government in February 2018 [20] to supersede the National Spatial Strategy. Project Ireland 2040 is the overarching policy and planning framework for the social, economic and cultural development of Ireland over the next 20 years.

The National Planning Framework is a strategic high-level plan for shaping future growth and development, while the National Development Plan outlines a strategy for investment of capital of over €116 billion to enable Project Ireland 2040. Sustainable development is at the core of Project Ireland 2040. The focus is based on people, places and building communities.

Project Ireland 2040 currently incorporates two policy documents:

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- The National Planning Framework ('NPF') (2018) [21]; and,
- The updated National Development Plan 2021 – 2030 (2021) [22].

Specifically, regarding the quarry industry, the Government of Ireland's guidelines for quarries [12], published by the Department of Housing, Local Government and Heritage, outline best practices for quarry operations. These guidelines cover various aspects, including environmental management, planning, and safety. Key points include:

- Ensuring that quarries operate within the framework of the Safety, Health and Welfare at Work (Quarries) Regulations, 2008 (now amended);
- Recognising that quarries vary greatly in size and environmental impact, and tailoring planning responses accordingly; and,
- Emphasising the importance of environmental management to mitigate impacts on biodiversity, water quality, and air quality.

2.3.1 Project Ireland 2040 – National Planning Framework

The First Revision of the NPF, was published on the 8th April 2025, and approved by both Houses of the Oireachtas on 30th April 2025 [14]. The NPF is the national policy for the strategic planning and sustainable development for Ireland up to 2040.

The NPF states the importance of the aggregates industry in delivering Ireland's national infrastructure:

> *"Extractive industries are important for the supply of aggregates and construction materials and minerals to a variety of sectors, for both domestic requirements and for export. The planning process will play a key role in realising the potential of the extractive industries sector by identifying and protecting important reserves of aggregates and minerals from development that might prejudice their utilisation.*
>
> *Aggregates and minerals extraction will continue to be enabled where this is compatible with the protection of the environment in terms of noise, air and water quality, natural and cultural heritage, the quality of life of residents in the vicinity, and provides for appropriate site rehabilitation particularly with respect to opportunities that may be provided for enhancement or restoration of nature in line with EU policies, such as the Nature Restoration Law, the EU Green Deal and EU Biodiversity Strategy 2020, and legislative instruments".*

The National Framework also highlights the need for additional housing within Ireland:

> *"To meet projected population and economic growth as well as increased household formation, annual housing output will need to increase to approximately 50,000 homes per annum in the years to 2040 and will be subject to monitoring and review."*

The following National Policy Objectives ('NPO') directly relates to quarries and the extraction industry:

NPO-30

> *"Facilitate the development of the rural economy, in a manner consistent with the national climate objective, through supporting a sustainable and economically efficient agricultural and food sector, together with forestry, fishing and aquaculture, energy and extractive industries, the bio-economy and diversification into alternative on-farm and off-farm activities, while at the*

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same time noting the importance of maintaining and protecting biodiversity and the natural landscape and built heritage which are vital to rural tourism."

NPO-42

"To target the delivery of housing to accommodate approximately 50,000 additional homes per annum to 2040."

The expansion of quarrying activities at the Site will be a direct fulfilment of the national development objectives outlined in the NPF by providing aggregates for the local sector. The Applicant is currently the only Irish company manufacturing large high quality concrete products for roads, surface water drainage, land drainage and large-scale projects. The provision of such products is essential to deliver Ireland's national infrastructure. The Proposed Development will contribute to the expansion of the rural economy of Offaly by promoting local employment. This will build on the Midlands economic base and thus encourage further economic development and promote more self-sustaining rather than commuter-driven activity in this region.

2.3.2 Project Ireland 2040 – National Development Plan (2021-2030)

The Project Ireland 2040 National Development Plan (2021-2030) ('NDP') is the national policy for development, which focuses on developing solutions for housing, transport, healthcare, jobs and climate change [20].

The NDP 2021-2030 estimates that the public investments in infrastructure etc. laid out in the NDP will sustain approximately 80,000 direct and indirect construction jobs per annum over the lifetime of the plan. It outlines the intent to deliver approximately 6,000 affordable homes per year and to improve regional accessibility through enhanced public infrastructure. Multiple National Road projects are also outlined in the NDP to improve connectivity and accessibility.

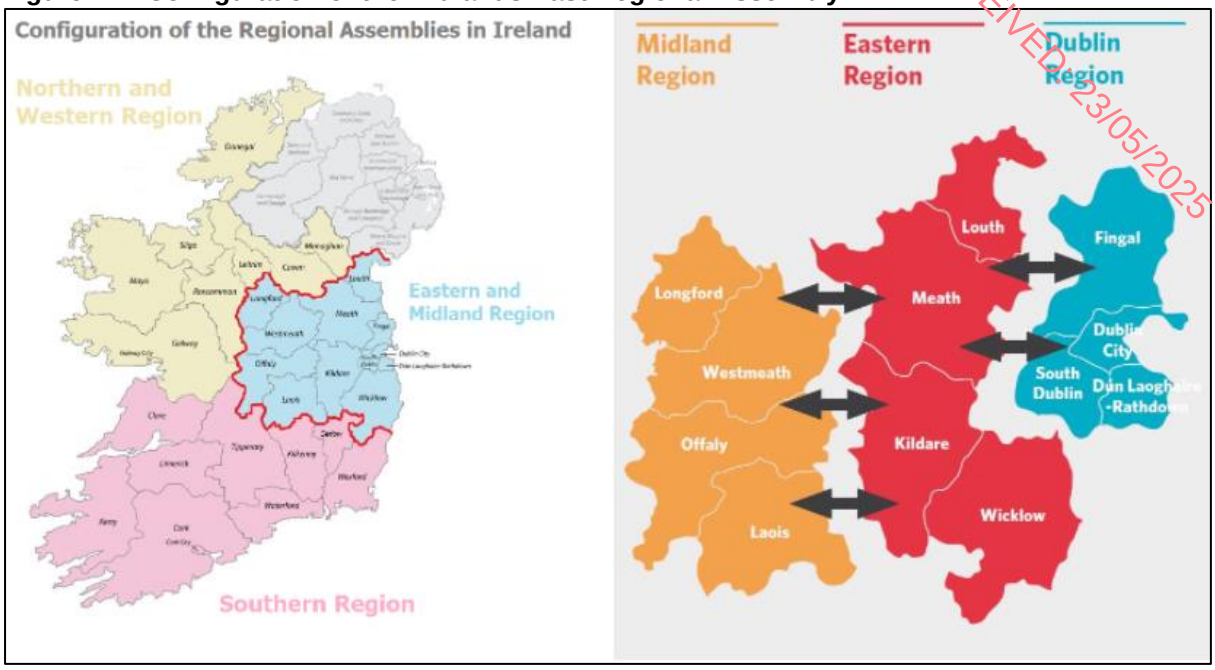
2.4 Regional Planning Policy Context

The Local Government Reform Act 2014 [23], saw the creation of Regional Assemblies. County Wicklow lies within the Eastern and Midland Region, which comprises the following counties (see Figure 2-1 below [20].):

- Kildare;
- Laois;
- Longford;
- Louth;
- Meath;
- Offaly;
- Westmeath; and,
- Wicklow.

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Figure 2-1: Configuration of the Midlands East Regional Assembly



The Eastern and Midland Regional Assembly ('EMRA') created a Regional Spatial and Economic Strategy 2019-2031 ('RSES') [24] which is a strategic plan and investment framework to shape the future development of the region. The strategy includes the following Regional Policy Objective ('RPO') specifically noting the importance of the aggregate industry to the Region's rural employment and economic strength:

> *'**RPO 6.7**: Support local authorities to develop sustainable and economically efficient rural economies through initiatives to enhance sectors such as agricultural and food, forestry, fishing and aquaculture, energy and extractive industries, the bioeconomy, tourism, and diversification into alternative on-farm and off-farm activities, while at the same time noting the importance of maintaining and protecting the natural landscape and built heritage.'*

Furthermore, the RSES looks to the ongoing need for investment in infrastructure (which will require a local supply of good quality aggregate) within the Region through RPO 6.33:

> *'**RPO 6.33**: With the allocation outcomes from the competitive calls EMRA, in cooperation with the Department of Public Expenditure and Reform (DPER), will prepare a Regional Investment Plan for the Region in accordance with Project Ireland 2040 and the Public Spending Code.'*

Prior to the creation of EMRA, County Offaly fell within the Midland Regional Authority ('MRA'). This Authority released Regional Planning Guidelines (2010-2022) ('RPGs') [25] which included an 'Economic Development Strategy' outlining the perceived existing and potential areas for future growth and development in the Midland Region.

The RPG document aimed to concentrate on sectors where, for reasons of location, infrastructure or natural resources, there existed a competitive advantage. Extractive industries such as peat and quarrying benefit the local economy, as industries associated with these sectors locate near the resource. Quarry expansion will lengthen the lifespan of the extraction at the Site and thus provide longer term benefit to the local economy.

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The Midland RPG stated that:

> *"Targeted investment in transport and infrastructure is a fundamental element in the creation of a more competitive, sustainable region with an improved quality of life for all."*

The Proposed Development will assist in reaching these regional objectives, as it will provide essential aggregate for infrastructure required to promote the sustainable development of County Offaly and the surrounding gateway towns of the Midlands.

2.5 Local Planning Policy Context

The Offaly County Development Plan ('OCDP') 2021-2027 [26] provides a framework for the continued development of the county. The OCDP contains several objectives which relate directly to quarries and the extraction industry, including:

Biodiversity and Landscape Policies

BLP-12

> *'It is Council policy to assess the impact of proposals for quarry development on nearby eskers, with reference to their status or relative importance, for example, amenity, landscape and scientific value in the context of the overall esker system.'*

BLP-13

> '*It is Council policy to recognise the natural heritage value of disused quarries as rich habitats and to encourage landowners to preserve quarries post extraction as habitats rather than levelling or infilling the quarry area where possible subject to health and safety considerations and the protection of the relevant conservation objectives, qualifying interests and integrity of Natura 2000 sites.'*

Rual Economic Development Policies

REDP-03

> *'It is Council policy to continue to protect existing resource-based industry from encroachment by residential development, for example mining, quarrying, gravel pits and intensive agriculture.'*

REDP-19

> *It is Council policy to ensure those extractions (quarries / sand and gravel pits) which would result in a reduction of the visual amenity of Areas of High Amenity, eskers, esker landscapes, protected views or damage to designated sites, habitat types or species shall not be permitted. It is Council policy that all such workings should be subjected to landscaping requirements and that worked out quarries should be rehabilitated to a use agreed with the Council which could include recreational, biodiversity, amenity or other end-of-life uses. Planning applications for extraction shall be assessed against section 28 Ministerial Guidelines.*

SMAP-35

> *It is Council policy that in considering applications for quarries, the Council shall seek to ensure access to the highest possible category of the road network hierarchy.*

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The CDP Chapter 13: Development Management Standards details the laws and guidelines which the Council will have regard to when assessing planning applications under DMS-112 and states:

> *'The Council favours the use of existing licensed quarries over proposals for extraction from green field sites. There is a presumption against new quarry developments on the county's eskers.'*

and,

> *'This list is not exhaustive and the Council may consider other requirements contained in the chapter on a case by case basis with planning applications should the need arise.'*

2.6 Need for the Development

The Proposed Development seeks to allow extension of the existing Agall Quarry, Co. Offaly. This will allow for the continuation of quality aggregate supply to the already established market. The benefit of maintaining this market for the economic growth of the region is in congruence with the aims set out in the OCDP.

The policies of the local and strategic plans for the Midlands area, as outlined in Sections 2.5 and 2.6 above, are targeted at development and increases in employment and infrastructure for the region and nationally. These plans will, therefore, require the supply of good quality aggregate material from a selection of competitive quarry operators and quarry sites.

The Proposed Development will utilise the existing infrastructure within the existing quarry which will continue to operate during the lifetime of the Proposed Development, with impacts, where deemed relevant, assessed cumulatively within this EIAR.

The Agall Quarry is a key resource for the operation of the Applicant's manufacturing plant, which directly supplies the housing market with high-quality concrete products. The Tullamore facility is a concrete manufacturing plant, including pipes and tiles. These products are supplied both nationally and internationally and are essential to deliver Ireland's national infrastructure. The Proposed Development will also support jobs in manufacturing, quality assessment, research and development and haulage.

With increasing lands designated under various protection, many locations with viable gravels are no longer practicable for development, either through Natura 2000 designation, Landscapes and Views by County Development Plans or proximity to urban developments / local area zoning designation. As such, viable reserves within lands that are open in principle to development, and that are connected to authorised operational quarries are limited in number.

2.6.1 Essential Aggregates: Providing For Ireland's Needs to 2040

Following the launch of Project Ireland 2040, the Irish Concrete Federation released the report "Essential Aggregates: Providing For Ireland's Needs to 2040" [1]. It notes the importance of aggregates identified in the National Planning Framework 2018, stating:

> *"It is essential that the importance of aggregates and aggregate based products to Ireland's future is recognised by Government and that Ireland's strategic reserves of aggregates are identified and protected and their use enabled in a sustainable manner. It is equally important that the quarrying industry plays its part in ensuring that operations are carried out in a sustainable manner and that the state's planning enforcement and procurement functions ensure that only authorised operators are entitled to supply the marketplace"*

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The document breaks down the National Planning Framework 2018 into essential points, identifying both the restricted accessibility of aggregates for extraction to areas that they occur in as well as a demand for "approximately 1.5 billion tonnes of aggregates" required to facilitate the goals of Project Ireland 2040. It notes that there are arising scarcities in particular aggregate products, such as sand, where:

> *"…in the eastern and midland regions of the country [scarcities] are already emerging as terrestrial sources of aggregates from sand and gravel and rock deposits continue to be diminished"*

Therefore, based on this report, there is a clear ongoing demand for aggregates to meet the goals of Project Ireland 2040. Given arising scarcities noted in the report and the protection of many aggregate reserve areas under County Geological Sites ('CGS'), protected culturalm / heritage site, and on or adjacent national and European protected ecological sites, continued operation of the quarry through the Proposed Development help maintain the supply of high-quality concrete products nationally and help facilitate the goals of Project Ireland 2040.

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3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

3.1 Introduction

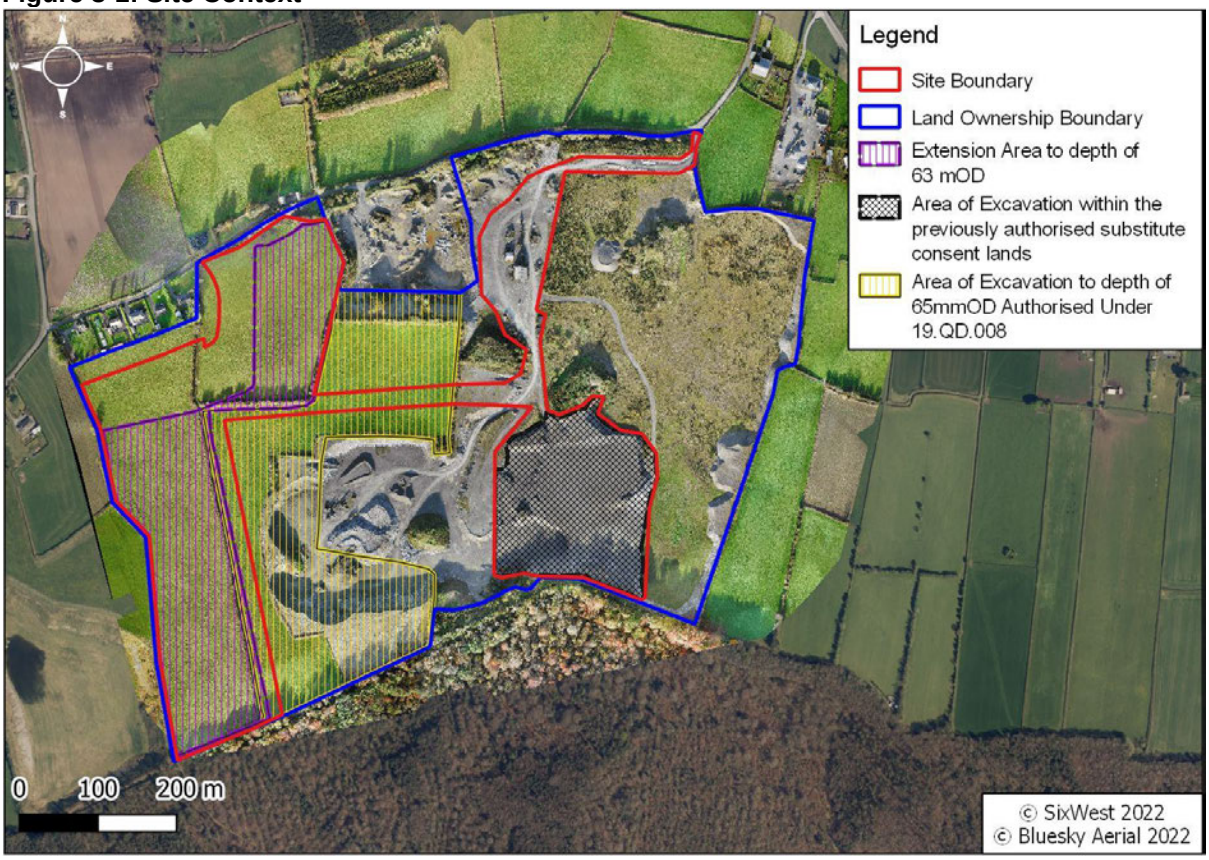
This Chapter provides a detailed description of the Proposed Development comprising information on the Site, design, size and other relevant features.

3.2 Current Context of the Proposed Development

The Site is located within the Agall Quarry. The lands are under the control of the Applicant and lie in the townlands of Glaskill and Agall, Co. Offaly. The Site is located within a predominately rural and agricultural landscape and is accessed via the L20113, which joins the L2011 local road to the east.

The Site is predominately comprised of areas of agricultural grassland with sections of hedgerows and treelines along the northern perimeter, followed by residential properties. The Site also includes areas of the existing Agall Quarry operations. The Site is bordered to the south by mixed-broadleaved woodland, to the east by the existing operations of the Agall Quarry and restored lands of the Agall Quarry, and to the west by agricultural grassland. Refer to Figure 3-1 below.

Figure 3-1: Site Context



Adjoining the western boundary of the Site is an agricultural field historically utilised for aggregate extraction, refer to Chapter 2 above. This field was restored to an approximate topographical level of 59mOD to 63mOD with an original field height of ca. 77mOD to 80mOD.

The local road to the north, the L20113 varies in elevation from the west (ca. 68mOD) to the east at the quarry entrance (ca. 59mOD). This is a narrow road, with overhanging tree canopy as it passes the landholding. Residential homes are present to the northwest of the Site along the L20113 at variable distances between 20m and 30m to the north of the Site boundary. The

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distance from the Site entrance to the junction with the L2011 road, is ca. 270m, with low height managed hedgerows.

To the east of the Site, there is a mix of agricultural fields, utilised in the feeding of livestock, farmyards and commercial use, with residential homes along the L2011. The currently restored lands within the eastern portion or the Site are ca. 65mOD to 66mOD, while the agricultural lands to the east rise from ca. 71 mOD to 75mOD.

The southern boundary of the Site rises to ca. 79mOD to 83mOD, prior to entering the cover of the mixed woodland of Blackwood Forest. This woodland is owned and managed by Coillte who identifies it as an Oak Ash woodland with young native woodland and mixed high forest on an old woodland site.

The Site is accessed solely via the Agall Quarry entrance to the northeast and onto the L20113, which connects to the Mucklagh to Rahan Road (L2011), ca. 270m from the quarry entrance.

North of the Site and the local road L20113, there is a spring utilised for the supply of water to the local Group Water Scheme. This spring, known as the Agall Water Supply Scheme had a groundwater protection zone developed in April 2021 by the Geological Society of Ireland ('GSI'). The groundwater supply notes the operational quarry and Blackwood in proximity to the spring source and within the northern portion of the protection zone which extends southward to Blue Ball. Further assessment of the potential effects on water is presented in Chapter 8.

The local population is relatively dispersed, with linear and single housing / farmhouses being the dominant settlement pattern. The local residents are shown in Figure 5-4 below.

3.2.1 Scale of the Proposed Development

The land at the Agall Quarry under the control of the Applicant covers an area of ca. 45 ha in size. The Site lies within this boundary and is ca. 17ha, distributed as follows:

- Ca. 11ha for the proposed greenfield extension, of which ca. 6.96ha is the proposed extraction area;
- Ca. 3.81ha for proposed extraction within the previously authorised substitute consent lands; and,
- Another ca. 2ha. which relates to continued use of the existing onsite infrastructure, including processing plant, wheel wash, site access, office / welfare unit, and continued temporary storage and processing of aggregates.

The layout of the various elements on the Site is presented in Figure 1-2 above. The Proposed Development will enable the continued extraction of key aggregates from the Agall Quarry to supply the Condron Concrete facility in Tullamore, extending the operational life of the quarry by up to 30 years from the date of grant and is necessitated by the strong economic growth experienced by the Applicant since the current permission was granted at the quarry in 2017, refer to Chapter 2 above.

The Proposed Development will see a continuation of existing activities on site, with works expanding laterally to the west and north. Extraction has been permitted to date to a depth of ca. 65mOD. The Proposed Development will increase the depth of extraction to ca. 63mOD within the relevant extraction areas.

The Proposed Development incorporates distinct elements, which are presented below in further detail.

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3.3 Development Design and Management

The Proposed Development design considerations and key elements are discussed below in detail. This covers operational aspects such as operational hours, parking, water supply, traffic management, key production plant, welfare and re-fuelling.

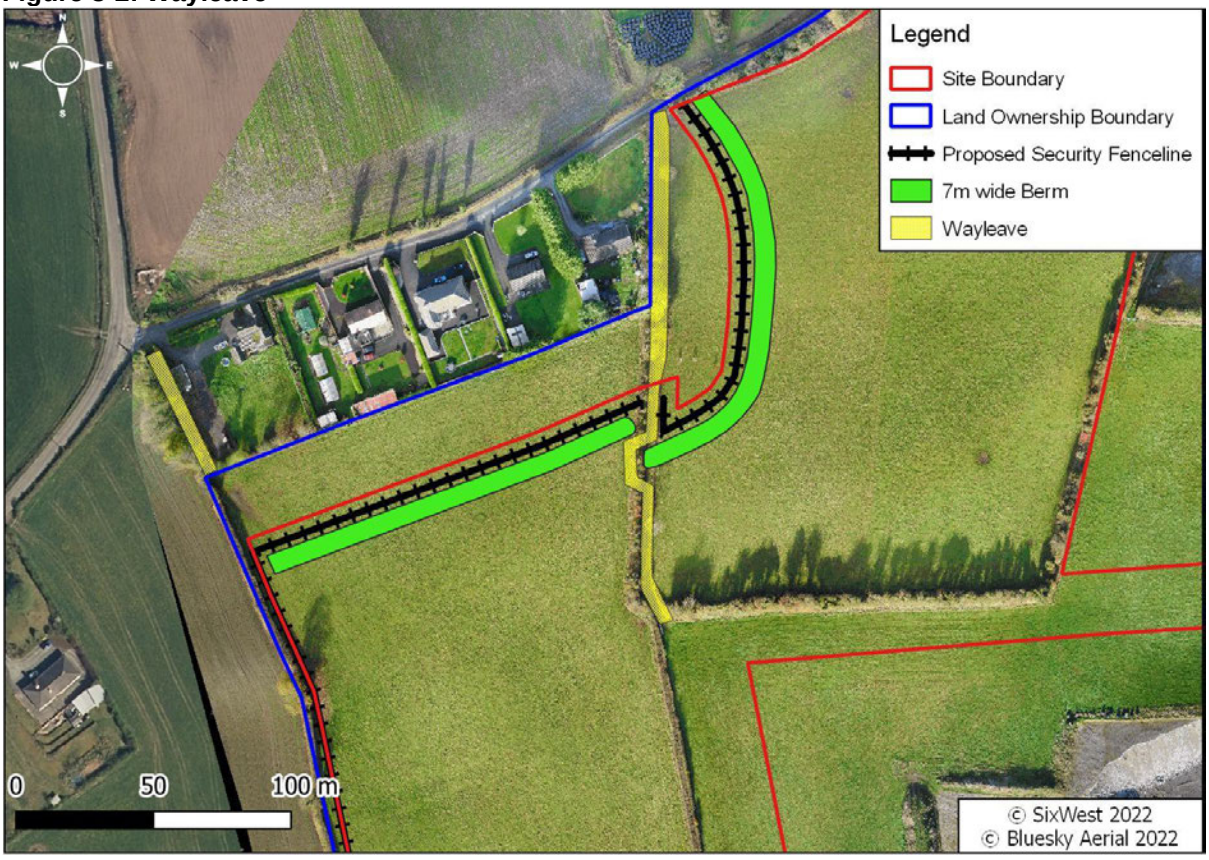
Although some elements of preliminary construction / enabling works will form part of the Proposed Development, no new plant or buildings are required to successfully undertake this project, as the existing haulage roads, fixed plant and welfare will be used. The construction/enabling works will include the works detailed below.

Topsoil to be stripped from the Site will be reused, where possible, in two screening berms, ca. 7m wide and 3m high. This will ensure that impacts on the soil are minimised / avoided. These berms will be located within the northwest portion of the Site, in between the proposed extraction area and the residential dwellings that border the Site. Establishment of the proposed berms close to the northern boundary of Folio OY307f and close to the western boundary of Folio OY3342F. The northern berm will be planted with native trees in a low-density planting programme, along with additional tree planting on the residential (northern) slope of the field. A hedgerow will then be planted north of this low-density tree planting along with a security fence consisting of wooden post and wire mesh fencing, ca. 2m tall. Two mammal gates will be introduced along this security fence, refer to Appendix 6-1 for further details. A hedgerow will then be planted north of this fence.

The western berm will be seeded to bind the soil and a security fence, as above, using timber posts and mesh, will be erected on the residential side of this berm.

There is an existing wayleave that will be facilitated through the berms. Refer to Figure 3-2 below, which presents an extract of this detail within design drawing 110 submitted with this application.

Figure 3-2: Wayleave



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During the initial 5 years following the planting, an ecological review of the planting will be undertaken seasonally, and any trees or planting not successful will be identified and replaced.

Development phasing of the works is outlined in section 3.4 below.

3.3.1 Construction / Operational Hours and Staffing

The operational hours for the Proposed Development will reflect the current operational hours of the Agall Quarry under 19.QD.0008 which are:

- 07:00 – 18:00 Monday – Friday;
- 07:00 – 14:00 Saturday; and,
- Closed Sundays and Bank Holidays.

The Agall Quarry supports two full-time employees arising from onsite personnel and an additional five full-time employees arising from hauliers. The Proposed Development will not result in a change to employment.

3.3.2 Car Park

Car parking facilities for onsite personnel will be maintained within the authorised quarry, located near the fixed plant building. No additional parking is proposed as part of the Proposed Development. Existing onsite parking is sufficient and will continue to be.

3.3.3 Access Route / Security

The existing entrance, located just off the local road, will be maintained as the ongoing access and egress route from the Agall Quarry. This road has a secure gate to prevent unauthorised access, as shown in Plate 1-2 above, which is closed outside of operational hours.

3.3.4 Water Abstraction

Water abstraction is from the existing well (PW1) located along the northern edge of the Agall Quarry and serves to fill the pre-existing wheel wash and sprinkler system. Low volumes of water are required to operate this system (ca. $3m^3$/day). The volumes of water required will remain unchanged as a result of the Proposed Development.

3.3.5 Wheel Wash

From within the gate, the initial portion of the access road is tarmac with a wheel wash and sprinkler system deployed along the route for dust control. Drainage from the road is to the haul road edges where it percolates to the ground. Refer to Plate 3-1.

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Plate 3-1: On-site Wheel wash



The wheel wash is periodically emptied into a secure container onsite, prior to short term storage and removed by competent and authorised contractors. Top-up of the wheel wash is supplied by PM1.

3.3.6 Processing Plant, Machinery and Storage

The access route incorporates the main shed located towards the centre of the Site (Plate 3-4). The fixed processing plant is partially housed within this shed. This plant provides for additional screening of extracted aggregates on the Site and is used on occasion. It is intended that mobile processing machinery (Plate 3-2 below) will be used to process aggregates closer to the working face and also continue to utilise the fixed plant on occasion with the Proposed Development.

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Plate 3-2: Mobile Plant Equipment



Plate 3-3: Fixed Plant Equipment



Plate 3-4: Storage Shed



Plate 3-5: Excavator



3.3.7 Welfare

Adjacent to the pumphouse is the onsite canteen unit for onsite staff, and an office unit (Plate 3-6 below). A toilet is located beside the Storage Shed (Plate 3-4). It discharges to an underground tank which is emptied as required by a licensed contractor and in accordance with the requirements of relevant waste legislation.

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Plate 3-6: Existing Canteen and Pumphouse



3.3.8 Fuel and oil storage

No fuel will be stored within the Site. Any oils (and/or lubricants) will be stored in a storage container onsite. Re-fuelling of mobile plant will continue to take place using a fuel truck direct from a fuel merchant when required.

The existing fixed screening plant will be utilised to provide secondary / tertiary processing of aggregate from the Site within the Agall Quarry. This will continue to be refuelled using a fuel truck direct from a fuel merchant when required

It is important to note that all plant and machinery subject to refuelling procedures will be refuelled by a competent person utilising a drip tray. In addition, absorbent sands and a full spill kit system are stored within the Quarry.

Nonetheless, environmental risks to soils and groundwater and relevant mitigation measures are outlined in Chapter 7 (Lands, Soils and Geology) and Chapter 8 (Water).

3.4 Development Phasing

The extent of the phasing plan and individual phases is shown in Figure 3-3 below and forms the current best knowledge in terms of an approach.

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Figure 3-3: Proposed Extraction Phasing



The extraction area will be cleared, and aggregates removed in a structured manner over time to minimise exposed ground. The future extraction faces will be subject to changes depending upon the available type of aggregate in each section of the Site, and the needs of the Applicant over time. The proposed extraction phasing plan will be carried out alongside the current authorised phasing plan within the Agall Quarry.

The northern extraction phase (Phase D), approaching the local road will likely be carried out in 20 – 25 years' time and this incorporates a sloping topography to the roadside, and setbacks from housing and third-party lands to the west.

The western phase, Phase B is a similar size to the existing extraction face and mirrors the multiple aggregates that have been identified within this Site by the Applicant. This will be processed in line with aggregates remaining in Phase A, which is located within the main quarry to the east. It is planned that activities will commence on the south and central sections, closest to Blackwood, and move in a northerly direction.

Phase C, positioned in the north of the greenfield lands, will be developed as Phase B is finishing. Extractions within Phase C are predicted to be carried out in 18-20 year's time.

3.4.1 Construction Phase

3.4.1.1 Vegetation Clearance and Overburden Stripping

The main extraction will see the Agall Quarry expand to the north and west into new agricultural fields. This will incorporate an area of ca. 6.96ha to be stripped of topsoil and subsoils and will expose the underlying aggregate deposits for extraction and processing. Refer to Section 3.4.2.2 for details on phasing of these works. Works will include the clearance of hedgerows / treelines at the appropriate time of year and in a phased manner, only exposing

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the ground that will be worked over the short term. Soils will be used in the creation of the proposed berms or stockpiled onsite for future restoration works.

To remove the soils, a bulldozer or similar will be deployed on the field to strip and push the soils into an embankment along the boundaries. Stripping of new lands will be controlled to expose two phases of extraction at one time to ensure a correct blend of gravels is available.

It should be noted that the works within the proposed extraction area (i.e. ground clearance and quarrying works) will be completed in a structured manner over time to minimise areas of exposed ground. In addition, the future extraction faces will be subject to changes depending on the available type of aggregate in each section of the Site. As such, some areas within the proposed extraction area will not be cleared or removed if the aggregate in these areas is not considered to be of good quality.

3.4.1.2 Berm Construction / Landscaping

As a key development design, once extraction commences in Phase B, a ca. 3m high and 7m wide embankments will be formed to the south of the residential landholdings to the north of the new fields. The berm to the west, along the southern boundary of the residential lands to the north, will be planted with a double row of native tree species in the first planting season following formation.

Prior to extractions commencing in Phase D a ca. 3m high and 7m wide embankments will be formed to the east of the residential landholdings to the north of the new fields. The berm to the east will be sown with a grass seed mix upon formation.

Following the Applicant's consultation in September and October 2024 with local residents living to the northwest of the Site and within 100m of the proposed extension lands with residential properties, an area of known aggregate reserves was removed from the proposed extraction extent to increase the set-back of future operations under this application from residents to a minimum distance of 80m.

A hedgerow and a treeline will be planted to the north of the western berm. A security fence will be installed in between these linear features and the residential housing to the north. Furthermore, ca. 95m of treeline will be planted along the western boundary to provide additional screening to the landholding to the northwest of the Site. This treeline will be planted alongside the existing hedgerow. The security fence along this boundary will be setback ca.5m from the proposed treeline and will contain two mammal gates. A 140m long hedgerow will then be planted along the north of this fence.

The planting mixes utilised for the hedgerow, treeline and planted berm have been designed to replace the native species removed during the vegetation clearance works and to reflect the species found in the wider surrounding area. The planting will take place within the first available season (November to March) and any trees that fail to become established within 5 years of planting will be replaced by trees of a similar size / species within the next available planting season. However, it should be noted that the Proposed Development will be undertaken in phases so that the area of exposed ground does not significantly increase over time. Therefore, the removal of vegetation onsite will be staggered. The construction phase planting has been designed to replace and establish vegetation onsite at the earliest possible point to mitigate the removal of treelines and hedgerows as the Proposed Development progresses.

For further information relating to the proposed landscaping and restoration of the Site, refer to Appendix 6-1.

The construction phase will take 3-4 months to complete and will be done in stages.

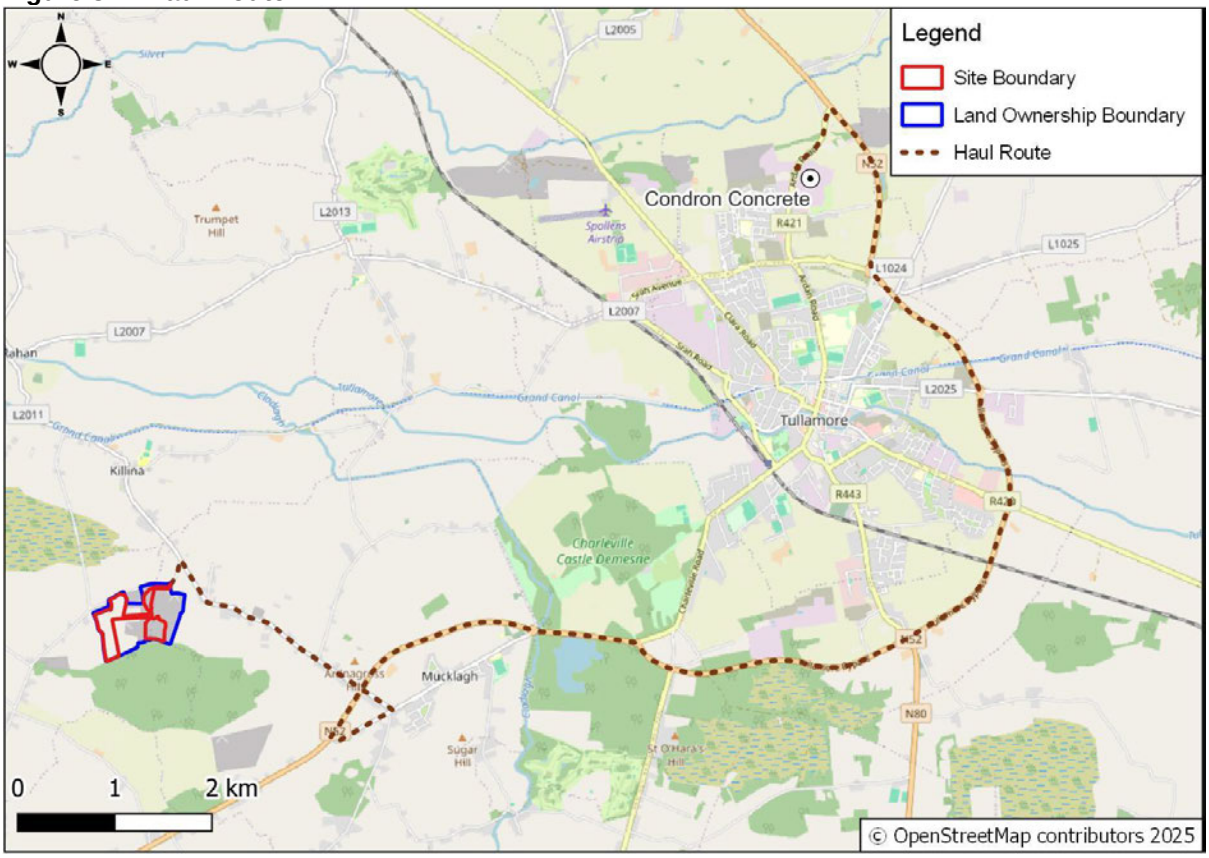
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3.4.2 Operational Phase – Aggregate Extraction

The Proposed Development will operate in a similar manner to the current activities at the Agall Quarry. It is estimated that a further 1,770,000m^3 of aggregate is in the operational areas, including the greenfield extension and within the historically exposed grounds. Extraction itself will be undertaken by use of an excavator, positioned on the pit floor, dragging aggregate down with the bucket. A loading shovel will collect aggregate from the pit floor and transport it to the mobile screening plant. The mobile screening plant will continue to follow the working face, at an operational distance of 20-100m from the working face. The plant will then move periodically to re-position closer to the working face as it progresses. Fixed plant onsite will be used as required.

Aggregate will be processed into stockpiles of usable fractions by the screening plant, which will be loaded onto trucks as needed, for off-site transportation. The applicant has committed to avoid ingress and egress into Tullamore town and Mucklagh Village and utilise the N52 transport links for the haulage of aggregates, refer to Figure 3-4 below which presents the haulage route from the Site to Tullamore.

Figure 3-4: Haul Route



Due to the varying aggregate on the pit face, the extraction face will vary depending upon the needs of the Applicant. Additionally, more than one area of pit face may be extracted at any one time to ensure the requisite blend of coarse and fine aggregates.

As part of the project design, a minimum set-back of ca. 80m from the boundaries of the residential homes will be maintained as the extraction area extends.

An additional 1ha of land, within the existing operational pit area, will be utilised for the short-term storage and processing of materials and internal haulage of aggregates. This area has been included to ensure sufficient space is presented on the Site for such activities. As the

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new lands are extracted, this area of Agall Quarry will be restored and all plant and processing will move forward into the new reserves.

A secondary area for extraction will also be opened within the existing Agall Quarry lands. This ca. 3.81ha area contains viable aggregate reserves, including finer sands and stones. This land is already exposed with soils historically removed. As no intensification of extraction is proposed within the Site, plant and equipment will be moved from the active face to this area, as and when the aggregates within this location are required.

The Operational Phase will occur over 25-28 years.

3.4.2.1 Development Phasing

This application for permission to extend and develop the Agall Quary is submitted with a proposed commencement date of 2025. At this time, the existing authorised Agall Quarry will be further advanced within its extraction and will have moved forward with the agreed phased restoration of exhausted sections; refer to Figure 3-5 below. However, it is noted that the full extent of this permission will be still on-going, and aspects of this application will enable this plan to be amended. The amended restoration plan to facilitate the Proposed Development is shown in Figure 3-5 below.

As visible on the aerial survey shown in Figure 3-3 above, the existing authorised operations still have reserves to the south and west and a significant reserve into the final field to the north. These reserves present a 7-10 year aggregate reserve based on current extractions – however, as noted earlier the requirement by the Applicant is for a mix of stone and sands, which necessitates this application for extraction to enable a suitable ongoing mix of aggregates to be extracted.

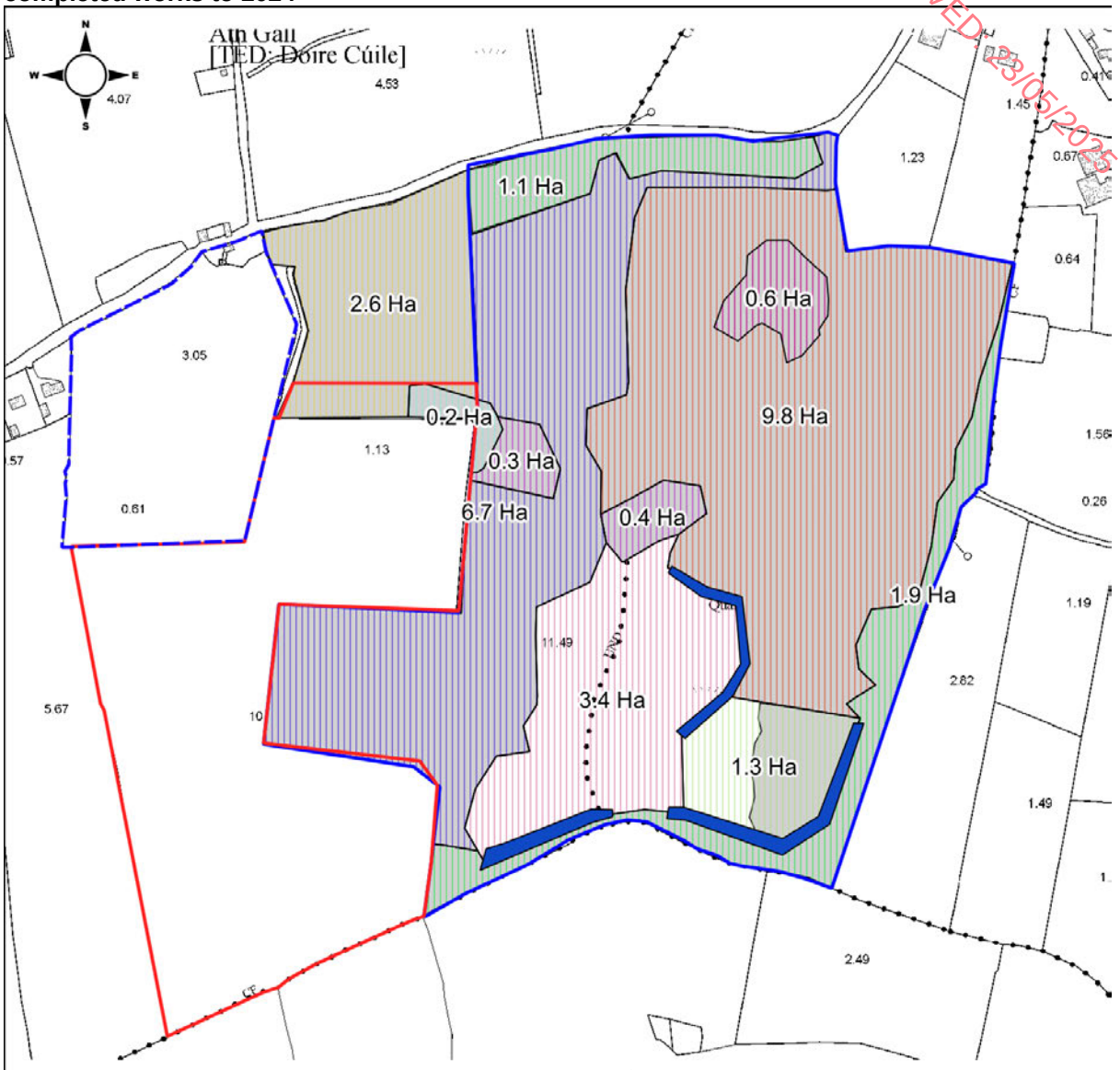
It is planned that, during the currently authorised extraction in the northern field, extraction would commence within Phase A of this Proposed Development works, and similarly, Phase A will be ongoing, during the movement of activities into Phase B.

Therefore, it is likely that if authorised, portions of the Proposed Development will be operating at a time when the existing development is still in operation.

The Proposed Development will continue operation after the expiry of the planning permission for the existing extraction activities, condition 3 of QD0008, utilising the onsite haulage routes, fixed plant and welfare system. The Proposed Development will operate within the permitted outputs under the application to ABP for substitute consent and future works (references: 19.QD.0008) which is currently ca. 200,000 tonnes per annum pending market conditions.

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Figure 3-5: Restoration Plan associated with existing planning permission including completed works to 2024



id	Text	Area (ha)
1	Proposed Restoration with Soil	1.3
2	Restoration with Soil (Complete)	9.8
3	Proposed Low Nutrient Restoration	3.4
4	Red Hemp Nettle Protection Zone (Existing)	0.2
5	Boundary and Recolonised Ground (Existing)	1.9
6	Access and Operational Area (Existing)	6.7
5	Boundary and Recolonised Ground (Existing)	1.1
7	Soil Embankment	0.3
7	Soil Embankment	0.6
7	Soil Embankment	0.4
8	Low Nutrient Landscape Returned to Landowner	2.6

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3.4.3 Restoration Phase – Site Closure

The Restoration Plan submitted as part of this application (attached as Appendix 6-1) supersedes the previous restoration plans for the Agall Quarry submitted under An Bord Pleanála ('ABP') References 19.SU.031 and 19.QD.0008. The general plan is shown in Figure 3-6.

The restoration of the Site will be a continuous process in line with the previous plans. The exhausted areas will be re-levelled, creating an undulating landscape, and all stockpiles and trenches will be removed from these areas. The stockpiled material and soils stripped from the next phase of extraction will be used to cover the previously exhausted area, allowing for continuous restoration. The soils will be spread to a depth not exceeding 300mm and these areas will then be reseeded. The hedgerows / treelines removed during quarrying activities will also be replanted once operations have ceased.

As such, the proposed restoration will be undertaken in phases as works progress within the Site. The continuous restoration of the Site will involve the following works:

- Extracting aggregate in phases;
- Providing safe slopes from the new ground level to the adjoining lands;
- Spreading soil over exhausted areas within the western portion of the Site with soil removed from the next phase of extraction;
- Re-establishing grasslands and hedgerows within these exhausted areas;
- Introducing a ca. 0.26ha woodland within the southwest portion of the Site once extraction in this area has ceased;
- Establishing a low-nutrient habitat with sand martin embankments within the eastern portion of the Site; and,
- Erecting a kestrel nest box within the northeast portion of the Site.

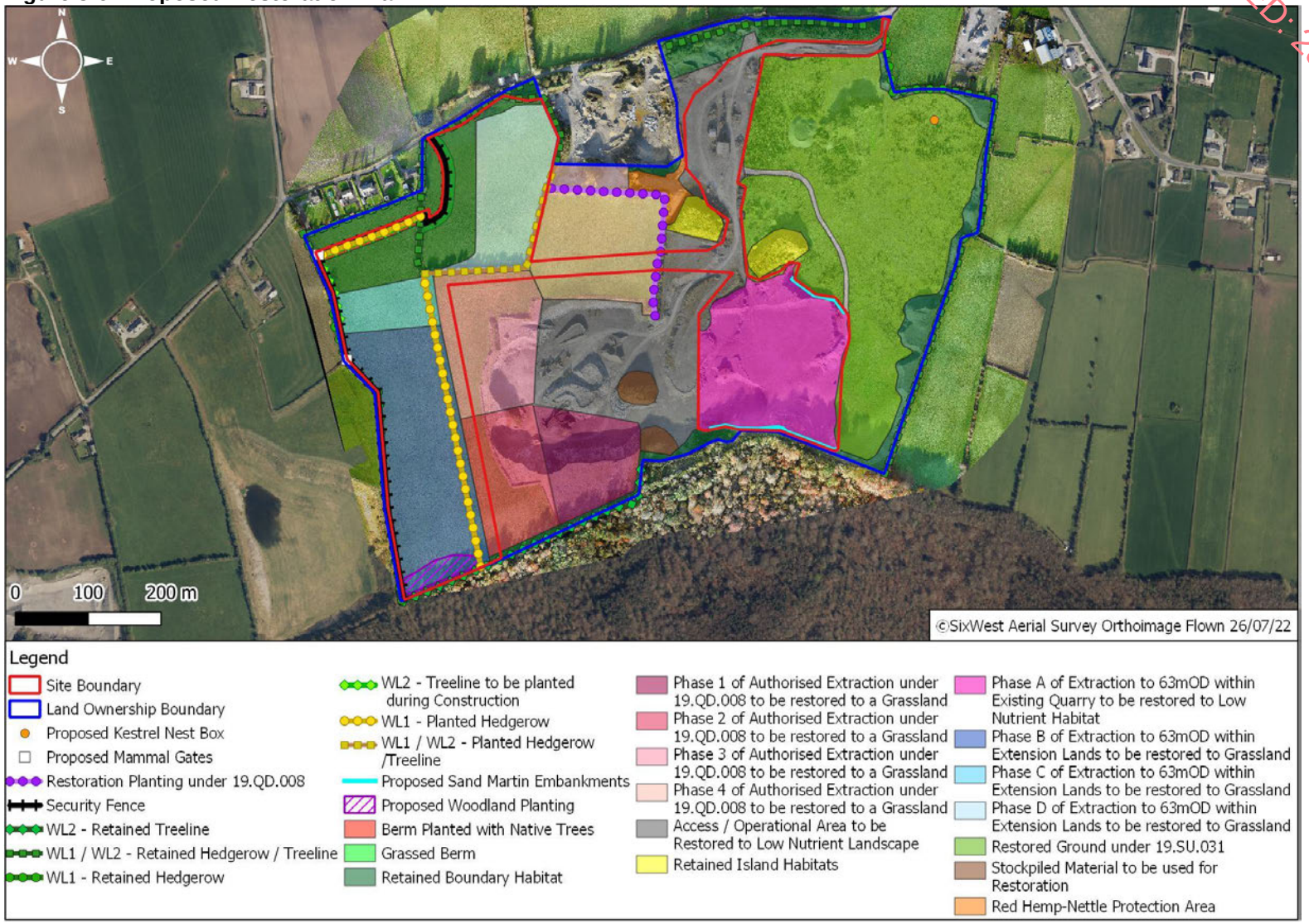
Upon completion of extraction activities, the Site will be fully decommissioned within a 2-year period, with all plant and equipment removed during the initial stage of final restoration.

Waste considered unsuitable for re-use or recycling, which includes, inter alia, domestic waste, will be disposed of off-site by an appropriately permitted waste contractor at a suitable permitted waste facility. All-access routes will be broken up to improve the percolation of the surface into the ground.

The boundaries of the Site will be checked and security measures in the form of additional perimeter fencing, and signage will be erected as required to prevent unauthorised access to the Site by members of the public.

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Figure 3-6: Proposed Restoration Plan



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4 CONSIDERATION OF ALTERNATIVES

4.1 Introduction

Schedule 6 of the Planning and Development Regulations, 2001 (S.I. No. 600 of 2001), as amended requires an EIAR to contain:

> *"A description of the reasonable alternatives studied by the person or persons who prepared the EIAR, which are relevant to the Proposed Development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the Proposed Development on the environment."*

This Chapter assesses the alternative options considered by the Applicant when deciding to progress the Proposed Development and outlines the following alternative considerations;

- Location;
- Design; and,
- Process.

4.2 Alternative Location

In assessing alternative locations, both the commercial and the environmental aspects need to be considered. In considering the environmental effects of quarry developments, the issues arising from new development are generally higher as the activity is untried and the operator is unknown locally. Furthermore, in greenfield developments not associated with existing operations, an increased preparatory phase is needed to develop the site to a working floor and thereby achieve the reduced noise and dust and visual effect that an existing project already possesses.

As discussed in Section 3, the Proposed Development will seek to provide key aggregates to the Applicant's facility in Tullamore. The aggregate requirements of the Applicant's facility in Tullamore are specific and must correspond to the rigorous quality testing at the concrete manufacturing works. The aggregate must be clean and regularly sized. The sourcing of such material restricts the number of available suitable sites and as outlined in Section 2.4.1.1; the location of extractive industries is limited to where aggregates occur. As a finite resource, a proposed quarry or quarry extension must look at a range of environmental and commercial issues such as:

- The presence of the required gravels;
- Contamination with other gravels or soils;
- Its depth below the surface;
- Presence of groundwater;
- Access to necessary haulage routes;
- Proximity to markets; and,
- Historical unauthorised activities.

Many potential alternative quarry locations are located within the areas of high amenity associated with the Esker landscapes of Offaly and Westmeath. However, the prohibition on the extraction of eskers under their recognition within the County Development Plan as both a visual and cultural heritage feature acts as a limiting factor of available gravel reserves within an economic distance of Tullamore. Moreover, quarrying at such locations would increase potential impacts relating to views, landscape and general amenities and therefore, extracting

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material in these areas would be in direct conflict with the Local Development Plans under each jurisdiction.

Geotechnical investigations undertaken by APEX Geophysics Limited, refer to Volume 3 Appendix 7-2, have indicated the presence of sand and gravel within the proposed extension lands. These lands have no previous planning history. The occurrence of high-quality aggregate in proximity to an established quarry with suitable infrastructure for exploitation of the aggregate makes this a prime location. Maintaining the existing quarry through the extension of the extraction area into available aggregate resources, and re-opening reserves not yet realised within the lands subject to the substitute consent application, was seen as the most viable option to ensure the continued supply of high-quality aggregate to the Applicant's facility in Tullamore.

Some consideration was given to utilising third-party existing facilities. However, these options were found to be unsatisfactory given the smaller scale of reserves, unpredictability of ongoing supply costs and the loss of direct quality control.

4.3 Alternative Design

Further to alternative locations, a review of alternative designs was considered at the design stage. These include alternative access options, alternative phasing of extraction, extraction extent, soil importation for restoration purposes, and alternative processes on the Site.

4.3.1 Access

Consideration was given to different access routes into the Site.

Initial iterations of the design showed an internal access road entering the Site along a ramped track that transitioned into a straight road along the northern hedgerow / treeline separating the greenfield lands within Agall Quarry with the landholding to the north. This potential route was seen as the most efficient route into the proposed extension lands. However, this potential route would involve the construction of a new access ramp into the northern field through an area of spoil and bare ground previously maintained and protected for red hemp nettle.

Red hemp-nettle is a plant that thrives on sites that are mainly comprised gravels, pebbles and stone without any soil medium [27]. Although red hemp-nettle relies on other plants to attract pollinators, it is not competitive and cannot survive in a close sward [27]. Therefore, the bare slope to the north of the existing greenfield land within the Agall Quarry provides suitable growing conditions for this species.

Red hemp-nettle is a legally protected species under the Flora (Protection) Order 2022 [28]. This means that:

> *'It is illegal to cut, uproot or damage the listed species in any way, or to offer them for sale. This prohibition extends to the taking or sale of seed.*
>
> *In addition, it is illegal to alter, damage or interfere in any way with their habitats. This protection applies wherever the plants are found and is not confined to sites designated for nature conservation.'*

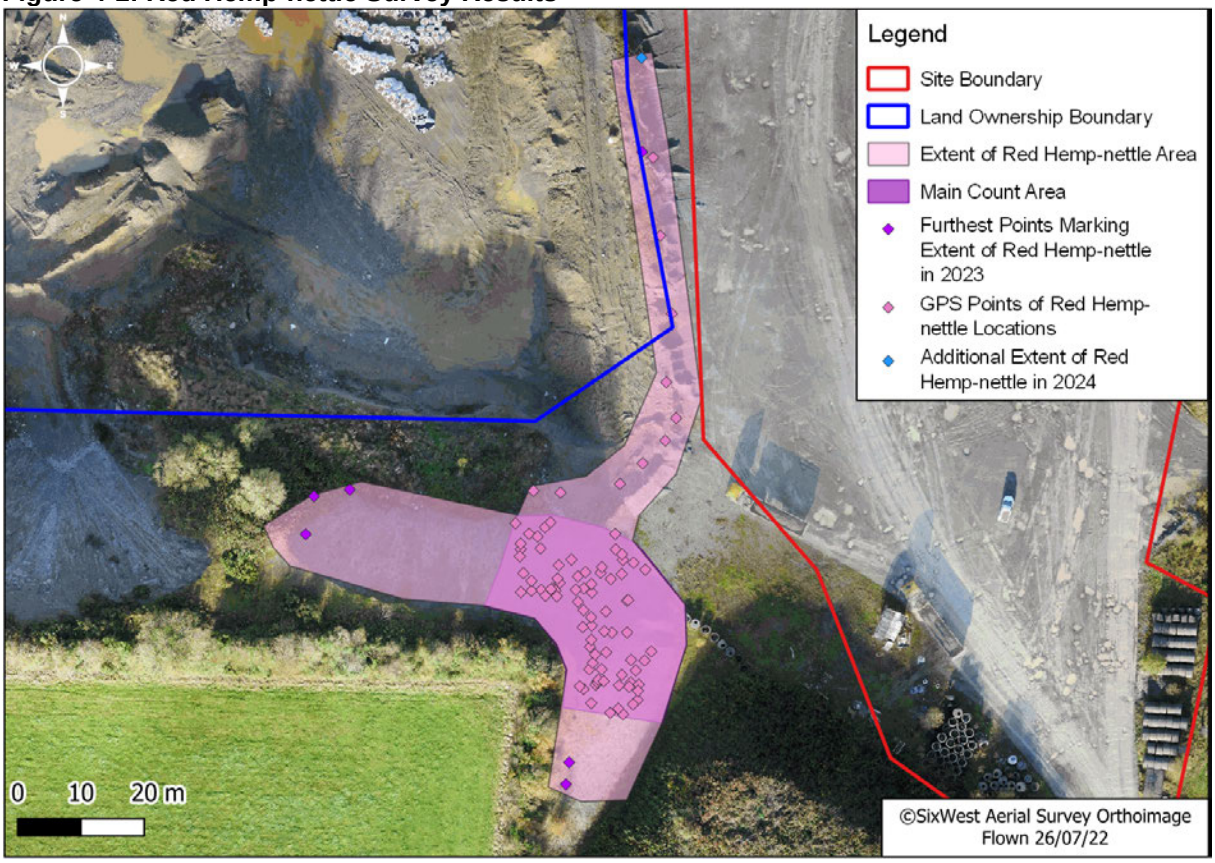
The National Parks and Wildlife Service ('NPWS') state that exceptions can only occur '*under licence of the Minister, and then strictly for Scientific, Educational or other such purposes*.' Contact was made with Ciara Flynn, the divisional ecologist for Offaly, who recommended contacting Mike Wyse Jackson, a botanical expert for NPWS. A call with Mike Wyse Jackson occurred on 30th May 2023 to discuss a potential licence application under Section 21 of the Wildlife Acts for the translocation of red hemp-nettle in order to facilitate the proposed access track. It was emphasised that the NPWS would only entertain a licence to protect this plant if the Applicant could prove that there were no viable alternatives.

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In order to establish the extent of red hemp-nettle onsite, a targeted red hemp-nettle survey was undertaken on 26th June 2023 by a suitably qualified MOR Environmental Ecologist. A GPS unit and red surveyor flags were used to mark out the extent of red hemp-nettle onsite. Transects were walked to count the visible red hemp-nettle and to determine whether the cover was sparse or dense. The survey identified over 2500 red hemp-nettle plants within the stockpiled area directly in the way of this route i.e. the Main Count Area presented in Figure 4-1 below. The full extent of red hemp-nettle spanned from ITM 0626910 0723076 and ITM 0626869, 0723112 on the slope. The extent of red hemp-nettle within the main count area had not altered during the updated survey conducted on 9th August 2024. Over 1500 red hemp-nettle plants were also counted along the berms to the north of the main count area. Red hemp-nettle was recorded as far as ITM 0626920 0723183 along these berms during the 2024 survey. Refer to Figure 4-1 for context.

Given the extent of red hemp-nettle onsite, its legal protection and the stance of the NPWS with regard to the translocation of this species, an access road through its supporting habitat was not considered to be a viable option. Therefore, a new access track was designed to bypass the red hemp-nettle area entirely and to enter the agricultural field along its eastern boundary instead of the northeast corner.

Figure 4-1: Red Hemp-nettle Survey Results



4.3.2 Alternative Phased Extraction

A phased extraction starting from the northern portion of the extension lands and working in a phased manner southwards was considered. However, this method had no significant advantages to the future operation of the Quarry. To provide for a gradual proximity of the development, through a south-to-north progression through the greenfield extension, over the life of the extension, potential nuisance effects associated with noise and can be measured and tracked through compliance monitoring and reporting to the Council. This enables validation of the assessments made and the effectiveness of outlined mitigation measures.

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The proposed phasing plan was developed in line with the current operational face within the quarry, which, as presented in Figure 3-3 above, logically extends into Area A first.

4.3.3 Extent of Extraction

Omission of the greenfield to the west and the inclusion of the extension only to the north was considered. However, this land, though containing viable aggregate reserves, slopes steeply to the road. Alternatively, developing only to the field to the west was considered. However, leaving the northern field with its viable resources for the aggregate industry was deemed unsatisfactory.

Similarly, the inclusion of the remaining viable reserve within the restored lands east of the current extraction face has been included due to its value, however, its exclusion was considered during the design phase of this project. Again, the ability to show how this material can be removed and the land restored within one complete and overarching design and assessment was deemed the best environmental approach.

Consultation led to an amended design. Following the initial assessment, a setback of 40 meters from boundaries was determined to be achievable in terms of environmental nuisance compliance, using best practices for the extraction and processing of aggregates. However, pre-planning with Offaly County Council recommended increasing the minimum to 50m, which was then reassessed. This design was presented to residents near the greenfield boundary. After further concerns about proximity, the extraction face was extended to 80m to demonstrate the Applicant's ability to operate responsibly and be a good neighbour.

4.3.4 Soil Importation

It is common in many applications for aggregate extraction to include for soil importation to support and assist in the restoration of the land.

The importation of soils for use at this Site was considered during the design and planning of the project, and the activity was found to have some merits. However, as the core business of the Applicant is manufacturing, further study on the economic benefits and management of soil importation, including the likely effects arising from additional truck movements in and out of the Site and the control and management of the soil importation, and the proof of origin, were determined to be the best course of action.

4.4 Alternative Process

The aggregate processing / screening methods for developments at this scale can require the use of fixed or mobile screening equipment.

A fixed aggregate processing / screening plant can provide a large central processing area within the Site. This can allow the devolvement of storage areas and management of stockpiles around the central processing area. Potential noise / dust effects arising from the processing are centralised within the quarry void. However, the existing fixed screening plant has been in operation with no issues. However, as the development reaches later stages of aggregate phasing, longer haul routes must be established for aggregates to be transported from the working face to the fixed processing plant.

Mobile aggregate processing / screening plant can be compact equipment, which reduces the need for a large area to process and can reduce haulage routes from the extraction face to the processing point. The high mobility makes the plant easily transported to other areas close to the quarry's working face. Mobile aggregate processing / screening plant can be more economical and with the option of hybrid power of diesel and electricity, which can be cost effective. Though mobile plant will generally follow the operational face, noise and dust can be controlled by the elevation difference from the pit floor where the plant is and the top of the face, which presents a solid barrier for wind-blown dust and for noise pathways.

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The use of fixed and mobile screening equipment was determined to be the most effective form of aggregate processing. Aggregate processing can be done close to the working face or transported to the fixed plant onsite as needed.

The existing plant have been in operation onsite with no issues. They are well maintained with a documented service history.

The extracted aggregate is relatively clean, requiring dry screening only onsite to create the viable resources needed at the Condron Concrete facility in Tullamore. Therefore, investment in a washing plant at the Site, as used on some quarries, is not warranted for the Proposed Development.

4.5 Alternative Uses Including a "Do-Nothing" Scenario

In addition to the main alternatives considered above, a "do-nothing" scenario was also considered.

A 'do-nothing' scenario would restrict the Applicant to their existing consent for Agall Quarry (19.QD.0008). This would involve the continued operation of the quarry until the aggregate reserves within the permitted extraction area were exhausted alongside the restoration of the quarry to the agreed end-use. Refer to Figure 3-6 above.

A 'do-nothing' scenario would result in a shorter lifespan for the quarry and subsequently, a shorter employment period for staff locally and within the Applicant's manufacturing business Moreover, existing scarcities in the Eastern Midlands Region would likely be exacerbated.

To future protect the Applicant's manufacturing business, alternative locations on land not currently owned or within the interest of the Applicant, would need to be sourced. This would result in similar environmental effects, but potentially in areas where quarrying is not currently present.

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5 POPULATION AND HUMAN HEALTH

5.1 Introduction

This chapter was prepared to provide a description and assessment of the likely effects of the Proposed Development in terms of population and human health.

The local or receiving population comprises a significant element of the overall environment. In carrying out developments, one of the principal concerns is that people should experience no diminution in their quality of life as a consequence of the Construction and Operational Phases of a development.

5.2 Methodology

A desk-based study was carried out to characterise the environment in relation to human beings, including the receiving population, change over time in population, employment levels and human health indicators.

This chapter has been prepared taking cognisance of the guidance set out in Chapter 1 and the following specific guidance documents:

- Institute of Public Health Ireland ('IPHI') Health Impact Assessment Guidance (2021) [29];
- Institute of Environmental Management and Assessment ('IEMA') Health Impact Assessment in Planning, Impact Assessment Outlook Journal, Vol 8 (2020) [30];
- IEMA Health in Environmental Impact Assessment, A Primer for a Proportionate Approach (2017) [31];
- IEMA: Effective Scoping of Human Health in Environmental Impact Assessment (2022) [32];
- IEMA: Determining Significance for Human Health in Environmental Impact Assessment (2022) [33]; and,
- International Association for Impact Assessment ('IAIA') and European Public Health Association ('EPHA'): Human Health – Ensuring a High Level of Protection (2020) [34].

5.2.1 Health Sensitivity

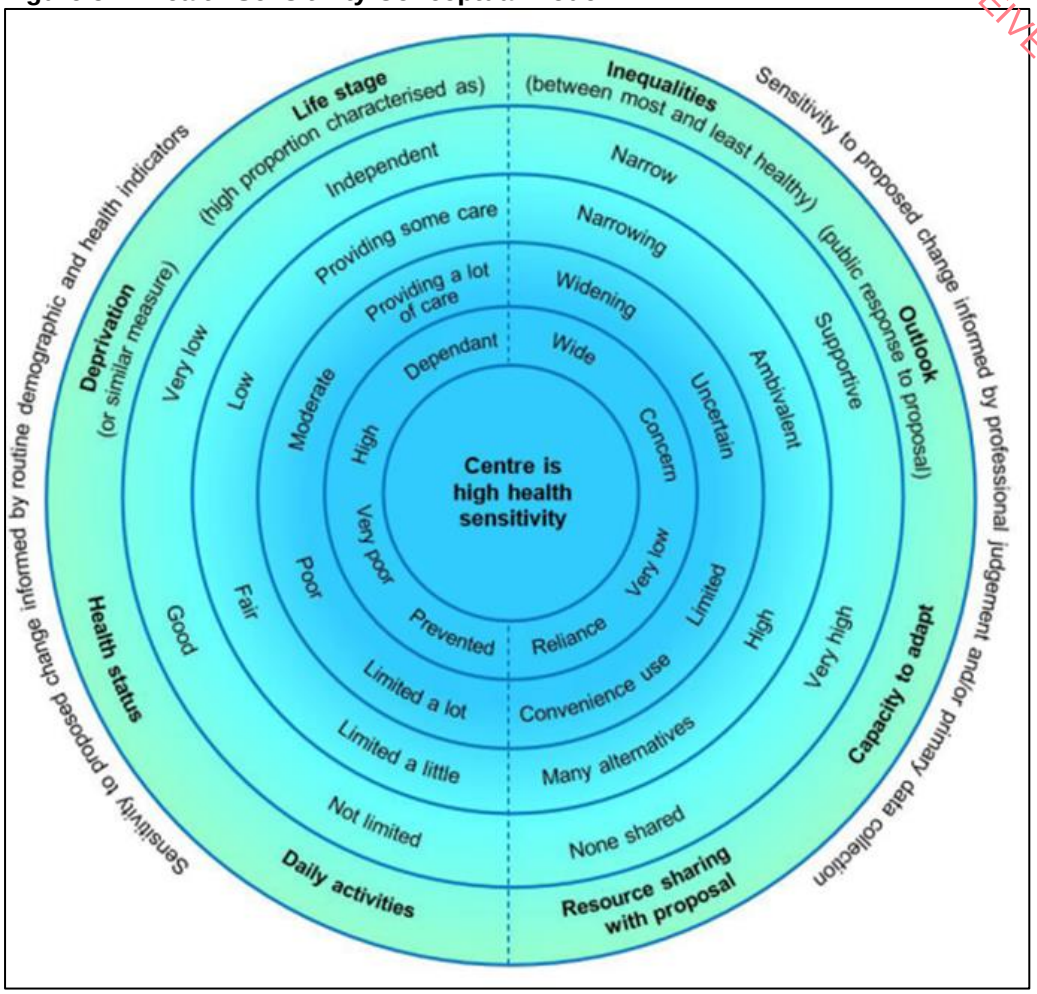
In accordance with the IPHI guidance, the health sensitivity of the local population was determined following the methodology set out in Part 4: Analysis tools and resources of the above guidance [29] and summarised in Figure 5-1 below. The determined sensitivity in each factor was considered to determine an overall sensitivity for the local population of both the immediate area and a close population centre – Mucklagh Village. The results of this analysis are set out in section 5.4 below.

The following sources were consulted and used to determine both the sensitivity of the local population and the potential impacts on them:

- Central Statistics Office ('CSO') Census Data for 2011, 2016 and 2022 [35]; and,
- CSO Census Mapping Small Area Population Maps [36].

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Figure 5-1: Health Sensitivity Conceptual Model



5.3 Receiving Environment

5.3.1 Population

The CSO provides data on population and socio-economic aspects of the population at different levels for the entire state, at county level and for individual Electoral Districts ('ED') within each County.

The Site is situated in the Local Electoral Area ('LEA') of Tullamore, and within the ED of Derrycooly and Screggan (Offaly).

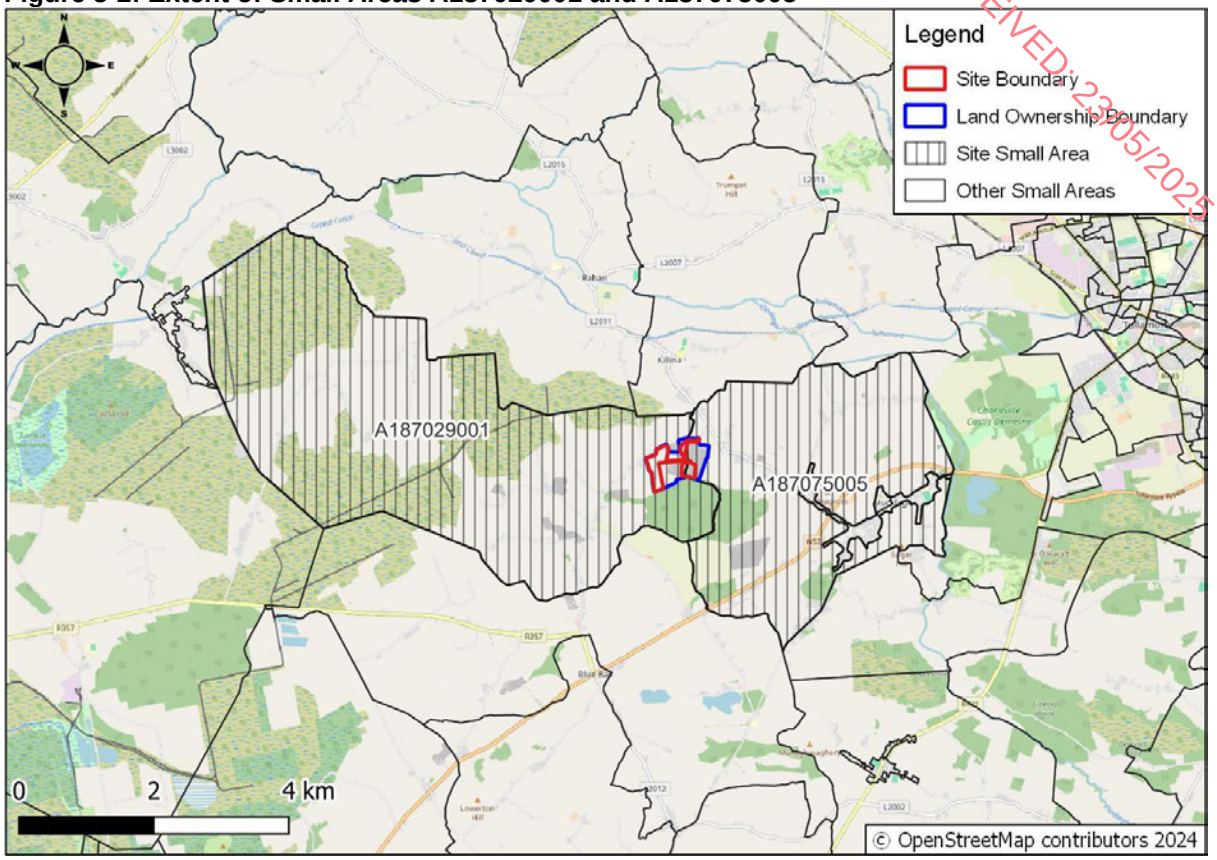
5.3.1.1 Small Area Population Statistics

'Small Areas' ('SA') were established in the 2011 census to give greater clarity and context to population trends. The boundaries of Small Areas can change between censuses and therefore direct comparisons between sets of census data are not always possible.

The Site is located within SA A187075005 and SA A187029001. The 2022 extent of the SAs is shown in Figure 5-2 below.

