

**Remedial Stage 1: Appropriate
Assessment - Screening and Stage
2: Natura Impact Statement**

**Substitute Consent Application
at
Ardcahan Quarry, Dunmanway, Co.
Cork**

**On behalf of
Murray Brothers Tarmacadam Ltd.**





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Impact Statement
Substitute Consent Application
Murray Brothers Tarmacadam Ltd.
Ardcahan Quarry, Dunmanway, Co. Cork**

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1 INTRODUCTION

This report has been prepared by Malone O'Regan Environmental ('MOR Environmental') on behalf of our client Murray Brothers Tarmacadam Ltd ('the Applicant'), to undertake a remedial Natura Impact Statement ('rNIS') at Ardcahan Quarry, Dunmanway, Co. Cork (ITM OS Reference W 25061 55898).

The quarry requires regularisation through the planning process due to historic activities on site; this regularisation is accomplished through an application for Substitute Consent. The Substitute Consent process allows developers to apply to An Comisiún Pleanála ('ACP') seeking permission to regularise developments that are deemed to have required EIA or Appropriate Assessment ('AA') for their development, but which were not done due to exceptional circumstances. The provision was introduced under Section 177 of the Planning and Development Act 2000 [1].

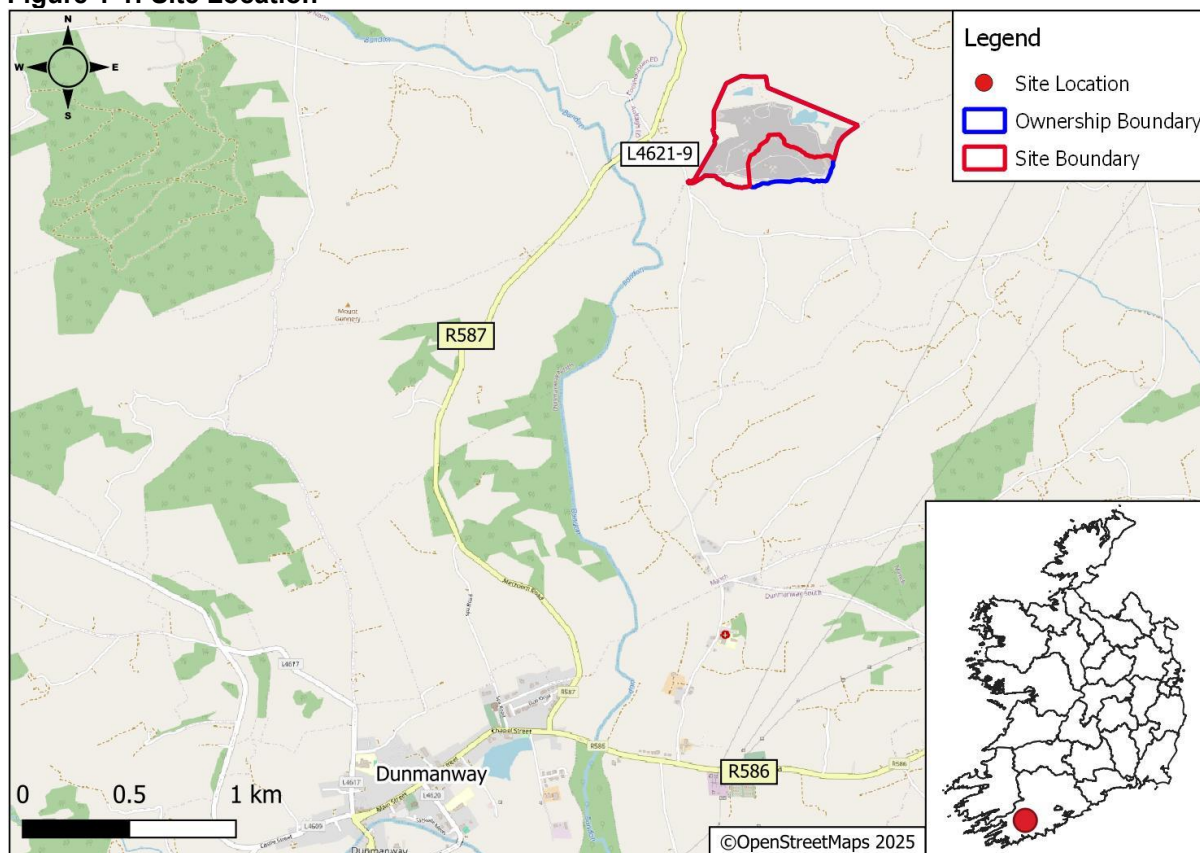
Substitute Consent is being sought under Section 177E of the Planning and Development Act, 2000, as amended, to regularise a circa ('ca.') 19.1 hectares ('ha') area of land including an extraction area of 5.2 ha, within the Applicant's landholding which has been subject to rock extraction, storing crushed product, use as a settling pond and backfilling ('the Development'). This rNIS has been prepared to support the application for substitute consent to ACP. The application does not include provisions for future development.

The Development is located within the townland of Ardcahan, Co. Cork, ca. 3.5km northeast of Dunmanway, Co. Cork and is shown in Figure 1-1 ('the Site'). This assessment relates to the land used for excavations and processing of aggregate, along with adjoining lands integral to the operations within the Site.

This rNIS has been prepared in support of the Substitute Consent to assess likely significant effects, if any, of historic activities between 1990 and 2014 on nearby sites with European conservation designations (i.e., Natura 2000 sites) from the Development, which was carried out without the required AA.

On completion of the Appropriate Assessment Screening Report, it was found necessary to progress to Stage 2 of the Appropriate Assessment process and prepare a rNIS to assess effects on the integrity of European sites.

Figure 1-1: Site Location



1.1 Background

This rNIS assesses the lands that have undergone development. Quarrying began at the Site prior to 1964. The substitute consent application relates to quarrying that took place between 1990 (when the EIA Directive came into force) and 2014 (when quarrying ceased). The area where quarrying took place is ca. 5.2 ha. The total amount of rock extracted between 1990 and 2014 equates to ca. 2,234,000 tonnes or an average of 93,000 tonnes of stone per annum over a 24-year period.

Previous relevant planning application cases for the Site are listed in Table 1-1.

Table 1-1: Relevant Planning Application History

Planning Ref	Applicant	Details	Decision	Decision Date
98294	Murray Bros Tarmacadam Ltd	<i>Tarmacadam/asphalt manufacturing plant, ancillary buildings & works, storage bays, weighbridge and septic tank</i>	Granted with conditions	02/04/1998
11317	Murray Bros Tarmacadam Ltd	<i>Permission for the extraction of stone, to a depth of 77.52 m.o.d. (development comprises of an overall area of 4.85 hec.) and all associated site works</i>	Refused	13/07/2011

Planning Ref	Applicant	Details	Decision	Decision Date
14616	Murray Brothers Tarmacadam Ltd	The quarrying of stone with an extraction area of approximately 6 hectares and to a ground (quarry floor) level of 77 metres over datum (MOD) and all associated site works.	Granted with conditions	26/06/2015

1.2 The Applicant

Murray Brothers Tarmacadam Ltd ('Murray Bros.') was established in 1972, and over 50 years later, it is run by the same family. The company is well-established in the Dunmanway area and currently employs seven people.

Murray Bros. acquired Ardcahan Quarry and the tarmacadam 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 Site Context

Ardcahan Quarry is in the townland of Ardcahan, approximately 3.5km northeast 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 1-2).

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 third party 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 (referred to as the 'boundary stream') that flows into the Bandon River extends along the eastern and southern boundaries of the landholding.

The area within the overall landholding measures ca. 25 ha. The lands are sloped with lower ground levels in the southwest (ca. 72 to 75 MOD1) rising to the north (118 MOD).

The former extraction area (1990 - 2014) is 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.

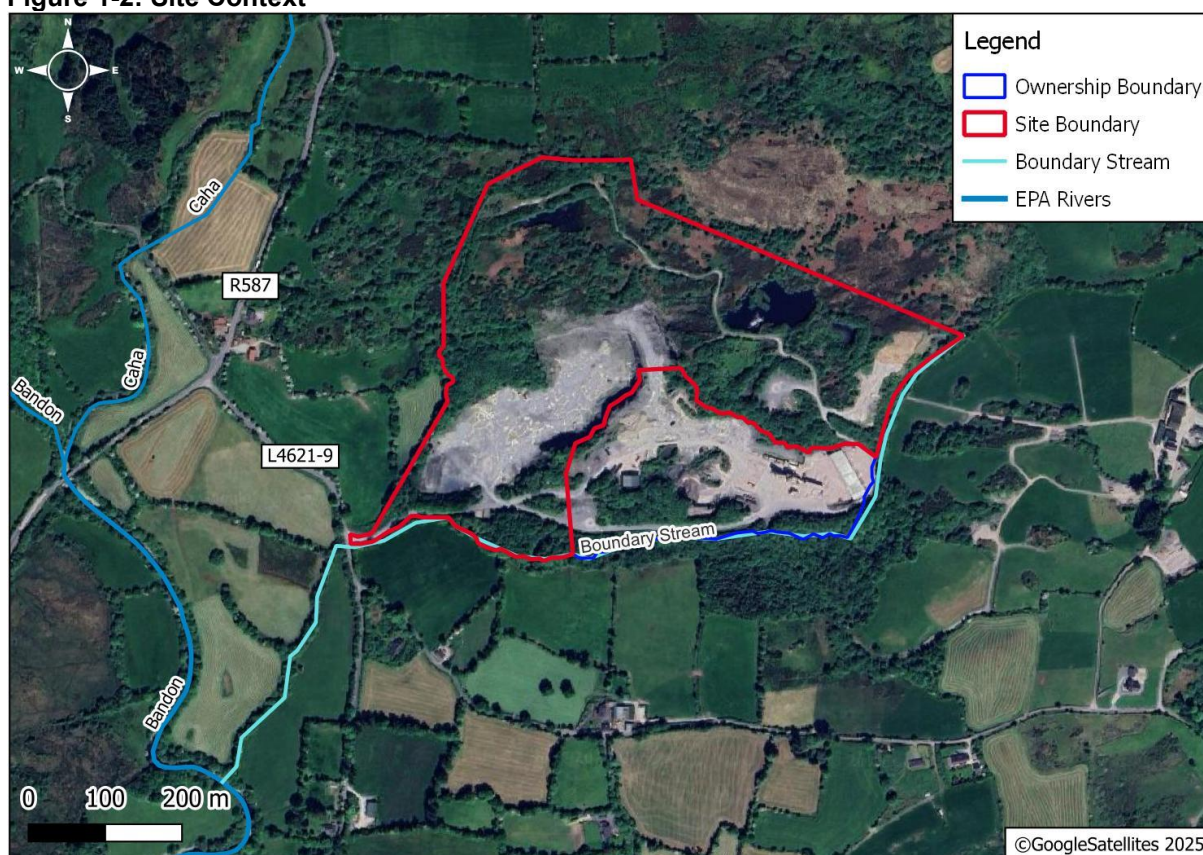
In the southeast of the landholding is a tarmacadam production plant and buildings used for administration, welfare and storage purposes. Development in this part of the site was granted planning permission under the Reg. Ref. 98/294 inclusive of the following:

- Prefabricated office building / toilet / canteen;
- Laboratory;

- Mixing plant;
- Storage silos;
- Bins for plant;
- Covered aggregate storage bays;
- Storage shed;
- Bitumen tanks;
- Well / pumphouse;
- Weighbridge; and,
- Car parking area for staff and visitors.

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

Figure 1-2: Site Context



1.3.1 Extent of Development Site

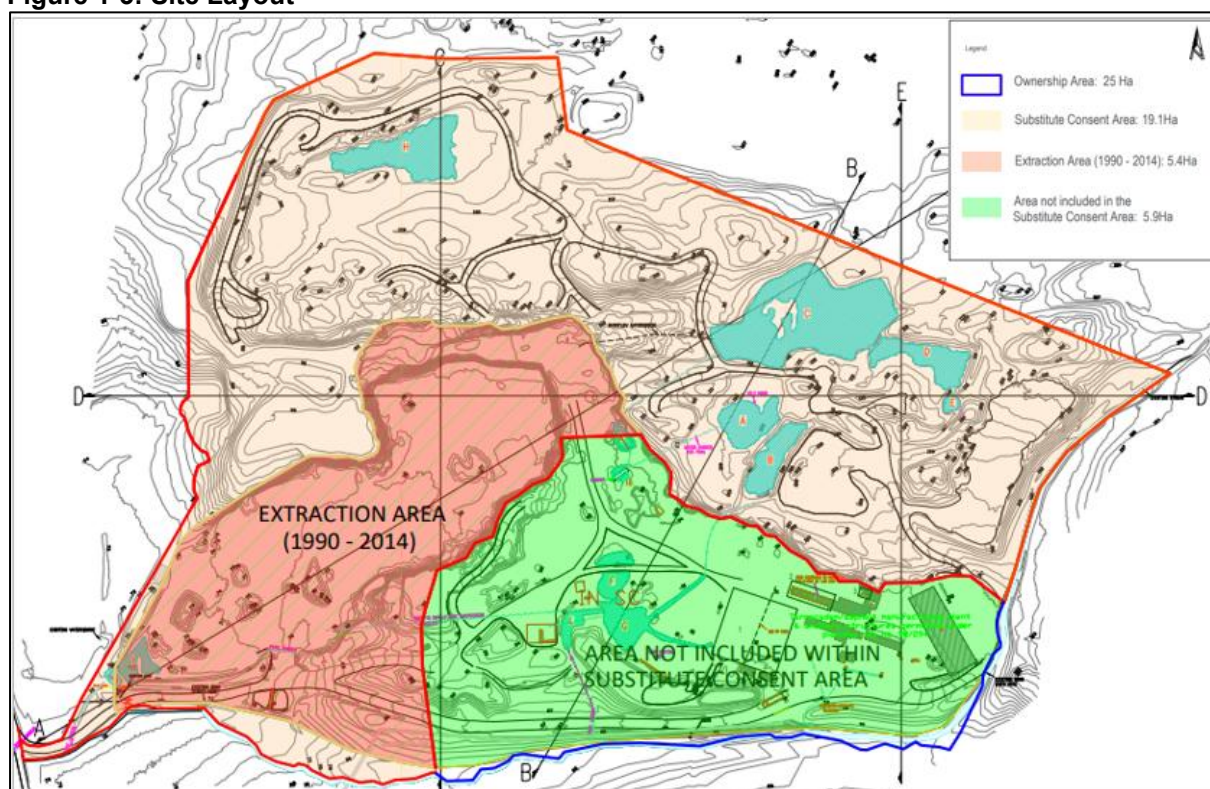
The Site that is the subject of this substitute consent application incorporates extraction and ancillary areas as follows:

- Quarry development, which took place between February 1990 and October 2014 including the extraction area (total 5.2 ha.) where an environmental impact assessment would have been required under the EIA Directive;

- Quarry development, which took place between February 1997 and October 2014, where appropriate assessment would have been required under the Habitats Directive; and,
- The former quarry that was identified as unauthorised development under Cork County Council Enforcement Notice Ref. SKBE/13/.

The application site has an area of approximately 19.1ha. The southeast part of the landholding (shaded green in Figure 3-2) is not included within the red line boundary as it contains land quarried prior to 1990 and the tarmacadam 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. See Figure 1-3.

Figure 1-3: Site Layout



1.4 Watercourses within the vicinity of the Site

The Site is situated within the Bandon-Ilen WFD Catchment [Catchment_ID: 20] and the Bandon_SC_010 subcatchment [Subcatchment_ID: 20_6] [2].

1. Boundary Stream

There is one unnamed watercourse ('boundary stream') on the eastern and southern boundaries of the Site that is not present on EPA maps. The boundary stream flows in a southwest direction and drains into the Bandon River ca. 375m downstream of the Site.

