Murray Brothers Tarmacadam Ltd

ARDCAHAN QUARRY SUBSTITUTE CONSENT REMEDIAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT (rEIAR)

VOLUME II

Main Statement

February 2026

Murray Brothers Tarmacadam Ltd

VOLUME II – MAIN STATEMENT

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CHAPTER 1
INTRODUCTION

VOLUME II
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FEBRUARY 2026

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1 Introduction

1.1 Preamble

This remedial Environmental Impact Assessment Report (hereafter, the 'rEIAR') has been prepared to accompany an application to An Coimisiún Pleanála (ACP) for Substitute Consent in respect of development at Ardcahan Quarry, Dunmanway, Co. Cork.

A remedial Natura Impact Statement (rNIS) also accompanies the application.

Substitute Consent is being sought under Section 177E of the Planning and Development Act 2000, as amended (the Act), to regularise quarrying development that took place at the site between 1990 when the EIA Directive came into force, and 2014 when quarrying ceased.

The substitute consent process provides a mechanism for developers to seek permission to bring into compliance developments falling within the scope of the EIA Directive and/or the Habitats Directive for which Environmental Impact Assessment (EIA) or Appropriate Assessment (AA) was not carried out due to exceptional circumstances.

The purpose of this rEIAR is to retrospectively address the environmental effects of the development which was carried out without the required EIA. It includes an assessment of the environmental effects of the development, measures to mitigate any adverse environmental impacts and a timeframe for implementation of these measures.

The Substitute Consent application will be accompanied by an application under Section 37L of the Act for proposed future quarrying at Ardcahan Quarry. There is overlap between the project site and lands included in the Section 37L application which are included to accommodate ancillary quarry activities (aggregate processing, internal roads, settling ponds, stockpiling etc) associated with the proposed future extraction.

This chapter outlines the background and describes the scope and methodology of the EIA process as it applies in the context of substitute consent. Information regarding consultation is also provided, together with details of the environmental assessment team.

1.2 The Applicant

This rEIAR has been prepared on behalf of Murray Brothers Tarmacadam Ltd (Murray Bros.) which was established in 1972 and over 50 years later, is still run by the same family. The company is well-established in the Dunmanway area and currently employs thirteen people.

Murray Bros. acquired Ardcahan Quarry and the macadam plant at Ardcahan in 1999. Prior to this, the quarry was owned by Cork County Council and leased to Mid Cork Quarries until it was acquired by Murray Bros in 1999. The quarry was established by the Council prior to October 1964 and operations had continued up until Cork County Council issued a notice to cease quarrying activities in 2014 following their review of all quarries in Cork under Section 261A of the Planning and Development Act 2000, as amended.

1.3 The Application Site

The Ardcahan Quarry landholding has a total area of approx. 25 hectares. The application for Substitute Consent relates to lands within the landholding measuring 19.1 hectares, including the former extraction area of 5.2 hectares in the southwest, as shown in Figure 1-1.

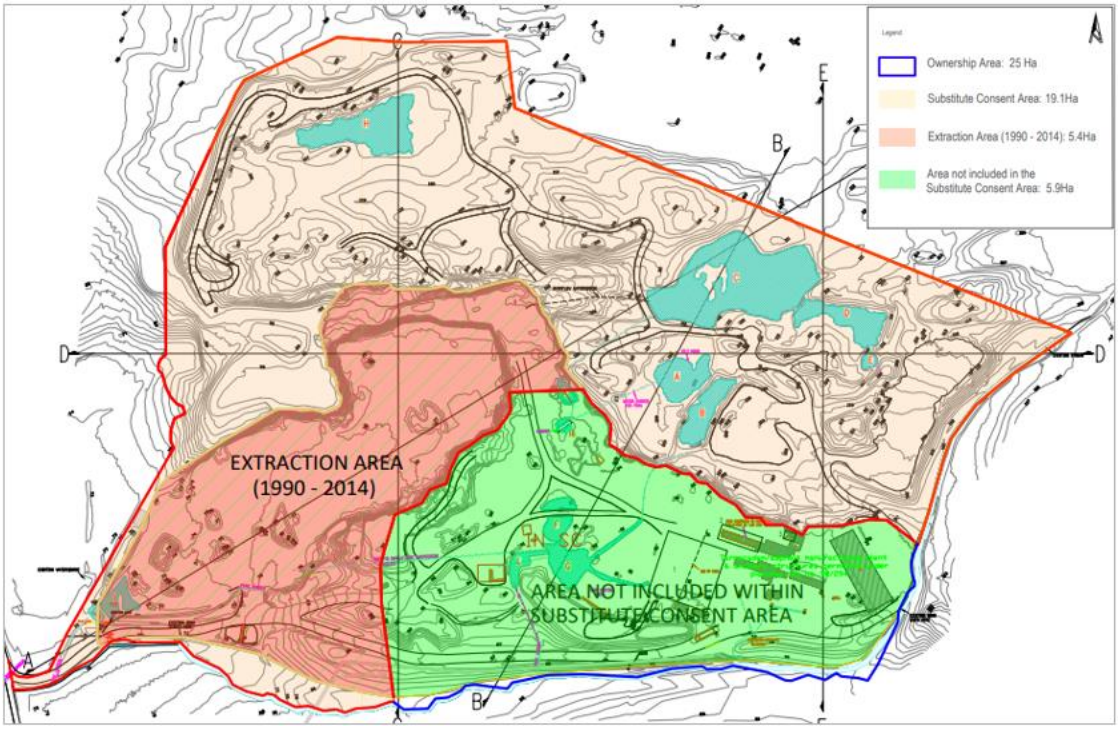


Figure 1-1 Site Layout Plan

The site boundary was determined having regard to the definition of quarry in Section 2 of the Act, as follows:

"quarry" means an excavation or system of excavations made for the purpose of, or in connection with, the getting of minerals (whether in their natural state or in solution or suspension) or products of minerals, being neither a mine nor merely a well or bore-hole or a well and bore-hole combined, and shall be deemed to include—

> *(i) any place on the surface surrounding or adjacent to the quarry occupied together with the quarry for the storage or removal of the minerals or for the purposes of a process ancillary to the getting of minerals, including the breaking, crushing, grinding, screening, washing or dressing of such minerals but, subject thereto, does not include any place at which any manufacturing process is carried on;*
>
> *(ii) any place occupied by the owner of a quarry and used for depositing refuse from it but any place so used in connection with two or more quarries, and occupied by the owner of one of them, or by the owners of any two or more in common, shall be deemed to form part of such one of those quarries as the Minister may direct;*
>
> *(iii) any line or siding (not being part of a railway) serving a quarry but, if serving two or more quarries shall be deemed to form part of such one of them as the Minister may direct;*

(iv) a conveyor or aerial ropeway provided for the removal from a quarry of minerals or refuse.

The application site captures the former extraction area and adjoining areas within the wider landholding (measuring 19.1 hectares) which were used for purposes such as access roads, plant, and stockpiling of topsoil and quarried material. Inclusion of these areas in the application site is aligned with the definition of quarry in the Act due to their use for activities "*ancillary to the getting of minerals*". The balance of the site (c. 5.9 hectares) is principally occupied by an existing macadam plant. In accordance with the definition which states that quarry "*does not include any place at which any manufacturing process is carried on",* this part of the landholding is not considered to form part of the quarry.

For the purposes of this rEIAR, the period of 1990 to 2014 has been identified for assessment. The EU Directive requiring the preparation of Environmental Impact Assessments was transposed into Irish Law in 1990 and as such an EIA would have been required for the quarrying works carried out on site between 1990 (when the EIA Directive came into force) and 2014 (when the quarrying works ceased).

1.4 Requirement for EIAR

Environmental Impact Assessment (EIA) requirements derive from EU Directives. Council Directive 2014/52/EU amended Directive 2011/92/EU and is transposed into Irish Law by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

Development which falls within one of the categories of development specified in Schedule 5 of the Planning and Development Regulations 2001, as amended, which equals or exceeds, a limit, quantity, or threshold prescribed for that class of development must be accompanied by an EIAR.

Paragraph 19 of Part 1 of Schedule 5 states that the following form of development requires an EIA:

19. Quarries and open-cast mining where the surface of the site exceeds 25 hectares.

Paragraph 2 of Part 2 of Schedule 5 refers to Extractive Industry and part (b) of that section states that the following requires an EIA:

(b) Extraction of stone, gravel, sand or clay, where the area of extraction would be greater than 5 hectares.

The development for which Substitute Consent is sought comprises a former extraction area of 5.2 hectares, within the wider application site boundary measuring 19.1 hectares. The former extraction area excludes the adjoining areas within the wider landholding which were used for ancillary purposes such as access roads, plant, and stockpiling of topsoil and quarried material. As the (net) extraction area exceeds 5 hectares, it may be reasonably concluded that an EIAR was required in respect of the former quarry development.

1.5 Purpose of Environmental Impact Assessment

The objective of the Directive (Directive 2011/92/EU), as amended by Directive 2014/52/EU, is to ensure a high level of protection of the environment and human health, through the establishment of minimum requirements for environmental impact assessment (EIA).

The 2014 Directive, for the first time, provides a definition of EIA and this is now defined by section 171A of the Planning and Development Act, 2000 (as inserted by Regulation 16 of the 2018 Regulations).

It is defined as a process consisting of:

a) the preparation of an EIAR by the developer;
b) the carrying out of consultations with the public, prescribed bodies (and, where relevant, any affected Member States);
c) the examination by the competent authority of the EIAR, any supplementary information provided, where necessary, by the developer and relevant information received through the consultation process;
d) the reasoned conclusion of the competent authority on the significant effects of the project on the environment; and
e) the integration of the competent authority's reasoned conclusion into any development consent decision.

The definition of EIA thus provides a clear distinction between the process of environmental impact assessment to be carried out by the competent authority and the preparation of an EIAR by the developer.

Section 2 of the 2000 Act has been amended to define an EIAR as 'a report of the effects, if any, which development, if carried out, would have on the environment and shall include the information specified in Annex IV of the Environmental Impact Assessment Directive'.

The EIAR presents the information necessary for the competent authority to identify, describe and assess the direct and indirect significant effects of the project on the environment.

1.6 Content of Environmental Impact Assessment Report

Article 3 of the amended EIA Directive prescribes a range of environmental factors that must be addressed in the EIAR, and requires consideration of risks to the project from major accidents and disasters, as follows:

1. *The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:*
    a) *population and human health;*
    b) *biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;*
    c) *land, soil, water, air and climate;*
    d) *material assets, cultural heritage and the landscape;*
    e) *the interaction between the factors referred to in points (a) to (d).*

2. *The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned*.

Article 5(1) (a-f) of the amended Directive addresses the information that is required to be included in an EIAR, as set out below:

The information to be provided by the developer shall include at least:

a) a description of the project comprising information on the site, design, size and other relevant features of the project;

b) a description of the likely significant effects of the project on the environment;

c) a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;

d) a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;

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

f) any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.

The EIAR presents the results by reference to the prescribed environmental factors and information requirements in the amended EIA Directive, which enables the potential environmental effects to be systematically identified and evaluated, and where likely significant effects are identified, scope for modifying or mitigating these effects, to be properly evaluated.

1.7 Remedial EIAR Requirements

There is no specific guidance in relation to the preparation of a remedial EIAR. However, Section 177(F) (1) of the 2000 Act requires that it address the matters outlined below:

> *(1) A remedial environmental impact assessment report shall contain the following:*
>
> *(a) a **statement of the significant effects**, if any, on the environment, which **have occurred** or which **are occurring** or which **can reasonably be expected to occur** because the development the subject of the application for substitute consent was carried out;*
>
> *(b) details of—*
>
> > *(i) any **appropriate remedial measures** undertaken or proposed to be undertaken by the applicant for substitute consent to remedy any significant adverse effects on the environment;*
> >
> > *(ii) the **period of time within which any proposed remedial measures shall be carried out** by or on behalf of the applicant;*
>
> *(c) such information as may be prescribed under section 177N.*
>
> (Emphasis added)

Furthermore, An Coimisiún Pleanála's evaluation of the remedial EIAR shall be in accordance with the general requirement under Section 177E (4A) (a) which states:

> *(4A)(a) The Board shall consider whether a remedial environmental impact assessment report submitted under this section identifies and describes adequately the direct and indirect significant effects on the environment of the development*.

This rEIAR relates to development at Ardcahan Quarry carried out between 1990, when the EIA Directive came into force and 2014, when quarrying ceased, and which should have been subject to EIA.

In accordance with Section 177(F)(1), this rEIAR presents details regarding the environmental impacts arising from the former quarrying activity for which Substitute Consent is sought, with a focus on significant effects which have either occurred, are occurring or which can reasonably be expected to occur. It also includes details of proposed remedial measures intended to mitigate adverse effects and a timeframe for implementation.

As required under Article 3 of the EIA Directive and referred to in Section 177E (4A)(a) of the 2000 Act, this rEIAR presents details of both the direct and indirect significant effects on the environment.

Having regard to the relevant statutory provisions for remedial environmental impact assessment reports, the evaluation of likely significant effects takes into account:

- Effects which **'have occurred'**

  The relevant period for consideration of effects that 'have occurred' is from the transposition of the EIA Directive into Irish Law in February 1990 to the present. Within this period, the existing macadam plant became operational (1999) and so consideration of the associated cumulative impacts is factored into the assessment where relevant.
- Effects which **'are occurring'**

  This aspect of the assessment considers effects arising from the former quarrying activities that are currently being experienced. The assessment of likely significant effects that 'are occurring' is based on a description of the relevant aspects of the existing present-day environment at Ardcahan Quarry and the surrounding area, informed by site visits and environmental surveys, where appropriate. Where relevant, the assessment includes consideration of cumulative impacts associated with the existing macadam plant which remains operational.

- Effects which **'can reasonably be expected to occur'**

  Assessment of the likely significant effects of the former quarrying activities that 'can reasonably be expected to occur' includes consideration of cumulative impacts, where relevant to individual environmental factors, of continued operation of the existing macadam plant and the potential effects that may arise if the proposed development subject of the concurrent Section 37L application is granted permission.

1.8 Legislation, Guidance & Other Information Sources

This rEIAR has been prepared in accordance with the relevant provisions of Directive 2011/92/EU, as amended by Directive 2014/52/EU. All the factors prescribed in Article 3 of the amended EIA Directive are addressed, and the information required under Article 5(1) and Annex IV is provided.

The Planning and Development Act 2000 and Planning and Development Regulations 2001 have been amended by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (SI No. 296 of 2018) to take account of the requirements of the Directive (Directive 2014/52/EU).

The amended Directive sets the fundamental framework which has informed preparation of this rEIAR. Additional requirements relevant to this rEIAR arising from the transposing legislation have been adhered to.

Preparation of this rEIAR was also informed by consideration of the following guidance:

- Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Reports (European Commission, 2017)
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (Environmental Protection Agency, May 2022).
- Guidelines on Information to be Contained in Environmental Impact Statements (EIS) (Environmental Protection Agency, 2002)
- Environmental Management in the Extractive Industry (Non-scheduled Minerals (Environmental Protection Agency, 2006)
- Quarries and Ancillary Activities (Department of Heritage, Heritage and Local Government, 2004).
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018).

Where relevant, contributors have had regard to other discipline-specific guidelines, details of which are set out in individual chapters of the rEIAR.

In addition to the above, an earlier planning application for this site has been referred to for background context and environmental information. Permission was granted for quarrying of stone at Ardcahan Quarry under Cork Co. Council Ref. 14/616 and upheld on appeal under ACP Case Ref. PL88.245174[1]. The application provided for an extraction area of 6 hectares and was accompanied by an Environmental Impact Statement (EIS). A Natura Impact Statement (NIS) was also submitted in response to a Request for Further Information. The environmental surveys completed to inform the EIS and NIS have been used as an additional source of information to establish the baseline for this rEIAR.

[1] A subsequent judicial review of the PL88.245174 permission [2016 No. 499 JR] granted certiorari of the decision.

1.9 Consultation

On behalf of the applicant, McCutcheon Halley Planning engaged in pre-application consultation with statutory authorities to inform the EIAR preparation process.

Consultation letters containing information about the project (including the development subject of the Substitute Consent application and the proposed extension under Section 37L) were issued to the prescribed bodies listed below on 29 November 2024.

The prescribed bodies were invited to respond within a seven-week period, up to 17 January 2025. Input was sought regarding any specific environmental receptors, sensitive areas or key issues that should be addressed, as well as any relevant data sources and recommended methodologies to inform the assessments. Prescribed bodies shown in bold text provided a response. Where the response included comments or recommendations, these have been considered by the EIAR contributors and are addressed in the relevant chapters, as appropriate.

1. **Cork County Council**
2. Department of Housing, Local Government and Heritage (Development Applications Unit)
   a. National Monuments Service
   b. **National Parks and Wildlife Service**
   c. The Heritage Council
3. Department of Environment, Climate and Communications
4. Department of Rural and Community Development
5. Department of Agriculture, Food and the Marine
6. An Chomhairle Ealaíon - The Arts Council
7. Environmental Protection Agency
8. **Geological Survey Ireland**
9. **Transport Infrastructure Ireland**
10. An Taisce - The National Trust for Ireland
11. The Health and Safety Authority
12. **The Health Service Executive**
13. Birdwatch Ireland
14. Bat Conservation Ireland
15. **Uisce Eireann**
16. Department of Education
17. **Inland Fisheries Ireland**
18. **Failte Ireland**

In addition to the above, the required information has been issued for the Department of Housing, Planning, and Local Government's EIA Portal. This tool informs the public in a timely manner of applications accompanied by an EIAR.

1.10 Competency

It is a requirement that the EIAR must be prepared by competent experts. For the preparation of this EIAR, the Applicant engaged McCutcheon Halley Chartered Planning Consultants to direct and coordinate the preparation of the rEIAR and a team of qualified specialists was engaged to prepare individual chapters. The consultant firms and lead authors for each chapter are listed in Table 1-3.

Details of the competency, qualifications, and experience of the lead author for each environmental factor is outlined in the relevant chapters.

1.11 Study Area

A study area has been defined for each environmental topic to inform the related technical assessments. This study area has been determined by reference to relevant guidance and the geographic scope of potential impacts. The potential impacts may be temporary or permanent and may be positive or negative. All types of impact are considered when defining the study area.

The individual chapters provide details of the study area, including a description of baseline conditions, for each discipline. For the purpose of this rEIAR, the baseline environment refers to conditions within the study area as of January 1990, in the absence of development and prior to the EIA Directive coming into force.

1.12 Impact Assessment Methodology

Each chapter of this EIAR assesses the direct, indirect, cumulative, and residual impact of the development.

Having regard to the nature of this development, there is no traditional 'construction phase'. Rather there is an initial development phase that includes stripping of the topsoil and placement in berms to screen the active area. For the purpose of this rEIAR, this phase is referred to as the Construction Phase.

The identified quality, significance, and duration of effects for each aspect is primarily based on the terminology set out in the EPAs Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022) as summarised in Table 1-1.

Table 1.1 Impact Rating Terminology

Quality of Effect	
Positive	A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of and ecosystem, or by removing nuisances or improving amenities.
Neutral	No effects of 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 or by causing nuisance).

Quality of Effect	
Significance of Effect	
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline 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 most of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics.
Extent and Context of Effects	
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?).
Probability of Effects	
Likely	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Duration of Effects	
Momentary Effects	Seconds to minutes
Brief Effects	Less than 1 day
Temporary Effects	Less than 1 year
Short-term Effects	1-7 years
Medium-term Effects	7-15 years
Long-term Effects	15-60 years
Permanent Effects	Over 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).

Quality of Effect	
Types of Effects	
Indirect 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).

1.13 Scoping

The purpose of scoping is to identify the information to be contained in an EIAR and the methodology to be used in gathering and assessing that information. The scope of this rEIAR is informed by the requirements of the Directive 2014/52/EU and the transposing Regulations together with the Guidelines set out above. Applicants are not required to seek a formal scoping opinion.

The scope of individual assessments is informed by discipline-specific guidelines and, where this is the case, they are referenced in each chapter.

1.14 Scope of Cumulative Effects

Directive 2014/52/EU substituted a new Annex IV into Directive 2011/92/EU. Annex IV of the EIA Directive is to be read in conjunction with article 5(1) and sets out the information to be included in an EIAR. Annex IV was transposed into national law via article 97 of the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (the "2018 Regulations") which substituted a new Schedule 6 into the Planning and Development Regulations 2000, as amended.

The Directive requires that the EIAR describes the cumulation of effects with other existing and/or approved projects.

Cumulative effects may arise from:

- *The interaction between the various impacts within a single project;*

- *The interaction between all the differing* existing and / or approved projects *in the same areas as the proposed project.* [2]

In August 2018, the Department of Housing, Planning and Local Government issued Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment. The Guidelines summarise "cumulative effects" in the following way on page 40;

Effects are not to be considered in isolation but cumulatively i.e., when they are added to other effects. A single effect on its own may not be significant in terms of impact on the environment but, when considered together with other effects, may have a significant impact on the environment. Also, a single effect which may, on its own, have a significant effect, may have a reduced and insignificant impact when combined with other effects.

Paragraph 2(e)(i)(V) of Schedule 6 (paragraph 5(e) of Annex IV) provides as follows;

> *...the cumulation of effects with other* ***existing or approved developments, or both****, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources.* (Emphasis added).

In relation to the assessment of cumulative impacts arising from the construction and operation of the quarry between 1990 and 2014, the operation of a permitted macadam / asphalt manufacturing plant, owned and operated by Murray Bros since 1998 have been considered (details below). No other industrial or business developments in close proximity to the site have been identified, the construction and/or operation of which between 1990 and 2014 would have led to a significant impact on the environment. The majority of the applications in the surrounding area related to one off housing and minor agricultural works.

Table 1.2 Projects considered for cumulative impacts

Planning Ref.	Description	Decision
CCC 98/294	Tarmacadam/asphalt manufacturing plant, ancillary buildings & works, storage bays, weighbridge and septic tank	Granted 2nd February 1998

Each EIAR contributor has adopted an approach to the assessment of cumulative impacts that is appropriate to their discipline based on relevant technical guidance and best practice, and having regard to the nature, magnitude and geographical extent of the predicted impacts, as well as the sensitivity of the receiving environment.

Cumulative effects are not limited to projects, and relevant plans must also be considered. According to the Environmental Protection Agency (2020), in Ireland, key cumulative effects—where environmental receptors are at or near their thresholds or their capacity to assimilate more change—include climate change, water management, including flood risk management, air quality, and biodiversity, including peatlands and wetlands.

The retrospective nature of a remedial EIAR has a limiting effect on the relevance of plans in the

[2] Department of Housing, Planning and Local Government, "Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment" (August 2018), page 40.

consideration of cumulative effects. Arguably, the consideration of historic plans is negated by the fact that their implementation during the relevant period will have directly informed conditions within the study area. The greatest potential for cumulative impacts between plans and the historic quarrying activities therefore arises in connection with effects that can reasonably be expected to occur.

For the purpose of this rEIAR, the following Plans have been considered in relation to potential cumulative effects:

- **Project Ireland 2040** - comprises the Revised National Planning Framework (NPF), which sets the overarching spatial strategy that will shape the future growth and development of Ireland to the year 2040, along with the National Development Plan (NDP), which sets out the ten year investment strategy. As a strategic development framework, Project Ireland 2040 sets the long-term context for our country's physical development and associated progress in social, economic and environmental terms, in a national and European context. The NPF sets the context for the Regional Spatial Economic Strategies (RSES) through 10 National Strategic Outcomes (NSOs) including Strengthened Rural Economies and Communities, and Enhanced Amenities and Heritage.
- **Regional Spatial and Economic Strategy (RSES) for the Southern Region** - the RSES provides a long-term, strategic development framework for the future physical, economic and social development of the Southern Region. The RSES primarily aims to support the delivery of the programme for change set out in Project Ireland 2040 and recognises the strategic role played by all areas, urban and rural, in achieving the set regional and national targets and objectives.
- **Cork County Development Plan 2022-2028** - sets out an overall strategy for the proper planning and sustainable development of the functional area of Cork County Council. The Plan has a key role in protecting the environment, heritage, and amenities of the county and in mitigating against the impacts of climate change. It includes policies and objectives for all aspects included in this EIAR. Accordingly, each chapter of the EIAR has been prepared having regard to the cumulative effects of the development and relevant Development Plan policies and objectives.
- **The Climate Action Plan 2025** - climate change is the ultimate cumulative effect, nationally and internationally. The Climate Action Plan provides a roadmap of actions which will ultimately lead Ireland to meet its national climate objective of pursuing and achieving the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy, by no later than 2050. It aligns with the legally binding economy-wide carbon budgets and sectoral emissions ceilings that were agreed by Government in July 2022.
- **National Biodiversity Action Plan 2023-2030** - The Plan sets out actions for a "Whole-of-Government, Whole-of Society" approach to the governance and conservation of biodiversity. It has been developed to align with EU and International Biodiversity strategies and policies, as well as National plans and policies focussed on environmental protection and climate action that influence biodiversity. The cumulative effects of this Plan and the development are considered in the Biodiversity chapter.
- **EU Habitats Directive** - provides the legislative framework for the protection of habitats and

species across Europe through the establishment of a network of designated conservation areas known as the Natura 2000 network. The Natura 2000 network includes sites designated as Special Areas of Conservation (SACs), under the EU Habitats Directive and Special Protection Areas (SPAs) designated under the EU Birds Directive. The cumulative effects of this Plan and the project are addressed in the Biodiversity chapter.

- **EU Birds Directive** - requires that important concentrations of migratory waterfowl and internationally important wetlands be protected in the same way as Annex 1 and Annex II habitats and species under the Habitats Directive. The cumulative effects of this Plan, together with the development, are considered in the Biodiversity chapter.
- **Standards in the EU Air Quality Directive and 'daughter' directives** - establish the levels of air pollutants that have no significant impacts on human health or the environment. The cumulative effects of the Directive, together with the development, are considered in the Population & Human Health chapter and the Air Quality & Climate chapter.

In addition, each of the specialist chapters (4-15) considers the cumulative effects of projects and plans relevant to the zone of influence and discipline-specific factors.

1.15 Screening for Major Accidents and Disasters

This rEIAR has been prepared in accordance with the requirements set out in the Planning and Development Act 2001 (as amended) and in Council Directive 2011/92/EU as amended by Directive 2014/52/EU (the EIA Directive), and is based on the draft guidance presented in Guidelines on the Information to be contained in Environmental Impact Assessment Reports, Draft (EPA 2017).

Schedule 6 of the European Union (Planning and Development) (Environmental Impact Assessment) (Regulations) 2018 (and Annex IX of the EIA Directive) specify the information to be contained in an EIAR. These requirements identify a range of prescribed environmental factors, the significant effectsof which have been addressed in this EIAR. These include population and human health, biodiversity, land and soil, water, air and climate, noise, landscape, cultural heritage and material assets as well as the inter-relationship between the above topics.

Schedule 6 requires that the following is provided in the EIAR where relevant;

> *(h) a description of the expected significant adverse effects on the environment of the proposed development deriving from its vulnerability to risks of major accidents and/or disasters which are relevant to it.*

Section 8 of Annex IV of the EIA Directive specifies that the EIAR must include;

> *"A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this Directive are met. W here appropriate, this description should include*

measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies".

A major accident can be defined as an acute or chronic accident or disaster, of human or natural origin, which occurs either as a consequence of, or which interacts with, the construction or operation of the proposed Scheme, and which has substantial consequences for people or the environment.

The Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances)2 Regulations 2015 transpose the Seveso III Directive (2012/18/EU) into Irish Law. The Regulations replace with effect from 1 June 2015 the European communities (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2006 and 2013. The purpose of the COMAH Regulations is to lay down rules for the prevention of major accidents involving dangerous substances, and to seek to limit as far as possible the consequences for human health and the environment of such accidents, with the overall objective of providing a high level of protection in a consistent and effective manner.

There are two tiers of establishment, which are related to the quantities of dangerous substances present. Depending on quantity, an establishment may be upper-tier or lower-tier. Upper-tier establishments have greater quantities of dangerous substances present and therefore are obliged to comply with additional requirements specified in the Regulations. The Health and Safety Authority provides a list of upper and lower tier sites. There are no sites in proximity to the quarry at Ardcahan.

The risk of major accidents as a result of the construction and operation of the proposed project has been considered by each discipline throughout the EIAR where relevant. It is noted that no historic records of major accidents, such as oil spills, major flooding on site, collapse of spoil heaps or berms or resultant fish kills have been identified in the specified period (1990 – 2014). Any effects on the surrounding environment are considered to be "Imperceptible" in regard to major accidents and disasters.

1.16 Limitations & Difficulties Encountered

Difficulties were encountered compiling the information prescribed under Schedule 6 of the Regulations[3] as it relates to the Project Description.

The description of development was prepared based on limited or incomplete information sourced from Cork County Council, historic Ordnance Survey aerial photography and the Applicant who acquired the site in 1999.

Due to the nature of the project and the significant timeframe involved, extending back some 35 years, it was necessary to make certain assumptions regarding the operational characteristics of the historic quarrying activities.

In the absence of records, estimates were made regarding the quantities of material extracted between 1990 and 1999. Assumptions were also made regarding the number of vehicle movements

[3] Article 97 of S.I. No. 296/2018 European Union (Planning and Development)(Environmental Impact Assessment) Regulations 2018

in this period and the frequency of blasting activities. However, the details provided are informed by similar developments from the period, the extensive experience of the applicant as a quarry operator, and the technical expertise of the appointed environmental specialists.

It is worth noting that the quarry was in operation pre-1963 and the works carried out post 1990 were an extension of the established practice, including the use of already developed areas and a similar plant.

In all cases where it was necessary to rely on assumptions, conservative estimates have been applied. Reliance on conservative estimates ensures a robust approach to the impact assessment, allowing for potential 'worst case' environmental effects to be predicted.

As documented within the individual specialist chapters, the project description information was supplemented where needed by publicly available information sources for the purpose of carrying out the impact assessment.

Published environmental data was sourced from the Environmental Protection Agency (EPA), Geological Survey of Ireland (GSI), and Department of Climate, Energy and the Environment digital mapping services. Historic census data published by the CSO was also reviewed to inform the assessment.

Every effort has been made to ensure the information relied upon for the purpose of this EIAR is accurate. The EIAR contributors are experts in their respective areas and are skilled at identifying the relevant information and the likely scenarios over time.

Notwithstanding the difficulties encountered in the preparation of this rEIAR, the overall conclusions are considered to be reliable and accurate.

1.17 Format & Structure of the rEIAR

This rEIAR has been prepared according to the 'Grouped Format Structure' as described in the Guidelines on information to be contained in Environmental Impact Statements (EPA, 2022). This means that each topic is considered as a separate section. The advantages of using this format are that it is easy to investigate a single topic and it facilitates easy cross-reference to specialist studies.

The EIAR is subdivided into 3 volumes as follows:

- **Volume I** Non-Technical Summary;
- **Volume II** Environmental Impact Assessment Report; and
- **Volume III** Appendices to Environmental Impact Assessment Report.

Volume II is presented as 17 chapters, outlined in Table 1-2.

Table 1.3 EIAR Chapters & Contributors

Chapter	Aspect	Consultant	Lead Author
1	Introduction	McCutcheon Halley Planning	Martina Keenan Rivero
2	Planning Policy	McCutcheon Halley Planning	Martina Keenan Rivero
3	Project Location and Description	McCutcheon Halley Planning	Martina Keenan Rivero
4	Alternatives Considered	McCutcheon Halley Planning	Martina Keenan Rivero
5	Population and Human Health	McCutcheon Halley Planning	Martina Keenan Rivero
6	Land, Soils & Geology	Viridus Consulting Ltd	Darragh Musgrave
7	Hydrology and Hydrogeology	Viridus Consulting Ltd	Darragh Musgrave
8	Air Quality	AWN Consulting	Ciara Nolan
9	Climate	AWN Consulting	Ciara Nolan
10	Noise and Vibration	CLV Consulting	Brian Johnson
11	Landscape and Visual Impact	Cathal O'Meara Landscape Architects	Cathal O'Meara
12	Traffic and Transport	MHL Consulting Engineers	Shane Moriarty
13	Material Assets – Services and Utilities	McCutcheon Halley Planning	Martina Keenan Rivero
14	Biodiversity	MOR Consulting Engineers	Dyfrig Hubble
15	Cultural Heritage and Archaeology	Lane Purcell Archaeology	Avril Purcell
16	Significant Interactions of Impacts	McCutcheon Halley Planning	Martina Keenan Rivero
17	Summary of Remedial and Mitigation Measures and Monitoring	McCutcheon Halley Planning	Martina Keenan Rivero

1.18 Statement of Significant Effects

Any significant effects which may have occurred as a result of construction and operation at the quarry between 1990 and 2014 are identified by each discipline within each chapter, and a statement of significant effects is included at the end of the chapter.

Murray Brothers Tarmacadam Ltd

CHAPTER 2
PLANNING POLICY

VOLUME II
MAIN STATEMENT

FEBRUARY 2026

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2 Planning Policy

2.1 Introduction

2.1.1 Overview

This section sets out the planning and development context relating to the former quarry development and reviews the national, regional and local planning policy. In the interests of comprehensively addressing the policy context, this chapter addresses policy which coincided with the relevant period for the development (1990 to 2014) and the current policy framework.

In recent years, there has been a conscious move in Ireland towards strategic planning with various policy documents and plans introduced to support strategic planning and development.

Policies and objectives of the Government filter down from the national level to regional plans and to the local authority level in County Development Plans and Local Area Plans.

It is worth nothing that despite the high demand for aggregates and aggregate based products in Ireland, there is no sector specific policy developed for the extractive industry. County Development Plans have traditionally been the key source for planning guidance and safeguarding of resources.

2.1.2 Author Information and Competency

This chapter was prepared by Martina Keenan Rivero of McCutcheon Halley Chartered Planning Consultants. Martina holds a BSc (Hons) in Spatial Planning from Technological University Dublin and an Advanced Diploma in Planning and Environmental Law from Kings Inns. She has 10 years of professional experience, working in NSW, Australia with a Local Authority and as a planning and environmental consultant in Ireland. Martina has prepared AA screening reports, Environmental Impact Assessment screening reports and coordinated and contributed to Environmental Impact Assessment Reports for a range of development projects. Relevant project experience includes large housing developments, mixed-use schemes, industrial and commercial projects.

Martina was involved in the coordination and preparation of EIARs to accompany planning applications for the following projects that received permission:

- Southwest Gate – A mixed-use scheme across 13 blocks comprising 1,123 residential units with supporting amenities, retail units, office accommodation, a primary healthcare centre, gym, cultural centre, childcare facility, hotel and a series of public open spaces.

- Primark Distribution Centre – Construction of a Distribution Centre incorporating office floor space and ancillary buildings with a cumulative gross floor area of approx. 64,550 sq.m and associated site works.

- Oscar Traynor Road – Construction of 853 residential units (social, affordable and cost rental homes), together with a creche, retail unit/café, community facilities and a new public park.

2.2 National Planning Framework: First Revision (2025)

The First Revision of the National Planning Framework (NPF) approved in April 2025, provides a strategic framework for Ireland's social, economic, and cultural development up to 2040, targeting. It sets a target to accommodate a population increase of 950,000 while promoting balanced regional development through the revitalisation of rural and urban areas.

As part of this vision, the Revised NPF places particular emphasis on strengthening regional cores such as Cork and its hinterlands, recognising its potential to act as a key driver of economic growth and innovation outside of Dublin. The plan supports the diversification of Cork's employment base and the creation of conditions that attract and retain talent, enhancing the region's competitiveness and appeal to investors.

As part of its broader strategy, as per National Policy Objective (NPO) 30, the plan aims to:

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

This objective underscores the importance of supporting traditional and emerging rural industries while safeguarding environmental and cultural assets that underpin rural tourism and community identity.

Further reinforcing this commitment, Section 9.2 of the NPF addresses resource efficiency and the transition to a carbon-neutral economy. It highlights the strategic importance of extractive industries in supplying essential materials for construction and export and supports the identification and protection of key mineral reserves from conflicting land uses to ensure their sustainable use.

> *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.*

In accordance with the Revised NPF, extraction activities are supported where they meet environmental standards, including those related to noise, air and water quality, and the protection of natural and cultural heritage, as well as the quality of life for nearby communities. Additionally, it places strong emphasis on site rehabilitation and encourages nature restoration in line with EU initiatives such as the Nature Restoration Law, the EU Green Deal, and the EU Biodiversity Strategy 2020.

2.3 Quarries and Ancillary Activities Guidelines for Planning Authorities (2004)

The Guidelines for Planning Authorities, 'Quarries and Ancillary Activities', April 2004 notes that aggregates are a significant natural resource and that the extraction industry makes an important contribution to economic development in Ireland.

The Guidelines also note that, by their nature, aggregates can only be worked where they occur, and that sand and stone/gravel have a low value-to-weight ratio. It is therefore generally neither economically nor environmentally sustainable to transport aggregates any great distance to their market due to freight costs.

The guidelines highlight that there will be a continuing need for some new or expanded aggregates quarrying operations on land to meet regional and local requirements and that the planning system should ensure an adequate supply to meet construction demands, while at the same time protecting Irelands natural and cultural heritage.

2.4 Regional Spatial and Economic Strategy for the Southern Region 2020-2032

The Regional Spatial and Economic Strategy (RSES) for the Southern Region of Ireland is a strategic framework to guide spatial planning and economic development over a 12-year period, aligning with the broader goals of Project Ireland 2040 and the National Planning Framework.

The RSES aims to foster sustainable development, promote economic growth, and ensure the efficient use of resources across the Southern Region, which covers over 40% of Ireland's landmass and supports one-third of its population. It focuses on enhancing infrastructure, fostering innovation, and supporting key industries to ensure that both urban and rural areas thrive.

2.5 Cork County Development Plan 2022-2028

The Cork County Development Plan (CCDP) 2022-2028 which came into effect on 6 June 2022, serves as a strategic framework to guide the sustainable development of County Cork until 2028, with a focus on balancing economic growth, environmental protection, and community well-being.

The CCDP 2022-2028 serves as a strategic framework to guide the sustainable development of County Cork until 2028, with a focus on balancing economic growth, environmental protection, and community well-being.

Under the CCDP, the application site is situated within lands designated as a greenbelt ('Greenbelt1') surrounding Dunmanyway, subject to the objectives shown below.

> ***County Development Plan Objective***
> ***RP 5-16: Long Established Uses***
>
> *Recognise the requirements of long established commercial or institutional uses located entirely within the Greenbelt which may make proposals for expansion / intensification of existing uses. Such expansion proposals of an appropriate scale will be considered on their merits having regard to the overall function and open character of the Greenbelt and where development would be in accordance with normal proper planning and sustainable development considerations*.
>
> ***County Development Plan Objective***
> ***RP 5-19: Greenbelts around Settlements***
>
> *(a) Retain the identity of towns, to prevent sprawl, and to ensure a distinction in character between built up areas and the open countryside by maintaining a Greenbelt around all individual towns.*

(b) *Reserve generally for use as agriculture, open space or recreation uses those lands that lie in the immediate surroundings of towns. Where Natura 2000 sites, Natural Heritage Areas, proposed Natural Heritage Areas and other areas of biodiversity value occur within Greenbelts, these shall be reserved for uses compatible with their nature conservation designation and biodiversity value.*

(c) *Prevent linear roadside frontage development on the roads leading out of towns and villages.*

Section 8.17 of the CCDP addresses Mineral Extraction, acknowledging the economic importance of extractive industries as a source of raw materials for the construction sector and infrastructure development.

The Plan provides policy support for the protection of existing quarries and proven aggregate resources and the continued viability of extractive industries in the County, as set out below.

8.17 Mineral Extraction

8.17.1 It is important to protect important reserves of aggregates and minerals from development that might prejudice their utilisation. In line with this Cork County Council recognises the economic value and significance of the aggregate and mineral sector to the local, regional and national economy in terms of employment generation and providing raw materials for the construction industry. The Council therefore aims to protect and safeguard the operations of working quarries and proven aggregate resources from incompatible developments to ensure the continued viability of the extractive industry, whilst also ensuring that environmental, rural, scenic and residential amenities are protected.

8.17.2 In 2020 the ICF published a document 'Essential Aggregates: Providing for Irelands Needs to 2040' which is an industry led call for Government to ensure that Ireland's future supply of aggregates (crushed rock, sand and gravel) is planned, monitored and managed in a sustainable manner, to provide for Ireland's future infrastructure development. The document calls for a National Planning Policy for Aggregates which will underpin local and regional planning policy. The Planning Authority recognises the essential role of Aggregates and the need for the preparation of a County Minerals Strategy which will support a sustainable extractive industry during the lifetime of the County Development Plan.

8.17.3 There are 230 quarries registered under Section 261 of the Planning and Development Act 2000, as amended, operating within the County, primarily engaged in Sand and Gravel and stone quarrying. There are distinct clusters at locations near Carrigtwohill, Midleton, Ovens, along the Bandon River from Dunmanway to Innishannon and to the east of Kanturk around Cecilstown.

County Development Plan Objective
EC: 8-16 Safeguarding Mineral Reserves

a) Protect and safeguard the county's natural mineral resources from inappropriate development, by seeking to prevent incompatible land uses that could be located

elsewhere, from being located in the vicinity of the resource, since the extraction of minerals and aggregates is resource based.

b) *Prepare a Minerals Strategy Plan to support a sustainable extractive industry during the lifetime of the plan. This strategy will be prepared taking account of environmental, nature, conservation, heritage, landscape, and other planning considerations.*

2.6 Cork County Development Plans for the S.C. Period 1990-2014

The development subject of this application for substitute consent was carried out from 1990 to 2014 inclusive. Accordingly, the subject development spans the provisions of five Cork County Developments Plans (CDP 1986, 1996, 2003, 2009, 2014) and an array of national, regional and local area plans. All of the Cork CDPs over the period have been supportive of extractive industry.

2.6.1 1986 Cork County Development Plan

The 1986 CDP covered the period from 1986 to 1996. In relation to quarrying/extractive industry, Section 4.23 of the 1986 CDP states that the Council will endeavour to protect identified deposits for possible exploitation and will co-operate with the industry in this regard.

2.6.2 Cork County Development Plan 1996

In the 1996 Cork County Development Plan, there are no specific objectives included relating to the quarrying/extractive industry. However, section 1.2 of the 'West Cork' chapter outlines the need for West Cork to overcome the long-term tendency towards static population and declining employment and that a turnaround in employment performance is badly needed. Table 1.2 highlights the overall decline in the 'Agricultural, Fishing and Mining Employment':

Table 2.1 Agricultural, Fishing and Mining Employment, West Cork, 1971-2001 (000s)

1971	*1981*	*1986*	*2001 (proj.)*
9.1	6.6	5.9	4.2

2.6.3 Cork County Development Plan 2003

In the 2003 Cork County Development Plan, objective ECO 5-2 Safeguarding Mineral Reserves states that it is an objective:

Where significant mineral resources, such as aggregates, building stone or other minerals have been identified and are suitable for extraction and delivery to industry without undue adverse impact on the environment, on scenic or residential amenity or on transport networks, it is an objective to safeguard the resource by seeking to prevent incompatible land uses, which could be located elsewhere, from being located in the vicinity of the resource.

In addition, Objective ECO 5-3 entitled Identification of Strategic Reserves states:

"Where appropriate, in the preparation of Local Area Plans, important strategic mineral reserves, particularly aggregates, may be identified and appropriate site-specific policies developed for safeguarding the reserve. This would be based on existing study work already carried out, and, if necessary, existing work could be updated."

2.6.4 Cork County Development Plan 2009

In the 2009 Cork County Development Plan objective ECON 5-11 states that where significant mineral resources have been identified and are suitable for extraction, it is an objective to safeguard and optimise the resource so that it can be of benefit to the wider economy:

> *"Where significant mineral resources such as aggregates, building stone or other materials have been identified and are suitable for extraction and delivery to industry without undue adverse impact on the environment, on scenic or residential amenity or on transport networks, it is a objective to safeguard the resource by seeking to prevent incompatible land uses, which could be located elsewhere, from being located within the vicinity of the resource".*

ECON 5-12 of the 2009 CDP (Identification of Strategic Reserves) states that where appropriate, during the life time of the plan, important strategic mineral reserves, particularly aggregates, should be identified and appropriate site-specific policies developed for safeguarding the reserves.

In addition to the above, Section 5.5.25 (p.194) of the plan states that it is a "*a general objective of this County Development Plan is to ensure that the supply of these resources (i.e. primary aggregates of sand, gravel and crushed rock) is managed in a manner so as to ensure the sustainable extraction of locally sourced aggregates and/or minerals will continue to contribute to the local economy and provide the essential raw materials, necessary for the construction industry."*

2.6.5 Cork County Development Plan 2014

In the 2014 Cork County Development Plan (current plan), objective EE 12-1 states that where significant mineral resources have been identified and are suitable for extraction, it is an objective to safeguard and optimise the resource so that it can be of benefit to the wider economy:

"Protect and safeguard the county's natural mineral resources from inappropriate development, by seeking to prevent incompatible land uses that could be located elsewhere, from being located in the vicinity of the resource, since the extraction of minerals and aggregates is resource based."

2.7 Local Area Plans for the S.C. Period

2.7.1 Skibbereen Local Area Plan 2005

Section 4.7 of the LAP is entitled Mineral Extraction and refers to the fact that the Cork County Development Plan 2003 contains a number of important objectives relating to mineral extraction. The various objectives supportive of the extractive industry are stated.

Section 4.7.5. of the LAP states that:

> *The extractive industry makes an important contribution to economic development in the Electoral Area. There are a number of important quarries in the electoral area, where Cork County Council must safeguard the resources. The main quarries in the area are located at Dunmanway, Drimoleague, Skibbereen, Ballineen-Enniskeane and Caheragh*

2.7.2 Skibbereen Electoral Area Local Area Plan 2011

The subject lands at Ardcahan are partially included within Dunmanway's town greenbelt under the Skibbereen Electoral Area Local Area Plan 2011 as shown below in Figure 3-1.

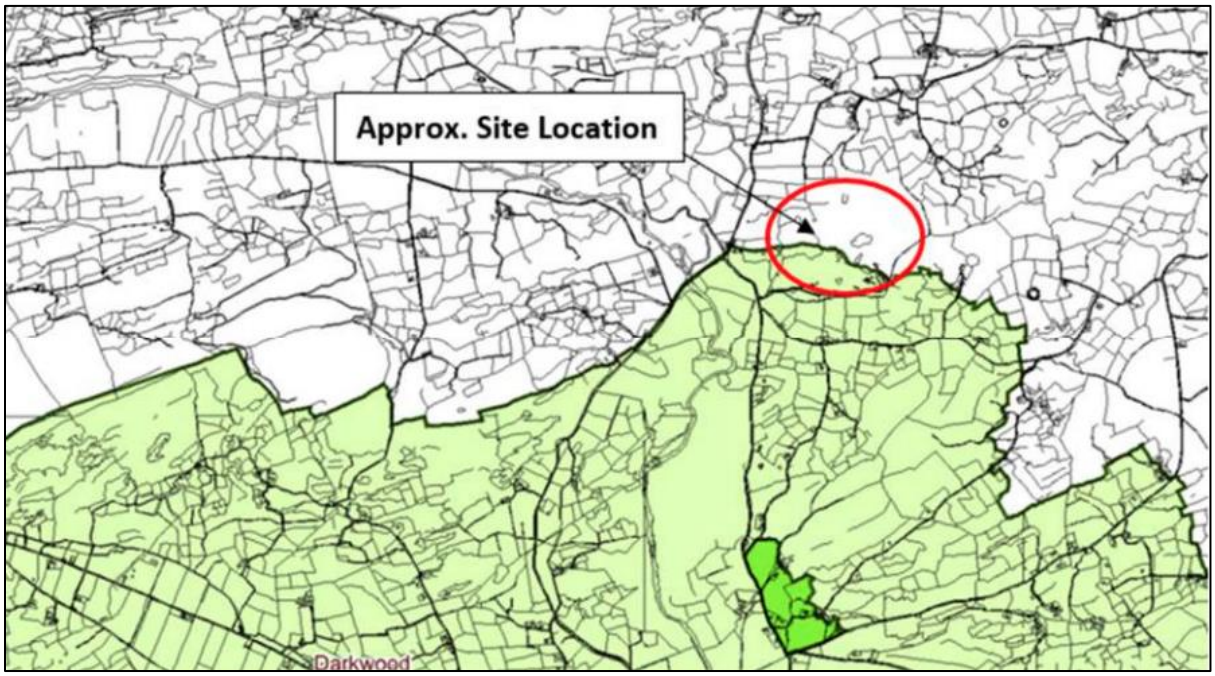


Figure 2-1 Extract of Zoning Map taken from Skibbereen Electoral Area Local Area Plan 2011

Section 1.9.23. of the plan references the subject quarry:

The regional road to Macroom (R587) also follows the Bandon River to the north and the boundary of the green belt is well defined where this road meets the river at the town water treatment works. Fairly close to the water works in the northeast is the Ardachahan quarry, which is well set in a surrounding forested area. There are a number of low hills defining the northeastern boundary and these contain a number of forested and sparsely settled areas in broken lands around the hospital complex.

2.7.3 West Cork Municipal District Local Area Plan 2017

Section 2.5 of the 2017 West Cork Municipal District Local Area Plan (MDLAP) relates to employment and states that 10.3% of jobs within the Municipal District fall under "Manufacturing, mining/quarrying" and that 10.7% of the population of the area are employed in Manufacturing, mining/quarrying.

The subject lands at Ardcahan are partially included within Dunmanway's town greenbelt under the West Cork Municipal District Local Area Plan 2017. The primary objective of the greenbelt was to restrict one-off housing and encourage more housing/population within the development boundary of Dunmanway.

2.8 Conclusion

It is considered that the subject development is consistent with national level guidelines for the provision of aggregates to meet local construction requirements and Cork County Council policies for the provision of sustainable locally sourced aggregates. Our clients' quarry at Ardcahan has long been recognised as being of significant value containing high quality resource and has for a very long period of time provided material to a significant number of clients, including Cork County Council. In 1999, our client's operation in Ardcahan was supplemented and improved by the addition of a macadam / asphalt manufacturing plant permitted under Council Ref. 98/294.

Extraction from the Ardcahan Quarry provides a sustainable option for the provision of aggregates for local road construction projects in Counties Cork and Kerry. The development is consistent with national level guidelines for the provision of aggregates to meet regional and local construction requirements and county policy for the provision of sustainable locally sourced aggregates. Murray Brothers Tarmacadam Ltd. are a substantial employer in the context of the rural location and the development helped sustain the company and support the local economy. Overall, the subject development is consistent with national level guidelines as well as County and local planning policy.

Murray Brothers Tarmacadam Ltd

CHAPTER 3
PROJECT LOCATION AND DESCRIPTION

VOLUME II
MAIN STATEMENT

FEBRUARY 2026

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3 Project Location & Description

3.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) provides a description of the project for which substitute consent is sought, as required by the EIA Directive;

"*a description of the project comprising information on the site, design, size and other relevant features of the project*".

The information contained herein is informed by the Environmental Protection Agency (EPA) Guidelines on the information to be contained in Environmental Impact Assessment Reports (May 2022) which provides guidance as follows:

"it is appropriate for most EIARs to include (to varying degrees of detail) a description of:

- *The **location** of the project.*
- *The **physical characteristics** of the whole project, including, where relevant, demolition works, the land-use requirements during construction and operation and other works that are integral to the project.*
- *The **main characteristics of the operational phase** of the project (production and maintenance processes in particular), for example energy demand, energy used, nature and quantity of materials and natural resources (including water, land, soil, biodiversity etc.) use.*
- *An estimate, by **type and quantity of expected residues and emissions** (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operational phases)''.*

The Guidelines state that the typical categories for describing the physical characteristics of a project are:

- *the site location.*
- *the size, design and appearance of the proposed project.*
- *the cumulation with other proposed projects.*
- *the use of natural resources.*
- *the production of waste.*
- *emissions and nuisances.*
- *a description of the risk of accidents – having regard to substances or technologies used.*

This chapter was prepared by McCutcheon Halley Planning (MHP) Consultants in conjunction with the Applicant.

3.2 Project Site

3.2.1 Site Location & Description

Ardcahan Quarry is in the townland of Ardcahan, approximately 3.5km north-east of Dunmanway in West Cork. The site is situated off the L4621-9 local road ('Hospital Road'), approximately 300m east of its junction with the R587 regional road, which links Dunmanway and Macroom (see Figure 2.1).

The site is located in a rural setting characterised by undulating topography, irregularly shaped fields and clusters of mixed woodland. The land immediately around the quarry consists of scrub, woodland and agricultural grassland. Land uses in the surrounding area primarily comprise livestock farming and rural housing.

The nearest dwellings to the quarry site (red line boundary) are located approximately 300m south; 275m west; 450m north and 400m east of the site. There are no commercial premises or community facilities in the immediate environs.

The junction of the Caha and Bandon Rivers is located approximately 400m west of the site. A small watercourse that flows into the Bandon River extends along the eastern and southern boundaries of the landholding.

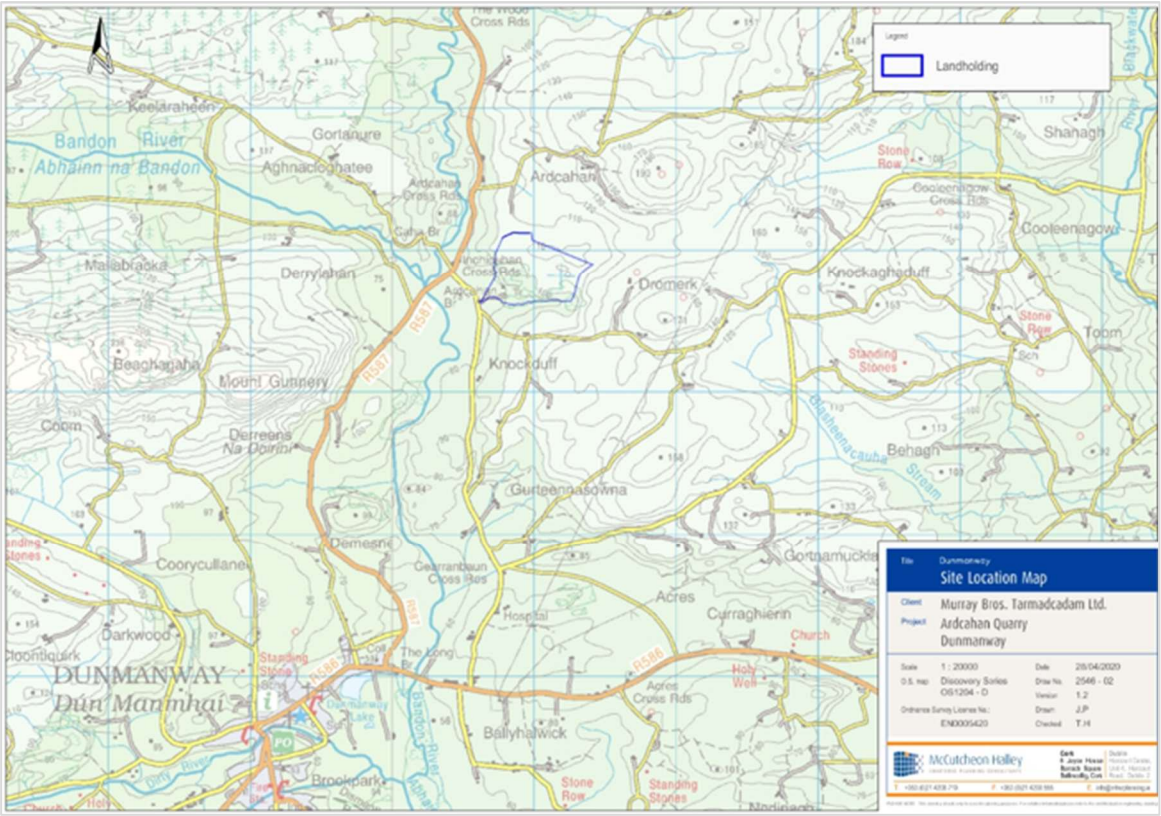


Figure 3-1 Site Location (Applicant's landholding outlined in blue)

The area within the overall landholding measures approx. 25 hectares (ha). The lands are sloped with lower ground levels in the south-west (~72 to 75 MOD[1]) rising to the north (118 MOD).

[1] Metres over datum



Figure 3-2 Aerial image of Ardcahan Quarry showing an indicative outline of the landholding in blue, the former extraction area and the existing macadam plant

Figure 3.2 shows the former extraction area (1990 - 2014) situated in the southwest of the overall landholding. The northern part of the landholding has not been quarried but portions of it were used for storing crushed product, as a settling pond and for backfilling.

In the southeast of the landholding is a macadam production plant and buildings used for administration, welfare and storage purposes. Development in this part of the site was granted planning permission under Reg. Ref. 98/294 inclusive of the following:

- Prefabricated office building/toilet/canteen
- Laboratory
- Mixing plant
- Storage silos
- Bins for plant
- Covered aggregate storage bays
- Storage shed
- Bitumen tanks
- Well / pumphouse
- Weighbridge
- Car parking area for staff and visitors

The quarry site also contains a network of internal roads which extend across the wider landholding.



Figure 3-3 View looking north toward Ardcahan Quarry (Photograph taken July 2014)



Figure 3-4 Macadam Plant (Photograph taken July 2014)

3.2.2 Extent of Development Site

The site that is the subject of this substitute consent application incorporates extraction and ancillary areas as follows:

- Quarry development which took place between February 1990 and October 2014[2] including the extraction area (total 5.2 ha) where environmental impact assessment would have been required under the EIA Directive;
- Quarry development which took place between February 1997 and October 2014[3], where appropriate assessment would have been required under the Habitats Directive;
- The former quarry that was identified as unauthorised development under Cork County Council Enforcement Notice Ref. SKBE/13/7.

The application site has an area of approximately 19.1 ha. The southeast part of the landholding (shaded green in Figure 3.5) is not included within the red line boundary as it contains land quarried prior to 1990 and the macadam plant and associated development permitted under Reg. Ref. 98/294. It is therefore outside the scope of the project for which substitute consent is sought.

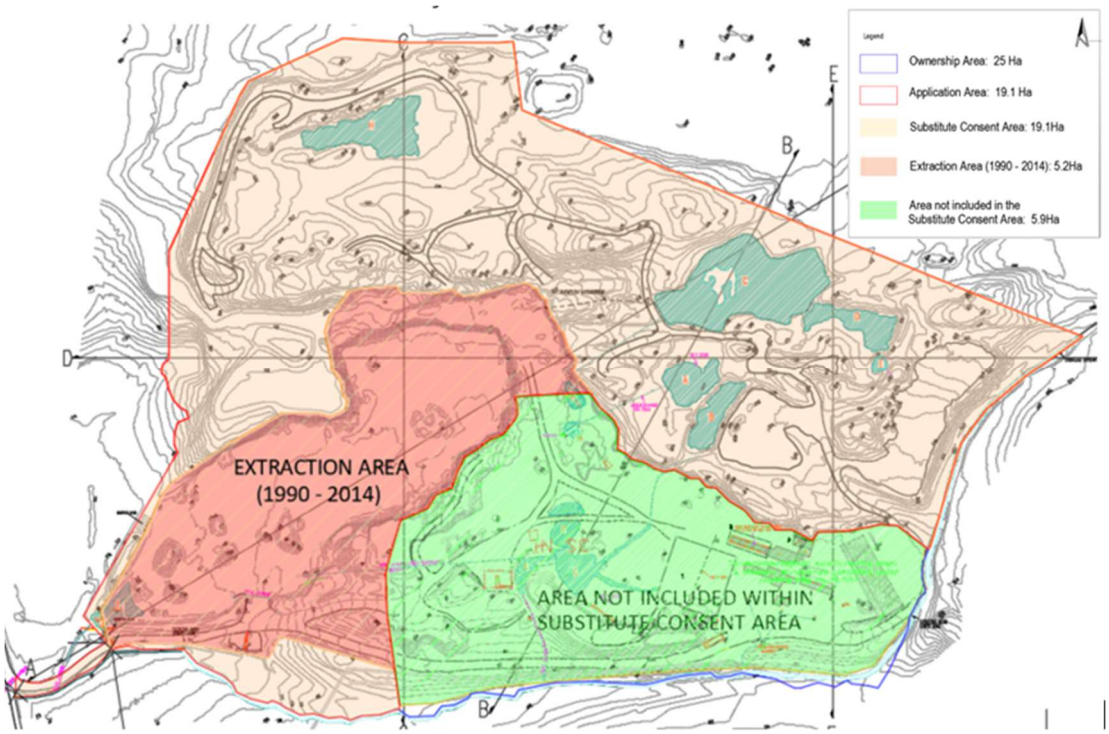


Figure 3-5 Site Layout

[2] When the Council closed its enforcement case under SKBE/13/7.

[3] When the Council closed its enforcement case under SKBE/13/7.

3.3 Project Description

The project is limited to quarry development which was carried out on site between 1990 (when the EIA Directive came into force) and 2014 (when quarrying ceased), comprising the extraction of quartzitic sandstone and ancillary activities.

The total area excavated between 1990 and 2014 measures approximately 5.2 ha. As shown in Figure 3.5, it is situated in the southwest of the applicant's landholding.

The extent of the former extraction area has been ascertained using Ordnance Survey aerial photography for the years 1995, 2000, 2005, and 2014. The aerial images are shown in Figures 3-6 to 3-9 inclusive (see Appendix 3-1 for complete OSI aerial maps). Aerial photography is not available for the baseline year, so the size of the extraction area in 1990 has been established using information provided by the quarry operators.

Table 3.1 Extent of Former Extraction Area (1990 – 2014)

Year	Total Extraction Area (Ha)	Increase in Extraction Area within the Period (Ha)	Cumulative Increase in Total Extraction Area (Ha)
1990	5.1	-	-
1995	6.42	1.32	1.32
2000	7.49	1.07	2.39
2005	9.26	1.77	4.16
2014	10.3	1.04	5.2

As shown in the aerial images and information presented in Table 3-1, the extent of the extraction area progressively increased from approximately 5.1 ha in 1990 to c. 10.3 ha in 2014. This represents a total increase of 5.2 ha during the period, comprising the former extraction area subject of the Substitute Consent application[4].

It is highlighted that some areas within the site, which may appear as worked-out areas in the aerial photography, were actually used for ancillary purposes such as stockpiling topsoil and quarried material (e.g. to the north of the macadam plant). These areas are not included in the 'extraction area' figures presented in Table 3.1 but do form part of the 'quarry development' area for which Substitute Consent is being sought[5]. Conversely, the former extraction area includes small pockets of vegetation which appear unquarried in more recent aerial imagery due to natural recolonisation.

[4] The information presented in Table 2-1 indicates the total extraction area for the period 1990 to 2014 was 5.2 ha, triggering the relevant threshold of 5 ha for mandatory EIA.

[5] In accordance with the definition of 'quarry' set out in section 2 of the Planning and Development Act 2000, as amended, which is not confined to areas of extraction and is deemed to include *"any place on the surface surrounding or adjacent to the quarry occupied together with the quarry for the storage or removal of the minerals or for the purposes of a process ancillary to the getting of minerals, including the breaking, crushing, grinding, screening, washing or dressing of such minerals".*

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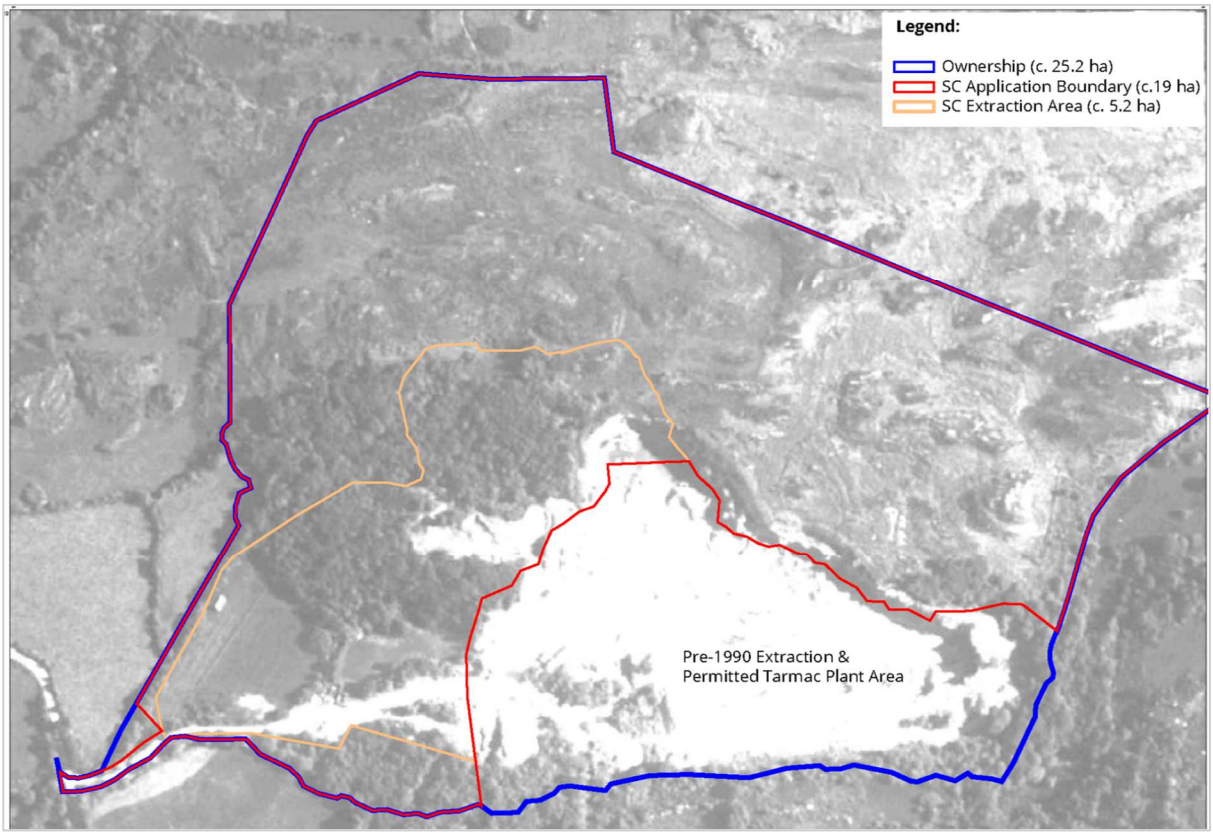


Figure 3-6 Aerial Image 1995

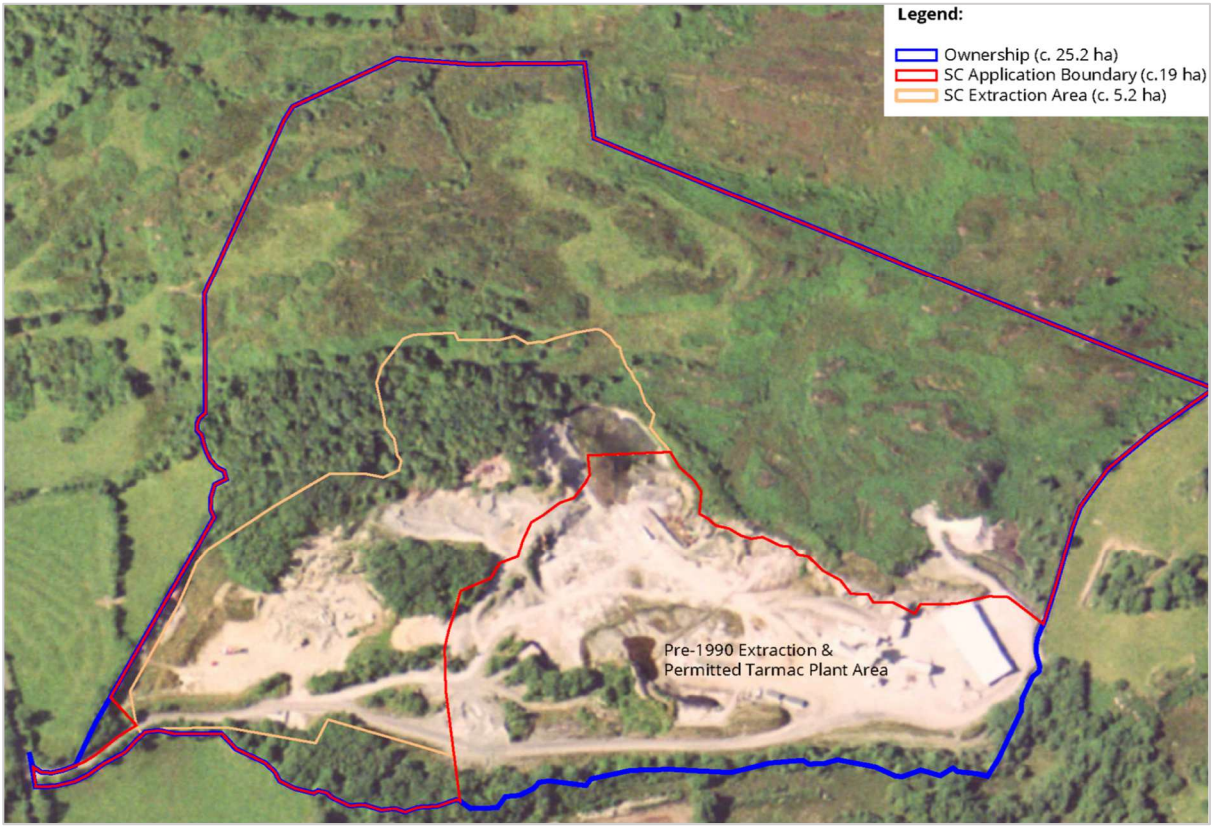


Figure 3-7 Aerial Image 2000

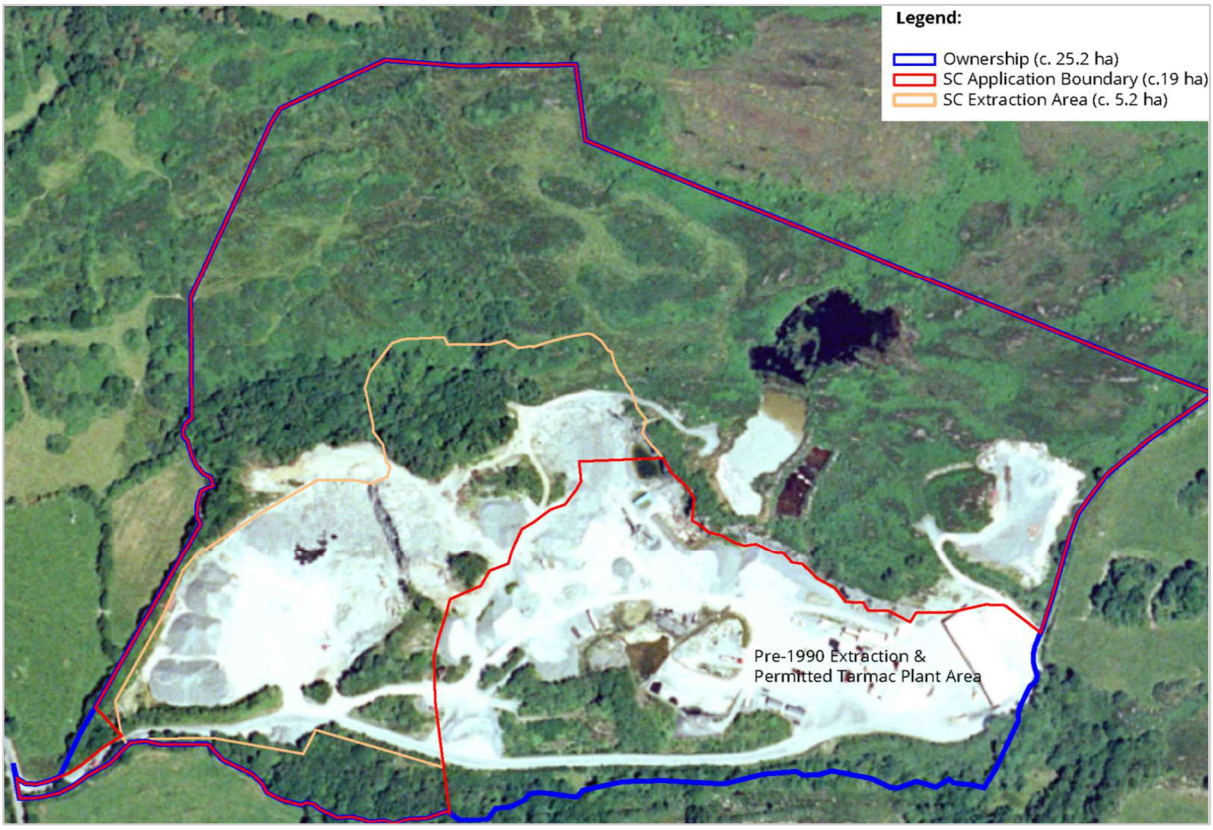


Figure 3-8 Aerial Image 2005



Figure 3-9 Aerial Image 2014

The extraction process involved stripping the overburden (the soil and subsoil above the bedrock) with an excavator to an average depth of approximately one metre below ground level. The overburden was then transported within the site by large dump trucks and stockpiled for later use. Cleared areas were then worked in a bench system by removing the rock in layers, generally excavating to a level of 74 to 75 MOD.

Figure 3-10 provides a view of the quarry floor in the southwest of the site, taken from the edge of the extraction area in 2014. This area was used for crushing stone, screening[6] and stockpiling of excavated materials.



Figure 3-10 Quarry Floor of Former Extraction Area in the Southwest of the Site (Photograph taken 2014)

Based on the historic aerial photography and information provided by the quarry operators, it is estimated that approximately 1,000,000 tonnes of rock aggregate were extracted between 1990 and 1999[7]. Following a pause in extraction activity in 2000 and 2001, annual extraction data indicates that 1,234,547 tonnes were quarried from 2002 to 2014, as detailed in Table 3-2.

[6] The process of separating stone aggregates by size is known as 'screening'.

[7] The applicant acquired the quarry in 1999 and has estimated the quantity of extracted material, as records are not available for the period.

Table 3.2 Estimated Quantities of Rock Extraction - 2002 to 2014

Year	Quantity of Rock Extracted (Tonnes)
2002	77,785
2003	70,413
2004	89,657
2005	142,720
2006	178,295
2007	202,222
2008	163,386
2009	143,904
2010	NIL
2011	44,998
2012	43,600
2013	32,360
2014	45,207
TOTAL	**1,234,547**

The total amount of rock excavated between 1990 and 2014 equates to approximately 2,234,000 tonnes or an average of 93,083 tonnes of stone per annum over a 24-year period.

Following its completion in 1999, the quarried aggregate/material provided single sized aggregate, which was primarily used to supply the macadam plant on site, and crushed grade stone for civil engineering use for road construction projects in Counties Cork and Kerry.

On average, 93 truckloads of aggregate[8] left the site weekly, carrying an average of 20 tonnes per lorry (estimated weekly average over the 24-year period, based on a 50-week operational year).

The quarried material was extracted by boring and blasting using industrial explosives. Boring or drilling would have occurred one week prior to blasting. Blasting typically occurred every few months (c. 4 to 6 blasts per annum), depending on stocks and the commercial environment.

The blasting was undertaken by a specialist company (Irish Industrial Explosives Ltd) under Garda escort. The rock was then crushed and screened on the quarry floor under contract, before being stored in stockpiles and storage bays on site.

Between 1990 and 2014, the quarrying operation employed an average of seven full-time staff members, and the crushing contractors employed an average of six people. Transportation of aggregates was carried out by employees of the quarry and contracted out to haulage companies, as required.

General operating hours were 7.30 am to 5.30 pm Monday through Friday, with occasional Saturday hours of 7.30 am to 2.30 pm. Blasting operations were restricted to between 10.00 am and 4.00 pm.

A contract crushing company processed excavated materials on-site, using primary jaw crushers and

[8] Excludes traffic associated with the macadam plant.

cone crushers to crush the stone and screening plants to size and separate the aggregate. Other machinery used at the quarry included loading shovels, excavators, and haulage vehicles.

Aggregates produced from blast rock include 20mm; 14mm; 10mm, 6mm and dust, and the products from this included 4 inch stone and 2 inch stone, used as a sub-base for all types of road works, from 75mm and down.

Operational processes at the quarry were undertaken using the site's existing infrastructure, including the bored well and pump house, septic tank, and existing roads.

3.1.1 Remediation Plan

As part of this application, a Site Layout and Remediation Plan has been prepared by Cathal O'Meara Landscape Architects and included as Appendix 11.1 of this rEIAR. The remediation plan aims to:

- Retain the existing fragmented but long-established woodland in the western boundary and allow this to expand though self-seeding into the adjacent areas. This regeneration is to be allowed all along the western and north-eastern site boundaries.
- The existing "Dry Siliceous heath" vegetation is to be retained and protected along the northern site boundary. The adjacent areas as indicated in the Landscape Plan are to be managed to facilitate the expansion of this heath as per the ecologist's report.
- An additional seasonal lagoon is proposed in the south of the site and this is to be planted in its margins with native wetland plugs.
- The adjacent wet woodland in this area is to be retained.
- The southern boundary woodland is to be protected and remain undisturbed.
  The existing hardstanding in the east of the site is be covered with 100mm of site found soil and allowed develop through habitat colonisation as part of a successional process.

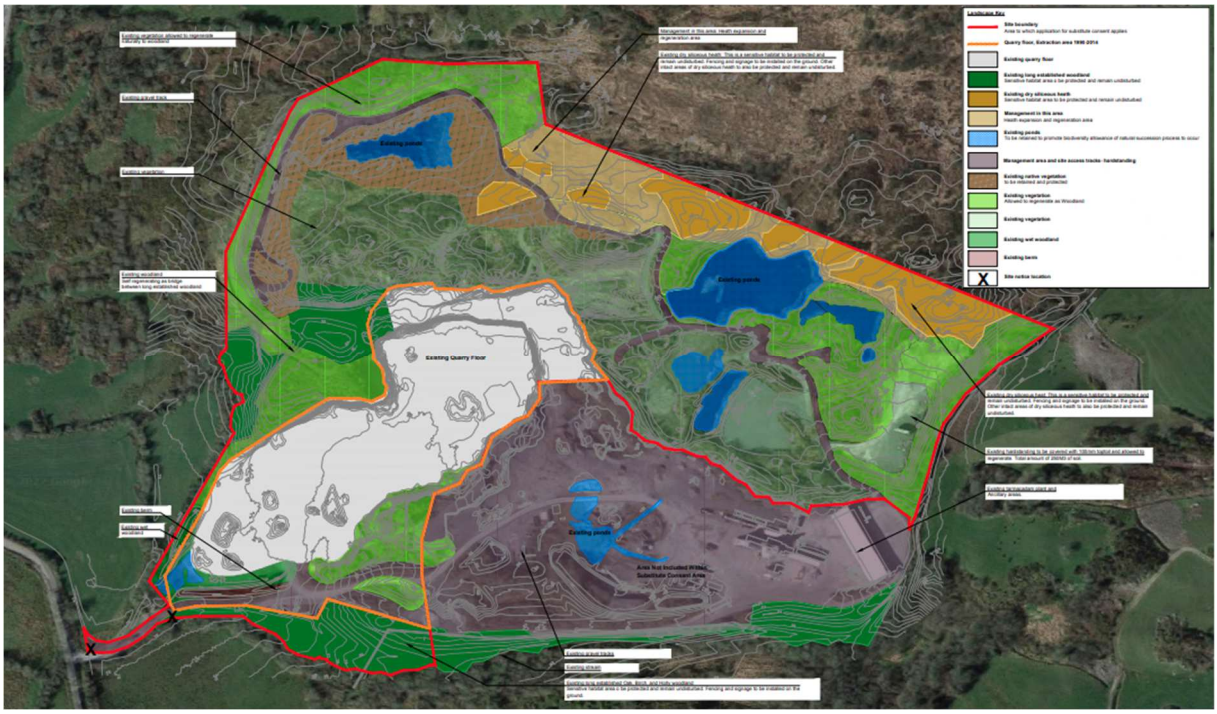


Figure 3-11 Extract from Site Layout and Remediation Plan

3.4 Project Need

Aggregates are an essential building material for the construction industry. The supply of aggregates facilitates the construction of buildings and infrastructure, which are vital for sustaining economic growth and development.

Crushed and screened aggregates are used in the production of bituminous macadam or asphalt concrete which are used in the construction of roads, airfields, and other trafficked areas such as driveways, car parks and pathways.

Companies rely on the road network to move goods efficiently, and people depend on roads to get around by car, public transport and active travel modes such as walking and cycling.

The network of road infrastructure plays a critical role in economic competitiveness and is a significant factor influencing the decisions of foreign multinational companies about where to locate their operations.

Ardcahan Quarry contributed to meeting the needs of the construction sector during the relevant period for the substitute consent application, supplying aggregates to local road projects in Counties Cork and Kerry, as well as the macadam plant on site.

Murray Brothers Tarmacadam Ltd

CHAPTER 4
ALTERNATIVES CONSIDERED

VOLUME II
MAIN STATEMENT

FEBRUARY 2026

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4 Alternatives Considered

4.1 Introduction

Annex IV (2) of the amended EIA Directive requires that an EIAR contain:

'A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are ***relevant to the proposed project*** *and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.'* (Emphasis added)

The EC Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report (2017) provides an explanation for the term 'Alternatives' stating:

'*Different ways of carrying out the Project in order to meet the agreed objective. Alternatives can take diverse forms and may range from minor adjustments to the Project, to a complete reimagining of the Project*.'

The EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (May 2022) provide further guidance, defining 'Alternatives' as follows:

'Description of other options that may have been considered during the conception of a project; these include alternative locations, alternative designs and alternative processes.'

The EIA Directive requires consideration of reasonable alternatives relevant to the proposed project. This rEIAR has been prepared to accompany a substitute consent application for development already carried out at Ardcahan Quarry, which ceased in 2014. Its scope does not extend to a proposed project. As such, the retrospective nature of the substitute consent process inherently limits the consideration of reasonable alternatives.

Notwithstanding the inherent limitations, the requirement of the EIA Directive to identify and consider reasonable alternatives relevant to the project, has been addressed herein to the extent that is practicable.

4.2 The 'Do Nothing' Scenario

The 'Do Nothing' Scenario implies that quarrying activities at the site would have been discontinued in February 1990, when the EIA Directive came into force and which marks the beginning of the relevant period for the purpose of this substitute consent application. Strictly speaking, a 'Do Nothing' Scenario would mean that quarrying at the site would not have been carried out between 1990 and 2014, and the predicted impacts for each of the environmental disciplines addressed within this rEIAR would likely not have occurred. The potential impacts associated with this 'Do Nothing' Scenario are considered according to the prescribed environmental factors within the individual chapters.

It is noteworthy, however, that this scenario does not take account of the relevant history regarding the implementation of the EIA Directive into Irish Law, and the specific procedures that were introduced in 2004 in respect of quarries.

Section 261 of the Planning and Development Act 2000, which was commenced in April 2004, introduced a new registration system for quarries. All quarries except those which obtained planning permission in the five years before the commencement of the section were required to register with the planning authority by 27 April 2005. Quarries failing to comply became unauthorised development regardless of their previous status.

The 'Do Nothing' Scenario may therefore also reasonably be deemed to encompass the potential impacts associated with cessation of aggregate extraction at the site from April 2005 onwards[1], as activities at the quarry were effectively lawful under the planning regime that existed up to that point.

Based on the historic satellite imagery which has been relied upon to inform the scope of this S.C application (see Chapter 3 for details), it can be concluded that under this scenario, up to 4.16 hectares of the former extraction area would have been quarried and the adjacent Murray Brothers macadam plant, granted permission in 1998, would have been established and likely, continue to operate.

The former extraction area would instead occupy approx. 83% of the 5.2 hectares indicated in the current layout and an estimated 1,237,855 tonnes[2] of rock would have been extracted between 1990 and 2004. Under this scenario, the potential impacts associated with operation of the quarry to April 2005, are likely comparable to those set out within the individual chapters for the period 1990 to 2014.

The table below sets out the extraction areas from 1990 to 2014. The extraction during this period results in an open void as would have similarly existed on site as of 1990. The 'Do Nothing' scenario would have resulted in the 5.1ha void (1990 total extraction area) remaining on site without any further increase in size.

Table 4-1 Former Extraction Areas

Year	Total Extraction Area (Ha)	Increase in Extraction Area within the Period (Ha)	Cumulative Increase in Total Extraction Area (Ha)
1990	5.1	-	-
1995	6.42	1.32	1.32
2000	7.49	1.07	2.39
2005	9.26	1.77	4.16
2014	10.3	1.04	5.2

[1] The Planning Statement should be referred to for further background context in respect of Ardcahan Quarry. It confirms that the applicant was unaware of their statutory obligation to register the quarry by April 2005, only becoming aware of in July 2011 when Cork County Council refused permission for proposed extraction under Reg. Ref. 11/317.

[2] As detailed in Chapter 3, based on the historic aerial photography and information provided by the quarry operators, an estimated 1,000,000 tonnes of rock aggregate were extracted between 1990 and 1999. There was a subsequent pause in quarrying activity in 2000 and 2001. The balance of 237,855 tonnes, is the combined total of rock extracted for the years 2002, 2003 and 2004 as per the annual extraction data shown in Table 3-2.

4.3 Alternative Locations

The scope to consider reasonable alternatives is limited in this instance by the substitute consent process. Although it must be noted that opportunities for consideration of alternative sites tend to be limited in the case of quarry development, regardless, due to the nature of quarrying activities. The extraction of aggregates is dependent on the availability and quality of the materials, which determine the overall scale and design of the quarry.

As a 'pre-1963' quarry which remained operational up to 2014 providing aggregates to the construction sector, it is reasonable to assume that the reserves of available material which were extracted from 1990 to 2014 were of proven high quality and a key determinant of the overall scale and design approach.

In this instance, consideration of alternative sites is constrained by the historic authorised nature of the development for most of its development (by measured area). It is also of note that aggregates, by their nature, can only be worked where they occur, a further limitation to the consideration of alternative sites. There is an absence of rock quarries in the wider Dunmanway area and the Ardcahan quarry is located south of Marcroom, north of Rosscarbery and Clonakilty, and therefore has a natural service area.

As an established quarry with sufficient rock reserves to facilitate the continued supply of aggregates to the construction sector, strategically located close to the R587 regional road, it can be assumed that an extension to the existing quarry would have been considered as the preferred alternative to quarrying at a different location for the period of relevance to this rEIAR. Extension of the established quarry would reduce the land take and corresponding habitat disturbance that could reasonably be expected to occur, with obvious environmental benefits for biodiversity and landscape character.

4.4 Alternative Substitute Consent Areas

As the works subject of this substitute consent application have occurred in the past, it is not possible to assess an alternative layout. However, there were three alternative areas considered for this substitute consent application. The first and second substitute consent areas options were submitted to An Bord Pleanála in 2018 and 2019 as part of two separate Applications for Leave to Apply for Substitute Consent (ALASC), under ABP Ref. 302158 and ABP Ref. 305621. The third area is the area submitted with the current application for substitute consent.

4.1.1 Alternative Area 1 (2018 ALASC area)

The area proposed under ABP Ref. 302158 in 2018 ALASC included an area of approximately 19Ha (i.e. included within the red line in Figure 4-1 below). The area included the north-western corner of the MBTL's overall landholding to the west and northwest of the existing macadam plant and included the former excavated area, as shown in Figure 4-1 below.

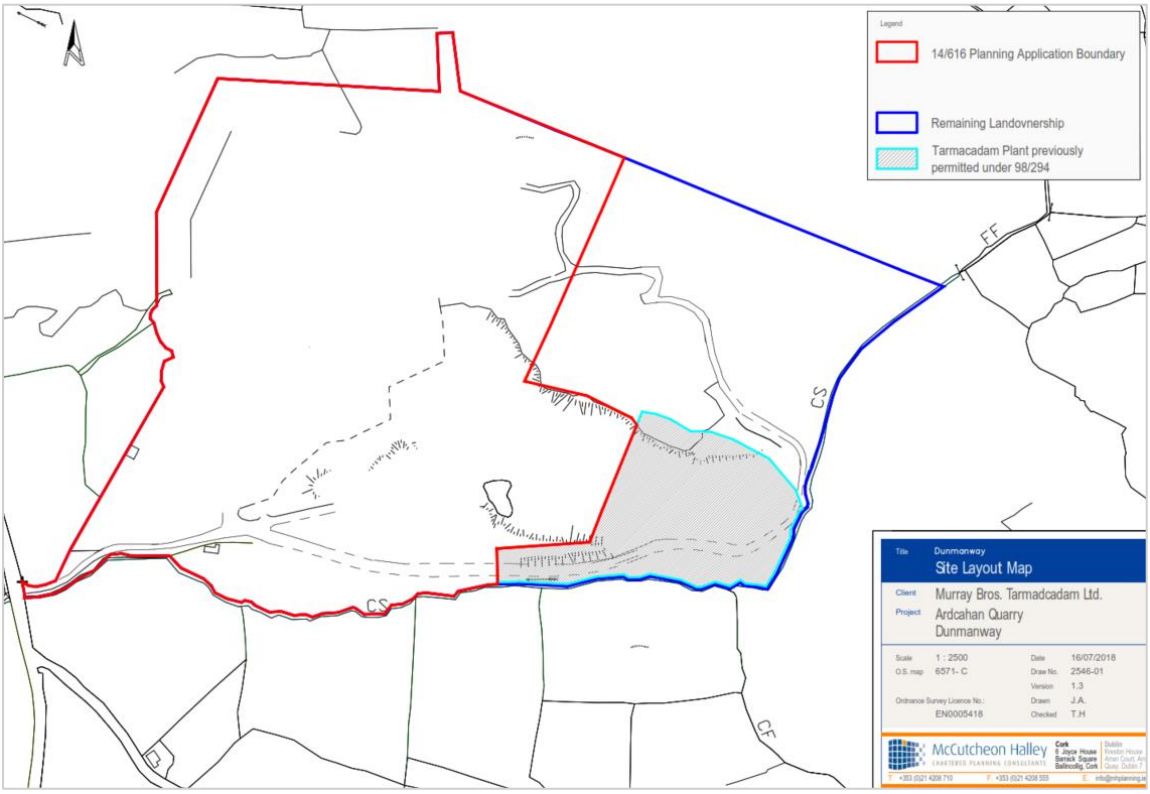


Figure 4-1 Alternative Area 1 - ALASC Ref. 302158-18

The 2018 ALASC area was refused leave to apply for Substitute Consent under section 177C, as it was considered that the application for leave should have been based on historic development only (without any element or reference to future works i.e. there could be no reference to works that were previously proposed under Cork County Council Ref. 14/616/ABP Ref. 245174).

In their decision under ABP Ref. 302158, ABP stated that any future application for leave to apply for SC, should only relate to historic quarrying development and specifically quarrying development that took place between 1990 and 2014.

4.1.2 Alternative Area 2 (2019 ALASC area)

Following the ABP Ref. 302158-18 decision, a revised application for leave to apply for substitute consent (ALASC) was made under ABP Ref. 305621-19 and included a revised area which is shown in Figure 4-2 (i.e. the 2019 ALASC) and was based on the following area:

1. Quarry development that took place between February 1990 and October 2014[3] where an EIA would have been mandatory;
2. Quarry development which took place between February 1997 and October 2014[4], where an AA would have been required under the Habitats Directive;
3. The inclusion of quarrying (non-extractive) area that was considered unauthorised development under CCC ref. SKBE/13/7.
4. The omission of land quarried prior to 1990 (labelled as "Area not included in Leave to Apply

[3] When the Council closed its enforcement case under SKBE/13/7.

[4] When the Council closed its enforcement case under SKBE/13/7.

for Substitute Consent – 2" i.e. ALSC-2) and future development/lands that have not been quarried (labelled as "Area not included in Leave to Apply for Substitute Consent – 1" i.e. ALSC-1) on Drawings 2546-S1, 2546-S2 and 2546-S3.

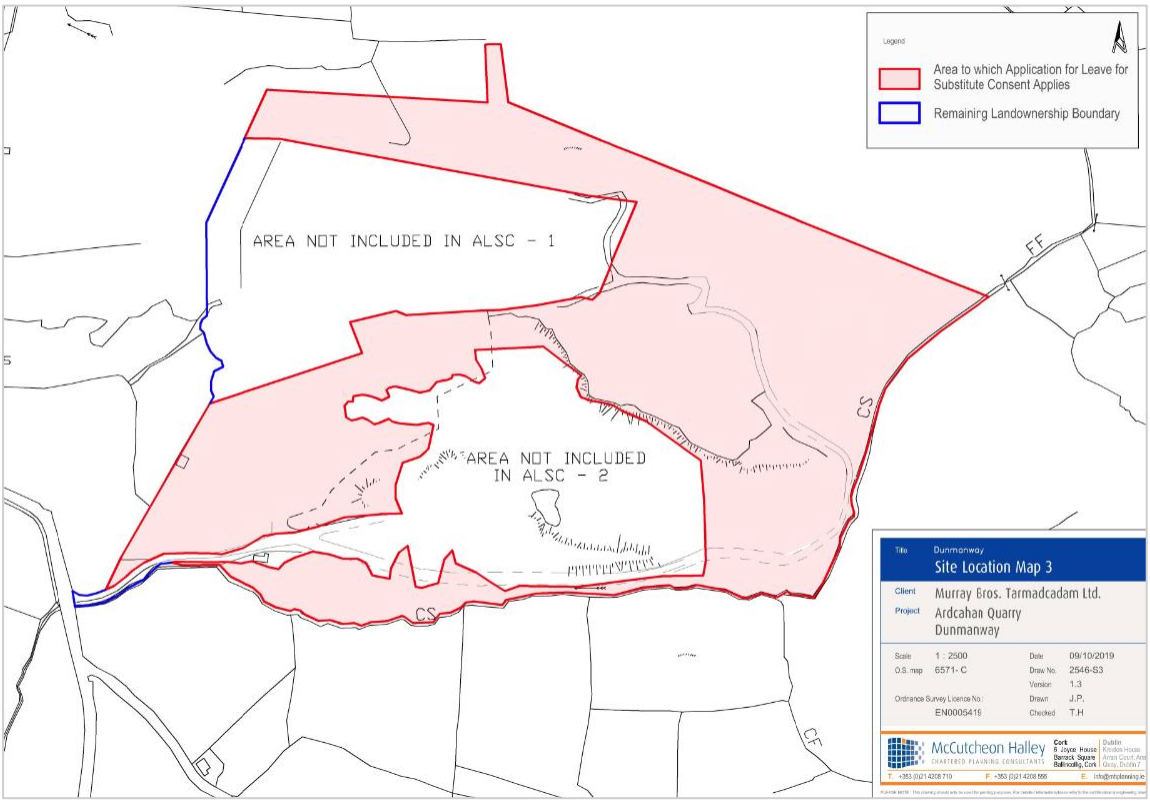


Figure 4-2 Alternative Area 2 - Area based on Enforcement CCC ref. SKBE/13/7 and submitted under ALASC Ref. 305621-19

ABP granted leave to apply for substitute consent under section 177D of the PDA 2000 (as amended) on the 3rd of March 2020, and gave direction on the layout/area that should be included within any subsequent consent application in that it needed to include quarry development that took place between February 1990 and October 2014 (where an EIA would have been mandatory) and quarry development which took place between February 1997 and October 2014, where an AA would have been required under the Habitats Directive. In the Direction issued under ABP Ref. 305621-19, the Board also stated that it had regard to the full extent of the meaning of 'quarry' as set out in section 2 of the Planning and Development Act 2000, as amended by the European Union (Environmental Impact Assessment and Habitats) (No. 2) Regulations 2011 (S.I. No. 584 of 2011), reg. 3, and noted that this meaning is not restricted to areas of extraction.[5]

The direction provided under ABP Ref. 305621-19 was used to further refine the SC area– this is outlined in Section 4.1.3.

[5] ABP also noted that any substitute consent, if granted, would regularise previous development and, save as regards the taking of remedial measures, would not allow for continuing or future development of the quarry, and that such continuing or future development would require separate planning permission to be obtained following the granting of such substitute consent.

4.1.3 Alternative Area 3 – Current Proposal

The area included in the current application for Substitute Consent is outlined below and has been further refined following the Direction provided by ABP under 302158-18 and 305621-19; additional assessments, planning history and a review of other historic information for the area, including historical aerial photography.