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Figure 5-2: Extent of Small Areas A187029001 and A187075005



The closest settlements to the Site are:

- Killina, located ca. 1.2km north-northeast of the Site. Killina includes a post-primary school;
- Mucklagh, located ca. 2.6km southeast. Mucklagh includes a pre-school, national school and the local GAA club; and,
- Tullamore Town, the County Town of Offaly, located ca. 6.8km east of the Site.

Kilcormac is further afield, located ca. 13.5km southwest of the Site. Kilcormac includes a GAA Centre of Excellence, GAA Club, community centre and both a National School and a post-primary school.

The boundaries of SA A187075005 changed substantially between the 2016 and 2022 census and therefore a comparison of population figures is not possible. Killina sits within SA A187070002 and the population of the village itself is not available from the census data. Population figures from the 2022 census are shown within Table 5-1 below.

5.3.1.2 Local Population

A variety of CSO population figures for the immediate SAs and the nearest population centre from the 2022 census data is set out in Table 5-1 below. The corresponding figures for the County and State are also shown for context. This data is fundamental in assessing the sensitivity of the local population in response to the proposed works, detailed in Section 5.3.4.1.

The low population reflects the rural nature of the area.

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Table 5-1: Population Statistics (2022)

Dataset	A1870290001	A1870750005	Mucklagh	Co Offaly	Ireland
Registered Permanent Households	92	110	281	28,923	1,846,938
Unoccupied Buildings (%)	15%	8%	9%	10%	13%
Population No (% Male/Female)	297 (47.5/52.5%)	331 (47.7/52.3%)	918 (50.0/50.0%)	83.150 (50.1/49.9%)	5,149,139 (49.4/50.6%)
Age Breakdown (%)					
Aged 0 - 9	13.47%	14.20%	12.42%	12.84%	12.39%
Aged 10 – 14	6.73%	8.76%	7.95%	7.81%	7.27%
Aged 15 - 19	7.07%	7.25%	8.06%	7.00%	6.56%
Aged 20 – 24	5.39%	7.55%	5.77%	5.49%	5.96%
Aged 25 – 64	52.86%	44.41%	46.62%	51.28%	52.74%
Aged 65 – 80	10.77%	13.90%	13.18%	12.02%	11.56%
Aged 80+	3.70%	3.93%	5.99%	3.56%	3.52%
% with Irish/UK Nationality	94.28%	97.28%	97.49%	89.09%	84.52%
% Identifying as White Irish	89.56%	94.26%	89.22%	81.46%	75.61%
% Identifying as Irish Traveller	0.00%	0.00%	0.00%	1.41%	0.64%
% BAME	1.01%	0.91%	1.20%	2.25%	4.71%
% No/Poor/Unknown Levels of spoken English	0.67%	1.21%	0.65%	2.25%	2.45%
% of:					
1 person households	9.78%	17.27%	16.37%	22.11%	23.14%
>1 adult households	77.17%	71.82%	72.24%	66.26%	65.48%
Single-parent households	13.04%	10.91%	11.39%	11.63%	11.38%
% Owner/Occupiers	85.87	86.36%	87.19%	71.02%	65.77%
% Renting	1.09%	7.27%	9.61%	22.02%	27.48%
(Private Landlord)	(1.09%)	(7.27%	(4.27%	(12.99%)	(17.96%)
(LA/Housing Body)	(0.00%)	(0.00%)	(5.34%)	(9.02%)	(9.52%)
% with Central Heating:	93.48%	97.27%	97.15%	95.18%	93.85%
(Electric/Gas-Fired)	(8.70%)	(9.09%)	(4.63%)	(15.46%)	(44.40%)
(Oil-Fired)	(26.09%)	(46.36%)	(59.43%)	(41.94%)	(38.79%)
(Coal/Wood/-Fired)	(14.13%)	(8.18%)	(8.90%)	(7.90%)	(5.18%)
(Peat Fired)	(38.04%)	(29.09%)	(21.71%)	(27.09%)	(3.69%)

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Dataset	A1870290001	A1870750005	Mucklagh	Co Offaly	Ireland
% with confirmed water supply (Mains Water Supply) (Private Water Supply) (Group Scheme)	98.91% (56.52%) (19.57%) (18.48%)	98.18% (53.64%) (16.36%) (27.27%)	100.00% (85.05%) (2.14%) (12.81%)	98.71% (67.69%) (12.97%) (17.28%)	97.72% (79.90%) (9.90%) (7.69%)
% with Stated Sewerage (Mains Sewerage) (Septic Tank)	97.83% (1.09%) (78.26%)	98.18% (0.91%) (83.64%)	100.00% (77.22%) (20.28%)	98.52% (55.96%) (36.53%)	94.95% (63.30%) (24.78%)
% With a Disability	19.53%	22.05%	15.36%	22.63%	21.55%
% Caring for Disabled Person	7.41%	6.34%	5.88%	6.39%	5.81%
% Working Age Unable to Work (Illness/Disability)	2.95%	3.14%	3.15%	5.91%	4.58%
Health: Very Good/Good Fair Bad/Very Bad	 81.82% 8.42% 1.35%	 89.73% 8.46% 0.60%	 85.62% 6.10% 1.74%	 82.96% 9.77% 1.84%	 82.89% 8.64% 1.74%

5.3.1.3 Pobal Information

The census statistics have been used by Pobal on behalf of the Government of Ireland to develop deprivation indices to help inform planning and policy decisions [37]. Deprivation is categorised into eight bands from 'extremely affluent' to 'extremely disadvantaged'. Both Small Areas around the Site are categorised as 'Marginally Below Average'. Due to the boundary changes, it is not possible to make a direct comparison of the Pobal deprivation description between the 2022 census and previous census data. The Pobal dataset for 2022 does not provide data for Mucklagh as a whole. Table 5-2 below shows Pobal data from the 2022 census for the local SAs. County Offaly data is given for context.

Table 5-2: Pobal Deprivation Index (2022)

Dataset	A187029001	A187075005	Co Offaly
Pobal HP Index	-0.42	-1.09	-3.95%
Pobal HP Description	Marginally Below Average	Marginally Below Average	Marginally Below Average
Age dependency ratio^	34.68%	40.79%	36.23%
Primary Education only#	12.11%	8.65%	12.95%
Third Level Education#	31.58%	40.38%	31.86%
Male Unemployment Rate*	6.98%	7.41%	9.48%
Female Unemployment Rate*	1.69%	6.45%	9.26%

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^The Pobal age dependency ratio is the percentage of persons aged 0-15 & >64 within the whole population. Higher ratios mean a greater dependency burden on the working age population. In 2022 the comparable figure for Ireland was 34.74% [35].

In the 2022 census, 11% of the population of Ireland aged 15+ had no formal education/primary education only and 48% had a third-level education [35].

*In 2022 Q2 the male unemployment rate across Ireland was 4.5% and the female unemployment rate was 4.5% [35].

5.3.2 Surrounding Land Use

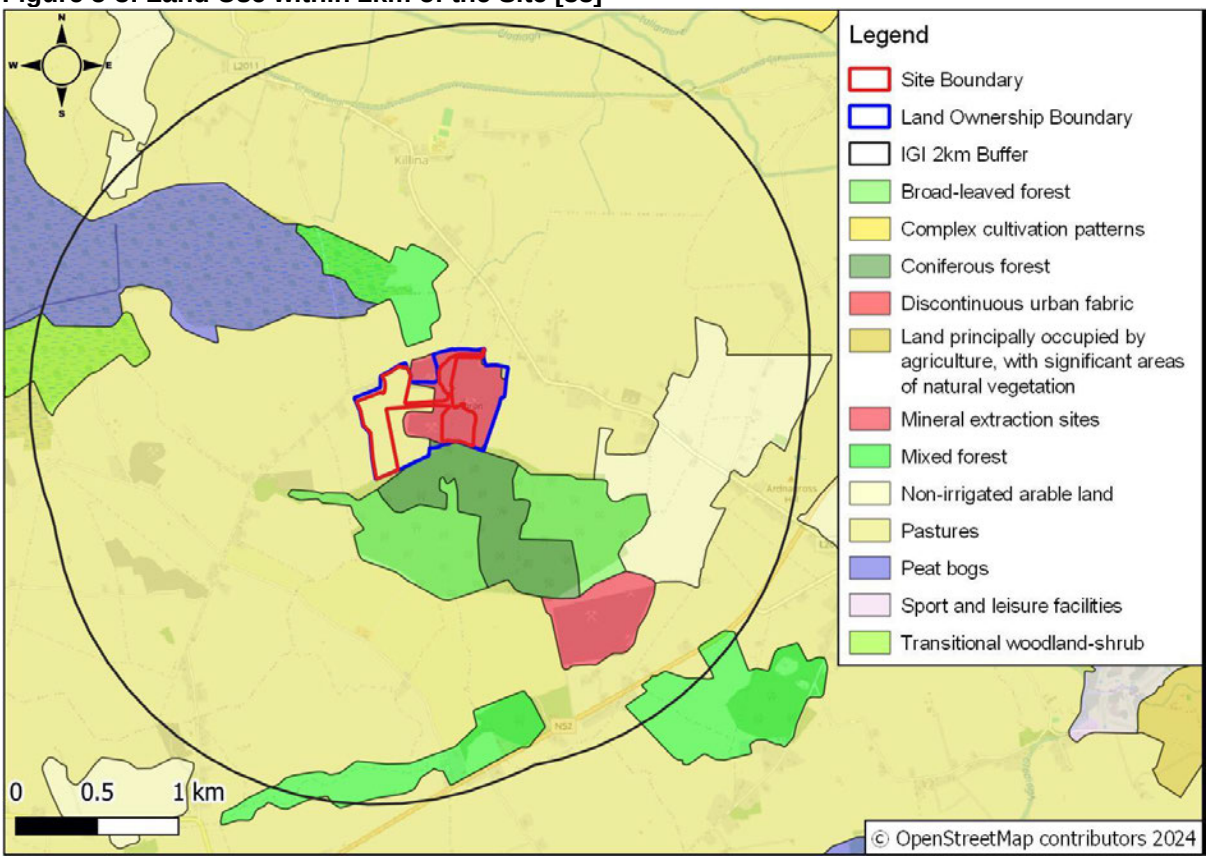
5.3.2.1 General Land use

Land use to the immediate north of the Site is a mixture of agricultural and forestry, with scattered residential buildings along the line of the L2011 which runs in a northwest to southeast direction. Land use to the northwest and west is agricultural with peat bog beyond. To the south, the immediate land use is forestry, with a mixture of agricultural land, forested land and peat bog beyond.

The northern border of the Site is bounded by hedgerows and treelines, with residential houses beyond this to the north. There is also a mix of individual dwellings scattered around with agricultural and rural businesses. The Site is also surrounded by mixed broad-leaved woods to the south and agriculture grassland to the east and west. Land use to the east is a fairly complex mix of agricultural, forestry and residential with the village of Mucklagh and Tullamore Town separated by a mixture of woodland and agricultural land.

The major agricultural land use is pastoral with some arable and forestry use. There are extensive areas of peat bog to the west and east and scattered areas of bog land to the north and south. The Grand Canal is 1.6km north of the Site and the River Clodiagh flows east-to-west ca 1.9km north of the Site. See Figure 5-3 below.

Figure 5-3: Land Use within 2km of the Site [38]

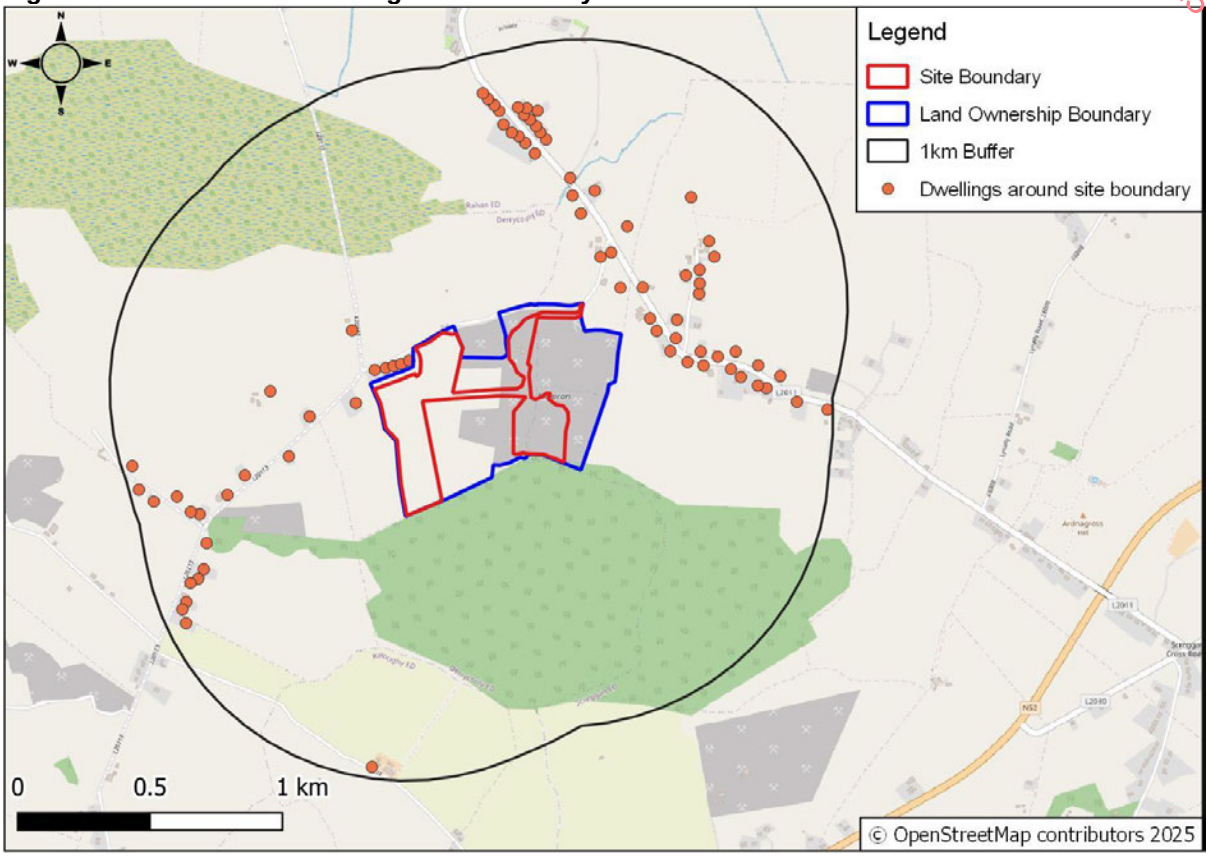


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5.3.2.2 Residential Development

Residential development in the area consists of a mixture of one-off residential dwellings, linear development along local roads and the local villages of Killina and Mucklagh. The closest residential dwellings to the Site are six residences immediately outside the northwest boundary of the Site, situated along the L20113.

Figure 5-4: Residential dwellings in the vicinity of the site



5.3.2.3 Local Extractive Industries

Areas of the boglands to the west of the Site have been historically used for peat harvesting. However, the legal situation around turf-cutting is undergoing change due to European laws on carbon emissions. There are also several former and current quarries in the area. The largest is the Kilsaran Quarry to the immediate south of Blackwood, ca. 1.6km southeast of the Site. This is a working quarry, which in 2021 was granted planning permission for an 18-year extension to the extraction plus an additional two years for site restoration. It should be noted that there were many submissions to the initial Kilsaran extension planning permission (Offaly County Council ref 19478), and that the granting of permission was appealed to ABP (ABP ref 307797) by third-party objectors on grounds including size and amenity and environmental impacts. ABP granted permission on 21st June 2021. Since this permission was granted, Kilsaran have applied for and received permission (22542) for the addition of a cold-feed Reclaimed Asphalt Pavement ('RAP') plant and RAP milling plant on their site.

Registered S261 quarries within 5km of the Site are presented in Table 5-3 below, as extracted from the Offaly County Council GIS planning viewer programme [38].

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Table 5-3: S261 Locations within 5km of Site [38]

S261 Code	From Site		Notes
	Distance	Direction	
QY007	700m	SW	Noted as 'never a quarry'
QY031B	900m	SW	Fully remediated
QY072	1.1km	SW	Possibly still in use
QY118/120	2.3km	SW	Fully remediated
QY026	2.5km	SW	Possibly still in use
QY025	3.2km	SW	No trace of quarry in any aerial photographs
QY063	4.2km	SW	Does not appear to be in use
QY064	4.4km	SW	Fully remediated
QY087	1.7km	W	Fully remediated
QY045	1.9km	W	Seemingly partly remediated
QY009	2.1km	W	No trace of quarry in any aerial photographs
QY062	2.4km	W	Planning applications 02540 and 061330 for extraction and remediation both refused. Fully remediated.
QY080	2.9km	W	In use – Buckley Sand & Gravel
QY059	4.7km	NE	Now Esker Hills Golf Club
QY012	1.1km	E	Possibly still in use
QY065	1.9km	E	Possibly still in use
QY119/126	1.6km	SE	In use - Kilsaran site at Blackwood
QY027	1.9km	S	Registered quarry

5.3.3 Economic Activity and Employment

The economic activity types of the working-age population (i.e., those aged 15-64) in the immediate vicinity of the Site is outlined in Table 5-4 below based on the CSO [35]. Figures for County Offaly and Ireland are included for context.

Table 5-4: Principal Economic Status (2022)

Status	A187029001	A187075005	Mucklagh	Co Offaly	Ireland
In Work	58.23%	52.16%	53.63%	53.42%	56.09%
Unemployed (inc. looking for first job)	2.95%	3.92%	3.83%	5.53%	5.10%
Student	9.70%	13.33%	10.94%	10.32%	11.10%

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Status	A187029001	A187075005	Mucklagh	Co Offaly	Ireland
Caring for home/family	12.24%	7.45%	6.16%	8.03%	6.58%
Retired	12.66%	18.82%	22.16%	16.02%	15.90%
Unable to work due to illness/disability	2.95%	3.14%	3.15%	5.91%	4.58%

The industrial occupations of working persons in the immediate vicinity of the Site are detailed in Table 5-5 below based on the CSO [35]. The figures for County Offaly and Ireland are provided for context. The above-average proportion employed within the agricultural / forestry sector is indicative of the rural nature of the area.

Table 5-5: Industry of Employment of Adults in Paid Employment (2022)

Status	A187029001	A187075005	Mucklagh	Co Offaly	Ireland
Agriculture, Forestry and Fisheries	5.80%	7.52%	1.09%	6.02%	3.54%
Building and Construction	5.80%	9.02%	5.71%	7.32%	5.80%
Commerce and Trade	26.09%	21.80%	21.90%	20.59%	23.82%
Manufacturing Industries	13.77%	11.28%	12.38%	15.62%	11.77%
Professional Services	23.19%	30.83%	33.33%	24.54%	24.48%
Public Administration	7.25%	9.02%	11.43%	6.63%	5.67%
Transport and Communications	1.45%	6.02%	1.90%	5.86^	9.15%
Other	16.67%	4.51%	11.43%	5.86%	15.76%

The current (or former for those out of work) occupations of working persons in the vicinity of the Site are detailed in Table 5-6 below from the CSO [35]. The figures for County Offaly and Ireland are given for context. Despite the close location of the Agall and Kilsaran quarries, process/plant/ machine operatives are not represented in the area any more significantly than in Ireland as a whole and in fact are under-represented in the local area than across Offaly as a whole. Skilled tradespersons are a more significant presence in both local Small Areas than within Ireland as a whole, with a quarter of the working population of Small Area A187072005 employed or experienced as skilled tradespersons.

Table 5-6: Current and Former Occupations (2022 census)

Status	A187029001	A187075005	Mucklagh	Co Offaly	Ireland
Admin/Secretarial	6.90%	10.71%	12.32%	8.92%	9.20%
Associate Professional and Technical	14.48%	6.43%	11.35%	9.56%	11.72%
Caring/Leisure/Services	7.59%	4.29%	9.18%	8.66%	7.35%
Elementary	6.90%	4.29%	7.00%	8.95%	8.15%
Managerial/Director/Senior Official	4.14%	10.71%	7.25%	6.64%	7.72%
Process/Plant/Machine Operative	6.90%	5.71%	7.25%	9.38%	6.91%

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Status	A187029001	A187075005	Mucklagh	Co Offaly	Ireland
Professional Occupations	16.55%	23.57%	22.22%	15.37%	20.31%
Sales/Customer Service	8.28%	5.71%	7.00%	5.83%	6.18%
Skilled Trade	18.62%	25.00%	13.29%	17.35%	12.57%
Not Stated	9.66%	3.57%	3.14%	9.31%.	9.90%

5.3.3.1 Employment Opportunities in the Surrounding Area

Opportunities for employment exist within the vicinity of the Site in agriculture, the local quarries and other rural industries, the local villages and Tullamore town. Table 5-7 below based on the CSO [35] shows the methods of travel and travel times for journeys to work and education in the vicinity of the Site. Figures for Offaly and Ireland are shown for context.

The low proportion of persons commuting by foot / bicycle or by public transport reflects the rural nature of the immediate area. Although Mucklagh is on the Birr-Dublin bus route, this route does not run throughout the day. The proportion of local persons using private transport is higher in the vicinity of the Site than in Offaly and Ireland. The high proportion of people with a short (less than 15 minutes) commute reflects the importance of local employment in the area. The importance of skilled trade within local employment may contribute to the relatively low proportion of persons who work from home.

Table 5-7: Commuting Methods and Duration

Status	A187029001	A187075005	Mucklagh	Co Offaly	Ireland
Commute to Work					
On Foot/Cycling	3.62%	2.26%	3.83%	8.27%	10.41%
Public Transport	0.72%	1.50%	3.07%	2.42%	7.85%
Scooter/Motorcycle	0.00%	0.00%	0.26%	0.17%	0.37%
Car – Driver	68.12%	71.43%	67.52%	60.39%	52.29%
Car – Passenger	4.35%	0.75%	6.65%	4.64%	3.69%
Van	7.25%	10.53%	8.44%	8.28%	6.38%
Other (inc lorry)	0.00%	0.00%	0.77%	0.94%	0.56%
Mainly Work From Home	4.35%	12.03%	8.95%	8.28%	11.31%
Not Stated	11.59%	1.50%	0.51%	5.74%	7.14%
Commute for Education					
On Foot/Cycling	2.70%	5.77%	17.70%	8.27%	23.85%
Public Transport	5.41%	17.31%	21.40%	2.42%	17.37%
Scooter/Motorcycle	0.00%	0.96%	0.00%	0.03%	0.05%
Car – Driver	1.35%	6.73%	4.94%	4.61%	4.16%

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Status	A187029001	A187075005	Mucklagh	Co Offaly	Ireland
Car – Passenger	78.38%	67.31%	53.50%	51.97%	45.95%
Van	0.00%	0.00%	0.00%	0.19%	0.19%
Other (inc lorry)	0.00%	0.00%	0.00%	0.06%	0.10%
Mainly Work From Home	0.00%	0.00%	0.00%	0.44%	0.55%
Not Stated	12.16%	1.92%	2.47%	7.49%	7.77%
Duration of Commute (Work and Education)					
Less than 15 min	31.94%	49.27%	51.24%	36.74%	29.39%
15 – 29 min	29.84%	27.32%	23.05%	24.01%	28.08%
30 – 59 min	16.75%	15.12%	9.93%	18.29%	23.13%
1 hr+	7.33%	5.37%	12.06%	11.20%	8.67%

5.3.3.2 Site Employment

The current Agall Quarry has been a strong local employer in recent years, directly employing two people within the Proposed Development and a further five in haulage. Indirect employment is supported via jobs in the main facility in Tullamore, and in the maintenance of plant and equipment on-site, supply of fuel to vehicles, and the welfare of the staff (maintenance of toilets, supply of food). The Proposed Development will not increase the employment levels at the quarry. However, the Proposed Development will allow the Applicant to continue to offer local employment opportunities for the lifespan of the Proposed Development.

5.3.4 Human Health

5.3.4.1 Sensitivity

The population of the immediate Small Areas (A187029001) and (A18707500) was considered in terms of the categories set out in Figure 5-1 above, with the results set out in Table 5-8 below. The overall sensitivity of the local population to any resulting impact is deemed to be 'Medium'.

Table 5-8: Sensitivity of Local Population

Criteria	Classification	Basis
SA187029001		
Life Stage	Providing some care	The Pobal age dependency ratio is in line with the national average and the % of those aged <15 and >64 are both in line with national figures.
Deprivation	Low	The Pobal Description is "marginally below average"
Health Status	Good	The % of people reporting 'very good/good', and 'bad/very bad' health are in line with the national figures. The % of persons who are unable to work due to illness/disability is slightly below the national figure.

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Criteria	Classification	Basis
Daily Activities	Limited a little	The % of the population with a disability is slightly below the national figure, but the % of people caring for those with a disability is slightly above the national figure. However, the % of persons who are unable to work due to illness/disability is slightly below the national figure.
Inequalities	Narrowing	Although the % of people with no/primary-level education is only slightly above the national average, the % of people with a third-level education is well below the national average. Although the male unemployment rate is above the national figure, it is below the County male unemployment figure. The female unemployment rate is well below the national and County figures and the over-all % in work is slightly above the national figure. The % of people unable to work due to illness/disability is below the national figure. The rate of home-ownership is approximately 30% above the national figure and there are no social renters. The population is largely homogenous and the % who do not speak English/do not speak English well is below the national figure
Outlook Towards Proposal	Supportive to Ambivalent	The Proposed Development has been an important local employer since extractive work began and no known complaints have been lodged with the owner or with MCC
Capacity of Health Services to adapt	Very High	The Proposed Development is not a health-related project and will not create additional specific demands on the local health infrastructure.
Resource Sharing with Proposal	None Shared	The Site will not have high power or water demands. Just over 50% of the local residents are on mains water. The majority of local residents utilise septic tanks for sewerage requirements and over 60% use peat- or oil-fired heating. Traffic impact is outlined in Chapter 14.
Overall Sensitivity Score	**Low**	
SA 187075005		
Life Stage	Providing some care	The Pobal age-dependency ratio is somewhat above the national figure. Although the % aged above 65 is lower than the national figure, the % of those aged <15 is above the national figure, which increases the over-all care burden.
Deprivation	Low	The Pobal Description is “marginally below average”
Health Status	Good	The % of people reporting ‘very good/good health’ is above the national figure and the % reporting ‘bad/very bad health’ is below the national average. In addition, the % of the population unable to work due to illness/disability is well below the national figure.
Daily Activities	Limited a little	The % of people identifying as having a disability is slightly above the national figure, as is the % of people acting as carers for those with a disability. The % of those unable to work due to illness/disability is well below the national figure.

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Criteria	Classification	Basis
Inequalities	Widening	Although the % of people in work is above the County figure and the unemployment rate is below the County figure, both male and female unemployment rates are above the national figure. The % in work is below the national figure. However, the % of people unable to work due to illness/disability is well below the national figure. The rate of homeowner-ship is approximately 30% above the national figure and there are no social renters. Although the % of people with no/primary-level education is slightly below the national figure, the % of people with a third-level education is also below the national average. The population is largely homogenous and the % who do not speak English/do not speak English well is below the national figure.
Outlook Towards Proposal	Supportive to Ambivalent	The Proposed Development has been an important local employer since extractive work began and no known complaints have been lodged with the owner or with MCC.
Capacity of Health Services to adapt	Very High	The Proposed Development is not a health-related project and will not create additional specific demands on the local health infrastructure.
Resource Sharing with Proposal	None Shared	The Site will not have high power or water demands. Just over 50% of the local residents are on mains water. The majority of local residents utilise septic tanks for sewerage requirements and over 75% use peat- or oil-fired heating. Traffic impact is outlined in Chapter 14.
Overall Sensitivity Score	**Medium**	

5.4 Characteristics & Potential Effects of the Proposed Development

This section examines the potential effects on population and human health that may arise from the Proposed Development during the construction and operational phases and also examines potential effects that may arise if the Proposed Development did not proceed. This includes the potential for unplanned events.

5.4.1 Population

The Agall Quarry has enabled the Applicant to provide valuable local employment in a rural environment. The Proposed Development would enable this employment to continue into the foreseeable future. This will support the local economy. If the Proposed Development does not go ahead, the available resources within the current Agall Quarry will become exhausted. This will reduce the lifespan of the quarry and leave Condron Concrete unable to continue to employ the entirety of the current workforce, resulting in a loss of jobs.

5.4.2 Human Health

There is no record of any complaint having been lodged to either OCC or the Applicant in respect of any nuisance arising from or associated with Agall Quarry during its lifetime.

The potential effects on human health, particularly potential effects on residents in the immediate locality, are addressed in detail in the following specialist chapters. The conclusions of these chapters are considered here in the context of the low health sensitivity determined in section 5.3.4.1 above. Refer to the specific chapters for further details.

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Chapter 7: Land, Soils and Geology – A geological examination of the Site was carried out, with the conclusion that the residual effect on land use and soils will be "not significant". Therefore, the potential for impact on human health is "not significant".

Chapter 8: Water – An assessment of the hydrology and hydrogeology of the Site was conducted. This identified no effects for surface water resulting from the Site. Effects on groundwater were deemed to be not significant. Therefore, the potential for effects on human health is "not significant".

Chapter 9: Acoustics (Noise and Vibration) – An assessment of the noise and vibration arising from the Proposed Development found that with mitigation measures in place, the residual effect would be "not significant", and the Proposed Development would be in compliance with set noise limits. Therefore, the potential for effect on human health is "not significant".

Chapter 10: Air Quality – An assessment of potential air pollution arising from the Proposed Development and the processes taking place in the Agall Quarry was carried out in this Chapter. This concluded that with the mitigation measures to be employed, the impact on air quality was considered to be imperceptible. Therefore, the potential for impact on human health is not significant.

Chapter 11: Climate – An assessment of the effect of the Proposed Development on greenhouse gas emissions was carried out with the conclusion that emissions associated with the operations of the Proposed Development likely to have a not significant effect on national GHG emissions and in turn, climate change that can impact human health.

Chapter 12: Landscape and Visual – The assessment of the landscape impacts and visual impacts arising from the Proposed Development carried out in this Chapter found that the landscape and visual impact would be 'not significant'. Therefore, the potential for effects on human health is "not significant".

Chapter 13: Cultural Heritage – An assessment of the cultural heritage impacts of the Proposed Development was carried out in this Chapter. This found no indirect or indirect effects on cultural heritage arising from the Proposed Development. Therefore, there will be no effects on human health.

Chapter 14: Material Assets – Traffic and Transport. An assessment of the impacts on traffic and transport arising from the Proposed Development was carried out in this Chapter. This found with the mitigation measures in place, the impact from traffic and transport would be 'not significant'. Therefore, the potential for effects on human health is "not significant".

5.4.2.1 Safety

The Health and Safety Authority ('HSA') views the quarrying industry as a high-risk sector [39].

As a gravel quarry, no explosives are required or will be needed on-site. Activities will continue as have been long established by the Applicant in the Agall Quarry. However, risks are still present to workers on the Site due to the nature of the business involving heavy machinery and working in the open environment.

The Applicant has confirmed there have been no accidents or incidents associated with the Agall Quarry.

5.4.2.2 Unplanned Events

As with all similar developments, there is some risk that accidents or disasters outside the operator's control could result in a risk to the environment. Such incidents could theoretically include fire, flood, explosions and oil / fuel spills arising from vehicle accidents. However, in practice, these incidents are unlikely due to the following control measures:

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- Fire - the nature of the Site means that there are very few combustible materials or sources of ignition, as the Site's plant and equipment will be maintained to a high standard of safety. In addition, the distance between the various elements of infrastructure means that there is very little risk of a fire spreading beyond the initial point. Unplanned events therefore may result in a plant or machine being exposed to fire, but a notable fire event or requirement for fire tender support is not deemed likely;
- Flood – the Proposed Development is flood compatible, with key plant and equipment been mobile. However, the works are above water table by a minimum of three meters, and no historic flooding has been noted on the Site or within the Agall Quarry;
- Explosion – as stated in section 5.4.2.1 above, no explosives are required, needed or stored on-site; and,
- Vehicular accidents – staff cars are permitted to the main shed building and all staff are fully trained and certified as required to operate mobile plant.

It should be stressed that there is no history of any unplanned event at Agall Quarry.

5.5 Mitigation measures

Mitigation measures against the potential effects which may impact on human health from the Proposed Development are considered in detail within the following chapters:

- Chapter 7: Land, Soil and Geology - Measures to avoid any potential contamination of land soil and geology will be implemented;
- Chapter 8: Water - Measures to avoid any potential contamination of water will be in place;
- Chapter 9: Acoustics (Noise and Vibration) - Measures to reduce the noise and vibration arising from the Site will be in place;
- Chapter 10: Air - Measures to avoid excess dust will be in place;
- Chapter 11: Climate - Measures will be in place to reduce Greenhouse Gas Emissions;
- Chapter 12: Landscape and Visual – measures will be implemented to mitigate the effects on the landscape and visual experience of the local population; and,
- Chapter 14: Material Assets - Traffic and Transport. Measures to ensure both local residents' and highway users' safety in regard to Site traffic will be placed.

5.6 Cumulative and In-Combination Effects

The Site will, in combination with other businesses / enterprises in the area, support local employment and the local economy.

As outlined in section 5.3.2.3 above, there are several other local working quarries. Although none are closer than 1km, there is a potential cumulative effect in terms of dust and noise.

The potential cumulative impact of noise is examined in section 9.6 below. The cumulative impact of dust is examined in section 11.6 below.

There is a potential cumulative impact on the Agall Spring Public Water supply in terms of quality. This is examined in section 8.6 below.

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5.7 Interactions With Other Environmental Attributes

Population and human health have the potential to be impacted positively or negatively by several environmental issues. The relevant interactions with other key environmental factors are set out in section 5.4.2 above (and more extensively in chapters 6-14).

5.8 Indirect Effects

The Proposed Development will have a neutral to slight, positive long-term effect regarding continued indirect local employment such as machinery maintenance and upkeep and professional services such as:

- Health and safety specialists;
- Refuelling;
- Environmental monitoring personnel; and,
- Quality control personnel.

5.9 Residual Effects

The effect of the Proposed Development on the population and local economy in terms of direct employment can be considered as long-term and neutral. The effects on the local and regional aggregate supply can be considered as long-term, positive and moderate.

The residual effect in terms of human health within the local population will be ‘imperceptible’ to ‘not significant’ and long-term.

5.10 Monitoring Required

Monitoring requirements are detailed in the relevant specialist chapters.

5.11 Reinstatement

A restoration plan is presented as part of this planning application (see section 3.4.3 above). This will see the site being restored and the lands eventually reinstated for agricultural use following the exhaustion of the aggregate resources. This will mark the completion of the works on site, and no further effects will arise following closure.

5.12 Difficulties Encountered

No difficulties were encountered.

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6 BIODIVERSITY

6.1 Introduction

This Chapter of the EIAR details the methods and results of a desk study and field surveys undertaken to establish the baseline ecological status of the Site and the full landholding to assess the potential impacts of the Proposed Development.

A detailed ecological appraisal has been carried out by a fully qualified and experienced MOR Environmental Ecologist in line with *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (2018 and revisions) [40]. In addition, an assessment on potential impacts on European sites was also undertaken and is presented in the Stage One: Appropriate Assessment Screening Report ('AA') submitted as part of the overall planning application.

6.2 Study Assessment and Methodology

6.2.1 Relevant Guidance

The following standards and guidance documents were utilised to characterise the baseline conditions of the Site, the assessment of potential impacts to biodiversity and the appropriate mitigation measures required:

- Guidelines for the Protection of Biodiversity within the Extractive Industry [13];
- Plantlife, 'Looking After Red Hemp-nettle: Ecology and Conservation Portfolio,' [27];
- NRA, 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' [40];
- Chartered Institute of Ecology and Environmental Management ('CIEEM'), Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (2018 and revisions) [41];
- Fossitt's Guide to Habitats in Ireland [42];
- Heritage Council's 'Best Practice Guidance for Habitat Survey & Mapping' [43];
- National Road Authority ('NRA'), 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes;' [44];
- Scottish Badgers, 'Surveying for Badgers: Good Practice Guidelines,' [45];
- The Mammal Society, 'Surveying Badgers,' [46];
- DoEHLG, 'Bat Mitigation Guidelines for Ireland' [47];
- NRA, 'Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes' [48];
- Bat Conservation Trust ('BCT'), 'Bat Surveys for Professional Ecologists Good Practice Guidelines' [49];
- British Trust for Ornithology ('BTO') - A Field Guide to Monitoring Nests [50];
- Common Bird Census ('CBC') in Bird Monitoring Methods [51];
- C811 – 'Environmental Good Practice on Site (5th Edition)' [52];
- NRA, 'Guidance for the Treatment of Badgers Prior to the Construction of National Road Schemes' [53]; and,

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- NRA, 'Guidance on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads [54].

6.2.2 Legislation / Policy Context

6.2.2.1 Legal Protections

Within Ireland, several sites of international or national importance to nature conservation, as well as many species of animal and plants are afforded some degree of legal protection; for details see Box 1 below.

Box 1 Designated Wildlife Sites and Protected and Otherwise Notable Habitats and Species

The National Parks and Wildlife Service ('NPWS') notifies sites in Ireland that are of international or national importance for nature conservation (although some sites that are of national importance for certain species have not been so designated).

Internationally important sites may also be designated as:

- Special Areas of Conservation ('SACs') and Candidate Special Area pf Conservation ('cSACs'): the legal requirements relating to the designation and management of SACs in Ireland are set out in the European Communities (Birds and Natural Habitats) Regulations 2011-2021.
- Special Protection Areas ('SPAs') and candidate Special Protected Areas ('cSPAs'): strictly protected sites classified in accordance with Article 4 of the EC Directive on the Conservation of Wild Birds (2009/147/EC), also known as the Birds Directive; and,
- Ramsar sites: wetlands of international importance designated under the Ramsar Convention, to which Ireland is a signatory.

Other statutory site designations relating to nature conservation are:

- Natural Heritage Areas ('NHAs'): these represent examples of some of the most important natural and semi-natural terrestrial and coastal habitats in the country and are afforded protection under the Wildlife (Amendment) Act 2000. NHAs are legally protected from damage and receive protection from the date they are formally proposed for designation; and,
- Proposed Natural Heritage Areas ('pNHAs'): these sites are not afforded the same protection as NHAs. These sites are proposed by the NPWS but are not statutorily proposed or designated. Prior to statutory designation these are subject to a very limited legal protection. They are, however, sites of significance for wildlife and habitats and are important for the purposes of this Biodiversity Chapter.

Legally protected species

Many species of animal and plant receive some degree of legal protection. For the purposes of this study, legal protection refers to:

- Species included in the Wildlife (Amendment) Act 2000, excluding species that are only protected in relation to their sale, reflecting the fact that the site disposal will not include any proposals relating to the sale of species; and,
- Species afforded protection under the Flora (Protection) Order 2022 (S.I.No.235/2022).

Other notable habitat/species categories

- Biodiversity Action Plan ('BAP') species: those targeted in local or national BAPs as being of particular conservation concern (priority species).
- Red and Amber List birds: those listed as being of high or medium conservation concern as listed by Birdwatch Ireland on the Birds of Conservation Concern in Ireland 2020-2026 [55].
- Other Irish Red Data Book species [56] and Nationally / Regionally / Locally Notable species where appropriate.

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6.2.2.2 National Planning Context

A study of biodiversity-related planning policy at the national and local levels has been undertaken for the Site and locality to highlight any potential conflicts with the relevant legislation and guidance documents as outlined in Box 1 above.

Project Ireland 2040 National Planning Framework

Project Ireland 2040 was launched by the Government in February 2018 and incorporates two policy documents - the National Planning Framework ('NPF') [21] and the National Development Plan ('NDP') [22].

Following a decision of the Government in June 2023, the preparation of a revised NPF [57] commenced to take account of changes that have occurred since it was published (in 2018) and to build on the existing framework. Public consultation took place from 10th July 2024 to 12th September 2024, following which the Government agreed to progress and publish a draft schedule of amendments to the First Revision to the NPF in November 2024. On 8th April 2025, the Government approved the revised NPF following the conclusion of environmental assessments which included a Strategic Environmental Assessment ('SEA'); NIS and Appropriate Assessment Determination and a Strategic Flood Risk Assessment ('SFRA'). Both houses of the Oireachtas, the Seanad and the Dáil, approved this document as of 30th April 2025. The revised NPF is a direct replacement of the NPF and therefore, is detailed further below.

<u>First Revision to National Planning Framework (April 2025)</u>

Objectives under the '*Strategic Planning for Biodiversity*' section of the revised NPF include the following:

NPO 84

> *'In line with the National Biodiversity Action Plan and European Union Nature Restoration Law, and best available scientific information, regional and local planning authorities shall support the preparation and implementation of the National Restoration Plan.'*

NPO 85

> *'In line with the National Biodiversity Action Plan; the conservation, enhancement, mitigation and restoration of biodiversity is to be supported by:*
>
> - *Integrating policies and objectives for the protection and restoration of biodiversity, including the principles of the mitigation hierarchy of - avoid, minimise, restore and offset - of potential biodiversity impacts, in statutory land-use plan.*
> - *Retention of existing habitats which are currently important for maintaining biodiversity (at local/regional/national/international levels), in the first instance, is preferable to replacement/restoration of habitats, in the interests of ensuring continuity of habitat provision and reduction of associated risks and costs.'*

NPO 86

> *'In line with the objectives of the National Biodiversity Action Plan, planning authorities should seek to address no net loss of biodiversity within their plan making functions.'*

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NPO 87

> *'Enhance the conservation status and improve the management of protected area and protected species by:*
>
> - *Implementing relevant EU Directives to protect Ireland's environment and wildlife and support the objectives of the National Biodiversity Action Plan;*
> - *Developing and utilising licensing and consent systems to facilitate sustainable activities within Natura 2000 sites;*
> - *Continued research, survey programmes and monitoring of habitats and species.'*

The National Development Plan (2021-2030)

The National Development Plan also lists the following items as strategic investment priorities in relation to National Heritage and biodiversity [22]:

- *'Implementation of the current and future National Biodiversity Action Plan, delivery of National Parks and Wildlife Service Farm Plans and LIFE projects, enhanced wildlife crime investigation capacity and identification and delivery conservation measures at designated sites as identified in the Prioritised Action Framework for Ireland (2021-2027).'*;
- *'Investment in nature and biodiversity, to improve the quality of natural habitats and support native plants and animals, including those under threat, and to bolster broader societal wellness and sustainability goals.'*; and,
- *'Future-proofing obligations under the Biodiversity Strategy 2030, including potential national designations and the preparation and delivery of a National Restoration Plan.'*

6.2.2.3 Regional Planning Context

Eastern & Midland Regional Spatial and Economic Strategy 2019-2031

The Eastern & Midland Regional Spatial and Economic Strategy 2019-2031 ('RSES') [24] recognises the need to conserve and enhance biodiversity through coordinated spatial planning in the eastern and midland region.

One of the guiding principles of this document relating to the Proposed Development is to:

> *'Explore opportunities for biodiversity enhancement to improve ecological connectivity as part of the strategic re-intensification of urban infill and brownfield sites.'*

Under the biodiversity section, the following regional policy objectives relative to the Proposed Development are listed:

RPO 7.16

> *'Support the implementation of the Habitats Directives in achieving an improvement in the conservation status of protected species and habitats in the Region and to ensure alignment between the core objectives of the EU Birds and Habitats Directives and local authority development plans.'*

RPO 7.17

> *'Facilitate cross boundary co-ordination between local authorities and the relevant agencies in the Region to provide clear governance arrangements and coordination mechanisms to support the development of ecological networks and enhanced connectivity between protected sites whilst also*

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addressing the need for management of alien invasive species and the conservation of native species.'

RPO 10.6

'Delivery and phasing of services shall be subject to the required appraisal, planning and environmental assessment processes and shall avoid adverse impacts on the integrity of the Natura 2000 network.'

6.2.2.4 Local Planning Context

Offaly County Development Plan 2021-2027

The Offaly County Development Plan ('OCDP') 2021-2027 [26] contains a number of policies and objectives which relate directly to biodiversity. The following biodiversity polices were considered relevant to the Proposed Development:

BLP-01

'It is Council policy to protect, conserve, and seek to enhance the county's biodiversity and ecological connectivity.'

BLP-02

'It is Council policy to conserve and protect habitats and species listed in the Annexes of the EU Habitats Directive (92/43/EEC) (as amended) and the Birds Directive (2009/147/EC), the Wildlife Acts 1976 (as amended) and the Flora Protection Orders.'

BLP-05

'It is Council policy to ensure that development does not have a significant adverse impact, incapable of satisfactory avoidance or mitigation, on plant, animal or bird species protected by law.'

BLP-07

'It is Council policy to support the implementation of the National Biodiversity Action Plan 2017-2021 and the Offaly Heritage Plan Key Actions 2017-2021 and future editions in partnership with relevant stakeholders subject to available resources.'

BLP-34

'It is Council policy to continue to deliver and support measures for the prevention, control and/or eradication of invasive species within the county, and to seek details of how these species will be managed and controlled where their presence is identified.'

BLP-38

'It is Council policy to protect and enhance the county's landscape, by ensuring that development retains, protects and where necessary, enhances the appearance and character of the county's existing landscape.'

BLP-39

'It is Council policy to seek to ensure that local landscape features, including historic features and buildings, hedgerow, shelter belts and stone walls, are retained, protected and enhanced where appropriate, so as to preserve the local landscape and character of an area, whilst providing for future development.'

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The following biodiversity objectives were also considered relevant to the Proposed Development:

BLO-02

> *'It is an objective of the Council that no plans, programmes or projects giving rise to significant cumulative, direct, indirect or secondary impacts on European sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall be permitted on the basis of this Plan (either individually or in combination with other plans, programmes, etc. or projects).'*

BLO-04

> *'It is an objective of the Council to ensure that the impact of development within or adjacent to national designated sites, Natural Heritage Areas, proposed Natural Heritage Areas, Ramsar Sites and Nature Reserves likely to result in significant adverse effects on the designated site is assessed by requiring the submission of an Ecological Impact Assessment prepared by a suitably qualified professional, which should accompany planning applications.'*

Offaly Draft Biodiversity Action Plan 2025 – 2030

The Offaly Biodiversity Action Plan 2025–2030 [58] has been under development by OCC, with pre-draft public consultations held in March and April 2024. The draft Biodiversity Action Plan ('dBAP') was reviewed as part of this report, and a number of objectives were considered relevant to the Proposed Development.

Objective 2 of the draft states:

> '*Meet urgent conservation and restoration needs.'*

A number of targeted outcomes are listed under this objective which are considered relevant to the Proposed Development. These include the following:

Outcome 2A:

> '*The protection of existing designated areas and protected species is strengthened and conservation and restoration within the existing protected area network are*
>
> *Enhanced'.*

Outcome 2B:

> *'Biodiversity and ecosystem services in the wider countryside are conserved and restored – agriculture & forestry.'*

Outcome 2F:

> *'A National Restoration Plan is in place to contribute to the ambition of the EU Biodiversity Strategy 2030 and global restoration targets.'*

Outcome 2H:

> *'Invasive alien species (IAS) are controlled and managed on an all-island basis to reduce the harmful impact they have on biodiversity and measures are undertaken to tackle the introduction and spread of new IAS to the environment.'*

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Under Objective 3, the following targeted outcome is considered relevant to the Proposed Development:

Outcome 3A:

> *'Ireland's natural heritage and biocultural diversity is recognised, valued, enhanced and promoted in policy and practice.'*

Coillte Midlands Five Year Forest Plan 2021-2025

As mentioned in Section 1.3 above, Blackwood, a commercial woodland managed and operated by Coillte is located to the south of the Site boundary. This is a ca. 70ha woodland dominated by oak and ash trees. Under the Coillte Midlands Five Year Forest Plan 2021-2025, the management strategy is to restore Blackwood to a broadleaf woodland [2].

6.2.3 Assessment Methodology

The starting point for the assessment was to undertake a scoping exercise for those ecological receptors that would require further consideration as part of the assessment. This involved differentiating the biodiversity receptors (i.e., designated sites, habitats, and species populations) that could be likely and significantly affected by the Proposed Development.

The approach that was used for determining which receptors have the potential to be significantly affected by the Proposed Development involved using baseline data collected through the desk study and field surveys for the landholding. Based on professional judgement data from the following radii was collected: 2km away for protected species, 15km for Natura 2000 sites and 5km away from Natural Heritage Areas. The desk and field-based data was used to determine:

- Which, if any, of the species or habitats recorded are legally protected or controlled (see Box 1); and,
- Which, if any, sites, areas of habitat or species recorded are of importance for biodiversity conservation.

The next stage of the assessment was to determine whether the identified receptors are of sufficient biodiversity value that an impact upon them would be of potential significance in terms of this EIA. In this regard:

- Biodiversity conservation value relates to the quality and / or size of sites or habitats, or the size of species' populations; and,
- Potential significance means that the effect could be of sufficient concern or, for positive effects, of such substantial benefit that it could be material to influencing the decision on planning.

Receptors that have been identified as having sufficient value, and that an impact upon them could be of potential significance, have been taken forward for further consideration. Legally protected species were also considered further (refer to Box 1 above). This involved:

- Identifying, for each receptor, any significant impact that is likely to be caused by the Proposed Development, which has the potential to lead to a significant effect and / or to contravene relevant legislation;
- Determining the area within which the likely impacts would cause a potentially significant impact on the identified receptor and / or could contravene relevant legislation (ecological zone of influence); and,
- If the receptor occurs or is likely to occur within the zone of influence and it is concluded that the receptor could be significantly affected and / or the relevant legislation contravened, the receptor would be subject to further assessment.

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6.2.4 Evaluation of the Conservation Importance of the Site

In terms of biodiversity conservation value, identified receptors have been valued using the National Roads Authority Scheme [59], using the following scale:

- International importance;
- National importance;
- County importance (or vice-county in the case of plant or insect species);
- Local importance (higher value); and,
- Local importance (lower value).

6.2.5 Desk Study

As a starting point, the desk study focused on identifying European designated sites within a 15km radius of the Site, nationally designated sites within a 5km radius of the Site and records of legally protected and notable species within 2km of the Site.

The area for which biological data were collected was based on an assessment of the ecological zone of influence of the Site (i.e. the area that could be affected by the scheme within which there is the potential for significant ecological effects).

The following literature sources were consulted as part of the desktop study for ecological information:

- Review of aerial maps of the Site and surrounding area;
- The National Parks and Wildlife Service ('NPWS') website was consulted with regard to the most up to date detail on conservation objectives for the European sites relevant to this assessment [60];
- The National Biodiversity Data Centre ('NBDC') website was consulted with regard to species distributions [61];
- The Environmental Protection Agency ('EPA') Maps website was consulted to obtain details about watercourses in the vicinity of the Site [62]; and,
- The Offaly County Council Planning Portal was consulted to obtain details about existing / proposed developments in the vicinity of the Site [3].

6.2.6 Field Survey

To gain a full understanding of the Site and its surrounding habitats, the field-based assessment was extended to cover the full landholding as outlined in Figure 6-1.

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Figure 6-1: Site and Landownership Boundaries



6.2.6.1 Habitat Survey

A habitat survey was undertaken by two suitably qualified MOR Environmental Ecologists on 27th September 2022. An updated habitat survey was undertaken on 9th August 2024 by two suitably qualified MOR Environmental Ecologists to establish that the habitats previously identified during the 2022 survey remained unchanged. These surveys aimed to assess the extent and quality of habitats present within the landholding and to identify any potential ecological receptors. The habitat survey was undertaken using the Fossitt's Guide to Habitats in Ireland [42] in line with the Heritage Council's '*Best Practice Guidance for Habitat Survey & Mapping'* [43].

The assessment was also extended to identify the potential for these habitats to support other features of nature conservation importance, such as species afforded legal protection under either Irish or European legislation.

6.2.6.2 Protected / Notable Species

The methodologies used to establish the presence / potential presence of faunal species are summarised below. These relate to those species / biological taxa that the desk study and habitats present indicated could occur within the area of the landholding.

<u>Flora</u>

The landholding was assessed for the presence of notable / protected flora species in accordance with the following:

- Flora (Protection) Order 2022 (S.I. No. 235/2022); and,
- Ireland Red List No. 10: Vascular Plants [63].

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The habitat survey identified red hemp-nettle (*Galeopsis angustifolia*) growing within the north-central portion of the landholding, as shown in Figure 6-2 below. Given the presence of this legally protected flora species, a targeted red hemp-nettle survey was undertaken on 26th June 2023 by a suitably qualified MOR Environmental Ecologist. This area was re-surveyed on 9th August 2024.

Figure 6-2: Red Hemp-nettle Survey Area Extent and Main Count Area



As outlined in Section 4.3.1 of this report, the Applicant requested that the survey focused on an area of potential disturbance from a potential design option, this area is referred to as the Main Count Area, as presented in Figure 6-2 above. Transects were walked to count the visible red hemp-nettle and to determine whether the cover was sparse or present in dense clusters. A GPS unit and red surveyor flags were used to mark out the full extent of red hemp-nettle within the landholding.

The habitat conditions were noted; however, given the lack of soil medium in the area supporting red hemp-nettle, no tests relating to texture of the soil or nutrient levels were undertaken. The methodology used for this survey was adapted from '*Looking After Red Hemp-nettle: Ecology and Conservation Portfolio*,' by Plantlife [27].

Amphibians

The landholding was assessed for its potential to provide sheltering, foraging and breeding habitat for amphibians in line with the NRA, now TII, '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes,*' [44]. These include water bodies suitable for egg-laying, and terrestrial habitats comprising open areas with mixed-height vegetation, such as heathland, rough grassland, open scrub or water body margins. Suitable well-drained and frost-free areas are needed to enable amphibians to survive the winter.

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Badgers

The survey aimed to identify and examine areas where badgers might occur by noting any evidence of badger activity. This included:

- Mammal paths;
- Badger hairs caught in sett entrances / fences / vegetation;
- Paw prints;
- Evidence of foraging (usually in the form of 'snuffle holes');
- Badger Scat (isolated badger droppings);
- Latrines (shallow pits/holes occurring together comprised of exposed badger droppings); and,
- Badger setts.

A mammal path was assumed to be used by badgers if the character of the path (in terms of size) was appropriate and / or if any other signs were in close vicinity (e.g. a badger sett).

The field survey of the landholding was conducted in line with the following relevant guidance for badger:

- Scottish Badgers, '*Surveying for Badgers: Good Practice Guidelines,*' [45];
- The Mammal Society, '*Surveying Badgers*,' [46]; and,
- NRA, now TII, '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes,*' [44].

Bats

An initial assessment was carried out during the habitat survey for suitability of the habitats within the landholding to support bat roosting, foraging and commuting.

No trees or buildings with bat roost potential were identified within the eastern portion of the Site including the access into the Site and the recommencement area. Given the disturbed nature of these habitats and the absence of suitable hedgerows / treelines, no additional surveys for bats were conducted in these areas.

A ground level tree assessment was undertaken within the greenfield area of the Site. This area was characterised by well-established linear habitats. Particular focus was given to the areas with the potential to be disturbed by the Proposed Development, refer to Figure 6-3 below for context. This inspection was undertaken using close-focusing binoculars and a powerful focused-beam light source.

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Figure 6-3: Bat Survey Area



The following criteria were used to assess mature trees onsite:

- Presence of natural cavities, splits, cracks, loose bark and rot holes in the trunk or boughs of the tree;
- Presence of dense and woody ivy (*Hedera helix*) growth that could be used by bats for roosting;
- Evidence of bat droppings, which may also be seen as a black streak beneath holes, cracks, branches, etc; and,
- Presence of smooth edges with dark marks and urine stains at potential entrances to roosts.

Given the presence of linear features suitable for foraging and commuting bats that have the potential to be disturbed / impacted by the Proposed Development, follow up dusk activity surveys were undertaken to confirm if any of these trees were being used by roosting bats and to establish the level and type of activity onsite. These surveys were conducted on 14th and 28th August 2023.

All surveys were undertaken in accordance with recognised best practice as outlined below:

- DoEHLG, '*Bat Mitigation Guidelines for Ireland*' [47];
- NRA *'Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes*' [64]; and,
- BCT, '*Bat Surveys for Professional Ecologists Good Practice Guidelines*' [49].

Two passive bat detectors, Wildlife Acoustics Song Meter 4 ('SM4s'), were also placed on two of the hedgerow / treelines that traverse the Site for 14 nights. These static monitoring surveys

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recorded bat calls 30 minutes before sunset until 30 minutes after sunrise. The SM4s were used to determine the levels of foraging and commuting bat species in the area.

Full details of the survey methodology are provided in Appendix 6-2: Bat Report.

During the most recent Site visit on 9th August 2024, the Site was assessed in line with the most recent Bat Conservation Trust ('BCT') guidance document, '*Bat Surveys for Professional Ecologists - Good Practice Guidelines (4th ed.)'* [65].

Birds

The landholding was assessed for its potential to provide nesting habitat for breeding birds or to support important assemblages of birds of rare or notable species. After the initial walkover of the landholding, it was deemed necessary to undertake breeding bird surveys within the greenfield portion of the landholding.

The breeding bird surveys were undertaken on 21st April 2023, 11th May 2023 and 26th June 2023. The breeding bird surveys were conducted in line with the methodology described in:

- BTO - *A Field Guide to Monitoring Nests* [50]; and,
- Common Bird Census in *Bird Monitoring Methods* [66].

To establish whether any breeding bird species were utilising the landholding and the airspace above the Site, transect surveys were undertaken by a suitably qualified and experienced MOR Environmental Ecologist. Transects were walked along the perimeter of the greenfield lands as presented in Figure 6-4 below.

Figure 6-4: Breeding Bird Survey Transect



All birds were recorded through sight and sound. Optical equipment was used, including binoculars, to minimise disturbance to potentially breeding birds. The hedgerow, hedgerow / treeline onsite were examined for the presence of nests. During the survey, the behavioural

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activity of the recorded birds was noted using the BTO breeding status codes [67]. Birds that displayed non-territorial behaviours were recorded as well (i.e. birds that were flying over the transect area, birds that were foraging and not calling, birds that were loafing).

Therefore, birds were classified as non-breeding, possibly breeding and confirmed breeding based on the behaviours exhibited. The criterion for each classification is described below:

- Non-breeding – Birds that were flying over the transect area, birds that were foraging and not calling, birds that were loafing;
- Possible Breeding – Birds observed in suitable nesting habitat and displaying either territorial and / or courtship behaviours, nest building behaviours or observed visiting a possible nest; and,
- Confirmed Breeding – Birds observed either on nest or carrying faecal sac or food, sighting of a nest with eggs / chicks, used nests, eggshells or recently fledged young.

The survey dates, times and weather conditions for both dates are described in Table 6-1.

Table 6-1: Meta Data for Breeding Bird Surveys

Date	Survey Times (Start-End)	Temperature (°C) (Start – End)	Wind (Beaufort Wind Scale)	Rain	Cloud Cover
21/04/2023	10:30 – 12:45	10 -12	2	No Rain	0-66%
11/05/2023	8:45-11:30	10 -12	4	No Rain	66-100%
26/06/2023	08:30-11:15	14 -16	2	Heavy shower from 11:05-11:15am	66-100%

Invasive Species

The Site was assessed for the presence of any noxious / invasive species that are regulated under Regulations 16(1) and 16(2) of the European Union (Invasive Alien Species) Regulations 2024 (S.I. 374 of 2024) [68] such as Japanese knotweed (*Reynoutria japonica*) and Himalayan balsam (*Impatiens glandulifera*).

The landholding was also assessed for the presence of non-regulated invasive species that have the potential to impact local biodiversity.

Other Species

In addition, an assessment was carried out of the potential for the landholding to support any other species considered to be of value for biodiversity, including those that were identified as occurring locally by the desktop study.

6.2.6.3 Survey Limitations

No survey limitations were encountered.

6.3 Receiving Environment

6.3.1 Desk Study Results

Prior to conducting any Site surveys, a desk-based review of information sources was completed. The findings of the desk-based review provided valuable insight into the types of flora and fauna that may occur onsite and allowed for the identification of features / habitats located in the vicinity of the Site that may require further assessment.

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6.3.1.1 European Designated Site

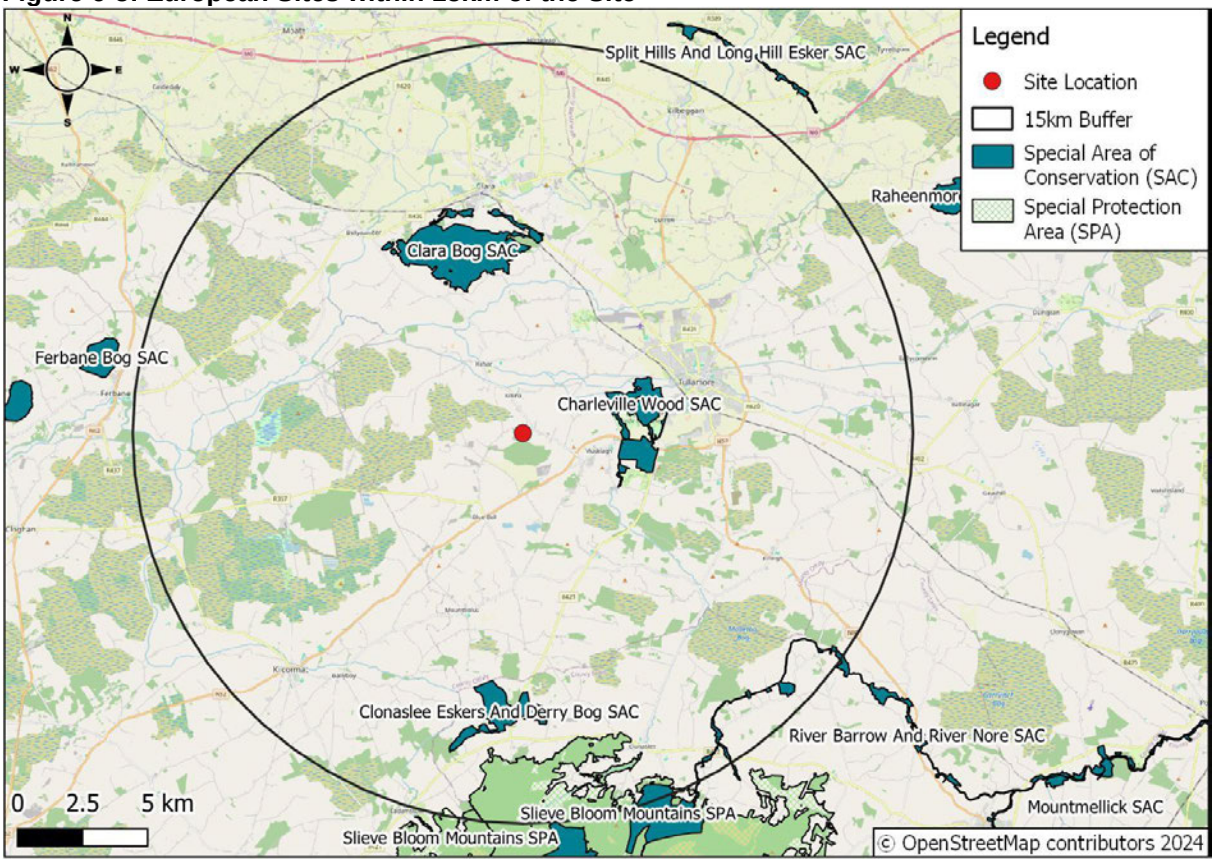
In accordance with the European Commission Methodological Guidance [69] a list of European sites that can be potentially affected by the Proposed Development has been compiled. Guidance for Planning Authorities prepared by the Department of Environment Heritage and Local Government [70] states that defining the likely zone of impact for the screening and the approach used will depend on the nature, size, location, and the likely effects of the project. The key variables determining whether or not a particular European site is likely to be negatively affected by a project are:

- The physical distance from the project to the European site;
- The presence of impact pathways;
- The sensitivities of the ecological receptors; and,
- The potential for in-combination effects.

All SPAs and SACs within 15km have been considered to assess their ecological pathways and functional links. As acknowledged in the OPR guidelines [71], few projects have a Zone of Influence this large, however, the identification of European sites within 15km has become widely accepted as the starting point for the screening process. For this reason, all SPAs and SACs in 15km have been identified for consideration as part of the screening.

Six European sites were identified within 15km of the Site – these are presented in Figure 6-5 and Table 6-2 below.

Figure 6-5: European Sites within 15km of the Site



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Table 6-2: European Designated Sites within 15km of the Site

Site Name	Code	Distance	Direction from the Site
Special Areas of Conservation ('SAC')			
Charleville Wood	000571	3.8km	E
Clara Bog	000572	5.5km	N
Clonaslee Eskers and Derry Bog	00859	9.0km	SW
River Barrow and River Nore	002162	13.0km	SE
Slieve Bloom Mountains	000412	14.3km	SE
Special Protection Area ('SPA')			
Slieve Bloom Mountains	004160	11.5km	S

The Site is not located within or directly adjacent to any European sites and no impact pathways were identified during the desk-based or field-based studies.

Nonetheless, further consideration to these European sites is provided in the Stage 1: Appropriate Assessment Screening Report ('AA') submitted alongside this report as part of the overall planning application and presented in Volume 3 Appendix 6-3.

6.3.1.2 Natural Heritage Areas

The Natural Heritage Areas ('NHAs') and proposed Natural Heritage Areas ('pNHAs') within a 5km radius of the Site have been considered.

No NHAs or pNHAs are located within or directly adjacent to the Site. However, there is one NHA and five pNHAs within 5km of the Site; please see Figure 6-6 and Table 6-3.

It should be noted that no impact pathways to these NHAs or pNHAs were identified during the desk-based or field-based studies.

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Figure 6-6: Natural Heritage Areas and Proposed Natural Heritage Areas within 5km of the Site

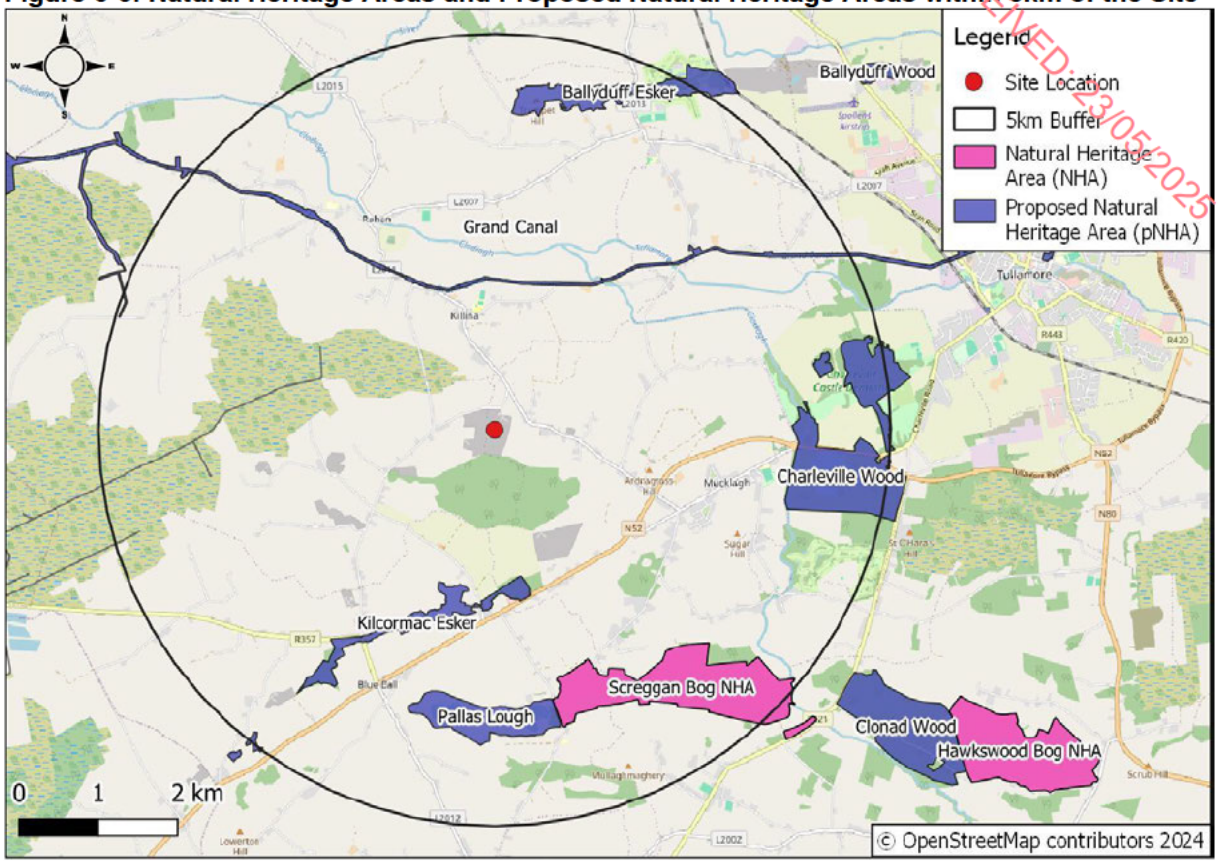


Table 6-3: Natural Heritage Areas and Proposed Natural Heritage Areas within 5km of the Site

Site Name	Site Code	Distance (km) & Direction	Qualifying Features of Interest
Natural Heritage Area ('NHA')			
Screggan Bog	000921	3km S	This NHA is a site of considerable conservation significance as it comprises mainly of raised bog, which is rare habitat in the E.U. An area of scrub woodland on the eastern side of the site contains two Red Data Book species, Alder Buckthorn (*Frangula alnus*) and Bird Cherry (*Prunus padus*).
Proposed Natural Heritage Area ('pNHA')			
Kilcormac Esker	000906	1.5km S	This pNHA comprises of Kilcormac Esker which extends from Idle corner to Screggan. This pNHA forms part of an esker chain that runs from the Shannon, past Birr to Screggan. This pNHA is considered to be a site of importance due to its geomorphology and examples of woodland communities, esker grassland flora and short species rich fescue (*Festuca spp.*) turf.
Grand Canal	002104	1.6km N	The Grand Canal is a man-made waterway linking the River Liffey at Dublin with the Shannon at Shannon Harbour and the Barrow at Athy. This pNHA is comprised of a number of different habitats including hedgerows, tall herbs, grasslands, reeds, open water, scrub, woodland, and aquatic vegetation. The pNHA is utilised by a number of different species including otter and smooth newt. The rare Opposite-leaved pondweed (*Groenlandia densa*)

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Site Name	Site Code	Distance (km) & Direction	Qualifying Features of Interest
			which is legally protected under the Flora (Protection) Order 2022 (S.I.No. 235/2022) is present at a number of sites in the eastern section of the Main Line, between lowtown and Ringsend Basin in Dublin. The canal is considered a refuge for species threatened by modern farming methods as it crosses through agricultural land.
Pallas Lough	000916	3.1km S	Pallas Lough is located on a limestone-rich gravel drift ca.7km southwest of Tullamore, Co. Offaly. This leads to the precipitation of marl (i.e. unconsolidated sedimentary rock or soil consisting of clay or lime) into the water resulting in a calcium-rich 'marl' lake. This pNHA encompasses both wet and dry habitats including two small wet woods dominated by Downy Birch (*Betula pubscens*), a limestone grassland, reed swamps, marsh areas and aquatic lake vegetation, The pNHA is of botanical interest due to the diversity of habitats and the species richness of those habitats. For example, a small area of swamp within the pNHA recorded up to 79 plant species. This pNHA also supports significant numbers of wildfowl and waders, providing nesting areas for species such as Mallard, Teal and Wigeon alongside foraging habitat for geese in winter. The rare Marsh Harrier has also been spotted hunting in the area.
Charleville Wood	000571	4.1km E	Charleville Wood is situated roughly 3km southwest of Tullamore, Co. Offaly. Charleville wood is one of the most important woodlands in Ireland, with sections that have remained undisturbed for over 200 years. These woods are located on deep glacial deposits and are examples of alluvial forest which is an Annex I habitat under the E.U. Habitats Directive. The fungal flora of this woodland contains several rare Myxomycete species which further emphasise the importance of this site. The rare Desmoulin's whorl snail (*Vertigo moulinsiana),* an Annex II species, is found within Charleville Wood pNHA alongside a number of unusual insects. Charleville wood also includes extensive swamps and lake habitat. The lake habitat is important for wildfowl such as mute swan, whooper swan, teal, wigeon, shoveler, pochard and tufted duck.
Ballyduff Esker	000885	4.2km N	Ballyduff Esker stretches from north of Rahan to south of Tyrellspass in Co. Offaly. This pNHA is considered to be a site of importance as a feature of glacial deposition and ecological interest. The Ballyduff Esker pNHA is one of the best-known remaining eskers which still support an open and relatively natural flora. A mosaic of habitats is present within this pNHA including diverse grassland communities, hazel (*Corylus avellana*) woodland and scrub. The scrub onsite comprises of Blackthorn *(Prunus spinosa),* Hawthorn *(Crateagus monogyna),* Hazel, and willows *(Salix spp.).* Red Hemp-nettle (*Galeopsis angustifolia*), a plant protected under the Flora (Protection) Order 2022, has also been identified in areas of loose open gravel.

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6.3.1.3 Protected / Notable Species

Table 6-4 provides a summary of records of legally protected or otherwise notable species that occur within 2km of the Site at the time of writing this report [61]. The NBDC records were checked on 13th January 2025. The following NBDC grids have been checked: N22K, N22L, N22M, N22Q, N22R, N22S, N22W, N22V, N22X [61].

Only species recorded within the past 10 years were included in Table 6-4. The parameter of 10 years was chosen on the basis of habitat and modification, it is considered that any records over 10 years old would not be representative of the current distribution of species populations.