2. The Bandon River – Bandon_020

The Bandon_020 River is located ca. 260m to the southwest of the Site, at its closest point. This river flows in a southeasterly direction and drains into the Kinsale Harbour, ca. 54km downstream of the Site. The River Bandon forms part of the Bandon River SAC.

Under the Water Framework Directive ('WFD') 2000/60/EC, as amended, the EPA classifies the status and the risk of not achieving good water quality status for all waterbodies in Ireland [2]. According to the WFD 2019-2024 monitoring events, the most up-to-date data at the time

of writing this report, the water quality within the Bandon River is considered to be 'moderate,' and the status of this river is considered 'at risk' [2].

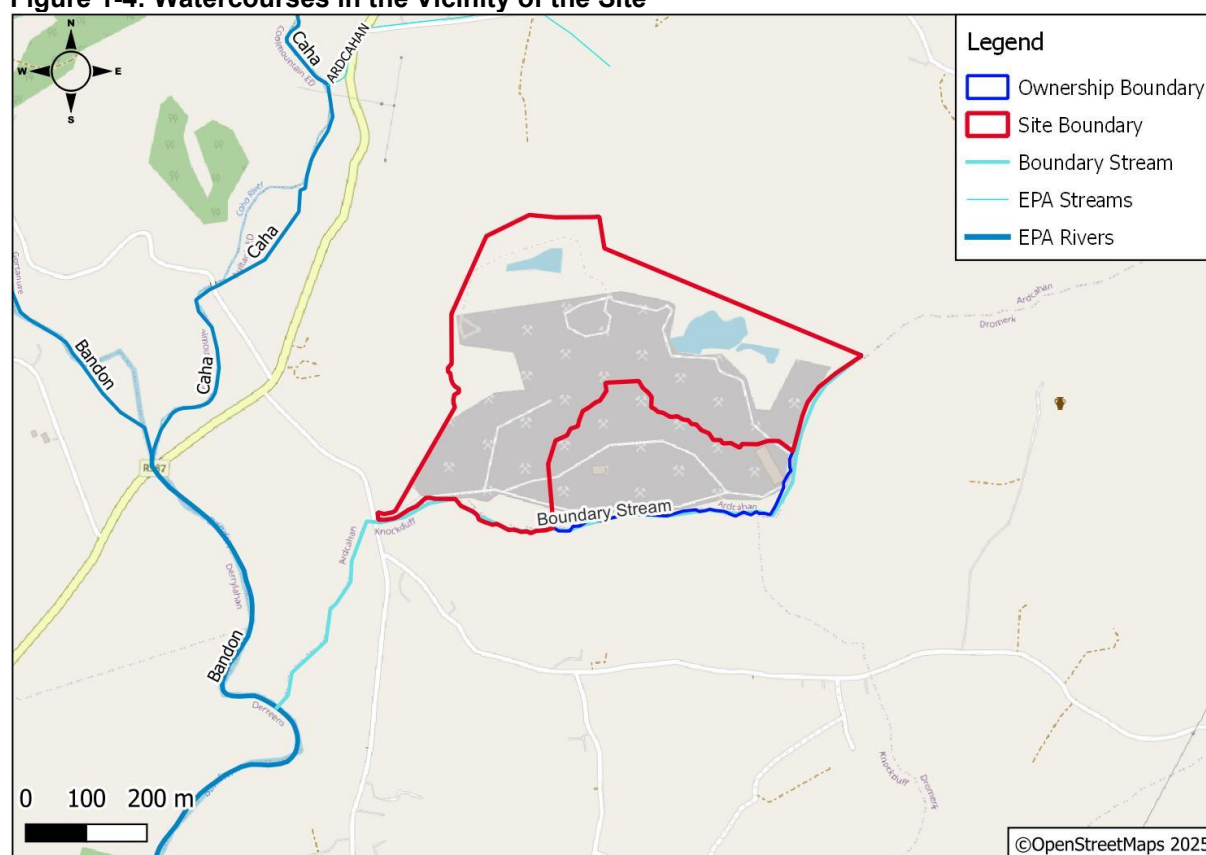
3. The River Caha – Caha_020

The Caha_020 River is located ca. 360m to the northwest of the Site, at its closest point. This river flows in a southeasterly direction, and drains into the Bandon_020, which subsequently drains into Kinsale Harbour, ca. 54km downstream of the Site. The Caha_020 River forms part of the Bandon River SAC.

According to the WFD 2019-2024 monitoring events, the most up-to-date data at the time of writing this report, the water quality within the Caha_020 is considered to be 'moderate,' and the status of this river is considered 'at risk' [2].

The location of the key surface water features in the vicinity of the Site is illustrated in Figure 1-4.

Figure 1-4: Watercourses in the Vicinity of the Site



1.4.1 Drainage Ditch Network

The OPW Flood Maps identify Drainage Districts, Arterial Drainage Schemes and Benefited Areas [3]. Arterial Drainage Schemes were works that were carried out under the Arterial Drainage Act, 1945, to improve land for agriculture and to mitigate flooding. The Benefited land identifies land that was drained as part of the Drainage District to improve land for agriculture and mitigate flooding.

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. See Appendix A for locations of drains on-site. No areas of the Site are designated as part of a Drainage District or Arterial Drainage Scheme, and the Site does not form part of any of the benefited areas [3].

1.5 Statement of Authority

This report was approved by Mr. Dyfrig Hubble, Associate Director - Ecologist. Dyfrig is a full member of the Chartered Institute of Ecology and Environmental Management ('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.

1.6 Guidance and Legislative Context

The following guidance has informed the preparation of this rNIS report:

- Government of Ireland, *Planning and Development Regulations 2001 to 2022 (Part 10)* [4];
- OPR Practice Note PN01, *Appropriate Assessment for Screening for Development Management*, The Office of the Planning Regulator [5];
- *Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*, European Commission [6];
- *Guidelines for Ecological Impact Assessment in the UK and Ireland*, Chartered Institute of Ecology and Environmental Management [7];
- *Managing Natura 2000 Sites: The Provision of Article 6 of the Habitats Directive 92/43/EEC* [8];
- *Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities*, DoEGLH [9]; and,
- *Appropriate Assessment under Article 6 of the Habitats Directive; Guidance for Planning Authorities. Circular NPW 1/10 and PSSP 2/10*, DoEGLH [10].

This rNIS was prepared in accordance with and in compliance with the following legislation, including:

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna, better known as "The Habitats Directive". This provides the framework for legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. The Habitats Directive was transposed into Irish law by the Planning and Development Act 2000 (as amended) and the European Communities (Birds and Natural Habitats) Regulations (S.I. 477 / 2011) (as amended) [11].

For completeness, the Planning and Development Act 2000 (as amended) states "European site" means:

- a. A candidate site of Community Importance ('cSCI');
- b. A site of Community Importance ('SCI');
- c. A Special Area of Conservation ('SAC');
- d. A candidate Special Area of Conservation ('cSAC'); or,
- e. A Special Protection Area ('SPA').

These are Special Areas of Conservation ('SACs') designated under the Habitats Directive and Special Protection Areas ('SPAs') designated under the Conservation of Wild Birds Directive (79/409/EEC as amended 2009/149/EC) (better known as "The Birds Directive").

Article 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect European sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment.

“Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site’s conservation objectives. In light of the conclusions of the assessment of the implication for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public”

The Court of Justice of the European Union (‘CJEU’) has issued several rulings on Appropriate Assessment, addressing when it is required, its purpose and the standards it must meet. Two of the key rulings include, Case C-127/02 Waddenzee where the CJEU found that *“Any plan or project not directly connected with or necessary to the management of the site is to be subject to an appropriate assessment of its implications for the site in view of the site’s conservation objectives if it cannot be excluded, on the basis of objective information, that it will have a significant effect on that site, either individually or in combination with other plans or projects”* and that the plan or project may only be authorised *“where no reasonable scientific doubt remains as to the absence of such effects”*, and Case C-258/11 Sweetman4 where the CJEU found that *“(The Appropriate Assessment) cannot have lacunae and must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the works proposed on the protected site concerned”*. Consideration has been given in the preparation of this report to the evolution in interpretation and application of directives and national legislation arising from jurisprudence of the European and Irish courts, in respect of Article 6 of the Habitats Directive.

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures. First, the project should aim to avoid any negative effects on European sites by identifying possible effects early in the planning stage and designing the project in order to avoid such effects. Second, mitigation measures should be applied, if necessary, during the Appropriate Assessment process to the point where no adverse effects on the site(s) remain. If the project is still likely to result in adverse effects, and no further practicable mitigation is possible, it is rejected. If no alternative solutions are identified and the project is required for imperative reasons of overriding public interest (‘IROPI test’) under Article 6 (4) of the Habitats Directive, then compensation measures are required for any remaining adverse effect.

1.7 Stages of Appropriate Assessment

The relevant stages to undertaking an AA as outlined in the current European Union (‘EU’) and Department of Environment, Heritage and Local Government (‘DoEHLG’) guidance:

Stage 1: Screening

The purpose of this screening stage is to determine, in view of the best scientific knowledge, whether a plan or project, individually or in-combination with other plans or projects, is likely to have a significant effect on a European site in view of the site’s conservation objectives. If likely significant effects are identified after mitigation, the plan or project cannot be screened out and must proceed to Stage 2.

Stage 2: Appropriate Assessment

Where likely significant effects are identified or uncertain, an assessment of the potential mitigation of those effects is required; this stage considers the appropriateness of those mitigation measures in the context of maintaining the integrity of the Natura 2000 sites in

light of their conservation objectives. Consideration is then required to determine if the potential for adverse effects on Natura 2000 sites cannot be eliminated with appropriate mitigation measures; if this is the case, the assessment must proceed to Stage 3.

Stage 3: Assessment of Alternative Solutions

This process examines alternative ways to achieve the objectives of the plan or project that avoid adverse effects on the integrity of the Natura 2000 site if mitigation measures are deemed insufficient.

Stage 4: Imperative Reasons of Overriding Public Interest ('IROPI')

Assessment where no alternative solution exists for a plan or project, and where adverse effects remain. This includes an assessment of compensatory measures, which, in the case of projects or plans, can be considered necessary for IROPI.

2 METHODOLOGY

2.1 Determining Zone of Influence

The starting point for this assessment was to determine the Zone of Influence. The Zone of Influence comprises the area in which the Development may have potentially affected the conservation objectives (or qualifying interests) of a European site.

Previous guidance for 'Appropriate Assessment of Plans and Projects in Ireland' noted that a distance of 15km is recommended for the identification of relevant European sites [9]. However, guidance from the Office of the Planning Regulator ('OPR') and guidance from the National Parks and Wildlife Service ('NPWS') recommend that the distance should be evaluated on a case-by-case basis with reference to the nature, size and location of the project, the sensitivities of the ecological receptors, and the potential for in-combination effects (cumulative) [9] [10]. For some projects, the distance could be greater than 15km, and in some cases, less than 100m.

Definition of the zone of influence for the Development includes evaluating the following:

- Identification of the European sites that are situated within, in close vicinity or downstream within the zone of influence of the Development;
- Identification of the designated habitats and species and conservation objectives for the identified European sites;
- Identification of the environmental conditions that stabilise and increase the qualifying interests of the European sites towards favourable conservation status;
- Identification of the threats / impacts, actual or potential, that could have negatively affected the conservation objectives for the European sites;
- Identifying the activities of the Development that could have give rise to significant adverse effects; and,
- Identification of other plans or projects, for which in-combination impacts would likely have had significant adverse effects.

2.1.1 Source-Pathway-Receptor Model

European sites are only at risk from significant effects where a source-pathway-receptor link exists between a Development and a European site. This can take the form of a direct impact (e.g., where the Development is located within / in close vicinity to the boundary of a European site), or an indirect impact where impacts occur outside of the European site but affect ecological receptors within the European site (e.g., impacts to water quality which can affect estuarine habitats at a distance from the impact source).

The likely effects of the Development on any European site have been assessed using a source-pathway-receptor model. A source-pathway-receptor model is a standard tool used in environmental assessment [12], [13]. The model comprises:

- A source: any potential impacts from the Development, e.g., the runoff of sediment / construction pollution;
- A pathway: the means or route by which a source can affect the ecological receptor; and,
- A receptor: the qualifying interests and / or special conservation interests of the European sites.

In order to establish the Zone of Influence of the Development, the likely key environmental impacts / changes associated with the Development were determined, having regard to the

project characteristics set out in Section 3.3 of this report. The Zone of Influence for various potential impact pathways are discussed in Section 4.1.

2.2 Desk Based Review

A desk-based review of information sources was completed, which included the following sources of information:

- Review of aerial maps of the Site and surrounding area;
- The NPWS website was reviewed with regard to the most up-to-date details on conservation objectives for the European sites relevant to this assessment [14];
- The Cork County Council ('CCC') Planning Portal was reviewed to obtain details about existing / proposed developments in the vicinity of the Site [15];
- The Department of Housing, Local Government and Heritage's planning portal – the National Planning Application Database was reviewed to obtain details about existing / proposed developments in the vicinity of the Site [16];
- 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 [17];
- The National Biodiversity Data Centre ('NBDC') website was reviewed with regard to species distributions [18]; and,
- The Environmental Protection Agency ('EPA') Maps website was reviewed to obtain details about watercourses in the vicinity of the Site [2].

The desk-based review 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 the historic maps [19];
- The Geohive Hub Website was consulted for the examination and comparison of historic aerial imagery [20]; and,
- The Google Earth website was consulted to evaluate the expansion of the Site and the habitats that previously occurred in that area [21].

In addition, the baseline surveys, rEIAR (Biodiversity Chapter) and rNIS (dated 2022) undertaken by Kelleher Ecology Services Ltd. and Croft Ecology in 2022 were reviewed as part of the preparation of this document.

The information gathered from these resources has been used as baseline data within this report, where appropriate. This information has been presented in combination with the desk survey results in Section 5.1.2.

2.3 Field-Based Studies

2.3.1 Habitat Survey

A Site walkover was undertaken on 9th January 2023 by two suitably qualified and experienced MOR Environmental Ecologists to assess the extent and the quality of habitats present on the Site and to identify any potential ecological receptors associated with the European sites.

The habitat survey was undertaken for the Site utilising the Heritage Council's – '*A Guide to Habitats in Ireland*' [22]. This is the standard habitat classification system used in Ireland and includes both a desk-based and field-based assessment.

Updated habitat surveys were undertaken on the following dates:

- 17th September 2024; and,
- 21st May 2025.

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

2.3.2 Freshwater Pearl Mussel Survey

A specialist Freshwater Pearl Mussel ('FWPM') survey was conducted on 25th May, 30th May, 1st June and 22nd June in 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 in June 2023 and on 10th September 2024 by Sweeney Consultancy, along with an MOR Environmental Ecologist. The assessment aimed to identify the presence / habitat suitability of watercourses for FWPM.

The methodologies implemented for the survey are outlined in Appendix B.

2.3.3 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) [23] 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 local biodiversity.

2.3.4 Other Species

In addition, as part of the overall ecological assessment for the Site, an assessment was carried out for the potential of the Site to support any other species considered to be of value for biodiversity, including those that were identified as occurring locally by the desktop study. This information was used as part of the rNIS to inform the assessment of potential adverse effects on both Annex I species and habitats identified as part of the study.

2.4 Survey Conditions and Limitations

As with all rNIS'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 from 1990-1995.

It should also be noted that the retrospective identification of certain ecological effects is not possible solely based on historical mapping information. Therefore, professional judgment is 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.

3 DESCRIPTION OF THE DEVELOPMENT

3.1 Description of the Development

Historic Activities

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 1-3, 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 3-1 to 3-4 inclusive.