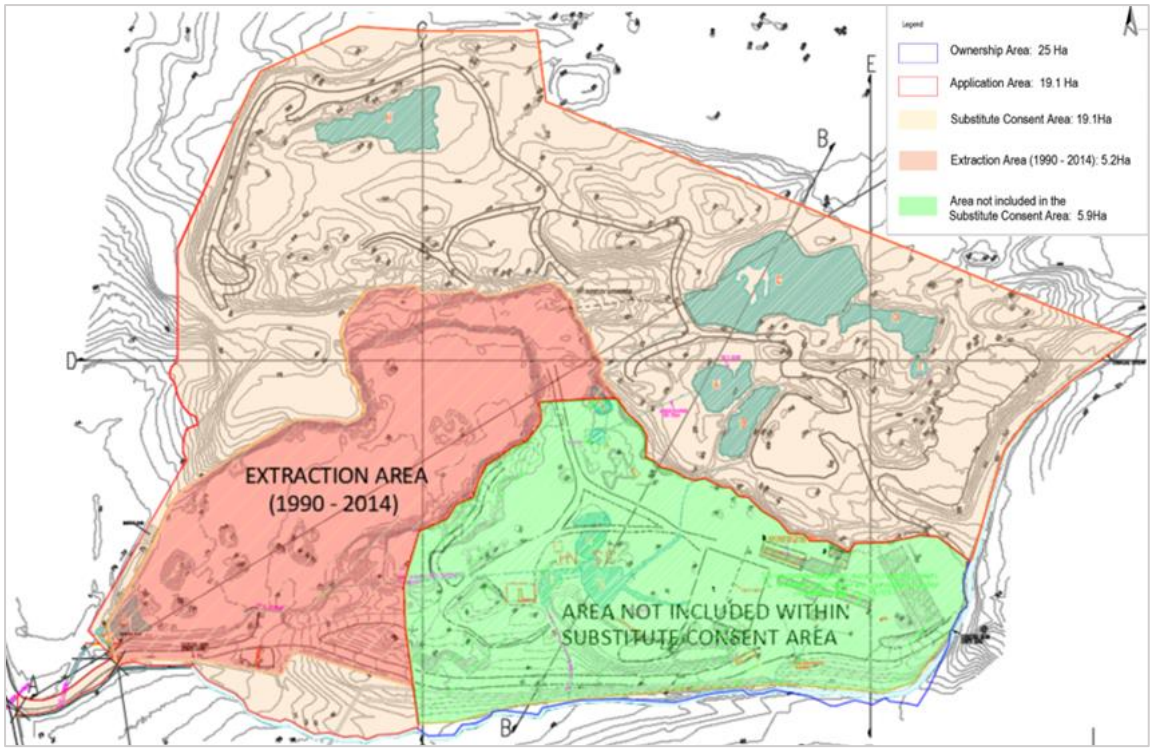


Figure 4-3 Alternative Area 3 - Current Substitute Application

The area includes the 1990-2014 extraction area and ancillary areas such as the ponds, lagoons and access routes located to the north/northeast of the extraction area and excludes the extraction areas that occurred before 1990 and the macadam plant (and ancillary areas) granted permission in 1998.

4.2 Alternative Plant

In relation to alternative plant and equipment, it is noted that there are mobile plant and fixed plant options. The previous owners of the site, Cork County Council, had not invested in plant. By the ownership passed to Murray Brothers in the late 1990s mobile plants, which allowed the primary crusher or both primary and secondary in series to be in relative proximity to the active quarry face and move with the face progression, were the industry norm. Given the small requirement for single sized aggregates compared to overall site output (crusher run material), mobile plant was the choice for associated screening equipment.

Murray Brothers Tarmacadam Ltd

CHAPTER 5
POPULATION AND HUMAN HEALTH

VOLUME II
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Table 5.19 General Health of the study area population based on results of 2011 Census. 5-30

5 Population & Human Health

5.1 Introduction

This chapter of the rEIAR assesses the potential impacts of the construction and operation of the quarry at Ardcahan on population and human health that are not covered elsewhere in the rEIAR. It also details the proposed remedial and/or mitigation measures where necessary. The potential impacts on, and mitigation or remediation measures for population and human health were assessed under the following headings: Do Nothing Scenario, Human Health (including Health and Safety), Population and Settlement Patterns, Economic Activity, and Local Amenity.

5.1.1 Author Information and Competency

This chapter was prepared by Martina Keenan Rivero of McCutcheon Halley Chartered Planning Consultants. Martina holds a BSc (Hons) in Spatial Planning from Technological University Dublin and an Advanced Diploma in Planning and Environmental Law from Kings Inns. She has 10 years of professional experience in both the public and private sector. Martina has coordinated the preparation of Environmental Impact Assessment Reports for a range of project types. Relevant experience includes large housing developments, mixed-use schemes, commercial and tourism projects, including the following developments that received permission:

- Southwest Gate – A mixed-use scheme across 13 blocks comprising 1,123 residential units with supporting amenities, retail units, office accommodation, a primary healthcare centre, gym, cultural centre, childcare facility, hotel and a series of public open spaces.
- Primark Distribution Centre – Construction of a Distribution Centre incorporating office floor space and ancillary buildings with a cumulative gross floor area of approx. 64,550 sq.m and associated site works.
- Oscar Traynor Road – Construction of 853 residential units (social, affordable and cost rental homes), together with a creche, retail unit/café, community facilities and a new public park.
- Inis Cealtra Visitor Experience - Proposed Visitor Centre and associated visitor facilities at Inis Cealtra (Holy Island) and Mountshannon Village, Co Clare.

5.1.2 Guidelines & Legislation Relevant to Discipline

This chapter has been prepared having regard to the following guidelines:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (Environmental Protection Agency, 2022);
- Advice Notes for Preparing Environmental Impact Statements (EPA, draft September 2015);
- Guidelines on the Information to be Contained in Environmental Impact Statements (EPA, 2002);
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003).

5.1.3 Scope of the Assessment

This chapter has been prepared pursuant to Schedule 6 of the Planning and Development Regulations 2001 (as amended). Section 2 of Schedule 6 sets out the additional information relevant to the specific characteristics of the project required, which includes a description of the likely significant effects on the environment of the development resulting from, among other things;

(IV) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters)

A number of potential receptors that may have been impacted by the construction and operation of the quarry between 1990 and 2014 have been identified;

- Staff working at the quarry including HGV drivers, operators of machinery, office staff
- Visitors to the quarry including clients/customers
- Residents in proximity
- Temporary receptors such as passing motorists or pedestrians.

5.1.4 Methodology

The Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022) state that:

'..in an EIAR, the assessment of impacts on population and human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in the EIAR e.g. under the environmental factors of air, water, soil etc.'

Recital 22 to the EIA Directive provides that;

"In order to ensure a high level of protection of the environment and human health, screening procedures and environmental impact assessments should take account of the impact of the whole project in question, including, where relevant, its subsurface and underground, during the construction, operational and, where relevant, demolition phases".

The EPA advice notes (2003 and 2015) recommend consideration of the following issues when assessing the potential impacts and effects of a development on population and human health;

- Economic Activity likely to lead to projects - will the development stimulate additional development and/or reduce economic activity, and if either, what type, how much and where?
- Social Consideration - will the development change the intensity of patterns and types of activity and land use?
- Land-use - will there be severance, loss of rights of way or amenities, conflicts, or other changes likely to ultimately alter the character and use of the surroundings?
- Tourism – will the development affect the tourism profile of the area?
- Health – have the vectors through which human health impacts could be caused been assessed, including adequate consideration of interrelationships between those assessments.

The site does not have any intrinsic tourism value and is not in proximity to any important tourism or amenity resources. Potential impacts on tourism will therefore be assessed under Economic Activity.

There is no specific guidance available in relation to the preparation of an rEIAR. It is therefore considered appropriate to refer to the Act, the Planning and Development Regulations as well as to the general guidance on carrying out and assessing EIAR.

Under section 177F of the 2000 Act, a remedial EIAR must contain;

1) *(a) a statement of the significant effects, if any, on the environment, which have occurred or which are occurring or which can reasonably be expected to occur because the development the subject of the application for substitute consent was carried out;*

   (b) details of—

   i. *any appropriate remedial measures undertaken or proposed to be undertaken by the applicant for substitute consent to remedy any significant adverse effects on the environment;*

   ii. *the period of time within which any proposed remedial measures shall be carried out by or on behalf of the applicant;*

   (c) such information as may be prescribed under section 177N.

The appraisal of the likely significant effects of the development on population and human health was conducted by reviewing the socio-economic environment in four Electoral Divisions (EDs) surrounding Ardcahan Quarry— Aultagh, Coolmountain, Dunmanway North, and Manch — for the period of 1990 to 2014. This timeframe is relevant because it corresponds to the years when the quarry was in operation, allowing for an assessment of its impact during that period. To comply with Section 177F of the Planning and Development Act 2000 (as amended), the analysis extends to 2022 to capture past, present, and potential future impacts.

The 1990–2014 period evaluates effects that "have occurred," as required by Section 177F(1)(a), focusing on historical impacts from quarrying activities, including cumulative effects from the macadam plant operational since 1999. Extending the analysis to 2022 addresses effects that "are occurring," capturing residual impacts post-closure. The assessment of effects that "can reasonably be expected to occur" considers the existing macadam plant, which remains operational, and the development under the concurrent Section 37L application.

The rEIAR study area encompasses the quarry's red-line development boundary and the surrounding Electoral Divisions, as depicted in Figure 4.1. Socio-economic data were sourced from census reports for 1991, 1996, 2002, 2006, and 2011, aligning with the quarry's operational period, with 2016 and 2022 census data included to provide context for post-closure trends. These data cover population size, age profiles, household composition, employment, and unemployment rates, offering a comprehensive socio-economic profile. A desktop survey of relevant documents and websites, combined with site visits, visual assessments, aerial photography, and Ordnance Survey mapping, supports the assessment.

The data included information on population, structure, age profile and household size, number of persons at work and the unemployment profile. A desktop survey of the following documents and

websites also informed this:

- Cork County Development Plan 2022 - 2028
- Cork County Development Plan (CDP) 2014 - 2021;
- Cork County Development Plan 2009 - 2014
- Cork County Development Plan 2003 - 2009
- Cork County Development Plan 1996 – 2003
- Cork County Development Plan 1986 - 1996
- Skibbereen Electoral Area Local Area Plan 2011
- Skibbereen Electoral Area Local Area Plan 2005
- Central Statistics Office (CSO) website www.cso.ie;

The EIAR prepared in 2014 for a proposed application for quarrying of stone with an extraction area of approximately 6 hectares and all associated site works was also used to inform this chapter (Cork County Council Ref: 14/616 and ABP Ref: 245174).

Consultations with both the local authority and statutory bodies were also used to ensure that environmental issues, including socio-economic, recreational and amenity issues relating to the development were addressed.

5.1.5 Difficulties Encountered in Compiling Information

The requirement to consider potential impacts between 1990 and 2014 meant that it was challenging at times to find information. The more recent censuses of 2006, 2011, 2016 and 2022 provide a more granular assessment of data, with more categories added. This makes it more challenging to compare earlier years (1991, 1996 and 2002). For example, no information at ED level is available for principle economic status for 1991 and 2006. Notwithstanding, no difficulties were experienced that negatively impacted drafting this chapter.

5.2 Description of Receiving Environment

The following provides a description of the receiving environment, with a focus on demographics, land use, and local amenities. A detailed description of the project is provided in Chapter 3.

5.2.1 Population and Settlement Patterns

The study area includes four Electoral Divisions (EDs): Aultagh, Coolmountain, Dunmanway, and Manch, all within Cork County Council's administrative area. The subject site, located in the townland of Ardcahan within Aultagh ED, is positioned very close to the borders of the other EDs—Coolmountain to the west, Dunmanway to the southwest, and Manch to the south. This central location near the boundaries of the four EDs makes the site a focal point, justifying the inclusion of all four EDs in the study due to their adjacency and relevance.

The site is located approximately 3.5km northeast of Dunmanway and 20km southwest of Macroom. Dunmanway is an old market town with a low to medium population density and is probably the core area for access to amenities servicing the four EDs (refer to Figure 5.1).

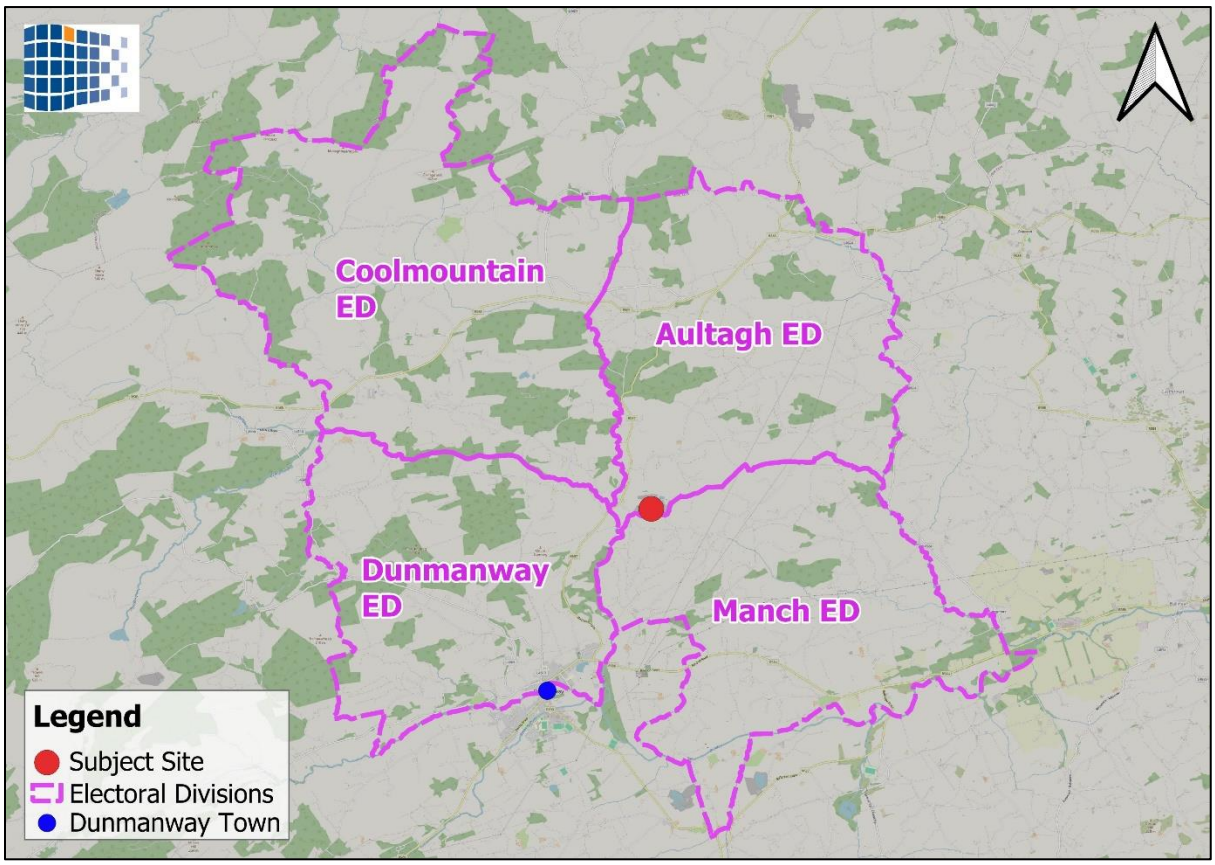


Figure 5-1 Study Area: Electoral Divisions surrounding the quarry at Ardcahan.

Access to the site is via the R587 which connects Dunmanway with its northern environs. Please refer to Chapter 3 (Project Description) for detailed site location and project description. The site is in close proximity to the Coolmountain, Dunmanway and Manch EDs, and is situated in a rural landscape, characterised by a dispersed settlement pattern and relatively low population density. The nearest dwellings are located approximately 370 m south; 275 m west; 540 m north and 680 m east of the development. Figure 5.2 shows the locations of the nearest dwellings as well as other facilities and services.

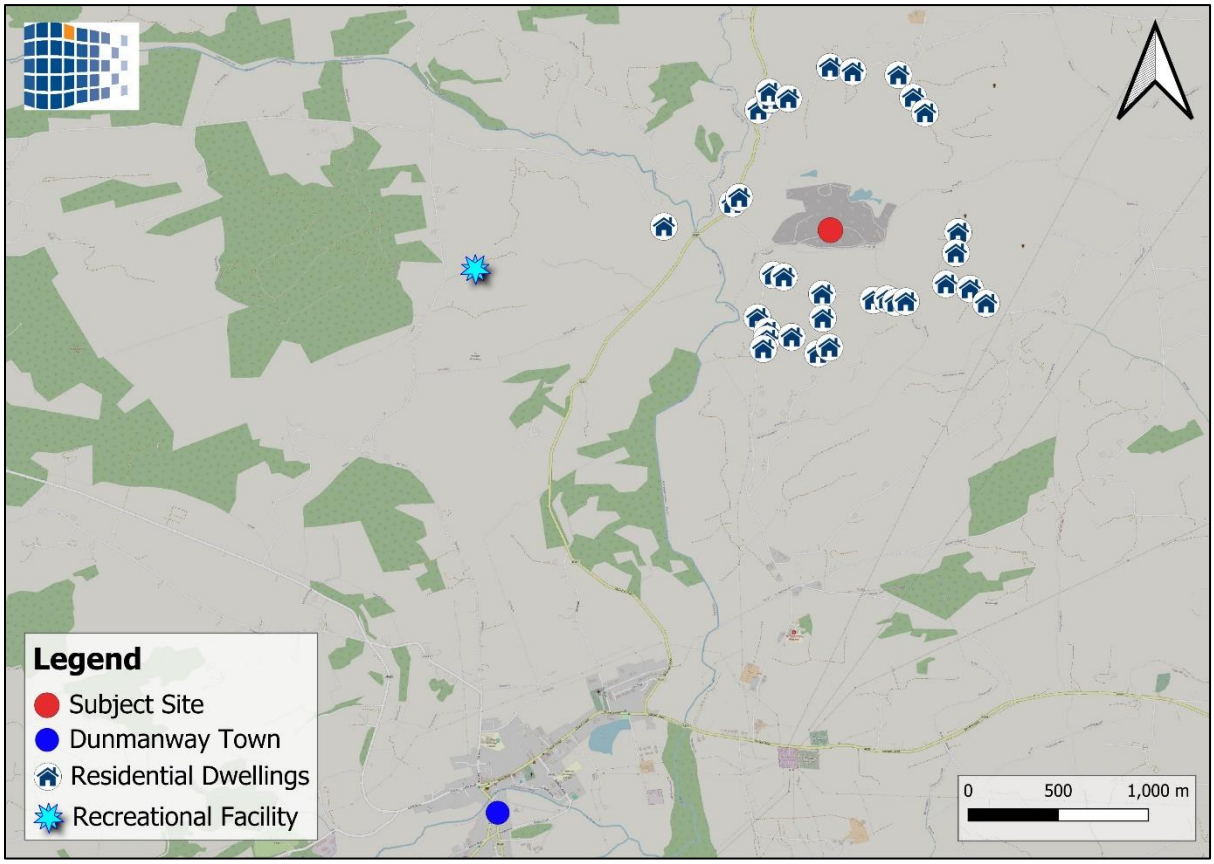


Figure 5-2 locations of residential properties and activities in proximity to the Ardcahan Quarry.

The 1996-2003 Cork County Development Plan proposed a conservative approach to the development of rural housing in proximity to settlements, stating in paragraph 4.3.2 that there would not be an objection in principle to individual rural housing outside commuting pressure areas. The area surrounding Dunmanway was subject to a restrictive Zoning Objective (A), where it was an objective to "Maintain agricultural uses and control rise in housing densities". This area extended to "within 3 miles of St Mary's Church, Dunmanway, but outside the town", which would incorporate lands in proximity to Ardcahan Quarry. This zoning objective was only relaxed where the proposal was made by the farmer of the land, his direct descendant or ancestor, or a person who has lived outside the town and within 1.5 miles of the site for 7 or more years, for their own use. This suggests that there was a general restriction on rural housing in proximity to Ardcahan Quarry, making unlikely that one-off housing would be developed in this area unless it was by an individual with a direct connection to the area.

The situation regarding rural housing changed somewhat with the adoption of the 2005 Skibbereen Electoral Area Local Area Plan. Ardcahan and Dunmanway were also incorporated in the Skibbereen Electoral Area Local Area Plan for 2005 and 2011.

Ardcahan Quarry is located on the northern edge of what was defined as the Dunmanway green belt in the 2005 Skibbereen Electoral Area Local Area Plan. The Local Area Plans defined green belts around the main towns in the county and replaced the former rural housing control zones of the 1996 County Development Plan. In the Skibbereen Electoral Area, the towns of Clonakilty, Skibbereen and Dunmanway were the subject of new Green Belts in that way. The Dunmanway greenbelt was significantly smaller than that area to which housing controls applied in the 1996 Development Plan.

The green belts around Ring and County Towns are primarily to discourage isolated residential development and residential sprawl near towns and to control linear roadside development. Land within green belts was generally reserved for agricultural, open space or recreational uses. Other appropriate rural land uses, such as forestry or quarrying would also be regarded as acceptable, subject to appraisal of environmental impacts.

The population density and composition for each of the EDs has experienced substantial changes between 1991 to 2022 (Table 5.1) However, overall the area has maintained the relatively low population density typical of rural areas.

There was an increase in population for Aultagh, Coolmountain, Dunmanway North and Manch (13.73%, 7.41%, 1.04% and 35.29% respectively) between 1996 and 2022.

Overall for the 4 EDs combined, the population increased by 10.07% over the 31-year period.

Table 5.1 Population for the EDs of Aultagh, Coolmountain, Dunmanway and Manch between 1991 and 2022 and overall percentage change. Statistics for County Cork and Ireland are included for comparison.

Population									% Change during 1991 to 2022
DED	1991	1996	2002	2006	2011	2016	2022	Change from 1991 to 2022	
Aultagh	335	299	306	327	335	357	381	46	13.73%
Coolmountain	405	476	430	443	429	430	435	30	7.41%
Dunmanway North	1251	1236	1161	1060	1087	1050	1264	13	1.04%
Manch	442	448	477	547	596	583	598	156	35.29%
Total	2433	2459	2374	2377	2447	2420	2678	245	10.07%
Co. Cork (excludes Cork City)	283,116	293,323	324,767	361,877	399,802	333,460	360,152	77,036	27.20%
Ireland	3,525,719	3,626,087	3,917,203	4,239,848	4,581,269	4,761,865	5,149,139	1,597,817	45.31%

Table 5.2 provides an indication of the population density of the study area between 1991 and 2022. The density for Coolmountain and Dunmanway North has remained roughly the same for the study period, while Aultagh and Manch has experienced a steady increase in population density over time. The figures for Dunmanway North are consistently higher as the ED overlaps with the north-west of Dunmanway town.

The average population density for the state increased from 50.2 per sq km in 1991 to 52 in 2022. The average population density for the total study area of c. 107 sq km was 28. Overall the figures for

Aultagh, Coolmountain and Manch indicate a sparse population.

Table 5.2 Population density – persons per square kilometre

DED	1991	1996	2002	2006	2011	2016	2022
Aultagh (Area = c. 24sq km)	13.4	12.0	12.2	13.1	13.4	14.3	16
Coolmountain (Area = c. 36sq km)	11.3	13.2	11.9	12.3	11.9	11.9	12
Dunmanway North (Area = c. 22sq km)	56.9	56.2	52.8	48.2	49.4	47.7	57
Manch (Area = c. 25sq km)	17.7	17.9	19.1	21.9	23.8	23.7	24
Total (Area = c. 107 sq km)	22.1	22.4	21.6	21.6	22.2	22.0	28
Co. Cork (Area = c. 7,500sq km)	37.7	39.1	43.3	48.3	53.3	55.6	48
Ireland (Area = 70,265 sq km)	50.2	51.6	55.7	60.3	65.2	70	52

5.2.2 Housing and Households

Table 5.3 provides information on household size for the entirety of the study area, County Cork and Ireland between 1996 and 2022. The information provides insight into changing settlement pattern trends across the study area.

Across all areas (Aultagh, Coolmountain, Dunmanyway North, Manch, Co. Cork, and Ireland), the average household size remains relatively stable, ranging between 2.5 and 3.2 persons per household over the 26-year period.

The average household size of Aultagh has fluctuated slightly, peaking at 3.2 in 2006 and dipping to 2.8 in 2011, but returns to 3.0 by 2022. Both Aultagh and Manch consistently have larger households compared to Coolmountain (2.7–2.9), Dunmanyway North (2.5–3.0), Co. Cork (2.8–2.9), and Ireland (2.7–2.9).

Overall a decline in average household size would be expected in line with national trends.

Table 5.3 changes in average household size for EDs, Cork County and State between 1991 and 2022 (figures rounded)

Area	Average Household Size (%)					
	1996	2002	2006	2011	2016	2022
Aultagh	3.1	3.1	3.2	2.8	3.0	3.0
Coolmountain	2.8	2.8	2.9	2.7	2.7	2.8
Dunmanyway North	3.0	3.0	2.8	2.6	2.5	2.6
Manch	3.2	3.2	3.2	3.2	3.2	3.1
Total	3.0	3.0	3.0	2.8	2.8	2.8
Co. Cork	2.9	2.9	2.9	2.8	2.8	2.8
Ireland	2.9	2.9	2.9	2.8	2.8	2.7

5.2.3 Affluence and Deprivation.

The Pobal Deprivation Index is Ireland's most widely used social gradient metric, which scores each Small Area (SA comprises 50 – 200 households) in terms of affluence or disadvantage. The EDs typically overlap the SAs, and an Electoral Division may incorporate a number of SAs. Information is available at ED level for 2006, 2011, 2016 and 2022. The index uses information from Ireland's census, such as employment, age profile and educational attainment, to calculate this score. The data is presented in a series of maps (available at https://maps.pobal.ie/).

Table 5.4 Pobal Deprivation Indices and Description for the study area for 2006 to 2022.

Area	Indices and Categorisation					
	1996	2002	2006	2011	2016	2022
Aultagh	-	-	Marginally Above Average (2.87)	Marginally Below Average (-0.07)	Marginally Below Average (-0.58)	Marginally Below Average (-0.86)
Coolmountain	-	-	Marginally Below Average (-7.04)	Marginally Below Average (-5.73)	Marginally Below Average (-6.81)	Marginally Below Average (-5.12)
Dunmanyway North	-	-	Marginally Below Average (-1.79)	Marginally Below Average (-2.67)	Marginally Below Average (-5.49)	Marginally Below Average (-3.54)

Area	Indices and Categorisation					
Manch	-	-	Marginally Below Average (-0.24)	Marginally Below Average (-2.07)	Marginally Above Average (0.18)	Marginally Below Average (-1.01)

5.2.4 Economic Activity

The nearest town centre is Dunmanway, which is 4.6km from the development and is limited in terms of its service and employment provisions. Current employment trends nationally show that workers in the tertiary sector are migrating to larger urban centres for employment, and the trend is expected to be similar in West Cork.

Extractive Industry

An understanding of the economic importance and contribution of the extractive industry in Ireland, and by extension the importance of Ardcahan Quarry to the local and regional economy, between 1990 and 2014 can be inferred from the growth of the construction sector between 1990 and 2004. According to the ESRI, the number of dwellings built in Ireland at the height of the boom was approximately 100,000, compared to the levels in 2014 (10,000). The graphic below (Figure 4.3) shows the percentage of GDP that was devoted to building and construction between 1980 and 2012. This began to reach a peak in 2004, with the economic crisis hitting in 2007 (Fitzgerald, 2014).

This illustrates the importance of the extractive industry in Ireland in the 1990's and up until the decline in 2006-2007.

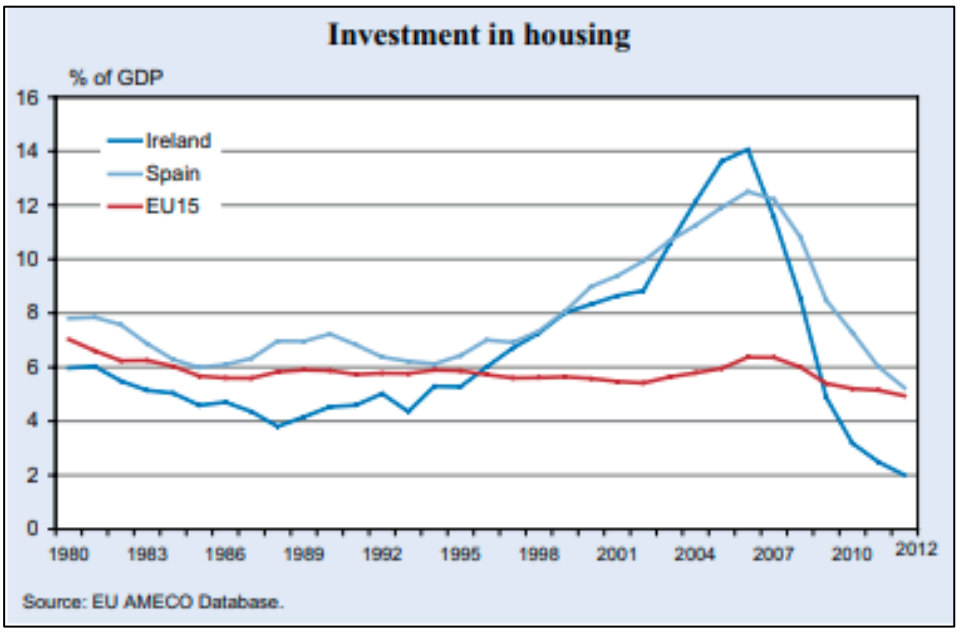


Figure 5-3 The percentage of GDP that was devoted to building and construction between 1980 and 2012

The Cork County Development Plan 1996 (1996 CCDP) does not provide specific policies or text relating to extractive industries. With regard to cross-sectoral employment, the 1996 CCDP identified that in order to meet demanding employment objectives, Cork County "needs a competitive advantage in Cork for as many sectors as possible" in order to improve specialist skills and resources across industries. It is also stated that Cork needs to capture the wealth of the primary sector in order to increase development and employment (Section 3, Employment: Strategic Issues). Table 3.5 in the 1996 CCDP provides a breakdown of distribution of employment in the primary sector, based on the results of the 1986 Census (Table 3.5 reproduced as Figure 5.4 below).

Table 3.5.
Percentage Distribution of Employment in Primary Sector, 1986

	State	Cork (excl Cork RD)	Cork RD
Farming	88.8	91.9	86.4
Market Gardening	1.8	1.0	5.5
Other Agricultural Inds.	1.3	2.0	1.5
Forestry	1.9	2.0	0.9
Fishing	1.4	1.8	0.6
Mining/Quarrying	2.0	1.4	5.0
Turf	2.8	0	0
Total	100	100	100

Source: 1986 Census

Figure 5-4 Percentage Distribution of Employment in the Primary Sector, 1986 (Source: Section 3 of the 1996 CCDP).

It is obvious from Fig 5.4 above that most people in the State, and in the Cork Rural District (RD) were employed in the farming sector, however the percentage employed in Mining/Quarrying was considerably higher than the rest of the county and the state (5%), thus highlighting its importance for rural economic development in the County.

The 2003 Cork County Development Plan (2003 CCDP) highlighted the importance of protecting mineral reserves, identifying that while at the time there were no national planning guidelines relating to the extraction of minerals, proper planning and sustainable development would require appropriate policies for protecting essential mineral reserves (such as aggregates) and to ensure that adverse environmental and other impacts of mineral extraction are kept to a minimum.

Paragraph 4.5.3 of the 2003 CCDP stated that "*Because mineral extraction is a very significant industry serving the construction, industrial and energy sectors, it is important to facilitate development, particularly by safeguarding mineral reserves so that inappropriate development does not occur in the vicinity and cause difficulties in exploiting the resource*". Specifically, policies ECO 5-2 and ECO 5-3 applied.

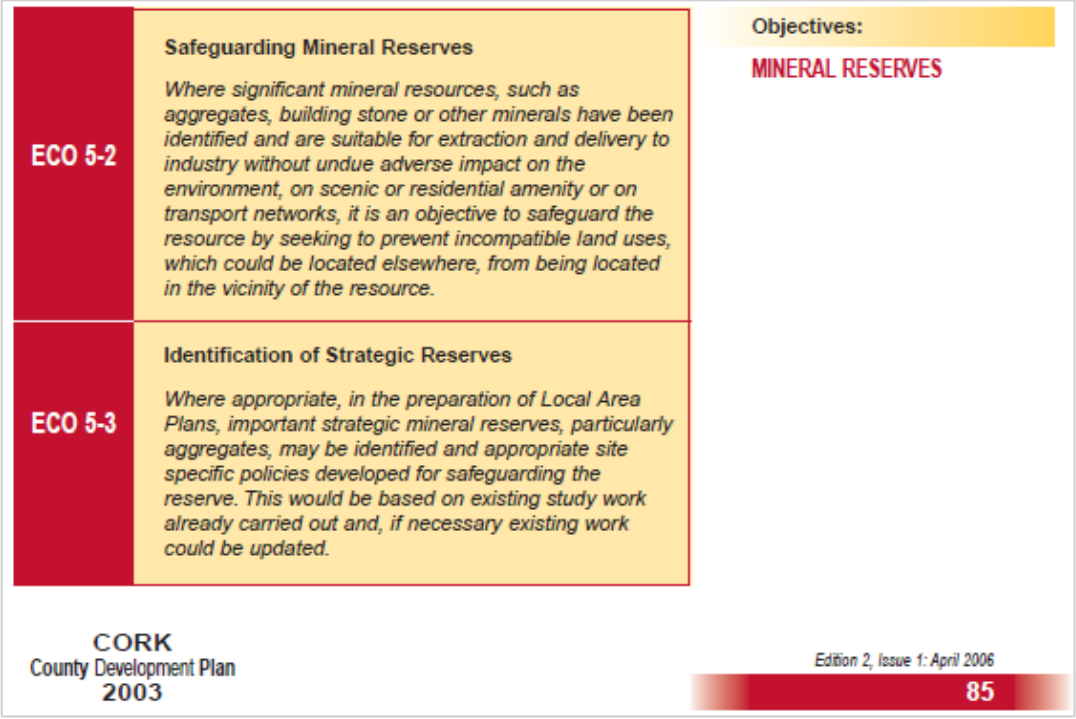


Figure 5-5 The objectives for mineral reserves as per the 2003 Cork County Development Plan.

The Skibbereen Electoral Area Local Area Plan 2005 identified that the extractive industry made an important contribution to economic development in the Electoral Area, stating that *"There are a number of important quarries in the electoral area, where Cork County Council must safeguard the resources. The main quarries in the area are located at Dunmanway, Drimoleague, Skibbereen, Ballineen-Enniskeane and Caheragh."*

The 2009 Cork County Development Plan notes that a general objective of the plan is to ensure the supply of primary aggregates to ensure that the sustainable extract of locally sourced aggregates or minerals will continue to contribute to the local economy and provide the essential raw materials necessary for the construction industry.

5.2.5 Employment

Tables 5.5 to 5.10 display information regarding the principal economic status of the resident population aged 15 years and over, for the demographic study area, the county, and the state, for the 1991 to 2022 Census periods.

Aultagh consistently had the highest employment rate among the EDs, peaking at 61% in 2011, dropping to 55% in 2016 and recovering to 57.7% in 2022. Other EDs (Coolmountain: 51.5%, Dunmanway North: 53.6%, Manch: 51.5% in 2022) and the EDs combined (54.6%) were slightly below Co. Cork (56.2%) and Ireland (56%). Nationally, employment rose from 47% in 1996 to 57% in 2006, dipped to 50% in 2011, and reached 56% by 2022, showing recovery.

Unemployment in the combined EDs fell from 9% in 2011 to 7.4% in 2016 and 4.6% in 2022, reflecting economic recovery. Aultagh had the lowest rate among EDs at 3.4% in 2022, compared to Coolmountain (5.5%), Dunmanway North (5.4%), and Manch (3.3%). Co. Cork (4.1%) and Ireland (5.1%) had slightly higher rates. Nationally, unemployment dropped from 8% in 1996 to 5% in 2006, spiked to 12% in 2011, and fell to 5.1% by 2022.

The 'Unable to Work' category averaged 5% across the combined EDs from 1996 to 2022, peaking at 15% in 2016 (up from 5% in 2011), before falling to 5.2% in 2022. Aultagh and Manch had the lowest rates at 3.1% in 2022, compared to Coolmountain and Dunmanway North (6.4%). Co. Cork (4.9%) and Ireland (4.6%) were similar. Nationally, this category rose from 3% in 1996 to 4.6% in 2022.

The 'Retired' population in the combined EDs increased from 12% in 2002 to 16.4% in 2022, aligning with Co. Cork (15.7%) and Ireland (15.9%). Coolmountain (17.3%) and Dunmanway North (17.6%) had the highest ED rates in 2022, followed by Manch (14.6%) and Aultagh (14.3%). Aultagh's 16% in 2011 was above the national average (13%)

The State figures show that there is a continuous increase of people at work between 1991 and 2006. The unemployment rate falls in the same period from 9% in 1991 to 5% in 2006. The figures for 2011 reflect the impact of the economic crash and subsequent recession with an unemployment rate of 12%.

Societal changes are apparent in the decrease of persons identifying as "looking after the home". While a breakdown based on ED is not available for this category pre-2002, the figures for the combined EDs have remained in line with the figure for Cork County between 2002 and 2022. The number of people identifying as "looking after the home" decreased steadily, from 25% in 1991 to 9.7% in 2022, which may indicate the increased participation of women in education or in the workforce.

Between 1991 and 2022, the percentage of respondents identifying as "Student" has remained relatively stable at between 10-12% for the combined EDs, and also for the State and Cork County,

The percentage of persons unable to work has increased by 1% to 4% in the 2000s in comparison to 3% in the 1990s.

The number of persons employed is categorised in terms of their occupation in Tables 4.11 to 4.16.

In 2011, Agriculture, Forestry, and Fishing was a leading occupational sector across the study area, particularly in both Aultagh (27%) and Coolmountain (25%) ED. Manch ED also had significant agricultural employment at 21%, surpassing Co. Cork (8%) by 13% and the State (5%) by 16%. Dunmanway North, however, had only 10% employed in agriculture, notably lower than the other EDs, but stood out with 26% in Professional Services, exceeding Co. Cork (23%) and State (24%) averages. This suggests a more urbanised economy in Dunmanway North compared to the rural character of other EDs.

In 2006, the census data indicates a shift, with Agriculture employing a smaller share (15% across EDs) compared to 2011 (18%). Building and Construction peaked during this period, engaging 18–22% of workers across the EDs, averaging 19%, above Co. Cork's 13%. This reflects the construction boom from 1996 to 2006.

In 2002 (Table 13.14) the Building sector already provides close to one quarter of jobs in the combined

EDs (18%). The Agricultural sector provides 20% of employment in the combined EDs, double the County (10%) and more than three times the State average (6%). In the Aultagh ED the predominantly rural character is reflected by 35% of persons at work in the Agricultural sector.

Over the years, Agriculture's share of employment in the combined EDs (Aultagh, Coolmountain, Dunmanway North, Manch) declined, reaching 9.8% by 2022. Construction stabilised at 7.9% after 2011, likely reflecting the economic slowdown post-2008. Professional Services increased, reaching 22.8% in 2016 and 19.54% in 2022. These changes indicate a shift from agriculture in rural EDs like Aultagh toward more diverse sectors, with Dunmanway North maintaining a consistent focus on Professional Services.

Table 5.5 Census Results 2022: Principle Economic Status for the EDs of Aultagh, Coolmountain, Dunmanway and Manch and overall percentage change. Statistics for County Cork and Ireland are included for comparison.

Principle Economic Status 2022															
Area	**At Work**		**Unemployed**		**Student**		**Looking after home**		**Unable to Work**		**Retired**		**Other**		**Total Aged 15+**
		%		**%**		**%**		**%**		**%**		**%**		**%**	
Aultagh	169	57.7%	10	3.4%	37	12.6%	23	7.9%	9	3.1%	42	14.3%	3	1%	293
Coolmountain	178	51.5%	19	5.5%	34	9.8%	32	9.3%	22	6.4%	60	17.3%	1	0.3%	346
Dunmanway North	546	53.6%	55	5.4%	81	8%	80	7.9%	65	6.4%	179	17.6%	12	1.2%	1,018
Manch	274	51.5%	16	3.3%	68	14.2%	34	7.1%	15	3.1%	70	14.6%	3	0.6%	480
Total EDs	1167	54.6%	100	4.6%	220	10.3%	169	7.9%	111	5.2%	351	16.4%	19	0.9%	2,137
Co. Cork	264,423	56.2%	19,443	4.1%	54,387	11.6%	32,425	6.9%	22,874	4.9%	73,811	15.7%	3,126	0.7%	470,489
Ireland	2,317,449	56%	210,802	5.1%	459,275	11.1%	275,438	6.7%	189,308	4.6%	657,790	15.9%	27,062	0.7%	4,136,852

Table 5.6 Census Results 2016: Principle Economic Status for the EDs of Aultagh, Coolmountain, Dunmanway and Manch and overall percentage change. Statistics for County Cork and Ireland are included for comparison

Principle Economic Status 2016															
Area	**At Work**		**Unemployed**		**Student**		**Looking after home**		**Unable to Work**		**Retired**		**Other**		**Total Aged 15+**
		%		**%**		**%**		**%**		**%**		**%**		**%**	
Aultagh	146	55%	14	5.3%	31	11.7%	27	10.2%	40	15.1%	6	2.3%	1	0.4%	265
Coolmountain	155	45.9%	41	12.1%	37	10.9%	37	10.9%	47	13.9%	21	6.2%	0	0%	338
Dunmanway North	427	50.4%	65	7.7%	74	8.7%	94	11.1%	142	16.8%	44	5.2%	1	0.1%	847
Manch	231	52.6%	19	4.3%	68	15.5%	53	12%	55	12.5%	13	3%	0	0%	439
Total EDs	959	50.8%	139	7.4%	210	11.1%	211	11.2%	284	15%	84	4.4%	2	0.1%	1,889
Co. Cork	181,717	56.5%	16,460	5.1%	35,933	11.2%	27,965	8.7%	45,612	14.2%	12,926	4%	1007	0.3%	321,620
Ireland	1,841,526	51%	390,677	10.8%	408,838	11.3%	339,918	9.4%	457,394	12.7%	156,993	4.4%	13,316	0.4%	3,608,662

Table 5.7 Census Results 2011: Principle Economic Status for the EDs of Aultagh, Coolmountain, Dunmanway and Manch and overall percentage change. Statistics for County Cork and Ireland are included for comparison.

Principle Economic Status 2011															
Area	**At Work**		**Unemployed**		**Student**		**Looking after home**		**Unable to Work**		**Retired**		**Other**		**Total Aged 15+**
		%		**%**		**%**		**%**		**%**		**%**		**%**	
Aultagh	152	61%	14	6%	20	8%	21	8.4%	5	2%	39	16%	0	0%	251
Coolmountain	141	43%	37	11%	38	12%	40	12%	23	7%	48	15%	0	0%	327
Dunmanway North	402	47%	80	9%	100	12%	93	11%	62	7%	123	14%	2	0.2%	862
Manch	220	50%	38	9%	61	14%	50	11%	11	3%	59	13%	0	0%	439
Total EDs	915	49%	169	9%	219	12%	204	11%	101	5%	269	14%	2	0.1%	1879
Co. Cork	164,441	53%	28,603	9%	32,611	11%	31,071	10%	12,390	4%	37,612	12%	1068	0.3%	307,796
Ireland	1,807,360	50%	424,843	12%	408,838	11%	339,918	9%	156,993	4%	457,394	13%	13,316	0.4%	3,608,662

Table 5.8 Census Results 2006: Principle Economic Status for the EDs of Aultagh, Coolmountain, Dunmanway and Manch and overall percentage change. Statistics for County Cork and Ireland are included for comparison.

Principle Economic Status 2006															
Area	**At Work**		**Unemployed**		**Student**		**Looking after home**		**Unable to Work**		**Retired**		**Other**		**Total Aged 15+**
		%		**%**		**%**		**%**		**%**		**%**		**%**	
Aultagh	152	59%	5	2%	24	9%	45	17%	6	2%	26	10%	1	0%	259
Manch	226	56%	12	3%	47	12%	58	14%	12	3%	49	12%	0	0%	404
Coolmountain	141	42%	22	7%	43	13%	74	22%	28	8%	31	9%	1	0%	340
Dunmanway North	474	56%	22	3%	96	11%	106	12%	49	6%	105	12%	2	0%	854
Total EDs	993	54%	61	3%	210	11%	283	15%	95	5%	211	11%	4	0%	1857
Co. Cork	167,092	59%	10,485	4%	28,032	10%	35,846	13%	10,361	4%	30,244	11%	954	0%	283,014
State	1,930,042	57%	179,456	5%	349,596	10%	387,014	12%	138,382	4%	377,927	11%	12,982	0%	3,375,399

Table 5.9 Census Results 2002: Principle Economic Status for the EDs of Aultagh, Coolmountain, Dunmanway and Manch and overall percentage change. Statistics for County Cork and Ireland are included for comparison.

Principle Economic Status 2002															
	At Work		Unemployed		Student		Looking after home		Unable to Work		Retired		Other		Total Aged 15+
Area		%		%		%		%		%		%		%	
Aultagh	139	55%	10	4%	33	13%	32	13%	7	3%	31	12.3	1	0%	253
Manch	187	51%	9	3%	41	11%	77	21%	11	3%	38	10.4	2	1%	365
Coolmountain	143	46%	31	10%	33	11%	50	16%	18	6%	35	11.3	0	0%	310
Dunmanway North	440	50%	22	3%	118	13%	139	16%	45	5%	114	12.8	11	1%	889
Total EDs	909	50%	72	4%	225	12%	298	16%	81	5%	218	12.0	14	1%	1817
Co. Cork	136,344	54%	9,331	4%	28,471	11%	39,110	16%	9,472	4%	26,714	10.6	2,628	1%	252,070
State	1,641,587	53%	159,346	5%	350,774	11%	438,986	14%	130,255	4%	333,255	10.8	35,572	1%	3,089,775

Table 5.10 Census Results 1996: Principle Economic Status for County Cork and Ireland are included for comparison

Principle Economic Status 1996															
	At Work		**Unemployed***		**Student**		**Looking after home**		**Unable to Work**		**Retired**		**Other**		**Total 15+**
Area		%		**%**		**%**		**%**		**%**		**%**		**%**	
Co. Cork	107,219	49%	13149.0	6%	27,143	12%	48,002	22%	5291	2%	20,037	9%	43	0%	220,884
State	1,307,236	47%	226,728	8%	339,596	12%	553,215	20%	78,864	3%	258,454	9%	2,570	0%	2,766,663
Principle Economic Status 1996															
	At Work		**Unemployed***		**Student**		**Looking after home**		**Unable to Work**		**Retired**		**Other**		**Total 15+**
Area		%		**%**		**%**		**%**		**%**		**%**		**%**	
Co. Cork	107,219	49%	13149.0	6%	27,143	12%	48,002	22%	5291	2%	20,037	9%	43	0%	220,884
State	1,307,236	47%	226,728	8%	339,596	12%	553,215	20%	78,864	3%	258,454	9%	2,570	0%	2,766,663

Table 5.11 Census results showing the number of persons at work by occupation in 2022 for the EDs of Aultagh, Coolmountain, Dunmanway and Manch.

Persons at Work by Occupation 2022																	
	Agriculture, Forestry & Fishing		Building & Construction		Manufacturing Industries		Commerce & Trade		Transport & Communications		Public Administration		Professional Services		Other		Total
AREA		**%**		**%**		**%**		**%**		**%**		**%**		**%**		**%**	
Aultagh	35	20.7 %	12	7.1%	38	22.5 %	30	17.8 %	7	4.1 %	7	4.1 %	27	16%	13	7.7%	169
Coolmountain	25	14%	17	9.6%	18	10.1 %	33	18.5 %	10	5.6 %	5	2.8 %	39	21.9 %	31	17.4 %	178
Dunmanway North	29	5.3%	44	8.1%	87	16%	107	19.6 %	25	4.6 %	25	4.6 %	107	19.6 %	122	22.3 %	546
Manch	38	13.9 %	28	10.2 %	41	15%	56	20.4 %	9	3.3 %	10	3.7 %	55	20.1 %	37	13.5 %	274
Total EDs	127	9.8%	101	7.9%	184	10.6 %	226	10.5 %	51	3.1 %	47	2.2 %	228	19.5 %	203	9.1%	1,167
Co. Cork	10,861	4.1%	15,012	5.7%	46,395	17.6 %	57,401	21.7 %	20,125	7.6 %	12,535	4.7 %	64,710	24.5 %	37,384	14.1 %	264,423
State	82,228	3.5%	134,482	5.8%	273,102	11.8 %	552,642	23.8 %	212,383	9.2 %	131,633	5.7 %	568,105	24.5 %	365,716	15.8 %	2,320,297

Table 5.12 Census results showing the number of persons at work by occupation in 2016 for the EDs of Aultagh, Coolmountain, Dunmanway and Manch.

Persons at Work by Occupation 2016																	
	Agriculture, Forestry & Fishing		Building & Construction		Manufacturing Industries		Commerce & Trade		Transport & Communications		Public Administration		Professional Services		Other		Total
AREA		**%**		**%**		**%**		**%**		**%**		**%**		**%**		**%**	
Aultagh	36	24.8 %	12	8.3 %	29	20%	13	9%	6	4.1 %	5	3.4 %	32	22%	12	8.3%	145
Coolmountain	41	26.6 %	11	7.1 %	16	10.4 %	29	18.8 %	5	3.2 %	2	1.3 %	31	20.1 %	19	12.3 %	154
Dunmanway North	27	6.4%	34	8.1 %	56	13.4 %	87	20.8 %	29	6.9 %	17	4.1 %	103	24.6 %	66	15.8 %	419
Manch	46	20%	18	7.8 %	32	13.9 %	49	21.3 %	15	6.5 %	7	3%	50	21.7 %	13	5.7%	230
Total EDs	150	15.8 %	75	7.9 %	133	14%	178	18.8 %	55	5.8 %	31	3.3 %	216	22.8 %	110	11.6 %	948
Co. Cork	11,946	6.6%	10,035	5.6 %	29,307	16.3 %	39,716	22%	13,343	7.4 %	8,409	4.7 %	41,819	23.2 %	25,315	14%	179,890
State	91,526	5%	87,371	4.8 %	209,803	11.6 %	456,289	25.2 %	146,530	8.1 %	113,860	6.3 %	425,349	23.5 %	276,632	15.3 %	1,807,360

Table 5.13 Census results showing the number of persons at work by occupation in 2011 for the EDs of Aultagh, Coolmountain, Dunmanway and Manch.

Persons at Work by Occupation 2011																	
	Agriculture, Forestry & Fishing		Building & Construction		Manufacturing Industries		Commerce & Trade		Transport & Communications		Public Administration		Professional Services		Other		Total
Area		**%**		**%**		**%**		**%**		**%**		**%**		**%**		**%**	
Aultagh	41	27%	14	9%	28	18%	18	12%	10	7%	6	4%	27	18%	8	5%	220
Coolmountain	35	25%	15	11%	17	12%	23	16%	2	1%	4	3%	29	21%	16	11%	141
Dunmanway North	39	10%	37	9%	54	13%	63	16%	24	6%	21	5%	103	26%	61	15%	402
Manch	46	21%	16	7%	24	11%	53	24%	10	5%	9	4%	46	21%	16	7%	220
Total EDs	161	18%	82	9%	123	13%	157	17%	46	5%	40	4%	205	22%	101	11%	915
Co. Cork	12,424	8%	9,227	6%	26,066	16%	37,600	23%	10,647	6%	8,877	5%	37,754	23%	21,846	13%	164,441
State	91,526	5%	87,371	5%	209,803	12%	456,289	25%	146,530	8%	113,860	6%	425,349	24%	276,632	15%	1,807,360

Table 5.14 Census results showing the number of persons at work by occupation in 2006 for the EDs of Aultagh, Coolmountain, Dunmanway and Manch.

Persons at Work by Occupation 2006																	
	Agriculture forestry and fishing		Building and Construction		Manufacturing industries		Commerce and trade		Transport and Communications		Public Administration		Professional Services		Other		Total
Area		%		%		%		%		%		%		%		%	
Aultagh ED	36	24%	34	22%	19	13%	23	15%	9	6%	3	2%	20	13%	8	5%	152
Manch ED	45	20%	40	18%	30	13%	46	20%	5	2%	4	2%	36	16%	20	9%	226
Coolmountain	34	24%	25	18%	22	16%	23	16%	3	2%	3	2%	14	10%	17	12%	141
Dunmanway North	35	7%	86	18%	59	12%	87	18%	19	4%	13	3%	81	17%	94	20%	474
Total EDs	150	15%	185	19%	130	13%	179	18%	36	4%	23	2%	151	15%	139	14%	993
Co. Cork	12,042	7%	20,949	13%	27,800	17%	41,114	25%	8,018	5%	7,385	4%	27,526	16%	22,258	13%	167,092
State	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4,239,848

Table 5.15 Census results showing the number of persons at work by occupation in 2002 for the EDs of Aultagh, Coolmountain, Dunmanway and Manch.

Persons at Work by Occupation 2002																	
	Agriculture forestry and fishing		Building and Construction		Manufacturing industries		Commerce and trade		Transport and Communications		Public Administration		Professional Services		Other		Total
Area (ED)		**%**		**%**		**%**		**%**		**%**		**%**		**%**			
Aultagh ED	48	35 %	28	20%	22	16%	19	14%	3	2%	2	1%	12	9%	5	4%	139
Manch ED	50	27 %	25	13%	32	17%	38	20%	6	3%	2	1%	24	13%	10	5%	187
Coolmountain ED	41	29 %	28	20%	22	15%	19	13%	6	4%	2	1%	8	6%	17	12 %	143
Dunmanway North	40	9%	80	18%	63	14%	91	21%	15	3%	20	5%	73	17%	58	13 %	440
Total EDs	179	20 %	161	18%	139	15%	167	18%	30	3%	26	3%	117	13%	90	10 %	909
Co. Cork	13,003	10 %	13,630	10%	25,169	18%	33,498	25%	6,522	5%	6,548	5%	21,106	15%	16,868	12 %	136,344
State	97,281	6%	149,271	9%	262,224	16%	441,110	27%	96,855	6%	94,746	6%	252,821	15%	247,279	15 %	1,641,587

Table 5.16 Census results showing the number of persons at work by occupation in 1991 and 1996 for the State.

Census Year and % Employed	Broad Occupational Group								
	Farming, fishing and forestry	Manufacturing	Building and construction	Clerical, managing and government	Communication, warehouse and transport	Sales and commerce	Professional, technical and health	Personal service and childcare	Total Labour Force
Census Year 1996	140625	237146	109798	246205	89228	195666	225855	148377	1533964
% Employed	9.2	15.5	7.2	16.1	5.8	12.8	14.7	9.7	90.8
Census Year 1991	163549	215175	87661	218018	80307	170953	183899	107933	1382870
% Employed	11.8	15.6	6.3	15.8	5.8	12.4	13.3	7.8	88.8

5.2.6 Health

In 2022, the Census revealed shifts in health perceptions across Ireland, with 83% of the state's population reporting "Very Good" (53.24%) or "Good" (29.66%) health, a decline from 87% in 2016, reflecting a broader trend of reduced positive health perceptions.

In Cork County, 55.16% reported "Very Good" health and 29.45% "Good" health, slightly above the state average. Aultagh ED saw a bounce back in "Very Good" health from 56.4% in 2016 to 61.94% in 2022, though still below its 2011 peak of 63.6%, while "Good" health dropped from 35.2% in 2016 to 25.20% in 2022, aligning closer to 2011's 24.4%.

Manch ED experienced a decline in "Very Good" health from 62.3% in 2011 to 56.02% in 2022, with 26.92% reporting "Good" health. Coolmountain ED reported 52.18% "Very Good" and 27.36% "Good" health, remaining below Cork County and state averages, consistent with 2011 trends.

Dunmanway North ED, with 48.10% "Very Good" and 25.16% "Good" health in 2022, saw a decrease in "Good" health from 30.7% in 2011 and continued to have lower "Very Good" health percentages compared to Cork County and the State.

Overall, the percentage of the population identifying as being in "Bad" or 'Very Bad' health for the entire study area, the county and the state is extremely low, staying under 2.5%.

Table 5.17 General Health of the study area population based on results of 2022 Census.

General Health	State	Cork County	Aultagh ED	Coolmountain ED	Dunmanway North ED	Manch ED
Very Good	53.2%	55.2%	61.9%	52.2%	48.1%	56%
Good	29.7%	29.5%	25.2%	27.4%	25.2%	26.9%
Fair	8.6%	8.2%	7.1%	7.6%	8.8%	8.2%
Bad	1.4%	1.3%	0.5%	2.3%	1.2%	0.3%
Very Bad	0.3%	0.3%	0.5%	0.5%	0.2%	0.0%
Not stated	6.7%	5.6%	4.7%	10.1%	16.5%	8.5%

Table 5.18 General Health of the study area population based on results of 2016 Census.

General Health	State	Cork County	Aultagh ED	Coolmountain ED	Dunmanway North ED	Manch ED
Very Good	60.3%	63.8%	56.4%	58.0%	56.0%	63.3%
Good	28.0%	26.5%	35.2%	24.2%	29.9%	28.0%
Fair	8.0%	6.8%	5.1%	10.5%	10.2%	7.4%
Bad	1.2%	0.9%	0.9%	3.5%	1.0%	0.3%
Very Bad	0.3%	0.2%	0%	0.7%	0.3%	0.2%
Not stated	2.2%	1.8%	2.4%	3.0%	2.7%	0.8%

Table 5.19 General Health of the study area population based on results of 2011 Census.

General Health	State	Cork County	Aultagh ED	Coolmountain ED	Dunmanway North ED	Manch ED
Very Good	59.4%	61%	63.6%	55.3%	55.2%	62.3%
Good	27.6%	27.5%	24.4%	29.5%	30.7%	27.8%
Fair	8.0%	7.9%	9.0%	8.4%	10.6%	7.0%
Bad	1.3%	1.2%	0.6%	1.9%	1.0%	0.9%
Very Bad	0.3%	0.3%	0%	0.7%	0.5%	0.2%
Not stated	3.3%	2.1%	2.5%	4.2%	2.0%	1.9%

5.2.7 Land Use and Amenity

The Landscape and Visual Impact Assessment (LVIA) completed for this rEIAR (Chapter 11) identifies that the quarry is located in a middle ground landscape, comprising of rolling topography with rugged rock ridges.

This landscape is identified as being of "Medium" value. Based on the Cork Draft Landscape Strategy (2007) the site is located in an area sub-categorised as "Shanlaragh: Middle Valley of Rugged Moorland and Patchwork Moraines". The LVIA notes that shallow river basins; low hills and rocky ridges define this terrain, with the vegetation characterised by irregular, patchy pastureland,

moorland scrub and small clusters of trees.

The study area which contains the development is dominated by large parcels of agricultural land throughout with the exemption of Dunmanway town which is approximately 3km to the South-West of the development. The landscape contains a dispersed settlement pattern throughout with primarily one-off housing developments.

In terms of amenities, the study area is relatively secluded and offers minimal services or community facilities. The closest service is the Bluebell Cottage/Waterfall Guesthouse which is located 1.6km from the subject site. The other two services in the vicinity are Funmanway Adventure Land and Dunmanway Community Hospital which are 4.6km and 2.4km respectively. There are a number of walking and cycling trails[1] located to the west of the Quarry, which are concentrated around Nowen Hill (c. 10km to the west) and Pipe Hill (c. 10km to the north-west).



Figure 5-6 Aerial image displaying the amenities in the vicinity of Ardcahan Quarry. Source: Google maps, accessed January 2022

[1] https://explorewestcork.ie/walking/dunmanway-hill-walking-trails/

5.3 Impact Assessment

The potential impacts of the proposed redevelopment on human beings are assessed under the following headings:

- Economic Activity
- Population and Settlement Patterns
- Land Use and amenity
- Health and Safety

Potential impacts are assessed for Construction and Operation. Activities which took place at the quarry for the relevant period and which can be described as construction related include;

- Excavation and removal of topsoils and vegetation;
- Construction of settlement ponds;
- Construction of berm;

Operational Activities are identified as;

- Blasting and drilling;
- Crushing and Screening;
- Stockpiling of overburden;
- Discharge of water to settlement ponds;
- Transportation of aggregates to and from site.

Consideration is also given to the 'Do Nothing Scenario', i.e. assuming that the development did not proceed and that the pre-1990 situation at Ardcahan Quarry was maintained.

According to the Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003), quarrying has the potential to create significant environmental impacts during operation in terms of traffic, noise, dust, vibration, water pollution, visual intrusion and loss of groundwater supplies. It can also pose a safety hazard to workers, the public and fauna (farm and wild stock). The impact can be permanent, even after closure and decommissioning, unless carefully planned rehabilitation is undertaken. The potential impacts of these factors are assessed by other disciplines within this rEIAR.

5.3.1 Do Nothing Scenario

The 'Do Nothing Scenario' would have resulted in no further quarrying activity at the quarry post 1990, with cessation of aggregate extraction. A significant portion of the site would have remained in active use for Murray Brothers macadam plant, which it is assumed would still have operated. The longevity and feasibility of Murray Bros as a company would have been compromised.

At present Ardcahan Quarry and Murray Brothers macadam plant have a combined work force of 7

employees, and between 1990 and 2014 the maximum number of employees at the site would have reached a maximum of 10.

In terms of a 'Do Nothing Scenario', the impact with regards to aggregate provision is indeterminable without data projections for future aggregate demand and other alternative sources. The potential 'Do Nothing Scenario' would have put pressure on other quarry resources in the vicinity to meet output requirements in the medium to long term as these quarries would need to export to the Ardcahan quarry. Overall, the impacts of this scenario on land use is deemed neutral to indeterminable.

The 'Do Nothing Scenario' could therefore have a medium negative long-term impact on economic activity in the locality.

In terms of health and safety, the quarry would still be marked as a base for activity relating to the macadam plant, therefore any health and safety impacts to the population from the macadam plant would remain.

5.3.2 Economic Activity

5.3.2.1 Construction Phase Impacts

5.3.2.1.1 Effects That Have Occurred

The construction activities are not regarded as having had any impacts on economic activity in the wider area between 1990 and 2014. Construction would have taken place within the boundary of the site. While construction activities at the quarry would have had a negligible effect on the economic profile of the rEIAR study area, they were necessary to support the activities at the quarry and to provide facilities for onsite staff, to ensure that the quarry and the macadam plant could operate efficiently. Indirectly construction activities would therefore have had a positive effect on the economic viability of the quarry.

5.3.2.1.2 Effects That Are Occurring

No economic impacts have been identified that are resulting in ongoing economic effects, either positive or negative, as a result of construction related activities. In terms of potential future/residual effects, the infrastructure remains in place.

5.3.2.1.3 Effects That Can Reasonably Be Expected to Occur

The existing infrastructure enables Murray Brothers to seek substitute consent to resume and potentially expand quarry operations under the Section 37L application. If approved, this could facilitate future economic activity by leveraging the established facilities, with no anticipated negative impacts from past construction activities.

5.3.2.2 Operational Phase Impacts

5.3.2.2.1 Effects That Have Occurred

The development resulted in the continued extraction of aggregates between 1990 and 2014. This enabled Murray Brothers to secure and sustain the aggregates company and increase the feasibility of the macadam plant, which was permitted in 1998 (Cork County Council Ref 98294). The macadam

plant was deemed suitable at the location as it was an active quarry.

The development also provided employment security of between 7 and 10 total employees within the company and contributed to security of indirect employment.

Additionally, a varying degree of economic activities in the vicinity of the study area have been identified as livestock farms an outdoor adventure centre and tourism accommodation (Bluebell Cottage/Waterfall Guesthouse). Ardcahan Quarry has been in operation as far back as 1960 and by 1990 would form part of the wider economic landscape, co-existing with other economic activities.

The quarry continued to operate until 2014. Any continued economic benefits are therefore related to the operation of the permitted macadam plant, which is not subject to this application for substitute consent. However, material continues to be imported to the macadam plant, to be used in the macadam production process.

Overall, the significance of these construction activities is deemed **negligible** due to their **temporary nature** and **strictly localised impact**.

5.3.2.2.2 Effects That Are Occurring

The macadam plant remains operational, sustaining limited economic activity through direct and indirect employment and material processing. No ongoing negative economic impacts from past quarrying activities are identified. The quarry's current inactivity does not disrupt local economic activities, which continue to coexist with the site's present state, as confirmed by site visits and environmental surveys.

5.3.2.2.3 Effects That Can Reasonably Be Expected to Occur

The proposed development under the Section 37L application aims to resume quarry operations, enhancing the medium- to long-term sustainability of Murray Brothers' business. This is expected to secure approximately 12 direct jobs and support indirect employment, positively impacting local economic activity. The continued operation of the macadam plant, alongside resumed quarrying, is anticipated to have no negative cumulative impacts on nearby economic activities, maintaining compatibility with the existing economic landscape.

5.3.2.2.4 Impact that may occur/Continue to occur

The potential operational impacts on economic activity are directly associated with the medium to long term sustainability of the existing business, continuation of direct and indirect employment and impacts on other economic activities in the vicinity of the development.

Overall, the development at Ardcahan Quarry had and will continue to have positive medium-term impact on economic activity both on site and in the vicinity of the development. The ongoing operation of the quarry will increase the sustainability of the business and will guarantee the prolongation of direct and indirect employment in the local economy.

5.3.2.3 Proposed Remediation

There is no requirement for remediation measures for the development as no negative impacts on economic activity have been established. No monitoring is proposed.

5.3.2.4 Residual Impacts

There is no requirement for mitigation measures for the development as no negative impacts on economic activity have been established.

5.3.3 Population and Settlement Patterns

The demographic changes between 1990 and 2022 that occurred within the study area are presented in Section 4.2 of this report. It is noted that 2008 saw the start of a significant economic decline throughout the Country, and a significant period of outward migration for the West Cork region as a whole. The quarry commenced operation in the 1960's, establishing the landuse at that site, and it is unlikely that the continuation of activity at the quarry had a significant negative effect on population and settlement patterns in the area, given the extent of the overall landholding and the low population density in the surrounding area.

5.3.3.1 Construction Phase Impacts

The assessment completed for Chapter 6 Land and Soils (Geology) of this EIAR identifies that the primary land use in the total land holding was woodland and scrub in the southern area, and scrub-heathland in the northern area. Construction activities would have resulted in the removal of soils, and construction of internal roads, establishment of settlement ponds and construction of the berm.

The construction activities are not regarded as having had any impacts on population and settlement patterns for the rEIAR study area between 1990 and 2014. All of the activities would have taken place within the boundary of the site.

The features such as the berm, settlement ponds, etc. remain in situ and given the size of the overall landholding the loss of lands to quarrying is not likely to have had an effect on the wider area in terms of availability of lands for housing, community uses, etc.

5.3.3.2 Operational Phase Impacts

It is not likely that the operation of the quarry had any effect on population and settlement patterns in proximity to the quarry or the wider area. As discussed in Section 4.2.1 of this chapter, rural housing development in the area has been subject to a number of restrictive policies. Housing development in the area would most likely have been driven by need to remain near or within an agricultural land holding, and/or development to support existing families. This would have been in line with trends in other rural areas within West Cork and is not likely to have been influenced by the operation of the quarry.

In addition, the quarry has been operating in its present location since the 1960's, and any residential development in proximity between 1991 and 2014 would have occurred in full knowledge of the ongoing operation of the quarry.

5.3.3.3 Impact that may occur/Continue to occur

No ongoing impacts to population and settlement patterns as a result of the construction and operation of the quarry have been identified.

5.3.3.4 Proposed Remediation and/or Mitigation

There is no requirement for remediation measures for the development as no negative impacts on population and settlement patterns have been established.

5.3.3.5 Residual Impacts

No residual impacts have been identified.

5.3.4 Land Use and Amenity

The assessment of potential impacts on land use and amenity needs to consider the extent of changes in the character to the landscape, and the potential loss of amenities. The lands have been used for quarrying since before 1960, therefore the type of landuse at the site was well established prior to 1990. The lands were therefore not likely to be in use for any kind of amenity activity for local communities or the surrounding area. Construction activities and operation of the quarry have not resulted in any severances or interferences with existing rights of way or wayleaves.

5.3.4.1 Construction Phase Impacts

The LVIA noted that activities associated with construction have not resulted in significant landscape or visual impacts. While the landscape would have changed as vegetation and topsoil was removed the retention of existing screening vegetation and the form of the landscape where views are restricted owing to the undulating landscape character has provided natural mitigation.

Potential impacts as a result of emissions to air were assessed in Chapter 8 Air Quality and Chapter 9 Climate. The assessment found that dust emissions were likely to occur during initial topsoil removal and stripping. However, as there are no sensitive receptors in close proximity to the site it is likely there were no significant dust impacts as a result of initial construction works and therefore mitigation measures were not necessary.

The assessment of potential impacts of noise and vibration (Chapter 10) identified that construction activity would have had the potential for slight to significant noise impacts, of momentary to temporary duration, depending on the location of the works, the proximity to and acoustic screening to the nearest noise sensitive location. However, it is also recognized that there is a level of inherent uncertainty in making the assessment, given the extended period of assessment (24 years) and the large footprint of the assessment site.

No ongoing impacts on land use and amenity have been identified associated with the construction phase.

5.3.4.2 Operational Phase Impacts

Most of the recreational activities identified in the vicinity of the development have co-existed with the quarry since it became operational in 1960. The area subject to the substitute consent application contained within the current landholding of Murray Brothers and has not directly impact local

amenities such as walking trails. The spatial extent and nature of the activities that took place between 1990 and 2014 suggests that leisure pursuits such as kayaking activities on the Bandon River are unaffected.

Other recreational activities such as fishing in the Bandon and Caha Rivers is reliant on water quality in the rivers and therefore any additional untreated run-off from the development could have had negative impacts on the availability of fish stocks. Any potential impacts from the development on the watercourses i.e., ecological status and water quality of these rivers is assessed in Chapter 7 Water (Hydrology and Hydrogeology) and Chapter 14 Biodiversity.

An assessment of the potential effects of traffic was carried out as part of Chapter 12 Traffic and Transportation. The assessment identified that the most likely route for HGV's to (and from) the development site would be from the Dunmanway direction along the R587, followed by a right turn at the priority junction with L4621. The traffic assessment examined the import and export of material at the site as well as potential cumulative impacts when considered with the operation of the macadam plant. The results indicate that any negative effects (between 1990 and 2014) of the generated traffic movements on the surrounding road network would have been slight. The junction of the R587 and L4621 operated well within capacity with negligible queuing for both morning and evening peak hour analyses.

The slight negative impact on the surrounding road network would continue if the quarry continues to operate, should a further permission be granted.

Potential impacts on air and climate as a result of the operation of the quarry are assessed in Chapter 8 Air Quality and Chapter 9 Climate. The assessment identified that there were a number of operational measures in place on site to prevent significant dust emissions from on-site activities. These measures include:

- Dampening of site roads during drier summer months
- Speed restriction on internal site roads enforced via ramps
- Aggregates are stored in an enclosed shed once processed

These measures were incorporated into the modelling assessment completed as part of the assessment of impacts on air and climate to determine the impact of the site on levels of dust deposition and ambient levels of particulate matter (PM10 / PM2.5). The modelling assessment found that there was an imperceptible impact on the ambient air quality environment as a result of the development.

There are no recorded archaeological sites within the quarry at Ardcahan, and the assessment of potential impacts on Cultural heritage and Archaeology concluded that the main impacts of the construction phase would have been the loss of part of the Clashnagallagh Wood removed between 1990 and 2014 (see also Chapter 14 Biodiversity). This would have had a negative, significant, and long term effect on the cultural landscape of the substitute consent application area, and surrounding area within the overall landholding. The operation of the quarry would not have had any direct or indirect significant effects on the archaeological, architectural or cultural heritage environment.

The assessment found that no direct or indirect significant effects are occurring, or are reasonably

expected to occur on the archaeological, architectural or cultural heritage environment as a result of operational works between 1990 and 2014.

Historical noise monitoring data (Chapter 10 Noise and Vibration) was analysed to determine potential impacts that may have occurred as a result of blasting and on-site activity, and effects on local residents. Historical data is available for the period 2009 to 2014. The assessment identified that activity relating to the preparation of quarry area for extraction, the processing and handling of quarried materials during operations would have had the potential for slight to significant noise impacts, of momentary to temporary duration, depending on the location of the works, the proximity to and acoustic screening to the nearest noise sensitive location. The impact of quarry related activities on the local road network would have given rise to negligible to slight negative impacts, of long term duration over the assessment period.

Blasting vibration would have given rise to slight to moderate negative impacts of momentary duration over the assessment period.

The assessment concluded that, while there is a high degree of uncertainty in determining noise and vibration related impacts that occurred during the time period, the mitigation measures that were applied during this time are considered to have successfully mitigated against any significant impacts.

5.3.4.3 Effects that will occur/continue to occur

The subject areas are contained within the Murray Brothers landholding and are adjoining the previous extraction zones. In the vicinity of the development there is no evidence that amenities or rights of way are being negatively impacted or will experience negative impacts as a result of quarrying activities that took place between 1990 and 2014. No ongoing impacts or potential impacts as a result of noise and vibration have been identified. The assessment on air quality and climate identifies that any impacts are imperceptible, however mitigation measures such as dampening of roads in drier months, and storage of aggregates in closed sheds should continue to be enforced to prevent significant dust emissions from the site.

5.3.4.4 Proposed Remediation and/or Mitigation

A remediation plan has been prepared (refer to Chapter 11 Landscape and Visual Impact Assessment, and Appendix X). The plan aims to retain existing quarry faces and permit natural regeneration of habitat as much as possible, with some additional planting proposed. These remediation measures will be carried out on a phased basis, as re-use of on-site materials is a key component of the works.

While the development does not impact Scenic Routes, Protected Structures, areas of special designation or historical areas and has only a minor impact on culturally relevant areas, the remediation of the quarry, the regeneration of the habitats and the additional planting would have an overall positive effect on visual amenity for local residents. It is recommended that dust deposition monitoring is carried out on the site boundary to ensure that mitigation measures are working satisfactorily and that no significant dust nuisance is occurring.

5.3.4.5 Residual Impacts

No residual impacts on population and human health have been identified.

5.3.5 Health & Safety

The Health and Safety issues of the development were governed by the Safety, Health & Welfare at Work (Quarries) Regulations 2008 ("the Quarry Regulations"). In addition to this, other relevant regulations are of considerable importance with regards to the development, such as the General applications Regulations 2007, Construction Regulations and Chemicals Regulations. The Quarry Regulations are specific to quarry operations and require the management and control of operations at the quarry including management of the extraction faces, tips, stockpiles and lagoons, blasting activities, traffic management and health hazards.

Quarry operators must register with the Health and Safety Authority (HSA) and they must notify the authority of any commencement or abandonment of quarrying, or any change in operation.

5.3.5.1 Construction Phase Impacts

Potential impacts as a result of emissions of dust and reduction in air quality are discussed in Chapter 8 Air Quality and Chapter 9 Climate. The assessment found that it is likely there were some dust emissions during initial topsoil removal and stripping. However, as there are no sensitive receptors in close proximity to the site it is likely there were no significant dust impacts as a result of initial construction works and therefore mitigation measures were not necessary. No significant impacts to amenity are considered likely as a result of noise or traffic movements.

No ongoing or potential impacts to health and safety are considered likely as a result of construction that occurred at the site between 1990 and 2014.

5.3.5.2 Operational Impacts

The assessment on air quality and climate identified that emissions to air would have been associated with plant and machinery undertaking day to day activities such as extraction, onsite processing and transportation of material and dust blow generated during dry windy conditions. Air dispersion modelling of operational activities at the site was undertaken to assess the impact of the development with reference to EU ambient air quality standards which are based on the protection of human health. The modelling results showed that emissions of PM10 and PM2.5 as a result of the development are compliant with all National and EU ambient air quality limit values and, therefore, would not have resulted in a significant impact on human health.

The Health and Safety impacts of the operational phase of the development have been identified as relating to access and egress from office buildings and around the site; fire related to the macadam plant or machinery; electrical or chemical accidents; noise or accidents from blasting and quarrying activities; and manual handling of materials.

Blasting activities would be undertaken under contract, approximately twice a year and would be strictly controlled in compliance with the Quarry Regulations 2008.

5.3.5.3 Effects that will occur/continue to occur

A Health and Safety statement for macadam plant is already in place, as required under the Safety Health and Welfare at Work Act 1989 and would apply to the operational phase of the development. The health and safety statement identifies that the Works Manager has overall responsibility for ensuring that all arrangements outlined in the policy are adhered to and updated as necessary.

The assessment of potential impacts on Land and Soils (Chapter 6) identified that there is the potential occurrence of unstable rock slopes following blasting and/or rock removal from the exposed rock faces which could create a health risk to site users. This would have a temporary negative but long-term neutral impact to the site. Proper quarry face management would negate this rock fall and slope stability risk.

Based on predictive models presented in Chapter 8 Air Quality and Chapter 9 Climate, the nearest potential receptor would be exposed to 12 % of the maximum TA Luft Limit Value in a worse-case scenario, therefore there would be no likely significant impacts to human health.

5.3.5.4 Proposed Mitigation/Remediation

There is no requirement for mitigation or remediation measures for the development as no negative impacts on health and safety have been established.

5.3.5.5 Health & Safety – Residual Impacts

Land and Soils (Chapter 6) identified that there is the potential occurrence of unstable rock slopes following blasting and/or rock removal from the exposed rock faces which could create a health risk to site users. Good practice on-site and quarry face management will be on-going at the site to manage any risk to health and safety.

5.3.6 Cumulative

A review of the planning application history in the vicinity of the development was undertaken to establish any planning applications that were recently approved, pending a decision or awaiting development. This was assessed to determine the likely cumulative impacts on human beings within the wider study area. In the last 7 years there have been 9 valid planning applications attributed to different sites outside of the development, and these are all within a 2km radius. Of these 9 applications, 5 applications were associated with single one-off housing or proposed extensions to existing dwellings.

Potential cumulative impacts associated with the operation of the Macadam Plant has been assessed by each discipline. The plant commenced operation in 1998, as the quarry entered its busiest period and would have operated simultaneously with the quarry. The Macadam Plant continues to operate. It is considered that the potential cumulative air, noise and water effects on human health surrounding the Site are not significant.

No major infrastructure plans or projects were in proximity to Ardcahan Quarry during the assessment period, which would have resulted in significant impacts to human health when considered in combination with the quarry's construction and operation.

No significant cumulative impacts have been identified.

5.4 Risk of Major Accidents and Disasters

The risk of major accidents and disasters is considered for each discipline within the respective rEIAR chapters and summarized in Chapter 1. No risk of major accidents or disasters as a result of development or quarrying activities that took place between 1990 and 2014 has been identified.

Monitoring

No monitoring is proposed.

5.5 Statement of the Significant Effects

No significant effects on population and human health have occurred or continue to occur on the due to the quarrying activities completed at the Ardcahan Quarry in the 1990 to 2014 period.

5.6 References

- Central Statistics Office www.cso.ie Statbank, and Population and Labour Force Projections
- Environmental Protection Agency: www.epa.ie
- Health and Safety Authority: www.hsa.ie
- Pobal Deprivation Indices: https://maps.pobal.ie/

Murray Brothers Tarmacadam Ltd

CHAPTER 6

LAND, SOILS & GEOLOGY

VOLUME II

MAIN STATEMENT

FEBRUARY 2026

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6 Land Use, Soils (Geology)

6.1 Introduction

Viridus Consulting Ltd., (VCL) were appointed by Murray Brothers Tarmacadam Ltd., to complete the Land Use, Soils, (Geology), Chapter of the Ardcahan Quarry, remedial Environmental Impact Assessment Report (rEIAR), as part of the application for Substitute Consent for development and quarrying related works, that took place at the Ardcahan Quarry site, located near Dunmanway Co. Cork, between 1990 and 2014.

The work was completed by Mr. Darragh Musgrave, an experienced, Senor Geo-Environmental Scientist with Viridus Consulting Ltd., (VCL).

It should be read in conjunction with Chapter 1 (Introduction), Chapter 3 (Site and Project Description), Chapter 7 (Water), Chapter 15 (Biodiversity), and Chapter 16 (Interactions Summary) of the EIAR.

6.1.1 Author Information and Competency

This chapter of the rEIAR has been prepared by Mr. Darragh Musgrave, a senior Geo-Environmental Consultant with VCL. Darragh has an honours degree in Geology (Earth Science) from the National University of Ireland Galway, (NUIG 1992) and a Higher Diploma in Environmental Protection from the Institute of Technology Sligo (ITS 2006).

He has over 30 years of experience working in the environmental, geological, geotechnical, hydrogeological and hydrological sector and has completed numerous environmental assessment and associated Environmental Impact Assessment Reports (EIARs) for many quarry, infrastructure, commercial and residential developments over the years, including more recently,

- DUCON Sand/Gravel Quarry, Dripsey, Cork, EIAR for Quarry Consulting Ltd., (2025),
- Rooskagh Sand/Gravel Quarry, Athlone, EIAR for Mr. E. Harney (2021/2023),
- O'Regan's Quarry, Co. Cork & Harringtons Quarries, Co. Mayo, Env Assessments,
- Ballinglanna, Lake View, Dunkettle & Maglin Residential LSD EIARs – O'Flynn Group,
- Maryborough Ridge, Cork, The Paddocks, Waterford, Residential EIARs – Glenveagh,

Darragh has been appointed to assess, as per Annex IV of Directive 2014/52/EU, the Land/Soils (Geology) elements of the rEIAR for the completed development works undertaken at the Ardcahan Quarry between 1990, when the EIA Directive came into force and 2014, when quarrying ceased.

VCL completed the Land/Soil (Geology) and Water Chapters as part of an Environmental Impact Assessment (EIA) Report for a former planning application at the same study site in 2014, (by McCutcheon Halley Walsh 2014 under CCC reference 14/00616 and ABP reference PL 88.245174).

6.1.2 Guidelines & Legislation Relevant to Discipline

The Land/Soil (Geology) Chapter for the rEIAR follows the guidelines outlined by the EPA guidance document, "*Guidelines on the information to be contained within an EIAR from May 2022"*, in Directive 2014/52/EU and Annex IV amendments, as well as European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, (S.I No. 296/2018).

The work also is cognisant of the previous EPA EIAR Guidelines (2022) and the Environmental Impact Statement (EIS), EPA Draft guidelines, from September 2015, which outline the process of preparation and the content required for an EIS.

The assessment work also follows the Institute of Geologists of Ireland (IGI) Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of EISs, (IGI April 2013), and National Roads Authority (NRA) Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology & Hydrogeology for National Road Schemes, (NRA 2009).

As per Section 177(f) of the Planning and Development Act 2000 (as amended) the remedial EIAR will include the completion of a 'Statement of the significant effects on the environment,' with details of any remedial measures, as necessary. (Refer to Section 6.5 and Table 6.6.)

Other related guidelines such as 'Environmental Management in the Extractive Industry' (EPA 2006) and the Irish Concrete Federation (ICF) 'Environmental Code' 2nd Edition, (2005), were also reviewed.

6.1.3 Methodology

The methodology and scope of the assessment involved the completion of a Desk Study and Site Walkovers which included the collation and review of all available information pertaining to the site including any hydrological studies or databases relevant to the development site area, such as the previous 2014 EIA, Geological Survey of Ireland (GSI) and Environmental Protection Agency (EPA) on-line data.

The Site Walkover recognisance, completed by VCL during a number of site visits in 2014, 2015, 2020, 2023, 2024 and 2025 enabled the physical examination of the geological, geomorphological, soil and land use characteristics of the site and its setting in the locality.

The development relates to the removal of thin soils/subsoils and quarrying of quartz rich sandstone and siltstone bedrock primarily in the western, southwestern and eastern areas of the quarry site and stockpiling of the subsoil and creation of settlement ponds in the northern area of the site.

The overall landholding is 25.2 hectares (ha) while the footprint of the Subsequent Consent area is about 15.2 ha with a 1990 quarry area of 4.72 ha and a total extraction area between 1990-2014 of 5.94 ha. Refer to the Subsequent Consent rEIAR Site Area outlined in Chapter 1 and maps included in Appendix 1.1.

In this chapter the historic baseline conditions and character of the Land/Soil (Geology) characteristics of the site are presented and the potential impacts anticipated from the expansion of the quarry from 1990 to 2014 are identified and discussed. Mitigation measures are considered, and potential residual impacts are assessed. This chapter should also be read in conjunction with Chapter 11 (Landscape & Visual Impact and Restoration), Chapter 7 (Water), Chapter 14 (Biodiversity) and Chapter 16 (Interactions).

Consultation was carried out with the relevant bodies by the project planning co-ordinator, including An Bord Pleanála (ABP), the GSI, Cork Co. Co., and EPA. A summary of the third-party responses received are listed in Chapter 1 of the EIAR and presented in Appendix 1.2.

6.1.4 Difficulties Encountered in Compiling Information

The difficulty encountered in the compilation of the information required for this chapter involved a lack of records, such as volumes of product, site specific maps and site photographs of the quarry

development, especially for the period 1990 to 1997, when the ownership of the quarry was not with Murray Brothers.

6.2 Description of Existing Environment

The detailed description of the development and completed quarrying activities are provided in Chapter 1 (Introduction) and Chapter 3, (Project Description). A record of aerial photos showing of the evolution of the quarry area from 1990 to 2014 is included in Chapter 3.

The history of the site is one of rural woodland with little agricultural use, as can be seen on the old OSI 1840's 6" and early 1900's 25" Map Surveys for the locality. These maps field shapes and forestry clearance suggests that possibly a small amount of quarrying was occurring on the site from that time. Refer to the old OSI mapping presented in Appendix 6.1.

Information on the Land Use, Soils, and Geological conditions pertaining to the development site and locality was acquired from existing literature and previous reports including;

- Geology of West Cork, (Map Sheet 24 & Booklet, GSI, 2002).
- General Soil Map of Ireland (An Foras Talúntais, 2nd Edition,1980)
- GSI & EPA On-line Databases for Soil, Geology & Hydrogeology/Aquifer Information,
- Planning Application & Env Report for Ardcahan Quarry by ATServices, May 2011.
- Previous 2014 and 2015 EIA Reporting and Planning Submissions for the site.

The baseline information available from these sources is relevant for the site prior to 1990 and for the quarrying period before quarrying stopped in 2014.

In addition to the available desk study information a number of walkovers of the quarry area were undertaken by VCL in July 2014, February 2015, May 2020, July 2023, October 2024, January May and August 2025.

6.2.1 Site Location and Setting

The Ardcahan Quarry is located in a rural setting in an area of undulating hilly topography previously known as Clashnagallagh Woods, located approximately three kilometres (km) northeast of the town of Dunmanway in West Cork. The site is accessed from the public road (R587) via a third-class road from the Inchicahan Crossroads and has its entrance in the south-western corner of the site. Refer to the Site Location Map presented in Appendix 1.1 and the aerial photograph presented in Figure 6.1.

It is a sloped site with lower ground levels (~72 to 75 MOD) in the southwestern area which rises to the north and east. The northern area of the site forms a broad ridge with higher ground levels (110 to 118MOD) which is on the western side of an area of higher undulating topography and hills which form the eastern part of the Caha River catchment.

The site office, administration buildings and toilet facilities, including percolation area, are sited in the old (pre-1990) quarry, located in the south-central area on the southern side of the site.

Figure 6.1 Aerial Photo of Site Locality with approximate Pre-1990 and site boundaries shown.



The main (post 1990) quarry area was established in the southwestern portion of the site, which was also used as the main rock crushing and product stockpile area.

The quarry had a permanent settlement pond system situated in the SW corner downgradient of this area. The northern part of the site has not been quarried but portions of it were used for stockpiling subsoils and crushed rock, for settling ponds and for backfilling areas with surplus soil and sludge material.

A small un-named stream flows along the eastern and southern site boundaries and this watercourse joins the Main Bandon River about 400m to the southwest of the site.

The macadam production plant, that received planning and commenced operation in 1998, is located in a previously quarried area (pre 1990) in the south-eastern part of the site. The bitumen batching and preparation area is located around the admin buildings in the old quarry area in the southern and central part of the site.

6.2.2 Land Use

The primary land use in the total land holding area, which was 25.2 hectare (ha), was native woodland and scrub in the southwestern area of the site, and natural scrub-heath land in the northern and north-eastern portion of the site. There is evidence on the old maps of a small agricultural holding in the low-lying area in the southwestern corner part of the site. See the old OSI maps in Appendix 7.1.

The historic quarry area, recorded on the site before 1964, was along the exposed rock face on the eastern side of the small field situated in the southwestern corner of the site. The quarry area was extended further into the southwestern and central areas of the site after 1990.

6.2.3 Soils and Subsoils

Topsoils and Subsoils (Quaternary sediments) were deposited during or after the last ice age, (the Midlandian), which was at its maximum extent about 22,000 years ago, and essentially comprise the unconsolidated materials overlying the solid bedrock. Subsoils in Ireland are dominated by poorly sorted materials in glacial tills or boulder clays and outwash deposits of sands and gravels with deposits of peat, river alluvial and coastal sediments occurring in particular environmental settings.

The An Foras Talúntais soils mapping for the Soil Map of Ireland, (1980), indicates that this part of West Cork is defined by Rolling Lowland Physiography. The Ardcahan site area is identified to be underlain by Brown Podzolics of Acid Brown Earths with sandstone and shale parent material in the western and southern area and by areas of rock outcrop and peat to the eastern and northern areas.

The Geological Survey of Ireland (GSI) soil mapping data, available from the GSI On-line Database, indicates that the site comprises of non-calcareous Rock Outcrop (RckNCa) at or near surface with any soils comprising of shallow rocky, peaty and non-peaty mineral complexes (Mainly Acidic) (AdminSRPT) derived chiefly from non-calcareous rock. Refer to the GSI Database Topsoil Map and the Subsoil Map presented in Appendix 6.2.

Similarly soil mapping presented in the online EPA/Teagasc/Cranfield On-Line Database identify that the site is primarily occupied by Rock and Peat material. There is soil shown in most south westerly corner of the site which is identified as the Ross Carbery (0900RO) Soil Association. This is described as “coarse loamy compact drift with siliceous stones”. These soils reportedly occupy the agricultural land to the south and east of the site and, like the Rock and Peat material, is very widespread in the West Cork area. The Teagasc Soil Mapping for the locality is presented in Appendix 6.2.

Observations made during the site walkovers confirmed the findings of the desk study as only thin (<0.5m) poorly sorted, very gravelly and occasionally peaty topsoil and subsoil cover was identified over the bedrock in areas where it was exposed. Discussions with quarry staff indicated that rock is more or less at the surface around the quarry site with excavations encountering either weathered or hard bedrock material either at the surface or within about 1m of the ground surface.

6.2.4 Made Ground

A review of the old maps and earliest aerial photographs of the locality from 1995 shows the quarry area in the southwestern and south-central part of the Ardcahan Quarry site. The footprint of the quarry works is limited to the work area and there is no evidence of the movement of subsoils, waste rock or the creation of made ground in other parts of the site.

As the quarry work progressed removed soils and waste rock was used in earth berms placed around the boundary of the site and forming the berms around the surface water ponds in the northern area of the site. This fill was sourced from quarry activity and there is no evidence of the importation of foreign material from off-site sources.

Following the commencement of the macadam production plant in 1998 fine sludge material from that process has been deposited in an area in the southeastern part of the site. This material has solidified over time and forms an area of backfill and made ground in this part of the site.

6.2.5 Bedrock Geology

The area of the quarry extraction is identified by the regional 1:100,000 scale GSI Bedrock Geology Map Sheet 24 and GSI on-line bedrock mapping to be underlain by the Upper Devonian Caha Mountain Formation (CH). This geological bedrock unit consists of Devonian age quartizic ‘purple siltstones and fine-grained parallel and cross laminated sandstones’. This geological unit extends under all of the quarry area as well as for a number of kilometres to the North, West and Northeast of the site. It is a very common bedrock unit in the Munster Basin and occurs extensively in Cork and Kerry.

The southern boundary area of the site is identified by the GSI as being underlain by the Gun Point Formation (GP) which is described as ‘green-grey to purple medium to course grained sandstones,

inter-bedded with thick sequences of purple siltstones and fine grained purple, parallel and cross laminated red sandstones'. The two formations are separated by an east-west orientated geological fault which is roughly orientated along the line of the quarries main access road and small stream located along the southern boundary of the site. This bedrock unit is not quarried at the site.

A second northwest-southeast orientated geological fault is identified between these units to the south west of the site. Refer to the GSI On-Line Bedrock Map included in Appendix 6.3.

As the site was an established quarry (pre-1990) there would have been a lot of bedrock outcrop exposed along the face of excavated rock in the southwestern part of the site and also a lot of natural rock exposures occurring in the higher ground in the northern part of the site.

Bedrock outcrop of northward dipping, inter-bedded purple grey sandstone and siltstone sequences are exposed around the site. Occasional thicker sandstone units are very distinctive in the generally thinly inter-bedded sediments. Some variation in the bedrock bedding and its orientation is evident in the high wall of the exposed quarry and in the outcrops on the site indicating the potential for some local faulting and/or folding structures within the bedrock underlying the site area.

The large exposure of rock in the quarry face from the old quarry floor at the western end of the site shows that the bedding dips steeply to the north indicating that its part of the southern limb of a large synclinal fold feature. Such folding and fracturing would be expected to occur in the local bedrock as it does throughout the sedimentary geology of the whole Munster area.

As well as bedrock outcrop throughout the site, notes on eight open boreholes drilled in two parallel rows to test for rock quality in 2006 in the northern site of the site were also available. While no detailed geological logs were recorded the driller notes identified the time it took to drill 20m and the quality of the returns. These notes show variable rock quality in the northern area of the site with generally poorer, (less hard 'gritty' sandstone chip returns), to the west and good, (more 'gritty' sandstone chip returns), to the east. A rough location map was drawn of the borehole drilling locations and this is presented in Appendix 6.3.

6.2.5.1 Bedrock Extraction 1990 to 2014

The old Ardcahan quarry area was reportedly owned and operated by Cork Co. Co., before being bought by McSweeneys Bros who operated it until the change of ownership to Murray Bros in 1997.

In 1990 the main quarry area was in the southern and central part of the site and extended over an area of 4.72 hectares. Refer to the aerial image and quarry extent maps presented in Chapter 3.

While the extracted tonnage records and aerial photographs are very limited for the pre 1990 and 1990 to 1995 period the quarry reportedly progressed at the existing ground levels from the quarry face in the south-eastern corner of the site and into the higher quarry face and higher ground in the northeast corner of the existing quarry. Based on the aerial photographs the extraction area is estimated to have expanded by about 1.12 hectares from 1990 to 1995.

Based on available quarry records from 1990 to 1995 McSweeney Bros extracted approximately ten acres with a 10 to 15m quarry face, which would have yielded an estimated one million tonnes of rock material. The 1995 black and white aerial photograph of the site shows the extent of the quarry at that time. Refer to the old aerial photos for the site presented in Chapter 3.

There was very little extraction reported from 1995 to 1997 in the couple of years before the Cork County Council sold the quarry, but production increased from 1998 with the majority of the aggregate used by the new macadam production Plant which was built in that year.

Based on the aerial photographs the extraction area is estimated to have expanded by about 1.84 hectares in the 1995 to 2000 period and this increased by 1.74 hectares in the 2000 to 2005 period and subsequently by 0.78 hectares from 2005 to 2014. Annual rock extraction data is available from 2002 to 2014 with a total of 1,234,547 tonnes quarried during that period. Refer to Table 6.1.

Table 6.1 Murray Brothers Extraction Records

YEAR	TONNES QUARRIED
2002	77,785
2003	70,413
2004	89,657
2005	142,720
2006	178,295
2007	202,222
2008	163,386
2009	143,904
2010	NIL
2011	44,998
2012	43,600
2013	32,360
2014	45,207
TOTAL	**1,234,547**

The total rock excavated from 1990 to 2014 equates to 2,234,000 with an average of 93,083 tonnes per annum over the 24-year period. The rock was extracted variously by boring and blasting which occurred bi-annually, depending on the stocks and commercial environment at the time. The total extraction area between 1990-2014 was 5.2 ha.

6.2.6 Soft or Unstable Ground and Geohazards

It is generally accepted that peat, lacustrine and alluvial deposits do not make for stable ground conditions of which there are no significant quantities present on the proposed development site.

The GSI have completed Landslide Susceptibility Mapping for the country which is based on the local topography. For the Ardcahan area Low to Moderate Landslide Risk is identified with the higher risk associated with the naturally occurring steeper slopes. The site-specific quarrying activity is not considered by this regional assessment. The GSI has also developed a database of historical landslides in Ireland and none of the recorded events lie within the study area. The landslide susceptibility mapping for the area is presented in Appendix 6.3.

Naturally an active quarry has steep rock faces which if not properly managed could pose a rock slope stability risk, especially after fresh blasting and/or during active rock removal from the exposed quarry face. The Ardcahan Quarry has a number of steep quarry rock faces around the site but given the time that they have been open since quarrying work ceased is >10 years they are not considered to pose an ongoing slope stability risk. The orientation of the bedding dip to the north means that the upper rock is supported by the underlying rock mass and the risk of rock slides due to unsupported bedding plains opening (windowing) out to the unsupported quarry face is much reduced.

6.2.7 Landfills and Contaminated Sites

In 1996 the Environmental Protection Agency (EPA) began licensing certain activities in the waste sector. These include landfills, transfer stations, hazardous waste disposal and other significant waste

disposal and recovery activities. It has been determined from the EPA website that there are no waste licensed facilities within the study area or within the general locality around the site.

Information from Cork County Council indicates that there are no 'Legacy Landfills' or contaminated sites situated within the study area or in the general locality of the site.

There are no reports of foreign soil material being imported to the site and there is no record of backfilling or waste being brought to the site during any period of its operation. No foreign or waste material was observed on the site during the walkover assessments.

6.2.8 Integrated Pollution Prevention Control (IPPC) Licensed Facilities

The EPA has been licensing certain large-scale industrial and agriculture activities since 1994 and since 2003 this had been done under the Integrated Pollution Prevention Control (IPPC) Directive and the control of Industrial Emissions Licencing (IEL). A review of the EPA On-line mapping resource shows that there are no IEL facilities in the locality or within the study area. The nearest industrial site identified was the Carbury Food Ingredients facility (IEL PO390) at Ballineen, which is about 7.5km to the south the quarry.