Table 6-4: NBDC Species within 2km of the Site (Grid Codes: N22K, N22L, N22M, N22Q, N22R, N22S, N22W, N22V, N22X)

Common Name	Scientific Name	Date of last record	Designation
Bird Species			
Common Kestrel	*Falco tinnunculus*	06/04/2018	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Red List
Common Pheasant	*Phasianus colchicus*	06/04/2018	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II Section I and Annex III and Section I Bird Species
Eurasian Curlew	*Numenius arquata*	07/02/2021	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II Section II Bird Species Birds of Conservation Concern Red List
Sand Martin	*Riparia riparia*	12/06/2015	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Yellowhammer	*Emberiza citrinella*	17/04/2021	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Red List
Amphibians			
Common Frog	*Rana temporaria*	21/03/2018	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex V
Terrestrial Mammals			
[redacted]	[redacted]	31/12/2015	Wildlife Acts 1976 / 2000
European Otter	*Lutra lutra*	23/11/2018	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II and IV
Eurasian Pygmy Shrew	*Sorex minutus*	08/09/2021	Wildlife Acts 1976 / 2000
Eurasian Red Squirrel	*Sciurus vulgaris*	06/10/2017	Wildlife Acts 1976 / 2000

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Common Name	Scientific Name	Date of last record	Designation
Pine Marten	*Martes martes*	16/04/2020	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex V
West European Hedgehog	*Erinaceus europaeus*	07/06/2021	Wildlife Acts 1976 / 2000
Invasive Species*			
Canadian Waterweed	*Elodea canadensis*	15/05/2014	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Nuttall's Waterweed	*Elodea nuttallii*	16/05/2014	High Impact Invasive Species Regulation S.I. 477 (Ireland)

*Only invasive species that are regulated under S.I. 477 were included in the Table.

6.3.2 Field Survey Results

6.3.2.1 Habitat Survey

The following section provides details of the field-based assessments that were undertaken on the Site between 2022 and 2024. The distribution of the habitats and target notes identifying the location of features of interest are shown in Figure 6-7 below.

Habitats within the Site Boundary

Improved Agricultural Grassland (GA1)

The western portion of the Site encompassed two improved agricultural grassland fields and part of a third field. These fields were utilised for the production of grass for agricultural feed material and as pastures for cattle. At the time of the survey, signs of trampled ground were evident.

This habitat was dominated by creeping bent grass (*Agrostis stolonifera*), perennial rye grass (*Lolium perenne*), false oat grass (*Arrhenatherum elatius*), Yorkshire fog (*Holcus lanatus*) and orchard grass (*Dactylis glomerata*).

However, the following herbaceous species were also identified in this area, particularly along the field margins, ribwort plantain (*Plantago lanceolata*), prostrate knotweed (*Polygonum arenastrum*), tansy ragwort (*Jacobaea vulgaris*), silverweed (*Argentina anserina*), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), wild carrot (*Daucus carota*), common dandelion (*Taraxacum officinale*), creeping buttercup (*Ranunculus repens*), spiny sow thistle (*Sonchus asper*), rough hawkbit (*Leontodon saxatilis*), sun spurge (*Euphorbia helioscopia*), stinging nettles (*Urtica dioica*) and bitter dock (*Rumex obtusifolius*).

Hedgerow / Treeline (WL1 / WL2)

Hedgerows / treelines formed the principal boundaries within the greenfield lands onsite.

A hedgerow / treeline runs from east to west along the southern boundary of the northern agricultural grassland field. This hedgerow / treeline was largely characterised by ash (*Fraxinus excelsior*) trees covered in ivy (*Hedera helix)* hawthorn (*Crataegus monogyna)* and pedunculate oak (*Quercus robur*) trees. However, holly (*Ilex aquifolium*), hazel (*Corylus avellana*), common lilac *(Syringa vulgaris*) and dog-rose (*Rosa canina*) were also recorded in these hedgerows / treelines.

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The hedgerow / treeline in between the agricultural field and the local road to the north comprised of common lilac, dogrose, mature ash, hawthorn, ivy, European plum (*Prunus domestica*), sycamore (*Acer pseudoplatanus*), cypress (*Chamaecyparis lawsoniana*) and brambles (*Rubus fruticosus* agg).

Two managed hedgerows were identified onsite. One hedgerow separated the existing Agall Quarry from the proposed extension lands and the second hedgerow formed the western boundary of the Site. These hedgerows comprised of blackthorn (*Prunus spinosa*), elder (*Sambucus nigra*), hawthorn, hazel, pedunculate oak, spindle (*Euonymus europaeus*) and dog rose. Brambles, ivy, stinging nettles, herb Robert (*Geranium robertianum*), broad leaf dock (*Rumex obtusifolius*), hairy willowherb (*Epilobium hirsutum*), lords and ladies (*Arum maculatum*), germander speedwell (*Veronica chamaedrys*), Italian arum (*Arum italicum*), cow parsley (*Anthriscus sylvestris*) were recorded in the understorey of these hedgerows.

A treeline also bordered the Site to the south. This treeline lay behind a fence line and formed the edge habitat of a mixed broadleaved woodland. The species identified in this area included hawthorn, hazel, ash, sycamore, alder, pedunculate oak, wild privet (*Ligustrum vulgare*) and holly. Mature trees within this treeline were characterised by dense ivy cover. The understorey of this treeline was comprised of bramble, ground ivy (*Glechoma hederacea*), gorse, dog-rose and stinging nettles. A stonewall also ran along a section of this treeline (see below).

Stone Walls and Other Stonework (BL1)

A section of a stone wall was present in the southern corner of the Site This stone wall was comprised of discarded and broken stones, and no notable plant species were observed within this habitat.

Active Quarries and Mines (ED4)

The eastern portion of the Site is comprised of quarry habitat. This area was previously subject to extraction and therefore, was largely devoid of vegetation. This habitat comprised sand, gravel and sediment and contained steep slopes and stockpiled material in places.

The quarry habitat extends into the northern portion of the Site where the main shed, fixed processing plant, welfare facilities, wheel wash and access road were located.

Spoil and Bare Ground (ED2)

A small area of spoil and bare ground is located within the Site boundary. This habitat was dominated by topsoil and loose stones and showed signs of recent disturbance by machinery. This area was devoid of vegetation and was separated from the agricultural field to the north by a soil berm. This ground has been cleared to enable the expansion of quarrying activities towards the western Site boundary as per the authorisation by An Bord Pleanála reference number: 19.QD.0008.

Habitats within the Landholding

The landholding encompasses the Site, the active portion of Agall Quarry and the restored lands to the east. The following habitats were identified within the wider landholding, outside the Site boundary:

- Improved Agricultural Grassland (GA1);
- Scrub (WS1);
- Hedgerows / Treelines (WL1 / WL2);
- Active Quarry and Mines (ED4);
- Recolonising Bare Ground (ED3);

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- Dry Meadows and Grassy Verges (GS2); and,
- Spoil and Bare Ground (ED2).

The improved agricultural grassland within the wider landholding is a continuation of the third field within the Site boundary. This field was bound by hedgerows / treelines and a low spoil berm at the time of the survey. The spoil and bare ground identified onsite is continued along the boundary of the active quarry habitat to the south of the landholding. This active quarry habitat is regularly disturbed by machinery and is characterised by steep unstable slopes and stockpiles of material.

Loose spoil and bare ground also formed unvegetated berms within the eastern portion of the landholding, where the ground has been restored to a low-nutrient landscape. Hedgerows / treelines were recorded adjacent to or atop these steep banks. The dominant species within these hedgerows / treelines were hawthorn and ash.

Additional habitats were also recorded within the wider landholding, these habitats are described below in more detail.

Recolonising Bare Ground (ED3)

This habitat was present in small patches onsite but was predominantly identified in areas within the wider landholding subject to less disturbance i.e. the margins of active work zones, on the slopes of recolonising berms / stockpiles and within the restored land to the east of the landholding. Blue fleabane was found in abundance throughout this habitat. Red hemp nettle (*Galeopsis angustifolia*) was also found along the northwest berm, which separates the landholding from the ca. 2.6 ha quarry to the north, refer to Section 6.2.2.2 for more details.

Herbaceous plants that are adapted to nutrient-poor conditions characterised these areas with species such as colt's foot (*Tussilago farfara*), fireweed (*Chamaenerion angustifolium*), scarlet pimpernel (*Anagallis arvensis*), tansy ragwort, silverweed, clovers, marjoram (*Origanum vulgare*), yellow wort (*Blackstonia perfoliata*), St. John's wort (*Hypericum perforatum*), yarrow (*Achillea millefolium*), rough hawkbit, common knapweed (*Centaurea nigra*), field scabious (*Knautia* arvensis), oxeye daisy (*Leucanthemum vulgare*), black medic (*Medicago lupulina*), corn poppy (*Papaver rhoeas*), silverweed (*Potentilla anserina*) and fescue (*Festuca* spp.) identified.

In addition, wild oregano (origanum vulgare), hogweed (Heracleum sphondylium), creeping buttercup, false oat grass, hairy willowherb, brambles, dandelion, lesser knapweed (*Centaurea nigra*), common kidney vetch (*Anthyllis vulneraria*), orchard grass, glaucous sedge (*Carex flacca*), bracken (*Pteridium aquilinum*), wild carrot, greater knapweed (*Centaurea scabiosa*), catsear (*Hypochaeris radicata*), mouse ear (*Cerastium sp.*), hawkweed (*Hieracium sp.*), thistle (*Cirsium sp.*), bitter dock, long leaf speedwell (*Veronica longifolia*), montbretia (*Crocosmia sp.*), smooth hawksbit (*Crepis capillaris*) and pale toadflax (*Linaria repens*) were identified.

Small clusters of willow (*Salix spp.*) and gorse (*Ulex europaeus*) were present on top of berms and in open areas where vegetation was slowly transitioning towards scrub. Individual saplings and immature trees were also present in this habitat. They are comprised of the following species: lilac, cypress, hazel, silver birch (*Betula pendula*) and sycamore. Red-stemmed feather moss (*Pleurozium schreberi*) was also commonly observed as ground cover in less disturbed areas.

Slight variation between the berms and areas of recolonising bare ground was identified during the habitat survey with white campion (*Silene latifolia*) and bindweed (*Convolvulus arvensis*) observed along the berm in the northern portion of the landholding and lesser hawkbit (*Leontodon taraxacoides*) and field horsetail (*Equisetum arvense*) recorded on berms within

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the central portion of the landholding. However, most of the areas of recolonising bare ground within the landholding comprised of the same species mixes listed above.

Scrub (WS1)

Several unmanaged vegetated stockpiles were present within the wider landholding. These stockpiles comprised of species commonly associated with scrub habitats such as gorse and willow trees. Common ruderals and weeds were also identified in these areas including; brambles, stinging nettles, bracken fern, bitter dock, tansy ragwort, field horsetail and fireweed.

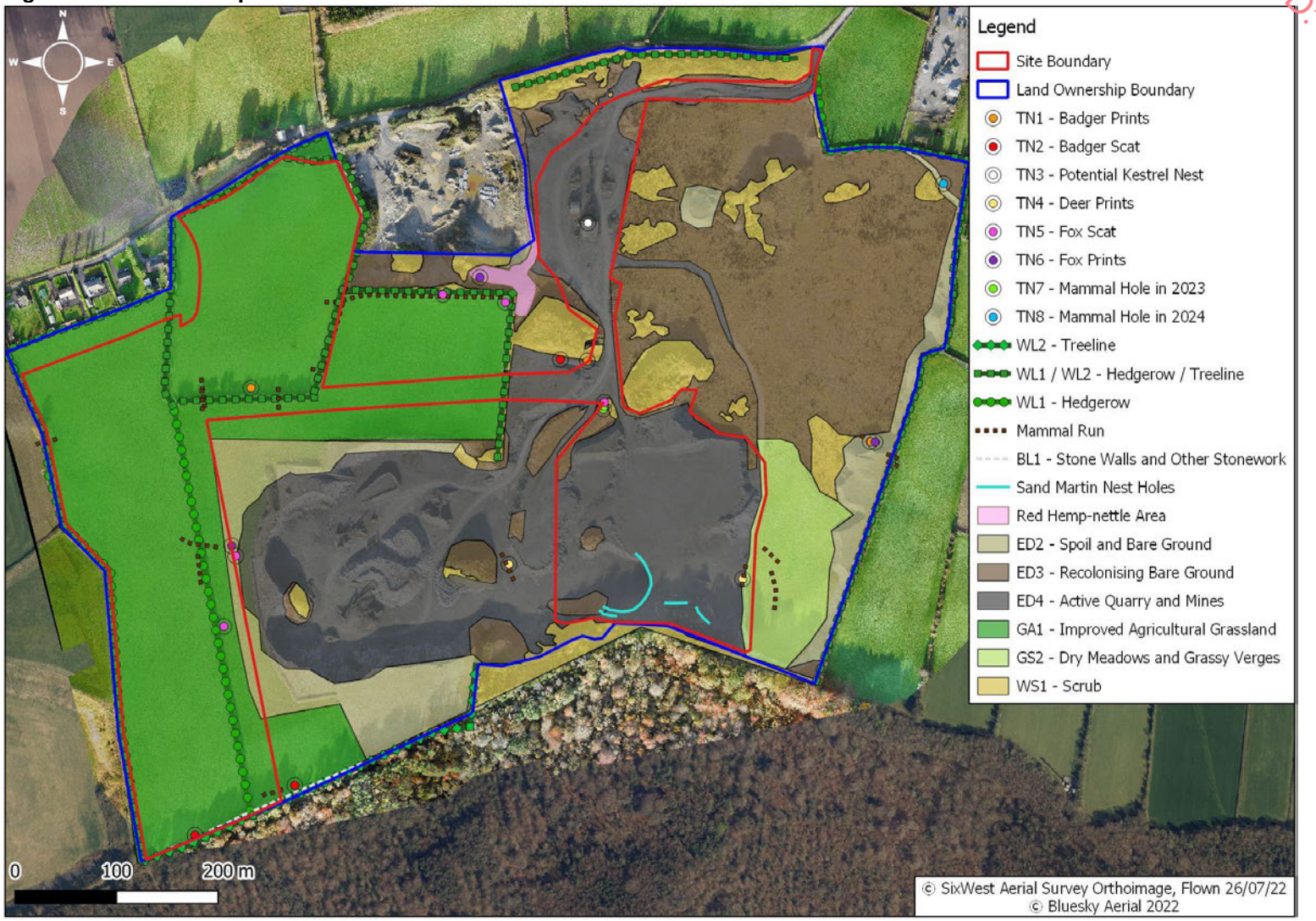
Areas of scattered gorse and immature willow trees were identified to the north and east of the landholding where recolonising bare ground has transitioned towards scrub habitat. Immature downy birch (*Betula pubescens*), sycamore and cypress trees were recorded in these transitional areas to the north of the landholding whilst Scot's pine (*Pinus sylvestris*) saplings were recorded to the east. In addition, hawthorn and hazel trees were observed within areas of scrub atop steep banks. Pedunculate oak, elder, european plum, lilac and silver birch saplings were also recorded in these areas.

Dry Meadows and Grassy Verges (GS2)

A restored grassland habitat, which was transitioning towards a dry meadow, was located within the southeast portion of the Site. The following species were recorded in this habitat; creeping bent, false oat grass, cow parsley, tansy ragwort, creeping buttercup, bitter dock, black medic, field scabious, perennial rye, yarrow, Yorkshire fog, oregano, selfheal (*Prunella vulgaris*), germander speedwell, dandelion, daisy, scarlet pimpernel, bull thistle (*Cirsium vulgare*), orchard grass, hogweed, buttercup, ribwort plantain and nettle.

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Figure 6-7: Habitat Map



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6.3.2.2 Protected / Notable Species

Flora

Two notable plant species, blue fleabane (*Erigeron acris*) and red hemp-nettle (*Galeopsis angustifolia*) were recorded within the landholding.

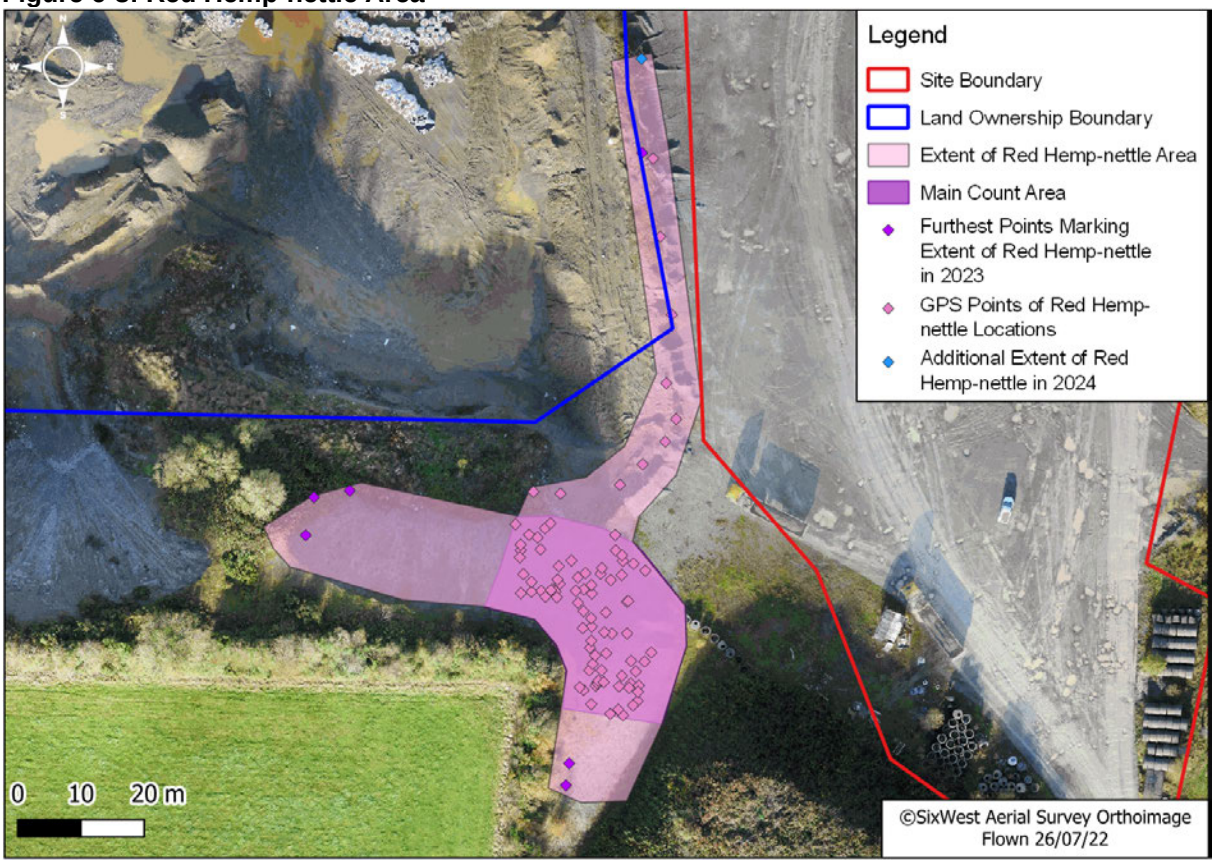
Red hemp-nettle is a legally protected species under the Flora (Protection) Order 2022 [28]. This plant is also listed as *'critically endangered'* under the Red List of Irish Vascular Plants [72] and the NBDC [68].

Red hemp nettle was present along the northwest berm separating the landholding from the separate ca.2.6ha quarry to the north. The survey identified over 2500 red hemp-nettle plants within the Main Count Area presented in Figure 6-8 below. The full extent of red hemp-nettle spanned from ITM 0626910 0723076 to ITM 0626869 0723112 on the slope bordering the agricultural fields to the south. The extent of red hemp-nettle within the main count area had not altered in 2024 during the updated survey.

Over 1500 red hemp-nettle plants were also counted along the berms to the north of the Main Count Area. Red hemp-nettle was recorded as far as ITM 0626920 0723183 along these berms during the 2024 survey which was further than the extent of red hemp-nettle recorded in 2023.

The full extent of red hemp-nettle recorded in 2023 and 2024 is presented in Figure 6-7 above and 6-8 below for context.

Figure 6-8: Red Hemp-nettle Area



Blue fleabane is an endangered species according to the NBDC and is categorised as '*least concern*' under the Red List of Irish Vascular Plants according to the NPWS [72]. This plant was recorded in bare-ground habitats within the previously quarried areas within the Site

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boundary. In addition, this species was noted in abundance throughout the eastern portion of the landholding within the recolonising / restored habitats.

Amphibians

The NBDC held records of common frog within 2km of the Site [68]. No evidence of amphibians was identified within the landholding. The habitats within the landholding have the potential to support amphibians during the terrestrial phase of their life cycle. However, no suitable groundwater waterbodies or drainage ditches were identified within the landholding to support common frog or other amphibians.

[redacted]

Bats

The Site is located within a rural landscape with extensive areas of open farmland, woodland pockets and hedgerows / treelines. According to the NBDC, the Site is located within a moderate to high bat suitability landscape with an index score ranging from 21.3 - 36.4 [68]. However, the NBDC does not contain any records of bats within 2km of the Site over the last ten years [68].

The habitat survey identified a number of mature trees and linear features within the landholding which were considered suitable foraging and commuting habitat for bat species. No direct evidence of roosting bats was identified during the initial assessment of these features. However, the hedgerows and hedgerows / treelines within the Site boundary that have the potential to be affected by the Proposed Development were subjected to dusk surveys.

The dusk surveys confirmed the absence of bat roosts within these hedgerows / treelines. However, moderate to high bat activity was recorded during both dusk bat surveys.

The dusk surveys confirmed that the Site is used as foraging and commuting habitat for common pipistrelle, soprano pipistrelle, Leisler's bat, Nathusius' pipistrelle, brown long-eared bat, and whiskered bat. It is considered that the most important habitats for foraging and commuting bats within the Site boundary are the hedgerows / treelines. However, the sections of mixed broadleaved woodland bordering the Site to the south was also considered to be an important habitat for bats.

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Please refer to Appendix 6-2 – Bat Report for full details of the results of the bat surveys.

It should be noted that during the most up-to-date habitat survey on 9th August 2024, the on-site habitats remained unchanged, and it was considered that the initial assessment of the suitability of the Site for bats and the findings of the bat surveys undertaken in 2023 remained valid.

Birds

A total of 24 species were recorded either within or flying over the Site during the 2023 transect surveys. Of these species, 17 were observed displaying territorial behaviours and classified as '*possible breeding*'; and one species, starling, were classified as '*confirmed breeding*.'

The key findings from the comprehensive breeding bird surveys undertaken at the Site were:

Of the 24 species that were recorded:

- 16 Green-listed Birds of Conservation Concern Ireland ('BoCCI'), non-annex I, species were recorded – blackbird, blackcap, blue tit, buzzard, chaffinch, dunnock, goldfinch, great tit, hooded crow, jackdaw, magpie, mistle thrush, robin, rook, wood pigeon and wren;
- Six Amber-listed BoCCI, non-annex I, species were recorded – barn swallow, goldcrest, linnet, sand martin, spotted flycatcher and starling; and,
- Two Red-listed BoCCI, non-annex I, species were recorded – kestrel and, yellowhammer.

The results of these surveys are fully detailed below in Table 6-5.

Sand martin nest holes were identified within the southeast portion of the Site in 2023. Over 100 nest holes were counted. These nest holes were located outside of the breeding bird survey area. These nest holes were active during the 2024 habitat survey. Refer to Figure 6-7 above and Plate 6-1 below for context.

Plate 6-1: Sand Martin Nest Holes identified in 2024



In addition, a nest was identified within the storage shed underneath the fixed conveyor, refer to TN3 in Figure 6-7 above and Plate 6-2 below for context.

Kestrels do not build their own nests, instead they utilise nests built by other species such as raptors or corvids. The identified nest was considered suitable for kestrels and the surveyors noted high levels of kestrel activity in this area in 2023 i.e. kestrels flushed out of the storage shed by surveyors, mating displays nearby and kestrel perching on slopes within view of the storage shed, refer to Table 6-5 for further details. It is considered highly likely that kestrels are utilising this nest.

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During the 2024 habitat survey, this nest was unoccupied; however, remnant feeding remains were identified within the nest.

Plate 6-2: Nest in Storage Shed identified in 2024



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Table 6-5: 2023 Breeding Bird Survey Results

BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
Green-Listed	Blackbird	*Turdus merula*	7	13	0	Visit 1 Multiple individuals were identified across the proposed greenfield extension lands. Five blackbirds were identified calling / singing within the hedgerow / treelines to the north of the Site. One individual was flushed from the managed hedgerow along the eastern boundary of the Site and one individual was flushed by the surveyor from the central hedgerow into the woodland to the south of the Site. Visit 2 Blackbirds were recorded throughout the proposed greenfield extension lands. Four individuals were identified singing and two were heard calling from the field boundaries i.e. the hedgerows / treelines, pockets of scrub in the existing quarry and the woodland to the south. Four blackbirds were observed foraging within areas of improved agricultural grassland and three blackbirds were flushed into vegetation by the surveyor. Visit 3 No blackbirds were recorded during the June 2023 survey.	Possible Breeding
	Blackcap	*Sylvia atricapilla*	4	3	2	Visit 1 One individual was heard singing and calling within the northern treeline dividing the Site from the L20113 local road. Three individuals were recorded singing within the woodland bordering the Site to the south. Visit 2 At least three individuals were heard singing within the woodland to the south of the Site. Visit 3 One individual was recorded calling within the treeline separating the Site from the L20113 local road. One individual was recorded calling within the treeline to the south of the Site.	Possible Breeding

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BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
	Blue tit	*Cyanistes caeruleus*	1	0	1	Visit 1 One individual was identified calling and perching within the northern hedgerow separating the Site from the L20113 local road. Visit 2 No blue tits were recorded during the May 2023 survey. Visit 3 One individual was recorded calling within a treeline bordering the northern field onsite.	Possible Breeding
	Buzzard	*Buteo buteo*	0	0	1	Visit 1 and 2 No buzzards were recorded during the April or May 2023 surveys. Visit 3 One individual was flushed from the treeline separating the Site from the L20113 local road.	Non-breeding
	Chaffinch	*Fringilla coelebs*	7	4	0	Visit 1 Four individuals were identified perching in the treeline separating the Site from the adjacent quarry to the north. Two individuals were identified perching and foraging in the treeline separating the northern field from the western field. One chaffinch was identified calling from the central hedgerow. Visit 2 One individual was heard singing from the treeline dividing the Site from the L20113 local road. A second individual was seen perching within the treeline along the western boundary of the northern field. Two male chaffinches were recorded flying along the hedgerow / treeline dividing the Site from the residential properties to the north.	Possible Breeding

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BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
						Visit 3 No chaffinches were recorded during the June 2023 survey.	
	Dunnock	*Prunella modularis*	1	0	0	Visit 1 One individual was identified singing within the central hedgerow. Visit 2 and 3 No dunnocks were recorded during the May or June 2023 surveys.	Possible Breeding
	Goldfinch	*Carduelis carduelis*	0	0	7	Visit 1 and 2 No goldfinches were recorded during the April or May 2023 survey. Visit 3 Six individuals were recorded calling, flying and perching within the treeline separating the Site from the L20113 local road. One individual was recorded foraging within the northern field.	Possible Breeding
	Great tit	*Parus major*	0	3	1	Visit 1 No great tits were recorded during the April 2023 survey. Visit 2 Two individuals were recorded singing onsite – one in the woodland to the south and one in the treeline bordering the northern field to the west. One individual was recorded calling from vegetation within the northern portion of the Site. Visit 3 One individual was recorded calling within the woodland to the south of the Site.	Possible Breeding

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BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
	Hooded crow	*Corvus cornix*	0	1	0	Visit 1 and 3 No hooded crows were recorded during the April or June 2023 surveys. Visit 2 One individual was recorded perching within a tree in the northern field.	Non-breeding
	Jackdaw	*Corvus monedula*	0	0	2	Visit 1 and 2 No jackdaws were recorded during the April or May 2023 surveys. Visit 3 Two individuals flushed a buzzard from the treeline to separating the Site from the L20113 local road.	Non-breeding
	Magpie	*Pica pica*	3	1	4	Visit 1 Three individuals were recorded perching within treelines to the north of the Site. Visit 2 One individual was recorded perching within a treeline in the northern portion of the Site. Visit 3 Two individuals were heard calling within the hedgerow / treeline separating the Site from the residential properties to the north. One individual was identified foraging within the northern field and one individual was identified foraging along the central hedgerow.	Possible Breeding
	Mistle thrush	*Turdus viscivorus*	4	0	0	Visit 1 One individual was recorded singing, and two individuals were identified perching within treelines bordering the northern field. One individual was recorded flying south over the agricultural grassland fields towards the woodland.	Possible Breeding

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BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
						Visit 2 and 3 No mistle thrushes were recorded during the May or June 2023 surveys.	
	Wood pigeon	*Columba palumbus*	15	8	7	Visit 1 Multiple individuals were flushed from vegetation or recorded flying over the proposed greenfield extension lands. One individual was recorded perching in a tree along the southern boundary of the Site. Visit 2 Two individuals were recorded singing within vegetation bordering the northern field. One individual was observed perching on the hedgerow bordering the Site to the west. Four individuals were flushed from vegetation by the surveyor and one individual was identified foraging within the improved agricultural grassland habitat. Visit 3 Three individuals were identified foraging within areas of improved agricultural grassland onsite. Two individuals were heard calling from the treeline to the south of the Site and one individual was heard calling in the hedgerow / treeline within the northwest portion of the Site. One individual was flushed from vegetation by the surveyor.	Possible Breeding
	Wren	*Troglodytes troglodytes*	4	5	8	Visit 1 Three individuals were heard singing from vegetation surrounding the northern field. One individual was heard singing within the managed hedgerow bordering the Site to the west. Visit 2 Multiple individuals were identified singing from vegetation onsite – one within the central managed hedgerow, one within the woodland to the south of the Site and two within treelines in the northern portion of the extension lands.	Possible Breeding

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BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
						Visit 3 Multiple individuals were identified calling from vegetation within the proposed greenfield extension lands.	
	Robin	*Erithacus rubecula*	5	2	1	Visit 1 Three individuals were identified singing within the treeline separating the proposed greenfield extension lands from the adjacent quarry to the north and the disturbed areas onsite to the east. One individual was identified perching atop the central hedgerow and one individual was recorded perching in the hedgerow / treeline dividing the Site from the residential properties to the north. Visit 2 One individual was observed perching and singing within a tree along the western boundary of the northern field. One individual was recorded calling from the hedgerow / treeline separating the Site from residential properties in the north. Visit 3 One individual was recorded calling within the woodland along the southern boundary of the Site.	Possible Breeding
	Rook	*Corvus frugilegus*	5	13	1	Visit 1 One individual was recorded perching within the hedgerow / treeline separating the residential houses in the north from the Site. Two individuals were recorded foraging in the western field and one. individual was identified perching and singing within a nearby tree. One individual was recorded flying over the quarry area to the east of the proposed greenfield extension lands. Visit 2 Six individuals were recorded foraging within the western field. Five individuals were recorded flying over the Site. Two individuals were flushed from vegetation.	Non-breeding

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BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
						Visit 3 One individual was recorded foraging within the improved agricultural grassland in the northwest portion of the Site.	
Amber-Listed	Barn swallow	*Hirundo rustica*	2	0	22	Visit 1 Two individuals were identified foraging around the treeline within the northwest corner of the Site. Visit 2 No barn swallows were recorded during the May 2023 survey. Visit 3 Multiple individuals were identified foraging over the agricultural grassland habitats onsite.	Non-breeding
	Goldcrest	*Regulus regulus*	1	0	0	Visit 1 One goldcrest was identified calling and singing within the woodland bordering the Site to the south. Visit 2 and 3 No goldcrests were recorded during the May or June 2023 surveys.	Possible Breeding
	Linnet	*Carduelis cannabina*	0	0	1	Visit 1 and 2 No linnets were recorded during the April or May 2023 surveys. Visit 3 One individual was recorded calling and foraging within the hedgerow along the western boundary of the Site.	Possible Breeding

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BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
	Sand martin	*Riparia riparia*	35	31	9	Visit 1 30 individuals were recorded flying over the quarry area to the northeast of the Site. Five individuals were recorded foraging over the northern field within the proposed greenfield extension lands. Visit 2 Multiple individuals were recorded flying and foraging within the northern portion of the proposed greenfield extension lands. Visit 3 Multiple individuals were identified foraging across the extension lands.	Non-breeding*
	Spotted flycatcher	*Musciapa striata*	0	0	1	Visit 1 and 2 No spotted flycatchers were recorded during the April or May 2023 surveys. Visit 3 One individual was recorded calling within a treeline bordering the northern field.	Possible Breeding
	Starling	*Sturnus vulgaris*	5	3	2	Visit 1 Three individuals were identified perching atop the residential buildings to the north of the Site. Two starlings were identified perching within a treeline bordering the northern field. Visit 2 Two individuals were observed displaying territorial behaviour within the scrub area to the south of the existing storage shed; one individual was calling, and a second individual was seen carrying a food parcel. One individual was observed carrying a food parcel to a nest within the roof structure of the residential houses to the north.	Confirmed Breeding

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BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
						Visit 3 Two individuals were identified foraging in an area of spoil and bare ground atop the existing quarry face.	
Red-Listed	Kestrel	*Falco tinnunculus*	0	2	1	Visit 1 No kestrels were recorded during the April 2023 survey. Visit 2 A pair of kestrels were observed in a courtship display over a stockpiled area within the existing quarry at the start of the survey. At the end of the survey, a kestrel was flushed from an existing nest underneath the conveyor (refer to Plate 6-2) within the storage shed. No chicks were identified. Visit 3 A kestrel was observed perching on a slope to the southwest of the storage shed.	Possible Breeding
	Yellowhammer	*Emberiza citrinella*	0	2	0	Visit 1 No yellowhammers were recorded during the April 2023 survey. Visit 2 One individual was recorded perching and calling from a tree along the western boundary of the Site. A second individual was heard singing from the arable land outside the Site boundary to the west. Visit 3 One individual was heard calling from the central managed hedgerow.	Possible Breeding

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During the 2024 habitat survey, ten bird species were recorded as outlined below:

- Eight Green-listed BoCCI, non-annex I species were recorded: blue tit, bullfinch, magpie, robin, rook, stonechat, wood pigeon and wren; and,
- Two Amber-listed BoCCI, non-annex I species were recorded: barn swallow and goldcrest.

The species identified onsite were consistent with data from previous bird surveys conducted in 2023.

Invasive Species

No high impact invasive species or plant species listed on the First Schedule of the 2024 European Union (Invasive Alien Species) Regulations 2024 (i.e. species of which it is an offense to disperse, spread or otherwise cause to grow in any space) were identified onsite.

Other Species

Deer prints (TN4) were identified within the southeast portion of the Site in 2023 and within the wider landholding. These prints were heading in a southerly direction towards the mixed broadleaved woodland.

Fox scat (TN5) was identified onsite and within the wider landholding, refer to Figure 6-7 for further details. Fox prints (TN6) and a mammal hole (TN7) were identified outside the Site boundary in 2023. Fox prints were identified leading into and out of the mammal hole. The mammal hole also carried the distinct odour of foxes. In 2024, this mammal hole was no longer present; however, a new mammal hole (TN8) was located along the northeast boundary of the landholding. Fox prints and scat were also recorded in 2024 alongside numerous mammal paths.

A hare (*Lepus timidus hibernicus*) was recorded beside the buildings in the northern portion of the Site during the 2024 survey. Two additional hares were recorded within the wider landholding. According to the NBDC, pine marten have been recorded within 2km of the Site [61] [68]. Pine martens display a preference for woodland habitats to forage and shelter but have also been recorded in scrub and rocky areas. No evidence of this species was identified within the landholding. Pine marten tend to avoid open areas which are devoid of suitable cover. Therefore, the grasslands and open areas within the landholding are not considered suitable for this species. However, there is potential for this species to utilise the hedgerows / treelines onsite for foraging and commuting purposes.

The NBDC also held records for red squirrel within 2km of the Site [68]. During the habitat survey, no evidence of red squirrels in the form of dreys or cone cores were observed. Red squirrels have a preference for coniferous woodlands and medium-large concentrations of trees. Therefore, it is considered highly likely that the species utilise the woodland to the south of the landholding. However, the hedgerows / treelines onsite have the potential to provide a connection to habitats within the wider area for this species and may be utilised for migrating / commuting squirrels.

Hedgehogs and pygmy shrews are common and widespread species that typically occur in scrub, woodland and rank grassland habitats. The NBDC held records of these species within 2km of the Site [68]. No direct evidence of hedgehogs was identified within the Site; however, the greenfield habitats onsite and the woodland to the south of the landholding provide suitable cover and sheltering habitat for this species.

The NBDC held records for otter within 2km of the Site [68]. However, the records held by the NBDC relate to sightings of otter within the Clodiagh (Tullamore) River which is ca.1.9km north of the Site at its closest point [68]. No evidence of otter activity or suitable prey species were identified and there were no suitable waterbodies, watercourses or drainage ditches recorded

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within the landholding. The nearest waterbody, the Killina Stream is located ca.240m northeast of the Site across the L20113 local road. It is not considered that otters will utilise the habitats onsite.

No other notable or protected species were identified within the landholding or are considered likely to occur given the nature of the habitats and activities at the Site and on the adjoining lands.

6.4 Characteristics & Potential Effects of the Proposed Development

6.4.1 Sensitive Design

- The Proposed Development has been designed to avoid the area of red hemp-nettle within the landholding as outlined in Section 4.3.1 of this EIAR. The red hemp-nettle onsite will be protected during the lifetime of the Proposed Development and no works will take place within this area;
- A Restoration Plan will be implemented for the Site. This plan will seek to conserve and, where possible, enhance the areas of retained and created habitat. Extractive activities can create important habitats which are suitable for a number of rare and protected species, such as Red Hemp-nettle (*Galeopsis angustifolia*), Basil thyme (*Acinos arvensis*), rare orchids and sand martins;
- All boundary trees, hedgerows and planted areas that are to be retained will be protected from unnecessary damage. A minimum buffer of 5m will be maintained between the proposed extraction area and the retained hedgerows onsite / the woodland to the south. Along the northern boundary of the Site, this buffer has been extended to include the full crown extent of the hedgerow / treeline;
- All vegetation removal required onsite will be undertaken in accordance with relevant legislation to avoid potential disturbance to nesting birds. These works will be undertaken outside the period of 1st of March to 31st of August;
- Topsoil to be stripped from the Site will be reused, where possible, in two screening berms, ca. 7m wide and 3m high. This will ensure that impacts on the soil are minimised / avoided. These berms will be located within the northwest portion of the Site, in between the proposed extraction area and the residential dwellings that border the Site. Refer to Section 3.4.1 above;
- The planting of the western berm, a treeline at its base, a hedgerow at its base, a hedgerow to the north of the security fence and a treeline along the western boundary of the Site will take place during the construction phase to ensure vegetation is established during the early stages of the Proposed Development. The early planting of these areas will reduce the impact of the required vegetation clearance works; and,
- The Site's standard operation hours will be from 07:00 to 19:00 on Monday to Friday and 08:00 to 14:00 on Saturdays. Therefore, potential impacts to nocturnal species in the area will be limited.

6.4.2 Identification of Potentially Significant Effects on Identified Receptors

Based on the methodology that is set out in Section 6.2, Table 6-6 sets out the findings of the valuation of important and legally protected receptors. Each receptor is assessed and a scoping justification for each receptor is provided for the Construction, Operational and Rehabilitation Phases combined.

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Table 6-6: Valuation of Potential Ecological Receptors

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Result and Justification	Scoping Result
Protected sites				
Natura 2000 sites	European Communities (Natural Habitats) Regulations 1997 (as amended)	Internationally designated sites for conservation.	A Stage One Appropriate Assessment ('AA') Report was prepared as part of the overall planning application, refer to Volume 3, Appendix 6-3. These designated sites were assessed in line with Objectives BLP-02, BLP-05 and BLO-02 of the OCDP [26]. The AA concluded that the Proposed Development would not cause any significant adverse impacts on any European sites or any of their designated features of interest. Therefore, progression to Stage Two of the Appropriate Assessment process (i.e. Natura Impact Statement) was not considered necessary. This conclusion was based on the lack of impact pathways between the Site and any European sites in the wider area. Therefore, this receptor has been scoped out from further consideration.	Natura 2000 sites have been scoped out from further consideration.
Natural Heritage Areas ('NHAs') and proposed Natural Heritage Areas ('pNHAs')	Wildlife Act 2000 (as amended).	Nationally designated sites for conservation.	There is one Natural Heritage Area within 5km of the Site and four proposed Natural Heritage Areas ('pNHA'). It should be noted that the pNHAs were considered as part of this assessment in line with objective BLO-04 of the OCDP [26]. Due to the distance separating the Site from the NHA and pNHAs and the absence of impact pathways, it is not considered that the Proposed Development will result in any significant adverse impacts on these sites. This receptor has therefore been scoped out from further consideration.	Natural heritage areas have been scoped out from further consideration.
Habitats				
Improved Agricultural Grassland (GA1)	N/A	Low Local Value	Improved agricultural grasslands are widespread across Ireland. The species recorded in this habitat were typical grassland species and not of conservation concern. This grassland is currently used to graze cattle, lowering its biodiversity value. Any loss of this habitat is not considered to be significant. Therefore, the impact of the Proposed Development on this habitat is not significant and this receptor has been scoped out from further consideration. It should be noted that the proposed restoration of the Site includes the re-establishment of agricultural grassland once quarrying activities have ceased. Therefore, any loss of this habitat will not be permanent.	Improved Agricultural Grassland has been scoped out from further consideration.

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Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Result and Justification	Scoping Result
Active quarries and mines (ED4)	N/A	Low local value	Given the disturbed and active nature of this habitat, it is considered to be of limited ecological value. Therefore, any alteration / loss of this habitat is not considered to be significant. Subsequently, the impact of the Proposed Development on active quarry areas is not significant and this receptor has been scoped out from further consideration. However, sand martin nest holes were recorded along the southeast boundary of the Site within this habitat. This receptor is considered further below under the bird's section.	Active quarry has been scoped out from further consideration.
Spoil and bare ground (ED2)	N/A	Low local value	Spoil and bare ground is of low ecological value. Therefore, any alteration / loss of this habitat is not considered to be significant. Subsequently, the impact of the Proposed Development on spoil and bare ground is not significant and this receptor has been scoped out from further consideration.	Spoil and bare ground has been scoped out from further consideration.
Stone Walls and other stonework (BL1)	N/A	Low Local Value	This habitat will be left in-situ as part of the Proposed Development. However, it should be noted that no notable plant species were identified in this stone wall which was comprised of mostly broken stones. As such, any loss or disturbance to this habitat will not negatively impact the overall biodiversity of the Site. This receptor has therefore been scoped out from further consideration.	Stone walls and other stonework been scoped out from further consideration.
Hedgerow / Treeline (WL1 / WL2)	N/A	High Local Value	It will be necessary to remove sections of the hedgerows / treelines onsite to facilitate the Proposed Development. It should be noted that the removal of vegetation within the existing quarry has been approved under a 37L planning consent reference number: 19.QD.008. However, additional sections of hedgerow and hedgerow / treeline, ca. 702m in total, within the proposed greenfield extension lands will be removed to facilitate the proposed extraction area. Restrictions apply with regards to the time of year in which vegetation can be cut in order to avoid impacts to protected species such as nesting birds (see below). All trees to be retained will be protected from unnecessary damage. In addition, landscape planting will be implemented along and to the north of the proposed berm to compensate for the loss of any vegetation removed as part of the Proposed Development. This receptor has been scoped in for further consideration.	Hedgerow / Treeline has been scoped in for further consideration.

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Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Result and Justification	Scoping Result
Flora and Fauna				
Flora	Red hemp-nettle Flora (Protection) Order 2022 (S.I. No. 235/2022) Blue fleabane N/A	N/A	Red hemp-nettle: Red hemp-nettle, a species protected under the Flora Protection Order, was recorded within the wider landholding. The Proposed Development has been designed to avoid this area as outlined in Section 4.3.1. This plant will be protected as part of the Proposed Development in line with BLP-05 of the OCDP [26]. Therefore, this receptor has been screened in for further consideration. Blue fleabane: Blue fleabane was recorded in low numbers within the eastern portion of Site and as an abundant species within the wider landholding. Operations onsite will disturb the blue fleabane within the Site boundary. However, once extraction ceases within the eastern portion of the Site, a low nutrient landscape will be developed which will provide a viable habitat for blue fleabane to re-colonise. It is also important to note that this plant is not afforded any legal protection under Irish law and that blue fleabane was abundant within the wider landholding. As part of the Restoration Plan, suitable habitats for this species will be maintained within the wider landholding. As such, this receptor has been scoped out from further consideration.	Flora has been scoped in for further consideration.
Amphibians	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex V	Low Local Value	Amphibians are commonly associated with quarry sites. It should be noted that amphibians are relatively widespread and abundant in Ireland, however, they are of conservational interest and are protected under the Schedule V of the Wildlife Act. No amphibians were identified within the landholding nor any waterbodies suitable for frogs or newts. Therefore, this receptor has been scoped out from further consideration.	Amphibians have been scoped out from further consideration.
Bats	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV	High Local Value	No trees or buildings suitable for roosting bats were identified within the Site or wider landholding. However, moderate foraging and commuting activity was recorded. Given the presence of bat activity onsite and the loss of foraging / commuting habitats onsite to facilitate the Proposed Development, this receptor has been screened in for further consideration. It is important to note that no lighting is proposed as part of the Proposed Development and therefore, it is reasonable to conclude that bats and other nocturnal species will not be adversely affected as a result of light spillage into dark areas.	Bats have been scoped in from further consideration.

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Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Result and Justification	Scoping Result
Badger	Wildlife Acts 1976 / 2000	Low Local Value	No badger setts were recorded during the field surveys and given the minimal evidence of badger identified, it is not considered that the Site or wider landholding is of significant importance to badger. [redacted] Therefore, general mitigation measures to prevent impacts on badger will be undertaken, refer to Section 6.5 below for further details. These measures are in line with.BLP-01, BLP-02, BLP-05 of the OCDP [26]. This species has been scoped in for further assessment.	Badgers have been scoped in for further consideration.
Birds	<u>Nesting Birds</u> Wildlife Acts 1976 / 2000 <u>Kestrel</u> Wildlife Acts 1976 / 2000 Birds of Conservation Concern – Red List <u>Sand Martin</u> Wildlife Acts 1976 / 2000 Birds of Conservation Concern – Amber List	Low Local Value	<u>Nesting Birds</u> The works will require the removal of agricultural grassland, hedgerows and treelines onsite. This will result in the loss of potential nesting and foraging habitat for a range of countryside birds. Therefore, mitigation measures have been incorporated below in relation to nesting birds. It is important to note that additional planting will be implemented to partially compensate for the vegetation removed within the proposed extraction area. <u>Kestrel</u> High levels of kestrel activity were recorded within the Site and wider landholding. A potential kestrel nest was also identified by the surveyor. It was considered highly likely that kestrel are utilising the Site and wider landholding for nesting and foraging purposes. Further consideration will be given to this species in order to ensure kestrel are not disturbed by the Proposed Development. <u>Sand Martin</u> Sand martins are commonly associated with quarries as these sites often provide suitable nesting habitat in exposed / disturbed banks. A number of sand martin nest holes were identified within the Site. As such, further consideration will be given to this species in order to ensure this species is not disturbed by the Proposed Development.	Birds have been scoped in for further consideration.

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Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Result and Justification	Scoping Result
Invasive Species	N/A	N/A	No high impact invasive species or plant species listed on the First Schedule of the European Union (invasive Alien Species) Regulations 2024 (i.e. species of which it is an offense to disperse, spread or otherwise cause to grow in any place) were noted on the Site during the field surveys. Standard measures will be implemented in order to ensure no invasive species are introduced into the Site during the construction phase (see Section 6.5).	Invasive species have been scoped in for further consideration.
Other Species	Pine marten, hedgehogs, pygmy shrews, red squirrels Wildlife Act 2000 (as amended) Common species N/A	Low Local Value	Given the presence of suitable habitats onsite and within the wider area for foxes, deer, hedgehogs, pine marten, pygmy shrews, red squirrel and other terrestrial mammals, standard protection measures for these species will be incorporated into the works. These measures are in line with.BLP-01, BLP-02, BLP-05 of the OCDP [26].	Other species have been scoped in for further consideration.

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6.4.3 Summary

Following a detailed assessment, the following species and habitats were identified as receptors that warranted further consideration in Section 6.5 below:

- Hedgerows / Treelines (WL1 / WL2);
- Flora;
- Bats;
- [redacted]
- Birds;
- Invasive species; and,
- Other species.

In addition to habitat and species-specific mitigation for the receptors listed above, general mitigation / best practice measures have also been included for the Proposed Development. As noted above a Restoration Plan has been developed for the Site which involves continuous restoration as works progress through the Site. This Restoration Plan is presented as part of Appendix 6-1. An annual review of the Restoration Plan will be conducted to track the progress of restoration works and outline any additional works required.

6.5 Proposed Mitigation Measures

The following mitigation measures will be incorporated and adhered to during the Construction, Operational and Rehabilitation Phases at the Site to ensure that the works do not result in contravention of wildlife legislation:

- Quarrying activities will comply with all relevant legislation and best practice to reduce any potential environmental impacts. The mitigation measures detailed within this EIAR will be fully adhered to; and,
- The Site manager shall ensure that all personnel working onsite are trained and aware of the mitigation measures detailed within the EIAR.

The following general measures will also be adhered to during the Proposed Development works:

- If protected or notable species are encountered during operations at the Site, works will stop within the area that the notable species was identified in, and a suitably qualified ecologist will be contacted for advice; and,
- Should unidentified burrows be identified within the works area, a suitably qualified ecologist will be contacted, and advice sought.

6.5.1 Protection of Trees and Hedgerows

Care will be required to protect the retained vegetation onsite from both direct and indirect disturbance during the proposed works as per policies BLP-05 and BLP-38 of the OCDP [26]. The following protection measures will be adhered to during the works:

- A minimum buffer of 5m will be maintained between the proposed extraction area and the retained hedgerows onsite / the woodland to the south. Along the northern boundary of the Site, this buffer has been extended to include the full crown extent of the hedgerow / treeline. The extraction area has also been reduced to allow for a 5m buffer from the proposed treeline along the western boundary of the Site;

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- No materials, equipment or machinery will be stored within close proximity to retained hedgerows / treelines;
- Notice boards, wires, etc. will not be attached to any trees;
- The construction of the berms onsite will be supervised by an Ecological Clerk of Works ('ECoW') to ensure that no impacts occur to bordering hedgerows / treelines. The retained trees will be assessed following the completion of these works;
- In addition, the condition of the trees bordering the extraction areas within the Site will be inspected by the ECoW on an annual basis; and,
- In order for treeline protection measures to work effectively, all personnel associated with the operation of heavy plant machinery must be familiar with the above principles for the protection of treelines.

It should be noted that the works within the proposed extraction area (i.e. ground clearance and quarrying works) will be completed in a structured manner over time to minimise areas of exposed ground. In addition, the future extraction faces will be subject to changes depending upon the available type of aggregate in each section of the Site. As such, some areas within the proposed extraction area will not be cleared or removed if the aggregate in these areas is not considered to be of good quality. The potential impacts on biodiversity are based on the worst-case scenario, i.e., all vegetation within the extraction area (702m of hedgerows / treelines) removed.

6.5.2 Proposed Planting

As outlined in Section 3.4.1 of this EIAR, two screening berms will be constructed within the north / northwest portion of the proposed extension lands. These berms will be located in between the proposed extraction area and the residential properties outside the Site boundary. A minimum setback of 80m from the proposed extraction area and these residential properties will be maintained at all times.

The berms will be ca. 3m high and 7m wide at the base. The eastern berm will be sown with a grass seed mix to retain the soils and prevent dust. This berm will not be planted with any trees and will be removed once operations have ceased. The soils from this berm will be used in the restoration of the northern field where possible.

The western berm will be retained throughout the lifetime of the Proposed Development. This berm will be planted with a double row of native trees amounting to ca. 288m of hedgerow / treeline. A 140m treeline will be planted at the base of this screening berm to the north alongside a 140m hedgerow. A fence will be located to the north of these linear features. An additional 140m hedgerow will be introduced in front of this fence. A ca. 95m treeline will also be planted along the northwest boundary of the Site.

The planting of these linear habitats will ensure that the managed hedgerows and sections of treelines removed to facilitate the Proposed Development will be replaced during the construction phase. In total, ca.795m linear habitats will be planted as part of the construction phase.

The planting of these linear features will take place within the first available season (November to March) and any trees that fail to become established within five years of planting will be replaced by trees of a similar size / species within the next planting season. Early planting during construction will allow these habitats to become established during the operations on-site.

In addition, once quarrying operations have ceased in an area, any hedgerows or treelines removed to facilitate the extraction of aggregate will be replanted. Therefore, the proposed

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planting will ensure that all vegetation removed is replaced and additional areas for biodiversity are created.

Furthermore, a ca. 0.26ha woodland area will be planted within the southwest portion of the Site. This woodland area will extend from the treeline along the southern boundary. Works during Phase B will progress from south to north. Therefore, as extraction occurs within the central and northern portion of Phase B, restoration works (including the planting of this woodland area) will begin in the southern section of Phase B. The addition of woodland planting within an exhausted section of an ongoing operational phase will maximise the amount of time the trees have to become established. This woodland area will help fully compensate for the hedgerows / treelines removed as the operations within the Site progress.

Refer to Appendix 6-1 for full details.

6.5.3 Protection of Flora

Red Hemp-nettle:

Red hemp nettle was not identified within the application Site; however, habitats supporting this species were identified adjacent to the Site boundary. Currently within the wider landholding, protection measures are in place for this species as per the Restoration Plan attached, as Appendix 6-1. These measures include:

- Delineating a red hemp-nettle protection zone and restricting access into this area to activities relating to the management or monitoring of this species; and,
- Ensuring that no materials or equipment are stored in the red hemp-nettle protection zone.

Should any red hemp nettle colonise areas within the Site boundary, these protection measures will be implemented. The distribution of red hemp-nettle within the Site and wider landholding will be confirmed by annual monitoring.

6.5.4 Protection of Bats

The following mitigation measures will be followed during the works to ensure that no impacts occur to bats:

- No lighting will be installed as part of the Proposed Development;
- A minimum buffer of 5m will be maintained between the proposed extraction area and the retained hedgerows onsite / the woodland to the south. Along the northern boundary of the Site, this buffer has been extended to include the full crown extent of the hedgerow / treeline. This will ensure that bats can continue to utilise the retained linear features for foraging and commuting purposes;
- The construction of a vegetated screening berm in the northern / northwestern portion of the Site will provide potential foraging and commuting habitat for bats; and,
- The Restoration Plan (attached as Appendix 6-1) will ensure that as habitats are removed, restoration is occurring in other areas of the Site. In addition, the habitats removed to facilitate extraction will be restored to grassland after quarrying works cease, including grasslands, hedgerows and hedgerow / treelines.

Please refer to Appendix 6-2 - Bat Report for full details of the mitigation measures for bats.

6.5.5 Protection of Birds

To ensure no impacts occur to birds as a result of the Proposed Development, the following general mitigation measures will be put in place:

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Nesting birds

- Any vegetation clearance required will take place outside of the nesting bird season (1st March to 31st August), as per Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000;
- In the event that works need to be undertaken within the main breeding season, this would be undertaken in consultation with NPWS;
- Prior to the vegetation removal the ECoW will inspect the Site;
- The management and removal of vegetation onsite will be undertaken in a systematic way under the direction of an ecologist to ensure that retained areas of vegetation are not damaged by the works;
- Vegetation will be removed and replaced on a phase-by-phase system;
- In the unlikely event birds nest within the active working area during the works, all works within the immediate area will stop and the ECoW will be consulted; and,
- If notable / protected bird species are identified colonising any areas to be impacted by the works, then works will stop within the identified area. An appropriate undisturbed buffer zone will need to be established for the duration of the breeding season or until the chicks have fledged and left the nest. This will be confirmed by the ECoW.

Sand Martins

To avoid potential impacts as a result of the proposed works on sand martins, the following mitigation measures will be implemented:

- Areas where nesting activity is noted will be clearly marked to ensure disturbance is avoided and routinely monitored, making changes to these marked areas as necessary;
- All exposed faces designated for excavation during the breeding season (1st March to 31st August) will be assessed for their potential to provide breeding sites by early March each year under the advice of the ECoW. These areas can then be managed or worked in such a way as to make them unattractive to sand martin so that extraction can continue without interruption. These management procedures include reprofiling the quarry face to less than 45° or utilising netting to cover nest holes outside the breeding season. This will prevent sand martin from nesting / burrowing within the active areas onsite;
- Old disused / inactive nests will be removed outside of the nesting season under the supervision of the ECoW, to ensure that no birds are utilising the nests, and the nests are fully removed;
- Before the commencement of the nesting season, a suitable quarry / aggregate face for sand martins will be set aside or a sand martin embankment will be created. This should ideally be away from the main works area to avoid any potential impacts; and,
- Should sand martin be observed nesting within the boundary of the Site, then the ECoW will be consulted for advice.

In addition, as part of the Restoration of the Site, permanent sand martin embankments will be created once operations have ceased within the eastern portion of the Site, refer to Volume 3 Appendix 6-1 for further details and indicative locations.

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Kestrel

A potential kestrel nest was identified within the storage shed onsite, underneath a conveyor. This nest did not appear to be impacted by the on-going operations within the Agall Quarry. Nonetheless, it is proposed to relocate the kestrels potentially utilising this nest to a less active area. Therefore, the following mitigation measures will be implemented for this species:

- The potential kestrel nest will be dismantled outside of the breeding bird season;
- An alternative nest box will be installed in advance of this nest being dismantled to maintain a breeding habitat for this species. The kestrel nest box will be designed to attract kestrels and will be erected on a post within the northeast portion of the Site, refer to Plate 6-3. The exact location will be specified by the ECoW; and,
- If kestrel are identified colonising any areas to be impacted by the works, then works will stop within the identified area. An appropriate undisturbed buffer zone will need to be established for the duration of the breeding season or until the chicks have fledged and left the nest. This will be confirmed by the ECoW.

Plate 6-3: Examples of Kestrel Nest Boxes



6.5.6 Protection of Terrestrial Mammals

Given the presence of habitats that have the potential to support sheltering, foraging and commuting mammals ([redacted] pine marten) onsite and bordering the Site, general construction procedures and mitigation measures, which are in line with the NRA [redacted]

- [redacted]
- [redacted]
- [redacted]

6.5.7 Measures for Invasive Species

In order to mitigate against the unintentional introduction of invasive species to the Site during operations, the following measures will be followed in-line with policy BLP-34 of the OCDP [26] and the NRA guidelines for the management of noxious weeds and non-native invasive plant species [54]:

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- Before machinery or equipment is unloaded at the Site, equipment will be visually inspected to ensure that all adherent material and debris has been removed; and,
- Any vehicles and machinery that are not clean will not be permitted entry to the Site.

6.5.8 Unplanned Events

Should any protected or notable species colonise the Site during the life cycle of the project there is a potential for these species to be impacted by the operations onsite. However, the taxa commonly associated with quarry environments have been considered as part of this assessment.

Ongoing ecological monitoring throughout the life cycle of the Proposed Development will ensure that any protected or notable species will be identified and that appropriate mitigation / preventative actions can be taken.

6.6 Cumulative and In-combination Impacts

The Proposed Development consists of an extension to the existing Agall Quarry. Therefore, cumulative or in-combination impacts of the Proposed Development in combination with the existing extraction activity in Agall Quarry have been considered throughout this assessment. As described above, the proposed works are unlikely to have a significant impact on valued ecological receptors following the implementation of mitigation measures.

Following a review of the files on the OCC Planning website [3], no other projects were identified that are considered likely to have a significant effect on valued ecological receptors either alone or in combination with the Proposed Development.

Furthermore, any potential cumulative impacts will be reduced as all works will be completed in line with relevant best practice and legislation and mitigation measures detailed within the EIAR.

It is, therefore, considered unlikely that any significant cumulative impacts will arise as a result of the Proposed Development. Subsequently, the cumulative impacts on ecology arising from the Proposed Development in combination with other developments is considered to be imperceptible.

6.7 Interactions with other Environmental Attributes

The Environmental Attributes with which flora and fauna interact include:

- Chapter 7 - Land and Soils: potential effects on soils and geology through contamination can have adverse effects on local biodiversity and ecological conditions. Mitigation measures have been included in Chapter 7 to avoid the contamination of soils. In addition, direct effects on local biodiversity in relation to the removal of soils, and habitat loss has been assessed within this chapter;
- Chapter 9 - Acoustics (Noise & Vibration): Species in the locality are likely habituated to noise arising from quarry activities given the on-going quarry operations onsite. No species-specific noise mitigation measures were considered necessary. A full assessment on noise and details on general mitigation measures relating to noise is presented in Chapter 9;
- Chapter 10 - Air Quality: Dust related effects can have an impact on water quality and therefore aquatic biodiversity. Dust can also affect the ability of vegetation to photosynthesise. Dust mitigation measures have been included in Chapter 10; and,
- Chapter 11 - Climate: Climate change has the potential to affect ecosystems. An assessment was carried out on the projected GHG emissions, refer to Chapter 11 for further details from this assessment.

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6.8 Indirect Effects

There have been no significant or likely indirect effects identified outside of those previously assessed throughout the Chapter.

6.9 Residual Effects

Based on the methodology set out in Section 6.4.2, the initial assessment of potentially significant ecological receptors (Table 6-6 above) screened out the following protected sites, habitats and species:

- Natura 2000 sites;
- Natural Heritage Areas ('NHA') and proposed Natural Heritage Areas ('pNHA');
- Improved agricultural grassland (GA1);
- Active quarries and mines (ED4);
- Spoil and bare ground (ED2);
- Stone Walls and other stonework (BL1); and,
- Amphibians.

These ecological receptors were screened out from further assessment as the potential impacts were considered to be imperceptible or not significant; refer to Table 6-6 above for further details. The following habitats and species, as outlined in Table 6-6, were identified as receptors that warranted further consideration to avoid impacts:

- Hedgerows/Treelines (WL1/WL2);
- Flora;
- Badgers;
- Bats;
- Birds;
- Invasive species; and,
- Other species.

Mitigation has been proposed for each of these ecological receptors alongside enhancement measures for the Site as part of the Restoration Plan; refer to Section 6.5 and Appendix 6-1 for context. The results of these measures on these ecological receptors and the resulting residual impact are described below in Table 6-7.

Table 6-7: Valuation of Potential Ecological Receptors Post Mitigation and Enhancement

Receptor	Potential Impact	Assessment of Impacts Post Mitigation and Enhancement	Residual Impact
Hedgerow (WL1) / Treeline (WL2)	Loss and disturbance to vegetation.	Following the implementation of the proposed tree protection measures, outlined in Section 6.5.1, all retained trees will be protected from disturbance / damage. The Proposed Development will require the removal of ca. 408m of managed hedgerows and ca. 294m of mature hedgerows / treelines to access the full abstraction area. This will have a negative medium-long term effect. However, as part of the proposed works, the western berm will be planted with native trees to partially compensate for the vegetation lost during the clearance works. This berm will be ca.	Slight positive

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Receptor	Potential Impact	Assessment of Impacts Post Mitigation and Enhancement	Residual Impact
		3m high and 7m wide and as such, it will provide a wide area for double row tree planting. A treeline and two hedgerows (one on either side of the proposed security fence) will also be planted to the north of the western berm and an additional treeline will be planted along the northwest boundary of the Site. These works will ensure ca. 795m of linear habitats are plantedon-site. The landscape planting during the construction phase will ensure that the vegetation clearance undertaken at the Site is compensated for as early as possible and the removal works are reduced from a negative medium-long term effect to not significant. Refer to Section 6.5.2 and Appendix 6-1 for details. The Restoration Plan also includes for the re-establishment of grassland fields and the re-planting of all hedgerows / treelines removed during the construction and operational phase of the Proposed Development on a phased basis. A total of ca. 702m of hedgerows / treelines will be re-planted during the restoration phase. The Restoration Plan also includes for the establishment of a 0.26ha woodland. Following the successful implementation of the restoration plan it is considered that the Proposed Development has the potential to have a slight positive long-term impact on ecology within the area.	
Flora	Disturbance	Following the implementation of the mitigation measures outlined in Section 6.5.3, it is considered that potential effects on notable and protected flora will not be significant.	Not significant
[redacted] Other Species	Disturbance and entrapment	Following the implementation of the mitigation measures outlined in Section 6.5.6, [redacted]	Imperceptible
Bats	Disturbance of roosts and foraging / commuting habitats.	Following the implementation of the mitigation measures outlined in Section 6.5.4, it is considered that potential impacts on bats will not be significant.	Not significant
Birds	Disturbance of breeding birds	Following the implementation of the mitigation measures outlined in Section 6.5.5, it is considered that the potential effects on breeding birds including kestrel and sand martin will not be significant.	Not significant
Invasive Species	Introduction and spread of invasive species.	Provided the mitigation outlined in Section 6.5.7 is followed, it is considered that the effects to valued ecological receptors as a result of the spread or introduction of invasive species will be imperceptible.	Imperceptible

Considering the mitigation measures and proposed planting that will be implemented, it is considered that the impacts on ecology from the construction and operational phase of the Proposed Development will be not significant.

In the longer term, following the cessation of quarry activities at the Site and the successful implementation of the Restoration Plan, it is considered that the Proposed Development will not have a significant negative effect on biodiversity. The proposed Restoration Plan will tie

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into the existing restoration plans for the landholding agreed under conditions presented under ABP references: 19.SU.031 and 19.QD.0008.

6.10 Monitoring

The following monitoring works will be implemented to ensure that the works comply with the recommendations detailed within this chapter of the EIAR:

- The ECoW will inspect the Site in advance of ground stripping works commencing to ensure that all of the works are completed in line with the EIAR;
- The construction of the berms onsite will be supervised by an ECoW to ensure that no impacts occur to bordering hedgerows / treelines;
- An arborist will assess the health of retained trees following the completion of berm construction and vegetation removal works;
- The success of the berm, treeline, hedgerow and woodland planting will be monitored and any trees that fail to become established within 5 years of planting will be replaced by trees of a similar size / species within the next planting season; and,
- Annual monitoring will take place to ensure that the on-going restoration of the Site is successful, and no invasive species have been introduced onsite. These surveys will be undertaken within the optimal season for botanical surveys including the appropriate months for red hemp-nettle surveys. Annual monitoring will also ensure each phase of the Proposed Development is carried out in line with the mitigation measures contained within this EIAR and that the retained hedgerows / treelines are being protected. Refer to Appendix 6-1 for further information.

6.11 Reinstatement

The Site will be subject to a Restoration Plan following the cessation of extraction onsite. Details of the Restoration Plan are included in Appendix 6-1.

6.12 Difficulties Encountered

No difficulties were encountered in undertaking this assessment.

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7 LAND, SOILS & GEOLOGY

7.1 Introduction

This chapter provides a description and assessment of the potential likely and significant effects (if any) on the geological and soil environment which can reasonably be expected to occur due to the Proposed Development and subsequent restoration.

7.2 Methodology

7.2.1 Legislative Context

The importance / sensitivity of the geological receptors within the Site was assessed on completion of the desk study as set out in Table 3-4 of the EPA's '*Guidelines on the Information to be contained in Environmental Impact Assessment Reports*' [18].

In addition to the EPA Guidelines, the assessment was carried out in accordance with the following guidance and tailored accordingly based on professional judgement:

- Department of Environment, Heritage and Local Government: Quarries and Ancillary Activities - Guidance for Planning Authorities [12];
- EPA Environmental Management in the Extractive Industry (Non-Scheduled Minerals) [17];
- Institute of Geologists Ireland ('IGI') Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements [73]; and,
- IEMA Guide: A New Perspective on Land and Soil in Environmental Impact Assessment [74].

7.2.2 Desk-based Study

A desk-based study of the Site was conducted using available geological information held by the Geological Survey of Ireland ('GSI') for the general area and any available site-specific information. The following sources were reviewed for this purpose:

- Geological Survey of Ireland ('GSI') Public Data Viewer [75];
- Environmental Protection Agency ('EPA') Online Mapping [62]; and,
- All available site investigation results (See Section 7.2.3 below).

7.2.3 Site Investigations

Four groundwater monitoring wells (MW1A, MW2A, MW3A and MW3B) were installed at the Site in August 2017 to characterise the geological and hydrogeological environment at the Agall Quarry. In addition to these existing wells, two groundwater monitoring wells (MW4 and MW5) were installed in May 2023 to further characterise geology and hydrogeology within the Site.

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Figure 7-1: Groundwater Well Locations



The monitoring wells were installed at depth ranging from 14.55mbgl (MW5) to 49.30mbgl (MW3B). During the installation works the MOR Environmental consultant noted changes in the lithological profile and evidence of water present within the overburden (MW1A, MW2A, MW3A, MW4 and MW5) and the bedrock (MW3B). The borehole logs are shown in Appendix 7-1. These records provide insight into the condition of the overburden, bedrock and general geology, as well as water strike information during the drilling of the boreholes to determine the depth of the water table of the aquifer underneath the Site.

A topographical site survey was undertaken by SixWest in June 2023 to inform the topography of the Site and provide Ordnance Datum height references for the onsite boreholes.

7.3 Receiving Environment

7.3.1 Current Land Use and Site Description

The current land use of the west of the Site is best described as agricultural pasture. The east of the Site is an aggregate extraction site / quarry. A description of the Proposed Development is provided in Section 3 of this EIAR.

7.3.2 Topography

The Site topography is varied with both unextracted agricultural lands and previously extracted lands within the boundary. Agricultural lands to the west have a generally higher elevation (74-80mAOD), with higher elevations occurring in the south of the agricultural lands, dropping to a lower elevation in the north.

The extracted lands to the southeast of the Site are generally flat, with elevations between 68-69mAOD. However, high elevations of 71-76mAOD occur in the north of the extracted area and in regions where unextracted material remained at the time of the survey. The area

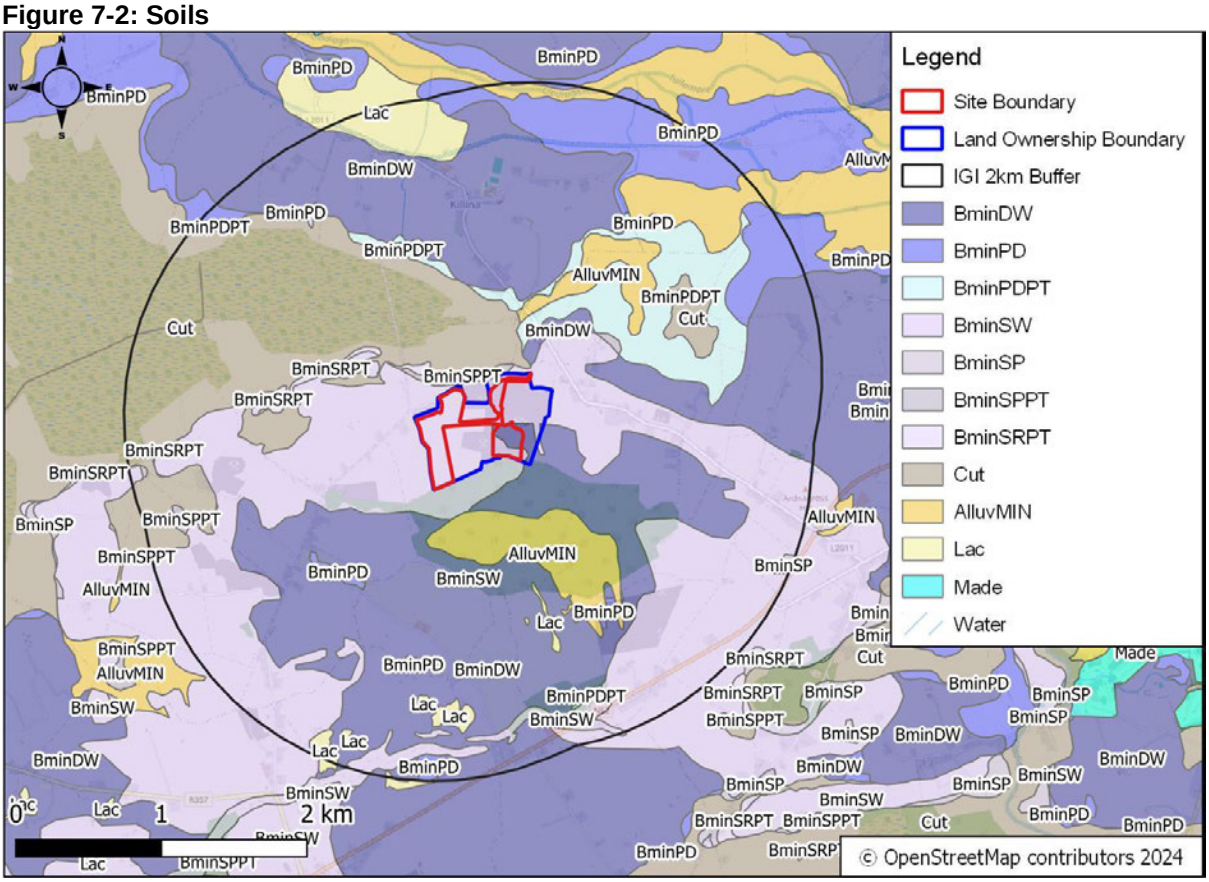
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containing access roads to the northeast of the Site is mainly flat, with elevations between 64-65mAOD.