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 ca. 10.3ha in 2014. This represents a total increase of 5.2 ha during the period, comprising the former extraction area subject to 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 tarmacadam 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. Conversely, the former extraction area includes small pockets of vegetation which appear unquarried in more recent aerial imagery due to natural recolonisation.

Figure 3-1: Aerial Image 1995

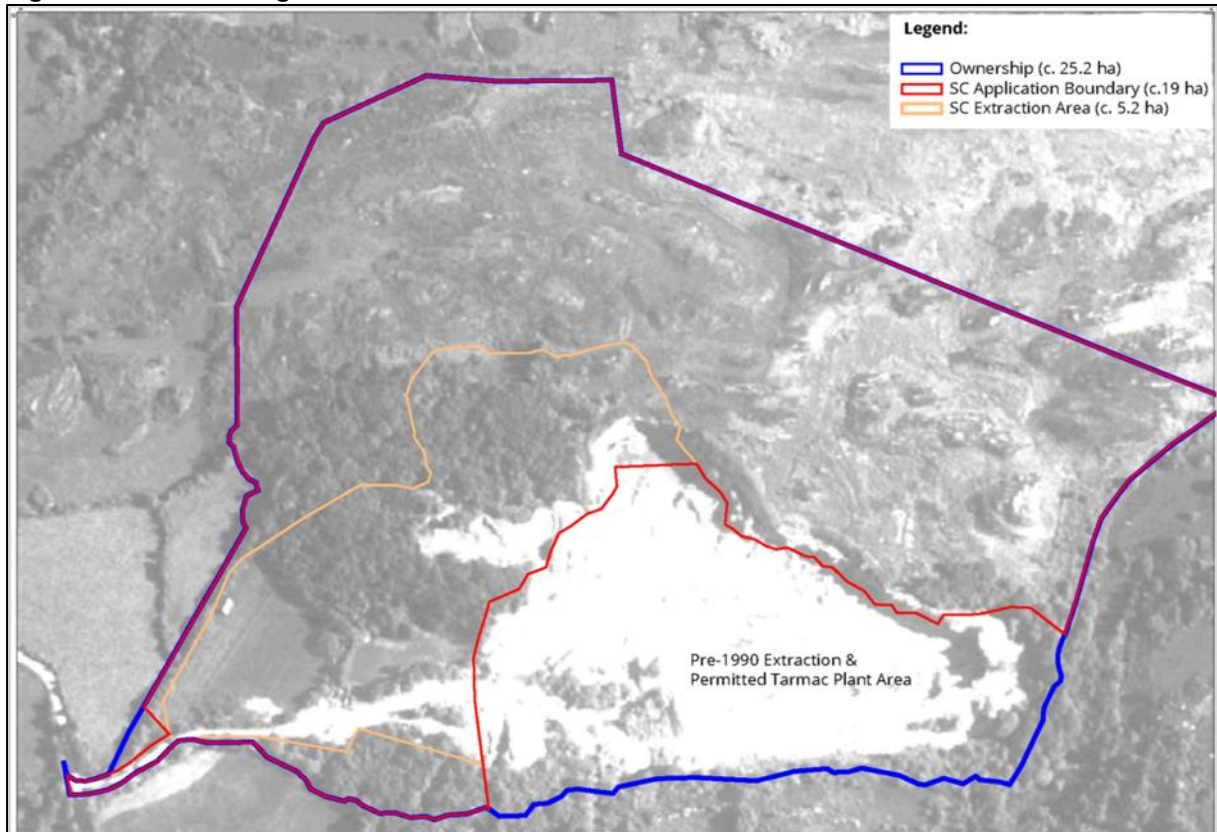


Figure 3-2: Aerial Image 2000

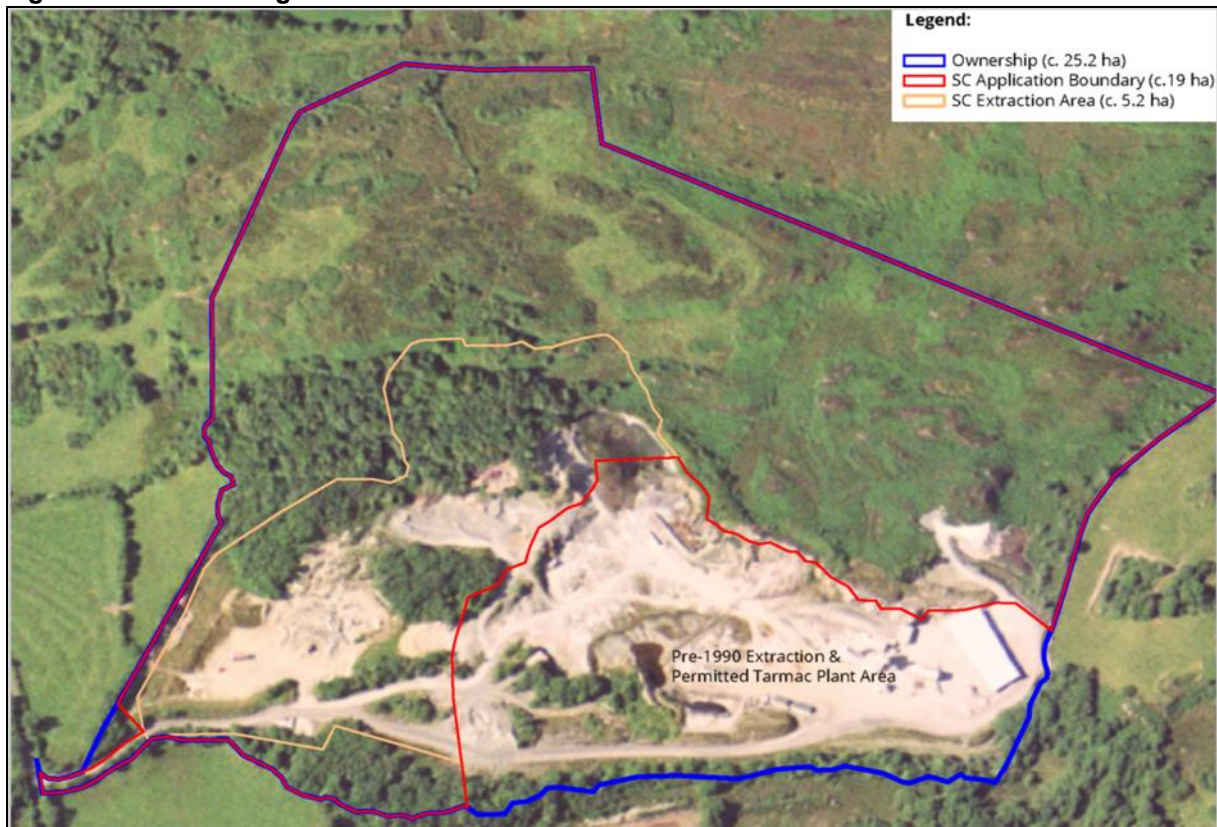


Figure 3-3: Aerial Image 2005



Figure 3-4: 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. The area in the southwest of the Site was used for crushing stone, screening and stockpiling of excavated materials.

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. Following a pause in extraction activity in 2000 and 2001, annual extraction data indicate that 1,234,547 tonnes were quarried from 2002 to 2014, as detailed in Table 3-2.

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 majority of the quarried aggregate/material was used to supply the tarmacadam plant on site. The remaining aggregate was primarily used for road construction projects in Counties Cork and Kerry.

On average, 93 lorry loads of aggregate¹ 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 occurred normally 4 to 6 times 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.

¹ Excludes traffic associated with the macadam plant.

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

A contract crushing company processed excavated materials on site, using primary jaw crushers and 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 extracted on site include 20mm, 14mm, 10mm, 6mm and dust. 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 Surface Water Drainage

3.1.1.1 Local Hydrology 1990 to 2014

For full details on hydrology please refer to Chapter 7 of the remedial Environmental Impact Assessment Report ('rEIAR'). The following text refers to Section 7.2 of the rEIAR.

'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 in Figures 3-1 to 3-4.

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 A.

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 photograph from 2005 shows that the majority of the quarrying activity was centred on the excavations in the bedrock in the 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 lying 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.

Refer to Appendix A for the location of ponds and catchments on the Site.

3.1.1.2 On-site Quarry Surface Water Catchments

'Using information from the detailed topographical survey 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 3-3.'

Table 3-3: Summary of On-Site Surface Water Catchments

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	Area 6 (A6)

'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 valve 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 overflow 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).'

3.1.1.3 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.

3.1.1.4 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 installation.'

3.1.1.5 Groundwater Vulnerability

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

3.2 Remediation Plan

A Remediation Plan has been prepared by Cathal O'Meara Landscape Architects. Please refer to Chapter 9: Landscape and Visual Impact of the associated rEIAR. The regeneration plan involves the following measures:

- Retain the existing fragmented but long-established woodland in the western boundary and allow this to expand through 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;
- 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; and,
- The existing hardstanding in the east of the Site is to be covered with 100mm of Site found soil and allowed to develop through habitat colonisation as part of a successional process.

4 IDENTIFICATION OF EUROPEAN SITES

In accordance with the European Commission Methodological Guidance [8] a list of European sites that can / 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 [9] states that defining the likely zone of impact for the screening and the approach used will depend on the nature, size, location and the likely significant effects of the project. The key variables determining whether or not a particular European site is likely to be significantly affected by a project are:

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

All SPAs and SACs within 15km have been considered to assess their ecological pathways and functional links. As acknowledged in the OPR guidelines [5], few projects have a zone of influence this large; however, the identification of European sites within 15km has become widely accepted as the starting point for the screening process. For this reason, all SPAs and SACs within 15km have been identified for consideration as part of the screening.

There are three European sites located within 15km of the Site - these are identified in Figure 4-1 and Table 4-1.

Figure 4-1: European Designated sites within 15km of the Site

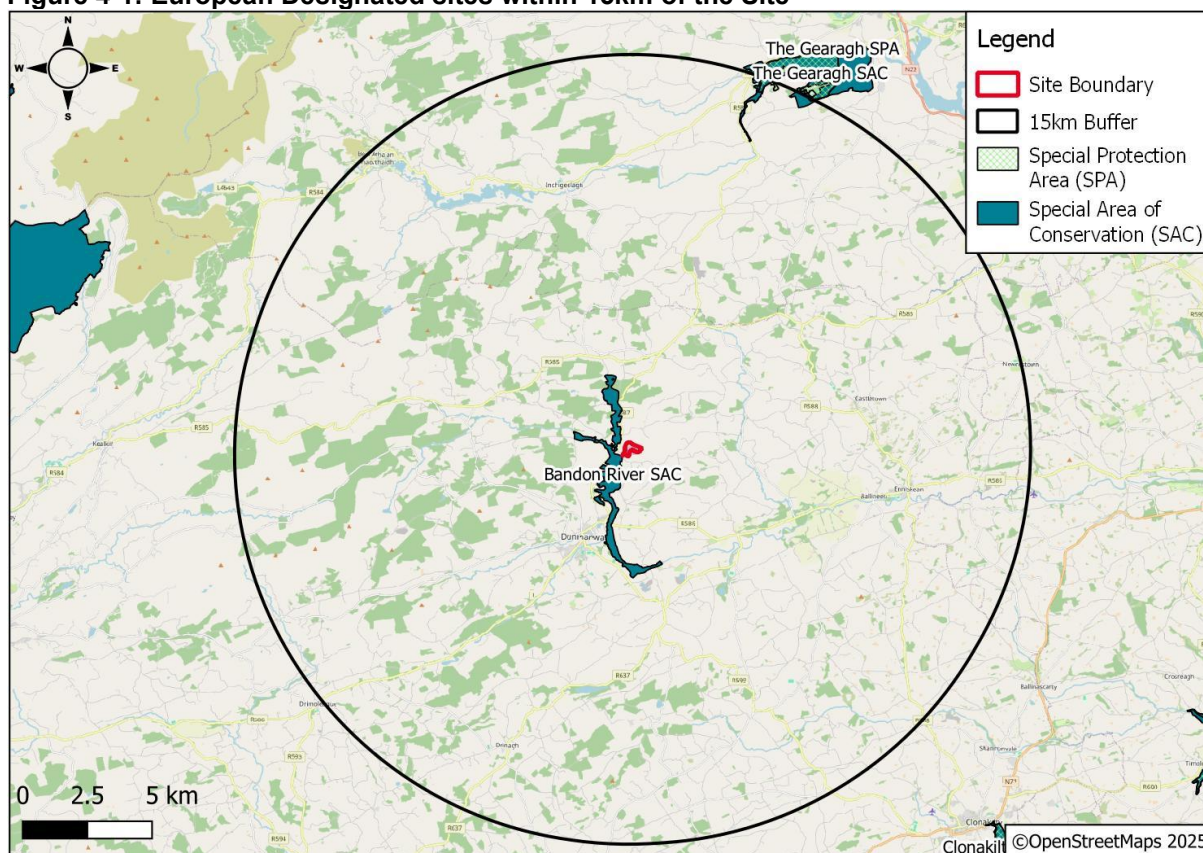


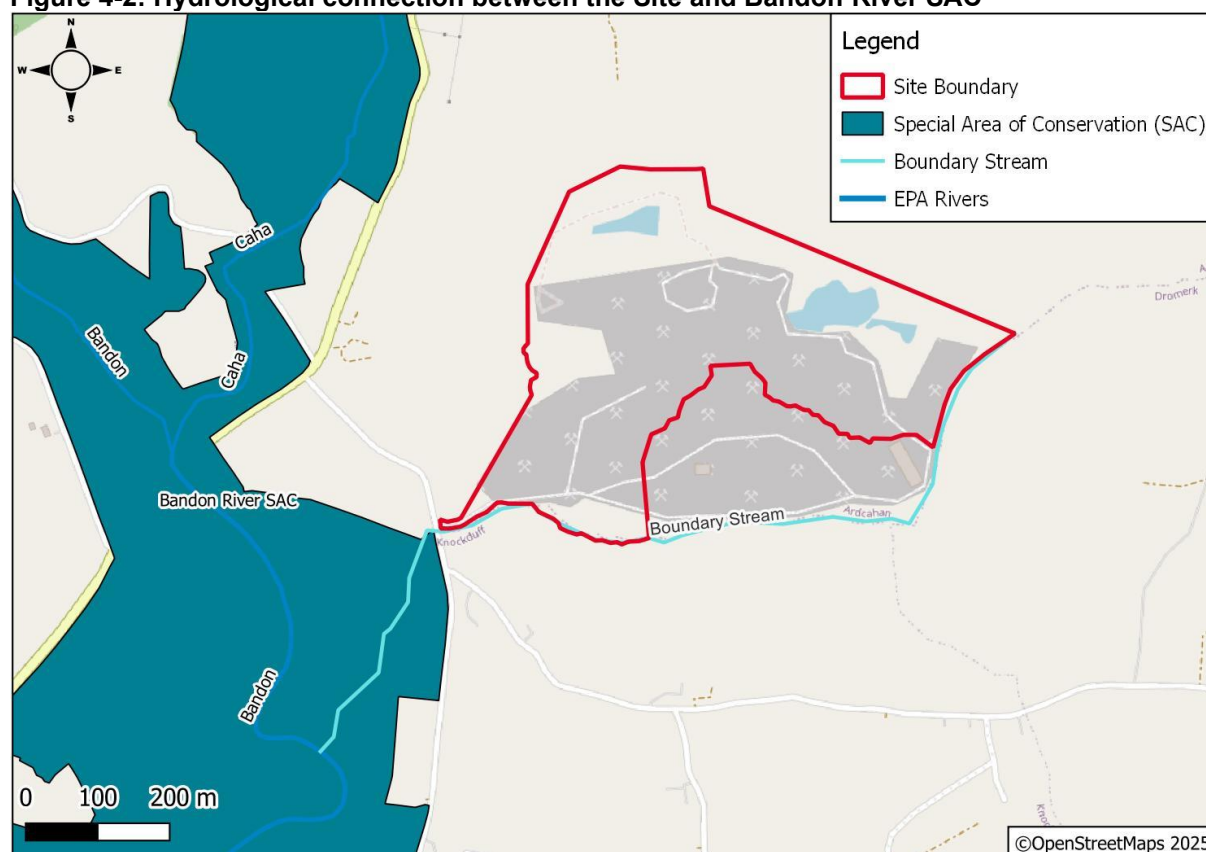
Table 4-1: European Designated sites within 15km of the Site

Site Name	Code	Date of Designation [24]	Distance	Direction from the Site
Special Areas of Conservation ('SAC')				
Bandon River SAC	002171	January 2002	10m	W
The Gearagh SAC	000101	November 1997	12.5km	NE
Special Protection Area ('SPA')				
The Gearagh SPA	004109	October 1996	14.4km	NE

4.1 Hydrological Connection

The boundary stream that flows along the eastern and southern boundaries of the Site discharges into the River Bandon ca. 350m downstream after it crosses the L4621-9 road. The boundary of the Bandon River SAC covers the area south of where the boundary stream crosses the road. Therefore, the Site is hydrologically connected to the Bandon River SAC via the boundary stream on the eastern and southern boundaries of the Site. See Figure 4-2.

