

### EIAR – Volume 3 - Appendices Proposed Quarry Re-Commencement & Extension Part 3

Herbie Stephenson Limited
Deerpark, Donard, Co. Wicklow





## EIAR – Volume 3 - Appendices Proposed Quarry Re-Commencement & Extension Herbie Stephenson Limited Deerpark, Donard, Co. Wicklow

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## Environmental Impact Assessment (EIA) Scoping Report



Proposed Quarry Recommencement & Extension at Deerpark, Donard, Co. Wicklow

On behalf of Herbie Stephenson







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Title: Environmental Impact Assessment (EIA) Scoping Report, Proposed Quarry Recommencement & Extension at Deerpark, Donard, Co. Wicklow, on behalf of Herbie Stephenson.

Job Number: E2123

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### Environmental Impact Assessment (EIA) Scoping Report Proposed Quarry Re-commencement & Extension at Deerpark, Donard, Co.

### **Wicklow**

### On behalf of Herbie Stephenson

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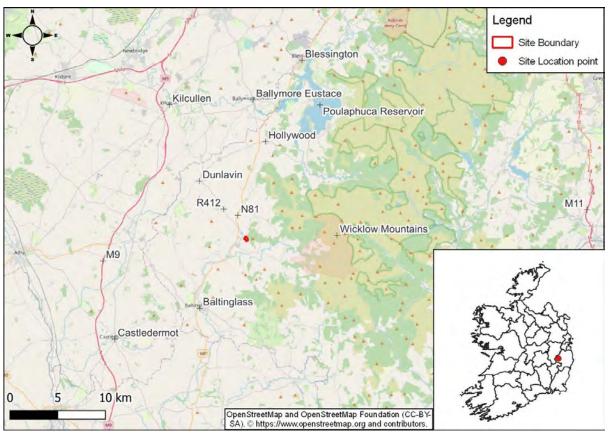
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### 1 INTRODUCTION

Malone O'Regan Environmental (MOR) has been commissioned by Mr. Herbie Stephenson (the Applicant) to prepare an Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS) in support of a planning application to Wicklow County Council, for the proposed re-commencement of an old rock quarry in Deerpark, Donard, Co. Wicklow, along with the extension of the quarry into reserves to the south and east of the historic quarry.

The site is located approximately 2.4km southwest of Donard, Co. Wicklow, Ordnance Survey Reference ITM E 691950, N 695434, as shown in Figure 1-1, and covers an area of ca.9.8 Hectares (ha) (henceforth referred to as the Site).

Figure 1-1: Site Location



The Site will extend the historic quarry into land to the east and south. These lands are currently in agricultural use by local farmers.

This document outlines the Site details and the methodology that MOR and the guidance documents to be utilised to prepare the EIAR.

### 1.1 Applicant

The Wicklow based applicant, Mr. Herbie Stephenson, has worked in the construction materials sector since 2003, including managing an extractive development. His wide experience also includes site clearance/construction and demolition, including project managing the set-up of a concrete recycling centre. Having gained significant management experience in construction and demolition (C&D) wastes, he currently operates a large fleet of permitted waste collection vehicles operating under a countrywide waste collection permit, in addition to a permitted waste facility dealing with the intake of inert soil and stone.

From this wide experience, he has attained all the expertise required to successfully execute the development the subject of this application. At present his company has 15 employees and is currently recruiting to expand further.

### 1.2 Existing Development

The Site was originally a pre-1960 quarry development which sought, and was granted, planning permission in 1991, covering an area of ca.2.5ha (planning reference 90/006374) for a period of five years. Operation ceased at the former quarry upon the expiry of the planning permission.

Planning was sought to recommence quarrying in 2021, with a site area of ca.2.4ha planning reference 21/1472, on behalf of the Applicant, which was refused by the Local Authority on the grounds that a sub-threshold EIAR and NIS were required as part of the planning application. The Site context is shown in Figure 1-2 below.

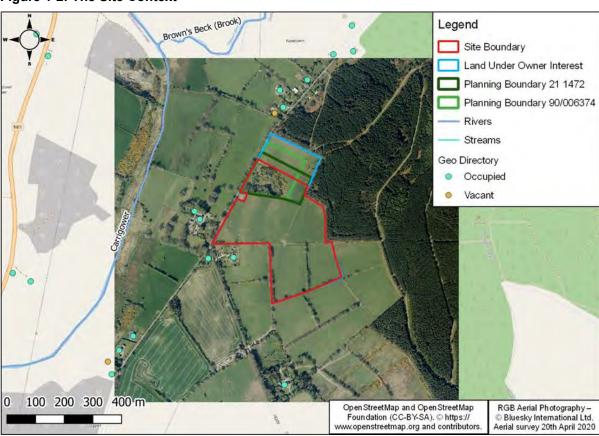


Figure 1-2: The Site Context

### 1.3 Description of the Proposed Development

The Site consists of a total area of ca.9.8 ha of which 2.6ha comprises the original quarry permitted area, which will primarily be used for the administration and dispatch, and a further ca. 4.6Ha extension area comprises the extent of the extraction zone. The remainder of the Site will be utilised for boundary set-backs and development of soil embankments/berms.

It is proposed to utilise the existing entrance to the historic quarry for the siting of the office, welfare, wheel-wash and weighbridge. To establish this entrance and administration area, modification to the existing ground levels towards the rear of the historic quarry will be required along with the clearance of a small number of trees located along the roadside hedge to achieve safe sightline distances.

The roadside level along the western boundary of the historic quarry is can 66mOD, with the existing ground level within the historic guarry of ca. 168mOD. This level rises to ca. 172mOD towards the centre rear of the historic quarry. The proposed quarry expansion will involve extracting rock from an extension area to the east and south of the existing quarty: 20/07/2025

The Proposed Development activities will comprise of the following:

- Extraction of rock by blasting means down to 165mOD;
- Dry processing of material using mobile plant:
- Landscaping and restoration of the quarry; and,
- All other ancillary facilities and works.

The Proposed Development will not involve washing aggregates. Planning permission is being sought for a 25-year, with an annual extraction rate of up to 275,000 tonnes per annum. The number of loads per day is presented as an upper limit over a typical year, based on the scale of the Proposed Development and the likely market need.

It is proposed to extract the materials over a phased approach, which will include a phased restoration of the Site over its operational period. Overburden stripping limited to sufficient ground for 12-18 months of extraction, thereby minimising the area of high-level exposed ground. As part of the development of the Site, a depression or low point will be developed to gather water with the working area, to ensure water on-site is managed and controlled, as necessary.

Blasts at the quarry will take place at predetermined times with all neighbouring properties notified in advance. Once the initial development phase of the guarry faces has been achieved, the likely number of operational blasts per annum will be of the order of 10-15. Blasting will follow best practice guidelines as outlined by the Health and Safety Authority (HSA) with benches of approximately 15m depth.

The Proposed Development will have 3 distinct stages per Phase:

- Stage I: Removal of topsoil and overburden;
- Stage II: Aggregate Extraction (blasting), Processing, Stockpiling & Haulage to Market; and,
- Stage III: Restoration.

Plant used on site will incorporate the following plant and machinery, which includes:

- **Excavators**:
- Wheel Loader 2-3 units:
- Mobile Crushers:
- Mobile Screeners;
- Drilling Rig; and,
- Tractor & Bowser.

The plant above will be brought to the Proposed Development once operations on site commence. Activities will initially work within the existing quarry to, clear vegetation and reduce the floor level and prepare the face for blasting. In tandem with these preparation works the guarry area adjacent the local road will be improved to provide for a modern site entrance off the local road, positioning of an office with welfare, weighbridge, wheel wash and parking. Prior to moving into the existing agricultural fields, the topsoil and over burden will need to be removed. This material will be utilised in the creation of the boundary embankments/berms and planted with native species to stabilise the berm. To minimise the area of exposed ground, the removal of soils and overburden will be done on a phased basis, as required by the quarry operator. As operations allow and following cessation of works within distinct phases, stockpiles will be used to source soil for the restoration of quarry floor and bench tops on a phased basis.

There are currently no connection to public utilities at the Site. An ESB line to supply standard 2-phase power will be sought to connect the office and general plant. Mobile plant on site will be self-powered, with refuelling occurring as required by a mobile bowser. Potable water will be available in the office and supplied by bottled container. Welfare water, and water for the wheel wash will be supplied by an onsite well.

Following initial works to establish the entrance, administration, and services, and to clear the historic quarry and prepare it for blasting, the quarry will move into phase one production, with the blasting of the rock face, extending the quarry to the east and south. The quarry will be developed to a working quarry floor of ca. 165mOD. During phase one works, and the development of the Site, smaller controlled blasts will occur, releasing smaller quantities of aggregate from the targeted working face, minimising vibration, and air over pressure emissions. At full production blasts will be more in-line with standard quarry practices, generating ca. 20,000-25,000 tonnes of broken rock per blast, and occurring generally 10-15 times per year.