7.3.3 Soils

According to the GSI database soil map [75], the Site is characterised by BminSW soil (shallow well drained mineral (mainly basic)) present across the majority of the Site area as well as the surrounding area. Additionally, there is an area of BminDW soil (deep well drained mineral (mainly basic)) located in the southeast of the Site, which corresponds to the areas identified as till in Section 7.3.4. Soils located in areas of past extraction activities are no longer present due to removal and reworking. Along the northern edge of the Site is a thin region of BminSPPT soil (shallow peaty poorly drained mineral (mainly basic)). Refer to Figure 7-2 below.

Figure 7-2: Soils

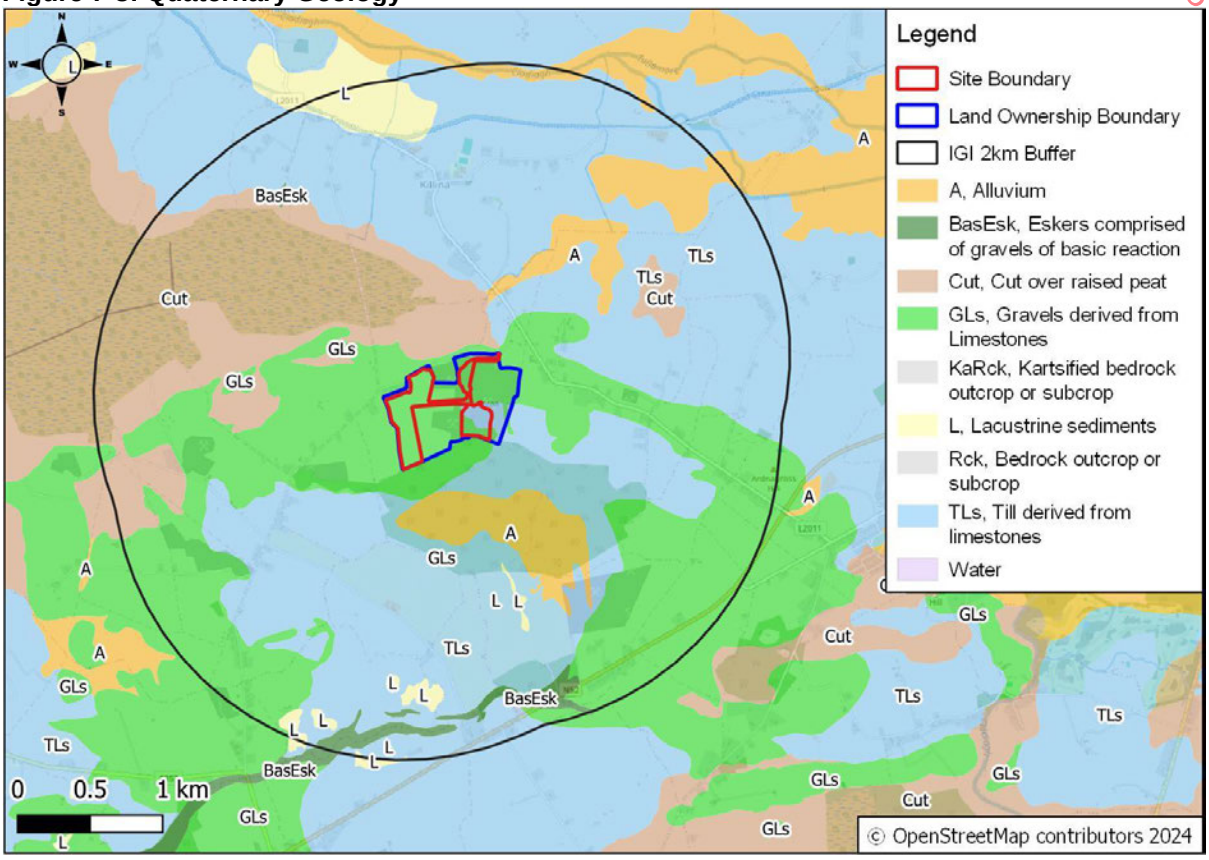


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7.3.4 Quaternary Geology

According to the GSI database [75], the Site is in a region of Gravels derived from Limestones ('GLs') with some Till ('TLs') derived from Limestones in the southeast corner. However, past extraction and restoration has altered the Agall Quarry such that this classification likely no longer applies in the east of the landholding. See Figure 7-3 below.

Figure 7-3: Quaternary Geology



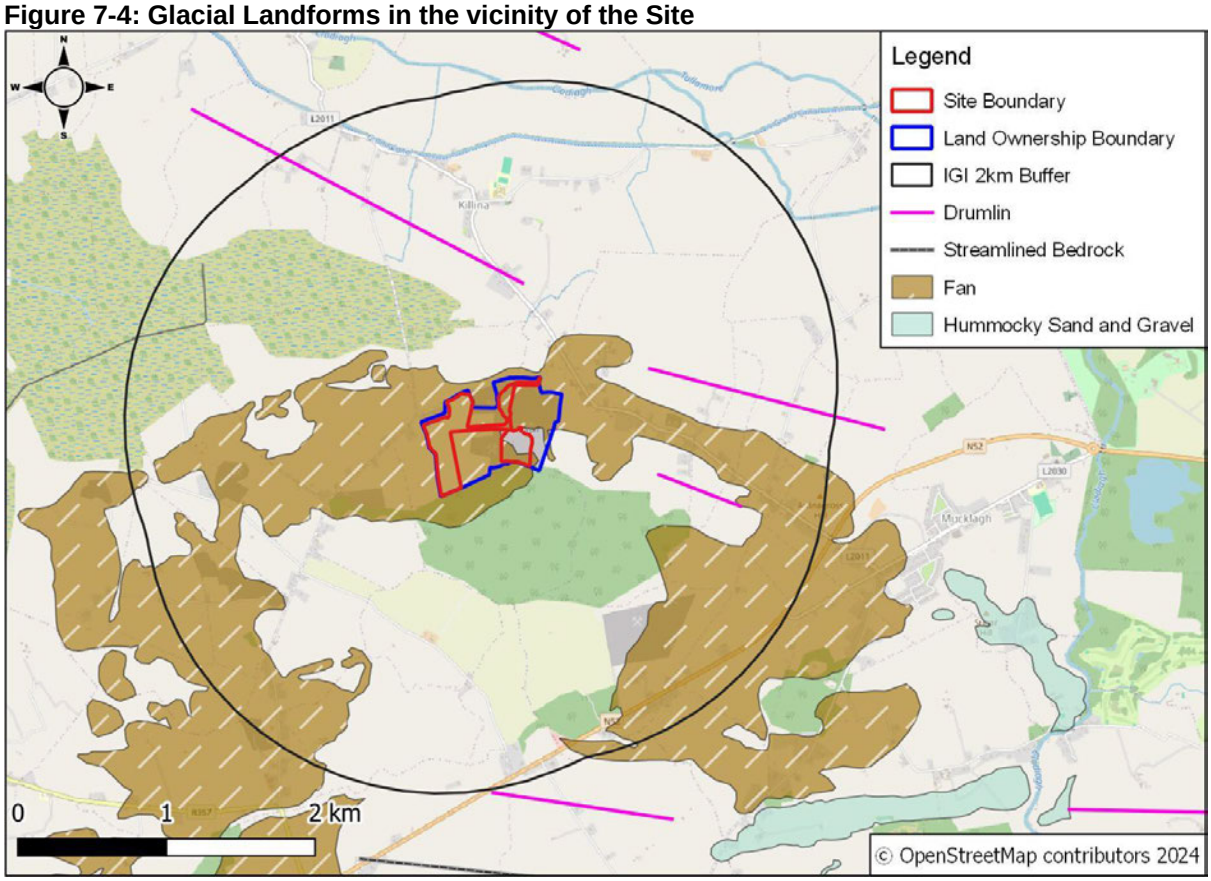
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7.3.5 Glacial Landforms

The Site is located within a deglacial fan, which is part of the Screggan Fan System, which corresponds to the GLs regions in Figure 7-1 above. Past extraction within the Agall Quarry have likely altered / removed much of the geomorphological and sedimentary structures associated with the fan system onsite. Unextracted areas within the Site boundary are completely underlain by the fan system.

There is a large section of esker ca. 1.7km to the south of the Site which is orientated from east to southwest and is associated with both the Screggan and Kilcormac Fan Systems. A very small section of esker is located ca. 1.5km to the northwest of the Site, and further deglacial deposits of hummocky sand and gravel occur to the southeast of the Site. Additionally, there are drumlins to the north, east and south, all with an approximately east-west orientation. The nearest drumlin is ca. 0.6km northeast of the Site. See Figure 7-4 below.

Figure 7-4: Glacial Landforms in the vicinity of the Site

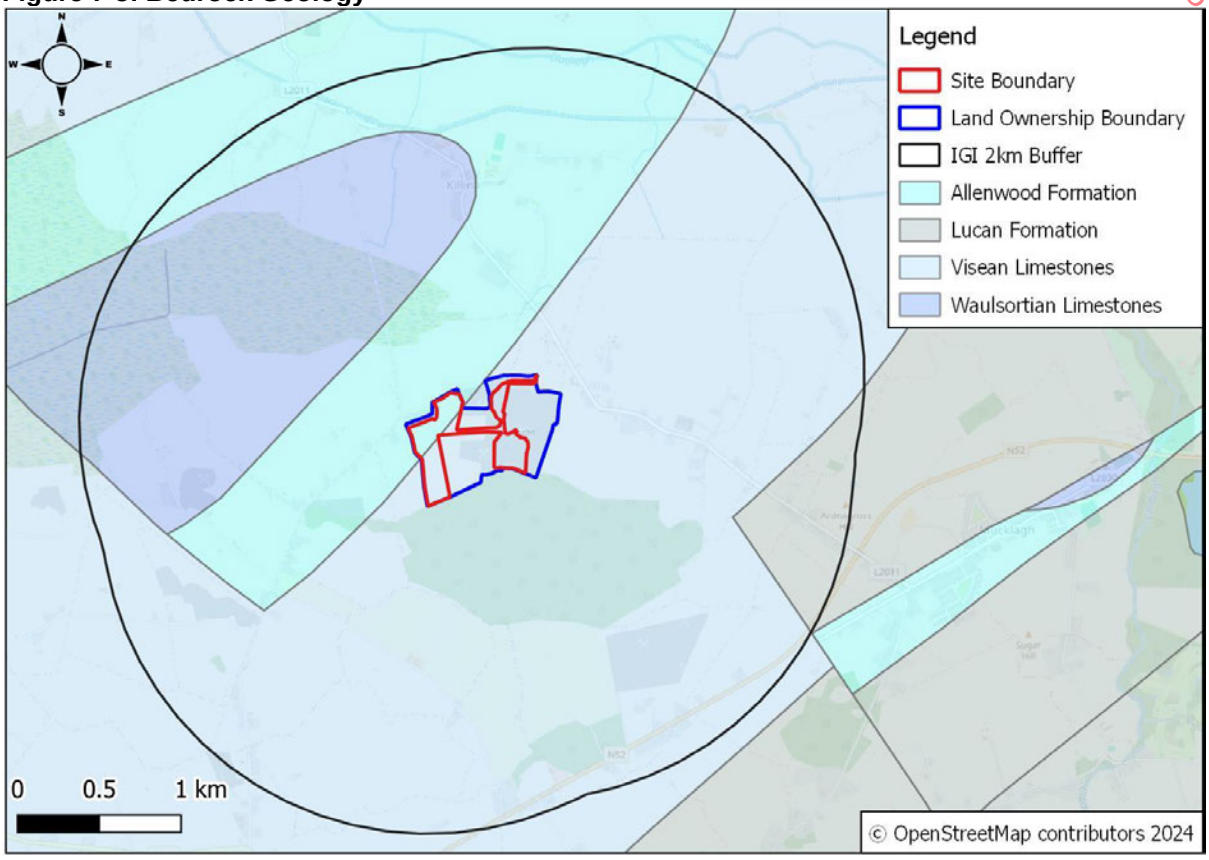


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7.3.6 Bedrock Geology

According to GSI mapping [75], the bedrock beneath the majority of the Site comprises undifferentiated limestones referred to as the Visean Limestones and, in the northwest, thick-bedded, locally peloidal limestone, referred to as the Allenwood Formation. Refer to Figure 7-5 below.

Figure 7-5: Bedrock Geology



7.3.7 Geological Heritage

The Site does not lie within a County Geological Site ('CGS'), however there are two within 2km of the Site, associated with the glacial landforms in the area.

The Screggan Fan CGS is located ca. 1.1km southeast of the Site to the nearest point. The CGS only represents a specific section of the overall Screggan Fan System and does not overlap with the Site. According to the site report [76], it is designated a CGS due to its importance in understanding the final deglaciation stages of the last Ice Age. The site consists of glaciofluvial sand and gravels that were deposited as subaqueous fans from the nearby melting ice sheet into a glacial lake. The thickness of the deposits is evident from the depth of local quarries and the N52 Tullamore bypass road excavations at Screggan. A disused (2016) pit at Screggan provides good exposure of cross-bedding in the sand and gravel quarry faces.

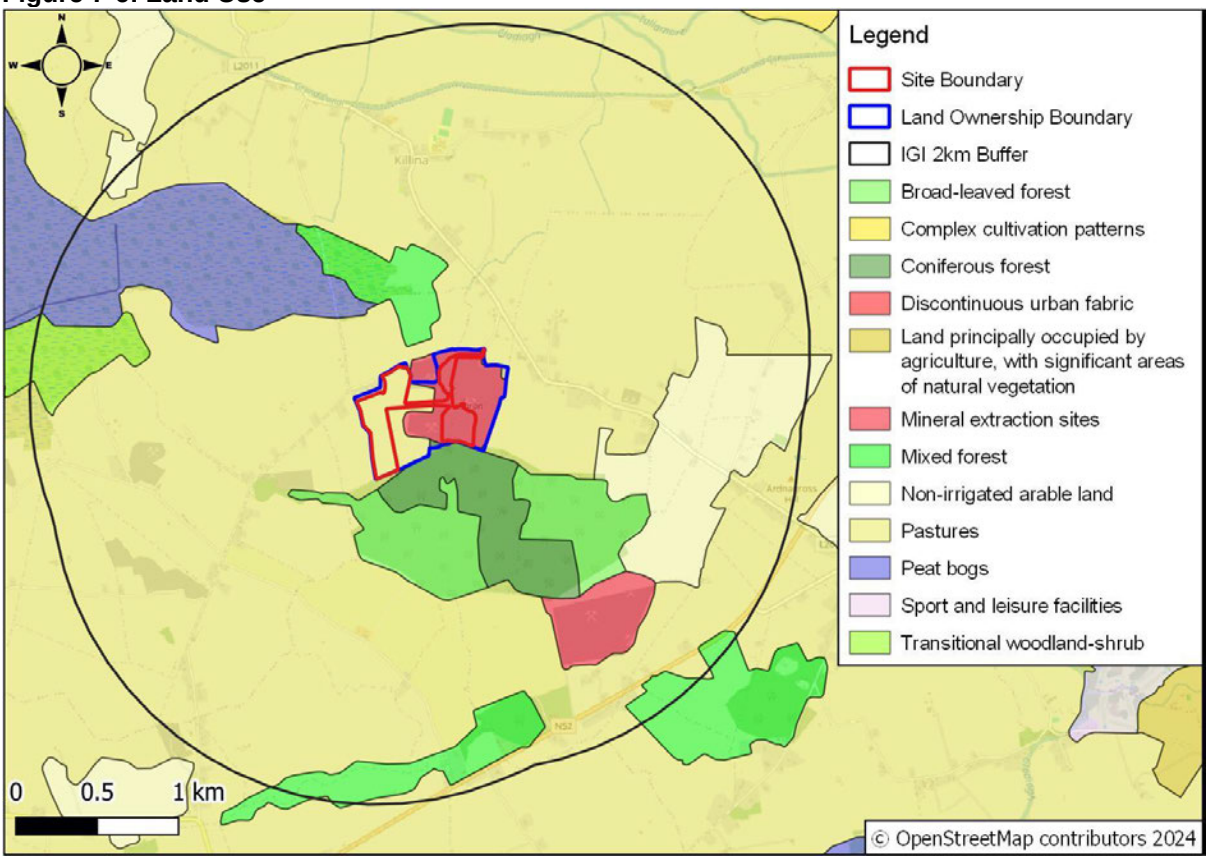
The Kilcormac Esker CGS is located ca. 1.4km south of the nearest point. According to the site report [76], it is designated a CGS as the eskers and their associated sands and gravels in the locality provide a good example of a deglacial, meltwater-deposited complex, with portions of deposition from both under the ice sheet and at the ice sheet margin. This particular esker forms part of the much larger Killimor-Birr-Fivealley-Kilcormac Esker System which extends across the midlands for over 70km linear extent. The esker feature is important because it faithfully records the ice movement across the area of Offaly during the final phase of deglaciation.

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7.3.8 Land use and Economic Geology

Based on Corine 2018 data [77] and use at the Site is currently agricultural to the west and aggregate extraction to the east, as shown in Figure 7-6 below. There is broad-leafed and coniferous forest to the south, broadleaf forest to the north and peatland to the northwest of the Site. The remainder of the surrounding lands in the direct vicinity are also agricultural areas.

Figure 7-6: Land Use



The Proposed Development will change the usage of the west of the Site to an aggregate extraction activity, through the extraction of granular aggregates onsite.

The Site is situated within an area of Very High Potential for granular aggregate, as identified in GSI database [75]. This area roughly corresponds to the Screggan Fan System shown in Figure 7-3 above.

7.4 Characteristics & Potential Effects of Proposed Development

The land at the Agall Quarry under the control of the Applicant covers an area of ca. 45ha in size. The Proposed Development, which lies within this boundary covers an area of ca. 17ha, and it will be a continuation of existing activities on-site, with works expanding and splitting into different phases as follows:

- Ca. 11ha for proposed greenfield extension, located to the west and north of the existing quarry. The proposed new extraction area covers an area of ca. 6.96ha to a working quarry floor of 63mAOD (2m below the current permitted depth under the existing permission) highlighted as Phase B, C and D in Figure 3-2;

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- Ca. 3.81ha for proposed extraction of an area of land previously excavated, east of the existing working face, which will be worked and brought down to a level of 65mAOD highlighted as Phase A in Figure 3-2; and,
- Ca. 2ha which relates to site access, welfare and continued temporary storage and processing of aggregates.

The expansion of the quarry into new fields will involve the stripping of topsoil and extraction of the underlying subsoil aggregates for processing. As a result, the land use of these fields will change from agricultural land to a 'mineral extraction'. The removed soils will be used for boundary embankments, including ca. 3.0m high x 7.0 wide embankment surrounding the residential landholding to the north of the new fields, which will be planted. The removal and reworking of these soils will result in both the alteration of soil character and the loss of any geomorphological structures associated with the glacial fan through the mixing of soil layers. Based on Table 2 of the 2022 IEMA guidance [74], these soils have a "low" receptor sensitivity, based on the predominantly mineral nature of the soils, the lack of archaeological interest and the lack of community, recreational and educational usage of the land.

Although the Agall Quarry is greater than 20ha in total area, only an area of ca. 10ha corresponding to the new fields of undisturbed agricultural soils will be impacted. This phase of the Proposed Development represents the lateral expansion to the north and west of the existing permitted activities onsite. As such, utilising Table 3 of the same guidance, the magnitude of the impact associated with the removal of soils from the Site is "Moderate" as the Proposed Development would result in the loss of agricultural pasture soil function for between 5-20ha, which will be reversed through restorative infilling. Therefore, under Table 5 and Table 6 of the guidance, the impact of the soil removal will be negative and slight, which is considered "not material in the decision-making process" by the guidance. Under 2022 IEMA guidance [74] the overall impact will be slight and negative in relation to land and soils, without mitigation.

7.5 Proposed Mitigation Measures

The mitigation measures for the protection of soils and geology, as well as the protection of surface water and groundwater, which are related to the soils and geology, are described below. These mitigation measures are also applicable to the water environment (described in Chapter 8).

7.5.1 Oil Storage / Refuelling

During the construction and operational stages of the Proposed Development, the usage of fuel powered equipment and machinery will be required. The employment of good environmental management practices will serve to minimise the risk of pollution to the surrounding environment from the extraction activities at the Proposed Development. Therefore, mitigation measures will be in accordance with the EPA (2006) Environmental Management Guidelines: *Environmental Management in the Extractive Industry (Non-Scheduled Minerals)* [17], whereby;

- All quarry vehicles will be refuelled via fuel truck direct from a fuel merchant when required with adequate spill protection measures employed;
- Spill kits will be available adjacent to all refuelling operations;
- Items of plant will be refuelled utilising adequately sized and positioned drip trays;
- The wheel wash will be serviced and maintained, including the removal of sediment offsite periodically by a permitted contractor to a licensed facility, to prevent the release of finer sediment, fuels and greases that accumulate over time;

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- Unauthorised access is prevented; and,
- Any hazardous waste, such as waste oils, generated onsite will be collected in leak-proof containers and stored onsite in designated areas to be collected and recycled/ disposed of by an authorised waste contractor.

In addition, the following measures will be implemented to prevent contamination release of hydrocarbons:

- Preventative maintenance and relevant maintenance logs will be kept for all on-site plant and equipment;
- Procedures and contingency plans will be implemented to deal with emergency accidents or spills;
- Lubricants and hydraulic fluids for screening equipment used on the Site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best practice codes; and,
- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained, and the contaminated soil removed from the Site and properly disposed of.

7.5.2 Soil Management

Stockpiling of excavated material will be required and will be appropriately managed onsite. All topsoil will be stored in berms, some of which will be used for the remediation stage of the Proposed Development. Topsoil removal and storage will be conducted considering best practice guidance from Department for Environment Food and Rural Affairs ('DEFRA') (2009) [78]. To minimise the overall impact on soils arising during the construction phase, the following mitigation measures will be adhered to:

- The quality of the soil will be maintained as best as possible;
- Soil stripping and stockpiling will not take place during particularly dry or wet weather. This will minimise damage to the soil quality;
- The volume of berms will be optimised to avoid anaerobic conditions at the centre, this will help maintain soil chemistry and structure as much as possible;
- Berms will be seeded as soon as possible to ensure the stability of the stockpiled soil; and,
- Berms will be dampened down during dry periods to prevent wind dispersion until planting has established.

7.6 Cumulative and In-Combination Effects

The potential cumulative impact of the extraction onsite is the degradation of the geological value of the Screggan Fan System, which contains large areas of high aggregate potential, through combined extractive activities, e.g. Kilsaran Quarry, (see Section 5.3.2.3.) across the system. However, a section of the system c. 1.1km southeast of the Site, has been zoned as the Screggan Fan CGS, preserving the geological value of these sediments and as such cumulative impacts from extraction are considered adverse and permanent in nature, but "not significant".

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7.7 Interactions with other Environmental Attributes

Land, soils and geology interact with other environmental attributes as follows:

- Chapter 6 - Biodiversity: the change in land use and removal of soils would have had a negative impact on biodiversity. The impacts on biodiversity are addressed in Chapter 6;
- Chapter 8 - Water: Soil contamination can act as a contamination source that negatively impacts underlying aquifer (groundwater) and surface water quality. Surface water quality may also be impacted through the mobilisation of suspended soils and release of dissolution of mineral / nutrients from rock and soil into surface water. Groundwater will be rendered more vulnerability to contamination due to the extraction of the gravel overburden and therefore providing less protection to the gravel aquifer within the overburden. These impacts on water quality are discussed in Chapter 8; and,
- Chapter 10 - Air Quality: the mobilisation of dust through extraction processes such as screening can impact air quality. The impacts on air quality are addressed in Chapter 10.

7.8 Indirect Effects

There have been no significant or likely indirect effects identified outside of those previously assessed throughout this chapter.

7.9 Residual Effect

Given the widespread nature of pasture farmland across Ireland and that, after restoration, the area of the Site that will undergo extraction will be restored to grassland, it is considered that the residual impact on land use and soils will be slight adverse but “not significant”.

7.10 Monitoring

Not applicable.

7.11 Reinstatement

The restoration phase of the Proposed Development will be undertaken in phases as works progress within the Site. The key focus of the restoration plan corresponds to the phased extraction and restoration of the greenfield lands to the west of the Site. The stripping of the new lands will be completed in different phases to expose only the new phase of extraction to make sure that the area of exposed grounds does not significantly increase over time.

The exhausted areas will be re-levelled, creating an undulating landscape, and all stockpiles and trenches will be removed from these areas. The stockpiled material and soils stripped from the next phase of extraction will be used to cover the previously exhausted area, allowing for continuous restoration. The soils will be spread to a depth not exceeding 300mm and these areas will then be reseeded. The hedgerows/treelines removed during quarrying activities will also be replanted once operations have ceased.

7.12 Difficulties Encountered

No difficulties were encountered in undertaking this assessment.

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8 WATER

8.1 Introduction

This chapter provides a description and assessment of the potential likely and significant effects, if any, on the hydrological (surface water) and hydrogeological (groundwater) environment, which can reasonably be expected to occur because of the Proposed Development.

8.2 Methodology

8.2.1 Legislation Context

The EU Water Framework Directive (2000/60/EC) ('WFD') [79] established a framework for the protection of both surface water and groundwater. The European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003) [80] transposes this EU legislation into Irish law. It outlines the water protection and water management measures required in EU member states to achieve and maintain at least 'good' status of all water bodies by 2027 and prevent any deterioration in existing water status. Water bodies comprise both surface water and groundwater bodies, and the achievement of an overall 'good' status classification depends on the achievement of 'good' ecological status which is defined by the worst performance under assessments of biological, chemical and hydromorphological status. The WFD is implemented through River Basin Management Plans ('RBMPs') in three six-year cycles, each of which provides an opportunity to assess water conditions at different stages and set out actions to achieve the water quality objectives.

The first cycle of the River Basin Management Plan ('RBMP') ran from 2009 - 2015. Eight separate plans were devised for all the River Basin Districts ('RBDs') with the objective of achieving at least 'good' status for all waters by 2015 (noting that later dates were set for certain waterbodies noted to be under significant pressures). The second cycle of the River Basin Management Plan was published in April 2018, covering the 2018 – 2021 period, and merged the multiple RBDs to form one national RBD. The third cycle RBMP was published in September 2024, covering the 2022 – 2027 period, and sets out the measures that are necessary to protect and restore water quality in Ireland. The overall aim of the plan is to ensure that all water bodies are sustainably managed and that freshwater resources are protected so as to maintain and improve Ireland's water environment. The third cycle plan focuses on integrated catchment planning, with catchment management work plans to be put in place for each of the 46 hydrometric catchments as sub-plans to the national RBMP.

The assessment was carried out in accordance with the following guidance and tailored accordingly based on professional judgement:

- Department of Environment, Heritage and Local Government; Quarries and Ancillary Activities - Guidance for Authorities [12];
- EPA Environmental Management in the Extractive Industry (Non-Scheduled Minerals) [17];
- Institute of Geologists Ireland ('IGI') Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements [73];
- Groundwater Regulations 2010 (S.I. No. 9 of 2010) as amended (S.I. No. 289 of 2011; S.I. No. 149 of 2012; S.I. No. 366 of 2016 and S.I. No. 287 of 2022) [81];
- Surface Water Regulations 2009 (S.I. No. 272 of 2009) as amended (S.I. No.327 of 2012; S.I. No.386 of 2015; S.I. No. 77 of 2019; S.I. No. 659 of 2021; S.I. No. 288 of 2022 and S.I. No. 410 of 2023) [82]; and,
- European Union (Drinking Water) Regulations 2023 (S.I. No. 99 of 2023) [83].

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8.2.2 Desk-based Study

A desk study of the Site and surrounding area was carried out to collate all available and relevant hydrogeological, hydrological and meteorological data for the Site area, using the following data sources:

- Geological Survey of Ireland ('GSI') public data viewer [75];
- Environmental Protection Agency ('EPA') Maps database [84];
- Environmental Protection Agency ('EPA') Catchments [85]; and
- Office of Public Works ('OPW') 'Flood Maps' [86].

8.2.3 Site Investigations

An intrusive site investigation was conducted between the 25th May 2023 and 26th May 2023 to characterise the geological, hydrogeological, and hydrological environment at the Site. The investigations included the following:

- Installation of two groundwater wells at the Site, refer to Section 7.2.3 of the Land, Soils and Geology chapter of this EIAR. The borehole logs for the newly installed wells are shown in Appendix 7-1 associated with the Land, Soils and Geology chapter of this EIAR;
- During the installation works the MOR Environmental consultant noted changes in the lithological profile and evidence of water present within the overburden. The water strike information obtained during the drilling of the boreholes is particularly important to determine the presence of groundwater underneath the Site. Groundwater level monitoring was carried out to determine the depth to the water table; and,
- A topographical site survey was undertaken by SixWest on 8th June 2023 in order to survey the area to Ordnance Datum.

Biannual monitoring of groundwater is carried out at the Site in accordance with Condition 6 of Planning Permission (Ref: 19.QD.0008) granted in April 2017 for the Agall Quarry by An Bord Pleanála ('ABP'):

> *"6. Prior to commencement of quarrying, groundwater monitoring wells shall be installed to the written satisfaction of the planning authority. A programme of monitoring of water quality and levels shall be undertaken. These details shall provide for the number and location of boreholes, frequency of sampling and reporting, and the water quality parameters to be monitored."*

The implementation of a groundwater monitoring programme satisfies Condition 3 (i) of Substitute Consent relating to existing quarry operations at Agall Quarry granted by ABP in April 2017 (Ref: 19.SU.0131):

> *"3. (i) a programme for the monitoring of groundwater levels and groundwater quality."*

The scope of the biannual groundwater monitoring programme, proposed by MOR Environmental on behalf of the Applicant, was agreed with Offaly County Council (OCC) and Irish Water on 21st July 2017, following which four groundwater monitoring wells were installed onsite in August 2017. MOR Environmental has carried out groundwater monitoring at the Site since August 2017.

Groundwater sampling events at all six wells took place on 27th June 2023 (Q2 2023) and 24th October 2023 (Q4 2023). Each monitoring event included the following:

- Field hydrochemistry measurements for groundwater, (electrical conductivity, pH and temperature); and,

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- Laboratory analysis of groundwater samples for a broad range of parameters – refer to Appendix 8-1.

Groundwater level measurements were taken on 27th June, 13th July, 10th October, 24th October, 8th November 2023 and 5th March 2024 at the six groundwater monitoring wells (see Section 7.3.2 above) and a pumping well (PW1) onsite.

8.2.4 Impact Assessment Methodology

The conventional source-pathway-receptor model for groundwater / surface water protection is applied to assess impacts on groundwater and surface water, specifically on downstream sensitive ecological receptors and local groundwater supplies.

Sources

The primary potential hazards to water from onsite activities are contaminants such as hydrocarbons (lubricants or vehicle engine spills) used onsite and suspended solids released during the extraction of aggregates.

Pathway

The pathway in terms of groundwater flow is through the identified sources, infiltrating the underlying exposed bedrock during extraction and processing.

Receptor

The primary receptors are the underlying aquifers and groundwater source protection areas. The secondary groundwater receptors are groundwater in downgradient aquifers, downgradient karstic features (e.g. springs) and local groundwater wells in the vicinity of the Site.

There are no predicted direct SPR linkages for surface water.

Where impacts are identified, the classification of impacts in the assessment follows the descriptors provided in the Glossary of Impacts contained in the following guidance documents produced by the EPA:

- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003); and,
- Environmental Protection Agency (May 2022) – Guidelines on the Information to be contained in Environmental Impact Assessment Reports.

8.3 Receiving Environment

8.3.1 Hydrogeology

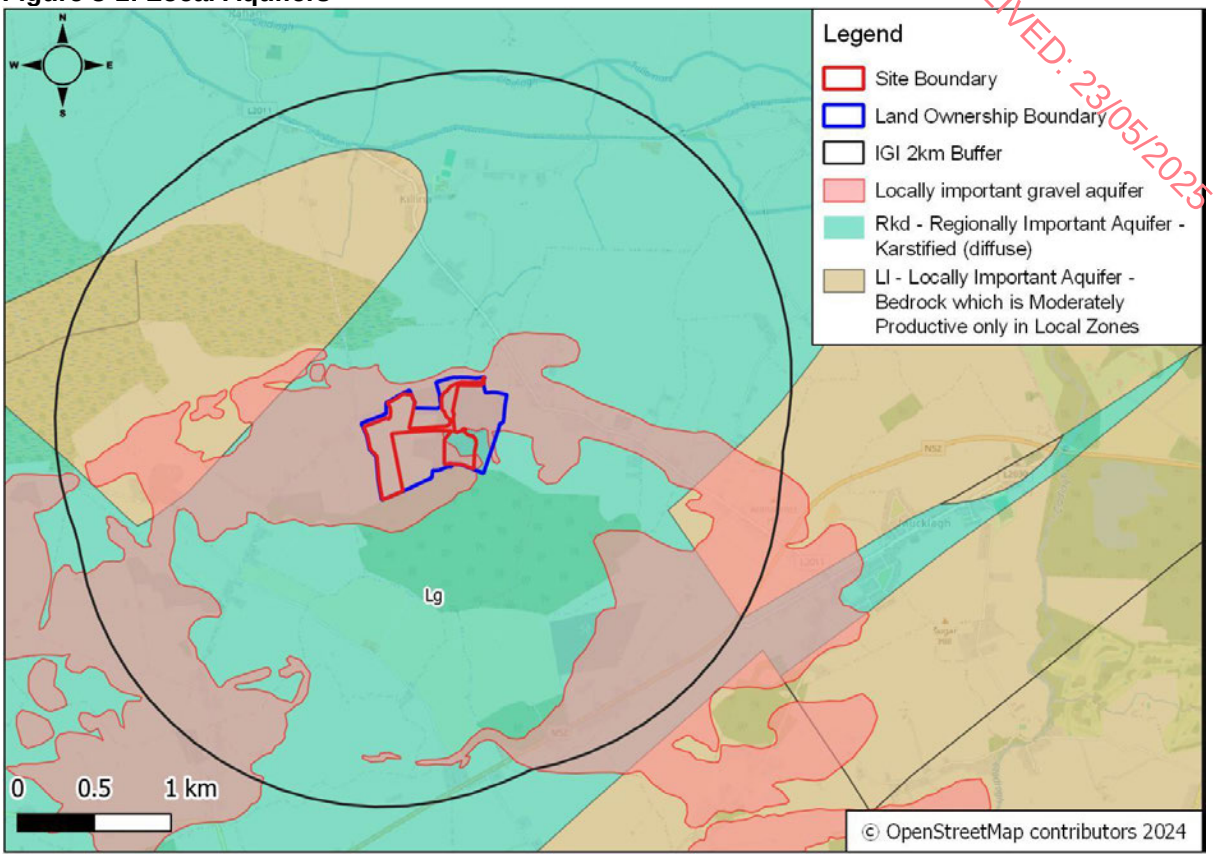
This section describes the groundwater features in the area and those which are potentially relevant to the assessment.

8.3.1.1 Groundwater Aquifers

The EPA maps indicates that the entire Site is underlain by a Regionally Important Bedrock Aquifer (‘Rkd’) - Karstified (diffuse). EPA mapping identifies that there is a locally important gravel aquifer (Lg) across the majority of the Site that correlates with the Screggan Fan system (described in Section 7.3.5 of the Land, Soils and Geology Chapter of this EIAR). See Figure 8-1 below.

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Figure 8-1: Local Aquifers



8.3.1.2 Groundwater Body ('GWB') Status

EPA Maps places the Site within the groundwater body ('GWB') of Holimshill-Killeigh Gravels (IE_SH_G_254) which corresponds to the extents of the sand and gravel deposits of the Screggan Fan System. The Holimshill-Killeigh Gravels GWB is assigned a "Good" status under the WFD 2016 - 2021 monitoring round [85]. The groundwater body risk is currently considered "not at risk" of failing to meet its environmental objectives.

The Tullamore (IE_SH_G_232) GWB that underlies the Holimshill-Killeigh Gravels GWB (IE_SH_G_254) corresponds to the bedrock and is assigned a "Good" status under the WFD 2016 - 2021 monitoring round [85]. The Tullamore GWB risk is currently considered "not at risk" of failing to meet its environmental objectives.

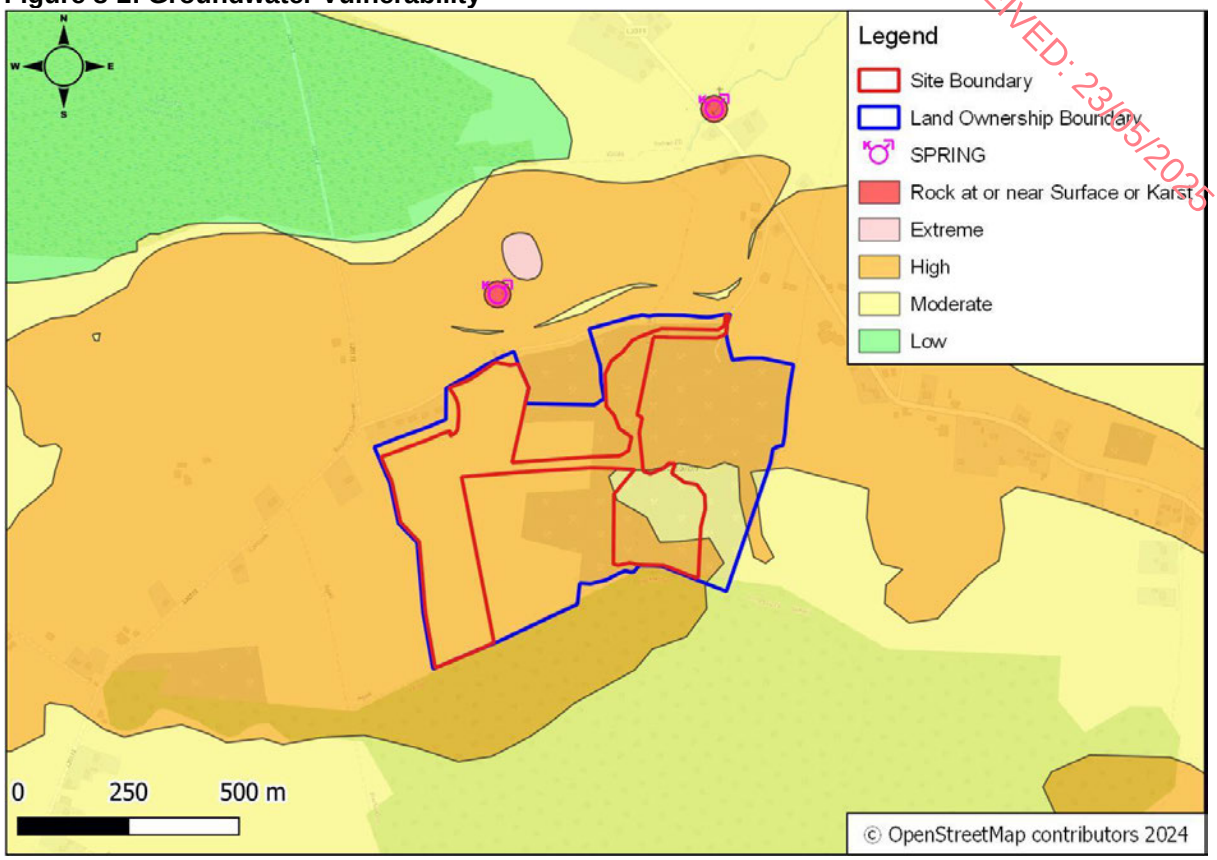
8.3.1.3 Groundwater Vulnerability

Groundwater vulnerability represents the characteristics of the intrinsic geological and hydrogeological features at the site which influence the ease at which groundwater may become contaminated by human activities. It is a function of the subsoil thickness, subsoil permeability as well as the presence of karst features where recharge to the bedrock aquifer can be unhindered [87]. The majority of the Site is classified as having High (H) vulnerability, with a region of Moderate (M) vulnerability in the southeast of the Site. However this classification is based on the general local environment and so due to quarry activities exposing the bedrock, the classification can be reviewed and treated as 'Extreme – Bedrock at or Near Surface or Karst' (X). See Figure 8-2 below.

Additionally, there are two areas of Karst associated with karstic spring features – an unnamed spring approximately 130m north of the Site and St. Anthony's Well, located approximately 470m north of the Site. These features correlate to areas of Extreme – Rock at or Near Surface or Karst groundwater vulnerability.

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Figure 8-2: Groundwater Vulnerability

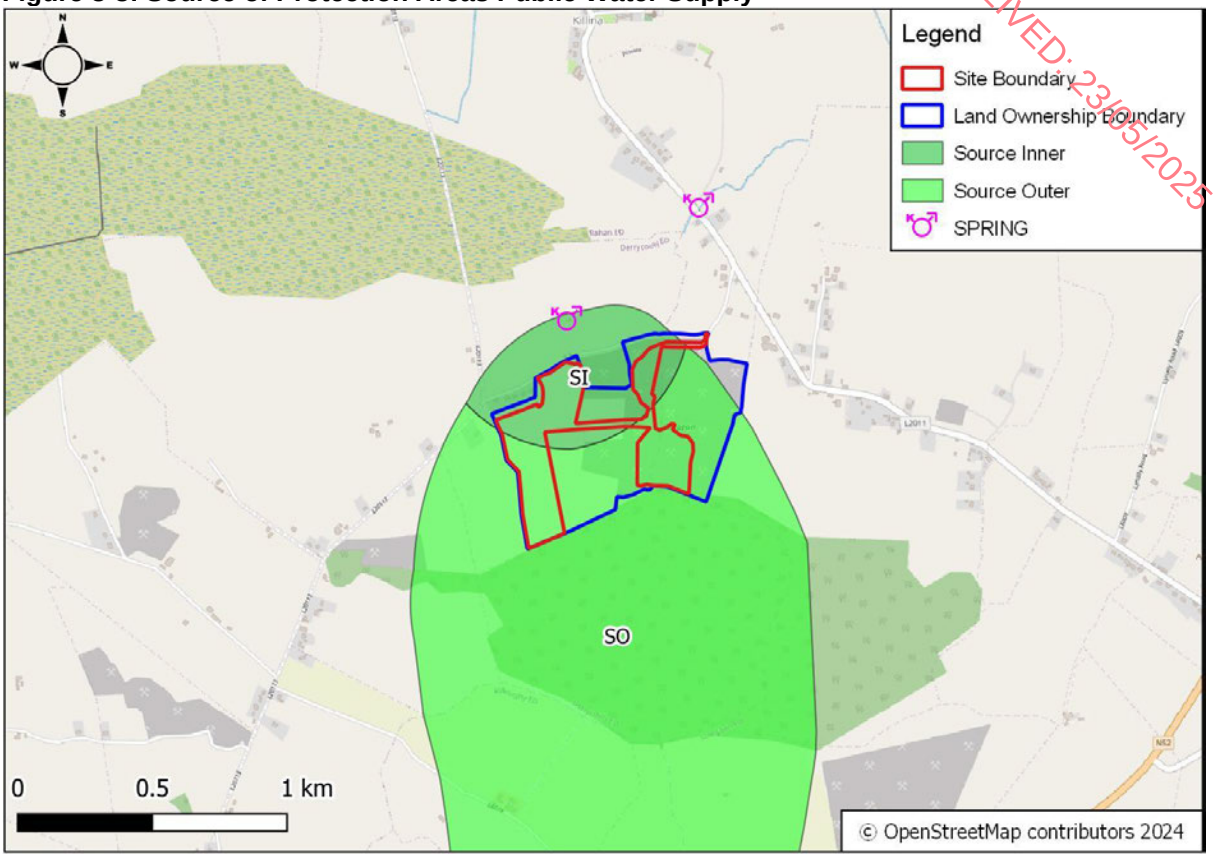


8.3.1.4 Groundwater Protection and Use

Groundwater Protection Schemes provide a framework for the protection of groundwater source zones (i.e., areas of contribution to groundwater for drinking water supplies). The Agall Spring Public Water Supply Source Protection Areas are shown in Figure 8-3 below. The northern portion of the Site is within the Source Inner ('SI') protection zone and the southern portion of the Site is within Source Outer ('SO') protection zone.

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Figure 8-3: Source of Protection Areas Public Water Supply



It is noted in the Agall Water Supply Scheme Groundwater Source Protection Zones report [88] that the regional groundwater flow is northwards, with a relatively flat hydrological gradient within the bedrock aquifer. Additionally, the report considers the groundwater in the area to be unconfined due to the presence of highly permeable gravels over the limestone aquifer. The report also identifies the potential pollution sources that pose a threat to groundwater in the area, namely:

- Agricultural activities and septic tanks are the principle hazard;
- Machinery at the sand & gravel quarry (the Site) pose a threat to the groundwater from diesel spills, fuel leaks, etc.;
- Spillage and runoff from roads also pose a threat; and,
- Diesel/ oil spills, nitrogen, faecal bacteria and viruses are the main potential pollutants identified.

The GSI maintains a wells and springs database which shows the approximate location of dug wells, springs and boreholes across Ireland. The database is not exhaustive and was created by collating data collected by the GSI or submitted to the GSI from local authorities and other state bodies, private well grants, drillers, consultants, group water schemes and academia. The location of individual dug wells, springs and boreholes is presented as circles ranging in diameter, with smaller diameters indicating greater location certainty and larger diameters indicating greater location uncertainty. A search of this database was conducted to identify well and spring features within a 2km radius of the Site. There are 11 wells within 2km of the Site, refer to Table 8-1 below for details.

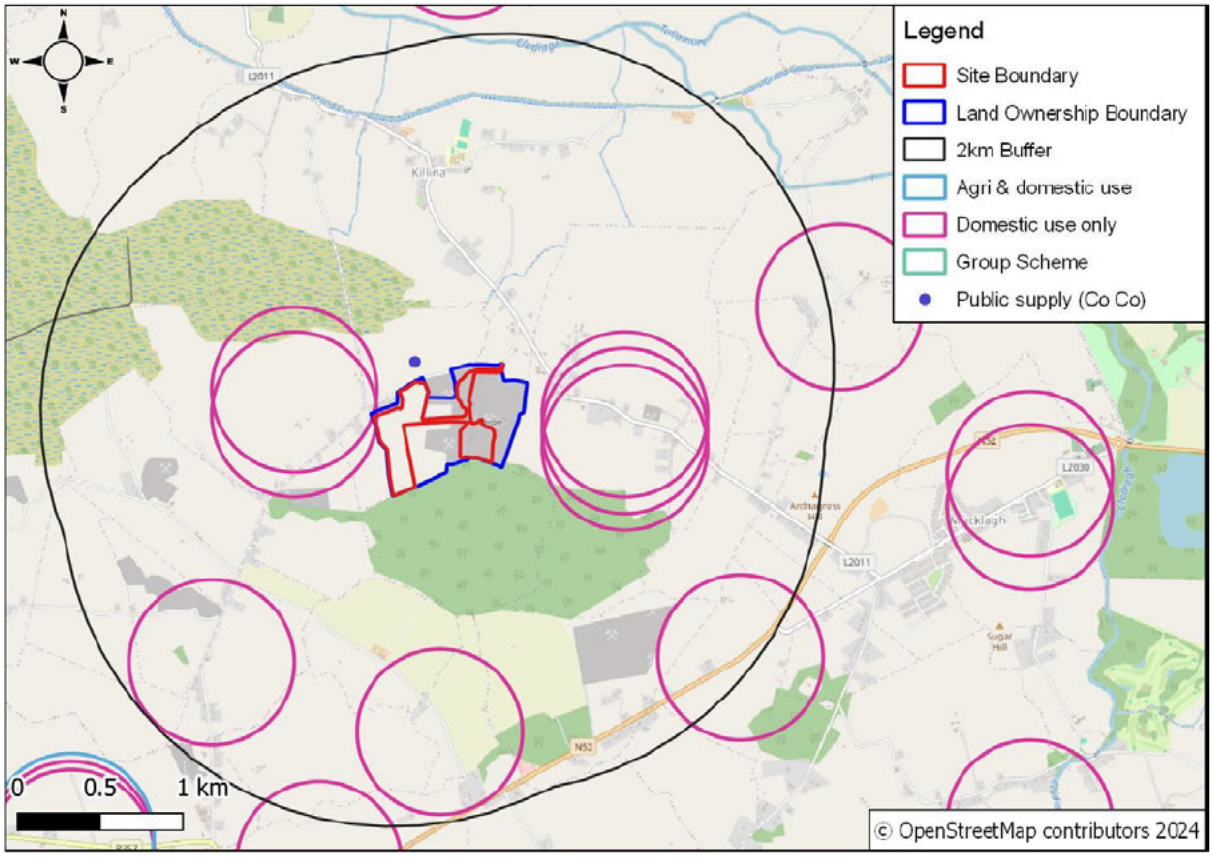
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Table 8-1: Wells and Springs within 2km of the Site

Borehole ID	Centre Distance from Site	Grid Reference (Irish Grid)	Well Type	Total Depth (m)	Townland	Yield (m^3d)
2021NEW004	0.13km N	223320 226730	Spring	-	Agall	1090
2021NEW019	0.47km W	223000 226000	Dug well	12.2	Roscore	19.6
2021NEW021	0.48km NW	223150 226000	Borehole	12.8	Roscore	21.8
2021NEW023	0.61km E	223000 228000	Borehole	29.9	Glaskill	16.4
2021NEW022	0.62km E	222900 228000	Borehole	24.5	Glaskill	4.4
2021NEW024	0.65km E	222800 228000	Borehole	43.9	Glaskill	Not recorded
2021NEW009	1.46km S	221080 226880	Dug well	4.9	Brackagh	27.3
2021NEW015	1.49km SW	221500 225500	Borehole	61	Glasshouse	13.1
2021NEW010	1.84km SE	221530 228700	Dug well	14	Heath	21.8
2021NEW025	1.94km SE	223650 229300	Borehole	16.4	Lynally Glebe	28
2021NEW039	2.27km S	220280 226150	Borehole	18.9	Lugglass	21.8

These boreholes and any other abstraction points downgradient of the Site are the secondary receptors for contamination under any SPR linkages in relation to groundwater, with groundwater flow in the bedrock aquifer and gravel deposits acting as a pathway to these receptors.

Figure 8-4: Wells and Springs Within 2km of the Site Boundary

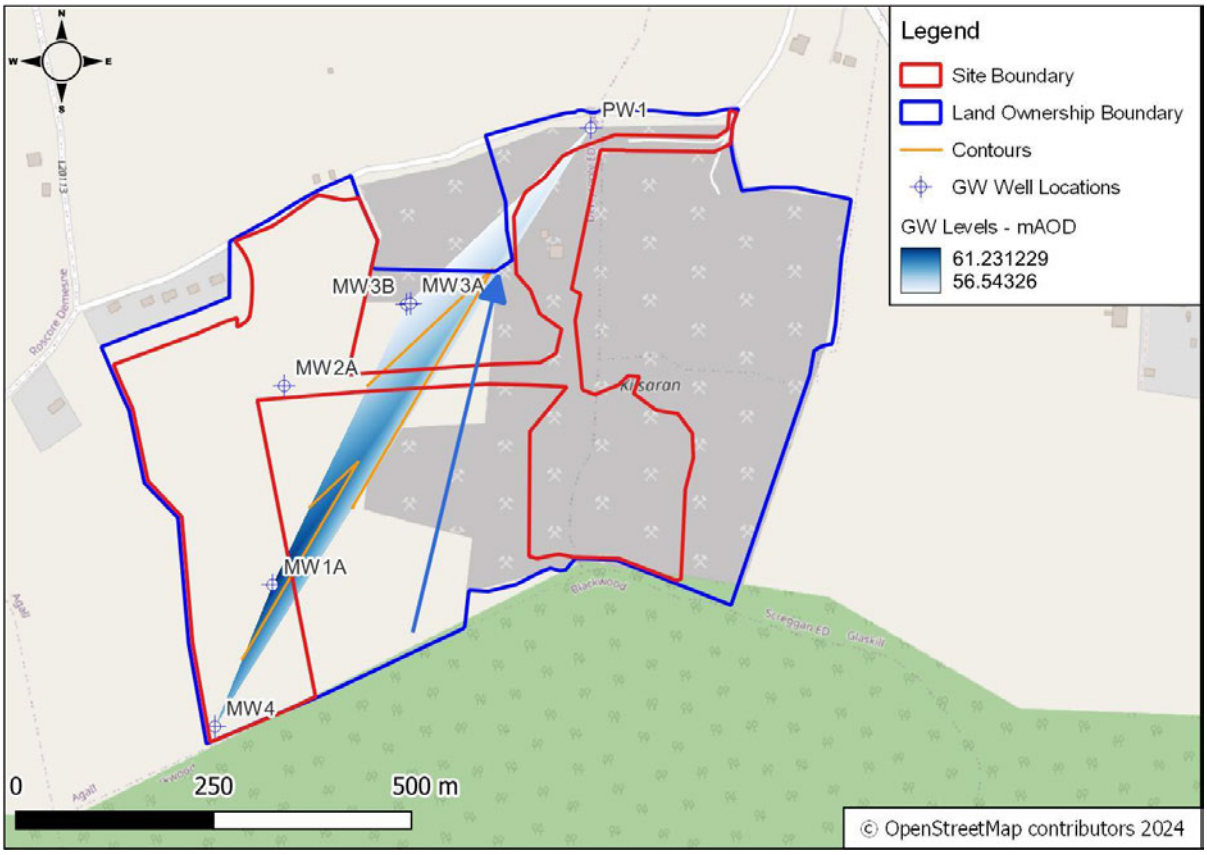


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8.3.1.5 Groundwater Levels and Flow Direction

Groundwater levels were measured at Agall Quarry in June 2023, July 2023, October 2023, November 2023 and March 2024, with results shown in Table 8-2 below. Historic groundwater levels across the Site between August 2017 and November 2023 are presented in Appendix 8-2. The groundwater level measurements indicate that the local groundwater flow direction across the Site is from south to north. Monitoring well locations and groundwater flow direction from November 2023 are shown in Figure 8-5 below.

Figure 8-5: Groundwater Flow Direction



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Table 8-2: Site Groundwater Level Measurements

Well ID	Elevation of Reference	Water Level											
	mAOD	27/06/2023		13/07/2023		10/10/2023		24/10/2023		08/11/2023		05/03/2024	
		mbtoc	mAOD	mbtoc	mAOD	mbtoc	Mbtoc	mbtoc	mAOD	mbtoc	mAOD	mbtoc	mAOD
MW1A	78.77	17.60	61.17	17.84	60.93	17.79	60.98	17.83	60.94	17.48	61.29	17.23	61.54
MW2A	79.81	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW3A	80.59	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW3B	80.57	23.80	56.77	24.09	56.48	23.91	56.66	23.67	56.90	23.32	57.25	22.60	57.97
MW4	80.79	21.56	59.23	21.01	59.78	21.95	58.84	20.93	59.86	21.92	58.87	20.66	60.13
MW5	71.78	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
PW1	64.35	9.69	54.66	8.33	56.02	8.12	56.23	7.81	56.54	7.71	56.64	7.64	56.71

mAOD – metres above Ordinance Datum

mbtoc - metres below top of casing

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8.3.1.6 Groundwater Monitoring

Groundwater monitoring data is available for the Site since the installation of the four groundwater monitoring wells (MW1A, MW2A, MW3A and MW3B) in August 2017, including monitoring data for PW1.

In addition to this intrusive site investigation, two groundwater monitoring wells (MW4 and MW5) were installed in May 2023, as part of the planning application for the proposed extension of the quarry.

Four groundwater monitoring events have been conducted at the Site since the latter intrusive Site investigations on 27th June 2023 (Q2 2023) and 24th October 2023 (Q4 2023) in accordance with best practice standards (ISO 5667-11:2009).

In addition to the sampling, hydrochemistry monitoring was taken during the sampling of the wells. The laboratory results are presented in Appendix 8-1 and compared with the relevant acceptance criteria within the Groundwater Regulations (S.I. No. 9 of 2010 as amended) ('GAC') [89] and the European Union (Drinking Water) Regulations 2023 (S.I. No. 99 of 2023) ('DWAC') [83]. In the instances where there is no GAC or DWAC available, the EPA Interim Guideline Values ('IGV') [90] were used for comparison. Groundwater monitoring wells MW2A, MW3A and MW5 were noted as being dry during the Q2 and Q4 2023 monitoring events.

No detections of petroleum hydrocarbons ('TPH CWG'), benzene, toluene, ethylbenzene, and xylene ('BTEX'), as well as methyl tertiary-butyl ether ('MTBE'), were recorded above laboratory detection limits during historical monitoring or the Q2 and Q4 2023 monitoring events. However, there was one instance of exceeding the IGV limit (0.03mg/l) for orthophosphate as PO_4 at MW3B during the October 2023 monitoring event (0.1mg/l). Additionally, a single detection below the lower GAC and DWAC limit (6.5 units) for pH at PW1 occurred during the October 2023 monitoring event (6.19 units). In terms of historic data, there was one exceedance of the GAC limit (0.065mg/l) for ammoniacal nitrogen as N at PW1 during the June 2021 monitoring event (0.1mg/l).

However, reported concentrations for the remaining analytical parameters (pH, nitrate as NO_3, sulphate, chloride, orthophosphate as PO_4, and ammonia as N/ammonium as NH_4) remained below groundwater and drinking water limits.

8.3.2 Hydrology

8.3.2.1 Surface Waterbodies

The Site is within the Lower Shannon 25A WFD Catchment and the Brosna_SC_040 Sub-catchment. The majority of the site lies within the Clodagh (Tullamore)_050 river sub-basin, with a small portion of the southeastern and southwestern areas within the Derrycooly Stream_010 river sub-basin [85].

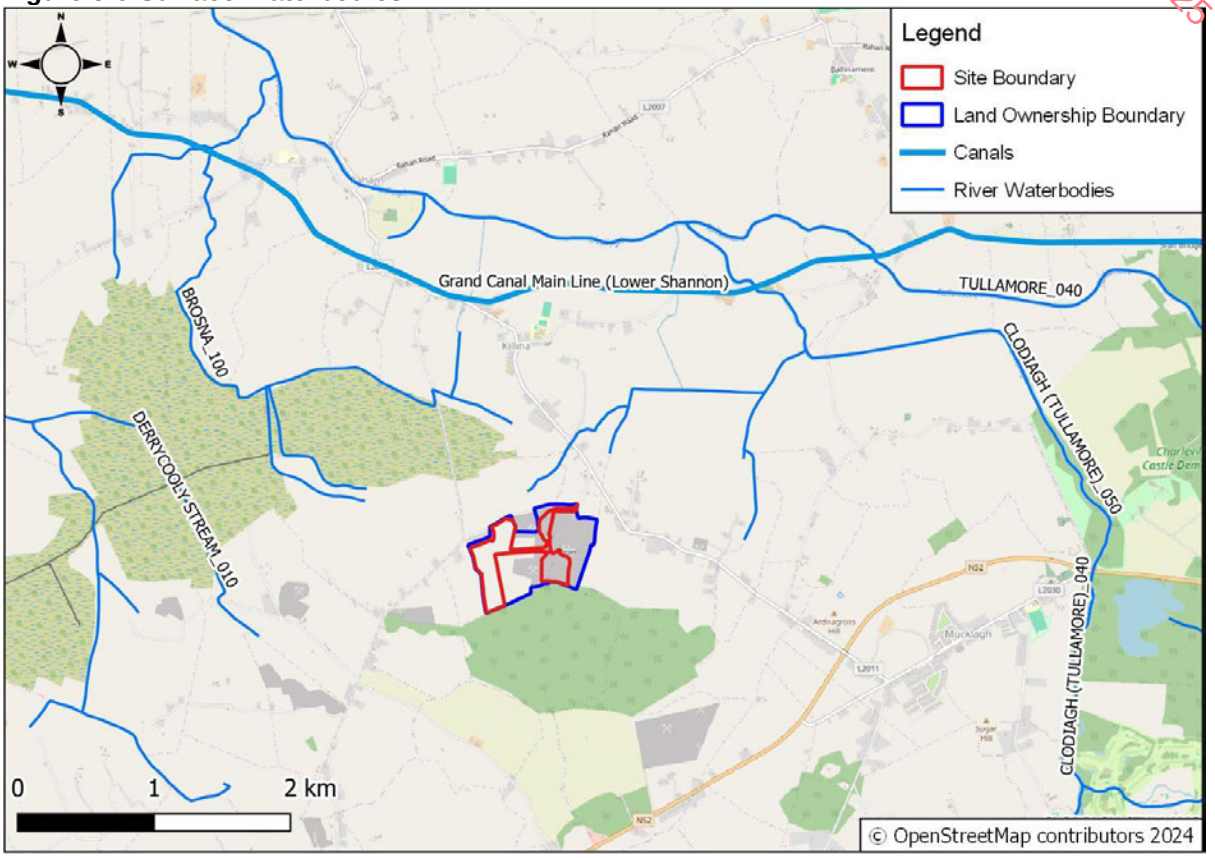
The nearest mapped surface waterbody to the Proposed Development is the Killina Stream, which is located ca. 0.24km northeast of the Proposed Development and forms part of the Clodiagh (Tullamore)_050 river waterbody. This river waterbody flows in a general northeast direction before crossing the Grand Canal canal system approximately 2.1km north of the northern Site boundary and then flows westward. The Clodiagh (Tullamore)_050 river waterbody merges into to the Brosna_100 river waterbody approximately 6km downstream of its closest point to the Proposed Development, with multiple tributaries including the Tullamore_040 river waterbody merging with it beforehand.

The Clodiagh (Tullamore)_050 waterbody is considered to have a moderate status based on WFD screenings between 2016 - 2021 [62], with the waterbody failed to achieve good status in each chemical screening due to the presence of Polycyclic aromatic hydrocarbons (PAHs)

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[85]. Additionally, the river waterbody is currently considered "at risk" of failing to meet its environmental objectives i.e. to achieve and maintain at least 'good' status before 2027. The Clodiagh (Tullamore)_050 river waterbody is hydrologically connected to the River Shannon Callows SAC and the Middle Shannon Callows SAC, however this connection is over 30km downstream of the closest point of this waterbody to the Site. See Figure 8-6 below.

Figure 8-6:Surface Waterbodies



8.3.2.2 Flood Risk Assessment ('FRA')

The OPW's Catchment Flood Risk Assessment and Management ('CFRAM') maps [86] Flood Hazard Mapping, the GSI Groundwater Flood Mapping, and historical maps (i.e. 6" and 25" base maps) were reviewed to assess flood risk in the area of the Proposed Development.

CFRAM mapping has been completed for the Proposed Development and shows that the Proposed Development is not located within any potential fluvial or pluvial flood areas, with land from the northwest to northeast of the Proposed Development benefiting from arterial drainage schemes. CFRAM mapping indicates that the rivers north of the Proposed Development that surround the Grand Canal are prone to flooding; however, the closest modelled flood extent is located approximately 1.5km northeast of the Site.

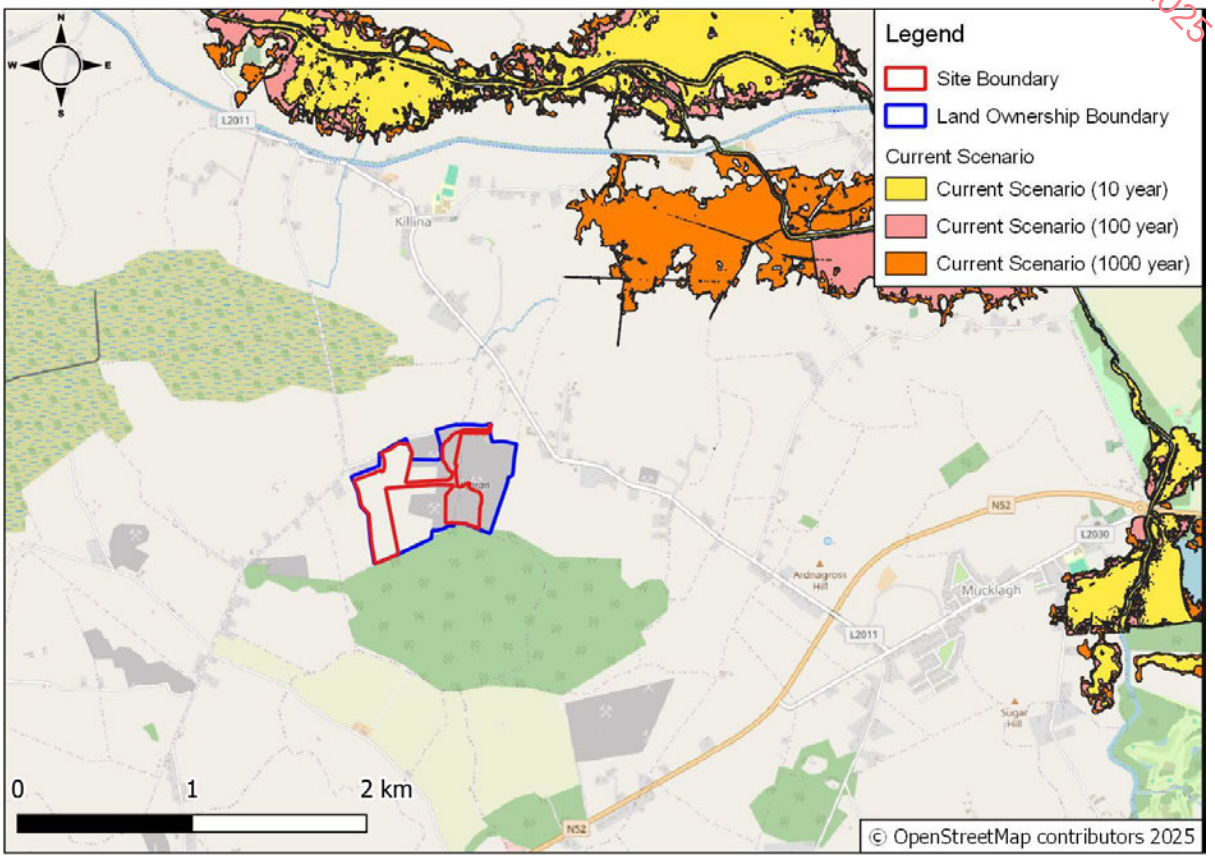
Additionally, GSI groundwater flood probability mapping indicates regions of potential groundwater flooding south of the Proposed Development, the closest of which is approximately 1.5km south.

No flood events or recurring flood incidents were identified at the Site, however within a 2.5km radius, one single flood event occurred approximately 1.5km north of the Site in 2008 and one recurring flood event is noted approximately 1.3km north of the Site (see Appendix 8-3 for a copy of the Past Flood Event Local Area Summary Report for the Site). The 2008 flood event was noted to have occurred after a period of prolonged and heavy rainfall, with the recurring flood event identified as being associated with annual heavy rains on low lying land.

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In addition to the OPW historic flood events, GSI 2015/2016 surface water flood extents are identified to the north (nearest point approximately 1.9km) and the south (nearest point approximately 0.6km) of the Site. Historical groundwater flooding was identified by GSI south (nearest point approximately 0.7km) of the Site.

Figure 8-7: Flood Hazard Mapping



8.3.3 Wastewater

Waste generation is limited to an onsite toilet and is retained within an underground tank and periodically emptied by a suitably authorised contractor. No wastewater discharges occur or are proposed to ground or surface waters.

8.4 Characteristics & Potential Effects of the Proposed Development

The removal of overburden / soils during the Proposed Development to extract aggregate will result in a smaller thickness of soils above the monitored groundwater level in the sand and gravel deposits. This, in turn, will increase the risk of contamination to the groundwater within the sand and gravel deposits and potentially to the underlying bedrock aquifer as well.

The Proposed Development lies within the inner source protection area of a public water scheme associated with the Agall Spring. Although agricultural pressures and septic tanks are identified as the principal hazard to the water quality of the spring, the use of onsite machinery within the quarry is also raised as a hazard, primarily from the fuels and hydrocarbon oils utilised by machinery during quarry operations. Currently, the GSI classifies the Site as having high vulnerability; however, there will be extraction, leaving up to 3m thickness of subsoils above the water table. As such, it is likely that the vulnerability will increase to the extreme, giving the removal of the overburden. This removal of parts of the overburden, combined with a spill or release of hydrocarbons onsite, could potentially result in a slight negative effect on the quality of local groundwater and the public water scheme. The risk for such an event to

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occur would remain until the completion of restoration / infilling onsite. As such, mitigation will be required to reduce the risk of such a spill or release from occurring to an acceptable level. Additionally, mitigation will be implemented to provide measures that will limit the magnitudes of any impacts should such a spill or release occur.

Existing groundwater quality measurements at the Site show that groundwater quality has remained compliant within groundwater and drinking water regulatory limits. Operational activities at the Proposed Development are not predicted to differ significantly from existing activities at the Agall Quarry. This application functions as a continuation and extension of the quarry into new lands as well as slightly furthering extraction in the existing pit from a depth of 65mAOD to 63mAOD. Based on existing monitoring, these new levels remain above groundwater levels and as such, the exposure of groundwater is not predicted to occur onsite. Additionally, the overall groundwater body underlying the Site has maintained a “Good” quality status under the Water Framework Directive and is considered “not at risk” of losing its good quality status in the next directive cycle. As such, operational activities such as the extraction of aggregate are predicted to result in imperceptible, negative impacts on groundwater quality.

No impacts are identified for surface water in the vicinity of the Site.

8.5 Proposed Mitigation Measures

Mitigation measures as proposed in section 7.5 of Chapter 7 (Land, Soils and Geology) are also applicable to the protection of water.

8.6 Cumulative and In-Combination Effects

There are no notable third-party quarries or extraction projects in the immediate locality. The nearest is the development by Kilsaran, located west of Blackwood. A review of the local environment and plans does not show any notable developments likely to have a cumulative effect on the receiving environment with this Proposed Development.

The existing restored site remains under the Applicant's land holding, and this has been considered. Therefore, any cumulative impacts from the Proposed Development are expected to be negative, but imperceptible and not significant.

8.7 Interactions with other Environmental Attributes

Water (Hydrogeology and Hydrology) interacts with other environmental attributes as follows:

- Chapter 5 (Population and Human Health). Potential impacts on human health due to groundwater contamination are unlikely to occur following implementation of mitigation;
- Chapter 6 (Biodiversity). Potential impacts on hydrology can also impact on ecological conditions and ecologically designated sites. The impacts on biodiversity are addressed in Chapter 6; and,
- Chapter 7 (Land and Soils). Impact on soils / bedrock can result in related impacts on surface water and groundwater. These impacts on the bedrock are discussed in Chapter 7.

8.8 Indirect Effects

The Clodiagh (Tullamore)_050 surface waterbody (the closest surface waterbody to the Proposed Development) overlaps with the karstic groundwater springs shown in Figure 8-3. As such, there is a potential connection between the surface waterbody and local groundwater through these springs. Therefore, any negative effects on local groundwater quality from the Proposed Development could have an indirect negative effect on this surface waterbody.

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Appropriate mitigation to control and limit potential negative effects on the groundwater quality (as discussed in Section 8.5) will control and prevent any potential indirect negative effects.

8.9 Residual Effect

Following the restoration phase of the Proposed Development, soils within stockpiles and berms will have been redistributed across the Site to facilitate the planting scheduled in Appendix 6-1. This will reduce the exposure of the underlying bedrock and decrease the operational groundwater vulnerability from extreme back to the current high status. As such, the operational impacts in relation to groundwater vulnerability should be considered a short-term to medium-term significant impact that, following restoration, will decrease to a long-term imperceptible negative impact. Additionally, the hazard presented by onsite hydrocarbons will be removed following the removal of onsite plant and vehicles.

8.10 Monitoring

Continuation of the current biannual groundwater monitoring programme is planned to ensure water quality is protected during the lifetime of the Quarry. The monitoring programme will also include an annual topographic survey and quarterly groundwater level monitoring at all well locations. As per current Planning Application there will be a 3m buffer between the high-water table and extraction levels.

8.11 Reinstatement

Restoration of the Site is presented in Section 3.4.3 above. No likely or significant effects in relation to water will arise from the proposed restoration to mixed biodiversity and low intensity farming use.

8.12 Difficulties Encountered

No difficulties were encountered in undertaking this assessment.

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9 ACOUSTICS (NOISE & VIBRATION)

9.1 Introduction

This chapter of the EIAR provides a description and assessment of the likely impact of the Proposed Development on noise and vibration in the receiving environment.

9.2 Methodology

A glossary of the acoustic terms is presented in Appendix 9-1.

The following acoustic standards and guidance documents were utilised to characterise the baseline conditions and in the assessment of potential acoustic impacts:

- Department of Environment Heritage and Local Government ('DEHLG') – Quarries and Ancillary Activities: Guidelines for Planning Authorities, 2004 [12];
- EPA 2006, Environmental Management Guidelines, Environmental Management in the Extractive Industry (Non-Scheduled Minerals), 2006 [17];
- BS4142:2014 Methods for rating and assessing industrial and commercial sound, 2014 [91] ;
- BS5228-1:2009, Code of practice for noise and vibration control on construction and open sites, Noise [92];
- S.I. No. 140/2006 Environmental Noise Regulations 2006 [93];
- S.I. No. 549/2018 European Communities (Environmental Noise) Regulations 2018 [94]
- Acoustics and Noise Consultants ('ANC') Guidelines (Greenbook) Environmental noise measurement guide 2013 [95];
- IEMA Guidelines for environmental noise impact assessment, 2014 [96];
- ISO 1996-1:2016 Acoustics - Description, measurements and assessment of environmental noise - Part 1: Basic quantities and assessment procedures 2003 [97];
- ISO 1996-2:2017 Acoustics - Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels [98];
- NRA Guidelines for the treatment of noise and vibration in National Road Schemes, 2004 [99];
- NRA Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes, March 2014 [100];
- Smith, Peterson and Owens Acoustics and Noise Control, 1996 [101];
- World Health Organization's ('WHO') Night noise guidelines for Europe [102];
- World Health Organization's ('WHO') Guidelines for Community Noise [103];
- Aggregate Levy Sustainability Fund ('ALSF'): Sustainable Aggregates Theme 1 - Reducing the environmental effect of aggregate quarrying: Dust, noise and vibration, year unknown [104];
- Irish Concrete Federation ('ICF') 2005, Environmental Code, Second Edition, October 2005 [105].
- Offaly County Development Plan 2021 – 2027 [26]; and
- Offaly Noise Action Plan 2024-2028 [106].