Figure 4-2: Hydrological connection between the Site and Bandon River SAC



4.2 Identification of European Sites within Zol

The Zone of Influence ('Zol') comprises the area in which the Development may have potentially affected the conservation objectives (or qualifying interests) of a European site. The definition of Zol for the Development works evaluated multiple factors as outlined in Section 2.1 and discussed below. Please note that the extent of Zol differs for different environmental aspects, e.g. air, water, etc.

4.2.1 Evaluation of Potential Habitat Loss / Degradation

The Site is not located within or directly adjacent to any European sites.

Given the lack of impact pathways and intervening lands between the Site and the Gearagh SAC and the Gearagh SPA, it is considered that the Development could have and has not resulted in any direct habitat loss or degradation for these European sites.

However, there is a hydrological connection between the Site and the Bandon River SAC. Additionally, Bandon River SAC is ca. 10m west of the Site. Therefore, there was potential for indirect habitat loss and degradation as a result of water quality impairment from the Development. Refer to the water quality section below for further information.

4.2.1.1 Evaluation of Remediation Plan

As part of the remedial measures for the Site, a regeneration plan has been prepared by Cathal O'Meara Landscape Architects. Please refer to Section 3.2. For full details, please refer to Chapter 9: Landscape and Visual Impact of the associated rEIAR. The changes implemented as part of this plan are localised and small-scale. The remediation measures will not result in a loss of habitat or degradation. Additionally, the plan will not have any impact on water quality, air quality or noise on the Site.

4.2.2 Water Quality Impairment

A hydrological connection was identified between the Site and the Bandon River SAC via the boundary stream as described in Section 3.2 and shown in Figure 4-2.

Potential water quality effects that would typically be associated with the Development could result from the release of sediment and other pollutants to surface water during the Construction and Operational Phase of the quarry. Given the hydrological connection between the Site and the River Bandon via the boundary stream, potential effects associated with the Development are considered as part of this assessment.

A detailed Hydrology and Hydrogeology assessment has been undertaken as part of the application by Viridus Consulting Ltd, and full details are presented in Chapter 7 of the rEIAR. The assessment identified and considered the following potential effects on water quality from the construction and quarrying activities:

- *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 floccs, 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.
- Faecal coliforms: Contamination risk from on-site toilet and washing facilities is negated by the instillation of a septic tank and percolation area.

Given the hydrological connection between the Site and the Bandon River SAC, further consideration will need to be given to potential water quality impairment as a result of the Development.

4.2.3 Air Quality Impairment

A detailed air quality assessment has been undertaken as part of the application by AWN Consulting, and full details are presented in Chapter 8 of the rEiAR.

The primary impacts to air quality would have occurred due to operational activities such as the extraction of materials, screening, crushing, and processing of materials, and the movement of vehicles on site, which have the potential to release dust and particulate matter (PM10 and PM2.5) emissions.

Engine emissions from vehicles accessing the site may impact air quality by releasing nitrogen dioxide (NO₂) and particulate matter (PM10 and PM2.5).

The results of the dispersion modelling assessment show that dust deposition levels, annual and daily mean concentrations of PM10 and annual mean concentrations of PM2.5 from the historic quarrying operations are below the relevant limit values.

The air quality chapter concluded that *'the development had a localised, direct, long-term, negative and slight effect on air quality which is overall not significant.'*

The assessment of significant effects stated that the residual effects from effects that have occurred were slight (not significant).

This conclusion takes into account the air quality measures that were in place during the 1990–2014 period, as further outlined in Section 7.1.4 on mitigation and remedial actions.

4.2.4 Noise / Disturbance

A detailed noise assessment has been undertaken as part of the application by CLV Consulting, and full details are presented in Chapter 10 of the rEiAR.

Noise from anthropogenic activities has the potential to cause disturbance to resting, foraging, and commuting species of the European sites.

Individual species will provoke different behavioural responses to disturbances at different distances from the source of disturbance.

- Transport Infrastructure Ireland (formally the National Roads Authority) has produced a series of best practice planning and construction guidelines for the treatment of certain protected mammal species (i.e. otter), which indicate that disturbance to terrestrial mammals would not extend beyond 150m [25]; and,
- Studies have noted that different types of disturbance stimuli are characterised by different avifaunal reactions; however, in general, a distance of 300m can be used to represent the maximum likely disturbance distance for waterfowl [26].

The Zol for noise / disturbance is therefore established as the Site with a 300m buffer.

The Gearagh SAC and the Gearagh SPA are located outside of this Zol and therefore, there was no potential for designated species to be disturbed.

Although none of the habitats onsite are suitable for designated FWPM and brook lamprey for the Bandon River SAC, the Site is located within 300m of the SAC. However, these species are purely aquatic with no terrestrial element to their life cycle. Therefore, there is no impact receptor pathway for the Bandon River SAC in relation to potential disturbance / displacement of FWPM or brook lamprey through noise / disturbance.

4.2.5 Invasive Species

The NBDC held records for two invasive species within 2km of the Site – Japanese knotweed and rhododendron [17].

Japanese knotweed and rhododendron are both non-native, high-impact plant species that are subject to restrictions under Regulations 16(1) and 17 of the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) [41]. These species were both identified onsite.

Four medium impact invasive species – sycamore, butterfly bush, traveller’s joy and winter heliotrope were also identified on site during the surveys. These species are not currently regulated in Ireland, and it is unknown whether invasive species were present on the Site during the substitute consent period. A stand of Japanese Knotweed was noted along the boundary stream, ca. 18m away. No signs of Japanese Knotweed were noted within the river. An Invasive species Management plan has been developed for the Site to remediate Japanese Knotweed.

4.3 Zol Conclusions

The Site is not located within or directly adjacent to any European sites; however, the boundaries of three are located within 15km from the Site.

Given the distance separating the Site from the Gearagh Sac and the Gearagh SPA, and the intervening lands separating the Site from these European sites and the lack of impact pathways, it is considered that the Development did not have adverse effects on these European sites, and they have therefore been screened out from further consideration.

The following European site listed in Table 4-2 have been screened in for further consideration to assess potential adverse effects resulting from the Development.

Table 4-2: European Designated sites within Zol

Site Name	Code	Distance at closest point and source-pathway-receptor link
Bandon River SAC	002171	The Site is located 10m east of the Bandon River SAC, see Figure 4-2. Given the close proximity of the Site to the SAC, potential indirect habitat loss/degradation and water quality impairment to designated species and habitats, this SAC will be taken forward for further consideration.

The screening assessment for individual designated habitats and species for the screened in European site and the potential for them to have been adversely affected by the Development are presented in Section 6.

Further information on the screened in European sites is provided below.

4.4 Bandon River SAC (Site Code: 002171)

The Bandon River SAC (Site Code: 002171) consists of relatively short adjoining stretches of the Bandon and Caha Rivers. These rivers flow in a southerly direction to the east of Dunmanway, Co. Cork. Towards the southern end of the site, the Bandon River takes an

easterly course. The predominant rock formations are Old Red Sandstone to the north and Carboniferous slate stretching south of Dunmanway. Soils in the northern section consist of peats, podzols and skeletal soils. The southern section consists of alluvial soils and Brown Podzolics.

The east-west exposure of Old Red Sandstone to the north of Dunmanway displays distinct ridgelines of bare rock with poor pasture and scrub. In this area around Lovers Leap, the Bandon River cuts a narrow channel southward, cascading over a series of rock steps through a narrow valley. Below this and above Long Bridge, the river widens and meanders through a fertile floodplain. Immediately south of Long Bridge, the reduced flow gradient and broad, flat valley permit the main channel to split and extend into a network of braided streams forming islands.

Table 4-3: Qualifying Annex I Habitats for the Bandon River SAC

Qualifying Habitats	Code	Site Specific Conservation Objective
Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	3260	Restore favourable conservation condition
Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>)	91E0	Restore favourable conservation condition

Table 4-4: Qualifying Annex II Species for the Bandon River SAC

Species	Species Name	Code
Molluscs listed on Annex II of the Habitats Directive	Freshwater pearl mussel (<i>Margaritifera margaritifera</i>)	1029
Fish listed on Annex II of the Habitats Directive	Brook Lamprey (<i>Lampetra planeri</i>)	1096

4.5 Conservation Objectives

European and national legislation places a collective obligation on Ireland and its citizens to maintain a favourable conservation status at areas designated as candidate Special Areas of Conservation. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

According to the Habitats Directive, favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, is stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and,
- The conservation status of its typical species is favourable as defined below.

The favourable conservation status of a species is achieved when:

- Population data on the species concerned indicate that it is maintaining itself;
- The natural range of the species is neither being reduced or likely to be reduced for the foreseeable future; and,
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Conservation objectives for the identified Natura 2000 SAC Site are as follows:

'To maintain or restore the favourable conservation condition of the Annex I habitat(s) and the Annex II species for which the SAC has been selected.'

The full reports for the conservation objectives for the Bandon River SAC² can be found on the NPWS website [14].

² https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002171.pdf

5 STUDY RESULTS

5.1 Desk-Based Results

5.1.1 Records of Designated Species

The NBDC provides records of species within 2km of the Site, offering further context for potential fauna use. These records span from 1960 to 2024, reflecting species that were present in the area during this period. The NBDC records were checked on 8th January 2025. The following 2km grids were checked: W25G, W25H, W25I, W25L, W25M, W25N, W25R, W25S, W25T [18].

At the time of writing this report, there were no records of species designated under the Bandon River SAC recorded within 2km of the Site.

5.1.2 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.

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 5-1 and 5-2, reflect a period before the introduction of modern classification systems, such as Fossit habitat codes in 2000. The descriptions in Table 5-1 are based on historical mapping data and traditional land-use practices and are outlined further in Appendix C – OSI Characteristic Sheet for Maps on a scale of 6 inches to 1 Mile and 25.344 inches to 1 Mile.

Table 5-1: 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.	National Importance
Rough pastures and cropping rock	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.	Lower value local importance
Agricultural Grassland	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

Figure 5-1: OSI 6-inch Mapping of the Site between 1837-1842

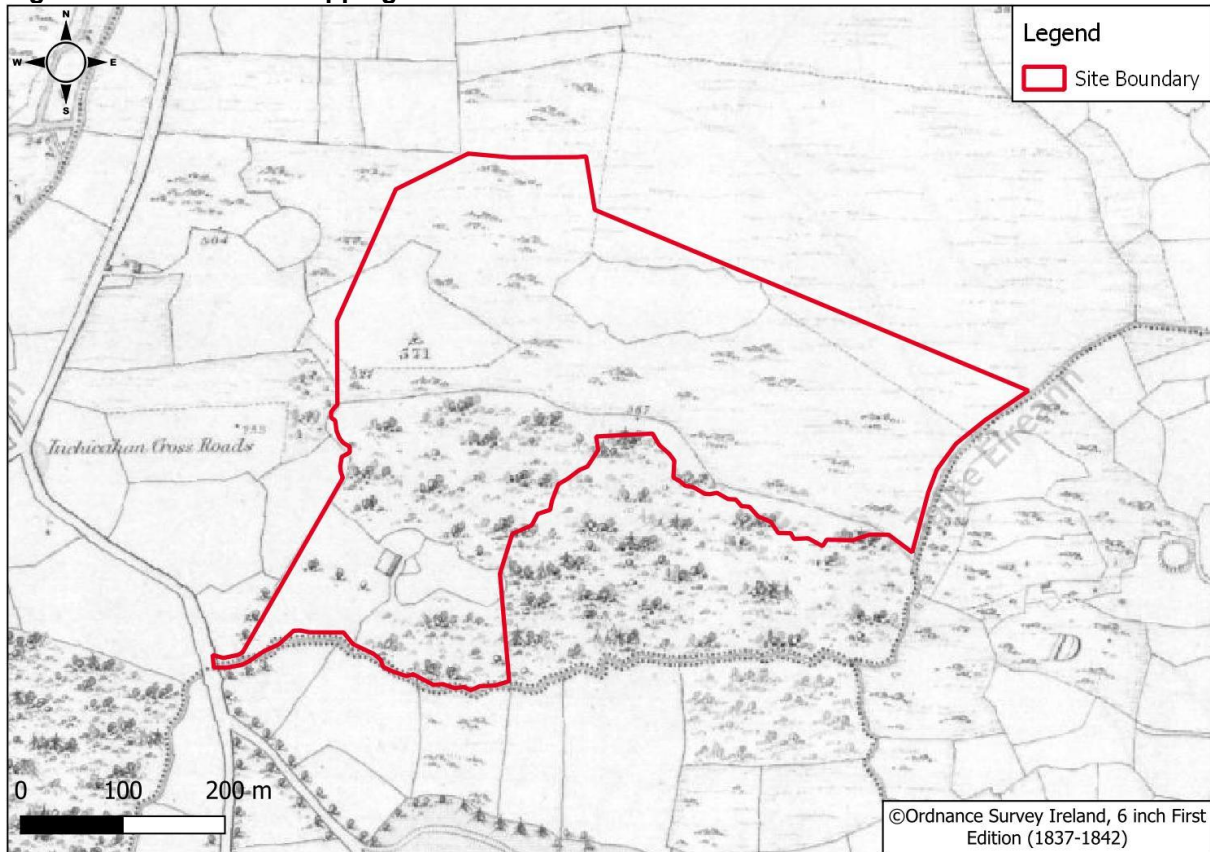
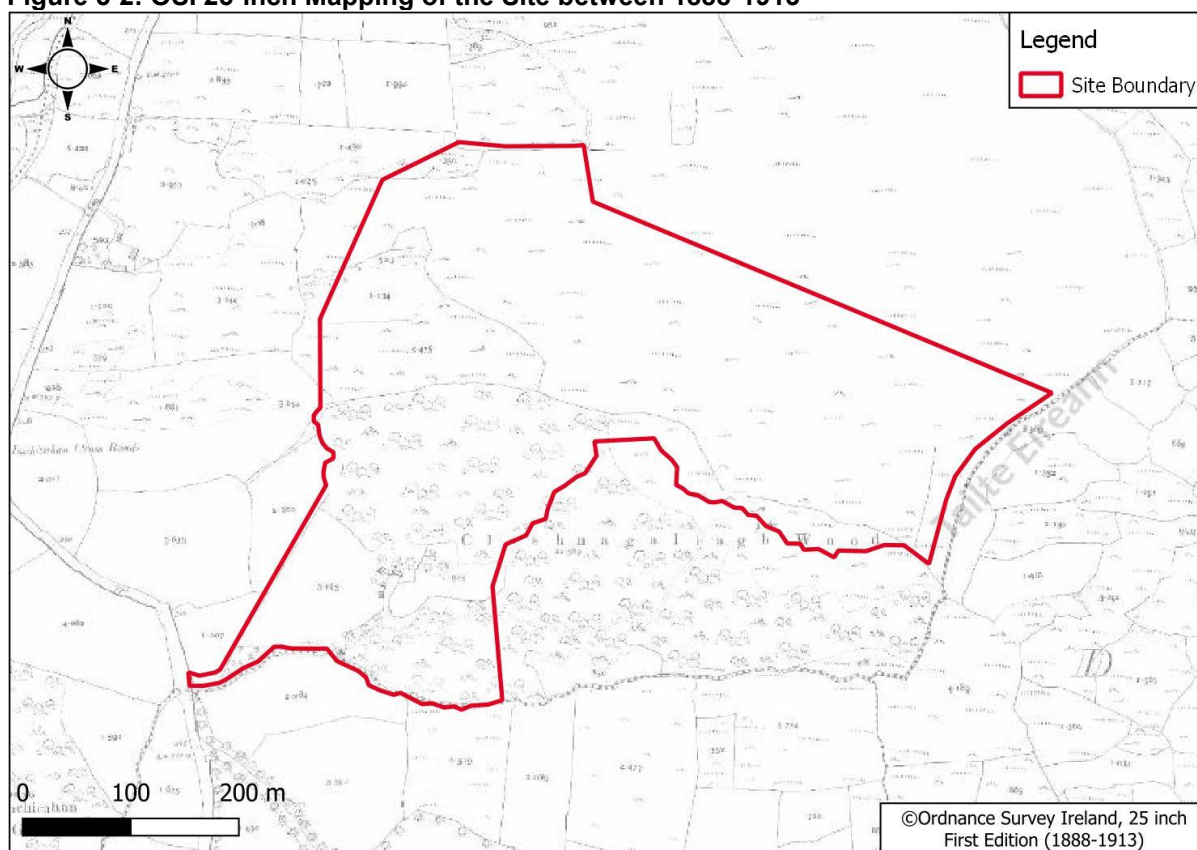