6.2.9 Economic Geology and Geological Heritage Sites

A review of the on-line GSI and EPA web mapping indicates that apart from the Ardcahan Quarry there are no other active or historical quarries or mines in the locality (within 5km) and there are no Geological Heritage Sites identified in this part of Co. Cork, (within 20km, from GSI Web Mapping).

The Ardcahan Quarry has been in operation since the 1960's and was an important source of aggregate stone in this area of West Cork. The high Polished Stone Value (PSV) of the crushed bedrock makes it an ideal macadam and road stone and product from the quarry was used throughout County Cork and Kerry by the local councils and their contractors in the maintenance and upgrade of the region's roads. Some of the sites PSV laboratory Results are presented in Appendix 6.3. The Ardcahan Quarry site would be considered to be an important economic resource for producing high quality aggregate.

6.2.10 Areas of Scientific Interest

A review of the EPA and National Park & Wildlife Service (NPWS) on-line databases has shown that the Bandon River, which is located about 400m to the south west of the site, is designated as a Special Areas of Conservation (SAC - Ref No. 002721). The local watercourse forms part of the SAC from the bridge on the public road where the turn for the quarry access road is, about 40m SW of the site.

The Dunmanway Bandon River Valley southeast of Dunmanway Town is a designated proposed National Heritage Area (NHA) and is located approximately 3km south of the site. The ecological aspects of the site are discussed in more detail in Chapter 14 – Biodiversity.

6.2.11 Groundwater

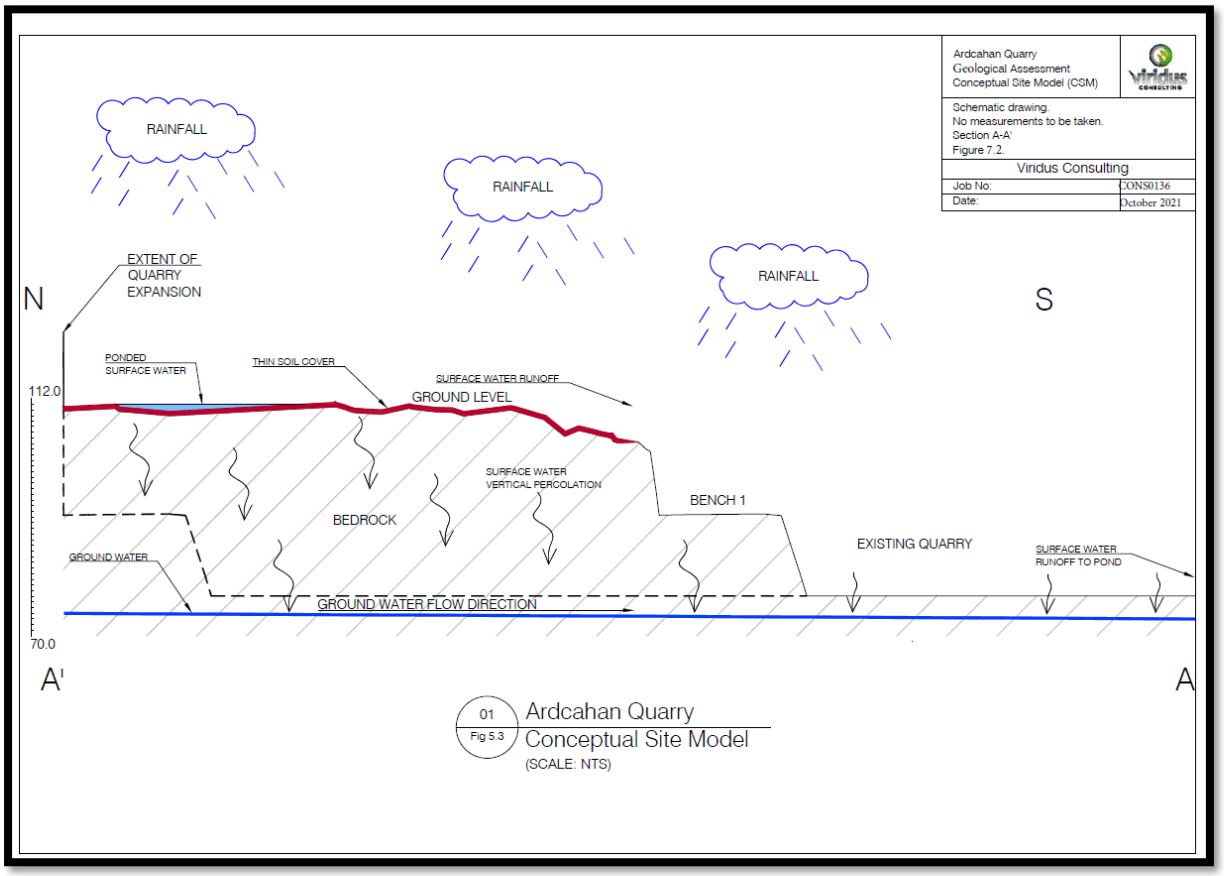
All the bedrock extraction was done above the permanent water table and the site was operated as a 'dry' quarry, without any need for dewatering, in this regard. The assessment of the sites groundwater attribute is included with the Water (Hydrology & Hydrogeology) Assessment in Chapter 7.

6.2.12 Conceptual Site Model

As per the IGI Guidance recommendations a Conceptual Site Model (CSM) has been conceived for the site examining the interaction of the post 1994 to 2014 quarrying with the geological environmental.

An interpreted cross section of the site showing the context of the geological and hydrogeological regimes for the quarry are presented in Figure 6.2 The cross section forms an important part of the 'Conceptual Site Model (CSM) for the site.

Figure 6.2 Conceptual Site Model – Diagrammatic Quarry Cross Section



6.2.13 Type of Land and Soil/Geological Environment

As per Step 3 of the IGI Guidelines the baseline information and CSM enables the type of soil/geological and hydrogeological environment to be determined. From the range of generic environments outlined in the IGI document (Types A to E) the Ardcahan Quarry site is interpreted to have a:

Type A - Passive geological/hydrogeological environment.

This is based on the fact that the area is underlain by a stable, non-karstic, sedimentary bedrock type that is classified as poor aquifer which is dominantly a recharge area with a historically stable geological environment.

The site does not represent any aspect of a Type B groundwater discharge area with a regionally important aquifer, Type C Man-Made Dynamic Hydrogeological Environment with mining or quarrying below the water table, or with nearby waste discharges to ground or a Type D Sensitive Geological/Hydrogeological environment with karst limestone or water supply SPAs or a Type E

Groundwater Dependent Ecosystem or wet land with a nearby river with a high base flow of groundwater.

Site Photographs from the VCL walkovers are presented in Appendix 6.4.

6.2.14 Criteria for Rating the Site/Attribute Importance – Geological Features

Based on the criteria presented in the NRA Guidelines, 2009 Box 4.1, (Table C2 of the IGI Guidelines), the importance of the land and soil/geological attributes of the Ardcahan Quarry site are rated as Low to Very High, as outlined in Table 6.2.

Table 6.2 Rating of Land/Soil – Geological Site Attribute Importance

Attribute	Criteria	Typical Example	Importance
Topsoil/Subsoil	Attribute has low quality significance as the material is thin or absent	Thin, low fertility soils- where present	Low
Bedrock Resource	Attribute has a high to very high quality significance or value on a regional scale	Bedrock aggregate in moderately sized existing quarry with proven economically extractable mineral resource	High to Very High
Geological Heritage	Attribute has a low quality significance or value on a local scale	Common geology with no geological heritage or features of importance	Low

6.2.15 Activities Associated with the Substitute Consent Development

A range of Generic Activities that can potentially interact and impact with the geological/ hydrogeological /environment are presented in the Activities/Environment Matrix identified as Figure 2 in the IGI Guidelines. This IGI Guideline Matrix is presented as Appendix.6.5.

The activity which is related to the Ardcahan Quarry Substitute Consent development is:

EXCAVATION OF SOIL AND BEDROCK MATERIALS ABOVE THE WATER TABLE.

The areas where bedrock was excavated for quarry stone covers an area about 5.94 hectares in the southwestern and south-eastern areas of the site while the north-eastern and north-western areas were used for storing surplus soil and waste sludge material as well as the development of settlement ponds and water management features. The application for substitute consent relates to a total site area of approximately 15.2 hectares.

As described in Section 6.2.5.1 an average of 93,083 tonnes of rock material was produced by the quarry per annum with a total estimated volume of about 2.234 million tonnes of quartzitic sandstone and siltstone removed down to depth of 74m to 75m OSD. The ground level of the established quarry area and the lands in the southwestern corner of the site are the lowest on the site and these areas are all above the groundwater table. No dewatering was undertaken for the quarry development.

Any unexposed bedrock was exposed by the removal of any vegetation and thin soil cover and then blasted through the use of industrial explosives. Blasting occurred about twice per year depending on stocks and commercial demand. Rock was excavated, crushed and screened and used in the macadam plant and by private clients, including Cork and Kerry Co. Councils, for road sub-base.

6.3 Impact Assessment

The potential impact of the development on the land and soils/geology attributes is primarily the extraction of the bedrock material and use as a mineral aggregate resource.

Other impacts relate to the removal of the thin soil cover on the bedrock and the deposition of this material as berms to create surface water settlement and storage ponds or in stockpiles for potential future backfilling and landscaping works.

The quarrying removed the thin soils cover, where present, over the site area which given its lack of depth, did not greatly increase the vulnerability of the groundwater to surface contamination or change the overall vulnerability classification for the site.

The blasting, rock crushing and aggregate production creates the potential for dust generation in dry weather and fine suspended sediments in wet weather. If not managed these could impact the local environment and water courses.

Given the amount of bedrock exposure in the established quarry, that a resource assessment was completed and the fact that there is already a large area of established quarry floor above the groundwater table and no excavation below the groundwater table was completed, no further site investigations or studies, as outlined in the 2nd Element and summarised in Figure 2 of the IGI Guidelines, are deemed necessary before the potential nature of the impact of the subsequent consent quarry development can be determined.

6.3.1 Impact Assessment Methodology

An analysis of the predicted impacts or effect of the completed quarrying on the land and soils/geology during the quarrying, as per Annex IV of Directive 2014/52/EU, EPA EIAR Guidance Documents, (2022 & 2017), NRA Guidance (2009) and Appendix C of the IGI EIS Preparation Guidelines (IGI 2013), is presented in the following section.

The impact assessment was undertaken using the following considerations:

- Quality of an Impact: Described as being Positive, Neutral or Negative where:
- Positive Effects = ones which improve the quality of the environment.
- Neutral Effect = represents no effects or effects that are imperceptible.
- Negative/Adverse Effects= change which reduces the quality of the environment.
- Duration of Impacts: The duration of each impact was considered to be either temporary, short-term, medium-term, long-term or a permanent impact. Temporary impacts are considered to be those which are construction related and last less than one year. Short term impacts were seen as lasting one to seven years. Medium-term impacts are those lasting seven to 15 years. Long-term impacts last 15 to 60 years and permanent impacts are anticipated to last over 60 years.
- Magnitude of an Impact:

The rating of the potential 'Magnitude of Impacts' at EIAR stage are defined by the NRA guidance (2008), which includes typical examples, as outlined in Table 6.3.

Table 6.3 Criteria for Rating Land/Soil Impact Magnitude at EIS Stage,**

Impact Magnitude	Criteria	Typical Example
Large Adverse	Results in loss of attribute and/or quality and integrity of attribute	Irreversible loss of high proportion of local high fertility soils Removal of entirety of geological heritage feature Requirement to excavate and replace a high proportion of peat, organic soils and/or soft mineral soils
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Irreversible loss of moderate proportion of local high fertility soils Removal of part of geological heritage feature Loss of moderate portion of future quarry or pit reserves.
Small Adverse	Results in minor impact on integrity or attribute or loss of small part of attribute	Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils. Removal of small part of geological heritage feature Sub-economic extractable mineral or rock resource.
Negligible	Results in an impact on attribute but insignificant magnitude to affect either use or integrity	No measurable changes in attributes.

(**Data sourced from Box 5.1 of the NRA 2009 EIA Guidelines Page 103 & IGI Guidelines Table C4).

The potential impact magnitude of the quarrying would be considered to be 'Negligible' for the land/soils geological attributes as the bedrock type is extensive while the extractability of the resource has not been diminished. The loss of the thin soil cover in some areas would result in no measurable changes in the soil attribute on a local or regional scale.

- Significance of an Impact: The impact significance was considered as having either an: Imperceptible/Not Significant, Slight, Moderate, Significant/Very Significant or Profound impact.

The rating of potential environmental impacts on the land/soil (geological) environment can be assessed based on the matrix presented in Table 6.4, which takes account of both (1) the Importance of an Attribute and (2) the Magnitude of the Potential Environmental Impacts of the proposed development on it. The criteria apply to potential impacts during both the development and operational phases.

Table 6.4 Rating of Significant Environmental Impacts at EIA Stage***

		Magnitude of Impact (Table 6.3)			
		Negligible	**Small Adverse**	**Moderate Adverse**	**Large Adverse**
Importance of Attribute (Table 6.2)	**Extremely High**	Imperceptible	Significant	Profound	Profound
	Very High	Imperceptible	Moderate/ Significant	Significant/Profound	Profound
	High	Imperceptible	Slight/Moderate	Moderate/Significant	Significant/Profound
	Medium	Imperceptible	Slight/Not Significant	Moderate	Significant
	Low	Imperceptible	Imperceptible	Slight	Slight/Moderate

(***Based on NRA Guidelines (2009) – Box 5.4 Page 106 and IGI Guidelines Table C6).

The magnitude of each impact was considered from Negligible to Large Adverse. Negligible impacts are effects that result in an impact on an attribute but of insufficient magnitude to affect either its use or integrity. A major impact results in the significant loss of an attribute and/or quality and integrity of an attribute.

The Ardcahan Quarry development would result in a Negligible Impact, on the Low heritage but High economic importance of the geological attributes, as all potential impacts would have insufficient magnitude to effect either its use or integrity.

The descriptions of the 'Significance of an Impact' used are as presented in the EPA EIAR Guidelines 2022 – Section 3 Table 3.3 Page 50 as shown in Table 6.5. (The word 'effect' is used interchangeably with the work 'impact' in the EPA EIAR guidelines).

Table 6.5 Describing the Significance and Quality of Potential Effects for EIARs

Significance of Effect	Criteria	Quality
Imperceptible	An effect capable of measurement but without significant consequences.	Positive/Negative/Neutral
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.	Positive/Negative/Neutral
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.	Positive/Negative/Neutral
Moderate	An effect that alters the character of the environment in a manner which is consistent with existing and emerging trends.	Positive or Negative
Significant	An effect which by its character magnitude duration or intensity alters most of a sensitive aspect of the environment.	Positive or Negative
Very Significant	An effect which by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.	Positive or Negative
Profound	An effect which obliterates sensitive characteristics	Negative Only

For the Subsequent Consent activity at the Ardcahan Quarry Reinstatement the rating of Significant Environmental Impacts would be considered 'Imperceptible' with Neutral Quality effects regarding the bedrock and subsoils and potentially Positive Quality effects regarding the use of the bedrock as an economic resource.

6.3.2 Do Nothing Scenario

The 'Doing Nothing' Scenario would have resulted in no quarrying at the site from 1990 to 2014 which would negatively impact both the quarry and the subsequent operation of the adjacent macadam facility which used approximately 25,000 tonnes of rock aggregate from the quarry operation per year. The macadam facility has to import rock material from other sites which has increases truck traffic on the local roads and the carbon footprint of the aggregate transportation to the site.

No additional quarrying would also have left a large accessible bedrock resource of high economic importance in-place.

The supply of road aggregate suitable as road surfacing material to the local county councils and contractors would have to be supplied by other either existing or new quarry locations the development or expansion of which may create more significant environmental impacts at other locations in the region.

If substitute consent is not granted, then the proposed remediation and landscaping plans for the site are less likely to progress and the rock faces and open areas will remain as they are.

6.3.3 Construction Phase

Construction activities over the 1990 to 2014 period include the site clearance and excavation of the shallow soil cover in new quarry areas, the creation of some of the internal roads in the northern part of the site, some earthen berms, new settlement ponds and quarry wash water treatment and internal surface water supply and water recycling infrastructure.

Low volumes of soil material were generated by the quarry development and no agricultural land occurs within the quarry subsequent consent area. Volumes of soil created were small due to its limited depth and extent. Soils were used to create berms for road edges, ponds or stockpiled for future landscaping use, as necessary.

The impact of the soil removal would be long term to permanent depending on how the site is reinstated but given the type and extent of the soil material it would be considered to have a neutral quality impact.

6.3.4 Operational Phase

Operational activities from 1990 to 2014 include the main quarry works such as drilling and blasting, crushing and screening, stockpiling of aggregate, water management and discharges from settlement ponds as well as transport of materials to and from site.

While the interbedded siltstones and sandstones are an important aggregate resource, they are not an unusual geological unit and no geological importance or heritage value has been attributed to them or occurs locally. The impact of the excavation of the bedrock would be permanent and would be considered to have neutral quality impact on the geology attribute and a positive impact in terms of its use as an economical aggregate resource.

There is the potential occurrence of unstable rock slopes following blasting and/or rock removal from the exposed rock faces which could create a health risk to site users. This would have a temporary negative but long-term neutral impact to the site. Proper quarry face management would negate this rock fall and slope stability risk.

6.3.5 Risk of Major Accidents and Disasters

In terms of Land Use and Soils (Geology) the 'Worse Case Scenario' Environmental Impact would probably relate to the accidents around fuel losses, which would impact soils or bedrock and ultimately create a risk to the underling aquifer and local watercourses. In either case the potential volume of fuel loss from quarry equipment and machinery would be relatively small in the 10's rather than 100's of liters and the duration of the impact would be temporary to short term.

There would have been a potential risk to human health from accidents related to blasting and rock falls from steep, unmanaged quarry faces and exposed high walls. These risks were mitigated by following proper procedures and experienced operators cleaning down the steep quarry rock faces after blasting.

There are a number of shallow earthen berms located around the edges of some of the surface water ponds on the site, which could, if they were to fail create a sudden outwash of sediment laden runoff which could be considered a major accident risk. These berms tend to be low, broad structures of compacted clay rich material and the risk of collapse is considered very unlikely. Visual inspection of these berms would help ensure that no instability was potentially developing.

No major accidents or incidents are reported to have occurred during the quarry operation and proper management and mitigations will limit their potential to arise if quarrying was to resume.

6.3.6 Cumulative Impacts

The site is located in a rural area with little commercial or residential infrastructure and housing around it. There are no similar quarry projects in the locality which involve the removal of soil and

bedrock material on any large scale. The other activities that are ongoing in the immediate vicinity of the quarry site or near the small boundary watercourse include the sites macadam plant and livestock farming.

The operation of the adjacent macadam plant used aggregate from the quarry and has the potential to create additional dust and/or suspended sediment risks on the site. The aggregate washing process used by the plant creates waste fines 'sludge' material which is deposited in a large spoil heap in the southeastern part of the site. The deposition of this material has created high, steep sided slopes on its southern and eastern flanks which border the adjacent boundary stream. While the slopes have been revegetated over the years and there are no signs of instability or slippages and there is a small buffer area and earthen ditch between the toe of the slope and the stream, the area would potentially pose a high risk to the stream if a large collapse was to occur. Visual inspection of the slopes would help ensure that no instability was potentially developing.

There are no other new residential, forestry or other potential developments known about for the local area or the local catchment of the small watercourse that the quarry site is part of.

6.4 Remedial Measures

The construction and operational phases of the quarry occurred in parallel as the quarry development progressed. Remedial measures for both phases would also have been applied in tandem as the work progressed and remedial measures for both phases are considered together.

6.4.1 Construction and Operational Phase

Cleared unconsolidated soil material was used in the construction of shallow berms and stored in the norther part of the site as material for future areas of backfilling and landscaping where required. A number of surface water ponds were established in this area to act as settlement ponds and also to provide water storage. No soil was stockpiled near quarry edges or water courses.

Proper blast design and implementation minimises the risk of fly rock or for long term unstable quarry faces to form. Good blast practice and rock management reduces the risk of accidents occurring and no incidents were reported for the sites operation since the early 1990's.

Potential occurrence of unstable rock slopes following blasting and/or rock removal from the exposed rock faces would occur locally but are removed as part of the proper excavation management of the quarry face and subsequent resource use.

The potential for fuel spills or leaks to occur from site machinery has been restricted by the implementation of good management good practices including adequate bunding for storage containers, refuelling in designated areas and regular plant maintenance.

All fuel storage areas on the site are sufficiently bunded and any mobile bowers used on site are double skinned. Bunds sufficiently large to fully contain accidental spills are provided around all tanks/storage areas containing harmful substances.

Spill kits are maintained on site and site staff are trained in the response to accidental spills and the use of clean up materials. Good housekeeping (site clean-ups, use of disposal bins, etc.) around the site and proper use of storage and disposal facilities for lubricants fuels and oils are used.

6.4.2 Monitoring

Site investigations in the form of resource assessment drilling has been completed on the site to help quantify and prove the bedrock resource and this data, as well as the high amounts of exposed bedrock around the site means that additional resource potential monitoring is not proposed.

The areas of steep quarry rock faces, the shallow earthen berms around some of the surface water ponds and the slopes of the macadam plant sludge waste material should be visually inspected to ensure that no visual signs of slope instability are occurring in these areas.

6.5 Statement of the Significant Effects on the Environment

No significant effects on the geological environment have occurred or continue to occur on the Land Use/Soils (Geology) Attributes due to the quarrying activities completed at the Ardcahan Quarry in the 1990 to 2014 period.

In accordance the relevant legislation an assessment of the past effects, current effects and possible future effects or residual impacts and the associated mitigation measures applied during the operation of the Ardcahan Quarry from 1990 to 2014 are presented in Table 6.6.

6.5.1 Residual Impacts

The potential residual impacts are those that will occur after the proposed mitigation measures have taken effect. As presented in Table 6.6 all identified residual effects have an environmental impact rating of Imperceptible.

Table 6.6 Land Use – Soils (Geology) Attributes Assessment of Effects for Ardcahan Quarry Expansion Substitute Consent

Impact Assessment	Effects	Mitigation Applied During Work	Likelihood of Significant Effects	Remediation Measures Required	Residual Effects
i) Effects that have occurred, (Retrospective Assessment)	Removal of Soil Removal of Bedrock	Stock Piling for future re-use. Expert blasting & rock excavation & management.	Small area of low-quality soil material removed – low likelihood of significant effects. Common bedrock type with high economic importance and no heritage value - low likelihood of significant effects.		Imperceptible
ii) Effects that are occurring or ongoing.	Soil Stockpiles Exposed Quarry Rock Faces	Placed away from water courses, with stable slopes and vegetated. Quarry faces made safe by removing loose rock/debris.	Low likelihood of significant effects. Low likelihood of significant effects.	Visual monitoring of steep rock or soil slopes to ensure no signs of instability are developing.	Imperceptible
iii) Effects that may be reasonably expected to occur	<u>If Quarrying Continues</u> Removal of Soil Removal of Bedrock Site Restoration	Continued implementation of environmental management measures and best practice for soil removal, rock blasting and quarry excavations. Implementation of restoration plan.	Low likelihood of significant effects. Low likelihood of significant effects	Effective and efficient use of explosives and excavation and crushing equipment to reduce amount of waste material and potential for contamination to occur. Re-use of soil material as back fill material around the site for long term reinstatement and landscaping work.	Imperceptible
	<u>If Quarrying Stops</u> Site closure	Implementation of environmental management measures during site closure.	Low likelihood of significant effects.	Making safe of exposed quarry faces by restricting access and removing any loose rock fragments.	Imperceptible

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Murray Brothers Tarmacadam Ltd

CHAPTER 7
HYDROLOGY AND HYDROGEOLOGY

VOLUME II
MAIN STATEMENT

FEBRUARY 2026

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7 Hydrology & Hydrogeology

7.1 Introduction

Viridus Consulting Ltd., (VCL) were appointed by Murray Brothers Tarmacadam Ltd., to complete the Water, (Hydrology & Hydrogeology), Chapter of the Ardcahan Quarry, remedial Environmental Impact Assessment Report (rEIAR), as part of the application for Substitute Consent for development and quarrying related works, that took place at the Ardcahan Quarry site, located near Dunmanway Co. Cork, between 1990 and 2014.

The work was completed by Mr. Darragh Musgrave, an experienced, Senior Geo-Environmental Scientist with Viridus Consulting Ltd., (VCL).

It should be read in conjunction with Chapter 1 (Introduction), Chapter 2 (Site and Project Description), Chapter 5 Land/SoilsGeology), Chapter 12 (Biodiversity), and Chapter 15 (Interactions Summary).

7.1.1 Author Information and Competency

This chapter of the rEIAR has been prepared by Mr. Darragh Musgrave, a senior Geo-Environmental Consultant with VCL. Darragh has an honours degree in Geology (Earth Science) from the National University of Ireland Galway, (NUIG 1992) and a Higher Diploma in Environmental Protection from the Institute of Technology Sligo (ITS 2006).

He has over 30 years of experience working in the environmental, geological, geotechnical, hydrogeological and hydrological sector and has completed numerous environmental assessment and associated Environmental Impact Assessment Reports (EIARs) for many quarry, infrastructure, commercial and residential developments. Recent projects include;

- DUCON Sand/Gravel Quarry, Dripsey, Cork, EIAR for Quarry Consulting Ltd., (2025),
- Rooskagh Sand/Gravel Quarry, Athlone, EIAR for Mr. E. Harney (2021/2023),
- O'Regan's Quarry, Co.Cork & Harringtons Quarries, Co. Mayo, Env Assessments,
- Bellacorrick Hydrogen Plant, Co. Mayo, EIAR, Quarry Consulting Ltd., (2022),
- Ballinglanna, Lake View, Dunkettle & Maglin Residential LSD EIARs – O'Flynn Group,
- Maryborough Ridge, Cork, The Paddocks, Waterford, Residential EIARs – Glenveagh.

Darragh has been appointed to provide the necessary information for the assessment, as per Annex IV of Directive 2014/52/EU, the Water (Hydrology & Hydrogeology) elements of the rEIAR for the completed development works undertaken at the Ardcahan Quarry between 1990, when the EIA Directive came into force and 2014, when quarrying ceased.

VCL completed the Land/Soil (Geology) and Water Chapters as part of an Environmental Impact Assessment (EIA) Report for a former planning application at the same study site in 2014, (by McCutcheon Halley Walsh 2014 under CCC reference 14/00616 and ABP reference PL 88.245174).

7.1.2 Guidelines Relevant to Discipline

The Water Chapter for the rEIAR follows the guidelines outlined by the EPA guidance document, Guidelines on the information to be contained within an EIAR from May 2022, in Directive 2014/52/EU and Annex IV amendments, as well as European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, (S.I No. 296/2018).

The work also is cognisant of the previous EPA Draft EIAR Guidelines (2017) and the Environmental Impact Statement (EIS), EPA Draft guidelines, from September 2015, which outline the process of preparation and the content required for an EIS.

The assessment work also follows the Institute of Geologists of Ireland (IGI) Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of EISs, (IGI April 2013), and National Roads Authority (NRA) Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology & Hydrogeology for National Road Schemes, (NRA 2008).

As per Section 177(f) of the Planning and Development Act 2000 (as amended) the remedial EIAR will include the completion of a 'Statement of the significant effects on the environment,' with details of any remedial measures, as necessary.

Other related guidelines such as 'Environmental Management in the Extractive Industry' (EPA 2006) and the Irish Concrete Federation (ICF) 'Environmental Code' 2nd Edition, (2005), were also reviewed.

7.1.3 Legislation

As well as the Environmental Impact Assessment requirements there are a number of regulations, acts and directives regarding the legislative context for the assessment of the water attributes, some of which are summarised below.

The EU Water Framework Directive (2000/60/EC) requires all Member States to protect and improve water quality in all waters so that we achieve good ecological status by 2015 or, at the latest, by 2027 and and maintain "high status" where the status already exists. It was given legal effect in Ireland by the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003). It applies to rivers, lakes, groundwater, and transitional coastal waters. The Directive requires that management plans, based on River Basin Districts (RBD), be prepared on a river basin basis and specifies a structured method for developing these plans.

Under the WFD water quality of River Basin Districts is assessed biologically, physically and chemically. Assessment is done using surveys that are predominately conducted by the EPA, local authorities and complemented by other government bodies including Inland Fisheries.

The European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2015, (S.I No. 386 2015), have been devised as a more complete and stringent set of surface water quality regulations which covers the requirements of the Water Framework Directive and the Dangerous Substances Directive.

European Communities (Quality of Salmonoid Waters) Regulations SI 293 of 1988

The Salmonoid Regulations set water quality standards for salmonoid waters, with identification of salmonoid waters, water quality standards, and frequencies of sampling and methods of analysis and inspection.

Local Government (Water Pollution) Acts 1977 – 1990

The Act is the main legislation for the prevention and control of water pollution, including the general prohibition of discharge of polluting matter to waters, licensing discharges, fines and prosecution, water quality standards and management plans.

7.1.4 Methodology

The methodology and scope of the assessment involved the completion of a Desk Study and Site Walkover which included the collation and review of all available information pertaining to the site including any hydrological studies or databases relevant to the development site area, such as the previous 2014 EIA, OSI, EPA and Office of Public Work (OPW) on-line data.

The Site Walkover recognisance, completed by VCL during a number of site visits in 2014, 2015, 2020, 2023, 2024 and 2025 enabled the physical examination of the geological, geomorphological, hydrological and land use characteristics of the site and its setting in the locality. Groundwater and water sampling was completed by VCL during the site works completed in July 2014, May 2020, July 2023 and January 2025.

The development relates to the removal of soils/subsoils and quarrying of quartz rich sandstone and siltstone bedrock primarily in the western, southwestern and eastern areas of the quarry site and stockpiling of the subsoil and creation of settlement ponds in the northern area of the site.

The overall landholding is 25.2 hectares (ha) while the footprint of the Substitute Consent area is about 15.2 ha with a 1990 quarry area of 4.72 ha and a total extraction area between 1990-2014 of 5.94 ha. There has been no extraction or quarrying at the site since 2014. Refer to the Substitute Consent rEIAR Site Area outlined in Chapter 1 and maps in Appendix 1.1.

In this chapter the historic baseline conditions and character of the hydrological and hydrogeological characteristics of the site are presented and the potential impacts anticipated from the expansion of the quarry from 1990 to 2014 are identified and discussed. Mitigation measures are considered, and potential residual impacts are assessed. This chapter should also be read in conjunction with Chapter 9 (Landscape & Visual Impact and Restoration), Chapter 5 (Land Use/Soils/Geology), Chapter 12 (Biodiversity) and Chapter 15 (Interactions).

Consultation was carried out with the relevant bodies by the project planning co-ordinator, including An Bord Pleanála (ABP), the GSI, Cork Co. Co., and EPA. A summary of the third-party responses received are listed in Chapter 1 of the EIAR and presented in Appendix 1.2.

7.1.5 Difficulties Encountered in Compiling Information

The difficulty encountered in the compilation of the information required for this chapter involved a lack of records, such as volumes of product, site specific maps, environmental monitoring records and site photographs of the quarry development, especially for the period 1990 to 1997, when the ownership of the quarry was not with Murray Brothers.

7.2 Description of Existing Environment

The detailed description of the development and completed quarrying activities are provided in Chapter 1 (Introduction) and Chapter 2, (Site Location & Project Description). A pictorial record of aerial photos showing of the evolution of the quarry area from 1990 to 2014 is included in Chapter 2.

The history of the site is one of rural hilly woodland and scrub with little agricultural use, as can be seen on the old OSI 1840's 6" and early 1900's 25" Map Surveys for the locality. Refer to the old OSI mapping presented in Appendix 6.1.

Information on the Water (hydrological & hydrogeological) conditions pertaining to the development site and locality was acquired from existing literature and previous reports including:

- EPA On-line Databases for Water, Hydrology & Hydrogeology/Aquifer Information,
- OPW on-line Flood Risk Assessment Mapping
- Previous 2014 EIA Reporting and 2015 RFI Planning Submissions for the site.

The baseline information available from these sources is relevant for the site prior to 1990 and for the quarrying period before the active quarrying ceased in 2014.

In addition to the available desk study information a number of walkovers of the quarry area were undertaken by VCL in July 2014, February 2015, May 2020, July 2023, October 2024, January, May and August 2025.

7.2.1 Site Location and Setting

The Ardcahan Quarry is located in a rural setting in an area of undulating hilly topography previously known as Clashnagallagh Woods, located approximately three kilometres (km) northeast of the town of Dunmanway in West Cork. The land immediately around the quarry consists of scrub, woodland and agricultural grass land. The site is accessed from the public road (R587) via a third-class road from the Inchicahan Crossroads and has its entrance in the south-western corner of the site. Refer to the Site Location Map presented in Appendix 1.1 and the aerial photograph presented in Figure 7.1.

It is a sloped site with lower ground levels (~72 to 75 MOD) in the southwestern area which rises to the north and east. A small watercourse, (referred to as the 'boundary stream'), which is a tributary of the River Bandon, forms the southern and eastern boundary of the site and the majority of the site area is in the catchment of this boundary stream watercourse.

The northern area of the site forms a broad ridge with higher ground levels (110 to 118MOD) which is on the SW-western side of an area of higher undulating topography and hills which form the eastern part of the Caha River catchment.

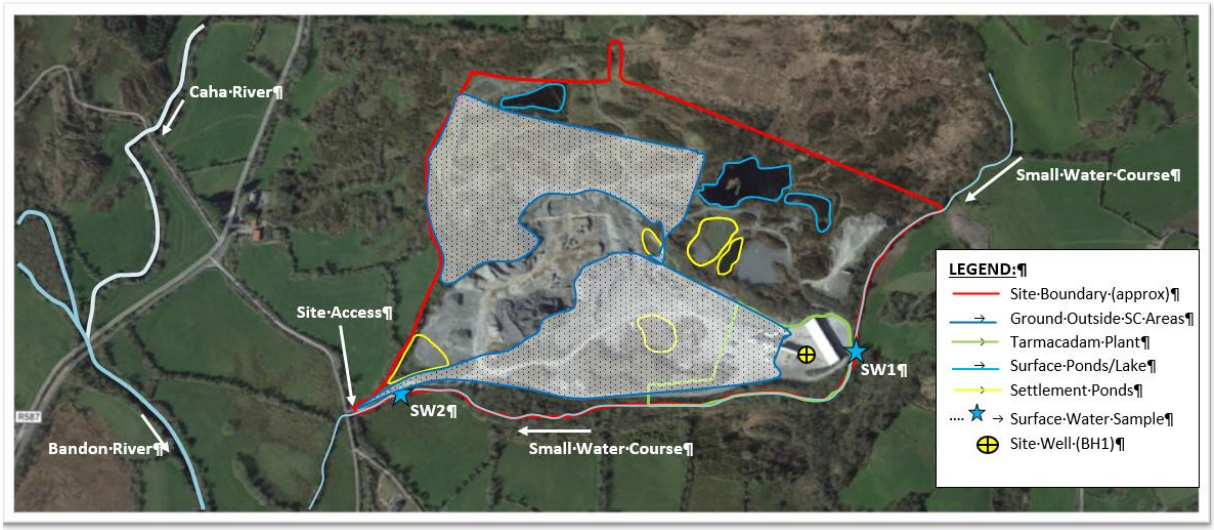
The junction of the Caha and Bandon Rivers is located about 400m west of the site boundary and the Bandon River then flows southwards in a broad valley towards Dunmanway town.

The site office, administration buildings and toilet facilities, including percolation area, are sited in the old (pre-1990) quarry, located in the south-central area on the southern side of the site.

The main (post 1990) quarry area was established in the southwestern portion of the site, which was also used as the main rock crushing and product stockpile area. The quarry had a permanent settlement pond system situated in the SW corner downgradient of this area. The northern part of the site has not been quarried but portions of it are used for stockpiling subsoils and crushed rock, for settling ponds and for backfilling areas with surplus soil and sludge material.

A number of permanent shallow ponds/lakes have also been developed by placing berms around the natural depressions and lower-lying areas in the northern part of the site. The settlement ponds were also used for water storage and water re-use in the quarry and tarmac areas as necessary.

Figure 7.1 Aerial Photo of Site Locality with Hydrological Features.



The tarmacadam production plant, which received planning and commenced operation in 1998, is located in a previously quarried area (pre 1990) in the south-eastern part of the site. The sites groundwater well is also located in this area. The bitumen batching and preparation area is located around the admin buildings in the old quarry area in the southern and central part of the site. This south eastern area is under the separate permission for the hotmix tarmacadam plant.

7.2.2 Regional Hydrological Catchments

The Ardcahan Quarry site is situated in the South Western River Basin District (SWRBD) and the river catchments are located within Hydrometric Area (HA) No. 20 (Bandon-Ilen ID 20) as defined by the Water Frame Work Directive (WFD).

The sub-catchment for the rivers to the northwest of Dunmanway is identified by the EPA as Bandon_SC_10 with the majority of the quarry site located with the Sub Basin Bandon_020 catchment which covers an area of 48.34km^2. A small section of the northern boundary of the site is located on the southern boundary of the Sub Basin Caha_20 catchment. Refer to the EPA Catchment Maps presented in Appendix 7.1.

The main hydrological feature near the site is a small unnamed stream that flows along the sites eastern and southern boundaries. This small watercourse, (identified as the boundary stream), has an estimated catchment area of about one square kilometre (1km^2) of which the site area occupies approximately 25%. The remainder of the catchment is occupied by upland agricultural grassland and scrub vegetation.

The stream flows adjacent to the site close to its eastern and southern boundaries and reaches the Bandon River about 500m to the southwest of the quarry site. Refer to Figure 7.2.

Figure 7.2: Map of Site Locality with Hydrological Features.



7.2.3 Local Hydrology 1990 to 2014

The natural topography of the site area means that surface water flows from the upland areas in the north to the lower ground in the south and southwest. This flow direction has generally been maintained during the period that the quarry has been operating but with some local changes to the site drainage pattern and discharge locations, especially with the evolution of a number of ponds and surface water management features around the site.

There are no detailed water management design drawings available for the 1990 to 2014 quarrying period but the evolution of the surface water features can be seen on the available historic aerial photographs. The historic aerial photos of the site and evolution of the Substitute Consent area are presented in Chapter 2.

A detailed topographically survey of the whole site area, completed by drone survey in 2014, enabled the accurate identification of six small sub catchments, (called A1 to A6), across the quarry site. This survey map is presented in Appendix 6.2.

The historic aerial photos enable the sequence of the creation of the different ponds and related sub catchments to be estimated.

The pre 1990 quarry activity was dominantly in the central area of the southern portion of the site and occupies some of the area identified as the A3 sub-catchment. There is visual evidence from the old photograph of a small water feature/pond in the location of the Ponds F and G, (as identified on the detailed catchment map). It is likely that the surface water discharge to the stream which flows to the south under the access road from these pond features was established to allow runoff from this part of the quarry from very early on in the quarry development, i.e., Pre 1990.

The expansion of the quarry area, especially in the south-eastern corner, is evident in the 1995 aerial photograph, however there is no indication of changes to the runoff topography or any new connections or discharges to the stream being established or resulting from this work.

The aerial photograph from 2000 shows a large pond feature at the location of Pond G in the central area of the site as well as the new Admin/Office Cabins and Tarmac Plant in place in the south-eastern area of the site. The aggregate shed and other tarmac production buildings are evident in this area, and it is assumed that the drainage system from the plant area, which included three silt trap drains, concrete interceptor and a new direct discharge to the stream, would have been established by this stage. The new road on the eastern side of the aggregate shed was built by the stream and it is likely that the drainage ditch created by this road just to the north of the aggregate shed, which connects directly to the stream, was also established at around this time.

The quarry is also noted to have expanded from the low-lying field area into the wooded hill in the south-western area of the site. A new earthen berm is evident along the access road in this area and it is likely that the small ponds, (identified as ponds I and J on the recent mapping), and the discharge to the stream in the south western corner of the site were established around this time.

The aerial photographs from 2003 and 2005 shows that the majority of the quarrying activity was centred around the excavations in the bedrock on north-western area of the site. Large stockpiles of stone aggregate are also evident in the low-lying ground in the south-western area. The new ponds in the northern part of the site are evident, including the settlement Ponds A, and B and the large surface water storage Pond C.

The small water treatment Pond K is evident, and it is likely that the connectivity between Ponds A and K, K and G and B to G was established at this stage. The Tarmac Plant process fines sludge deposition area is visible to the north of the tarmac aggregate shed.

The 2014 aerial photograph shows the quarry in its current state with excavation activity extended into the north-western area as well as the creation of the internal network of roads in the northern area. The ponds D and E to the east of Pond C are evident as well as Pond H in the northwest corner. It is assumed that the overflow pipe from Pond E to the stream, now buried under the sludge spoil area, was established at this stage.

In terms of discharges to the local stream the five locations evolved over different stages with the most upstream location from Pond E (Discharge Location 01) established most recently. The runoff from the roadside ditch to the north of the aggregate shed (Discharge Location 02) and the Tarmac Plant area discharge (Discharge Location 03) were established in the late 1990's. The original surface water runoff, via the central area of the site (Discharge Location 04) was established with the quarry's original development (pre- 1990) and the out flow in the south-western corner of the site (Discharge Location 05), which has always been the lowest part area of the site, was also present pre-1990.

It is important to note that despite the quarry's proximity to the adjacent boundary stream the surface water runoff is prevented from directly entering it as the fall of ground is away from the stream and sloping back into the quarry site in most areas and also by the presence a continuous earthen berm which runs along the eastern and southern edge of the access road of the quarry. This berm. which prevents surface water leaving the site, was probably established with the development of the access road to the quarry area before 1990 and has been enhanced and maintained post 1990.

The camber on the surface of the quarry access road is formed in such a way that surface water runoff flows off the roadway into the low lowing south-western corner of the quarry area.

Surface water ponds developed in shallow depressions and low-lying areas in the northern area of the site due to the construction of berms and internal roads in this area. They provide clean water storage for use if and when required by the quarry and have also developed into natural aquatic habitats.

In the established quarry area surface water pools on the level ground of the excavated floor and either evaporates, percolates slowly into the fractured bedrock or flows down gradient to the southwestern corner of the site where it is contained in ponds I & J before slowly percolating to ground or over-flowing to the local stream. There is an anecdotal report of a large soakaway being established in this area to help percolate the runoff but its presence or exact location has not been verified.

7.2.4 On-site Quarry Surface Water Catchments

Using information from the detailed topographical survey (see Appendix 7.2) and observations during the site walkovers the site area has been divided into a number of small surface water catchments. A description of the areas and discharge locations are summarised in Table 7.1.

Table 7.1 Summary of On-Site Surface Water Catchments (Refer to site map in Appendix 7.2).

Area ID	Description	Discharge to Stream Location	Risk
Area 1 (A1)	Small area on surface of Tarmac Plant sludge deposition site	No direct linkage to a discharge point.	Low
Area 2 (A2)	Upper area to north of and around the Tarmac Plant Area.	Upper area runoff can flow to road site ditch (Loc 02) while Tarmac Plant area goes to drains and pipe to stream (Loc 03). Established in late 1990's.	High – Very High
Area 3 (A3)	Central part of old quarry area and up land area to north.	Ponds A, B, F, G, K and L are in this area which discharge to stream via overflow from Pond L, (Loc 04). Original quarry discharge established pre-1990.	Medium
Area 4 (A4)	Large area covering southwest part of site where main quarrying was done	Ponds I and J are located in the SW corner – lowest part of the site where water drains to. Connected to stream via overflow ditch, (Loc 05). Likely that original site drainage was in this area but enhanced in 1990's.	Medium - High
Area 5 (A5)	North-western part of the site – little development in this area.	Contains Pond H but there is no evidence of connectivity to the active quarry or linkage to a discharge point.	Low
Area 6 (A6)	North-eastern part of site area with fresh water ponds and no quarrying.	Contains Ponds C, D and E which contain clear surface water that overflow to stream via buried pipe (Loc 01). Pipe discharge probably established in late 2000's	Low

It is important to note that the overall size of the quarry catchment or the general destination of the rainfall runoff to the local boundary stream and ultimately to the Bandon River has not changed due to the quarrying activity. While some surface water retention in the sites ponds has been established, that would reduce potential peak flows as they fill up, the overall water budget for the site area has not significantly changed.

The quarry developed a surface water recycling system in-order to re-use process water and manage wash water on the site. This reduced the raw water volume used and managed wash water on-site.

The Catchment Area A3 occupies the central part of the site which contains the main holding pond (Pond A) for silty wash water which is pumped from the Washer to Pond A in the upper level of the catchment. There is a large storage volume in this pond and water usually percolates to ground or evaporates from this area. If there is any overflow it goes to the adjacent Pond B, via an overflow pipe. Pond B can be drained via a water release value which allows water to flow back down the quarry face to the lower pond G.

The lower ponds F, G and L hold runoff from the lower central area of the site and the water is used for cooling in the production of tarmac coated chips and the mastic bitumen blocks. Water was pumped from G to the holding pond near the washer (Pond K) and also down to the quarry floor for dust control sprinkles as necessary. Water was circulated from Pond C to Pond K and/or Pond B if required. Water from Pond L can over flow from this area of the site when all three ponds (F,G & L) are at capacity following an overland route through woodland and under the access road via a pipe to the boundary stream, (Location 04).

The linkage between ponds is shown on the site map in Appendix 7.2 and photographs of the ponds and drainage systems in the identified catchments on the quarry site are presented in Appendix 7.3.

7.2.5 Use of Poly Aluminium Chloride (PAC)

The quarry washing process used a flocking agent in order to improve the settlement of fines from wash water used to clean finer grades of aggregate in the central part of the site, (Catchment Area A3). The quarry described the process as – "A mixing ratio of one litre of Poly Aluminium Chloride (PAC) coagulant solution is added to a 1,000-litre water container in the wash plant (Pond K) and then this water is slowly added to the large volumes of process water being used to wash the aggregate. When operating its washes about 20 tonnes of aggregate per hour and was run for a couple of hours per week. About 25 litres of PAC was used on the site annually (about 1 litre per fortnight). The volumes are very low as not all quarried aggregate material needs to be washed. The very small quantities of coagulant are currently added to the wash water to ensure the settlement of fine particulates out of suspension after washing particular grades of the finer sand material".

All quarry wash-water was collected in Pond K and pumped up gradient from to Pond A which has a large holding capacity (~1,000m3). Typically wash water in Pond A was retained but in wet weather conditions can overflow to Pond B, which also had a large holding and dilution capacity (>870m3). Surface water from Pond B was returned back down to Pond G via a manually operated discharge valve when water was needed for onsite processes such as dust suppression, bitumen cooling and/or as wash water. This water retention in Pond A, dilution with rainfall runoff and overflow to retention Pond B ensured sediment settlement and that particulates were not re-circulated down to pond G in the lower part of Catchment Area 3.

7.2.6 Hydrogeology

The GSI has devised a system for classifying the aquifers in Ireland based on the hydrogeological characteristics of the bedrock as well as the potential size and productivity of the groundwater resource. Groundwater in Ireland is derived from open fracture or fissures in the bedrock which is identified as secondary permeability rather than groundwater coming from pores or openings in the rock fabric which is identified as primary permeability. The GSI aquifer classification depends on a number of parameters including, the aerial extent (km^2), well yield (m^3/d), specific capacity ($m^3/d/m$), aquifer transmissivity (m^2/d) & groundwater flow.

The three main GSI aquifer classifications are listed as follows:

(1) Regionally Important (R) Aquifers

(i) Karstified aquifers (**Rk**)

(ii) Fissured bedrock aquifers (**Rf**)

(iii) Extensive sand/gravel aquifers **(Rg)**

(2) Locally Important (L) Aquifers

(i) Sand/gravel (**Lg**)

(ii) Bedrock which is Generally Moderately Productive (**Lm**)

(iii) Bedrock which is Moderately Productive only in Local Zones (**Ll**)

(iv) Karstified Bedrock (**Lk**)

(3) **Poor (P) Aquifers**

(i) Bedrock which is Generally Unproductive except for Local Zones (**Pl**)

(ii) Bedrock which is Generally Unproductive (**Pu**)

The GSI classifies the Caha Mountain Formation underlying the Ardcahan Quarry area of the site, as a Poor Aquifer which is Generally Unproductive except for local zones (Pl). The Gunpoint Formation (GP) located to the south of the site is classified by the GSI as a Locally Important Aquifer which is Moderately Productive only on local zones, (Ll). Refer to the GSI On-Line Mapping Database Aquifer Mapping presented in Appendix 7.4.

7.2.7 On-Site Groundwater Well

The Ardcahan quarry has its own drinking water supply well which was drilled in the Tarmac Plant Yard area in the late 1990's. The water is used as a potable supply for the site canteen and wash water in the site's welfare facilities. Water usage is low and there have been no water supply or significant quality issues since its instillation. The well location is shown on Figure 7.1 and in Appendix 7.3.

7.2.8 Groundwater Vulnerability

The vulnerability of a groundwater body is the term used to describe the ease with which the groundwater in the area can be contaminated by human activities. The vulnerability is determined by many factors including the speed at which the contamination can enter the aquifer, the quantity of contaminants and the capacity of the deposits overlying the bedrock to attenuate contaminants.

These factors in turn are based on the type, thickness and permeability of the subsoils, e.g. groundwater in bedrock which has a thick cover of low permeability clay is less vulnerable than the groundwater in bedrock which is exposed at the surface.

It is important to note that all the bedrock extraction on the Ardcahan quarry site was done above the permanent water table and the site was operated as a 'dry' quarry in this regard, with no pumping or dewatering required to enable quarrying.

The criteria for determining groundwater vulnerability, as developed by the GSI and Department of Environmental and Local Government (DoELG), are shown in Table 7.2 below.

Table 7.2 GSI Groundwater Vulnerability Mapping Guidelines (DoELG 1999)

Vulnerability Rating	Hydrogeological Conditions				
	Subsoil Permeability (Type) & Thickness			Unsaturated Zone	Karst Features
	High Permeability (sand/gravel)	Moderate permeability (e.g. sandy subsoil)	Low permeability (e.g. clayey subsoil, clay, peat)	(sand/gravel aquifers only)	(<30m radius)
Extreme (E)	0 – 3.0m	0 – 3.0m	0 – 3.0m	0 – 3.0m	-
High (H)	>3.0m	3.0 – 10.0m	3.0 – 5.0m	>3.0m	N/A
Moderate (M)	N/A	>10.0m	5.0 – 10.0m	N/A	N/A
Low (L)	N/A	N/A	>10.0m	N/A	N/A
Notes: (1) N/A = not applicable (2) Precise permeability values cannot be given at present (3) Release point of contaminants is assumed to be 1-2m below ground surface					

Regional Groundwater Vulnerability Maps have been produced for the country by the GSI and these have six classifications. 'Extreme' and 'Extreme rock near surface' or 'karst' are those areas most at risk from contamination and mitigation measures should be put in place for their protection. Areas classified as having 'High' vulnerability are less vulnerable to contamination; however, they still need a certain measure of protection. 'Moderate' and 'Low' vulnerability areas have natural protection in place and mitigation measures do not usually need to be put in place assuming no reduction in soil thickness . In areas which have been classified as 'High-Low' only an interim study has taken place.

An Extreme Vulnerability (E) rating has been given over the whole Ardcahan study area indicating a consistent subsoil thickness cover of less than 3m. This would be expected for a quarry area and/or an area with naturally thin soil cover as is the case of the quarry site. The GSI Vulnerability Map for the locality is presented from the GSI On-Line Database is presented in Appendix 7.4.

The GSI vulnerability classification for the site did not change due to the quarrying activities completed from 1990 to 2014.

7.2.9 Groundwater Body Classification

Under the Water Framework Directive, different geological formations have been grouped into similar 'rock unit groups' (RUGs), of similar hydrogeological characteristics. The RUG in the site area including the Caha and Gun Point Formations identified as is the Devonian Old Red Sandstones, (ORS).

Large areas of these RUGs have been defined as 'groundwater bodies', the management unit for groundwater for the purposes of the Water Framework Directive. The overall status of each GWB has been assessed as either 'Good' or 'Poor' as part of the Water Framework Directive implementation work in Ireland. The Under the Water Framework Directive classification system the quality of the groundwater within the 'Bandon Groundwater Body', which includes the Bandon and Caha River Catchments was classified by the EPA as having "good status" during the, (EPA On-line Data). Pressures on groundwater quality generally arise from agricultural practices, septic tanks and industrial development. These classifications were not influenced by the quarrying activities.

7.2.10 Groundwater Flow Direction

The direction of groundwater movement is principally influenced by topography and the groundwater table is generally a subdued reflection of the ground surface. Therefore, for the Ardcahan Quarry site area the natural groundwater flow direction is expected to flow in a south to south-westerly direction towards the small stream on the southern boundary of the site and/or towards the Caha and Bandon Rivers located to the southwest.

Previous rock quality test holes drilled to 20m below ground level in the northern half of the site reportedly did not encounter much groundwater. Refer to the drilling logs in Appendix 5.3.

The groundwater level in the sites supply well, located in the eastern side of the site, has been recorded as being between one to three metres below ground level during site monitoring over the years. The recent instillation of five new groundwater monitoring locations around the site in 2025, indicates that the water is generally 2m to 4m below the ground level. The boreholes in the northern side of the site are considered to have a perched water table.

While the perched water table would have reduced as the ground height was lowered during previous quarrying work, the low permeability of the bedrock means that groundwater effects are very local and all quarrying was above the permanent saturated bedrock which is a metre or two below final floor level of the quarry works in the southwestern part of the site.

Similarly, while ground heights would have been lowered the overall topography of the site area has not changed and therefore there were no changes to the overall groundwater flow direction due to the historic quarry activities.

The recharge to the aquifer would be through the shallow soils and bedrock which given their poor permeability would be limited. The GSI On-Line Mapping Database gives an average recharge value of 51 to 100mm/yr as presented in Appendix 7.4.

There are no changes to the site groundwater flow direction or natural water table due to the quarry activities from 1990 to 2014. Similarly the GSI recharge value for the site will not have changed due to the quarrying activities completed on the site, as the bedrock was always close to the surface.

7.2.11 Water Balance & Runoff

Noting the pre-1963 origins of the site, the 1990 to 2014 Substitute Consent excavation area covers approximately six hectares, the majority of which is in the western and southwestern portions of the site. Given the topography of this portion of the site nearly all rainfall precipitation that falls in this area will flow towards the low-lying southwestern corner as runoff with some limited percolation to ground. This runoff scenario has not changed in this part of the site due to the completed quarrying as the soil cover, topography, catchment areas and overall flow direction characteristics will not have been changed.

The annual rainfall in this part of the Ireland is given by Met Eireann as being between in the order of 1,200 to 1,400 mm and an average annual rainfall (AAR) of 1,243mm/yr is given for the Dunmanway area. Data from the GSI gives an effective evaporation value for the south of Ireland as 486mm/yr giving an effective annual precipitation of 757mm/yr. Percolation to ground in terms of aquifer recharge of a Poor Bedrock Aquifer (Pl) is given by the GSI as 100mm/yr therefore the majority of the effective rainfall will collect on the site as surface water which will pond on the quarry floor and flow to the existing surface water ponds, (identified as Ponds I & J) in the southwestern corner of the site.

The Meteorological Department of Ireland (Met Eireann) have rainfall profiles in the form of a Depth-Duration-Frequency (DDF) model for any location in Ireland. A depth duration frequency model allows for the estimation of point rainfall frequencies for a range of durations for any location in Ireland. The model consists of an index (median) rainfall and a log-logistic growth curve which provides a multiplier of the index rainfall. Rainfall station data were analysed and an index rainfall extracted. Computer applications were written to apply the model and produce outputs of the return period rainfalls (Fitzgerald, 2007).

Met Eireann were contacted to get the rainfall profile at the site location (Irish Grid: Easting: 124723, Northing: 55805). The DDF table is included in the Appendix 8.5. The rainfall amount (mm) resulting from a 6 hours storm is identified as 31.1mm. 59.1mm and 72.3mm for the 1 year, 30 years and 100 years return periods respectively.

The original quarry site and Substitute Consent excavated area will have similar run-off characteristics. The runoff calculation method used was the Rational Formula in the form Q=2.78CiA (National Coal Board, 1982). The Rational Formula assumes the flow (Q) is a function of the permeability and slope of the land surface (C), the rainfall intensity (i) and the area of the land (A).

The coefficient of runoff 'C' depends on the type of land use, slope of the site and type of soil. The current land use quarry area with soil type classified as Winter Rain Acceptance Potential 5 (WRAP 5) which represents low rainfall acceptance and high runoff potential, (classification as per Flood Studies Report). The slope across the site is variable but has generally been reduced by the completed excavation works. The post development landform is variable but similar to the original runoff characteristics of the area. The 'C' coefficient value for the pre and post development stage was taken to be in the order of 0.7 which is a conservative value representing reasonably impermeable ground, low rainfall acceptance and high runoff potential.

The estimated runoff volume for 1, 30 and 100 year return period is presented in Table 7.3.

Table 7.3 Volume estimates of pre and post development runoff from a six hectare site area.

Return Period (year)	6 hrs Rainfall (mm)	Pre Development		Post development		Change in Attenuated Volume (m^3)
		Peak Runoff (l/s)	Run-off Volume (m^3)	Peak Runoff (l/s)	Run-off Volume (m^3)	
1	31.1	61	1307	61	1307	0
30	59.1	115	2484	115	2484	0
100	72.3	141	3039	141	3039	0

The surface water attenuation system that was in place in the southwestern portion of the site is a water settlement and attenuation pond area in the bottom corner of this area. The pond is triangular in shape and has a berm on the two down gradient sides and is open to the existing quarry floor on the up-gradient side. This allows surface water to easily runoff to the pond and the water level and size of the pond to increase and decrease as the amount of runoff changes. The area that this attenuation pond services includes the established quarry floor, the access road and majority of the substitute consent excavation area. The photographic evidence would suggest that these attenuation and settlement ponds (Ponds I & J) were established in this corner of the site in the late 1990's when quarrying activities commenced up-gradient of this area.

Down gradient from the discharge from Ponds I & J in the south-western corner of the site there is a low-lying boggy area of land on the edge of a level field located on the north side of the access road near the main gate of the site. Drainage under the quarry's access road in this area allows surface water to drain to the small water course before it goes under the public road and flows south westwards towards the River Bandon. This discharge to the stream is likely to have been in existence as a drainage point for the low-lying lands in the southwestern part of the site before the quarry development.

7.2.12 Flooding Risk

The Office of Public Works (OPW) website database on the national flood hazard mapping was reviewed and two historical flooding events were found to be registered in proximity (<1km distance) to the site. OPW records from Feb 1991 and Feb 2007 show flooding of the road at the Inchacuhan Cross Roads and in the Ardcahan Bridge area.

No detailed flood assessment data is available for the Bandon River near the site area and no 'benefitting lands' or 'drainage districts' have been identified by the OPW adjacent to the site. An OPW drainage scheme is in place for the Bandon River Channel about 2km downstream of the site near the Long Bridge east of Dunmanway. The OPW flood record data for the Ardcahan Bridge is presented in Appendix 7.6.

The OPW Flood Mapping shows that the Ardcahan Quarry does not form any part of the flood plain for the Caha or Bandon River systems and no part of the proposed development is in a flood risk area or has any history of flooding.

The similar nature of the permeability of the shallow bedrock before and after excavation means that the characteristics of runoff from the site before and after development will not be that different and in fact permeability to ground may increase post quarrying.

The scale of the site (0.25km^2) and the adjacent stream catchment (~1km^2) with regard to the Caha and Upper Bandon river catchment areas above the Ardcahan Bridge (~100km^2) and over all Bandon River catchment (~400km^2) means that the potential for any site runoff to increase the flooding potential in the system would be considered extremely low to negligible. Flood risk is further mitigated by the capacity of the natural ponds and sites settlement ponds to reduce peak storm water runoff from the site. It is considered that the flood risk from the site did not change due to the quarrying activities completed from 1990 to 2014.

7.2.13 Areas of Scientific Interest

A review of the EPA and National Park & Wildlife Service (NPWS) on-line databases has shown that the Bandon River is designated as a Special Areas of Conservation (SAC - Ref No. 002721). The small boundary stream is part of the SAC from where the bridge on the public road near the quarry access gate which is located approximately 40m to the west of the site.

The Dunmanway Bandon River Valley southeast of Dunmanway Town is a designated proposed National Heritage Area (NHA) and is located approximately 3km south of the site. The ecological aspects of the site are discussed in more detail in Chapter 12 – Biodiversity.

7.2.14 Surface Water Quality

Information on the Surface Water Quality of the local boundary stream and River Bandon downstream of the site are presented and discussed in Chapter 12 – Biodiversity.

7.2.15 Surface Water Abstractions & Licensed Facilities

According to the online EPA database, no portion of the Caha or Bandon Rivers in the vicinity (>10km) of the site are identified as a drinking water abstraction resource.

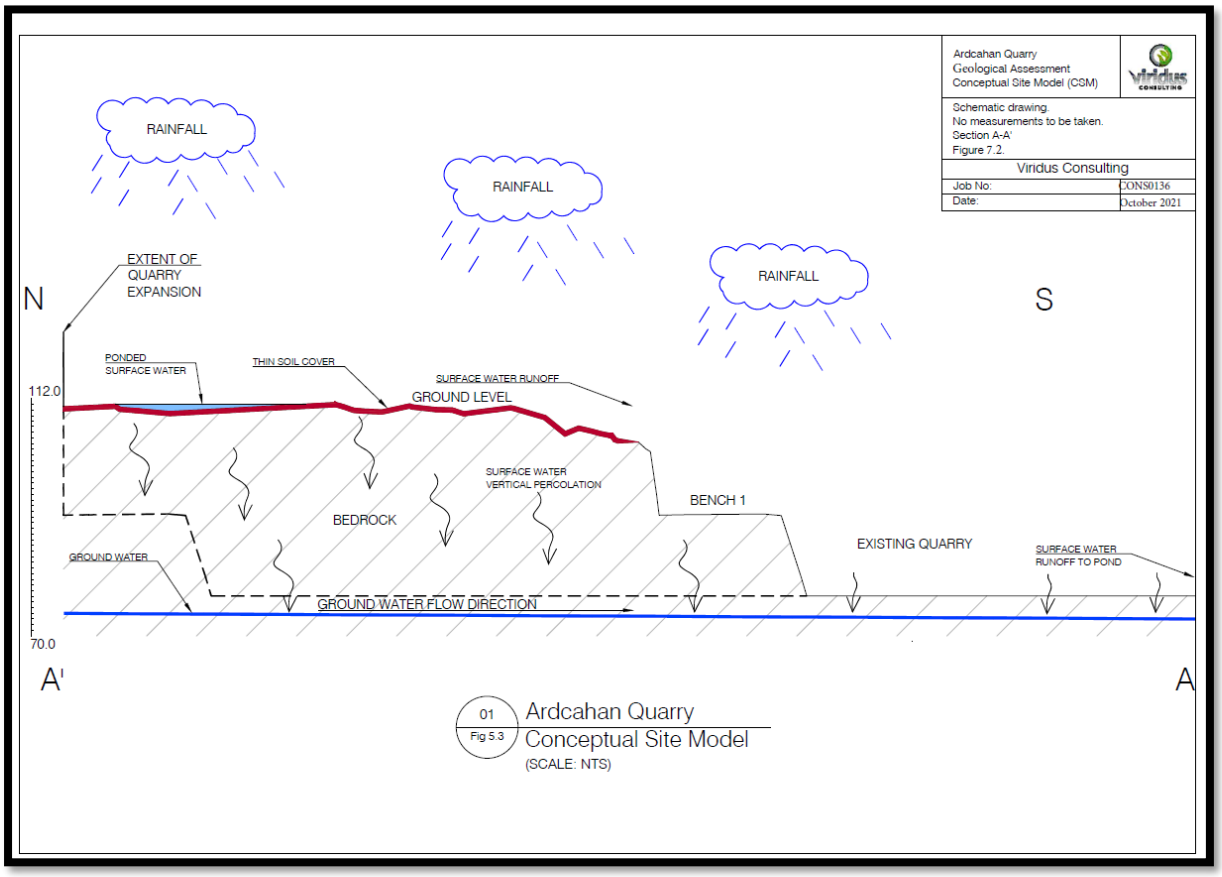
There is an active IPPC license on the Bandon River granted to Carbery Milk Product Ltd., (EPA Ref PO-390-04) which is located over 5km downstream of the site.

7.2.16 Conceptual Site Model

As per the IGI Guidance recommendations a Conceptual Site Model (CSM) has been conceived for the site examining the interaction of the project with the water environment.

An interpreted cross section of the site showing the context of the geological and hydrogeological regimes for the quarry are presented in Figure 7.3. The cross section forms an important part of the 'Conceptual Site Model (CSM) for the site.

Figure 7.3 Conceptual Site Model – Diagrammatic Quarry Cross Section



7.2.17 Type of Land and Soil/Geological Environment

As per Step 3 of the IGI Guidelines the baseline information and CSM enables the type of soil/geological and hydrogeological environment to be determined. From the range of generic environments outlined in the IGI document (Types A to E) the Ardcahan Quarry site is interpreted to have a:

Type A - Passive geological/hydrogeological environment.

This is based on the fact that the area is underlain by a poor aquifer which is dominantly a recharge area with a historically stable geological environment.

7.3 Impact Assessment

The potential impacts of the Ardcahan quarry expansion from 1990 to 2014 on the hydrological and hydrogeological regime are primarily short-term runoff related pollution risks during site development and rock blasting, excavation and aggregate preparation works with longer term changes in site topography and drainage which could affect the long-term surface water runoff characteristics and aquifer vulnerability.

The quarrying removed the thin soils cover, where present, over the site area which given its lack of depth, did not greatly increase the vulnerability of the groundwater to surface contamination or change the vulnerability classification for the site. The blasting, rock crushing and aggregate production creates the potential for dust generation in dry weather and fine suspended sediments in wet weather. If not managed these could impact the local environment and adjacent water courses.

Given that there were no physical changes to, or quarrying works in, the boundary stream and the fact that there is already a large area of established quarry floor above the groundwater table and no excavation below the groundwater table was completed, , no further site investigations or studies, as outlined in the 2nd Element and summarised in Figure 2 of the IGI Guidelines, are deemed necessary before the potential nature of the impact of the Substitute Consent quarry development can be determined.

7.3.1 Criteria for Rating Site Importance – Water Attributes

For rating the Site Importance of the hydrological attributes, the guidance follows the NRA use of five importance criteria – Extremely High, Very High, High, Medium and Low depending on the attribute quality. (The methodology and rating criteria are as per the NRA EIS Hydrology Assessment guidelines document, (2007).

The water attributes that are relevant to Ardcahan Quarry site are the underlying groundwater aquifer, the small watercourse that forms the boundary stream on the eastern and southern boundaries and also the River Bandon, as the boundary stream is a small tributary of it. The site importance criteria, with examples, are applied to the Ardcahan Quarry site in Table 7.4.

Table 7.4 Criteria for rating Site Importance for Water Elements at EIS stage.

Importance	Criteria	Typical Example	Ardcahan Quarry Site
Extremely High	Attribute has a high quality or value on an international scale.	River, wetland or surface water body ecosystem protected by E.U Legislation e.g. Salmonoid River or SAC/SPA	Yes – the River Bandon SAC, which is downstream and in hydrological connection to the site.
Very High	Attribute has a high quality or value on a regional or national scale.	River, Wetland or Surface Water body ecosystem protected by national legislation e.g. pNHA, Regionally Important Aquifer with multiple wells, Potable Water Supply >2500 homes	No – River Bandon has a extremely high importance as an SAC with pearl mussel population.
High	Attribute has a high quality or value on a local scale	Salmon Fishery, Regionally Important Aquifer, Potable Water Supplying >1000 homes.	Yes – Boundary Stream would support trout with a high water quality River Bandon is a Salmon River System.

Medium	Attribute has a medium quality or value on a local scale	Coarse Fishery, Locally Important Aquifer Local potable water supply to >50 homes.	No – higher surface water values and lower aquifer importance.
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer Local potable supply <50 home.	Yes – Poor bedrock Aquifer

As per the relevant guidelines for hydrogeological attributes the bedrock aquifer classification of Poor, gives the site a groundwater rating of Low Importance.

The small boundary stream would be an attribute of High Importance as the stream is likely supporting juvenile trout and other fish species, (such as eel, brook lamprey, etc), and it is also part of the designated River Bandon SAC and important salmonoid and pearl mussel river system. The start of the SAC in the stream is at the point where the public road crosses it, which is located about 40m downstream of the south western corner of the quarry site.

7.3.1.1 Impact Assessment Methodology

An analysis of the predicted impacts or effect of the completed quarrying on the water attributes during the quarrying, as per Annex IV of Directive 2014/52/EU, EPA EIAR Guidance Documents, (2022 & 2017), NRA Guidance (2008/9) and Appendix C of the IGI EIS Preparation Guidelines (IGI 2013), is presented in the following section.

The impact assessment was undertaken using the following considerations:

- Quality of an Impact: Described as being Positive, Neutral or Negative where:
- Positive Effects = ones which improve the quality of the environment.
- Neutral Effect = represents no effects or effects that are imperceptible.
- Negative/Adverse Effects= change which reduces the quality of the environment.
- Duration of Impacts: The duration of each impact was considered to be either temporary, short-term, medium-term, long-term or a permanent impact. Temporary impacts are considered to be those which are construction related and last less than one year. Short term impacts were seen as lasting one to seven years. Medium-term impacts are those lasting seven to 15 years. Long-term impacts last 15 to 60 years and permanent impacts are anticipated to last over 60 years.
- Magnitude of an Impact:

The rating of the potential magnitude and significance of impacts at EIA stage on the Water Attribute are defined by the NRA guidance (2008 – Boxes 5.2 & 5.3), which includes typical examples, as outlined in Table 7.5

Table 7.5 Criteria for rating Hydrology and Hydrogeology impact magnitude at EIS stage.

Impact Magnitude	Criteria	Typical Example
Large Adverse	Results in loss of attribute and/or quality and integrity of attribute	Loss or extensive change to a water body or dependent habitat. Increase of predicted flood level >100mm. Removal of large proportion of aquifer, or changes to aquifer resulting in extensive change to existing water supply or river base flow. Extensive loss of fishery or high risk of pollution to surface or groundwater from routine runoff.
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Moderate loss or change to a water body or dependent habitat. Increase of predicted flood level >50mm. Removal of moderate proportion of aquifer, or changes to aquifer resulting in moderate change to existing water supply systems or river base flow. Moderate loss of fishery or medium risk of pollution to surface or groundwater from routine runoff.
Small Adverse	Results in minor impact on integrity or attribute or loss of small part of attribute	Small loss or change to a water body or water dependent habitat. Increase of predicted flood level >10mm. Removal of small proportion of aquifer, or changes to aquifer resulting in small change to existing water supply systems or river base flow. Minor loss of fishery or potential low risk of pollution to surface or groundwater from routine runoff.
Negligible	Results in an impact on attribute but insignificant magnitude to affect either use or integrity	No measurable changes in attributes. Negligible change in predicted peak flood level. Risk of serious pollution incident <0.5% annually.

(After Table C4 of the IGI 2013 and NRA 2008 Guidelines),

The magnitude of each impact is considered from negligible to large. Negligible impacts are effects that result in an impact on an attribute but of insufficient magnitude to affect either its use or integrity. A major impact results in the significant loss of an attribute and/or quality and integrity of an attribute.

The potential impact magnitude of the quarry development would be considered to be 'Negligible' for the water attributes as there have been no measurable or physical changes to the hydrological characteristics of the local boundary stream in terms of flood risk or water quality and there has been no quarry below the groundwater table or changes to the groundwater table which is in a Poor Aquifer bedrock type.

- **Significance of an Impact:** The significance of each impact was considered as having an Imperceptible, Not Significant, Slight, Moderate, Significant, Very Significant or Profound effect.

The descriptions of the 'Significance of an Impact' used are as presented in the EPA EIAR Draft Guidelines 2017 – Section 3 Table 3.3 Page 50 as shown in Table 7.6. (The word 'effect' is used interchangeably with the word 'impact' in the EPA EIAR guidelines).

Table 7.6 Describing the Significance and Quality of Potential Effects for EIARs.

Significance of Effect	Criteria	Quality
Imperceptible	An effect capable of measurement but without significant consequences.	Positive/Negative/Neutral
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.	Positive/Negative/Neutral
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.	Positive/Negative/Neutral
Moderate	An effect that alters the character of the environment in a manner which is consistent with existing and emerging trends.	Positive or Negative
Significant	An effect which by its character magnitude duration or intensity alters most of a sensitive aspect of the environment.	Positive or Negative
Very Significant	An effect which by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.	Positive or Negative
Profound	An effect which obliterates sensitive characteristics	Negative Only

The rating of potential environmental impacts on the hydrological and hydrogeological (Water) environment can also be assessed based on the matrix presented in Table 7.7, which takes account of both the importance of an attribute and the magnitude of the potential environmental impacts of the proposed development on it. The criteria apply to potential impacts during both the development and operational phases of the project.

Table 7.7 Rating of Significant Environmental Impacts at EIA Stage***

		Magnitude of Impact (Table 7.5)			
		Negligible	**Small Adverse**	**Moderate Adverse**	**Large Adverse**
Importance of Attribute (Table 7.4)	**Extremely High**	Imperceptible	Significant	Profound	Profound
	Very High	Imperceptible	Moderate/ Significant	Significant/Profound	Profound
	High	Imperceptible	Slight/Moderate	Moderate/Significant	Significant/Profound
	Medium	Imperceptible	Slight/Not Significant	Moderate	Significant
	Low	Imperceptible	Imperceptible	Slight	Slight/Moderate

(***Based on NRA Guidelines (2009) – Box 5.4 Page 106).

- **Type of Impact:** These are described as 'Do Nothing', Construction, Operational, Cumulative, Synergistic or 'Worse Case' scenarios, which look at Major Accident Risks. (These are examined in Section 7.4).

7.3.2 Do Nothing Scenario

The 'Doing Nothing' Scenario may have resulted in no quarrying at the site from 1990 to 2014, assuming no other land use or activity occurred instead, this would have reduced the potential risk of suspended particles or contamination due to the quarry operation from impacting the water environment. It is still possible that the Tarmac Plant or similar development may have gone ahead on the old quarry site.

The supply of road aggregate suitable as road surfacing material to the local county councils and contractors would have to be supplied by other either existing or new quarry locations the development or expansion of which may create more significant environmental impacts at other locations in the region.

7.3.3 Construction Phase

Construction activities for the 1990 to 2014 period included some site clearance and the excavation of the shallow soil cover in new quarry areas, the creation of some of the internal roads in the northern part of the site, some of the internal earthen berms, new settlement ponds and the internal quarry water PAC treatment and internal process water supply infrastructure.

Low volumes of soil material, due to its limited depth and extent, were generated by the quarry development. Soils were used to create berms for road edges, ponds or stockpiled for future landscaping use, as necessary. The risk of suspended sediment to arise from this material was limited by the small areas of soil material exposed, the placement of excavated material a long way away from the boundary stream and the quick re-vegetation of any soil material.

While the soil removal will have increased the exposure and vulnerability of the bedrock to surface contamination the thin nature of the original soil means that the increase is not significant and the vulnerability classification of the area, as defined by the GSI, was not changed by the activity.

The creation of the sites surface water management ponds would have positively impacted on the hydrological environmental as they enabled attenuation and control of silty water, the re-use and re-circulation of water on the site, the reduction in peak flow runoff after heavy rainfall and the improvement of the natural aquatic biodiversity of the locality.

The impact of the soil removal and creation of the surface water ponds would be long term to permanent depending on how the site is reinstated but given the low magnitude of the change in vulnerability of the bedrock, site drainage and runoff characteristics it would be considered to have a neutral quality impact.

7.3.4 Operational Phase

Quarrying activities can pose a significant risk to watercourses with uncontrolled surface water runoff from quarry activities, rock crushing and screening, stockpiling of aggregate, water management and discharges from settlement ponds as well as transport of materials to and from site in road going vehicles.

Impacts on the adjacent boundary stream and local environmental that could have occurred during the quarry operation from:

- Ammonia: Used in quarry blasting residual ammonia products remaining in the rock mass can leach to surface waters and impact on the chemical balance and water quality. Good blast management and control of materials can greatly reduce or eliminate this risk. Any potential impact would be short term and periodic as blasting activity was limited to annual or bi-annua events.
- Silt/Clay: Elevated fine sediment silt/clay loading in surface water discharge may result from aggregate crushing, stock piling and washing activities. All wash water is discharged to the settlement ponds A and B and water is re-cycled through Ponds K and G. The quarry operated a water treatment system using chemical flocs, which accelerated the settlement of fine particulates in Ponds A & B. The active quarry area in the southwestern part of the site has a down gradient surface water attenuation system with Ponds I and J. The risk of elevated sediment runoff existed from the quarry area during periods of heavy and persistent rainfall. Concentrations of suspended solids would be reduced by the attenuation ponds with impacts being temporary to short term with very fine particulate material not settling out in higher stream and river flows that accompany heavy rain.

- Hydrocarbons: Accidental spillages or leaks from quarry machinery, equipment and storage depots. All fuels are bunded on site and equipment refuelled in designated areas. No losses or leaks of hydrocarbons were reported arising from the quarry during its operations.
- Surface water runoff from hard standing areas is likely to contain mild diffuse contamination in the form of hydrocarbons or silt. This risk is reduced by the use of attenuation ponds such as F, G, L, I and J to retain water, allow sediment settlement and dilution of any pollutants.
- Faecal coliforms: Contamination risk from on-site toilet and washing facilities is negated by the instillation of a septic tank and percolation area.

Any of these impacts would have been temporary to short term with a longer term cumulative effect.

Assessment of the local stream and Bandon River directly below the quarry do not show any significant biological or physical impacts to the surface water environment. Refer to Chapter 12 – Biodiversity.

7.3.5 Risk of Major Accidents and Disasters

In terms of the water attributes the 'Worse Case Scenario' Environmental Impact would probably relate to accidents around fuel losses, which would impact soils or bedrock and ultimately create a risk to the underling aquifer and local watercourse. The original quarry used mobile plant to refuel machines. The Tarmac Plant installed above ground fuel storage tanks that are fully bunded. Therefore the potential volume of fuel loss from quarry equipment and machinery being used on the site would have been relatively small, in the 10's rather than 1000's of liters. The duration of any impact would be considered to be temporary to short term.

No spills or incidents are reported to have occurred during the operation of the quarry in the past and water quality testing has not identified any evidence of historic spills occurring.

7.3.6 Cumulative Impacts

The site is located in a rural area with little or no residential infrastructure and housing around it. There are no similar projects in the locality which involve the removal of soil and bedrock material on any large scale. The other activities that are ongoing in the immediate vicinity of the quarry site or near the small boundary watercourse include the sites tarmacadam plant and livestock farming.

The operation of the adjacent tarmac plant uses quarry rock aggregate and tar materials for its process which pose a risk to the local surface water environment. The eastern end of the quarry is occupied by the plant buildings, aggregate storage, sludge disposal area and associated hard standing and administration area. The northern area drains to the local stream via a shallow ditch adjacent to an internal access road (Location 02) while the hard standing area drains to the stream via three sediment traps and a small concrete interceptor (Location 03). The plant area has no attenuation pond system as there is not enough room to accommodate one in this part of the site. There are ponds near the tarmac building of the west of the admin buildings which discharge to the stream, (Location 04).

There was a risk of a cumulative effect from elevated suspended sediment arising during rainfall events from the tarmac plant and impacting the boundary stream and Bandon River.

The fine waste sludge material from the tarmac plant operation is deposited in a spoil heap on the south eastern part of the site and while there is a level buffer area and an old earthen ditch/hedge-line between the base of the sludge material and the stream there would be a potentially significant impact if the slope was to collapse or fail and inundate the watercourse.

The intensification of agricultural activity in the lands to the south and east of the site area over the last two decades are likely to pose a long-term cumulative risk in contributing potential sediment and nutrient runoff to the small local watercourse and Bandon River system. The management of fertilizer applications, clearance of areas of scrub and the vegetated riparian zone adjacent to the stream to increase the areas of grass growth for silage and livestock as well as the direct access that livestock have to the bed of the stream for drinking water, pose a very high risk and potential cumulative impact on the water quality of the small stream in areas upstream, adjacent to and downstream of the site.

Adherence to good agricultural practices and the fencing of the river to prevent livestock access would help mitigate these potential long term diffuse and point load impacts into the future.

There are no other new residential, forestry or other potential developments known about for the local area or the local catchment of the small watercourse that the quarry site is part of.

7.4 Remedial Measures

7.4.1 Development and Operational Phases

Cleared unconsolidated soil material was used in the construction of shallow berms and stored in the norther part of the site as material for future areas of backfilling and landscaping where required. No soil or aggregate is stored near the local watercourse.

Proper blast design and implementation minimised the risk of ammonia or other chemicals entering the local environment.

The potential for fuel spills or leaks to occur from site machinery was reduced by the implementation of good management good practices including adequate bunding for storage containers, refuelling in designated areas and regular plant maintenance.

All fuel storage areas on the site were sufficiently bunded and any mobile bowers used on site would have been in good condition. Good housekeeping (site clean-ups, use of disposal bins, etc.) around the site and proper use of storage and disposal facilities for lubricants fuels and oils were used.

Very small quantities of Poly Aluminium Chloride (PAC) solution used to be added to the wash water to ensure the settlement of fine particulates out of suspension. This wash water was pumped up gradient into Pond A which had a large capacity and could also overflow to Pond B if necessary, which ensured sediment settlement and that no particulates were re-circulated down to the ponds in the lower part of Catchment Area 3. Refer to Appendix 7.2 for the detailed catchment map and ponds.

As far as possible surface water was re-used and recycled on the site. Water was pumped from Pond C to Pond K for the washer plant and water was released from Pond B to Pond G if required. Water from Pond G was also used in dust suppression on the quarry floor and water could be pumped from Pond C to Pond K and/or Pond B if additional water was required in this area of the quarry.

It should be noted that the fine sediments that originate from rock this type of sandstone quarry are dominated by quartz rich fine sands and silts which tend to settle out of the water column more quickly than the very fine colloidal clay particulates associated with soil earth works and construction sites. The use of PAC flocculate helped ensure that any fine particulates from the washing activities, were rapidly taken out of suspension when discharged into Pond A.

7.4.2 Monitoring

There are no historic environmental monitoring records available for the quarry area.

In more recent times the site has periodically sampled the on-site groundwater well and local stream to access its chemical quality. Similarly biological Q-Rating assessment of the local stream has been completed for previous EIA assessments and planning applications. The results have not indicated any significant impact on the local surface water environment from previous quarry works.

7.5 Statement of the Significant Effects on the Environment

There is no evidence that significant effects on the environment have occurred or continue to occur on the Water Attributes due to the quarrying activities completed at the Ardcahan site in the 1990 to 2014 period.

In accordance the relevant legislation an assessment of the past effects, current effects and possible future effects or residual impacts and the associated mitigation measures applied during the operation of the Ardcahan Quarry from 1990 to 2014 are presented in Table 7.8.

7.5.1 Residual Impacts

There is no evidence of significant sediment transport or impact occurring to the local watercourses although the quarry has pre-1963 origins and was in operation for decades prior to the cessation of activity in 2014.

Table 7.8 Water (Hydrology & Hydrogeology Attributes) Assessment of Effects for Ardcahan Quarry Expansion Substitute Consent

Impact Assessment	Effects	Mitigation Applied During Work	Likelihood of Significant Effects	Remediation Measures Required	Residual Effects
i) Effects that have occurred, (Retrospective Assessment)	Changes to drainage pattern/topography.	Creation of attenuation and settlement ponds.	No changes to local catchment area and minor volumes of water in terms of regional catchment – low likelihood of significant effects.	Those applied during site operation	Imperceptible
	Suspended Sediment or Contaminated Water Runoff Risk	Control of surface water runoff in ponds and use of PAC on sediment rich wash water.	Limited risk of elevated suspended sediment - low likelihood of significant effects.	Those applied during site operation	
ii) Effects that are occurring or ongoing.	Direct discharges to local stream at a number of locations.	Site runoff to local stream via attenuation ponds from quarry area.	Low likelihood of significant effects.	Regular monitoring of local stream	Imperceptible
	Tarmac Plant Operation	Fuel bunds & silt traps in use	Low to medium likelihood of significant effects.	Enhanced environmental management and new interceptor.	
iii) Effects that may be reasonably expected to occur	<u>If Quarrying Continues</u> Sediment generation	Implementation and improvement of environmental management measures for runoff attenuation.	Low likelihood of significant effects.	Water management including treatment and re-use/re-circulation and attenuation ponds to reduce potential for water contamination by fuels and sediment to occur.	Imperceptible
	Fuel Storage	Best practice applied for fuel storage and management in quarry and tarmac plant areas.		A new interceptor installed on outflow from Pond L in the central quarry area.	
	Site Restoration	Implementation of site restoration plan including pond enhancement	Low likelihood of significant effects	Pond management including long term landscaping & enhancement.	
	<u>If Quarrying Stops</u> Site closure	Implementation of environmental management measures during site closure.	Low likelihood of significant effects.	Landscaping of pond features and retention of ponds for biodiversity.	Imperceptible

7.6 References

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Murray Brothers Tarmacadam Ltd

CHAPTER 8
AIR QUALITY

VOLUME II
MAIN STATEMENT

FEBRUARY 2026

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8 Air Quality

8.1 Introduction

This chapter assesses the likely air quality impacts associated with historical quarrying extraction activities at Ardcahan Quarry, Co. Cork. A full description of the development can be found in Chapter 3.

The subject site encompasses a total area of approximately 25 hectares (ha). Historical excavation, and the area that is the focus of this application, was undertaken within a c. 5.2 ha area. The site is located within the townland of Ardcahan, approximately 3.5km north-east of Dunmanway in West Cork. The site is situated off the L4621-9 local road ('Hospital Road'), approximately 300m east of its junction with the R587 regional road, which links Dunmanway and Macroom.

For the purposes of this assessment, quarrying activities over the period 1990 until 2014 have been assessed.

8.1.1 Author Information and Competency

This chapter was completed by Ciara Nolan. Ciara is a Principal Environmental Consultant in the Air Quality & Climate section of AWN Consulting. She holds a BSc in Energy Systems Engineering from University College Dublin and has also completed an MSc in Applied Environmental Science at UCD. She is a Member of the Institute of Air Quality Management (MIAQM) and the Institution of Environmental Sciences (MIEnvSc). She has over 9 years of experience in undertaking air quality and climate assessments. She has prepared air quality and climate impact assessments as part of EIARs for residential developments including Woodbrook, Shankill (Planning Application Ref. ABP30584419), Ballygossan Park, Skerries (Planning Application Ref. LRD0010/S3), SHD Ratoath (Planning Application Ref. SH305196), SHD Rathmullen, Drogheda (Planning Application Ref. SH305552), commercial and industrial developments by Dublin Airport Authority, Abbvie, Mountpark, Pfizer, Takeda, as well as renewable energy developments such as Crockahenny Windfarm, Upperchurch Windfarm, Knocknamona Windfarm and Keerglen Windfarm. She also specialises in conducting air dispersion modelling assessments of emissions from data centres, energy centres and the chemical industry as part of EPA Industrial Emissions Licences for Echelon DC, AWS, Takeda, MSD and Regeneron. She has undertaken air quality and climate impact assessments for transportation schemes, primarily regional and national road schemes, from constraints, through to route selection and EIAR stage.

8.1.2 Aspects Relevant to this Assessment

Due to the nature of the development as a quarry, there were no specific significant construction works required. The primary impacts to air quality have occurred due to operational activities such as extraction of materials; screening, crushing, and processing of materials; and movement of vehicles on site which have the potential to release dust and particulate matter (PM_{10} and $PM_{2.5}$) emissions.

Engine emissions from vehicles accessing the site have the potential to impact air quality through the release of nitrogen dioxide (NO_2) and particulate matter (as PM_{10} and $PM_{2.5}$) emissions.

The baseline environment has been prepared with reference to published air quality data from the Environmental Protection Agency (EPA) and Met Éireann. For the purposes of this assessment, while the activities assessed have occurred over the past decades, until quarrying ceased in 2014, impacts have been assessed against the most recently published air quality guidance and policies which are likely more stringent than historical policies from previous years. Therefore if it can be determined that, based on the most recent standards, no significant effects occurred as a result of the development then it is unlikely that significant impacts occurred based on historical standards.

8.1.3 Guidelines & Legislation Relevant to Discipline

The principal guidance and best practice documents used to inform the assessment of potential impacts on air quality are summarised below.

- PE-ENV-01106: Air Quality Assessment of Specified Infrastructure Projects (Transport Infrastructure Ireland (TII), 2022);
- Air Dispersion Modelling from Industrial Installations Guidance Note (AG4) (EPA, 2020); and
- Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition (Periodically Updated) (USEPA, 1986).

In addition to specific air quality guidance documents, the following guidelines were considered and consulted in the preparation of this chapter:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018); and
- Environmental Impact Assessment (EIA) Directive Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission, 2017).

While there is no specific guidance available in relation to the preparation of an rEIAR, it is therefore considered appropriate to refer to the Act, the Planning and Development regulations as well as to the general guidance on carrying out and assessing EIAR.

Under section 177F of The Act, a remedial EIAR must contain;

(a) a statement of the significant effects, if any, on the environment, which have occurred or which are occurring or which can reasonably be expected to occur because the development the subject of the application for substitute consent was carried out;

(b) details of—

(i) any appropriate remedial measures undertaken or proposed to be undertaken by the applicant for substitute consent to remedy any significant adverse effects on the environment;

(ii) the period of time within which any proposed remedial measures shall be carried out by or on behalf of the applicant;

(c) such information as may be prescribed under section 177N.

As per section 177F of the Planning and Development regulations a statement on the 'Significant Effects on the Environment' is included within Section 8.6 of this rEIAR.

8.1.4 Development Plans

The Cork County Development Plan 2014 (Cork County Council, 2014) sets out specific objectives in relation the air quality. Air quality is currently monitored at several locations within County Cork, including stations that are within the Cork City Council area. Data from the EPA (EPA, 2020) suggests that there is a good level of air quality within Cork county and city. The Cork County Development Plan objective in relation to air quality is Objective GI 12-1 Air Quality;

> *"Monitor air quality and air quality trends in accordance with EU policy directives and take appropriate action where required including the provision of additional air quality monitoring infrastructure".*

Air quality is covered in Section 15.10 of the Cork County Development Plan 2022 – 2028. The plan states that poor air quality is a health risk in both rural and urban environments. Point 15.10.2 states:

> "*Cork County Council will have regard to European Union, National and Regional policy in all matters relating to air quality and, where appropriate, take steps to reduce the effects of air pollution on people and the environment."*

Objective BE 15-12 (c) is of relevance to the assessment and states:

"Air emissions associated with all new development are to be in line with Environmental Quality Standards as set out in the Air Quality Standards Regulations 2011, or any updated/superseding documents."

8.2 Methodology

8.2.1 Criteria for Rating Impacts

The rating of potential environmental effects of the development on air quality is based on the criteria presented in Table 3.3 of the EPA (2022) document titled *Guidelines on the Information to Be Contained in Environmental Impact Assessment Reports*. These criteria consider the quality, significance, duration and types of effect characteristics identified.

8.2.1.1 Ambient Air Quality Standards

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values.

In 1996, the Air Quality Framework Directive (96/62/EC) was published. This Directive was transposed into Irish law by the Environmental Protection Agency Act 1992 (Ambient Air Quality Assessment and Management) Regulations 1999. The Directive was followed by four Daughter Directives, which set out limit values for specific pollutants:

- The first Daughter Directive (1999/30/EC) addresses sulphur dioxide, oxides of nitrogen, particulate matter and lead;
- The second Daughter Directive (2000/69/EC) addresses carbon monoxide and benzene. The first two Daughter Directives were transposed into Irish law by the Air Quality Standards Regulations 2002 (SI No. 271 of 2002);
- The third Daughter Directive, Council Directive (2002/3/EC) relating to ozone was published in 2002 and was transposed into Irish law by the Ozone in Ambient Air Regulations 2004 (SI No. 53 of 2004); and,
- The fourth Daughter Directive , published in 2004, relates to polyaromatic hydrocarbons (PAHs), arsenic, nickel, cadmium and mercury in ambient air and was transposed into Irish law by the Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations, 2009 (S.I. No. 58 of 2009).

The Air Quality Framework Directive and the first three Daughter Directives have been replaced by the Clean Air for Europe (CAFE) Directive (Directive 2008/50/EC on ambient air quality), which encompasses the following elements:

- The merging of most of the existing legislation into a single Directive (except for the Fourth Daughter Directive) with no change to existing air quality objectives;
- New air quality objectives for particulate matter less than 2.5 micrometers (µm) referred to as $PM_{2.5}$ including the limit value and exposure concentration reduction target;
- The possibility to discount natural sources of pollution when assessing compliance against limit values; and,
- The possibility for time extensions of three years for particulate matter less than 10µm (PM_{10}) or up to five years (nitrogen dioxide, benzene) for complying with limit values, based on conditions and the assessment by the European Commission.

The CAFE Directive was transposed into Irish legislation by the Ambient Air Quality Standards Regulations 2022 (S.I. No. 739/2022). These regulations supersede the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011), which previously superseded the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004), and the Ambient Air Quality Assessment and Management Regulations 1999 (S.I. No. 33 of 1999).

The Air Quality Standards Regulations 2022, which incorporate EU Directive 2008/50/EC, set similar or more stringent limit values in relation to the air pollutants outlined in the previous directives and also set limit values in relation to $PM_{2.5}$.

In October 2024 the EU formally adopted Directive (EU) 2024/2881 *of the European Parliament and of the Council of 23 October 2024 on ambient air quality and cleaner air for Europe (recast)*. This Directive supersedes EU Directive 2008/50/EC and sets out air quality standards for pollutants to be reached by 2026 and 2030.

The Ambient Air Quality Standards Regulations 2022 (S.I. 739 of 2022) (the Air Quality Standards Regulations 2022) further transposed the CAFE Directive and revoked the Air Quality Standards Regulations 2011, as amended. With the adoption of Directive (EU) 2024/2881, Ireland must similarly transpose this directive into national law, i.e. update the Air Quality Standards Regulations, before December 2026.

The ambient air quality limit values for pollutants are set out in Annex I of Directive (EU) 2024/2881. Table 1 of Annex I in Directive (EU) 2024/2881 sets out the updated air quality limit values for pollutants to be achieved by 1 January 2030, these are more closely aligned with the WHO air quality guidelines. Table 2 of Annex I in Directive (EU) 2024/2881 sets out the limit values for air pollutants which are to be achieved by 11 December 2026 and are also applicable up to 2030. The limit values in Table 2 of Annex I are the same as the limits set under Directive 2008/50/EC and the Air Quality Standards Regulations 2022.

In relation to the current assessment, the applicable limit values are for particulate matter (PM_{10} and $PM_{2.5}$). Table 8.1 outlines the limit values pre-2030 and post-2030 for the specified pollutants. The pre-2030 limit values are applicable to the current assessment as historic quarrying activities have been assessed for the period 1990 – 2014.

Table 8.1 Air Quality Limit Values

Pollutant	Directive (EU) 2024/2881 Annex I Table 2		Directive (EU) 2024/2881 Annex I Table 1	
	Limit Type	Limit Value (to be attained by 2026 and applicable until 2030)	Limit Type	Limit Value (to be attained by 2030)
Particulate Matter (as PM_{10})	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m^3	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	45 µg/m^3
	Annual limit for protection of human health	40 µg/m^3	Annual limit for protection of human health	20 µg/m^3
Particulate Matter (as $PM_{2.5}$)	N/A	N/A	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	25 µg/m^3
	Annual limit for protection of human health	25 µg/m^3	Annual limit for protection of human health	10 µg/m^3

8.2.1.2 Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust that are less than 10 microns (PM_{10}) and less than 2.5 microns ($PM_{2.5}$). The EU ambient air quality standards outlined in Table 8.1 have set ambient air quality limit values for PM_{10} and $PM_{2.5}$.

With regard to larger dust particles that can give rise to nuisance dust through dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/m^2/day averaged over a one-year period at any receptors outside the site boundary. The TA-Luft standard has been applied for the purpose of this assessment based on recommendations from the EPA in Ireland in the document titled *Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)* (EPA, 2006). The document recommends that the TA-Luft limit of 350 mg/m^2/day be applied to the site boundary of quarries. This limit value can be implemented with regard to dust impacts from the operation of the development.

8.2.2 Dispersion Modelling Methodology for Quarrying Operations

The methodology used as part of this assessment involved undertaking a desk-based study to examine all relevant information relating to air quality conditions in the vicinity of the application site.

The air quality assessment has been carried out following procedures described in the publications by the EPA (EPA, 2020, 2022) and using the methodology outlined in the guidance documents published by the USEPA (USEPA, 2017, 2024). The air dispersion modelling input data consisted of information on the physical environment, design details from all emission sources on-site and five full years of meteorological data. Using this input data the model predicted ambient ground level concentrations and deposition rates beyond the land ownership boundary for each hour of the modelled meteorological years. The model post-processed the data to identify the location and maximum of the worst-case ground level concentration. This worst-case concentration and deposition rate was then added to the background concentration and deposition rate to give the worst-case predicted environmental concentration (PEC) and deposition flux. The PEC was then compared with the relevant ambient air quality standard to assess the significance of the releases from the site.