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9.2.1 Policy and Legislative Context

The following policies and objectives have been identified in relation to the Proposed Development:

9.2.1.1 Offaly County Council Development Plan (2021-2027)

Under the Offaly County Council Development Plan (2021-2027) [26], the following has been stated in relation to noise:

REDP-14:

> *'It is Council policy to favourably consider proposals for the expansion of existing industrial or new business enterprise in the open countryside where the proposal;*
> *…*
> *(C) has regard to and complies with the guidelines/standards including traffic, noise and environmental considerations.'*

ENVP-20:

> *'It is Council policy to promote the implementation of the Environmental Noise Directive and associated regulations through the Offaly County Council Noise Action Plan 2018-2023 and any subsequent Plan.'*

ENVP-21:

> *'It is Council policy to propose the pro-active management of noise where it is likely to have significant adverse impacts on health and the quality of life. Planning permission will not normally be granted for new uses/development or extensions of existing uses that produce significant and unacceptable levels of noise and/or vibration at site boundaries or within noise sensitive areas, especially residential areas.'*

ENVP-22:

> *'It is Council policy that noise sensitive development proposals located within proximity to a noise source, such as an existing or proposed national road, should include noise attenuation measures.'*

9.2.1.2 Offaly County Council Noise Action Plan (2024-2028)

Offaly County Council has prepared a Noise Action Plan (2024-2028) [106] in accordance with the requirement of the Environmental Noise Regulations 2006 [93]. The purpose of the Noise Action Plan is to avoid, prevent and reduce, on a prioritised basis, the harmful effects, including annoyance due to long-term exposure to environmental noise. The Noise Action Plan does not state any limits or recommendations in relation to the Proposed Development.

<u>Construction Phase</u>

The Construction Phase, as presented in chapter 3.4.1 above will be assessed utilising the British Standard BS5228-1 [92], which is designed for the assessment of noise arising from construction and open sites.

The standards identify a methodology, 'the ABC' method, for assigning construction noise limits at Noise Sensitive Receptors ('NSRs') based upon the existing ambient noise levels. This method is detailed in Table 9-1 below.

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Table 9-1: BS5228- ABC Method for Assessing Construction Noise Impacts

Assessment category and threshold value period (L_{Aeq})	Threshold value, in decibels (dB) ($L_{Aeq,T}$)		
	Category A[A)]	Category B[B)]	Category C[C)]
Night-time (23:00-07:00)	45	50	55
Evening and weekends [D)]	55	60	65
Daytime (07:00-19:00) and Saturday (07:00-13:00)	65	70	75

Note 1 A potentially significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.

Note 2 If the ambient noise level exceeds the Category C threshold values given in the table (i.e., the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3dB due to site noise.

Note 3 Applied to all residential receptors only.

A) Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.

B) Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as Category A values.

C) Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than Category A values.

19:00-23:00 weekdays, 13:00-23:00 Saturday and 07:00-23:00 Sunday.

This method requires an understanding of the receiving environment at NSRs to allocate suitable construction noise limits. The construction phase will be limited to daytime hours only.

9.2.2 Operational Site-Specific Noise

As noted above in Chapter 3.4.2, the operational phase will be the primary activity over time on the Site and relates to the extraction and primary processing of extracted aggregate.

Under Condition 11 of An Bord Pleanála's Order (ABP reference 19.QD.0008), the following was stated:

> *'The noise level shall not exceed 55dB(A) (corrected by penalty for tonal and impulsive components) at dwellings in the vicinity. Procedures for determining compliance with this limit, including frequency of reporting, shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development.'*

Condition 11 of the ABP Order utilises the typical daytime noise limits as per the EPAs Environmental Management in the Extractive Industry (Non-Scheduled Minerals) [17] which is as follows:

- Daytime (08:00 to 20:00hrs) – $L_{Ar,1hour}$ 55dB(A).

Under the requirements of the Environmental Noise Regulations 2018 [107] competent authorities have the remit to classify 'Quiet Areas'. The EPA have developed a Quiet Area Screening methodology which has been prepared by MOR Environmental for this Site, refer to Table 9-3 below. A modification to the setting of limits at baseline monitoring methods are triggered in 'Quiet Areas'.

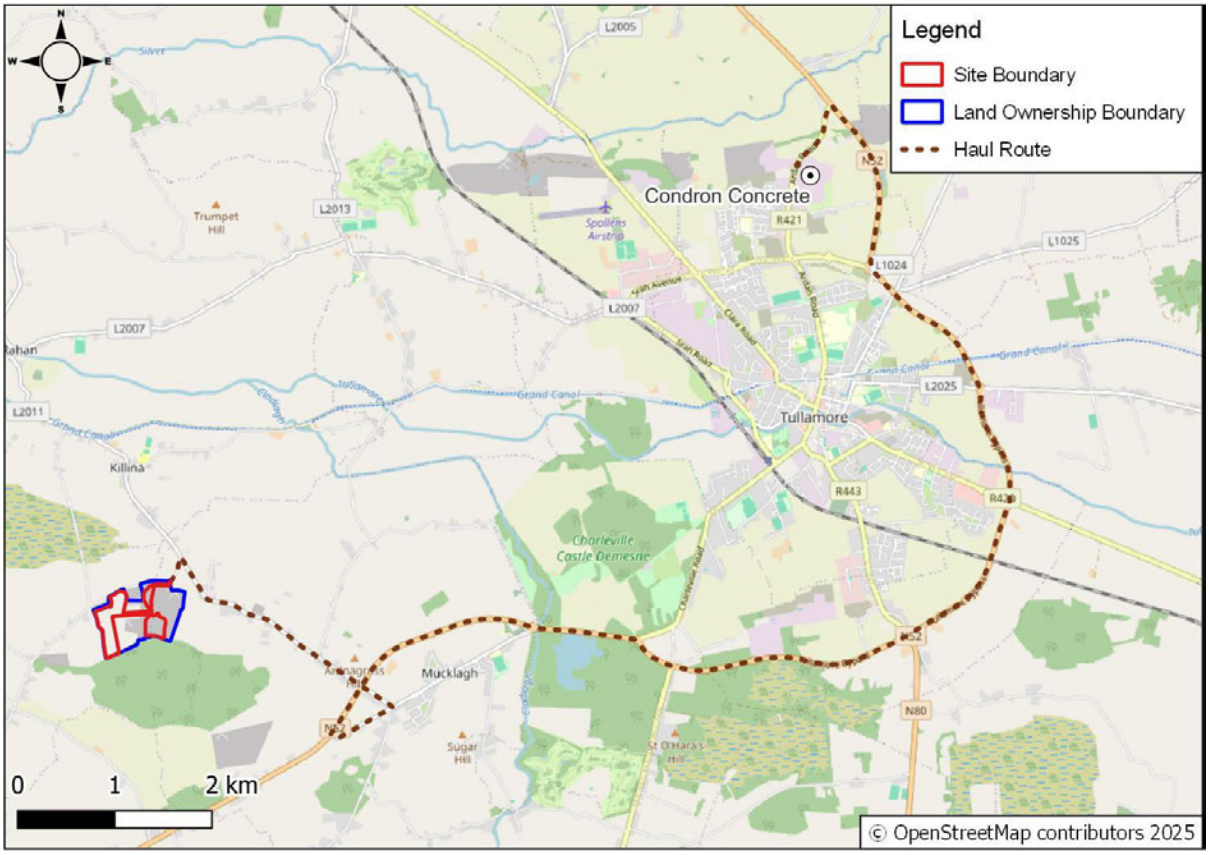
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9.2.3 Site Associated Road Traffic

Vehicles accessing and egressing the Site will continue to utilise the L20113 local road located immediately to the north. Vehicles leaving the Site will then travel southeast on the L2011 towards Mucklagh Village, located ca. 3km to the east of the Site. Vehicles will then access the N52. Further details on haulage route are outlined in Chapter 3.4.2 above.

Routes along the N52 (such as the Mucklagh to Blueball and Tullamore By-Pass) have been included in the Offaly County Council Noise Action Planning Area. The point in which the vehicles will access the N52 at Mucklagh Village was included in the Round 4 of the Strategic Noise Mapping under the 2018 Environmental Regulations [107]. The local L2011 road, which is the main access route for vehicles associated with the Proposed Development, did not constitute a major road under the regulations.

Figure 9-1: Haul Route



9.2.4 Noise Modelling

Noise modelling was carried out using SoftNoise Predictor Version 2024 software. The Predictor-LimA Software Suite is the complete solution for all environmental noise projects. Noise predictor for industry, roads, railways, aircraft and wind turbines are all supported. The software is used by acoustic consultants, environmental authorities, heavy industries and educational institutes.

The noise model only assesses site-specific emissions – i.e., it does not incorporate existing ambient sources such as road traffic. Source sound values were populated utilising the in-house MOR Environmental source library, consisting of measured sources from similar facilities and the SourceDB provided with the Predictor software package.

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9.2.4.1 Model Calculations

The Noise Model calculation formula is based on ISO 9613 – 1 & 2. Utilising this standard Predictor calculates the noise level as follows:

$$L|t.per = L_{dW} - C_{m,per} - C_{t,per}$$

Where

$$L_{dw} = L_W + D_c - A$$

$L_{lt,per}$	Long-term average octave (or 1/3-octave) SPL during the evaluation period in dB
L_{dw}	Equivalent continuous downwind octave (or 1/3-octave) SPL in dB
$C_{m,per}$	Meteorological correction during the evaluation period in dB
$C_{t,per}$	Correction for the active time of the source during the evaluation period in dB
L_W	Sound power level in dB(A) per octave (or 1/3-octave), re 1 pW
D_c	Directivity correction in dB
A	Attenuation (octave-band) in dB per octave (or 1/3-octave)

The attenuation A is calculated as follows:

$$A = A_{div} + A_{atm} + A_{gr} + A_{bar} + A_{fol} + A_{site} + A_{hous}$$

A_{div}	Geometrical divergence in dB
A_{atm}	Atmospheric absorption in dB/octave (or 1/3-octave)
A_{gr}	Ground effect in dB/octave (or 1/3-octave)
A_{bar}	Screening in dB/octave (or 1/3-octave)
A_{fol}	Attenuation due to foliage in dB/octave (or 1/3-octave)
A_{site}	Attenuation due to installations on an industrial site in dB/octave (or 1/3-octave)
A_{hous}	Attenuation due to housing in dB

The modelling inputs and outputs are presented in Appendix 9-2.

9.2.5 Noise Monitoring

Four periods of compliance daytime noise monitoring were carried out at the Agall Quarry complex between 2021 and 2024 inclusive. These occurred on:

- 4th October 2021;
- 15th September 2022;

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- 9th February 2023; and,
- 29th August and 27th September 2024.

The acoustic standards and guidance documents utilised to evaluate the baseline conditions are listed in section 9.2.1 above of this EIAR. All compliance surveys occurred during permitted quarrying works within the Site.

9.2.5.1 Measurements

Measurements during monitoring periods were conducted at four locations (NM1-NM4), as shown in Figure 9-2 below, to characterise ambient noise levels associated with the current operation of the Agall Quarry complex. The four locations were attended measurements and were completed for daytime only, to ensure compliance with the above mentioned ABP condition.

At all locations, the Sound Level Meter ('SLM') was positioned to maximise distance from reflective surfaces and mounted on a tripod to a maximum height of 1.2 to 1.5 metres over ground level.

9.2.5.2 Frequency Analysis

Real time 1/3 octave band frequency analysis was carried out at all monitoring location during the day (between 08:00am to 08:00pm). This data was used to evaluate objective tonality arising at each monitoring location.

Condition 11 states the noise level be '*corrected by penalty for tonal and impulsive components'*, which is as per the EPAs Guidance Note [108], which specifies that during the daytime period, rigorous efforts should be made to avoid clearly audible tones and impulsive noises at all NSRs and that a penalty of +5dB for tonal and/or impulsive elements is to be applied to the measured $L_{Aeq,\,T}$ values to determine the appropriate rating level ($L_{Ar,\,T}$).

Tones were objectively assessed in accordance with ISO 1996-2:2017 [98], which requires that for a tone to be identified as present, the time-average sound pressure level in the one-third octave band of interest must exceed the time-average sound pressure levels of both adjacent one-third octave bands by some constant level difference.

The standard gives the level differences as follows:

- 15dB in the low-frequency one-third-octave bands (25Hz to 125Hz);
- 8dB in the middle frequency bands (160Hz to 400Hz); and,
- 5dB in high-frequency bands (500Hz t0 10,000Hz).

In addition, the onsite acoustician noted subject tonality or defining characteristics arising from site-specific noise emission sources.

9.2.5.3 Equipment

All onsite monitoring was conducted using a Type 1 SLM, laboratory calibrated within the last 24 months, and field calibrated using a Class 1 Calibrator, which was laboratory calibrated within the last 12 months.

Wind speed and temperature were monitored during the survey using a handheld anemometer (Kestrel 2500 Weather Meter), weather notes were recorded within the acoustician field notes at the start and end of the monitoring periods.

Laboratory calibration certificates are available upon request.

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9.2.5.4 Weather Conditions

The prevailing weather conditions at the time of the survey were noted and recorded in the survey reports.

During the first (October 2021), the second (September 2022) and the third (February 2023) monitoring periods, conditions were dry and breezy with a few sunny spells. Onsite weather observations were supplemented with data from the nearest Met Eireann meteorological station, Mullingar, which is located ca. 32km to the northeast of the Proposed Development. Table 9-2 below details the weather observations for both monitoring periods.

Table 9-2: Summary of Weather Conditions from monitoring periods

Date	Rainfall	Temperature (Max °C)	Temperature (Min, °C)	Mean Wind Speed (m/s)
04/10/2021	0.0	14.6	9.2	2.9
15/09/2022	0.0	15.9	9.9	2.5
09/02/2023	0.0	8.6	-1.6	4.0
29/08/2024	0.1	19.5	7.7	2.5
27/09/2024	0.7	11.9	5.4	3.4

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9.3 Receiving Environment

A review of the locality was conducted using OSI online mapping, Google and Bing Aerial Photography. In addition, a 25cm BlueSky Aerial photography was purchased, in addition 2m Contours.

9.3.1 Noise Sensitive Receptors

Based on the desk-based research of the area and surrounding landscape, Noise Sensitive Receptors ('NSRs') were identified, as shown in Figure 9-2 below. Table 9-3 shows a description of the NSRs.

Figure 9-2: Identification of Noise Sensitive Receptors ('NSRs')



Table 9-3: Description of Noise Sensitive Receptors (NSRs)

NSR ID	Easting (ITM)	Northing (ITM)	Description	Distance to the Embankment (m)
NSR01	626558	723117	Northwest of the Site boundary	ca.65m
NSR02	626528	723104	Northwest of the Site boundary	ca.65m
NSR03_1	626498	723096	Northwest of the Site boundary	ca.60m
NSR03_2	626489	723078	Secondary building, south of NSR03_1 on same site.	ca.55m
NSR04	626469	723089	Northwest of the Site boundary	ca.68m
NSR05	626426	723082	Northwest of the Site boundary	ca.79m

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NSR ID	Easting (ITM)	Northing (ITM)	Description	Distance to the Embankment (m)
NSR06*	626351	722958	West of the Site boundary	ca.91m
NSR07*	626184	722910	West of the Site boundary	ca.252m
NSR08*	626106	722757	West of the Site boundary	ca.370m
NSR09*	627482	723230	East of the Site boundary	ca.147m
NSR10*	627344	723391	Northeast of the Site boundary	ca.286m

**Distance calculated to the Site Boundary, where plant will be located, as this is closer than the proposed embankment.*

The Site is an agricultural area. There are several NSR's identified within the study area.

9.3.2 Noise Compliance Monitoring

As previously discussed, noise compliance monitoring was completed at four locations over a three-year period. As operations only occur during daytime hours, monitoring was only conducted during the daytime. Table 9-4 below details the results of these noise monitoring periods at the four mentioned locations (NM1- NM4). The results display both the $L_{Aeq,T}$ and L_{A90} background levels associated with the monitoring periods. Monitoring was conducted for 60 minutes. Figure 9-3 below shows the noise monitoring locations.

Figure 9-3: Noise Monitoring Locations



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Table 9-4: Results for Noise Compliance Monitoring for Daytime Period

Survey Date	Description	NM1	NM2	NM3	NM4
		East of the Existing Quarry	South of the existing Quarry	Northwest of the existing Quarry	North of the existing Quarry
Oct – 2021	$L_{Aeq, T}$	41	46	47	55
	$L_{A90, T}$	32	43	42	32
Sep – 2022	$L_{Aeq, T}$	37	47	38	51
	$L_{Aeq, T}$	32	43	31	27
Feb – 2023	$L_{Aeq, T}$	39	40	44	48
	$L_{Aeq, T}$	33	36	34	33
Aug & Sep – 2024	$L_{Aeq, T}$	41	53	45	52
	$L_{A90, T}$	36	47	37	36
Average	$L_{Aeq, T}$	**40**	**47**	**44**	**52**
	$L_{A90, T}$	**33**	**42**	**36**	**32**

Based on the above data, the noise monitoring at the designated locations around the proximity of the operating Agall Quarry showed average background levels ($L_{A90,60min}$) ranging between 31dB to 47dB. The lowest average background values were shown at the east and northern boundaries of the Agall Quarry (33dB and 34dB, NM1 and NM4 respectively). The highest average background values were shown at southern and western boundary of the Agall Quarry (42dB and 32dB at NM2 and NM3 respectively).

Average L_{Aeq} values from the four years of monitoring ranged between 40dB and 52dB. NM1 shows lower L_{Aeq} values compared to all other noise monitoring locations.

9.3.3 Screening for Quiet Area

A Quiet Area is defined by the Environmental Noise Directive and subsequent S.I Noise Regulations as an area with low intrusion of human activities. NG4 identifies a specific screening mechanism for Quiet Areas [108], and the screening process is identified in Table 9-5 below.

Table 9-5: Screening for Quiet Area

Parameter	Quiet Noise Criteria Distance	Criteria Met	Note
Distance to urban area with population >1,000 persons.	>3km	Yes	Town of Mucklagh (population ca. 900 people) located ca, 3km to the southeast of the Proposed Development
Distance to urban area with population >5,000 persons.	>10km	No	

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Parameter	Quiet Noise Criteria Distance	Criteria Met	Note
Distance to urban area with population >10,000 persons.	>15km	No	Urban Area of Tullamore (population ca. 15,000 people) located ca. 7km east of the Proposed Development
Distance to local industry (small or individual activities).	>3km	No	Other local extractive sites located ca. 1.1km to the southwest and ca. 1.77km to the southeast
Distance to major industry centre.	>10km	No	IDA Business and Technology Park is located ca. 6.5km to the northeast of the Proposed Development
Distance to National Primary Route.	>5km	No	N52 national road is located ca. 300m to the south of the Proposed Development
Distance to Motorway or Dual Carriageway.	>7.5km	Yes	There are no dual carriage ways or motorways within 7.5km of the Proposed Development. Both the N52 and N80 national roads are single carriage roads
Site locality is 'Quiet Area'		**No**	**Proximity to N52 national road, IDA Business and Technology Park and town centre of Tullamore)**

The Site is not a 'Quiet Area'; however, a full assessment is completed below to assess the likely effect arising from the Proposed Development.

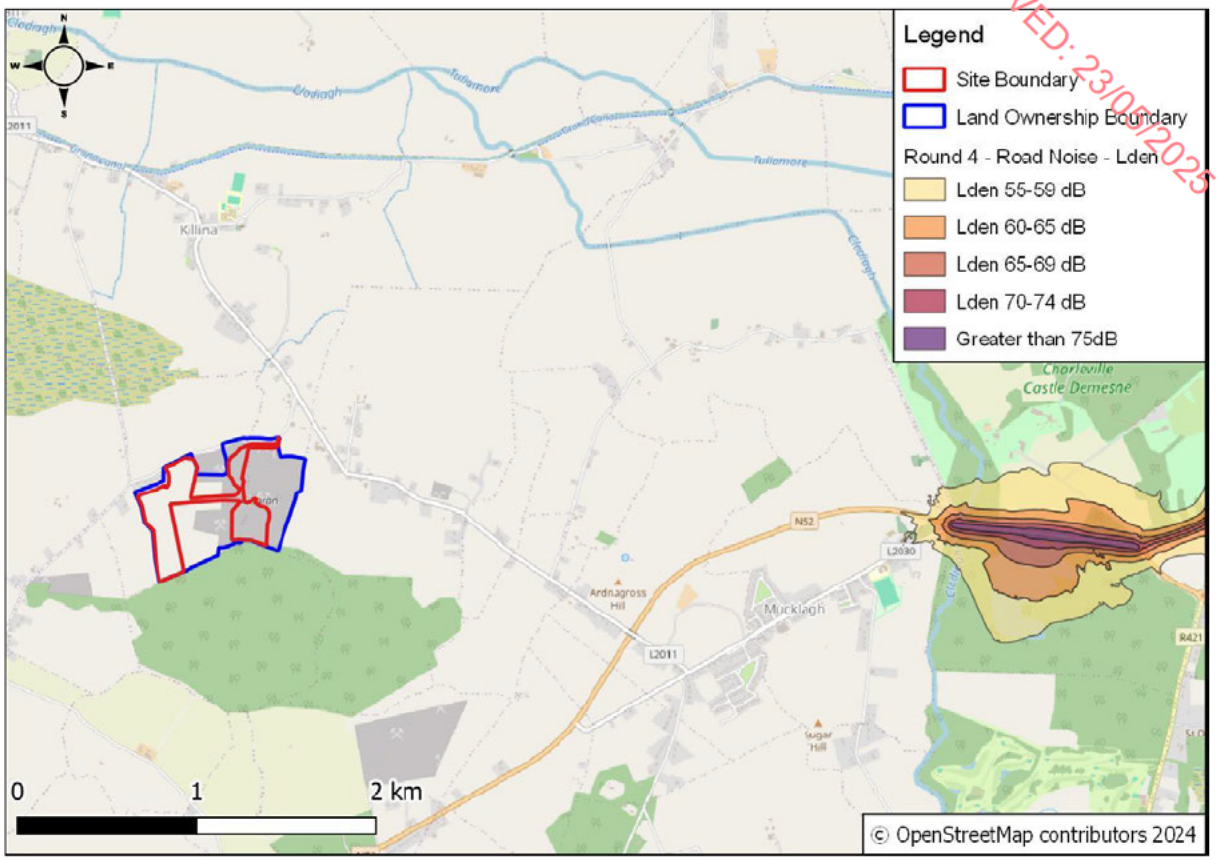
9.3.4 Strategic Noise Mapping

As discussed in section 9.2.5 above, part of the N52 national road is included in the Strategic Noise Mapping (Mucklagh to Bluebell and Tullamore Bypass). This section of the N52 is located ca. 3.5km to the east of the Proposed Development.

Figure 9-4 below displays the location of the N52 road that was qualified under the Strategic Noise Mapping under the Environmental Noise Directive.

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Figure 9-4: N52 Road Noise – Strategic Noise Mapping ($L_{den, 24hour}$)



As none of the sensitive receptors are within the noise contours, further detailed assessment on the road noise associated with the N52 was not required.

9.3.5 Ambient Noise Characterisation

The results of the daytime noise monitoring indicate the main sources in the receiving environment are as followed:

- Environmental noises (e.g. bird songs);
- Local traffic on nearby L2011 road;
- Activity associated with the operation of the Agall Quarry (materials handling); and,
- HGV movements onsite.

Generally, the higher levels of acoustic noise were monitored at NM4 located near the access track for HGV vehicles.

Utilising characteristics noted during the ambient survey monitoring, the identified NSRs are linked to representative ambient monitoring locations in Table 9-6 below.

Table 9-6: NSRs with representative ambient monitoring locations

NSR ID	Representative NM ID	Orientation to Site
NSR01	NM3	Northwest of the Site boundary
NSR02	NM3	Northwest of the Site boundary
NSR03-1	NM3	Northwest of the Site boundary

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NSR ID	Representative NM ID	Orientation to Site
NSR03-2	NM3	Northwest of the Site boundary
NSR04	NM3	Northwest of the Site boundary
NSR05	NM3	Northwest of the Site boundary
NSR06	NM3	West of the Site boundary
NSR07	NM3	West of the Site boundary
NSR08	NM3	West of the Site boundary
NSR09	NM1	East of the Site boundary
NSR10	NM4	Northeast of the Site boundary

9.4 Characteristics and Potential Effects of the Proposed Development

The potential for noise arising from the Site will occur in three distinct phases:

- Construction Phase;
- Operational Phase; and,
- Site Restoration Phase.

9.4.1 Construction Phase Noise

Noise during the Construction Phase will consist mainly of topsoil and overburden removal and construction of soil embankments. The work will require the use of a bulldozer or similar unit along with an excavator unit for the creation of the embankment.

Table 9-7 below gives typical sound pressure levels ($L_{Aeq,T}$) for typical equipment employed for such works.

Table 9-7: Typical equipment employed for Construction Phase

Plant	Description	Reference (BS5228-1)	Sound Pressure L_{Aeq} at 10m
Bulldozer	Clearing of soils	C.2.01	75
Excavator	Creation of embankments	C.2.02	77
Combined Sound Pressure Level (at 10m)			79dBA

Activities that would have had a negligible sound such as surveying, planting of embankments etc. have been omitted. Similarly, activities that are characteristic of the agricultural area including fencing and hedgerow maintenance have not been assessed.

Table 9-8 below details the potential historical construction noise impact at NSRs, which utilised the BS5228 ABC Method for peak noise, associated with the Site Preparation Phase of the Development (utilising combined sound power of 79dB at 10m).

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The predicted historical levels at the NSRs facades have been compared directly to noise construction limits. Utilising the measured ambient sound levels, the lowest construction limit has been selected within the ABC method.

Table 9-8: Site Preparation Noise Assessment (BS5228 ABC Method)

NSR	Distance to Main Construction Work (m)	Predicted Site Specific Sound Pressure Level at NSR Facade $L_{Aeq,T}$ dB	ABC Threshold Compliant for main Site	Compliant with BS5228-1
NSR01	65	63	65	Compliant
NSR02	65	63	65	Compliant
NSR03-1	60	64	65	Compliant
NSR03-2	55	64	65	Compliant
NSR04	68	62	65	Compliant
NSR05	79	61	65	Compliant
NSR06	91	60	65	Compliant
NSR07	252	51	65	Compliant
NSR08	370	48	65	Compliant
NSR09	147	56	65	Compliant
NSR10	286	50	65	Compliant

All NSRs identified will experience less than a $L_{Aeq,1hr}$ of 65dB, due to the distances between NSRs and the proposed construction works. These values represent the worst case when plant was operational on the closest boundary to each of the NSRs'.

The primary construction activities, will be short duration, occurring over a discrete period within ca. 6 months. As such, construction stage noise without mitigation, is deemed a negative, brief to temporary, localised not significant effect without mitigation.

This assessment assumes all on-site plant is operating at the closest point of the boundary to these receptors for a constant duration of 1 hour. These values are below the typical construction noise nuisance limit of $L_{Aeq,1hr}$ 65dB.

9.4.2 Construction Phase Vibration

Vibration from the Construction Phase of works is imperceptible, based on the works required. No piling or blasting is required as part of this Proposed Development.

9.4.3 Operational Phase Noise

The Operational Phase will comprise processing and primary screening, along with stockpiling and utilising mobile plant.

Table 9-9 below presents typical sound pressure ($L_{Aeq,T}$) values for plant utilised within the Site as part of the Operational Phase of the Proposed Development.

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Table 9-9: Operation Sound Pressure levels

Plant	Description	Reference [109]	Sound Pressure L_{Aeq} at 10m
Excavator	Excavator	C.2.02	77
Loading shovel	Wheeled loader	C.9.07	88
Lorry / HGV	4 Axle truck movement onsite	C.2.34	80
Screening Plant	Screening plant	C.10.14	81

As part of this assessment, a noise model using specialist acoustic software Predictor V.2024, has been prepared to assess predicted noise emissions at the Site during the operational phase. The site-specific emissions for daytime from the Proposed Development, for the Site operational activity are outlined in Table 9-10 below and displayed in Figure 9-5 below.

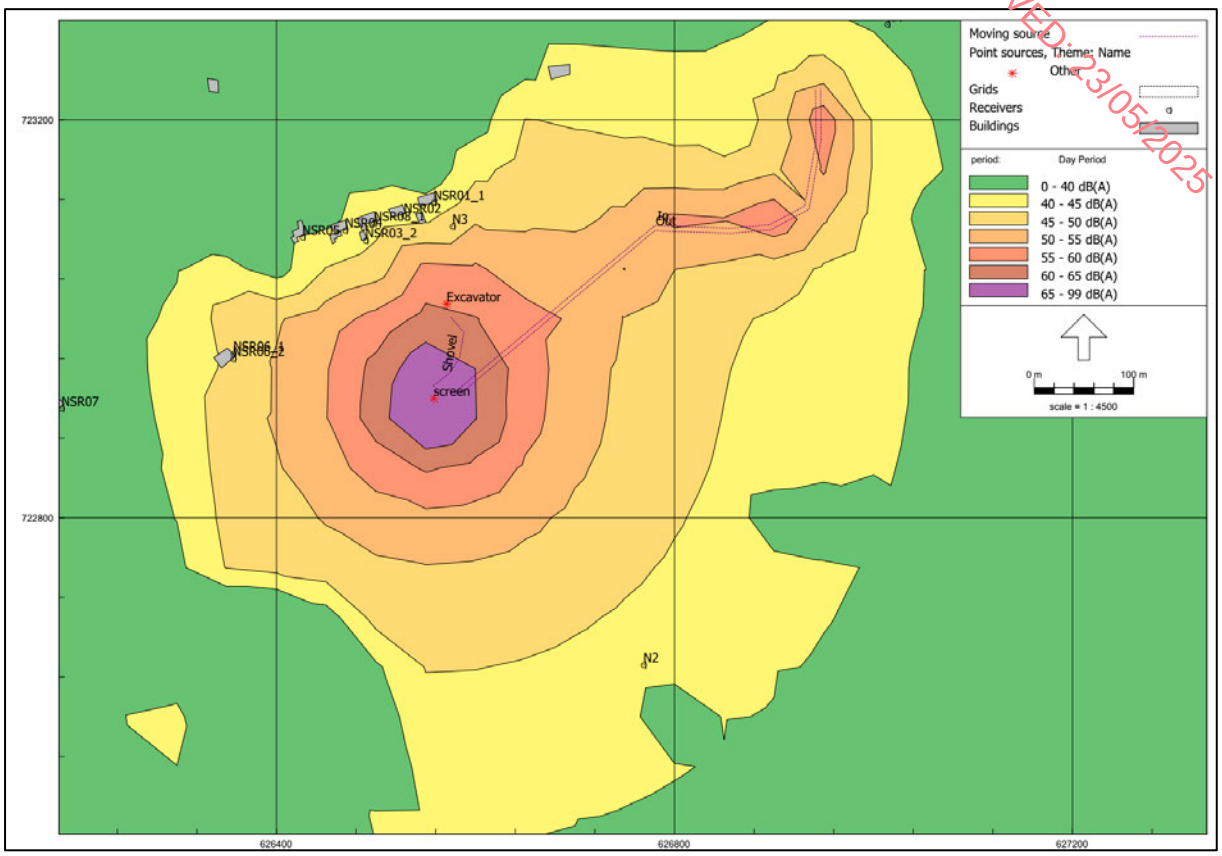
Table 9-10: Site Operation Activities Noise Values – Daytime

NSR	Predictor Output L_{Aeq} (dB)	Ambient Measured L_{Aeq} (dB)	Ambient Measured Background L_{A90} (dB)	Predicted Cumulative (Predictor + L_{A90}) (dB)	EPA Limit
NSR01	39	44	36	41	55
NSR02	40	44	36	41	
NSR03-1	40	44	36	41	
NSR03-2	40	44	36	42	
NSR04	38	44	36	40	
NSR05	37	44	36	39	
NSR06	47	44	36	47	
NSR07	35	44	36	38	
NSR08	34	44	36	38	
NSR09	27	40	33	34	
NSR10	31	52	32	34	

The daytime noise contours are shown in Figure 9-5 below. As presented above, the Operational Phase will comprise processing and primary screening, along with stockpiling utilising mobile plant. As a worst-case scenario, all the plant is modelled to work simultaneously within the extension lands, Phase B, Phase C and Phase D, as these are in closer proximity to the residents than the Phase A lands.

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Figure 9-5: Proposed Operation Noise Contours (Daytime)



Activities likely to result in audible noise at NSRs will occur during daytime hours. As such, receptor positions are assessed to ground floor for the daytime assessment.

All NSRs are predicted to experience a change from the measured ambient background $L_{A90,T}$ of ca. 1-12dB during the daytime hours. However, all of them will remain in compliance of the EPA [17] and ICF [110] limit ($L_{Aeq,T}$ 55dB). These results are prior to mitigation.

The primary noise affecting these NSRs is the movement and operation of the track excavator. This noise sources will be mobile across the extraction area, depending upon the current pit face and aggregate requirements.

All activities modelled are currently on-going within the existing Agall Quarry and at production levels in-line with future proposed activities.

No impact is predicted during night-time hours, due to the predicted operational hours associated with the Proposed Development.

As such, operational stage noise without mitigation, is deemed a neutral, long-term localised slight impact without mitigation.

9.4.4 Operational Phase Vibration

Operational Phase vibration will not occur during normal operations. No piling on the Site will be required.

9.4.5 Restoration Phase Noise

Noise during the restoration of the Site will be associated with the following:

- Levelling;

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- Tilling and ploughing; and,
- Seed planting.

This activity will require minimal plant, consisting of tractor to prepare the soil and spread seeds. Table 9-11 below gives typical sound pressure ($L_{Aeq,T}$) values for plant utilised in quarry restoration sites for each of the steps.

Table 9-11: Restoration Sound Pressure Levels

Activity	Plant	Description	BS5228-1 Reference [111]	Sound Pressure L_{Aeq} at 10m
Restoration	Tractor	Spreading seeds - towing equipment	C.4. 74	71

The site-specific emissions from the Proposed Development at the closest NSR's, with ca. 55m to the Site Boundary NSR03-2 is 56dBA.

Closure / Restoration Phases, due to the similarities in activities and the short duration of the works, are typically rated against the Construction limits, as the closure will see the end of the site operations. In this case, the peak site-specific emissions are predicted to be below the construction limit stated in Section 9.2.3

The Proposed Development will not introduce new sound characteristics, nor will the restoration project present sound qualities typically deemed to be objectionable, such as tonal or clearly impulsive/impact sounds.

Based on the assessment the predicted impact is deemed to be negligible to slight temporary-term impact on a local basis, prior to mitigation, as the worst-case effects described above will only occur for short durations on the closet boundaries to any NSR.

9.4.6 Restoration Phase Vibration

No Restoration Phase vibration is likely.

9.5 Proposed Mitigation Measures and / or Factors

9.5.1 Construction Phase

9.5.1.1 Noise

Based on the assessment conducted here, typical mitigations measures during construction should be implemented as:

- Construction Phase works will be designed to avoid noisy work outside the hours of:
  - Monday to Friday 7am to 6pm; and,
  - Saturday 7am to 2pm.
- Work occurring outside these hours will be subject to tighter construction stage noise limits, as per BS5228 (Section 9.2.3 of this EIAR);
- Nomination of a responsible person to accept and respond to complaints;
- Ensuring all plant and equipment is serviced and in good repair;
- Avoidance of plant or equipment left idling;
- Planning of works to ensure drop heights from equipment are minimised to reduce noise generated; and,
- Noise monitoring programme during Construction Phase works.

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9.5.1.2 Vibration

No mitigation required for the Site Preparation Phase relating to vibration control.

9.5.2 Operational Phase

9.5.2.1 Noise

Site operating hours will be from:

- Monday to Friday 07:00 to 18:00; and,
- Saturdays 07:00 to 14:00.
- No activities will take place on Sundays or Public Holidays.

The equipment associated with the Operational Phase will be mobile during the operational lifetime within the Site. This will aid in reducing noise emissions from the operations onsite to any individual receptor.

The following mitigation measures will be in place as part of the Proposed Development:

- All plant (fixed and mobile) is maintained to a high standard to reduce any tonal or impulsive sounds;
- All plant is throttled down or switched off when not in use; and,
- Internal routes are reduced in gradients where practical and routed to minimise noise emissions from vehicles onsite.

Incorporating the above measures, and the mobile nature of the projects works within the Site, noise nuisance compliance at NSRs will be complied with to the noise criterion of:

$L_{Ar1,hr}$ 55dB from 07:00 to 19:00

Environmental noise monitoring will be conducted as outlined in section 9.11 below.

9.5.2.2 Vibration

There are no proposed sources within the design that will result in the creation of vibration at the Site boundaries. Therefore, the proposed future operation will not have a vibration impact at NSRs.

9.5.3 Restoration Phase

9.5.3.1 Noise

Plant operating hours will be from 07:00 to 18:00, Monday to Friday and 07:00 to 14:00 Saturdays. No activities will take place on Sundays or Public Holidays.

The equipment associated with the Restoration Phase will be mobile during the operational lifetime within the Site. This will aid in reducing noise emissions from the operations onsite to any individual receptor.

The following mitigation measures will be in place as part of the Proposed Development:

- All plant (fixed and mobile) is maintained to a high standard to reduce any tonal or impulsive sounds;
- All plant is throttled down or switched off when not in use; and,
- Internal routes are reduced in gradients and routed to minimise noise emissions from vehicles onsite.

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Incorporating the above measures, and the mobile nature of the projects works within the Site, the compliance at NSRs will be complied with to a noise criterion of:

$L_{Aeq,60min}$, 65dB from 07:00 to 19:00,

9.5.3.2 Vibration

No mitigation is required for the Restoration Phase relating to vibration control.

9.6 Cumulative and In-combination Effects

The Proposed Development has been assessed in relation to the potential variation in ambient noise levels and found no significant effects.

Residual effects, following the implementation of mitigation measures are assessed to be likely imperceptible and short-term during the construction and restoration phases, and likely not significant and long-term during the operational phase. As such, the Proposed Development will not have a cumulative and in-combination effect with this development either during the Construction Phase or the Operational Phase.

There are no newly authorised or applied for developments in sufficient proximity to the Site likely to result in cumulative noise effects to identified NSLs.

9.7 Interactions with Other Environmental Attributes

- Chapter 5 – Population and Human Health: Noise is closely linked with human beings. Residential receptors are the primary noise sensitive receptors and have been discussed as the primary receptor in this chapter;
- Chapter 6 – Biodiversity: Noise can influence fauna, through disturbance of animals. Impacts on specific species have been outlined in Chapter 6 where relevant; and,
- Chapter 14 – Material Assets (Transport and Traffic): Noise and traffic are closely linked in terms of noise generation, the assessment of noise impact arising from proposed haulage has been completed with review and consultation with the traffic assessment completed in Chapter 14.

9.8 Indirect Effects

There have been no significant or likely indirect effects identified outside of those previously assessed throughout this chapter.

9.9 Residual Effects

The residual noise effect, based on the proposed emissions, phasing and intensity of the Site, the mitigation and practices to be employed and within the context of the existing ambient environment, is deemed to be not significant negative, local and reversible during the main operational phase of works.

The Proposed Development will be subject to, and has been modelled to show, it can comply with, noise limits for the construction, operation and restoration phases.

9.10 Monitoring

The operator will conduct the following ongoing monitoring.

General activities onsite will be acoustically monitored on an annual basis at a minimum of four locations, with a site-specific noise limit, measured or calculated to NSR of:

- Daytime $L_{Ar,1hr}$, 55dB.

Normal operations at the Site will not operate during the evening or night-time period; therefore, monitoring has not been specified for these periods. However, in the event out-of-

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hours works are required – tighter limits, as presented in section 9.2.4, are applicable. Any tonal or impulsive characteristics of the site-specific noise emissions, during the day or evening periods, will accrue a 5dB weighting. No tonal or impulsive characteristics to Site-specific noise emissions during the night-time period. 95% of all noise levels shall comply with the specified limit value, with no noise level exceeding the limit by more than 2dB.

The extent and timing of the monitoring shall be agreed with the Competent Authority in advance. The results of the monitoring shall be submitted to the Competent Authority.

9.11 Reinstatement

The Proposed Development is for the restoration of part of Agall Quarry. As such, the noise associated with the restoration have been outlined within this chapter under restoration noise.

Following the success of this project, no additional reinstatement requirements are required.

9.12 Difficulties Encountered

There were no difficulties encountered.

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10 AIR QUALITY

10.1 Introduction

This chapter of the EIAR provides a description and assessment of the likely effects of the Proposed Development on air quality in the vicinity of the Site.

10.2 Methodology

The following standards and guidance documents were used to assess the baseline conditions and in the assessment of potential impacts:

- Department of Environmental Heritage and Local Government ('DEHLG') – Quarries and Ancillary Activities: Guidelines for Planning Authorities, 2004 [12];
- EPA Environmental Management in the Extractive Industry (Non-scheduled Minerals), [17];
- Irish Concrete Federation ('ICF') Environmental Code, 2005 [110];
- Institute of Air Quality Management ('IAQM') – Guidance on the Assessment of Mineral Impacts for Planning, 2016 [112];
- EPA, Air Quality in Ireland 2022 – Indicators of Air Quality [113];
- EPA, Air Quality in Ireland 2023 – Indicators of Air Quality [114];
- Transport Infrastructure of Ireland – Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document (2022) [115]
- Federal Government of Germany - Technical Instructions on Air Quality Control (TA-Luft) (2002) [116]; and,
- EPA, Air Dispersion Modelling from Industrial Installations Guidance (AG4), 2019 [117].

Given the nature of activities associated with the Proposed Development, the IAQM Guidance [112] was used for preparing a disamenity dust risk assessment on human receptors and ecological receptors and an assessment of the health effects from dust particles suspended in the air (PM_{10}). Appendix 10-1 provides further detail regarding these assessments. The IAQM guidance [112] describes 'disamenity' as 'impaired amenity' and 'could be considered as a negative element or elements that detract from the overall character or enjoyment of an area' [112].

The main potential impacts on air quality from the Proposed Development are airborne particulate matter (PM_{10}) and nuisance dust deposition.

Nitrogen dioxide (NO_2) will also be emitted during operation of on-site plant and heavy goods vehicles (HGVs). However, NO_2 emissions were screened out of this assessment based on the IAQM [118] and the Transport Infrastructure of Ireland (TII) guidance documents [115]. Section 10.4.2 provides further details on the screening for NO_2.

10.2.1 Policy Context

The following sections review and highlight relevant policies relating to the Proposed Development in the context of national, regional and local air quality objectives.

10.2.1.1 Clean Air Strategy

The Department of Environment, Climate Action and Communications ('DECC') published a National Clean Air Strategy in April 2023 [119].

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The Strategy builds upon the National Air Pollution Control Plan ('NAPCP'), which sets out a pathway based on a comprehensive cross-government programme of policies and measures that will tackle all sources of air pollution, including those from the transport, agriculture and residential sectors. The aim of this strategy is to reduce certain specific sources of emissions to air that are having the greatest impact, whilst also identifying cost-effective approaches to emission reductions [119].

The Clean Air Strategy outlines key strategic priorities relating to air quality in Ireland, including:

- Ensuring continuous improvements in air quality across the country;
- Ensuring the integration of clean air considerations into policy development across Government;
- Enhancing regulation and enforcement; and,
- Promoting and increasing awareness of the importance of clean air.

Emissions of PM_{10} in Ireland amounted to ca. 28.28kt in 2020. The main source of PM_{10} emissions is from agriculture, which accounted for 31.3% share of the national total in 2020, with combustion in the combined sectors of residential and commercial/institutional accounting of 25.4% of the shared total [119].

10.2.1.2 Offaly County Council Development Plan 2021 -2027

The Offaly County Council Development Plan 2021-2027 ('OCDP') [26] seeks to implement a policy-based approach to managing air quality in order to integrate land use planning and transport and promote measures which seek a reduction in fossil-fuel-based energy sources to reduce air pollution, particularly targeting emissions from vehicles and home heating. The following objectives are outlined in the OCDP:

ENVP-17:

> *"It is the Council policy to manage air quality in accordance with relevant legislation and policy".*

ENVP-18:

> *"It is Council policy to promote the preservation of best ambient air quality compatible with sustainable development in accordance with the EU ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC) and ensure that all emissions associated with new developments are within the European Quality Standards as set out in the Air Quality Standards Regulations 2011, or any updated/superseding documents."*

ENVP-19:

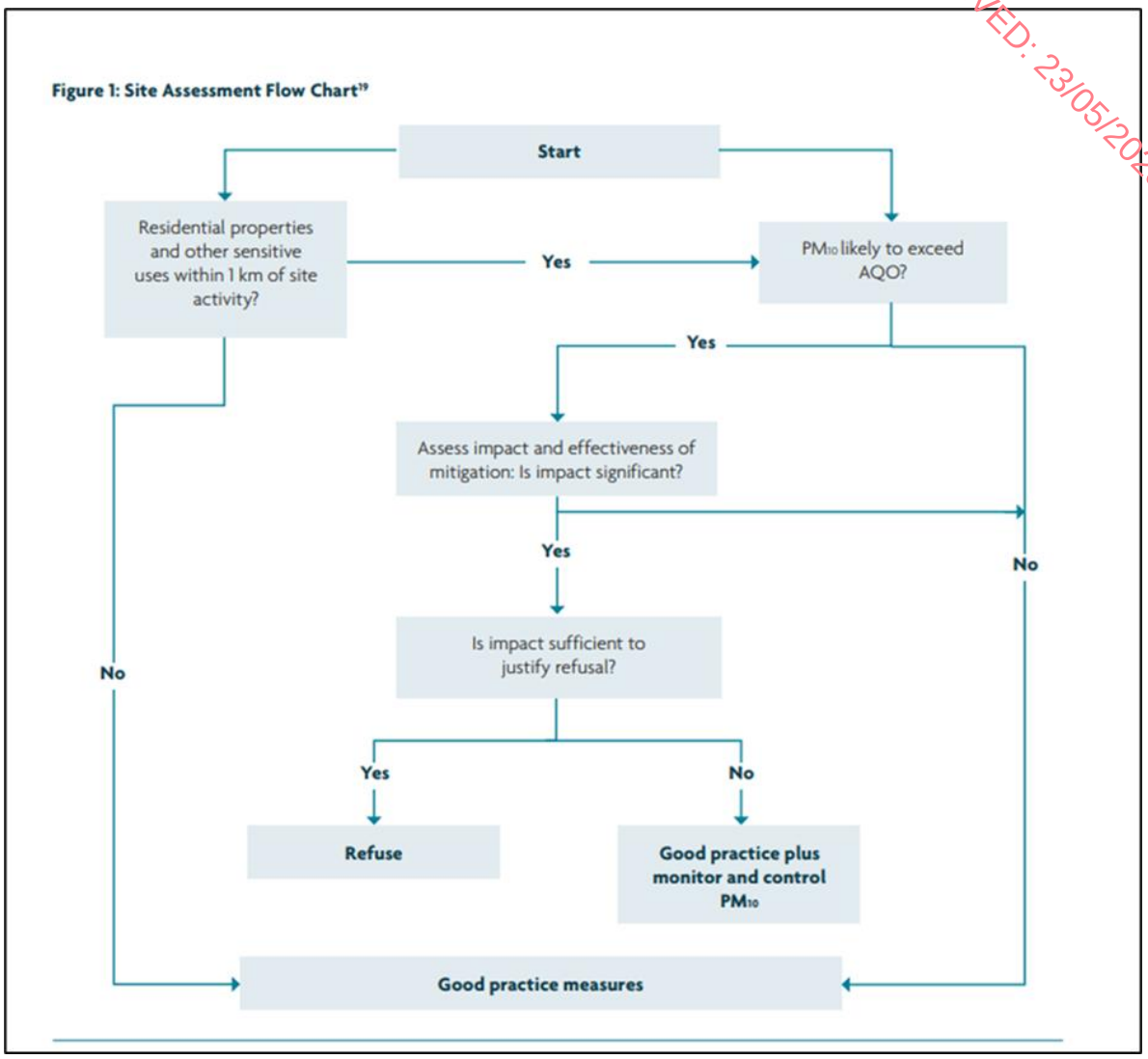
> *"It is Council policy to require activities likely to give rise to air emissions to implement measures to control such emissions and to undertake air quality monitoring. Application of this policy will take into account instances whereby activities are licenced by other bodies through other processes (such as Integrated Pollution / Control Licencing or Industrial Emissions Licencing)."*

10.2.2 Mineral Dust Risk Assessment

A risk assessment of the impact of dust emissions arising from activities associated with the Proposed Development was completed in accordance with the IAQM Guidance [118]. A flow chart outlining the various steps associated with conducting a mineral dust risk assessment is outlined in Figure 10-1, with further details presented in Appendix 10-1.

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Figure 10-1: Flowchart Outlining Steps Associated with Mineral Dust Risk Assessment



10.3 Existing Receiving Environment

10.3.1 Existing Quarry

As outlined in Chapter 3, operations at the existing quarry include:

- Extraction of aggregate materials using an excavator;
- Processing included primary screening; and,
- Stockpiling, utilising mobile plant.

Existing dust suppression controls implemented at the Agall Quarry include:

- Use of a wheel-wash and sprinkler system;
- Dampening of the internal roads by water bowser during dry weather conditions; and,
- Provision of a road sweeper as required.

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10.3.2 Air Quality Standards

Air Quality Standards in Ireland are set down by the Clean Air for Europe ('CAFÉ') Directive (2008/E50/EC), which was transposed into Irish law under the Air Quality Standards Regulations 2011 (S.I 180 of 2011).

Air Quality Standards ('AQSs') are typically based on the effects of relevant pollutants on human health, although effects on other receptors, such as vegetation, are sometimes considered. The relevant limit values for particulate matter are laid out in Table 10-1.

Table 10-1: Irish Air Quality Standards ('AQS') for PM_{10} and NO_2

Pollutant	Objective			
	Limit Values ($\mu g/m^3$)	Concentration expressed as percentile	Maximum No. of Exceedances permitted per year	Averaging Period
Particulates (PM_{10})	50	90.4th percentile	35	24-hour mean
	40	Not Applicable	None	Annual mean
Nitrogen dioxide (NO_2)	200	99.8th percentile	18	1-hour
	40	Not Applicable	None	Annual mean

The above AQS limit values are applicable to the air quality in the locality of the Proposed Development. It should be noted that that suspended dust generated from quarry operations is primarily present in the coarse sub-fraction $PM_{2.5-10}$ (i.e. PM_{10} size fraction and greater) rather than in the fine fraction PM2.5 [118]. As such, $PM_{2.5}$ has not been considered in this assessment. NO_2 will also be emitted at low levels from the operation of mobile and fixed plant and HGVs. Emissions of NO_2 from the Proposed Development were not considered given the number of operational plant and HGVs were below thresholds for assessment as prescribed in the IAQM [112] and TII guidance [115].

10.3.3 Dust Deposition Limits

The EPA's Guidelines for Extractive Industries and the DEHLG, Quarries and Ancillary Activities [12], indicate that quarries, by their nature, generate dust, with the main impact being disamenity due to dust deposition. However, there are currently no Irish Statutory limits or Guidelines for dust deposition.

The Bergerhoff Method specified in the German TA Luft Air Quality Standards is referenced in the EPA [17] , DEHLG [12] and ICF [110] guidance for monitoring dust deposition at quarries. The TA Luft prescribes a dust deposition limit value of 350mg/m^2/day (when averaged over a 30-day period) and is typically set as a limit at the site boundaries of quarry and infill developments in Ireland [116]

Currently, a dust deposition monitoring program is implemented at the Agall Quarry, the results of which are compared to the TA Luft limit of 350mg/m^2/day. Further details of this program are presented in section 10.3.6.

10.3.4 Background Air Quality

EU legislation on ambient air quality requires that all Member States divide their territory into zones for the monitoring, assessment and management of air quality. The current trends in

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air quality in Ireland are reported in the EPA publications EPA publication Air Quality in Ireland – Annual Report 2022 [113] which is the most recent report on air quality in Ireland.

For ambient air quality monitoring and management in Ireland, four zones (A, B, C, D) are defined in the AQS Regulations (S.I. No. 180 of 2011) as follows:

- Zone A: Dublin Conurbation;
- Zone B: Cork Conurbation;
- Zone C: 24 cities and large towns. Includes Galway, Limerick, Waterford, Clonmel, Kilkenny, Sligo, Drogheda, Wexford, Athlone, Ennis, Bray, Naas, Carlow, Tralee, Dundalk, Navan, Newbridge, Mullingar, Letterkenny, Celbridge and Balbriggan, Portlaoise, Greystones and Leixlip; and,
- Zone D: Rural Ireland, i.e. the remainder of the State excluding Zones A, B and C.

According to the above classification, the Proposed Development is located within Zone D. Table 10-2 shows the baseline air quality data monitored by the EPA stations across towns located in Zone D in 2022 and 2023.

Table 10-2: Annual Mean PM_{10} (µg/m³) Concentrations Measured in Zone D

Monitoring Stations	Annual Mean PM_{10} Concentrations (µg/m³)	
	2022	2023
Birr	14.5	13.1
Carrick-on-Shannon/Askeaton	9.4	8.4
Castlebar	11.2	9.9
Cavan	11.0	10.0
Claremorris	7.9	8.1
Cobh Carrignafoy	13.2	11.8
Cobh Cork Harbour	14.4	11.4
Edenderry	17.7	16.3
Enniscorthy	15.0	13.3
Kilkitt	8.5	7.1
Killarney, Co. Kerry	9.1	8.9
Longford	16.0	13.1
Macroom	16.1	11.3
Malin Head	No Data	12.8
Mallow	13.5	10.5
Roscommon Town	11.2	9.7
Tipperary Town	13.9	10.8

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Monitoring Stations	Annual Mean PM_{10} Concentrations (µg/m³)	
	2022	2023
Average Zone D	12.7	11.0
Average Zone D (2022-2023)	11.8	

The maximum concentration recorded in Zone D for PM_{10} was recorded at Edenderry in 2022 (17.7µg/m³). Annual PM_{10} concentrations across Zone D range between 7.1µg/m³ and 17.7µg/m³. The closest Zone D EPA monitoring station to the Proposed Development recording PM_{10} concentrations is located in Birr (Station 79), ca. 20km to the west. Annual PM_{10} concentrations of 14.5µg/m³ and 13.1µg/m³ were recorded in 2022 and 2023 respectively averaging at 13.8µg/m³ over the two years.

To determine appropriate background concentrations for the Proposed Development Site, a minimum of two-consecutive years were used [117]. Further details of the determination of background PM_{10} concentrations relative to the Proposed Development are detailed in section 10.4.4.1.

10.3.5 Sources of Emissions to Air in the Vicinity of the Site

Existing sources of air emissions within the vicinity of the Site include:

- Operations currently active at the Agall Quarry (i.e., screening, handling/transport of materials);
- Operational quarries within 5km of the Proposed Development e.g. Kilsaran Quarry approximately 1.6km to the south-east;
- Two quarries approximately 1.1km to the east and southwest of Proposed Develpment and are possibly still operational;
- IEL and IPC licensed facilities within 10km of the Proposed Development;
- Vehicles travelling along nearby roads (N52, L2011, L6018);
- Agricultural activities; and,
- Fuel burning for heating at residential dwellings.

Table 10-3 presents further detail on the licenced facilities within 10km of the Proposed Development. Three of the facilities are licensed to emit particulate matter and have the potential to contribute to the local air quality, albeit at low levels.

Table 10-3:The nearest IEL and IPC licensed facilities within 10km of the Proposed Development

Licence Number	Name	Licensable activity	Orientation	Distance	Licensed Emissions
P0638	Zoetis Belgium S.A	Industry	East	Ca. 6.4km	NO_x, VOCs, CO
P0980	William Grant & Sons Irish Manufacturing Limited	Industry	East	Ca. 6.1km	NO_x, CO, Particulate matter

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Licence Number	Name	Licensable activity	Orientation	Distance	Licensed Emissions
P0978-01	JMW Farms (IRL) Limited	Industry	East	Ca. 6.3km	Odour
P0833-01	Castle Paints (Tullamore) Limited	Industry	East	Ca. 8.2km	VOCs. odour
W0104-04	Bord Na Mona Recycling Limited	Industry	East	Ca. 8.7km	Odour, Particulate matter
W0113-04	KMK Metals Recycling Limited	Industry	East	Ca. 8.7km	Hg, Heavy metals, Particulate matter, TVOCs, dioxins/furans
P0500-01	Bord Na Mona Energy Limited Leabeg	Industry	East	Ca. 9.5km	Minimal air emissions due to decommissioning and rehabilitation of bogs

IAQM Guidance on Mineral Dust, indicates that impacts caused by quarry operations on PM_{10} or nuisance dust can occur up to 250m from a sand and gravel quarry [112]. Three of the facilities are licensed to emit particulate matter and have the potential to contribute to the local air quality, albeit at low levels.

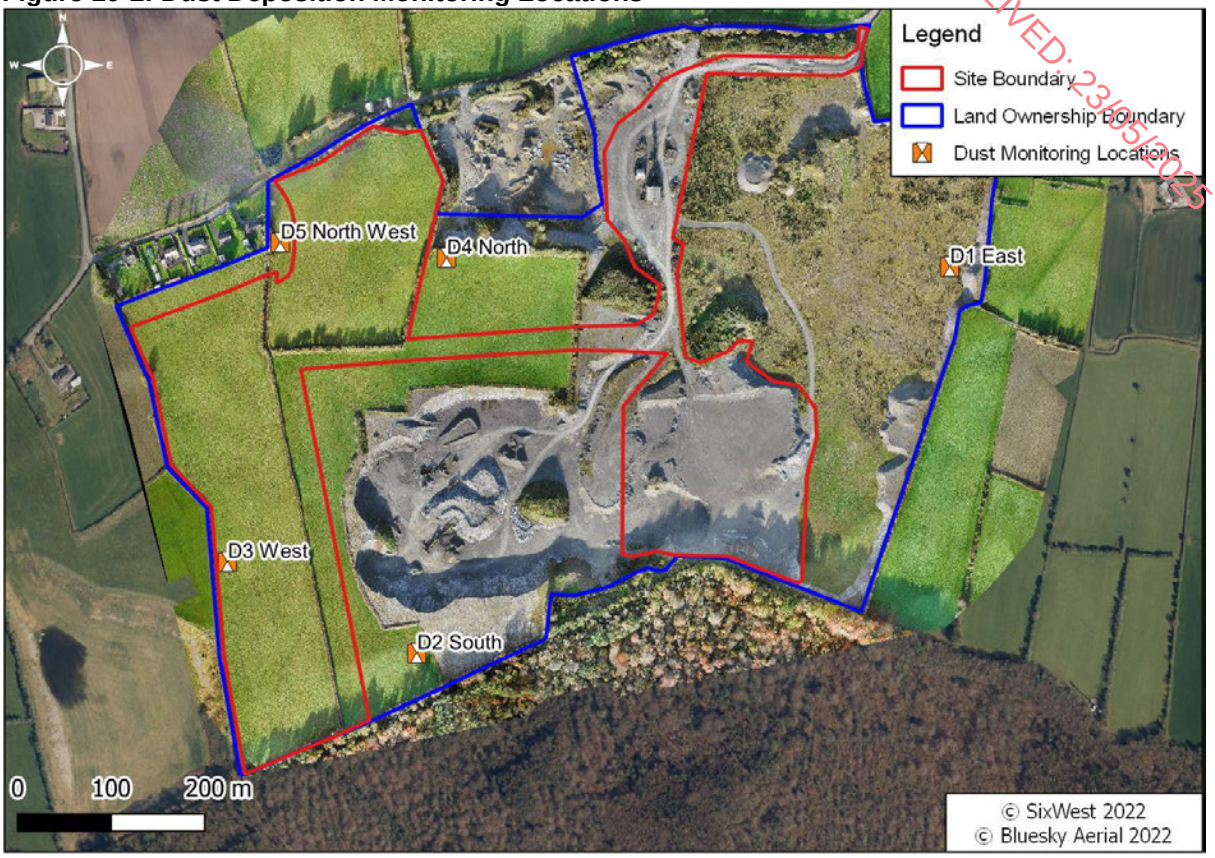
As a result, the potential for cumulative effects on local air quality, and consequently on sensitive receptors, from licensed and non-licensed facilities and the Proposed Development is determined as not likely and not significant.

10.3.6 Historic Dust Deposition Monitoring

Dust deposition monitoring using the Bergerhoff method was conducted at four locations in 2021, and five locations from 2022 to 2024 along the Site boundary. These locations are presented in Figure 10-2. This monitoring results were compared to the 350mg/m^2/day limit as specified in the TA Luft Guidance [116]. The results are presented in Table 10-4 to Table 10-9.

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Figure 10-2: Dust Deposition Monitoring Locations



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Table 10-4: Summary of Historic Dust Monitoring Data for July to October 2021

Monitoring Locations	Monitoring Event 1 02/07/2021- 05/08/2021	Monitoring Event 2 05/08/2021 – 10/09/2021	Monitoring Event 3 10/09/2021-13/10/2021	TA Luft Limit mg/m²/day
D1	70	*	76	350
D2	261	**759**	107	350
D3	134	124	91	350
D4	132	**620**	239	350

*Denotes damage to the dust jar during this monitoring period.

Table 10-5: Summary of Historic Dust Monitoring Data for 2022

Monitoring Locations	Monitoring Event 1 12//06/2022 12/07/2022	Monitoring Event 2 12/07/2022- 15/08/2022	Monitoring Event 3 15/08/2022- 15/09/2022	Monitoring Event 4 15/09/2022 - 18/10/2022	Monitoring Event 5 18/10/2022- 15/11/2022	Monitoring Event 6 15/11/2022- 14/12/2022	Monitoring Event 6 14/12/2022- 18/01/2023	TA Luft Limit mg/m²/day
D1	249	64	170	138	100	129	74	350
D2	**987**	237	**496**	133	168	136	97	350
D3	**987**	141	11	71	49	187	95	350
D4	**547**	70	253	31	N/A	126	**350**	350
D5	~	~	~	~	~	79	93	350

~Denotes that the D5 location was not active during this monitoring period.

Bold: Denotes elevated results during this monitoring period.

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Table 10-6: Summary of Historic Dust Monitoring Data for Q1 and Q2 2023

Monitoring Locations	Monitoring Event 1 09/02-09/03/2023	Monitoring Event 2 09/03/-07/04/2023	Monitoring Event 3 07/04/-08/05/2023	Monitoring Event 4 08/05/-06/06/2023	Monitoring Event 5 08/05/-06/06/2023	Monitoring Event 6 06/07/-10/08/2023	TA Luft Limit mg/m²/day
D1	59	104	70	268	213	**393**	350
D2	44	63	81	55	58	261	350
D3	180	62	**1,820**	**894**	**548**	**724**	350
D4	64	27	120	96	157	251	350
D5	229	59	204	10	4	260	350

Bold: Denotes elevated results during this monitoring period.

Table 10-7: Summary of Historic Dust Monitoring Data for Q3 and Q4 2023

Monitoring Locations	Monitoring Event 7 10/08/2023-08/09/2023	Monitoring Event 8 08/09/2023-06/10/2023	Monitoring Event 9 06/10/2023-08/11/2023	Monitoring Event 10 08/11/2023-08/12/2023	Monitoring Event 11 08/12/2023-10/01/2024	TA Luft Limit mg/m²/day
D1	194	202	*	**482**	66	350
D2	34	79	36	47	82	350
D3	**370**	109	57	42	46	350
D4	88	57	78	28	102	350
D5	192	136	90	83	130	350

*Denotes that the dust jar was damaged during this period

Bold: Denotes elevated results during this monitoring period.

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Table 10-8: Summary of Historic Dust Monitoring Data Q1 & Q2 2024

Monitoring Locations	Monitoring Event 1 (10/01/2024 to 08/02/2024)	Monitoring Event 2 (08/02/2024-07/03/2024)	Monitoring Event 3 (07/03/2024-04/04/2024)	Monitoring Event 4 (04/04/2024-07/05/2024)	Monitoring Event 5 (07/05/2024-07/06/2024)	Monitoring Event 6 (07/06/2024-03/07/2024)	TA Luft Limit mg/m²/day
D1	128	44	62	58	**352**	**1,126**	350
D2	101	33	91	56	137	119	350
D3	60	62	92	183	132	**622**	350
D4	123	60	87	216	112	76	350
D5	104	51	101	225	135	239	350

Bold: Denotes elevated results during this monitoring period.

Table 10-9: Summary of Historic Dust Monitoring Data Q3 & Q4 2024

Monitoring Locations	Monitoring Event 7 (03/07/2024 – 07/08/2024)	Monitoring Event 8 (07/08/2024 – 04/09/2024	Monitoring Event 9 (04/09/2024 to 04/10/2024)	Monitoring Event 10 (04/10/2024 to 06/11/2024	Monitoring Event 11 (06/11/2024 to 06/12/2024	Monitoring Event 12 (06/12/2024 to 08/01/2024)	TA Luft Limit mg/m²/day
D1	**492**	82	151	112	100	135	350
D2	91	319	21	46	77	73	350
D3	**394**	126	87	148	74	15	350
D4	156	153	63	68	54	94	350
D5	0	264	177	328	78	79	350

Bold: Denotes elevated results during this monitoring period.

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Over 12 of the monitoring periods from 2021 to 2024, dust deposition monitoring levels exceeded the 350mg/m^2/day at locations D1 to D4. During the monitoring period D1 exceeded the TA Luft limit five times, D2 three times, D3 eight times and D4 three times respectively. There were no exceedances recorded at location D5 which commenced monitoring in November 2022.

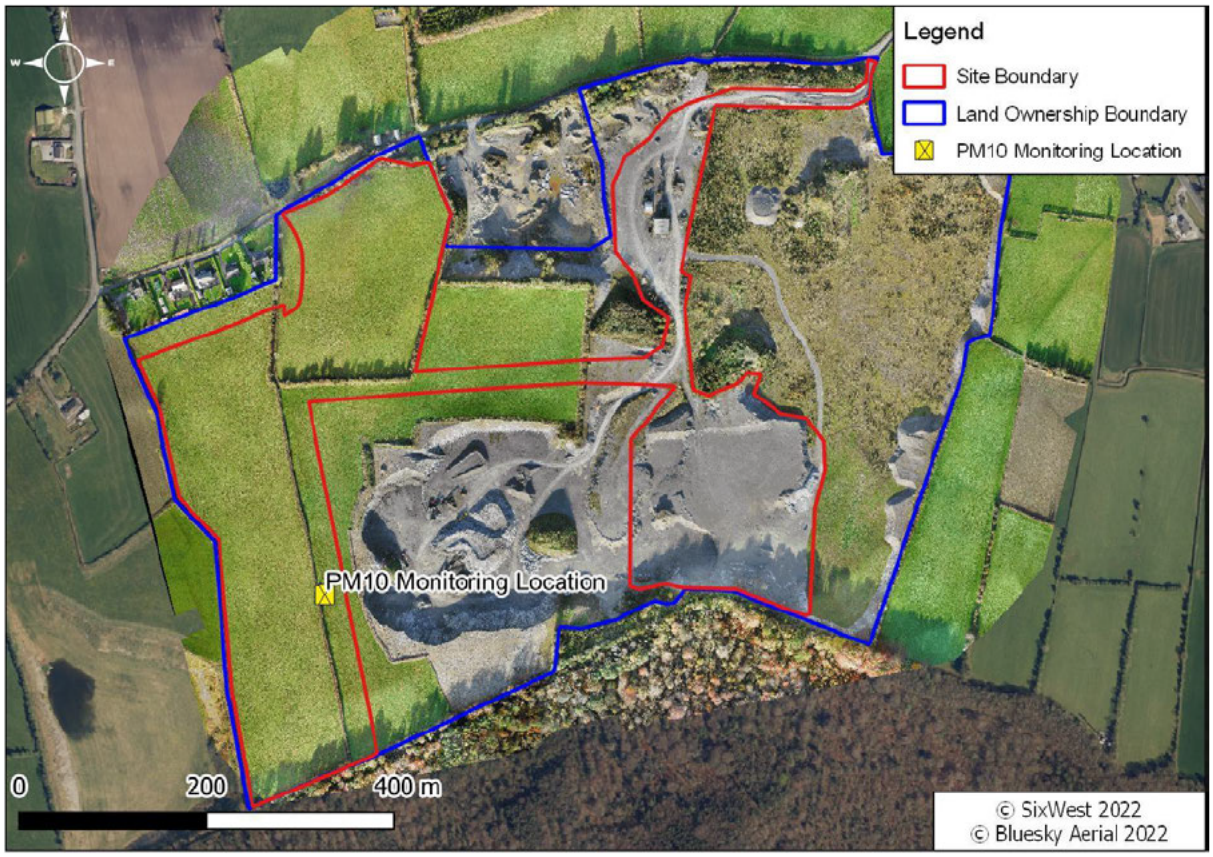
To reduce dust emissions associated with activities at the Agall Quarry management and mitigation measures are proposed, refer to section 10.5.1 below.

It is understood no complaints regarding dust have been made to the local authority or the Applicant during the operation of the Agall Quarry.

10.3.7 PM_{10} Monitoring

Ambient air quality monitoring of PM_{10} was carried out at the Site in May 2023 for a period of 10 days from 15 to 25 May 2023 by MOR Environmental. Figure 10-3 displays the location of the PM_{10} monitor.

Figure 10-3: Location of PM_{10} Monitoring Location for 15 to 25 May 2023



The monitoring results, presented in Table 10-10, present the 24-hour PM_{10} concentrations at the monitoring location.

Table 10-10: PM_{10} Monitoring Results from May 2023

Monitoring Period	Monitored PM_{10} µg/m^3 24-hour mean	% of 24-hour mean AQS
15/05/2023 (14:00-00:00)	7.3	14.5%
16/05/2023	12	24.0%

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Monitoring Period	Monitored PM_{10} µg/m³ 24-hour mean	% of 24-hour mean AQS
17/05/2023	9.2	18.4%
18/05/2023	7.8	15.7%
19/05/2023	28	55.9%
20/05/2023	21	41.7%
21/05/2023	2.8	5.6%
22/05/2023 (00:00-10:35)	14	28.2%
Average result over the Monitoring Period (15/05/2023-22/05/2023)	**13.1**	**-**
24-hour PM_{10} AQS Limit Value	**50**	**-**

The 24-hour mean PM_{10} concentrations recorded during the monitoring period was below the 24-hour AQS limit of 50µg/m³ and ranged from 2.8µg/m³ on 21 May 2023 to 28µg/m³ recorded on 19 May 2023.

The average concentration of 24-hour PM_{10} across the entire monitoring period (13.1µg/m³) was below the 24-hour AQS limit for PM_{10} (50µg/m³).

10.3.8 Dust Sensitive Receptors (Human)

A dust risk assessment was completed in accordance with the IAQM's Guidance on The Assessment of Mineral Dust [112].

The IAQM Guidelines indicate that adverse impacts from sand and gravel quarries are uncommon beyond 250m and beyond 400m from hard rock quarries measured from the nearest dust-generating activities [112]. [112]. As such, a conservative approach for assessing receptors within 400m of the dust generating activities has been adopted for this assessment (Figure 10-4 below).

Dust-generating activities for the Proposed Development will primarily occur within the quarry void where the excavation works are located (unless otherwise specified). Five human receptors were identified within 400m of dust-generating activities associated with the Proposed Development (SR01-SR05), as shown in Table 10-11.