Extracted material is processed into aggregates and stockpiled onsite, prior to loading and transportation to market. Dry processing, including crushing, screening and stock piling will occur within the quarry floor, with only occasional need for rock breaking. No fuel storage will be required within the quarry, with machinery re-fuelled on an as needed basis by a fuel bowser by trained personnel. All processing plant will be mobile/semi-mobile, enabling key plant to follow, over time, the working face within the quarry. A loading shovel will load trucks within the quarry floor, with trucks departing via the improved site entrance, utilising the weighbridge and wheel wash.

Operational (processing) hours at the Proposed Development will be:

- 08:00am to 18:00pm Monday to Friday inclusive; and,
- 08:00am to 14:00pm on Saturdays.

Truck movements will be restricted to one hour before and after the Site operational hours to allow for loading and dispatch over a 12-hour day. The market for these aggregates is both local and regional, depending upon availability and market pressures. Based on a maximum of 50 trucks entering and exiting the site per day, this equates to one exiting and entering every one movement every 15 minutes approximately at maximum capacity; such a level of traffic is not seen as a usual occurrence, noting 275,000 tonnes/annum equates to 30-40 trucks based on a combination of articulated ad four axle trucks for 50 weeks.

Aggregate will be supplied from the quarry on an occasional basis outside normal opening hours to service exceptional customer requirements. The Proposed Development will provide employment for ca. 5-8 employees on a fulltime basis.

The nature of the Proposed Development results in virtually no waste. Almost all products and by-products arising from aggregate processing have inherent commercial value.

Soils and topsoil removed during stage 1 (Site preparation works) will be stockpiled and utilised in stage 3 works (the restoration remediation of the lands).

### LEGAL AND PLANNING CONTEXT

### 2.1 Legal Context

PECENED The Planning and Development Act 2000 (as amended) forms the foundations for planning regulation in Ireland. This Act covers a large range of planning-related issues and combines a wide range of legislation under its guidance in one place.

The specific requirements for planning development are outlined within the Planning and Development Regulations 2001 as amended. These Regulations implement the Planning and Development Act, 2000. They consolidate all previous Regulations and replace the Local Government (Planning and Development) Regulations 1994-2000.

On 14th April 2014, the EIA Directive (2014/52/EU) was adopted, amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment. The directive was transposed into Irish law through Statutory Instrument S.I. No. 296 of 2018 with a commencement dated 1st September 2018.

Developments that require EIA are specified in Schedule 5 of the Planning and Development Regulations 2001 (as amended), as follows:

Schedule 5 sets out the criteria for assessing whether a mandatory EIA is required for a development. It transposes Annex I and Annex II of the EU EIA Directive (85/337/ECC as amended) into Irish law under Parts 1 and 2 of the schedules.

There are no new criteria for EIA projects under the 2014/52/EU Directive.

Schedule 7 sets out the criteria for assessing whether a project is likely to have "likely" and "significant" effects on the environment, in which case an EIA is also required where the proposed project or development is listed under Schedule 5 but is not mandatory under Part II thresholds. These criteria include the following:

- "Characteristics of proposed development;"
- "Location of proposed development;" and,
- "Characteristics of potential impacts."

The Environmental Impact Assessment Report is the document prepared by the proposer of a project setting out the effects (both positive and negative) that the Proposed Development would have on the environment.

### 2.2 Planning Context and Zoning

The land is outside the Local Area Plans developed and proposed within Wicklow, and there is no specific zoning identified within the county wide Wicklow County Development Plan (CDP) 2022-2028 for the Site.

A detailed review of the planning history for the Site will be conducted as part of the EIAR. Part of the Site, including the historic quarry, have 2 previous planning permissions applied for on the land. An application in 1990, reference 90/006374 successfully secured planning on a pre-1963 guarry, planning on which expired in 1995. An application to recommence quarrying was submitted in 2021, referenced 21/1472, which was refused, with commentary that a sub threshold EIA is to be submitted.

### 2.2.1 Planning Policies & Guidance

The following national, regional and local policies and guidance will be reviewed:

- Project Ireland 2040, National Planning Framework [1];
- National Development Plan 2021-2030 [2];

- Regional Spatial and Economic Strategy for the Eastern and Midlands Region 2019
   [3]:
- Wicklow County Development Plan, 2022 2028 [4];
- Spatial Planning and National Roads Guidelines (2012) [5];
- The Planning System and Flood Risk Management Guidelines for Planning Authorities (2009) [6];
- Sections 261 of the Planning and Development Act 2000 (as amended);
- Environmental Management Guidelines Environmental Management in the Extractive Industry [7];
- Quarry and Ancillary Activities Guidelines for Planning Authorities [8];
- Irish Concrete Federation (2009) Environmental Code: Second Edition [9];
- Geological Heritage Guidelines for the Extractive Industry Geological Survey of Ireland [10];
- Code of Practice between the department of the Environment, Heritage and Local Government and the Irish Concrete Federation 2009; and,
- Irish Concrete Federation Essential Aggregates Providing for Ireland's Needs To 2040 [11].

Guidance specific to the individual chapters of the EIAR will be listed in Section 3 below.

### 3 ENVIRONMENTAL IMPACT ASSESSMENT

### 3.1 Proposed Structure and Contents of EIAR

The EIAR will be prepared in accordance with the following guidance documents:

- EU Guidance Environmental Impact Assessment of Projects Guidance or the preparation of the Environmental Impact Assessment Report [12];
- EPA Advice notes on current practice in the preparation of Environmental Impact Statements [13]; and,
- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022) [14].

The EIAR will contain the following key sections:

### Non-Technical Summary

An overview of the Proposed Development, its location, the identity of the applicant, and the reason the EIAR was prepared. The Non-Technical Summary is a review of the main EIAR text to enable clear identification of significant impacts, relevant mitigation measures where required and the residual impacts.

### Description of the Proposed development

A full description of the Proposed Development in physical and functional terms during the Site preparation, operational and restoration stages.

### Main Alternatives Considered

A summary of the alternatives considered in respect of the proposal and environmental aspects will be included within the EIAR, including alternative Site layout and Site use.

### Assessment of Environmental Effects

The significance of the impact of the Proposed Development on various aspects of the environment will be assessed under the headings set out in Section 3.2.

### 3.2 Aspects of the Environment Considered in the EIAR

The EIAR will address the following environmental aspects:

- Population and Human Health;
- Biodiversity;
- Water (Hydrology and Hydrogeology);
- Land Use, Soils and Geology;
- Air Quality;
- Climate:
- Noise and Vibration:
- Landscape and Visual Impacts;
- Cultural Heritage;
- Material Assets including traffic and soil management;
- Interaction of the above: and.
- Schedule of Commitments.

As far as practicable, the examination of each aspect of the environment will be undertaken as follows:

• The Receiving Environment ("baseline") - A description of the specific receiving environment into which the Proposed Development will fit.

- The Characteristics of the Site A projection of the specific "load" on each particular aspect of the environment which the Proposed Development would be likely to generate.
- The Potential Effects of the Proposed Development A general description of the probable or 'likely' effects which the Proposed Development would be likely to produce.
- Mitigation Measures A description of any specific remedial or reductive measures considered necessary and practicable, resulting from the assessment of potential effects.
- Cumulative Effects of the Proposed Development The cumulative effects of the development will be assessed where relevant.
- Interactions A description of interactions of each environmental discipline with other environmental attributes.
- Residual Effects of the Proposed Development The assessment of the significance of direct and indirect effects of the Proposed Development arrived at after mitigation measures have been employed.
- Monitoring A description of any monitoring of effects on the environment which might be necessary, covering the monitoring methods and the agencies responsible for their implementation.
- Reinstatement Where required, a description of reinstatement measures and the agencies responsible for their implementation.
- Difficulties Encountered An indication of the difficulties encountered, if any, during the compilation of information.

### 3.3 Scope of the Proposed Assessments

### 3.3.1 Population and Human Health

An assessment of the local population and the sensitivity of the receiving environment to the Proposed Development and to specifically the extension of the Proposed Development will be assessed in accordance with the Institute of Public Health Impact Assessment Guidance and the IEMA guidance for Determining Significance for Human Health in Environmental Impact Assessments.

The Proposed Development does present potential for effects on human health through various mediums (air, water, soil, noise etc.). These effects will be assessed in detail in the respective chapters of air quality, climate, noise and vibration, water (hydrology and hydrogeology), and lands and soils.

The Proposed Development will provide direct employment for 5-8 personnel in the medium term. However, no significant additional direct employment is expected from this application.

### 3.3.2 Biodiversity

This chapter of the EIAR aims to establish the baseline ecological status of the Site and its immediate surroundings and to assess the potential effects of the Proposed Development on biodiversity. A detailed ecological appraisal will be carried out by a suitably qualified MOR Ecologist in line with 'Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine' (2018 and revisions).