Air dispersion modelling was undertaken in order to assess the dust deposition flux at the land ownership boundary and the PM_{10} and $PM_{2.5}$ concentrations associated with the quarrying activities at sensitive locations beyond the land ownership boundary. Modelling using the United States Environmental Protection Agency (USEPA) new generation dispersion model AERMOD (USEPA, 2024) (version 24142) was used as recommended by the USEPA (2017) and the Irish EPA (2020). The model is a steady-state Gaussian plume model used to assess pollutant concentrations associated with industrial sources. The model has been designated the regulatory model by the USEPA for modelling emissions from industrial sources in both flat and rolling terrain (USEPA, 2017). The AERMET meteorological pre-processor (USEPA, 2018) was used to generate hourly boundary layer parameters for use by AERMOD. Dust generation rates were calculated from factors derived from empirical assessment and detailed in the USEPA database entitled *Compilation of Air Pollution Emission Factor*s, Volume 2, AP-42 (1986, updated periodically) (USEPA, 1986). The emission factors have been presented in Appendix 8.1.

8.2.2.1 Process Emissions

Quarrying activities typically emit dust. Dust is characterised as encompassing particulate matter with a particle size of between 1 and 75 microns (1 - 75µm). Deposition typically occurs in close proximity to each site and potential impacts generally occur within 500 metres of the dust generating activity as dust particles fall out of suspension in the air. Larger particles deposit closer to the generating source and deposition rates will decrease with distance from the source. Sensitivity to dust depends on the duration of the dust deposition, the dust generating activity, and the nature of the deposit. Therefore, a higher tolerance of dust deposition is likely to be shown if only short periods of dust deposition are expected and the dust generating activity is either expected to stop or move on.

The potential for dust to be emitted will depend on the type of activity being carried out in conjunction with environmental factors including levels of rainfall, wind speed, wind direction and dust prevention measures in place. This chapter identifies and quantifies the dust sources from the quarry.

The focus of this rEIAR is on quarrying activities that took place between 1990 – 2014, works prior to 1990 are not included within this assessment. The Murray Brothers quarry is a quartzitic sandstone quarry. The total area excavated between 1990 and 2014 measures approximately 5.2 ha. The site is accessed via a c.180 m long access road directly off the L4621-9.

Over the period 1990 – 2014 a total of approximately 2,234,000 tonnes of rock was excavated, which equates to on average 93,083 tonnes per annum. This annual extraction rate has been used in order to estimate the impact of the quarry in the surrounding environment.

For the purposes of this assessment 47 truck (HGV) movements in and out of the site per day has been assumed, based on the average of the annual predicted development trip generation over the period 1990 –2014 outlined in Chapter 12 Traffic & Transport (see Table 12.3 of Chapter 12).

The quarrying operational hours as previously permitted were: 07:30 – 17:30 Monday to Friday, 07:30 – 14:30 Saturday with no operations on Sundays or bank holidays. The site is assumed to operate for 50

weeks per year or 300 days per year. Extraction activities were undertaken using mechanical methods as well as blasting and drilling. Blasting took place twice per year between 10:00 and 16:00 and approximately 30,000 tonnes of material could have been extracted during a blast event, this has been incorporated into the modelling assessment.

The following operations were the main dust generating sources or activities at the quarry:

- Topsoil removal;
- Movement of trucks along paved public roads;
- Movement of trucks along unpaved haul roads;
- Extraction of material;
- Crushing of material;
- Screening of material;
- Transfer of material along conveyors;
- Stockpiling of material;
- Loading of material;
- Blasting and drilling;
- Wind erosion at dump areas, stockpiles and exposed quarry surface;

The formulae and emission rates for the onsite activities are outlined in Appendix 8.1.

8.2.2.2 Dust Generation Rates

Dust generation rates depend on the site activity, particle size, the moisture content of the material and weather conditions. Dust emissions are dramatically reduced where rainfall has occurred due to the cohesion created between dust particles and water and the removal of suspended dust from the air. It is typical to assume no dust is generated under "wet day" conditions where rainfall greater than 0.2mm has fallen.

Large particle sizes (greater than 75 microns) fall rapidly out of atmospheric suspension and are subsequently deposited in close proximity to the source. Particle sizes of less than 75 microns are of interest as they can remain airborne for greater distances and give rise to the potential dust nuisance at the sensitive receptors. This size range would broadly be described as silt. Emission rates are normally predicted on a site-specific particle size distribution for each dust emission source. In the absence of such information, the particle size distribution outlined in AP-42 Appendix B.2.2 for Category 3 (mechanically generated aggregate) (USEPA, 1986) has been used and is outlined in Table 8.2. The moisture content of the extracted quartzitic sandstone has been estimated at 2%, which is based on information provided by the client.

Table 8.2 Category 3 Mechanically Generated Aggregates (Source: AP-42 (USEPA, 1986.)

Cumulative % ≤ Stated Size	Particle Size, µm	Minimum Value	Maximum Value	Standard Deviation
4	1.0	-	-	-
11	2.0	-	-	-
15	2.5	3	35	7
18	3.0	-	-	-
25	4.0	-	-	-
30	5.0	-	-	-
34	6.0	15	65	13
51	10.0	23	81	14

8.2.3 Air Quality & Road Traffic Emissions

There is the potential for emissions from road vehicles accessing the site to impact air quality. Pollutants such as NO_2, PM_{10} and $PM_{2.5}$ are emitted from road vehicles.

The TII guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022), states that road links meeting one or more of the following criteria can be defined as being 'affected' by a development and should be included in the local air quality assessment. While the guidance is specific to infrastructure projects, the approach can be applied to any development that causes a change in traffic.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- Daily average speed change by 10 kph or more;
- Peak hour speed change by 20 kph or more;
- A change in road alignment by 5m or greater.

Chapter 12 Traffic & Transport has analysed the predicted increase in traffic volumes based on the historic quarrying activities. As per Chapter 12 Table 12.3 and Table 12.4, the development resulted in a maximum of increase of 192 AADT in 2006 and 2007, increases for all other years over the period 1990 – 2014 were lower. Therefore, the development did not result in a greater than 1000 AADT change or greater than 200 HGV AADT change. Thus, a detailed assessment of operational phase traffic emissions has been scoped out and there was no potential for significant impacts to air quality from operational phase traffic emissions.

8.2.4 Difficulties Encountered in Compiling Information

In order to establish the baseline environment air quality monitoring data and meteorological data from as far back as possible has been reviewed. In relation to some parameters data for the entire 1990 – 2014 time period was not available but data from as far back as possible has been reviewed. This does not significantly alter the conclusions of the assessment.

8.3 Description of Existing Environment

The substitute consent application area is located in the townland of Ardcahan approximately 3.5 km north east of Dunmanway. The site is located on the L4621-9 just off the main R587 Dunmanway to Macroom road. Vehicular access to the site is via a c.180 m long gated access road directly off the L4621-9. The site is located in a rural area with the predominant land use in the vicinity of the site being livestock farming and low density housing.

Historical data for air quality was investigated in order to establish the relevant baseline for the purposes of the assessment. Data for the full 1900 – 2014 extraction period was not available, however data from as far back as possible has been used in establishing the baseline.

8.3.1 Meteorological Conditions

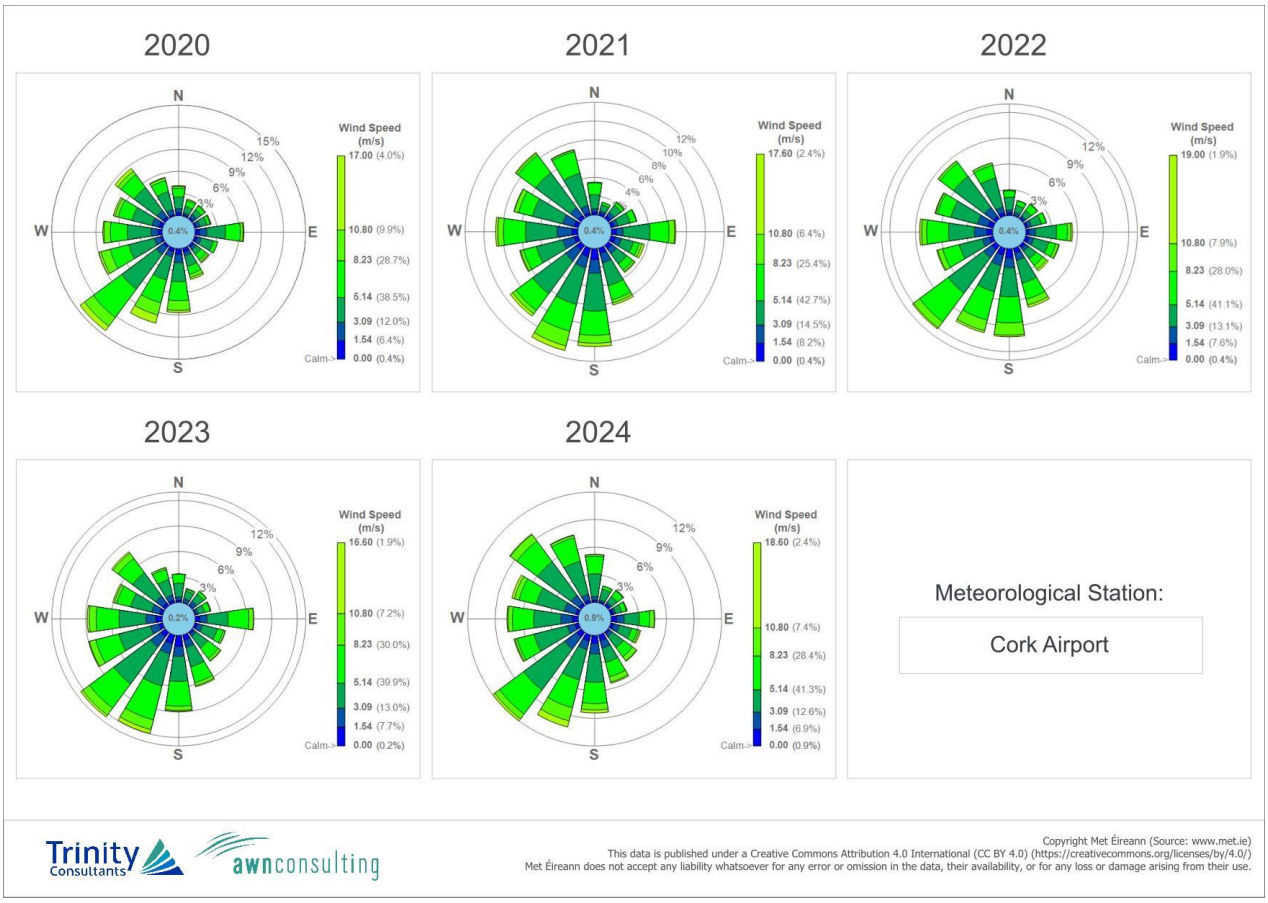
Meteorological conditions significantly affect the level of dust emissions and subsequent deposition downwind of the source. The most significant meteorological elements affecting dust deposition are rainfall and wind-speed. High levels of moisture either retained in soil or as a result of rainfall help suppress the generation of dust due to the cohesive nature of water between dust particles. Rain also assists in removing dust from the atmosphere through washout. Wind can lift particles up into the air and transport the dust downwind as well as drying out the surface. The worst dust deposition conditions typically occur, therefore, during dry conditions with strong winds.

The closest representative Met Éireann synoptic station to the application site is at Cork Airport meteorological station, which is approximately 42 km east of the site. Dust emissions are dramatically reduced where rainfall has occurred due to the cohesion created between dust particles and water and the removal of suspended dust from the air. It is typical to assume no dust is generated under "wet day" conditions where rainfall greater than 0.2 mm has fallen. Historical data collected from Cork Airport Meteorological Station over the period 1991 – 2020 (Met Eireann, 2025) identified that on average 218 days per annum are "wet". Thus, approximately 60% of the time no significant dust generation would have been likely due to natural meteorological conditions.

Wind frequency is also important as dust can only be dispersed by winds, and deposition of dust is a simple function of particle size, wind speed and distance. The closer the source of dust is to a receptor, the higher the potential risk of impact from dust blow. According to the data from Cork Airport the prevailing winds in the area are south-westerly, thereby predominantly dispersing any potential dust emissions to the north-east of the site (see Figure 8.1). Wind speeds averaged 6.4 m/s over the period 2020 – 2024. Calm conditions account for only a small fraction of the time in any one year, peaking at 83 hours in 2024 (0.94% of the time). The average wind speed over the 1991 – 2020 period at the Cork Airport meteorological station was 5.0 m/s.

All meteorological data referenced within this report is provided by Met Éireann (source www.met.ie) (Met Eireann, 2025).

Figure 8.1 Wind Roses for Cork Airport Meteorological Station



8.3.2 Background Sources of Dust

The sources of dust arising from the site contribute to background levels of dust. Dust is present naturally in the air from a number of sources including weathering of minerals, and pick-up across open land and dust generated from fires.

Historical dust monitoring data for the site has been reviewed in order to inform background levels of dust deposition in the area of the quarry. Monitoring data of dust soiling for the period 09/06/1999 – 30/06/1999 and 15/06/2000 – 18/07/2000 is available, further monitoring data is not available. Monitoring was carried out using the sticky pad method and took place at 3 no. locations on site in 1999 and 2000. A fourth location was monitored on one occasion in 1999 (Site 4, 23/06/1999 – 30/06/1999)

The average dust soiling level measured at the four locations exceeded the limit value of 3.0% of the effective area coverage (EAC) on one occasion at Site 2 and on three occasions at Site 3 (see Table 8.3).

Results ranged from 0.2% - 4.5% over the sample periods. The average result for each location is well below the 3% EAC limit. These results would suggest that there is a low level of dust nuisance as a result of soiling occurring within the area of the quarry.

However, as more recent monitoring data is not available and dust deposition data specifically is not available a review of relevant studies has been undertaken in order to inform background levels of dust deposition within the vicinity of the quarry. A study by the UK ODPM (UK ODPM, 1986) gives estimates of likely dust deposition levels in specific types of environments. In open country a level of 39 mg/m^2/day is typical, rising to 59 mg/m^2/day on the outskirts of town and peaking at 127 mg/m^2/day for a purely industrial area. A level of 39 mg/m^2/day can be estimated as the background dust deposition level for the region of the quarry at Ardcahan Co. Cork.

Table 8.3 Dust Soiling Monitoring Results

Sample Date	Site 1 (% EAC / Day)	Site 2 (% EAC / Day)	Site 3 (% EAC / Day)	Site 4 (% EAC / Day)
09/06/1999 - 16/061999	0.6	2.5	3.9	-
16/06/1999 - 23/06/1999	-	3.2	4.5	-
23/06/1999 - 30/06/1999	1.5	0.6	3.8	0.9
15/06/2000 - 22/06/2000	1.2	0.2	1.0	-
22/06/2000 - 29/06/2000	-	0.7	1.0	-
29/06/2000 - 06/07/2000	-	1.0	0.8	-
06/07/2000 - 12/07/2000	0.5	1.1	0.2	-
12/07/2000 - 18/07/2000	0.3	1.0	1.0	-
Average	0.8	1.3	2.0	0.9
Licence Limits (% EAC / Day) Note 2	3.0	3.0	3.0	3.0

Note 1 Site 1 Left of control building
Site 2 Bank alongside office
Site 3 Left hand side of entrance laneway to plant
Site 4 Left of Site 1

Note 2 EAC – Effective Area Coverage

8.3.3 Background Sources of PM_{10} and $PM_{2.5}$

Air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The EPA website details the range and scope of monitoring undertaken throughout Ireland and provides both monitoring data and the results of previous air quality assessments (EPA, 2025). Monitoring data for the period 2006 – 2024 is available on the EPA website. The results of previous air quality monitoring are published in annual reports by the EPA (EPA, 2025).

As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), as amended, four air quality zones have been defined in Ireland for air quality management and assessment purposes. Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 no. towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000 is defined as Zone D. In terms of air monitoring the development site is within the area categorised as Zone D (EPA, 2025). The long-term air monitoring data has been reviewed and used to determine background concentrations for the key pollutants of PM_{10} and $PM_{2.5}$ in the region of the development site. Representative rural Zone D sites have been reviewed as these are deemed the most appropriate in relation to the location of the development which is in a predominantly rural area. There are monitoring stations in closer proximity to the development however, these were not considered representative sites for background air quality purposes. The closer sites are not within the Zone D category, are suburban monitoring stations and background traffic monitoring stations which are not within a rural setting and therefore, do not represent the background air quality environment in proximity to the development site.

8.3.3.1 PM_{10}

Long-term PM_{10} monitoring has been carried out at the rural Zone D location of Kilkitt Co. Monaghan with data available for the period 2006 – 2024. Over the period 2006 – 2024 annual mean concentrations of PM_{10} ranged from a maximum of 11 µg/m^3 in 2013 to a low of 7 µg/m^3 in 2023 and 2024 (see Table 8.4) (EPA, 2025). The average annual mean concentration for the 2006 – 2024 period is 8.7 µg/m^3 which is significantly below the annual limit value of 40 µg/m^3. In addition, there were at most 3 exceedances of the daily limit value of 50 µg/m^3 (35 exceedances are allowed per year). Based on the above information an annual mean baseline concentration of **11 µg/m^3** has been used in this assessment.

In relation to the maximum 24-hour averaging period (as a 90.4th%ile), a value of **14 µg/m^3** was employed using the methodology outlined in Appendix E of AG4 (EPA, 2020) based on the 5-year average of the long-term PM_{10} monitoring at the identified Zone D locations over the period 2020 – 2024 as percentile data was not available for the full 2006 – 2024 period.

For the dispersion modelling assessment in order to calculate the predicted environmental concentration (PEC) a background concentration is added to the modelled process concentration (PC). In relation to the annual averages, the ambient background concentration is added directly to the process concentration. However, in relation to the short-term peak concentration, concentrations due to emissions from elevated sources cannot be combined in the same way. Guidance from the UK DEFRA (UK DEFRA, 2022) and the EPA (EPA, 2020) advises that for PM_{10} an estimate of the maximum combined pollutant concentration can be obtained as below:

PM_{10} – The 90.4th%ile of total 24-hour mean PM_{10} is equal to the maximum of either A or B below:

a) [90.4th%ile of 24-hour mean background PM_{10}] + [annual mean process contribution PM_{10}].

b) [90.4th%ile 24-hour mean process contribution PM_{10}] + [annual mean background PM_{10}].

8.3.3.2 $PM_{2.5}$

Monitoring of $PM_{2.5}$ is undertaken at the rural Zone D location of Claremorris Co. Mayo. Data is available for the period 2011 – 2024 on the EPA website (EPA, 2025). Annual mean concentrations of $PM_{2.5}$ ranged from 4 - 8 µg/m^3 over the period 2011 – 2024 which are significantly below the annual mean limit value of 25 µg/m^3 (see Table 8.5). The average annual mean concentration for the 2011 – 2024 period is 5.7 µg/m^3. Based on the EPA data, an annual mean baseline $PM_{2.5}$ concentration of **8 µg/m^3** was used in this assessment.

While specific pollutant concentrations prior to 2006 are not available it can generally be assumed that historical air quality was of a lesser quality than in more recent years. The EPA state that air quality is improving over time (EPA, 2025) as a result of the introduction of various policies and measures particularly in relation to road transport emissions and the use of cleaner fuels and the gradual introduction of hybrid and electric vehicles.

Table 8.4 Baseline Air Quality – PM_{10}

Station	Averaging Period	Year																		
		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Kilkitt, Co. Monaghan	Annual Mean PM_{10} ($\mu g/m^3$)	10	10	10	8	10	9	9	11	9	9	8	8	9	7	8	8	9	7	7
	24-hr Mean > 50 $\mu g/m^3$	0	2	1	1	0	1	1	3	2	1	0	0	0	1	0	0	0	0	0

Table 8.5 Baseline Air Quality – $PM_{2.5}$

Station	Averaging Period	Year													
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Claremorris, Co. Mayo	Annual Mean $PM_{2.5}$ ($\mu g/m^3$)	6	6	8	5	6	6	6	6	4	5	8	6	5	5

8.3.4 Operational Phase Quarrying Activities Modelled Receptors

There are varying degrees of dust sensitivity depending on the receptor type. Those of highest sensitivity have the greatest risk of being adversely impacted by increases in ambient dust levels. However, this principle does not always apply and variation from the standard can occur depending on local factors such as rainfall and wind direction and receptor distance from the source.

Receptor sensitivity criteria for quarrying activities has been derived from the Institute of Air Quality Management (IAQM) guidance document *Guidelines on the Assessment of Dust from Demolition and Construction* (2024). The dust generation potential from quarrying activities is similar to construction activities. As per the IAQM guidance (2024) high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time. Commercial properties and places of work are regarded as medium sensitivity while low sensitivity receptors are places where people are present for short periods or do not expect a high level of amenity. Additionally, The TII guidance (2022) defines sensitive receptor locations for the purposes of modelling annual mean pollutant concentrations as: residential housing, schools, hospitals, care homes and short term-accommodation such as hotels, i.e. locations where members of the public are likely to be regularly present for 24 hours.

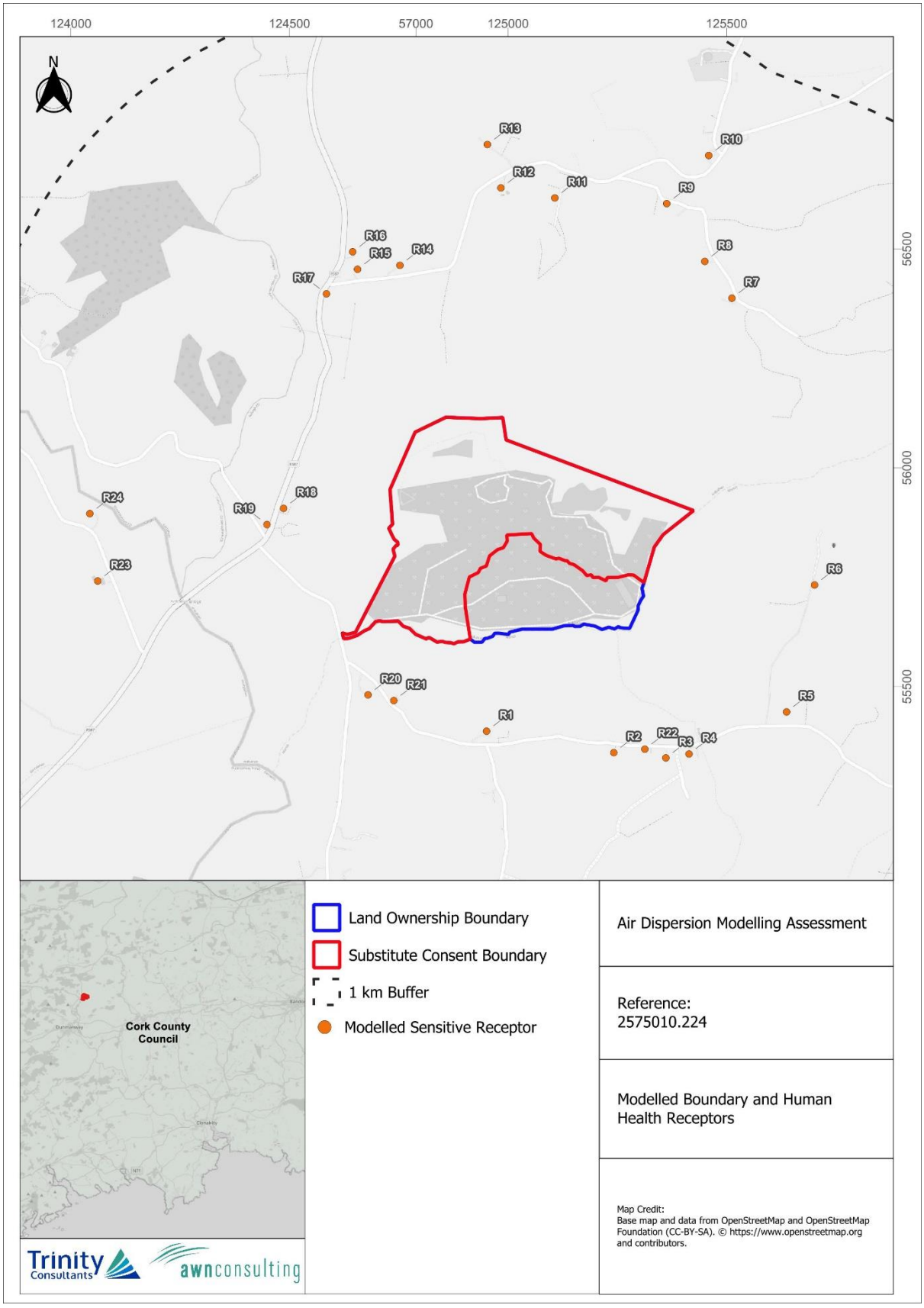
The receptor types in the study area consist of high and low sensitivity receptors consisting mainly of residential areas and farms. There are a limited number of human receptors in the vicinity of the application site in the form of occupied dwellings. The nearest dwellings to the quarry site (red line boundary) are located approximately 300m south; 275m west; 450m north and 400m east of the site. There are no commercial premises or community facilities in the immediate environs.

The land ownership boundary and sensitive residential receptors used in the modelling assessment are shown in Figure 8.2.

Dust deposition typically occurs in close proximity to the dust-generating source. Generally, the potential for severe dust impacts is greatest within 100m of dust generating activities, though residual impacts can occur for distances beyond 100m. Vegetation, berms and the natural topography can act as breaks between the sources and the receptor. Tree lines can also act as an efficient dust filter and can be a useful dust control safeguard.

Two receptor grids were created at which concentrations would be modelled. The receptor grids were based on a Cartesian grids with the site at the centre. The outer grid measured 4km x 4km with the site at the centre and concentrations calculated at 200 m intervals, a smaller inner grid measured 1.5km x 1.5km with concentrations calculated at 50m intervals. Boundary receptor locations were also placed along the land ownership boundary of the site, at 50 m intervals. Nearby sensitive residential properties were also added to the model as discrete receptors giving a total of 1,536 calculation points for the model. The modelling has investigated the deposition of dust, and concentrations of PM_{10} and $PM_{2.5}$ for the quarrying activities.

Figure 8.2 Modelled Boundary and Human Health Receptors



8.4 Impact Assessment

8.4.1 Do Nothing Scenario

As outlined in the EPA Guidelines (2022), the description of 'Do-Nothing Effects' relates to the future environment as it would be, should the project not be carried out.

The "Do Nothing" scenario would have involved no quarrying works occurring over the period 1990 – 2014. However, as quarrying works had taken place prior to this and the site was an active quarry the predicted impacts of dust deposition and PM_{10}/$PM_{2.5}$ emissions would likely have still occurred. However, emissions may have been lower than those predicted in Section 8.4.3 due to the smaller site area.

8.4.2 Construction Phase

Due to the nature of the development, no significant construction works would have been required. Land was cleared and berms constructed as part of the day to day activities. Land clearance has been included within the operational phase assessment in Section 8.4.3. Therefore, no significant construction phase impacts to air quality are predicted.

8.4.3 Operational Phase

8.4.3.1 Quarrying Operations – Dispersion Modelling Results

The primary sources of emissions to air were from plant and machinery undertaking day to day activities such as extraction, onsite processing, transportation of material and dust blow generated during dry, windy conditions. Potential impacts associated with day to day activities have been categorised into dust deposition, PM_{10} and $PM_{2.5}$ emissions.

The results of the dispersion modelling assessment show that dust deposition levels, annual and daily mean concentrations of PM_{10} and annual mean concentrations of $PM_{2.5}$ from the historic quarrying operations are below the relevant limit values.

The results indicate that the effect of the operational phase (i.e. Substitute Consent Operations Scenario) on air quality is ***localised, direct, long-term, negative*** and ***slight*** which is overall ***not significant***.

Quarrying activities ceased on site by 2014 and there are no activities taking place within the application site at present, as a result, there are currently no impacts to air quality associated with the development site.

In relation to future air quality impacts from the development site, if the subject application is not approved, no activities on site will occur and therefore, there will be no effects on air quality. Should quarrying activities with the same historical practices recommence on site following grant of a relevant planning permission, impacts to air quality similar to those identified herein would likely occur.

Dust Deposition

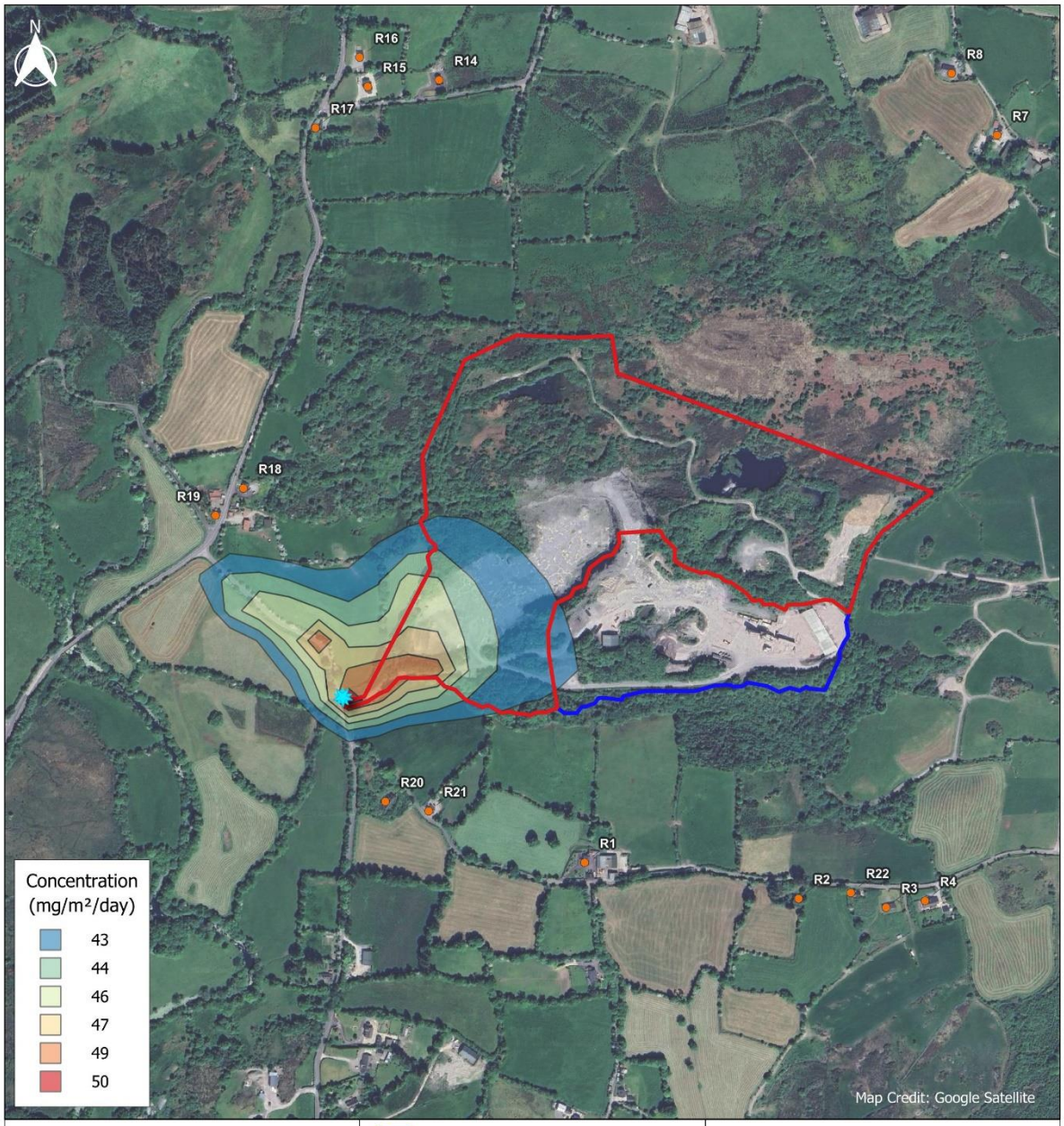
Historic quarrying operations from the site lead to a dust deposition level, averaged over the full year, of at most 16.7 mg/m^2/day at the land ownership boundary to the quarry (see Table 8.6). Based on a worst case background dust deposition of 39 mg/m^2/day in the region of the site, the combined dust deposition level peaks at 55.7 mg/m^2/day which is 16% of the TA Luft Limit Value of 350 mg/m^2/day.

Figure 8.3 shows the geographical variation in annual dust deposition levels in the region of development. The dust deposition level decreases with increasing distance from the site.

Table 8.6 Dispersion Modelling Results for Dust Deposition at Boundary – Substitute Consent Operations Scenario

Pollutant/ Year	Averaging Period	Worst Case Receptor		Process Contribution (PC) (mg/m²/day)	Background Concentration (mg/m²/day)	Predicted Environmental Concentration (PEC) (mg/m²/day)	Limit Value (mg/m²/day)	PEC as a % of Limit Value
		Type	X,Y (UTM Zone 29 N)					
Dust / 2020	Annual Mean	Boundary	493619, 5733082	16.3	39	55.3	350	16%
Dust / 2021	Annual Mean	Boundary	493619, 5733082	16.9	39	55.9	350	16%
Dust / 2022	Annual Mean	Boundary	493619, 5733082	16.6	39	55.6	350	16%
Dust / 2023	Annual Mean	Boundary	493619, 5733082	16.6	39	55.6	350	16%
Dust / 2024	Annual Mean	Boundary	493619, 5733082	16.7	39	55.7	350	16%

Figure 8.3 Annual Mean Dust Deposition Rate (mg/m²/day) – Substitute Consent Operations Scenario



Particulate Matter (PM_{10})

Predicted PM_{10} concentrations as a result of the historic quarrying operations are presented in Table 8.7.

Due to the emissions from the historic quarrying operations, the annual mean concentrations (including background concentration) at the worst-case receptor peak at 11.14 µg/m^3. This equates to 28% of the annual PM_{10} limit value of 40 µg/m^3.

The predicted 24-hour PM_{10} concentration (including background) peaks at 14.14 µg/m^3 (based on Method A) which is 28% of the 24-hour limit value of 50 µg/m^3 (measured as a 90.4th%ile).

The geographical variation in the 24-hour mean (90.4th%ile) PM_{10} ground level concentrations are illustrated as concentration contours in Figure 8.4. The geographical variation in annual mean PM_{10} ground level concentrations in the region of the development are illustrated as contours in Figure 8.5. The locations of the maximum concentrations for PM_{10} are close to the boundary of the site with concentrations decreasing with distance from the subject site.

Table 8.7 Dispersion Model Results for PM_{10} – Substitute Consent Operations Scenario

Pollutant/ Year	Averaging Period	Worst Case Receptor		Process Contribution (PC) (µg/m^3)	Background Concentration (µg/m^3)	Predicted Environmental Concentration (PEC) (µg/m^3) Method A	Predicted Environmental Concentration (PEC) (µg/m^3) Method B	Limit Values (µg/Nm^3)	PEC as a % of Limit Value
		Type	X,Y (UTM Zone 29 N)						
PM_{10} / 2020	Annual Mean	Sensitive	493446, 5733329	0.127	11	11.13	11.13	40	28%
	24-hr Mean (as 90.4th%ile)	Sensitive	493446, 5733329	0.493	14	14.13	11.49	50	28%
PM_{10} / 2021	Annual Mean	Sensitive	493484, 5733366	0.134	11	11.13	11.13	40	28%
	24-hr Mean (as 90.4th%ile)	Sensitive	493484, 5733366	0.477	14	14.13	11.48	50	28%
PM_{10} / 2022	Annual Mean	Sensitive	493484, 5733366	0.135	11	11.13	11.13	40	28%
	24-hr Mean (as 90.4th%ile)	Sensitive	493484, 5733366	0.524	14	14.13	11.52	50	28%
PM_{10} / 2023	Annual Mean	Sensitive	493484, 5733366	0.144	11	11.14	11.14	40	28%
	24-hr Mean (as 90.4th%ile)	Sensitive	493484, 5733366	0.493	14	14.14	11.49	50	28%
PM_{10} / 2024	Annual Mean	Sensitive	493484, 5733366	0.130	11	11.13	11.13	40	28%
	24-hr Mean (as 90.4th%ile)	Sensitive	493484, 5733366	0.394	14	14.13	11.39	50	28%

Figure 8.4 Maximum 24-Hr PM_{10} (as a 90.4th%ile) (µg/m^3) – Substitute Consent Operations Scenario

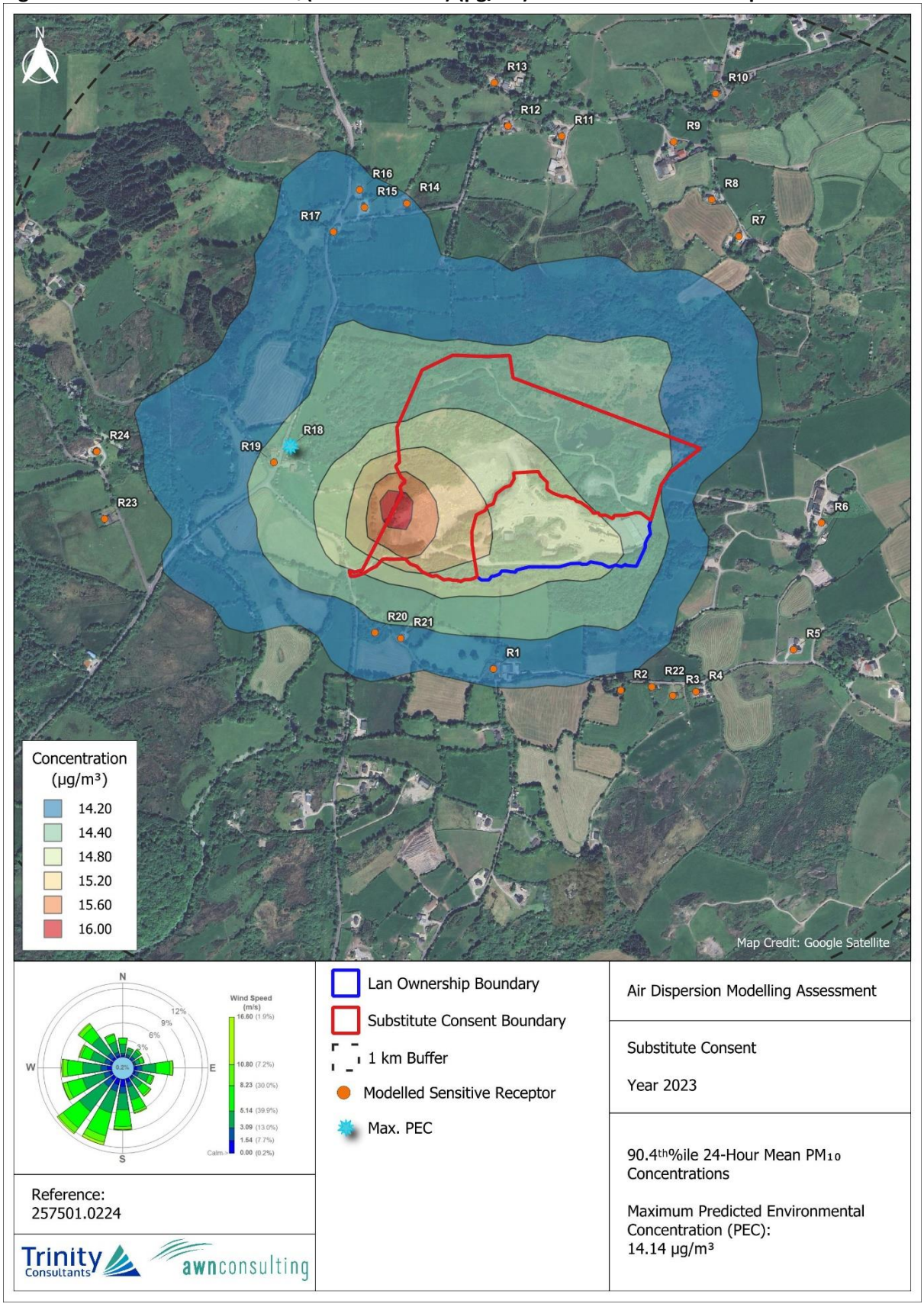
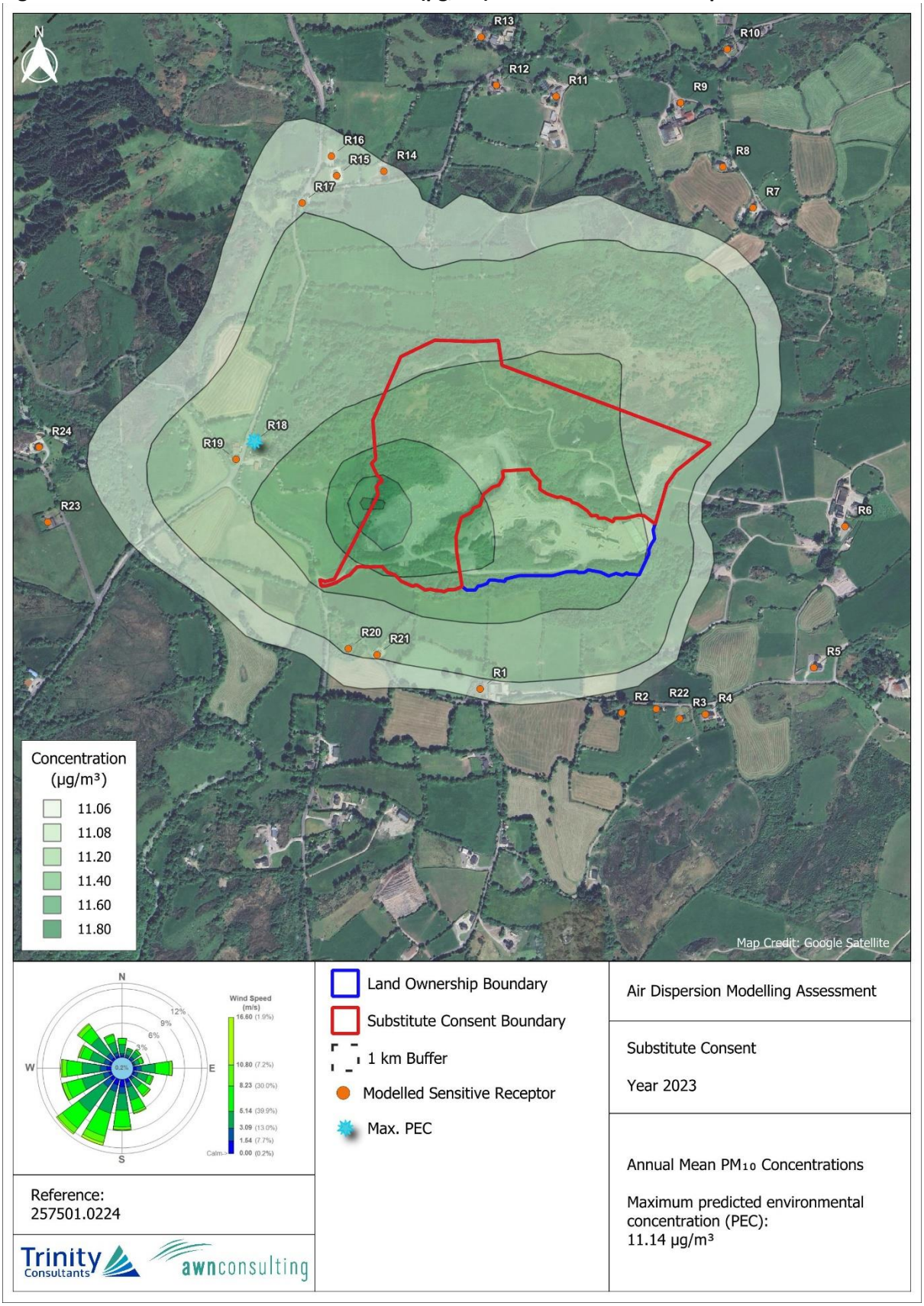


Figure 8.5 Annual Mean PM_{10} Concentration (µg/m³) – Substitute Consent Operations Scenario



Particulate Matter ($PM_{2.5}$)

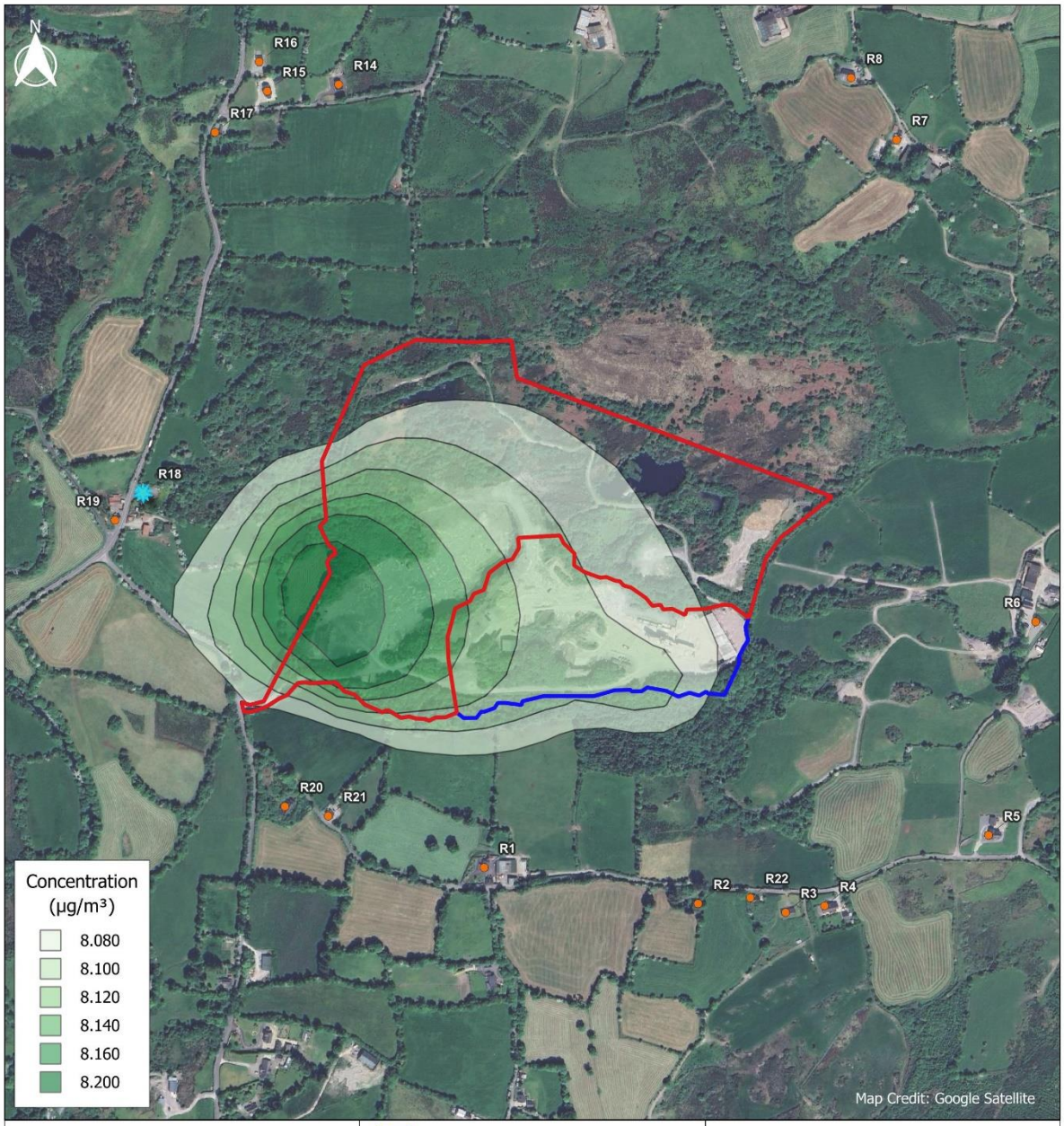
Predicted $PM_{2.5}$ concentrations at the worst-case receptor are below the limit value of 25 µg/m^3 (see Table 8.8). Based on a background $PM_{2.5}$ concentration of 8 µg/m^3 in the region of the site, the annual mean $PM_{2.5}$ concentration including the operations (i.e. PEC) peaks at 8.047 µg/m^3. This peak level equates to 32.19% of the annual limit value for $PM_{2.5}$.

The geographical variation in annual $PM_{2.5}$ ground level concentrations in the region of the development are illustrated as contours in Figure 8.6. The locations of the maximum concentrations for $PM_{2.5}$ are close to the boundary of the site with concentrations decreasing with distance from the subject site.

Table 8.8 Dispersion Model Results for $PM_{2.5}$ – Substitute Consent Operations Scenario

Pollutant/ Year	Averaging Period	Worst Case Receptor		Process Contribution (PC) (µg/m^3)	Background Concentration (µg/m^3)	Predicted Environmental Concentration (PEC) (µg/m^3)	Limit Values (µg/Nm^3)	PEC as a % of Limit Value
		Type	X,Y (UTM Zone 29 N)					
$PM_{2.5}$ / 2020	Annual Mean	Sensitive	493446, 5733329	0.042	8	8.042	25	32.17%
$PM_{2.5}$/ 2021	Annual Mean	Sensitive	493484, 5733366	0.045	8	8.045	25	32.18%
$PM_{2.5}$/ 2022	Annual Mean	Sensitive	493484, 5733366	0.045	8	8.045	25	32.18%
$PM_{2.5}$/ 2023	Annual Mean	Sensitive	493484, 5733366	0.047	8	8.047	25	32.19%
$PM_{2.5}$/ 2024	Annual Mean	Sensitive	493484, 5733366	0.043	8	8.043	25	32.17%

Figure 8.6 Annual Mean $PM_{2.5}$ Concentration (µg/m³) – Substitute Consent Operations Scenario



8.4.4 Risk of Major Accidents and Disasters

Due to the nature of the development, the risk of major accidents and disasters in relation to air quality are not anticipated. There were no major accidents or disasters in relation to air over the period of concern, 1990 – 2014.

8.4.5 Cumulative

Cumulative effects have been assessed for the development. Background concentrations have been included in the modelling study based on EPA data for PM_{10} and $PM_{2.5.}$ These background concentrations account for non-localised sources of the pollutants of concern. Impacts from the site are localised to the immediate vicinity of the site (see Figure 8.3 - Figure 8.6).

There are no other significant sources of dust, PM_{10}, or $PM_{2.5,}$ within the area of impact from the quarry and therefore no further prediction of cumulative impact is required.

8.5 Remedial Measures

8.5.1 Construction Phase

No specific construction phase mitigation was implemented.

8.5.2 Operational Phase

There were some mitigation measures in place on site to prevent significant dust emissions from on-site activities. These measures include:

- Dampening of site roads during drier summer months
- Speed restriction on internal site roads enforced via ramps
- Aggregates are stored in an enclosed shed once processed

These measures have been incorporated into the modelling assessment to determine the impact of the site on levels of dust deposition and ambient concentrations of particulate matter (PM_{10} / $PM_{2.5}$). The modelling assessment found that there was an non-significant impact on the ambient air quality environment as a result of the development.

8.5.3 Monitoring

Monitoring of dust soiling was undertaken for the period 09/06/1999 – 30/06/1999 and 15/06/2000 – 18/07/2000. Monitoring was carried out using the sticky pad method and took place at 3 no. locations on site in 1999 and 2000. A fourth location was monitored on one occasion in 1999 (Site 4, 23/06/1999 – 30/06/1999). The results of the monitoring are presented in Section 8.3.2.

No further monitoring data is not available.

8.6 Residual Impacts

8.6.1 Statement on the Significant Effects on the Environment

The assessment involved modelling emissions from the historic quarrying operations. Predicted dust deposition rates, and annual mean concentrations of PM_{10} and $PM_{2.5}$ from the quarrying operations are in compliance with the ambient air quality limit values which are set for the protection of human health and the environment. Additionally, predicted 24-hour PM_{10} concentrations are in compliance with the daily limit value of 50 $\mu g/m^3$ for the protection of human health and the environment.

It can be concluded that the development had a ***localised, direct, long-term, negative*** and ***slight*** effect on air quality which is overall ***not significant***.

As quarrying operations ceased in 2014 no significant impacts to air quality continue to occur due to the development site. Table 8.9 summarises the effects to air quality that have occurred, continue to occur and may reasonably be expected to occur in the future.

Table 8.9 Assessment of Effects for Ardcahan Quarry Substitute Consent

Impact Assessment	Effects	Mitigation Measures	Likelihood of Significant Effects	Remediation Measures Required	Residual Effects
i) Effects that have occurred	Dust emissions from quarrying activities	As per Section 8.5.2: Dampening of site roads Speed restrictions on site Storage of aggregates in enclosed shed	Low	n/a	Slight (not significant)
ii) Effects that are occurring or ongoing	Dust emissions from soil stockpiles	Stockpiles are vegetated	Low	n/a	Imperceptible (not significant)
iii) Effects that may reasonably be expected to occur	If quarrying continues: Dust emissions from quarrying activities Traffic emissions from site vehicles	Continued implementation of on-site mitigation measures as per (i) and Section 8.5.2	Low	n/a	Slight (not significant)
	If quarrying stops: Site closure, no potential for dust emissions	Site restoration measures	Low	n/a	Imperceptible (not significant)

8.7 References

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Murray Brothers Tarmacadam Ltd

CHAPTER 9
CLIMATE

VOLUME II
MAIN STATEMENT

FEBRUARY 2026

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9 Climate

9.1 Introduction

This chapter assesses the likely climate impacts associated with historical quarrying extraction activities at Ardcahan Quarry, Co. Cork. A full description of the development can be found in Chapter 3.

The subject site encompasses a total area of approximately 25 hectares (ha). Historical excavation, and the area that is the focus of this application, was undertaken within a c. 5.2 ha area. The site is located within the townland of Ardcahan, approximately 3.5km north-east of Dunmanway in West Cork. The site is situated off the L4621-9 local road ('Hospital Road'), approximately 300m east of its junction with the R587 regional road, which links Dunmanway and Macroom.

For the purposes of this assessment, quarrying activities over the period 1990 until 2014 have been assessed.

9.1.1 Author Information and Competency

This chapter was completed by Ciara Nolan. Ciara is a Principal Environmental Consultant in the Air Quality & Climate section of AWN Consulting. She holds a BSc in Energy Systems Engineering from University College Dublin and has also completed an MSc in Applied Environmental Science at UCD. She is a Member of the Institute of Air Quality Management (MIAQM) and the Institution of Environmental Sciences (MIEnvSc). She has over 9 years of experience in undertaking air quality and climate assessments. She has prepared air quality and climate impact assessments as part of EIARs for residential developments including Woodbrook, Shankill (Planning Application Ref. ABP30584419), Ballygossan Park, Skerries (Planning Application Ref. LRD0010/S3), SHD Ratoath (Planning Application Ref. SH305196), SHD Rathmullen, Drogheda (Planning Application Ref. SH305552), commercial and industrial developments by Dublin Airport Authority, Abbvie, Mountpark, Pfizer, Takeda, as well as renewable energy developments such as Crockahenny Windfarm, Upperchurch Windfarm, Knocknamona Windfarm and Keerglen Windfarm. She also specialises in conducting air dispersion modelling assessments of emissions from data centres, energy centres and the chemical industry as part of EPA Industrial Emissions Licences for Echelon DC, AWS, Takeda, MSD and Regeneron. She has undertaken air quality and climate impact assessments for transportation schemes, primarily regional and national road schemes, from constraints, through to route selection and EIAR stage.

9.1.2 Aspects Relevant to this Assessment

The climate assessment focuses on greenhouse gas (GHG) emissions associated with site activities, fuel usage and traffic emissions as these have been identified as the primary sources of GHG emissions from the site. GHG emissions will be compared against national GHG emissions, carbon budgets and targets to contextualise magnitude.

The baseline environment has been prepared with reference to published climate data from the Environmental Protection Agency (EPA) and Met Éireann. For the purposes of this assessment, while the activities assessed have occurred over the past decades, until quarrying ceased in 2014, impacts have been assessed against the most recently published climate guidance and policies which are likely more stringent than historical policies from previous years. Therefore, if it can be determined that, based on the most recent standards, no significant effects occurred as a result of the development, then it is unlikely that significant impacts occurred based on historical standards.

9.1.3 Guidelines, Legislation & Policy Relevant to Discipline

The principal guidance and best practice documents used to inform the assessment of potential impacts on climate are summarised below. In addition to specific climate guidance documents, the following guidelines were considered and consulted in the preparation of this chapter:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022); and
- Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017).

The assessment has referred to national guidelines where available, in addition to international standards and guidelines relating to the assessment of climate impacts. These are summarised below:

- Transport Infrastructure Ireland (TII) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (TII, 2022);
- Transport Infrastructure Ireland (TII) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document (TII, 2025);
- The Institute of Sustainability and Environmental Professionals (ISEP) (formerly known as IEMA) Environmental Impact Assessment Guide to: Assessing GHG Emissions and Evaluating their Significance (ISEP, 2022);
- ISEP GHG Management Hierarchy (hereafter referred to as the ISEP 2020 GHG Management Hierarchy) (ISEP, 2020b)
- ISEP Principles Series: Climate Change Mitigation & EIA (ISEP, 2010).

While there is no specific guidance available in relation to the preparation of an rEIAR, it is therefore considered appropriate to refer to the Act, the Planning and Development regulations as well as to the general guidance on carrying out and assessing EIAR.

Under section 177F of The Act, a remedial EIAR must contain;

(a) a statement of the significant effects, if any, on the environment, which have occurred or which are occurring or which can reasonably be expected to occur because the development the subject of the application for substitute consent was carried out;

(b) details of—

(i) any appropriate remedial measures undertaken or proposed to be undertaken by the applicant for substitute consent to remedy any significant adverse effects on the environment;

(ii) the period of time within which any proposed remedial measures shall be carried out by or on behalf of the applicant;

(c) such information as may be prescribed under section 177N.

As per section 177F of the Planning and Development regulations a statement on the 'Significant Effects on the Environment' is included within Section 9.6 of this rEIAR.

9.1.4 Legislation

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (as amended) (Government of Ireland, 2015) was enacted (the 2015 Act). The purpose of the 2015 Act was to enable Ireland "*to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050*" (3.(1) of No. 46 of 2015). This is referred to in the 2015 Act as the 'National Transition Objective'. The 2015 Act made provision for a national mitigation plan, and a national adaptation framework. In addition, the 2015 Act provided for the establishment of the Climate Change Advisory Council with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations.

The key duty imposed on planning authorities by Section 15 of the Climate Action and Low Carbon Development Act 2015 (as amended) is:

> *"1) A relevant body [a planning authority] shall, in so far as practicable, perform its functions in a manner consistent with—*
>
> *(a) the most recent approved climate action plan,*
>
> *(b) the most recent approved national long term climate action strategy,*

(c) the most recent approved national adaptation framework and approved sectoral adaptation plans,

(d) the furtherance of the national climate objective, and

(e) the objective of mitigating greenhouse gas emissions and adapting to the effects of climate change in the State."

Following on from Ireland declaring a climate and biodiversity emergency in May 2019, and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the General Scheme in December 2019, followed by the publication of the Climate Action and Low Carbon Development (Amendment) Act 2021 (hereafter referred to as the 2021 Climate Act) in March 2021. The Climate Act was signed into Law on the 23rd of July 2021, giving statutory effect to the core objectives stated within the CAP.

In relation to carbon budgets, the 2015 Act (as amended) states "*a carbon budget, consistent with furthering the achievement of the national climate objective, shall be proposed by the Climate Change Advisory Council, finalised by the Minister and approved by the Government for the period of 5 years commencing on the 1 January 2021 and ending on 31 December 2025 and for each subsequent period of 5 years (in this Act referred to as a 'Budget Period'*)".

A carbon budget is defined as the total amount of greenhouse gas emissions that are permitted during the budget period. The carbon budget is to be produced for 3 sequential budget periods (Table 9.1). The carbon budget can be revised where new obligations are imposed under the law of the European Union or international agreements or where there are significant developments in scientific knowledge in relation to climate change. In relation to the sectoral emissions ceiling, the Minister for the Environment, Climate and Communications (the Minister for the Environment) shall prepare and submit to government the maximum amount of GHG emissions that are permitted in different sectors of the economy during a budget period and different ceilings may apply to different sectors. The sectorial emission ceilings for 2030 were first published in the Climate Action Plan 2023 (CAP23) and are reproduced in

Table 9.2.

Table 9.1 5-Year Carbon Budgets

Budget Period	Carbon Budget	Reduction Required
2021-2025	295 Mt CO_2e	Reduction in emissions of 4.8% per annum for the first budget period.
2026-2030	200 Mt CO_2e	Reduction in emissions of 8.3% per annum for the second budget period.
2031-2035	151 Mt CO_2e	Reduction in emissions of 3.5% per annum for the third provisional budget.

Table 9.2 Sectoral Emission Ceilings 2030

Sector	Baseline ($MtCO_2e$)	Carbon Budgets ($MtCO_2e$)		2030 Emissions ($MtCO_2e$)	Indicative Emissions % Reduction in Final Year of 2025 – 2030 Period (Compared to 2018)
	2018	2021-2025	2026-2030		
Electricity	10	40	20	3	75
Transport	12	54	37	6	50
Built Environment – Residential	7	29	23	4	40
Built Environment – Commercial	2	7	5	1	45
Industry	7	30	24	4	35
Agriculture	23	106	96	17.25	25
Other (F-gases, waste, petroleum refining)	2	9	8	1	50
Land Use, Land-use Change and Forestry (LULUCF)	5	Reflecting the continued volatility for LULUCF baseline emissions to 2030 and beyond, a new approach aligned with the EU LULUCF Regulation has been adopted.			
Total	68				
Unallocated Savings	-	-	26	-5.25	-
Legally Binding Carbon Budgets and 2030 Emission Reduction Targets	-	295	200	-	51

9.1.5 Policy

9.1.5.1 National Policy

The first Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019). The CAP 2019 outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture. It also outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. CAP 2019 detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The Government published the second CAP (CAP21) in November 2021 (Government of Ireland, 2021a) with further updates in 2022 (CAP23) and 2023 (CAP24). The current CAP is CAP25 published in April 2025 (DECC, 2025).

CAP25 is the fourth plan to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021, and following the introduction, in 2022, of economy-wide carbon budgets and sectoral emissions ceilings. The plan follows on from CAP23 and CAP24 with the implementation of the carbon budgets and sectoral emissions ceilings and sets out a roadmap for taking decisive action to reach net zero no later than 2050, as committed to in the Programme for Government. CAP25 sets out how Ireland can accelerate the actions that are required to respond to the climate crisis, putting climate solutions at the centre of Ireland's social and economic development.

A key target in CAP25 is to reduce the embodied carbon of construction materials. Section 12 of CAP25 outlines the following target for 2030 in relation to construction materials -

- Decrease by at least 30% embodied carbon for materials produced and used in Ireland.

Quarrying activities directly provide construction materials or provide the raw material to be used in construction materials.

9.1.5.2 Regional Policy

Development Plans

Climate change adaptation is a prominent feature in the Cork County Development Plan 2014 (Cork County Council, 2014). One of the key Environmental Protection Objectives (EPO 7) is "*contribute to mitigation of, and adaptation to climate change*" (Cork County Council, 2014). As part of this it is intended to tackle climate change through increasing the modal shift in the favour of public transport, walking and cycling, encouraging the production of renewable energy, encouraging energy efficiency in building design and construction and avoiding development in flood risk areas or including flood risk mitigation measures where appropriate.

Climate action is covered in Section 17 of the Cork County Development Plan 2022 – 2028. The plan outlines the objectives of the council to reduce impacts and adapt to climate change within County Cork.

Local Authority Climate Action Plan

The Cork County Council Climate Action Plan 2024–2029 (CCC, 2024) sets out a comprehensive framework for climate mitigation and adaptation across Cork County, aiming to reduce greenhouse gas (GHG) emissions by 51% by 2030 (from a 2018 baseline) and to achieve climate neutrality by 2050. The plan aligns with national and EU climate objectives and is structured around a place-based approach, with a strong emphasis on community engagement and a just transition.

This Climate Action Plan sets a pathway for Cork County Council to actively translate national climate policy to local circumstances with the prioritisation and acceleration of evidence-based measures including to:

- Reduce its direct carbon emissions by 51% by 2030;
- Assist in the delivery of the climate neutrality objective at local and community levels; and
- Identify and support the development of a Decarbonising Zone (DZ) within the local authority area

The plan is built around five key thematic areas: Governance and Leadership; Built Environment and Infrastructure; Transport; Natural Environment, Biodiversity and Land Use; and Circular Economy and Resource Management. The CCC Climate Action Plan 2024 - 2029 also highlights the risks that climate change poses, with risks mainly associated with extreme weather events.

9.2 Methodology

As per the EU guidance document *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (European Commission, 2013) the climate baseline is first established with reference to EPA data on annual GHG emissions (see Section 9.3.1).

The assessment accounts for various components relating to the development during different life stages to determine the total impact of the development on climate. The assessment has focussed on estimated annual GHG emissions associated with site activities and traffic emissions.

9.2.1 Site Activities

GHG emissions would have occurred due to on-site plant and machinery use, these have been quantified by calculating the GHG emissions from the annual fuel (diesel) usage on site. GHG emissions from vehicles accessing the site delivering and collecting materials are likely to have been the dominant source of vehicle-related GHG emissions.

The carbon emissions associated with the fuel usage on site have been quantified using the TII Carbon Tool (TII, 2025). The TII Carbon Tool (TII, 2025) uses emission factors from recognised sources including the Civil Engineering Standard Method of Measurement (CESSM) Carbon and Price Book database (CESSM, 2013). The carbon emissions are calculated by multiplying the emission factor by the quantity of the material. The outputs are expressed in terms of tCO_2e (tonnes of carbon dioxide equivalent).

It is estimated that there was approximately 360,000 litres of diesel used per year for mobile plant and machinery, based on an average of 1,200 litres per day. This annual quantity has been used in the assessment.

9.2.2 Traffic Emissions

Emissions from road traffic associated with the development have the potential to emit carbon dioxide (CO_2) which will impact climate.

Chapter 12 –Traffic and Transport was reviewed in order to gather the necessary information for the climate assessment. Section 12.3 of Chapter 12 discusses the development traffic generation. Section 12.3.1 sets out the methodology used to generate traffic figures for the historic quarrying operations from 1990 – 2014. Table 12.3 of Chapter 12 (reproduced as Table 9.3 below) includes the extracted annual tonnages and the associated daily vehicle movements for the development.

For the purposes of this assessment, staff employed at the site lived locally in Dunmanway and a one-way trip distance of 10 km has been utilised. A one-way distance of 60 km has been used for HGV trips as materials were supplied to sites within the locality. The site was assumed to be operational for a maximum of 50 weeks per year. It is assumed that all staff trips were via private car.

Using the trip generation data from Chapter 12 and the distances travelled, an annual average figure of 355,680 km for staff vehicle trips was used in the assessment and an annual average figure of 1,961,280 km for HGV trips was used in the assessment (see Table 9.3 adapted from Table 12.3 of Chapter 12).

The vehicle trips and assumed distances were multiplied by the relevant emission factors in the TII Carbon Tool in order to quantify the GHG emissions as a tCO_2e.

Further detail on the traffic generated by the development can be found in Chapter 12 – Traffic and Transport.

Table 9.3 Development Traffic (adapted from Table 12.3 of Chapter 12 –Traffic and Transport)

Year	Tonnes Removed from Site	Tonnes of Tarmacadam from Plant	Employees (All movements / day)	Exporting Trucks (All movements / day)	Importing Truck (All movements / day)	Total Movements / day	Total Annual Distance Staff (km)	Total Annual Distance Trucks (km)
1990	100,000.00*	-	26	36	6	68	156,000	1,512,000
1991	100,000.00*	-	26	36	6	68	156,000	1,512,000
1992	100,000.00*	-	26	36	6	68	156,000	1,512,000
1993	100,000.00*	-	26	36	6	68	156,000	1,512,000
1994	100,000.00*	-	26	36	6	68	156,000	1,512,000
1995	100,000.00*	-	26	36	6	68	156,000	1,512,000
1996	100,000.00*	-	26	36	6	68	156,000	1,512,000
1997	100,000.00*	-	26	36	6	68	156,000	1,512,000
1998	100,000.00*	-	26	36	6	68	156,000	1,512,000
1999	100,000.00*	100,000.00	78	72	10	160	468,000	2,952,000
2000	-	120,000.00	78	44	6	128	468,000	1,800,000
2001	-	120,000.00	78	44	6	128	468,000	1,800,000
2002	77,785.00	100,000.00	78	64	10	152	468,000	2,664,000
2003	70,413.00	80,000.00	78	54	8	140	468,000	2,232,000
2004	89,657.00	80,000.00	78	62	10	150	468,000	2,592,000
2005	142,720.00	70,000.00	78	72	12	162	468,000	3,024,000
2006	178,295.00	80,000.00	78	100	14	192	468,000	4,104,000

Year	Tonnes Removed from Site	Tonnes of Tarmacadam from Plant	Employees (All movements / day)	Exporting Trucks (All movements / day)	Importing Truck (All movements / day)	Total Movements / day	Total Annual Distance Staff (km)	Total Annual Distance Trucks (km)
2007	202,222.00	70,000.00	78	100	14	192	468,000	4,104,000
2008	163,386.00	60,000.00	78	82	12	172	468,000	3,384,000
2009	143,904.00	40,000.00	78	66	10	154	468,000	2,736,000
2010	-	20,000.00	78	8	2	88	468,000	360,000
2011	44,998.00	25,000.00	78	26	4	108	468,000	1,080,000
2012	43,600.00	15,000.00	78	22	4	104	468,000	936,000
2013	32,360.00	15,000.00	78	18	2	98	468,000	720,000
2014	45,207.00	15,000.00	78	22	4	104	468,000	936,000
* Estimated tonnage removed from site								
						Average	**355,680**	**1,961,280**

9.2.3 Criteria for Rating Impacts

The rating of potential environmental effects of the development on air quality is based on the criteria presented in Table 3.3 of the EPA (2022) document titled *Guidelines on the Information to Be Contained in Environmental Impact Assessment Reports*. These criteria consider the quality, significance, duration and types of effect characteristics identified.

9.2.3.1 Significance Criteria for Greenhouse Gas Assessment

The Transport Infrastructure Ireland (TII) guidance document entitled *PE-ENV-01104 Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document* (TII, 2022) outlines a recommended approach for determining the significance of both the construction and operational phases of a development.

The significance of GHG effects set out in PE-ENV-01104 (TII, 2022) is based on ISEP guidance (ISEP, 2022) which is consistent with the terminology contained within Figure 3.4 of the EPA's 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (EPA, 2022).

The 2022 ISEP Guidance (ISEP, 2022) sets out the following principles for significance:

- When evaluating significance, all new GHG emissions contribute to a negative environmental impact; however, some projects will replace existing development or baseline activity that has a higher GHG profile. Therefore, the significance of a project's emissions should be based on its net impact over its lifetime, which may be positive, negative or negligible;
- Where GHG emissions cannot be avoided, the goal of the EIA process should be to reduce the project's residual emissions at all stages; and
- Where GHG emissions remain significant, but cannot be further reduced, approaches to compensate the project's remaining emissions should be considered.

The criteria for determining the significance of effects are a two-stage process that involves defining the magnitude of the impacts and the sensitivity of the receptors (i.e. Ireland's National GHG targets). In relation to climate, there is no project specific assessment criteria, but the project will be assessed against the recommended TII significance determination. This takes account of any embedded or committed mitigation measures that form part of the design which should be considered.

TII (TII 2022) states that professional judgement must be considered when contextualising and assessing the significance of a project's GHG impact. TII reference the ISEP guidance (ISEP, 2022) which states that the crux of assessing significance is "*not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050".*

Significance is determined using the criteria outlined in Table 9.4 (derived from Table 6.7 of PE-ENV-01104 (TII 2022)) along with consideration of the following two factors:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

Table 9.4 Significance Criteria for GHG Assessment

Effects	Significance Level	Description
Significant adverse	Major adverse	• The project's GHG impacts are not mitigated. • The project has not complied with do-minimum standards set through regulation, nor provided reductions required by local or national policies; and • No meaningful absolute contribution to Ireland's trajectory towards net zero.
	Moderate adverse	• The project's GHG impacts are partially mitigated. • The project has partially complied with do-minimum standards set through regulation, and have not fully complied with local or national policies; and • Falls short of full contribution to Ireland's trajectory towards net zero.
Not significant	Minor adverse	• The project's GHG impacts are mitigated through 'good practice' measures. • The project has complied with existing and emerging policy requirements; and • Fully in line to achieve Ireland's trajectory towards net zero.
	Negligible	• The project's GHG impacts are mitigated beyond design standards. • The project has gone well beyond existing and emerging policy requirements; and • Well 'ahead of the curve' for Ireland's trajectory towards net zero.
Beneficial	Beneficial	• The project's net GHG impacts are below zero and it causes a reduction in atmosphere GHG concentration. • The project has gone well beyond existing and emerging policy requirements; and • Well 'ahead of the curve' for Ireland's trajectory towards net zero, provides a positive climate impact.

Ireland's carbon budgets can also be used to contextualise the magnitude of GHG emissions from the development (TII, 2022). The approach is based on comparing the net development GHG emissions to the relevant carbon budgets (DECC, 2025). With the publication of the Climate Action Act in 2021 and the Climate Action Plan 2025, sectoral carbon budgets have been published for comparison with the net GHG emissions from the development over its lifespan. The aim of the carbon budgets is to ensure we are on a trajectory to meet the National Climate Objective of Net Zero by 2050.

9.2.4 Difficulties Encountered in Compiling Information

In order to establish the baseline environment historical GHG emissions data and meteorological data from as far back as possible have been reviewed. In relation to some parameters data for the entire 1990 – 2014 time period was not available but data from as far back as possible has been reviewed. This does not significantly alter the conclusions of the assessment.

9.3 Description of Existing Environment

The substitute consent application area is located in the townland of Ardcahan approximately 3.5 km north east of Dunmanway. The site is located on the L4621-9 just off the main R587 Dunmanway to Macroom road. Vehicular access to the site is via a c.180 m long gated access road directly off the L4621-9. The site is located in a rural area with the predominant land use in the vicinity of the site being livestock farming and low density housing.

Historical data for climate was investigated in order to establish the relevant baseline for the purposes of the assessment. Data from as far back as possible has been used in establishing the baseline. 1990

is typically taken as the historical baseline year by countries when reporting GHG emissions under the United Nations Framework Convention on Climate Change (UNFCCC). Data from 1990 are considered representative of the baseline conditions prior to 1990. Trends in GHG emissions for the period 1990 – 2024 have been discussed in the following section.

9.3.1 GHG Emissions

Although variation in climate is thought to be a natural process, the rate at which the climate is changing has been accelerated rapidly by human activities. Climate change is one of the most challenging global issues facing us today and is primarily the result of increased levels of GHGs in the atmosphere. These GHGs come primarily from the combustion of fossil fuels in energy use. Moving away from our reliance on coal, oil and other fossil fuel-driven power plants is essential to reduce emissions of GHGs and combat climate change.

For the purposes of this assessment, the definition for GHGs outlined in Council *Directive 2009/28/EC* on the promotion of the use of energy from renewable sources and amending and subsequently repealing *Directives 2001/77/EC* and *2003/30/EC* (European Parliament and Council of Europe 2009) has been used. In *'Annex V, C. Methodology Point 5'* the relevant GHGs are defined as Carbon Dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) which are also the most significant GHGs. Climate is defined as the average weather over a period of time, whilst climate change is a significant change to the average weather. In recent years human activities, which have resulted in the release of GHGs, have impacted on climate causing climate change. The release of anthropogenic GHGs is altering the Earth's atmosphere resulting in a 'Greenhouse Effect'. This effect is causing an increase in the atmosphere's heat trapping abilities resulting in increased average global temperatures over the past number of decades. The release of CO_2 as a result of burning fossil fuels, has been one of the leading factors in the creation of this 'Greenhouse Effect'.

Trends in GHG emissions at a national level are available in annual reports by the EPA. The most recent EPA report entitled '*Ireland's Provisional Greenhouse Gas Emissions 1990 – 2024* [1] (EPA, 2025) reviews national emissions in 2024 and trends in emissions from 1990.

The EPA reported that GHG emissions in 2024 are -3.4% less than emissions in 1990, which is the second consecutive year that emissions are below the 1990 historic baseline. Between 1990 and 2024 the greatest overall increase in emissions is from the Transport sector which has shown a 126.6% increase in emissions, particularly in relation to road transport which in large part is attributable to increasing population and economic prosperity. The Energy Industries have shown a decrease in emissions of 36.9% over the 1990 – 2024 period. This decrease reflects the improvement in efficiency of modern gas fired power plants replacing older peat and oil-fired plants and the increased share of renewables, primarily wind power, along with increased interconnectivity. The Agricultural sector has shown a 0.8% decrease in emissions over the 1990 – 2024 period. Agriculture sector emissions decreased between 1998 until 2011 but since 2011 emissions have been on an upward trend. Emissions from the Residential sector showed a general upward trend in emissions after 1997 due to increased housing stock and growing population. Emissions remained relatively stable over the 2015 to 2021 period despite an increasing population. Emissions from the Residential sector in 2024 were 25.8% lower than in 1990.

Figure 9.1 taken from the EPA report (2025) shows the trend in emissions from the largest sectors over the 1990 – 2024 period.

[1] https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/EPA-Provisional-GHG-Report-Jul24-v6.pdf

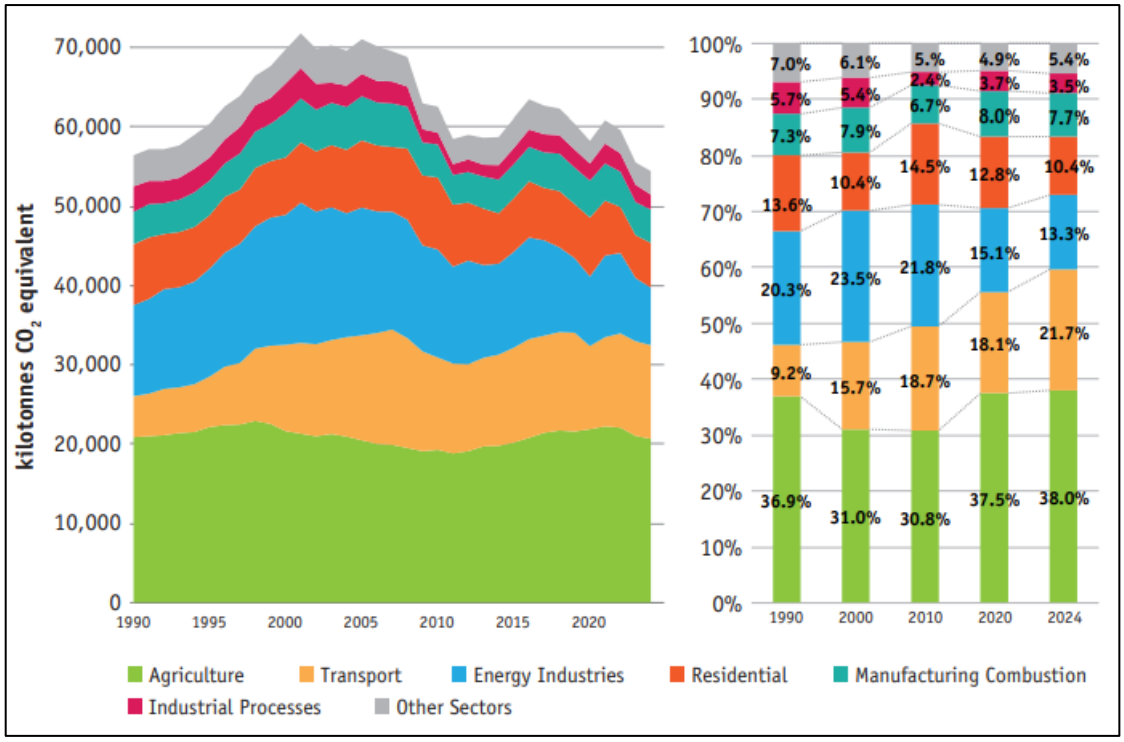


Figure 9.1 Trend in Emissions for Largest Sectors 1990-2024 (Source: Figure 25 EPA (2025) Ireland's Provisional Greenhouse Gas Emissions 1990 – 2024)

In relation to the current climate GHG emissions baseline, and in order to frame the historic baseline against a current climate context, Ireland's compliance with the EU Effort Sharing Regulation (ESR) (EU 2018/842) and the published carbon budgets (Table 9.1), data published in July 2025 (EPA, 2025) predicts that Ireland exceeded (without the use of flexibilities) its 2024 annual limit set under EU's Effort Sharing Regulation (ESR) by 3.74 $MtCO_2e$. Cumulatively from 2021-2024 and after using the ETS flexibility, Ireland is not in compliance with the ESR by a net distance to target of -1.03 Mt CO_2e, there is an exceedance of 1.83 Mt CO_2e above its Annual Emissions Allocation with the ETS flexibility. Agriculture and Transport accounted for 75.4% of total ESR emissions in 2024. The sectoral breakdown of 2024 GHG emissions is shown in Table 9.5. The sector with the highest emissions in 2024 was Agriculture at 35.22% of the total, followed by transport at 20.1%.

The EPA report (EPA, 2025) states that the latest projections indicate that currently implemented measures (With Existing Measures) will achieve a reduction of 10% on 2005 levels by 2030, significantly short of the 42% reduction target. If measures in the higher ambition (With Additional Measures) scenario are implemented, EPA projections show that Ireland can achieve a reduction of 22% by 2030, still short of the 42% reduction target.

The current estimates of National greenhouse gas emissions (including LULUCF) in 2024 are 12% below 2018, well off the National Climate ambition of a 51% reduction by 2030. The data indicates that from 2021- 2024 Ireland has used 82.5% of the 295 Mt CO_2e Carbon Budget for the five-year period 2021-2025. This leaves 17% of the budget available for 2025, requiring a substantial 10.3% annual emissions reduction for 2025 to stay within budget.

Table 9.5 Total National GHG Emissions in 2024

Sector	2024 Emissions (Mt CO_2e)	% Total 2024 (including LULUCF)
Agriculture	20.408	35.40%
Transport	11.652	20.21%
Energy Industries	7.157	12.42%
Residential	5.615	9.74%
Manufacturing Combustion	4.13	7.16%
Industrial Processes	1.88	3.26%
F-Gases	0.581	1.01%
Commercial Services	0.771	1.34%
Public Services	0.721	1.25%
Waste Note 2	0.837	1.45%
Land Use, Land-use Change and Forestry (LULUCF)	3.895	6.76%
National total excluding LULUFC	**53.752**	-
National total including LULUFC	**57.646**	-

Note 1: Reproduced from Latest emissions data from the EPA (EPA, 2025)

Note 2: Waste includes emissions from solid waste disposal on land, solid waste treatment (composting and anaerobic digestion), wastewater treatment, waste incineration and open burning of waste.

9.3.2 Meteorological Data

The region of the development has a temperate, oceanic climate, resulting in mild winters and relatively cooler summers when compared with continental Europe. This baseline data is derived from the European Centre for Medium-Range Weather Forecasts (ECMWF) ERA5 data reanalysis (ECMWF, 2023) which includes observed data from individual meteorological weather stations across Ireland from 1950-2023 such as that at Cork Airport. This data is reanalysed to model a complete picture of Irelands historical climate. This method has been chosen to ensure data can be analysed at the daily level and harmoniously compared with future scenarios. The baseline time-period referred to for the Baseline assessment was from 1991-2020 and is specific to County Cork and the location of the development in question.

Figure 9.2 below shows the climatology for County Cork across the 30-year period from 1991 to 2020 indicating the wettest months are from October through to January, with December (109mm) being the wettest on average. Late Spring and Summer are markedly drier compared to the wettest months with average monthly precipitation 85mm-78mm respectively. The driest month on average was June (78mm), with March and September also experiencing lower than average rainfall (~80mm). Ireland's and Cork's precipitation patterns are strongly influenced by its oceanic climate, with the wettest months typically coinciding with periods of frequent low-pressure Atlantic storm systems.

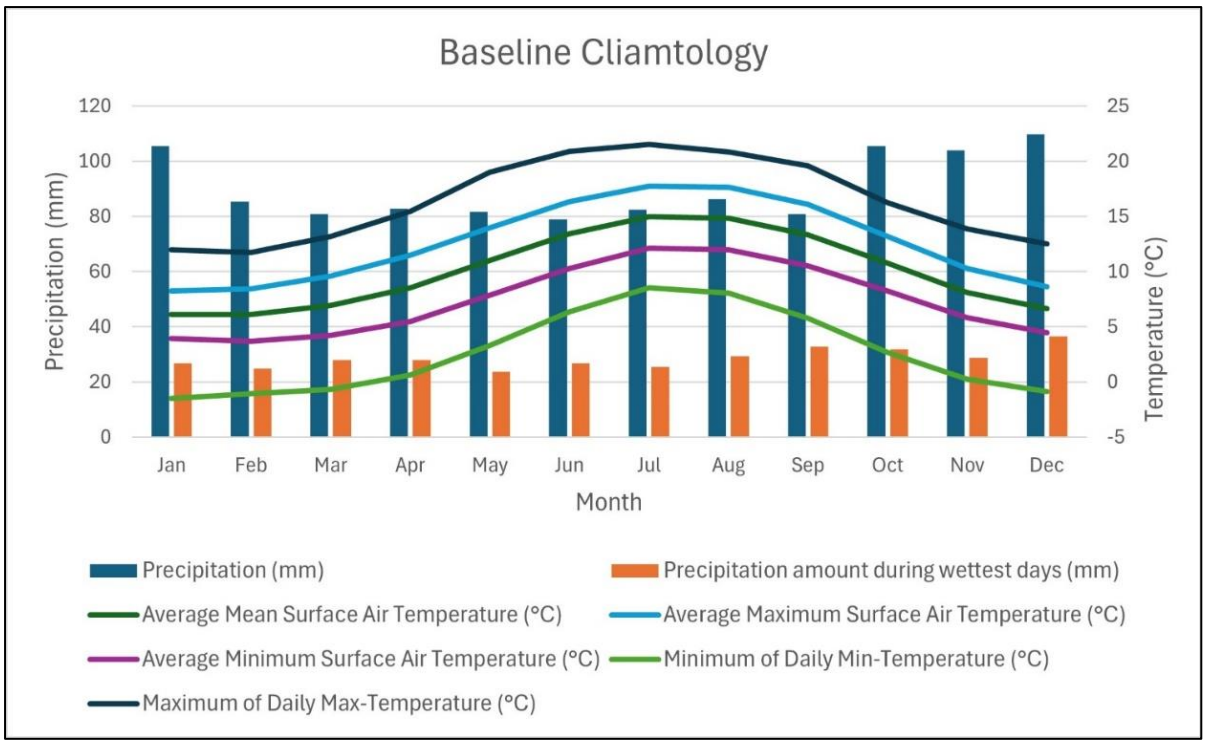


Figure 9.2 Baseline Climatology (Cork County) 1991-2020

July was the warmest month with a mean temperature of 14.9°C with average mean surface temperatures across the summer months (July – August) >17°C. July is also the warmest month for maximum daily temperatures (21°C) which showcases the higher value ranges recorded during a particular month. Across May – September average maximum daily temperatures exceed 19°C.

January and February are the coldest months with average mean surface air temperatures of 6.1°C and average minimum temperatures of 3.7-3.9°C. For daily minimum temperatures which reference the lowest range values (10th percentile range) of the data, January (-1.5°C) and February (-1.0°C) also remain the coldest with marginal difference. Several other winter and early spring months (November - March) also experience minimums of below 0°C.

Historical records show Cork has experienced several severe storms, with wind speeds exceeding 100 km/h. Storm activity is concentrated in winter (December–February), with an average of eight named storms annually (Met Éireann, 2026).

Analysis of data from Cork Airport (1962–2020) indicates a mean 10m wind speed of 10 knots (18 km/hr) and an average maximum gust speed ≥60 knots (111 km/h) (Met Éireann, 2026).

Overall, the baseline climatology for the development location and region shows evidence of a high frequency of precipitation across the year with instances of very wet days (≥30mm) occurring across October and December. Mild winters with average minimums >0°C and relatively mild summers with average maximums of +17°C but not significant for extreme heat or prolonged drought.

9.4 Impact Assessment

9.4.1 Do Nothing Scenario

As outlined in the EPA Guidelines (2022), the description of 'Do-Nothing Effects' relates to the future environment as it would be, should the project not be carried out.

The "Do Nothing" scenario would have involved no quarrying works occurring over the period 1990 – 2014. However, as quarrying works had taken place prior to this and the site was an active quarry the

predicted impacts of GHG emissions would likely have still occurred. However, emissions may have been lower than those predicted in Section 9.4.3 due to the smaller site area.

9.4.2 Construction Phase

Due to the nature of the development, no significant construction works would have been required. Land was cleared and berms constructed as part of the day to day activities. Therefore, no significant construction phase impacts to climate are predicted. The primary impacts to climate have occurred as part of the day-to-day operational activities on site.

9.4.3 Operational Phase

Site fuel usage and vehicle emissions were identified as the primary sources of GHG emissions for the development. The estimated fuel usage on site is c. 360,000 litres of diesel per year. Using the carbon emission factor for diesel fuel usage from the TII carbon tool it has been calculated that there were 1,203 tCO_2e per year associated with fuel usage on site (see Table 9.6). Traffic movements include HGV trips as well as staff vehicle trips (assumed by car), traffic emissions resulted in 2,202 tCO_2e.

Table 9.6 Predicted Annual GHG Emissions from Site Activities

Activity		tCO_2e	Sector for Emissions Comparison	Sectoral Budget (tCO_2e)	Site GHG Emissions as % of Relevant Budget
Fuel Usage	c. 360,000 litres diesel/yr	1,203	Industry	4,000,000	0.03%
Traffic	Staff vehicle and HGV movements to/from site	2,202	Transport	6,000,000	0.04%
Total	total site GHG emissions	3,405	National Non-ETS 2030 Target	27,721,670	0.012%
			Ireland's 2024 Total GHG Emissions (existing baseline)	57,640,000	0.006%

The GHG emissions from the development as a total cannot be compared against one specific sector 2030 carbon budget, the emissions are broken down into different assessment categories and these must be compared separately to the relevant sectoral emissions budgets (see Table 9.6). The relevant sectoral emissions for the development comparison include the Industry sector and Transport sector.

In Table 9.6, GHG emissions have been compared against the carbon budget for the industry and transport sectors in 2030 (DECC, 2024), against Ireland's total GHG emissions in 2024 and against Ireland's EU 2030 target of a 30% reduction in non-ETS sector emissions based on 2005 levels (27.7 Mt CO_2e) (set out in Regulation EU 2018/842 of the European Parliament and of the Council).

The estimated total annual GHG emissions are equivalent to 0.006% of Ireland's total GHG emissions in 2024 and 0.012% of Ireland's non-ETS 2030 emissions target. The estimated GHG emissions associated with transport-related activities are 0.04% of the 2030 Transport budget, and fuel usage is 0.03% of the 2030 Industry budget.

Quarrying activities ceased on site by 2014 and there are no activities taking place on site at present, as a result, there are currently no impacts to climate associated with the development site.

In relation to future climate impacts from the development site, if the subject application is not approved, no activities on site will occur and therefore, there will be no impact to climate. Should quarrying activities recommence on site following grant of a relevant planning permission, impacts to climate similar to those identified herein would likely occur.

The historic quarrying activities resulted in some GHG emissions which impacted climate. The quarrying activities supplied materials locally, particularly during the boom period. Having an available material source locally would have reduced the need to import similar products from further away, and this would have reduced transport distances. However, overall, the development did not have

any specific measures in place to mitigate GHG emissions and impacts to climate. Based on the quantified GHG emissions and, using the assessment criteria from Section 9.2.3.1 and Table 9.4, the significance of the GHG emissions is considered moderate adverse, as per Table 9.4 this includes a project which:

- The project's GHG impacts are partially mitigated.
- The project has partially complied with do-minimum standards set through regulation, and have not fully complied with local or national policies; and
- Falls short of full contribution to Ireland's trajectory towards net zero.

In accordance with the EPA guidelines (EPA, 2022), this equates to a ***direct, long-term, negative***, ***significant*** effect.

9.4.4 Risk of Major Accidents and Disasters

Due to the nature of the development, the risk of major accidents and disasters in relation to climate are not anticipated. There were no major accidents or disasters in relation to climate over the period of concern, 1990 – 2014.

9.4.5 Cumulative

With respect to the requirement for a cumulative assessment the ISEP (ISEP, 2022) and TII (TII, 2022a) guidance on which the assessment is based states that "*the identified receptor for the GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable. By presenting the GHG impact of a project in the context of its alignment to Ireland's trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the potential for the project to affect Ireland's ability to meet its national carbon reduction target. This assessment approach is considered inherently cumulative*".

As per the above, the cumulative impact of the development in relation to GHG emissions is considered ***direct, long-term, negative*** and ***significant*** in EIA terms.

9.5 Remedial Measures

9.5.1 Construction Phase

No specific construction phase mitigation was implemented.

9.5.2 Operational Phase

The information available indicates that there were no specific mitigation measures implemented on site in relation to reducing emissions or climate impacts.

9.5.3 Monitoring

There is no information available on any monitoring measures in relation to climate.

9.6 Residual Impacts

9.6.1 Statement on the Significant Effects on the Environment

The historic quarrying activities resulted in some GHG emissions which impacted climate. Based on the quantified GHG emissions and, using the assessment criteria from Section 9.2.3.1 and Table 9.4, the significance of the GHG emissions is considered moderate adverse, as per Table 9.4 this includes a project which:

- The project's GHG impacts are partially mitigated.
- The project has partially complied with do-minimum standards set through regulation, and have not fully complied with local or national policies; and
- Falls short of full contribution to Ireland's trajectory towards net zero.

In accordance with the EPA guidelines (EPA, 2022), this equates to a ***direct, long-term, negative***, ***significant*** effect.

Quarrying activities ceased on site by 2014 and there are no activities taking place on site at present, as a result, there are currently no impacts to climate associated with the development site.

In relation to future climate impacts from the development site, if the subject application is not approved, no activities on site will occur and therefore, there will be no impact to climate. Should quarrying activities recommence on site following grant of a relevant planning permission, impacts to climate similar to those identified herein would likely occur.

9.7 References

Civil Engineering Standard Method of Measurement (CESMM) (2013) Carbon and Price Book database.

Construction Industry Federation (2021) Modern Methods of Construction

Cork County Council (2014) Cork County Development Plan 2014

Cork County Council (2022) Cork County Development Plan 2022 – 2028 Volume 1 Main Policy Material

Cork County Council (CCC) (2024) Climate Action Plan 2024-2029

Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports

Environmental Protection Agency (2025a) Ireland's Provisional Greenhouse Gas Emissions 1990-2024

European Centre for Medium-Range Weather Forecasts (ECMWF) (2023) ERA5 Fifth Generation Atmospheric Reanalysis: Copernicus Climate Change Service - Complete ERA5 global atmospheric reanalysis. Accessed through: DOI: 10.24381/cds.143582c

European Commission (2014) 2030 Climate and Energy Policy Framework

European Commission (2017) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report

European Commission (2021a) Technical guidance on the Climate Proofing of Infrastructure in the Period 2021-2027

European Commission (2021b) 2030 EU Climate Target Plan

European Union (2018) Regulation 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013

Government of Ireland (2015) Climate Action and Low Carbon Development Act

Government of Ireland (2019) Climate Action Plan 2019

Government of Ireland (2020) Climate Action Plan 2021

Government of Ireland (2021) Climate Action and Low Carbon Development (Amendment) Act 2021 (the 2021 Climate Act) (No. 32 of 2021)

Government of Ireland (2022) Climate Action Plan 2022

Government of Ireland (2023) Long-term Strategy on Greenhouse Gas Emissions Reductions

Government of Ireland (2025) Climate Action Plan (CAP) 2025

The Institute of Sustainability and Environmental Professionals (ISEP) (formerly known as IEMA) (2020b) GHG Management Hierarchy

The Institute of Sustainability and Environmental Professionals (ISEP) (formerly known as IEMA) (2022) Environmental Impact Assessment Guide to: Assessing GHG Emissions and Evaluating their Significance

Met Éireann (2026) Ireland's 30-year Climate Averages. Available from: https://www.met.ie/climate/30-year-averages

Transport Infrastructure Ireland (2022a) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document

Transport Infrastructure Ireland (2025) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document

Murray Brothers Tarmacadam Ltd

CHAPTER 10
NOISE AND VIBRATION

VOLUME II
MAIN STATEMENT

FEBRUARY 2026

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10 Noise and Vibration

10.1 Introduction

This chapter evaluates the impacts and remedial measures, if required, for historic quarrying activity at Ardcahan Quarry, Dunmanway in terms of Noise and Vibration as defined in the Environmental Protection Agency *Advice Notes on Current Practice in the Preparation of EIS, 2003*.

The rEIAR is to be submitted as part of a Substitute Consent planning application covering the period 1990 to 2014.

10.1.1 Author Information and Competency

This chapter of the EIAR has been prepared by Brian Johnson, Acoustic Consultant at CLV Consulting.