Table 10-11: Sensitive Receptors ('SR')

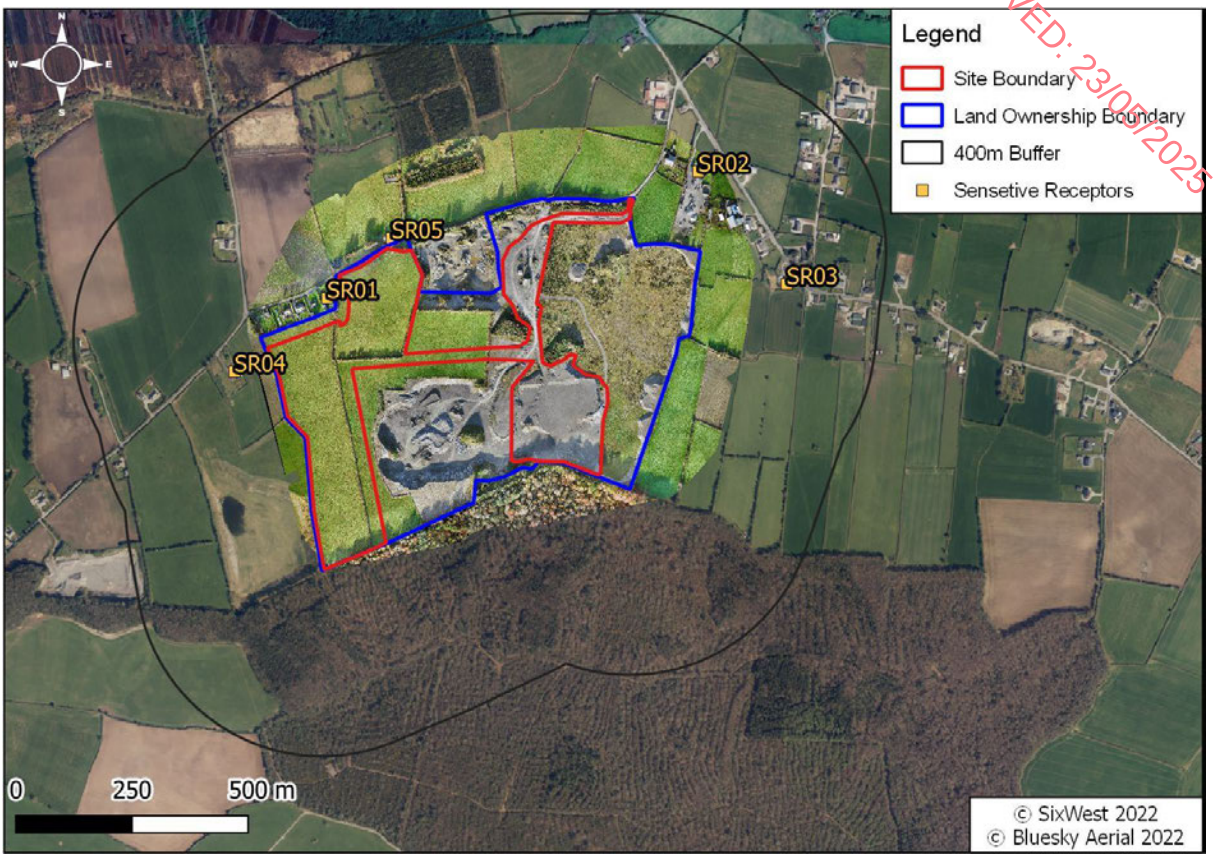
ID	ITM (Eastings, Northings)		Description of Sensitive Receptor	Distance/ Orientation from Emission Source (m)	Land use between Site and Receptor
	E	N			
SR01	226601	223093	Proxy For Residential Dwellings to the northwest	ca. 60m Northwest	Tree cover to the east and south of the receptor. The dominant landscape feature is hedgerows.

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ID	ITM (Eastings, Northings)		Description of Sensitive Receptor	Distance/ Orientation from Emission Source (m)	Land use between Site and Receptor
	E	N			
SR02	227401	223366	Proxy For Residential Dwellings to the northeast	ca. 150m Northeast	Tree cover to the south of the receptor. The dominant landscape features are agricultural fields and ditch lines.
SR03	227591	223123	Proxy Residential Dwellings to the east	ca. 370m East	Tree cover to the south and east of the receptor. The dominant landscape features are agricultural fields and ditch lines.
SR04	226401	222935	Proxy For Residential Dwelling to the west	ca. 90m West	Tree cover to the east of the receptor. The dominant landscape features are agricultural fields and ditch lines.
SR05	226401	222935	Farm building to the north	ca. 35m. North	Tree cover to the south of the receptor. The dominant landscape features are a small local road and ditch lines.

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Figure 10-4: Location of Sensitive Receptors (Human)



10.3.9 Ecological Receptors

The closest ecological receptors to the Proposed Development are as follows:

- the Kilcormac Esker pNHA (site code:000906), located ca.1.5km to the south of the Site;
- the Grand Canal pNHA site code: 002104), located ca. 1.6km to the north of the Site;
- the Charleville Wood SAC (site code: 000571), a European Protected Site (Natura 2000), located ca.3.3km to the east of the Site.
- the Screggan Bog NHA (site code: 000921), located ca.3.8km to the southeast of the Site.

There are no ecological receptors within 1km of the Proposed Development. The IAQM guidance [112], does not require a dust risk assessment to be undertaken in this case, 'irrespective of the size, nature and operation of the Site'. As such the risk of dust impacts on the identified ecological receptors are likely to be negligible and any potential dust effects not significant. No further assessment of potential dust effects on ecological receptors is required.

10.3.10 Weather Conditions

Wind speed and wind direction can influence the dispersion of pollutants, with the potential to have an adverse effect on sensitive receptors. Higher levels of dust generation typically occur during dry periods with medium to strong breezes (>5.0m/s).

The nearest synoptic meteorological station is located at Mullingar, Co. Westmeath ca. 35km to the northeast of the Proposed Development.

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Figure 10-5 presents a wind rose plot for the Mullingar meteorological station for the years 2020 to 2024 (5-years). The predominant wind direction is from the southwest followed by the northwest and south/southeast.

Due to its relative proximity to the Site, the wind rose for the Mullingar meteorological station is broadly representative of conditions experienced onsite with local variations expected.

Figure 10-5: Wind Rose Plot for Mullingar Station, Co. Westmeath (2020-2024)

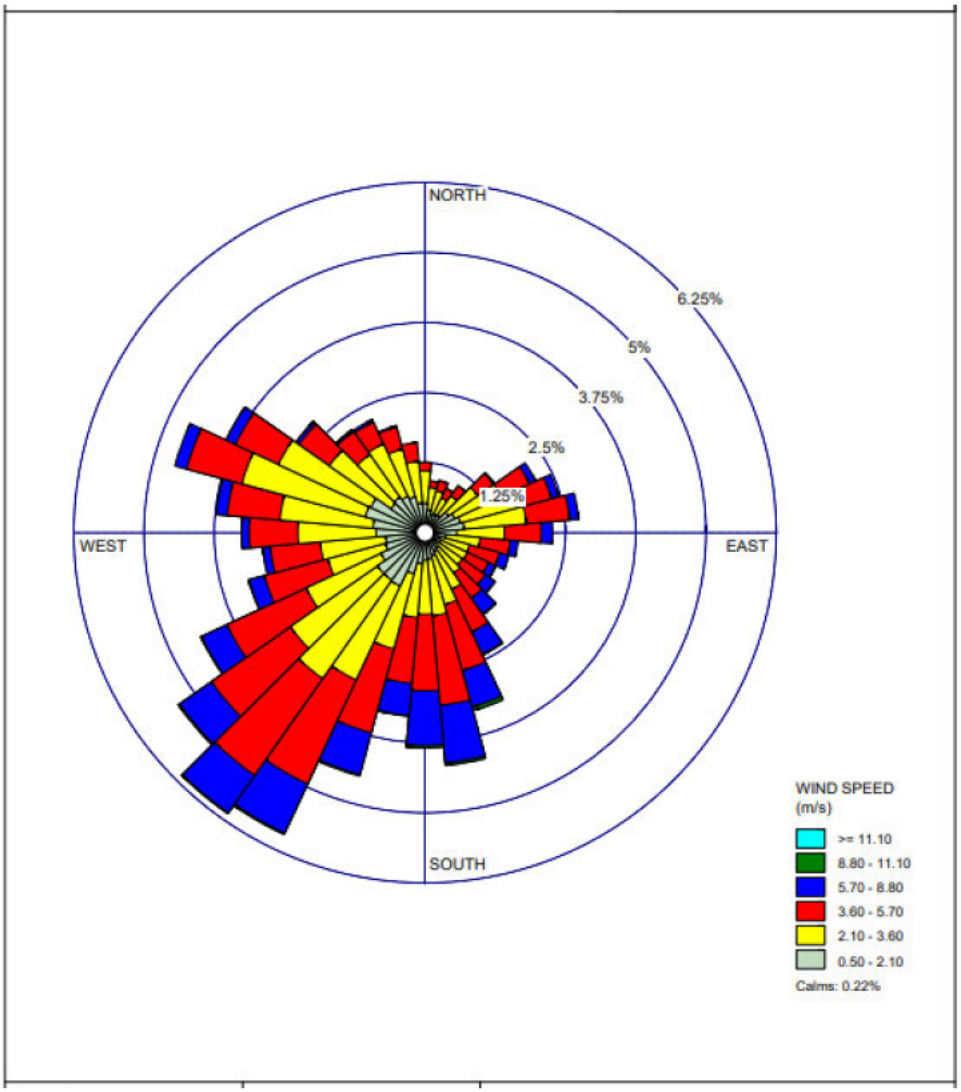


Table 10-12 summarises specific meteorological parameters recorded at the Mullingar station between 2020-2024.

Table 10-12: Summary of Meteorological Variables at Mullingar Station (2020-2024)

Year	Total Precipitation (mm)	Average windspeed (m/s)
2020	1,079	6.6
2021	981	5.8
2022	1,002	6.1
2023	1,158	6.1

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Year	Total Precipitation (mm)	Average windspeed (m/s)
2024	891	6.1

10.4 Characteristics and Predicted Effects of the Proposed Development

The main potential effects on air quality from quarries are dust emissions, which can have the following impacts:

- Disamenity dust arising from dust deposition on surfaces e.g. window ledges, cars, plants, laundry drying outside; and,
- Threats to human health arising from increased concentrations of dust particles (PM_{10}) suspended in the air.

The assessment of the effects of disamenity and suspended dust particles (PM_{10}) are detailed below. Activities associated with the Proposed Development will be considered in three phases:

- The Construction Phase (Site Preparation Phase);
- The Operational Phase; and,
- The Rehabilitation Phase

The operation of onsite plant, which are powered by diesel engines, will omit nitrogen oxides, particulate matter and carbon monoxide, all which have the potential to impact air quality.

10.4.1 Site Preparation Phase (Construction Phase)

The Construction Phase associated with the Proposed Development is anticipated to be controlled to expose only the next phase of extraction. Activities associated with this phase that have the potential to generate dust includes:

- Stripping of overburden and subsoils;
- Creation of soil embankments and berms along the boundaries; and,
- Creation of haul routes to connect the existing Agall Quarry to the Proposed Development.

The planting of berms with broadleaf woodland mix will provide a screen to sensitive receptors as the assemblage develops. The potential dust generating activities are fully considered in the mineral dust risk assessment presented in section 10.4.3 below.

10.4.2 Operational Phase

The following activities will occur during operation of the Proposed Development:

- Site preparation (working soil and overburden);
- Extraction;
- Materials handling;
- Aggregate processing (dry screening);
- Onsite transportation; and,
- Offsite truck movements (potential track out).

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The Proposed Development will utilise existing infrastructure (e.g., a wheel wash), where possible. The requirement for HGVs to leave hardstanding surfaces will be minimal, as will the dust generated by the haul routes.

The Operational Phase of the Proposed Development is anticipated to last ca. 25-28 years and will present the greatest potential for dust generation from the Proposed Development. The Operational Phase will comprise of the following activities;

- Excavation of ca. 200,000 tonnes of aggregates per annum;
- Mobile screening plants and loading shovels;
- The placement of aggregates into stockpiles; and,
- The onsite transportation of aggregates to existing processing infrastructure within the Condron Concrete Limited Ardan Tullamore manufacturing plant or stockpiled onsite.

In addition, the potential impact on traffic, relating to the Proposed Development, is also assessed below.

The movement of HGVs and the operation of onsite plant have the potential to cause impacts on local air quality. Potential traffic emissions were screened out accordance with the thresholds set out by the Transport Infrastructure of Ireland, *Air Quality Assessments for Specified Infrastructure Projects* [115]. According to the guidance, a detailed assessment is required when:

- Heavy good vehicles ('HGV') (vehicles greater than 3.5 tonnes, including buses and coaches) flows will change by 200AADT2 or more.

The Proposed Development will involve the movement of ca. 25 HGVs per day.

There is no change in HGV movement associated with the Proposed Development, as it will operate within current permitted traffic levels.

According to the IAQM Guidance on Demolition and Construction [118], exhaust emissions from onsite plant and onsite traffic are unlikely to make a significant impact on local air quality.

Therefore, assessing the potential effects on air quality as a result of plant and traffic both onsite and offsite has also been screened out.

As the Restoration Phase will include minor works such as the removal of plant and equipment from the Site, no additional sources of dust are considered.

10.4.3 Rehabilitation Phase

The restoration will be done in line with a Restoration Plan which is submitted with this planning application. The restoration will comprise placement of the topsoil and subsequent seeding to establish a habitat similar to that which existed prior to the historic quarrying.

Potential for dust emissions will be similar to that outlined for the construction phase.

10.4.4 Mineral Dust Risk Assessment

10.4.4.1 Suspended Dust

The IAQM Guidance on Mineral Dust states that:

> *"if the long-term background PM_{10} concentration is less than 17µg/m^3, there is little risk that the Process Contribution (PC) would lead to an exceedance of the annual mean*

[2] Annual Average Daily Traffic (AADT) is defined as the total two-way traffic volume passing a point or segment of a road for one calendar year, divided by the number of days in a year (365)

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objective……. 17µg/m³ is considered to be a suitable screening value for an assessment of annual mean PM_{10} concentrations"

The figure is based on the estimated maximum annual process contribution of 15µg/m³ for mineral extraction activities.

When determining the background concentrations of PM_{10} at the Proposed Development, it was conservatively estimated to be 13.1µg/m³ based on the results of the week-long monitoring conducted in 2023 (Section 10.3.7).

Table 10-13 details the Predicted Environmental Concentrations ('PEC') of ambient PM_{10}.

Table 10-13: Predicted Environmental Concentrations ('PEC') of ambient PM_{10}

Parameters	PM_{10} Concentration (µg/m³)
Maximum Process Contribution*	15µg/m³
Background Concentrations**	13.1µg/m³
Predicted Environmental Concentration (PEC)	28.1µg/m³
Annual Mean Objective	32µg/m³
Annual AQS Limit for PM_{10}	40µg/m³

***Determined from the IAQM Guidance. ** determined from onsite ambient PM_{10} monitoring**

The predicted environmental concentration ('PEC') is 28.1µg/m³, which is below both the annual mean objective and the annual AQS for PM_{10}. According to the IAQM Guidance [112], if the predicted environmental concentration of PM_{10} is less than 32µg/m³, there is little risk of the annual AQS limit being exceeded and no further consideration of the risk posed by ambient PM_{10} to human health is warranted.

10.4.4.2 Disamenity Dust Risk Assessment

The IAQM Guidelines [112], assesses the risk of disamenity dust which follows the Source-Pathway-Receptor Concept, whereby a combination of the Residual Source Emission (Source), frequency of wind speeds (Pathway) and the distance of the receptors to the source (Receptor) determines the likely impacts and subsequent effects.

Table 10-12 presents the magnitude of Residual Source Emissions.

The magnitude of the Residual Source Emission was determined based on the scale of the anticipated operations at any one time and was classified between small and large, taking into account the design in mitigation as detailed in section 10.6. The classification of magnitude is presented in Table 10-14 and was conducted in accordance with the IAQM Guidance (Appendix 10-1).

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Table 10-14: Magnitude of Residual Source Emissions

Activity	Activity Details (all values are approximations)	Magnitude of Residual Source Emissions
Site Preparation/Restoration	• Additional aggregate expansion area of ca. 11ha proposed of which ca. 6.96ha used for extraction of aggregates. The total Site area of ca. 17ha. • Estimation of ca. 200,000 tonnes of aggregate extracted per annum; • Total of four heavy plant equipment in operation; • Berms will be a maximum height of 3m; and, • Stockpiling will occur on Site.	**Medium**
Mineral Extraction	• Total working area ca.10.77ha; • Extraction will be done using a hydraulic excavator; • Extraction rate estimated at ca. 200,000 tonnes per annum; and, • Material to be extracted is primarily sand and gravel (High dust dispersion potential).	**Medium**
Material Handling	• Two loading shovels will be used; • Two mobile screening plant; and fixed plant; • Transferring sand and gravel which has a high dust potential; • Activities will occur close to the quarry face; and, • Use of conveyor belts will be used.	**Small**
Onsite Transportation	• Loading shovels will be used to transport materials; • Use of existing compacted unpaved haul routes will occur for onsite transportation; and, • Speed limit of 15km/hr will be kept for onsite vehicles.	**Small**

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Activity	Activity Details (all values are approximations)	Magnitude of Residual Source Emissions
Stockpiling/Exposed Surfaces	• Aggregates will continue to be stockpiled onsite within the quarry void; • Daily stockpile of sand and gravel which is a high dust potential material; • Ground surface will be generally unkept; • Stockpiling will occur near excavated aggregate piles; and, • Quarry production estimated at ca. 200,000 tonnes per annum.	**Small**
Mineral Processing	• Raw material and end product of high dust potential; • Process includes the use of mobile screening plant; and, • Maximum of ca. 200,000 tonnes per annum will be processed.	**Medium**
Offsite Transportation	• 25 HGVs outward movements associated with the Proposed Development traffic and exported quarry material; • HGVs will transport materials via consolidated surfaced access routes from the quarry void; • HGVs will traverse a hardstanding access road of ca >100m; and, • HGVs will be subject to current speed limits (i.e. 15km/hr).	**Medium**

The residual source of emission quantifies how much dust is expected to be generated by activities, including built-in mitigation measures. To determine the impact on sensitive receptors, it is important to consider how the dust will be transported, i.e.., the Pathway Effectiveness [112]. The site-specific factors considered to determine the Pathway Effectiveness of potential dust emissions are the distance and the direction of receptors from the Proposed Development and the relevant prevailing wind directions.

For each receptor, wind frequency with wind speeds >5.0m/s from the direction of dust source emissions were calculated for the five years of data from the Mullingar Station (2020-2024). A wind speed greater than 5.0m/s is characterised as a moderate breeze and is used as a general threshold for when wind dispersion of dust is most likely to occur [112]. According to the IAQM, high-risk meteorological conditions are when the wind is coming from the direction

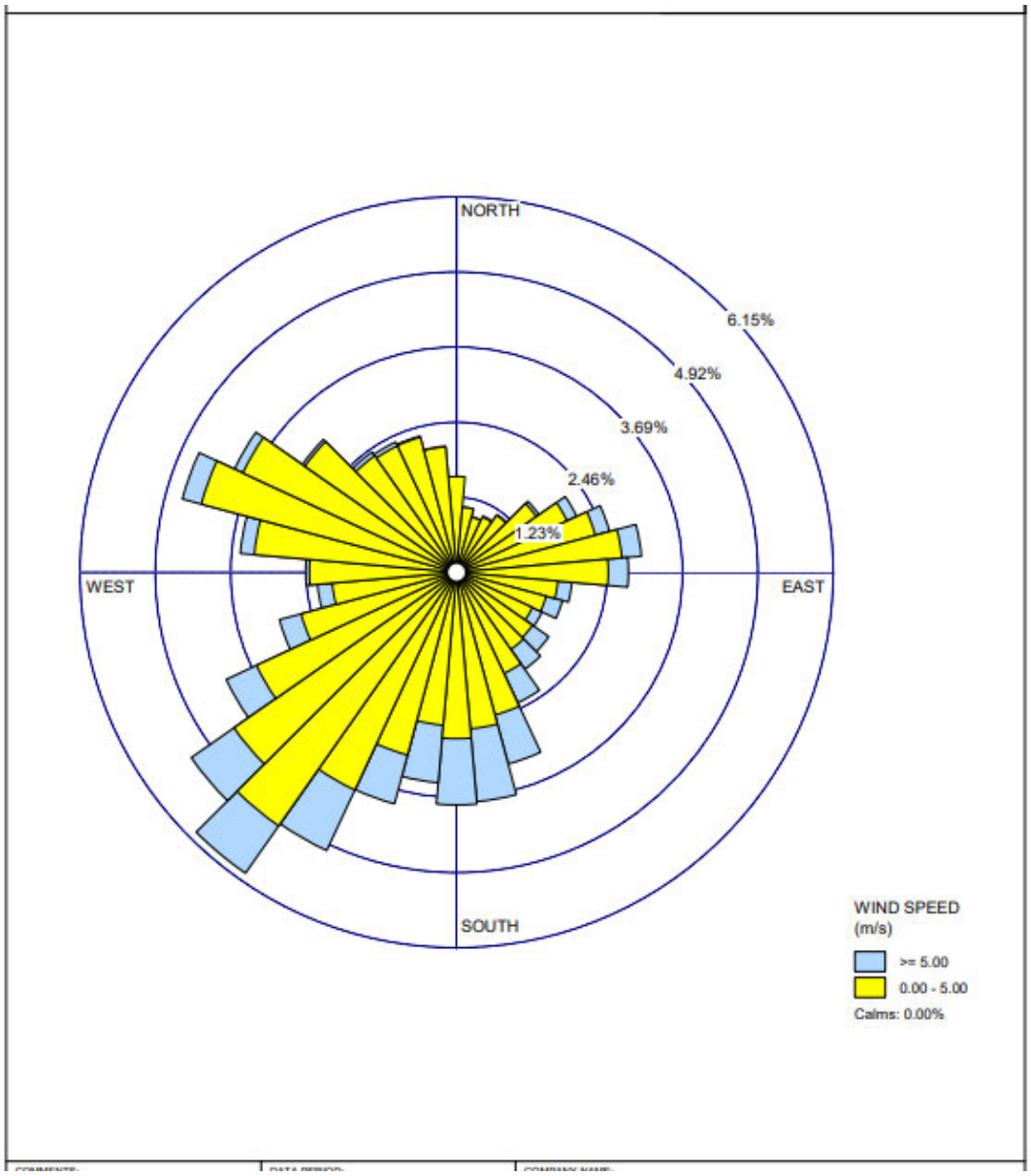
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of the dust source at a sufficient strength, during periods of little or no rainfall (<0.2mm) or 'dry days'. As such, the meteorological information used for the risk assessment considered only dry days. The windrose plot is presented in Figure 10-6.

Criteria for wind speed ranging from infrequent to very frequent, are detailed in Appendix 10-1. Table 10-13 details the classification of wind-related to each sensitive receptor along with the pathway effectiveness, as per the IAQM Guidelines [112].

When determining the rating of the receptor distance from the dust source, close represents a receptor less than 100m from the source, intermediate represents a receptor between 100-200m from the dust source and a distant distance represents a receptor between 200-400m from the dust source. Table 10-15 details these sensitive receptors and their classification based on the Pathway Effectiveness.

Figure 10-6: Windrose for Mullingar Station (for dry days) for 2020-2024 period.



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Table 10-15: Classification of Pathway Effectiveness

ID (Receptor Sensitivity)	Distance from the Emission Source (Orientation to emission source)	Frequency of wind from the direction of dust source (dry weather) (>5.0m/s)	Pathway Effectiveness
SR01 **(High)**	ca.63m **(Northwest) (Close)**	1.4% (614 hours) from the southeast (95-145 degrees) **Infrequent**	**Ineffective**
SR02 **(High)**	Ca.153m **(Northeast) (Intermediate)**	3.4% (1491 hours) from the southwest (205-245 degrees) **Infrequent**	**Ineffective**
SR03 **(High)**	Ca.367m **(East) (Distant)**	0.5% (219 hours) from the west (225-255 degrees) **Infrequent**	**Ineffective**
SR04 **(High)**	Ca.83m **(West) (Close)**	1.8% (789 hours) from the southeast (65-115 degrees) **Infrequent**	**Ineffective**
SR05 **(Low)**	Ca.15m. **(North) (Close)**	3.3% (1,447 hours) from the north (125-175 degrees) **Infrequent**	**Ineffective**

Note: Close receptors include 5 increments of degrees. Intermediate receptors include 4 increments of degrees. Distant receptors include 3 increments of degrees.

All SRs except SR05 (Farmyard) were identified as having a high sensitivity to dust deposition. SR05 would not be expected to have the same level of amenity as a residential dwelling.

Having considered the distance of the receptors from the emission source and the frequency of winds (>5.0m/s) on dry days, the pathway effectiveness was derived for each sensitive receptor.

Table 10-13 indicates the pathway effectiveness was “Ineffective” for all five sensitive receptors (SR01-SR05).

To identify the potential risk of dust impact on the receptors, the pathway effectiveness and Residual Source Emission were considered together. As the Residual Source Emission ranged from small to medium (Table 10-12), medium was applied to dust sources, as recommended in the IAQM guidelines [112].

The estimation of dust impact risk from this process is outlined in Table 10-16.

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Table 10-16: Dust Impact Risk for Sensitive Receptors

ID	Residual Source Emission	Pathway Effectiveness	Dust Impact Risk
SR01	Medium	Ineffective	Negligible Risk
SR02	Medium	Ineffective	Negligible Risk
SR03	Medium	Ineffective	Negligible Risk
SR04	Medium	Ineffective	Negligible Risk
SR05	Medium	Ineffective	Negligible Risk

The Dust Impact Risk has been classified as having a 'Negligible risk' at sensitive receptors based on the conservative estimation of the Residual Source Emissions and the receptor relevant Pathway Effectiveness.

To identify the magnitude of dust impact at receptors, the sensitivity of the receptors was combined with the Dust Impact Risk in Table 10-17.

Table 10-17: Magnitude of Dust Impact on Receptors

ID	Receptor Sensitivity	Dust Impact Risk	The Magnitude of Dust Effect
SR01	High	Negligible Risk	Negligible Effect
SR02	High	Negligible Risk	Negligible Effect
SR03	High	Negligible Risk	Negligible Effect
SR04	High	Negligible Risk	Negligible Effect
SR05	Low	Negligible Risk	Negligible Effect

It is estimated that the magnitude of dust effects will have a "Negligible Effect" on all sensitive receptors identified.

10.4.4.3 Unplanned Events

Plant refuelling will not be undertaken onsite. All plant and machinery refuelling will be undertaken by a competent person in accordance with Site refuelling procedures and take place within the wider landholding area. During refuelling there is a risk of fire occurring that can result in emissions to air. The likelihood of such an occurrence is considered low with the potential consequence medium given the overall receptor sensitivity and distance to sensitive receptors. As such, the risk from the occurrence of a fire at the Site is considered low.

10.5 Mitigation measures

10.5.1 Dust Mitigation Measures

Mitigation measures for the Proposed Development are divided into general measures (e.g. Site management and maintenance) and those more specific to the Construction / Operation

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/ Restoration Phases of the Proposed Development. Table 10-18 details the suggested mitigation measures associated with the Proposed Development.

A dust monitoring programme is in place for the existing Agall Quarry and will continue for the Site and agreed upon by the Local Authority. The dust monitoring programme will be implemented primarily during the Operational Phase of the Proposed Development and also incorporate aspects of the Site Preparation and Restoration Phases.

Table 10-18 details the mitigation measures associated with the Proposed Development.

Table 10-18: Proposed Dust Mitigation Measures

General Mitigation Measures for the Entire Site
Design Measures The design measures to reduce the potential impacts of dust include: • Hedgerows surrounding the Site boundary will be maintained during the Operational and Rehabilitation Phases. The hedgerows, once mature, should result in dense foliage; • As a key development design, a 35m setback and a ca. 3m high and 7m wide berm/embankment will be formed to the south and east of the residential landholding to the north of the new fields. This will be planted and provide a substantial buffer to SRs located in that direction which will significantly reduce risk of disamenity dust leaving the Site boundary in the subsequent Operational Phase. Additionally, as part of the design process, the area proposed for aggregate reserve removal was adjusted to increase the set-back distance of future operations under this planning from residents to a minimum distance of 80m; • Extraction activities will be done in phases to minimise dust; • Access roads will consist of compacted gravel minimising exposed surfaces; and, • Exposed surfaces, e.g. topsoil and overburden storage mounds, will be planted with mixed species fast growing plants.
Construction and Operational Phase The following mitigation measures will be implemented to minimise dust generation during the Construction Phase and Operational Phases: • Dust and air quality complaints will be recorded including the cause, identify and appropriate action taken; • Complaints log will be maintained at the Site office, available for review at any reasonable time; • Training will be provided to Site personnel on dust mitigation measures to be implemented at the Site; • Regular inspections of Site work will be undertaken to ensure compliance. The frequency of these inspections will be increased to coincide with activities where the risk of impact is higher during dry and/or windy conditions; • Monitoring of dust at the site boundaries using the Bergerhoff method will be continued; and, • Good communication with the local community will be continued.
Site Preparation • Soil stripping and overburden handling will be avoided during dry and windy (>5.0m/s) conditions; and, • Drop heights of material will be reduced to less than 3m.
Mineral Processing • Screening will take place close to the operational face or sheltered parts of the quarry to reduce the likelihood of dust generation and migration;

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General Mitigation Measures for the Entire Site
• Screening plant will be used within its design capacity; and, • All plant and equipment will be subjected to routine preventative maintenance.
Materials Handling • Materials will be dampened sufficiently during dry and windy conditions (.5m/s and rainfall <0.2mm a day); • Clearance of any spillage during extraction will be completed regularly to minimise accumulation of loose dry materials; • Minimisation of drop heights will be maintained; and, • During Phase C and Phase D extraction works a sprinkler system will be deployed for use on stockpiles and the operational floor to minimise potential dust generation.
Vehicle Movements • Abrupt changes in direction will be avoided where possible; • Regular clearing, grading and maintenance of haul routes will be conducted; • Speed restrictions within and around the quarry will be limited to less than 15 km/hr; • Vehicles will be evenly loaded to reduce the potential for spillages; • Daily application of water to haul routes during dry conditions will be conducted; • HGVs will pass through wheel wash prior to leaving the Site; and, • Road sweepers will be utilised when needed (i.e during dry and windy conditions).

10.5.2 Rehabilitation Phase

Relevant mitigation measures listed in Sections 10.5.1 will be implemented during the Rehabilitation Phase, if and as required. Given the proposed rehabilitation design, dust generation is anticipated to be not significant during this phase.

10.6 Cumulative and in-combination Effect

The surrounding landscape of the Agall Quarry is primarily woodland to the south and north of the Site. Land use to the east and west is a mix of agricultural activities, livestock feeding, farmyards and commercial, with smaller areas of tillage ground. Due to the nature of the surrounding activities, minimal dust is expected directly from grazing activities.

10.6.1 Potential Cumulative Ambient Dust Effects

The background concentrations of PM_{10} have been identified and discussed in Section 10.3.7. The background concentration of PM_{10} selected from the ambient air quality monitoring of PM_{10} onsite is considered to be the cumulative concentration of PM_{10} for the receiving environment.

The potential concentrations of PM_{10} associated with the Proposed Development were outlined in Section 10.4.4.1, which identified there was little risk of the annual PM_{10} air quality standard being exceeded given the existing background concentrations and likely contribution. As such, the potential for significant cumulative effects to arise from ambient dust is not expected.

10.6.2 Potential Cumulative for Disamenity Effects

The potential cumulative effect from disamenity dust from the Proposed Development together with activities from the existing Agall Quarry has been assessed, the residual source

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emissions had no change from the mineral dust risk assessment, given the scale and nature of activities associated with the existing Agall Quarry and the Proposed Development.

The nearest licenced quarries to the Site which may give rise to cumulative effects is located ca.1.1km to the east and southwest of the Site respectively.

However, following the IAQM Guidance on assessing the effects of mineral dust, the quarry does not fall within the 250m threshold radius of the Proposed Development for sand and gravel quarries. Therefore, the potential for cumulative dust effects is deemed not significant.

10.7 Interactions With Other Environmental Attributes

- Chapter 5: (Population and Human Health): Air Quality is an important consideration as PM_{10} concentrations can affect human health. The assessment on air quality showed that there was a low risk that the Proposed Development will have exceeded the AQS PM_{10} standard, indicating a negligible effect on human health;
- Chapter 6: (Biodiversity): Air quality can potentially affect ecosystems; however, this assessment demonstrated that emissions from air associated with the Proposed Development will have no negative effect on ecosystems;
- Chapter 7: Land, Soils and Geology. Air-borne dust arising from the Proposed Development are sourced directly from the geology at the Site. This is a key component of air quality at the Site and has been comprehensively considered in this chapter (Chapter 9); and,
- Chapter 14: (Material Assets - Traffic): Air quality can be impacted by increased traffic volumes. However, the traffic volumes associated with the Site were low, below threshold criteria required for a detailed assessment and therefore will not have an effect on local air quality.

10.8 Indirect Effect

There have been no significant or likely indirect effects identified outside of those previously assessed in this chapter.

10.9 Residual Effect

Based on the receiving environment, type and intensity of activities (associated with the Proposed Development and the Rehabilitation Plan) and mitigation measures that will be implemented, the residual effect on air quality from dust will be imperceptible.

10.10 Monitoring

Section 10.3.6 details the locations of existing Bergerhoff monitoring points associated with the existing quarry complex. Five locations are currently located at the Site boundary (D1, D2, D3, D4, D5 of Figure 10-2).

Continuation of this monitoring programme is proposed with the modification to remove D4, located to the north, as this location will no longer be relevant with the deployment of D5 in 2023, positioned closer to sensitive receptors.

10.11 Reinstatement

The Restoration Phase of the Proposed Development outlines how the Site will be restored to an inert state. This phase and potential associated effects have been considered throughout this Chapter.

10.12 Difficulties Encountered

There were no difficulties encountered.

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11 CLIMATE CHANGE

11.1 Introduction

This chapter of the EIAR provides a description and assessment of the likely effects of the Proposed Development on climate change in the context of national greenhouse gas ('GHG') emissions and relevant sectoral targets. This chapter also assesses the potential effects to the Proposed Development from identified climate hazards.

11.2 Methodology

The following plans, policies and guidance documents were taken into account in preparing this assessment:

- Offaly County Council Development Plan 2021-2027 [26];
- Offaly County Council Climate Change Adaption Strategy 2019-2024 [120];
- IEMA: Environmental Impact Assessment Guide to Assessing Greenhouse Gases and Evaluating their Significance, 2017 [121];
- International Panel on Climate Change: Guidelines for National Greenhouse Gas Inventories, 2019 [122];
- ISO 14064: Part 1 Specification with guidance at the organizational level for quantification and reporting of greenhouse gas emissions and removals, 2018 [123]
- The European Commission – Climate ADAPT [124];
- The European Commission - The European Climate Data Explorer [125];
- Environmental Protection Agency – Climate Ireland [126];
- Global Facility for Disaster Reduction and Recovery - ThinkHazard [127];
- Department of Communications, Climate Action and Environment – Climate Action Plan 2023 [128];
- Transport Infrastructure of Ireland – Carbon Tool [129];
- Department of Communications, Climate Action and Environment – National Adaption Framework, Planning for a Climate Resilient Ireland, 2018 [130]; and,
- Government of Ireland – Technical Annex B Climate Change Risk Assessment, 2023 [131].

Anthropogenic GHG emissions have a global effect on climate when they are released into the atmosphere over a long time. Therefore, assessing the effects of GHG emissions of a relatively small development at a local level is inconsequential to these global effects on climate.

The potential effects of the Proposed Development on climate were determined through an assessment of the sources of GHG emissions from the Proposed Development. The assessment of GHG emissions follows IEMA's Guidance on *Assessing Greenhouse Gas Emissions and Evaluating their Significance* [121]. These guidelines specify the use of emission factors, which were sourced from the Transport Infrastructure of Ireland ('TII') Carbon Tool [129]. The TII Carbon Tool is primarily used for lifecycle assessments of national roads and rail projects but provides a comprehensive list of emission factors and methods to calculate GHG emissions that are relative to the Proposed Development.

The potential risks of climate change to the Proposed Development have also been assessed by completing a climate risk assessment. By utilising available policy and guidance, the

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vulnerability of assets associated with the Proposed Development to potential climate hazards was determined. The identification of climate hazards was achieved through a detailed desk-based review of local, regional and continental scale tools.

Due to the size and nature of the Proposed Development, there are no potential effects on microclimate in terms of wind tunnelling and shading. As such, the potential effects on microclimate will not be assessed.

11.2.1 Policy Context

11.2.1.1 Paris Climate Agreement

The Paris Agreement is a legally binding international treaty on climate change that was adopted by 196 parties at the COP 21 in Paris 2015 [132]. The goal of the agreement is to limit global warming to below 2°C, preferably 1.5°C, compared to pre-industrial levels. The agreement aims to reach a global peaking of GHG emissions as soon as possible to achieve climate neutrality by 2050. The agreement includes commitments from all countries to reduce their emissions and work together to adapt to the impacts of climate change and calls on countries to strengthen their commitments over time [132]. The agreement provides a pathway for developed nations to assist developing nations in their climate mitigation and adaption efforts, while creating a framework for the transparent monitoring and reporting of countries' climate goals.

11.2.1.2 National

According to the EPA, annual GHG emissions for Ireland for 2021 are estimated to be 61.53 million tonnes of CO2eq (MtCO2eq), which is 4.7% higher (or 2.76 Mt CO2eq) than emissions in 2020 (58.77 MtCO2eq). There was a decrease of 3.4% in emissions reported for 2020 compared to 2019, which could be attributed to the COVID-19 pandemic and the strict restrictions on travel and working from home. The 2021 emissions are over 1% higher than pre-pandemic 2019 figures [133].

The Department of Environment, Climate and Communications recently published its updated Climate Action Plan in 2021 to coincide with COP26 [128]. The objective of the Plan is to enable Ireland to meet its new EU targets under the EU Green Deal to reduce overall carbon emissions by 51% between 2021 and 2030 (compared to 2018 levels) and lay the foundations for achieving net zero carbon emissions by 2050. These legally binding objectives are set out in the Climate Action and Low Carbon Development (Amendment) Act 2021. The Climate Act will support Ireland's transition to net-zero emissions and the achievement of a climate neutral economy no later than the end of the year 2050. The Plan evaluates every relevant sector: electricity, enterprise, housing, heating, transport, agriculture, waste and the public sector [128].

The Climate Action Plan places emphasis on developing Ireland's bioeconomy, which is a facet of the circular economy. An important objective of the bioeconomy is to aid Ireland's transition to carbon neutrality in line with the aforementioned EU Green Deal and the Fit for 55 package. The development of Ireland's bioeconomy, in efforts to reach carbon neutrality by 2050, will be achieved through the use of renewable resources such as crops, forestry, and fisheries to produce food and products, as well as energy, while also reducing waste [128].

Included in the Climate Action Plan are climate adaptation measures to ensure that the State is ready to protect people from the negative effects of climate change in Ireland. There are 12 sectoral plans, which identify the key risks faced across the sector and the approach being taken to address these risks and build climate resilience for the future. Owners of the actions / objectives within those sectoral plans are mostly government departments and agencies.

Nonetheless, a brief review of the Proposed Development in context of the relevant sectoral plans and objectives was completed.

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11.2.1.3 Climate Action Plan 2024

The Climate Action Plan 2024 is the third annual update to Ireland's Climate Action Plan. The plan is the second to be prepared in accordance with the Climate Action and Low Carbon Development (Amendment) Act 2021 [128].

The climate action plan sets out the roadmap to deliver on Ireland's climate ambitions and aligns with the legally binding economy-wide carbon budgets and sectoral emission ceilings that were agreed by the Government in July 2022 [128]. Whilst the extractive industry is not considered in any of the sectors outlined in the Climate Action Plan, specific industries were used for contextual purposes and are discussed in section 11.3.4 below.

11.2.1.4 National Adaption Framework

The National Climate Change Adaption Framework was developed in 2018, under the Climate Action Law and Low Carbon Development Act of 2015, and updated in 2024 [130]. The key objective of the National Adaption Framework is to support climate action by setting out policy with a view to becoming more resource-efficient and contributing to the low carbon economy. The framework was set out as a national strategy to reduce the vulnerability of the country to the negative effects of climate change and to avail of positive impacts. The strategy also aims at improving the enabling adaption through online engagement and civil society, the private sector and the research community [130].

11.2.1.5 National Carbon Budgets and Sectoral Emissions Ceilings

The National Sectoral Emission Ceilings refer to the total amount of permitted GHG emissions that each sector of the economy can produce during a specific period of time.

Under Section 6C of the Climate Action and Low Carbon Development Act (as amended), sectoral emission ceilings outline the maximum GHG emissions that are permitted in different sectors of the Irish economy and commits Ireland to achieving climate neutrality by 2050. The carbon budget programme, which includes three successive 5-year periods of national emission ceilings, is measured in tonnes of CO_2e (tCO_2e).

Table 11-1: Irelands National Carbon Budget

National Climate Budget	Emission Ceiling for Assessment Periods (tCO_{2e})
First Carbon Budget (2021 – 2025)	295,000,000
Second Carbon Budget (2026 to 2030)	200,000,000
Third Carbon Budget (2031 to 2035)*	160,000,000*

*proposed budget by the Climate Change Advisory Council [134].

GHG emissions associated with the entire Proposed Development will be compared to the First and Second Irish Carbon Budget (2021 to 2025, 2026 to 2030) in Table 11-1 above.

Within the national carbon budgets, sectoral emission ceilings have been created to reflect the EPA's Emission Inventory. Currently, the sectoral emission ceilings are only presented for the first two carbon budget periods (2021 to 2025 and 2026 to 2030). For GHG emissions associated with the Proposed Development, sectoral emissions for the Transport Sector (Table 11-2 below) will be used to account for emissions associated with vehicle movements. Emissions associated with the electricity generation will be compared against the Electricity Sector emission ceiling for the respective period (Table 11-2 below).

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Table 11-2: Sectoral Emission Ceilings relative to the Proposed Development

Sectors	First Sectoral Emission Ceiling (2021 to 2025) (tCO_2e)	Second Sectoral Emission Ceiling (2026 to 2030) (tCO_2e)
Transport	54,000,000	37,000,000
Electricity	40,000,000	20,000,000

Other sources of emissions associated with the Proposed Development, such as the operation of plant and water usage, are not currently accounted for in any of the sectoral emission ceilings under the Current Climate Action Plan 2024 [128]. As such, these emissions were compared to the first and second national climate budgets respectively. It is anticipated that emissions beyond 2030 will be influenced by improvements in plant performance, advancements in energy sources, and increased utilisation of renewable energy. Therefore, it is not feasible to extrapolate current estimates of emissions beyond 2030.

11.2.1.6 Offaly County Council Development Plan 2021-2027

The Offaly County Council Development Plan 2021-2027 [26] has taken a role to:

- Ensure proper comprehension of the risks and vulnerabilities of climate change;
- Bring forward the implementation of climate resilient actions in planned and proactive manner;
- Ensure that climate adaption considerations are mainstreamed into all plans and policies and integrated into all operations and functions of Offaly County Council.

The following policies are identified under the County Development Plan:

CAEP-29:

> *'It is council policy to support the circular economy and within that the bioeconomy including in particular through greater efficiency in land management, greater use of renewable resources and by reducing the rate of land use change from urban sprawl and new development, resulting in optimal socioeconomic and environmental impacts such as resource efficiency and reduction of greenhouse gas emissions.'*

CAEP-66:

> *'It is Council policy to support the fulfilment of the vision of carbon neutrality in the agriculture, forest and land use sector through better sustainable agricultural, land management and resource efficiency.'*

11.2.1.7 Offaly County Council Climate Adaption Strategy 2019-2024

The Offaly County Council Climate Change Adaption Strategy 2019-2024 was prepared as part of the National Adaption Framework ('NAF'), which was given statutory authority by the provisions of the Climate Action and Low Carbon Development Act 2015.

The strategy that's the role at a local level to:

- Ensure a proper comprehension of the key risks and vulnerabilities of climate change;
- Bring forward the implementation of climate resilient actions in a planned and proactive manner; and,
- Ensure that climate adaption considerations are mainstreamed into all plans and policies and integrated into all operations and functions of Offaly Local Authority.

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Offaly County Council identified the impacts of current weather extremes and recent climatic trends in Offaly and identified the most important weather events in the last 30 years using data from Met Eireann. These events were categorised into:

- Wind;
- Rain;
- Flooding;
- Frost;
- Snow;
- Heat; and,
- Drought.

These hazards will be further discussed in the context of the climate risk assessment.

11.2.2 Assessing Greenhouse Gas Emissions

Anthropogenic GHG emissions have a global effect when they are released into the atmosphere over time. Therefore, assessing the effects of GHG emissions of the Proposed Development at a local level are inconsequential to these global emissions.

Currently, there is no set methodology to evaluate significance criteria or a defined threshold for GHG emissions for the extractive industry. The quantity of emissions from a quarry is dependent on the size and type of activities that are occurring within a site. The main sources of GHG emissions associated with the Proposed Development are from the use of vehicles onsite as well as the operation of plant and equipment.

According to the IPCC 2019 refinement of the 2006 publications of Guidelines for National Greenhouse Gas Inventories [122] GHG emissions can be split into three categories (or 'scope'):

- Scope 1: Direct emissions from sources owned or controlled by the reporting entity, such as emissions from combustion of fuels used in plant and machinery;
- Scope 2: Indirect emissions associated with the generation of purchase heat, steam and water; and,
- Scope 3: Other indirect emissions that occur in the value chain.

For the purpose of this stage of the assessment, potential GHG emissions have been divided into Scope 1, Scope 2 and Scope 3 emissions, as recognised by the ISO 14064 Part 1 Standard [123]. Table 11-3 below details the scopes that were considered for this assessment.

Table 11-3: Scoped Emissions used in the GHG Assessment

Scope	Source
Scope 1 – Direct Emissions	Operation of onsite plant
Scope 2 – Indirect Emissions Associated with the Proposed Development	Electricity purchased associated with the entire Agall Quarry
Scope 3 – Indirect Emissions	Truck and vehicle movements assumed to be owned by third parties

Scope 1 emissions will arise from the operation of plant/equipment operated and owned by the Proposed Development. This is provided in terms of total fuel used during a typical year.

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It is estimated that the total diesel supplied to the site is ca. 45,000 litres per annum. Emission factors (kg of CO_2e per litre used) were provided by the TII Carbon Tool [129], which has taken these specific emission factors from databases such as the SEAI and the BEIS to convert GHG's into CO_2e.

Scope 2 emissions were provided by the client in terms of total annual electricity usage used to supply a water pump onsite (395kWh).

Scope 3 emissions, those indirectly influenced by the operations of the Proposed Development, include vehicle movements not owned by the company (contracted HGVs, employee vehicles and delivery vehicles). It is estimated that 50 truck movements (25 outward movements) will be required in a typical day in regard to incoming and out-going aggregates. For the purpose of this assessment and to demonstrate that the effects of transport GHG emissions from the Proposed Development will be not significant in terms of National Carbon Budgets or Sectoral Ceilings a gross overestimation in terms of HGV travel has been assessed. It has been assumed that each HGV will travel 60km per movement.

It is anticipated that there will be a total of two staff ('LGVs') onsite as a result of the Proposed Development. With regards to LGV vehicle movements, the Central Statistics Office calculated that an average worker would travel 16.8 kilometres in 2022. As a conservative estimate 17km per day (34km round trip) was used in the assessment for employee vehicles travelling to and from the Site. Therefore, it is assumed that every employee vehicle will travel ca. 17km for each movement.

To ensure the consistency in the approach, emission factors used in this assessment assumes an average laden condition for HGV's both entering and leaving the Site.

11.2.3 Climate Change Risk Assessment

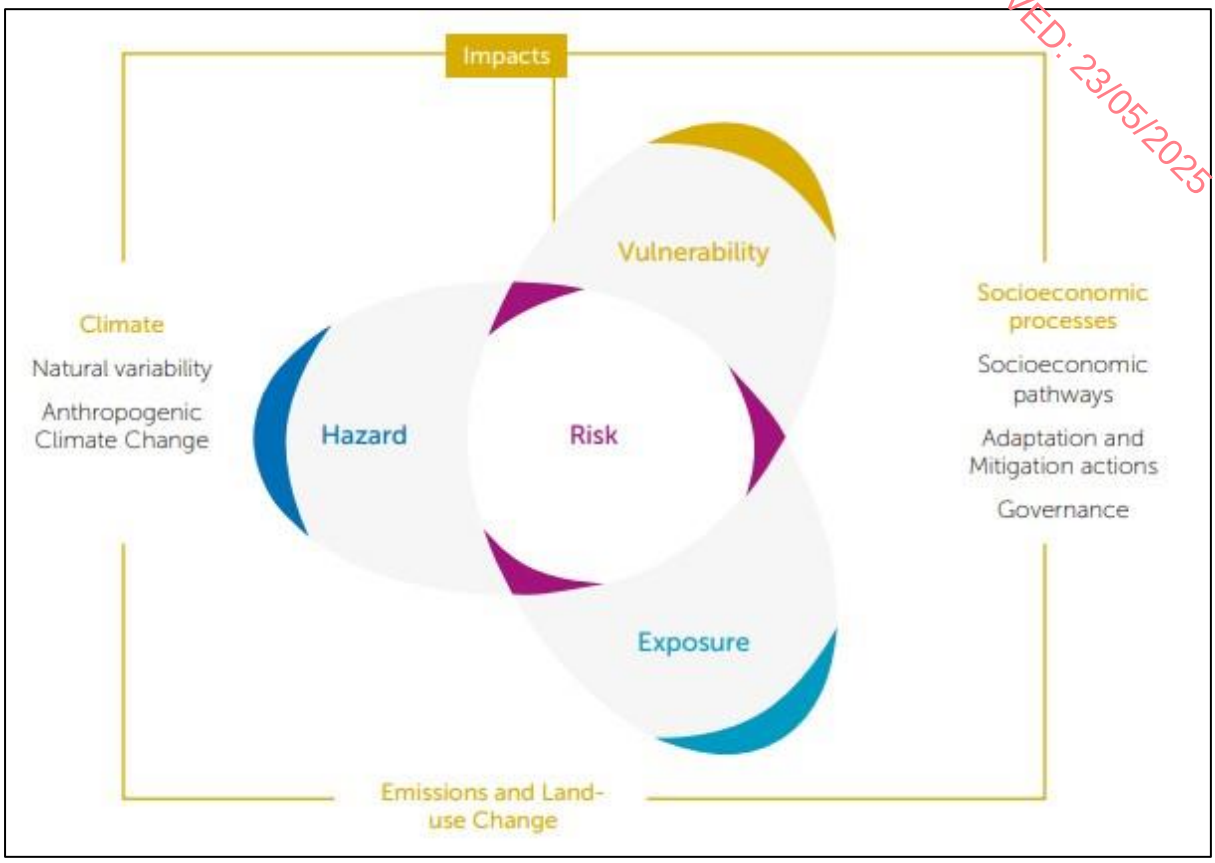
The IPCC define three key categories for identifying climate risk that interact to generate the risk of climate impact [135]. These include:

- Hazard: The potential occurrence of a natural or a human-induced physical event or trend (such as a heatwave, heavy rainfall event, or sea level rise) that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources;
- Exposure: The presence of people, livelihoods, species or ecosystems, environmental functions, services and resources, infrastructure, or economic, social or cultural assets in places and settings that could be adversely affected (e.g. homes in a flood plain); and,
- Vulnerability: The propensity or predisposition to be adversely affected (e.g. people's underlying health conditions can be worsened by high temperatures or heatwaves).

Figure 11-1 below displays the framework for identifying potential climate risk associated with a development and in turn the completion of a climate vulnerability assessment.

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Figure 11-1: IPCC Sixth Assessment Report – 'Risk Propellor'



In adherence to the Annex B Guidelines provided for local councils, the assessment process entails the identification and characteristics of climate hazards. This involves both the frequency and magnitude of impacts across the 'Asset Damage' category.

Given the scale and nature of the Proposed Development, the climate risk assessment will focus exclusively on the physical vulnerabilities of the Proposed Development to climate hazards both present and future. According to Annex B these physical vulnerabilities are described as:

> *'Properties of an asset related to the structure or facilities can exacerbate/reduce the impacts before, during or after a hazard event e.g. poor design and construction of building provision of active cooling.'*

The impact of climate risks that will potentially cause disruptions of services and functions of the Proposed Development are considered to be the main focus of this assessment. Full details on the qualitative descriptions of impacts can be found in Appendix 10-1.

Future changes in climate hazards will be identified as likely to be of significance if the current climate hazards exposure to the Proposed Development are determined to be significant. A detailed desk-based review of available resources (Climate Ireland, ThinkHazard, Climate-ADAPT) will be used to determine the potential climate hazards that the Proposed Development may be exposed to in the present and future.

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11.3 Receiving Environment

11.3.1 Baseline Climate

The climate of Ireland is primarily driven by ocean influences, mainly the Atlantic, resulting in maritime climate conditions. This results in relatively warm summers and mild winters. The wettest months of the year typically occur between November to January. The prevailing wind direction is from the southwest, contributing heavily to the wet weather experienced in the spring and warmer temperatures in the summer.

Typically, climate is averaged weather data over a 30-year period to determine long-term trends in important variables such as temperature, precipitation and windspeed. The period of 30 years is considered long enough to smooth out year-to-year variations. Recently, Met Eireann has compiled a set of climate averages for the period 1991 to 2020.

The closest station to the Proposed Development that has available 30-year averages is located in Birr, Co. Offaly ca. 27km to the southwest. However, this station closed in 2007/2008, meaning that over a decade of recent climate variability is not available. The closest station that has the available 30-year data for the 1991-2020 period is Casement Aerodrome, located ca. 77km to the east of the Site. Due to the lack of available information, this station was chosen as the best representation of recent climate data. See Table 11-4 below.

Table 11-4: Climate Averaged Data from Casement Aerodrome (1991 to 2020)

Variable	1991 to 2020 Averages
Mean Temperature (°C)	9.9
Precipitation (sum of monthly mean in mm)	783.5
Mean of wind speed (kn)	10.1
Mean number of days with gale force winds	16

According to Met Eireann's Climate Average report, which compares the 1961 to 1990 averages to the 1991 to 2020 averages, the following is noted:

- Comparing the 1991 to 2020 annual mean air temperature for Ireland with the 1961 to 1990, there has been an increase of approximately 0.7°C. Spring showed the highest increase (0.8°C), whilst winter showed the smallest increase (0.6°C);
- Annual average rainfall has increased by approximately 7% between the two periods. The greatest increase was seen in the west and north of the country;
- The 30-year average annual distribution of rainfall shows a typical west-to-east decline in the number of rain days and wet days, with east and southeast regions experiencing the lowest number of rain days and wet days; and,
- The average annual number of very wet days observed over the period 1991 to 2020 shows that these events are more frequent in the west of the country than in the eastern and midland regions.

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11.3.2 Protected Future Climate Change

Observed changes in Ireland's climate over the last century are in line with global and regional trends associated with human induced climate change. Climate projections in Ireland are based on global GHG emission scenarios, predicting the future usage of fossil fuels globally and the corresponding release of GHG gases. The Representative Concentration Pathway ('RCP') is a trajectory adopted by the IPCC [135]. RCP scenario 4.5 (RCP4.5) represents an intermediate scenario with emissions expected to peak in 2040 and then decline [135]. RCP scenario 8.5 (RCP8.5) is the worst-case scenario approach based on an overestimation of projected coal outputs [135]. The range of these scenarios provides an intermediate and worst-case estimation of potential changes in the environment in response to climate change. Based on this range, the following projections were made regarding Ireland's climate:

- Projected seasonal changes in temperature range from 0.9°C to 1.9°C (RCP8.5), with an increase in the duration and intensity of heatwaves expected; and,
- Projected changes in the frequency of very wet days (>30mm of precipitation) range between a 21% increase (RCP4.5) and a 31% increase (RCP8.5).

Projections regarding regional scale sea-level risk and changes in wind speed require more comprehensive research to determine the long-term trends.

11.3.3 Climate Hazards

As discussed in section 11.2.3, climate hazards were identified following a desk-based review of available resources. Full details on the hazards identified from the review are presented in Appendix 11-1. For the purpose of this assessment, the following hazards were considered relevant to the vulnerability of the assets associated with the Proposed Development:

- Flooding (River);
- Heatwaves / Droughts;
- Cold weather;
- Landslides;
- Extreme Rainfall; and,
- Wildfires.

The frequency and level of impact of these hazards will be assessed based on the Annex B Guidelines on Climate Risk Assessments [131].

11.4 Characteristics and Potential Effects of the Proposed Development

11.4.1 Characteristics of the Proposed Development

GHG emissions will mainly arise from the following activities that will take place at the Proposed Development:

- Movement of HGVs associated with the transport of aggregates to market;
- Use of machinery onsite; and,
- Electricity and water usage.

11.4.1.1 Site Preparation Phase

As per the description of the Proposed Development presented in Chapter 3, the Site Preparation works will be controlled to expose only the next phase of extraction. The Site Preparation Phase will involve processes such as the stripping of overburden and subsoils, which will require the use of plant that will release GHG emissions.

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Over the course of this period, land will be converted into a quarry landscape, which has the potential to result in a net CO_2e loss by the removal of vegetation that would have sequestered carbon.

The Site Preparation Phase of the Proposed Development will use existing ancillary infrastructure as far as practicable, removing the necessity to employ additional equipment, resulting in GHG emissions.

11.4.1.2 Operational Phase / Restoration Phase

The Operational Phase of the Proposed Development is expected to span over ca. 25-28 years and will involve activities such as aggregate processing and the haulage of materials to market.

For the purpose of the assessment regarding GHG emissions, calculations will be compared as a proportion of the first two sectoral emission ceilings (2021 to 2025 and 2026 to 2030) as detailed in section 11.3.4 above.

To calculate the GHG emissions relevant to the sectoral emission ceiling, a typical year will be used as the first basis and then extrapolated over the relative carbon budget period. Since the Proposed Development is anticipated to commence in 2025 only one year of CO_2e will be incorporated into the assessment. For the second carbon budget period (2026-2030), a total of 5-years' worth of GHG emissions will be assessed.

The GHG emissions associated with the Proposed Development will be sourced from Scope 1 (litres of fuel used per annum), Scope 2 (electricity used to supply the water pump) and Scope 3 (vehicle movements), which have been identified and discussed in section 11.2.2 above. These emissions encompass direct activities from onsite processing and other emissions associated with the project supply chain.

11.4.2 Potential Effects of/to the Proposed Development

11.4.2.1 Climate Change Risk Assessment

The Climate Vulnerability Assessment determines the sensitivity of the Proposed Development to climate hazards combined with the corresponding exposure of the Proposed Development to these hazards. To determine the potential vulnerability, the receptors associated with the Proposed Development have been divided into the following:

- Onsite Assets (e.g. plant, equipment and building);
- Inputs (Electricity and Water);
- Outputs (Mineral Processing, operational capacity); and,
- Transport Links.

Table 11-5 below identifies the potential impacts to the identified receptors using the UK *Guidance on Adapting to Climate Change: Industry Sector examples for your risk assessment*.

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Table 11-5: Potential Impacts to the identified receptors from Climate Change

Climate Hazard	Potential Impacts
Temperature	• Pressures on cooling systems, such as bearing or belts; • Fuel storage, both conventional and waste, need special consideration to avoid spontaneous combustion; • Lower inherent moisture can lead to movement problems and increased dust deposition during aggregate processing; • Increased heat or sun exposure can cause the expansion of metallic infrastructure in building elements or tracks, or rapid degradation of materials such as rubbers or plastics; • Increased snowing and snow loading could damage buildings and other structures; and, • Severe cold can lead to contraction of metals and embrittlement of materials such as plastic, rubber and metals.
Water	• Increases in groundwater levels due to sea level rise can cause quarries to become brackish; • Impacts on the wider supply chain infrastructure for critical emissions control plant by docks and road access flooding • Increased in flow may cause damage caused from flooding; • Bunded areas could get flooded reducing their capacity; • Potential for increased site surface water and flooding; • Increased rainfall can result in the washing of suspended solids from all areas, including stockpiles and roadways causing blocked drainage infrastructure and offsite pollution; and, • Increases in groundwater levels may affect material extraction from the quarry;
Droughts	• Drought restrictions on abstractions may affect availability of water leading to reduced water for processing use and dust control.
Wildfires	• Wildfires can cause extensive damage to quarry infrastructure; • Working activities may have to be suspended during a wildfire to ensure safety of their employees and equipment; and, • Wildfires can cause damage to access roads and transportation routes;

11.4.2.2 Frequency of Climate Hazards

Based on the Annex B Guidelines on current climate hazards, the frequency of the climate hazards were quantified through an analysis of available information. The frequency scores assigned, rated between 1-5 for each hazard, are justified below (Table 11-6).

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Table 11-6: Frequency of Climate Hazards

Climate Hazard	Frequency Score	Frequency Description	Justification
Flooding	1	Rare	According to the CFRAM Flood Information maps, the Proposed Development is not located within a zone which is impacted by Fluvial or River Flood Extents. There is evidence for one single flood event and one reoccurring flood event located within 2.5km of the Proposed Development. However, these floods are not located within the boundary of the Site.
Heatwaves/Droughts	3	Common	According to the OCC Climate Action Plan a heatwave is indicated by five consecutive days of maximum temperatures exceeding over 25°C. According to temperature data from the Mullingar station (ca. 35km to the NE of the Proposed Development) the following number of classified heatwaves occurred: • Between 1975 to 1990, two heatwaves occurred (July, '83 and July '89). • Between 1991-2005, one heatwave was recorded (August '95) • Between 2006 and 2022, three heatwaves were recorded (July '13, Jun '18, July '21) including the longest consecutive days of temperatures above 25°C (eight days in 2021)
Cold Snap	4	Frequent	According to Met Eireann an orange weather warning occurs when low temperatures are expected to be below -5°C. The minimum temperature values from the Mullingar station indicates that minimum temperatures were below the -5°C threshold a total of 189 times. The breakdown in cold snaps can be described as following: • Between 1975-1990 a total of 70 days had minimum temperatures below the threshold (1.2% of all days). • Between 1990-2005 a total number of 41 days had minimum temperatures below the threshold (0.7% of all days). • Between 2005 and 2022 a total number of 78 days had minimum temperatures below the threshold (1.3% of all days)
Landslides	1	Rare	According to the Geological Survey of Ireland (Landslide Susceptibility Map) there are no recorded landslides within 10km of the Proposed Development. The susceptibility of the Proposed Development to landslides has been classified as "Moderately Low".

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Climate Hazard	Frequency Score	Frequency Description	Justification
Extreme Rainfall	3	Common	According to Met Eireann, an orange weather warning for rainfall occurs when daily precipitation exceeds 50mm in a single day. The daily precipitation totals from the Mullingar station indicates that 39 days had rainfall which exceeded 50mm. to summarise: • Between 1975 and 1990, two days exceeded the 50mm threshold (Dec '84, Oct '87); • Between 1991 to 2005, two days exceeded the threshold June '93, Oct '95); and, • Between 2006 and 2022, three days exceeded the 50mm threshold (September '10, August '14 and Aug' 21)
Wildfires	1	Rare	According to the Global Wildfire Information Service, there is no evidence for wildfire activity within 5km of the Proposed Development between 2002 and 2022.

It is important to recognise that there can be co-occurrences of multiple hazards (such as prolonged dry temperatures increasing the risk of wildfire). However, given the small spatial nature of the Proposed Development and the rarity of associated hazards, these impacts are not considered further.

11.4.2.3 Potential Impacts of Current Climate Risks

The impacts of current climate risks will result in the disruption to the delivery service and function expected to be performed by the Proposed Development. For each of the climate hazards identified, the potential impacts are categorised as "Asset Damage" and will be determined in accordance with the Annex B Guidelines (Appendix 11-1). This quantification of potential impacts will be determined for each of the receptors identified. See Table 11-7 below.

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Table 11-7: Potential Impacts of Receptors to "Asset Damage" as a result of climate change

Receptors	Climate Hazard	Impact Score	Classified Asset Impact	Justification
Onsite Assets	Wildfires	2	Minor	The highest impacts associated with onsite assets would be from a landslide events. Although the nature of activities located within a void given the high permeability to the quarry void will allow rainfall to percolate away. Assets would be particularly vulnerable to moving mass. However, the Proposed Development will create a safe working gradient which are properly designed and suitable to stabilise slopes to minimise the risk of landslides occurring to onsite assets. The asset damage category of minor is defined as "an adverse event that can be absorbed by taking business continuity action".
	Heatwaves/ Droughts	1	Negligible	
	Cold Snaps	2	Minor	
	Extreme Rainfall	2	Minor	
	Flooding	2	Minor	
	Landslides	2	Minor	
Inputs (Electricity and Water)	Wildfires	2	Minor	According to the OCC Climate Adaption strategy, storms, snow and extreme rainfall will result in service disruptions and increased pressure on electricity systems The asset damage category of moderate is defined as "a serious event that requires additional emergency business continuity".
	Heatwaves/ Droughts	2	Minor	
	Cold Snaps	3	Moderate	
	Extreme Rainfall	3	Moderate	
	Flooding	3	Moderate	
	Landslides	2	Minor	
Outputs	Wildfires	2	Minor	Due to the nature of activities associated with the Proposed Development (processing and extraction of earth material) the highest level of impact for a hazard was for a landslide event. However, given the equipment and operations onsite to reduce landslide occurring this hazard was classified as Minor.
	Heatwaves/ Droughts	1	Negligible	
	Cold Snaps	1	Negligible	
	Extreme Rainfall	2	Minor	

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Receptors	Climate Hazard	Impact Score	Classified Asset Impact	Justification
	Flooding	2	Minor	The asset damage category of minor is defined as "an adverse event that can be absorbed by taking business continuity action".
	Landslides	2	Minor	
Transport Links	Wildfires	1	Negligible	The highest level of impact that would potentially impact the transport links associated with the Proposed Development would be a flood event, classified as minor. This would be due to the nature of infrastructure, haul routes and internal road networks, would not have the adequate capacity to respond to a flood event compared to more complex road networks,
	Heatwaves/ Droughts	1	Negligible	
	Cold Snaps	2	Minor	
	Extreme Rainfall	1	Negligible	
	Flooding	2	Minor	
	Landslides	2	Minor	

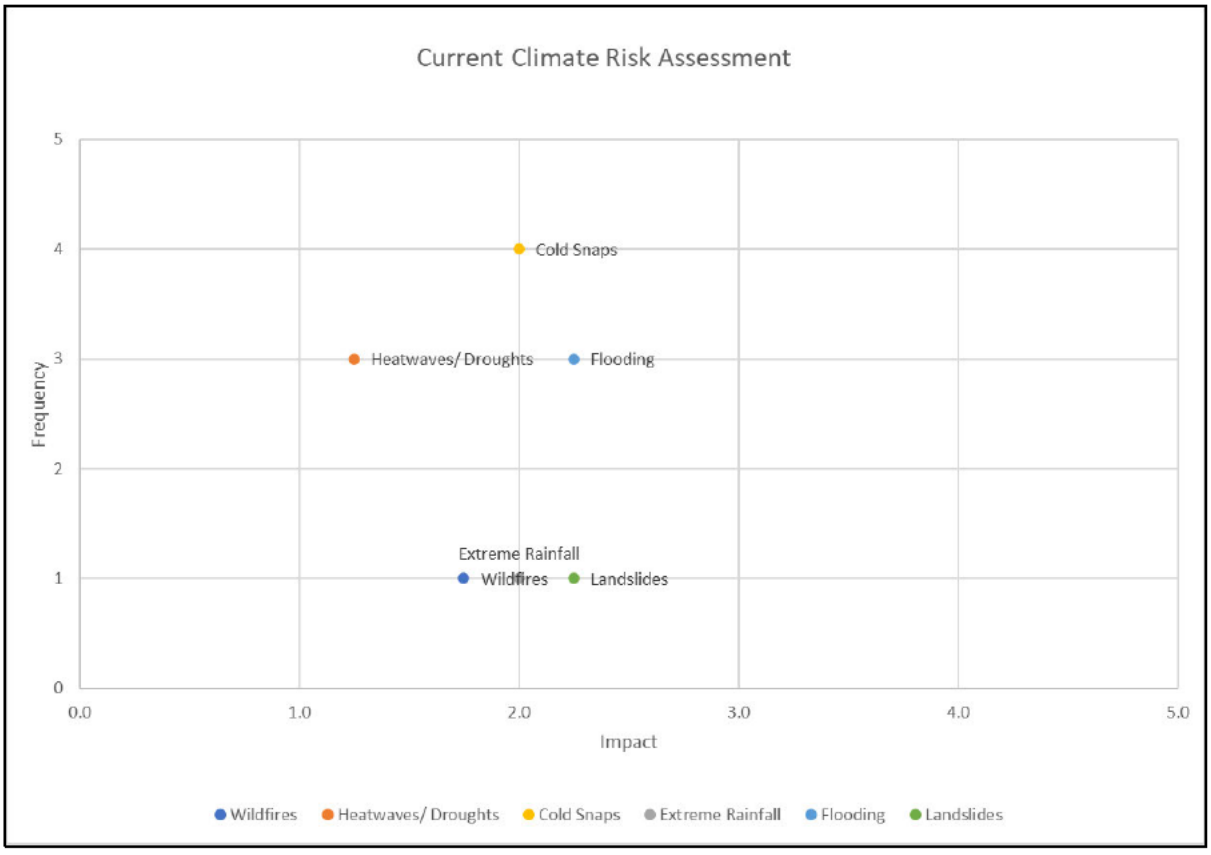
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Based on a qualitative judgement of impacts of assets across all the receptors identified, the frequency and impact score for each hazard was identified and classified for the Proposed Development (Table 11-8 below) with an illustrative graph presented in Figure 11-2.

Table 11-8: Summary of Current Climate Impacts for the Hazards Identified.

Hazard Type	Curren frequency	Current Frequency Score	Average Impact Score (Across All Receptors)
Flooding	Rare	1	2.3
Heatwaves/Droughts	Common	3	1.3
Cold Snaps	Frequent	4	2.0
Landslides	Rare	1	2.3
Extreme Rainfall	Common	3	2.0
Wildfires	Rare	1	2.0

Figure 11-2: Classification of Climate Hazards



* Frequency is measured between 1 (Rare) to 5 (Very Frequent). Impact is measured between 1 (Negligible) to 5 (Catastrophic). Further details are presented in Appendix 11-1.

Based on the availability of information, it is not possible to quantify the potential future climate risks associated with wildfires and landslides. Based on this, and their current frequency, the potential effects of these hazards on the Proposed Development are considered not likely and not significant.

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11.4.2.4 Potential Future Climate Risk

Understanding how climate change risks may evolve in the future is fundamental to identifying how existing risks may change as a result of climate change.

Table 11-9 below presents the future changes in climate hazards expected due to climate change, based on a desk-based review of the Climate Ireland platform. As assets are expected to remain similar throughout the Operational Phase of the Proposed Development, the level of impacts from these hazards will remain the same. Whilst the Operational Phase of the Proposed Development is expected to cease in ca. 2055, for a complete understanding of future climate risks, the CMIP climate scenarios outlined by Climate Ireland (RCP4.5 and RCP8.5) for the future period 2021-2050 will be discussed.

The Climate Ireland platform was used to determine the potential changes in frequency of these hazards. All climate hazards were assessed relative to the Proposed Development area as far as practicable.

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Table 11-9: Future Changes in climate hazards expected due to Climate Change

Climate Hazard	Current Frequency Description	Future Frequency Description	Justification
Flooding	Rare	Rare	According to the CRAM Flood maps, the Proposed Development does not fall within the Mid-Range/High-End future scenario for Fluvial, Coastal or River Flood Extents. Given there is no change in the current and potential future change in frequency of flood events associated with the Proposed Development, the projected frequency of future flooding will remain rare.
Heatwaves/Droughts	Common	Frequent	According to the Climate Ireland platform under RCP4.5 and RCP8.5, the number of heatwaves impacting the area associated with the Proposed Development are expected to increase by 0.2 and 0.27 heatwaves. Given the area associated with the Proposed Development shows higher levels of projected drought occurrences (Figure 11-3 below), compared to the rest of the country, the frequency of the hazard has been upgraded to Frequent.
Cold Snap	Frequent	Frequent	According to the Climate Ireland platform, under RCP4.5 the number of ice days (where the number of days when maximum temperature is <0°C) are expected to increase by 0.2 days between 2021-2050 associated with the Proposed Development. Under RCP8.5, the number of ice days are expected to increase by 0.17 days over the same period. Due to the low change in frequency expected for ice days, the frequency of cold snaps hazards will remain as Frequent (Figure 11-4 below).
Extreme Rainfall	Common	Common	According to the Climate Ireland platform, under RCP4.5 the number of days where precipitation will exceed 20mm (classified as a "Wet Day") is expected to be ca. 2.5 days. The number of wet days are modelled as 2.5 days under RCP8.5 also (Figure 11-5 below). Given the existing frequency of current rainfall events, under future climate change, the frequency of extreme rainfall is also classified as Common.