As a starting point, the following parameters will be used for the desk-based study: 2km for protected species, 15km for European sites and 5km for nationally protected sites. The desk-based study will involve a review of the following resources:

• Aerial maps of the Site and surrounding area;

- The National Parks and Wildlife Service (NPWS) website will be consulted with regard to the most up to date detail on conservation objectives for the Natura 2000 sites relevant to this assessment (https://www.npws.ie/);
- The National Biodiversity Data Centre (NBDC) website will be consulted with regard to species distributions (https://maps.biodiversityireland.ie/Map);
- The EPA Maps website will be consulted to obtain details about watercourses in the vicinity of the Site (https://gis.epa.ie/EPAMaps/); and,
- The Wicklow County Council Planning Portal will be consulted to obtain details about existing / proposed developments in the vicinity of the Site (https://www.wicklow.ie/Living/Services/Planning).

In addition, a habitat survey will be undertaken to assess the quality of the habitats on and bordering the Site and 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. The habitat survey will be undertaken using *Fossitt's Guide to Habitats in Ireland* and will be conducted in line with the following guidance documents:

- Heritage Council's 'Best Practice Guidance for Habitat Survey & Mapping;'
- NRA, 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes;'
- DoAHG, 'Guidelines for the Protection of Biodiversity within the Extractive Industry;'
- NRA, 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes;
- Scottish Badgers, 'Surveying for Badgers: Good Practice Guidelines;'
- The Mammal Society, 'Surveying Badgers;' and,
- NRA, 'Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes.'

The habitat survey will take full cognisance of any species protected under the Flora (Protection) Order 2022 (S.I. No. 235/2022) or listed on Ireland Red List No. 10: Vascular Plants [15].

In line with previous planning applications for the Site, specialist bat surveys will be undertaken in line with the following guidance:

- DoEHLG, 'Bat Mitigation Guidelines for Ireland;' and,
- BCT, 'Bat Surveys for Professional Ecologists Good Practice Guidelines.'

In addition to the bat surveys, breeding bird surveys will be undertaken in line with the following guidance:

- BTO A Field Guide to Monitoring Nests; and,
- Common Bird Census (CBC) Methodology in Bird Monitoring Methods.

Due to the potential reptile habitat onsite, presence / absence surveys will be undertaken in line with the following guidance:

- Chapter 23: Reptiles in Handbook of Biodiversity Methods: Survey, Evaluation and Monitoring;
- JNCC Herpetofauna Worker's Manual;
- JNCC Common Standards Monitoring Guidance for Reptiles and Amphibians;
- Survey Protocols for the British Herpetofauna;
- Froglife Reptile Survey: An introduction to planning, conducting and interpreting surveys for snake and lizard conservation; and,
- TII (formerly NRA) Guidelines for Assessment of Ecological Impacts of National Roads Schemes.

A professional survey for presence of raptors along with a ledge suitability assessment and nesting survey will be undertaken. This work will lead to the development of the survey and, if

relevant, mitigation report for the Site which will be implemented into the design of the Proposed Development and its aftercare management.

The potential effect on biodiversity from the Proposed Development will be assessed to include all phases associated with the Proposed Development across the Site. The scale of activities onsite will be considered when determining the zone of influence. When identifying suitable mitigation measures for the protection of biodiversity against potential effects arising from the Proposed Development, the following guidance will be referred to:

- C741 'Environmental Good Practice on Site (4th Edition)';
- NRA, 'Guidance for the Treatment of Badgers Prior to the Construction of National Road Schemes;'
- NRA, 'Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes;' and,
- NRA, 'Guidance on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads.

The assessment shall also include a plan for the restoration / aftercare of the Site.

In addition to the EIAR, a Stage One: Screening for Appropriate Assessment (AA) will be undertaken to identify potential effects on European designated sites. The AA will be prepared in accordance with the following documents:

- European Commission Methodological Guidance on the provision of Article 6(3) and 6(4) of the 'Habitats' Directive 92/43/EEC;
- The European Commission Guidance 'Managing Natura 2000 Sites' and the OPR Guidance 'Appropriate Assessment. Screening for Development Management;' and,
- The Guidance for Planning Authorities published by the Department of Environment, Heritage and Local Government.

### 3.3.3 Water (Hydrology and Hydrogeology)

Hydrology and hydrogeology are highly interlinked, and as such a comprehensive joined assessment is proposed to clearly lay out the in-combination effects. The EIAR will assess the potential effects of the Proposed Development on both groundwater and nearby surface water if required.

The EIAR will present existing hydrogeological conditions at the Site and assess the potential effects posed by the Proposed Development, including water management at the Site, local groundwater and any surface water bodies, groundwater abstractions for public/private supply and surface water features.

MOR will review wells drilled within the Site and publicly available well information locally to develop the understanding of the baseline environment.

Detailed site investigations will be carried out as part of the hydrogeological assessment of the Proposed Development which will include:

- Walkover survey and topographical survey review;
- Desk-based review of the existing ground conditions utilising published available mapping (i.e. Geological Survey of Ireland (GSI) and EPA websites);
- Groundwater sampling to determine rest water level, permeability of the rock body and ground water flow rates, and the quality of the groundwater beneath the Site.

The hydrogeological assessment will be conducted in accordance with all relevant guidelines, and suitable mitigation measures will be outlined where necessary to avoid significant effects

on the water environment. Where required, mitigation measures will be specified within the EIAR to avoid significant effects.

The following guidelines will be the guidelines used during the assessment:

- Institute of Geologists Ireland (IGI) Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements;
- National Roads Authority (NRA) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes;
- CIRIA-C532 Control of Water Pollution from Construction sites Guidance for Consultants and Contractors;
- Department of Environment, Heritage and Local Government Quarries and Ancillary Activities Guidance for Authorities;
- EPA Environmental Management in the Extractive Industry (Non-Scheduled Minerals);
- Groundwater Regulations 2010 (S.I. No. 9 of 2010) as amended (S.I. No. 149 of 2012 and S.I. No. 366 of 2016);
- Surface Water Regulations 2009 (S.I. No. 272 of 2009) as amended (S.I. No.327 of 2012 and S.I. No.386 of 2015 and S.I. No. 77 of 2019); and,
- European Union (Drinking Water) Regulations 2014 (S.I. No. 122 of 2014) as amended (S.I. No. 464 of 2017 and S.I. No. 286 of 2022).

### 3.3.4 Land, Soils and Geology

The EIAR will assess the potential effects of the Proposed Development on soils, geology and land. A desk-based evaluation on soils and geology will be undertaken.

Characterisation of the receiving environment will be completed using a desk-based review of the existing ground conditions utilising published Geological Survey of Ireland (GSI) information and other publicly available information.

The impact assessment will examine any proposed removal of topsoil and overburden during Phase I of the Proposed Development.

Site investigations will be carried out as part of the land, soils and geological assessment of the Proposed Development which will include:

- Walkover survey; and,
- Assessment and review of the borehole logs for the new wells installed within the Site.

The soils and geology assessment will be conducted in accordance with all relevant guidelines, and suitable mitigation measures will be outlined where necessary to avoid significant effects on the land, soils and geological environment. The following guidelines will be used for this assessment:

- Institute of Geologists Ireland (IGI) Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements;
- National Roads Authority (2008): Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes;
- Department of Environment, Heritage and Local Government: Quarries and Ancillary Activities Guidance for Planning Authorities;
- EPA Environmental Management in the Extractive Industry (Non-Scheduled Minerals), and,
- Institute of Environmental Management & Assessment (IEMA) Guide: A New Perspective on Land and Soil in Environmental Impact Assessment.

### 3.3.5 Air Quality

The potential effects on air quality will be assessed across all phases of the Proposed Development. A desk-based review of existing monitoring results will be conducted to better understand the air quality in the area. This will involve reviewing data collected by the Environmental Protection Agency as well as historical monitoring conducted onsite.

Bergerhoff dust monitoring at boundaries will be conducted to assess ambient levels associated with the baseline environment. A PM<sub>10</sub> monitoring unit will be deployed (over a short time frame) to assess ambient levels of dust associated with the baseline environment.

The methodology proposed by the UK Institute of Air Quality Management (IAQM) in their Guidance on Mineral Dust for Planning will be used to determine the potential effects on sensitive receptors (within 400m of the Proposed Development) from disamenity dust and ambient dust (i.e. human health effects of PM<sub>10</sub> exposure).

These assessments will consider potential dust generation from typical quarry activities (e.g., overburden removal, blasting, processing, onsite and offsite transportation etc.) and determine the likely effects on sensitive receptors with appropriate mitigation measures prescribed to offset effects, where necessary.