Figure 5-2: OSI 25-inch Mapping of the Site between 1888-1913



Aerial Imagery Historical Maps

Aerial Imagery from 1995, 1996, 2001, 2006 and 2013 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 3-1 to 3-4 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 the Site, it is presumed that these habitats were dry siliceous heath and wet grassland. See Table 5-2 for a full description of the habitats.

Table 5-2: 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	National Importance

Habitat	Description	Value
	bracken. This habitat corresponds to an Annex I habitat listed under the EU Habitats Directive (Annex I European Dry Heaths [4030]) [27].	
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 filled 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]) [27].	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

5.2 Field Based Study Results

5.2.1 Existing Habitats

5.2.1.1 Habitats within the Ownership Boundary

The following section provides details of the initial field-based assessment that was undertaken for the Site on 17th September 2024 and the updated assessment on 21st May 2025. A description of the habitats and features of ecological significance is outlined below and illustrated in Figure 5-3.

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 tarmacadam 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 tarmacadam 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 Siliceous Heath (HH1)

Dry heath was recorded along the northern boundary of the Site, with additional patches identified in the northeast corner. 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 gorse (*Ulex europaeus*), bell heather (*Erica cinerea*), ling heather (*Calluna vulgaris*) and cross-leaved heath (*Erica tetralix*), 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]).

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 trifoliata*), broad leaved pondweed (*Potamogeton natans*), 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 siliceous 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 tarmacadam 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]) [27].

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.

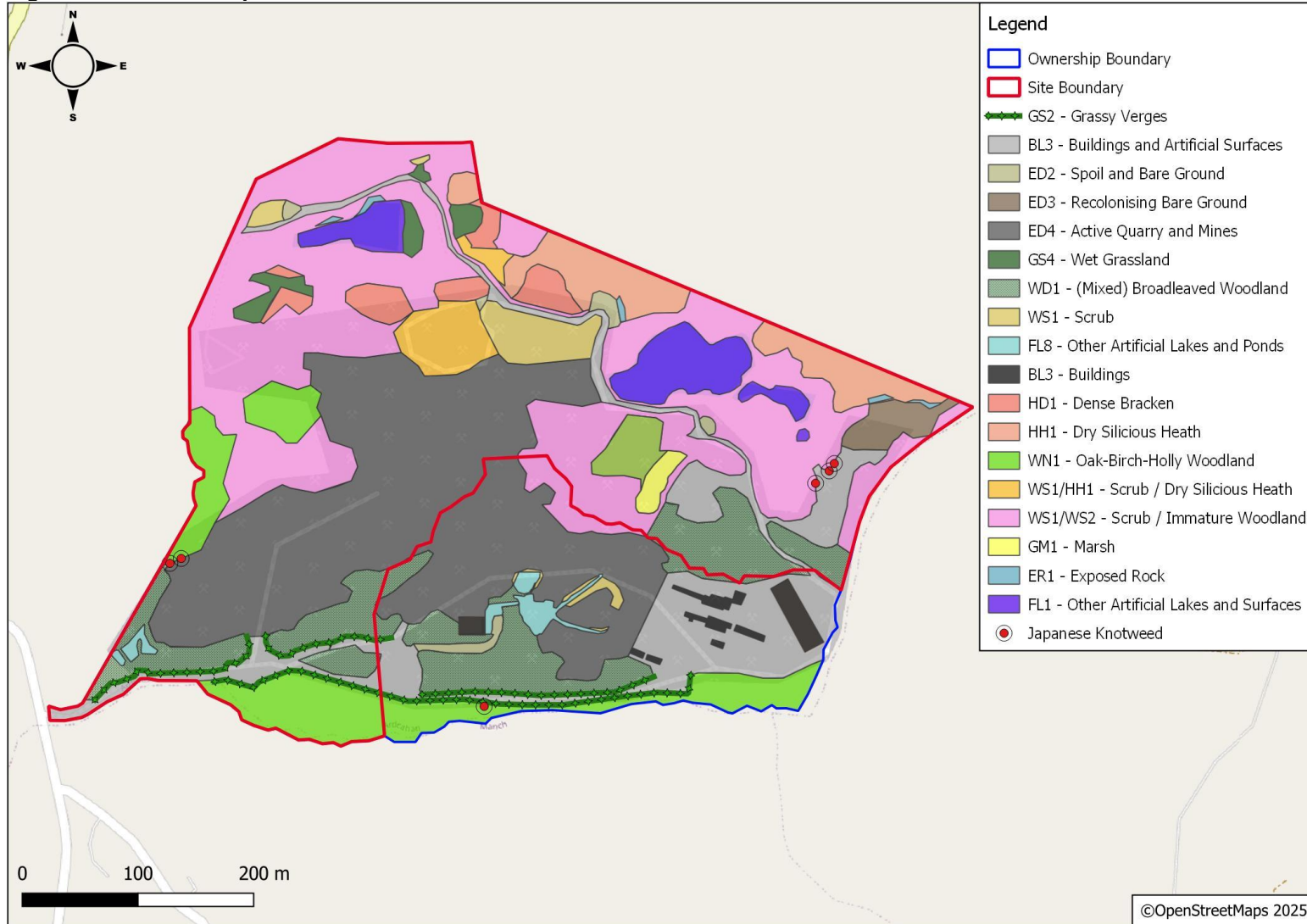
Common rush and sharp-flowered rush (*Juncus acutiflorus*) were dominant in wetter areas and contributed to the habitat's tussocky structure.

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 the Site.

Figure 5-3: Habitat Map



5.2.2 Species

5.2.2.1 Freshwater Pearl Mussel Survey

The NBDC held no records for FWPM within 2km of the Site [18]. 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 of the population at this location is outlined in the FWPM Report attached as Appendix B.

5.2.2.2 Invasive Species

The NBDC held records for two invasive species within 2km of the Site – Japanese knotweed and rhododendron [18].

Japanese knotweed and rhododendron are both non-native, high-impact plant species that are subject to restrictions under Regulations 16(1) and 17 of the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) [23]. These species were both identified on site.

Four medium impact invasive species – sycamore, butterfly bush, traveller's joy and winter heliotrope – were also identified onsite during the surveys. These species are not currently regulated in Ireland.

6 STAGE 1 SCREENING: IDENTIFICATION OF POTENTIAL SIGNIFICANT EFFECTS

6.1 Potential Significant Effects

The potential for significant effects on the Bandon River SAC was considered further in this section. The key output of this stage of the assessment is the identification of likely significant effects of the Development alone and in combination with other plans and projects on relevant European sites without the implementation of mitigation measures.

Table 6-1 and Table 6-2 present further details and the rationale for the screening assessment undertaken for each of the European sites identified as potentially having been significantly affected by the Development, in light of their site conservation objectives and best scientific knowledge.

Table 6-1: Screening Assessment: Annex I Habitats – Bandon River SAC

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho - Batrachion</i> vegetation	The distribution of this habitat throughout this SAC is currently unknown [29]. However, according to the NPWS Conservation Objectives Report, bryophyte assemblages are known to occur in the River Bandon and River Caha, located ca. 315m southwest and ca 360m northwest of the Site, respectively [29].	Effects associated with water pollution from construction and quarrying.	Given the hydrological connection between the Site and the River Bandon via the boundary stream, there was potential for this habitat to have been impacted by the Development, either directly or indirectly, during the Construction and Operation Phases. Hence, this habitat has been screened in for further consideration.	Screened In
Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>)*	Alluvial forests are woodlands along river flood plains that require periodic flooding. According to the NPWS Conservation Objectives Report, the nearest mapped location is 2.7km southwest of the Site [29]. This habitat was not identified onsite or in the immediate vicinity of the Site. The riparian woodland within the Site boundary did not contain any target species associated with alluvial forests, including willow (<i>Salix</i> spp.), ash (<i>Fraxinus excelsior</i>) or alder (<i>Alnus glutinosa</i>) trees. This habitat was not identified onsite or in the immediate vicinity of the Site to the east of the river.	As above	As above.	Screened In

Table 6-2: Screening Assessment: Annex II Species for the Bandon River SAC

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Freshwater pearl mussel	The NBDC held no records of FWPM within 2km of the Site [18].	Effects associated with water pollution from the construction and quarrying	This species is very sensitive to water quality and any effects on water quality could have adversely affected this species.	Screened In

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
<i>(Margaritifera margaritifera)</i>	<p>However, according to the NPWS Conservation Objectives Report, the Site is within the catchment area for this species.</p> <p>The full extent of the freshwater pearl mussel habitat in the Bandon system is not fully mapped but according to the NPWS Conservation Report, within the SAC, the habitat is considered to be on the SAC boundary of the Caha to below Caha Bridge and, on the Bandon main channel, from just below the Caha confluence to below the braided channel and Mileeananannig [29].</p> <p>The boundary stream on the boundary of the Site discharges ca. 550m downstream of the Caha confluence.</p> <p>During the survey in 2024, 1,008 FWPM were found in the River Bandon downstream of where the boundary stream discharges into the river. In 2023, 148 FWPM were found in the same locations.</p>		<p>This species has been known to occur within the vicinity of the Site and the FWPM survey conducted in 2023 and 2024 found a maximum count of 1,008 FWPM in the River Bandon downstream of where the boundary stream discharges into the river.</p> <p>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.</p> <p>Therefore, this species has been screened in for further assessment based on water quality impairment.</p>	
Brook Lamprey (<i>Lampetra planeri</i>)	<p>The NBDC held no records of brook lamprey within the 2km of the Site [18].</p> <p>However, according to the Inland Fisheries Ireland ('IFI') Bandon River Catchment 2021 Survey Report, lamprey species were identified at 8 of the 35 survey sites within the following sub-catchments: Brewery, Bealanscartane, Ballynacarriga, Bandon Lower, Bridewell and Enniskean [30]. This report confirms the presence of lamprey species in the Bealnascartane River, which discharges into the Bandon River ca. 6km downstream of the Site.</p>	As above.	<p>This species has not been recorded within 2km of the Site. However, lamprey species have been recorded within rivers that discharge into the Bandon River and have the potential to utilise the stretch of river adjacent to the Site.</p> <p>Given the hydrological connection between the Bandon River and the Site, there was potential for this species to have been affected by the Development.</p> <p>Therefore, this species will be screened in for further assessment.</p>	Screened In

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
	<p>According to the Southwestern River Basin District Rivers 2009 Report, a juvenile lamprey species were recorded in the Bandon River site [31].</p> <p>The National Barriers Programme has identified a barriers assessment tool to identify barriers to fish migration. The database has not identified barriers that would block fish migration downstream of the Site [32].</p> <p>Suitable habitats are not present for this species within the Site, but the River Bandon is considered suitable, and this lamprey may utilise the adjacent stretch of the River Bandon.</p>			

6.2 Stage 1 – Analysis of ‘In-Combination’ Effects

The Habitats Directive requires competent authorities to make an appropriate assessment of any plan or project which is likely to have a significant effect alone or in-combination with other plans and projects.

Table 1-1 outlines the planning applications granted within the Site throughout the substitute consent period.

The majority of nearby planning permissions are related primarily to one-off residential dwellings, garages and agricultural buildings. These applications were not subject to Appropriate Assessment, and it is considered unlikely that those planning permissions would have had any significant in-combination effects on the Bandon River SAC with the Development.

The Tarmacadam plant, as outlined in Table 1-1, 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 tarmacadam / 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 tarmacadam plant could have arisen from silt washout, bitumen cooling and PAC or sewage and waste supply.

Excess Fine Aggregate

The tarmacadam plant, which began construction in 1998, is situated in the south-east corner of the landholding. Buildings, process equipment, fuel and tar storage, product cooling and storage facilities and new surface water drainage infrastructure were constructed over the following years. The plant produces mastic blocks and bitumen-coated aggregate (tarmacadam). Aggregate is of different grades depending on the application and was either sourced from the quarry itself or imported. It is stored in a large shed at the rear of the plant, where each grade is separated into different loading bays accessed from a large truck manoeuvring area adjoining the boundary stream at the rear (northeast) of the shed. Surface runoff is collected via three gullies in the flat open area in front of the plant, i.e. to the south of the process buildings and just west of the aggregate storage shed. Each gully has a sump, the overflow from which is piped via a concrete interceptor situated immediately south of the main access road, which discharges into a small saucer-like depression above the bank of the boundary stream and from there flows through a gap in the stone embankment down into the stream. The sumps in the gullies are periodically desludged to maintain their efficiency in removing solids.

Dry periods where erodible material had time to accumulate on the Site’s surfaces, followed by heavy rainfall, had the potential to enter the boundary stream onsite. It is likely that several such runoff events occurred each year from this source. These are believed to have only minor and short-lived effects on most aspects of the receiving environment. Specifically, they are not expected to have lowered water quality, cause mortality or significant effects to habitats for fish (including salmonids), lamprey or FWPM.

However, these events could have previously contributed to the accumulation of silt in areas where FWPM may have occurred or could have potentially survived, particularly in slow-flow marginal zones. In these locations, while the physical habitat may appear suitable, the presence of silt could have reduced habitat quality below the threshold needed for survival.

The extent and severity of this historical potential effect are difficult to determine, as such silt deposits are likely to have been dispersed, and no records have been kept of sediment

releases into the boundary stream or condition assessments of the stream. Any potential effect is considered to be localised and would have extended no more than a few hundred metres downstream of the quarry stream confluence due to the volume of water within the Bandon River SAC.

During the FWPM surveys in 2023 and 2024, it was also noted that the upstream sections of the Bandon River above the confluence of the outflow of the drainage system also appeared to be affected by silt buildup.