Brian is an internationally experienced acoustic consultant who has been working in the fields of architectural / environmental acoustics and noise control since 1994. Brian holds a Bachelor of Science in Acoustical Engineering (Purdue University), Certificate of Competence in Building Acoustic Measurements (Institute of Acoustics), Certificate of Competence in Environmental Noise Measurements (Institute of Acoustics) and is a LEED Certified Green Professional. He has prepared close to a hundred noise and vibration chapters for EIARs over the course of his career including similar assessments for the Dripsey, Ballymacoda and Camp Fire (Cappoquin) Quaries in Co. Cork and the Ballymurn Quarry in Wexford.

CLV Consulting is a multidisciplinary acoustic and vibration consultancy offering specialist design and assessment advice in respect of Architectural / Building and Environmental Acoustics and both Structural and Occupational Noise & Vibration. Guidelines and Legislation Relevant to Discipline

10.1.2 Guidelines and Legislation Relevant to Discipline

In developing the noise and vibration assessment for this project, consideration will be given to the following guidance documents where appropriate:

- Cork County Council planning decision (Ref. 98/294);
- Cork County Council correspondence and decision (Ref; 14/00616);
- *Environmental Management in the Extractive Industry (Non-Scheduled Minerals)*, EPA 2006;
- *Quarries and Ancillary Activities – Guidelines for Planning Authorities* – DoEHLG, April 2004;
- BS 8233 (2014): Guidance on Sound Insulation and Noise Reduction for Buildings.
- ISO 1996-2:2017 *Acoustics - Description, measurement and assessment of environmental noise - Determination of sound pressure levels*;
- BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites - Noise*;
- BS 5228-2:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites - Vibration*;
- BS 7385-2:1993 *Evaluation and measurement for vibration in buildings Guide to damage levels from groundborne vibration; and,*
- BS 6472:2008 - *Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting*.
- *Planning and Development Act 2000*

While there is no specific guidance available in relation to the preparation of an rEIAR, it is therefore considered appropriate to follow guidance contained in *Planning and Development Act 2020* as well as to the general guidance on carrying out and assessing EIAR.

10.1.3 Noise Criteria

10.1.3.1 All operations excluding blasting

The existing permitted macadam production plant and ancillary buildings, which are located to the east of the site boundary but within the wider landholding, were permitted under Cork County Council planning decision 98/294. While the application did not relate to quarrying / extraction activities, the permission required compliance with noise criteria under Condition 4 which states that:

> *"Noise levels emanating from the proposed development when measured at the site boundaries shall not exceed 55 dBA (15 minute L_{eq}) between 08.00 hours and 20.00 hours Monday to Saturday inclusive and shall not exceed 45 dBA (15-minute L_{eq}) at any other time. Measurements shall be made in accordance with I.S.O. Recommendations R.1996/1 "Acoustics - Description and Measurement of Environmental Noise, Part 1: Basic quantities and procedures".*
>
> *If the noise contains a discrete, continuous note (whine, hiss, screech, hum, etc.), or if there are distinct impulses in the noise (bangs, clicks, clatters or thumps), of if the noise is irregular enough in character to attract attention, a penalty of +5 dBA should be applied to the measured noise level and this increased level shall be used in assessing compliance with the specified levels. (Ref. BS 4142 Section 7.2)".*

It is noted that these criteria are in line with those outlined in the Environmental Protection Agency's guidance note *Environmental Management in the Extractive Industry (Non-Scheduled Minerals)*, as such they are deemed appropriate as reference to operations during the substitute consent period and for quarrying / extraction activities. The only discrepancy are the assessment periods which are explicitly defined as being 1-hour in duration. 1-hour periods are also consistent with the DoEHLG *Quarries and Ancillary Activities - Guidelines for Planning Authorities 2006* guidance document and most other applicable best practice guidance documents and will therefore be considered in this instance.

Note that the applicant has confirmed that the quarry did not operate outside of the hours of 07:30 to 17:30, Monday through Friday during the SC period.

As such, the following limits were adopted as appropriate for the assessment of noise from the quarry operations outside of blasting:

> *During the daytime period (07:00 to 19:00) Monday to Friday, specific noise levels from the site shall not exceed 55 dB $L_{Aeq,1hr}$ at the nearest noise sensitive locations.*
>
> *During all other periods, limit of 45dB $L_{Aeq,1hr}$ shall apply to specific noise levels from the site.*

10.1.3.2 Noise criteria for blast events

Blasting noise is assessed using the air overpressure parameter. Air overpressure is energy transmitted from the blast site within the atmosphere in the form of pressure waves. As such a wave passes a given position, the pressure of the air at this point rises very rapidly to a value above the ambient pressure, and then falls more slowly to a value below, before returning to the ambient value after a series of oscillations. The maximum excess pressure in this wave is known as the peak air overpressure. This value can be measured in terms of pounds per square inch or, more usually, in terms of dB (Lin).

These pressure waves will consist of energy over a wide range of frequencies, some of which are audible and known as sound waves or noise, but most of the energy is inaudible at frequencies of less than 20 Hz.

Air overpressure is transmitted through the atmosphere in a similar manner to sound waves. Thus, meteorological conditions, such as wind speed and direction, temperature, cloud cover and humidity will affect the intensity of the air overpressure value experienced at a distance from the blast site.

The Environmental Protection Agency's guidance note *Environmental Management in the Extractive Industry (Non-Scheduled Minerals)* indicates blast air overpressure should not exceed 125 dB (linear maximum peak value) with a 95% confidence limit.

The appropriate criterion for blast related air overpressure is therefore as follows:

> *The air overpressure arising from any blast carried out on the site, when measured outside the nearest inhabited house to the location of the blast, shall not exceed 125 dB (linear) at frequencies of 2Hz or over.*

10.1.4 Vibration Criteria

10.1.4.1 During general operations

In the absence of appropriate local or national guidance in this regard, reference is made to British Standards BS 7385-2:1993 *Evaluation and Measurement for Vibration in Buildings - Guide to Damage Levels from Groundborne Vibration* and BS 5228-2:2009+A1:2014 *Code of Practice for Noise and Vibration Control on Construction and Open Sites – Vibration.*

The guidance outlined in each is discussed further in the following sections.

BS 7385-2:1993 states that there should typically be no cosmetic damage if transient vibration does not exceed 15 mm/s at low frequencies rising to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above. These guidelines relate to relatively modern buildings and should be reduced to 50% or less for more critical buildings.

BS 5228-2:2009+A1:2014 recommends that, for soundly constructed residential property and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above. Below these values minor damage is unlikely. Where continuous vibration is such as to give rise to dynamic magnification due to resonance, the guide values may need to be reduced by up to 50%. BS 5228-2:2009+A1:2014 also comments that important buildings which are difficult to repair might require special consideration on a case by case basis.

A summary of appropriate vibration criteria for the prevention of cosmetic damage to buildings are presented in Table 10.1 below.

Table 10.1 Summary of Vibration Thresholds for Cosmetic Damage to Buildings

Type of Building	Peak particle velocities (PPV in mm/s) in frequency range of predominant pulse below which transient vibration should not cause cosmetic building damage (BS 7385, 1993 & BS 5228-2, 2009)	
	4 - 15 Hz	≥ 15 Hz
Reinforced or framed structures, industrial or heavy buildings	50 mm/s at 4 Hz and above	50 mm/s at 4 Hz and above
Residential or light commercial buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

10.1.4.2 During blasting

Appropriate conditions offering protection against blast related vibration are outlined in the Environmental Protection Agency guidance note *Environmental Management in the Extractive Industry (Non-Scheduled Minerals)* which indicates blast vibration should not exceed 12 mm/s.

Considering this, the following criteria is deemed appropriate:

> *The transmitted ground vibration arising from any blast carried out on the site shall not exceed a peak particle velocity of 12 millimetres per second for any individual blast.*

In terms of this assessment, these criteria have been adopted as an appropriate guideline against which to assess the impacts of the substitute consent operations.

10.2 The Receiving Environment

It is necessary to try and establish the prevailing noise climate in the vicinity of the nearest noise sensitive receptors during the substitute consent period. The nearest noise sensitive locations to the substitute consent site are located approximately 150 to 550 metres to the nearest property boundary. The relevant noise sensitive locations are comprised solely of residential properties.

The majority of the nearest noise sensitive receptors are all located in a rural location situated at a significant remove from major urban centre or transport infrastructure. The noise climate at these locations would have been dominated by local road traffic which has not increased significantly over the period of interest. Review of the Traffic Chapter of the rEIAR confirms that road traffic volumes on the R587 have increased marginally over the period but not enough to significantly increase the ambient noise levels for receptors located in close proximity to the road (traffic flows would have to increase by more than 25% to increase noise emissions levels by 1dB).

Given the context of the site, it is the opinion of CLV Consulting that it is reasonable to consider that the prevailing noise climate towards the end of the substitute consent period would be generally representative of that throughout the entire substitute consent period. Data from the noise survey completed in 2014 as part of the previous EIAR for the site (refer to P.R. #14/616 Chapter 8 Noise & Vibration) has therefore been utilised to inform the rEIAR assessment.

Details of the survey are outlined in the following section.

10.2.1 2014 Noise Survey

An environmental noise survey was conducted in order to quantify the existing noise environment during quarry operations. The survey was conducted in general accordance with *ISO 1996-2:2007 Acoustics - Description, measurement and assessment of environmental noise - Determination of environmental noise levels*[1]. A summary of the survey has been set out below.

The survey was conducted on 19 June 2014, between 09:08 and 12:17 hrs. This period was selected in order to provide a typical snapshot of the background noise climate during the normal operating hours for the quarry.

Ronan Murphy (AWN) conducted the noise level measurements. The noise measurements were conducted using a Brüel & Kjær Type 2260 Sound Level Analyser. The measurement apparatus was check calibrated both before and after the survey using a Brüel & Kjær Type 4231 Sound Level Calibrator.

Measurements were carried out at three locations which are shown on Figure 10.1 in the context of the development.

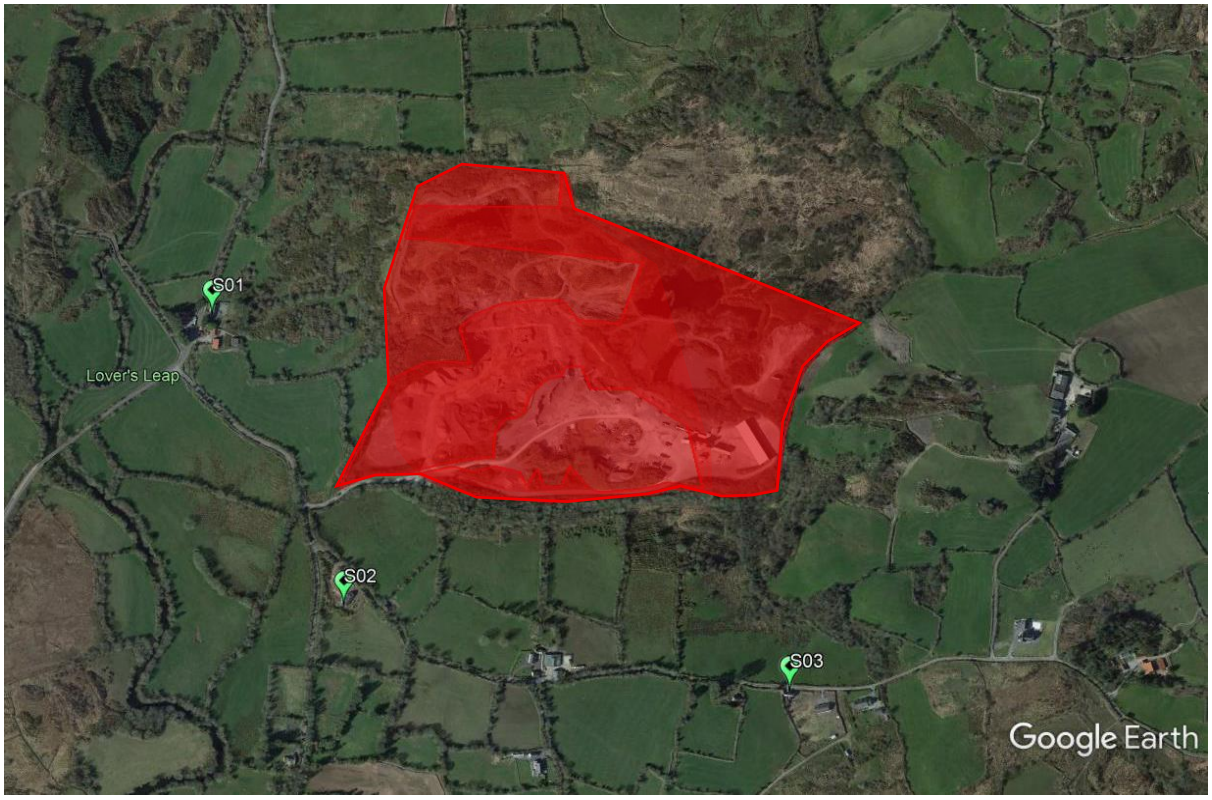


Figure 10.1 Site/Ownership Boundary and Survey Locations (Satellite Imagery: 2013)

[1] While this standard was replaced in 2017 by ISO 1996-2:2017 *Acoustics - Description, measurement and assessment of environmental noise - Determination of sound pressure levels,* the survey was completed in accordance with the standard relevant at the time.

Table 10.3 Noise Survey Details'

Survey Location	Sound Pressure Level dB re 20 µPa				
	L_{Aeq}	L_{AFmax}	L_{AFmin}	L_{AF10}	L_{AF90}
S01	51	73	29	54	34
S02	51	82	30	46	35
S03	49	79	27	43	33

The dominant source of noise during the survey at all locations was intermittent road traffic. Quarry activity was just audible at survey location S02. The survey results are indicative of typical rural location removed from major industry or transport infrastructure but in close proximity to regional and local roads. Considering the contributory sources to the prevailing noise climate, the 2014 survey can therefore be considered as largely representative of noise levels over the substitute consent period.

10.3 Predicted Impacts

10.3.1 Do Nothing Scenario

In a do nothing scenario, prevailing noise levels at the nearest noise sensitive receptors in the vicinity of the site would not have varied significantly. The potential for noise and vibration from site activities would have been totally eliminated.

10.3.2 General Onsite Activity

Onsite quarry activity having the potential to generate noise during the SC period can be summarised into a number of key groups as follows:

Table 10.4 Summary of Noise Generating Activities Onsite

Activity	Typical Noise Generating Tasks
Preparation of Quarry Area	• Ground clearance and removal of vegetation • Excavation and removal of soil and overburden • Drilling of blast holes
Processing Quarried Material	• Loading and operation of crushers and screens
Material Handling	• Stockpiling quarried aggregate within the site • Stockpiling of soil and overburden • Loading customer vehicles • Loading Murray Brothers trucks and movement offsite

It is also understood that ancillary construction works also occurred during the period as required; these works included construction of internal roads, settlement pond and an earth berm.

Detailed noise calculations for construction activities typically include a high level of uncertainty due to various factors such as plant on-time and machinery specifications. Even with this information, variation in operational work practices still introduces a degree of uncertainty. In the case of the

current application, due to the extended period of assessment (24 years) and the large footprint of the assessment site, the level of uncertainty involved in such calculations would be so significant that they would not provide any meaningful insight into noise levels generated during the period.

In lieu of detailed calculations, it is necessary to adopt a more qualitative approach to assessment. The various activities outlined above have been discussed further in the following sections in terms of the potential noise and vibration generating plant items involved. Section 10.4 in this chapter will review mitigation measures that were applied during the period before determining if any of the potential noise impacts arising may have been sufficiently mitigated.

10.3.2.1 Preparation of Quarry Area

A 20 tonne tracked excavator and 40 tonne tipper dump truck or front loader would typically be used to strip an area of vegetation and overburden. Occasionally, a breaker arm may be required to remove larger outcrops and offer up a level platform for the holeshot drilling rig to operate. The holeshots would have been drilled by the blasting contractor using a crawler mounted rotary drill rig.

Noise associated with these activities include engine noise from the machinery, and impulsive noise including hammering and scraping, which would have been generated during the breaking and scraping of rock and operation of the drill rig.

Activity relating to the preparation of quarry area for extraction would have had the potential for slight to significant noise impacts, of momentary to temporary duration, depending on the location of the works, the proximity to and acoustic screening to the nearest noise sensitive location. Note also that the *Quarries and Ancillary Activities - Guidelines for Planning Authorities 2004* guidance document allows temporary increases during the 'construction phase' (basically when stripping ground and machines are working at heights over or near mitigation berms).

10.3.2.2 Processing of Quarried Material

Quarried blastrock material would be transferred to the crusher using a dumper loaded by a 40 to 50 tonne excavator, depending on the location and accessibility of the blasted material within the site. A 40 tonne front loader would be used to transfer the crushed aggregate between primary and secondary crushing stockpiles.

Noise associated with these activities include engine noise from the machinery and impulsive noise from the loading and operation of the crusher intake hopper. The crusher operation would typically be one of the most significant noise sources in use within the site.

Activity relating to the processing of quarry material would have had the potential for slight to significant noise impacts, of momentary to temporary duration, depending on the location of the works, the proximity to and acoustic screening to the nearest noise sensitive location.

10.3.2.3 Material Handling

The main noise generating operation arising from material handling within the site is the movement of front loaders and dump trucks. A high level of noise would be expected when tipper dump trucks are loaded with larger fill material such as 6 inch down.

Activity relating to the handling of quarry material within the site would have had the potential for slight to significant noise impacts, of momentary to temporary duration, depending on the location of the works, the proximity to and acoustic screening to the nearest noise sensitive location.

10.3.3 HGV Movements on Public Roads

It is noted that the heavy vehicle access to the quarry during the SC period was via the R587 and that a latter prohibition of HGVs accessing the site via the L4621 south of the site entrance was implemented. Reference to Chapter 12 (Traffic) of the rEIAR confirms the increase in Annual Average Daily Traffic (AADT's) on the R587 due to quarry traffic was 4.5% during the peak years of quarry extraction, 2007 where 202,222 tonnes of material were exported from the site.

The impact of quarry related road traffic on the local road network would have therefore given rise to negligible to slight negative impacts, of long-term duration over the assessment period.

10.3.4 Blasting Noise

Historical air overpressure monitoring data during blasting has been outlined in Table 10.5.

Table 10.5 Historic Blasting Air Overpressure Monitoring Data (2009 to 2014)

Date	Location	Distance to Blast	Peak Sound
20-Jan-09	Tarmac Plant	328	102
06-Apr-09	na	na	120
30-Apr-09	Tarmac Plant	na	121
12-Nov-10	Tarmac Plant	316	106
14-Jun-11	Pat Hayes	744	121
16-Jan-12	Tarmac Plant	273	122
16-Feb-12	Pat Hayes	739	119
20-Mar-13	Tarmac Plant	739	100
20-Mar-13	Pat Hayes	359	119
14-Feb-14	Pat Hayes	732	116
14-Feb-14	Tarmac Plant	366	122

Historical blasting air overpressure monitoring data for the site demonstrates that blasting air overpressure ranged from 116 to 121 dB (Lin) at the measurement position. Routine open-pit blasting operations in the UK regularly generate air overpressures up to a magnitude of 120 dB (Lin) (measured with a 2.0 Hz High Pass system), with levels in excess of 125 dB (Lin) being relatively rare. Damage levels are rarely approached, let alone exceeded.

Although the measured historic data for the site demonstrates compliance with the adopted criteria, it is important to note that the measurement location does not represent the nearest noise sensitive location to the blast area in each case. As such, it cannot be determined if other receptors located closer to the blast site were exposed to peak noise levels greater than those permitted.

It is likely that that due to the elevated profile of intermediate ground between the blast areas within the SC area and the receptors to the west and north, there would have been sufficient acoustic screening to compensate against the potentially increased proximity of blasting locations to these receptors. As such, blasting noise would have given rise to slight to moderate negative impacts of momentary duration over the assessment period.

10.3.5 Blasting Vibration

Historical blasting vibration monitoring data as measured during blasting over the period 2009 to 2014 is presented in Table 10.6.

Table 10.6 Summary of Blasting Vibration Measurements (2009 to 2014)

Date	Location	Distance to Blast (m)	Peak Particle Velocity (PPV)		
			L	T	V
20-Jan-09	Tarmac Plant	328	1.5	1.4	0.6
06-Apr-09	na	na	4.6	3.9	3.9
30-Apr-09	Tarmac Plant	na	1.4	1.3	0.8
12-Nov-10	Tarmac Plant	316	2.4	1.7	1.4
14-Jun-11	Pat Hayes	744	1.2	1.2	0.8
16-Jan-12	Tarmac Plant	273	2.5	2.0	4.1
16-Feb-12	Pat Hayes	739	1.4	0.6	1.0
20-Mar-13	Tarmac Plant	739	1.6	1.6	1.6
20-Mar-13	Pat Hayes	359	1.2	0.6	0.6
14-Feb-14	Pat Hayes	732	1.8	1.0	0.6
14-Feb-14	Tarmac Plant	366	2.0	2.0	2.7

No blasting events during the period exceeded the 12 mm/s criteria.

Although people exhibit a wide variation of tolerance to vibration within residential properties, vibration magnitude of greater than 6 mm/s is potentially perceptible to the majority of people under certain conditions. The potential for nuisance is increased further when this vibration magnitude is accompanied by an associated air overpressure as has been shown above.

Based on the results of the vibration monitoring, it has been shown that vibration levels measured on and off the site were below the magnitude of that which is typically perceptible.

Predictions of blasting vibration magnitude at distance are generally not undertaken due to the significant level of uncertainty inherent in the calculations. Based on the proximity of the onsite monitoring location, which was generally within 370 metres of the blast site, it may be reasonable to assume that vibration magnitudes generated at other receptors within this range should not be significantly higher than this.

Blasting vibration would have given rise to slight to moderate negative impacts of momentary duration over the assessment period.

10.4 Mitigation Measures

10.4.1 Retrospective Assessment of Mitigation Measures

In the first instance, the site layout itself and surrounding topography provides a significant degree of natural acoustic screening to the nearest residential dwellings.

One of the most feasible options for noise mitigation of general quarry operations is the appropriate stockpiling of overburden to maximise screening to noisy areas within the site. It is understood that stockpiling on the site was completed over the period of assessment with consideration to noise propagation offsite.

Mitigation measures applied to control noise and vibration impact from blasting were as follows:

a) Ensuring appropriate burden to avoid over or under confinement of the charge;
b) Accurate setting out and drilling;
c) Appropriate charging;
d) Appropriate stemming with appropriate material such as sized gravel or stone chippings;
e) Using delay detonation to ensure smaller maximum instantaneous charges (mics);
f) Using decked charges and in-hole delays;
g) Blast monitoring to enable adjustment of subsequent charges;
h) Designing each blast to maximize its efficiency and reduce the transmission of vibration;
i) Avoiding the use of exposed detonating cord on the surface in order to minimize air overpressure – if detonating cord is to be used in those cases where down-the-hole initiation techniques are not possible, it should be covered with a reasonable thickness of selected overburden.

It is reasonable to assume that noise and vibration impacts arising from quarry activity during the assessment would have been reduced through the implementation of these mitigation measures.

10.4.2 Remedial Mitigation

Noise and vibration generated by the site during the assessment period can be considered transient. As such, remedial mitigation measures are not applicable.

10.5 Residual Impacts

There would have been no significant residual noise and vibration impacts as a result of the quarry operation during the substitute consent period. Any impact associated with the quarry operations during the substitute consent period would not have given rise to any significant increase above existing noise and vibration levels.

The noise and vibration effects for the operational phase can be summarised as follows:

- Noise from general onsite operations - Slight to moderate negative impacts, of momentary to temporary duration.
- Noise from HGV movement on public roads - Negligible to slight negative impacts, of long-term duration.
- Blasting noise and vibration - Slight to moderate negative impacts of momentary duration.

10.6 Statement on the Significant Effects on the Environment

A statement on the significant effects of noise and vibration during the substitute consent period have been outlined in Table 10.7.

Table 10.7 Assessment of Noise and Vibration Effects for Ardcahan Quarry Substitute Consent

Impact Assessment	Effects	Mitigation	Likelihood of Significant Effects	Remediation Measures Required	Residual Effects
i) Effects That Have Occurred	Noise from general onsite operations	Appropriate stockpiling of material onsite to maximise acoustic screening	Slight to significant noise impacts, of momentary to temporary duration	No remedial measures required	Slight to moderate noise impacts, of momentary to temporary duration
	Noise from HGV movement on public roads	No mitigation was required	Negligible to slight negative impacts, of long term duration	No remedial measures required	Negligible to slight negative impacts, of long term duration
	Blasting noise and vibration	Application of best practice blasting techniques	slight to moderate negative impacts of momentary duration	No remedial measures required	slight to moderate negative impacts of momentary duration
Ii) Effects That Are Occurring or Ongoing	There are no occurring or ongoing noise and vibration effects arising from operations during the substitute consent period				
Iii) Effects That May Reasonably Be Expected to Occur	There are no noise and vibration effects that would be expected to occur after the substitute consent period				

10.7 References

- Cork County Council planning decision (Ref. 98/294);
- Cork County Council correspondence and decision (Ref; 14/00616);
- An Bord Pleanála Grant of leave to apply for substitute consent (ABP Ref. 302158-18).
- *Environmental Management in the Extractive Industry (Non-Scheduled Minerals)*, EPA 2006;
- *Quarries and Ancillary Activities – Guidelines for Planning Authorities* – DoEHLG, April 2004;
- ISO 1996-2:2017 *Acoustics - Description, measurement and assessment of environmental noise - Determination of sound pressure levels*;
- BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites - Noise*;
- BS 5228-2:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites - Vibration*;
- BS 7385-2:1993 *Evaluation and measurement for vibration in buildings Guide to damage levels from groundborne vibration; and,*

- BS 6472:2008 - *Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting*.
- *Planning and Development Act 2024*

Murray Brothers Tarmacadam Ltd

CHAPTER 11
LANDSCAPE AND VISUAL IMPACT

VOLUME II
MAIN STATEMENT

FEBRUARY 2026

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11 Landscape and Visual Impact

11.1 Introduction

This chapter of the remedial EIAR provides an assessment of the landscape and visual impact associated with the development, which took place between the years 1990 and 2014 at Ardcahan Quarry. The Ardcahan Quarry landholding has a total area of approx. 25 hectares. The application for Substitute Consent relates to lands within the landholding measuring 19.1 hectares, including the former extraction area of 5.2 hectares in the southwest, as shown in

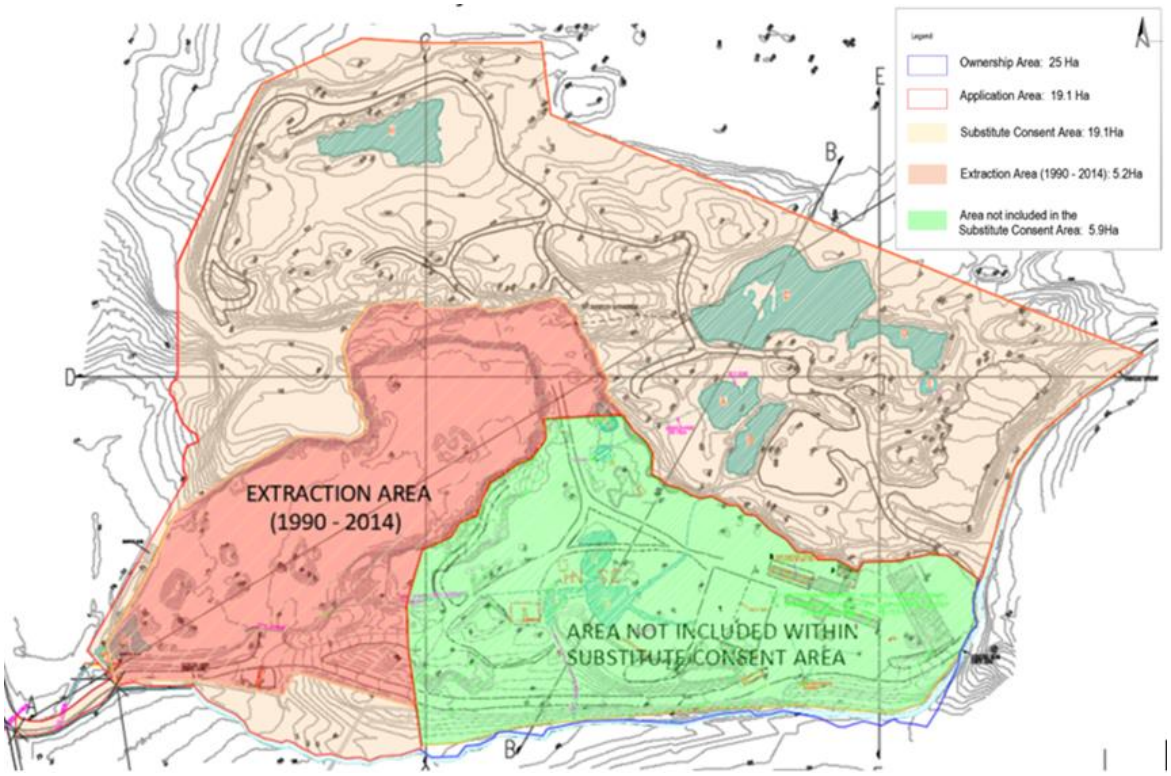


Figure 11.1 Image of Area to Which Substitute Consent Applies

The assessment of potential landscape effects considers the sensitivity of the landscape resource and the magnitude of landscape change, which resulted from this development. The acceptability of a development is determined by the extent to which the long-term landscape and visual effects are significant. Understanding the character, quality and value of the landscape prior to the existence of the development determines the sensitivity of that landscape to accommodate change that would have occurred through development.

By employing these criteria, the potential significant impacts (prior to mitigation measures) are considered to occur where highly sensitive landscape and visual receptors occur with high order landscape and visual effects.

11.1.1 Author Information and Competency

Cathal O'Meara Landscape Architects were commissioned to conduct the Landscape and Visual Impact Assessment of the site and its environs. Cathal O'Meara undertook this Assessment. Cathal has studied, taught and practiced Landscape Architecture at a Masters level for 18 years, is a Chartered Landscape Architect and Member of the Irish Landscape Institute. Cathal has recently written Landscape and Visual Impact Assessments for the 10 storey student development on the site of the

former Bottleworks factory on the Carrigrohane Road as well as for the redevelopment of the Square Deal site on Washington Street, Cork. Prior to establishing Cathal O'Meara Landscape Architects in 2010 Cathal worked as a landscape consultant in Saudi Arabia, Dubai, Guatemala, Norway and the UK. Cathal also holds a graduate Degree in Industrial Design where he was awarded a first-Class honours from the National College of Art and Design.

11.1.2 Guidelines & Legislation Relevant to Discipline

This Assessment methodology follows best practice advisory guidelines set out in the following guidance documents

- Guidelines for landscape & Visual Impact Assessment" 3rd Edition, published by the Landscape Institute (UK), - (2013).
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2022) and the
- Draft Advice Notes for preparing Environmental Impact Statements (EPA, 2015)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018)

This assessment has regard to related legislation, planning policies and Guidance, specifically;

- The European Landscape Convention
- The National Landscape Strategy for Ireland 2015-2025
- Cork County Draft Landscape Character Assessment (2007)
- Cork County Development Plan 2023-2028

11.1.3 Methodology

This methodology includes a desktop analysis of the existing landscape area, including specific designations and land use patterns. Site visits were undertaken to assess the impact of the historical development on the surrounding landscape and to assess likely visibility and consequent visual impact of the development. Cathal O'Meara undertook these visits of the site and from the roads in the vicinity in May 2020 and April 2025. The conditions were clear with good visibility. This report includes photographs taken with a Nikon D-3300 SLR camera with a Nikkor 18-105mm lens. Photographs were taken at a variety of lens settings including a setting of 32 mm (equivalent to 50 mm on a standard 35 mm camera) to approximate normal human eyesight relative to scale. Additional landscape photography includes photos with a wide angle to represent panoramic views, which were then digitally stitched together in Adobe Photoshop CS.

The following maps were included as part of the desktop review and were also used as field references.

- 1:50,000 OSI Discovery Series (Maps 85, 86)
- A digital OSI Map was also used

In order to classify the significance of effects/impacts of the development the "Guidelines on information to be contained in Environmental Impact Assessment Reports (EPA, 2022)" was used, specifically Figure 11.2, included below.

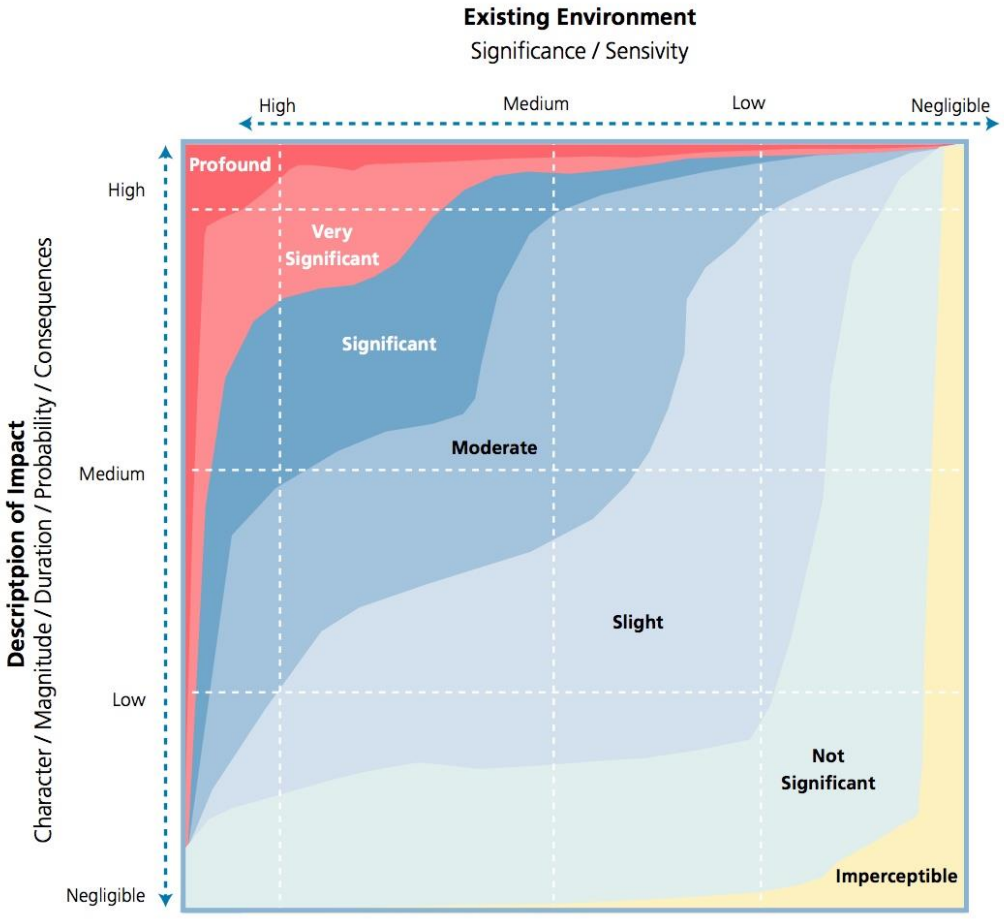


Figure 11.2 Classification Of Significance Of Effects (Impacts), EPA, 2022

The EPA has defined the impacts concerned with the likely and probable impacts of the development. These principal headings are outlined in the introduction to this report. This classification system as well as the descriptions used provides the basis for the assessment of the viewpoint receptors, which follows.

The relevance of defining the effect (impact) is to inform the non-specialist whether an effect is positive, neutral or negative.

11.1.4 Difficulties Encountered in Compiling Information

As is the case in many rural locations it was not possible to gain unfettered access to private sites/dwellings within the study area. In order to carry out visibility analysis, a proximate setting or receptor location has in these instances been used.

11.2 Description of Receiving Environment

The baseline scenario includes a description of the present-day characteristics, and then describes the changes which are likely to have occurred between 1990 and 2014.

The applicant site is located 3.5km northeast of Dunmanway, in West Cork Co, approximately 300meters east of the regional road the R587. Dunmanway serves as the local population centre with smaller villages dispersed within the wider area.

Quarrying operations at the existing quarry site commenced prior to 1964. The quarry was formerly owned by Cork County Council, who leased the site to Mid Cork Quarries before transferring operations to Murray brothers in 1999. The application site has an area of approximately 19.1 ha. The southeast part of the landholding (shaded green in Figure 11.3) is not included within the red line boundary as it contains land quarried prior to 1990 and the macadam plant and associated development permitted under Reg. Ref. 98/294. It is therefore outside the scope of the project for which substitute consent is sought.

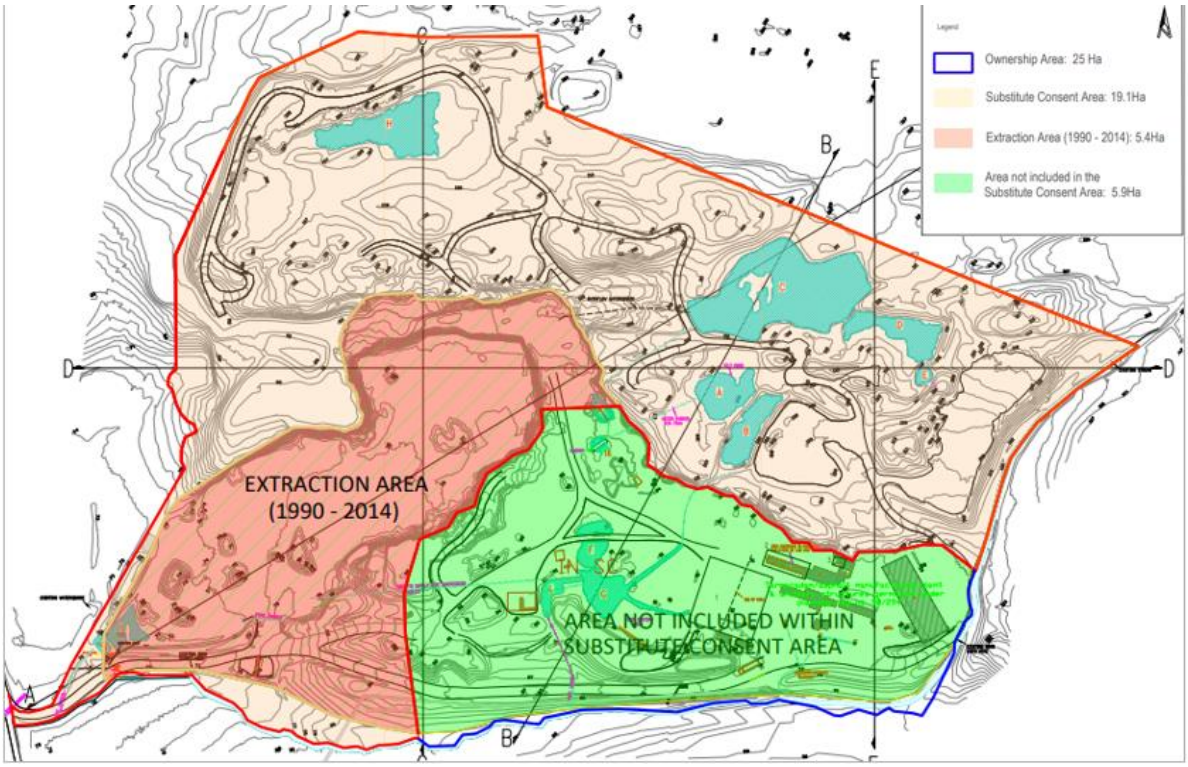


Figure 11.3 Site Layout

The site is located in a rural setting characterised by undulating topography, irregularly shaped fields and clusters of mixed woodland. The land immediately around the quarry consists of

scrub, woodland and agricultural grassland. Land uses in the surrounding area primarily comprise livestock farming and rural housing.

The nearest dwellings to the quarry site (red line boundary) are located approximately 300m south; 275m west; 450m north and 400m east of the site. There are no commercial premises or community facilities in the immediate environs.

The junction of the Caha and Bandon Rivers is located approximately 400m west of the site. A small watercourse that flows into the Bandon River extends along the eastern and southern boundaries of the landholding.

11.2.1 Cork County Draft Landscape Strategy

The Cork County Draft Landscape Strategy notes the presence of coniferous commercial forestry in the vicinity and views from the site confirm this. This land use is seen as temporal, with evidence of extensive felling noted in the Landscape Strategy. This contributes to a less static landscape quality compared with equivalent rural environs. Much of this coniferous tree cover is evident from aerial photos from 1995.

The Draft Landscape Strategy also identifies the site as being located a "middle ground landscape comprising of rolling topography with rugged rocky ridges" (classification no. 12b). It has the subcategorisation of "Shanlaragh: Middle Valley of Rugged Moorland and Patchwork Moraines". Shallow river basins; low hills and rocky ridges define this terrain. The vegetation is characterised by irregular, patchy pastureland, moorland scrub and small clusters of trees, exhibiting a mottled colour and texture in the landscape.

There is one SAC within this landscape type "The Bandon River SAC". This is south of the site adjacent to the Bandon River and is described as an "important example of alluvial wet woodland, a rare and important habitat". Given proximity to the site, intervening terrain and the low laying elevation of the Scenic Landscape zone, visual connectivity to the site would appear unlikely.

Scenic Routes S30 and S31 are located approximately 3km southwest and southeast of the site respectively. But, as a result of intervening "rolling topography", visual connectivity to the site would also appear unlikely.

The site is located east of the Bandon and Caha Rivers. These rivers are identified as "The Bandon River SAC" and are listed as A Special Area of Conservation (SAC-2171). As a result of the river basin, the surrounding environs have a greater degree of deciduous tree planting than the landscape classification description would suggest.

The Ordnance Survey Discovery Series map indicates a scattering of ring forts to hilltops 1km east of the site and an Ogham Stone 2km north of the site. These features are on private lands. No other monuments or structures of significance are identified.

A notable local landscape feature is the conical, tree-less rocky peak of of Mount Gunnery (known locally as Yew Tree Hill, but referred to as the former Mount Gunnery, as this is the name still identified on Ordnance Survey maps). The conical hill of Mount Gunnery is located approximately 2km from the subject site. Given its elevated position, views of of several wind farms are afforded from these vantages points including, Milane Hill, Currabwee, Kilvinane, Killaveengoe, and Coomatallin.

To the east and north, the terrain rises sharply to peaks and ridgelines. This terrain prevents long-range site visibility from the north and east, while also providing a backdrop for views from the west and south. Located along these ridgelines are a number of residential houses having views of the site.

Further afield (10-30km), the peaks of the Sheehy Mountains and Milane Hill are visible in the distance.

11.2.2 Baseline Scenario

The Baseline context against which the substitute consent application (between 1990 and 2014) is considered is the pre-existing situation, i.e. prior to 1990. In relation to unauthorised development, legislation requires consideration of impacts, which have occurred, impacts, which are occurring, and impacts, which reasonably can be expected to occur.

As described in the Introduction, the Landscape Assessment attempts to measure the sensitivity of specific landscape resources and describe the significance of changes to that resource occurring as a result of the development. Primary mitigation measures would normally be developed in advance of

the existing development. However, in the current scenario as the development has already taken place mitigation opportunities are limited to 'secondary measures'. These are designed to address residual negative effects of the development.

Table 11.1 ***Location of Ardcahan Quarry As Per The Draft Cork Landscape Strategy***

Landscape Character Types	Low - High
Low Value	
Medium Value	Ardcahan Quarry
High Value	
Very High Value	

Within the context of the current (Draft) Landscape Strategy the site is situated in a landscape classified as having a Medium Value landscape. Medium value landscapes are those "with positive characters and with local or county importance.

Similarly, the Landscape Character Sensitivity is classified as being of Medium Value. Medium sensitivity landscapes can accommodate development pressure, but with limitations in the scale and magnitude of the development. In this rank of sensitivity, the landscape can accept some changes while others are more vulnerable to change. If pressure exceeds the landscapes limitation the character of the landscape may change.

Table 11.2 ***Landscape Character Sensitivity of Ardcahan Quarry As Per The Draft Cork Landscape Strategy***

Landscape Character Sensitivity	Low - High
Low Value	
Medium Value	Ardcahan Quarry
High Value	
Very High Value	

Finally, the baseline assessment with respect to the Landscape Character Importance, describes the wider context of the site as being locally important.

Table 11.3 ***Landscape Character Importance of Ardcahan Quarry As Per The Draft Cork Landscape Strategy***

Landscape Character Importance	Low - high
Locally Important	Ardcahan Quarry
County Importance	
National Importance	

11.2.3 Summary of Landscape Characteristics

The wider landscape in 1990 would have had a similar character to that of today. The gently undulating farming landscape characteristic of the area would also have been characteristic of the area in 1990. The rural character in 1990 may have been stronger than it is today, with less traffic on the R587 and less residential development. A much larger extent of Clashnagallagh Wood would have been present and this would have informed the local landscape character in a positive way.

11.2.4 Development Which Has Occurred

A typical Landscape and Visual Impact Assessment (LVIA) will assess the landscape and visual effects of a development on the receiving environment. This remedial LVIA aims to assess the effects of the Development which have already occurred from 1990 to 2014 as well as any that are still occurring or can reasonably be expected to occur. For this remedial LVIA a baseline date of 1990 is therefore used.

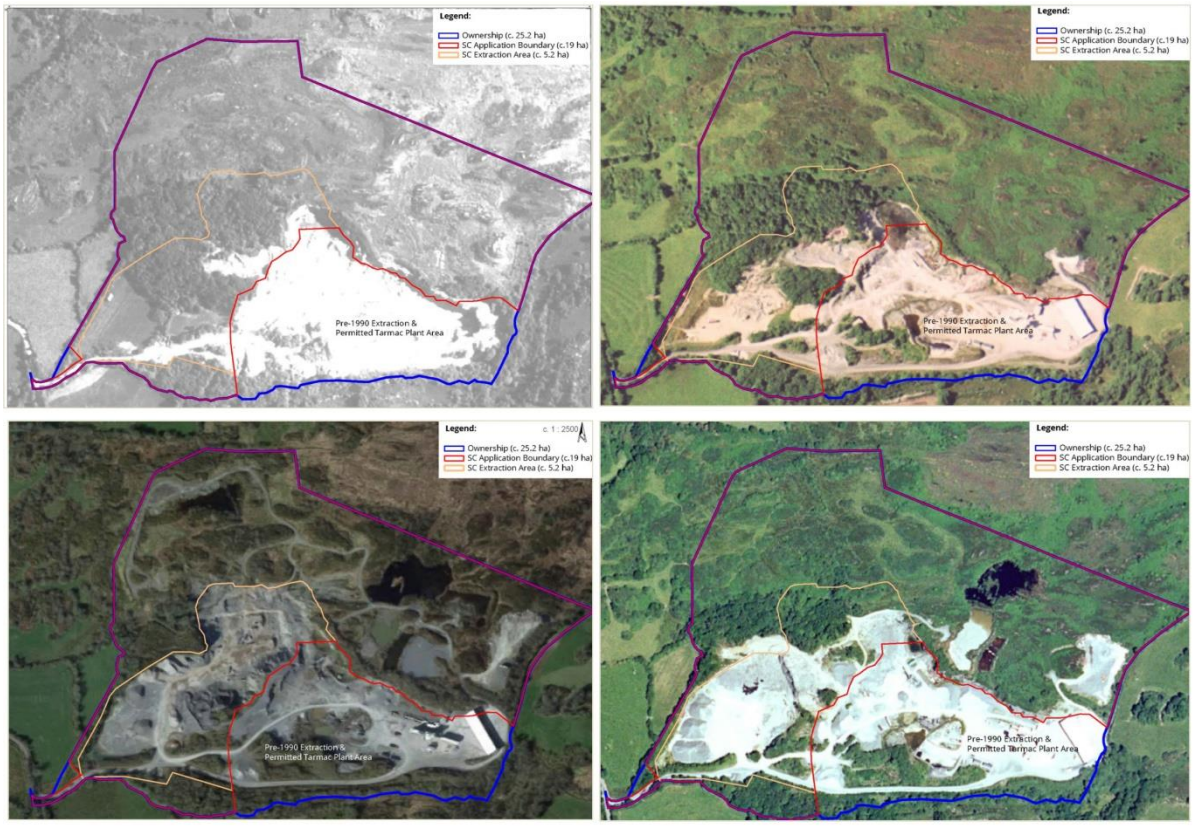


Figure 11.4 ***Aerial imagery dated showing the increase in quarring activity since 1990. Images top left, clockwise Aerial image in 1995, areaial image in 2000, aerial image 2005, and aerial image in 2014. Note the removal of mature woodland (remnant of Clashnagallagh Wood) to the west and soutwest of the site.***

The total area excavated between 1990 and 2014 measures approximately 5.2 ha. It is situated in the southwest of the applicant's landholding.

The extent of the former extraction area has been ascertained using Ordnance Survey aerial photography for the years 1995, 2000, 2005, and 2014. The aerial images are shown above. Aerial photography is not available for the baseline year, so the size of the extraction area in 1990 has been established using information provided by the quarry operators.

Table 11.4 Extent of Former Extraction Area (1990 – 2014)

Year	Total Extraction Area (Ha)	Increase in Extraction Area within the Period (Ha)	Cumulative Increase in Total Extraction Area (Ha)
1990	5.1	-	-
1995	6.42	1.32	1.32
2000	7.49	1.07	2.39
2005	9.26	1.77	4.16
2014	10.3	1.04	5.2

As shown in the aerial images and information above, the extent of the extraction area progressively increased from approximately 5.1 ha in 1990 to c. 10.3 ha in 2014. This represents a total increase of 5.2 ha during the period, comprising the former extraction area subject of the Substitute Consent application.

It is highlighted that some areas within the site, which may appear as worked-out areas in the aerial photography, were actually used for ancillary purposes such as stockpiling topsoil and quarried material (e.g. to the north of the macadam plant). These areas are not included in the 'extraction area' figures presented in Table 2-1 but do form part of the 'quarry development' area for which Substitute Consent is being sought[1]. Conversely, the former extraction area includes small pockets of vegetation which appear unquarried in more recent aerial imagery due to natural recolonisation.

The basis for the description of the changes that have occurred between 1990 and 2014 is aerial photos from 1995, 2000, 2005 and 2014 shown above as well as site visits which help build a picture of the site morphology over time. Prior to 1990 the area of the quarry that was worked and presented exposed (quarried) faces was to the centre in the south of the subject site. This area also contains the macadam plant and development in this part of the site was granted planning permission under Reg. 98/294 and is outside of this substitute consent application. The macadam plant therefore cannot be ascribed to the 1990 baseline but is acceptable as baseline from 1998 onwards.

Changes that have occurred within the Substitute Consent Area include:

- Excavation and removal of soils and vegetation including a large part of the Clashnagallagh Wood
- Construction of internal roads
- Construction of settlement ponds
- Construction and planting of a berm to the south/southwest of site

Other activities that have occurred within this time are

- Blasting and drilling
- Crushing and screening
- Stockpiling of overburden
- Discharge of water to settlement pond
- Transportation to and from site

Before 1990, (and with the passage of time) is it reasonable to assume that views of the visible quarry faces would in any case have become less apparent (owing to the screening vegetation and) colour changes in exposed rock which become more consistent with the adjacent landscape. Recent quarrying activity leaves faces exposed and they initially appear as a sharp visual contrast, however this monotone contrast mottles over time as a process of muting of the colours and of vegetative recolonization would have continued within the quarry floor where native vegetation would have appeared. It is most likely that this would have consisted of mostly of gorse, willow and heather on any exposed ground.

Historical aerial photography shows that the remnants of (Clashnagallagh Wood) to the north, west and south of the site boundary would have further restricted views into the site forming a strong visual barrier.

11.3 Impact Assessment

11.3.1 Landscape Effects Which Have Occurred

The expansion of the existing quarry has altered the landscape of the local area and especially specific elements of the landscape itself. However, changes to the landscape elements or fabric such as the removal of Clashnagallagh Wood and the expansion of the quarry, while representing significant changes to the individual elements do not necessarily represent significant changes to the wider landscape character.

A significant amount of screening woodland and restoration works to the south, southwest and west have been completed.

In the south and southwest these woodlands have been planted on top of raised earthern berms, which has the effect of increasing the height of the vegetation screen.



Figure 11.5 ***Showing southern berm (left) and southwestern berm (right)***

11.3.2 Sensitivity of the Landscape Resource

As noted in the previous section the quarry is situated in a landscape classified as having a **Medium Value Landscape Character as well as a Medium Value Landscape Sensitivity**. Medium value landscapes are those "with positive characters and with local or county importance.

11.3.3 Magnitude of Landscape Change

At the scale of the wider landscape the change in character would have been noticeable from some viewpoints only where the Oak, Birch and Holly trees of Clashnagallagh Wood have been felled and the quarry void or exposed rockfaces can be seen. From some viewpoint's stockpiles, quarry tracks and or topsoil and storage berms are visible. These changes to the landscape character are not considered to be as pronounced as changes to the landscape fabric, as the quarry is largely screened from view from the wider landscape. **The level of landscape change is considered to be Medium.**

11.3.4 Significance of Effect

At the wider landscape scale (within 5km) the significance of effect that has occurred is considered as **Moderate-Slight**. The changes to the topography as a result of quarrying are visible in the wider landscape from certain viewpoints only, primarily to the south and west with most other views remaining unchanged.

In order to determine the visual effects on views and visual amenity nine viewpoints were identified to represent key visual receptors in the receiving environment. These are based on the analysis of the receiving environment.

11.4 Zone of Visual Influence and Visual Receptors

The zone of visual influence is the extent of visibility of the site from the landscape and is defined further by topography and built structures. Due to screening and local topography adjacent to the rivers Bandon and Caha as well as the presence of ridgelines to the east and south and the local peak of Mount Gunnery the number and spread of potential visual receptors is limited to lands principally to the south and immediately west of the site. Elevated views of the site exist from Mount Gunnery and are also included.

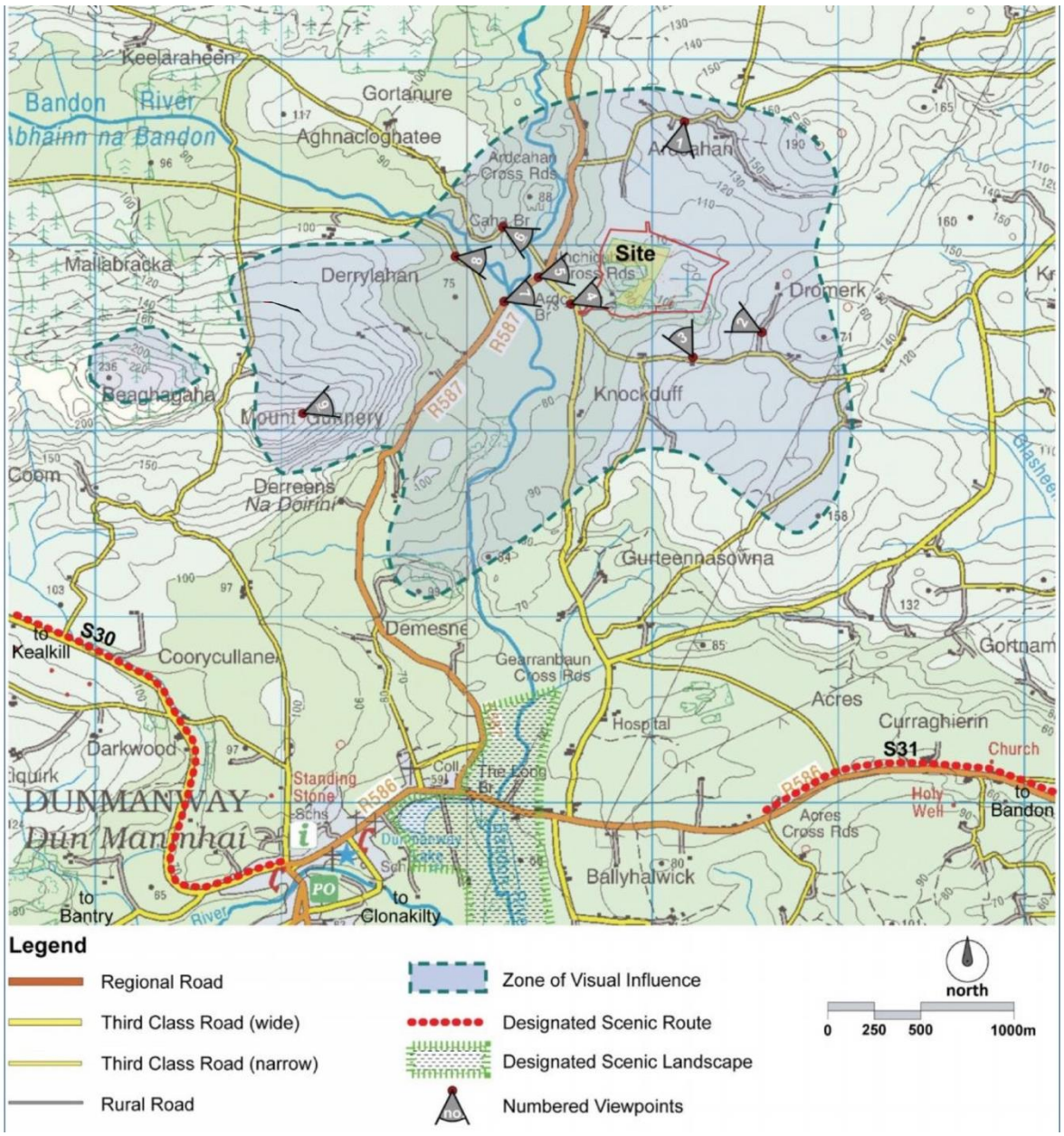


Figure 11.6 ***Location of Viewpoint receptors***

Viewpoint 1

View from Ardcahan on the L8664 looking south

Existing View

This view is approximately 600m from the subject site and is taken from a local road that serves a cluster of dwellings/farmsteads. Despite the proximity to the site and the gentle sloping intervening landscape, the existing hedgerows provide effective screening into the site. It is possible however, that occasional views towards storage of overburden and machinery on the tops of the slopes were occasionally visible.



Figure 11.7 Viewpoint 1, From Ardcahan on the L8664 Looking South

Visual Receptor Sensitivity

Visual Receptor Sensitivity is considered to be Medium. The view is a pleasant rural view but is not considered of high scenic value

Magnitude of Change

The magnitude of change which has occurred and which would have been evident from this view includes the expansion of the quarry to the north and the removal of part of the Clashnagallagh Wood. While the quarry void may have been visible the extent would have been less in 1990. **The magnitude of change is considered to be Medium-Low.**

Significance of Effect

Visual impact from this location has been Slight, Neutral.

Viewpoint 2
View from Dromerk on local laneway/cul de sac looking west.

Existing View
This view represents an elevated aspect approximately 800 meters from the subject site. The contextual landscape is defined by a series of undulating drumlins and a mosaic of landscape features. These features are dominated in the middle ground by a large drumlin, scrub vegetation and existing screening vegetation in the southeast corner of the quarry, which is restricting views. This long-established woodland vegetation is diluting the impact of the excavated rock faces and quarry floor which are still clearly visible and indicated by their monotonous grey colour. A portion of the roof of

the macadam plant is also visible. Long distance views of exposed hillsides and mountain ridges contain the views.



Figure 11.8 Viewpoint 2, From Dromerk On Local Laneway/Cul De Sac Looking West.

Visual Receptor Sensitivity

The visual receptor sensitivity is considered to be Medium. It is adjacent to a residence and the view is a pleasant expansive local view.

Magnitude of Change

The magnitude of change which has occurred and which would have been evident from this view includes the expansion of the quarry to the west. While the quarry void would have been visible prior to 1990 the extent would have been less especially to the west. **The magnitude of change is considered to be Medium.**

Significance of Effect

Rock faces that were previously excavated prior to 1990 represent the most dominant aspect of this viewpoint**. Visual impact from this location has been Moderate and Negative over time tending to Slight, Neutral** as scrub vegetation has developed in the southeast corner of the site.

Viewpoint 3

View from Knockduff, looking northwest.

Existing View

This viewpoint is in an elevated position and represents a series of single dwellings. It is defined in the foreground by mixed species hedgerows and fences with occasional taller trees. The middle ground, which contains a partial view of the quarry is characterised by a mottled hue of long-established

woodland vegetation. Longer distance views contain plantation forestry and give way to elevated peaks. Within this view the visual impact of the former quarrying activity is evident in the upper strata of exposed rock faces facing the receptor and having the greatest visual impact. Given the height of the macadam plant, a small portion of the structure is evident, however the existing woodland within the site is achieving an effective visual barrier and restricting views significantly.



Figure 11.9 Viewpoint 3, From Knockduff, Looking Northwest.

Visual Receptor Sensitivity

The visual receptor sensitivity is considered to be Medium. It is adjacent to residences and the view is a pleasant long distant view of rocky mountain ridges.

Magnitude of Change

The magnitude of change which has occurred and which would have been evident from this view includes the expansion of the quarry to the north and southwest. While the quarry void would have been visible the extent would have been less in 1990. Also, the continuation of operations has prevented the mottling of pre-exposed rock faces, leaving sharper colours of recently exposed rock visible. **The magnitude of change is considered to be Medium.**

Significance of Effect

Rock faces that were previously excavated prior to 1990 represent the most dominant aspect of this viewpoint. Without the intervening (substitute consent) activity these quarry faces would have muted in colour over time. However, the development of peripheral scrub vegetation has compensated somewhat for this impact. **Visual impact from this location has been Moderate and Negative over time tending to Slight, Neutral** as woodland vegetation has developed in the southern boundary of the site.

Viewpoint 4

View from L461 at site entry, looking northeast.

Existing View

This viewpoint is from a local road and as the viewpoint represents a transitory location on the L461, tends to be filtered through the existing vegetation at an oblique angle. Scrub willow in the foreground would have provided effective screening to the entrance. This is in addition to the dense screening vegetation within the site. The extraction area would not have been visible due to the presence of existing screening vegetation on raised berms within the site.



Figure 11.10 Viewpoint 4, From L461 At Site Entry, Looking Northeast.

Visual Receptor Sensitivity

The visual receptor sensitivity is considered to be Medium. It represents a transitory receptor, commonly viewed from an oblique angle while passing the site.

Magnitude of Change

The magnitude of change which has occurred and which would have been evident from this view includes the expansion of the quarry to the west. However, this expansion has occurred in tandem with the development of intervening screening vegetation which has mitigated the visual impact. While the quarry void would not have been visible prior to 1990, it remains so. **The magnitude of change is considered to be Low.**

Significance of Effect

Visual impact from this location has been Slight, Negative over time tending to Slight Positive as the raised berm and associated screening vegetation has matured in the southwest corner of the site.

Viewpoint 5

View from R587 at Inchicuhan Cross, looking east.

Existing View

This viewpoint represents a transitory receptor – the R587. The subject site is only partially visible at an oblique angle as one travels north. Vegetation including hedgerows and isolated trees limit views significantly. Inchicuhan Cross on the R587 allows partial visibility to the site. However, owing to the lower elevation of the cross and the existing hedgerow vegetation, visibility is limited. It is noted that much of the activity that has taken place between 1990 and 2014 has occurred to the west of the site approximately 250m from the Inchicuhan Cross. Despite this proximity the lower elevation of the junction has limited views into the site due to intervening vegetation.



Figure 11.11 Viewpoint 5, From R587 At Inchicuhan Cross, Looking East.

Visual Receptor Sensitivity

The visual receptor sensitivity is considered to be Medium. It represents a transitory receptor and the view is at an oblique angle.

Magnitude of Change

Views in the direction of the site are screened by the topography and intervening vegetation. The magnitude of change is considered to be Low. The removal of the remnants of Clashnagallagh Wood have been replaced with the development and growth of screening vegetation and hedgerows. **Magnitude of change is considered to be Low**

Significance of Effect

Visual impact from this location has been Slight and Neutral.

Viewpoint 6

View from the Caha Bridge, looking east.

Existing View

This viewpoint is from a local road crossing the Caha bridge. The receptor location is at a low elevation and views to the subject site are limited owing to the existing riverside vegetation. Additional layers of screening vegetation also exist such as hedgerows and more mature tree cover.



Figure 11.12, Viewpoint 6, From The Caha Bridge, Looking East.

Visual Receptor Sensitivity

Views would have been experienced by road users walking or driving slowing on these country roads

The view is a pleasant rural view with a scenic local element, the Caha Bridge. **The visual receptor sensitivity is considered to be Medium**

Magnitude of Change

Views in the direction of the site would have been limited by the topography and intervening vegetation. There is no visibility of the quarry development and no change. **Magnitude of change is considered to be Negligible**

Significance of Effect

Visual impact from this location has been Imperceptible.

Viewpoint7

View from the R587 at the Bandon River crossing, looking northeast, 200 meters southwest of viewpoint 5.

Existing View

This receptor represents a stationary position for northbound drivers as northbound traffic must give way to oncoming traffic at the bridge. As such, potential views would have been afforded to drivers as they wait at the bridge. The dense screening vegetation of the river banks and multiple layers of additional intervening vegetation would have restricted views of the subject site.



Figure 11.13, Viewpoint 7, From The R587 At The Bandon River Crossing, Looking Northeast, 200 Meters Southwest Of Viewpoint 5.

Visual Receptor Sensitivity

The visual receptor sensitivity is considered to be Medium. It represents a transitory receptor most commonly viewed from vehicles travelling the R587 and the view is at an oblique angle.

Magnitude of Change

Views in the direction of the site would have been screened by the topography and intervening vegetation. There would have been no visibility of the quarry development and no change. **Magnitude of change is considered to be Negligible**

Significance of Effect

Visual impact from this location has been Imperceptible.

Viewpoint 8

View from the L4615-27 adjacent to the Bandon River, looking east.

Existing View

This represents a cluster of houses adjacent to a local road the L4615-27. This road also accesses the proximate Birthplace of Sam Maguire. Multiple layers of vegetation including the wooden banks of the Bandon River and the rolling Drumlin landscape restrict views of the subject site.



Figure 11.14, Viewpoint 8, From The L4615-27 Adjacent To The Bandon River, Looking East.

Visual Receptor Sensitivity

The visual receptor sensitivity is considered to be Medium. It represents a local road as well as adjacent residences and the view is at a distance and not the object of focus. Although the view is pleasant it is not highly scenic.

Magnitude of Change

Views in the direction of the site are screened by the topography and intervening vegetation. The view in 1990 is likely to have been similar. **Magnitude of change is considered to be Negligible**

Significance of Effect

Visual impact and landscape character impact from this location has been Imperceptible.

Viewpoint 9

View from the top of Mount Gunnery, looking northeast.

Existing View

The peak of Mount Gunnery is accessibly via a car park and grotto on its western slopes. No views of the subject site are afforded from the car park or Grotto. The mountain peak however, offers wide sweeping views of the landscape in all directions. From this vantage, the rock faces of the quarry and the gravel basin provide a contrasting colour to the surrounding fields. Views of the quarry are contained in the foreground by the exposed bare rock of the top of Mount Gunnery. While this receptor has a higher degree of sensitivity than most other receptors the view afforded is of a local anthropomorphic landscape consisting of elements of strong human habitation. Wind turbines, pockets of coniferous forestry, isolated dwellings and clusters of houses all add to this composition.



Figure 11.15 Viewpoint 10, From The Top Of Mount Gunnery, Looking Northeast.

Visual Receptor Sensitivity

The visual receptor sensitivity is considered to be High. This is a scenic panorama over the countryside and represents the reward of a short but steep way marked hike up a local Peak, Mount Gunnery.

Magnitude of Change

Since 1990 it is likely that this view has changed somewhat. The quarry has expanded laterally to the southwest and north with the partial removal of Clashnagallagh Wood. The extent of the rock face in the view would have been of a lesser horizontal expression. Pre-1990 there would have been less quarry visible and with fields and Clashnagallagh Wood evident to the west of the existing quarry. The quarry however only occupies a small portion of the overall view, and is not the focus on any view not does it interrupt any prominent ridgelines.

The magnitude of change is therefore considered Low

Significance of Effect

The visual impact from this location has been slight and Neutral.

11.4.1 Do Nothing Scenario

In the *Do Nothing Scenario*, the site (which was partially quarried prior to 1990) would have remained in this quarried form and appear as a scar in the landscape. Appearance and landscape character in the area would be slow to evolve. In 25-40 years volunteer trees would have emerged, providing an additional visual buffer layer from low-level views. Views at higher elevations and therefore some distance would generally remain somewhat unchanged. The grey colour of the exposed rock faces and basin floor would gradually mute in time and their hue would become more sympathetic with the surrounding landscape.

11.4.2 Construction Phase

This development relates to the construction of a quarry. As the Construction Phase and the Operation Phase concern the transportation of soil and materials these activities are similar in visual respects. Construction Phase impacts include…

- Excavation and removal of soils and vegetation and trees
- Construction of any internal roads
- Construction of settlement ponds
- Construction of berms

The above activities, while representing significant ecological impacts have not had significant landscape or visual impacts. This is principally due to the retention of existing screening vegetation and the form of the landscape where views are restricted owing to the undulating landscape character. Furthermore, the construction phase concerns activities that from a landscape and visual impact perspective are similar to the operation of the pre-existing quarry. Taking the above into consideration the impacts associated with the construction phase of the development are considered likely to have had a **slight to moderate temporary negative impact** on landscape and visual resources

11.4.3 Operational Phase

The operational phase of the development has resulted in the use of the extraction area for quarrying aggregates. Operation of the quarry has also added machinery, traffic, noise and dust to the landscape. However, these are temporary impacts and have not changed the character of the immediate area as quarrying activities have taken place at this location since the 1960's. Operation phase impacts include

- Blasting and drilling
- Crushing and screening
- Stockpiling or overburden
- Discharge of water to settlement pond
- Transportation to and from site

Taking the above into consideration the impacts associated with the operation phase of the development are considered likely to have had a **slight to moderate negative impact** on landscape and visual resources.

11.4.4 Risk of Major Accidents

There were no major accidents or disasters during the relevant period.

11.4.5 Cumulative Impacts

Cumulative impact describes the "addition of many minor or significant effects" including both the applicant development and the wider context of surrounding lands to create "larger, more significant effects".

The current landscape of the wider site area contains limited industrial type activities. This landscape is impacted principally by agricultural and forestry activities with a dispersed settlement pattern of one off housing also evident, however within the period post 1990 the macadam plant became operational (1999), so a minor intensification of activities has occurred. This has impacted traffic on local roads as these impacts combine to contribute to a small-scale change which is continuing to occur.

As the applicant site was an extension of the pre-existing quarry, its impact is assessed within that context. Cumulatively the impact of the pre-1990 quarry and the quarry extension between 1990 – 2014 have increased the quarry footprint and increased lorry traffic on the local roads. The cumulative impact on the area has been **slight to moderate and long-term** resulting in permanent alterations to the landscape.

Therefore, no significant cumulative effects have occurred, are occurring or are reasonably expected to occur on the landscape and visual receptors.

11.4.6 Mitigation

Many of the exposed quarry faces are hidden from view owing to the angle of the receptors, the sunken nature of the quarry and the intervening vegetation. Screening vegetation as well as raised berms along the southern boundary and south-western boundaries should be retained undisturbed to restrict views from the nearby receptors Dromerk, Knockduff and at the L461 local road.

These berms and their associated planting were inspected as part of this report. Screen planting at these locations is developing well and needs to be retained to enable their screening function. These berms merge with the existing hedgerows and peripheral scrub vegetation lending a consistent naturalistic appearance when viewed from a distance.

An accompanying drawing (Site Layout and Remediation Plan) is included (in the drawing pack). The plan aims to

- Retain the existing fragmented but long-established woodland in the western boundary and allow this to expand though self-seeding into the adjacent areas. This regeneration is to be allowed all along the western and north-eastern site boundaries.
- The existing "Dry Siliceous heath" vegetation is to be retained and protected along the northern site boundary. The adjacent areas as indicated in the Landscape Plan are to be managed to facilitate the expansion of this heath as per the ecologist's report.
- An additional seasonal lagoon is proposed in the south of the site and this is to be planted in its margins with native wetland plugs.
- The adjacent wet woodland in this area is to be retained.
- The southern boundary woodland is to be protected and remain undisturbed.
  The existing hardstanding in the east of the site is be covered with 100mm of site found soil and allowed develop through habitat colonisation as part of a successional process.

11.4.7 Monitoring

A designated person from the project management team will have overall responsibility for ensuring that all landscape and remediation operations are carried according to an agreed landscape and remediation plan.

11.5 Residual Impacts

The Residual Impacts are the final effects after all the measures have been implemented. These remaining "Environmental Effects" are those impacts that could not be reasonably avoided.

The development does not impact Scenic Routes, Protected Structures, areas of special designation or historical areas and has only a minor impact on culturally relevant areas.

It is understood that a separate application will also be made concerning future quarrying at this site. In the event that permission for future works are not permitted, the site will be returned to biodiversity use as the remaining measures indicated in the substitute consent application are implemented.

These resultant landscape measures will represent a **Moderate-Slight** and on balance **Neutral Impact** on visibility and landscape character.

Given the history of quarrying on the site as well as the site suitability it is deemed that the works for which this substitute consent applies have not had a significant or profound residual landscape or visual impact.

11.6 Statement of Significant Effects

11.6.1 Effects which have occurred

11.6.1.1 Assessment of Impacts on Landscape Character which have occurred

At the wider landscape scale (within 5km) the significance of effect that has occurred as a result of the quarrying activity between 1990 and 2014 is considered as **Moderate-Slight**. The changes to the topography although 5.2 hectares in extent as a result of quarrying are not generally evident in the wider landscape and at the landscape level the impact has remained substantially unchanged.

11.6.1.2 Assessment of Visual Impacts which have occurred

Overall, the development has had a Slight or Imperceptible impact to the pre-existing views of the majority of receptors found within the study zone.
For the 9No. views examined,

- 3 are deemed Imperceptible
- 3 are deemed Slight and Neutral
- 2 are deemed Moderate Negative tending to Slight Neutral as intervening vegetation has developed
- 1 is deemed Slight Negative tending to Slight Positive as intervening vegetation has matured

11.6.2 Effects which are occurring

11.6.2.1 Assessment of Impacts on Landscape Character which are occurring

As the quarrying activity has ceased since 2014 the ongoing impacts to the landscape character is not considered significant in the context of a comparison with the condition if the quarrying activity ceased prior to 1990. As the macadam Plant was granted planning permission in 1998, this is considered as part of the baseline from that period forward. While differences may be evident at the vegetation level – these effects are not considered significant in the context of landscape level changes.

11.6.2.2 Assessment of Visual Impacts which are occurring

Given the passage of time which has taken place since 2014, there are only minor visual impacts that are now occurring owing the work taken place during the years 1990 – 2014. These visual impacts are the slightly increased visibility of the exposed rock faces, and internal gravel access track. In all instances these impacts are deemed slight in extent.

11.6.3 Effects which can reasonably be expected to occur

11.6.3.1 Assessment of Impacts on Landscape Character which can reasonably be expected to occur, with respect to the two scenarios outlined below

a) The effects of the former quarrying on landscape character which can reasonably be expected to occur if the Section 37L application is not granted permission. There are no anticipated changes to landscape character in this scenario other than the slow progression of vegetative colonisation on exposed rock faces which will continue apace.

b) The cumulative impact that may arise if the development subject of the Section 37L application is granted permission may involve further quarrying activity and these may cause further exposure of the quarried rock faces. While differences may be evident at the vegetation level – these effects are not considered significant in the context of landscape level changes.

11.6.3.2 Assessment of Visual Impacts which can reasonably be expected to occur with respect to the two scenarios outlined below

a) Visual effects of the former quarrying which can reasonably be expected to occur if the Section 37L application is not granted permission. There development of scrub type vegetation will extend into those exposed quarry faces. Existing scrub vegetation will revert to taller woodland vegetation.

b) Consideration of the cumulative impacts associated with potential effects that may arise if the proposed development subject of the Section 37L application is granted permission. It is likely that the impact on the visual receptors will be slight for the majority of receptors and slight – moderate for 3 of the receptors.

11.7 References

Guidelines for landscape & Visual Impact Assessment" 3rd Edition, published by the Landscape Institute (UK), - (2013).

Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2022)

Draft Advice Notes for preparing Environmental Impact Statements (EPA, 2015)

Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018)

The National Landscape Strategy for Ireland 2015-2025

Cork County Draft Landscape Character Assessment (2007)

Cork County Development Plan 2023-2028

Murray Brothers Tarmacadam Ltd

CHAPTER 12
TRAFFIC AND TRANSPORTATION

VOLUME II
MAIN STATEMENT

FEBRUARY 2026

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12 Traffic and Transportation

12.1 Introduction

The purpose of this chapter is to provide a retrospective impact assessment of the additional traffic movements that were generated by construction and operation at Ardcahan Quarry, which is located on the L4621 road in the townland of Ardcahan, Dunmanway. The site is located off the regional R587 Dunmanway to Macroom road approximately 3km from Dunmanway and 27km from Macroom.

12.1.1 Author Information and Competency

This chapter was prepared by Ken Manley BE CEng MIEI HDip Envm Eng FConsEI of MHL Consulting Engineers. Ken has been involved in the preparation of Traffic & Transportation Schemes for over 20 years and is fully competent in the use of traffic modelling software used as part of this assessment, namely Junctions 9: PICADY and TRICS.

12.1.2 Reference to Guidelines Relevant to Discipline

The structure of this TTA is in accordance with TII Document, Traffic and Transport Assessment Guidelines, 2014.

12.1.3 Methodology

The report adopts the guidance for such assessments set out by Transport Infrastructure Ireland (TII) in the document PE-PDV-02045 "Traffic and Transport Assessment Guidelines". The key elements of the study are:

- A review of the transport infrastructure in the vicinity of the development. (Section 11.2 - Description of Environment).
- A description of the nature of the development and the traffic volumes that were generated during the years 1990 to 2014 (Section 11.3 – Development Traffic Generation)
- A review of the impact of development generated traffic on the surrounding network, including an assessment of 2014 traffic flows and traffic flows adopted for the retrospective assessment years up to and including 1990. (Section 11.4 - Impact Assessment).
- A geometric assessment of the route and its capacity to accommodate the loads associated with the development (Section 11.5 - Development Traffic Impact on R589/L4621 Junction)
- A review of the cumulative impact on the surrounding road network (Section 11.6 – Cumulative Impacts)
- The conclusion is presented in the final section (Section 11.7 - Conclusion)

During the preparation of this assessment, reference was made to the following documents:

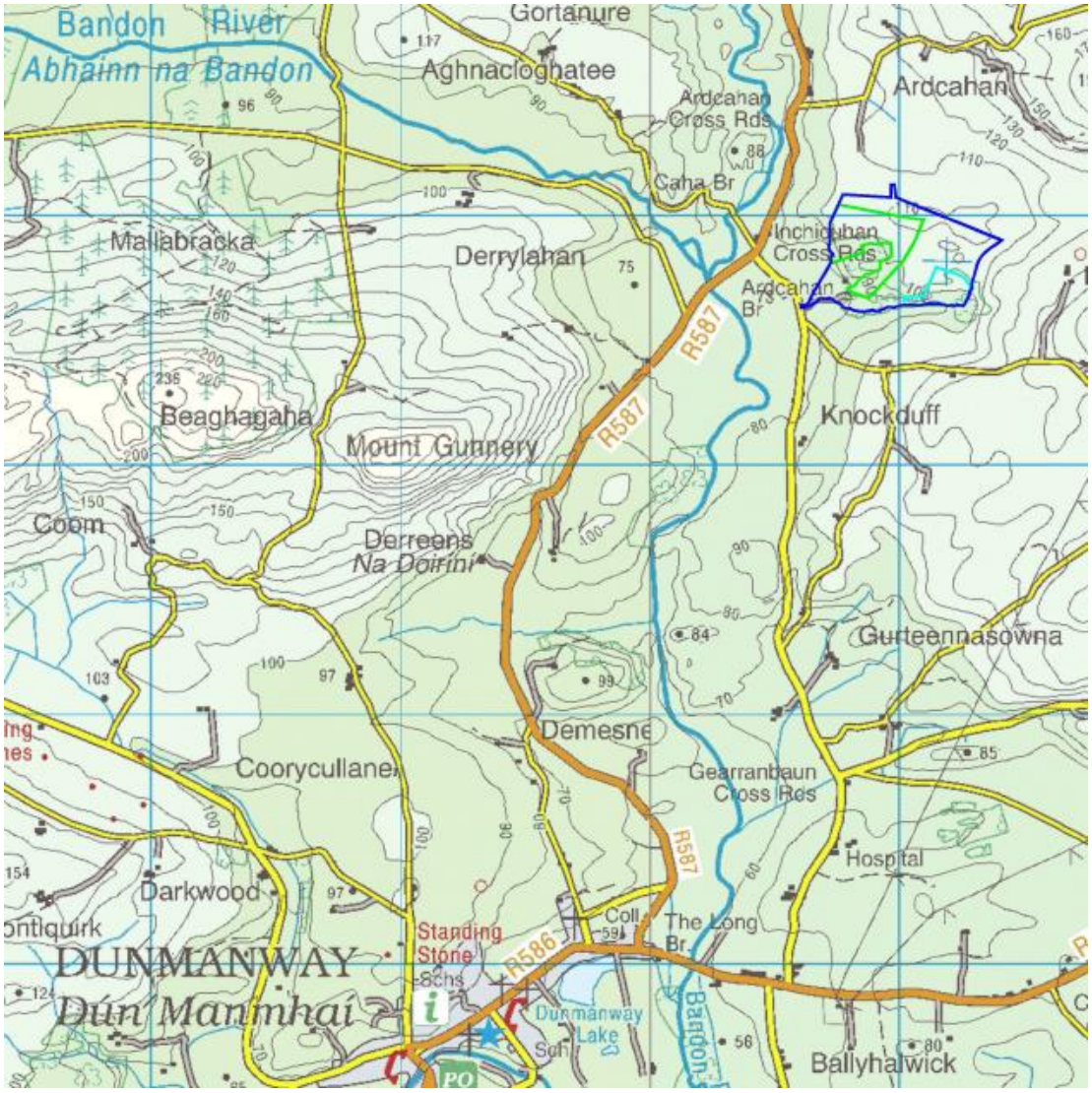
- PE-PDV-02045-01 'Traffic and Transport Assessment Guidelines, Transport Infrastructure Ireland (TII), May 2016,
- DN-GEO-03060 "Geometric Design of Junctions, Transport Infrastructure Ireland (TII), April 2017,
- PE-PAG- 02017 "Project Appraisal Guidelines, Unit 5.3 Travel Demand Projections, Transport Infrastructure Ireland (TII), October 2016,
- Automatic Traffic Count Data – TII Ireland,
- Collision Statistic – Road Safety Authority

12.2 Description of Environment

12.2.1 Site Location and Network Summary

The site is located in the Ardcahan townland in the Dunmanway area, Co. Cork, as shown in Figure 12.1 , which also highlights the surrounding local and national roads of development. The site is located off the L4621 Road (Hospital Road) which is approximately 300m from the R587/L4621 junction. The R587regional road links Dunmanway town with Macroom town via Kilmichael parish.

Figure 12-1 Site Location (outlined in blue) and Surrounding Road Network



The most likely route for HGVs to (and from) the development site is from the Dunmanway direction along the R587, followed by a right turn at the priority junction with L4621, as shown in Figures 12.2 and 12.3. This junction has standard geometry with 2 x 3.5m wide lanes on the R587 with wide splays turning onto the L4621 with comprises of 2 x 3.0m lanes. It is the responsibility of Cork County Council to maintain the surrounding road network and complete resurfacing works on an ad-hoc basis as required. Specific details on any maintenance work completed in the area by Cork County Council between the years 1990 – 2014 is unavailable.



Figure 12-2 R587 Access Junction (Looking North)



Figure 12-3 R587 Access Road Junction (Looking West)

Access to the quarry is gained via the development entrance junction as shown in Figure 12.4.



Figure 12-4 Looking South toward Site Entrance on the L4621

12.2.2 Development Description

The development comprises quarry development which took place between 1990 and 2014. The total area excavated between 1990 and 2014 (included in the application for substitute consent) measures approximately 5.2 ha, comprising the extraction of quartzitic sandstone and ancillary activities. A full site detail can be found in Chapter 3 – Project Location & Description.

12.2.3 Development Peak Traffic Hours

Trip generation estimates for the development, as discussed in Section 11.3, indicate the peak hours of activity for the development in 2014 were 08:00 - 09:00, which aligns with the AM peak hours for the surrounding road network. As background traffic flows also peak during this period it was selected as the time period on which to base the traffic impact assessment for the development

12.2.4 Observed Traffic Flows 2014

Annual traffic flows were not recorded for the surrounding road networks adjacent to the site for the year of 2014. However, Cork County Council provided an Annual Average Daily Traffic (AADT) data of 4,500 vehicles with a 6.5% HGV content for the R587 which was recorded in 2014 when the quarry was fully operational. The AADT provided was measured at different stages over the previous years but was deemed to be a reasonable estimate for the purposes of analysis.

A review of continuous Automatic Traffic Count (ATC's) sites maintained by Transport Infrastructure Ireland (TII), would suggest that a count on the N71 located to the south of Dunmanway and the N22 located to the north of the development are the most appropriate available sources of continuous seasonal traffic count data.

12.2.5 Retrospective assessment year 2014 traffic flows

As there are no recorded traffic counts on the study road network for the retrospective assessment year of 2014, and the TII ATC traffic count data extends back until 2013 only, assumptions were required to be made with regards the background traffic flows that would have existed on the study network in the assessment years of 1990 to 2014.

The Transport Infrastructure Ireland "Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections – PE-PAG-02017, October 2016" highlights factors for background traffic growth in low, central and high sensitivity growth areas for different regions of the country. These growth factors are shown in Table 12-1. The inverse of these growth factors was applied to the assessment year, 2014, back to 1990 to provide retrospective traffic volumes for the area.

Table 12-1 Low Sensitivity Background Traffic Growth

	LV	HGV	Combined
Count %	93.5%	6.5%	
Low Sensitivity Growth Background Traffic Growth (%) (per annum)	1.007	1.0221	1.008

Table 12-2 Inverse Background Traffic Growth

Inverse Growth Factor (%) (Per Annum)	0.992

12.2.6 RSA Collison data

The Road Safety Authority are presently reviewing their road traffic collision data sharing policies and have decided to remove access to the collision data until their review is complete. However, the following collision data was obtained prior to this decision when initial research for this application was undertaken.

The data obtained from the road collisions database, included as shown in Figure 12.5, shows that there have been a small number of road traffic incidents in the greater area of the development. The recorded incidents range in severity from minor to fatal. No accidents were recorded at the junction of R587 and L4621 during the years 2005 to 2014 inclusive. This would indicate that the local road network operated relatively safely during the years up to 2014. Road traffic incidents having occurred prior to 2005 were not available from the Road Safety Authority's road traffic collision database when this information was gathered.

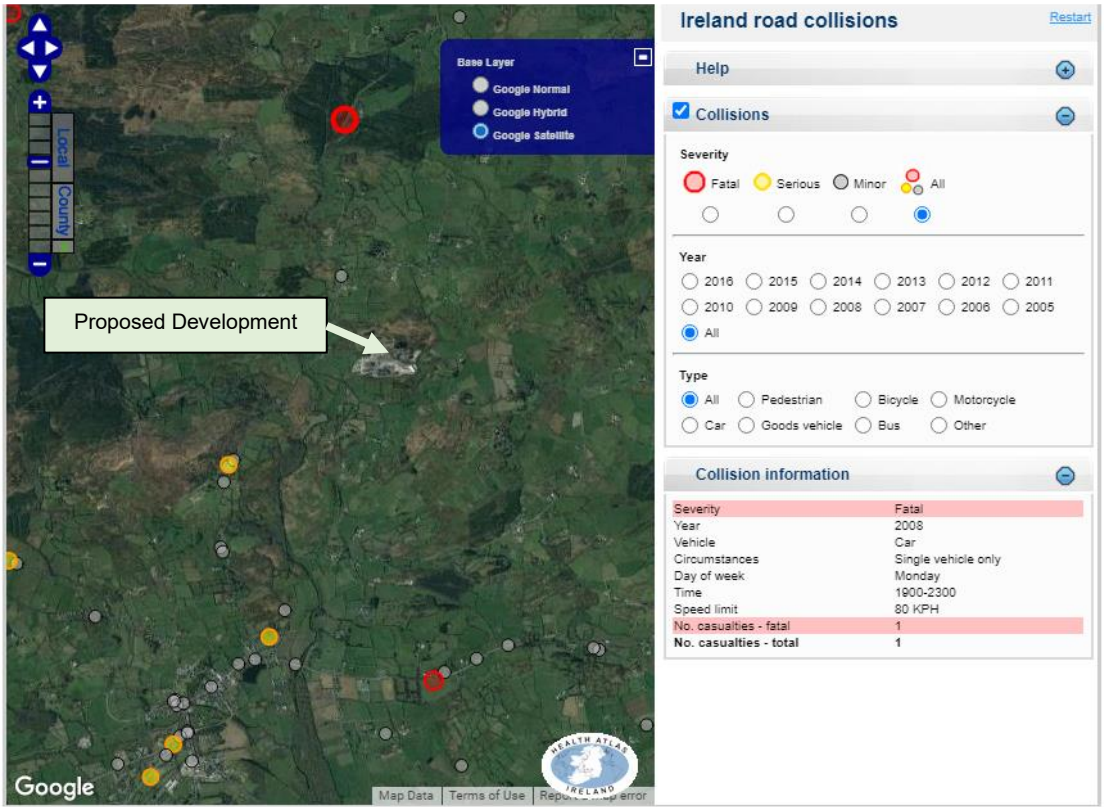


Figure 12-5 RSA Collisions Database for Surrounding Road Network

12.3 Development Traffic Generation

12.3.1 Development trip generation

The traffic generation estimates for the year 2014 were based on the annual tonnage of material imported and exported to (and from) the site. The following assumptions were made;

- 45,207 tonnes of excavated material and approximately 15,000 tonnes of macadam were exported in the year 2014, with 20 tonnes per truck load, resulting in 11 exporting trucks per day (22 truck movements) and 2 importing trucks per day (4 truck movements), being approximately 3,000 truck movements in the year.
- Approximately 10% -15% of every truck exporting material required an equivalent truck importing material, resulting in 450 importing trucks for 2014.
- Based on a 50-week working year, with operation 6 days a week, there were approximately 26 truck movements in and out of the site per working day.
- Based on the AM peak of 08:00-09:00, it can be assumed that 4 of these trips in and out of the site are made during this peak hour.
- The development employed a total of 39 employees consisting of 13 designated quarry staff and 26 tarmac plant staff. To ensure a robust analysis of the junction, it is assumed that all staff arrive individually by car during the peak AM hour.

This method of development traffic generation was applied for the retrospective years 1990 to 2014, shown in Table 12-3.

The figures shown below for the period 1990-1999 are approximates only with an overall 1,000,000 tonnes of aggregate estimated to have been removed from the site in that period. This overall tonnage has been distributed pro-rata across the years in question.

Table 12-3 Development Traffic Generation (1990-2014)

Year	Tonnes Removed from Site	Tonnes of Tarmacadam from Plant	Employees (All movements / day)	Exporting Trucks (All movements/ day)	Importing Truck (All movements/ day)	Total Movements/ day
1990	100,000.00*	-	26	36	6	68
1991	100,000.00*	-	26	36	6	68
1992	100,000.00*	-	26	36	6	68
1993	100,000.00*	-	26	36	6	68
1994	100,000.00*	-	26	36	6	68
1995	100,000.00*	-	26	36	6	68
1996	100,000.00*	-	26	36	6	68
1997	100,000.00*	-	26	36	6	68
1998	100,000.00*	-	26	36	6	68
1999	100,000.00*	100,000.00	78	72	10	160
2000	-	120,000.00	78	44	6	128
2001	-	120,000.00	78	44	6	128
2002	77,785.00	100,000.00	78	64	10	152
2003	70,413.00	80,000.00	78	54	8	140
2004	89,657.00	80,000.00	78	62	10	150
2005	142,720.00	70,000.00	78	72	12	162
2006	178,295.00	80,000.00	78	100	14	192
2007	202,222.00	70,000.00	78	100	14	192
2008	163,386.00	60,000.00	78	82	12	172
2009	143,904.00	40,000.00	78	66	10	154
2010	-	20,000.00	78	8	2	88
2011	44,998.00	25,000.00	78	26	4	108
2012	43,600.00	15,000.00	78	22	4	104
2013	32,360.00	15,000.00	78	18	2	98
2014	45,207.00	15,000.00	78	22	4	104

* Estimated tonnage removed from site

12.3.2 Traffic Impact of development

Using the above figures generated for development traffic and the extrapolated Annual Average Daily Traffic for the years 1990 to 2014, shown in Section 11.3 - Development and Traffic Growth, the impact of the local network could be assessed.

The impact on the local network for the peak hour of 08:00-09:00 was determined for the last year the site was in operation, 2014, shown in Table 12-4 For the previous years, 1990 to 2013, a broader, all day review was taken on the impact of the network, shown in Table 12-5.

The key points to notes are below;

- Heavy lorry access to the quarry is solely from the R587 with a prohibition of HGV's on the minor L4621 Hospital Road south of the site entrance location.
- Cork County Council provided an AADT of 4,500 vehicles (for 2014) on the R587 which broadly corresponds to measured peak hour flows being approximately 10% of the Annual Average Daily Traffic (AADT) flow.
- The maximum increase at the R587/L4621 junction in the year 2014 due to the development is estimated to have been +8.7% which occurred during the AM peak hour of 08:00-09:00.
- In 2014, the increase in traffic for the R587/L4621 throughout the day was +2.3%.
- The maximum daily increase in traffic generated by the development was +4.5% in 2006 & 2007, prior to the economic recession taking hold in 2008.

Table 12-4 Impact of Development Traffic on Network (2014)

Year 2014				
	Without Development	**With Development**	**Difference (Vehicles)**	**% difference**
AM Peak Hour (08:00-09:00)	449	492	43	8.7
All Day	4396	4500	104	2.3

Table 12-5 Impact of Development Traffic on Local Network (1990 to 2013)

Year	AADT Without Development	AADT With Development	% Difference
1990	3645	3713	1.8
1991	3675	3743	1.8
1992	3705	3773	1.8
1993	3735	3803	1.8
1994	3766	3834	1.8
1995	3796	3864	1.8
1996	3828	3896	1.7

Year	AADT Without Development	AADT With Development	% Difference
1997	3859	3927	1.7
1998	3890	3958	1.7
1999	3830	3990	4.0
2000	3894	4022	3.2
2001	3927	4055	3.2
2002	3935	4087	3.7
2003	3980	4120	3.4
2004	4003	4153	3.6
2005	4025	4187	3.7
2006	4029	4221	4.5
2007	4063	4255	4.5
2008	4117	4289	4.0
2009	4169	4323	3.6
2010	4270	4358	2.0
2011	4285	4393	2.5
2012	4324	4428	2.3
2013	4366	4464	2.2

12.4 Impact Assessment

12.4.1 Do Nothing Scenario

If the development had not been present, there would have been no impact in terms of changes in traffic levels on the surrounding road network.

12.4.2 Construction Phase

12.4.2.1 Effects that have occurred

The export of overburden and construction of a settlement pond and a berm resulted in a number of traffic movements entering and exiting the site lands. The negative short-term effect of the generated traffic movements on the surrounding road network was slight and similar in impact to the operational phase of the development detailed below.

12.4.3 Operational Phase

12.4.3.1 Effects that have occurred

The import and export of material at the site resulted in a number of traffic movements entering and exiting the site lands. The negative long-term effect of the generated traffic movements on the surrounding road network was slight. During the operational phase of the development (in the assessment year 2014), the impact of the additional development traffic generated on the R586/L4621 junction led to an increase in traffic flows by a maximum of 8.3% during the AM peak hour and by 2.3% all day.

12.4.3.2 Effects that are occurring

The import and export of material at the site has not occurred since 2014 when the quarry ceased operations. No effects on the surrounding road network are presently occurring.

12.4.3.3 Effects that can reasonably be expected to occur

No further effects on the surrounding road network are expected at the site with operations having ceased in 2014.

12.4.4 Risk of Major Accidents and Disasters

To reduce the likelihood of an accident occurring involving development traffic, heavy lorry access to the site was solely from the R587 with a prohibition of HGVs on the minor L4621 Hospital Road south of the site entrance location.

12.5 Development Traffic Impact on R589/L4621 Junction

TII guidelines suggest that a detailed capacity assessment should be undertaken for junctions where the subject development is estimated to result in an increase in traffic volumes of +10% on the main traffic route, or +5% in instances where the network is already congested. This would suggest that a detailed junction capacity assessment is not required for the development, however, a junction analysis was carried out for the AM Peak of retrospective year 2014 to ascertain what impact the development had on the junction capacity.

12.5.1 Junction Analysis

The morning peak traffic flows for the R587/L4621 junction are shown in Figure 12.6. The recorded peak hour flows have the HGV content shown in brackets. A PICADY analysis of the existing junction was carried out for the morning peak hour taken as 8:00-9:00. PICADY (Priority Junction CApacity and DelaY) is a computer software program dealing with capacities, queue lengths and delays at priority controlled 'T' junctions.