### 3.3.6 Climate

The potential effects on climate will be assessed by determining the levels of greenhouse gases emitted by the Site during a typical year of operation.

Generally, greenhouse gases are grouped into three categories:

- Scope 1: Emissions (or estimated emissions) directly associated with the operations of the Proposed Development (plant equipment, facility owned vehicles, employee vehicles etc.);
- Scope 2: Indirect emissions (or estimated indirect emissions) associated with the operations of the Proposed Development. This mainly relates to the use of electricity associated with the Site (lighting, wheel washes, buildings onsite etc); and,
- Scope 3: Indirect emissions not directly associated with the development. This
  will mainly relate to the movement of HGVs (third party owned) during the
  typical operations of the quarry.

Based on the information available, estimations on greenhouse gases will be calculated for both the extension area and the entire Site using available UK emission factors (DEFRA). The assessment of greenhouse gases will follow IEMAs Guidance on Assessing Greenhouse Gases and Evaluating their Significance.

A Climate Change Vulnerability Assessment will also be completed following the methodology proposed by the European Commission's *Technical Guidance on the climate proofing of infrastructure in the period 2021-2027.* A desk-based review of available climate data, online resources (such as the Global Facility for Disaster Reduction and Recovery) and local area climate action plans to determine the potential vulnerability of the Proposed Development to climate hazards. This will also include a review of Wicklow County Council carbon action policy.

### 3.3.7 Noise and Vibration

The EIAR will assess both noise and vibration arising from all stages associated with the Proposed Development.

The noise assessment will take cognisance of World Health Organisation research along with UK and Irish guidance specific to activities in the outdoors and quarrying works.

A baseline noise survey will be completed to characterise the daytime ambient acoustic characteristics. This will be completed in line with ISO 1996 Part 1:2016 'Acoustics – Description, measurement and assessment of environmental noise Part 1: Basic quantities and assessment procedures.'

The assessment will be based on the IOA & IEMA Guidelines for Environmental Noise impact Assessment, 2014 and BS5228:2008 (+Annex A1:2014). Furthermore, an assessment of noise and vibration to the emission limit values set out within the document 'Environmental Management Guidelines: Environmental Management in the Extractive Industry' (EPA 2006) will be carried out and presented.

Vibration will be assessed in line with BS 5228-2:2009+A1:2014 and BS7385-2:1993, and the measures incorporated to manage any activities likely to result in notable vibration off-site, including blasting. Where relevant, mitigation will be identified.

The acoustics assessment will extend beyond the Site boundaries to the closest noise sensitive receptors and will include site modelling of the future noise emission compared to existing ambient background levels and to standard industrial quarry limits.

### 3.3.8 Landscape and Visual

The EIAR will examine the potential impact to the physical landscape, landscape character and visual amenity because of the Proposed Development.

The Landscape and Visual Impact Assessment (LVIA) for the Site involves a desktop study to identify relevant landscape and visual designations and sensitive visual receptors, followed by fieldwork to establish the landscape character of the receiving environment and select potential viewpoints. A 2km study area will be used.

The LVIA will consider criteria for assessing the potential impacts on the landscape, including landscape character, value, sensitivity, magnitude of likely impact, and significance of landscape effects. The sensitivity of the landscape receptor and the magnitude of the predicted landscape impact will determine the significance of the landscape impact.

The visual impact of the Site will also be assessed by considering the sensitivity of visual receptors and the magnitude of the visual effect. The magnitude of visual effects will be determined based on the relative visual dominance of the Site and its effect on visual amenity. The significance of visual impacts will be determined as a function of visual receptor sensitivity and visual impact magnitude.

In addition to assessing the significance of landscape and visual effects, the LVIA will also consider the quality and timescale of the effects, categorizing them as temporary, short-term, medium-term, long-term, or permanent.

The assessment will be carried out in accordance with the Landscape Institutes 'Guidelines for Landscape and Visual Impact Assessment' (3rd edition, GLVIA3), 2013 (UK) and 'Landscape and Landscape Assessment Consultation Draft Guidelines for Planning Authorities', 2000 – Department of the Environment and Local Government.

### 3.3.9 Cultural Heritage

This Chapter of the EIAR addresses the effects on the archaeological, architectural and cultural heritage of the Site, and the surrounding area. The study will comply with the requirements of Directive EIA 2014/52/EU and the criteria and definitions for describing effects are drawn from the 2022 EPA Guidelines.

The study area to be examined utilises information from the:

- Record of Monuments and Places (RMP) of County Wicklow;
- The Sites and Monuments Record;

- The Wicklow County Development Plan 2022-2028;
- The National Inventory of Architectural Heritage;
- Aerial photographs;
- Excavation reports;
- Cartographic;
- Documentary sources; and,
- A field inspection.

Interactions with other environmental topics, including acoustics and visual impact will be assessed. Where relevant, further mitigation will be identified.

### 3.3.10 Material Assets

The EIAR will examine the potential impact of the Proposed Development during the operation phase regarding traffic, roads and waste management.

### **Traffic & Roads**

The travel route from the Site to the National Road will be assessed as the dominant haulage route. It is currently estimated the Proposed Development will generate up to 40 HGV movements in and out per day. This will be mixed between 4-axle rigid trucks and articulated truck units. Furthermore, to ensure the business can service the industry, truck movements will be spread across a 12-hour day from 7am to 7pm, however the additional hour in the morning and evening will be for the movement of trucks in or out, as production will be restricted as outlined in section 1.3 above.

The effect on road traffic arising from the construction phase and the operation of the Proposed Development, on the surrounding road network, will be assessed considering the Institute of Highways and Transportation; Guidelines for Traffic Impact Assessment (TIA). Traffic counts will be undertaken as part of the Traffic Impact assessment to confirm existing traffic volumes using this road. Site specific traffic count data will be obtained from the surrounding road network that will be used to inform the TIA.

Cumulative effects of the future operations at the Site will be carefully integrated into the assessment.

### **Waste Management**

The potential effects of the Proposed Development on solid waste management in the area during the construction and the operational phase will be examined. The assessment will be undertaken by means of a desk-based review of all relevant existing information, published EPA documents, and regional and national documents on solid waste management. The Proposed Development and its potential impact, both positive and negative, on the existing waste infrastructure both locally and nationally will be assessed in line with the IEMA guide to: Materials and Waste in Environmental Impact Assessment, 2020.

### 4 ALTERNATIVES, INDIRECT AND CUMULATIVE EFFECTS

The requirement to consider alternatives within an EIAR is set out in Annex IV (2) of the EIA Directive (2014/52/EU) which state, "A description of the reasonable alternatives studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed development on the environment."

This is expanded upon in Annex IV to the EIA Directive, which provides that the EIAR shall include "A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the

proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects."

The Proposed Development alternatives will include various alternative options that were considered during the design stage. An option for sub-threshold EIA development, as previously applied for under application 21/1472, will be included within the assessment of alternative approaches.

Indirect effects are defined within the EPA EIA Guidance 2022 as "the effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway" [14]. The indirect impact of the Proposed Development will be considered for each aspect of the EIAR.

Cumulative impacts will similarly be considered for each aspect of the EIAR and is defined as "the addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects" [14].

### 5 SCOPING REPORT

This document forms the scoping report for the project and has been issued to relevant prescribed bodies. Responses to the project, specifically in relation to the scope and extent of the proposed environmental assessment are requested to be sent to the MOR offices within 6 weeks from the date of the issue. Submissions from the prescribed bodies will be taken into consideration when preparing the EIAR.

Correspondence should be submitted to the following address:

Malone O'Regan Environmental

Ground Floor - Unit 3

Bracken Business Park

Bracken Road, Sandyford

Dublin 18, D18 32Y

Or alternatively to: admin@mores.ie

To ensure that the response finds the relevant persons, in all correspondence ensure to reference the project as:

 E2123 Proposed Quarry Re-commencement & Extension at Deerpark, Donard, Co. Wicklow.