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Figure 11-3: RCP4.5 and RCP8.5 Projected changes in number of heatwaves (2021-2050)

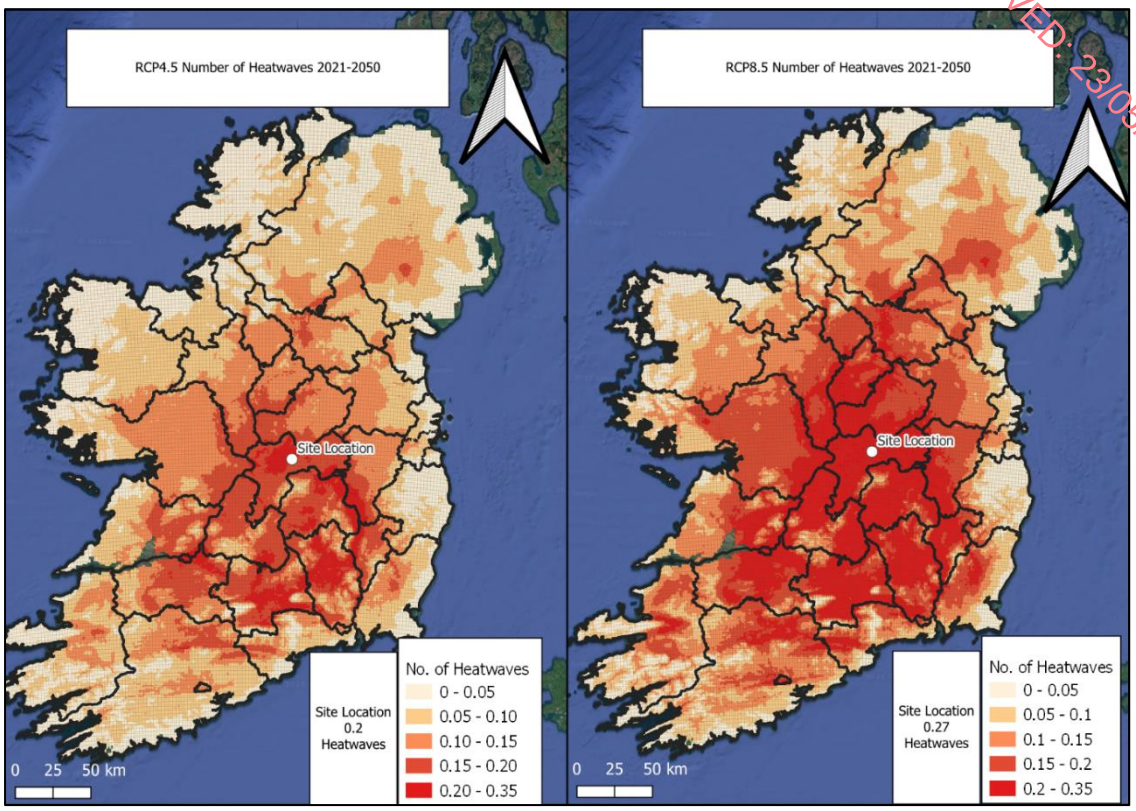
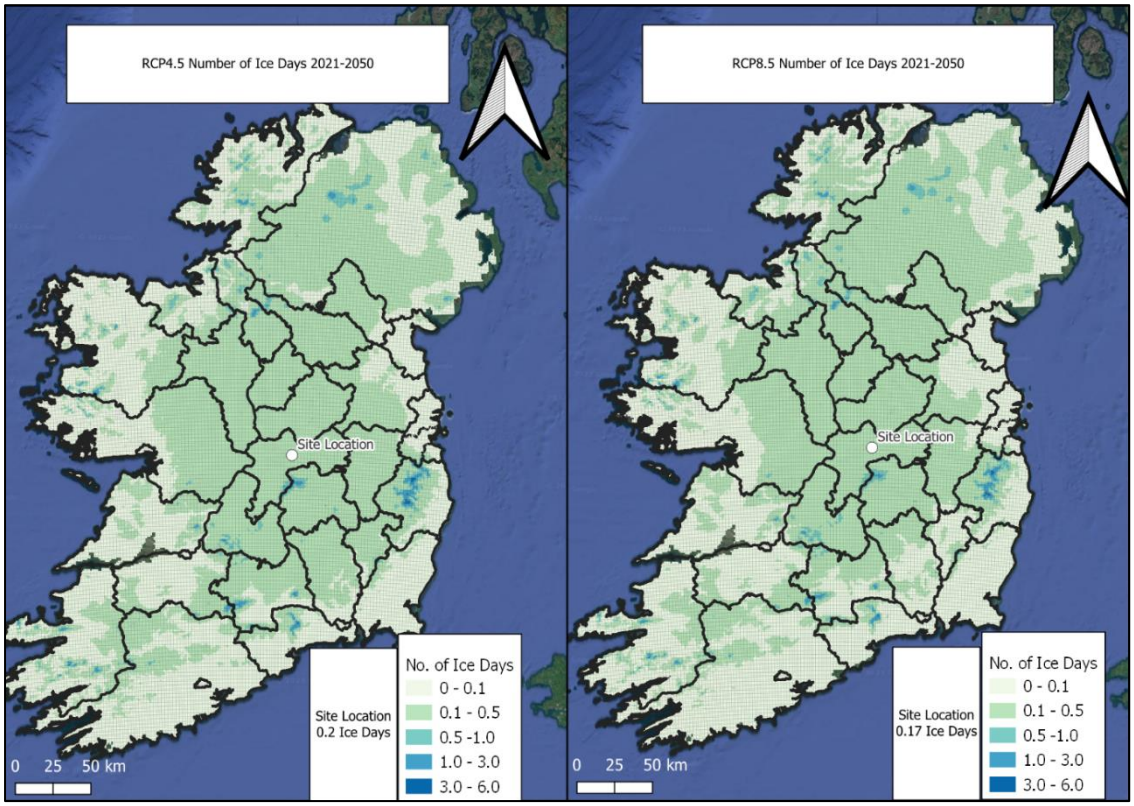
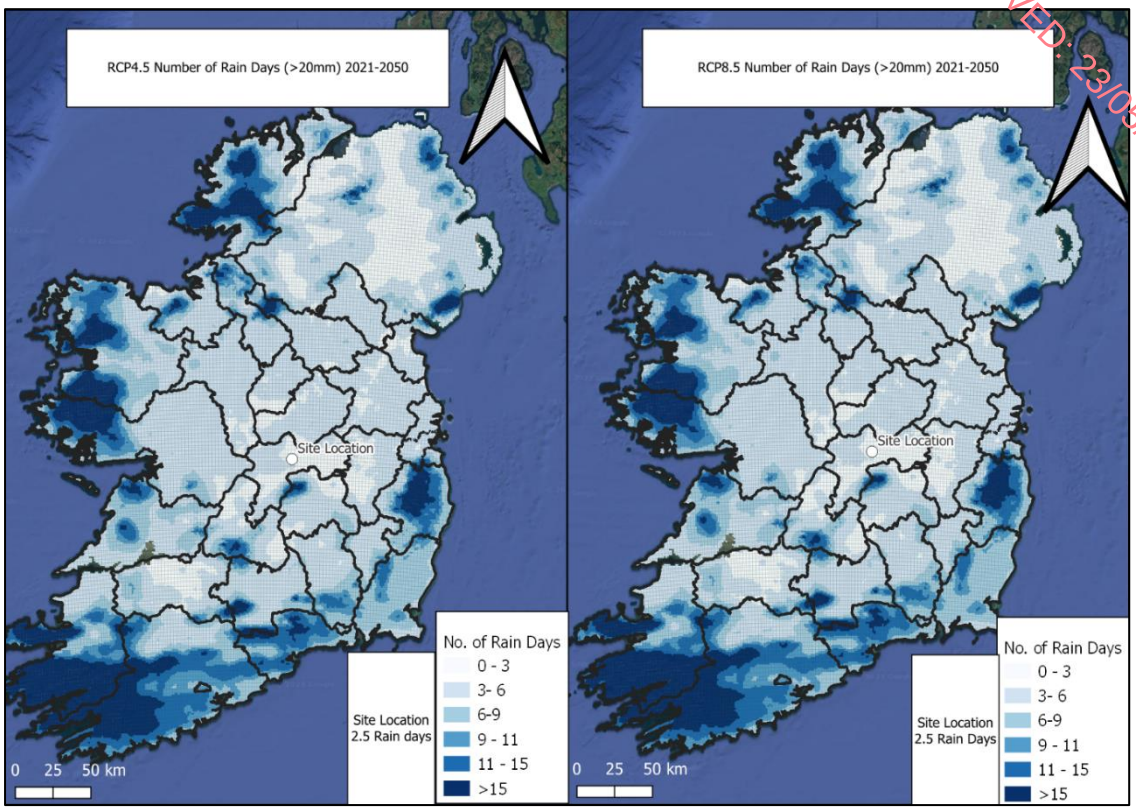


Figure 11-4: RCP4.5 and RCP8.5 Projected Changes in number of ice days (2021-2050)



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Figure 11-5: RCP4.5 and RCP8.5 Projected Changes in number of ice days (2021-2050)



Based on the availability of evidence, the frequency of most climate hazards associated with the Proposed Development will remain the same under future climate conditions. The frequency of heatwaves is expected to increase as a result of future climate change.

Due to the nature of the hazards identified and their understood change in frequency under future climate change, the county council climate adaption strategy is deemed appropriate to the scale of activities associated with the Proposed Development.

As the extractive industry is not currently covered as part of the climate adaption strategy for Offaly County Council, the indirect adaption measures proposed (such as sustainable management of water resources in response to drought conditions, and road improvement schemes as a result of cold and warm weather) are deemed applicable to the Proposed Development. As such the impacts of climate on the Proposed Development are considered not significant in the context of these local climate adaption strategies.

11.4.3 Greenhouse Gas Assessment

11.4.3.1 Operational Phase

The calculation of GHG emissions associated with Scope 1, Scope 2 and Scope 3 emissions, follows the methodology outlined by the IEMA Guidance [121] and the use of emission factors provided by the TII Carbon Tool, created and managed by the Transport Infrastructure of Ireland [129]. The emissions will be calculated for a typical year (303 days) and were compared against the relevant sectoral emission ceilings to evaluate significance.

The Operational Phase is expected to last ca. 25-28 years. However, the assessment of GHG emissions in the context of national emissions was not completed past 2030 as the sectoral emission ceilings outline the difficulties in quantifying emissions from sectors post 2030 [130]. The extrapolation of emissions associated with the Proposed Development represents a conservative estimation, as changes in technology will likely reduce emissions in the future.

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As discussed in section 11.2.2 above, the Proposed Development is expected to use ca. 45,000 litres of diesel per annum to fuel onsite plant. These scope emissions equate to approximately 120 tCO_2e being released as a result of this process, refer to Table 11-10 below.

Table 11-10: Scope 1 Emissions in the context of National Carbon Budgets

GHG Emission Source	**Tonnes of CO_2e per year**
Scope 1 emissions (fuel usage)	120
GHG Emission Source	**Tonnes of CO_2e per year**
Plant emissions per annum (2025)	120
Irelands First National Carbon Budget 2021 to 2025	295,000,000
Contribution to remaining first sectoral carbon budget	0.00004%
GHG Emission Source	**Tonnes of CO_2e per year**
Extrapolation of plant emissions for period 2026 to 2030	600
Ireland's Second National Carbon Budget (2026 to 2030)	200,000,000
Contribution to the second national carbon budget	0.0003%

Based on the calculation of Scope 1 emissions, the operational phase of the Proposed Development would contribute to 0.00004% of Irelands First National Carbon Budget and 0.0003% to Ireland's Second National Carbon Budget.

Regarding Scope 2 emissions, the Proposed Development is expected to use ca. 395kWh per annum as outlined in section 11.2.2 above. Table 11-11 below details the GHG emissions associated with the annual electricity use from the operational phase of the Proposed Development in the context of the national sectoral ceilings.

Table 11-11: Scope 2 Electricity GHG Emissions Associated with the Proposed Development

GHG Emission Source	**Tonnes of CO_2e per year**
Scope 2 emissions (Electricity)	0.12
GHG Emission Source	**Tonnes of CO_2e per year**
Electricity emissions for period 2025	0.12
Electricity Sectoral Emission Ceiling 2021 to 2025	40,000,000
Contribution to remaining first sectoral carbon budget	0.0000003%
GHG Emission Source	**Tonnes of CO_2e per year**
Extrapolation of electricity emissions for period 2026 to 2030	0.6
Electricity Sectoral Emission Ceiling (2026 to 2030)	20,000,000

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GHG Emission Source	Tonnes of CO_2e per year
Contribution to the second national carbon budget	0.000003%

These scope emissions equate to approximately 0.12 tCO_2e GHG emissions across a typical year. Across the period associated with the first sectoral emission ceiling for the Electricity sector (2025), this would equate to 0.12tCO_2e and 0.6tCO_2e for the second sectoral emission ceiling period (2025-2030). These low emissions are considered insignificant in the context of the Electricity sectoral emission ceilings (<0.0001%).

For Scope 3 emissions, relating to HGV movements and employee vehicles, it is estimated that the total distance travelled by HGVs per day will equate to 3,000km, including return trips (909,000km annually) and 34km per day for the two employees (20,604km annually). Table 11-12 shows the direct emissions related to Transport that has been compared against the sectoral emissions for the Transport sector.

Table 11-12: Scope 3 Transport GHG Emissions Associated with the Proposed Development

GHG Emission Source	Tonnes of CO_2e per year
Scope 3 emissions (Transport)	1,007.92
GHG Emission Source	**Tonnes of CO_2e per year**
Transport emissions for period 2025	1,007.92
Transport Sectoral Emission Ceiling 2021 to 2025	54,000,000
Contribution to remaining first sectoral carbon budget	0.002%
GHG Emission Source	**Tonnes of CO_2e per year**
Extrapolation of plant emissions for period 2026 to 2030	5,039.60
Transport Sectoral Emission Ceiling (2026 to 2030)	37,000,000
Contribution to the second national carbon budget	0.014%

It is calculated that vehicle emissions related to the Proposed Development will emit 1,007.92 tonnes of CO_2e per annum from vehicles, based on a conservative estimation of current technologies. Compared to the sectoral emission ceiling from the first carbon budget based on one year of Operations, vehicle emissions would account for 0.002% of the overall budget. When these emissions are further extrapolated over a 5-year period, to reflect the 2026 to 2030 carbon budget, the Proposed Development would contribute to 0.014% of these emissions across the period.

Overall, the Proposed Development will emit ca. 1,128.04 tonnes of CO_2e per annum. In context of the first carbon budget that is 0.00038% of the budget (2025 – one year period) and in the context of the second carbon budget that is 0.0028% of the budget (extrapolation of GHG emissions for five-year period 2026-2030).

Due to the low contributions of GHG emissions to the relative sectoral emission ceiling and national carbon budget, the effects of the Proposed Development on climate are determined as “not significant”.

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11.5 Unplanned Events

No unplanned events that would have a major impact on GHG emissions associated with the Proposed Development could occur.

11.6 Proposed Mitigation Measures

Mitigation measures can be introduced to avoid, reduce and replace carbon emissions associated with the Proposed Development. These measures will follow the mitigation hierarchy, which includes the following approaches:

Avoid: The avoidance of GHG emissions involves strategies to minimise emissions by avoiding or reducing activities that contribute to them, including:

- Soil Management: Effective soil management practices, including stockpiling and berm creation, to minimise off-site transport and associated emissions.

Reduce: The reduction of GHG emissions focuses on implementing measures that minimise emissions during the Construction and Operational phases. These include:

- Plant: Screening plant, loading shovels and HGVs will be powered down when not in use, to reduce the idling of onsite plant and its associated fuel wastage and emission.

Replace: The replacement approach involves substituting high-emission activities or materials with lower-emission alternatives. These include:

- Site Equipment: Site equipment worn will be reused as far as practicable.

11.7 Interactions With Other Environmental Attributes

- Chapter 5 – Population and Human Health. Climate Change could obviously pose a serious risk to human health. The likely emissions associated with the Proposed Development were deemed not significant when compared to the relevant sectoral targets for the coming energy budgets;
- Chapter 6: Biodiversity: Climate Change has the potential to impact ecosystems. However, the effects of GHG emissions associated with the Proposed Development was determined as ‘not significant’;
- Chapter 8: Water: Climate Change can have a direct impact on water shown to be influencing the Proposed Development. The frequency of extreme rainfall events are expected to increase under changing climate conditions. The impact of Climate Change on the Proposed Development, with respects to flooding, was considered to be ‘not significant’; and,
- Chapter 14: Material Assets – Traffic and Transport: Climate Change is directly linked to GHG emissions, with road traffic considered one of the highest contributors to national emissions. The assessment on GHG emissions from vehicle movements associated with the Proposed Development has shown effects to be not significant.

11.8 Indirect Effect

There have been no significant or likely indirect effects identified outside of those previously assessed throughout this chapter.

11.9 Residual Effect

The effects of GHG emissions as a result of the Proposed Development will be ‘not significant’ based on the size and nature of the Proposed Development. The effects of climate on the Proposed Development will be ‘not significant’ based on the results of the climate change risk assessment.

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11.10 Monitoring

No monitoring of GHG emissions is required.

11.11 Reinstatement

The restoration phase of the Proposed Development outlines how the Site will be restored to an inert state. The effects of this phase on GHG emissions will likely result in a net sink of CO_2e in the future as a result of a revegetated landscape.

11.12 Difficulties Encountered

No difficulties were encountered.

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12 LANDSCAPE AND VISUAL

12.1 Introduction

This Landscape and Visual Impact Assessment ('LVIA') has been prepared in respect of a planning application for a Proposed Development at the existing Agall Quarry Complex, Agall, Co. Offaly, on behalf of Condron Concrete Limited. The LVIA report describes the landscape context of the Proposed Development and assesses the likely landscape and visual impacts of the scheme on the receiving environment.

Landscape Impact Assessment ('LIA') relates to assessing effects of a development on the landscape as a resource in its own right and is concerned with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character.

Visual Impact Assessment ('VIA') relates to assessing the effects of a development on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements. Visual impacts may occur from; Visual Obstruction (blocking of a view, be it full, partial or intermittent) or; Visual Intrusion (interruption of a view without blocking).

This LVIA uses methodology as prescribed in the following guidance documents:

- EPA *'Guidelines on the Information to be contained in Environmental Impact Assessment Reports'* (2022) [18];
- Landscape Institute and IEMA '*Guidelines for Landscape and Visual Impact Assessment (GLVIA)*, Third Edition (2013) [136]; and,
- *'Photography and Photomontage in Landscape and Visual Impact Assessment'*, Landscape Institute Technical Guidance Note 06/2019 (2019) [137].

12.2 Methodology

Production of this Landscape and Visual Impact Assessment involved:

- A desktop study to establish an appropriate study area, relevant landscape and visual designations in the current Offaly County Development Plan as well as other sensitive visual receptors. This stage culminates in the selection of a set of potential viewpoints from which to study the effects of the proposal;
- Fieldwork to establish the landscape character of the receiving environment and to confirm and refine the set of viewpoints to be used for the visual assessment stage;
- Assessment of the significance of the landscape impact of the development as a function of landscape sensitivity weighed against the magnitude of the landscape impact;
- Assessment of the significance of the visual impact of the development as a function of visual receptor sensitivity weighed against the magnitude of the visual impact. This aspect of the assessment is supported by photomontages prepared in respect of the selected viewpoints, refer to Volume 3 Appendix 12-1; and,
- Incorporation of mitigation measures to reduce potential impacts and estimation of residual impacts once mitigation has become established.

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12.2.1 Landscape Impact Assessment Criteria

When assessing the potential impacts on the landscape resulting from a Proposed Development, the following criteria are considered:

- Landscape character, value and sensitivity;
- Magnitude of likely impacts; and,
- Significance of landscape effects.

The sensitivity of the landscape to change is the degree to which a particular landscape receptor (Landscape Character Area ('LCA') or feature) can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics. Landscape Value and Sensitivity is classified using the following criteria set out in Table 12-1.

Table 12-1: Landscape Value and Sensitivity

Sensitivity	Description
Very High	Areas where the landscape character exhibits a very low capacity for change in the form of development. Examples of which are high value landscapes, protected at an international or national level (World Heritage Site/National Park), where the principal management objectives are likely to be protection of the existing character.
High	Areas where the landscape character exhibits a low capacity for change in the form of development. Examples of which are high value landscapes, protected at a national or regional level (Area of Outstanding Natural Beauty), where the principal management objectives are likely to be considered conservation of the existing character.
Medium	Areas where the landscape character exhibits some capacity and scope for development. Examples of which are landscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use.
Low	Areas where the landscape character exhibits a higher capacity for change from development. Typically, this would include lower value, non-designated landscapes that may also have some elements or features of recognisable quality, where landscape management objectives include, enhancement, repair and restoration.
Negligible	Areas of landscape character that include derelict, mining, industrial land or are part of the urban fringe where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of landscape improvements and/or restoration to realise a higher landscape value.

The magnitude of a predicted landscape impact is a product of the scale, extent or degree of change that is likely to be experienced as a result of the Proposed Development. The magnitude considers whether there is a direct physical impact resulting from the loss of landscape components and/or a change that extends beyond the Site boundary that may have an effect on the landscape character of the area. Refer to Table 12-2 below.

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Table 12-2: Magnitude of Landscape Impacts

Magnitude of Impact	Description
Very High	Change that would be large in extent and scale with the loss of critically important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value and quality.
High	Change that would be more limited in extent and scale with the loss of important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value and quality.
Medium	Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to changes in landscape character, and quality.
Low	Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements.
Negligible	Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable.

The significance of a landscape impact is based on a balance between the sensitivity of the landscape receptor and the magnitude of the impact. The significance of landscape impacts is arrived at using the following matrix set out in Table 12-3 below.

Table 12-3: Significance Matrix

	Sensitivity of Receptor				
Scale/Magnitude	***Very High***	***High***	***Medium***	***Low***	***Negligible***
Very High	Profound	Profound-substantial	Substantial	Moderate	Minor
High	Profound-substantial	Substantial	Substantial-moderate	Moderate-slight	Slight-imperceptible
Medium	Substantial	Substantial-moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

12.2.2 Visual Impact Assessment Criteria

As with the landscape impact, the visual impact of the Proposed Development will be assessed as a function of sensitivity versus magnitude. In this instance, the sensitivity of the visual receptor, weighed against the magnitude of the visual effect.

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12.2.2.1 Sensitivity of Visual Receptors

Unlike landscape sensitivity, the sensitivity of visual receptors has an anthropocentric basis. It considers factors such as the perceived quality and values associated with the view, the landscape context of the viewer, the likely activity they are engaged in and whether this heightens their awareness of the surrounding landscape. A list of the factors considered by the assessor in estimating the level of sensitivity for a particular visual receptor is outlined below and used in Table 12-6 below to establish visual receptor sensitivity at each VRP:

1) **Susceptibility of Receptors** - In accordance with the Institute of Environmental Management and Assessment ('IEMA') Guidelines for Landscape and Visual Assessment (3rd edition 2013) visual receptors most susceptible to changes in views and visual amenity are:
    - *"Residents at home;*
    - *People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views;*
    - *Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience;*
    - *Communities where views contribute to the landscape setting enjoyed by residents in the area; and,*
    - *Travellers on road, rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened".*

Visual receptors that are less susceptible to changes in views and visual amenity include;

- *"People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape; and,*
- *People at their place of work whose attention may be focussed on their work or activity, not their surroundings and where the setting is not important to the quality of working life".*

2) **Recognised scenic value of the view** (County Development Plan designations, guidebooks, touring maps, postcards etc). These represent a consensus in terms of which scenic views and routes within an area are strongly valued by the population because in the case of County Developments Plans, for example, a public consultation process is required;
3) **Views from within highly sensitive landscape areas.** Again, highly sensitive landscape designations are usually part of a county's Landscape Character Assessment, which is then incorporated within the County Development Plan and is therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the landscape around them;
4) **Primary views from dwellings.** A Proposed Development might be seen from anywhere within a particular residential property with varying degrees of sensitivity. Therefore, this category is reserved for those instances in which the design of dwellings or housing estates, has been influenced by the desire to take in a particular view. This might involve the use of a slope or the specific orientation of a house and/or its internal social rooms and exterior spaces;
5) **Intensity of use, popularity.** This relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at county or regional scale;

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6) **Connection with the landscape.** This considers whether or not receptors are likely to be highly attuned to views of the landscape i.e. commuters hurriedly driving on busy national route versus hill walkers directly engaged with the landscape enjoying changing sequential views over it;
7) **Provision of elevated panoramic views.** This relates to the extent of the view on offer and the tendency for receptors to become more attuned to the surrounding landscape at locations that afford broad vistas;
8) **Sense of remoteness and/or tranquillity.** Receptors taking in a remote and tranquil scene, which is likely to be fairly static, are likely to be more receptive to changes in the view than those taking in the view of a busy street scene, for example;
9) **Degree of perceived naturalness.** Where a view is valued for the sense of naturalness of the surrounding landscape it is likely to be highly sensitive to visual intrusion by distinctly manmade features;
10) **Presence of striking or noteworthy features.** A view might be strongly valued because it contains a distinctive and memorable landscape feature such as a promontory headland, lough or castle;
11) **Historical, cultural and / or spiritual significance.** Such attributes may be evident or sensed by receptors at certain viewing locations, which may attract visitors for the purposes of contemplation or reflection heightening the sense of their surroundings;
12) **Rarity or uniqueness of the view.** This might include the noteworthy representativeness of a certain landscape type and considers whether the receptor could take in similar views anywhere in the broader region or the country;
13) **Integrity of the landscape character.** This looks at the condition and intactness of the landscape in view and whether the landscape pattern is a regular one of few strongly related components or an irregular one containing a variety of disparate components;
14) **Sense of place.** This considers whether there is special sense of wholeness and harmony at the viewing location; and,
15) **Sense of awe.** This considers whether the view inspires an overwhelming sense of scale or the power of nature.

Those locations which are deemed to satisfy many of the above criteria are likely to be of higher sensitivity. Overall sensitivity may be a result of a number of these factors or, alternatively, a strong association with one or two in particular.

12.2.2.2 Visual Impact Magnitude

The magnitude of visual effects is determined on the basis of two factors; the visual presence (relative visual dominance) of the Proposed Development and its effect on visual amenity.

Visual presence is a somewhat quantitative measure relating to how noticeable or visually dominant the Proposed Development is within a particular view. This is based on a number of aspects, aside from scale in relation to distance. Some of these aspects include the extent and complexity of the view, as well as the degree of existing contextual movement experienced. The backdrop against which the development is presented and its relationship with other focal points or prominent features within the view is also considered. Visual presence is essentially a measure of the relative visual dominance of the proposal within the available vista and is often, though not always, expressed as one of the following terms:

- Minimal;

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- Sub-dominant;
- Co-dominant;
- Dominant; and,
- Highly dominant.

Given that the Proposed Development, apart from the proposed berms, will be below current levels within the application site boundary, visual impacts will result almost entirely from visual 'intrusion' rather than visual 'obstruction' (the blocking of a view). The magnitude of visual impacts is classified in Table 12-4 below.

Table 12-4: Magnitude of Visual Impact

Criteria	Description
Very High	The proposal intrudes into a large proportion or critical part of the available vista and is without question the most noticeable element. A high degree of visual clutter or disharmony is also generated, strongly reducing the visual amenity of the scene.
High	The proposal intrudes into a significant proportion or important part of the available vista and is one of the most noticeable elements. A considerable degree of visual clutter or disharmony is also likely to be generated, appreciably reducing the visual amenity of the scene.
Medium	The proposal represents a moderate intrusion into the available vista, is a readily noticeable element and/or it may generate a degree of visual clutter or disharmony, thereby reducing the visual amenity of the scene. Alternatively, it may represent a balance of higher and lower order estimates in relation to visual presence and visual amenity.
Low	The proposal intrudes to a minor extent into the available vista and may not be noticed by a casual observer and/or the proposal would not have a marked effect on the visual amenity of the scene.
Negligible	The proposal would be barely discernible within the available vista and/or it would not detract from, and may even enhance, the visual amenity of the scene.

12.2.2.3 Visual Impact Significance

As stated above, the significance of visual impacts is a function of visual receptor sensitivity and visual impact magnitude. This relationship is expressed in the same significance matrix and applies the same EPA definitions of significance as used earlier in respect of landscape impacts (Table 12-3).

12.2.2.4 Quality and Timescale of Effects

In addition to assessing the significance of landscape effects and visual effects, EPA Guidance for EIAs requires that the quality of the effects is also determined. This could be negative/adverse, neutral, or positive/beneficial. In the case of new energy / infrastructure developments within rural and semi-rural settings, the landscape and visual change brought about by an increased scale and intensity of built form is seldom considered to be positive / beneficial.

Landscape and Visual effects are also categorised according to their duration:

- Temporary – Lasting for one year or less;
- Short Term – Lasting one to seven years;
- Medium Term – Lasting seven to fifteen years;
- Long Term – Lasting fifteen years to sixty years; and,

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- Permanent – Lasting over sixty years.

12.3 Existing receiving environment

12.3.1 Definition of the Study Area

From similar studies it is anticipated that the Proposed Development is likely to be difficult to discern beyond approximately 3km and is not likely to give rise to significant landscape or visual impacts beyond approximately 2km. In the interests of a comprehensive appraisal, a 3km radius study area was selected in this instance. See Figure 12-1 below.

Figure 12-1: Study Area



12.3.2 Landscape Baseline

The landscape baseline represents the existing landscape context and is the scenario against which any changes to the landscape brought about by the Proposed Development will be assessed. A description of the landscape context of the Proposed Development and wider study area is provided below under the headings of landform and drainage, vegetation and

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land use, centres of population and houses, transport routes and public amenities and facilities. Although this description forms part of the landscape baseline, many of the landscape elements identified also relate to visual receptors i.e. places and transport routes from which viewers can potentially see the Proposed Development. The visual resource will be described in greater detail in Section 12.3.4 Visual Baseline.

12.3.2.1 Landform and Drainage

This is a low land landscape interspersed with minor watercourses. A small stream (Killina) is the nearest watercourse adjacent to the northern side of the Proposed Development. It flows north and merges with the Clodiagh just before the Grand Canal. Shortly after this, the Clodiagh merges with the Tullamore River, the most substantial watercourse in the study area, flowing in a westerly direction through the northern portion of the study area. At a localised scale, the Proposed Development is contained on a localised plateau at ca. 70m Above Ordnance Datum ('AOD'), while portions of the study area sit at less than 50m AOD. Ardnagross Hill, in the southeastern extent of the study area, is the highest point in the local area.

12.3.2.2 Vegetation and Land Use

The predominant land use within the study area is agricultural farmland, contained in a small to medium-scale field pattern generally well-defined by treelined hedgerows (Figure 12-2 refers). The existing Agall Quarry dominates the central portion of the study area. Adjoining the southern perimeter of the Proposed Development is the Coillte Ballydaly woodland in the townland of Blackwood. Another quarry is located on the southern side of this woodland. Adjacent to the northern edge of the Proposed Development is a conifer plantation. To the west of this plantation is a portion of a larger exploited bog. There is an area of transitional scrub in the south-eastern extent of the study area in the townland of Cloghanbane. Tullamore River is flanked by riparian vegetation.

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Figure 12-2: Land use mix of the study area.



12.3.2.3 Centres of Population and Houses

The immediate environs of the Site are relatively sparsely populated, with just occasional farmsteads and a small settlement at Killina to the north. The settlement of Mucklagh lies approximately 3km southeast of the Site; nevertheless, there is a reasonably dispersed rural population along the local roads throughout the wider study area.

12.3.2.4 Transport Routes

The most notable transport route within the study area is the N52 national secondary road, which traverses the study area in an east-west orientation, passing the Site approximately 1.8km to the southeast. A very short section of the R357 regional road passed within the southwestern extent of the study area. The Site is bounded to the north by a local road. Additionally, there is a strong network of local roads across the study area.

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12.3.2.5 Ecological Designations

There are no ecological protections pertaining to the Site. The Grand Canal and Kilcormac Esker, located approximately 1.8km to the north and south of the Site respectively, are both proposed Natural Heritage Areas.

12.3.3 Landscape Planning Context

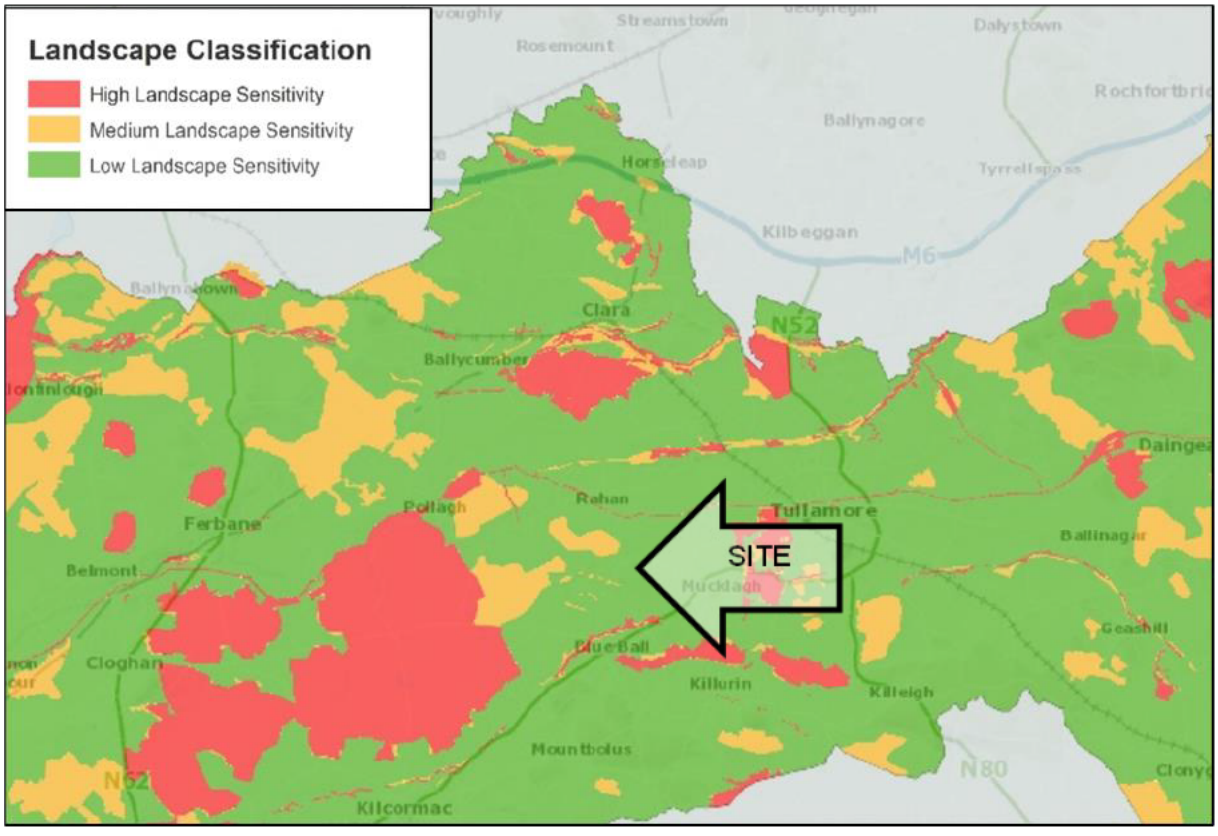
12.3.3.1 Offaly County Development Plan 2021-2027

Whilst a landscape character assessment has not yet been completed for the current Offaly OCDP [26], Chapter 4 – Biodiversity and Landscape of the current plan identifies several general landscape types and their associated sensitivity designations. The three landscape classifications include 'Low sensitivity', 'Moderate sensitivity' and 'High sensitivity'. The Site is shown to be in an area of 'Low Sensitivity' (Figure 12-3 refers) which:

> *"…are robust landscapes which are tolerant to change, such as the county's main urban and farming areas, which have the ability to accommodate development."*

There are areas with a 'high' sensitivity classification situated to the north and south of the Site associated with the Grand Canal and woodland on Kilcormac Esker respectively. There are areas with a 'medium' sensitivity classification dotted across the study area, the nearest being a strip of woodland located approximately 300m to the southwest of the Site boundary at the nearest point. An extensive list of landscape and amenity policies and objectives are also outlined in sub-section 4.16 and 4.17 of the OCDP. Figure 12- 3 below shows an extract of Map 4.22 of the OCDP, showing the approximate location of the Site in relation to landscape classifications in Offaly.

Figure 12-3: Landscape Classifications in Vicinity of the Site



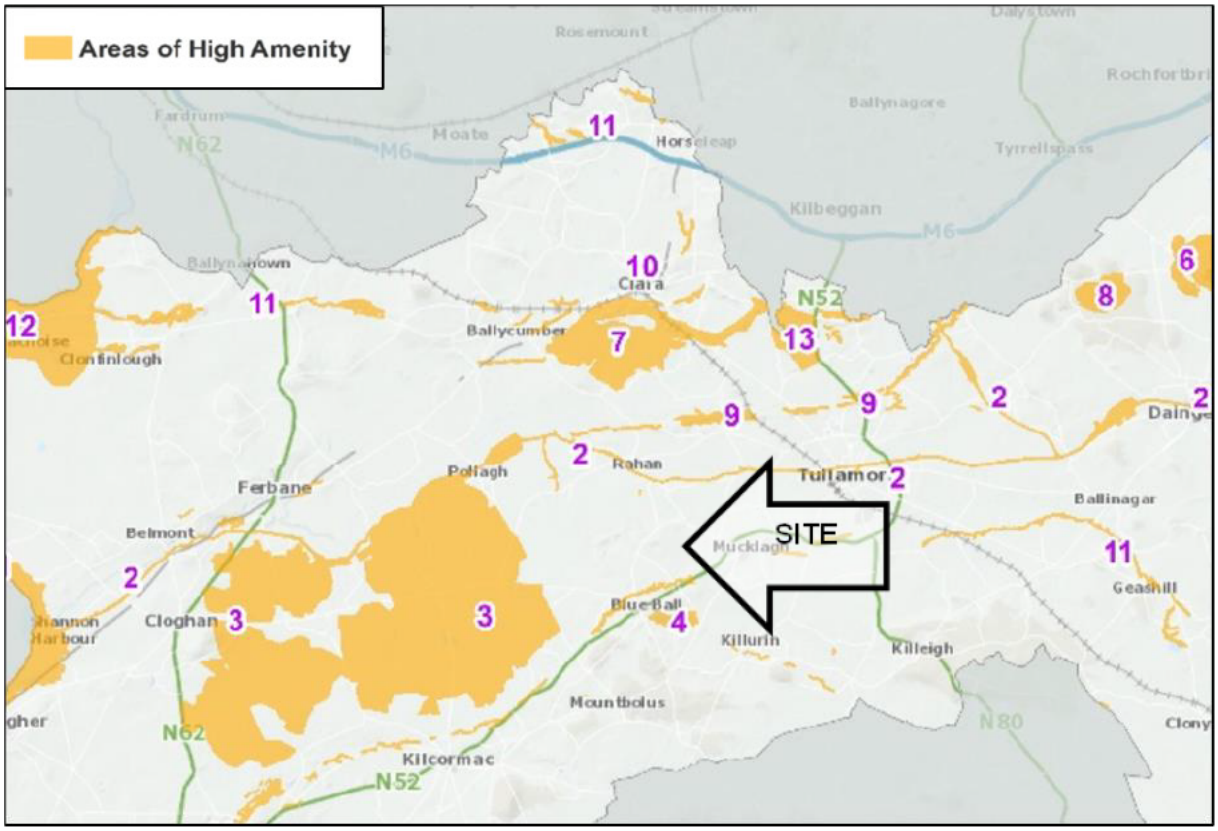
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The Offaly County Development Plan also identifies 'Areas of High Amenity' throughout the county as:

> *"…worthy of special protection / enhancement due to their uniqueness and scenic / amenity value."*

Within the study area these are the same areas as identified as 'High Sensitivity Landscapes' (see Figure12-3 above and Figure 12-4 below). Policy and objectives relating to areas of high amenity are outlined within the development plan in sub-section 7.9 and 7.10. Figure 12-4 below shows an extract of Map 4.18 of the OCDP 2021-2027 showing the approximate location of the Site in relation to Areas of High Amenity in Offaly.

Figure 12-4: Areas of High Amenity local to the Site



12.3.3.2 Views of Recognised Scenic Value

Views of recognised scenic value are primarily indicated within County Development Plans in the context of scenic views / routes designations, but they might also be indicated on touring maps, website, guidebooks, roadside rest stops or on post cards that represent the area.

Table 4.21 of the OCDP 2021-2027 lists views and prospects of special amenity value or special interest within County Offaly. See Figure 12-5 below for an extract of Figure 4.24 OCDP 2021-2027 showing the approximate location of the Site in relation to protected views. The nearest views to the Site are:

- 'V19', located south of the settlement of Rahan, approximately 1.5km to the northwest of the Site; and,
- 'V05', located approximately 1.9km southwest on the N52 national secondary road.

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Please note that both of these scenic viewpoints were scoped-out as a viewpoints for assessment at an early stage because neither are orientated towards the Proposed Development.

Figure 12-5: Protected Views in the Vicinity of the Site

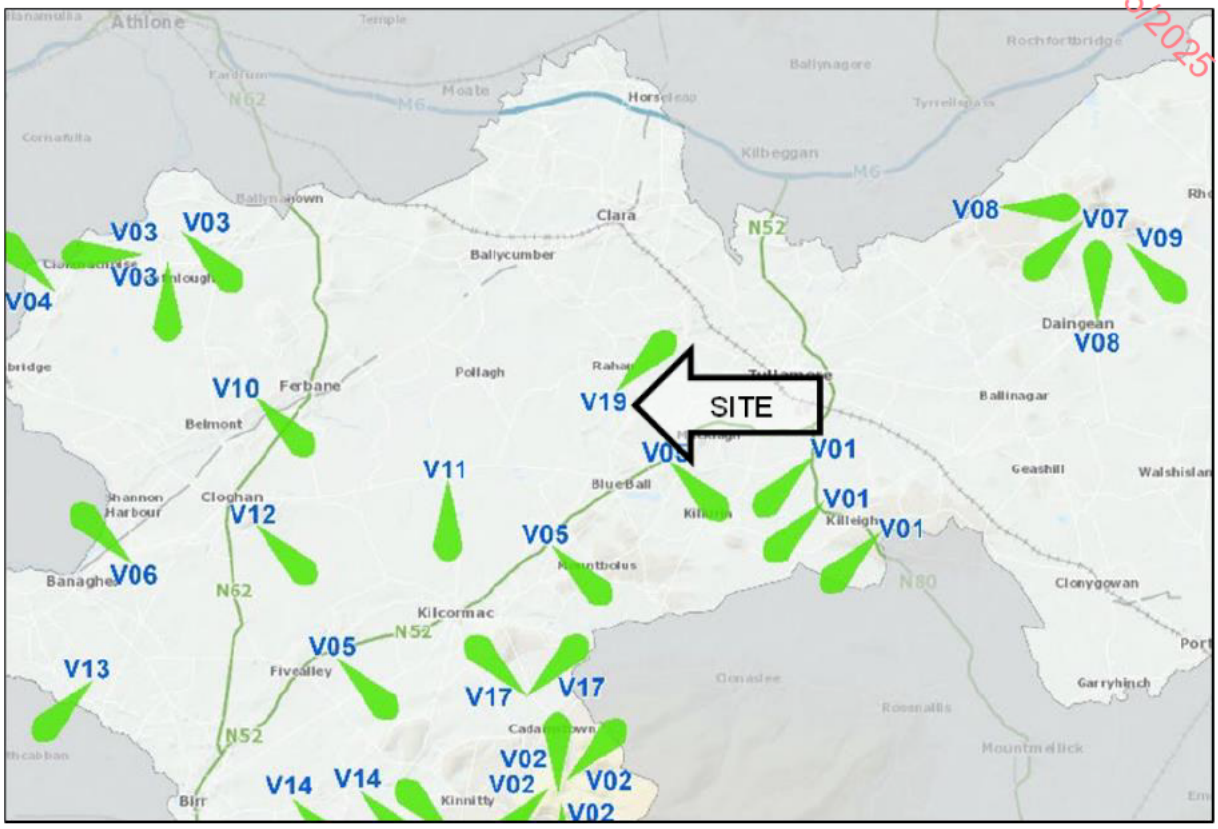
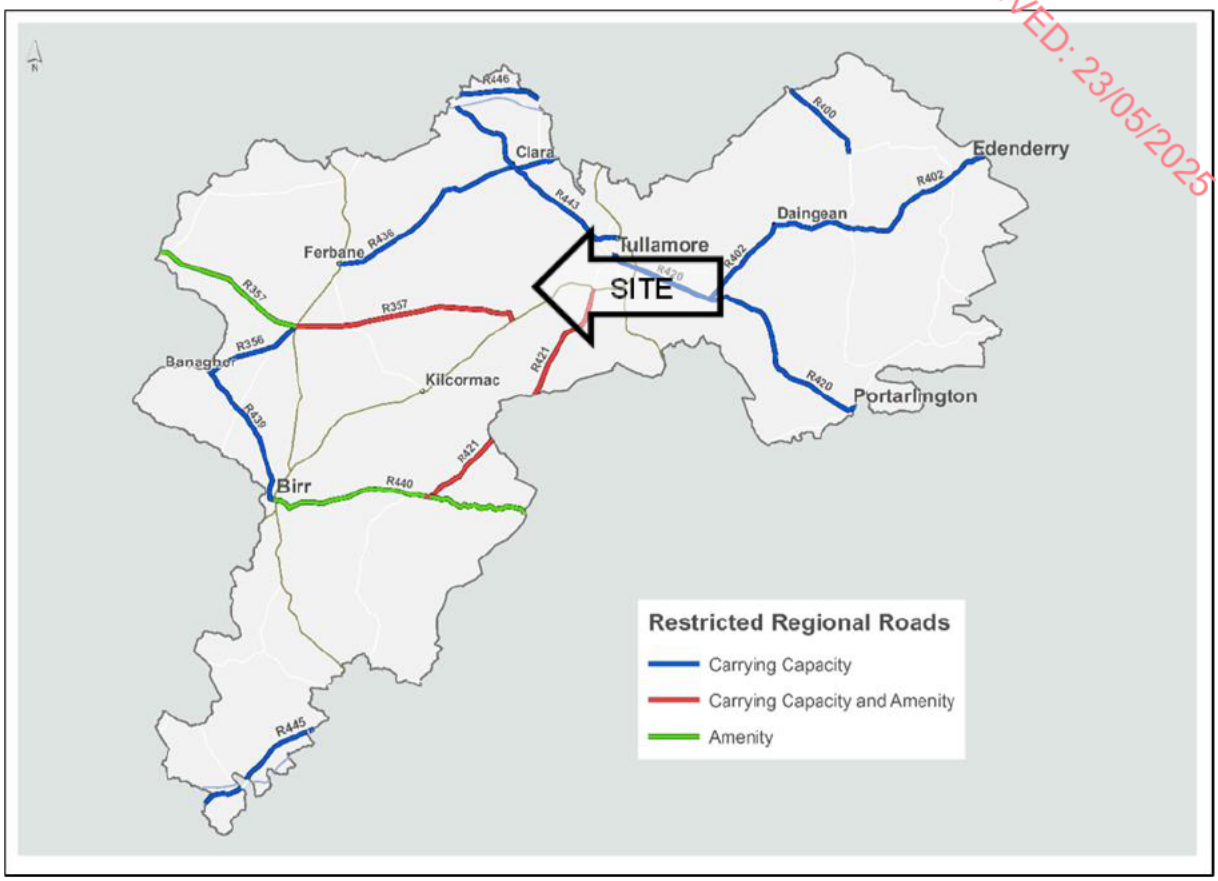


Table 4.22 of the OCDP Plan 2021-2027 lists Key Amenity Routes within County Offaly. These are also indicated on Figure 8.10 of Chapter 8 of the Offaly County Development Plan 2021-2027.

The short section of the R357 regional road which passes within the southwestern extents of the study area, approximately 2.4km from the Site, is identified as a 'Restricted Regional Road' with 'Carrying Capacity and Amenity' (Figure 12-6 below refers). (N.B. This Key Amenity Route was scoped-out for potential viewpoints for assessment at an early stage due to high levels of intervening screening in the direction of the Proposed Development.)

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Figure 12-6: Restricted Regional Roads in the Vicinity of the Site



12.3.4 Visual Baseline

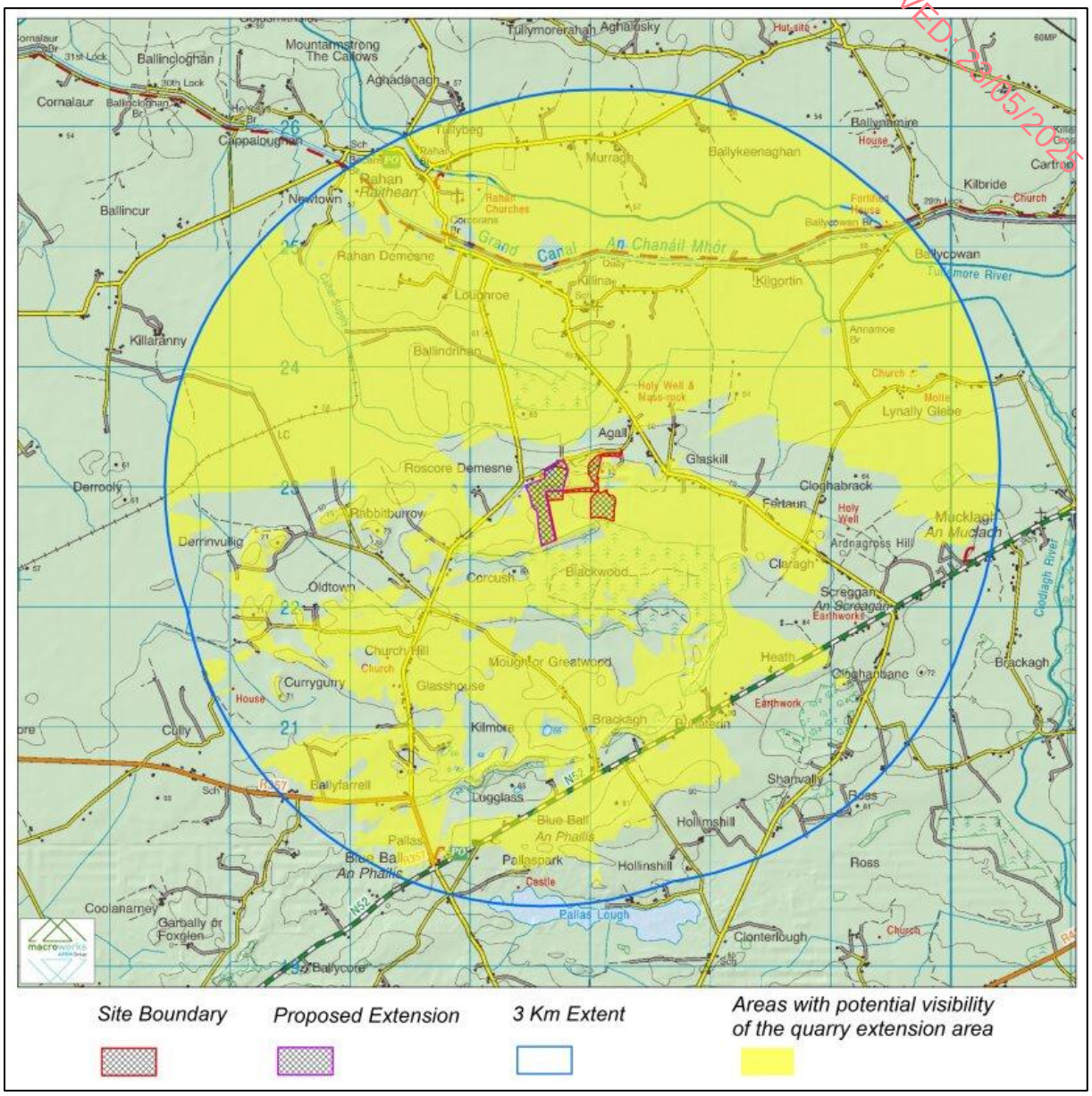
Only those parts of the study area that potentially afford views of the Proposed Development are of interest to this part of the assessment. Therefore, the first part of the visual baseline is establishing a Zone of Theoretical Visibility ('ZTV') and, subsequently, identifying important visual receptors from which to base the visual impact assessment.

12.3.4.1 Zone of Theoretical Visibility

A computer-generated ZTV map has been prepared to illustrate from where the Proposed Development is potentially visible. The ZTV below is based on a worst-case scenario for potential visibility within the study area. The ZTV map is based solely on terrain data (bare ground visibility), and ignores features such as trees, hedges or buildings, which may screen views. Given the complex vegetation patterns within this landscape, the main value of this form of ZTV mapping is to determine those parts of the landscape from which the Proposed Development will definitely not be visible, due to terrain screening within the 3km study area. Refer to Figure 12-7 below.

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Figure 12-7: Standard (bare-ground) ZTV map



The following key points are illustrated by the 'bare-ground' ZTV map (see Figure 12-7 above):

- The contours of the terrain mean there is no potential for views of the Proposed Development from some areas within the study area, most notably in the lower-lying parts of the more gently rolling lands in the southern half of the study area (where no colour is shown); and,
- The greatest potential for visibility of the Proposed Development will occur immediately surrounding the Site (where yellow colour is shown). These areas comprise primarily of agricultural fields and woodland to the north and south but also include dwellings on local roads to the east and west.

The most important point to make regarding this 'bare-ground' ZTV map is that it is theoretical. The Proposed Development will not rise more than the existing level of the terrain within that portion of the Site. Therefore, the Proposed Development will be considerably screened by

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surrounding and intervening hedgerow vegetation, trees, buildings and walls throughout the study area, resulting in a much lesser degree of actual visibility.

12.3.5 Identification of Viewshed Reference Points as a Basis for Assessment

Viewshed Reference Points ('VRPs') are the locations used to study the visual impacts of a proposal in detail. It is not warranted to include each and every location that provides a view of development as this would result in an unwieldy report and make it extremely difficult to draw out the key impacts arising from the Proposed Development. Instead, the selected viewpoints are intended to reflect a range of different receptor types, distances and angles. The visual impact of a Proposed Development is assessed by Macro Works using up to six categories of receptor type as listed below:

- Key Views (from features of national or international importance);
- Designated Scenic Routes and Views;
- Local Community views;
- Centres of Population;
- Major Routes; and,
- Amenity and heritage features.

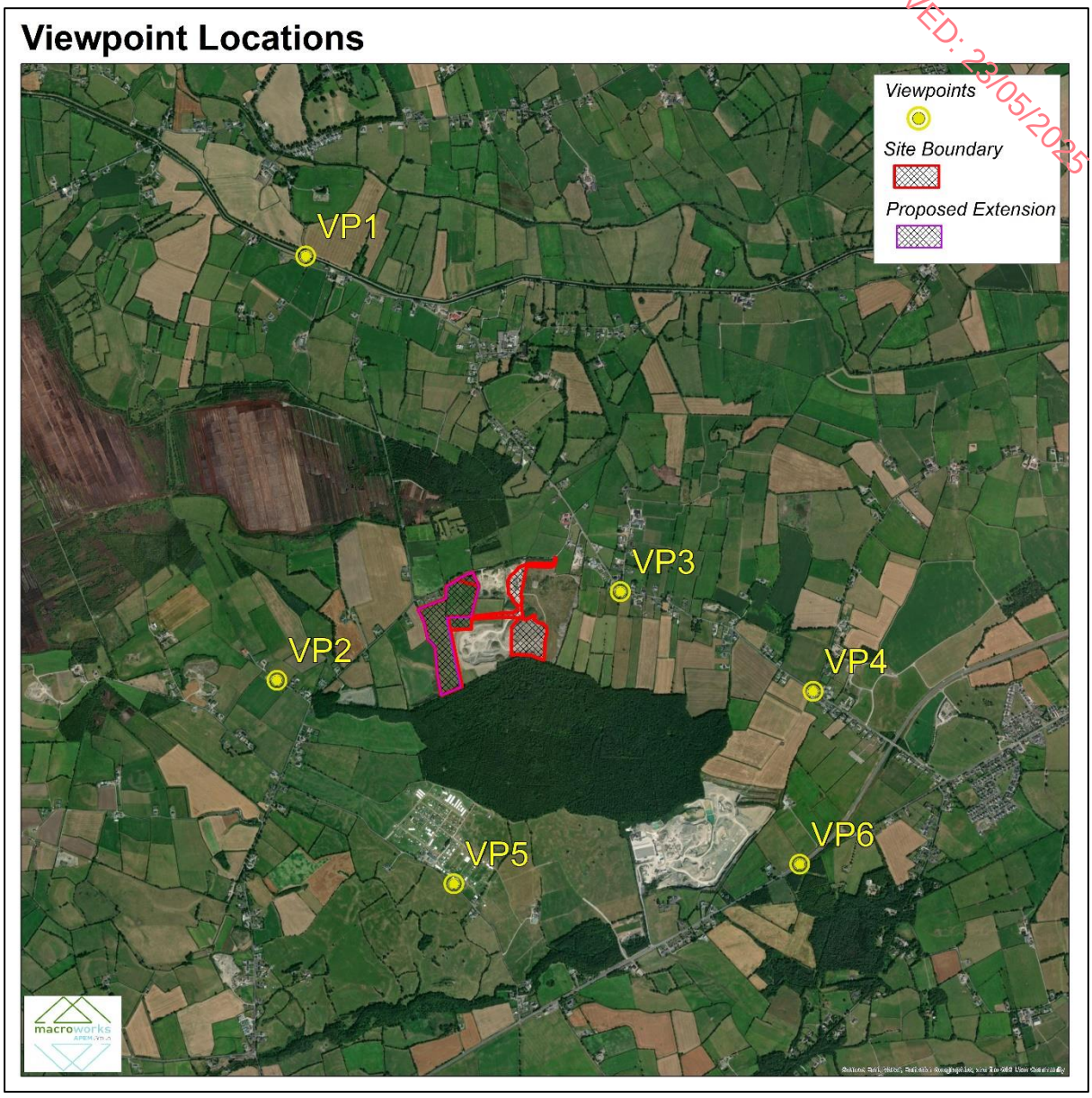
VRP's might be relevant to more than one category, and this makes them even more valid for inclusion in the assessment. The receptors that are intended to be represented by a particular VRP are listed at the beginning of each viewpoint appraisal. The VRPs selected in this instance are set out in the Table 12-5 and Figure 12-8 below.

Table 12-5: Outline Description of Selected Viewshed Reference Points (VRPs)

VRP No.	Location	Direction of view
VP1	Corcoran's Bridge on the Grand Canal at Loughroe	SE
VP2	Local road west of Site at Rabbitburrow	E
VP3	T-junction on Glaskill Lane at Glaskill	W
VP4	Local road east of Site at Claragh	W
VP5	Local road south of Site at Mough or Greatwood	N
VP6	N52 southeast of site at Heath	NW

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Figure 12-8: Viewpoint location map.



12.4 Characteristics and Potential Impacts of the Proposed Development

12.4.1 Proposed Development Characteristics

This LVIA assess the potential effects of the proposed continuation of, and extension to, the existing permitted and operational Agall Quarry area. The landholding (permitted, proposed and operational) covers an area of ca. 45ha. This includes the excavation of the area coved by permission 19.QD.0008, down to 65mOD in the western portion of the existing Agall Quarry.

- The Proposed Development covers an overall site area of ca.17ha and includes an extension of the existing Agall Quarry into the greenfield lands further to the west. This Proposed Development will involve the stripping of existing overburden to access the underlying aggregate within the proposed extraction area and will continue to excavate down to 63mOD; and,

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- The Proposed Development includes further excavation of an existing permitted area of ca. 3.81ha within the eastern portion of the existing Agall Quarry down to 63mOD.

It is important to note that the Proposed Development is an extension to the existing Agall Quarry and therefore, the potential for in-combination effects with ongoing operations within Agall Quarry have been considered throughout this report. The proposed operations onsite will emulate the existing excavation and processing operations within Agall Quarry. Upon removal of the aggregate reserve, the Site will undergo rehabilitation as per the Restoration Plan. An overview of the timelines associated with the Proposed Development are as follows;

- Construction Phase (Three- four months);
- Operational Phase (25-28 years); and,
- Restoration Phase (Two years).

12.4.2 Landscape Impact Assessment

12.4.2.1 Landscape Value and Sensitivity

Landscape value and sensitivity are considered in relation to several factors highlighted in the Guidelines for Landscape and Visual Impact Assessment 2013, which are set out below and discussed relative to the Site and wider study area.

Landscape quality (condition)

The study area comprises a mix of land uses. In the broader study area, the predominant land use is agricultural farmland, with quarrying evident in the central portions of the study area. Otherwise, this is a typical rolling rural landscape with relatively well-maintained field boundaries, comprising a mix of mature tree-lined hedgerows. Although this is a highly modified landscape, it is not degraded.

Scenic quality

Scenic quality exists within the Grand Canal corridor due to the broadleaved vegetation in an enclosed setting in the northern extents of the study area. This is also the case in the southern extents in relation to the Kilcormac Esker and associated woodland.

Rarity and Representativeness

There are some areas and features of aesthetic, cultural or heritage value within the study area, including a mass rock, several Holly Wells, Mottes and churches. Overall, it is not considered that the landscape within the nearer context of the Site is particularly rare or distinctive.

Conservation interests

Ecological designations are associated with the Grand Canal corridor and Kilcormac Esker, both of which are at a contextual remove from the Proposed Development as they occur some distance from where the Site is located.

Recreation Value

There is recreation value associated with the Grand Canal and for cyclists and walkers along the local roads away from the major routes.

Perceptual Aspects and Associations

There do not appear to be any strong landscape associations to particular people, historical events or mythology in the central portion of the study area surrounding the Agall Quarry. That is not to say that none exist, as all locations have local landscape associations with particular

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families or historical incidents. Still, these would not necessarily be associated with landscape values for the wider population.

Landscape Sensitivity Summary

Overall, this is considered a relatively diverse landscape comprising several contrasting land uses where transitions between each are clear and comprehensible. The Agall Quarry is predominant within the central portion of the study area, and this is echoed by the other existing quarry on the opposite side of the commercial Coillte operation.

However, the Grand Canal and the Kilcormac Esker are landscape components with increased sensitivity, containing broad-leafed vegetation with naturalistic qualities at these locations. However, these are not within the visual envelope of the Proposed Development and are separated by larger regions of typical working rural landscape that are not considered to be particularly distinctive or unique. On balance of these factors and in accordance with the criteria outlined in Table 12-1 the landscape sensitivity is deemed to be **Medium-low.**

12.4.2.2 Magnitude of Landscape Effects

In terms of physical landscape effects, the extraction area will create a new void within the Site from approximately ca. 79mOD down to a final extraction level of 63mOD. This extraction area is essentially an extension of the existing Agall Quarry immediately to the west. The physical landscape impacts are classified as 'negative', and their duration is 'permanent' (effects defined as lasting over sixty years in accordance with EPA guidelines). Quarrying activities are generally not readily reversible.

This productive rural landscape contains the adjoining Agall Quarry, intensive arable agricultural, transportation infrastructure and other rural land uses. Therefore, it is not considered that the proposed extended extraction area will noticeably detract from the integrity of landscape patterns or the productive landscape character that prevails in the area.

There will be activity within the Site in the form of workers and earth-moving machinery. However, most of this activity will remain below surrounding ground levels and, therefore, out of sight until close to the finished levels are achieved. Thus, effects from Site-related activities will be temporary/short-term in duration and low magnitude.

In addition to Site activity, there will also be HGV movements required along surrounding local roads, to and from the Site entrance, as they export excavated material There will be a maximum of 50 HGV movement trips accessing, 25 trips, and departing 25 trips, the Site daily. This quantity is within the confines of the existing permissions within the Agall Quarry. The off-site HGV movements will add to the general activity within the vicinity of the Site, and each movement will cause momentary visual impacts as HGVs pass surrounding dwellings.

However, it should be noted that the momentary visual impact of HGV traffic is commonplace along many local roads throughout the country par, particularly those in productive rural areas with forestry, ports, agriculture, and quarrying activities as exist in the vicinity of this Site. Furthermore, such intermittent visual impacts from traffic tend to be less of a concern to local residents than other environmental factors.

On the basis of the factors discussed above it is considered that the magnitude of landscape impact is in the order of **Medium** in the immediate vicinity of the Site (c. <500m from site boundaries). The magnitude of impact is will soon reduce thereafter as the Proposed Development becomes a smaller component of the overall landscape fabric and is more likely to be read in conjunction with the existing Agall Quarry.

With reference to the significance matrix (Table 12-3), the **Medium-low** landscape sensitivity judgement attributed to the study area coupled with a **Medium** magnitude of landscape impact is considered to result in an overall significance of no greater than **Moderate-slight** and

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Permanent within the immediate vicinity of the Site and reducing to slight and imperceptible at greater distances.

12.4.3 Visual Impact Assessment

12.4.3.1 Sensitivity of Visual Receptors

Views of the agricultural landscape are generally pleasant in terms of its rolling pastoral aesthetic and 'green', settled working character. The network of hedgerows and vegetation that occur throughout it contribute to some sense of naturalness, and in combination with its undulating topography generates a high degree of containment in many locations.

However, whilst the agricultural context forms the primary landscape and visual experience, in the local landscape of the Site, this is interrupted by features and activity associated with major transport routes. Indeed, all parts of this landscape, including those areas in agricultural use, demonstrate longstanding human intervention in the landscape.

There are some scenic view designations within the study area but not are orientated towards the Site. Likewise, the integrity and quality of landscape features is not considered to contribute to or generate any specific scenic value. Views within the study area tend to be typical and contained agricultural views rather than expansive and/or exceptional views.

Key differentials in terms of visual receptor sensitivity relate to the occupation of the visual receptor, and whether views of the surrounding landscape are an inherent part of the experience. Static residential receptors are considered generally more susceptible to changes in views over those where views are experienced transiently by those travelling through the landscape particularly on major transport routes where road infrastructure and traffic volume draw from visual amenity. Likewise, receptors located at closer proximity to the Site are considered more susceptible to changes in views over those where views are experienced at distance.

On the basis of the site-specific factors outlined above and in accordance with the general visual receptor sensitivity considerations contained in the methodology sections 12.2.2, visual receptor sensitivity judgement are provided for each representative viewpoint in Table 12-6 below.

12.4.4 Magnitude of Visual Effects

The assessment of visual impacts at each of the selected viewpoints is aided by photomontages / outline montages (as applicable) of the Proposed Development. Photomontages are a 'photo-real' depiction of the scheme within the view utilising a rendered three-dimensional model of the Proposed Development, which has been geo-referenced to allow accurate placement and scale. For each viewpoint, the following images have been produced:

1) Existing view;
2) Outline view (yellow / magenta outlines showing the extent of the Proposed Development; and,
3) Montage view (where appropriate) (N.B. none of the viewpoints required this.)

Table 12-6: Magnitude and Significance of Visual Effects

VP No.	*Title and description of existing view*	*Receptor Sensitivity*	*Description and Magnitude of Visual impact*	*Significance of Visual Impact*
VP1	**Corcoran's Bridge on the Grand Canal at Loughroe**	**Medium**	This is an 'illustrative view' used to confirm the absence of any potential for visual impact from this receptor. The Proposed Development will be thoroughly screened from here by a combination of	**Imperceptible / Negative / Permanent**

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VP No.	Title and description of existing view	Receptor Sensitivity	Description and Magnitude of Visual impact	Significance of Visual Impact
			natural intervening terrain and existing vegetation. The magnitude is, therefore, **Negligible** by default.	
VP2	**Local road west of site at Rabbitburrow**	**Medium-low**	This is an 'illustrative view' used to confirm the absence of any potential for visual impact from this receptor. The Proposed Development will be thoroughly screened from here by a combination of natural intervening terrain and existing vegetation. The magnitude is, therefore, **Negligible** by default.	**Imperceptible / Negative / Permanent**
VP3	**T-junction on Glaskill Lane at Glaskill**	**Medium-low**	This is an 'illustrative view' used to confirm the absence of any potential for visual impact from this receptor. The Proposed Development will be thoroughly screened from here by a combination of natural intervening terrain and existing vegetation. The magnitude is, therefore, **Negligible** by default.	**Imperceptible / Negative / Permanent**
VP4	**Local road east of site at Claragh**	**Medium-low**	This is an 'illustrative view' used to confirm the absence of any potential for visual impact from this receptor. The Proposed Development will be thoroughly screened from here by a combination of natural intervening terrain and existing vegetation. The magnitude is, therefore, **Negligible** by default.	**Imperceptible / Negative / Permanent**
VP5	**Local road south of site at Mough or Greatwood**	**Medium-low**	This is an 'illustrative view' used to confirm the absence of any potential for visual impact from this receptor. The Proposed Development will be thoroughly screened from here by a combination of natural intervening terrain and existing vegetation. The magnitude is, therefore, **Negligible** by default.	**Imperceptible / Negative / Permanent**
VP6	**N52 southeast of site at Heath**	**Medium-low**	This is an 'illustrative view' used to confirm the absence of any potential for visual impact from this receptor. The Proposed Development will be thoroughly screened from here by a combination of natural intervening terrain and existing vegetation. The magnitude is, therefore, **Negligible** by default.	**Imperceptible / Negative / Permanent**

12.5 Mitigation Measures

There is a cluster of five residential dwellings a short distance to the northwest of the proposed extension area and the restoration plan in this corner of the site indicates both grassed and woodland planted berms to aid visual screening, noise and dust effects in relation to these dwellings and the adjacent road. In addition, lands within the exclusion zone will not be excavated.

To enhance the existing screening provided by the hedgerows within this zone, they will be allowed to 'grow out', and any gaps will be filled. No significant landscape or visual effects are anticipated thus no associated mitigation measures are proposed or required given the modest scale of the Proposed Development.

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12.6 Cumulative and In-combination Impact

The main cumulative effect in this instance is in relation to the existing Agall Quarry. The in-combination effects of the existing Agall Quarry and this Proposed Development to it has been the focus of the assessment already undertaken in respect of both landscape impacts and visual impacts. Separate consideration of cumulative effects is, therefore, not considered necessary in this instance.

Overall, the cumulative landscape and visual impact of the Proposed Development is not considered to be significant.

12.7 Indirect Effects

Sometimes referred to as secondary effects or impacts, these are not a direct result of the project. Any indirect effects as a result of the Proposed Development are not anticipated to result in any material impacts in relation to the landscape or to visual receptors.

12.8 Residual Effect

The proposed mitigation, in the form of vegetated perimeter embankments, were considered to be embedded within the design of the development and were therefore included in the photomontages and formed an integral part of the assessment of predicted effects in section 12.4.3. Thus, residual effects are the same as predicted effects in this instance, as it was considered unnecessary / confusing to assess pre-mitigation and post-mitigation views separately.

12.9 Interactions With other Environmental Attributes

None identified.

12.10 Monitoring

Not Applicable

12.11 Reinstatement

The Site will be subject to a Restoration Plan following the cessation of extraction onsite. Details of the Restoration Plan are included in Appendix 6-1. The restoration plan will involve less than 300mm of soil, sourced from onsite stockpiles and berms to be spread across the worked pit, and seeded, and hedgerows re-planted. As the finished ground will be notably lower than the existing ground surrounding the Site, the visual effect will be Imperceptible, Negative and Permanent

12.12 Difficulties Encountered

There we no difficulties encountered in the process of completing the LVIA.

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13 CULTURAL HERITAGE

13.1 Introduction

This Chapter of the EIAR, commissioned by MOR Environmental on behalf of Condron Concrete Ltd, addresses the effects on the archaeological, architectural and cultural heritage of the Site, and the surrounding area, of the Proposed Development.

13.2 Methodology

This study complies with the requirements of Directive EIA 2014/52/EU. The chapter is an assessment of the known or potential cultural heritage resource within a specified area and includes the information that may reasonably be required for reaching a reasoned conclusion on the significant effects of the project on the environment, considering current knowledge and methods of assessment. It consists of a collation of existing written and graphic information to identify the likely context, character, significance and sensitivity of the known or potential cultural heritage, including architectural and archaeological aspects using an appropriate methodology (EPA 2002, 2003 and 2022). It consists of the following study stages:

- Baseline Studies; and,
- Assessment of the proposed development area.

The criteria and definitions for describing effects are those outlined in section 1.8.1 above.

13.2.1 Baseline Study

The baseline study research has been undertaken in two phases: the paper study phase and, subsequently, the field inspection phase.

13.2.1.1 Paper Study

The first phase comprised a paper survey of all available archaeological, historical and cartographic sources. This involved the following:

- A collation of existing written and graphical information to identify the likely context, character, significance and sensitivity of the known or potential cultural heritage, archaeological and structural resource using appropriate methodology;
- A detailed investigation of the archaeological and historical background of the Site, the landholding and the surrounding area extending 1km from the Proposed Development boundary (Figure 13-1 below). This area was examined using information from the following:
    - Record of Monuments and Places ('RMP') of County Offaly;
    - The Sites and Monuments Record;
    - The Offaly County Development Plan 2021-2027;
    - The National Inventory of Architectural Heritage;
    - Aerial photographs;
    - Excavation reports;
    - Cartographic; and,
    - Documentary sources;
- The Offaly County Development Plan 2021-2027: is the statutory plan detailing the development objectives / policies of the relevant local authority. The plan includes objectives and policies, relevant to this assessment, i.e. regarding cultural heritage;

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- The National Inventory of Architectural Heritage ('NIAH') - a state initiative under the administration of the Department of Culture, Heritage and the Gaeltacht and established on a statutory basis under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. The purpose of the NIAH is to identify, record, and evaluate the post-1700 architectural heritage of Ireland uniformly and consistently as an aid in the protection and conservation of the built heritage. NIAH surveys provide the basis for the recommendations of the Minister for Culture, Heritage and the Gaeltacht to the planning authorities for the inclusion of structures in their Record of Protected Structures ('RPS');
- The Record of Monuments and Places – this was established under section 12 (1) of the National Monuments (Amendment) Act 1994 and provides that the Minister shall establish and maintain a record of monuments and places where the Minister believes there are monuments, such record to be comprised of a list of monuments and relevant places and a map or maps showing each monument and relevant place in respect of each county in the State. The associated files contain information of documentary sources and field inspections where these have taken place;
- The Sites and Monuments Record – this is maintained by the Department of Culture, Heritage and the Gaeltacht and contains information on Recorded Monuments and additional unprotected sites that have been identified since the Record of Monuments was issued;
- Aerial photographs – these may record cropmarks, soil marks and earthworks that may have not been previously detected;
- Cartographic Sources - this includes seventeenth-century mapping as well as the 1st and 2nd editions of the Ordnance Survey six-inch maps; and,
- Documentary Sources – these may provide more general historical and archaeological background.

The second phase involved a field inspection and assessment of the Proposed Development.

13.2.1.2 Field inspection

A field inspection was carried out on the 17th of February 2023 to identify and assess any known archaeological sites and previously unrecorded features and portable finds within the Site.