Bitumen Cooling and PAHs

In Area A3, temporary stockpiles of bitumen-coated aggregate are cooled using sprinkler systems, with the excess cooling water flowing into Pond G. The same pond supplies water for the sprinklers. Nearby, mastic blocks are cooled on racks just north of Pond L, where it connects with Pond G. Water used in the cooling process eventually drains into Pond L. Periodically, water from these ponds reaches the top of the berm along the outlet channel from Pond L and overflows into the boundary stream.

This cooling water may contain small amounts of hydrocarbons, including Poly Aromatic Hydrocarbons ('PAHs'), which are classified as hazardous substances and known to be toxic to aquatic life. However, PAH concentrations originating from the Ardcahan Quarry are not considered likely to have posed a significant risk to FWPM in the Bandon River downstream of the quarry stream confluence.

A key mitigating factor is that the cooling water typically remains in Ponds G and L for several days, potentially weeks, allowing time for natural degradation or settlement of any contaminants, including PAHs, if present. Furthermore, any overflow from Pond L was diluted first in the boundary stream and then further in the Bandon River. These combined factors suggest that the likelihood of PAHs from the quarry causing any ecologically significant adverse effects is extremely low.

As a result, no cumulative effects are considered to have existed between the quarry and the Tarmacadam Plant with respect to bitumen cooling water discharge.

Wastewater / Sewage and Water Supply

Wastewater and sewage infrastructure is located in the southeastern portion of the landholding, associated with the permitted Tarmacadam Plant (planning reference CCC 98/294), and has historically served quarry personnel. These facilities discharge to a septic tank and a percolation area situated approximately 32m from the boundary stream. Importantly, there is no direct discharge to any surface water or watercourse. Given this setup, there is no pathway for wastewater-related effects on the Bandon River SAC and the risk to the adjacent boundary stream is considered very low.

Potable water for the site is sourced from an on-site borehole, and there is no water abstraction from the unnamed boundary stream. As such, there is no hydrological connection to surface waters or the Bandon River SAC in relation to the Site's water supply.

Overall Conclusion

Taking the above into consideration, no potential significant adverse effects on the Bandon River SAC are considered likely through cumulative or in-combination effects with other known plans or projects (i.e. the Tarmacadam Plant).

It is therefore considered that the Development is unlikely to have any significant in-combination contribution to possible significant effects on the Bandon River SAC.

However, as identified in Section 6.1, several qualifying features require further consideration and appropriate mitigation measures to ensure that the Development alone will not lead to in-combination effects with any proposed future developments.

6.3 Stage 1 – AA Screening Conclusion

A detailed assessment of the layout and nature of the Development, the construction methods employed and the overall activities that occurred at the Site has been carried out, and the potential for significant effects on European sites and qualifying features of interest within the zone of influence of the Site has been examined in detail.

The boundaries of two designated sites, the Gearagh SAC and the Gearagh SPA, were screened out, given the distances separating the Site from these European sites and the lack of impact pathways. It could be objectively concluded that the Development did not, either alone or in combination with other plans or projects, have significant effects on those sites.

A hydrological connection was identified between the Bandon River SAC and the Site, via the boundary stream onsite. Therefore, the Bandon River SAC was taken forward for further detailed consideration, Stage 2 appropriate assessment. Using professional experience, guidance and judgement, the following factors have been taken into account on identifying potential significant effects on the identified European site:

- Qualifying interests;
- Special conservation interests;
- Conservation objectives;
- The nature of the historical habitats;
- The nature of the onsite habitats; and,
- The location of the Site.

The screening process has examined the potential for the Development to significant effects on European sites and the qualifying features of interest as per the screening determination in Section 4.

Based on the above factors and taking a precautionary approach, the screening exercise has identified the following designated habitats and species as potential receptors of significant likely effects as a result of the Development, in the absence of appropriate mitigation:

Habitats

- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation; and,
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*).

Species

- Freshwater pearl mussel; and,
- Brook Lamprey.

AA Screening Conclusion

These habitats and species have been brought forward for further consideration due to the potential for adverse effects, as a result of the Development, in the absence of the appropriate mitigation measures.

Therefore, progression to Stage 2 of the Appropriate Assessment process is required.

Section 7 below further addresses potential issues that may have arisen from the Development and the mitigation measures used to negate any potential adverse effects on the habitats and species for which the River Bandon SAC is designated.

7 STAGE 2 NIS

7.1 Assessment of Potential Significant Effects

This section provides recommendations for measures which will mitigate against any adverse effects on the integrity of the identified European site as a result of the Development. The following have been considered further in terms of potential adverse effects on the conservation objectives of the Bandon River SAC:

- Potential loss of, or disturbance to designated habitats from construction / quarrying activities;
- Potential impairment of water quality from construction / quarrying activities; and,
- Potential impairment of air quality from the quarry construction / quarrying activities.

The screening exercise did not identify any other factors that will result in any likely significant effects.

7.1.1 Potential loss of, or Disturbance to Designated Habitats from Construction and Quarrying Activities

Degradation of European sites habitats can happen indirectly through changes in water quality or hydrology, like increased silt, nutrient release, polluted runoff, or dust. These effects rely on a connection between the Site and the SAC. As discussed previously, a small unnamed boundary stream is a tributary of the Bandon River SAC and runs along the eastern and southern boundaries of the Site. Therefore, a hydrological receptor was present during the period of substitute consent between 1990 and 2014.

7.1.1.1 Construction Phase

The Construction Phase of the Development involved:

- Ground Clearance and internal access tracks; and,
- Drainage / Settlement Ponds.

Ground Clearance and internal access tracks

Topsoil and vegetation were stripped to about 1m depth before quarrying. The removed material was generally stored in low-risk areas (north and east of the quarry) in depressions and other areas of the quarry with no rock extraction. Furthermore, the majority of the ground clearance activities would have taken place at least 10m from the boundary stream. Therefore, it was unlikely to cause runoff into the boundary stream. These spoil deposits would have re-vegetated within about a year, further minimising erosion risk. As a result, this activity likely posed negligible risk to the boundary stream and the Bandon River SAC.

Other activities included the construction and formation of berms and access tracks within the Site. Between 1995 and 2005, no clear internal access roads were visible in aerial images except for the original access road. By 2005–2010, dedicated haul routes were established in the Site's vegetated northern zone. These routes were made with crushed quarry stone. The closest point of an access track is ca. 35m from the boundary stream. Additionally, vegetation was present between the route and the boundary stream, which would have helped trap any runoff at the margins. Hence, this posed little to no threat to suspended solids reaching the boundary stream and the Bandon River SAC.

Drainage / Settlement Ponds

The method used to build ponds F, G, and L is unclear, though they appear to have been dug into natural depressions without extensive berms. These ponds were well away from the stream and likely had negligible effect on water quality of the boundary stream. Other ponds

(A, K, B, C, D, E, J) formed in surface depressions due to spoil blockages and were unlikely to cause sediment runoff into the SAC. Ponds I and J are separated from the boundary stream by vegetated ground and hence little to no suspended solids could have reached the boundary stream. Any runoff from the construction of ponds A and K would have been intercepted by ponds F and G. The primary purpose of the settlement ponds was to control surface water runoff and manage suspended solids from the Site. Overall, it is considered that settlement pond construction would not have caused any significant adverse effect to the Bandon River SAC.

Construction Phase Conclusion

Based on the available information, it is not considered that the Construction Phase had any significant direct or indirect negative effects on the Bandon River SAC, especially due to the implemented water protection measures outlined in Section 7.1.3 below.

7.1.1.2 Operational Phase

The Operational Phase of the Development involved:

- Blasting and Drilling;
- Crushing and Screening;
- Stockpiling Overburden;
- Washing aggregate and discharging water to ponds; and,
- Transport to and from the Site.

Blasting and Drilling

Blasting and drilling activities would have occurred well away from the boundary stream onsite and would have been dampened down by water browsers or intercepted by settlement ponds. Additionally, the woodland is intersecting the quarried area from the boundary stream. Furthermore, blasting was a relatively infrequent event, with it only occurring bi-annually. Therefore, it is considered that no adverse effect would have occurred to the Bandon River SAC.

Crushing and Screening

Crushing and screening would have taken place on the quarry floor without the use of water. This dry process would have produced a significant amount of dust and fines, which were washed into settlement ponds during rain. It is considered that these materials would have settled effectively due to their grain size.

During periods of heavy rain, these settlement ponds could have overflowed, and fine fractions of suspended solids could have been discharged into the boundary stream.

The effect of suspended solids is outlined in section 7.1.2.1 below.

Stockpiling of Overburden

Overburden and aggregates were stored in designated areas. Heavy rainfall during the Site's Operational Phase could have caused fines and silt to wash into the surface water drainage. This could have happened as a result of the stockpiling of internally generated aggregate and imported aggregate both of which occurred around the quarry floor in A4 to a greater or lesser extent. Additionally, more recently stocked material might have increased washout, which would have decreased with each subsequent rainstorm event. If formed in A4, all of these washed-out particles would eventually have settled in ponds I and J; if generated in A3, they would have settled in ponds F, G and L. The potential effects are considered further below in Section 7.1.2.1.

Aggregate Washing

Aggregate washing is known to have taken place in Catchment 3 between at least 2000 and 2014. The procedure involved recirculating water between multiple ponds and using very small amounts of a coagulant (PAC) to help settle the finer particles (for more information on this, see the section below on the Use of Coagulant, 7.1.2.3).

It is our understanding that this pumping and settlement system between Ponds A, B, C, and K appears to have developed somewhere between 2003 and 2005. Several of these ponds were non-existent before that period. Refer to Substitute Consent Site Layout Dwg Ref. 4597-03-SC.

However, the Hydrology and Hydrogeology Chapter of the rEiAR notes that Area 3 was also the centre of aggregate washing and related settlement ponds. Water from Pond L could have flowed from this area of the site when all three ponds (F, G & L) were at capacity, following an overland route through the woodland and under the access road via a pipe to the boundary stream. The effect of this activity on surface waters is outlined in Section 7.1.2.1.

Transport to and from the Site

Vehicles may have tracked fines or caused dust runoff, particularly at the entrance where the berm is narrow. However, this likely had only a slight and short-lived effect on the stream, with no lasting effects on the Bandon River SAC.

Trucks departing the Site may have produced fines either in the form of fines washing off loads or dust washing from tyres in rainy weather. These might have caused the solids to wash out onto the entrance road. With the exception of the Site entry, where there is only a very thin margin separating the road from the boundary stream, the entrance road is mostly protected from the boundary stream by the berm. As a result, there is a chance that some solids washed out with extremely high rains at this location.

Overall, this would have had an imperceptible to slight intermittent adverse effect on the boundary stream and no adverse effect on the Bandon River SAC.

7.1.2 Potential Impairment of Water Quality from Construction / Quarrying Activities

7.1.2.1 Effect of suspended solids

As outlined above, all quarrying activities produced solid particles that were directed into settlement ponds, specifically ponds F, G and L in the central area (A3), and ponds I and J in the southwest section (A4). It is our understanding that these ponds were fully functional from around the year 2000, meaning that any solids generated onsite would have been captured and treated either through natural settling or with the help of coagulants. However, during periods of heavy rainfall, the final ponds in each series - pond L in A3 and pond J in A - could have overflowed into the nearby boundary stream.

It is not considered that the water discharging from these ponds would have posed a significant risk given that they are the last ponds in the settlement drainage system. The only likely material that would have been released would have been finer materials such as silt or clay, which are easily transported by water. It is considered that this release would have only occurred during periods of heavy rainfall and high-flow events.

It is considered unlikely that these particles would have settled in the boundary stream; instead, they would have been carried further downstream and dispersed into the Bandon catchment.

It is not considered that these events would have caused any significant deterioration in the water quality in the boundary stream or downstream within the Bandon River. It should be

noted that sediments are a natural part of river ecosystems and play a role in shaping the physical habitat of the ecosystem. It is considered likely that the potential release of these sediments would have been similar to those already present in the watercourses. Therefore, any effect on the boundary stream and the Bandon River SAC would have been negligible.

7.1.2.2 Effects on Freshwater Pearl Mussels

The adult population of FWPM in the Bandon River SAC holds both national and international significance. Some of the densest populations are located within a ca. 3 km stretch of river between Ardcahan Bridge and Long Bridge, downstream of the Ardcahan Quarry stream confluence. A review of survey data from 2019 indicated no clear differences in adult mussel numbers between river sections upstream and downstream of the quarry stream. The likelihood of encountering abundant mussels was the same in six 100-metre stretches both above and below the confluence, based on the survey's standard sampling unit [33]. During the FWPM surveys in 2023, ca. 148 FWPM were recorded at the confluence and downstream. During the 2024 survey, ca. 1,008 FWPM were recorded in the same locations. As noted in the FWPM Survey Report, this is outside the normal margin of error, and further investigations upstream of the Site were undertaken. It was found that there were no FWPM located at Ardcahan Bridge. This bridge was surveyed in 2022 where 14 FWPM were found under the bridge, and high numbers were recorded downstream of it.

Additionally, survey work conducted in the catchment as part of 'A Survey of the Distribution and Abundance of Freshwater Pearl Mussels in the Upper Bandon, Garrown and Caha Rivers during Summer 2019' [34], noted heavy silt clouds when the riverbed was disturbed. As part of the FWPM survey in 2024, the Ardcahan Bridge was surveyed. At this location, evidence of silt was noted. Silt plumes were present when the riverbed was disturbed. This was present at Ardcahan bridge and at sampling locations downstream of the Site. These findings suggest that quarry operations between 1990 and 2014 did not adversely affect the adult mussel population.

However, the overall FWPM population in the Bandon River is not self-sustaining and is considered likely to be functionally extinct. Despite the presence of adults, no juveniles (i.e., individuals under 60 mm) have been detected in recent extensive surveys, including those conducted in 2023 and 2024.

This is likely due to poor substrate conditions, which are critical for juvenile survival. Juveniles spend several years buried around 5 cm into the riverbed, depending on the water flowing through the substrate for oxygen [33]. When coarse sand and fine gravel beds become clogged with mineral or organic fines, water movement is restricted and oxygen levels drop - especially in areas rich in organic material, which reduces juvenile survival rates, often eliminating them altogether across the SAC. The NPWS notes that '*the decline of the freshwater pearl mussel has resulted from failure to recruit young mussels to populations. The cause of these recruitment failures is damage to the species' habitat, specifically through hydrological, sedimentation, other morphological and enrichment impacts*' [35]. Young and juvenile FWPM are known to be even more sensitive than adult FWPM, as they live buried in the substratum for five or more years. FWPM are known to be extremely sensitive to environmental perturbations, owing to their complex life-cycle and vulnerability to habitat change.

Surveys undertaken by Moorkens as part of '2019 Survey of *Margaritifera margaritifera* condition in the Bandon and Caha Rivers, County Cork' [36], noted poor quality juvenile FWPM habitat conditions ca. 750m downstream of the confluence of the boundary stream and Bandon River. Moorkens noted that this habitat was degraded, particularly along the river's edge. As noted in the previous rNIS assessment, this is important given that the quarry's sediment control system, would likely have only discharged intermittently and during periods of prolonged and heavy rain events. During such times, the main river's flow would also be

high which in turn would have helped disperse fines widely downstream. These discharges would have coincided with larger runoff events from the broader Bandon/Caha catchment area.

In summary, while it is possible that quarry operations led to occasional increases in suspended solids reaching the river during high-flow events, such instances appear to have been rare. These would not likely have smothered adult mussels, and no direct adverse effects on this life stage are expected. Nevertheless, while land uses such as forestry, grazing, silage storage, construction, infilling, and peat cutting have been identified as the main contributors of diffuse silt pollution [36], it is also likely that the quarry played a role in the cumulative silt load. This combined effect may have contributed to the ongoing failure of juvenile mussels to survive in the SAC.