### 6 REFERENCES

- [1] Government of Ireland, "Project Ireland 2040 National Planning Framework," Government of Ireland, 2018.
- [2] Government of Ireland, "National Development Plan 2021-2023," Government of Ireland, 2018.
- [3] Eastern and Midland Regional Assembly, "Regional Spatial and Economic Strategy for the Eastern and Midlands Region," Eastern and Midland Regional Assembly, 2019.
- [4] Wicklow County Council, "Wicklow County Development Plan 2022 2028," Wicklow County Council, 2022.
- [5] TII, "Spatial Planning and National Roads," Environment, Community and Local Government, 2012.
- [6] OPW, "The Planning System and Flood Risk Management," Environment, Herritage and Local Government, 2009.
- [7] Environmental Protection Agency, "Environmental Management in the Extractive Industry," Environmental Protection Agency, 2006.
- [8] Government of Ireland, "Quarries and Ancillary Activities Guidelines for Planning Authorities," Government of Ireland, 2004.
- [9] Irish Concrete Federation, "Environmental Code Second Edition," Irish Concrete Federation, 2005.
- [10] Geological Survey Ireland, "Geological Heritage Guidelines for the Extractive Industry," GSI, 2008.
- [11] Irish Concrete Federation, "Essential Aggregates Providing for Ireland's Needs to 2040," Irish Concrete Federation, 2019.
- [12] EC, "Environmental Impact Assessment of Projects Guidance on the Preparation of the Environmental Impact Assessment Report," European Commission, 2017.
- [13] EPA, "Advice Notes on Current Practice in the Preparation of Environmental Impact Statements," Environmental Protection Agency, Dublin, 2003.
- [14] EPA, "Guidelines on the Information to be Contained in Environmental Impact Assessment Reports," Environmental Protection Agency, Dublin, 2022.
- [15] M. F. Ú. C. E. J. M. M. D. S. S. M. &. W. M. Wyse Jackson, "Ireland Red List No. 10: Vascular Plants.," National Parks and Wildlife Service, 2016.

# PECENED. 201072025

### An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta Department of Housing, Local Government and Heritage



Your Ref: **240130 - E2123** 

Our Ref: **G Pre00041/2024** (Please quote in all related correspondence)

5 March 2024

Malone O'Regan Environmental Ground Floor - Unit 3 Bracken Business Park Bracken Road Sandyford Dublin 18 D18 V32Y

Via email: <a href="mailto:adarcy@mores.ie">adarcy@mores.ie</a>; <a href="mailto:adarcy@mores.ie">admin@mores.ie</a>

Proposed Pre Planning Development: E2123 - Scoping Document - Proposed Quarry Re-commencement & Extension at Deerpark, Donard, Co. Wicklow

### A chara

I refer to correspondence received in connection with the above. Outlined below are heritagerelated observations/recommendations co-ordinated by the Development Applications Unit under the stated headings.

### **Archaeology**

The proposed greenfield development site is located in the environs of a cluster of archaeological sites identified in the Archaeological Survey of Ireland records including WI021-017003 cairn – unclassified, WI021-017002 cairn – unclassified, WI021-084 designed landscape feature, WI021-031 designed landscape feature, WI021-030 designed landscape feature, WI021-081 ogham stone and WI021-018 ringfort – rath and other archaeological monuments.

It is recommended that the developer engage an archaeologist to carry out a detailed and field-based archaeological impact assessment and to prepare a comprehensive report to be included in the EIAR and submitted with any future planning application. The assessment will involve documentary and cartographic research, an analysis of all previous archaeological assessments carried out in the area and fieldwork including geophysical survey and archaeological testing within the proposed development site (licensed under the National Monuments Acts 1930-1994).



Following completion of the geophysical survey and archaeological testing, the archaeologist shall prepare a written report, including an archaeological impact statement, to form an integral part of any EIAR and future planning application. Where archaeological material/features are shown to be present, preservation *in situ*, preservation by record (archaeological excavation) or monitoring may be required. The establishment of a 'buffer area' surrounding and including any identified archaeological features, in which no development or groundworks would be considered, might be recommended pending the results of the archaeological assessment. Mitigatory measures to ensure the preservation in-situ and/or recording of archaeological material/features should be suggested in the archaeological assessment report and the Department of Housing, Local Government & Heritage will advise further with regard to any further archaeological requirements following receipt of the assessment.

### Framework and Principles for the Protection of the Archaeological Heritage

The developer should have regard to the archaeological policy of the Department of Housing, Local Government & Heritage as outlined in the policy document entitled "Framework and Principles for the Protection of the Archaeological Heritage", (1999) and summarised below.

With regard to the preservation in-situ of archaeological remains, it is stated in our policy document that "there should always be a presumption in favour of avoiding developmental impacts on the archaeological heritage. Preservation in-situ must always be the preferred option to be considered rather than preservation by record in order to allow development to proceed, and preservation in-situ must also be presumed to be the preferred option."

It should also be noted that "if preservation by record is to be applied the developer must accept responsibility for the costs of archaeological excavation to the extent necessitated by the development. Such costs include those arising from the preparation of a report on the excavation."

### Wicklow County Development Plan 2022-2028

The developer should be aware of the archaeological objectives in the current County Wicklow Development Plan, including the following:

CPO 8.1 - To secure the preservation of all archaeological monuments included in the Record of Monuments and Places as established under Section 12 of the National Monuments (Amendment) Act, 1994, and of sites, features and objects of archaeological interest generally. In the development management process, there will be a presumption of favour of preservation in-situ or, as a minimum, preservation by record. In securing such preservation, the Planning Authority will have regard to the advice and recommendations of the Department



CPO 8.3 - Any development that may, due to its size, location or nature, have implications for archaeological heritage (including both sites and areas of archaeological potential / significance as identified in Schedules 08.01 & 08.02 and Maps 8.01 & 8.02 of this plan) shall be subject to an archaeological assessment.

### **Nature Conservation**

The Department is not in a position to make specific comment on this particular referral at this time. No inference should be drawn from this that the Department is satisfied or otherwise with the proposed activity.

The Department may submit observations/recommendations at a later stage in the process.

The above observations/recommendations are based on the papers submitted to this Department on a pre-planning basis and are made without prejudice to any observations that the Minister may make in the context of any consultation arising on foot of any development application referred to the Minister, by the planning authority/ies, in the role as statutory consultee under the Planning and Development Act, 2000, as amended.

You are requested to send further communications to the Development Applications Unit (DAU) at <a href="mailto:manager.dau@npws.gov.ie">manager.dau@npws.gov.ie</a>.

Is mise le meas,

**Diarmuid Buttimer** 

**Development Applications Unit** 

Administration



Seirbhís Sláinte Comhshaoil Náisiunta FSS

Bóthar Thaobh An Ghileanna, Cill Mhantáin, A67 HX3

National Environmental Health Service HSE

Glenside Road, Wicklow A67 HX30

wicklowpeho@hse.ie

t 0404 63031



Malone O'Regan Environmental Ground Floor – Unit 3 Bracken Business Park Bracken Road Sandyford Dublin 18

8 March 2024

Applicant: Herbie Stephenson

Proposal: Proposed Quarry Re-commencement and Extension at Deerpark, Donard, Co Wicklow

Ref: E2123

Dear Sir/Madam.

The HSE Environmental Health Consultation report regarding the above application is attached below. The following HSE departments were made aware of the consultation request for the proposed development on 1 February 2024.

- HSE Estates Helen Maher/Stephen Murphy
- Emergency Planning Brendan Lawlor
- Director of National Health Protection Eamonn O'Moore
- CHO Mary O'Kelly

All commitments to future actions including mitigation and further testing have been taken as read and all data results have been accepted as accurate. A site visit was undertaken by Joanna Troughton, Senior Environmental Health Officer on 1 March 2024. No additional investigations or measurements were undertaken. This report only refers to those sections of the documents which are relevant to the HSE.

If you have any queries regarding the report, please contact me.

Yours Sincerely,

Eugene Monahan

**Principal Environmental Health Officer** 

PECENED. 2012025

8 March 2024

EHIS Reference No. 3689

### **HSE EIA SCOPING**

### **Environmental Health Service Consultation Report**

Report to: Malone O'Regan Environmental, Ground Floor - Unit 3, Bracken Business Park,

Bracken Road, Sandyford, Dublin 18 **Type of consultation:** EIA Scoping **Applicant:** Herbie Stephenson

Proposal: Proposed Quarry Re-commencement and Extension at Deerpark, Donard, Co Wicklow

Ref: E2123

### Introduction

This report only comments on Environmental Health impacts of the proposed development. The Environmental Health Service (EHS) has made observations and submissions on the following specific environmental health areas.

### Description of proposed development

The applicant intends to apply for planning permission to recommence quarrying operations at an old rock quarry in Deerpark, Donard, Co Wicklow and extend the quarry into the south and east of the old quarry. These lands are currently in agricultural use.

The proposed development will comprise of the following:

- Extraction of rock by blasting means down to 165mOD;
- Dry processing of material using mobile plant;
- Landscaping and restoration of the quarry and
- All other ancillary facilities and works.

Planning permission is sought for a 25 year period, with an annual extraction rate of 275,000 tonnes per annum. The quarry will be developed on a phased basis and aggregates will be blasted in a controlled manner from targeted work faces. The applicant details the proposed development in the scoping report and provides information on the plant which will be used on site.

It is understood that there are no connections to public water supply or sewer on site. Potable water will be provided using bottled containers and welfare water and water for the wheel wash will be supplied from on-site well.