The areas of land within the existing exposed quarry, i.e. Phase A, due to the removal of all soils historically, and assessed under the EIS submitted in support of the substitute consent application ABP reference 19.QD.0131, hold no further likelihood of archaeological interest.

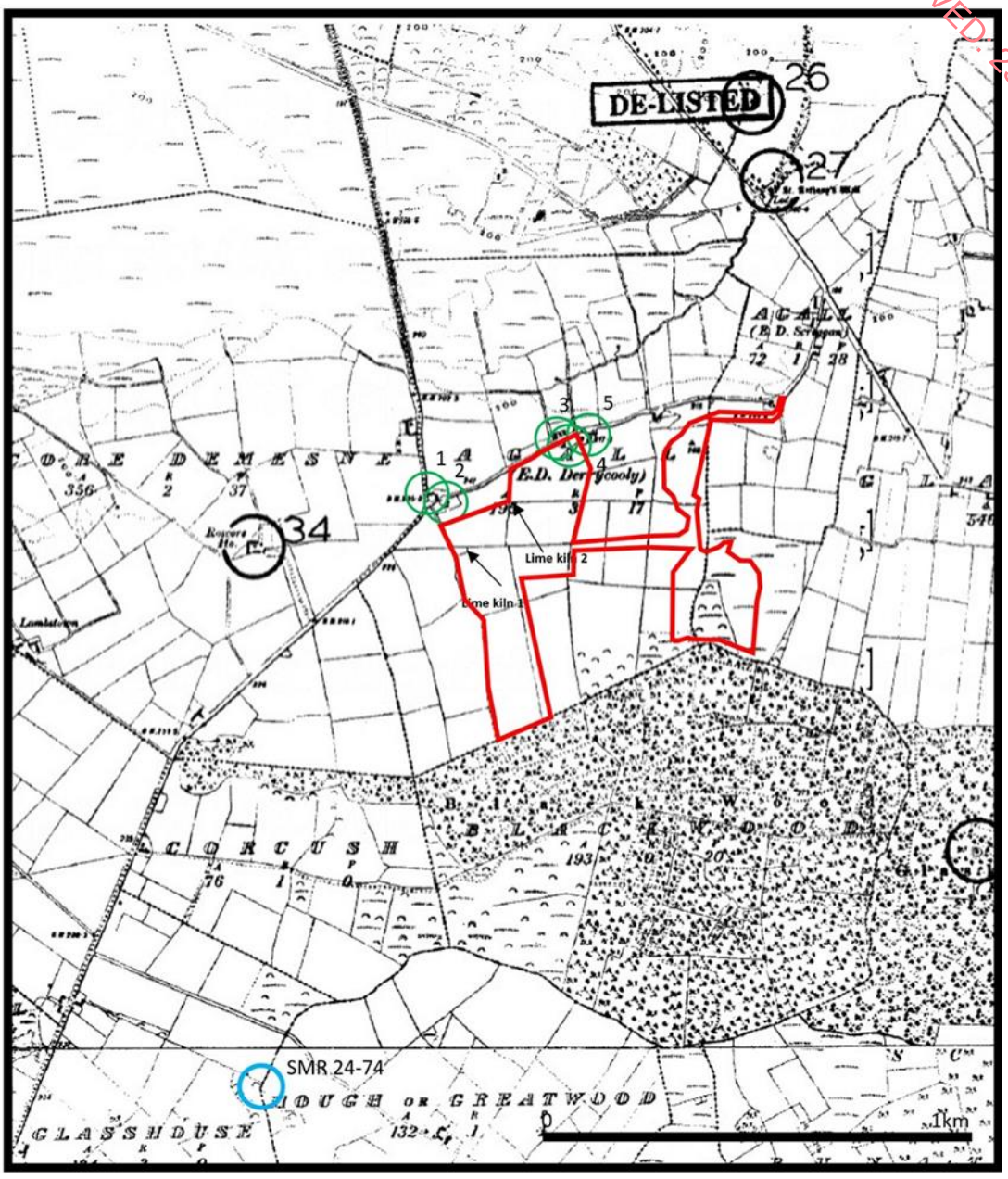
13.2.2 Assessment of the Proposed Development

An impact assessment and mitigation strategy have been prepared. An impact assessment is undertaken to outline potential adverse effects that the Proposed Development may have on the cultural resource, while a mitigation strategy is designed to avoid, reduce or offset such adverse effects.

Extracts from the Record of Monuments and Places for County Offaly are presented on a map of the local area around the site in Figure 13-1 below. RMP sites included on the Records of Monuments and Places statutory mapping are identified by black circles. SMR sites with blue circles, and unlisted buildings in the vicinity of the Site with green circles. The Site Boundary is shown with a red line.

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Figure 13-1: The Study Area Superimposed on the RMP Map for County Offaly



13.2.3 Legislation/ Policy Context

13.2.3.1 Offaly County Development Plan 2021-2027

Chapter 10 of the Offaly Co. Development Plan 2021-27 [26] sets out the policies and objectives on cultural heritage within the County.

Architecture and Protected Structures

Section 10.11 of the CDP details the Council's Built Heritage Policies, which include:

Protected Structures

- BHP-01 It is Council policy to ensure the protection, sympathetic and sensitive modification, alteration, extension or reuse of protected structures or parts of protected structures, and the immediate surrounds included and proposed for

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inclusion in the Record of Protected Structures that are of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest, together with the integrity of their character and setting;

- BHP-02 It is Council policy to ensure the protection of the curtilage of protected structures or proposed protected structures and to prohibit inappropriate development within the curtilage or attendant grounds of a protected structure which would adversely impact on the special character of the protected structure including cause loss of or damage to the special character of the protected structure and loss of or damage to, any structures of architectural heritage value within the curtilage of the protected structure;
- BHP-03 It is Council policy to promote best practice and the use of skilled specialist practitioners in the conservation of, and any works to, protected structures. Method statements should make reference to the Department of Culture, Heritage and the Gaeltacht's Advice Series on how best to repair and maintain historic buildings;
- BHP-04 It is Council policy to favourably consider the change of use of any structure included on the Record of Protected Structures provided such a change of use does not adversely impact on its intrinsic character and is in accordance with the proper planning and sustainable development of the area;
- BHP-05 It is Council policy to actively encourage uses that are compatible with the character of protected structures;
- BHP-06 It is Council policy to retain where practicable a protected structure which has been damaged by fire, and to retain those elements of that structure that have survived (either in whole or in part) and that contribute to its special interest;
- BHP-07 It is Council policy to prohibit the demolition of any protected structure unless the Council is satisfied that exceptional circumstances exist. The demolition of a protected structure with the retention of its façade will likewise not generally be permitted;
- BHP-08 It is Council policy to require an Architectural Heritage Assessment Report, as described in Appendix B of the Architectural Heritage Protection, Guidelines for Planning Authorities, Department of Culture, Heritage and the Gaeltacht (2013), to accompany all applications involving a protected structure;
- BHP-09 It is Council policy to advise owners of protected structures in preparation of funding applications under Built Heritage Scheme of the Historic Structures Fund;
- BHP-10 It is Council policy to ensure that in the event of a planning application being granted for development within the curtilage of a protected structure, the proposed works to the protected structure should occur, where appropriate, in the first phase of the development to prevent endangerment, abandonment and dereliction of the structure; and,
- BHP-11 It is Council policy to ensure that measures to upgrade the energy efficiency of Protected Structures and historic buildings are sensitive to traditional construction methods and materials and do not have a detrimental physical, aesthetic or visual impact on the structure. They should follow the principles and direction given in the Department of Arts, Heritage and the Gaeltacht's publication Energy Efficiency in Traditional Buildings.

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Architectural Conservation Areas

- BHP-12 It is Council policy to encourage the retention of original windows, doors, renders, roof coverings, street furniture and other significant features of historic buildings and landscape features within Architectural Conservation Areas;
- BHP-13 It is Council policy to proactively promote conservation through the Planning and Development Act 2000 (as amended), the Built Heritage Investment Scheme and other schemes available to the Council; and,
- BHP-14 It is Council policy to preserve the character of Geashill Architectural Conservation Area ('ACA') and any future ACA's in County Offaly by ensuring that any new development within or contiguous to the ACA is sympathetic to the character of the area and that the design is appropriate in terms of scale, height, plot density, layout, materials and finishes having regard to the advice given in the Statements of Character for each area.

Vernacular Buildings

- BHP-15 It is Council policy to encourage the protection, retention, appreciation and appropriate revitalisation of the vernacular heritage of Offaly;
- BHP-16 It is Council policy to consider the guidance in "The Thatched Houses of Kildare" and "Reusing Farm Buildings, A Kildare Perspective" published by Kildare County Council in assessing planning applications in County Offaly relating to thatched cottages and traditional farm buildings;
- BHP-17 It is Council policy to preserve the character and setting (for example, gates, gate piers and courtyards) of vernacular buildings where deemed appropriate by the planning authority;
- BHP-18 It is Council policy to seek the repair and retention of traditional timber and/or rendered shop fronts and pub fronts, including those that may not be protected structures;
- BHP-19 It is Council policy to communicate and work with owners of thatch buildings regarding the availability of conservation grants and funding;
- BHP-20 It is Council policy to encourage where appropriate the covering of thatch with metal, as a measure for the protection of buildings which are unoccupied and showing signs of considerable distress;
- BHP-21 It is Council policy to support proposals to refurbish vernacular structures that are in a run down or derelict condition, provided that:
    - Appropriate traditional building materials and methods are used to carry out repairs to the historic fabric; and,
    - Proposals for extensions to vernacular structures are reflective and proportionate to the existing building and do not erode the setting and design qualities of the original structure which make it attractive.

Industrial Heritage

- BHP-22 It is Council policy to protect the industrial heritage of Offaly, including mills, historic industrial buildings, canals and historic bridges;
- BHP-23 It is Council policy to utilise the information provided within Mills of County Offaly: An Industrial Heritage Survey (2009) when assessing development proposals for surviving industrial heritage sites;

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- BHP-24 It is Council policy to protect and enhance the built and natural heritage of the Grand Canal and ensure that development within its vicinity is sensitively designed and does not have a detrimental effect on the character of the canal, its built elements and its natural heritage values and that it adheres to the Waterways Ireland's Heritage Plan 2016-2020;
- BHP-25 It is Council policy to encourage appropriate change of use and reuse of industrial buildings, provided such a change does not seriously impact on the intrinsic character of the structure and that all works are carried out in accordance with best conservation practice;
- BHP-26 It is Council policy to seek the retention and appropriate repair/maintenance of the historic bridges and harbours of the county whether they are protected structures or not; and,
- BHP-27 It is Council policy to restrict vehicular access onto public roads that were formerly towpaths and any development permitted with access off a towpath must be screened effectively with trees and hedging. In relation to planning applications for housing in the open countryside with access proposed off towpaths, applicants must demonstrate compliance with Policy SSP-27 as towpaths are located within Natural Heritage Areas and Areas of High Amenity.

Country Houses, Gardens and Demesnes

- BHP-28 It is Council policy to encourage the protection, conservation, promotion and enhancement of Country Houses, Gardens and Demesnes in the county and support public awareness, enjoyment of and access to these sites where appropriate;
- BHP-29 It is Council policy to encourage the conservation, preservation, restoration and protection in their original setting of mausoleums and monuments: follies, grottoes; garden buildings and other structures of particular beauty or historic, environmental, architectural or industrial significance;
- BHP-30 It is Council policy to discourage development that would lead to a loss of, or cause damage to, the character, the principle components of, or the setting of Country Houses, Gardens and Demesnes; and,
- BHP-31 It is Council policy to consider the "Guidance Notes for the Appraisal of Historic Gardens, Demesnes, Estates and their Settings" published by Cork County Council 2006 in the appraisal and description of the impacts of proposed developments in County Offaly within or in close proximity to country houses and demesnes on historic designed landscapes, demesnes and gardens.

Protected Species

- BHP-32 It is Council policy to protect habitats and species when considering proposed works to buildings and structures which are likely to impact on protected ecological sites and protected species.

Archaeological Heritage

There are several policy objectives outlined in Section 10.11 of the plan in respect of Archaeological Heritage which state:

- BHP-33 It is Council policy to support and promote the protection and appropriate management and sympathetic enhancement of the county's archaeological heritage within the Plan area, in particular by implementing the Planning and Development Act 2000 (as amended) and the National Monuments Act 1930 (as amended);

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- BHP-34 It is Council policy to seek to promote awareness of and access to archaeological sites in the county where appropriate;
- BHP-35 It is Council policy to consult with the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht ('DCHG') in relation to archaeological sites within and/or adjoining a proposed development;
- BHP-36 It is Council policy to facilitate the identification of important archaeological landscapes in the county;
- BHP-37 It is Council policy that any development that may, due to its size, location or nature, have implications for archaeological heritage (including both sites and areas of archaeological potential / significance) shall be subject to an archaeological assessment. When dealing with proposals for development that would impact upon archaeological sites and/or features, there will be presumption in favour of the 'preservation in situ' of archaeological remains and settings, in accordance with Government policy. Where permission for such proposals is granted, the Planning Authority will require the developer to have the site works supervised by a licenced archaeologist;
- BHP-38 It is Council policy to ensure that archaeological excavation is carried out according to best practice as outlined by the National Monuments Service, Department of Culture, Heritage and the Gaeltacht, the National Museum of Ireland and the Institute of Archaeologists of Ireland and to protect previously unknown archaeological sites and features, where they are discovered during development works;
- BHP-39 It is Council policy to ensure the protection and preservation of underwater and terrestrial archaeological sites, both known and potential in riverine or lacustrine locations including wrecks such as the remains of bridges; and,
- BHP-40 It is Council policy to require archaeological assessment, including underwater archaeological assessment where relevant, for such developments that due to their location, size or nature may have implications for archaeological heritage. Such developments include those that are located at or close to an archaeological monument or site, those that are extensive in terms of area (0.5 hectares or more) or length (1 kilometre or more and developments that require an Environmental Impact Statement.

Monastic Sites

- BHP-41 It is Council policy to retain the nominated status of the area comprising the National Monument at Clonmacnoise, enclosing eskers, Mongans Bog, Clonmacnoise callows, Fin Lough and the limestone pavement at Clorhane as the "Clonmacnoise Heritage Zone" in accordance with the recommendations of the study of the area carried out by the Environmental Sciences Unit of Trinity College, Dublin as shown in Figure 10-7 of this Plan;
- BHP-42 It is Council policy to investigate the potential of Durrow Demesne as a public amenity and tourism asset; and,
- BHP-43 It is Council policy to support and promote the protection and appropriate management of all monastic sites in the county.

Mass Rocks and Holy Wells

- BHP-44 It is Council policy to preserve, protect and, where necessary, enhance mass rocks and holy wells in the County.

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Historic Military Fortifications and Castle Sites

- BHP–45 It is Council policy to support and promote the protection and appropriate management of historic military fortifications and castle sites in the county.

Funding

- BHP-46 It is Council policy to support the progression and delivery of projects that repair and conserve historic structures under the Historic Structures Fund, the Built Heritage Investment Scheme or other funding schemes as applicable.

Community Archaeology

- BHP-47 It is the policy of the Council to support the concept of Community Archaeology and greater collaboration in promoting awareness, knowledge and understanding of local archaeological resources in County Offaly.

13.3 Receiving Environment

13.3.1 The Landscape

The Site is in the townland of Agall, Co. Offaly, on OS Six Inch sheets No. 16, ca. 3.2km to the northwest of the village of Mucklagh and 0.7km west of the L2011 road. The local soil is a Baggotstown series coarse loam overlying calcareous gravels. The lands are currently in use for pastoral agriculture.

13.3.2 Historical and Archaeological Background

The following is a summary of the archaeological and historical development of the study area and the main types of sites, monuments and structures that are known from the surrounding area. The purpose of this approach is to place the types of sites, monuments and structures in the study area in a cultural and chronological context to assist the assessment. The Site is situated in the townland of Agall, in the civil parish of Lynally and the barony of Ballycowan. Note the original spellings of placenames recorded in source material are retained in the text.

13.3.2.1 The Prehistoric Period

Apart from the discovery of a stone battle axe (NMI 1943: 189) in Rabbitburrow townland there is no record of any prehistoric monuments or artifacts in the study area.

13.3.2.2 The Early Medieval Period

In the Early Medieval period (500 AD-1170 AD) the study area was part of the Kingdom of Fir Chell (men of the churches), often called in the medieval period Kenaliaghe, which extended from Birr to Uisnech and was ruled by the Cenel Fiachach sept, a branch of the southern Ui Neill (Byrne 1973, 93). Fir Chell was part of the Kingdom of Meath. The territory was originally ruled by the MacEochagin family but a junior branch the Ua Maelmhuaidh (O'Molloy) became independent in the southern part of Feara Ceall while the Macgeoghegans retained the northern part. Classically settlement at this period is indicated by the presence of enclosed farmsteads known as ringforts, when enclosed with earthen banks, and cashels when enclosed by stone walls. However, there are no ringforts or enclosures known from the study area.

13.3.2.3 The Medieval period

Following the loss of the Kingdom of Leinster in 1166, Diarmait Mac Murchada, King of Ui Chennselaig, regained the Kingdom in 1169-70 with the aid of Anglo-Norman mercenaries. He paid them with land grants and promised the succession of Leinster and his daughter to their leader Richard fitz Gilbert de Clare. On the death of Diarmait Mac Murchade in 1171 Leinster passed to de Clare, who became the first Anglo-Norman Lord of Leinster. Following

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this in 1172 King Henry II granted the Kingdom of Meath, including the study area, to Hugh de Lacy [138]. There was some Norman occupation to the south of the study area as indicated by the Motte castles at Rathlihen (RMP OF24-036) and Ballyboy (RMP OF31-015) and the Ringwork Castle at Ballynacarrig (RMP OF31-022), all between Mountbolus and Kilcormac. To the north of the study area there is another Motte Castle situated at Lynally Glebe (RMP OF16-032). However, Feara-Ceall and the study area appears to have remained in the hands of the Ua Maelmhuaidh (O'Molloy) family throughout the Medieval period.

13.3.2.4 The Post-medieval period

The fifteenth century was characterised by the decline of Anglo-Norman power in Ireland, which had been ebbing since the early fourteenth century. Part of the response to this was the construction of masonry tower houses which sprang up after King Henry VI introduced a building subsidy of £10 in 1429 [139]. However, there are no Tower Houses known in the study area. The now levelled possible 17th-century fortified house (OF016-034001-) in Roscore Demesne is the earliest known structure in the study area. The Down Survey [140] records that in 1641 Agall was held by Sir Jasper Herbert and in 1670 was in the hands of Sir George Harbert. Griffiths Primary Valuation of Ireland 1847-64 [141] records that in the mid-nineteenth century the Site was held by John and Mary Rigney in fee. (http://www.askaboutireland.ie/griffith-valuation).

13.3.3 Buildings

13.3.3.1 Designated Structures

The Record of Protected Structures in the Offaly County Development Plan 2021-2027 was reviewed as part of the baseline study for this EIAR chapter. The review established that there are no structures within either the Site or the study area listed in the Record of Protected Structures.

13.3.3.2 Structures National Inventory of Architectural Heritage

The National Inventory of Architectural Heritage ('NIAH') which is maintained by the Dept. of Housing, Local Government and Heritage was examined on 13th January 2023[3]. The review established that there are no structures within either the application area or the study area listed in the NIAH.

13.3.3.3 Field Inspection

On 17th February 2023 fieldwork was carried out to identify any additional unlisted upstanding structures in the vicinity of the application area. This involved assessing all upstanding structures that are marked on the 1912 edition of the six-inch Ordnance Survey mapping within 100m of the application area (see Table 13-1 to Table 13-5 and Plate 13-1 to Plate 13-5 below). There are five of these structures in this area (see below). None of these structures are of heritage interest.

Table 13-1: Structures in the vicinity of the Site

No. 1	House
Structure type	House
Townland	Agall
Designation	None

[3] http://webgis.archaeology.ie/historicenvironment/ Historic Environment Viewer of the Department of Culture, Heritage and the Gaeltacht. (URL accessed 15-7-2021)

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No. 1	House
Data source	1912 edition of the six-inch Ordnance Survey map
Perceived Significance:	None
Type of impact:	None
Significance & quality of impact	None
Description	Mostly ruined stone house, heavily overgrown, with only the west gable wall standing.
Image	Plate 13-1

Plate 13-1: Structure 1, looking north



Table 13-2: Structures in the vicinity of the Site

No. 2	House
Structure type	House
Townland	Agall
Designation	None

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No. 2	House
Data source	1912 edition of the six-inch Ordnance Survey map
Perceived Significance:	None
Type of impact:	None
Significance & quality of impact	None
Description	Original cottage with gable wall facing the road. It has a concrete tile roof and single chimney. The structure is mostly covered by a large two-storey extension that extends to the west.
Image	Plate 13-2

Plate 13-2: Structure 2, looking southeast



Table 13-3: Structures in the vicinity of the Site

No. 3	Sheds
Structure type	Sheds
Townland	Agall

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No. 3	Sheds
Designation	None
Data source	1912 edition of the six-inch Ordnance Survey map
Perceived Significance:	None
Type of impact:	None
Significance & quality of impact	None
Description	A pair of stone animal sheds situated on the west and east sides of a concrete yard. The sheds have corrugated roofs, and the western example has been rebuilt to a smaller plan with concrete blocks.
Image	Plate 13-3

Plate 13-3: Structure 3, looking north



Table 13-4: Structures in the vicinity of the Site

No. 4	Shed
Structure type	Shed
Townland	Agall
Designation	None
Data source	1912 edition of the six-inch Ordnance Survey map
Perceived Significance:	None
Type of impact:	None
Significance & quality of impact	None
Description	Ruined and partly overgrown stone shed with collapsed corrugated roof that has been partly rebuilt with concrete blocks.

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No. 4	Shed
Image	Plate 13-4

Plate 13-4: Structure 4, looking northwest



Table 13-5: Structures in the vicinity of the Site

No. 5	House
Structure type	House
Townland	Agall
Designation	None
Data source	1912 edition of the six-inch Ordnance Survey map
Perceived Significance:	None
Type of impact:	None
Significance & quality of impact	None
Description	Ruined stone house with mostly collapsed corrugated roof. Heavily overgrown.
Image	Plate 13-5

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Plate 13-5: Structure 5, looking south



13.3.4 Archaeological Assessment

13.3.4.1 Recorded Monuments

Examination of the Record of Monuments and Places indicated that there are no Recorded Monument in the application (see Figure 13-1 above).

The closest Recorded Monument externally to the application site is OF016-034001-3. This is described in the Record of Monuments as a fortified house and bawn but there is no longer anything visible at ground level (see Appendix 13-1). The site of this monument is located c.430m west of the application area. it has been levelled and is no longer visible at ground level. The monument will not be directly or indirectly impacted by the proposed development.

The remaining Recorded Monuments listed in the study area are all considered to be too far distant to be directly or indirectly impacted by the proposal.

13.3.4.2 Sites and Monuments Record

Examination of the Sites and Monuments Record ('SMR') which is maintained by the Department of Housing, Local Government and Heritage on 13th January 2023[4] indicated that there are no SMR sites in the Site area. There is one SMR in the study area OF024-074---- (see Appendix 13-2). This SMR is described in the SMR as:

> *OF024-074---- Glasshouse Glass works*
>
> *Situated in the corner of a field of pasture beside the townland boundary between Glasshouse and Mough or Greatwood in undulating countryside are the low grass covered wall footings of a 17th century glass working site. The remains of the furnace form a low rocky mound (H 0.4m; dims. 16.8m E-W x 16.6m N-S) in the corner of the field. Several glass covered stones possibly the remains of a glass furnace protrude above the surface of the ground. Local landowner Mr. Deigan informed me that over the years of ploughing in this field numerous glass covered stones had been removed from the field. This furnace was located in the middle of a forest that in 17th century was known as 'The Great Wood of Fircall'. Probable 17th century Huguenot glass furnace. The glassworks are mentioned in the Civil Survey of 1654-56 as located 'in*

[4] http://webgis.archaeology.ie/historicenvironment/ Historic Environment Viewer of the Department of Culture, Heritage and the Gaeltacht. (URL accessed 19-7-2021)

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the barony of Ballyboy through the great wood of Fercall to the Glasshouse of Boneturrin and from the Glasshouse of Bonneturrin in an antient highway through the said greate wood of Fercall'

This monument is located ca.980m southwest of the Site and is considered to be too far distant to be directly or indirectly impacted by the proposal.

13.3.4.3 Cartographic Sources

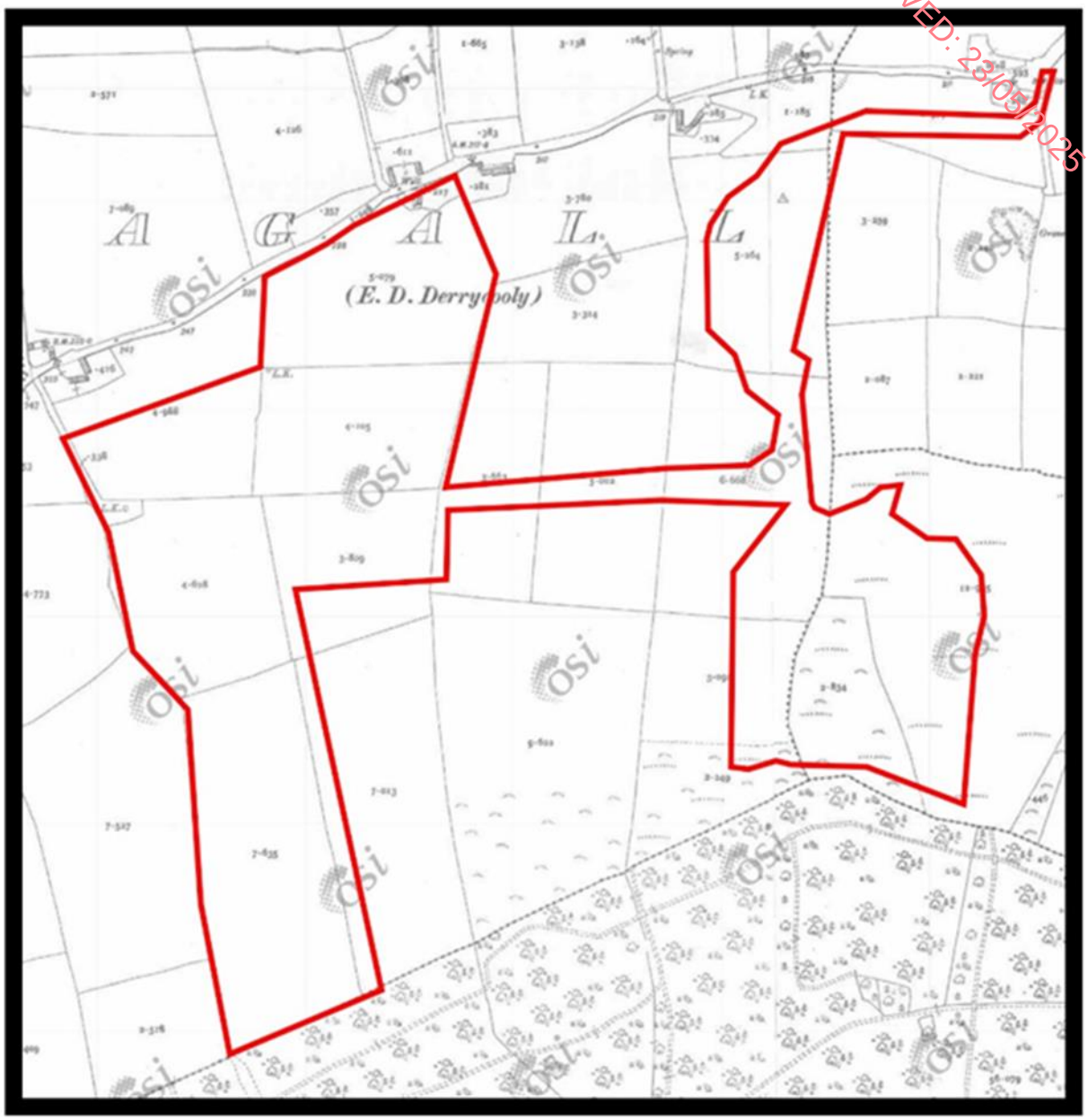
The Ordnance Survey 1st and 3rd edition six-inch maps and the first edition 25-inch maps of the area were examined (see Figure 13-2 and 13-3 below).

Figure 13-2: Site superimposed on the OS 1st edition six-inch map.



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Figure 13-3: Site superimposed on the OS 1st edition twenty five-inch map.



There are two lime kilns marked on the first edition 25-inch map (see Figure 13-3 above), the locations of which are indicated on Figure 13-1 above). The kilns are not visible at ground level (see section 13.3.4.9 below).

13.3.4.4 Place name evidence

The place names were extracted from the cartography to facilitate the search for structures and monuments and small finds, help identify any unrecorded monuments or structures, search for any published papers and documents related to the study area and to assist in the study of the historical development of the area. The place names were looked up in the Placenames Database of Ireland at Logainm.ie[5] - see Table 13-6 below. The placenames

[5] www.logainm.ie - The Placenames Database of Ireland, developed by Fiontar & Scoil na Gaeilge (Dublin City University) and The Placenames Branch (Department of Culture, Heritage and the Gaeltacht). (URL accessed: 5-5-2020).

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refer primarily to topographical features and landcover. The placenames do not indicate any additional heritage sites within the study area.

Table 13-6: Townland names in the study area

Townland name	Translation
Agall	Ford of the Foreigners
Ballindrinan	The town of the blackthorn
Blackwood	Anglicised. Originally Great wood of Fercall
Brackagh	Badger warren
Bunaterin	Mouth of the Teerin stream or bottom of the little district
Church Hill	Hill of the church
Corcush	Round hill of the cave
Glasshouse	Refers to a glass making furnace
Glasskill	Green wood
Killina	Wood of the ford
Loughroe	Red lake
Mough or Greatwood	Plain or great wood
Rabbitburrow	Refers to wildlife
Rahan Demesne	Ferny land
Roscore Demesne	Wood of the weir

13.3.4.5 Aerial photography

Online Ordnance Survey aerial photography taken in 1995, 1999-2000 and 2004-2005, 2005-6 and 2013, Google Earth imagery from 2009, 2013, 2018, 2019, 2020, 2021 and 2022, and Microsoft Bing imagery from 2011 were reviewed. There are no additional archaeological sites visible in the imagery – see Figure 13-4 below. The numbers relate to the fieldwork areas (see section 13.3.4.9 below)

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Figure 13-4: Aerial View of the Site (2022)



13.3.4.6 National Museum of Ireland

Examination of the national Museum registers revealed a single previous artefact discovery reported to the Museum from Rabbitburrow. The find was a Bann series stone battle axe of andesite (NMI 1943: 189) [142].

13.3.4.7 Other Sources

Examination of archaeological corpus works on prehistoric artefacts [143] [144] [145] [146] [147] [148] did not reveal any additional material from the study area.

13.3.4.8 Archaeological investigations

Examination of the Excavations Bulletin [149] indicated that there have been no licensed excavations carried out within the Site. There has been one investigation carried out in the study area:

Killaranny Bog Peatland survey 09E0409

The Re-assessment Survey 2009 included Bellair North and South, Killaranny, East Boora, Clongawney, Oughter (Roscore), riWest Drinagh and Galros Bogs, which are part of the Bord na Mona (BnM) Boora group of bogs. The Boora group of bogs was initially surveyed by the Irish Archaeological Wetland Unit (IAWU) in 1994, 1997 and 1998. The objective of the Re-assessment Survey was to re-identify any surviving previously recorded sites, identify new sites and subsequently record all archaeological sites identified during the course of survey. Killaranny Bog is located 1.3km south-west of Rahan, Co. Offaly. It lies at the eastern edge of

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the BnM Boora group of bogs directly north-east of Oughter (Roscore) Bog. It has a total area of 290ha, which is now cutaway.

A total of two archaeological sites, identified during the first-round survey of Killaranny Bog in 1997, were lodged in the records of the Archaeological Survey of Ireland. The sites were located on the eastern side of the bog.

At the time of survey Killaranny Bog was not in production and much of the bog was overgrown with trees and heather scrub covered many of the field surfaces and drain faces. A hand-held GPS was used to find the location of the previously identified sites, but they were no longer extant. No sites of archaeological significance were identified during the field-walking survey of this bog.

13.3.4.9 Field Inspection

A field inspection was carried out on 17th February 2023. This involved an inspection of all the lands in the application area (see Figure 13-1). The fieldwork areas are numbered on Figure 13-4 above.

Area 1

This is large, long and narrow field of undulating pasture, which slopes to the north near the northern end. The field is enclosed by mature hedgerow with a few trees at east and west, garden fences and hedges at north and a low stone wall at south (see Plate 13-6 below).

Plate 13-6: Panoramic view of Area 1, looking south



There is no visible indication of lime kiln 1 at ground level (see Plate 13-7 below). There is no visible indication of any archaeological, architectural or cultural heritage material at ground level.

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Plate 13-7: View of the location of Lime Kiln 1, looking north



Area 2

This is a large irregular-shaped field of north-west sloping pasture, enclosed by mature hedgerow with trees (see Plate 13-8 below).

Plate 13-8: Panoramic view of Area 2, looking southeast



There is no visible indication of lime kiln 2 at ground level (see Plate 13-9 below). There is no visible indication of any archaeological, architectural or cultural heritage material at ground level.

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Plate 13-9: View of the location of Lime Kiln 2, looking west



Area 3

This is a large irregular-shaped restored quarry area of land within the existing exposed quarry, i.e. Phase A. Due to the removal of all soils historically, and the historic impacts assessed under the EIS submitted in support of the substitute consent application ABP reference 19.QD.0131, no further likelihood of archaeological interest are present.

13.4 Characteristics and Potential Effects of the Proposed Development.

13.4.1 Construction and Operational Stage

There will be no direct effects on any known items of archaeology, buildings of heritage interest, or cultural heritage in the Site or the vicinity during the construction and operational phase of the Proposed Development.

There will be no indirect effects on any known items of archaeology, buildings of heritage interest, or cultural heritage in the Site or the vicinity during the construction and operational phase of the Proposed Development.

No interactions with other impacts have been identified as part of the assessment of effects arising from the Proposed Development. In the case of a 'do-nothing' scenario, if the Proposed Development were not to proceed there would be no negative impact on archaeology, buildings of heritage interest, or cultural heritage.

In the worst-case scenario, soil stripping in areas 1 and 2 has the potential to have a permanent, significant, irreversible, total, negative/adverse impact on previously unknown subsurface archaeological deposits or artefacts without preservation by record taking place.

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There are no known items of archaeology, buildings of heritage interest, or cultural heritage in the Site or the vicinity and cumulative impacts on heritage have not been identified.

13.4.2 Closure Stage

There will be no direct impacts on any known items of archaeology, buildings of heritage interest, or cultural heritage in the Site or the vicinity during the closure phase of the Proposed Development.

There will be no indirect impacts on any known items of archaeology, buildings of heritage interest, or cultural heritage in the Site or the vicinity during the closure phase of the Proposed Development.

No interactions with other impacts have been identified as part of the assessment of effects arising from the Proposed Development.

In the case of a do-nothing scenario if the Proposed Development were not to proceed there would be no negative impact on the cultural heritage. No worst-case scenario has been identified at closure stage.

13.5 Mitigation measures

Due to the potential survival of previously unknown sub-surface archaeological deposits or finds within the Site in areas 1 and 2 all soil-stripping in those areas should be monitored by a qualified archaeologist. Any archaeological material identified during monitoring should be preserved by record under licence from the National Monuments Service in advance of Proposed Development.

13.5.1 Unplanned Events

No impacts on any known items of archaeology, buildings of heritage interest, or cultural heritage in the Site or the vicinity arising from unplanned events associated with the Proposed Development have been identified by the assessment.

13.6 Cumulative and In combination Effects

Effects arising in respect of existing developments are considered within the assessment of the receiving environment.

In accordance with EIA legislation a search was undertaken for approved developments, not yet commenced, of relevance to the consideration of cumulative effects in respect of archaeology, cultural heritage or buildings of heritage interest within the study area and none were identified.

13.7 Interaction with other Environmental Attributes

The assessment has demonstrated that the Proposed Development will have no negative impacts on any known items of archaeology, buildings of heritage interest, or cultural heritage.

13.8 Indirect Effects

There will be no indirect effects on any known items of archaeology, buildings of heritage interest, or cultural heritage in the Site or the vicinity during the closure phase of the Proposed Development.

13.9 Residual Effects

After the proposed mitigation measures have been implemented there will be no residual impacts on cultural heritage present within Site or the vicinity.

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13.10 Monitoring

No additional monitoring, other than that required for mitigation, will be required.

13.11 Reinstatement

The Site will be subject to a Restoration Plan following the cessation of extraction onsite. Details of the Restoration Plan are included in Appendix 6-1.

13.12 Difficulties Encountered

No difficulties were encountered during the desktop study, field survey or in the preparation of this report.

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14 MATERIAL ASSETS – TRAFFIC AND TRANSPORT

14.1 Introduction

This chapter of the EIAR presents the findings of the transport assessment carried out for the Proposed Development. The existing transport features and surrounding road network is described, the likely impacts on the road network are assessed and mitigation measures are proposed where required.

In preparing this report, Roadplan Consulting has made reference to:

- The Offaly County Development Plan 2021 – 2027 [26];
- The Institute of Highways and Transportation (CIHT) Guidelines on the Preparation of Traffic Impact Assessments; [150]
- The TII Transport Assessment Guidelines, [151] and,
- The TII National Traffic Model [152].

This chapter, provides a thorough assessment of the likely effects of the Proposed Development on traffic, based on a 2026 base year. A review of the locality found no changes to the Applicant's baseline HGV movements, and no notable developments likely to affect vehicle movements on local roads. Therefore, the findings of this assessment are considered valid for evaluating the likely effects arising from the Proposed Development, based on the 2026 baseline.

14.2 Methodology

This section describes the assessment methodology to assess the potential impact the Proposed Development may have on the surrounding road network. The assessment describes the existing situation at the Site in terms of access while also describing the existing situation and the predicted future situation on the external road network. The methodology adopted for this assessment is summarised as follows:

- 12-hour traffic counts were undertaken by Irish Traffic Surveys DASO on the 3rd February 2023. Count information was obtained from the existing L20113 / Quarry Access priority junction and the existing L2011 / L20113 priority junction;
- Existing Traffic Assessment - A spreadsheet model was created which contains the base year do-nothing traffic count data described above. The traffic count data was used to develop a PICADY model of the L20113 / Quarry Access priority junction and the existing L2011 / L20113 priority junction;
- Future Year Assessment – The estimated future year traffic volumes on the study area road network, as a result of the increase in background traffic in 2026, year of opening, 2031, five years after opening and 2041 fifteen years after opening.

14.3 Receiving environment

The existing road network within the vicinity of the Site is illustrated in Figure 14-1 below and is described further below.

14.3.1 Existing Road Network

Access to the existing Agall Quarry via the L20113 local road. The existing L20113 local road comprises of a single carriageway road and is approximately 4.5m wide at the existing access to the development. The Agall Quarry access is approximately 250m from the existing 2011 local road which provides access to the N52. See Figure 14-1 below.

A speed limit of 60km/h applies along the existing L20113 and L2011 local road.

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Figure 14-1: Local Roads Network



14.3.2 Existing Traffic Volumes

Traffic flows for the L20113 / Quarry Access priority junction and the existing L2011 / L20113 priority junction are provided in Appendix 14-1 – Traffic Count Data. Traffic counts were undertaken on 3rd February 2023 during the AM and PM peak period (07:00 to 10:00 & 16:00 to 19:00). The traffic flows during the busiest AM and PM peak hours were abstracted from the surveyed data and are shown in Tables 14-1 to 14-4 below.

Table 14-1: L20113 / Quarry Access Priority Junction – 2023 AM Peak Flows (08:00 – 09:00)

From/To	L20113 (east)	Quarry Access	L20113 (west)	Totals
L20113 (east)	0	1	5	**6**
Quarry Access	3	0	0	**3**
L20113 (west)	9	0	0	**9**
Totals	**12**	**1**	**5**	**18**

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Table 14-2: L20113 / Quarry Access Priority Junction – 2023 PM Peak Flows (16:30 – 17:30)

From/To	L20113 (east)	Quarry Access	L20113 (west)	Totals
L20113 (east)	0	0	5	5
Quarry Access	2	0	0	2
L20113 (west)	8	0	0	8
Totals	**10**	**0**	**5**	**15**

Table 14-3: L2011 / L20113 Priority Junction – 2023 AM Peak Flows (08:00 – 09:00)

From/To	L2011 (south)	L20113	L20113 (north)	Totals
L2011 (south)	0	0	101	**101**
L20113	3	0	0	**3**
L2011 (north)	107	1	0	**108**
Totals	**110**	**1**	**101**	**212**

Table 14-4: L2011 / L20113 Priority Junction - 2023 PM Peak Flows (16:30 – 17:30)

From / To	L2011 (south)	L20113	L2011 (north)	Totals
L2011 (south)	0	1	56	**57**
L20113	1	0	0	**1**
L2001 (north)	46	1	0	**47**
Totals	**47**	**2**	**56**	**105**

From the traffic counts it is noted that the flows along the L2011 and the L20113 are low during the AM and PM peak hours. In addition, the flows to and from the existing Agall Quarry are low.

14.3.3 Background Traffic

Transportation Infrastructure Ireland (TII) issues a range of traffic growth factors to be applied to existing traffic flows which are broken down into three groups; low growth, medium growth and high growth. Due to the low traffic movement along the L2011 and the L20113 it is assumed that medium growth is most likely for the road network surrounding the existing Agall Quarry. See Table 14-5 below.

The zone in which the Agall Quarry is located is numbered 412 in the TII National Traffic Model. The medium growth factors for each operational phase are as follows:

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Table 14-5: Future Traffic Growth

Zone	2023 Existing	2026 Development Operational	2031 Development Operational	2041 Development Operational
412	1.00	+ 5.87%	+ 16.45%	+ 19.62%

These percentages have been used to predict the increase in background traffic along the road network surrounding the existing Agall Quarry that will occur in future years. Full summary tables and predicted future traffic flows for 2026, 2031 and 2041 future years are included in Appendix 14-2 – Traffic Flow Sheets.

14.4 Characteristics and Potential Effects of the Proposed Development

Roadplan Consulting have been informed by the client that the number of proposed truck movement per typical operational day will be approximately 25 truck movements of out-going aggregates, in-line with existing HGV movements on the Site.

It is anticipated that there will be no change to the number of staff (2No in total) on-site as a result of the extension to the Agall Quarry.

Based on a 12-hour operational day it is assumed that 4/2 HGV's (25 truck movements / 12-hours) will arrive / depart during the AM and PM peak hours.

In addition, to the above it is assumed that the 2 staff trips will arrive to the Site during the AM peak hour and depart the Site during the PM peak hour.

Table 14-6 below shows the additional trips to and from the Site as a result of the quarry extension.

Table 14-6: Expected AM and PM peak flows

	Trips to Quarry	Trips from Quarry
AM Peak	4	2
PM Peak	2	4

14.4.1 Junction Capacity Assessment

A capacity assessment using the computer programme PICADY for the existing L20113 / Quarry Access priority junction has been carried out.

Full details and results of capacity assessments are contained in Appendix 14-3 – PICADY Results. The parameters shown in the tables are defined as follows:

- **Ratio of Flow to Capacity (RFC)** is a factor indicating the flow on a junction arm relative to its capacity. An RFC of 1.0 means the junction has reached its ultimate capacity and an RFC of 0.85 means that the junction has reached its reserve capacity;
- **Avg. Queue** is the average number of vehicles queued over the time period on the junction approach;
- **Queue delay** is the average number of seconds delay to each vehicle in the time period; and,
- **Total Delay** is the total number of vehicle hours of delay to all vehicles at the junction over the time period.

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14.4.2 L20113 / Quarry Access Priority Junction

The following tables show the predicted RFC values (Ratio of Flow to Capacity), average queue lengths, average vehicle delay and total delays for the existing L20113 / Quarry Access priority junction. See Table 14-7 below.

Table 14-7: L20113 / Quarry Access Priority Junction - Peak Capacity Results

AM Peak			2023 Base Year	2026 no Dev	2026 with Dev	2031 no Dev	2031 with Dev	2041 no Dev	2041 with Dev
L20113 / Quarry Access	L20113 (east)	RFC value	-	-	-	-	-	-	-
		Avg. Queue (Vehicles)	-	-	-	-	-	-	-
		Avg. delay (sec / veh)	-	-	-	-	-	-	-
		Total Delay (veh / min)	-	-	-	-	-	-	-
	Quarry Access	RFC value	0.00	0.00	0.01	0.00	0.01	0.00	0.02
		Avg. Queue (Vehicles)	0	0	0	0	0	0	0
		Avg. delay (sec / veh)	0	0	9	0	9	0	9
		Total Delay (veh / min)	0	0	0.001	0	0.001	0	0.001
	L20113 (west)	RFC value	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Avg. Queue (Vehicles)	0	0	0	0	0	0	0
		Avg. delay (sec / veh)	0	0	0	0	0	0	0
		Total Delay (veh / min)	0	0	0	0	0	0	0

Table 14-8: L20113 / Quarry Access Priority Junction - Peak Capacity Results

PM Peak			2023 Base Year	2026 no Dev	2026 with Dev	2031 no Dev	2031 with Dev	2041 no Dev	2041 with Dev
L20113 / Quarry Access	L20113 (east)	RFC value	-	-	-	-	-	-	-
		Avg. Queue (Vehicles)	-	-	-	-	-	-	-
		Avg. delay (sec / veh)	-	-	-	-	-	-	-

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PM Peak			2023 Base Year	2026 no Dev	2026 with Dev	2031 no Dev	2031 with Dev	2041 no Dev	2041 with Dev
		Total Delay (veh / min)	-	-	-	-	-	-	-
	Quarry Access	RFC value	0.00	0.00	0.02	0.00	0.02	0.00	0.02
		Avg. Queue (Vehicles)	0	0	0	0	0	0	0
		Avg. delay (sec / veh)	0	0	9	0	9	0	9
		Total Delay (veh / min)	0	0	0	0	0	0	0
	L20113 (west)	RFC value	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Avg. Queue (Vehicles)	0	0	0	0	0	0	0
		Avg. delay (sec / veh)	0	0	0	0	0	0	0
		Total Delay (veh / min)	0	0	0	0	0	0	0

The tables above indicate the at present the existing L20113 / Quarry Access priority junction currently operates within capacity with no queues and delays at the junction during the AM and PM peak hour.

In 2026, 2031 and 2041 with the extension to the Agall Quarry the existing junction will continue to operate within capacity with no queues and delays.

14.4.3 L2011 / L20113 Priority Junction

A capacity assessment using the computer programme PICADY for the existing L20113 / Quarry Access priority junction has been carried out. See Table 14-9 and 14-10 below.

Full details and results of capacity assessments are contained in Appendix 14-3 – PICADY Results

Table 14-9: L2011 / L20113 Priority Junction - Peak Capacity Results

AM Peak			2023 Base Year	2026 no Dev	2026 with Dev	2031 no Dev	2031 with Dev	2041 no Dev	2041 with Dev
L2011 / L20113 Priority Junction	L2011 (south)	RFC value	-	-	-	-	-	-	-
		Avg. Queue (Vehicles)	-	-	-	-	-	-	-

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AM Peak			2023 Base Year	2026 no Dev	2026 with Dev	2031 no Dev	2031 with Dev	2041 no Dev	2041 with Dev
		Avg. delay (sec / veh)	-	-	-	-	-	-	-
		Total Delay (veh / min)	-	-	-	-	-	-	-
	L20113	RFC value	0.00	0.00	0.01	0.00	0.01	0.00	0.02
		Avg. Queue (Vehicles)	0	0	0	0	0	0	0
		Avg. delay (sec / veh)	0	0	10	0	10	0	10
		Total Delay (veh / min)	0	0	0.001	0	0.001	0	0.001
	L2011 (north)	RFC value	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Avg. Queue (Vehicles)	0	0	0	0	0	0	0
		Avg. delay (sec / veh)	5	5	5	5	5	5	5
		Total Delay (veh / min)	0.003	0.003	0.003	0.003	0.003	0.003	0.003

Table 14-10: L2011 / L20113 Priority Junction - Peak Capacity Results

PM Peak			2023 Base Year	2026 no Dev	2026 with Dev	2031 no Dev	2031 with Dev	2041 no Dev	2041 with Dev
L2011 / L20113	L2011 (south)	RFC value	-	-	-	-	-	-	-

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PM Peak			2023 Base Year	2026 no Dev	2026 with Dev	2031 no Dev	2031 with Dev	2041 no Dev	2041 with Dev
Priority Junction		Avg. Queue (Vehicles)	-	-	-	-	-	-	-
		Avg. delay (sec / veh)	-	-	-	-	-	-	-
		Total Delay (veh / min)	-	-	-	-	-	-	-
	L20113	RFC value	0.00	0.00	0.01	0.00	0.01	0.00	0.01
		Avg. Queue (Vehicles)	0	0	0	0	0	0	0
		Avg. delay (sec / veh)	0	0	9	0	9	0	9
		Total Delay (veh / min)	0	0	0.001	0	0.001	0	0.001
	L2011 (north)	RFC value	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Avg. Queue (Vehicles)	0	0	0	0	0	0	0
		Avg. delay (sec / veh)	5	5	5	5	5	5	5
		Total Delay (veh / min)	0.002	0.002	0.002	0.002	0.002	0.002	0.002

The tables above indicate the at present the existing L2011 / L20113 priority junction currently operates within capacity with no queues and delays at the junction during the AM and PM peak hour.

In 2026, 2031 and 2041 with the extension to the Agall Quarry the existing junction will continue to operate within capacity with no queues and delays.

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14.5 Mitigation Measures

It has been demonstrated in this chapter that the extension to the Agall Quarry would continue to generate HGV movements on the surrounding local network. HGV traffic can be of particular concern to both local residents and highway users, and the mitigation measures outlined below are designed to alleviate any adverse effects:

- Condron Concrete Limited will adhere to a routing policy to ensure all movements are made via the strategic road network (N52) to avoid HGV's passing through residential areas as far as is practical; and
- Condron Concrete Limited would employ a policy of safety and environmental awareness for all HGV drivers accessing the Site.

14.6 Cumulative and In Combination Effects

Potential cumulative effects associated with the Proposed Development were also assessed.

There will be a minimal increase in journeys during the and operational phase of the Proposed Development. Therefore, a minimal change in cumulative traffic demand will occur from the Proposed Development in the locality.

14.7 Interactions with other Environmental Attributes

The Environmental Attributes that Material Assets – Traffic and Transport would interact with includes:

Chapter 5 – Population and Human Health: Emissions from traffic may have a negative impact on human health. Traffic may also be considered a nuisance to the population. This was assessed as part of the air quality assessment (Chapter 10) which concluded that the impact will be imperceptible;

Chapter 9 – Acoustics: A large amount of noise and vibrations come from traffic and transport. Traffic adds to the level of noise on-site. Emissions from traffic were considered in the assessment detailed in Chapter 10, which concluded that the impacts relating to the Proposed Development will be not significant;

Chapter 10 – Air Quality: Air quality can be adversely impacted by particulates and gaseous emissions from traffic. This was assessed in this chapter (section 10.3.4), which concluded that the impact will be imperceptible; and,

Chapter 11 – Climate: Carbon emissions from traffic (both on and off-site) have the potential to increase overall GHG emissions related to the Proposed Development. GHG emissions related to traffic to and from the proposed development are considered negligible in comparison to GHG emission savings related to this development.

14.8 Indirect Effects

Potential indirect effects related to the transport of materials to and from the Proposed Development are addressed throughout this chapter.

14.9 Residual Effect

Junction capacity assessment was carried out to determine the operation performance of the existing L20113 / Quarry Access priority junction and the existing L2011 / L20113 priority junction. The analysis showed the following:

- The existing L20113 / Quarry Access priority junction operates within capacity with no queues and delays during the AM and PM peak hour when the quarry is operational in 2026, 2031 and 2041; and,

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- The existing L2011 / L20113 priority junction operates within capacity with no queues and delays during the AM and PM peak hour when the quarry is operational in 2026, 2031 and 2041.

14.10 Monitoring

Condron Concrete Limited will continuously monitor the routing policy to ensure all movements are made via the strategic road network to ensure that delays and impact at key junctions are minimised.

14.11 Reinstatement

Not applicable.

14.12 Difficulties Encountered

No difficulties were encountered when compiling this information.

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15 INTERACTIONS OF THE FORGOING

The major interactions between the environmental impact topics are assessed within the above chapters of this EIAR. Table 15-1 demonstrates a matrix to summarise the interactions between effects on the various topic areas.

Table 15-1: Interactions between environmental impact topics

Description	Population and Human Health	Biodiversity	Land, Soils and Geology	Water	Air Quality	Climate	Acoustics	Landscape and Visual	Cultural Heritage	Material Assets – Traffic and Transport
Population and Human Health		X	X	✓	✓	✓	✓	X	X	✓
Biodiversity	✓		✓	✓	✓	X	✓	X	X	X
Land, Soils and Geology	✓	✓		✓	X	X	X	X	X	X
Water	✓	X	✓		X	✓	X	X	X	X
Air Quality	✓	✓	✓	X		X	X	X	X	✓
Climate	✓	✓	X	X	X		X	X	X	✓
Acoustics (Noise and Vibration)	✓	✓	X	X	X	X		X	X	✓
Landscape and Visual	✓	X	X	X	X	X	X		X	X
Cultural Heritage	✓	X	X	X	X	X	X	X		X

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Description	Population and Human Health	Biodiversity	Land, Soils and Geology	Water	Air Quality	Climate	Acoustics	Landscape and Visual	Cultural Heritage	Material Assets – Traffic and Transport
Material Assets – Traffic and Transport	✓	X	X	X	✓	✓	✓	X	X	

Table 15-2: Indication of interaction for Table 15-1 above

Interaction	✓
No Interaction	X

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16 SCHEDULE OF COMMITMENTS

Table 16-1: Schedule of Commitments

Commitment
General
All activities will comply with relevant legislation and documented best practice to reduce any potential environmental impacts. The mitigation measures detailed within this EIAR will be fully adhered to; • The Proposed Development will seek to utilise established ancillary infrastructure, including the wheel wash and offices; • The main construction hours will be from 07:00 to 18:00 Monday to Friday and 07:00 to 14:00 on Saturday. No construction works will take place on Sundays and Bank Holidays. No noisy construction works will be permitted outside these hours; • The operational hours will align with the current operational hours at the Quarry which are 07:00 to 18:00 Monday to Friday and 07:00 to 14:00 on Saturday. No works will take place onsite on Sundays or Bank Holidays during the operational phase of the Proposed Development; • The restoration phase will be done in line with a Restoration Plan; • The Site manager shall ensure that all personnel working onsite are trained and aware of the mitigation measures detailed within the EIAR; and, • No fuel will be stored on Site. All trucks are refuelled off site and a fuel truck direct from a fuel merchant is used for Site plant when.
Biodiversity
<u>General measures</u> The following mitigation measures will be incorporated and adhered to during the Construction, Operation and Restoration Phases at the Site to ensure that the works do not result in contravention of wildlife legislation: • The site manager shall ensure that all personnel working onsite are trained and aware of the mitigation measures detailed within the EIAR; • If protected or notable species such as common frog are encountered during operations at the Site, works will stop within the area that these animals are identified, and the project Ecological Clerk of Works (ECoW) will be contacted for advice; • A Restoration Plan will be implemented for the Site in order to conserve and, where possible, enhance the areas of retained and created habitat; • All vegetation management will be planned in accordance with relevant legislation and undertaken outside of the period between the 1st March to 31st August to avoid potential disturbance of nesting birds;

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Commitment
• Topsoil to be stripped from the Site, will be reused, where possible, in two screening berms around the northwest perimeter of the proposed extraction area. This will ensure that impacts on the soil are minimised / avoided; • The planting of the western berm, a treeline at its base, a hedgerow at its base and a treeline along the western boundary of the Site will take place during the construction phase to ensure vegetation is established during the early stages of the Proposed Development; • Dust control measures will be implemented as part of ongoing works; • An ECoW will inspect the Site in advance of works commencing and will undertake site inspections as required during the construction works, to ensure that all of the works are completed in line with the measures in this EIAR and wildlife legislation; • If protected or notable species are encountered during operations at the Site, works will stop within the area that the notable species was identified and the ECoW will be contacted for advice; • Should unidentified burrows be identified within the works area, the ECoW will be contacted, and advice sought; and, • Ongoing ecological monitoring throughout the life cycle of the Proposed Development will ensure that any protected or notable species will be identified and that appropriate mitigation / preventative actions can be taken.
<u>Protection of Trees and Hedgerows</u> • A minimum buffer of 5m will be maintained between the proposed extraction area and the retained hedgerows onsite / the woodland to the south. Along the northern boundary of the Site, this buffer has been extended to include the full crown extent of the hedgerow / treeline. The extraction area has also been reduced to allow for a 5m buffer from the proposed treeline along the western boundary of the Site; • No materials, equipment or machinery will be stored within close proximity to retained hedgerows / treelines; • Notice boards, wires, etc. will not be attached to any trees; • The construction of the berms onsite will be supervised by an ECoW to ensure that no impacts occur to bordering hedgerows / treelines. The retained trees will be assessed following the completion of these works; • The condition of the trees bordering the extraction areas will be inspected by the ECoW on an annual basis; and, • In order for treeline protection measures to work effectively, all personnel associated with the operation of heavy plant machinery must be familiar with the above principles for the protection of treelines.
<u>Proposed Planting</u> • Two screening berms will be constructed within the north / northwest portion of the proposed extension lands;

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Commitment
• The berms will be located in between the proposed extraction area and the residential properties outside the Site boundary. A set-back of 80m from the proposed extraction area and these residential properties will be maintained at all time; • The berms will be 3m high and 7m wide; • The eastern berm will be sown with a grass seed mix to retain the soils and prevent dust. This berm will not be planted with any trees and will be removed once operations have ceased. The soils from this berm will be used in the restoration of the northern field where possible. • The western berm will be retained throughout the lifetime of the Proposed Development. This berm will be planted with a double row of native trees amounting to ca. 288m of hedgerow / treeline. A 140m treeline will be planted at the base of this screening berm to the north alongside a 140m of hedgerow planting. In addition, a ca. 95m treeline will be planted along the northwest boundary of the Site. • The planting will take place within the first available season (November to March) and any trees that fail to become established within five years of planting will be replaced by trees of a similar size / species within the next planting season; • In addition, once quarrying operations have ceased in an area, any hedgerows removed to facilitate the extraction of aggregate will be replanted; • A ca.0.26ha woodland will be planted within the southwest portion of the Site as part of the restoration of Phase B; and, • The success of all vegetation planting will be monitored and any trees that fail to become established within 5 years of planting will be replaced by trees of a similar size / species within the next planting season.
<u>Protection of Flora</u> Red hemp nettle was not identified within the application Site; however, habitats supporting this species were identified adjacent to the Site boundary. Protection measures for the species includes • Delineating a red hemp-nettle protection zone and restricting access into this area to activities relating to the management or monitoring of this species; and, • Ensuring that no materials or equipment are stored in the red hemp-nettle protection zone. Should any red hemp nettle colonise areas within the Site boundary, these protection measures will be implemented. The distribution of red hemp-nettle within the Site and wider landholding will be confirmed by annual monitoring.
<u>Protection for Bats</u> The following measures, outlined in the Bat Report submitted as Appendix 6-2, will ensure that the Proposed Development does not result in any adverse impacts to bats: • No lighting will be installed as part of the Proposed Development; • The Restoration Plan (attached as Appendix 6-1) will ensure that as habitats are removed, restoration is occurring in other areas of the Site. In addition, the habitats removed to facilitate extraction will be restored to grassland after quarrying works cease, including grasslands, hedgerows and hedgerow / treelines.

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Commitment
<u>Protection of Nesting Birds</u> To ensure no impacts occur to birds as a result of the Proposed Development, the following general mitigation measures will be put in place: • Any vegetation clearance required will take place outside of the nesting bird season (1st March to 31st August), as per Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000; • In the event that works need to be undertaken within the main breeding season, this would be undertaken in consultation with NPWS; • Prior to the vegetation removal the ECoW will inspect the Site; • The management and removal of vegetation onsite will be undertaken in a systematic way under the direction of an ecologist to ensure that retained areas of vegetation are not damaged by the works; • Vegetation will be removed and replaced on a phase-by-phase system; • In the unlikely event birds nest within the active working area during the works, all works within the immediate area will stop and the ECoW will be consulted; and, • If notable / protected bird species are identified colonising any areas to be impacted by the works, then works will stop within the identified area. An appropriate undisturbed buffer zone will need to be established for the duration of the breeding season or until the chicks have fledged and left the nest. This will be confirmed by the ECoW.
<u>Protection for Sand Martin</u> • Areas where nesting activity is noted will be clearly marked to ensure disturbance is avoided and routinely monitored, making changes to these marked areas as necessary; • All exposed faces designated for excavation during the breeding season (1st March to 31st August) will be assessed for their potential to provide breeding sites by early March each year under the advice of the ECoW. These areas can then be managed or worked in such a way as to make them unattractive to sand martin so that extraction can continue without interruption. These management procedures include reprofiling the quarry face to less than 45° or utilising netting to cover nest holes outside the breeding season. This will prevent sand martin from nesting / burrowing within the active areas onsite; • Old disused / inactive nests will be removed outside of the nesting season under the supervision of the ECoW, to ensure that no birds are utilising the nests, and the nests are fully removed; • Before the commencement of the nesting season, a suitable quarry / aggregate face for sand martins will be set aside or a sand martin embankment will be created. This should ideally be away from the main works area to avoid any potential impacts; • Should sand martin be observed nesting within the boundary of the Site, then the ECoW will be consulted for advice; and, • Sand martin embankments will be created once operations have ceased as per the Restoration Plan submitted as Appendix 6-1.

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<u>Protection for Kestrel</u> • The potential kestrel nest will be dismantled outside of the breeding bird season; • An alternative nest box will be installed to maintain a breeding habitat for this species. The kestrel nest box will be designed to attract kestrels and will be erected on a post within the northeast portion of the Site, refer to Plate 6-3. The exact location will be specified by the ECoW. • If kestrels are identified colonising any areas to be impacted by the Proposed Development, then works will stop within the identified area. An appropriate undisturbed buffer zone will need to be established for the duration of the breeding season or until the chicks have fledged and left the nest, which will be confirmed by the ECoW.
<u>Protection of Terrestrial Mammals</u> [redacted]
<u>Measures for Invasive Species</u> To mitigate against the unintentional introduction of invasive species to the Site during operations, the following measures will be followed in-line with policy BLP-34 of the OCDP and the NRA guidelines for the management of noxious weeds and non-native invasive plant species: • Before machinery or equipment is unloaded at the Site, equipment will be visually inspected to ensure that all adherent material and debris has been removed; and, • Any vehicles and machinery that are not clean will not be permitted entry to the Site.
<u>Monitoring</u> The following monitoring works will be implemented to ensure that the works comply with the recommendations detailed within this chapter of the EIAR: • The ECoW will inspect the Site in advance of ground stripping works commencing to ensure that all of the works are completed in line with the EIAR; • The construction of the berms onsite will be supervised by an ECoW to ensure that no impacts occur to bordering hedgerows / treelines; • An arborist will assess the health of retained trees following the completion of berm construction and vegetation removal works;

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• The success of the berm, treeline, hedgerow and woodland planting will be monitored and any trees that fail to become established within 5 years of planting will be replaced by trees of a similar size / species within the next planting season; and, • Annual monitoring will take place to ensure that the on-going restoration of the Site is successful, and no invasive species are located onsite. Annual monitoring will also ensure each phase of the Proposed Development is carried out in line with the mitigation measures contained within this EIAR and that the retained hedgerows / treelines are being protected. Refer to Appendix 6-1 for further information.
Land, Soils and Geology
Prevention of Contamination of Soil / bedrock from Leakages and Spillages To minimise the overall impact on soils arising during the Proposed Development, the following mitigation measures will be adhered to; • All quarry vehicles will be refuelled via a fuel truck direct from a fuel merchant when required with adequate spill protection measures employed; • Spill kits will be available adjacent to all refuelling operations; • Items of plant will be refuelled utilising adequately sized and positioned drip trays; • The wheel wash will be serviced and maintained, including the removal of sediment offsite periodically by a permitted contractor to a licensed facility, to prevent the release of finer sediment; • Unauthorised access is prevented in so far as possible; • Any hazardous waste, such as waste oils, generated onsite will be collected in leak-proof containers and stored onsite in designated areas to be collected and recycled/disposed of by an authorised waste contractor; • Preventative maintenance and relevant maintenance logs will be kept for all onsite plant and equipment; • Procedures and contingency plans will be set up to deal with emergency accidents or spills; • Lubricants and hydraulic fluids for screening equipment used on the Site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best practice codes; and, • Any spillage of fuels, lubricants or hydraulic oils will be immediately contained, and the contaminated soil removed from the Site and properly disposed of.
Soil Management. Stockpiling of excavated material will be required and will be appropriately managed onsite. All topsoil will be stored in berms for use in the remediation stage of the project. To minimise the overall impact on soils arising during the construction works, the following measures will be adhered to; • The structure of the soil will be disturbed as little as possible to maintain its quality;

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• Soil stripping and stockpiling will not take place during particularly dry or wet weather. This will minimise damage to the soil structure; • The volume of berms should be optimised to avoid anaerobic conditions at the centre, this will help maintain soil chemistry and structure as much as possible; • Berms should be seeded as soon as possible to ensure the stability of the stockpiled soil; and, • Berms will be dampened down during dry periods to prevent wind dispersion until planting has established.
Water
During preparatory and operational works at the Proposed Development the usage of fuel powered equipment and machinery will be required. In order to limit the risk of contamination from these materials on water mitigation measures should be followed: • All quarry vehicles will be refuelled via a fuel truck direct from a fuel merchant when required with adequate spill protection measures employed; • Spill kits will be available adjacent to all refuelling operations; • Items of plant will be refuelled utilising adequately sized and positioned drip trays; • The wheel wash will be serviced and maintained, including the removal of sediment offsite periodically by a permitted contractor to a licensed facility, to prevent the release of finer sediment; • Unauthorised access is prevented in so far as possible; • Any hazardous waste, such as waste oils, generated onsite will be collected in leak-proof containers and stored onsite in designated areas to be collected and recycled/disposed of by an authorised waste contractor; • Preventative maintenance and relevant maintenance logs will be kept for all onsite plant and equipment; • Procedures and contingency plans will be set up to deal with emergency accidents or spills; • Lubricants and hydraulic fluids for screening equipment used on the Site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best practice codes; and, • Any spillage of fuels, lubricants or hydraulic oils will be immediately contained, and the contaminated soil removed from the Site and properly disposed of.
Acoustics (Noise and Vibration)
<u>Construction Noise Mitigation</u> Construction Phase works will be designed to avoid noisy work outside the hours of:

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• Monday to Friday 07:00 to 18:00; • Saturday 07:00 to 14:00; • Work occurring outside these hours will be subject to tighter construction stage noise limits, as per BS5228 (Section 11.2.2.3 of this EIAR); • Nomination of a responsible person to accept and respond to complaints; • Ensuring all plant and equipment is serviced and in good repair; • Avoidance of plant or equipment left idling; • Planning of works to ensure drop heights from equipment or during demolition are minimised to reduce noise generated; and, • Noise monitoring programme during construction phase works.
<u>Operational Noise Mitigation Measures:</u> Site operating hours will be from: • Monday to Friday 07:00 to 18:00; • Saturdays 07:00 to 14:00; and, • No activities will take place on Sundays or Public Holidays. The equipment associated with the Operational Phase will be mobile during the operational lifetime within the Site. This will aid in reducing noise emissions from the operations onsite to any individual receptor. The following mitigation measures will be in place as part of the Proposed Development: • All plant (fixed and mobile) is maintained to a high standard to reduce any tonal or impulsive sounds; • All plant is throttled down or switched off when not in use; and, • Internal routes are reduced in gradients where practical and routed to minimise noise emissions from vehicles onsite. Incorporating the above measures, and the mobile nature of the projects works within the Site, the compliance at NSRs from operational activities will be complied with to a noise criterion of: L_{Ar} 55dB from 08:00 to 20:00
<u>Restoration Noise Mitigation Measures</u>:

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Plant operating hours will be from 07:00 to 18:00, Monday to Friday and 07:00 to 14:00 Saturdays. No activities will take place on Sundays or Public Holidays. The equipment associated with the Restoration Phase will be mobile during the operational lifetime within the Site. This will aid in reducing noise emissions from the operations onsite to any individual receptor. The following mitigation measures will be in place as part of the Proposed Development: • All plant (fixed and mobile) is maintained to a high standard to reduce any tonal or impulsive sounds; • All plant is throttled down or switched off when not in use; and, Internal routes are reduced in gradients and routed to minimise noise emissions from vehicles onsite.
Noise Monitoring Incorporating the above noise mitigation measures during restoration works, and the mobile nature of the works within the Site, the compliance at NSRs will be complied with to a noise criterion of: $L_{Aeq,60min}$, 65dB from 07:00 to 19:00.
Air Quality
Mitigation measures for the Proposed Development are divided into general measures (e.g. Site management and maintenance) and those more specific to the construction/operation/restoration phases of the Proposed Development. A dust monitoring programme ('DMP') is in place for the existing Agall Quarry and will continue for the Site and agreed upon by the Local Authority. • The dust monitoring programme will be implemented primarily during the Operational Phase of the Proposed Development but will also incorporate aspects of the Site preparation and restoration phases.
Design Measures The design measures to reduce the potential impacts of dust include: • Hedgerows surrounding the Site boundary will be maintained during the Operational and Rehabilitation Phases. The hedgerows, once mature, should result in dense foliage; • The soils initially excavated from the Site will be used to build an embankment along the southwest, and north-western boundaries. A 35m buffer with a 3m high and 7m wide berm will be constructed at the north-western portion of the Site; • Extraction activities will be done in phases to minimise dust;

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• Access roads will consist of compacted gravel minimising exposed surfaces; and, • Exposed surfaces, e.g. topsoil and overburden storage mounds, will be planted with mixed species fast growing plants.
Construction and Operational Phase The following mitigation measures will be implemented to minimise dust generation, during the Construction Phase and Operational Phases: • Record all dust and air quality complaints, identify cause(s), take appropriate action; • Complaints log will be maintained at the Site office, available for review at any reasonable time; • Provide training to Site personnel on dust mitigation measures to be implemented at the Site; • Complete regular inspections of Site works to ensure compliance. The frequency of these inspections should be increased to coincide with activities where the risk of impact is higher during dry and/or windy conditions; • Continue monitoring of dust at the site boundaries using the Bergerhoff method; and, • Maintain good communication with the local community.
Site Preparation • Soil stripping and overburden handling will be avoided during dry and windy (>5.0m/s) conditions; and, • Reduce drop heights of material.
Mineral Processing • Screening will take place within enclosed or sheltered parts of the quarry to reduce the likelihood of transport of dust via wind; • Screening plant will be used within its design capacity; and, • All plant and equipment will be subjected to routine preventative maintenance.
Materials Handling • Materials will be dampened sufficiently during dry conditions; • Clearance of any spillage during extraction should be completed regularly to minimise accumulation of loose dry materials; • Minimisation of drop heights will be maintained; and

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• During Phase C and Phase D extraction works a sprinkler system will be deployed for use on stockpiles and the operational floor to target potential dust generation.
Vehicle Movements • Abrupt changes in direction will be avoided where possible; • Regular clearing, grading and maintenance of haul routes will be conducted; • Speed restrictions within and around the quarry (15 km/hr); • Vehicles will be evenly loaded to reduce possibility of spillages; • Daily application of water to haul routes during dry conditions will be completed, when necessary; • HGVs will pass through wheel wash prior to leaving the Site; and, • Road sweepers will be utilised to when needed.
Climate Change
Proposed Mitigation approaches **Avoid**: The avoidance of GHG emissions involves strategies to minimise emissions by avoiding or reducing activities that contribute to them, including: • Energy Efficiency: Use high-performance insulation, windows and roofing materials to minimise heat loss and gain, which will reduce the energy required for heating and cooling; and, • Waste Management: Effective waste management practices, including recycling and composting programmes, to minimise landfill waste and associated methane emissions. **Reduce**: The reduction of GHG emissions focuses on implementing measures that minimise emissions during the Construction Phase. These include: • Plant and Operations: The Operational Phase will reduce the idling of onsite plant when not in use. **Replace**: The replacement approach involves substituting high-emission activities or materials with lower-emission alternatives. These include: • Site Equipment: Site equipment worn will be reused as far as practicable.
Landscape and Visual
No significant landscape or visual effects are anticipated thus no associated mitigation measures are proposed or required given the modest scale of the Proposed Development.

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Cultural Heritage
Due to the potential survival of previously unknown sub-surface archaeological deposits or finds within the Site in areas 1 and 2 all soil-stripping in those areas should be monitored by a qualified archaeologist. • Any archaeological material identified during monitoring should be preserved by record under licence from the National Monuments Service in advance of Proposed Development.
Material Assets – Traffic and Transport
It has been demonstrated that the extension to the quarry would continue to generate HGV movements on the surrounding local network as a result of the Proposed Development. HGV traffic can be of particular concern to both local residents and highway users, and the mitigation measures outlined below are designed to alleviate any adverse impacts: • Condron Concrete Limited will adhere to a routing policy to ensure all movements are made via the strategic road network to avoid HGV's passing through residential areas as far as is practical; • Condron Concrete Limited would employ a policy of safety and environmental awareness for all HGV drivers accessing the Site.

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