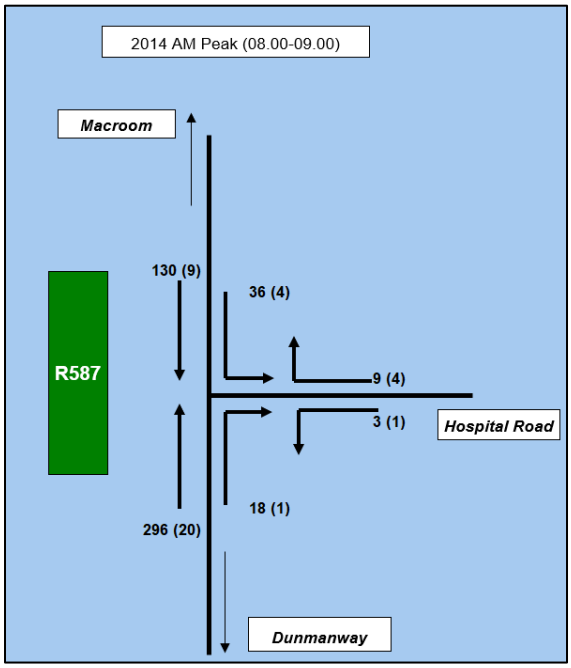


Figure 12-6 Morning Peak Traffic Flows (2014)

The Junctions 9: PICADY modelling software produces an RFC % (Ratio of Flow to Capacity), a Delay figure measured in seconds and a LOS (Level of Service) which are used to compare the effects the development will have on the junction being modelled. An RFC of 85% on a T- junction implies that the junction has reached capacity but is still operational with delay incurred. The following table describes the different LOS and the implications for the junction being assessed.

Figure 11.7 below shows the analysis results for 2014. The results indicate that the junction operated well within capacity with negligible queuing for the peak hour analyses.

	AM					
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
	2014 - Base					
Stream B-AC	D1	0.0	10.70	0.03	B	290 %
Stream C-AB		0.1	5.60	0.05	A	[Stream B-AC]

Figure 12-7 PICADY Results, 2014, 08:00-09:00

12.6 Cumulative Impacts

The transportation of aggregate and macadam from the site resulted in a quantity of traffic movements on the local road network. Per traffic assessment completed on the R587/L4621 junction for the year 2014, it can be seen that the impact of the development on the greater road network was slight.

12.7 Statement of Significant Effects

12.7.1 Effects which have Occurred

The import and export of material at the site resulted in a number of traffic movements entering and exiting the site lands. The negative long-term effect of the generated traffic movements on the surrounding road network was slight.

12.7.2 Effects which are Occurring

No effects on the surrounding road network are presently occurring at the site with operations having ceased in 2014.

12.7.3 Effects which can Reasonably be Expected to Occur

No further effects on the surrounding road network are expected at the site with operations having ceased in 2014.

12.8 Conclusion

The assessment outlined in this section for the years 1990 - 2014 concludes that the relatively low volumes of traffic generated by the development would have had a slight impact on the surrounding local network. The surrounding road network would have operated well within capacity up to the year 2014.

12.9 References

I. National Roads Authority (2014) Traffic and Transport Assessment Guidelines NRA, Dublin
II. Institution of Highways & Transportation (1994) Guidelines for Traffic Impact Assessment IHT, London
III. Transport Infrastructure Ireland (2016) Project Appraisal Guidelines for National Roads Unit 16.0- Estimating AADT on National Roads
IV. Transport Infrastructure Ireland (2019) Project Appraisal Guidelines for National Roads Unit 5.3- Travel Demand Projections
V. Communities and Local Government Department for Transport 2007 Guidance on Transport Assessment
VI. Guidelines for Traffic Impact Assessments" as published by the Institution of Highways & Transportation U.K. in 1994
VII. TII approved junction simulation modelling program (Picady traffic modelling suite)
VIII. Trip Rate Information Computer System (TRICS)
IX. TII Publications: Rural Road Link Design. DN-GEO-03031

Murray Brothers Tarmacadam Ltd

CHAPTER 13
MATERIAL ASSETS: SERVICES AND UTILITIES

VOLUME II
MAIN STATEMENT

FEBRUARY 2026

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13 Material Assets: Services and Utilities

13.1 Introduction

The purpose of this chapter is to assess the potential impacts which have occurred, are occurring or which can reasonably be expected to occur on material assets, including the existing utility network which includes the following infrastructure:

- Surface Water Drainage
- Foul Water Drainage
- Water Supply
- Electricity Supply
- Natural Gas
- Telecoms

The construction and operation of the quarry is described in detail in Chapter 3 'Project Description'.

13.1.1 Author Information and Competency

This chapter was prepared by Martina Keenan Rivero of McCutcheon Halley Chartered Planning Consultants. Martina holds a BSc (Hons) in Spatial Planning from Technological University Dublin and an Advanced Diploma in Planning and Environmental Law from Kings Inns. She has 10 years of professional experience, working in NSW, Australia with a Local Authority and as a planning and environmental consultant in Ireland. Martina has prepared AA screening reports, Environmental Impact Assessment screening reports and coordinated and contributed to Environmental Impact Assessment Reports for a range of development projects. Relevant project experience includes large housing developments, mixed-use schemes, industrial and commercial projects.

13.1.2 Methodology

The EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports 2017 state that:

> *"The meaning of this factor is less clear than others. In Directive 2011/92/EU it included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes roads infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils".*

Impacts on traffic are considered in Chapter 12 of this rEIAR.

Resources that are valued and that are intrinsic to specific places are called "material assets". They may be either human or natural origin and the value may arise for either economic or cultural reasons. This chapter is intended to deal with the physical resource in the environment which may be of either human or natural origin. The objective of the assessment is to ensure that these assets are used in a sustainable manner, so that they are available for future generations, after the delivery of the development.

The methodology used to prepare this section of the EIAR is in accordance with the EPA "Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports August 2017" and EPA "Draft Advice notes for preparing environmental Impact Statements September 2015".

These draft guidelines include information on the assessment of the effects of development on material assets and advises on the nature of the material assets which should be examined as part of the preparation of an EIAR.

The following sources have been used to collate information on built services within the general area of the site;

- Information from the applicant
- 2011 application for permission for a new quarrying face at the site (Planning Ref: 11/0031)
- Gas Networks Ireland https://www.gasnetworks.ie
- Information on infrastructure and utilities contained in Cork County Development Plans and Local Area Plans spanning 1990 – 2014.
- ESB Networks

The study area with regard to utilities comprises the entire rEIAR boundary and the landholding as indicated in Appendix 1.1.

13.1.3 Identification of Utilities

The scope of the investigation consists of a site investigation and desk study. Information in relation to Water Services (surface water drainage, foul water drainage and water supply) and utilities (i.e. ESB and Telecoms) was received from the owner and operator of the existing quarry and was verified based on visual inspections of the site, survey material and information submitted for previous planning applications.

13.1.4 Significance Criteria

Significance criteria for impacts on utilities are set out in Table 13.1 in accordance with the requirements of the following EPA guidance documents:

- Guidelines to Planning Authorities and An Bord Pleanála on carrying out EIA (Department of Housing, Planning and Local Government, 2018)
- Guidelines on the information to be contained in Environmental Impact Assessment Reports Draft. (EPA, 2017).

Table 13.1 Significance Criteria for Impacts on Material Assets – Utilities

Significance Level	Criteria
Profound	Profound impact occurs where there is permanent disruption to a utility service or where there is significant surcharging of an existing system.
Significant	Significant impact occurs where there is long-term disruption to a utility service or where there is minor surcharging of an existing system.
Moderate	Moderate impact occurs where there is medium-term disruption to a utility service or significant increase of flow within an existing system.
Slight	Slight impact occurs where there is short-term disruption to a utility service or minor increase of flow within an existing system.
Imperceptible	Imperceptible impact occurs where there is temporary disruption to a utility service or no quantifiable increase of flow within an existing system.

13.1.5 Difficulties Encountered in Compiling Information

There were some difficulties with accessing historical records, however no significant difficulties were encountered in the preparation of this chapter.

13.2 Description of Baseline Environment

13.2.1 Ownership and Access

The development comprises a quartzitic sandstone quarry which was quarried between 1990 and 2014. Details are provided in Chapter 3. The subject lands are owned by the applicant, Murray Brothers Tarmacadam Ltd who purchased the quarry from Cork County Council in the 1990's. The quarry was established by the Council prior to October 1964 and operations had continued for many years up until 2014.

Chapter 12 Material Assets Traffic and Transport was prepared by MHL Consulting Engineers and addresses the impact of the development on the surround road network.

Vehicular access and egress to and from the application site has always been and continues to be via an existing entrance at the public road. This site is accessed just off L4621-9 road along a paved roadway. In the locality this paved road is referred to as the Hospital road and is located in an area known locally as Clashnagallagh wood which is to the east of the Inchicahan crossroads.

13.2.2 Plant and Machinery

An environmental report was prepared in 2011 by ATServices in Skibbereen to accompany an application for permission for a new quarrying face at the site (Planning Ref: 11/0031) identified the following plant and machinery present at the site prior to 2011;

- A primary jaw crusher: this is used for crushing stones and works as the motor channels power through a belt, and therefore drives the moving jaw through the process of periodic motion. The jaw crusher contains to plates, the toggle plate and the moving jaw plate and the angle between both will either increase or decrease with respect to the fixed jaw. When the angle decreases, the jaw will go down and ultimately discharges the crushed aggregate.
- Cone crushers: These crush materials by the working surface between the fixed cone and the movable cone. The movable cone is supported by a spherical bearing and is anchored on a

hanging erect shaft which is set in the eccentric sleeve. The sleeve is set on the stopping and pushing bearing. The movable cone and erect shaft are driven by the eccentric shaft sleeve together.

- Screening plants: The materials crushed are transferred to the vibrating screen and separated into different sizes. Aggregate of suitable size are transferred to the final product pile. This forms a closed and manifold cycle. The sizes of the final products are graded and separated as required and the duster attached for the sake of environmental protection.

Additionally, other onsite machinery and equipment include; haulage vehicles, excavators and loading shovels.

13.2.3 Buildings and Structures

The buildings currently at the site have all been granted planning permission previously and include; Prefabricated office building/toilet/canteen, laboratory, mixing plant, storage silos, plant, plant/machinery, bins for plant, covered aggregate storage bays, storage shed, bitumen tanks, enclosed bitumen tanks, well/pumphouse, weighbridge and lagoon with pump.

There is also a septic tank with a 4000-litre capacity and percolation area present at the site having also been granted permission previously. From its construction up until 2011, the percolation area remains active and continues to act within its design parameters as per the planning application.

13.2.4 Surface Water

There is no public surface water drainage serving the site/area. All surface water drainage infrastructure existing on the site forms part of the existing quarry.

The quarry had a permanent settlement pond system situated in the SW corner of the site, downgradient of the main rock crushing and product stockpile area. The northern part of the site has not been quarried but portions of it are used for stockpiling subsoils and crushed rock, for settling ponds and for backfilling areas with surplus soil and sludge material. A number of permanent shallow ponds/lakes have also been developed by placing berms around the natural depressions and lower-lying areas in the northern part of the site. The settlement ponds are also used for water storage and water re-use in the quarry and tarmac areas as necessary.

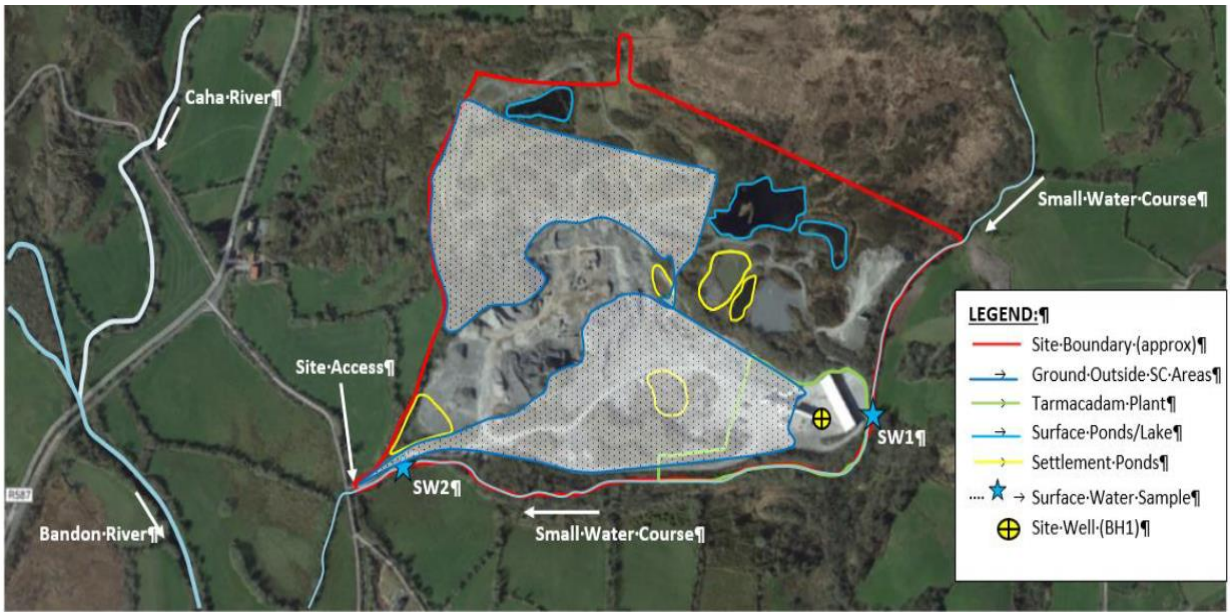


Figure 13.1 Surface water features at the quarry, including location of the well and tarmacadam processing area (reproduced from Fig 7.1, Chapter 7 Hydrology and Hydrogeology).

13.2.5 Foul Water

Permission was granted for a septic tank as part of the 1998 application for a tarmacadam / asphalt manufacturing plant, (Council Ref. 98/284). The 2011 Environmental Report prepared by ATServices identified that there was a percolation area and septic tank in operation at the site.

13.2.6 Water Supply

The Ardcahan quarry has its own drinking water supply well which was drilled in the Tarmac Plant Yard area in the late 1990's. The water is used as a potable supply for the site canteen and wash water in the site's welfare facilities. Water usage is low and there have been no water supply or quality issues since its installation.

Ardcahan is not in proximity to any group water schemes (refer to Fig 13.2).

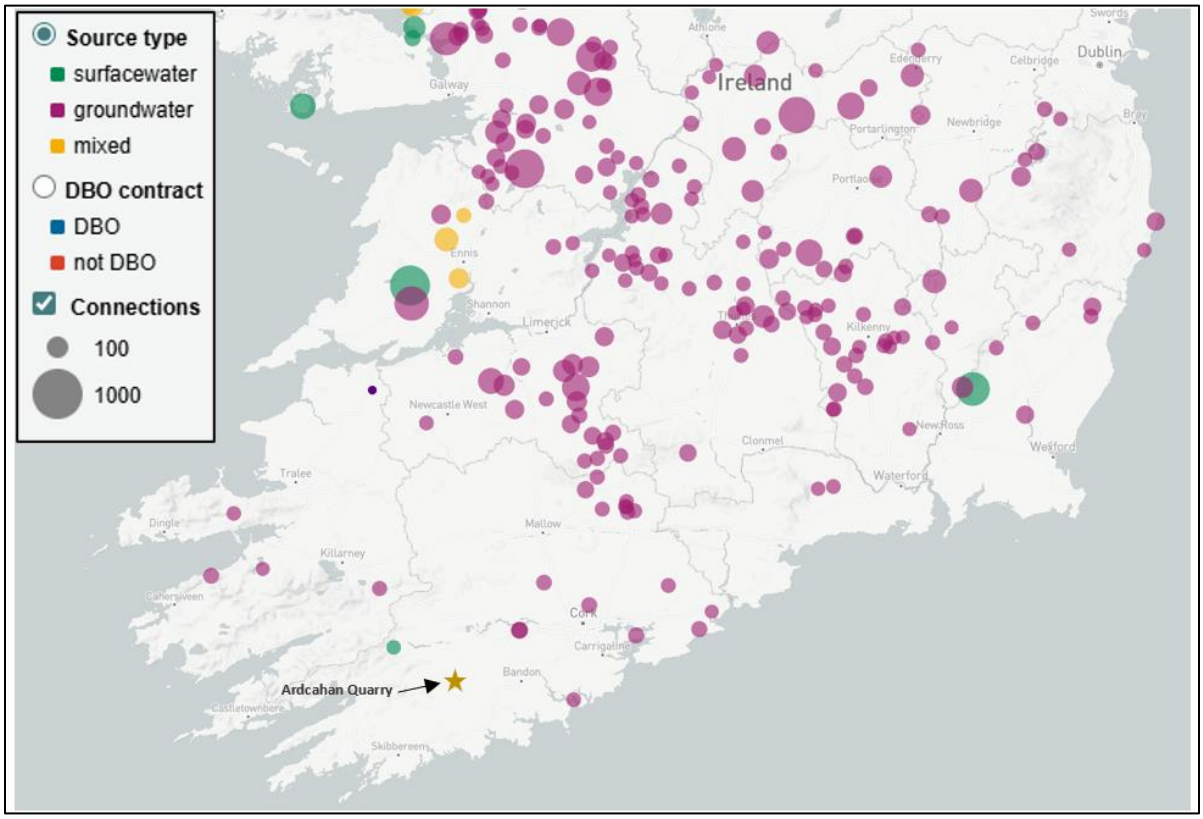


Figure 13.2 Extract from distribution map of group water schemes. Accessed from www.nfgws.ie. Accessed on 16th January 2026.

13.2.7 Telecoms

There is good communications network in the area with Imagine and Eircom having a relatively widespread communication networks in the vicinity. A landline was installed for office administration in April 1998 when Murray Bros took ownership of the quarry, following grant of permission for the tarmacadam plant. The 2003 Cork County Development Plan included a specific objective to the provision of new and innovative telecommunications infrastructure, subject to normal proper planning considerations

13.2.8 Electricity

The quarry has been in operation since the 1960's. An ESB supply was provided to the site prior to 1990 and was operational before Murray Brothers took ownership of the quarry. Fig 13.3 shows the Electricity network in proximity to the quarry – a 110 KV line connects the substations of Dunmanway and Macroom and runs c. 800m to the east of the quarry boundary.

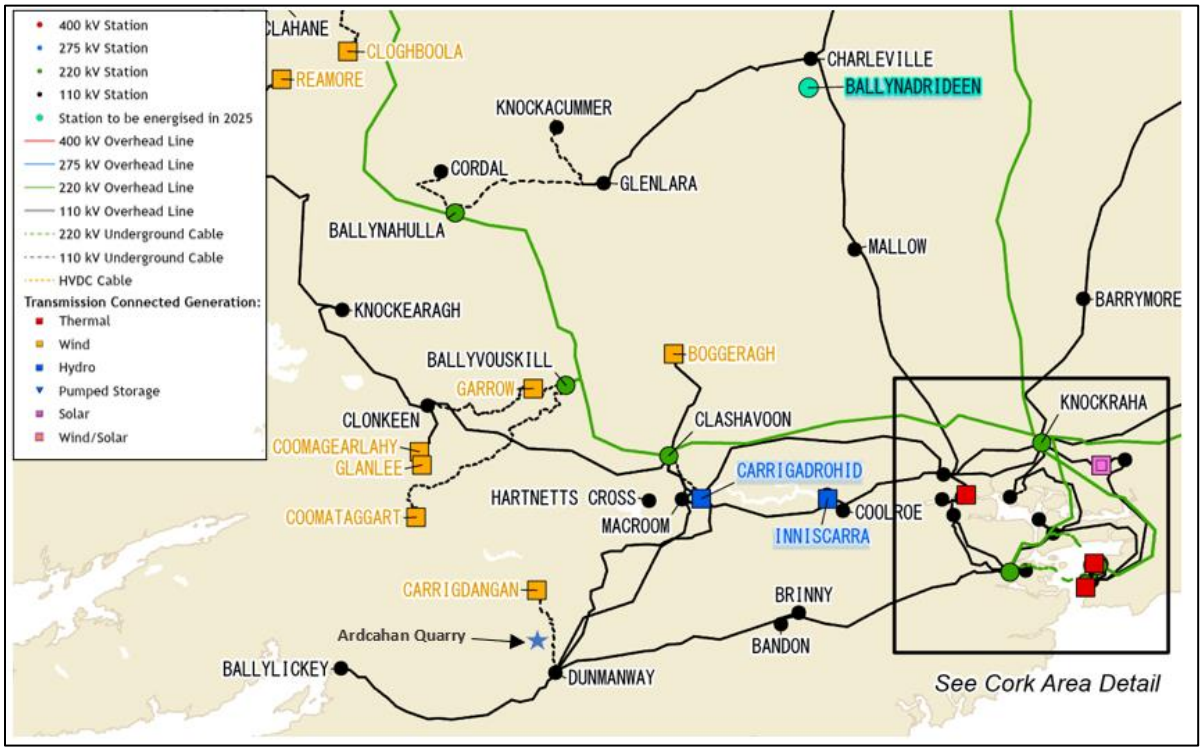


Figure 13.3 Extract from Eirgrid Group Transmission Systems Map. (https://www.eirgridgroup.com/). Accessed on 16th January 2026.

13.2.9 Gas

A desk study was carried out to determine the extend of gas infructure in the vicinity of the quarry. The quarry is not connected to the Gas distribion network. The nearest pipeline terminates at Ballineen, c. 10km to the east (refer to Fig 13.4).

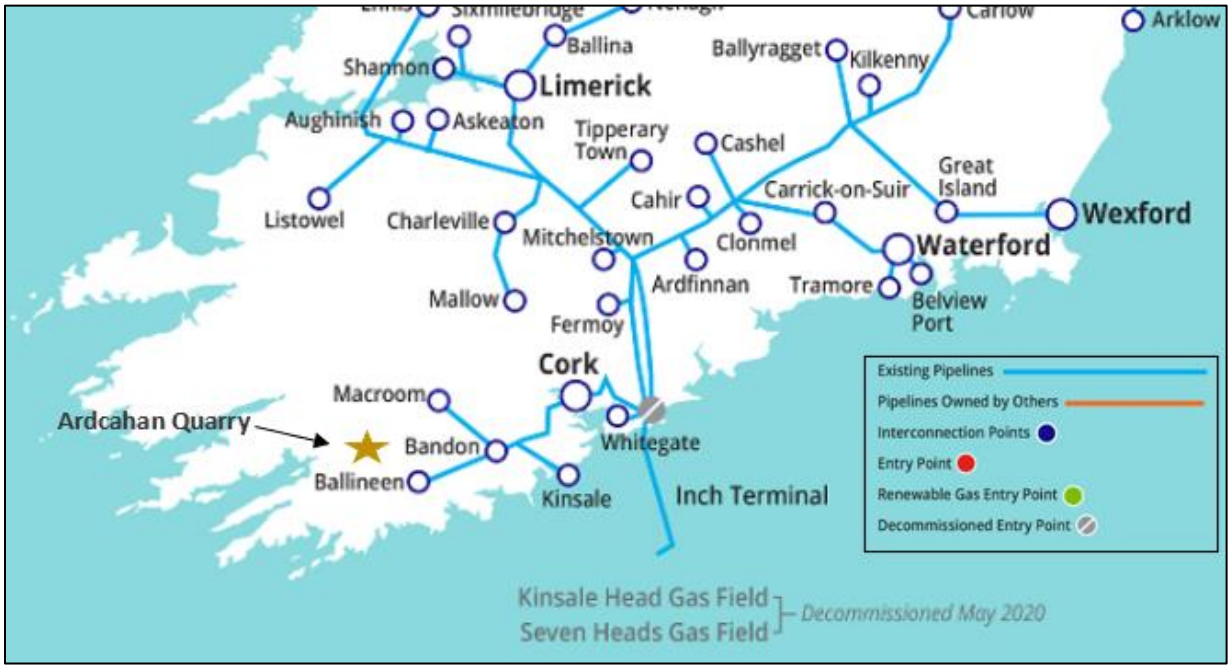


Figure 13.4 Pipeline map of gas networks in the vicinity of Ardcahan Quarry. (Source: Gas Networks Ireland, Accessed on 16th January 2026.).

13.2.10 Geological Resources

The geology of the Site and potential impacts associated with construction and operation of the quarry are assessed in detail in Chapter 6 (Land, Soils and Geology). No significant negative impacts have been identified.

13.2.11 Waste Management

Waste produced on site, such as packaging, food waste and sanitary waste was collected by appropriately licenced contractors between 1990 and 2014.

13.3 Do Nothing Scenario

If quarrying activity had not taken place between 1990 and 2014 there would have been no associated demand on services.

13.4 Impact Assessment

Potential impacts are assessed for Construction and Operation. Activities which took place at the quarry for the relevant period and which can be described as construction related include;

- Excavation and removal of topsoil and vegetation;
- Construction of settlement ponds;
- Construction of berm;

Operational Activities are identified as;

- Blasting and drilling;
- Crushing and Screening;
- Stockpiling of overburden;

- Discharge of water to settlement ponds;
- Transportation of aggregates to and from site.

Construction activity and the operation of the quarry between 1990 and 2014 would have resulted in increased demand on utilities servicing the quarry. Potential impacts as a result of blasting are also considered in Chapter 10 Noise and Vibration. However, there is no evidence that construction and operational activities had any significant negative impact on services, either within or in proximity to the quarry.

No effects on services or utilities that are ongoing or are reasonably likely to occur as a result of quarrying activity that took place between 1990 and 2014 have been identified.

13.4.1 Electricity

The activities which took place at the quarry between 1990 and 2014 are not anticipated to have resulted in a significant demand for power. There are no historical reports of interruptions to supply for the wider area. Any works which may have been required to the electrical network during the assessment period would have been carried out according to ESB Network Guidelines

13.4.2 Gas

There is no gas supply to the site, and there are no gas distribution pipelines within or in proximity to the quarry. The closest gas pipeline is c. 10km to the east of the quarry. The construction and operation of the quarry would not have had any impacts on Gas services or Gas networks in proximity.

13.4.3 Water

The quarry benefits from its own well, and no significant demands on water supply have been identified. There is no evidence of significant sediment transport or impact occurring to the local watercourses although the quarry has pre-1963 origins and was in operation for decades prior to the cessation of activity in 2014.

13.4.4 Surface Water and Foul Water

The impacts on surface water and foul water services are also assessed in Chapter 7 Water. No significant negative impacts have been identified.

13.4.5 Telecoms

The communications network servicing the site diversified from landline to mobile phone and internet up to 2014. It is noted that the 2003 Cork County Development Plan included an objective to to support a programme of broadband connectivity throughout the county (Objective INF 4-8). There is no evidence that any significant negative impacts on telecommunications at the site or wider area occurred as a result of construction and operations at the quarry between 1990 and 2014.

13.5 Risk of Major Accidents and Disasters

No risk of impacts to services has been identified.

13.6 Cumulative

A number of developments, mainly residential, can be expected to have taken place in proximity to Ardcahan Quarry between 1990 and 2014. Any impacts on water supply, foul and surface water drainage and utilities/telecommunications is expected to be imperceptible as the nearby developments would have separate private water supply and surface/wastewater treatment and utilities/telecommunications. The tarmacadam plant would have operated simultaneously with the quarry between 1998 and 2014 and used the existing services and utilities at the site. No significant cumulative impacts have been identified as a result.

13.7 Remedial Measures

No significant impacts on services, utilities or infrastructure have been identified and remedial measures are not required.

13.8 Monitoring

None proposed other than any general ESB and water metering and monitoring arrangements which are currently in place.

13.9 Residual Impacts

No residual impacts on services or utilities have been identified as a result of the construction and operation of the quarry between 1990 and 2014.

13.10 References

Websites:

www.gasnetworks.ie Last accessed 16th January 2026

www.eirgridgroup.com Last accessed 16th January 2026

National Federation of Group Water Schemes. https://nfgws.ie/distribution-map-of-group-water-schemes/ Last accessed 16th January 2026

Murray Brothers Tarmacadam Ltd

CHAPTER 14
BIODIVERSITY

VOLUME II
MAIN STATEMENT

FEBRUARY 2026

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14 Biodiversity

14.1 Introduction & Methods

This Chapter has been prepared by the Malone O'Regan Environmental ('MOR Environmental') team. This chapter provides the Biodiversity Assessment for the likely significant effects of historic activities on the Site between 1990 and 2014. Where likely significant effects were / are identified, appropriate remedial measures to reduce / avoid these effects have been outlined. A separate Stage 1 - remedial Appropriate Assessment Screening ('AA') and Stage 2 - remedial Natura Impact Statement ('rNIS') has been produced, which evaluates the likely significant effects on Natura 2000 sites from historic activities of the Site. The rNIS is submitted as part of the overall application and should be read in conjunction with this Chapter.

Please refer to Chapter 1 for a comprehensive overview of the Site location.

14.1.1 Author Information and Competency

This chapter of the EIAR was prepared by Ms. Annie Coady, MOR Environmental - Environmental Consultant. Annie is a qualifying member of the Chartered Institute of Ecology and Environmental Management ('CIEEM') with over two years of experience working in the environmental consultancy sector. As part of her role, Annie regularly conducts ecological surveys and assessments for various projects across Ireland and has experience in conducting surveys in accordance with Best Practice Guidelines.

This chapter of the EIAR was reviewed by Mr. Henry Tennyson, MOR Environmental – Senior Environmental Consultant. Henry is a qualifying member of the CIEEM with over four years of experience working in the environmental consultancy sector. As part of his role, Henry regularly conducts ecological surveys and assessments for various projects across Ireland and has experience in conducting surveys in accordance with Best Practice Guidelines. Henry was responsible for the management of all ecological surveys on-site.

This chapter of the EIAR was approved by Mr. Dyfrig Hubble, MOR Environmental – Associate Director - Ecologist. Dyfrig is a full member of CIEEM. Dyfrig has over 18 years' experience working in the ecological consultancy sector, including habitat surveys and appraisals and specialist protected species surveys in support of Appropriate Assessments and Ecological Impact Assessments.

14.1.2 Methodology

14.1.2.1 Guidelines & Legislation Relevant to Discipline

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

- CIEEM, *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (2018 and revisions) [1];
- NRA, '*Guidelines for Assessment of Ecological Impacts of National Roads Schemes*' [2];
- Fossitt's Guide to Habitats in Ireland [3];
- Heritage Council's '*Best Practice Guidance for Habitat Survey & Mapping*' [4];

- NRA, '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*,' [5];
- British Trust for Ornithology ('BTO') - *A Field Guide to Monitoring Nests* [6]; and,
- Common Bird Census in *Bird Monitoring Methods* [7].
- Raptors: *A Field Guide for Surveys and Monitoring* [8]; and
- Scottish Badgers, '*Surveying for Badgers: Good Practice Guidelines,*' [9];
- The Mammal Society, '*Surveying Badgers,'* [10];
- Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes [11];
- *A Conservation Plan for Irish Vesper Bats* Irish Wildlife Manual No. 20 [12];
- UK Bat Mitigation Guidelines: A guide to impact assessment, mitigation and compensation for developments affecting bats [13];
- Bat Mitigation Guidelines for Ireland – V2. Irish Wildlife Manuals, No. 134 [14] a publication by the NPWS;
- Bat Surveys for Professional Ecologists - Good Practice Guidelines (4th ed.). London: The Bat Conservation Trust [15];
- SNH, '*Technical Advice Note #2: Otter Surveys*' [16];
- DoAHG, '*National Otter Survey of Ireland 2010 / 12'* [17];
- Joint Nature Conservation Committee ('JNCC'), '*Common Standards Monitoring Guidance*,' [18];
- JNCC '*Herpetofauna Worker's Manual'* [19];
- Froglife, '*Surveying for Amphibians'* [20];
- CIRIA, C532 – Control of Water Pollution from Construction, Guidance for Consultants and Contractors [21];
- CIRIA, *C811- Environmental Good Practice on Site* (5th edition) [22];
- NRA, 'Guidelines for the Treatment of Bats during the Construction of National Road Schemes' [23];
- NRA '*Guidance for the Treatment of Badgers Prior to the Construction of National Road Schemes'* [24];
- NRA, '*Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads* [25]; and,
- '*Requirements for the Protection of Fisheries Habitat during Construction and Development*' [26].

In addition, the baseline surveys and Ecological Impact Assessment (dated 2022) undertaken by Kelleher Ecology Services Ltd. and Croft Ecology in 2022 were reviewed as part of the preparation of this document.

14.1.2.2 Desk Study

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. These distances are used as the starting point for the assessment and are based on accepted best practice and professional expertise.

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:

- 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 details on conservation objectives for the Natura 2000 sites relevant to this assessment [27];
- The Cork County Planning Portal to obtain details about existing / proposed developments in the vicinity of the Site [28];
- BirdWatch Ireland – The Irish Wetland Bird Survey ('I-WeBS') data, which is coordinated by BirdWatch Ireland and under contract to the NPWS, was reviewed with regard to wintering waterbird population within the vicinity of the Site [29];
- The Irish Townland and Historical Map Viewer was consulted with regard to historical aerial imagery of the Site [30];
- The National Biodiversity Data Centre ('NBDC') website was consulted with regard to species distributions [31]; and,
- The Environmental Protection Agency ('EPA') Maps website was consulted to obtain details about watercourses in the vicinity of the Site [32].

The desk study also included a comprehensive examination of historic aerial imagery as a means of evaluating the expansion of the Site and the habitats that were previously present within the area, using the following sources:

- The Geological Survey Ireland ('GSI') area maps website was consulted with regard to historic maps [33];
- The GeoHive Hub website was consulted for the examination and comparison of historical aerial imagery [34]; and,
- The Google Earth website was consulted to evaluate the expansion of the Site and the habitats that previously occurred in that area [35].

The information gathered from these resources has been used as baseline data within this report where appropriate. This information has been presented with the field survey results in Section 14.3.2.1.

14.1.2.3 I-WeBS Data Request

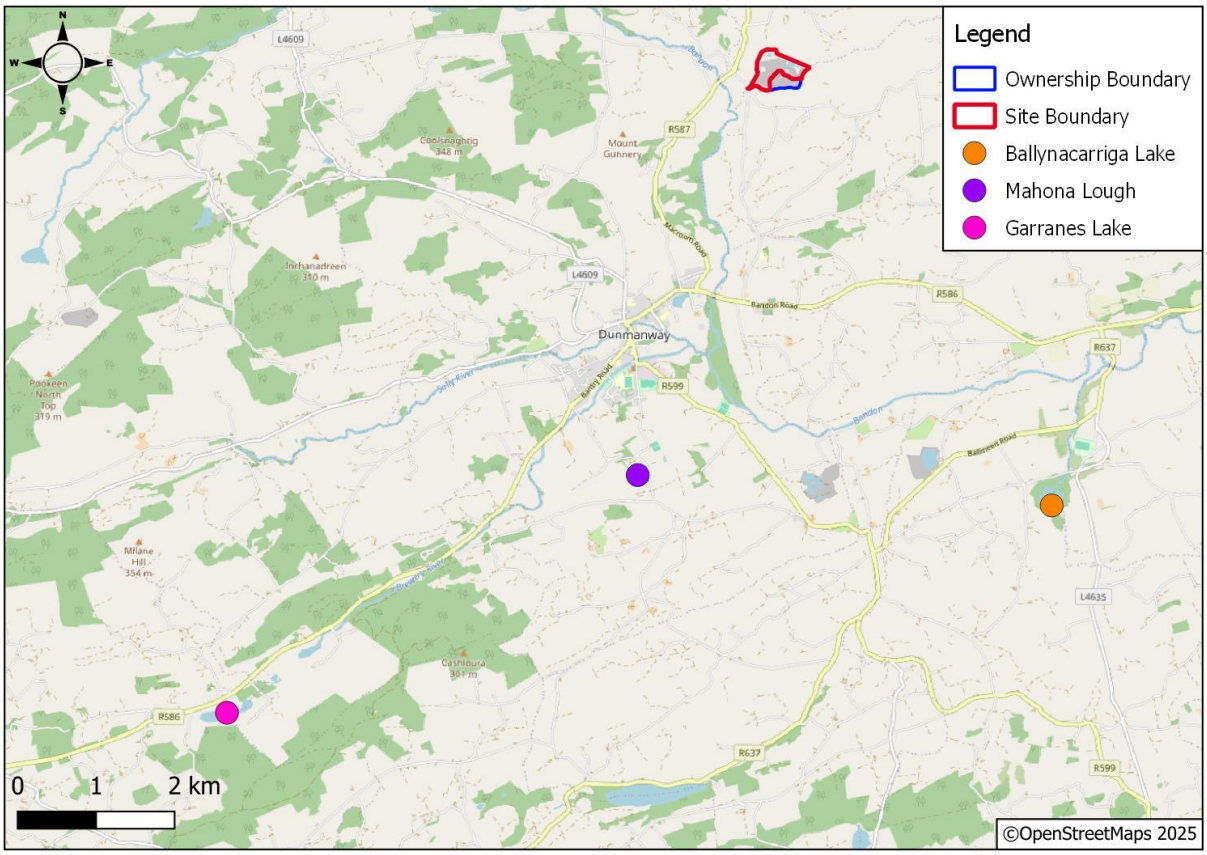
As mentioned above, I-WeBS data was reviewed in order to understand the potential assemblages of wintering bird populations that tend to occur within the vicinity of the Site.

As part of this review, a data request was submitted to the I-WeBS on 13th February 2025, which is coordinated by BirdWatch Ireland and under contract to the NPWS. The data request was made for all available data from the nearest subsites to the southeast and southwest of the Site, as listed in Table 14-1. See Figure 14-1 for the details of the subsites and their locations in in relation to the Site.

Table 14-1: I-WeBS Subsites

Site Name	Site Code
Ballynacarriga Lake	0L013
Mahona Lough	0L014
Garranes Lake	0L023

Figure 14.1: I-WeBS Subsites



14.1.2.4 Field Study

Habitat Survey

An initial habitat survey was undertaken on 9th January 2023, by two suitably qualified MOR Environmental Ecologists, with updated surveys completed on:

- 17th September 2024; and
- 21st May 2025.

These surveys aimed to assess the extent and quality of habitats present on the Site and to identify any potential ecological receptors. All the surveys were undertaken using the Fossitt's Guide to Habitats in Ireland [3] and were conducted in line with the Heritage Council's '*Best Practice Guidance for Habitat Survey & Mapping*' [4].

The assessment was extended to also 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. Based on the habitats present, additional species-specific surveys were also undertaken for birds, bats and amphibians, please see details below.

Protected / Notable Species

Flora

The Site 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 [36].

Amphibians

The Site was assessed for its potential to provide sheltering, foraging, and breeding habitat for amphibians. These include static or slow-moving waterbodies 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.

Static / slow-moving waterbodies suitable for egg-laying were identified on-site. It was therefore considered that the Site has the potential to support amphibians, and presence / absence surveys for amphibians were undertaken. Amphibian surveys were undertaken on 6th June 2023, 14th April 2025 and 6th May 2025. The following survey methodologies were utilised:

- Refugia Search:

  This will take place in daylight. A refugia search is carried out on the terrestrial area near the pond being surveyed. This includes searching amongst old debris, logs, under rocks and through vegetated areas.

- Egg Search:

  This is conducted before dusk. Systematic search through submerged vegetation for egg wraps. The inspection takes place in daylight hours. If smooth newt egg wrap is found, the search ends to avoid further disturbance.

- Netting:

  This is conducted during daylight. Surveyors, using a long-handled dip net walk the perimeter of the water body (where accessible). If a newt is caught, netting is ceased immediately due to the disruptive nature of netting.

- Torching:

  This is conducted after dusk as newts are most active. Torching is used to determine the presence or absence of newts and to estimate the population. A high-powered torch (1 million candle power) is used around the margins of the waterbody to detect newt activity.

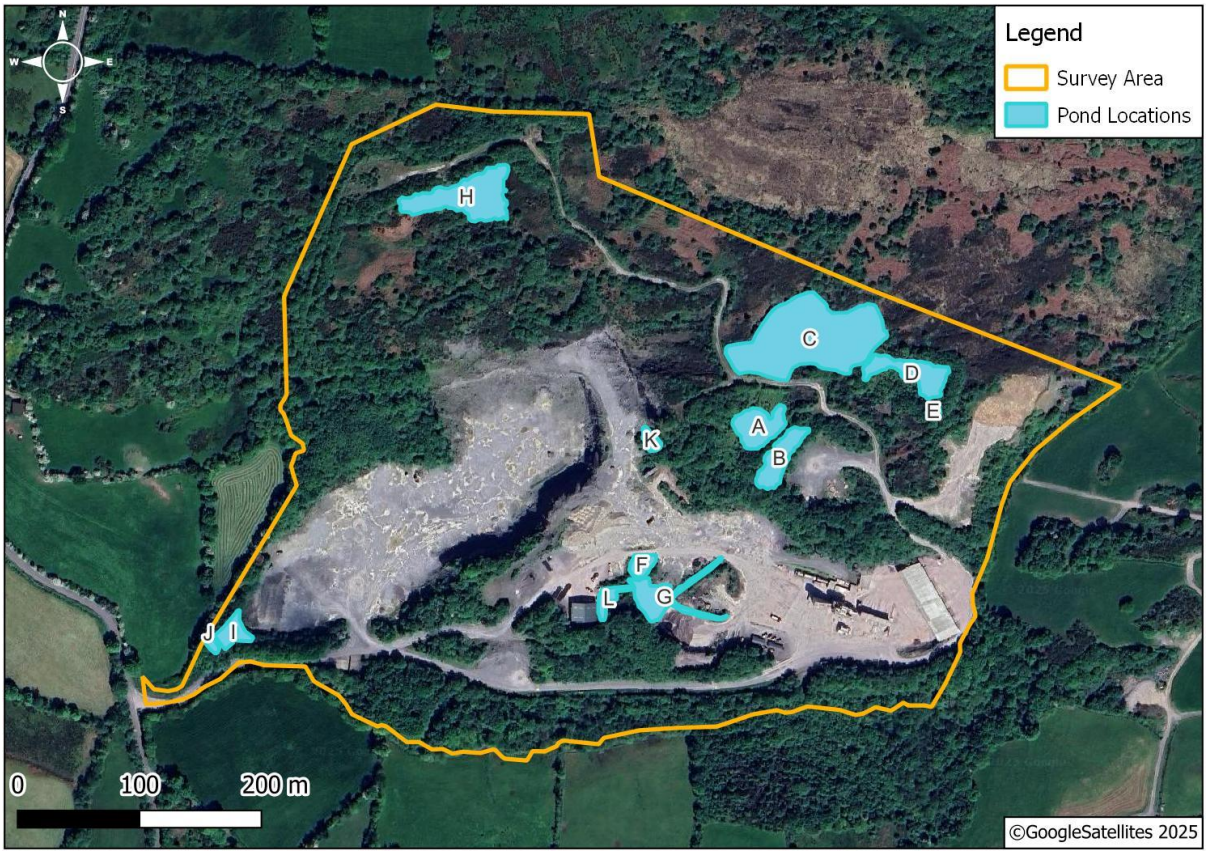
These methodologies are in line with the following guidance:

- NRA, now TII, '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*' [5];
- JNCC, '*Common Standards Monitoring Guidance*' [18];

- JNCC '*Herpetofauna Worker's Manual*' [19]; and,
- Froglife, '*Surveying for Amphibians'* [20].

See Figure 14-2 for the areas within the land ownership boundary that were surveyed for amphibians. Refer to Appendix 14-1 Amphibian Report for full details.

Figure 14.2 Amphibian Survey Locations



Aquatic Ecology

A specialist Freshwater Pearl Mussel ('FWPM') survey was conducted on 25th May, 30th May, 1st June and 22nd June 2023 by Sweeney Consultancy. An updated survey was carried out on 10th September 2024 by Sweeney Consultancy and MOR Environmental. The assessment aimed to identify the presence / habitat suitability of watercourses for FWPM.

The Aquatic Survey report is presented in Appendix 14-2.

Badger

The survey aimed to identify and examine areas where badgers (*Meles meles*) 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.

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

- Scottish Badgers, '*Surveying for Badgers: Good Practice Guidelines,*' [9];
- The Mammal Society, '*Surveying Badgers*,' [10]; and,
- NRA, now TII, '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*,' [5].

Bats

An initial assessment was carried out during the habitat survey for the suitability of the habitats within the Site to provide bat roosting, foraging and flight path habitats. Bat habitats and commuting routes identified were considered in relation to the wider landscape to determine connectivity for local bat populations, and through the examination of aerial mapping.

Assessment criteria for evaluating the potential suitability of the Site for bats were carried out in line with '*Bat Surveys for Professional Ecologists: Good Practice Guidelines'* [15].

Table 14-2: Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape, to be applied using professional judgement

Potential Suitability	Description of Roosting habitats in structures	Description of Potential flight-paths and foraging habitats
None	No habitat features on site likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevice/suitable shelter at all ground/underground levels).	No habitat features on site likely to be used by any commuting or forging bats at any time of the year (i.e. no habitats that provide continuous lines of shade/protection for flight-lines, or generate/shelter insect populations available to foraging bats).
Negligible[1]	No obvious habitat features on site likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.	No obvious habitat features on site likely to be used as flight-paths or by foraging bats, however a small element of uncertainty remains in order to account for non-standard bat behaviour.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate	Habitat that could be used by small numbers of bats as flight-paths such as a gappy hedgerow or unvegetated stream, but isolated, i.e., not very well connected to the surrounding landscape by another habitat.

[1] Negligible is defined as 'so small or unimportant as to be not worth considering, insignificant'. This category may be used where there are places that a bat could roost or forage (due to one attribute) but it is unlikely that they actually would (due to another attribute).

Potential Suitability	Description of Roosting habitats in structures	Description of Potential flight-paths and foraging habitats
	conditions[2] and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e., unlikely to be suitable for maternity and not a classic cool/stable hibernation site, but could be used by individual hibernating bats[3]).	Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation – the categorisation described in this table is made irrespective of species conservation status, which is established after presence is confirmed).	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats for flight-paths such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. These structures have the potential to support high conservation status roost, e.g. maternity or classic cool/stable hibernation site.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland.

[2] For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

[3] Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments [56] and [57] .Common pipistrelle swarming has been observed in the UK [58]And [59]) and winter hibernation of numbers of this species has been detected at Seaton Delaval Hall in Northumberland [60]. This phenomenon requires some research in the UK, but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in prominent buildings in the landscape, urban or otherwise.

Potential Suitability	Description of Roosting habitats in structures	Description of Potential flight-paths and foraging habitats
Potential Suitability	Description of Roosting habitats in structures	Description of Potential flight-paths and foraging habitats

Dusk Emergence and Nighttime Bat Walkover ('NBW') Surveys

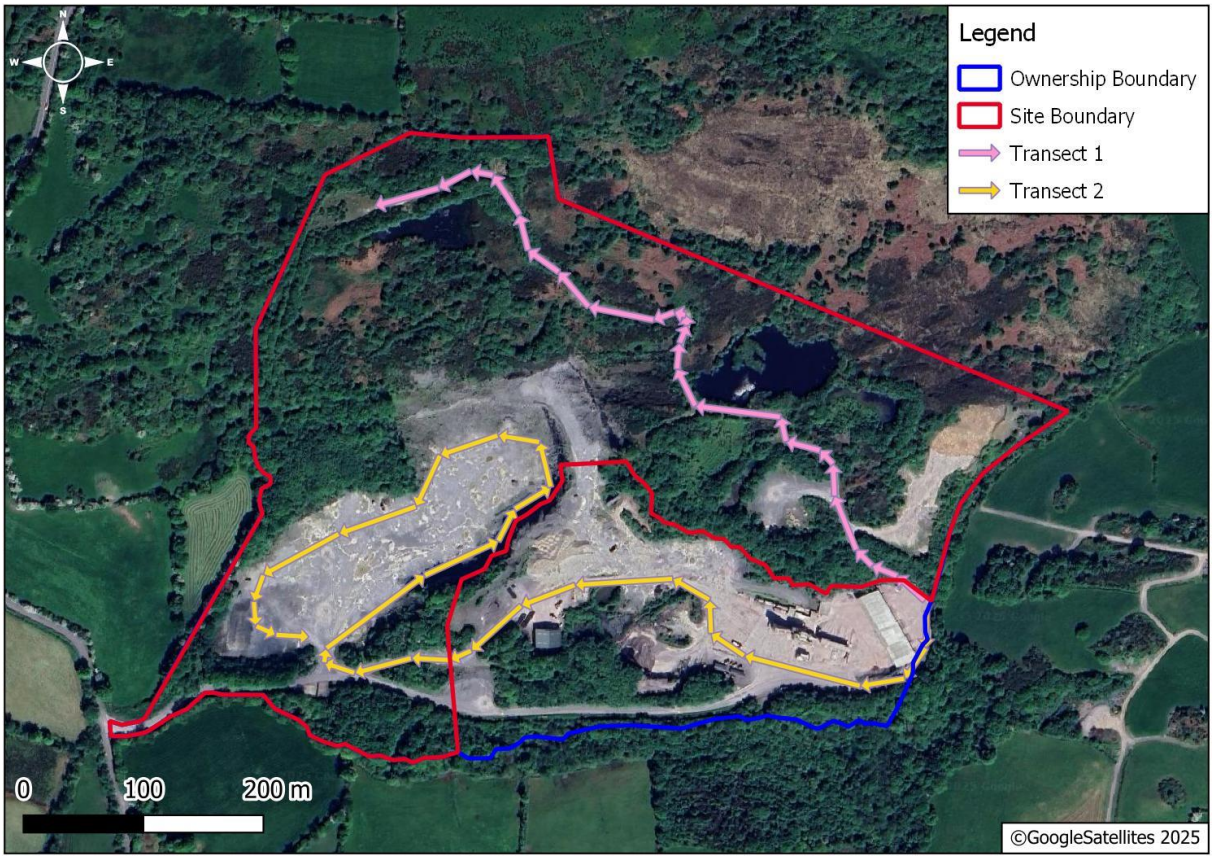
Given the presence of features suitable for commuting and foraging bats, three NBW surveys were undertaken for the Site to establish the importance of the on-site habitats for foraging and commuting bats. These surveys were conducted on 23rd July 2024, 17th September 2024 and 3rd June 2025. See Figure 14-3 for NBW Transects.

The survey design was informed by previous experience and the following publications:

- Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes [11];
- A Conservation Plan for Irish Vesper Bats Irish Wildlife Manual No. 20 [12];
- UK Bat Mitigation Guidelines: A guide to impact assessment, mitigation and compensation for developments affecting bats [13];
- Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25 [37] a publication by the NPWS; and,
- Bat Surveys for Professional Ecologists - Good Practice Guidelines (4th ed.). London: The Bat Conservation Trust [15].

Please refer to Appendix 14-3 – Bat Survey Report for full details of the methodologies for the bat surveys.

Figure 14.3: NBW Transects



Bird Suitability Assessment

The Site and ownership boundary area was assessed for its potential to provide nesting habitat for breeding birds or to support important assemblages of birds of rare or notable species. Surveys aimed to identify and examine areas where wintering and breeding birds might occur. Any activity and potential nesting habitats were noted.

The Site and ownership boundary area were noted to be suitable for nesting and foraging bird species on both the cliff faces of the quarry and the waterbody of the quarry. Additionally, the cliff faces of the quarry were noted to have potential nesting habitat for peregrine falcon.

Following the bird suitability assessment, it was deemed necessary to undertake breeding bird, peregrine falcon and wintering bird surveys.

Birds in the Existing Environment

During the initial habitat survey on 9th September 2023, the Site was assessed for its potential to provide nesting habitat for breeding birds, to support important assemblages of wintering birds or support rare or notable species.

Following the initial site walkover, it was deemed necessary to undertake wintering and breeding bird surveys and peregrine falcon surveys on-site.

Wintering Birds

Vantage point ('VP') bird surveys were undertaken at the Site by a suitably qualified and experienced MOR Environmental Ecologist on 16th February 2023 and 21st March 2023. The surveys were

undertaken at pre-determined VP locations; see Figure 14-4. Given the fact that the Site contains two separate waterbodies, two VP locations were identified that provide suitable views of each waterbody and were located in a safe position away from ongoing activities within the Site.

All species observed utilising the Site were recorded, and their locations were marked on the maps. The surveys were undertaken using the I-WeBS Core Counts methodology [38].

During the surveys, all birds were recorded using a standard British Trust for Ornithology ('BTO') code through sight and sound and optical equipment, such as a telescope and binoculars, to minimise disturbance to wintering birds. The behaviours and activities of the birds were recorded to identify whether the birds were roosting or feeding within the Site.

Full details on survey methodology are presented in Appendix 14-4 – Bird Report.

Breeding Birds

Breeding bird transect surveys were undertaken within the ownership boundary on the following dates:

- 17th May 2023;
- 7th June 2023;
- 12th July 2023;
- 10th April 2025; and,
- 23rd April 2025.

These breeding bird surveys were conducted by a suitably qualified and experienced MOR Environmental Ecologist and in line with the methodology described in:

- British Trust for Ornithology ('BTO') - *A Field Guide to Monitoring Nests* [6]; and,
- Common Bird Census in *Bird Monitoring Methods* [7].

The Common Bird Census ('CBC') methodology was used to establish whether any breeding bird species were utilising the Site.

All birds were recorded through sight and sound. Optical equipment was used, including binoculars, in order to minimise disturbance to potentially breeding birds. Suitable vegetation on-site was examined for the presence of nests. During the survey, the behavioural activity of the recorded birds was noted using the BTO breeding status codes. Birds that displayed non-territorial behaviours were recorded as well (i.e. birds that were flying over the Site, birds that were foraging and not calling, birds that were loafing). Birds were then classified as non-breeding, possibly breeding and confirmed breeding based on the behaviours exhibited.

Full details on survey methodology are presented in Appendix 14-4 – Bird Report.

Peregrine Falcon

Following the identification of suitable peregrine falcon (*Falco peregrinus*) habitat within the Site and the wider area, targeted surveys were undertaken to confirm the presence / absence of peregrine falcon within the Site and the vicinity of the Site on the following dates:

- 17th May 2023;

- 7th June 2023;
- 14th April 2025; and,
- 23rd April 2025.

The surveys were undertaken at a pre-determined vantage point to the southwest of the Site, which provided appropriate views of the suitable nesting habitat for peregrine falcon, see Figure 14-4.

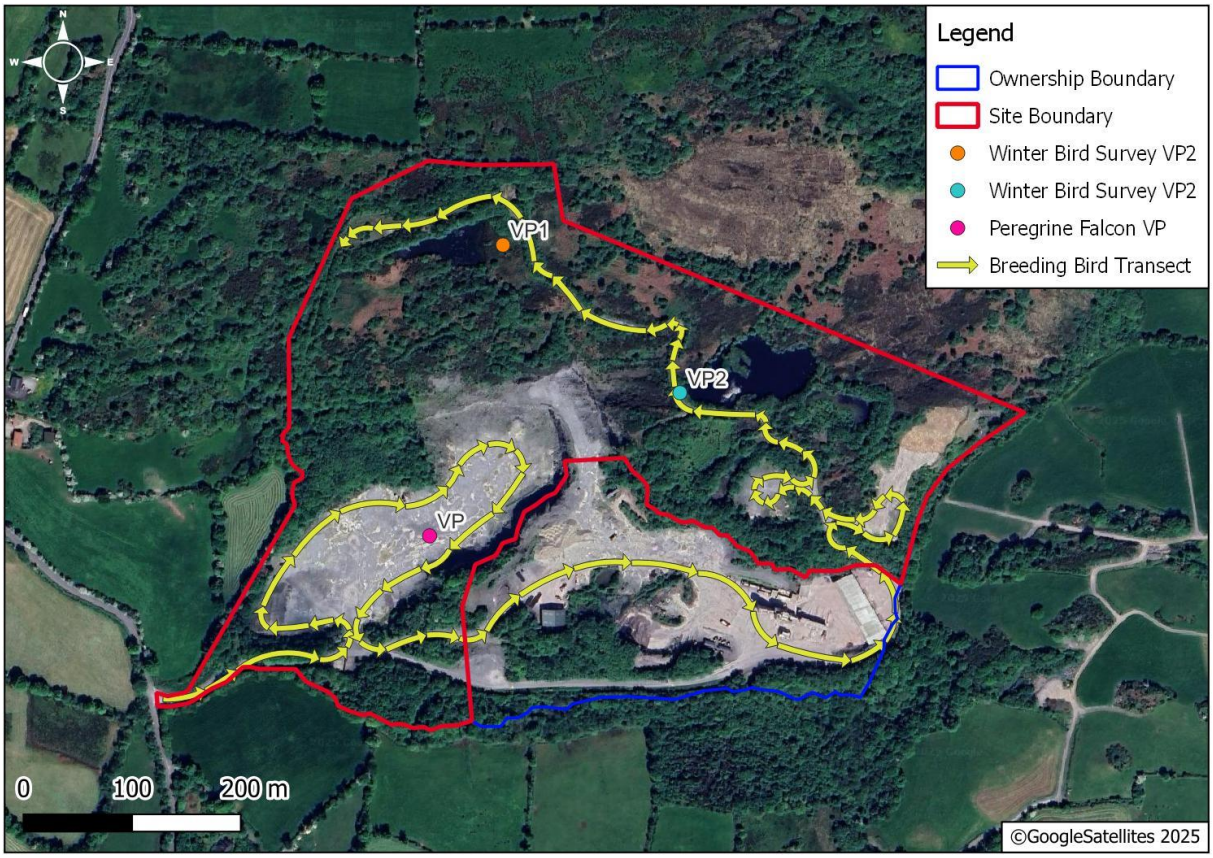
The surveyor recorded peregrine falcons through sightings and, where possible, sound. Optical equipment, including binoculars and telescopes, was used to minimise disturbance to any birds potentially present on-site.

The peregrine falcon surveys were conducted in line with the guidelines described in:

- Raptors: '*A Field Guide for Surveys and Monitoring'* [8]; and
- BTO – '*A Field Guide to Monitoring Nests'* [6].

Full details on survey methodology are presented in Appendix 14-4 – Bird Report.

Figure 14.4: Location of Winter VPs, Breeding Bird Transect and Peregrine Falcon VP



Hedgehogs and pygmy shrews

The habitats within and adjacent to the Site were appraised for their potential to support hedgehogs (*Erinaceus europaeus*) and pygmy shrews (*Sorex minutus*) in line with the NRA, now TII, '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*,' [5].

Otter

The survey aimed to identify and examine areas where otter might occur by noting any evidence of otter (*Lutra lutra*) observed. Evidence of otter searched for included:

- Holts (features log piles, caves and cavities);
- Slides (flattered areas of mud or vegetation);
- Paw prints;
- Evidence of foraging (usually in the form of feeding remains such as fish scales, shellfish, etc.); and,
- Spraints.

The field surveys of the Site were conducted in line with the following relevant guidance for otter:

- Scottish Natural Heritage ('SNH'), '*Technical Advice Note #2: Otter Surveys*' [16];
- DoAHG, '*National Otter Survey of Ireland 2010 / 12*' [17]; and,
- NRA, now TII, '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*,' [5].

Invasive Species

The Site was visually assessed for the presence of any noxious / invasive species that are regulated under the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) [39] such as Japanese knotweed (Reynoutria japonica) and Himalayan balsam (Impatiens glandulifera).

The Site was also assessed for the presence of non-regulated invasive species that have the potential to effect biodiversity.

Other Species

In addition, an assessment was carried out of the potential for the Site to support any other species considered to be of value for biodiversity including those that were identified as occurring locally based on the findings of the desktop study and professional judgment.

14.1.3 Difficulties Encountered in Compiling Information

As with all 'rEIAR's, the key limitation of these assessments is that they are based on the availability, completeness, and accessibility of publicly available data from the period applicable to the Development subject to the substitute consent. This application seeks to assess the works on-site from 1990 to 2014. However, OSI aerial imagery is only available from 1995 onwards. Therefore, there is an information gap between 1990-1995.

It should also be noted that the retrospective identification of certain ecological effects is not possible based on historical mapping information alone. Therefore, there is a reliance on professional judgment required.

Some areas of the Site were inaccessible due to dense vegetation. However, these areas were assessed using binoculars from a distance. It is not considered that this survey limitation will alter the findings of this assessment.

14.1.4 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 have been significantly affected by the Development.

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

- Which, if any, of the species or habitat that have been recorded are legally protected or controlled (see Box 1); and,
- Which, if any, sites, areas of habitat and species that have been 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 effect upon them would have been of potential significance in terms of this rEIAR. 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 for which an effect 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 below). This involved:

- Identifying, for each receptor, any significant effect that is likely to be caused by the Development, which has the potential to lead to a significant effect and / or to contravene relevant legislation;
- Determining the area within which the likely effects would cause a potentially significant effect 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 concluding that the receptor could be significantly affected and / or the relevant legislation contravened, the receptor would be subject to further assessment.

14.1.5 Evaluation of the Conservation Importance of the Site

In terms of biodiversity conservation, the Site was evaluated using the ecological evaluation guidance given in the Transport Infrastructure Ireland ('TII'), formally known as National Roads Authority ('NRA'), guidance on assessment of ecological impacts of National Road Schemes International importance [2], 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).

14.2 Planning Context

14.2.1 Legislation / Policy Context

Within Ireland, a number of 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 Park 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 ('SAC') and Candidate Special Area of Conservation ('cSAC'): 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 (S.I. No. 477/2011);
- Special Protection Areas ('SPA') and candidate Special Protected Areas ('cSPA'): 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:

- National Heritage Areas ('NHA'): 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 2023. NHAs are legally protected from damage and receive protection from the date they are formally proposed for designation; and,
- Proposed Natural Heritage Areas ('pNHA'): 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 [40].
- Other Irish Red Data Book species [41] and Nationally/Regionally/Locally Notable species where appropriate.

14.2.2 National Planning Context

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

14.2.2.1 Project Ireland 2040 National Planning Framework

Project Ireland 2040 was launched by the Government in February 2018 [15] and incorporates two policy documents - the National Planning Framework and the National Development Plan.

National Planning Framework

Under the biodiversity section "Project Ireland 2040 National Planning Framework", the National Policy Objective 59 is to:

> *'Enhance the conservation status and improve the management of protected areas and protected species by:*
>
> - *Implementing relevant EU Directives to protect Ireland's environment and wildlife;*
> - *Integrating policies and objectives for the protection and restoration of biodiversity in statutory development plans;*
> - *Developing and utilising licensing and consent systems to facilitate sustainable activities within Natura 2000 sites; and,*
> - *Continued research, survey programmes and monitoring of habitats and species.'*

The National Policy Objective 60 in the same document is to:

> 'Conserve and enhance the rich qualities of natural and cultural heritage of Ireland in a manner appropriate to their significance.'

Updated Draft Revised National Planning Framework (November 2024)

Following a decision of the Government in June 2023, the preparation of a revised National Planning Framework [42] commenced to take account of changes that have occurred since it was published in 2018 and to build on the framework that is in place. 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 National Planning Framework in November 2024. Finalisation will be subject to environmental assessments.

Objectives under the 'Strategic Planning for Biodiversity' section of this draft framework, include the following:

National Policy Objective 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.'

National Policy Objective 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; and,
> - 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.'

National Policy Objective 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.'

National Policy Objective 87

'Enhance the conservation status and improve the management of protected areas 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; and,
- Continued research, survey programmes and monitoring of habitats and species.'

<u>The National Development Plan (2021-2030)</u>

The National Planning Framework and the National Development Plan will continue to align and form a single vision for Ireland under Project Ireland 2040.

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

- *'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.'*
- *'Future-proofing obligations under the Biodiversity Strategy 2030, including potential national designations and the preparation and delivery of a National Restoration Plan.'*

14.2.2.2 Ireland's 4th National Biodiversity Action Plan 2023 – 2030

The 4th National Biodiversity Action Plan ('NBAP') 2023-2030 sets out a number of strategic objectives that lay out a clear framework for Ireland's approach to biodiversity and demonstrates Ireland's commitment to protect our biodiversity and also halt decline [43].

'This National Biodiversity Action Plan 2023-2030 builds upon the achievements of the previous Plan. It will continue to implement actions within the framework of five strategic objectives, while addressing new and emerging issues.' The five objectives are as follows:

- **Objective 1**: Adopt a Whole of Government, Whole of Society Approach to Biodiversity;
- **Objective 2**: Meet Urgent Conservation and Restoration Needs;
- **Objective 3**: Secure Nature's Contribution to People;
- **Objective 4**: Enhance the Evidence Base for Action on Biodiversity; and,
- **Objective 5**: Strengthen Ireland's Contribution to International Biodiversity Initiatives.

The following Objective Outcomes were considered relevant to the Development and this report:

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 2D:

'Biodiversity and ecosystem services in the marine and freshwater environment are conserved and restored.'

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.'

Outcome 3B:

'The role of biodiversity in supporting wellbeing, livelihoods, enterprise and employment is recognised and enhanced.'

Outcome 3C:

'Planning and development will facilitate and secure biodiversity's contributions to people.'

14.2.3 Regional Planning Context

14.2.3.1 Regional Spatial and Economic Strategy for the Southern Region

The Regional Spatial and Economic Strategy for the Southern Region ('RSES') [44] recognises the need to conserve and enhance biodiversity through coordinated spatial planning between the counties within the southern region of Ireland. This strategy came into effect on 31st January 2020.

Under the biodiversity section, Regional Policy Objective 126 states that the Southern Regional Assembly will:

a) *'Promote biodiversity protection and habitat connectivity both within protected areas and in the landscape through promoting the integration of green infrastructure and ecosystem services, including landscape, heritage, biodiversity and management of invasive and alien species in the preparation of statutory and non-statutory land-use plans. The RSES recognises the role of the National Biodiversity Data Centre through its Citizen Science initiatives;*

b) *Support local authorities acting together with relevant stakeholders in implementing measures designed to identify, conserve and enhance the biodiversity of the Region; seek and support the implementation of the All-Ireland Pollinator Plan, National Biodiversity Action Plan and National Raised Bog SAC Management Plan;*

c) *Local Authorities are required to carry out required screening of proposed projects and any draft land-use plan or amendment/ variation to any such plan for any potential ecological impact on areas designated or proposed for inclusion as Natura 2000/ European Sites and shall decide if an Appropriate Assessment is necessary, of the potential impacts of the project or plan on the conservation objectives of any Natura 2000/European Site;*

d) *Support local authorities to carry out, monitor and review biodiversity plans throughout the Region. Planning authorities should set objectives in their land use plans to implement and monitor the actions as set out in the National and County Biodiversity Plans, as the conservation of biodiversity is an essential component of sustainable development. Local authorities should address the issue of fisheries protection and invasive introduced species and encourage the use of native species for landscape planting in rural areas, in the review of their biodiversity plans;*

e) *Support local authorities to work with all stakeholders to conserve, manage and where possible enhance the Regions natural heritage including all habitats, species, landscapes and geological heritage of conservation interest and to promote increased understanding and awareness of the natural heritage of the Region.'*

The RSES also contains policies relating to invasive species. Regional Policy Objective 127 states that it is an objective to:

a) '*Support coordination between the Region's local authorities in terms of their measures to survey invasive species in their counties and coordinate regional responses;*

b) *Encourage greater awareness of potential threats caused by invasive species and how they are spread;*

c) *Carefully consider and implement the management of invasive species where there is a corridor, such as hydrological connections to European Sites in order to prevent the spread of invasive to sensitive sites.'*

14.2.4 Local Planning Context

14.2.4.1 Cork County Development Plan 2022-2028

The CCDP [45] contains several objectives which relate directly to the protection of biodiversity and natural heritage in the context of the Development. These include objectives to ensure compliance with the EU Habitats Directive and to ensure the protection of the integrity of European sites. It also includes objectives relating to the management of invasive species and the maintenance of ecological corridors. It includes the following policies and objectives that are considered relevant to this project:

Objective BE 15-1:

'a) Support and comply with the objectives of the National Biodiversity Plan 2017-2021 (and any future National Biodiversity Plan which may be adopted during the period of this Plan) as appropriate,

b) Implement the current County Biodiversity Action Plan and any future updated Plan

c) Support and comply with biodiversity policy set out in other national and regional policy documents as appropriate.'

Objective BE 15-2:

'a) Protect all natural heritage sites which are designated or proposed for designation under European legislation, National legislation and International Agreements. Maintain and where possible enhance appropriate ecological linkages between these. This includes Special Areas of Conservation, Special Protection Areas, Marine Protected Areas, Natural Heritage Areas, proposed Natural Heritage Areas, Statutory Nature Reserves, Refuges for Fauna and Ramsar Sites. These sites are listed in Volume 2 of the Plan.

b) Provide protection to species listed in the Flora Protection Order 2015, to Annexes of the Habitats and Birds Directives, and to animal species protected under the Wildlife Acts in accordance with relevant legal requirements. These species are listed in Volume 2 of the Plan.

c) Protect and where possible enhance areas of local biodiversity value, ecological corridors and habitats that are features of the County's ecological network. This includes rivers, lakes, streams and ponds, peatland and other wetland habitats, woodlands, hedgerows, tree lines, veteran trees, natural and semi-natural grasslands as well as coastal and marine habitats. It

particularly includes habitats of special conservation significance in Cork as listed in Volume 2 of the Plan.

d) Recognise the value of protecting geological heritage sites of local and national interest, as they become notified to the local authority, and protect them from inappropriate development.

e) Encourage, pursuant to Article 10 of the Habitats Directive, the protection and enhancement of features of the landscape, such as traditional field boundaries, important for the ecological coherence of the Natura 2000 network and essential for the migration, dispersal and genetic exchange of wild species.'

Objective BE 15-3:

'a) Ensure that biodiversity issues are considered at the earliest possible stages of plan making;

b) Ensure that plans and strategies comply with nature conservation legislation and policy as required (fulfil Strategic Environmental Assessment and Appropriate Assessment requirements); and

c) Carry out ecological impact assessment of plans and strategies as appropriate.'

Objective BE 15-4:

'a) Ensure that biodiversity protection is considered at design stage for works and development planned and progressed by Cork County Council and that all such projects comply with nature conservation legislation and policy as required;

b) Fulfil Appropriate Assessment and Environmental Impact Assessment requirements and carry out Ecological Impact Assessment in relation to Local Authority plans and projects as appropriate.'

Objective BE 15-6:

'Provide for the protection and enhancement of biodiversity in the development management process and when licensing or permitting other activities by:

a) Providing ongoing support and guidance to developers on incorporating biodiversity considerations into new development through preplanning communications and the Council's guidance document 'Biodiversity and the Planning Process – guidance for developments on the management of biodiversity issues during the planning process' and any updated versions of this advice;

b) Encouraging the retention and integration of existing trees, hedgerows and other features of high natural value within new developments;

c) Requiring the incorporation of primarily native tree and other plant species, particularly pollinator friendly species in the landscaping of new developments;

d) Fulfilling Appropriate Assessment and Environmental Impact Assessment obligations and carrying out Ecological Impact Assessment in relation to development and activities, as appropriate;

e) Ensuring that an appropriate level of assessment is completed in relation to wetland habitats subject to proposals which would involve drainage or reclamation. This includes lakes and ponds, watercourses, springs and swamps, marshes, heath, peatlands, some woodlands as well as some coastal and marine habitats;

f) Ensuring that the implementation of appropriate mitigation (including habitat enhancement, new planting or other habitat creation initiatives) is incorporated into new development, where the implementation of such development would result in unavoidable impacts on biodiversity - supporting the principle of biodiversity net gain.'

Objective BE 15-7:

'Implement best practice to minimise the risk of spread of invasive alien species, on Council owned or managed land, and require the development and implementation of Invasive Alien Species Management Plans for new developments where required.'

14.3 Description of Receiving Environment

14.3.1 Desk Study Results

14.3.1.1 European Designated Sites

In accordance with the European Commission Methodological Guidance [46] and with Objective BE 15-2 of the CCDP [45], a list of European sites that could have been potentially affected by the Development has been compiled. Guidance for Planning Authorities prepared by the Department of Environment, Heritage and Local Government [47] states that defining the likely Zone of Influence 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 Natura 2000 site is likely to be negatively affected by a project are:

- The physical distance from the Site to the Natura 2000 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 [48], few projects have a Zone of Influence this large; however, the identification of Natura 2000 sites within 15km has become widely accepted as the starting point for the screening process. For this reason, all SPAs and SACs within 15km have been identified for consideration as part of the screening.

There are three European designated sites located within 15km of the Site - these are identified in Figure 14-5 and Table 14-3.

Figure 14.5: European Designated Sites within 15km of the Site

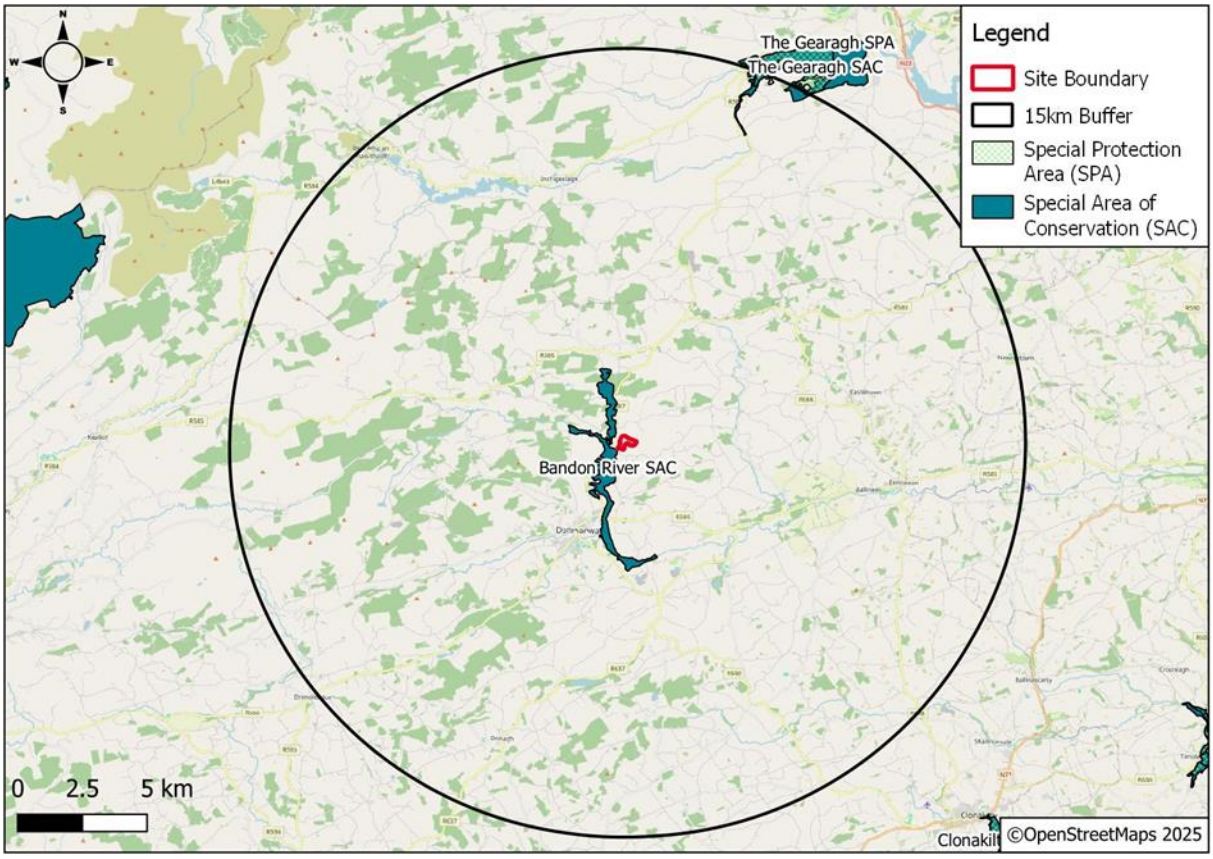


Table 14-2: European Designated Sites within 15km of the Site

Site Name	Code	Date of Designation [49]	Distance (km)	Direction from the Site
Special Areas of Conservation ('SAC')				
Bandon River SAC	002171	January 2002	40m	W
The Gearagh SAC	000101	November 1997	12.5km	NE
Special Protection Area ('SPA')				
The Gearagh SPA	004109	October 1996	14.4km	NE

Further consideration of these European Designated sites is provided in the rNIS that has been submitted as part of the overall planning application.

14.3.1.2 Nationally Designated Sites

There are no NHAs located within 5km of the Site. However, there was one pNHA identified within 5km of the Site (refer to Figure 14-6 and Table 14-3).

Figure 14.6: Proposed Natural Heritage Areas within 5km of the Site

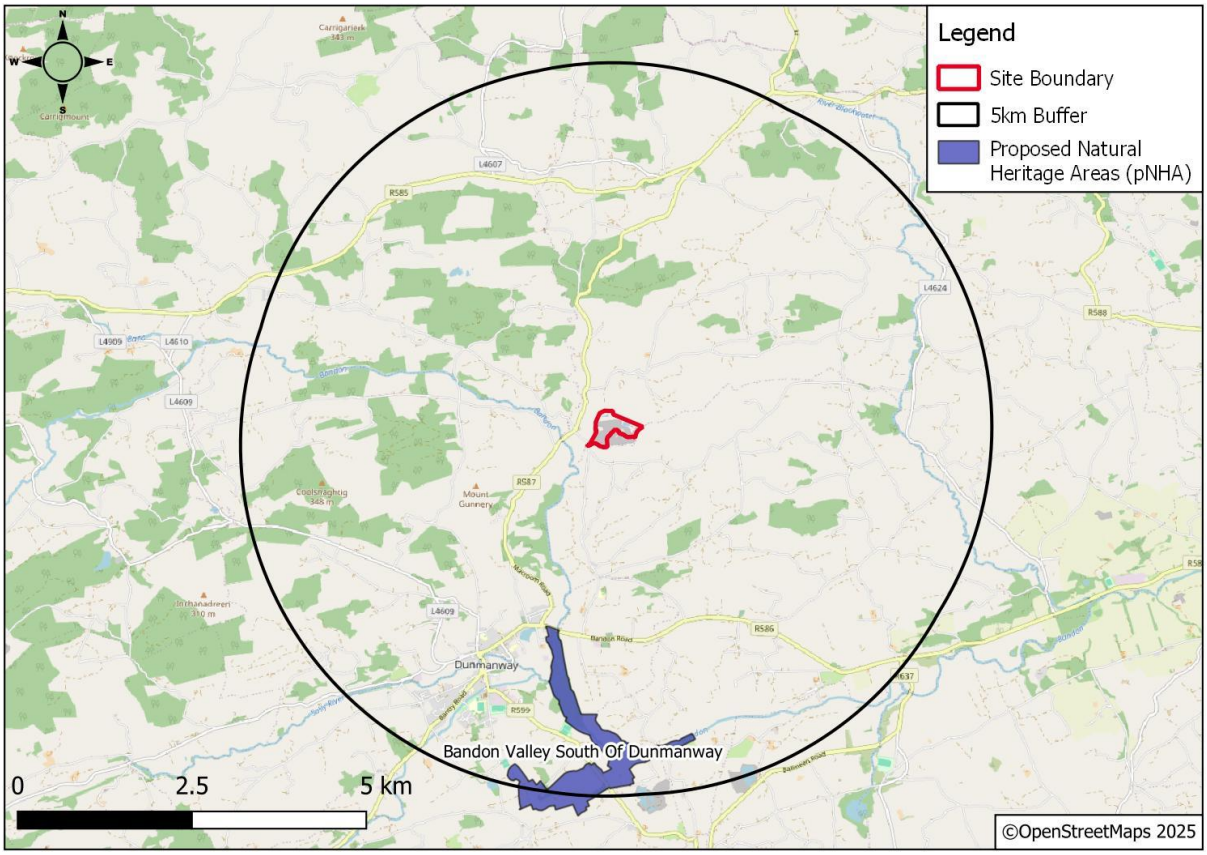


Table 14-3: Proposed Natural Heritage Areas within 5km of the Site

Site Name	Code	Date Proposed [27]	Distance (km) & Direction	Qualifying Interest
Proposed National Heritage Areas ('pNHA')				
Bandon Valley South of Dunmanway	001035	pNHA's were published on a non-stautory basis in 1995	2.7km S	There is no site synopsis available for this pNHA from the NPWS. However, the pNHA covers the southern sections of the Bandon River SAC.

14.3.1.3 NBDC Records of Notable / Protected Species

Historic Environment

Notable / protected species that may potentially have used the Site prior to and during the Development are listed in Table 14-4. These are informed by existing species data held by the NBDC, within 2km of the Site and span the period 1960 to 2014, reflecting species that were present during this period. Quarrying began at the Site prior to 1964 and continued until 2014.

The NBDC records were checked on 9th December 2025. The following 2km grids were checked: W25G, W25H, W25I, W25L, W25M, W25N, W25R, W25S, W25T [31].

Table 14-4: NBDC Records of Notable / Protected Species within 2km of the Site in the historic environment (Grid Codes: W25G, W25H, W25I, W25L, W25M, W25N, W25R, W25S, W25T)

Common Name	*Scientific Name*	Date of historic record	Designation
Flora			
Green Hoar-moss	*Hedwigia integrifolia*	05/12/2014	Flora Protection Order 2022
Large White-moss	*Leucobryum glaucum*	01/07/2009	EU Habitats Directive Annex V
Amphibians			
Smooth Newt	*Lissotriton vulgaris*	25/04/2013	Wildlife Acts 1976 / 2000
Bird Species			
Barn Swallow	*Hirundo rustica*	31/07/1991 31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Black-billed Magpie	*Pica pica*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Blackcap	Sylvia atricapilla	31/12/2011 06/10/2014	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Blue Tit	*Cyanistes caeruleus*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Chaffinch	*Fringilla coelebs*	31/07/1991 31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Coal Tit	*Periparus ater*	31/07/1991 31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Common Blackbird	*Turdus merula*	31/07/1991 31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Common Bullfinch	*Pyrrhula pyrrhula*	31/07/1991 31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Common Buzzard	*Buteo buteo*	30/06/2016	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Common Chiffchaff	*Phylloscopus collybita*	31/07/1991 31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Common Coot	*Fulica atra*	31/12/2011	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II and III Section I and II Bird Species Birds of Conservation Concern Amber List
Common Cuckoo	*Cuculus canorus*	31/07/1991 31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List

Common Name	***Scientific Name***	**Date of historic record**	**Designation**
Common Kestrel	*Falco tinnunculus*	31/07/1991 31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Red List
Common Kingfisher	*Alcedo atthis*	31/12/2001	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Common Linnet	*Carduelis cannabina*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Common Moorhen	*Gallinula chloropus*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Common Pheasant	*Phasianus colchicus*	31/07/1991	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II Section I and Annex III and Section I Bird Species Birds of Conservation Concern Green List
Common Raven	*Corvus corax*	31/07/1991 31/07/1991	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Common Snipe	*Gallinago gallinago*	31/12/2011	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II Section I and Annex III and Section III Bird Species Birds of Conservation Concern Red List
Common Starling	*Sturnus vulgaris*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Common Swift	*Apus apus*	14/07/2021	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Red List
Common Wood Pigeon	*Columba palumbus*	31/07/1991 31/12/2011	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II Section I and Annex III Section I Bird Species Birds of Conservation Concern Green List
Eurasian Collared Dove	*Streptopelia decaocto*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Eurasian Jackdaw	*Corvus monedula*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Eurasian Siskin	*Carduelis spinus*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List

Common Name	***Scientific Name***	**Date of historic record**	**Designation**
Eurasian Sparrowhawk	*Accipiter nisus*	18/03/2016	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Eurasian Teal	*Anas crecca*	31/12/2011	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II Section I and Annex III Section II Bird Species Birds of Conservation Concern Amber List
Eurasian Treecreeper	*Certhia familiaris*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Eurasian Wigeon	*Anas penelope*	31/12/2011	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II Section I and Annex III and Section II Bird Species Birds of Conservation Concern Amber List
European Goldfinch	*Carduelis carduelis*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
European Greenfinch	*Carduelis chloris*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
European Robin	*Erithacus rubecula*	31/07/1991 31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Fieldfare	Turdus pilaris	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Goldcrest	*Regulus regulus*	31/07/1991	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Great Cormorant	*Phalacrocorax carbo*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Great Tit	*Parus major*	31/07/1991 31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Grey Heron	*Ardea cinerea*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Grey Wagtail	*Motacilla cinerea*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Red List
Hedge Accentor	*Prunella modularis*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List

Common Name	*Scientific Name*	Date of historic record	Designation
Hooded Crow	*Corvus cornix*	31/07/1991 31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
House Martin	*Delichon urbicum*	31/07/1991 31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
House Sparrow	*Passer domesticus*	31/07/1991 31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Lesser Redpoll	*Carduelis cabaret*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Little Grebe	*Tachybaptus ruficollis*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Long-tailed Tit	*Aegithalos caudatus*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Mallard	*Anas platyrhynchos*	31/12/2011	Wildlife Acts 1976 / 2000 EU Birds Directive Annex II Section I and Annex III and Section I Bird Species Birds of Conservation Concern Amber List
Meadow Pipit	*Anthus pratensis*	31/07/1991 31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Red List
Mistle Thrush	*Turdus viscivorus*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Mute Swan	*Cygnus olor*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Northern Lapwing	*Vanellus vanellus*	31/12/2011	Wildlife Acts 1976 / 2000 EU Birds Directive Annex II Section II Bird Species Birds of Conservation Concern Red List
Redwing	*Turdus iliacus*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Red List
Rock Pigeon	*Columba livia*	31/12/2011	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II Section I Bird Species Birds of Conservation Concern Green List
Rook	*Corvus frugilegus*	31/07/1991 31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List

Common Name	*Scientific Name*	Date of historic record	Designation
Sand Martin	*Riparia riparia*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Song Thrush	*Turdus philomelos*	31/07/1991 31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Spotted Flycatcher	*Muscicapa striata*	31/07/1991 31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Stonechat	*Saxicola torquata*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
White Wagtail	*Motacilla alba*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Willow Warbler	*Phylloscopus trochilus*	31/07/1991 31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Winter Wren	*Troglodytes troglodytes*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List
Yellowhammer	*Emberiza citrinella*	31/07/1991	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Red List
Bat Species			
Soprano Pipistrelle	*Pipistrellus pygmaeus*	16/07/1999	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV
Terrestrial Mammals			
Eurasian Badger	*Meles meles*	31/12/2007 31/12/2008 31/12/2011 31/12/2013	Wildlife Acts 1976 / 2000
Eurasian Red Squirrel	*Sciurus vulgaris*	31/12/2007 31/12/2012	Wildlife Acts 1976 / 2000
Irish Stoat	*Mustela erminea subsp. hibernica*	06/02/2024	Wildlife Acts 1976 / 2000
Pine Marten	*Martes martes*	31/12/2012	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex V
West European Hedgehog	*Erinaceus europaeus*	04/10/2012	Wildlife Acts 1976 / 2000
Aquatic Species			
Brown/Sea Trout	*Salmo trutta*	31/12/1965	n/a
Rudd	*Scardinius erythrophthalmus*	31/12/1965	n/a
Invasive species*			
Japanese Knotweed	*Reynoutria japonica*	02/09/2014	High Impact Invasive Species Regulation S.I. 374 (Ireland)

Common Name	*Scientific Name*	Date of historic record	Designation
Jenkins' Spire Snail	*Potamopyrgus antipodarum*	31/12/1960	Medium Impact Invasive Species

Existing Environment

Table 14-5 provides a summary of records of legally protected or otherwise notable species that occur within 2km of the Site over the last 10 years at the time of writing this report [31]. The NBDC records were checked on 9th December 2025. The following NBDC 2km grid squares were checked: W25L, W25G, W25H, W25I, W25M, W25N, W25R, W25S and W25T.

Table 14-5: NBDC records of notable / protected species within 2km of the Site within the last 10 years in the existing environment

Common Name	Scientific Name	Date of last record	Designation
Bird Species			
Common Kingfisher	*Alcedo atthis*	15/06/2017	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex I Bird Species Birds of Conservation Concern Amber List
Bat Species			
Brown Long-eared Bat	*Plecotus auritus*	31/08/2019	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV
Daubenton's Bat	*Myotis daubentonii*	30/08/2021	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV
Invasive Species			
Japanese Knotweed	*Reynoutria japonica*	05/06/2018	High Impact Invasive Species Regulation S.I. 374 (Ireland)
Rhododendron	*Rhododendron ponticum*	21/03/2023	High Impact Invasive Species Regulation S.I. 374 (Ireland)
Terrestrial			
European Otter	*Lutra lutra*	31/12/2016	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II and IV
West European Hedgehog	*Erinaceus europaeus*	16/10/2021	Wildlife Acts 1976 / 2000

14.3.1.4 I-WeBS Data

I-WeBS data was requested for nearby sites within the vicinity of the Site. This data request was for all available data from the nearest I-WeBS sites. This included the following sites:

- Ballynacarriga Lake (Site code: 0L013);
- Mahona Lough (Site code: 0L014); and,
- Garranes Lake (Site code: 0L023).

It is important to note that the data sets for these sites and subsites were not continuous and contained information gaps for different months and years. However, the records were reviewed in order to gain an understanding of the potential assemblage of bird populations that may utilise the areas within the vicinity of the Site.

The I-WeBS data for wintering seasons between 1994/1995 to 2019/2020 for Ballynacarriga Lake, Mahona Lough and Garranes Lake was provided. A total of 29 species were recorded during this period. However, during the most recent counts available for the 2019/2020 season, a total of 26 species were recorded.

Only one species were recorded in numbers that are considered to be of national importance:

- Coot were recorded at numbers of international importance in the 2019/20 in Ballynacarriga Lake.

It should be noted that these subsites are not located within the immediate vicinity of the Site; the nearest records to the Site are from the Mahona Lough, Ballynacarriga Lake and Garranes Lake. These sites are located 5.1km southwest, 6.1km southeast and 10.3km southeast of the Site, respectively.

14.3.2 Habitats and Flora

14.3.2.1 Historic Habitats

Pre-1990 Historic Habitats

Pre-1990 Habitat Changes

The earliest available aerial imagery for the Site and the surrounding ownership area dates back to 1995. No aerial photography predating 1990 was found. As a result, the habitat types present prior to 1990 were determined using historical mapping data from the Ordnance Survey of Ireland ('OSI') 6-inch and 25-inch maps [30].

OSI 6-Inch Mapping (1837 – 1842) and 25-inch Mapping (1888 – 1913)

The OSI 6-inch maps were dated from 1837-1842, and the 25-inch maps dated from 1888-1913. The descriptions of historical habitats and ecologically significant features identified from these maps, as shown in Figures 14-7 and 14-8, reflect a period before the introduction of modern classification systems, such as Fossitt habitat codes in 2000 [3]. The descriptions in Table 14-6 are based on historical mapping data and traditional land-use practices and are outlined further in Appendix 14-5– OSI Characteristic Sheet for Maps on a scale of 6 inches to 1 Mile and 25.344 inches to 1 Mile.

Table 14-6: Pre-1990 Historic Habitat Description

Habitat	Description	Value
Deciduous Woodland	The OSI 6-inch maps shows the area that is now Ardcahan quarry as a large area of deciduous woodland. The OSI 25-inch maps identifies the area of deciduous woodland as Clashnagallagh Wood. Based on the available information and based on an assessment of similar habitats within the surrounding area.	National Importance
Rough pastures and cropping rock	The northern area of the Site is shown as rough pastures and cropping rock. Cropping rock refers to areas where bedrock is exposed or near the surface, often with minimal soil development. These areas were typically unsuitable for agriculture or grazing livestock.	Lower value local importance

Agricultural Grassland	The area to the west of the Site looked to be an area of grassland in the historic maps. It is not known if this habitat was used for growing arable crops or grazing livestock. Based on the available information and based on an assessment of similar habitats within the surrounding area.	Lower value local importance

Figure 14.7: OSI 6-inch Mapping of the Site between 1837-1842

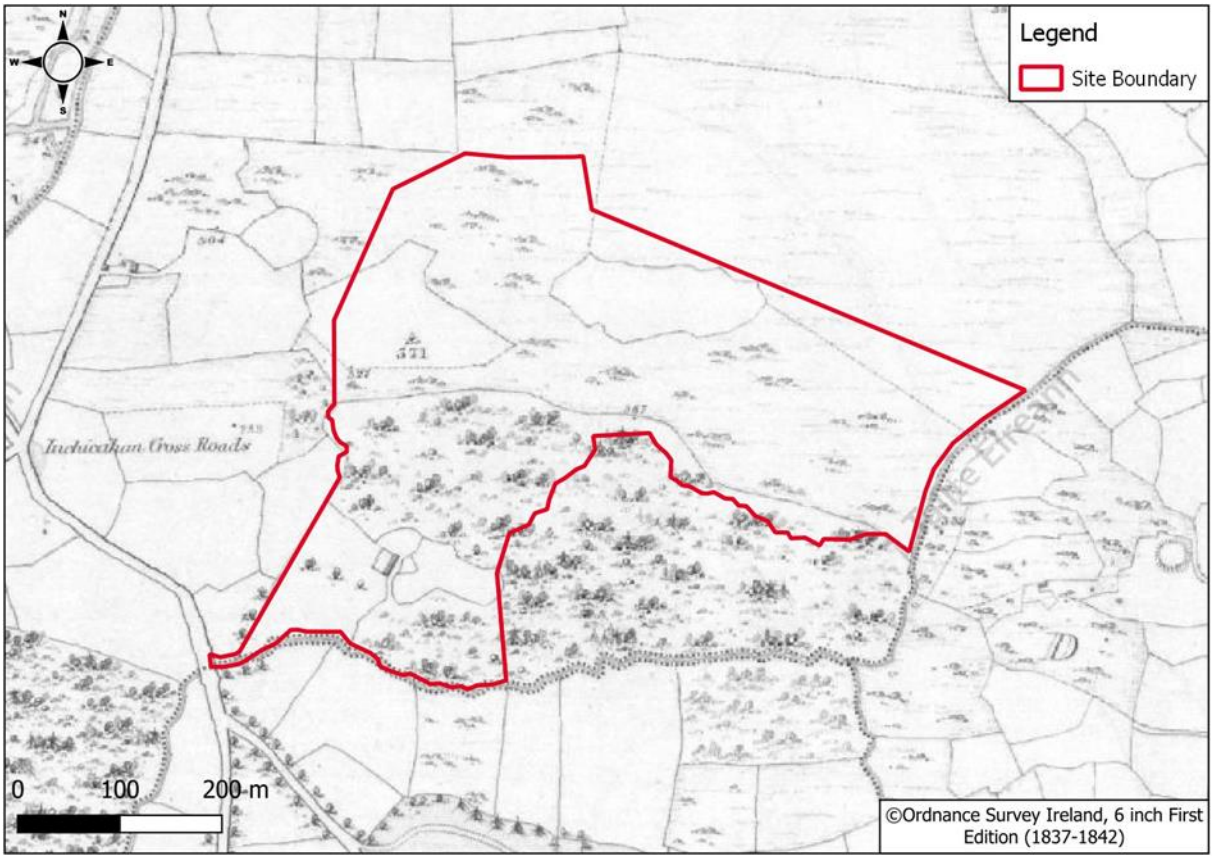
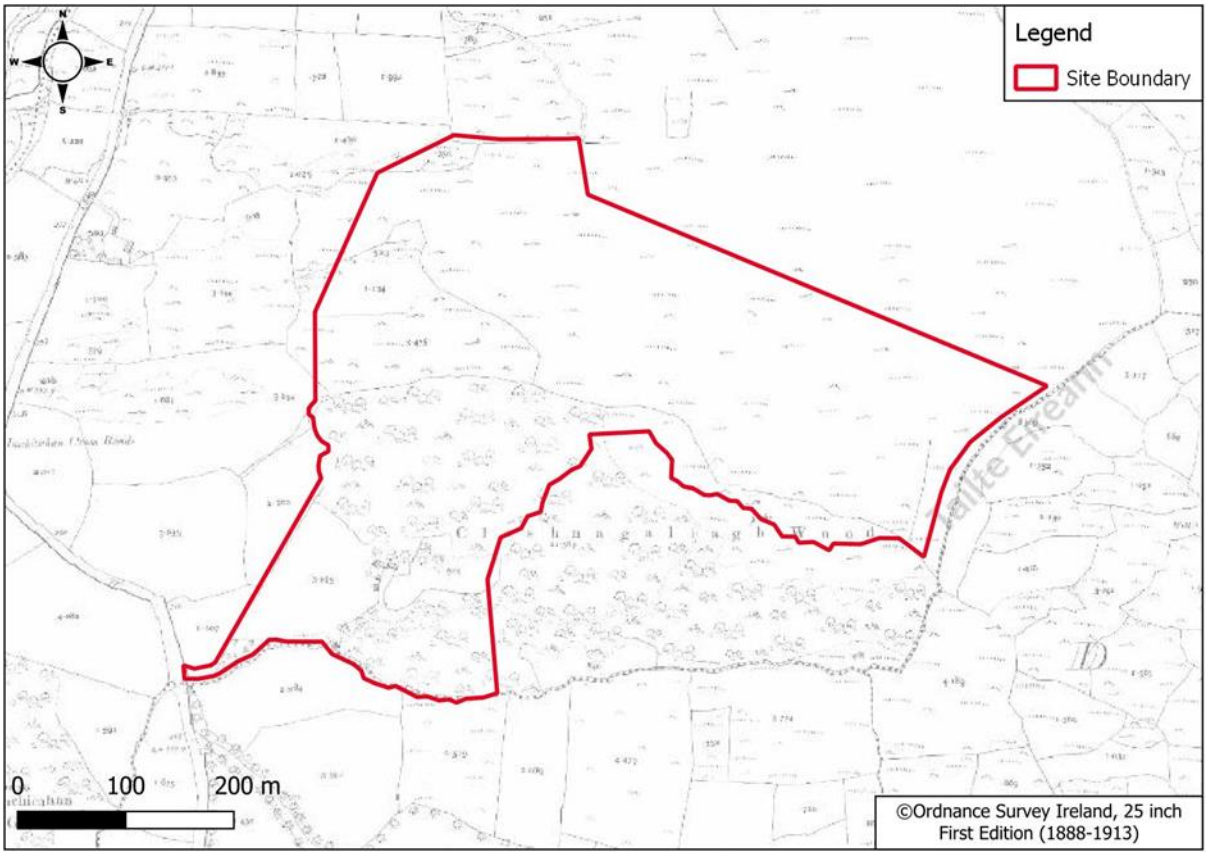


Figure 14.8: OSI 25-inch Mapping of the Site between 1888-1913



Aerial Imagery Historical Maps

Aerial Imagery from 1995, 1996, 2001, 2006 and 2014 provides evidence of changes within the Site. Through a desktop study of these images, the baseline habitats considered likely to be present during each year were identified and analysed. No aerial imagery is available prior to 1995. Refer to Figures 14-10 to 14-13 for historic aerial imagery of the Site.