### **General Scoping Introduction**

The following documents should be taken into consideration when preparing the Environmental Impact Assessment Report:

- Guidelines on the information to be contained in EIAR, 2022, www.epa.ie.
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment <a href="https://www.housing.gov.ie/sites/default/files/publications/files/guidelines for planning authorities">https://www.housing.gov.ie/sites/default/files/publications/files/guidelines for planning authorities and an bord pleanála on carrying out eia - august 2018.pdf</a>

EU publication: Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report, EU, 2017 <a href="http://ec.europa.eu/environment/eia/pdf/EIA">http://ec.europa.eu/environment/eia/pdf/EIA</a> guidance EIA report final.pdf

Generally the Environmental Impact Assessment should examine all likely significant impacts and provide the following information for each:

the following information for each:

- a) Description of the receiving environment
- b) The nature and scale of the impact
- c) An assessment of the significance of the impact
- d) Proposed mitigation measures
- e) Residual impacts

Directive 2014/52/EU has an enhanced requirement to assess likely significant impacts on Population and Human Health. The impacts on human health must be fully assessed in the EIAR, it is recommended that the wider determinants of health and wellbeing are considered. Guidance on wider determinants of health can be found at www.publichealth.ie

In addition to any likely significant negative impacts from the proposed development, any positive likely significant impacts should also be assessed.

The Environmental Health Service (EHS) recommends that the following matters are included and assessed in the EIAR:

- Water (Hydrology and Hydrogeology)
- · Land, Soils and Geology
- Air Quality
- · Climate Change and Opportunity for Health Gain
- · Noise and Vibration
- · Waste Management

The EIAR should identify the nearest sensitive receptors and consider the impact of the existing and proposed development on them. Sensitive receptors include but are not limited to:

- Occupied houses
- Farms
- Schools
- Childcare facilities
- Medical facilities and nursing homes
- Sports and community facilities and
- Food premises.

In considering the measures to be employed by the developer to minimise the potential impacts of the proposed development to human health, reference was made by the EHS to the EPA's 'Environmental Management Guidelines on the Environmental Management in the Extractive Industry (Non-Scheduled Minerals) 2006'

It is recommended that an Environmental Management System (EMS) is put in place, with training of all site staff. There should be on-going review of the effectiveness of the EMS. The EMS should be devised in accordance with international standards such as ISO 14001 2015 and EU EMAS (1993).

### **Public Consultation**

Public consultation, where the local community is fully informed of the proposed development must be undertaken. Members of the public should be given sufficient opportunities to express their views on the proposed development. The applicant should consider the appointment of a community liaison officer.

Early and meaningful public consultation with the local community should be carried out to ensure all potentially significant impacts have been adequately addressed. All parties affected by the proposed development must be fully informed of what the proposal entails especially with regard to potential impacts on surrounding areas. Sensitive receptors and other stake-holders should be identified to ensure all

necessary and appropriate mitigation measures are put in place to avoid any complaints about the proposed Quarry development in the future.

Site operation times should be considered as part of the consultation process with local residents.

The Environmental Impact Assessment Report (EIAR) should clearly demonstrate the link between public consultations and how those consultations have influenced the decision-making process in the EIAR.

### Decommissioning/site restoration

The decommissioning of the site must be considered in the EIAR. A site restoration plan should be included in the EIAR with a timeframe for restoration works. Potential for future health gain from the restoration of the proposed development should be included in the EIAR.

On decommissioning, the Environmental Health Service recommends that consideration be given to infilling the entire quarry void for use as agricultural land or as a public amenity. As a minimum, regard should be had to the guidance issued by the Health and Safety Authority's on 'Quarrying – Trespass, Boundary Fencing and Prevention of Drowning'. To discourage trespassers a barrier of sufficient height and strength should be installed around the perimeter of the proposed water-filled void. Barriers should be inspected regularly and maintained in good condition.

### **Noise and Vibration**

The potential impacts for noise and vibration from the proposed development on all noise sensitive locations must be clearly identified in the EIAR. The EIAR must also consider the appropriateness and effectiveness of all proposed mitigation measures to minimise noise and vibration. A baseline noise monitoring survey should be undertaken to establish the existing background noise levels. Noise from any existing industry/quarries or any potential sources in the area should not be included as part of the back ground levels.

In addition, an assessment of the predicted noise impacts during the construction phase and the operational phase of the proposed Quarry development must be undertaken which details the change in the noise environment resulting from the proposed development.

Details of the location and frequency of noise monitoring for the proposed development should be included in the EIA to be submitted as part of the Planning Application.

It is proposed to undertake blasting on site, the EHS recommends that a Vibration Monitoring Report is included in the EIA which includes blasting methods to be employed during the operation of the proposed quarry extension. Details of any advanced notification system advising occupants in the locality of the date and time of proposed blasting, should be included in the EIA. Blasting should not occur during hours of darkness or at weekends.

Details of any blast and vibration monitoring results for the existing quarry, if any, should be included in the EIAR.

### Air Quality

Due to the nature of the proposed construction works, generation of airborne dust has the potential to have significant impacts on sensitive receptors.

A Construction Environmental Management Plan (CEMP) should be included in the EIAR which details dust control and mitigation measures. Measures should include:

- Sweeping of hard road surfaces
- Provision of a water bowser on site, regular spraying of haul roads
- · Wheel washing facilities at site exit
- · Restrict speed on site
- Provide covers to all delivery trucks to minimise dust generation

PRICEINARD: POOT SOLD TO Clarify

- Inspect and clean public roads in the vicinity if necessary
- · Material stockpiling provided with adequate protection from the wind
- Dust monitoring at the site boundary
- Truck inspection and maintenance plan
- Details of a road maintenance agreement between the operator and the Local Roads Authority to clarify responsibility for the upkeep and repair of access roads during the construction phase of the project.

### **Surface and Ground Water Quality**

The proposed development has the potential to have a significant impact on the quality of both surface and ground water.

All drinking water sources, both surface and ground water, must be identified.

Public and Group Water Scheme sources and supplies should be identified in addition to any private wells supplying potable water to houses in the vicinity of the proposed development. Measures to ensure that all sources and supplies are protected should be described.

The Environmental Health Service recommends that a walk-over survey of the site is undertaken in addition to a desktop analysis of Geological Survey of Ireland data in order to identify the location of private wells used for drinking water purposes. Any potential significant impacts to drinking water sources should be assessed. Details of bedrock, overburden, vulnerability, groundwater flows, aquifers and catchment areas should be considered when assessing potential impacts and any proposed mitigation measures.

### **Ancillary Facilities**

The EIAR should include details of the location of the site office, construction compound, fuel storage depot, wheel washing, sanitary accommodation and canteen, Proposals for the sanitary disposal of wastewater and the provision of a potable water supply to the site canteen should be included.

### **Cumulative Impacts**

All existing or proposed Quarries/industry or developments/housing in the vicinity should be clearly identified in the EIAR. The impact on sensitive receptors of the proposed development combined with any other developments in the vicinity should be considered. The EIAR should include a detailed assessment of any likely significant cumulative impacts of the proposed Quarry application.

Carmel Lynch

**Environmental Health Officer** 

Grad dygod

**Environment and Climate Change Network Support Unit** 

Joanna Troughton
Senior Environmental Health Officer
National Environmental Health Service

From: Donnachadh Byrne To: Subject:

Admin - (Mores)
E123 proposed quarry re-commencement and extension at Deerpark, Donard, County Wicklow

Date: Attachments:

E123 proposed quarry re-commencement and extension at Deerpark, Donard, County Wicklow
Thursday 15 February 2024 11:21:14
email. 852418dc-7261-46bd-8cad-0f5cfb922b46.pnq
phone. fb192a96-ab34-4721-a173-456574efe4b1.pnq
web\_64d727b2-84ca-479d-bc60-45e02ad63d06.pnq
home. de60b8ad-bed2-446f-a08e-Sceec6c-9c-9fe.pnq
external-signature\_6737b7d5-5705-4554-b86d-f0ded9774efe.pnq
Submission to Malone\_0\*Regan re\_quarry recommencement and extension at Deerpark\_Donard\_County Wicklow near Carrigower.doc

PROPERTY. CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear Sir/Madam,

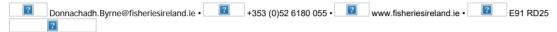
Please see attached submission from IFI relating to the proposed development at Deerpar, Donard. County Wicklow.

Would you mind acknowledging receipt of this submission.

Kind regards

Donnachadh

Donnachadh Byrne Senior Fisheries Environmental Officer



Help us protect Ireland's rivers, lakes and coastlines by reporting illegal fishing, water pollution or invasive species. Our confidential phone number is 0818 34 74 24, which is open 24 hours a day / 7 days a week.