Given the absence of specific surface water survey data during the period of Substitute Consent, it is not possible to confirm or quantify the contribution of silt from the quarry operations to the boundary stream or the River Bandon.

It is also not known if there were other sources of silt within the wider catchment. It is, however, likely that the quarry did contribute to a certain extent given the nature of the on-site operations and hydrological connection, particularly during high rainfall events. This effect is considered to have had a slight to moderate effect, with medium to long-term negative effects on the quality of juvenile pearl mussel habitat within the Bandon River SAC.

7.1.2.3 Use of PAC

As noted in Section 3.1.1.3, PAC was used in the water management process to improve water quality by the coagulation of fines and sediments. PAC is highly effective at removing suspended particles from water, and its primary function is to improve water quality.

However, in certain circumstances, PAC can be toxic to aquatic life and is influenced by pH, water hardness and dosage.

Impacts on aquatic organisms can include:

- Residual aluminium can clog fish gills, impairing their ability to regulate water content and oxygen transfer, which can lead to death;
- Exposure to high concentrations can cause oxidative stress and increased mortality in mussels and snails. Filter-feeding species are often more sensitive than other species; and,
- Zooplankton species show varying sensitivity; toxicity is largely dependent on the conductivity of the treated water.

However, based on the available information, the amount of aluminium entering the Bandon River SAC from PAC use at the quarry was likely very low, for several reasons:

- Only small quantities of PAC were used in the aggregate washing process;
- The PAC solution was heavily diluted with clean water before use;
- Most of the aluminium would have settled out along with the coagulated solids in settlement ponds A and B; and,
- Any remaining PAC would have only exited the site through ponds G and L during wet weather, when it would have been further diluted by rainfall and streamflow.

Aluminium toxicity is known to be more harmful to aquatic life in more acidic waters. Water sampling from the boundary stream was undertaken in 2014 as part of planning application submitted under CCC Planning No. 14/00616 and An Bord Pleanála Reference No. PL

08.245174, recorded pH values of 7.5 upstream and 8.14 downstream of the Site. These pH levels fall within the range where aluminium is far less harmful. Taking this data into account, the use of PAC in the stated volumes and method is considered to have posed a very low risk to aquatic invertebrates (including FWPM) and fish in the boundary stream and the Bandon River SAC.

7.1.2.4 Hydrocarbons

Oil pollution is known to cause significant damage to aquatic communities and loss of bulk stored oil or oil from construction vehicles would have had an adverse effect, the severity of which would have depended on the volumes of oil involved. Minor leaks could have had the potential to have negligible effects, whereas larger leaks and spills could have had significant negative short-term adverse effects if they were not controlled.

It is understood that all fuels were banded on site and equipment was refuelled in designated areas. No losses or leaks of hydrocarbons were reported arising from the quarry during its operations. It is therefore not considered that there would have been any potential effect arising from the Development.

Operational Phase Conclusion

Considering all of the above, it is unlikely that Operational Phase surface water runoff or discharge caused any significant indirect habitat loss, degradation or water quality improvement within the Bandon River SAC. This conclusion takes into account the water protection measures that were in place during the 1990–2014 period, as further outlined in Section 7.1.3 on mitigation and remedial actions.

7.1.3 Mitigation Measures During the Development

According to Chapter 7, Hydrology and Hydrogeology of associated rEIAR, the following measures were in place during the Development period 1990-2014.

- *'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 banded 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;*
- *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.'*

7.1.4 Potential Impairment of Air Quality from the Quarry Construction / Quarrying Activities

As outlined above in Section 4.2.3, it is not considered that air quality had a significant effect on European sites, given the mitigation measures in place during the Development's operational phase. The measures in place to prevent significant dust emissions from the Development included:

- Dampening of Site roads during drier summer months;
- Speed restrictions on internal Site roads enforced via ramps; and,
- Aggregates were stored in an enclosed shed once processed.

See Chapter 8 of the rEiAR for full details on the air quality assessment.

7.2 Stage 2 – Analysis of 'In-Combination' Effects

Based on the mitigation measures as described in Section 7.1, the Development alone did not have any direct or indirect adverse effects on the integrity of any European Sites.

Following a review of the Cork County Council Planning Files [15], and the Department of Housing, Local Government and Heritage's planning portal – the National Planning Application Database, no current or previously granted plans or projects were identified in the immediate vicinity that are considered to have had the potential to have any in-combination with the Development to result in significant effects on the integrity of European Sites.

It is therefore considered that the Development is unlikely to have had any significant in-combination contribution to possible significant effects on the Bandon River SAC.

Taking the above into account and given the fact that the aforementioned projects will not result in any adverse effects to European Designated Sites, it can be concluded that the Development will not result in any in-combination contribution to adverse effects on the integrity of any European Sites.

8 NIS CONCLUSIONS AND STATEMENT

The screening process has examined the details of the Development and has considered the potential for causing adverse effects on European sites and their qualifying interests within a 15km radius of the Site.

As detailed in Section 4.2, the Stage 1 AA Screening conclusion states that the boundaries of two designated sites, The Gearagh SAC and The Gearagh SPA, were screened out. It can be concluded that the Development did not, either alone or in combination with other plans or projects, have significant effects on these European sites.

However, a hydrological connection was identified between the Bandon River SAC and the Site, via the boundary stream and the Bandon River, which forms part of the Bandon River SAC. Therefore, the Bandon River SAC was taken forward for further detailed consideration.

Following an examination, analysis and evaluation of the relevant information, including the nature of the possible effects from the Development and all associated works, it has been objectively concluded that 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 and or any other European site in light of best scientific knowledge. No reasonable scientific doubt exists in relation to this conclusion.

Accordingly, progression to Stage 3 of the Appropriate Assessment process (i.e. Assessment of Alternative Solutions) is not considered necessary.

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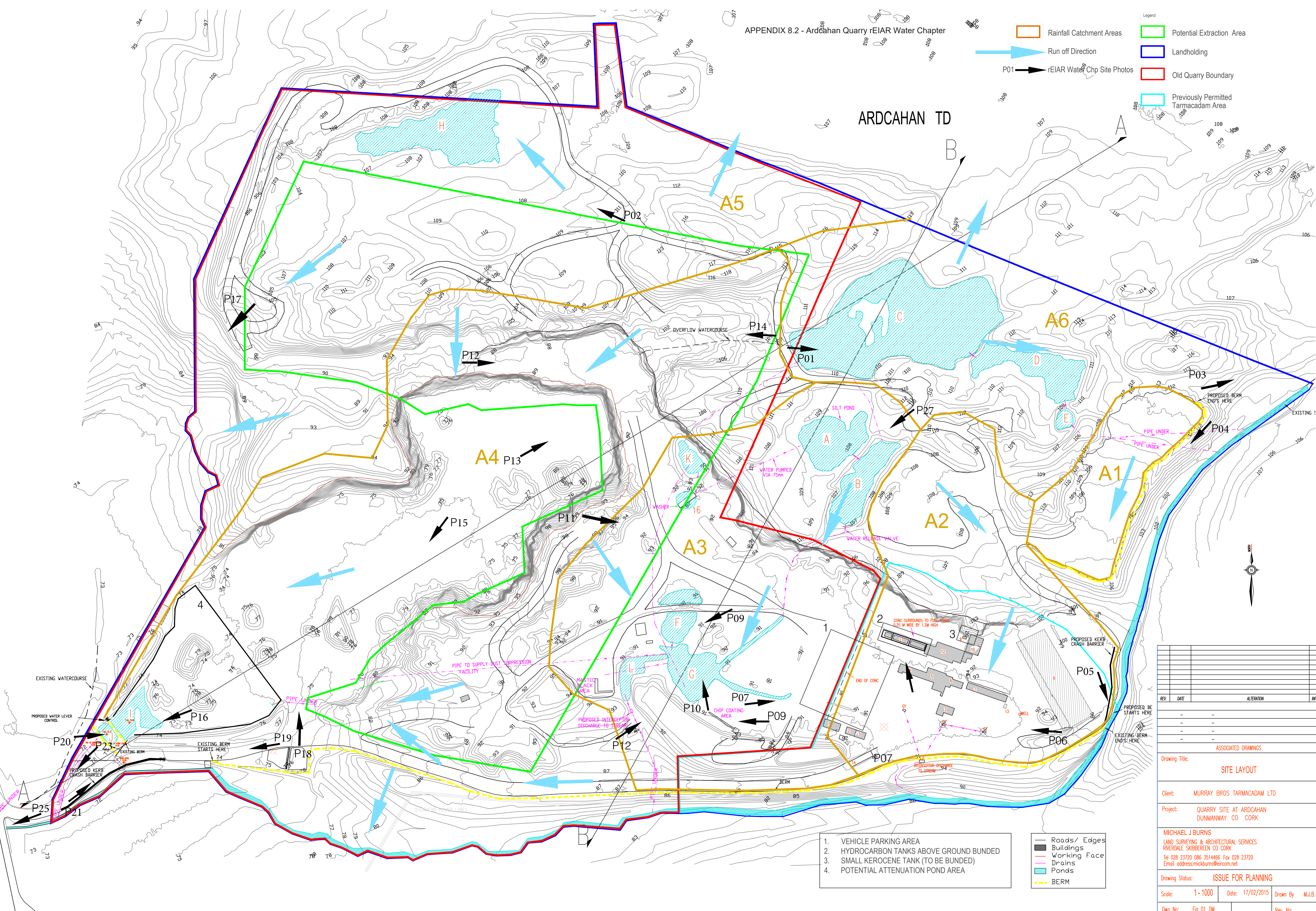
APPENDICES

APPENDIX A

ARDCAHAN TD

Legend

- Rainfall Catchment Areas
- Potential Extraction Area
- Landholding
- Old Quarry Boundary
- Previously Permitted Tarmacadam Area
- ▶ Run off Direction
- ▶ rEiAR Water Chp Site Photos



1. VEHICLE PARKING AREA
2. HYDROCARBON TANKS ABOVE GROUND BUNDED
3. SMALL KEROCENE TANK (TO BE BUNDED)
4. POTENTIAL ATTENUATION POND AREA

- Roads/ Edges
- Buildings
- Working Face
- Drains
- Ponds
- BERM

REV.	DATE	ALTERATION	INT.
ASSOCIATED DRAWINGS			
Drawing Title: SITE LAYOUT			
Client: MURRAY BROS TARMACADAM LTD			
Project: QUARRY SITE AT ARDCAHAN DUNMANWAY CO CORK			
MICHAEL J BURNS LAND SURVEYING & ARCHITECTURAL SERVICES RIVERDALE SKIBBEREEN CO CORK Tel 028 23720 086 3514466 Fax 028 23720 Email address:mickburns@eircom.net			
Drawing Status: ISSUE FOR PLANNING			
Scale: 1 - 1000	Date: 17/02/2015	Drawn By: M.J.B.	
Dwg No: Fig 01_DM			Rev. No: -

APPENDIX B

Sweeney Consultancy

Rahan, Mallow, Co. Cork.

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Freshwater Pearl Mussel (*Margaritifera margaritifera*)
Survey of the River Bandon
at Ardcahan, Dunmanway, Co. Cork.

September 2024

Due to the sensitive nature of data concerning the locations of freshwater pearl mussels, distribution of this report should be restricted and not released to the public.

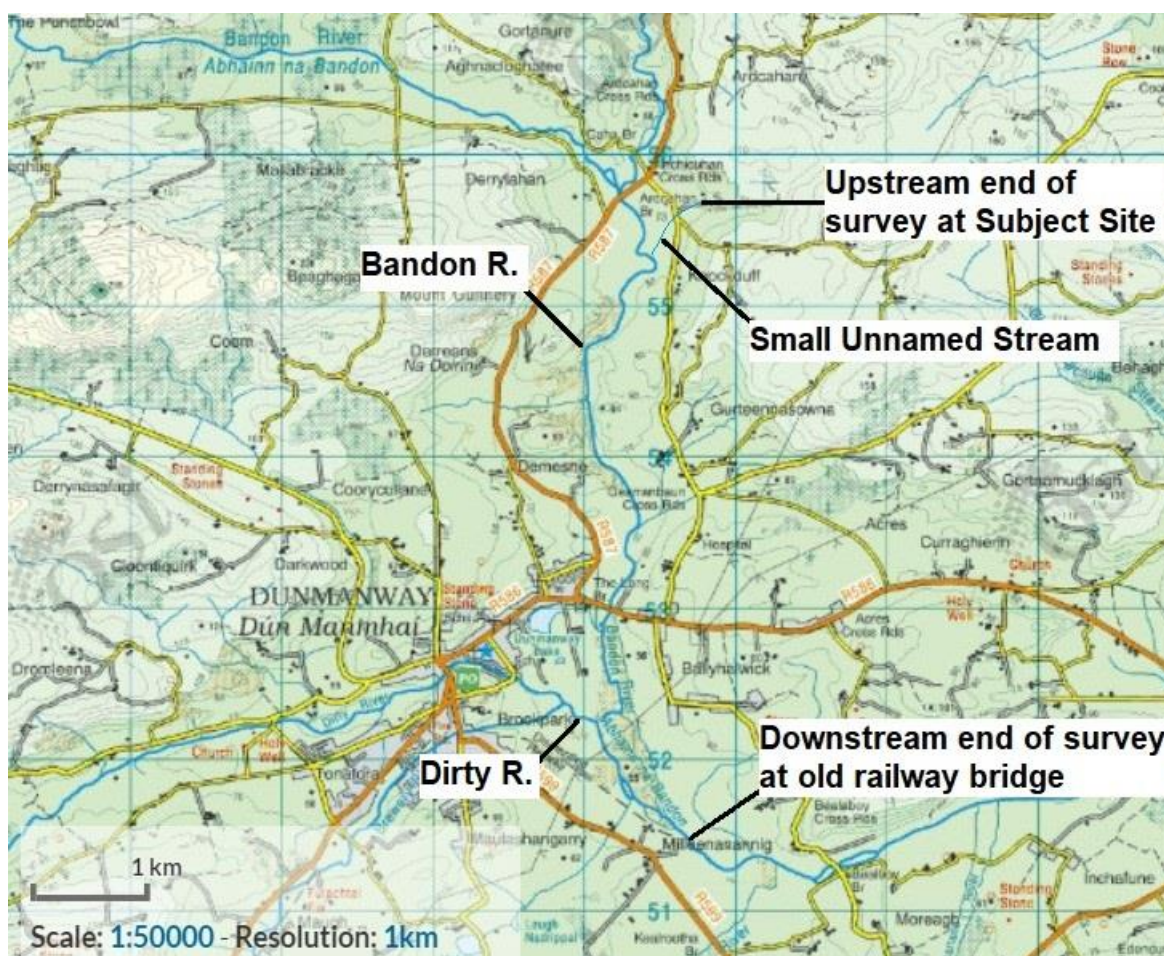
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SECTION 2	METHODOLOGY	5.
SECTION 3	RESULTS	5.
SECTION 4	FURTHER INVESTIGATIONS & DISCUSSION	6.
APPENDIX 21	REFERENCES	7.