The habitats in the 1995 and 1996 aerial imagery show that the southern portion of the Site is an active quarry, while the northwest of the Site remained an area of deciduous woodland historically known as Clashnagallagh Wood. The northern area of the Site had not been developed, and based on the existing habitats on-site, it is presumed that these habitats were dry siliceous heath and wet grassland. See Table 14-7 for a full description of the habitats.

Table 14-7: Aerial Imagery Historic Habitat Description

Habitat	Description	Value
Active Quarry and Mines (ED4)	The first aerial imagery shows this habitat is present within the south of the Site. This habitat extends north and northeast throughout the subsequent years of aerial imagery. This is the dominant habitat in the substitute consent area.	Moderate value local importance
Dry Siliceous Heath (HH1)	This area looks to have covered the vast area of the northern sections of the substitute consent study area. This habitat was also mixed with wet grassland and dense bracken. This habitat corresponds to an Annex I habitat listed under the EU	National Importance

Habitat	Description	Value
	Habitats Directive (Annex I European Dry Heaths [4030]) [50].	
Dry Siliceous Heath / Wet Grassland / Dense Bracken (HH1 / GS4 / HD1)	Dry heath is mosaiced throughout the northern extent of the substitute consent study area with wet grassland and dense bracken. Quarry infrastructure such as site access tracks and settlement ponds were developed through the study period	Higher value local importance
Mixed Broadleaved Woodland / Scrub (WD1 / WS1)	An area of woodland with associated scrub was present in the 1995 aerial imagery near the filed and access boundaries of the quarry. This area has been encroached in the subsequent years and a small section is still present. Areas of this habitat had been planted by quarry operators to provide screening function for the landscape	Higher value local importance
Oak-Birch-Holly Woodland (WN1)	The northwest of the Site consisted of an area of deciduous woodland historically known as Clashnagallagh Wood. This habitat was encroached by the quarrying works through the subsequent years. This habitat corresponds to an Annex I Habitat listed under the EU Habitats Directive (Annex I Old Sessile Oak Woods with Ilex and Blechnum [91A0]) [50].	National importance
Agricultural Grassland (GA1)	The 1995 aerial imagery shows that this habitat was present in the southwest of the study area south of the woodland. After 1996, and before 2005, these fields were fully quarried, resulting in their reclassification to Active Quarries and Mines.	lower value local importance
Hedgerow / Treelines (WL 1/ WL2)	Based on the aerial imagery, the fields of agricultural grassland were divided by a hedgerow / treeline. This was quarried before 2005	higher value local importance.
Artificial Lakes and Ponds (FL8)	The addition of the artificial ponds can be seen in the 2005 aerial imagery and is not present in the 2000 imagery. The pond in the northeast of the Site is present in the 2005 imagery. Both ponds are present in the 2014 aerial imagery	Moderate value local importance

Figure 14-9 below illustrates the indicative distribution of habitats present on the Site pre-1990. This indicative map is based on a review of available aerial imagery and desktop information and assumptions made based in the existing habitats present.

Figure 14.9: Pre-1990 Habitat Map

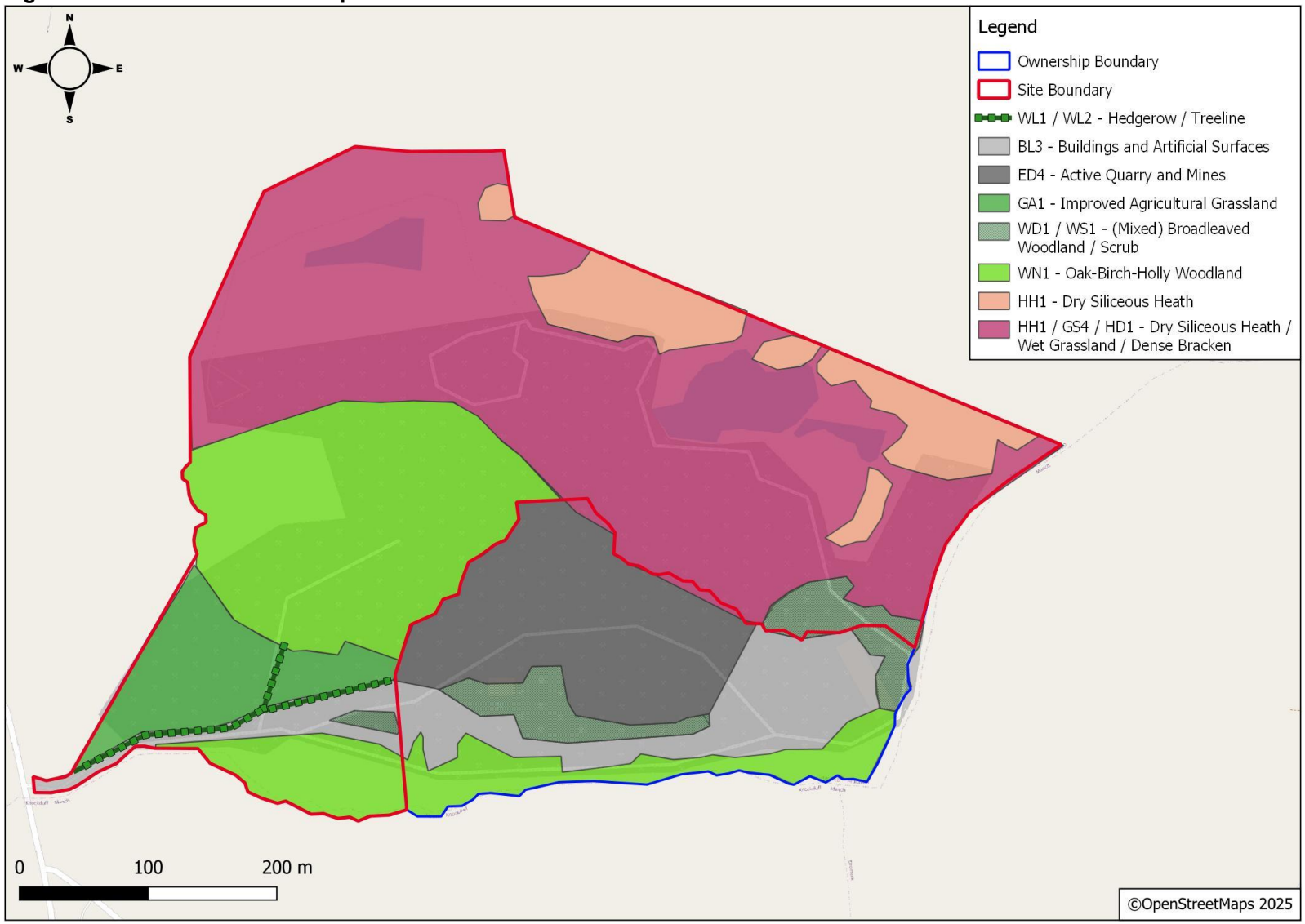


Figure 14.10: Aerial Image 1995

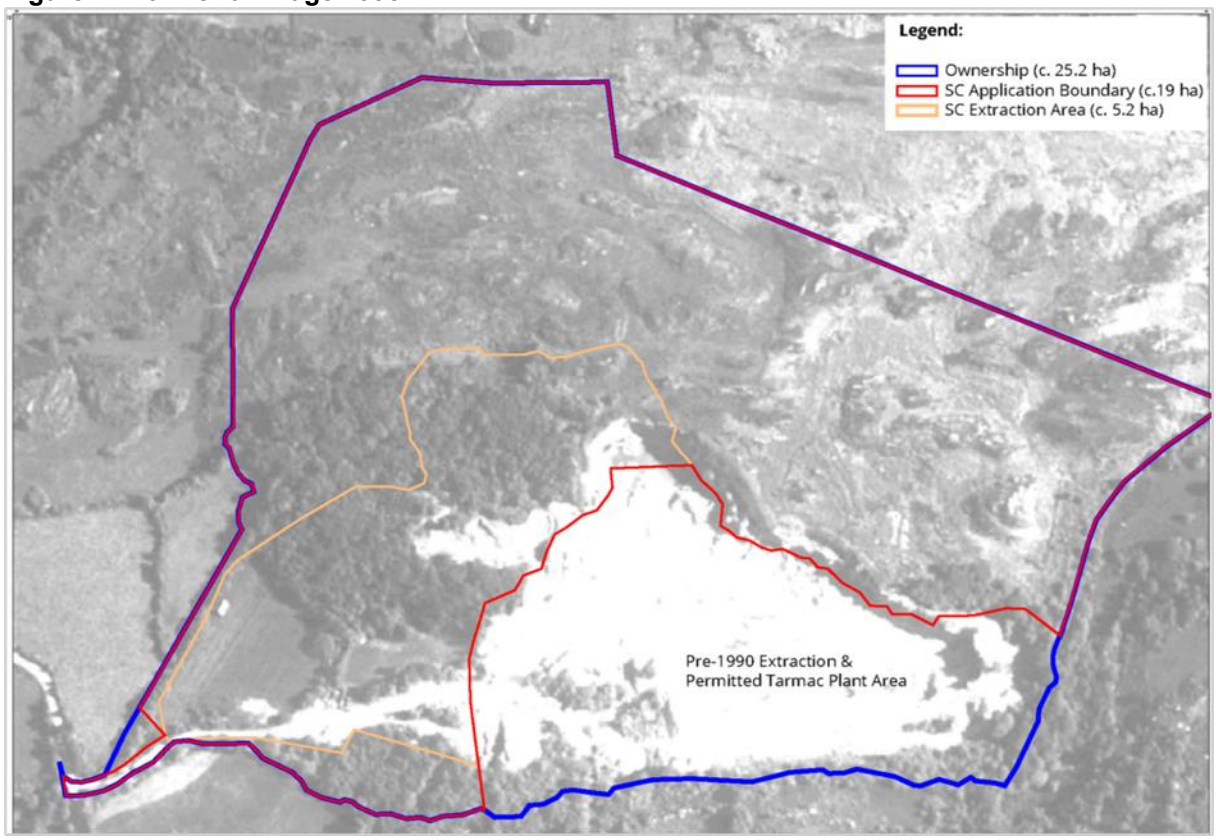


Figure 14.11: Aerial Image 2000

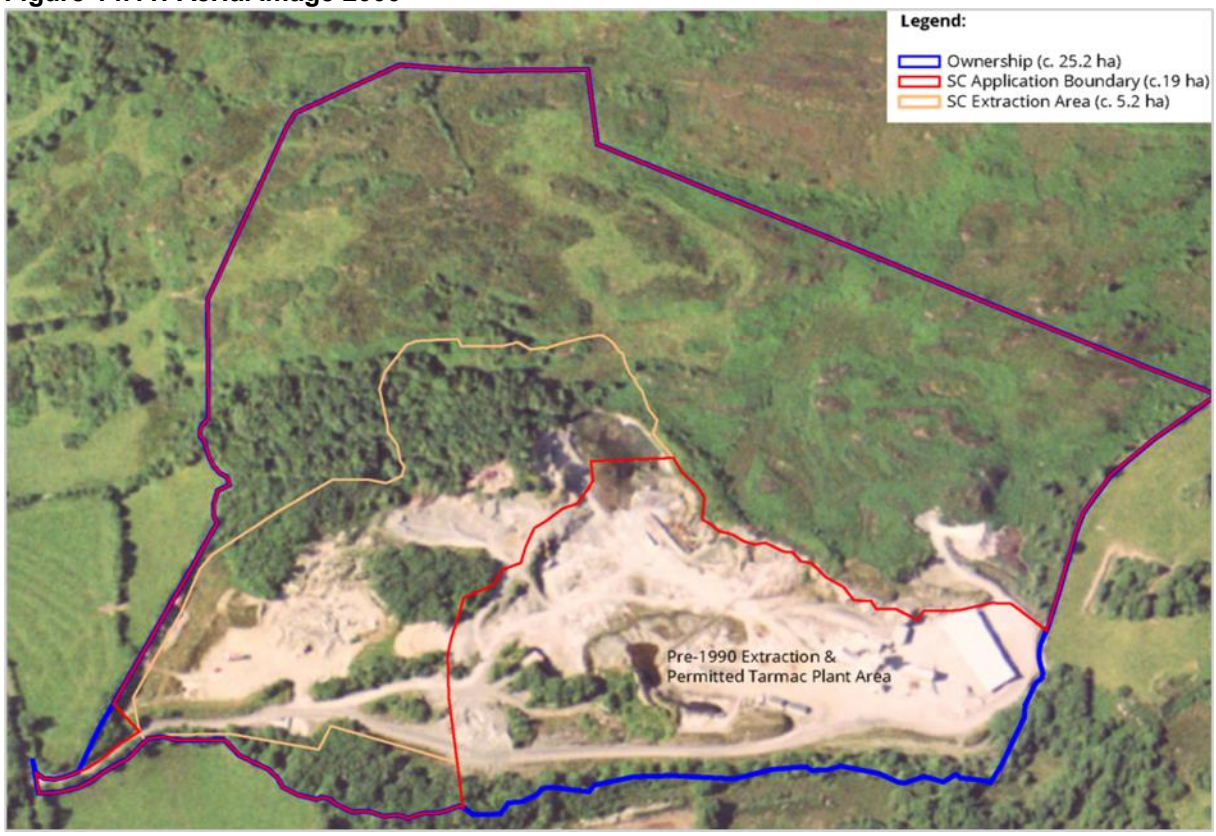


Figure 14.12: Aerial Image 2005

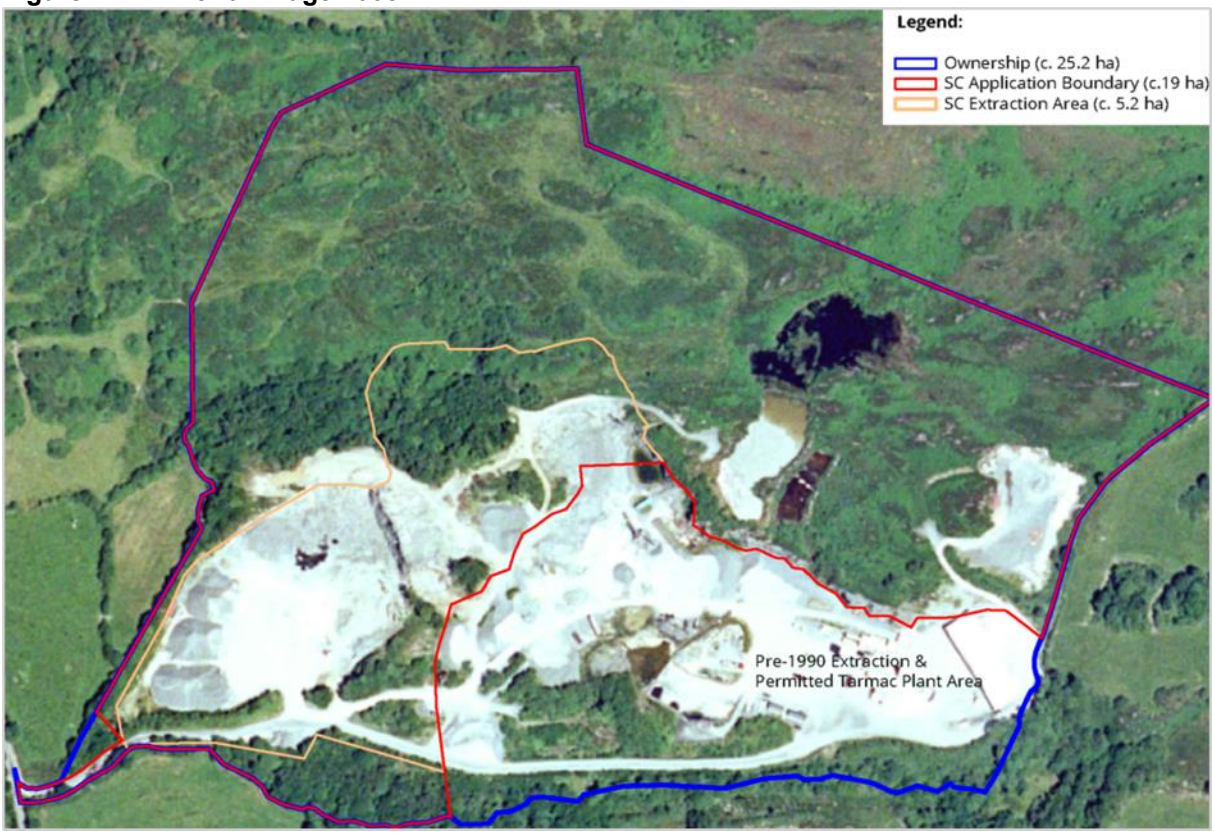


Figure 14.13: Aerial Image 2014



14.3.2.2 Existing Habitats

The following section provides details of the field-based assessment that were undertaken on the following dates:

- 9th January 2023;
- 17th September 2024; and,
- 21st May 2025.

A description of the habitats and features of ecological significance are outlined below and illustrated in Figure 14-14.

Active Quarry and Mines (ED4)

This habitat was located at the centre of the Site and comprised areas previously subject to the extraction of rock and associated operations. The habitat was predominantly unvegetated, characterised by exposed rock faces and compacted quarry floor. Occasional patches of bare ground and temporary water accumulation were observed, but lacked notable flora or fauna at the time of surveys.

Artificial Surfaces (BL3)

Artificial surfaces were present throughout the ownership boundary, primarily in the form of internal quarry roads, inactive quarry floor areas and built infrastructure, including prefabricated structures and a macadam plant.

While largely composed of compacted gravel or concrete, some of these areas supported sparse, pioneer vegetation within cracks, edges and less-trafficked sections. Species observed in these locations included oxeye daisy (*Leucanthemum vulgare*), lesser trefoil (*Trifolium dubium*), creeping buttercup (*Ranunculus repens*), ribwort plantain (*Plantago lanceolata*) and sweet vernal grass (*Anthoxanthum odoratum*), reflecting colonisation by disturbance-tolerant flora. These species were typically scattered and patchy, indicating low but ongoing vegetation growth within these artificial substrates. It should also be noted that Irish marsh orchids (*Dactyhoriza kerryensis*) were noted on the verges of this habitat around the ponds F and G. However, it should be noted that these are outside the Site boundary.

Buildings present within the eastern portion of the Ownership Boundary included a macadam plant, prefabricated office, canteen and toilets, aggregate storage sheds and silos and a laboratory.

Bare Ground (ED2)

Bare ground was present in scattered locations across the Site, typically occurring as narrow, unvegetated strips adjacent to access routes or separating other habitat types.

In the western portion of the Site, this habitat formed a transitional zone between an internal access road and adjacent scrub.

Further south, bare ground was noted as an informal pathway linking areas of hardstanding, likely the result of repeated disturbance and vehicular movement associated with quarry operations.

Dense Bracken (HD1)

Dense bracken (*Pteridium aquilinum*) was observed in several areas across the Site, most notably in patches surrounding existing scrub habitats and within a more extensive stand in the northern portion of the Site.

These areas were characterised by a thick, largely monocultural cover of dead or decaying bracken fronds, indicative of seasonal dieback and with very limited ground flora diversity. In the northern extent, signs of recent clearance were evident, with disturbed ground and flattened vegetation suggesting previous management works.

Dry Silicious Heath (HH1)

Dry heath was predominantly recorded along the northern boundary of the Site, with additional patches identified adjacent to it. This habitat was characterised by a dominance of dwarf shrub species and is considered of ecological value due to its structural diversity and sensitivity to disturbance.

The habitat was dominated by bell heather (*Erica cinerea*), ling heather (*Calluna vulgaris*), cross-leaved heath (*Erica tetralix*) and gorse (*Ulex europaeus*), forming a patchy but well-established low shrub layer. Bramble (*Rubus fruticosus*) was present throughout, generally occurring at habitat edges or within more open patches.

Juniper haircap (*Polytrichum juniperinum*) was also frequently recorded across the habitat, particularly in areas of shallower substrate or exposed mineral soil.

One discrete stand of invasive rhododendron (*Rhododendron ponticum*) was identified within the northernmost occurrence of this habitat, located near the northern Site boundary. Its presence is considered locally significant given the potential for further spread and potential suppression of native heath flora.

This habitat corresponds to an Annex I habitat listed under the EU Habitats Directive (Annex I European Dry Heaths [4030]) [50].

Dystrophic Lake (FL1)

The northern section of the Site contains two pond systems. These hydrological features were formed in the last 15 to 20 years as surface water became trapped in shallow depressions with the development of the internal quarry access tracks and silt ponds down gradient of these areas. The ponds have evolved into a more natural setting with the growth of aquatic vegetation. The ponds support typical wetland vegetation such as bog bean (*Menyanthes trifoliate*), broad leaved pondweed (*Potamogeton natan*), bulrush (*Typha latifolia*), horseweed (*Erigeron canadensis*) and common club rush (*Schoenoplectus lacustris*).

The margins of these ponds were often bordered by scrub or wet grassland habitats, creating transitional habitats that supported a range of hydrophilic and semi-aquatic vegetation. In several instances, natural colonisation had occurred along pond fringes, contributing to habitat complexity and local biodiversity.

Exposed Rock (ER1)

Sections of exposed sandstone rock and large boulders occur because of the upland nature of the terrain of the Site. Exposed rock was also found in the Oak-Birch-Holly woodland adjacent to the dry silicious heath. St. Patrick's cabbage (*Saxifraga spathularis*) was frequently present in the boulders

and rockfaces. Other species found growing from the rock included bramble, wild strawberry (*Fragaria vesca)* and ling heather.

Grassy Verges (GS2)

This habitat was present along the access road to the macadam plant bordering the oak-birch-holly woodland and mixed broadleaved woodland. The species present were coltsfoot, bramble, soft shield fern (*Polystichum setiferum)*, ribwort plantain, oxeye daisy, common rush (*Juncus effusus*), purple clover (*Trifolium pratense*), herb-robert (*Geranium robertianum*), winter heliotrope (*Petasites pyrenaicus),* foxglove (*Digitalis purpurea*), common polypody *(Polypodium vulgare*), black medick (*Medicago lupulina*), fringed willowherb (*Epilobium ciliatum*) and birdsfoot -trefoil (*Lotus corniculatus*). Tree species including pedunculate oak (*Quercus robur*) and grey willow (*Salix cinerea*) saplings had begun to establish in this habitat.

Marsh (GM1)

This habitat was identified within the central portion of the Site, directly adjacent to an area of wet grassland. This habitat occupied a shallow depression with seasonally wet soils and supported a community of hydrophilic and semi-aquatic species typical of marshy ground.

Characteristic marsh species identified here included water plantain (*Alisma plantago-aquatica*), lesser spearwort (*Ranunculus flammula*), water mint (*Mentha aquatica*), pennywort (*Hydrocotyle vulgaris*), fen bedstraw (*Galium uliginosum*) and marsh thistle (*Cirsium palustre*). Bulrush was also dominant, occurring in denser stands toward the wettest central areas of the habitat.

Grey willow was present along habitat edges and within transitional zones where the marsh graded into wet grassland. Creeping buttercup and field horsetail (*Equisetum arvense*) were also frequently recorded in marginal areas and slightly drier microhabitats within the marsh.

Mixed Broadleaved Woodland (WD1)

Mixed broadleaved woodland was recorded primarily in the central and northeastern portions of the Site, typically bordering areas of artificial surfaces and forming a transition between more heavily disturbed ground and adjacent natural habitats. This woodland was distinguished from surrounding scrub and immature woodland by the presence of more mature trees and a more developed canopy layer.

Canopy species included grey willow, hazel (*Corylus avellana*) and silver birch (*Betula pendula*), which together created a partially shaded environment conducive to a varied understorey flora. The understorey consisted of bramble, butterfly bush (*Buddleja davidii*), creeping buttercup, common polypody, St John's wort (*Hypericum perforatum*) and foxglove. These species contributed to a diverse woodland ground layer and reflected the transitional nature of this habitat within the quarry landscape.

Oak-Birch-Holly Woodland (WN1)

This habitat was identified primarily along the southern boundary of the Site, occurring along the southern boundary of the quarry access track, with smaller pockets also present atop the quarry cliff edge along the western boundary, within areas otherwise dominated by scrub and immature woodland. This habitat comprised an established woodland on relatively undisturbed ground.

The canopy layer consisted predominantly of sessile oak (*Quercus petraea*), downy birch (*Betula pubescens*), beech (*Fagus sylvatica*), holly (*Ilex aquifolium*) and hazel, forming a relatively dense canopy structure.

The understorey supported a diverse range of woodland herb and shrub species including bracken, bramble, gorse and wood rush (*Luzula multiflora*). Ferns such as soft shield-fern, hart's tongue fern (*Asplenium scolopendrium*) and wall fern (*Asplenium ruta-muraria*) were also recorded, typically occupying shaded banks or rocky outcrops.

Herbaceous flora included wood sorrel (*Oxalis acetosella*), foxglove, goldenrod (*Solidago virgaurea*), saxifrage (*Saxifraga* spp.) and herb-robert, which collectively contributed to the biodiversity of the woodland floor.

This habitat corresponds to an Annex I habitat listed under the EU Habitats Directive (Annex I Old Sessile Oak Woods with Ilex and Blechnum [91A0]) [50].

Other Artificial Lakes and Ponds (FL8)

A number of artificial ponds were recorded across the ownership boundary, mainly in the central portions of the Ownership Boundary. These waterbodies varied considerably in size and depth, with some appearing shallow and linked to past quarrying activities such as silt settlement. As the quarry ceased operations, the wetlands species recolonised these areas. Some of these ponds in the west of the Site dry out during the summer months. Aquatic vegetation such as bogbean, broadleaved pondweed, horseweed and bulrush were present in these areas. Wetland vegetation in these areas included common rush, water mint, water dock (*Rumex hydrolapathum*). The ponds in the centre of the Ownership Boundary are bordered by grey willow, pussy willow, downy birch and alder trees in areas.

Recolonising Bare Ground (ED3)

Recolonising bare ground was identified primarily within the northeast portion of the Site. This habitat featured a diverse assemblage of early-successional and disturbance-tolerant species such as dandelion (*Taraxacum officinale*), yarrow (*Achillea millefolium*), bird's-foot trefoil, cat's-ear (*Hypochaeris radicata*) and creeping buttercup. These species are typically associated with recently disturbed substrates and nutrient-poor soils.

Shrub species such as gorse, bramble and saplings of grey willow were also present and indicate the early stages of scrub encroachment and vegetation succession. Various grasses, including creeping bent (*Agrostis stolonifera*), cock's-foot (*Dactylis glomerata*), Yorkshire fog (*Holcus lanatus*), sweet vernal grass, red fescue (*Festuca rubra*) and common bent (*Agrostis capillaris*) were recorded throughout the habitat, contributing to a heterogeneous ground cover.

In addition, a range of flowering plants were identified, including ribwort plantain, common daisy (*Bellis perennis*), oxeye daisy, tufted vetch (*Vicia cracca*, mayweed (*Matricaria* spp.), figwort (*Scrophularia* spp.), black medick, birds foot trefoil, purple clover, germander speedwell (*Veronica chamaedrys*), rough hawkbit (*Leontodon hispidus*), colt's-foot (*Tussilago farfara*), foxglove and sheep's-bit (*Jasione montana*). These species reflect the transitional nature of the habitat and its high floristic diversity.

Tree and sapling species observed included downy birch and grey willow, with fuchsia (*Fuchsia magellanica*) also occasionally present. Ferns such as field horsetail were noted in patches of damper ground.

Toward the southern portion of this habitat, a gradual increase in surface gravel was noted, suggesting a transition into a more disturbed ground layer, consistent with artificial surfaces used as access tracks.

Scrub (WS1)

This habitat was recorded in small, scattered patches across the central and southern-middle portions of the Site. These areas were typically found on sloped or slightly elevated ground where soil conditions and disturbance allowed for encroachment by woody vegetation. The scrub was dominated by gorse, bracken, bramble and silver birch with frequent occurrences of grey willow and occasionally eared willow (*Salix aurita*). This habitat often formed a transitional zone between open ground and more established woodland or grassland areas.

Scrub / Immature Woodland (WS1 / WS2)

Scrub and immature woodland were dominant habitats within the northern portion of the Site. These two habitats formed a mosaic of woodland and dense scrub.

The canopy layer included tree species such as sycamore (*Acer pseudoplatanus*), beech, pedunculate oak, rowan (*Sorbus aucuparia*), downy birch and silver birch. These species were generally present as saplings or young trees, reflecting the early development stage of the woodland.

The scrub layer was dominated by species such as grey willow, bramble, gorse, butterfly bush and traveller's joy (*Clematis vitalba*). These species formed dense thickets, suppressing ground flora and preventing the growth of a mature woodland.

Stands of Japanese knotweed (*Reynoutria japonica*) were identified in the eastern-most portion of this habitat, bordering an area of recolonising bare ground.

Grasses were generally sparse but present in open patches and included species recorded in adjacent habitats such as creeping bent, Yorkshire fog, sweet vernal grass and red fescue.

Ruderal and disturbance-tolerant species were also scattered throughout the habitat, including ivy (*Hedera helix*), herb-robert and wild strawberry, indicating anthropogenic influence.

The understorey flora, limited by shading in denser areas, included oxeye daisy, ribwort plantain, dandelion, common polypody and germander speedwell. These species were present in more open zones of the habitat.

Wet Grassland (GS4)

Wet grassland was identified primarily in the central portion of the Site, directly adjacent to a marsh habitat, with small, fragmented patches also present in the eastern section. This habitat was indicated by seasonally waterlogged soils and supported a diverse mix of hydrophilic grasses, sedges and broadleaved herbs.

Grass species recorded included creeping bent, sweet vernal grass, red fescue, common bent and Yorkshire fog, forming a variable but generally dense sward across much of the habitat.

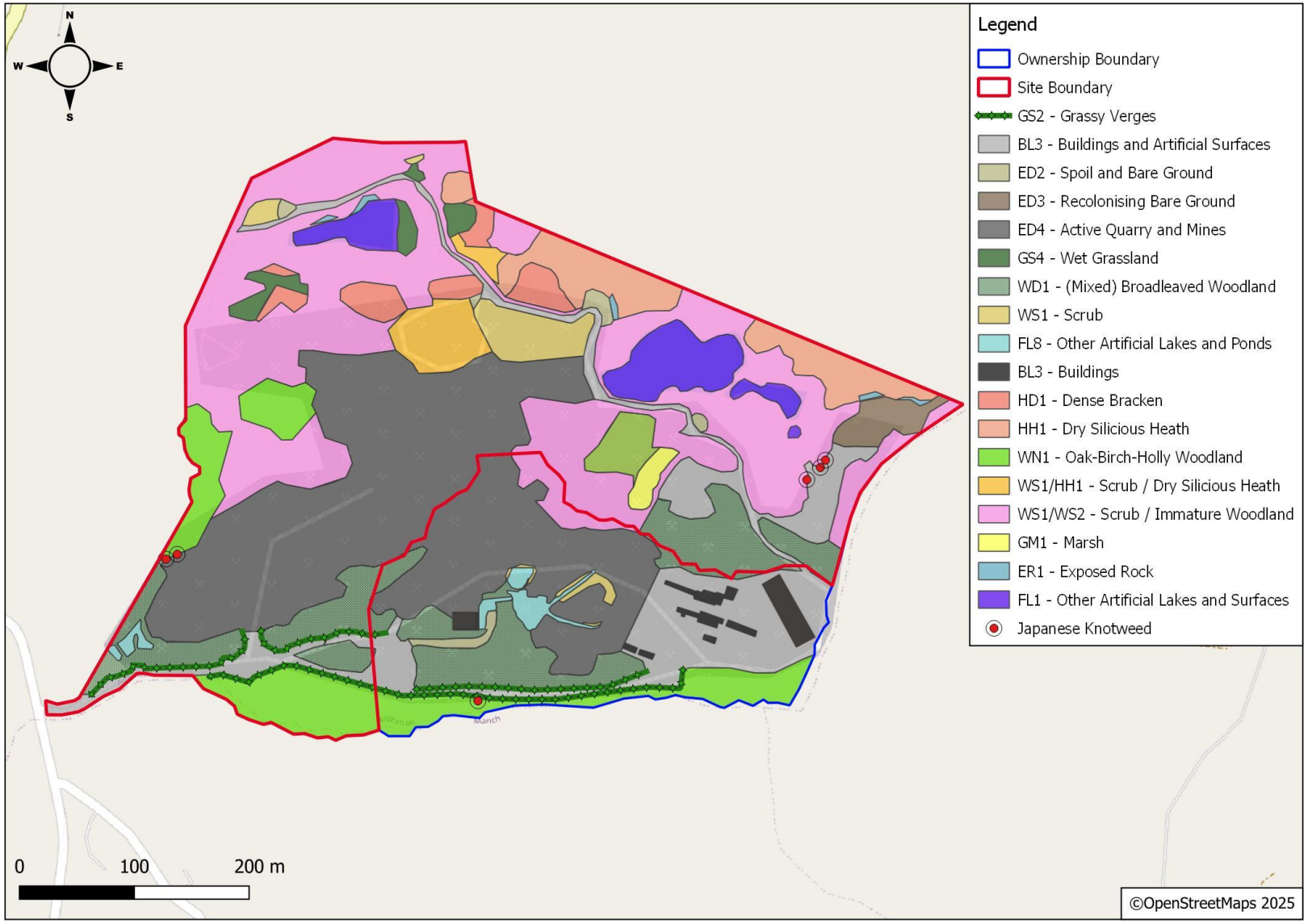
Common rush and sharp-flowered rush (*Juncus acutiflorus*) were dominant in wetter areas and contributed to the habitat's tussocky structure.

Forb species included ribwort plantain, tormentil (*Potentilla erecta*), heath bedstraw (*Galium saxatile*), sow thistle (*Sonchus* spp.) and bull thistle (*Cirsium vulgare*). Notably, a minimum of 29 flowering individuals of Irish marsh orchid were recorded throughout this habitat, significantly enhancing its botanical value and indicating favourable conditions for orchid establishment.

Bramble was observed encroaching in places, particularly at habitat edges where conditions were slightly drier.

Overall, the wet grassland habitats on-site were species-rich, providing valuable connectivity between wetter areas such as marsh and drier grassland and scrub communities elsewhere on-site.

Figure 14.14: Existing Habitat Map



14.3.3 Notable / Protected Species

14.3.3.1 Flora

Flora in the Historic Environment

The NBDC held records of Green Hoar-moss within 2km of the Site in 2014 [31]. This species is protected under the Flora Protection Order 2022. Large White-moss was recorded within 2km of the in 2009 [31]. This species is protected under the EU Habitats Directive Annex V.

Flora in the Existing Environment

No plant species protected under the Flora Protection Order was recorded on-site or within the 2km of the Site in the last 10 years [31]. Irish Marsh Orchids were recorded on-site during the recent surveys. This species is endemic to Ireland and is not protected under the Flora Protection Order.

14.3.3.2 Amphibians

Amphibians in the Historic Environment

The NBDC has records of smooth newt within 2km of the Site in 2013 [31]. The introduction of the waterbodies as seen in the 2001 aerial imagery provided potential foraging, resting and breeding habitat for amphibians.

Amphibians in the Existing Environment

The NBDC did not hold any records of common frog or smooth newt within 2km of the Site in the last 10 years [31].

Amphibians require static or slow-moving water bodies in order to successfully lay their eggs and tend to favour shallow areas where they are less susceptible to being preyed on by fish.

During the initial Site assessment undertaken on 9th January 2023, suitable waterbodies for breeding amphibians were located within the Site. One amphibian survey was conducted on 6th June 2023, with follow-up surveys conducted on 14th April and 6th May 2025. The methodology used and results from these surveys can be found in Appendix 14-1: Amphibian Report.

14.3.3.3 Aquatic Ecology

Aquatics in the Historic Environment

The NBDC held no records for FWPM within 2km of the Site between 1960 to 2014 [31]. The NBDC held records for Brown Trout and Rudd in the year 1965. This is before the period of substitute consent. The Bandon River would have been a suitable habitat for these species. The Site was hydrologically connected to the River Bandon via the boundary stream located along the eastern and southern boundary of the Site.

Aquatics in the Existing Environment

The NBDC held no records for FWPM within 2km of the Site in the last 10 years [31]. The 2023 survey conducted by Sweeney Consultancy found 148 FWPM at the confluence of the boundary stream and the River Bandon. In 2024, 1,008 FWPM were found in the same location. Further details for the

increase in the population at this location are outlined in the FWPM Report attached as Appendix 14-2.

14.3.3.4 Badger

Badger in the Historic Environment

The NBDC held records for badger within 2km of the Site. The oldest record dates back to 2007, with the most recent record held in 2013 [31].

Badger setts are commonly found in deciduous or mixed woodlands, especially when these habitats are adjacent to open ground such as pastures / cropland fields. Therefore, the woodland area may have supported a badger sett.

The area of agricultural grassland with hedgerow / treelines bordering it would have provided suitable landscape connectivity

Based on the aerial imagery from 1995, the woodland would have provided suitable habitats for badgers.

Badger in the Existing Environment

The NBDC held no records for badger within 2km of the Site in the last 10 years [31].

The field surveys did not identify any badger setts within the landholding. However, badger scat was identified within the Site boundary. The areas of woodland on-site could provide suitable commuting habitat for badger. Additionally, the woodland and scrub habitats on-site could provide suitable foraging habitat for badger. The presence of badger scat on-site leaves it reasonable to conclude that badger are utilising the Site for commuting or foraging purposes.

14.3.3.5 Bats

Bats in the Historic Environment

The NBDC held records for Soprano pipistrelle within 2km of the Site in 1999 [31]. The hedgerow / treeline would have provided a linear feature for bats to commute along. This habitat was lost due to quarrying works. The edge of the woodland also provided linear features that could have been used to commute along. This habitat was reduced in size due to the Development. The agricultural grassland and heath provided a suitable foraging habitat for bat species. The introduction of ponds would have attracted insects, providing additional suitable foraging habitat for bats. The addition of access tracks lined with trees provided suitable linear features for foraging and commuting bats.

Bats in the Existing Environment

The NBDC held records of Brown Long-eared Bat and Daubenton's Bat within 2km of the Site in the last 10 years [31].

The following bats were recorded as a result of the dusk emergence / transect surveys:

- Common pipistrelle, soprano pipistrelle, Leisler's bat, brown long-eared bat, and Myotis species were recorded commuting / foraging within or above the Site. The most frequently encountered species of these were soprano pipistrelle and common pipistrelle. These species are relatively widespread and the most commonly encountered species within Ireland;

- Leisler's bat and soprano pipistrelle were recorded soon after dusk during the first survey, indicating that a bat roost for this species is likely to be present within the local area. The survey recorded the majority of the bat commuting and foraging activity over the woodland, scrub and other vegetation in the north of the Site; and,
- No bats were identified to be roosting on site.

Based on the levels of activity and movement of the bats recorded during the surveys, it is considered that the Site is of high local value to foraging / commuting bats.

SM4 results

Common pipistrelle, Leisler's bat, soprano pipistrelle, Myotis species, brown long-eared bat and lesser horseshoe bat were the species recorded across the SM4 deployments on-site. Assuming that the Myotis bat calls were recorded from all three Myotis species found in Ireland (Daubenton's bat, Natterer's bat and whiskered bat), this means that eight of the nine resident Irish bat species found in Ireland were recorded on-site. Nathusius' pipistrelle was the only resident Irish bat species not recorded on-site.

Overall, SM4 #2 in the east of the Survey Area had higher levels of bat activity than SM4 #3 in the west of the Survey Area. However, SM4 #3 had higher species diversity recorded.

Leisler's bat was the most frequently recorded species at SM4 #2, followed by common pipistrelle and soprano pipistrelle. Myotis species were recorded on five out of 14 nights of monitoring, and brown long-eared bat was recorded on three out of 14 nights of monitoring. Lesser horseshoe bat was not recorded at SM4 #2. These results indicate that Leisler's bat, common pipistrelle and soprano pipistrelle are using the woodland in the east of the Survey Area frequently throughout the night for foraging and commuting.

Common pipistrelle was the most frequently recorded species at SM4 #2, followed by soprano pipistrelle, Leisler's bat and Myotis species. Brown long-eared bat was recorded on three out of 14 nights of monitoring, and lesser horseshoe bat was recorded on one night of deployment (31st May 2025). The lower levels of lighting in the west of the Survey Area, where SM4 #3 was installed, make this area within the Survey Area more suitable for light-averse species, including Myotis species, brown long-eared bat and lesser horseshoe bat. However, as lesser horseshoe bat was only recorded on one night of 14 nights of monitoring and only a single pass was recorded, it is unlikely that the Survey Area is a site of importance for lesser horseshoe bat.

Please refer to Appendix 14-3 – Bat Report for full details of the SM4 survey results.

14.3.3.6 Birds

Birds in the Historic Environment

The NBDC held records for a number of protected bird species within 2km of the Site as outlined in Table 14-5 [31]. The woodlands, hedgerow / treelines provided suitable nesting habitat for a variety of bird species. The quarry cliffs created as part of the Development would have provided suitable nesting habitat for peregrine falcon following cessation of works.

Birds in the Existing Environment

The NBDC held records of Kingfisher within 2km of the Site in the last 10 years [31], as outlined in Table 14-6.

During the initial habitat survey on 9th September 2023, the Site was assessed for its potential to provide nesting habitat for breeding birds, to support important assemblages of wintering birds or support rare or notable species.

Following the initial site walkover, it was deemed necessary to undertake wintering and breeding bird surveys and peregrine falcon surveys on-site.

Wintering Birds

Two wintering bird surveys were completed on 16th February 2023 and 21st March 2023. During the wintering bird VP surveys, a total of ten species were recorded:

- Four Green listed BoCCI non-Annex I species– buzzard, grey heron, jay; and, moorhen;
- Six Amber-listed BoCCI, non-Annex I species were recorded – coot, herring gull, mallard, tufted duck, teal and little grebe; and,
- No Red-listed BoCCI species were recorded.

Full details of the wintering bird survey results are provided in the Bird Report attached as Appendix 14-4– Bird Report

Breeding Birds

Breeding bird transect surveys were undertaken within the ownership boundary on 17th May, 7th June, 12th July 2023 and 10th April and 23rd April 2025.

During the 2023 breeding bird surveys, a total of 26 species were recorded:

- 20 Green Listed BoCCI non-Annex I species – blackbird, blackcap, blue tit, bullfinch, chaffinch, chiffchaff, dunnock, goldfinch, great tit, jackdaw, little grebe, moorhen, pied wagtail, redpoll, robin, rook, sedge warbler, song thrush, treecreeper; and wren; and,
- Six Amber Listed BoCCI, non-Annex I species were recorded – goldcrest, house sparrow, swallow, willow warbler, mallard and sand martin.

Of the species recorded, three were classified as 'Confirmed Breeding,' jackdaw, wren, and sand martin. In addition, seven other species were classified as '*Possibly Breeding*' and 16 species were classified as *'Non-breeding'.*

During the 2025 breeding bird surveys, a total of 28 species were recorded:

- 21 Green Listed BoCCI non-Annex I species – blackbird, blackcap, blue tit, chaffinch, chiffchaff, coal tit, dunnock, great tit, hooded crow, jackdaw, jay, little grebe, mistle thrush, peregrine falcon, pheasant, redpoll, robin, rook, song thrush, wood pigeon and wren; and,
- Six Amber Listed BoCCI, non-Annex I species were recorded – goldcrest, mallard, sand martin, swallow, willow warbler, grey wagtail and starling.

No Red-listed species were recorded.

Of the species recorded, four were classified as 'Confirmed Breeding,' blackbird, jackdaw, rook, and sand martin. In addition, 20 other species were classified as 'Possibly Breeding', and four species were classified as 'Non-Breeding'.

Full details on breeding bird survey results are presented in Appendix 14-4 – Bird Report.

Peregrine Falcon

Targeted peregrine falcon surveys were undertaken on 17th May 2023, 6th June 2023, 14th April 2025, and 23rd April 2025 to confirm the presence / absence of peregrine falcon within the vicinity of the Site.

During the 2023 peregrine falcon surveys:

- High levels of peregrine falcon activity were noted within the quarry during the first peregrine falcon survey. A male and female peregrine were identified potentially using a nest in the quarry face; and,
- In the second survey, two peregrine falcon chicks were observed in the nest during the survey. The female peregrine were observed bringing food to the nest and both the male and female were observed feeding the chicks.

During the 2025 peregrine falcon surveys:

- High levels of peregrine and raptor activity were observed during the survey on 10th April 2025. A peregrine was observed incubating on a nest with signs suggesting the possible presence of chicks; and,
- High levels of peregrine activity were observed during the survey on 24th April 2025. Two peregrines were noted utilising the quarry cliff face. No eggs or chicks were observed.

Full details on survey results are presented in Appendix 14-4 – Bird Report.

14.3.3.7 Otter

Otter in the historic environment

The NBDC held no records of otter within 2km of the Site between 1960 and 2014. Otters are known to utilise the River Bandon [51]. Given the hydrological connection between the boundary stream on the southern and eastern boundary of the Site and the River Bandon, the boundary stream had the potential to provide suitable commuting and foraging habitat for otter.

Otter in the existing environment

The NBDC held records of otter within 2km of the Site in the last 10 years [31]. During the Site walkover, no evidence of otter in the form of spraints or holts were identified.

There is potential for otter to utilise the boundary stream for commuting and foraging purposes. Otters are known to travel up to 500m from waterbodies for holt construction. The woodland habitats within the Site have the potential to support otter as they are within 500m of the nearest watercourse.

14.3.4 Other Taxa

Other Species in the Historic Environment

Pine Marten

The NBDC held records of pine marten within 2km of the Site in 2012 [31]. Pine Martens display a preference for woodland habitats, especially conifer trees, to forage and shelter, but have also been recorded in scrub, crags and rocky areas. Pine marten tend to avoid open areas which are devoid of suitable cover. The woodlands on-site are deciduous woodland and would not be preferential for this species. However, the woodland may have supported this species.

Red Squirrel

The NBDC held records for red squirrel within 2km of the Site in 2007 and 2012 [31]. Red squirrels require coniferous or deciduous woodland for drey construction. The woodland on-site would have been considered suitable for drey construction.

Irish Stoat

The NBDC did not hold records for Irish stoat between 1960 and 2014 [31]. The on-site woodland, scrub and rocky areas would have been suitable for commuting and foraging. It is considered that the habitats on-site may have supported this species.

Other Species in the Existing Environment

Pine Marten

There are no recent records of pine marten within 2km of the Site in the last 10 years [31]. As per the historic environment, the remaining woodland has the potential to support this species, but would not be preferential. Pine marten scat was found in the area of wet grassland in the northwest of the Site. It is considered that this species is utilising the northern area of the Site for commuting and foraging purposes.

Red Squirrel

There are no recent records of red squirrel within 2km of the Site in the last 10 years [31]. However, the remaining woodland on-site is considered suitable for drey construction and foraging activities. There was no evidence of red squirrel recorded during recent surveys on the Site.

Irish Stoat

The NBDC held records for Irish stoat within 2km of the Site in 2024 [31].

Irish stoats occur in most habitats with sufficient cover; however, they display a preference for woodland habitats. Stoats tend to avoid open areas that lack suitable cover. The remaining area of woodland on-site has the potential to support Irish stoat.

14.3.5 Overall Biodiversity Evaluation:

14.3.5.1 1990-2014 Period

In view of the above, it is considered that the Site was of high ecological value between 1990-2014. The only habitats lowering the biodiversity value on-site were artificial surfaces and the quarry. The higher value habitats included woodlands, scrubs, heath, wet grassland and artificial lakes.

Habitats of national value were present on-site during this period. The woodland and heath habitats correspond to the following Annex I habitats of the EU Habitats Directive: Old Sessile Oak Woods with Ilex and Blechnum in the British Isles (91A0) and European Dry Heaths (4030) [50]. Given the national importance of these habitats, it can be concluded that the Site was of high biodiversity value.

The internationally significant Bandon River SAC and the nationally significant Bandon Valley South of Dunmanway pNHA are nearby sites that fall within the zone of influence of the Substitute Consent Site from 1990 to 2014.

14.3.5.2 Current Baseline

It is considered that the Site is still of high ecological value in its current state.

The dystrophic lakes support invertebrate and bird species. The scrub and immature woodland provide shelter and support a range of terrestrial mammals. The Irish Marsh Orchid, which is endemic to Ireland, is present throughout the wet grassland and near the artificial ponds on-site. The artificial ponds in the Ownership Boundary of the Site support amphibians, though these areas are not considered part of the Substitute Consent Site boundary. The northern portion of the Site has linear features supporting bat commuting and foraging. The quarry face has had peregrine falcon nests and kestrel nests.

Habitats of national value are still present on-site, though their size has been reduced significantly as part of the Development. The woodland and heath habitats correspond to the following Annex I habitats of the EU Habitats Directive: Old Sessile Oak Woods with Ilex and Blechnum in the British Isles (91A0) and European Dry Heaths (4030) [50]. Given the national importance of these habitats, it can be concluded that the Site is still of high biodiversity value.

14.4 Assessment of Effects

14.4.1 Identification of Potentially Significant Effects on Identified Receptors

Based on the methodology that is set out in Section 14.1.2, Table 14-8 sets out the findings of the evaluation of important and legally protected receptors. Each receptor is assessed and a scoping justification for each receptor is provided for the potential historical effects of the Construction and Operational Phases of the Development combined.

14.4.2 Historical / Current Mitigation

The Applicant has provided the following information regarding mitigation measures that were historically in place during the period for which substitute consent is being sought and are in place as part of the ongoing operations. These measures have been taken into consideration during the assessment of potential effects.

Further details on these are presented below and in the relevant chapters:

- Water Quality Mitigation Measures in Chapter 7: Hydrology and Hydrogeology; and,
- Air Quality Mitigation Measures in Chapter 8: Air Quality

Table 14-8: Valuation of Potential Ecological Receptors

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
Protected Sites					
European Designated Sites	Historic Environment	European Communities (Natural Habitats) Regulations 1997 (as amended) River Bandon SAC (002171) was designated in January 2002 [52].	Internationally designated sites for conservation.	A rNIS has been prepared as part of the substitute consent application, in line with Objective BE 15-2 of the CCDP [45]. As part of the historical quarrying activities at the Site, it was noted that mitigation and management measures were in place to protect the local environment. Most notably in the context of the River Bandon SAC, settlement ponds were constructed to manage surface water at the Site (See Chapter 7) and also air quality mitigation measures (see Chapter 8). Both the rNIS and the rEIAR identified potential effects that could have occurred on the River Bandon SAC; however, the assessments did not identify any significant long-term negative effects that had occurred as a result of the quarry activities. The rNIS and rEIAR assessments concluded that given the implementation of these mitigation measures as part of the historical quarrying activities, the Development did not, either alone or in combination with other plans or projects, adversely affect the integrity or conservation status of any of the qualifying interests of the Bandon River SAC and or any other European site in light of best scientific knowledge and that progression to Stage 3 of the Appropriate Assessment process (i.e., Assessment of Alternative Solutions) was not considered necessary. It should also be noted that the Bandon River SAC was designated as a European site in 2002, post commencement of quarrying activities.	European Designated sites in the historic environment have been scoped in for further consideration. Refer to rNIS submitted as part of planning for full details.

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
				For full details on the assessment of effects to European Designated sites, refer to the rNIS submitted as part of planning.	
	Existing Environment	European Communities (Natural Habitats) Regulations 1997 (as amended)	Internationally designated sites for conservation	As outlined above, a rNIS was prepared as part of the substitute consent application. The rNIS concluded that with the implementation of the mitigation measures, the Development did not, either alone or in combination with other plans or projects, adversely affect the integrity or conservation status of any of the qualifying interests of the Bandon River SAC. Therefore, the Development did not have any long-term effects on the Bandon River SAC. However, this was due to the implementation of mitigation measures. The remedial works will involve water quality mitigation measures outlined in Chapter 7. Therefore, this receptor has been scoped in for further consideration.	European Designated sites in the existing environment have been scoped in for further consideration
Nationally Designated Sites	Historic Environment	pNHA's were published on a non-stautory basis in 1995 [27]. Wildlife Act 1976	Nationally designated sites for conservation.	There are no NHAs within 5km of the Site; however, there is one pNHA. This site was included in this assessment in line with Objective BE 15-2 of the CCDP [45]. There is a hydrological connection between the Site and the Bandon Valley South of Dunmanway pNHA. However, as part of the historical quarrying activities at the Site, it was noted that mitigation and management measures were in place to protect the local environment. Most notably in the context of the Bandon Valley South of Dunmanway pNHA, settlement ponds were constructed to manage surface water at the Site. The rEIAR identified potential effects that could have occurred on the Bandon Valley South of Dunmanway pNHA; however, the assessments did not identify any significant long-term negative effects that had occurred as a result of the quarry activities.	NHA's & pNHA's have been scoped out for further consideration.

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
				The rEIAR assessments concluded that, given the implementation of these mitigation measures as part of the historical quarrying activities, the Development did not, either alone or in combination with other plans or projects, adversely affect the integrity or conservation status of any of the Bandon Valley South of Dunmanway pNHA or any other pNHA in light of best scientific knowledge. It should also be noted that the Bandon Valley South of Dunmanway was designated as pNHA in 1995, post commencement of quarrying activities. Given that no adverse effects have been identified on NHA's and pNHA's, this receptor has been scoped out from further consideration.	
	Existing Environment	Wildlife Act 2000 (as amended)		The period of substitute consent covers the years 1990-2014. There are no long-term effects on water quality associated with the Development. Therefore, this receptor has been scoped out from further consideration.	Natural Heritage Areas in the existing environment have been scoped out from further consideration.
Habitats					
Active Quarries and Mines (ED4)	Historic Environment	N/A	Moderate Local Value	It is understood that quarry operations began prior to the 1960s. An assessment of available aerial imagery was undertaken for the years 1995, 2000, 2005 and 2014. The aerial imagery provides	Active Quarries and Mines has been scoped

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
				evidence of the quarry's progressive expansion over time, with corresponding loss and replacement of natural habitats. The quarrying works ceased in 2014. This habitat is not considered to be of significant ecological value and has been scoped out from further consideration in terms of potential historical effects.	out from further consideration.
	Existing Environment	N/A	Moderate Local Value	The quarrying works ceased in 2014, and this habitat still covers 5.2ha of the Site. The 2025 field survey confirmed that this remained the dominant habitat within the Site. This habitat is not considered to be of significant biodiversity value, and this habitat will not be retained as part of the remediation plan. Quarries are, however, known to support peregrine falcon, and peregrine falcon have been confirmed using the quarry in recent years. The presence of this species is considered further below.	Active Quarries and Mines has been scoped out from further consideration.
Agricultural Grassland (GA1)	Historic Environment	N/A	Low Local Value	The 1995 aerial imagery shows that this habitat was present in the southwest of the Site, south of the woodland. Before 2000, these fields were fully quarried, resulting in their reclassification to Active Quarries and Mines. It is not known if these fields were used for pasture or crops. Agricultural grassland is considered to be of low ecological value. It is not considered that the loss of this habitat would be significant in terms of ecology, and therefore, this receptor has been scoped from further consideration.	Agricultural grassland in the historic environment has been scoped out from further consideration.
	Existing Environment	N/A	Low Local Value	This habitat was not identified on-site in the 2025 survey. Therefore, it has been scoped out from further consideration.	Agricultural grassland in the existing

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
					environment has been scoped out from further consideration.
Buildings and artificial surfaces (BL1)	Historic Environment	N/A	Low Local Value	Between the years of 2005 and 2014, internal access tracks were developed in the northern portion of the Site. These access tracks extended into the area of scrub and immature woodland. This would have resulted in the loss of these habitats. This habitat is considered to be of low ecological value and is therefore scoped out from further consideration.	Buildings and artificial surfaces has been scoped out from further consideration.
	Existing Environment	N/A	Low Local Value	This habitat is still present in the northern portion of the Site. These habitats will not be affected by the proposed remediation works and have been scoped out from further consideration.	Buildings and artificial surfaces has been scoped out from further consideration.
Bare Ground (ED2)	Historic Environment	N/A	N/A	Based on aerial imagery, this habitat was not present on-site during the period of substitute consent.	Bare Ground has been scoped out from further consideration
	Existing Environment	N/A	Low Local Value	Small sections of this habitat are present throughout the Site. These habitats are not considered to be of ecological value. Therefore, this habitat has been scoped out from further consideration.	Bare Ground has been scoped out

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
					from further consideration
Dense Bracken (HD1)	Historic Environment	N/A	Low Local Value	It is not known from the assessment of historic aerial imagery if this habitat was present on-site or its distribution on the Site during the period for which substitute consent is sought. This habitat is relatively common within the local environment, and it is considered likely that this would have been the case during the substitute consent period. This habitat is known to provide suitable habitat for nesting birds (please see birds below) as well as a range of invertebrate species. Should this habitat have been present on the Site, the historical loss is not considered significant in the local context, given the likely abundance of this habitat within the surrounding area. This receptor has been scoped out from further consideration.	Dense Bracken has been scoped out from further consideration in the historic environment
	Existing Environment	N/A	Low Local Value	The habitat survey identified this habitat with the northern portion of the Site. This habitat provides shelter for species and supports a range of invertebrate species. It should, however, be noted that the ecological value of this habitat is highly context-dependent. Bracken is known to displace other valuable habitats like heathlands, and it is considered likely that this habitat has become more dominant at the Site over time as the bracken outcompetes the heathland plant species. The remediation plan will not have an effect on this habitat and has therefore been scoped out from further consideration.	Dense Bracken has been scoped out from further consideration in the existing environment

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
Dry Silicious Heath (HH1)	Historic Environment	European Communities (Natural Habitats) Regulations 1997 (as amended) was transposed into Irish law in 1997	National Importance	Based on the historic aerial imagery of the Site, it is presumed that this habitat was present in the northern section of the Site. This habitat corresponds to European Dry Heaths (4030), which is designated under Annex I of the EU Habitats Directive [50]. The dry siliceous heath mainly occurs on rocky outcrops in the northern section of the Site; this habitat was largely avoided during the construction of access tracks, artificial lakes, and settlement ponds to the north of the Site. Based on the Site surveys and a review of desktop information, it is considered that quarry infrastructure was developed in the natural depressions, which avoided the heath and which made it easier to create holding ponds and build access / haul tracks. As a result, the Dry Siliceous Heath (HH1) in this area has remained mostly undisturbed. Based on the aerial images, it appears that quarrying activities have extended into the heathland, with some deposited material also spilling over into this habitat. This resulted in the gradual loss of a significant portion of this habitat type over time. It should, however, be noted that the exact distribution of this habitat across the Site is unknown prior to 1990, and it is difficult to quantify the exact amount of habitat that has been affected. However, given the value of this Annex 1 habitat, it is considered that the loss would be a significant negative effect on the environment. Therefore, this habitat has been scoped in for further consideration.	Dry Silicious Heath has been scoped in for further consideration
	Existing Environment	European Communities (Natural Habitats)	National Importance	This habitat is present in the northern sections of the Site. This habitat corresponds to European Dry Heaths (4030), which is designated under Annex I of the EU Habitats Directive [50].	Dry Silicious Heath has been scoped

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
		Regulations 1997 (as amended)		The areas of heath on site are smaller in size than those in the historic aerial imagery. Heathlands provide habitats for rare and threatened plants, animals and insects. This habitat is at risk of encroachment from the immature woodland and scrub on-site. As part of the on-site remediation plan, this habitat will be protected and remain undisturbed. Fencing and signage will be installed on the ground surrounding the heath. Areas of heath in the northeast of the Site are proposed to be manage to expand the habitat.	in for further consideration
Dystrophic Lake (FL1)	Historic Environment	N/A	Moderate Local Value	These habitats were not present on-site in the 1995 or 2000 aerial imagery. A waterbody is present in the northeast of the Site in the 2005 aerial imagery. The remaining on-site waterbodies were present in the 2014 aerial imagery. This habitat was introduced as part of the Development and has therefore been scoped out from further consideration in the historic environment.	Dystrophic Lake has been scoped out from further consideration in the historic environment
	Existing Environment	N/A	High Local Value	These hydrological features were not present historically but have developed in the last 15 to 20 years. Based on a review of desktop information, it is presumed that these lakes were formed as surface water became trapped in shallow depressions with the development of the internal quarry access / haul track network and silt ponds down gradient of these areas. These lakes have evolved into a more natural setting with the growth of aquatic vegetation over time. These lakes are considered to be of high ecological value based on the aquatic vegetation and support of bird and invertebrate species. These ponds are proposed to be retained as part of the on-site	Dystrophic Lake has been scoped out from further consideration in the existing environment

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
				remediation plan and are therefore scoped out for further consideration.	
Exposed Rock (ER1)	Historic Environment	N/A	High Local Value	It is presumed that this habitat was present on-site throughout the period of substitute consent. This habitat is present in the existing Oak-Birch-Holly woodland and near sections of heath. The distribution of this habitat during the period of substitute consent is not known; however, it is presumed that the extent of this habitat was larger prior to the Development. Therefore, this habitat has been scoped in for further consideration in the historic environment as it was most likely effected by the Development.	Exposed Rock has been scoped in for further consideration in the historic environment
	Existing Environment	N/A	High Local Value	This habitat supports a range of species. St. Patrick's cabbage is native to Ireland and present in this habitat. This habitat will be retained as part of the remediation plan and is therefore scoped out from further consideration.	Exposed Rock has been scoped out from further consideration in the historic environment
Grassy Verges (GS2)	Historic Environment	N/A	High Local Value	It is not known from the aerial imagery if this habitat was present on-site. However, based on the aerial imagery from 1995 – 2014, the internal road was present. This habitat is on the edge of the internal road and is most likely present during the period of substitute consent. It is not likely that the Development would have affected this habitat and therefore has been scoped out from further consideration.	Grassy Verges have been scoped out from further consideration

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
	Existing Environment	N/A	High Local Value	This habitat is present along the roadway to the Macadam plant in the south of the Site. This habitat supports a range of floral species associated with pollinators and is considered to be of high ecological value. This habitat will not be affected by remedial works and therefore has been scoped out from further consideration.	Grassy Verges have been scoped out from further consideration
Marsh (GM1)	Historic Environment	N/A	High Local Value	This habitat was not present in the 1995 or 2000 aerial imagery. The aerial imagery in 2005 and 2014 presents an image of a pond in the area where the marsh currently is. It is presumed that this pond dried up and marsh habitat formed. It is considered that this pond would have been of high ecological value and may have supported amphibians. This habitat was introduced as part of the Development and has therefore been scoped out from further consideration.	Marsh has been scoped out from further consideration in the historic environment
	Existing Environment	N/A	High Local Value	This habitat is located to the south of the access tracks, adjacent to a clearing composed of artificial surfaces in the east of the Site. Previous surveys on-site identified Irish Marsh Orchid in this habitat. However, they were not present in the most recent habitat survey. However, there is potential for this orchid to grow in this habitat. This habitat is considered to be of high ecological value. The remediation plan will not effect this habitat, and therefore it has been scoped out from further consideration.	Marsh has been scoped out from further consideration in the existing environment
Oak-Birch-Holly Woodland (WN1)	Historic Environment	European Communities (Natural Habitats) Regulations 1997 (as	National Importance	The historic aerial imagery shows the reduction of this habitat over time as the area of the quarry increased. This woodland is a remnant of the original Clashnagallagh Wood, which dates back to the late 19th and early 20th century. This habitat corresponds to the Annex I habitat of the EU Habitats Directive: 91A0 Old sessile oak woods with Ilex and Blechnum in the	Oak-Birch-Holly Woodland has been scoped in for further

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
		amended) was transposed into Irish law in 1997		British Isles [50]. This habitat was of high ecological value and of national value. The Development had a significant negative permanent loss of this habitat and is therefore scoped in for further consideration.	consideration in the historic environment
	Existing Environment	European Communities (Natural Habitats) Regulations 1997 (as amended)	National Importance	The quarrying works reduced the size of this habitat significantly. This habitat is still present on-site, located south of the entrance and roadway, as well as in the northeast corner of the quarry. This habitat is of national importance. As part of the remediation plan, this habitat will be protected, and areas surrounding it in the west of the Site will be allowed to undergo self-remediation as a bridge between the woodland. Therefore, this habitat has been scoped in for further consideration.	Oak-Birch-Holly Woodland has been scoped in for further consideration
Other Artificial Lakes and Ponds (FL8)	Historic Environment	N/A	High Local Value	These habitats were not visible in the 1995 or 2000 historic aerial imagery. The aerial imagery from 2005 shows two waterbodies in the northeast of the Site. The northern waterbody turned into a Dystrophic lake as outlined in the table above. The southern waterbody turned into a marsh habitat, but presents as a waterbody in the aerial imagery. This habitat is considered to be of high ecological value. These habitats were created as part of the Development and are therefore screened out from further consideration.	Other Artificial Lakes and Ponds has been scoped out from further consideration
	Existing Environment	N/A	High Local Value	The waterbody in the southwest of the Site is proposed to be turned into a wet woodland area with appropriate planting. The other waterbodies on-site will be retained, though they are not part of the substitute consent boundary.	Other Artificial Lakes and Ponds has been scoped in for further consideration

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
Recolonising Bare Ground (ED3)	Historic Environment	N/A	Low Local Value	Based on aerial imagery, this habitat was not present during the period of substitute consent. It did, however, form from the access track and clearing in the eastern section of the Site. This clearing appears on aerial imagery from 2005 and is present in 2014. This habitat was formed as part of the Development and has therefore been scoped out from further consideration.	Recolonising Bare Ground has been scoped out from further consideration
	Existing Environment	N/A	Low Local Value	This habitat was present in the habitat survey in 2025 and covers a small section of the Site in the northeast corner. It was identified in the northern part of the clearing. This receptor has been scoped from further consideration, given its low ecological value and small size on-site.	Recolonising Bare Ground has been scoped out from further consideration
Scrub (WS1)	Historic Environment	N/A	High Local Value	It is difficult to ascertain the distribution of this habitat on-site from the aerial images. This habitat was most likely formed and present on-site in the 2014 aerial imagery when the access tracks in the north were present. It has the potential to support protected and notable species and is considered to be of ecological value. Should this habitat have been present on the Site, the historical loss is not considered significant in the local context, given the likely abundance of this habitat within the surrounding area. This receptor has been scoped in for further consideration	Scrub has been scoped in for further consideration
	Existing Environment	N/A	High Local Value	Scrub habitat is present in the northern sections of the Site. This habitat has the potential to support protected / notable species, such as nesting birds. This receptor will not be altered as part of the remediation plan and is therefore scoped out from further consideration.	Scrub has been scoped out from further consideration

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
Scrub / Dry Heath (WS1 / HH1)	Historic Environment	N/A	High Local Value	The exact distribution of this habitat is not known based on the aerial imagery. If it was on-site, it is considered that the encroachment of scrub would have been smaller in size and the dry heath would have been in better condition. Given the importance of dry heath, this habitat mosaic has been scoped in for further consideration.	Scrub / Dry Heath has been scoped in for further consideration
	Existing Environment	N/A	High Local Value	Scrub invasion into the areas of heath is evident in the northern section of the Site. This habitat no longer conforms to the Annex I habitat due to the invasion of the scrub. However, it is still of high ecological value due to its potential to support protected species. This habitat will not be altered as part of the remediation plan and is therefore scoped out from further consideration.	Scrub / Dry Heath has been scoped out from further consideration
Scrub / Immature Woodland (WS1 / WS2)	Historic Environment	N/A	Moderate Local Value	The aerial imagery of the Site shows that this habitat started to establish between 2005 and 2014. It is not known if this was due to the works carried out on-site as part of the Development.	Scrub / Immature Woodland has been scoped out from further consideration
	Existing Environment	N/A	Moderate Local Value	The majority of the northern section of the Site is comprised of this habitat. This habitat supports protected and notable species. As part of the remediation plan, it is proposed to allow this habitat to regenerate as a woodland. This habitat supports protected species; however, it will not be altered as part of the remediation plan and is therefore scoped out from further consideration.	Scrub / Immature Woodland has been scoped out from further consideration

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
Wet Grassland (GS4)	Historic Environment	N/A	N/A	This habitat was established due to the Development. Surface water ponds were made for quarrying works and have since dried up and recolonised with wetland vegetation. Therefore, this habitat has been scoped out from further consideration.	Wet Grassland has been scoped out for further consideration associated with the historic environment
	Existing Environment	N/A	High Local Value	This is an important habitat present on-site. A section of this habitat south of the settlement pond int east of Site had 29 Irish Marsh Orchids which are endemic to Ireland. This habitat or these orchids would most likely not be present on-site if not for the Development. The northwest sections of this habitat are to be retained as part of the remediation plan on-site.	Wet Grassland has been scoped out from further consideration
Hedgerows / Treelines (WL1 / WL2)	Historic Environment	Wildlife Act 1976	High Local Value	The assessment of historic aerial imagery from 1995 indicated that hedgerow/ treelines formed the field boundaries of two small fields in the southwest of the Site. The section of hedgerow / treelines was subsequently removed and replaced by the quarry in the aerial imagery from 2000. This habitat was considered to be of high local value as it provided habitat connectivity to the surrounding areas and was removed as part of the Development. Therefore, this receptor has been scoped in for further consideration.	Hedgerow / treelines have been scoped in for further consideration.

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
	Existing Environment	Wildlife Act 2000 (as amended)	N/A	This habitat is not present on-site. Therefore, it can be scoped out from further consideration.	Hedgerow / treelines have been scoped out from further consideration.
Flora and Fauna					
Protected Flora	Historic Environment	Flora (Protection) Order 1987	High Local Value	A review of historical data from the NBDC held records of Green Hoar-moss and Large White-moss within 2km of the Site in the historic records. Green Hoar Moss was protected under the Flora Protection Order during this period. Large White Moss is protected under the EU Habitats Directive Annex V, which was transposed into Irish law in 1997. Given the historic record of these floral species, protected flora has been scoped in for further consideration.	Flora have been scoped in for further consideration in the historic environment
	Existing Environment	Flora (Protection) Order 2022 (S.I. No. 235/2022)	High Local Value	The desk-based assessment and the 2025 habitat survey did not identify any protected flora species on the Site. However, Irish Marsh Orchid were identified in the wet grassland on-site. This orchid is endemic to Ireland. This habitat will not be altered as part of the remediation plan, and it is therefore scoped out from further consideration.	Flora have been scoped out from further consideration in the existing environment
Amphibians	Historic Environment	Wildlife Act 1967 EU Habitats Directive Annex V was transposed	Low Local Value	Smooth newts were recorded within 2km of the Site in 2013 [31]. Based on the aerial imagery on-site, there were no waterbodies on-site suitable for amphibians. However, the historic habitats on-site may have been used during the terrestrial life stage of amphibians. The Development introduced the waterbodies on-site, which have the potential to be used by amphibians.	Amphibians have been scoped in for further consideration

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
		into Irish law in 1997			
	Existing Environment	Wildlife Act 2000 (as amended) EU Habitats Directive Annex V	High Local Value	Amphibian surveys were undertaken in 2023 and 2025. Smooth newt and common frog were identified within the ownership boundary. The majority of the amphibians were outside the substitute consent boundary. No amphibians were identified in the large ponds in the northern section of the Site. Smooth newt and tadpoles were recorded in pools of water on the access tracks in the northwest of the Site. The addition of waterbodies as part of the Development increased the likelihood of amphibians using the Site. Monitoring and enhancement measures are proposed for amphibians. Therefore, they have been scoped in for further consideration. See Appendix 14-1 – Amphibian Report for full survey results.	Amphibians have been scoped in for further consideration
Aquatic Species	Historic Environment	Freshwater Pearl Mussel Habitats Directive Annex II, Annex IV was transposed into Irish law in 1997 Wildlife Act (1976)	Low Local Value	The NBDC held no records for FWPM within 2km of the Site in the period of substitute consent [31]. The NBDC held records for Brown Trout and Rudd in the year 1965. This is before the period of substitute consent. FWPM were recorded in close proximity to the Site in the existing environment. Given that FWPM have a long lifespan, it is considered that they would have been present in the vicinity of the Site during the period of substitute consent. It is considered that the Development could have effected these species by way of water quality impairment if the boundary stream connecting the Site to the Bandon River was polluted. Therefore, aquatic species have been scoped in for further consideration.	Aquatic Species have been scoped in for further consideration
	Existing Environment	Freshwater Pearl Mussel	Low Local Value	FWPM are very sensitive to water quality and any effects on water quality could have adversely affected this species.	Aquatic Species have

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
		Habitats Directive Annex II, Annex IV Wildlife Act 2000 (as amended)		This species has been known to occur within the vicinity of the Site and the FWPM survey conducted in 2024 found 1,008 FWPM in the River Bandon downstream of where the boundary stream discharges into the river. See Appendix 14-2 Aquatics Report for full survey results. Given that the Site falls within the catchment area for this species and the recording of them ca. 375m downstream from the Site, the Development had the potential to negatively effect them during the construction and operational phases. Water quality mitigation measures are proposed for the remedial works and are outlined in Chapter 7. Therefore, this receptor has been screened in for further consideration.	been scoped in for further consideration
Badgers	Historic Environment	Wildlife Act 1976	High Local Value	The habitats present on-site in 1990 had the potential to support sett construction and commuting / foraging activity. The loss of the woodland on-site could have affected badgers by reducing habitat and foraging availability. The quarry is of little to no ecological value for badger and such the historic habitats were of higher value for this species. Due to the loss of suitable habitat for badger, this receptor has therefore been scoped in for further consideration.	Badgers have been scoped in for further consideration.
	Existing Environment	Wildlife Act 2000 (as amended	High Local Value	A potential badger sett was identified in the southwest of the Site. The woodland on-site is suitable for sett construction. Additionally, the immature woodland and scrub habitat are suitable for foraging and commuting badger. Evidence of badger has been found on site in the form of scat.	Badgers have been scoped out from further consideration.

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
				Therefore, this species has been scoped in for further consideration. The areas of immature woodland are proposed to be allowed to regenerate as woodland as part of the on-site remediation plan. This would provide further suitable habitat for badger. The remediation plan will have no negative effect on badgers and thus, they have been scoped out from further consideration.	
Bats	Historic Environment	Wildlife Act 1976 EU Habitats Directive Annex IV was transposed into Irish law in 1997	High Local Value	The NBDC held records for Soprano Pipistrelle during the period of substitute consent [31]. The loss of woodland and linear features such as hedgerow / treeline and edge of the woodland, loss of foraging habitat such a heath and scrub could have affected roosting, commuting and foraging bats and reduced overall bat activity levels. Given the potential effect on bats in the historic environment, this receptor has been scoped in for further consideration.	Bats have been scoped in for further consideration.
	Existing Environment	Wildlife Act 2000 (as amended) EU Habitats Directive Annex IV	High Local Value EU Habitats Directive Annex IV	No trees or buildings suitable for roosting bats were identified within the Site or wider landholding. The Site was deemed to be of high local value for foraging and commuting bats following the bat surveys undertaken in 2023, 2024 and 2025 on the Site. The remediation plan will retain features that are being used by foraging and commuting. In addition, artificial bat roosts will be provided for bats as part of the remediation works. Therefore, bats have been scoped out for further consideration. See Appendix 14-3 – Bat Report for full survey results.	Bats have been scoped out for further consideration
Birds	Historic Environment	Nesting Birds	High Local Value	The NBDC held records for a number of notable / protected bird species within 2km of the Site in the historic records [31]. These	Birds have been scoped

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
		Wildlife Act 1967		records pan from to 1964 to 2014 and include passerines, wildfowl, waders and raptors. A review of I-WeBS data was examined as part of the assessment. The I-WeBS data for wintering seasons between 1994/1995 to 2019/2020 for Ballynacarriga Lake, Mahona Lough and Garranes Lake was provided. During the period of substitute consent, no bird species were recorded at numbers of national or international importance. These sites are not immediately surrounding the Site. Historically, there was no large waterbody on the Site, and the Dystrophic lake was created during the 1990-2014 quarrying activities. It is not considered that the lake would have been of limited value for birds during its initial creation and when it was being actively used to manage surface water. However, it is considered that the creation of this lake would have been beneficial for wetland bird species. The hedgerow / treelines and woodland on-site most likely supported breeding birds. They were removed as part of the Development and therefore decreased the availability of suitable habitats for birds that were using the Site. It is considered that due to the high mobility of these species, they would have moved away from the disturbances caused by the Development. However, it is not known if the removal of habitat occurred during the breeding bird season. If it did, then eggs, chicks and fledglings may not have gotten the opportunity to move away from the disturbance. Given the loss of suitable foraging and nesting habitat, birds have been scoped in for further consideration.	in for further consideration

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
	Existing Environment	Nesting Birds Wildlife Act 2000 (as amended) Peregrine Falcon EU Habitats Directive Annex I Birds Species	High Local Value	Wintering Birds The I-WeBS data found that Coot were recorded at numbers of international importance in the 2019/20 in Ballynacarriga Lake. Ballynacarriga Lake is located ca. 6.1km southeast of the Site. During the winter bird surveys, a total of ten bird species were recorded during the surveys. No species were recorded during the surveys in numbers that would be considered of national or international importance. The Site is not considered to be of importance for wintering bird species. Breeding Birds During the 2023 breeding bird surveys, a total of 27 bird species were identified on-site during the breeding season. During the 2025 breeding bird surveys, a total of 28 bird species were identified on-site during the breeding season. The woodlands and cliff faces are noted for being important to breeding bird species. The Site is considered to be of importance for breeding birds. Therefore, they have been scoped in for further consideration. The areas of scrub and on-site immature woodland are to be allowed to regenerate as woodland as part of the remediation plan. This will provide further suitable habitat for breeding birds. As part of the remediation, on Site works will be required, and therefore nesting birds have been screened in for further consideration. Peregrine Falcon High levels of peregrine falcon activity have been recorded within the Site and wider landholding during surveys undertaken since 2023.	Birds have been scoped in for further consideration

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
				Peregrine falcon nests with chicks have been identified during these surveys. It is considered highly likely that peregrine falcon are utilising the Site and wider landholding for nesting and foraging purposes. If not for the Development, the Site would not be suitable for peregrine falcon. The quarry floor is to be retained as part of the remediation plan on-site, preserving the suitable nesting habitat for this species. As part of the remediation, on Site works will be required, and therefore Peregrine falcon have been screened in for further consideration. See Appendix 14-4 – Bird Report for full survey results.	
Otter	Historic Environment	Wildlife Act 1967	High Local Value	The boundary stream on-site is connected the Bandon River SAC which is known to support otter. It is possible that otter could have foraged and commuted upstream to the Site via the boundary stream. The adjacent woodland could have been suitable for holt construction. Portions of this habitat were removed as part of the Development. Therefore, this receptor has been scoped in for further consideration. Additionally, it is not considered that the waterbodies on-site would have been suitable for otter, given the presence of the expanding quarry and artificial surfaces were between the boundary stream and the waterbodies.	Otter have been scoped in for further consideration.
	Existing Environment	Wildlife Act 2000 (as amended)	Low Local Value	Otters are known to travel up to 500m from waterbodies for holt construction. The nearest surface waterbody was identified along the southern Site boundary. The woodland and scrub habitats within the Site have the potential to support otter as they are within 500m of the nearest river. In addition, the on-site waterbodies created as part of	Otter have been scoped out from further consideration.

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
				the 1090-2014 quarry activities are also considered to provide suitable foraging habitat for otters. The remediation plan will not alter the boundary stream, waterbodies or any of the woodland on-site. Therefore, otter have been scoped out from further consideration.	
Invasive	Historic Environment	Invasive Species under Regulation S.I. 477 (Ireland)	Species dependent	The NBDC held records for Japanese Knotweed and Jenkins' Spire Snail within 2km of the Site in the historic records [31]. The record for Japanese Knotweed was in 2014 and Jenkins' Spire Snail in 1960. It is considered likely that the Development caused the introduction of invasive species on site. Activities such as stockpiling and movement of spoil throughout the Site could have resulted in the spread of invasive species throughout the Site. Therefore, invasive species have been scoped in for further consideration.	Invasive species have been scoped in for further consideration.
	Existing Environment	Invasive Species under Regulation S.I. 477 (Ireland)	Species dependent	Two high-impact invasive 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 – Japanese knotweed and rhododendron. Additionally, three medium impact invasive species – sycamore, butterfly bush and traveller's joy –were also identified on site during the surveys. These species are not currently regulated in Ireland. It is possible that the Development caused the spread of on-site invasive species. A Japanese Knotweed Management Plan will be implemented as part of the remedial works and is located in Appendix 14-6 Therefore, this receptor has been scoped in for further consideration.	Invasive species have been scoped in for further consideration.

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
Other fauna	Historic Environment	Wildlife Act 1967	High Local Value	<u>Pine Marten</u> The NBDC held records of pine marten within 2km of the Site in 2012 [31]. It is considered that pine marten may have utilised the woodlands on-site. <u>Red Squirrel</u> The NBDC held records for red squirrel within 2km of the Site in 2007 and 2012 [31]. The woodlands on-site are considered to be suitable for drey construction. <u>Irish Stoat</u> The NBDC held no records for Irish Stoat during the historic period [31]. However, it is possible that stoat may have used the woodland and scrub habitats on-site. It is considered that the Development would have reduced the available habitat for these species. The quarrying activity could have caused noise disturbance to species utilising areas close to the Site.	Other fauna has been scoped in for further consideration.
	Existing Environment	Wildlife Act 2000 (as amended)	Moderate Local Value	<u>Pine Marten</u> Pine Marten scat was identified in the wet grassland in the northwest of the Site during the most recent habitat survey. <u>Red Squirrel</u> The woodland to the east of the Site provides suitable habitats for red squirrel, including habitat suitable for drey construction, foraging and commuting. There were no red squirrel dreys identified on-site. <u>Irish Stoat</u>	Other fauna has been scoped out from further consideration.

Potential Biodiversity Receptor	Environment	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
				The NBDC held records for Irish Stoat within 2km of the Site [31]. The on-site habitats are not the preferred type of woodland for this species. However, it is possible they may utilise the woodland areas of the Site. The remediation plan will retain the on-site habitats that are suitable for these species. Therefore, other species have been scoped out for further consideration.	

14.4.3 Summary of Potential Effects

Following a detailed assessment, the following receptors were identified as significant and brought forward for further consideration due to Potential Historical Effects and effects associated with the remedial works.

Table 14-9: Summary of Potential Effects

Receptor	Potential Historical Effect	Potential Remediation Effects
European Designated Sites	Water Quality Impairment	
Nationally Designated Sites	Water Quality Impairment	
Habitats		
Active Quarries and Mines (ED4)	Created as part of the works between 1990-2014	
Agricultural Grassland (GA1)		
Buildings and artificial surfaces (BL1)		
Bare Ground (ED2)		
Dense Bracken (HD1)		
Dry Silicious Heath (HH1)	Habitat Loss	
Dystrophic Lake (FL1)	Created as part of the works between 1990-2014	
Exposed Rock (ER1)	Habitat Loss	
Grassy Verges (GS2)		
Marsh (GM1)		
Oak-Birch- Holly Woodand (WN1)	Habitat Loss	Woodland habitat to be allowed to regenerate
Other Artificial Lakes and ponds (FL8)	Created as part of the works between 1990-2014	
Recolonising Bare Ground (ED3)	Created as part of the works between 1990-2014	
Scrub (WS1)	Habitat Loss	
Scrub / Dry Silicious Heath (WS1 / HH1)	Habitat Loss	
Scrub / Immature Woodland (WS1 / WS2)	Habitat Loss	Habitat to be allowed to regenerate to woodland
Wet Grassland (GS4)		
Hedgerow / Tree line (WL1 / WL2)	Habitat Loss	
Flora and Fauna		
Protected Flora	Habitat Loss	
Amphibians	Habitat Loss	Disturbance during the enhancement works. Habitat enhancement works and monitoring.
Aquatic Species	Water Quality Impairment	
Badgers	Habitat Loss	
Bats	Habitat Loss	Creation of artificial bat roosts
Birds	Habitat Loss	Disturbance to breeding birds during the enhancement works.

Receptor	Potential Historical Effect	Potential Remediation Effects
		Retention of Peregrine nesting location and habitat enhancement works that will provide suitable habitat for nesting birds.
Otter	Habitat Loss	
Invasive	Spread of invasive species	Invasive species management plan to remediate the Site.
Other Fauna	Habitat Loss	

The ecological receptors shaded in green in Table 14-10 were screened out from further assessment as the potential effects were not considered to be significant; refer to Table 14-9 for further details.

14.4.4 Do-nothing Scenario

In the "do-nothing" scenario, no construction or quarry operations would have occurred between 1990 and 2014. As a result, the habitat composition within the substitute consent area would be very different from what exists today. Crucially, there would have been no permanent and irreversible loss of nationally important Annex I habitats such as Oak-birch-holly woodland (WN1) and Dry siliceous heath (HH1).

A large portion of the southern section of the area was once covered by mature native Oak-birch-holly woodland (WN1), considered a remnant of the original Clashnagallagh Wood, which appears on 1830s OSI maps. Old established native woodland is rare in Ireland and is valued for the diverse plant communities it supports, as well as the foraging and sheltering opportunities it provides to other fauna. Its presence would also have enhanced habitat connectivity across the wider landscape. Both the Oak-birch-holly woodland and Dry siliceous heath are designated as Annex I habitats under the EU Habitats Directive. These habitats are protected due to their rarity and endangered status in Ireland and Europe. Without quarry development, these habitats could still exist today, as the rocky terrain would have limited alternative land uses such as agriculture or commercial forestry.

In the northern section, dry heath dominated, interspersed with mosaics of wet grassland, dense bracken, exposed rock and scrub. In the absence of quarrying, this area would likely have persisted in a similar state for some time. However, heathlands naturally revert to woodland if not grazed, as tree species gradually colonise and enrich the soil. Depending on grazing intensity, the heath may have been encroached by scrub or remained relatively unchanged. The wet grassland, which shows evidence of past agricultural improvement, has more recently reverted to a semi-natural habitat due to a lack of grazing and management. Under the do-nothing scenario, this land would likely have continued to be farmed and improved, reducing its ecological value to a locally important level.

By contrast, habitats such as the Dystrophic lakes, which formed as a direct result of quarrying, would not exist in the do-nothing scenario. These man-made wetlands have since become naturalised, supporting a wide variety of flora and fauna. In addition, the cliff faces created by quarrying, suitable for Annex I species like the Peregrine Falcon, would not have developed. The creation of these features is considered to be a slight positive effect - something absent without quarry development.

In the do-nothing scenario, no quarrying activity would have taken place between 1990 and 2014. This means there would have been no boring or blasting, no crushing or screening of aggregate, and no

washing processes carried out. Similarly, no new aggregate stockpiles or waste stockpiles would exist. The only potential sources of suspended solids would come from historic stockpiles of unusable native aggregate and residual imported sand.

In the do-nothing scenario, quarrying would not have occurred between 1990 and 2014. As a result, the significant habitat changes that have taken place would not have occurred, and key natural habitats such as established deciduous woodland, dry heath, and wet grassland would have remained to a much greater extent. The substitute consent area would likely have supported a higher overall local value for fauna due to the greater extent of natural habitats.

14.4.5 Risk of Major Accidents and Disasters

The desktop review did not identify any records of major accidents or disasters during the Construction and Operational Phases of the development or post the substitute consent assessment period.

The primary biodiversity-related accident risk that could or would likely arise is from surface water effects, particularly in the event of exceptionally heavy rainfall causing major flooding on the Site. Such flooding could potentially have / could lead to the release of sediment-laden runoff in the boundary stream. This material could be flushed downstream into the Bandon River, smothering adult freshwater mussels in the stretch immediately below the quarry boundary stream confluence and severely degrading juvenile mussel habitat. In addition, salmonid spawning grounds could be buried, and a fish kill event could occur. Importantly, no such incidents have been reported during the quarry's operation (See Hydrology and hydrogeology chapter for Further details).

Another potential risk that could have occurred relates to a significant failure of the fuel storage facility or a spillage during on-site refuelling. If diesel or fuel oil would have reached the boundary stream and subsequently the Bandon River, serious ecological damage could have occurred. That said, the likely volume of potential fuel loss from quarry machinery or equipment would have been relatively small (tens rather than hundreds of litres). Any resulting effects would therefore be temporary to short-term in nature. Furthermore, no such spills or incidents have been reported during the quarry's operation (see Chapter 7: Hydrology and Hydrogeology).

14.4.6 Cumulative

An assessment of potential effects on European Designated sites was undertaken and is presented in the Remedial Stage 1: Appropriate Assessment - Screening and Stage 2: Natura Impact Statement. The macadam plant in the land ownership boundary is the only other development that occurred in the landholding during the period of substitute consent. Permission was granted in 1998 (98/294) for the macadam / asphalt manufacturing plant, and all associated buildings and works, including storage bays, a weighbridge and a septic tank. The operation of the plant coincided with the period of substitute consent. The plant is still in operation at the time of writing this report.

Potential indirect cumulative effects on watercourses from the construction and operation of the macadam plant could have arisen from silt washout, bitumen cooling and Poly Aromatic Hydrocarbons ('PAHs') or sewage and waste supply. Further details on these effects are presented in the Remedial Stage 1: Appropriate Assessment - Screening and Stage 2: Natura Impact Statement submitted as part of the Development.

Fine Aggregate / Dust Deposits

A potential cumulative related effect for the quarry is if the placement of sludge deposits is to the east of the Site, adjacent to the boundary stream. These deposits have the potential to be washed into the stream or, in a worst-case scenario, topple into the stream.

However, the surveys and sampling did not identify effects on the stream associated with this deposit. Additionally, following discussion with the operator, the placement of material in this location has ceased, thus further reducing the potential for any sediments entering the stream.

14.5 Remedial / Mitigation Measures and Monitoring

Remedial actions are necessary to reduce, repair or compensate for the significant negative effects on the environment caused by the construction or operation of the quarry for which substitute consent is being sought. With regard to biodiversity, the key significant negative effects identified in this assessment are the loss of Annex I habitats, Annex I Old Sessile Oak Woods with Ilex and Blechnum, and Annex I European Dry Heath habitat, which cannot be replaced.

No other significant adverse effects have been recorded on designated sites, other habitats or flora, aquatic ecology, or fauna as a result of quarry activities between 1990 and 2014. However, remedial / mitigation measures are required to ensure that all potential effects identified in this chapter are addressed. These measures, along with appropriate monitoring actions to be implemented following consent, are detailed below and in the remediation plan.

14.5.1 Remediation Plan

A Remediation Plan has been prepared by Cathal O'Meara Landscape Architects. Please refer to Chapter 11: Landscape and Visual Impact. The remediation plan involves the following measures:

- Existing quarry floor to be retained;
- Existing long-established woodland to be protected and remain undisturbed;
- Existing dry silicious heath to be protected and remain undisturbed. Fencing and signage will be installed on the ground. This habitat is to be managed to allow expansion;
- Existing ponds to be retained to promote biodiversity; and,
- The existing wet woodland in the southwest of the Site to the west of the quarry floor is proposed to be maintained.

Historical quarrying has led to the permanent loss of nationally important Annex I habitats, specifically Old Sessile Oak Woods with Ilex and Blechnum (91A0) and European Dry Heath, which are irreplaceable. The Remediation Plan therefore prioritises the protection and conservation of the remaining areas of these habitats, along with associated Oak–Birch–Holly woodland and Dry Siliceous Heath.

The plan also maintains existing ponds and scrub habitats to encourage natural rewilding and ecological succession over time. Although the destroyed Annex I habitats cannot be recreated, the proposed measures will promote the development of other ecologically valuable local habitats. Over the medium to long term, this includes establishing new native woodland that, while not a direct replacement for the lost Old Sessile Oak Woods with Ilex and Blechnum (91A0), is expected to mature

into a mixed broadleaved woodland of notable local importance within 60–100 years. Considering that native woodland currently covers less than 2% of Ireland's land area, this new habitat will make a meaningful contribution to national biodiversity. Areas left to rewild naturally will first develop into transitional scrub before evolving into more mature woodland communities.

Collectively, the restoration of native woodland and the retention of existing semi-natural habitats (such as woodland, ponds and scrub) will improve long-term ecological opportunities for fauna; however, they are not expected to significantly influence stream- or river-dependent species.

The plan also provides for the preservation of the quarry shelf used by the Peregrine Falcon —an Annex I-listed raptor—for nesting. However, remediation activities during the breeding season could cause disturbance or displacement, and appropriate monitoring measures are outlined in Section 14.4.3.3.

As the site continues to regenerate and revegetate naturally under the Remediation Plan, the overall long-term effects are predicted to be neutral for habitats and flora, and neutral to slightly positive for fauna.

14.5.2 General Remediation Mitigation Measures

During the remedial works, all works will comply with all relevant legislation and best practice guidelines to reduce any potential environmental effects. The following guidance relevant to biodiversity will be referred to:

- CIEEM, Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (2018 and revisions) [1];
- NRA, 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' [2]
- Guidelines for the Protection of Biodiversity within the Extractive Industry [53]
- Fossitt's Guide to Habitats in Ireland [3];
- Heritage Council's '*Best Practice Guidance for Habitat Survey & Mapping*' [4];
- NRA, 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes,' [5];
- JNCC, '*Common Standards Monitoring Guidance*,' [18];
- JNCC '*Herpetofauna Worker's Manual*' [19]; and,
- Froglife, '*Surveying for Amphibians*' [20].
- Scottish Badgers, '*Surveying for Badgers: Good Practice Guidelines,*' [9];
- The Mammal Society, '*Surveying Badgers,'* [10]; and,
- DoEHLG, '*Bat Mitigation Guidelines for Ireland*' [54];
- BCT, 'Bat Surveys for Professional Ecologists Good Practice Guidelines' [15]
- SNH, 'Technical Advice Note #2: Otter Surveys' [16];
- DoAHG, 'National Otter Survey of Ireland 2010 / 12' [17];
- CIRIA, C532 – Control of Water Pollution from Construction, Guidance for Consultants and Contractors [21];
- CIRIA, *C811- Environmental Good Practice on Site* (5th edition) [22];
- NRA, 'Guidelines for the Treatment of Bats during the Construction of National Road Schemes' [23];

- NRA 'Guidance for the Treatment of Badgers Prior to the Construction of National Road Schemes' [24];
- NRA, 'Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads [25]; and,
- 'Requirements for the Protection of Fisheries Habitat during Construction and Development' [26].

14.5.3 Remedial Mitigation Measures

The following mitigation measures will be adhered to on-site.

14.5.3.1 Mitigation Measures for Amphibians

Given the confirmed presence of smooth newt and suitable breeding, foraging and sheltering habitat for amphibians, in order to ensure that the works do not have adverse effects on amphibians, the following remediation / mitigation measures will be implemented:

- No works or alterations to the existing waterbodies will take place until amphibians have been confirmed as being absent;
- Vegetation clearance and ground stripping adjacent to the ponds will be supervised by the ECoW to ensure no adverse effects occur to any amphibians in the area;
- Should potential effects to waterbodies confirmed as supporting amphibians be required, the NPWS will be consulted with regard to the requirement for a derogation licence;
- Should amphibians be encountered on-site during the works, the ECoW will be consulted for advice; and,
- The on-site ponds will be subject to monitoring in the years 1, 3 and 5 following the implementation of the remediation plan. Monitoring reports will be prepared and submitted to Cork County Council detailing the findings of the amphibian surveys.

14.5.3.2 Enhancement/compensation for Amphibians

<u>Hibernacula and Habitat Piles</u>

Hibernacula and habitat piles are valuable habitats and support a range of biodiversity, including insects, amphibians and small mammals. These habitats act as refuges and hibernation sites for amphibians as well as a host of other species of inverts and small mammals. The objective is to create a diversity of habitats within the Development.

Hibernacula and habitat piles can be created through the placement of either piles of rocks or logs around the margins of hedgerows / treelines, near wetland habitats and adjacent to drainage ditches. It is proposed to create these enhancement measures using the material generated by the vegetation clearance works on-site. Refer to the examples below, Figures 14-15 and 14-16.