To read our Privacy Policy and Email Disclaimer Notice, Please visit www.fisheriesireland.ie

PRCHINED. 2012 PROTECTS

Malone O'Regan Environmental Ground Floor Unit 3 Bracken Business Park Bracken Road, Sandyford Dublin 18, D18 32Y

February 15, 2024

### E123 Proposed Quarry Re-commencement and Extension at Deerpark, Donard, County Wicklow

### Dear Sir/Madam

With reference to the above application, the Carrigower, an important salmonid tributary of the Slaney flows close to the site. The Slaney River is a salmonid water with important populations of salmon, brown trout and sea trout. The River Slaney is a nationally important multi sea winter salmon catchment with the entire main channel River and many tributaries (including the Carrigower) designated as Special Area for Conservation (SAC) under the European Habitats Directive. The River supports several species listed in Annex II of the Directive including Salmon, River Lamprey, Brook Lamprey and Sea Lamprey.

The importance of the Carrigower River in terms of salmon recruitment on the Slaney system is recognised by the fact that the Carrigower is designated as a Special Area for Conservation SAC under the European Habitats Directive.

### The following are our concerns:

- One of the potential impacts of projects such as this, is the discharge of silt-laden waters to fisheries streams. Silt can clog salmonid spawning beds, and juvenile salmonids are particularly sensitive to siltation of gill structures. Similarly plant and macro-invertebrate communities can literally be blanketed over, and this can lead to loss or degradation of valuable habitat.
- 2. Systems should be put in place to ensure that there shall be no discharge of suspended solids or other deleterious matter to watercourses during any phase of works at this site.
- 3. The design and sizing of the surface water drainage system must ensure that no suspended solids enter the surface water network flowing to the Carrigower, even during periods of prolonged heavy rainfall.
- 4. All surface waters from the site and access roads should be channelled through adequately sized petrol/oil interceptors prior and be subject to attenuation prior to discharge to surface waters.

- 5. If silt settlement ponds are proposed for this facility. It is important that they are oversized to cope with all eventualities.
- 6. The activities proposed for this site are likely to result in significant to and from the site, with potential for the generation of significant suspended solids pollution in the associated road run-off. It is imperative that the potential for suspended solids pollution from road run-off associated with vehicles entering and leaving this site is fully addressed.

Yours faithfully

Donnachadh Byrne Senior Fisheries Environmental Officer

Please note that any further correspondence regarding this matter should be addressed to Mr. Donnachadh Byrne, Senior Fisheries Environmental Officer, Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24



Malone O'Regan Environmental Ground Floor – Unit 3 Bracken Business Park, Bracken Road Sandyford Dublin 18, D18 32Y

8 March 2024

By Email: adarcy@mores.ie

Uisce Éireann
Bosca OP 6000
Baile Átha Cliath 1
D01 WA07
Éire
Uisce Éireann

PO Box 6000 Dublin 1 D01 WA07 Ireland

T: +353 1 89 25000 F: +353 1 89 25001 www.water.ie

**Re: EIAR Scoping Request –** Proposed recommencement and extension of the existing quarry at Deerpark, Donard, County Wicklow.

Dear Ms Darcy,

This advice is in addition to the EIAR scoping advice issued by Uisce Eireann dated 25 February 2024 relating to the forthcoming planning application for the proposed recommencement and extension of the existing quarry at Deerpark, Donard, County Wicklow.

Having reviewed the EIA report submitted Uisce Eireann specifically want to highlight that the following must be addressed **prior to** lodgement of a planning application.

# **Dewatering**

Due to the extent and depth of excavation proposed, a Dewatering Plan must be prepared and submitted for Uisce Éireann's review as part of the planning application.

# **Proximity to Abstraction Point**

The impact of the proposed development on the Knockanarrigan borehole located approximately 2km away must be addressed in an updated EIAR.

### Stormwater Run Off

Details must be provided of how storm and surface water will be managed noting the proximity of the site to the River Slaney SPA.

All other advice contained within the previous letter dated 25 February 2024 remains valid.

Queries relating to the above, terms and the EIA scoping opinion should be directed to <a href="mailto:planning@water.ie">planning@water.ie</a>

PP. Ali Robinson

# **Yvonne Harris**

# Connections and Developer Services

Stiúrthóirí / Directors: Tony Keohane (Cathaoirleach / Chairman), Niall Gleeson (POF / CEO), Christopher Banks, Fred Barry, Gerard Britchfield, Liz Joyce, Patricia King, Eileen Maher, Cathy Mannion, Michael Walsh.

Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin, Ireland D01NP86 Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Uisce Éireann is a design activity company, limited by shares. Cláraithe in Éirinn Uimh.: 530363 / Registered in Ireland No.: 530363.



For the attention of Anna D'arcy Malone O'Regan Environmental Ground Floor - Unit 3 Bracken Business Park Bracken Road, Sandyford Dublin 18, D18 32Y

25th February 2024

By Email: adarcy@mores.ie

**Uisce Éireann** Bosca OP 6000 Baile Átha Cliath 1 D01 WA07 Eire Uisce Éireann PO Box 6000 Dublin 1 D01 WA07 Ireland

> T: +353 1 89 25000 F: +353 1 89 25001 www.water.ie

Re: EIA Scoping Request - For the Proposed Re-commencement & Extension of the Existing Quarry at Deerpark, Donard, Co. Wicklow, on behalf of Herbie Stephenson.

Dear Ms D'arcy,

Uisce Éireann has received notification of your Environmental Impact Assessment (EIA) scoping request relating to Herbie Stephenson forthcoming application for the Proposed Re-commencement & Extension of the Existing Quarry at Deerpark, Donard, Co. Wicklow,

Please see attached, Uisce Éireann's scoping opinion in relation to Water Services. On receipt of the planning referral, Uisce Éireann will review the finalised Environmental Impact Assessment Report (EIAR) as part of the planning process.

Queries relating to the terms and the EIA scoping opinions below should be directed to planning@water.ie

PP. Ali Robinson

## **Yvonne Harris**

Connections and Developer Services

# **Uisce Éireann's Response to EIA Scoping Requests**

At present, Uisce Éireann does not have the capacity to advise on the scoring of individual projects. However, in general the following aspects of Water Services should be considered in the scope of an EIA where relevant;

- a) Where the development proposal has the potential to impact an Uisce Éireann Drinking Water Source(s), the applicant shall provide details of measures to be taken to ensure that there will be no negative impact to Uisce Éireann's Drinking Water Source(s) during the construction and operational phases of the development. Hydrological / hydrogeological pathways between the applicant's site and receiving waters should be identified as part of the report.
- b) Where the development proposes the backfilling of materials, the applicant is required to include a waste sampling strategy to ensure the material is inert.
- c) Mitigations should be proposed for any potential negative impacts on any water source(s) which may be in proximity and included in the environmental management plan and incident response.
- d) Any and all potential impacts on the nearby reservoir as public water supply water source(s) are assessed, including any impact on hydrogeology and any groundwater/ surface water interactions.
- e) Impacts of the development on the capacity of water services (i.e. do existing water services have the capacity to cater for the new development). This is confirmed by Uisce Éireann in the form of a Confirmation of Feasibility (COF). If a development requires a connection to either a public water supply or sewage collection system, the developer is advised to submit a Pre-Connection Enquiry (PCE) enquiry to Uisce Éireann to determine the feasibility of connection to the Uisce Éireann network.
- f) The applicant shall identify any upgrading of water services infrastructure that would be required to accommodate the proposed development.
- g) In relation to a development that would discharge trade effluent any upstream treatment or attenuation of discharges required prior to discharging to an Uisce Éireann collection network.

- h) In relation to the management of surface water; the potential impact of surface water discharges to combined sewer networks and potential measures to minimise and or / stop surface waters from combined sewers.
- i) Any physical impact on Uisce Éireann assets reservoir, drinking water source, treatment works, pipes, pumping stations, discharges outfalls etc. including any relocation of assets.
- j) When considering a development proposal, the applicant is advised to determine the location of public water services assets, possible connection points from the applicant's site / lands to the public network and any drinking water abstraction catchments to ensure these are included and fully assessed in any pre-planning proposals. Details, where known, can be obtained by emailing an Ordnance Survey map identifying the proposed location of the applicant's intended development to <a href="mailto:datarequests@water.ie">datarequests@water.ie</a>
- k) Other indicators or methodologies for identifying infrastructure located within the applicant's lands are the presence of registered wayleave agreements, visible manholes, vent stacks, valve chambers, marker posts etc. within the proposed site.
- I) Any potential impacts on the assimilative capacity of receiving waters in relation to Uisce Éireann discharge outfalls including changes in dispersion / circulation characterises. Hydrological / hydrogeological pathways between the applicant's site and receiving waters should be identified within the report.
- m) Any potential impact on the contributing catchment of water sources either in terms of water abstraction for the development (and resultant potential impact on the capacity of the source) or the potential of the development to influence / present a risk to the quality of the water abstracted by Uisce Éireann for public supply should be identified within the report.
- n) Where a development proposes to connect to an Uisce Éireann network and that network either abstracts water from or discharges wastewater to a "protected"/ sensitive area, consideration as to whether the integrity of the site / conservation objectives of the site would be compromised should be identified within the report.
- o) Uisce Éireann does not permit building over of its assets. As an applicant you are required to;

- survey the site to determine the exact location of the assets. Any trial investigations should be carried out with the agreement and in the presence of Uisce Éireann.
- Provide evidence of separation distances between the existing Uisce Eireann assets and proposed structures, other services, trees, etc. have to be in accordance with the Irish Water Codes of Practice and Standard Details.
- p) Where a diversion of Public Infrastructure may be required subject to layout proposal of the development and separation distances, the applicant is required to submit a Diversions Enquiry to diversions@water.ie
- q) Mitigation measures in relation to any of the above ensuring a zero risk to any Uisce Éireann drinking water sources (Surface and Ground water).