1. INTRODUCTION

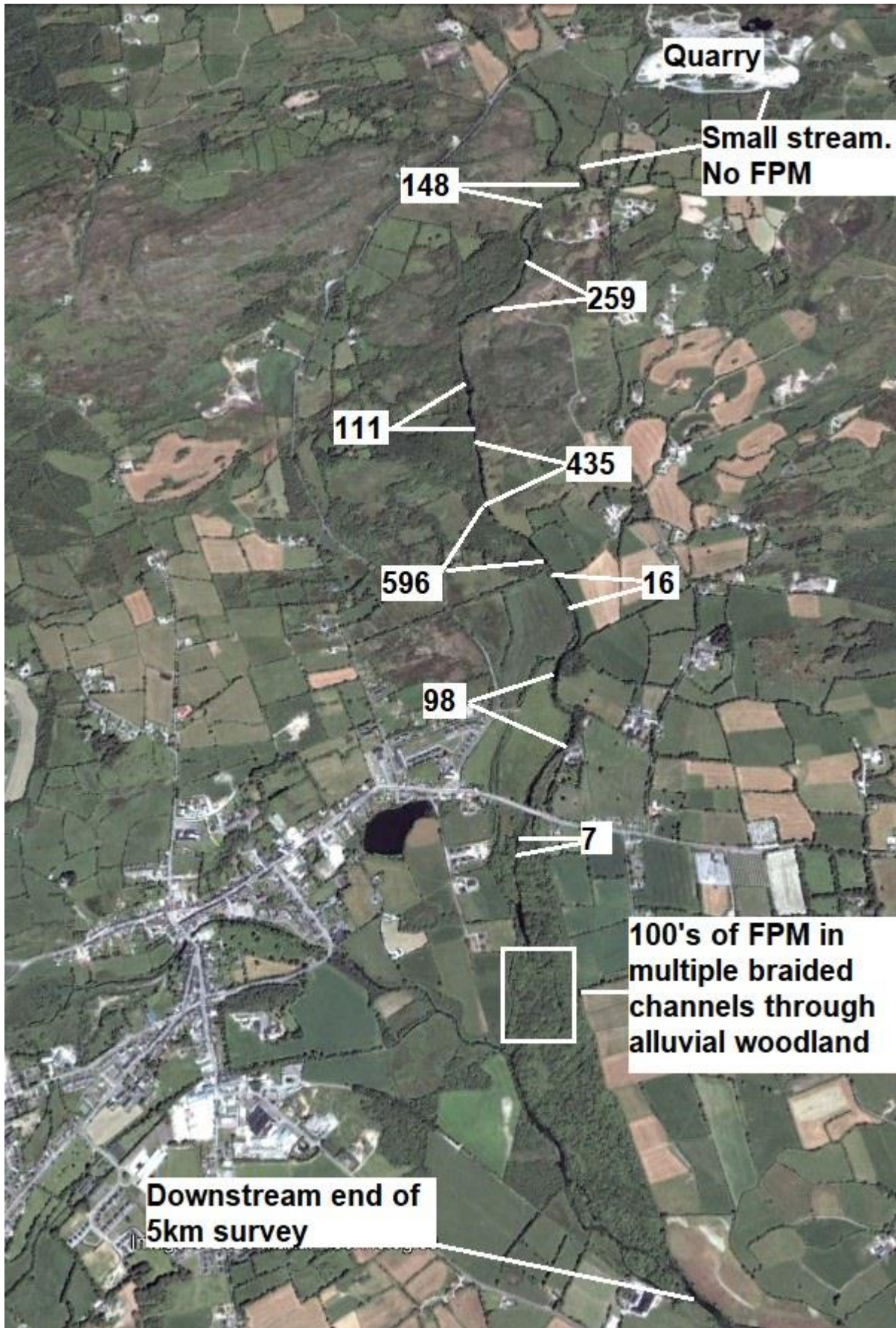
In June 2023, Sweeney Consultancy was commissioned by Malone O'Regan Environmental to undertake an aquatic ecological assessment, including a survey of Freshwater Pearl Mussels (*Margaritifera margaritifera*) downstream of a quarry at Ardcahan, Dunmanway, Co. Cork. As the aquatic zone of potentially highest impact is from the location of a proposed development to 5km downstream (Escauriaza *et. al.*, 2017), the section of watercourse assessed was from an unnamed small stream adjacent to the quarry site to the old railway bridge downstream of Dunmanway (Figure 1).

Figure 1. June 2023 Survey Location Map



The distance from the confluence of the stream from the quarry with the River Bandon (ITM 524406 555396) to the first Freshwater Pearl Mussel (FPM) downstream was c. 80m. From this point, at ITM 524438 655304 to ITM 524423 655268, 148 FPM were counted. (Figure 2). As the proposed development at the quarry site was delayed, Sweeney Consultancy was commissioned to re-survey this part of the River Bandon FPM population nearest the quarry.

Figure 2. Freshwater Pearl Mussel Locations and Numbers June 2023



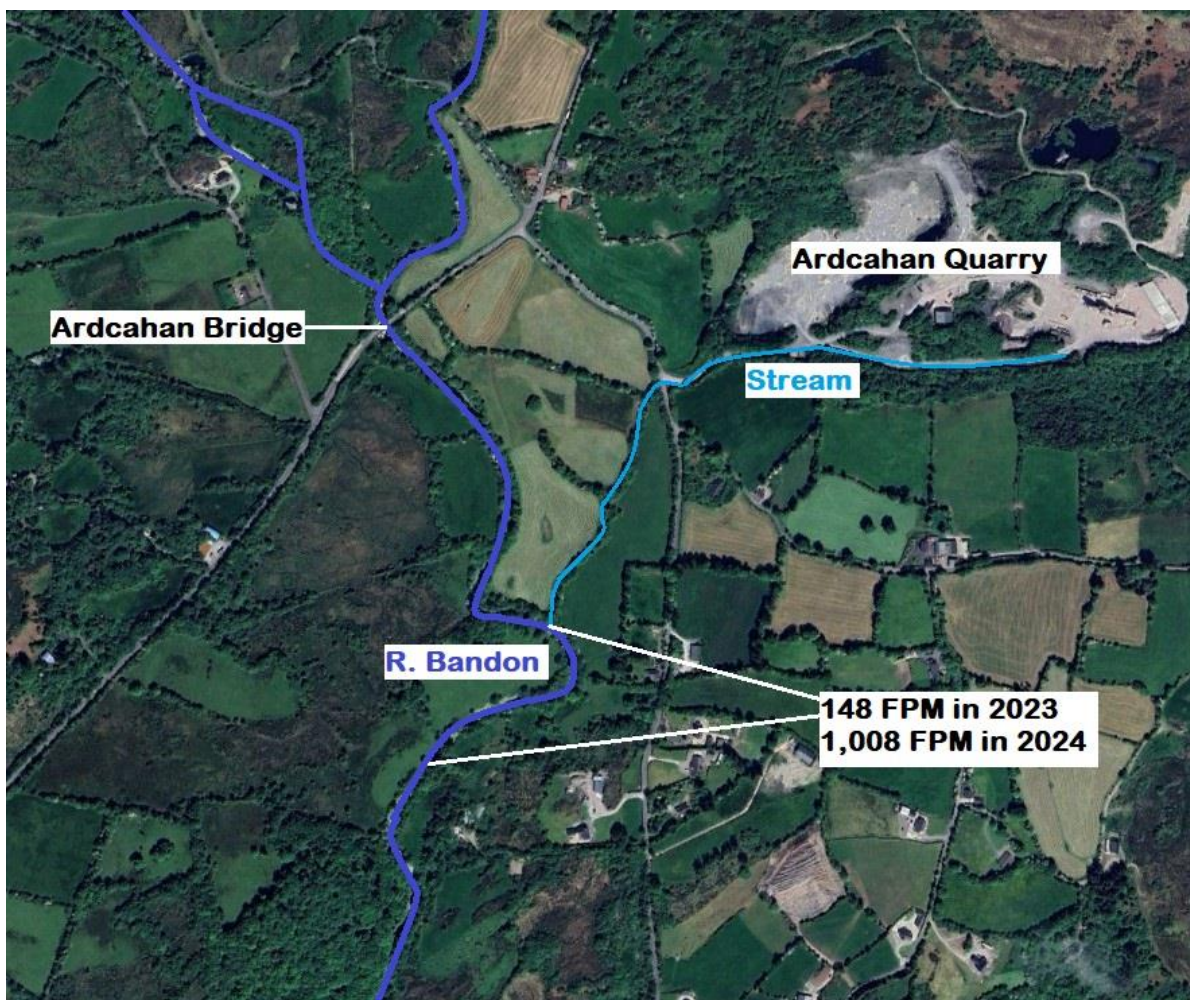
2. METHODOLOGY

A field survey was carried out on September 10th, 2024 by Pascal Sweeney (Licence No. C09/2024), and Henry Tennyson (Licence No. C196/2024). The survey methodology used was in accordance with the guidelines given in Irish Wildlife Manual No. 12, NPWS (Anon., 2004). Grid references were recorded using a hand-held Garmin GPS 72H.

3. RESULTS

1,008 live FPM were found in the section of the River Bandon surveyed (Figure 3). This included some very close to the confluence of the small stream from the quarry.

Figure 3. Freshwater Pearl Mussels close to Ardcahan Quarry



Information on the locations of freshwater pearl mussels gathered in this survey will be given to National Parks and Wildlife Service, as required by the Licence Conditions.

4. FURTHER INVESTIGATIONS & DISCUSSION

As an increased count of FPM from 148 in 2023 to 1,008 in 2024 in a relatively short section of river, is very far outside the normal margin of error for a survey of this kind, some further investigations were undertaken. In 2022, Sweeney Consultancy had been commissioned by Triturus Ltd to survey FPM bedded under Ardcahan Bridge, with a view to an application to re-locate them, in order to facilitate bridge repair and flood relief works. Fourteen FPM were recorded under the bridge and high numbers were observed within a short distance downstream. No licensed re-location of FPM followed.

On 10/09/2024, Pascal Sweeney and Henry Tennyson checked for FPM under and immediately downstream of Ardcahan Bridge. None were observed. It would appear that this absence of mussels at Ardcahan Bridge could be linked to the substantial increase found downstream of the stream from the quarry.

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APPENDIX C

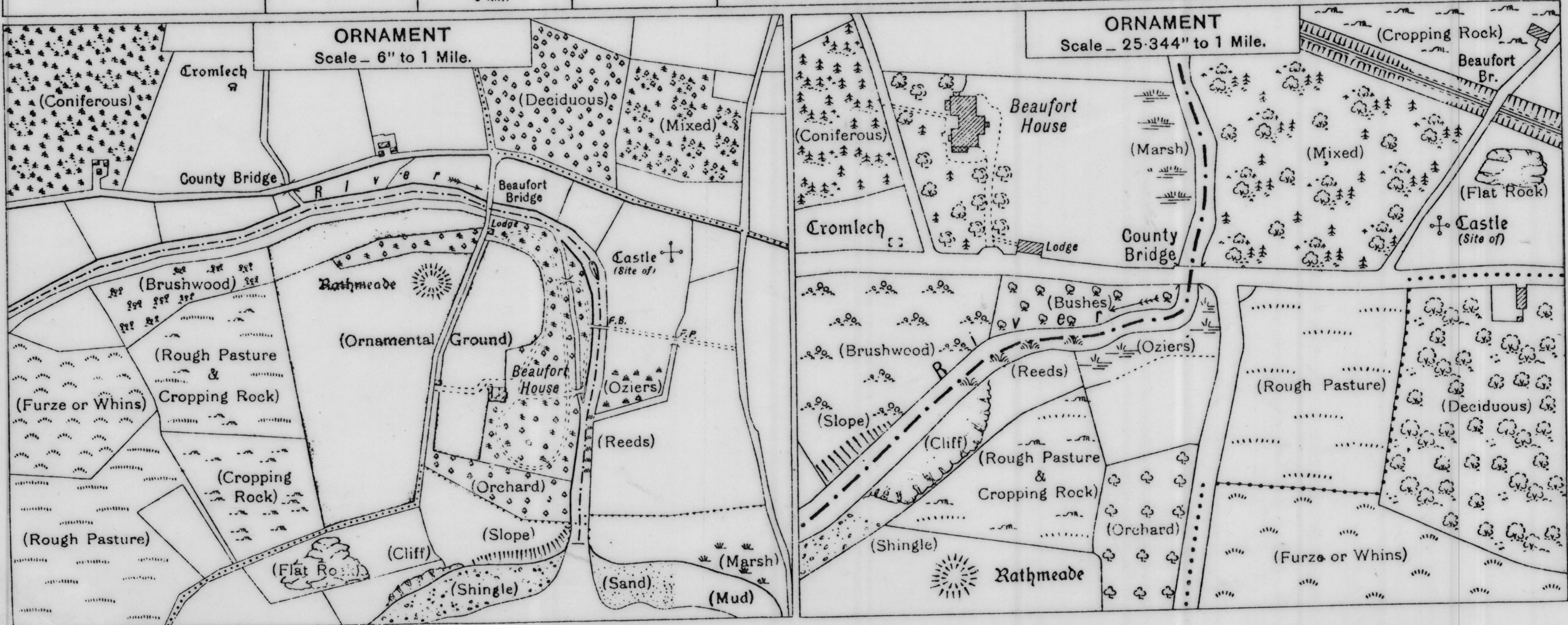
CHARACTERISTIC SHEET

FOR MAPS ON A SCALE OF

1:10,560 or 6 Inches to 1 Mile and 1:2,500 or 25.344 Inches to 1 Mile.

BOUNDARIES		WRITINGS		SYMBOLS	
<p>SCALES</p> <p>1:10,560 or 6" to 1 Mile. 1:2,500 or 25.344" to 1 Mile.</p>		<p><i>Plans published prior to 1938.</i></p> <p><i>Plans published subsequent to 1938.</i></p>			
Counties.....	-----	* BARONIES	* BARONIES	Bridges.....	
Baronies.....	-----	PARISHES	PARISHES	Weirs or Dams.....	
Parishes (only shown in County Boros. & Urban Distrs.)	-----	TOWNLANDS	TOWNLANDS	Ferries.....	
Townlands.....	-----	CO. BOROUGHES	CO. BOROUGHES	Fords.....	
Counties & Baronies.....	-----	MARKET TOWNS	MARKET TOWNS	Canals.....	
Baronies & Parishes.....	-----	Villages Villages (Important)	Villages Villages (Important)	Railways.....	
Parishes & Townlands.....	-----	Workhouses	County Homes	Tunnels.....	
Counties, Baronies, Parishes & Townlands	-----	Bridges, Public Buildings, Churches.	Bridges, Public Buildings, Churches.	Light Railways.....	
County Boroughs, Urban Districts, & Towns (when not coincident with other Boundaries)	(Described) -----	Locks, RAILWAYS, Manufactories, Bridges, &c.	Locks, RAILWAYS, Manufactories, Locks.	1 st Class Roads.....	
Wards (only shown in County Boros.)	(Described) -----	PARKS	PARKS	2 nd Class Roads.....	
When Centre of River.....		BAYS & HARBOURS	BAYS & HARBOURS	3 rd Class Roads.....	
When Centre of Stream.....		NAVIGABLE or TIDAL RIVERS	NAVIGABLE or TIDAL RIVERS	Unfenced Roads.....	
When Side of River.....		Smaller Rivers, Brooks.	Smaller Rivers, Brooks.	Quarries.....	
When Side of Stream.....		Antiquities	Antiquities	Gravel Pits.....	
When Centre of Road.....		Area Figures	Area of parcels given in Statute Acres, thus 4.370	Forts & Mounds.....	
When Centre of Wall or Fence		Bench Marks Minor Altitudes	Bench Marks Minor Altitudes	Wells & Springs.....	
When Face of Wall or Fence		B.M. 5.47 121	B.M. 5.47 121	Pumps.....	
When 6' Root of Hedge.....		Initial Letters to Small Objects.	Initial Letters to Small Objects.	Trigonometrical Station.....	
		M.P. Mile Post M.S. Mile Stone	M.P. Mile Post M.S. Mile Stone	Contours.....	
		S.P. Signal Post S.B. Signal Box	S.P. Signal Post S.B. Signal Box		

These Examples vary in Size and Extent according to the Importance of the District and Object to which they refer.



* Character used when entirely on body of Sheet.