Figure 14.15: Typical hibernaculum and cross section

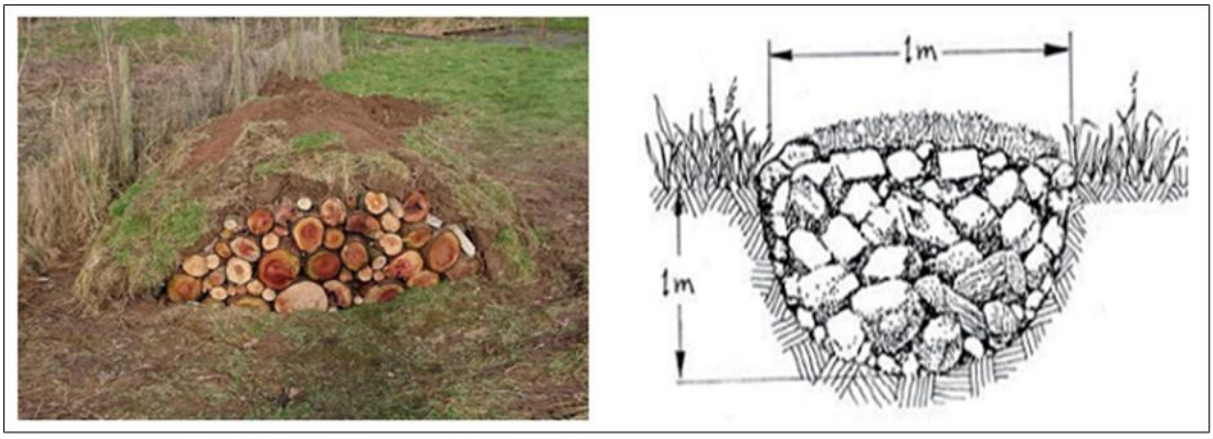


Figure 14.16: Habitat Piles



14.5.3.3 Protection for Breeding Birds

In order to ensure no effects occur to breeding bird species during the implementation of the remediation plan, the following measures will be adhered to:

- As per Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000, the cutting, grubbing, burning or destruction by other means of vegetation growing on uncultivated land or in hedges or ditches will be restricted during the nesting and breeding season for birds and wildlife, from 1st March to 31st August;
- In the event that works need to be undertaken within the main breeding season, the following measures will be implemented:

- Prior to the works commencing, consultation with the NPWS will be undertaken by the ECoW;
- Prior to the vegetation removal the ECoW will inspect the Site; and,
- All vegetation clearance works will be undertaken in a systematic way under the direction of the ECoW.

- In the unlikely event birds nest within the active working area during the works, all works will stop within the immediate area, and the project ECoW will be consulted.

14.5.3.4 Protection for Peregrine Falcon

To ensure that peregrine falcon that use the Site will be protected, the following measures will be implemented:

- All personnel operating on site will be made aware of the legal protection afforded to peregrine falcons and biodiversity signage will be erected throughout the quarry;
- Should an active peregrine falcon nest be identified on site, all personnel operating on the Site will be made aware of the presence and location of the nest. Access will be restricted below the cliffs, which are actively being utilised by peregrine falcons. This will be done using fencing and / or other appropriate barriers;
- As part of the remediation plan for the Site, all ledges currently occupied by peregrines shall be protected. This will retain the suitable breeding habitat for peregrine falcon; and,
- An annual peregrine falcon monitoring programme will be established during the remedial phases of the Development to establish the potential effects, if any, of the Development on peregrine falcon. The findings of the monitoring will be submitted to Cork County Council, the National Biodiversity Records Centre and NPWS.

14.5.3.5 Measures for Bats

<u>Roosting bats</u>

Given the levels of activity recorded during the on-site surveys, it is proposed to install artificial bat boxes within the Site.

Artificial bat boxes will also be erected on suitable mature trees within the Site. Artificial bat boxes can provide vital roosting places in habitats devoid of natural roosting opportunities. Bat boxes can also provide additional suitable roosting habitats for bats in an area.

Bat boxes should be placed in a position sheltered from strong winds and exposed to the sun for part of the day. The boxes will be located in / close to linear features, such as the treelines and placed a minimum of 2m above the ground. The number and location of which will be specified by an ecologist. Figure 14-17 below shows suitable bat roost box examples, including a Pole Mounted Bat Box, Bat Box Schwegler 1FF and Vivara Small Bat Box.

An example of the bat boxes is illustrated in Figure 14-17.

Figure 14-17: Suitable Bat Boxes



Additionally, as lesser horseshoe bats will not use bat boxes as they require flight space and flying access into their roost, it is proposed to construct a dedicated lesser horseshoe bat roosting space on site. The roost will have a suitable flight entrance space for lesser horseshoe bats (2.8m in height and 5m in length and width) [55]. Figure 14-18 below shows a suitable artificial lesser horseshoe bat roost structure that could be constructed on site. The lesser horseshoe bat roost will be located in the northwest of the Site within close proximity to the woodland area.

Figure 14.17: Suitable Artificial Lesser Horseshoe Bat Roost



Foraging and Commuting Bats

Bats will be able to use the retained and proposed habitats included in the Remediation Plan for foraging and commuting.

14.5.3.6 Water Quality Mitigation Measures

Given the hydrological connection between the Site and the River Bandon SAC and the presence of FWPM as well as other species that are known / have the potential to utilise this habitat, such as otter, lamprey Spp., brown trout, water mitigation measures have been developed to ensure water quality within the boundary stream, and the River Bandon are maintained. Please refer to Chapter 7 for full details on all water quality mitigation measures.

14.5.3.7 Measures for Invasive Species

An Invasive Species Management plan has been developed for the Site (refer to Appendix 14-6) that will include measures for the remediation of the stands of Japanese knotweed & rhododendron located on the Site. The plan will be issued and agreed with Cork County Council.

14.5.4 Monitoring

An Ecological Clerk of Works ('ECoW') will be appointed to the project to oversee compliance with the required ecological mitigation and remedial / biodiversity enhancement measures.

Peregrine falcon and Amphibian surveys will be undertaken by the 'ECoW' for the next five years to monitor for the presence of the species and to ensure no effects occur to breeding birds as a result of the Development. The findings of the monitoring will be submitted to Cork County Council and the National Biodiversity Data Centre.

14.5.5 Timescale for Implementation of Remedial / Mitigation Measures

The proposed mitigation / remedial measures and monitoring on-site will be implemented on an ongoing basis following receipt of the grant of planning. Details of the time frames will be provided and agreed with the consenting authority.

14.6 Interactions with other Environmental Attributes

The Environmental Attributes with which flora and fauna interact include:

- Chapter 6: Land, Soils and Geology; The alteration of soil conditions on-site through the removal of topsoil, subsoil and extraction of aggregate had an impact on biodiversity. However, appropriate mitigation measures utilised were outlined in detail in Chapter 6;
- Chapter 7: Hydrology and Hydrogeology; Potential impacts on hydrology can also impact on ecological conditions. The deterioration of water quality had the potential to impact European designated sites, proposed Natural Heritage Areas and protected / notable species within the wider area. However, Chapter 6 demonstrates that there were no negative effects on ecosystems; and,
- Chapter 8: Air Quality; Air quality can potentially effect ecosystems; however, an assessment detailed in full in Chapter 8 demonstrated that the emissions to air from the Development have not had significant negative effects on ecosystems.

14.7 Residual Effects

An assessment of potential effects on European sites was undertaken and is presented in Stage 2 - rNIS, which forms part of the substitute consent application.

The following species and habitats outlined in Table 14-10 were identified as receptors that warranted further consideration to remediate effects as part of the Development.

Mitigation has been proposed for each of these ecological receptors, alongside biodiversity enhancement measures for the Site, as part of the remediation plans, and is outlined in Section 14.5. The results of these measures on these ecological receptors and the resulting residual effects are described below in Table 14-10.

Table 14-10: Valuation of Potential Ecological Receptors Post Mitigation and Enhancement

Receptor	Potential Historical Effect	Potential Remediation Effect	Effect Post Mitigation and Enhancement	Residual Effects
Protected Sites				
European Designated Sites	Water Quality Impairment	Water Quality Impairment	It is considered that following the implementation of the water quality outlined in Chapter 7, the Bandon River SAC will not be affected by any remedial measures on-site.	Imperceptible
Habitats				
Dry Silicious Heath (HH1)	Habitat Loss	Protection	It is considered that following the implementation of the remediation plan on-site, the dry silicious heath will be protected and remain undisturbed. Fencing and signage will be installed. This, however, will not replace the heath lost as part of the Development.	Significant negative effect
Exposed Rock (ER1)	Habitat Loss	Protection	It is considered that, following the implementation of the remediation plan, this habitat will be protected.	Imperceptible
Oak-Birch-Holly Woodand (WN1)	Habitat Loss	Protection	It is considered that following the implementation of the remediation plan on-site, the oak-birch-holly woodland will be protected. Self-regeneration of the woodland between the areas of woodland will allow the habitat to expand as part of the remediation plan. This, however, will not replace the woodland lost as part of the Development.	Significant negative effect
Other Artificial Lakes and ponds (FL8)	Created as part of the works between 1990-2014	Habitat Loss	As part of the on-site remediation plan, the ponded area in the southwest of the Site is proposed to be converted into a wet woodland. This ponded area is already colonised with plant species. As part of the remedial works, an ECoW will survey this area before works commence to ensure any species utilising it are protected.	Imperceptible
Scrub (WS1)	Habitat Loss	Habitat Loss	It is considered that allowing the vegetation in the north of the Site to regenerate naturally will compensate for	Imperceptible

Receptor	Potential Historical Effect	Potential Remediation Effect	Effect Post Mitigation and Enhancement	Residual Effects
			the loss of this habitat during the period of substitute consent.	
Scrub / Dry Silicious Heath (WS1 / HH1)	Habitat Loss	Habitat Loss	It is considered that allowing the vegetation in the north of the Site to regenerate naturally will compensate for the loss of this habitat during the period of substitute consent.	Imperceptible
Hedgerow / Tree line (WL1 / WL2)	Habitat Loss	Habitat Loss	It is considered that allowing the vegetation in the north of the Site to regenerate naturally will compensate for the loss of this habitat during the period of substitute consent.	Imperceptible
Flora and Fauna				
Protected Flora	Habitat Loss	Protection	It is considered that with the implementation of the remediation plan, protected plant species on-site will be retained and allowed to persist in the environment.	Imperceptible
Amphibians	Habitat Loss	Habitat Enhancement	It is considered that the habitat piles and hibernaculum proposed as part of the remedial works will provide additional suitable habitat for amphibians and a range of other species.	Imperceptible
Aquatic Species	Water Quality Impairment	Water Quality Impairment	It is considered that following the implementation of water quality mitigation outlined in Chapter 7, the aquatic species within the boundary stream and River Bandon will not be affected by any remedial measures on-site.	Imperceptible
Badgers	Habitat Loss	Habitat Enhancement	It is considered that following the remediation plan on-site, the areas of woodland on-site will be allowed to regenerate into woodland, which will enhance foraging, commuting and sett-building habitat for badgers.	Imperceptible
Bats	Habitat Loss	Creation of artificial bat roosts	It is considered that following the implementation of artificial bat roosts and the regeneration of the northern extent of the Site, the effects on bats due to the Development will be remediated.	Imperceptible

Receptor	Potential Historical Effect	Potential Remediation Effect	Effect Post Mitigation and Enhancement	Residual Effects
Birds	Habitat Loss	Disturbance to breeding birds during the enhancement works. Retention of Peregrine nesting location and habitat enhancement works that will provide suitable habitat for nesting birds.	It is considered that following the implementation of the remedial measures, which includes the regeneration of existing habitats and woodland on-site and specific measures with regard to peregrine falcon potential effects on this receptor will be imperceptible.	Imperceptible
Otter	Water Quality Impairment, Habitat Loss	N/A	It is considered that the protection of the boundary stream and regeneration of the habitats on-site, potential historic effects on otter will be remediated.	Imperceptible
Invasive	Spread of invasive species	Invasive species management plan to remediate the Site.	It is considered that will the implementation of the JK Management Plan, the invasive species on-site will be managed and will not be spread throughout the Site.	Imperceptible
Other Fauna	Habitat Loss	N/A	It is considered that with the regeneration of the habitats on-site and the introduction of the wet woodland, other species will utilise these habitats.	Imperceptible

It is reasonable to conclude that, with the implementation of the remediation measures and appropriate mitigation measures and adherence to standard best practice procedures outlined in this chapter, no significant negative ecological effects are anticipated as part of the proposed remediation works.

14.8 Reinstatement

Not applicable. The effects of the proposed restoration are discussed in Section 14.5 above.

14.9 Statement of the Significant Effects on the Environment

Significant negative effects identified for biodiversity here relate to the loss of Annex I woodland and heath habitats; Annex I Old Sessile Oak Woods with Ilex and Blechnum (91A0) and Annex I European Dry Heath habitat [50]. No significant negative effects on designated sites, other habitats / flora, aquatic ecology or fauna have been identified as a result of the 1990-2014 quarry development.

The established Oak-Birch-Holly woodland (Clashnagallagh wood), which most likely matches to Annex I Old Sessile Oak Woods with Ilex and Blechnum (91A0) [50], was permanently lost as a result of quarrying activities inside the alternative consent area between 1990 and 2014.

The Dry siliceous heath corresponded to the European Dry Heaths listed in Annex I (4030) [50]. In this instance, both habitats are deemed to be nationally significant habitats that cannot be restored or replaced. Therefore, the consequences of losing both habitats are regarded as significant, adverse and permanent.

A Remediation Plan has been prepared by Cathal O'Meara Landscape Architects and is attached as Appendix 11-1. This plan provides details of proposed landscaping, including planting, biodiversity and management measures.

14.10 References

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CHAPTER 15
CULTURAL HERITAGE AND ARCHAEOLOGY

VOLUME II
MAIN STATEMENT

FEBRUARY 2026

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15 Cultural Heritage & Archaeology

15.1 Introduction

The assessment identifies the potential direct and indirect impacts, if any, on the archaeological, architectural and cultural heritage environment that have occurred, are occurring, or may reasonably be expected to occur as a result of construction and operational activities within the Substitute Consent Area (SCA) of the quarry at Ardcahan between 1990 and 2014. The project description is provided in Chapter 3, while full details of the planning and development history of previous works at Ardcahan Quarry are outlined in that Chapter. The SCA, which covers an area of 19.1ha and includes extraction zones and ancillary areas such as access roads, plant and stockpile zones, is outlined in red within the Landownership Boundary (LOB), which extends to 25ha and is shown in blue on **Fig. 15.1.** below.

This chapter initially sets out the methodology employed (Section 15.1.3) and provides a description of the existing environment (Section 15.2). An assessment of both direct and indirect impacts on the archaeological, architectural and cultural heritage environment arising from the construction and operation of the quarry between 1990 and 2014 is presented in Section 15.3. Proposed remedial measures are detailed in Section 15.4, and residual effects are discussed in Section 15.5. The chapter concludes with a list of references in Section 15.7.

There are no recorded archaeological sites within the SCA or the overall LOB. The nearest recorded archaeological sites are a ringfort (CO108-001), located 250m to the east and an enclosure and burial ground (CO108-002001- and CO108-002002-), situated 350m to the east in the adjoining townland of Dromerk. In total, there are twenty-two recorded archaeological sites within 2km of the LOB, eight of which lie within a 1km radius of the quarry.

There are no protected structures listed in the Cork County Development Plan 2022-2028, nor are there any structures listed in the National Inventory of Architectural Heritage (NIAH) for County Cork within the SCA, LOB or the broader 2km Study Area.

Some terms used in this report are explained hereunder;

Archaeological Heritage

Archaeological heritage can be described as the study of past human societies through their material remains and artefactual assemblages. The Valletta Treaty (or the European Convention on the Protection of the Archaeological Heritage, 1992) defines archaeological heritage as 'all remains and objects and any other traces of humankind from past times', including 'structures, constructions, groups of buildings, developed sites, moveable objects, monuments of other kinds as well as their context, whether situated on land or under water'.

Architectural Heritage

Architectural Heritage is defined in the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999 as structures and buildings together with their settings and attendant grounds, fixtures and fittings, groups of such structures and buildings, and sites, which are of architectural, historic, archaeological, artistic, cultural, scientific, social or technical interest.

Cultural Heritage

Cultural Heritage is a generic term that spans thousands of years and covers a multitude of cultural, archaeological and architectural sites and monuments within the landscape. EPA Guidelines (2003) define cultural heritage as including archaeological heritage, architecture, history, landscape and garden design, folklore and tradition, geological features, language and dialect, religion, settlements,

inland waterways (rivers) and place names. The more recent EPA Guidelines (2022) include archaeology, architectural heritage and folklore and history under the broad category of cultural heritage.

In this assessment, cultural heritage encompasses the following; the history of Dunmanway, the closest large settlement, 3.5km to the southwest; the birthplace of Sam Maguire in the townland of Mallabraka to the west; prominent landscape features such as Mount Gunnery (Yew Tree Hill), the grotto and holy well located on its western flank; historic rural settlement patterns such as single farmsteads and clusters of buildings depicted on early Ordnance Survey (OS) mapping; and placenames and historical references associated with the subject site and surrounding townlands.

Study Area: To support a comprehensive assessment of the Cultural Heritage environment, a study area encompassing a 2km radius of the LOB was chosen.

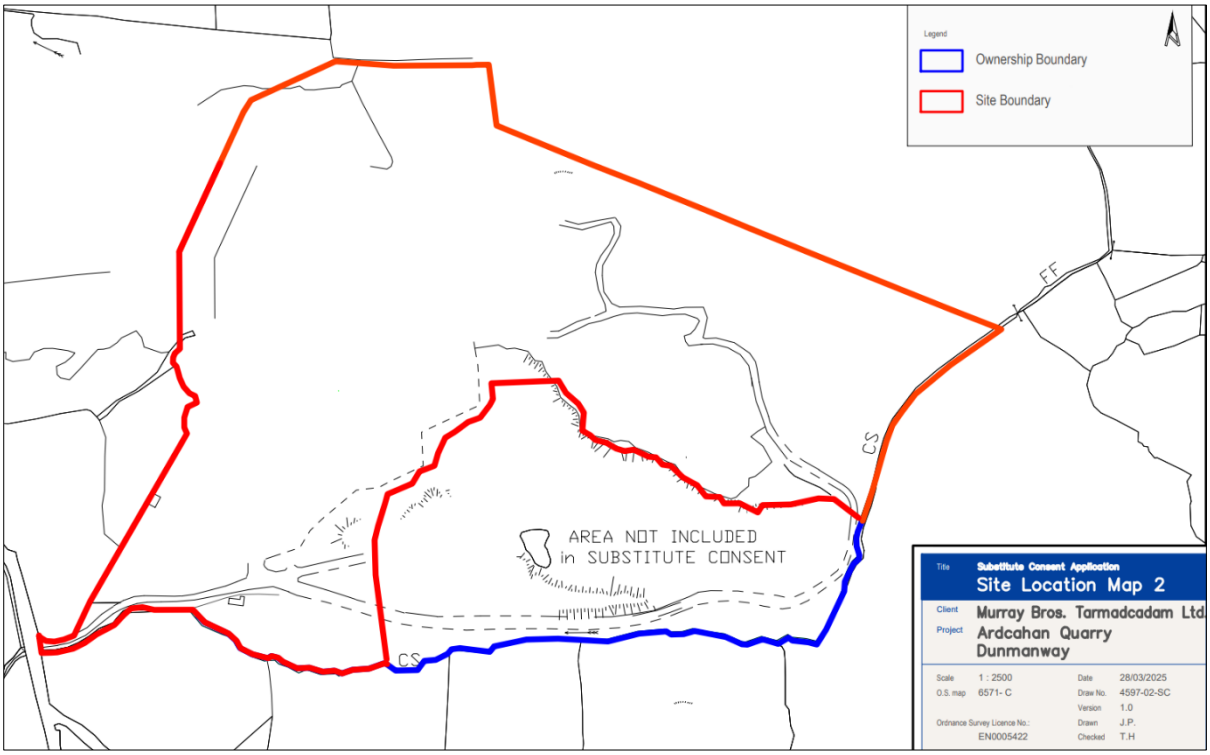


Figure - 15.1 OS map of quarry showing Substitute Consent Area (SCA) outlined in red (after McCutcheon Halley)

15.1.1 Author Information and Competency

This chapter of the EIAR has been prepared by Musetta O'Leary and Avril Purcell of Lane Purcell Archaeology.

Musetta O'Leary MA (Archaeology), NUI Cork

Musetta O'Leary has over 20 years' experience in all aspects of archaeological consultancy. She specialises in managing the archaeological and cultural heritage components of developments at the pre-planning stage. Musetta has coordinated and authored the Cultural Heritage sections of Environmental Impact Assessment Reports (EIARs) for a wide range of development types, including residential, infrastructure (roads and utilities), industrial, energy, and extractive industries. She has presented expert witness evidence at An Bord Pleanála oral hearings.

Avril Purcell MA (Archaeology), NUI Cork

Avril Purcell is the director of Lane Purcell Archaeology and is a licensed archaeologist with 30 years' experience in research, consultancy, surveying and excavation. She has contributed to a wide range of EIAR projects across the country, often from the initial constraint study stage through pre-development investigations, resolution and construction-phase monitoring. Avril has presented expert witness evidence at An Bord Pleanála oral hearings.

15.1.2 Guidelines & Legislation Relevant to Discipline

In Ireland, the primary means of protecting Cultural Heritage are: The National Monument (Amendments) Acts 1930 to 2014, The Heritage Act 1995, the relevant provisions of the National Cultural Institutions Act 1997, The Architectural Heritage (National Inventory) and Historic Monuments (Misc. Provisions) Act 1999 and the Local Government (Planning and Development) Act 2000.

Historical and Archaeological Heritage and Miscellaneous Provisions Act 2023

A new Heritage Bill, introduced by the Minister for Housing, Local Government, and Heritage, was passed by Seanad Éireann and Dáil Éireann on October 13, 2023. This Act replaces the National Monuments Acts (1930–2014) and other related legislation, strengthening protections for heritage sites. Key measures introduced by this Act include: A single Register of Monuments, A statutory reporting scheme for newly discovered monuments and Provisions to prevent the illicit import and possession of stolen cultural property. As the new Act is implemented over time, the existing legislation will remain in effect**.**

The government's policies for both the archaeological and architectural heritage are relayed in a series of published guidelines. This chapter is prepared with regard to the following guidelines:

Guidelines on the information to be contained in Environmental Impact Statements, (Environmental Protection Agency, 2022).

Advice Notes on Current Practice in the Preparation of Environmental Impact Statements, (Environmental Protection Agency, 2003) and Draft Revised Advice Notes (2015).

Framework & Principles for the Protection of the Archaeological Heritage, (Department of Arts, Heritage, Gaeltacht & the Islands, 1999).

Policy & Guidelines on Archaeological Excavation, (Department of Arts, Heritage, Gaeltacht & the Islands, 1999).

Architectural Heritage Protection, Guidelines for Planning Authorities, 2004. (Department of the Environment, Heritage and Local Government)

Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018)

Code of Practice between the Department of Environment, Heritage and Local Government and the Irish Concrete Federation, 2009. Department of Environment, National Monuments Service DHLG.

Comprehensive guidelines on the treatment of the archaeological and architectural heritage during the planning and design of national road schemes were published by the National Roads Authority in 2005. These were also used as a guide in the compilation of this chapter.

Guidelines for the assessment of Archaeological Heritage Impacts of National Road Schemes, (NRA, 2005a).

Guidelines for the assessment of Architectural Heritage Impacts of National Road Schemes, (NRA, 2005a).

15.1.3 Methodology

The methodology used to complete the Cultural Heritage section of this rEIAR comprised the following:

- A review of relevant Legislation and Guidelines;
- A desktop assessment of the SCA, LOB and the defined Study Area;
- A walkover survey of the SCA and LOB;
- An evaluation of the effects that have occurred, are occurring, or can be expected to occur on the archaeological, architectural and cultural heritage environment as a consequence of the development undertaken between 1990 and 2014;
- The identification of mitigation measures to reduce or offset potential impacts on the archaeological, architectural and cultural heritage environment.

Desktop Study

The desktop study provides a cultural heritage overview of the SCA and study area using the following sources.

Record of Monuments and Places (RMP) - This record was established under Section 12 (1) of the National Monuments (Amendment) Act 1994. It lists all monuments and places believed to be of archaeological importance in the County. The numbering system consists of two parts: the first part is the county code (CO for Cork) followed by the Ordnance Survey map number (six inch to the mile scale); the second part is the number of a circle surrounding the site on the RMP map, e.g. CO108-001 refers to circle 001 on OS sheet 108 for County Cork. The area within the circle is referred to as the *Zone of Archaeological Potential (ZAP)* for that site. Its diameter can vary depending on the size and shape of the site but it averages out at *c.* 180m. The RMP for County Cork was published in 1998. It is an offence to interfere with any of the sites or monuments listed in the RMP without first giving two months' notice in writing to the National Monuments Service (NMS) at the Department of Housing, Local Government and Heritage.

Sites and Monuments Record Database of the ASI - The purpose of the ASI is to compile a base-line inventory of the known archaeological monuments in the State. The large record archive and databases resulting from the survey are being continually updated. This database, complete with maps is now available for consultation via the NMS website at www.archaeology.ie

Archaeological Inventories and NMS Archive Files – Information on all the recorded archaeological sites within the Study Area has been sourced from the ASI online database. This database incorporates material published in the Archaeological Inventories of County Cork; Volume 1: West Cork (Power *et al.* 1992) and Volume 5 (Ronan *et al.* 2009). These volumes provide comprehensive descriptions of archaeological sites in the region. Where entries have since been revised or supplemented through more recent surveys or research, the online database reflects these updates. In instances where the ASI carried no descriptive record for a given RMP entry, additional information was obtained from the National Monuments Service (NMS) Archive Files. These archival files were accessed and supplied by the NMS through email request, where available.

Consultations – During the compilation of the rEIAR, Ms. Mary Sleeman, former County Archaeologist for Cork, was consulted.

Files of the National Monuments Service (NMS), Department of Housing, Local Government and Heritage – The NMS was consulted to retrieve information on RMP sites that have been afforded added protection such as;

- National Monuments in the ownership or guardianship of the state – None in the Study Area

- Monuments subject to Preservation Orders and Temporary Preservation Orders – None in the Study Area
- Monuments listed in the Register of Historic Monuments – One in the study area Kilmalooda souterrain (CO094-121).

County Development Plan for Cork 2022-2028 (CCDP) – Local Polices with regard to Heritage

The CCDP outlines Cork County Council's objectives/policies regarding the preservation of archaeological, architectural, and cultural heritage of the county. The Plan *'recognises the importance of identifying, valuing and safeguarding our archaeological, architectural and cultural heritage for future generations through appropriate protection, management and enhancement measures or via the sensitive development of this resource*' (CCDP, Vol. 1, Chapter 16, 353). The protection of archaeological, architectural, and cultural heritage is relayed through twenty-six Plan Objectives (HE 16-1 to HE 16-26) covering all heritage aspects.

Objectives relating to heritage which are of relevance to this development include the following;

Objective 16-13:

> *Previously unidentified archaeological sites that are uncovered during construction works must be investigated and recorded. 'The Council will require preservation in situ to protect archaeological monuments discovered. Preservation by record will only be considered in exceptional circumstances.*

Objective 16-23: The CCDP seeks to;

> *'Protect and promote the cultural heritage of County Cork as an important economic asset and for its intrinsic value to identity of place and the wellbeing of people within the County.'*

The Cork County Development Plan includes a Record of Protected Structures (RPS), as mandated by the Planning and Development Act 2000, to safeguard buildings of special heritage value. The RPS aims to ensure any changes to listed structures preserve their character and setting. Cork County Council's objectives include expanding the RPS, protecting structures and their surroundings, ensuring high-quality development proposals, and promoting best conservation practices. The Council also seeks to enhance historic features not formally listed. There are no protected structures within the SCA, the quarry site, or within 2km of it; the nearest protected structure is St. Patrick's Roman Catholic Church (RPS00683), located 2.7km southwest in Dunmanway North.

NIAH Architectural Inventory of North Cork - The NIAH was established under the 1999 Architectural Heritage Act, following the 1985 Granada Convention. It systematically identifies and records Ireland's architectural heritage from 1700 to the present through two surveys: the Building Survey and the Historic Garden Survey. Between 2006 and 2011, the NIAH surveyed County Cork, identifying approximately 6,500 items of architectural significance. Structures deemed of regional or higher importance are recommended for inclusion in the Recork of Protected Structures (RPS) under Section 53 of the Planning and Development Act 2000. There are no NIAH-listed buildings or historic gardens within the SCA, the overall quarry site, or the 2km study area. The nearest structures are in Dunmanway, approximately 2.7km to the south.

Database of Irish Excavation Reports (www.excavations.ie) - This web site contains summary records of archaeological excavations and investigations in Ireland from 1970 to 2026. A search of the database for the townlands within the Study Area revealed no investigations within the SCA, the overall quarry site or the 2km study area. Two investigations were carried out in Dunmanway town;

one at Underhill (Lane, 2001) and another at Dunmanway South (Purcell, 2002). Neither investigation produced features or finds of archaeological significance.

Review of the Cork County Council planning enquiry system - A review of the Cork County Council planning enquiry system was undertaken for the Substitute Consent Area (SCA). An application lodged in 2011 was refused. A subsequent application submitted in 2014, accompanied by an EIS (Purcell 2014), progressed to a grant of permission subject to archaeological monitoring; however, this decision was later quashed by Judicial Review and no associated works were undertaken.

A 1998 permission for a macadam plant was identified outside the current SCA boundary; no archaeological reports are attached to that file.

The quarry commenced operations prior to the introduction of planning controls in 1963 and subsequently continued in use as an unregistered quarry. In 2002, the government and quarrying industry introduced the Irish Concrete Federation/National Monuments Service Code of Practice, establishing guidance on archaeological protection for operating quarries, with revisions issued in 2009. From 2002 onward, the quarry, still operating outside the Section 261 registration process, would notionally have been required to comply with this Code, particularly in the period leading up to the 30th of April 2005 registration deadline.

However, no archaeological assessments, fieldwork or licensed monitoring are recorded within the SCA prior to the 2011 planning application. A review of the Cork County Council planning archive, National Monuments Service datasets (including the SMR/RMP and licensed work records), and the Excavations Bulletin (Excavations.ie) confirms that no archaeological mitigation, monitoring or reporting is documented for the quarry during this period.

Review of Previous EIS – A review was undertaken of the 2014 Environmental Impact Statement (EIS) prepared by McCutcheon Halley for the continued use of Ardcahan Quarry. Chapter 10 of the EIS, Cultural Heritage (Purcell, 2014), evaluated the potential effects of the proposed continuation of quarry operations on archaeological, architectural, and cultural heritage resources.

The assessment concluded that, subject to the implementation of the recommended mitigation measures, the proposed development would not give rise to any significant adverse impacts on cultural heritage assets either within the site or in the surrounding area.

Historical Sources Consulted – As part of the 2014 EIS (Purcell, 2014), the Ordnance Survey Name Books for County Cork were reviewed at Cork County Library. These were compiled during the 1841 six-inch mapping project and contain valuable antiquarian and folklore references; there are no OS letters for the county. The local history section of the library was also consulted for site-specific publications, including historical journals and local histories. For this rEIAR, a further library search was conducted to identify any new or updated sources relevant to the study area.

Cartographic Sources – The following maps were consulted as part of the assessment:

- OSI Discovery Series 1:50,000 scale maps.
- Ordnance Survey (OS) 6-inch maps; first edition (1841-42) and second edition (1902); no third edition exists.
- The 25-inch to one mile scale map (1897-1904), which informed the 1902 second edition 6-inch map.

Aerial Photographs – Ordnance Survey of Ireland online aerial photographs (dated 1995, 1996-2000, 2001-2005, 2006-2012, 2011-2013 and 2013-2018 and 2025) via GeoHive (OSI) and Google maps (www.google.ie). These were examined to identify any previously unrecorded features of archaeological/cultural heritage significance that may only be visible from the air. No archaeological

features were apparent in the photographs. The site appears as a quarry on all editions of the aerial photographs, with no potential archaeological features visible.

Walkover Survey

The primary purpose of the walkover survey was to assess the physical environment of the SCA and to identify any possible features of cultural heritage significance. Current land use, local topography and environmental conditions are evaluated to gain an overall understanding of the area. Walkover surveys were conducted on June 24th, 2014 (as part of the 2014 EIS), May 12th, 2020 and February 16th, 2023. On all occasions, no features, deposits, or finds of archaeological potential were identified (Refer to Figures 3-11 in Appendix 15.1).

15.1.4 Difficulties Encountered in Compiling Information

Much of our archaeological heritage survives only as subsurface remains, often forgotten and concealed from view. Within the SCA, quarrying works carried out between 1990 and 2014 altered ground levels and transformed the natural terrain. Areas outside the quarried footprint were historically used for ancillary quarry operations, including access routes, hardstanding, storage areas and settling ponds.

No archaeological site investigations or monitoring of ground works were carried out during this period. In the absence of archaeological mitigation, any previously unknown surface or subsurface archaeological sites that may have existed in these areas may have been lost.

Walkover surveys of the SCA were undertaken in 2014, 2020 and 2023. No visible features or artefacts of archaeological potential were identified during these inspections. However, the impenetrable nature and density of scrub vegetation rendered parts of the site inaccessible, restricting visibility and limiting the effectiveness of field assessment. Accordingly, while no archaeological features were recorded, the possibility remains that previously unrecognised upstanding or subsurface remains may survive within undisturbed areas of the site.

15.2 Description of Receiving Environment

Archaeological sites naturally erode and degrade with the passage of time, particularly those constructed from timber. Even stone-built structures and large earthworks can become denuded, collapse, or survive only as low or ground-level features. The pace of landscape change in Ireland accelerated in the second half of the 20th century and many archaeological sites have been levelled by activities associated with modern development and progress such as agriculture, industry and infrastructural improvements. This has ensured that the present-day archaeological landscape is not fully representative of the human occupation of this island, which has spanned some twelve thousand years. While many archaeological sites survive today as partially upstanding structures, such as earthworks and stone monuments, many more survive only as subsurface remains, often forgotten and concealed from view. Subsurface archaeological remains can be uncovered during archaeological investigations carried out in advance of development.

There are twenty-two recorded archaeological sites within 2km of the LOB, four of which are listed as Redundant Records, meaning they are no longer considered to be archaeological sites. Of the remaining eighteen, eight lie within a 1km radius of the quarry site (see Fig. 15.2 and Table 15.1 below). Only one archaeological site within the study area dates to the prehistoric period: a standing stone (CO094-076) in Ardcahan, c. 900m to the north of the SCA. This does not indicate an absence of human activity in the area during this very substantial period of time. The broader landscape beyond the study area contains ample evidence of prehistoric populations shaping and modifying the landscape around them for a diversity of purposes, be it agricultural, social, political, or religious.

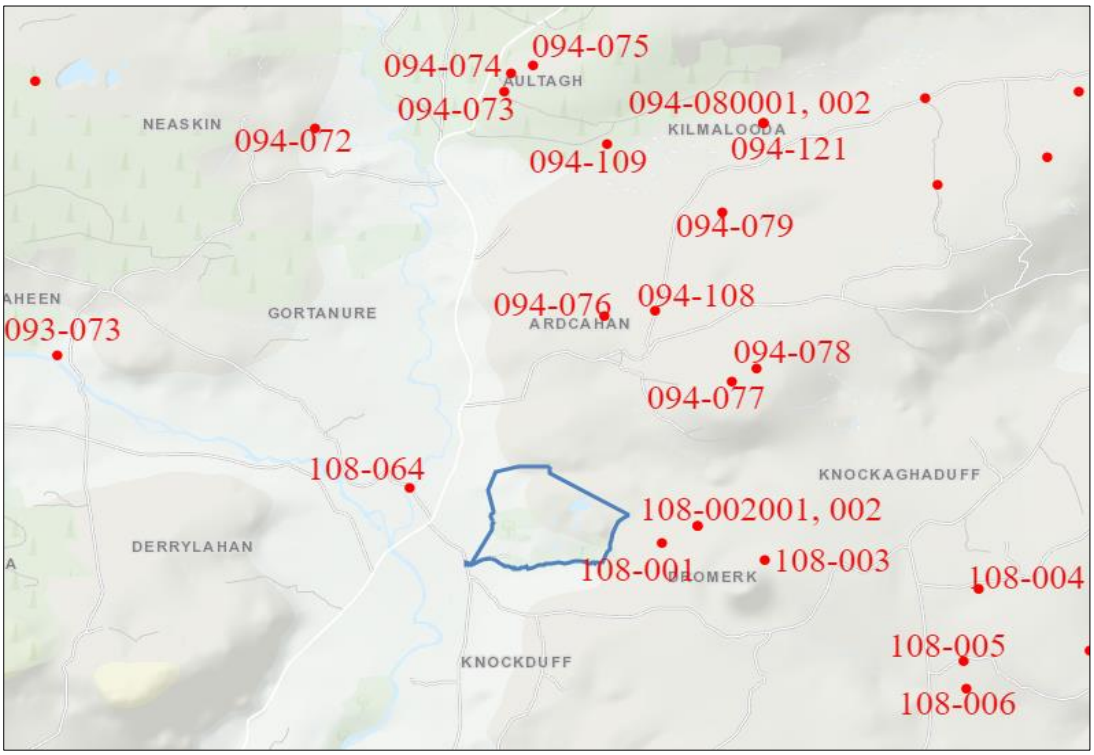


Figure - 15.2 OS map with LOB outlined in Blue and RMP detail within a 2km radius (source: www.archaeology.ie)

Table 15.1 RMP and SMR sites within a 2km radius of the SCA

RMP	Site Type	Townland	Distance from SCA
CO108-001	Ringfort	Dromerk	250m to E
CO108-002001-	Enclosure	Dromerk	350m to E
CO108-002002-	Burial ground	Dromerk	350m to E
CO108-003	Ringfort	Dromerk	800m to E
CO108-004	Redundant record	Knockaghaduff	1.9km to E
CO108-005	Ringfort	Behagh	1.6km to SE
CO108-006	Redundant record	Behagh	1.9km to SE
CO108-064	Bridge	Gortanure/Ardcahan	380m to W
CO093-073	Horizontal wheeled mill	Keelaraheen	2km to NW
CO094-072	Circular enclosure	Neaskin	2km to NE
CO094-073	Ogham stone	Aultagh	1.9km to N
CO094-074	Ringfort	Aultagh	2km to N
CO094-075	Redundant record	Aultagh	2km to N
CO094-076	Standing stone	Ardcahan	900m to N
CO094-077	Ringfort	Ardcahan	1km to NE
CO094-078	Ringfort	Ardcahan	1.1km to NE
CO094-079	Ringfort	Ardcahan	1.6km to NE
CO094-080001-	Early ecclesiastical enclosure	Kilmalooda	2km to NE
CO094-080002-	Burial ground	Kilmalooda	2km to NE
CO094-108	Country house	Ardcahan	1km to NE
CO094-109	Redundant record	Aultagh	1.8km to N
CO094-121	Souterrain	Kilmalooda	2km to NE

Prehistoric Period

Mesolithic - (*c.* 8000 to 4000 BC)*; Neolithic* - (*c.* 4000 to 2400 BC)*; Chalcolithic* (c. 2450 – 2200 BC); *Bronze Age* (*c.* 2200 to 700 BC) – *Iron Age* (*c.* 700 BC to AD 400).

15.2.1 Mesolithic And Neolithic

The earliest evidence for human colonisation and settlement in Cork can be dated to 8000 BC, the Mesolithic Period. The people of this era were hunter-gatherers, entirely dependent on what food could be obtained through hunting and gathering, including edible plants and shellfish. They used flint and other hard stone to manufacture their tools, and their settlements can often be identified by locating scatters of these discarded stone tools in ploughed fields. The transition of these early settlers from hunter/gatherers to a farming way of life in the Neolithic Period brought about revolutionary change. This led to more permanent settlements and substantial houses and a more complex and structured social hierarchy. A steady food supply meant that people had more time to increase their toolkit and domestic equipment and develop specialised crafts. While much evidence

for the Neolithic Period now remains below ground, the characteristic upstanding feature of this period is the Megalithic tomb.

There are no known archaeological sites dating to the Mesolithic or Neolithic Periods within the Study Area. The general lack of sites, however, does not mean that the region is devoid of such early settlement and use. In general, archaeological sites from the early Prehistoric Period leave little or no surface evidence on the landscape. In most cases they only come to light during archaeological testing/monitoring in association with industrial, residential and infrastructural development.

Consequently, the potential for finding archaeological sites from the period can never be overlooked and there is always the possibility of finding sites of prehistoric date below ground that would otherwise go undetected.

15.2.2 Chalcolithic And Bronze Age

The Chalcolithic, meaning the 'Copper and Stone Age' is a transitional phase in Ireland between the Neolithic and Bronze Age that is characterised by the adoption of copper metallurgy as an established technology prior to the use of bronze. This period is also frequently represented on excavated sites 'by the widespread cultural adoption of a new form of pottery, collectively referred to as Beaker Ware' (Hanley, 2013). The first metal to be used as a raw material in Ireland was unalloyed copper. Much evidence for primitive copper mining in Ireland has been discovered in the southwest, at Ross Island, Co. Kerry and Mountgabriel in Co. Cork. The communal burial tradition in large megalithic tombs of the Neolithic continued in this period in the form of wedge tombs. The great majority of megalithic tombs found in Co Cork are wedge tombs which generally date to this transitional period, the Chalcolithic period. The majority of wedge tombs conform to a general design; they have a pronounced wedge shape in plan and section with the entrance generally located at the broader southwestern end. The human remains interred in the monuments are generally cremated and grave goods frequently accompany them. Although there are no wedge tombs in the 2km study area, there are a large number in the wider landscape, which form part of this concentration at Milleennagun (CO121-038) approximately 9km to the south, at Keenrath (CO093-062) approximately 8km to the west, Inchincurka (CO093-052002-) approximately 5km to the northwest, Mamucky (CO094-005) approximately 6km to the north and Clashbredane (CO094-13) approximately 8km to the northeast. None of these monuments have been excavated but all are typical wedge tombs and are included in the Archaeological Inventories of Co Cork Volumes I and III (Power *et al.* 1992 and Power *et al.* 1997).

The Irish Bronze Age is characterised by the introduction of metallurgy, distinctive pottery styles, changes in burial traditions and an increase in population. The burial traditions of the Bronze Age were generally much simpler than the elaborate megalithic tombs of the earlier Neolithic and Chalcolithic periods, although these were frequently reused for later burials. Most Bronze Age burials, either cremated or inhumed, were placed in stone-lined cists or simple earth-cut pits often accompanied by grave goods. Some graves were marked with a cairn or a mound of stones, while others were marked by a mound of earth known as a barrow.

The erection of large unhewn stones in prominent locations was widespread and many date to the Early Bronze Age. Their exact function is unclear, although it is thought they were erected primarily for ceremonial and ritual purposes. They were often erected in prominent locations and may have marked routeways or tribal boundaries, but others may have marked burials or had a ceremonial or ritual purpose. An association exists between standing stones and other Bronze Age monuments such as stone circles, stone rows and stone pairs and many share a preference for a northeast – southwest alignment. There is one standing stone within the study area in Ardcahan (CO094-076) of which no upstanding trace now remains (Power *et al* 1992, 66). As the standing stone is no longer extant its alignment remains unknown.

Outside the study area there is a particularly noteworthy concentration of monuments dating to the Bronze Age, including stone circles, stone rows, standing stone pairs and lesser known monuments such as radial-stone cairns as well as the wedge tombs and standing stones discussed above. The closest to the SCA include a stone row (CO094-085) and radial stone cairn (CO094-125) in Behagullane 3km to the east and two standing stone pairs, one in Toom (CO108-011) 4km to the southeast and the other in Ballyhalwick (CO108-023) 4km to the south. This concentration of monuments extending across the valleys of the Rivers Lee and Bandon and their tributaries had been well-documented over many years. The precise reason for this concentration of activity remains elusive. It does, however, demonstrate large-scale human activity by a vibrant population over the broader landscape despite the relative paucity of activity within the study area itself.

15.2.3 Iron Age

The transition from bronze to iron working was a significant technological innovation, that had a major impact on agriculture, making it more efficient and productive and thus having an effect on society as a whole. Iron, a much harder substance than bronze, was used to make more efficient tools to clear large tracts of dense forest. It is around this time that we see the adoption of the La Tene style of art practiced by the Celtic peoples of Europe, a people who had been using iron as a far superior metal to bronze from around 1000 to 700 BC. This La Tene culture is represented in metalwork and some stone sculpture, mainly in the north and west of the country.

Burial practices included both cremation and inhumation, with remains interred in pits or in pre-existing tumuli. Burial monuments associated with this period include ring barrows, ring-ditches and embanked enclosures. Cremation burial appears to have declined in the Iron Age, a trend that has been attributed to a Roman and Christian influence.

Ogham is the earliest form of writing in Ireland, dating to approximately the early 5th century, during the transitional phase between the pagan Iron Age and the Early Medieval/Christian Period. Most surviving ogham stones are located in the southern part of the country, with Munster having the largest concentration of this monument type in either Britain or Ireland (Moore, 1998, 23). The ogham stones in Munster are found in various contexts, some associated with ringforts and enclosures, but the majority are linked to souterrains and ecclesiastical enclosures (*ibid*., 23). Many of the stones feature inscriptions that read the name of the person, followed by the name of their father and their tribe. According to Moore, the variety of contexts and their locations along geographical and political boundaries suggest that ogham stones may have served a broader function than merely being memorial monuments to the dead. They may also have been used to mark sacred places, burial grounds, tribal boundaries, church foundations, hermitages, or a combination of these (*ibid*., 25). Within the study area, there is one ogham stone at Aultagh (CO094-073) in Aultagh Wood, which bears an inscription on a flat face of the stone (Power *et al* 1992, 124).

15.2.4 Early Medieval Period (C. 500 To 1100 Ad)

This period in Ireland is characterised by the influx and influence of Christianity, which had become widely established by the 6th century AD. A distinctive feature of the development of early Irish Christianity was the significant role played by monasticism. From their monasteries, Irish monks embarked on pilgrimages, preaching the gospel and establishing new communities across the Continent. Monasteries became focal points for the lay communities spread throughout the countryside, in settlements such as ringforts/raths, crannogs and simple huts.

Ringforts are one of the most characteristic monuments of this period. There are seven ringforts in the study area in Behagh (CO108-005), Aultagh (CO094-074), three in Ardcahan (CO094-077, CO094-078 and CO094-079) and two in Dromerk (CO108-001 and CO108-003). Ringforts, also known by the names rath, lios, cathair or caiseal/cashel, generally consist of circular or sub–circular areas enclosed

by an earthen bank, made up of material thrown up from a concentric fosse outside the bank. The sub-surface remains of circular dwelling houses and associated outbuildings are frequently revealed within ringforts during excavation. More occasionally, evidence of specialised craftwork is also found during excavation, indicating the possibility of higher status sites. The main phase of construction and occupation of these sites dates from the beginning of the 7th century AD to the end of the 9th century. These sites would have been occupied by the elite and their families of the time while others of lower status in society lived outside the ringfort in small huts. Cattle dominated the agricultural economy of the period, with dairying being the primary pursuit. Tillage was secondary, the most important crops being wheat, oats, barley, rye and flax. In the absence of money (coinage did not become widespread until the medieval period), cattle were the indicator of one's status and were the currency for payment of fines, rent, tributes and gifts. Land was valued on the basis of the number of cows it could support (Feehan, 2003, 55). Cattle-raiding was widespread and the ringfort provided protection for the animals at night when they would have been kept within its defensive palisade (*ibid*. 62).

The closest ringfort to the SCA is the ringfort at Dromerk (CO108-001) 250m to the east. The monument is depicted on the OS 1842 map but no surface trace of it survives (Power *et al* 1992, 215). The other ringfort in the same townland (CO108-003) is a short distance to the east. This ringfort is upstanding and comprises an earthen bank and external fosse with a causeway, suggesting the presence of the entrance in the east (*ibid.* 167). The three ringforts in Ardcahan are located to the northeast of the SCA. Two are upstanding (CO094-077 and CO094-078) and the third (CO094-79) is no longer extant. Of the two that are upstanding one (CO094-078) is a small monument approximately 20m diameter defined by a low earthen bank and the other (CO094-078) is almost twice the diameter with a stone and earthen bank with a partially raised interior (*ibid*. 133 and 211). The ringfort in Aultagh (CO094-074) to the north was inaccessible when visited by the Archaeological Survey of Ireland (*ibid.* 211) and the ringfort in Behagh (CO108-005) to the east was barely discernible in a pasture field (*ibid.* 212).

There are two circular enclosures in the study area, one in Dromerk (CO108-002001-) approximately 350m east of the SCA and the other in Neaskin (CO094-072) to the north. The term enclosure is applied to archaeological sites, which cannot be definitively classified. Very often these enclosures are ringforts or cashels, which fall beyond the accepted size range for these monuments (i.e. less than 20m or more than 60m in diameter). Sometimes they can be of indeterminate shape and may date to as early as the Bronze Age or as recently as the last century when they were used as animal shelters. The enclosure in Neaskin defines a natural hillock of outcropping rock which is partially defined by a stone-faced earthen bank, a stone-faced scarp, an external fosse and a stream (*ibid.* 264). The enclosure in Dromerk defines a circular area enclosed by an eroded earthen bank topped in part by a modern stone wall. There is a burial ground (CO108-002002-) in the southeastern quadrant (*ibid.* 262) which is defined as a raised oval area with some grave markers present. The burial ground is marked 'burial ground for children on the 1842 OS 6-inch map (*ibid.* 299).

There is a second burial ground (CO094-080002-) within the study area in the early ecclesiastical enclosure at Kilmalooda (CO094-080001-). Early ecclesiastical enclosures are the earliest remains of Christian activity in the country and can date from the 6th century. These are the remains of scattered rural monasteries enclosed within usually circular or oval earthen banks ranging in size from 40m to 400m. The smallest of these may have contained churches, graveyards, dwellings, outbuildings, and workshops while the larger ones may have been akin to the size of a small town (*ibid.* 271). The early ecclesiastical enclosure at Kilmalooda (CO094-080001-) is approximately 100m in diameter. The bank is levelled and the western half destroyed by quarrying but a burial ground (CO094-080002-) and a souterrain (CO094-121) survive within the interior (*ibid.* 273). The burial ground is a sub-circular area in the southern quadrant of the enclosure with a mound to the southeast. A stone-lined grave was uncovered in 1981 during ground clearance but immediately filled in (*ibid.* 304). The souterrain was revealed during quarrying work in 1981 in the northern quadrant of the enclosure (it is the only

monument in the study area included in the Register of Historic Monuments). It comprised three chambers cut into gravel and significant collapse had occurred (*ibid.* 236). Souterrains are man-made underground tunnels leading to a chamber or series of chambers frequently associated with ringforts and ecclesiastical enclosures. They were used as areas of refuge in times of stress and probably had a secondary purpose as storage areas.

There is a horizontal wheeled mill in Keelaraheen (CO093-073), c. 2km to the northwest of the SCA on the River Bandon. These mills employed horizontal water wheels onto which water was directed by a wooden flume. They generally date from the early 7th to the late 10th century and they are the earliest example of hydro-engineering in the country (*ibid.* 289). The example at Keelaraheen was exposed by a mechanical excavator in 1976 and was dendrochronologically dated to *c.* AD 843 (*ibid.*).

15.2.5 Late Medieval To Early Modern Period (C. 12th Century To 19th Century)

There are no recorded monuments within the study area which date to the high medieval or late medieval periods (12th century – 16th century). However, two monuments date to the post medieval – early modern period (17th century – 19th century). Caha Bridge (CO108-064) is a road bridge with three semi-circular arches spanning the River Bandon, approximately 400m west of the SCA, between Gortanure to the west and Ardcahan to the east. Ardcahan House (CO094-108) is a country house situated 1km to the northeast of the SCA. While it is included in the RMP, no details are available on the ASI database. The Archive Files of the NMS were consulted, and the following information was retrieved: '*A 3-bay, 2-storey gable-ended residential house with unusual 1-bay, 2-storey concave-topped walls to the right and left. There is a central gabled (2-storey) projection to rear, with modern addition to right and stone-built addition to left*'. Ardcahan House is not listed in the Cork County Development Plan (2022-2028) and is not detailed in the National Inventory of Architectural Heritage.

15.2.6 Rivers And Streams

Waterways have always been a vital resource, encouraging human settlement along their banks and within their drainage areas from prehistoric times to the present. Their channels would have been central to activities such as transport, fishing and trade. As a result, there is a potential for archaeological finds and features associated with rivers and streams, either on their banks or within their beds. They are therefore considered Areas of Archaeological Potential (AAP).

An unnamed tributary of the Bandon River defines the eastern and part of the southern boundary of the SCA, forming the townland boundary between Ardcahan and Knockduff to the south and Ardcahan and Dromerk to the east. This small watercourse reaches the Bandon River approximately 500m southwest of the quarry. The northwestern townland boundary of Ardcahan is defined by the Caha River, after which the townland is named. This river flows south to join the Bandon River, 300m southwest of the SCA. The Caha River is bridged to the west of Ardcahan Quarry along a local road at Caha Bridge (CO108-064) while the Bandon River is bridged to the west along the R587 Dunmanway-Macroom Road at Ardcahan Bridge.

15.2.7 Cultural Heritage Of The Study Area

Ardcahan Quarry is located within the townland of Ardcahan in the parish of Fanlobbus, in the barony of East Carbery, in a rural, agricultural area of west County Cork, approximately 3.5km northeast of Dunmanway town. Dunmanway itself is a plantation town dating to the early 17th century, with two triangular 'squares' at its core (Pochin Mould 1992, 106). In the late 17th century, Cox described it as 'a fine English plantation' (O'Flanagan 1993, 410), and by the mid-18th century, it had become an important centre of linen production (*ibid.* 414). Lewis described the town of Dunmanway in 1837 as a relatively busy market town with its linen trade in decline but its corn trade expanding (Cadogan, 1998, 231). He describes the town as modestly consisting of 'one long street extending about half a

mile to the west of the bridge' which crosses the Bandon River and the 419 houses as 'indifferently built' but 'distinguished by an appearance of cleanliness and comfort'. The town is 'surrounded on the north, west and south by lofty hills, rocks and mountains' (*ibid.*) with the SCA is located to the north within these hills.

The quarry is located in the parish of Fanlobbus in Gaelic '*Fan Leaba Ois*' meaning the slope of the fawns bed. In former times, the surrounding district was known as Gleann-nacroim/Gleann Abha Croim or glen of the winding river, a name that is no longer in use (McCarthy, 2011). The Irish landscape is divided into over 62,000 townlands, a system of landholding that is unique in Western Europe for its scale and antiquity (O'Connor 2001, 7). Many townlands are pre-Anglo/Norman in origin and Irish historical documents consistently use townland names throughout the historic period to describe areas and locate events accurately in their geographical context. The townland names and boundaries were standardised in the nineteenth century when the Ordnance Survey began to produce large-scale maps of the country. Townlands existed long before the parishes and counties, original Irish names eventually anglicised based on how they sounded to English scribes.

The townland boundaries recorded by the Ordnance Survey, therefore, may well be aligned on older land divisions dating to early historic times and may physically overlie archaeological evidence for such early forms of land division. For this reason, they are considered Areas of Archaeological Potential (AAP). The social customs or history of the people who have lived in a particular place can often be reflected in the townland names, many of which describe the landscape of the area. The SCA and overall LOB lie within the townland of Ardcahan (*Ard Ceachan*) meaning 'the high land (height) of the River Caha' while part of the southern boundary of the SCA is aligned on the townland boundary of Ardcahan and Knockduff. Knockduff (An Cnoc Dubh) translates to 'the black hill'. The eastern boundary of the SCA aligns with the townland boundary of Ardcahan and Dromerk. Dromerk (*Drom Eirc*) translates to 'ridge' (www.logainm.ie). The townland names are descriptive of the natural rugged landscape of the quarry and surrounding region. The name Ardcahan, together with nearby townlands such as Knockduff and Dromerk, demonstrates how upland topography is embedded in townland naming traditions and reflected in historic land divisions. Thus, the mid-nineteenth-century Ordnance Survey mapping preserves earlier naming traditions that describe and reference the upland landscape.

The townland of Mallabraka, *c.* 2.5km to the west of Ardcahan Quarry, is the birthplace of Sam Maguire, born here in 1877, where the family farmed 200 acres. The townland of Mallabraka or 'land of the little hillocks' is now mostly under forestry. Sam Maguire worked for a time in the British Civil Service in London and captained the London Hibernians Gaelic football team, which won several All-Ireland finals between 1900 and 1904. A noted nationalist, he recruited Michael Collins to the Irish Republican Brotherhood in 1909 and served as Collins's chief of intelligence officer in London. Maguire became a central figure in the investigation into the assassination of Sir Henry Wilson and fled to Dublin in 1923, where he secured a position in the newly established Irish Civil Service. However, due to his Anti-Treaty sympathies, he clashed with his superiors and was dismissed. He developed TB and died penniless in 1927 (Walsh, 2003). Sam Maguire is buried in St. Mary's Cemetery in Dunmanway. After his death, the Sam Maguire Cup, designed like the Ardagh Chalice, was presented to the Gaelic Athletic Association in his honour. The former home of Sam Maguire is now a visitor centre, and a complex of eight holiday homes has been built in its grounds.

A notable landscape feature to the southwest of Ardcahan Quarry is Mount Gunnery, known locally as Yew Tree Hill. This tree-less, rocky formation is a popular hiking route, and an activity centre, Funmanway, is situated on its northern side. On the west side of Mount Gunnery, *c.* 2km to the southwest of the quarry, are a grotto and holy well. The holy well is not listed in the RMP. The tradition of visiting holy wells goes back to the very beginnings of Irish Christianity, but most wells probably have their origin in pre-Christian ritual activities. The majority of the 'wells' are springs or just depressions in rocks where rainwater collects; some have more recently constructed stone or concrete surrounds (Power 1994, 171). Some wells are still maintained for holy use when at certain

times of the year they would be visited in the form of a pilgrimage often referred to as a 'round' or 'pattern'. Other wells are known through tradition for their reputed curative properties. Patrick Logan in his book 'The Holy Wells of Ireland' notes the long tradition of visiting holy wells down through the centuries and lists many of the customs that have been associated with these sites. Customs such as leaving votive offerings at the well is an essential part of the pilgrimage to the site. Offerings of money, stones, pieces of cloth, buttons, brooches and other everyday items are commonplace (Logan, 1992, 116). Offerings may be left at the side of the well, tied to a nearby tree or thrown into the well. Holy wells are so abundant in Ireland that most parishes in the country have at least one such site, whether they are in use or not (*Ibid*, 14). The holy well on the western side of Mount Gunnery is well maintained and in use and has a dedication plaque which reads '*Blessed on 15-8-2000 by Rev. Canon Denis Forde P.P. Dunmanway'.* The grotto, a short distance to the north of the holy well is also well maintained and has a large car parking area to the front, used by visitors to both the grotto and those wishing to hike Mount Gunnery. The grotto has a dedication plaque that reads ''*Erected by Sean Kelleher during the Marian year 1988. Blessed by Canon D. McCarthy Dunmanway on 15th August* (Figures 1 & 2 in Appendix 15.1).

15.2.8 Cartographic Information

There are two Ordnance Survey (OS) maps dating to the second half of the 19th century and very early 20th century. In the mid-20th century, the OS revised these maps and published a third edition. Unfortunately, the third edition did not cover the entire country, and the SCA is among the areas without a third edition. The published maps depict field layout and usage during the second half of the 19th century and very early 20th century.

On the 1842 OS 6-inch map (Fig. 15.3), the SCA comprises the western, south-western sections of a large mixed wooded area with outcropping rock. The southwest of the SCA contains two irregular-shaped fields. Within the westernmost field, there is an unnamed rectangular structure orientated northeast/southwest, some trees and a short path to the wooded area. The northern end of the SCA is generally open rough pasture with outcropping rock and sections of two irregular-shaped fields to the northwest. These fields are featureless, except for the presence of a Trigonometrical Station in the western one, marked 371 Ht. OD.

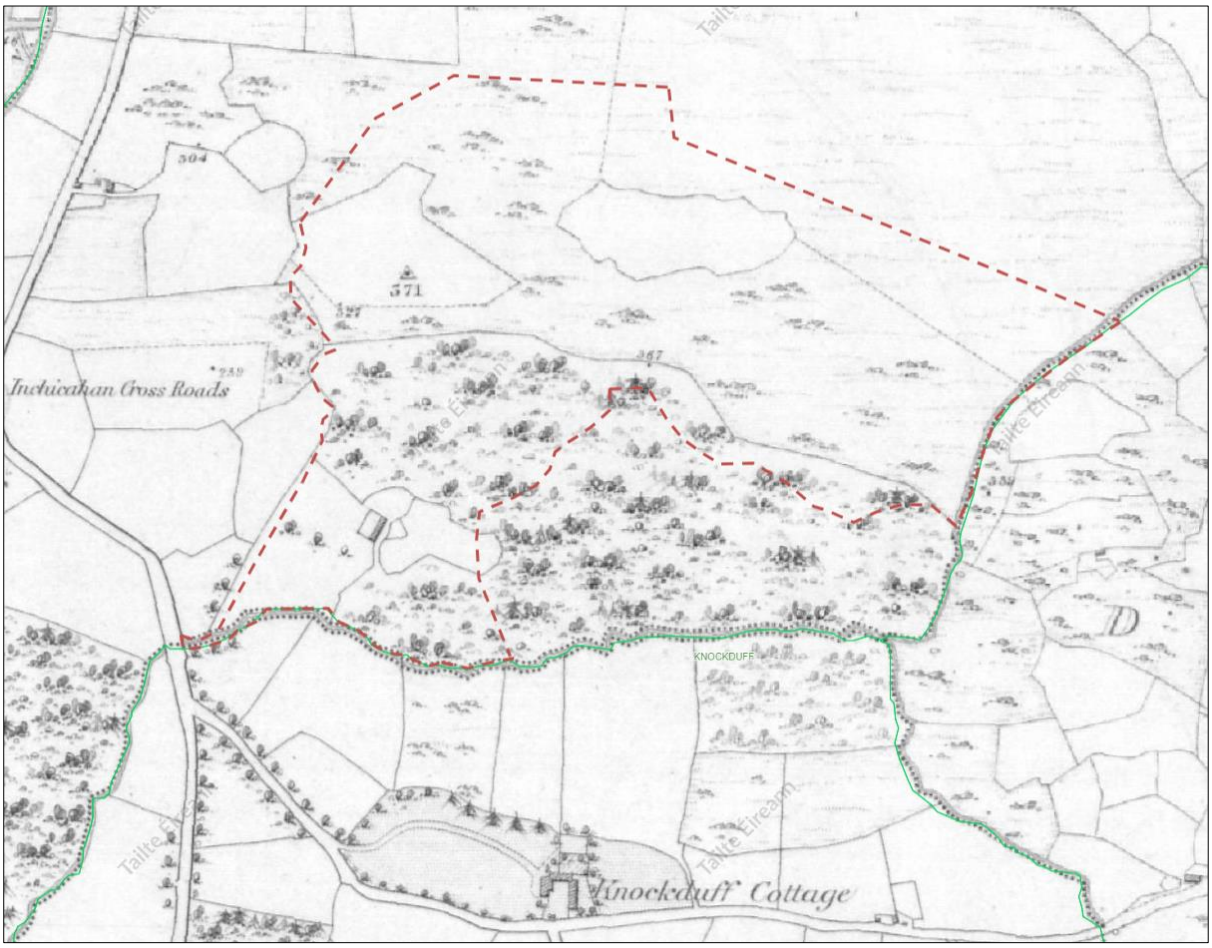


Figure - 15.3 OS 6-inch map (1841-42) with approximate SCA boundary outlined in red (source: www.archaeology.ie).

The 1902 OS 25-inch map (Fig. 15.4) shows a similar layout of the SCA with some minor changes since the mid-19th century. The large, wooded area is now named Clashnagallagh Wood, and several unfenced roads are depicted extending through it. A small, irregular field has been partially defined just inside the southern edge of the wood, within the SCA. The wooded area has contracted slightly along its north-eastern edge, where rough pasture and outcropping rock are now shown. The open, rough pasture at the north of the landholding has expanded to the north and into the two irregular fields, with the eastern one having been amalgamated into the open area. The two irregular fields to the southwest are shown similarly to how they appeared in the mid-19th century, with the unnamed structure still extant in the western one. A small rectangular field, or haggard, encloses it to the south and a number of small, additional unnamed structures are present. A pathway is now shown extending southwest from the main structure towards the stream along the southern boundary of the SCA, continuing onwards to the road to the west.

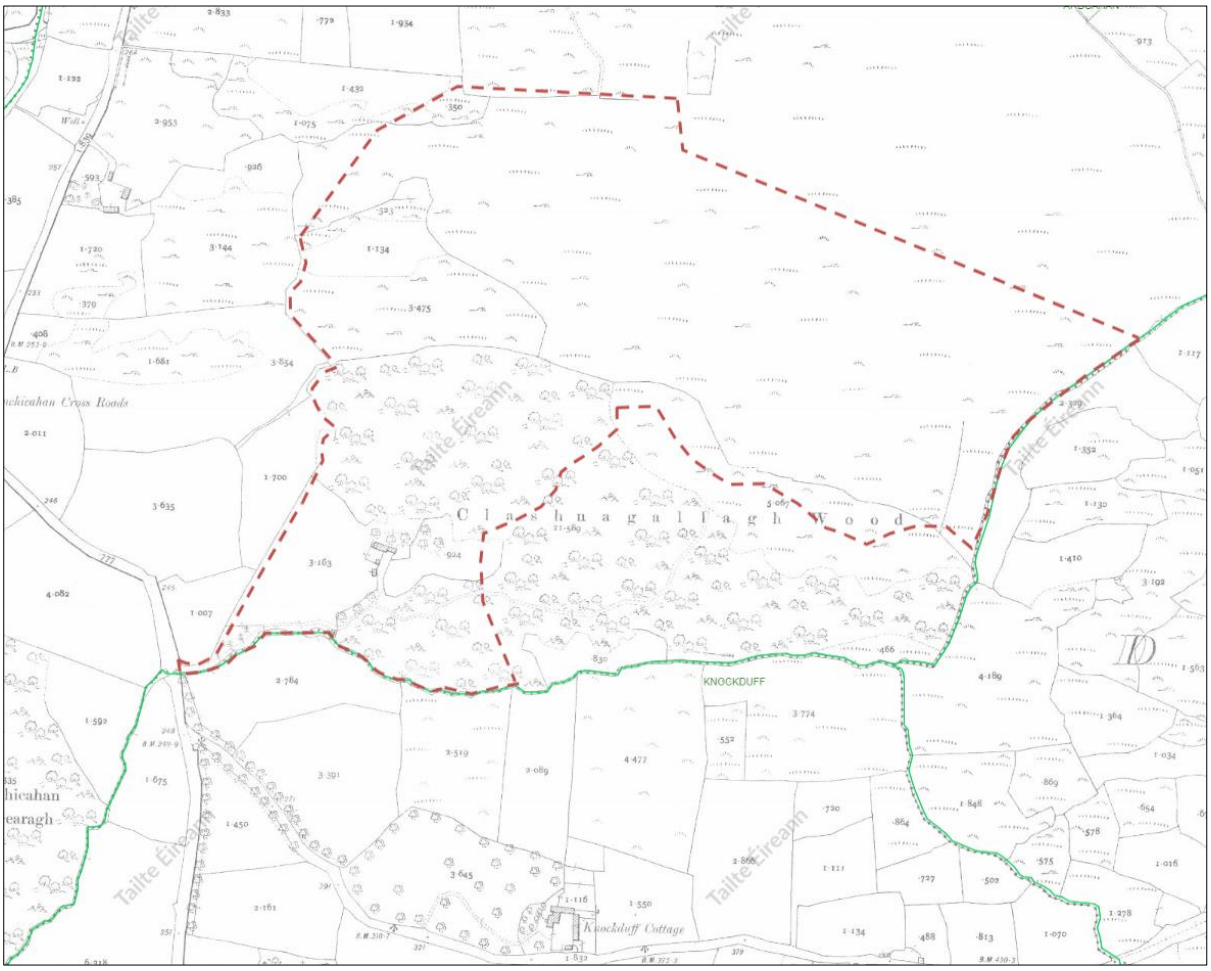


Figure - 15.4 OS 25-inch map (1902) with approximate SCA boundary outlined in red (source www.archaeology.ie)

15.2.9 Walkover Survey

The primary purpose of the walkover survey was to assess the physical environment of the SCA and to identify any possible features of cultural heritage significance. Current land use, local topography and environmental conditions are evaluated to gain an overall understanding of the area. Walkover surveys were conducted on June 24th, 2014 (as part of the 2014 EIS), May 12th 2020, and February 16th 2023. On all occasions, no features, deposits, or finds of archaeological potential were identified (Figures 3-11 in Appendix 15.1). Figure 15.5 illustrates the various elements that comprise the quarry, while the aerial photograph in Figure 15.6, provides a clear representation of the SCA and other components within the overall LOB.

Ardcahan Quarry occupies a small hill in the basin of a valley that is surrounded by higher peaks and ridgelines in a rural location, of low-density housing and modest farms. The quarry is accessed from a minor road, L4621-9, known locally as Hospital Road, near its junction with R587 at Inchicahan Cross Roads. This regional road provides a link between Dunmanway to the south and Macroom to the north. Within the LOB, a substantial portion of the southern end has been worked out.

The land within the SCA (19.1 hectares) contains one quarried area, located at the southwestern end of the LOB (Figure 3 in Appendix 15.1). This area lies to the west of the older, central quarry, which was excavated prior to 1990 and does not form part of this assessment. On the 1842 OS map, both of these quarried areas are depicted as woodland (Fig. 15.3) and are labelled 'Clashnagallagh Wood' on

the later 1902 OS 25-inch map (Fig. 15.4). Remnants of this undisturbed, former mixed woodland remain within the SCA, to the south of the quarry access road along the southern boundary.

Outside of the quarried areas to the south, the remainder of the SCA comprises a mix of dense scrubland, featuring heather, gorse, bramble and trees interspersed with large sections of exposed rock outcrop. Much of this scrubland is impenetrable and was not accessed (Figures 5-7 in Appendix 15.1). Numerous areas of hardstanding, some quite extensive, are present, along with several settlement ponds and a network of internal roads connecting these areas (Figures 8-10 in Appendix 15.1). In the northeast, a large shallow pond is visible in the 2005 aerial photographs but does not appear in the earlier 2000 image (Figure 11 in Appendix 15.1). Other artificial ponds have dried up over the years and have since been recolonised by moist ground grassland, rushes and sedges.

Within the SCA, potential undisturbed areas of ground comprise the following;

- Undisturbed natural woodland, a mix of oak, ash, birch and holly, densely planted and reaching heights of 8-15m along the southern boundary.
- Undisturbed natural scrub which is a mix of heather, gorse, bramble and willow, typically less than 3m in height, left as pockets between access roads, quarried areas, hardstanding, and artificial ponds.

No features, deposits or finds of archaeological potential were identified during the course of the walkover surveys.

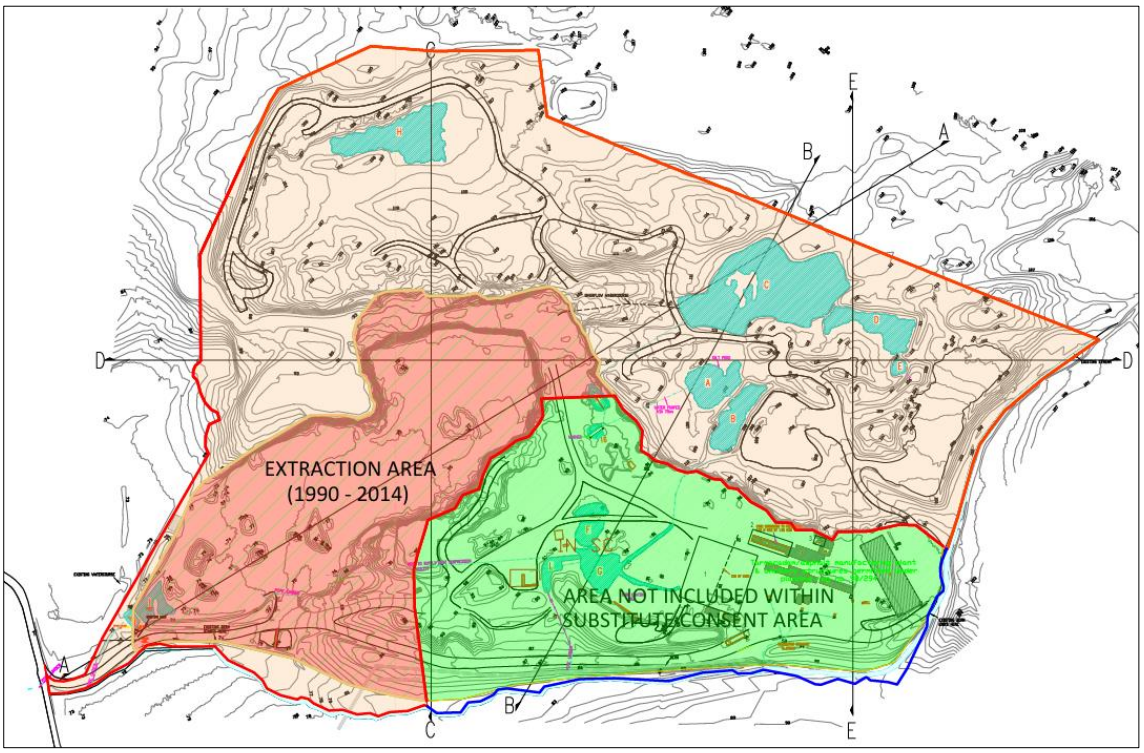


Figure - 15.5 OS map of the quarry with SCA outlined in red (after McCutcheon Halley)



Figure - 15.6 OS aerial view of quarry with SCA outlined in red (source www.google.ie)

15.3 Impact Assessment

The assessment of both direct and indirect impacts during the construction and operational phases within the SCA between 1990 and 2014 has been undertaken in accordance with Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022) under the following headings;

- Effects which have occurred: A retrospective assessment of activities undertaken within the SCA between 1990 and 2014;
- Effects which are occurring: Effects that continue to occur as a result of quarrying activity within the SCA between 1990 and 2014;
- Effects which can reasonably be expected to occur: Anticipated effects that could reasonably be attributed to quarrying activity within the SCA between 1990 and 2014.

15.3.1 Do Nothing Scenario

Had the development not occurred within the SCA, it is possible that previously unrecorded archaeological sites may have remained undisturbed within the overgrown scrub or beneath the natural ground surface. In such a scenario, the integrity of the upland rugged cultural landscape, which contributed the townland name (Ardcahan), would likely have been preserved intact.

15.3.2 Construction Phase

Construction works within the SCA between 1990 and 2014 comprised the following;

- Excavation and removal of soils and vegetation;
- Construction of settlement ponds;
- Construction of a berm.

15.3.2.1 Effects which have Occurred

Known recorded archaeological sites

There are no recorded archaeological sites within the SCA or within the LOB. Construction works within the SCA have not impacted any known archaeological site.

- No direct or indirect significant effects have occurred on any known recorded archaeological site.

Potential previously unknown archaeological sites or features

Much of our archaeological heritage survives only as subsurface remains, often hidden from view. Construction works within the SCA have significantly altered the natural terrain and ground levels. In the greater part of the SCA (in quarried and hard surface areas, ponds and internal roads) natural scrubland and trees were removed, topsoil stripped and the ground levels reduced. No archaeological site investigations or monitoring of ground works were carried out during construction works between 1990 and 2014 within the SCA. Consequently, it is not possible to determine whether any previously unknown archaeological sites or features were present.

- In the absence of any archaeological mitigation measures, construction works within these areas would have had a direct, negative impact on any potential previously unknown surface or subsurface archaeological sites. The significance of the effect could have ranged from slight to profound; however, it cannot be quantified, as any potential archaeological sites that may have been present would have been removed. Archaeology is a finite, non-renewable resource, so the impact on such sites would be permanent.
- It is also possible that no previously unknown archaeological sites existed within the SCA, in which case no direct or indirect significant effects would have occurred.

Within the SCA there are pockets of potentially undisturbed areas of ground (noted in Section 15.2.9 above). Walkover surveys conducted in 2014, 2020 and 2023 did not identify any finds or features of archaeological potential. However, due to the impenetrable nature of the overgrown scrubland, much of it remained inaccessible. It is therefore possible that previously unknown upstanding or subsurface archaeological features may exist within these areas.

- Construction works within the SCA may not have impacted these potentially undisturbed areas. As a result, previously unknown surface or subsurface archaeological sites may still be present in these areas.

An unnamed tributary of the Bandon River forms part of the southern and eastern site boundary of the SCA and also serves as the townland boundary between Ardcahan and Knockduff to the south and Ardcahan and Dromerk to the east. In this assessment, rivers and townland boundaries have been identified as AAP's. Construction works within the SCA have not impacted these watercourses. Consequently, it is possible that previously unknown surface or subsurface archaeological sites may be present within the river or along its banks.

- No direct or indirect significant effects have occurred on the watercourses that border the SCA.

Architectural Heritage

There are no protected structures listed in the County Development Plan 2022-2028, nor are there any entries in the NIAH within the SCA or the LOB. Construction works within the SCA have not impacted any known site of architectural merit.

- No direct or indirect significant effects have occurred on any known site of architectural merit.

Cultural Heritage

Cultural heritage includes archaeology, architecture and the wider historic landscape, reflected in placenames that preserve past perceptions of place. The townland of Ardcahan ('high land of the River Caha') and surrounding names such as Knockduff ('black hill'), Dromerk ('ridge') and Derrylahan ('broad wood') describe a rugged upland landscape characterised by height, slope and wooded cover. These names demonstrate a strong association between topography and identity within the historic landscape.

Nineteenth-century OS mapping (1842; Fig.15.3 and 1902; Fig. 15.4) shows extensive woodland cover across what is now the quarry footprint, labelled Clashnagallagh Wood on later mapping. Woodland originally occupied much of the southern central portion of the wider site, extending into the SCA and eastwards to the area now occupied by the macadam plant. While the extent of woodland survival into the late twentieth century is uncertain, aerial imagery from 1995 confirms that tree cover persisted within the southwest of the SCA at that time, with earlier clearance already evident to the east.

Quarrying between 1990 and 2014 progressively removed this woodland cover and modified the underlying landform, permanently altering the rugged upland character recorded on historic mapping. Only marginal remnants of the formerly wooded landscape survive south of the quarry access road along the southern boundary of the SCA (see also Chapter 14 Biodiversity).

These changes have reduced the ability of the modern landscape to communicate the upland character embodied in local placenames, weakening the relationship between physical landscape and cultural identity.

- Construction works within the SCA between 1990 and 2014 have had a direct, negative, significant, and long- term effect on the cultural landscape of the SCA and surrounding area.

15.3.2.2 Effects which are occurring

No direct or indirect significant effects are occurring on the archaeological, architectural or cultural heritage environment as a result of construction works within the SCA between 1990 and 2014.

15.3.2.3 Effects which are reasonably expected to occur

No direct or indirect significant effects are reasonably expected to occur on the archaeological, architectural or cultural heritage environment as a result of construction works within the SCA between 1990 and 2014.

15.3.3 Operational Phase

Operational works within the SCA between 1990 and 2014 comprised the following;

- Blasting and drilling
- Crushing and Screening
- Stockpiling of overburden
- Discharge of water to settlement ponds
- Transportation to and from the site

15.3.3.1 Effects which have Occurred

No direct or indirect significant effects have occurred on the archaeological, architectural or cultural heritage environment as a result of operational works within the SCA between 1990 and 2014.

15.3.3.2 Effects which are occurring

No direct or indirect significant effects are occurring on the archaeological, architectural or cultural heritage environment as a result of operational works within the SCA between 1990 and 2014.

15.3.3.3 Effects which are reasonably expected to occur

No direct or indirect significant effects are reasonably expected to occur on the archaeological, architectural or cultural heritage environment as a result of operational works within the SCA between 1990 and 2014.

15.3.4 Visual Impacts

15.3.4.1 Effects which have Occurred

Archaeology

The nearest archaeological sites to the SCA and LOB are a ringfort (CO108-001) 250m to the east and an enclosure and burial ground (CO108-002001- and CO108-002002-) 350m to the east in the adjoining townland of Dromerk. The ringfort is levelled and has no above-ground expression while the enclosure is eroded and is not highly visible in the landscape.

- No direct or indirect significant visual effects have occurred on these two recorded archaeological sites.

The next closest archaeological site is Caha Bridge (CO108-064) situated *c.* 400m to the west spanning the townlands of Ardcahan and Gortanure. The bridge is not visible from the quarry site and views to the quarry site from the bridge are screened by layers of intervening vegetation.

- The visual impact on Caha Bridge has been assessed in Chapter 11: Landscape and Visual as imperceptible. Consequently, an imperceptible indirect visual effect has occurred on one recorded archaeological site.

Architecture

No direct or indirect significant visual effects have occurred on the architectural environment as a result of construction and operational works within the SCA between 1994 and 2014.

Cultural Heritage

Construction works within the SCA between 1994 and 2014 have had a negative, significant, and long-term visual effect on the cultural landscape of the SCA and surrounding area.

15.3.4.2 Effects which are occurring

No direct or indirect significant visual effects are occurring on the archaeological, architectural or cultural heritage environment as a result of construction works within the SCA between 1994 and 2014.

15.3.4.3 Effects which are reasonably expected to occur

No additional direct or indirect significant visual effects are reasonably expected to occur on the archaeological, architectural or cultural heritage environment as a result of construction works within the SCA between 1994 and 2014.

15.3.5 Risk of Major Accidents and Disasters

In the event of a major accident or disaster, no significant effects on the archaeological, architectural and cultural heritage environment are anticipated.

15.3.6 Cumulative Impacts

Cumulative effects consider the potential impacts of the existing macadam plant at the southeast of the SCA, as well as any proposed or recently approved developments in the surrounding area that could amplify or alter the significance of the effects associated with the quarry.

There are no other industrial or business developments in the immediate vicinity of the quarry. While no significant cumulative effects have occurred, are occurring, or are reasonably expected to occur on the archaeological or architectural resource, quarrying activity combined with the construction and operation of the macadam plant has resulted in a cumulative loss of historic woodland cover and modification of the upland landform recorded on nineteenth-century mapping within the SCA.

15.4 Remedial Measures

15.4.1 Construction and Operational Phase

Construction works carried out within the SCA between 1990 and 2014 will have removed any surface or subsurface archaeological sites that may have existed in these areas. In the absence of archaeological mitigation, these works would have caused a direct, negative impact on any previously unknown archaeological sites, both on the surface and below ground. No remedial measures can reverse or alter this effect.

15.5 Residual Impacts

A significant portion of the SCA consists of quarried areas and sections where topsoil has been stripped for ancillary works such as roadways, storage areas, settlement ponds. These activities would have removed any surface or subsurface archaeological sites that may have been present in these areas. In the absence of archaeological mitigation, construction works within these areas would have had a direct, negative impact on any potential previously unknown surface or subsurface archaeological sites. As archaeology is a finite, non-renewable resource, the impact on any potential archaeological sites, whether surface or subsurface would be permanent. No remedial measures will alter this effect.

15.6 Statement on the Significant Effects on the Environment

This retrospective assessment identifies the potential direct and indirect impacts, if any, on the archaeological, architectural and cultural heritage environment that have occurred, are occurring or can reasonably be expected to occur as a result of construction and operational activities within the Substitute Consent Area (SCA) of the quarry at Ardcahan between 1990 and 2014. The findings are summarised as follows;

Effects Which Have Occurred

Archaeology

No effects have occurred on any known recorded archaeological site, as none are located within the SCA or LOB.

The removal of topsoil, reduction of ground levels, excavation of ponds, construction of internal roadways and the development of hardstanding areas would have removed any previously unknown surface or subsurface archaeological sites that may have been present.

In the absence of archaeological monitoring or testing during the 1990-2014 period, the extent of loss cannot be quantified. However, any such loss would represent a direct, negative, permanent effect on the archaeological resource, which is finite and non-renewable.

Pockets of inaccessible scrub remain within the SCA and may retain undisturbed archaeological deposits; construction works did not impact these areas.

Architecture

There are no protected structures or NIAH-listed buildings within the SCA or LOB, and no effects have occurred on any architectural heritage resource.

Cultural Heritage

Quarrying within the SCA between 1990 and 2014 removed the remaining vegetation and significantly altered the upland landform, resulting in the permanent loss of the rugged topographic character recorded on 19th century mapping. These changes have substantially reduced the capacity of the modern landscape to reflect the upland qualities embedded in local placenames such as Ardcahan ('the high land of the River Caha'). The effect on cultural heritage is negative, significant and long-term.

Effects Which Are Occurring

There are no ongoing direct or indirect significant effects on archaeological, architectural or cultural heritage arising from the historic development undertaken within the SCA between 1990 and 2014.

Effects Which Can Reasonably Be Expected to Occur

As this is a retrospective assessment of development undertaken between 1990 and 2014, no further direct or indirect significant effects are reasonably expected to occur on the archaeological, architectural or cultural heritage environment. All effects arising from the historic development have already occurred and no ongoing or future impacts are anticipated.

Conclusion

The principal environmental effects arising from the development undertaken between 1990 and 2014 relate to the permanent loss of any previously unknown archaeological sites in areas where topsoil stripping and ground reduction occurred, and to the significant, long-term alteration of the cultural landscape caused by the removal of historic woodland and the reshaping of the natural rugged landform.

No significant effects have occurred, are occurring, or are reasonably expected to occur in relation to architectural heritage, as no structures or features of architectural merit are present within the SCA or the LOB.

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Murray Brothers Tarmacadam Ltd

CHAPTER 16
SIGNIFICANT INTERACTIONS OF IMPACTS

VOLUME II
MAIN STATEMENT

FEBRUARY 2026

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16 Significant Interactions of Impacts

16.1 Introduction

The construction, operational and cumulative impacts of the development have been assessed within each chapter of the rEIAR. This chapter identifies the interactions and describes the potentially significant interactions of impacts identified in the previous chapters.

The potential cumulative effects of the proposed project in combination with other permitted developments in proximity has been considered in each chapter as relevant.

16.1.1 Author Information and Competency

This chapter was prepared by Martina Keenan Rivero of McCutcheon Halley Chartered Planning Consultants. Martina holds a BSc (Hons) in Spatial Planning from Technological University Dublin and an Advanced Diploma in Planning and Environmental Law from Kings Inns. She has 10 years of professional experience in both the public and private sector. Martina has coordinated the preparation of Environmental Impact Assessment Reports for a range of project types. Relevant experience includes large housing developments, mixed-use schemes, commercial and tourism projects, including the following developments that received permission:

- Southwest Gate – A mixed-use scheme across 13 blocks comprising 1,123 residential units with supporting amenities, retail units, office accommodation, a primary healthcare centre, gym, cultural centre, childcare facility, hotel and a series of public open spaces.
- Primark Distribution Centre – Construction of a Distribution Centre incorporating office floor space and ancillary buildings with a cumulative gross floor area of approx. 64,550 sq.m and associated site works.
- Oscar Traynor Road – Construction of 853 residential units (social, affordable and cost rental homes), together with a creche, retail unit/café, community facilities and a new public park.
- Inis Cealtra Visitor Experience - Proposed Visitor Centre and associated visitor facilities at Inis Cealtra (Holy Island) and Mountshannon Village, Co Clare.

16.1.2 Assessment Methodology

16.1.2.1 Legislative Requirements

The rEIAR has considered and assessed the interactive effects and cumulative impacts arising from the construction and operation of the quarry at Ardcahan based on best scientific knowledge. Interactive effects (or interactions), specifically refer to any direct or indirect effects caused by the interaction of environmental factors as outlined in Article 3 (1) of the amended EIA Directive;

> *"The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:*
>
> *(a) population and human health;*
>
> *(b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;*

(c) land, soil, water, air and climate;

(d) material assets, cultural heritage and the landscape;

(e) the interaction between the factors referred to in points (a) to (d).

"Annex IV of the amended Directive states that a description of impacts should include:

> *"…the direct effects and any indirect, secondary, cumulative, short, medium and longterm, permanent and temporary, positive and negative effects of the project"*

The relevant interactions and interdependencies between specific environmental aspects have been summarised in the matrix set out in Table 16-1.

16.2 Description of Interactions

Based on the assessments undertaken by the specialist consultants as set out in the previous chapters of this rEIAR, the primary interactions that are considered to have occurred are set out in Section 16.2.1

The potential significant impacts have been considered within the relevant discipline and remedial or mitigation measures outlined where appropriate, and in conclusion potentially significant interactions are identified in Section 16.3.1.

16.2.1 Population and Human Health

- **Land, Soils and Geology:** Site clearance may have resulted in increased dust and particulate emissions to air as well as the potential to release contaminated soils to the local environment. Potential effects on amenity on local residents or the wider study area as a result of the visibility of construction activities and changes to the landscape such as removal of topsoil, tree cover and vegetation to construct settlement ponds, etc
- **Air Quality and Climate:** Construction and operation activities may result in a decrease in local air quality which have negatively impacted on the health of staff, visitors, or temporary receptors such as pedestrians passing the site. It is not likely that any impacts occurred to residents in proximity to the site.
- **Noise and Vibration**: increased levels of noise and vibration as a result of the construction and operation of the quarry including blasting may have resulted in negative impacts to the amenity of local residents. This is not ongoing as the quarry is not operational.
- **Landscape and Visual**: The changes to the landscape, loss of vegetation and the loss of the woodland may have had negative impacts on residents if the changes were perceived negatively. However, it is likely that over time the screening provided by berms and the growth of vegetation has softened any perceived negative impacts.
- **Traffic and Transport**: Interactions with HGVs delivering product to and removing product from the quarry may have resulted in potential impacts to health and safety, through an increased risk of collisions. This is not ongoing as the quarry is not operational.

16.2.2 Land, Soils and Geology

- **Population and human health:** Site clearance may have resulted in increased dust and particulate emissions to air as well as the potential to release contaminated soils to the local environment. Potential effects on amenity on local residents or the wider study area as a result of the visibility of construction activities and changes to the landscape such as removal of topsoil, tree cover and vegetation to construct settlement ponds, etc
- **Water (Hydrology and Hydrogeology):** Quarrying activities may have resulted in discharge of contaminated run-off to surface water.
- **Landscape and Visual Impact:** Potential effects of site clearance during construction and quarrying activity on views and visual amenity. The development has the potential to negatively alter the composition of the view from a viewpoint.
- **Biodiversity:** Site clearance resulted in the loss of vegetation including woodland and heath. The construction and operation of the quarry has resulted in the creation of new features of benefit for fauna diversity at site, including dystrophic lakes and exposed quarry cliff face for nesting Annex I Peregrine Falcon.
- **Cultural Heritage and Archaeology:** undiscovered sub-surface remains may have been damaged or destroyed. Construction works within the SCA between 1994 and 2014 have had a negative, significant, and long-term effect on the cultural landscape of the SCA and surrounding area as a result of the loss of Clashnagallagh Wood and the change to the natural rugged landscape.

16.2.3 Hydrology and Hydrogeology

- **Land, Soils and Geology**: Quarrying activities may have resulted in discharge of contaminated run-off to surface water.
- **Biodiversity:** any negative impacts on water quality such as increased discharge of silt or sediment to surface water may have resulted in impacts to biodiversity downstream of the site. The creation of the settlement ponds would have resulted in features of benefit for fauna diversity at site (including dystrophic lakes and exposed quarry cliff face for nesting Annex I Peregrine Falcon.

16.2.4 Air Quality and Climate

- **Population and Human Health:** Construction and operation activities may result in a decrease in local air quality which have negatively impacted on the health of staff, visitors, or temporary receptors such as pedestrians passing the site. It is not likely that any impacts occurred to residents in proximity to the site.
- **Traffic and Transport**: Traffic and operation of machinery at the site may have resulted in increased dust and emissions to air. This is not ongoing as the quarry is not operational.

16.2.5 Noise and Vibration

- **Population and Human Health**: increased levels of noise and vibration as a result of the construction and operation of the quarry including blasting may have resulted in negative impacts to the amenity of local residents. This is not ongoing as the quarry is not operational.
- **Traffic and Transport**: Activity during day to day operations such as blasting and the use of HGVs may have given rise to local noise and vibration which may have an impact on the amenity of local residents. This is not ongoing as the quarry is not operational.

- **Biodiversity**: Noise and vibration as a result of construction and operation activities may have resulted in the displacement of fauna including birds within or in close proximity to the site. The effect is not ongoing as the quarry is not operational.

16.2.6 Landscape and Visual Impact

- **Population and Human Health**: The changes to the landscape, loss of vegetation and the loss of the woodland may have had negative impacts on residents if the changes were perceived negatively. However, it is likely that over time the screening provided by berms and the growth of vegetation has softened any perceived negative impacts.
- **Land, Soils and Geology:** Potential effects of site clearance during construction and quarrying activity on views and visual amenity. The development has the potential to negatively alter the composition of the view from a viewpoint.
- **Biodiversity**: The changes to the landscape and the loss of vegetation including the woodland and heath would have had a negative impact on biodiversity. The proposed landscape plan is anticipated to have a positive impact on biodiversity as areas are encouraged to revegetate naturally, existing woodland and dry siliceous heath is to be retained, and areas adjacent to the remaining woodland are to be planted with a native woodland mix.

16.2.7 Traffic and Transport

- **Population and Human Health**: Interactions with HGVs delivering product to and removing product from the quarry may have resulted in potential impacts to health and safety, through an increased risk of collisions. This is not ongoing as the quarry is not operational.
- **Noise and vibration**: Activity during day to day operations such as blasting and the use of HGVs may have given rise to local noise and vibration which may have an impact on the amenity of local residents. This is not ongoing as the quarry is not operational.
- **Air Quality and Climate**: Traffic and operation of machinery at the site may have resulted in increased dust and emissions to air. This is not ongoing as the quarry is not operational.

16.2.8 Biodiversity

- **Land, Soil and Geology:** Site clearance resulted in the loss of vegetation including woodland and heath. The construction and operation of the quarry has resulted in the creation of new features of benefit for fauna diversity at site, including dystrophic lakes and exposed quarry cliff face for nesting Annex I Peregrine Falcon.
- **Hydrology and Hydrogeology:** any negative impacts on water quality such as increased discharge of silt or sediment to surface water may have resulted in impacts to biodiversity downstream of the site. The creation of the settlement ponds would have resulted in features of benefit for fauna diversity at site (including dystrophic lakes and exposed quarry cliff face for nesting Annex I Peregrine Falcon.
- **Noise and Vibration**: Noise and vibration as a result of construction and operation activities may have resulted in the displacement of fauna including birds within or in close proximity to the site. The effect is not ongoing as the quarry is not operational.
- **Landscape and Visual Impact**: The changes to the landscape and the loss of vegetation including the woodland and heath would have had a negative impact on biodiversity. The proposed landscape plan is anticipated to have a positive impact on biodiversity as areas are encouraged to revegetate naturally, existing woodland and dry siliceous heath is to be

retained, and areas adjacent to the remaining woodland are to be planted with a native woodland mix.

16.2.9 Cultural Heritage and Archaeology

- **Land, Soils and Geology:** undiscovered sub-surface remains may have been damaged or destroyed. Construction works within the SCA between 1994 and 2014 have had a negative, significant, and long-term effect on the cultural landscape of the SCA and surrounding area as a result of the loss of Clashnagallagh Wood and the change to the natural rugged landscape.

16.3 Identification of Significant Interactions

16.3.1 Conclusion

Land (Soils and Geology) and Biodiversity: Quarrying activity within the substitute consent area during the 1990-2014 period resulted in the permanent loss of established old Oak-Birch-Holly woodland (Clashnagallagh wood) that likely corresponded to Annex I Old Sessile Oak Woods with Ilex and Blechnum (91A0), along with the loss of Dry Siliceous Heath that likely corresponded to Annex I European Dry Heaths (4030). Both habitats are evaluated as nationally important biodiversity features that cannot be replaced or restored in this case. The effects arising from the loss of both habitat features is therefore considered as significant negative permanent.

Land (Soils and Geology) and Cultural Heritage: Construction works within the SCA between 1994 and 2014 have had a negative, significant, and long-term effect on the cultural landscape of the SCA and surrounding area as a result of the loss of Clashnagallagh Wood and the change to the natural rugged landscape.

A landscape remediation plan has been proposed which includes replanting native woodland. It is acknowledged that off-setting for the loss of established old Oak-Birch-Holly woodland / Annex I Sessile Oak Woods with newly planted native woodland is not a like-for-like replacement such that the loss of mature Annex I Sessile Oak Woods with Ilex and Blechnum is still considered to be a significant adverse permanent impact.

However, it is acknowledged that newly planted native woodland will in time (60-100 years) be of local importance higher value. The biodiversity chapter also sets out measures to allow underlying Dry Heath habitat an opportunity to naturally regenerate in areas where Dry Heath existed at the north-eastern spoil/other storage area.

Interaction	Population & Human Health	Lands, Soils & Geology	Hydrology & Hydrogeology	Air Quality & Climate	Noise and Vibration	Landscape & Visual Impact	Traffic & Transport	Biodiversity	Cultural Heritage & Archaeology
Population & Human Health									
Lands, Soils & Geology									
Hydrology & Hydrogeology									
Air Quality & Climate									
Noise and Vibration									
Landscape & Visual Impact									
Traffic & Transport									
Biodiversity									
Cultural Heritage & Archaeology									

Table 16-1 Overview of identified interactions (yellow) and Significant Interactions (orange)