This is not an exhaustive list.

#### Please note:

- Where connection(s) to the public network is required as part of the development proposal, applicants are advised to complete the Pre-Connection Enquiry process and have received a Confirmation of Feasibility letter from Uisce Éireann ahead of any planning application.
- Uisce Éireann will not accept new surface water discharges to combined sewer networks.

From: INFC

To: Admin - (Mores)

Subject: TII24-126072 - E2123 - Scoping Document - Proposed Quarry Recommencement & Extension at Deerpark,

Donard, Co. Wicklow.

**Date:** Thursday 8 February 2024 09:34:10

Attachments: <u>image001.png</u>

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### A Chara,

Thank you for your email of 30 January 2024 in relation to the above EIAR Scoping exercise. The position in relation to your enquiry is as follows.

Transport Infrastructure Ireland (TII) will endeavour to consider and respond to planning applications referred to it given its status and duties as a statutory consultee under the planning acts. The approach to be adopted by TII in making such submissions or comments will seek to uphold official policy and guidelines as outlined in the Section 28 Ministerial Guidelines 'Spatial Planning and National Roads Guidelines for Planning Authorities' (DoECLG, 2012). Regard should also be had to other relevant guidance available at <a href="https://www.TII.ie">www.TII.ie</a>.

The issuing of this correspondence is provided as best practice guidance only and does not prejudice TII's statutory right to make any observations, requests for further information, objections or appeals following the examination of any valid planning application referred.

With respect to EIAR scoping issues, the recommendations indicated below provide only general guidance for the preparation of an EIAR, which may affect the national road network.

The developer/scheme promoter should have regard, inter alia, to the following:

- The developer, in preparing EIAR, should have regard to Section 28 Ministerial Guidelines 'Spatial Planning and National Roads Guidelines for Planning Authorities' (DoECLG, 2012).
- Consultations should be had with the relevant Local Authority/National Roads Design Office with regard to locations of existing and future national road schemes on the N81.
- TII would be specifically concerned with potential significant impacts the development would have on the national road network (and junctions with national roads) in the proximity of the proposed development.
- The developer should have regard to any environmental impact statement and all
  conditions and/or modifications imposed by An Bord Pleanála regarding road schemes in
  the area. The developer should in particular have regard to any potential cumulative
  impacts.
- The developer, in preparing EIAR, should have regard to TII Publications (formerly DMRB and the Manual of Contract Documents for Road Works).

- The developer, in preparing EIAR, should have regard to TII's Environmental Assessment and Construction Guidelines, including the Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (National Roads Authority, 2006),
- It would be important that, where appropriate, subject to meeting the appropriate thresholds and criteria and having regard to best practice, a Traffic and Transport Assessment (TTA) be carried out in accordance with relevant guidelines, noting traffic volumes attending the site and traffic routes to/from the site with reference to impacts the national road network and junctions of lower category roads with national roads. TII recommends, in relation to national roads, that TII's Traffic and Transport Assessment Guidelines (2014) (TII Publications PE-PDV-02045) should be referred to.
- The scheme promoter is also advised to have regard to Section 2.2 of the TTA Guidelines which addresses requirements for sub-threshold TTA. Any improvements required to facilitate development should be identified. It will be the responsibility of the developer to pay for the costs of any improvements to national roads to facilitate the private development proposed as TII will not be responsible for such costs.
- The designers are asked to consult TII Publications to determine whether a Road Safety Audit (TII Publication: TII GE-STY-01024) is required.
- In the interests of maintaining the safety and standard of the national road network, the EIAR should identify the methods/techniques proposed for any works traversing/in proximity to the national road network.
- TII recommends that the applicant/developer should clearly identify the haul routes proposed and fully assess the network to be traversed. Where abnormal 'weight' loads are proposed, separate structure approvals/permits and other licences may be required in connection with the proposed haul route and all structures on the haul route through all the relevant County Council administrative areas should be checked by the applicant/developer to confirm their capacity to accommodate any abnormal 'weight' load proposed.
- The developer, in preparing EIAR, should have regard to TII's Environmental Assessment and Construction Guidelines, including the Air Quality Assessment of Proposed National Roads Standard PE-ENV-01107 December 2022.
- The EIAR/EIS should consider the Environmental Noise Regulations 2006 (SI 140 of 2006) and, in particular, how the development will affect future action plans by the relevant competent authority.

Notwithstanding any of the above, the developer should be aware that this list is non-exhaustive, thus site and development specific issues should be addressed in accordance with best practice.

I trust that the above comments are of assistance in your EIAR preparation.

#### Mise le meas,

#### **Alban Mills**

# **Senior Regulatory & Administration Executive**



From: Anna D'arcy <adarcy@mores.ie> **Sent:** Tuesday, January 30, 2024 10:21 AM To: Admin - (Mores) <a href="mailto:admin@mores.ie">admin@mores.ie</a>>

Cc: E2123-Herbie Stephenson-Quarry Planning < E2123-HerbieStephenson-

QuarryPlanning@mores.ie>

Subject: E2123 - Scoping Document - Proposed Quarry Re-commencement & Extension at

Deerpark, Donard, Co. Wicklow

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To Whom It May Concern,

Please find attached a Scoping Document for the Quarry Re-commencement & Extension at Deerpark, Donard, Co. Wicklow, on behalf of Herbie Stephenson. This document forms the Scoping Document for the project and has been issued to relevant prescribed bodies. Responses to the project, specifically in relation to the scope and extent of the proposed environmental assessment, are requested to be sent to the MOR offices within 6 weeks from the date of issue. Submissions from the prescribed bodies will be taken into consideration when preparing the EIAR.

# Correspondence should be submitted to the following address:

Malone O'Regan Environmental Ground Floor - Unit 3 Bracken Business Park Bracken Road, Sandyford Dublin 18, D18 32Y

Or alternatively to: admin@mores.ie

To ensure that the response finds the relevant persons, in all correspondence ensure to reference the project as:

• E2123 Proposed Quarry Re-commencement & Extension at Deerpark, Donard, Co. Wicklow.

Kind Regards,

#### Anna D'Arcy

**Operations Manager** 

# for and on behalf of Malone O'Regan Environmental

Ground Floor - Unit 3 Bracken Business Park Bracken Road, Sandyford Dublin 18, D18 V32Y +353 1 567 76 55

⊠: <u>adarcy@mores.ie</u> Web: <u>www.mores.ie</u>



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PECENED. 2010/2025

23<sup>rd</sup> April 2024

Herbie Stephenson,
Donard,
Wicklow

# Re: Planning Permission Application To Wicklow County Council

To Whom it Concerns,

I Tom Stephenson of Castleruddery Park Donard Co Wicklow consent to Herbie Stephenson applying for planning permission to Wicklow County Council in relation to development for a quarry on my lands in land folio WW2979F and to the drainage of future discharge waters via land drains to an existing pond on my land in Folio WW2979F

Yours sincerely,

Tom Steohenson

8<sup>TH</sup> January 2025

Herbie Stephenson,

Donard,

Wicklow

**Re: Planning Permission Application To Wicklow County Council** 

To Whom it Concerns,

I Herbie Stephenson of Gibstown Donard Co Wicklow give consent to Herbie Stephenson Ltd applying for planning permission to Wicklow County Council in relation to development for a quarry on my lands in land folio WW7215.

Yours Sincerely,

X Hul Sofr

PECENED. 29018085

# **APPENDIX 7-1**







BH1.

Drilling date: 12/07/23

0-1M	Clay
1-7M	Brown shale
7-60M	Blue shale, very hard

Very little water, only producing 50 gallons per hour, water strike at 12m







BH2.

Drilling date: 12/07/23

0-1M	Clay
1-7M	Brown shale
7-13M	Blue shale, very hard
13-16M	Soft brown rock
16-18M	Blue shale
18-19M	Soft brown rock
19-36.5M	Blue shale

A big aquifer, producing over 800 gallons per hour, water strikes at 13M and 18M





BH3.

Drilling date: 13/07/23

0-3M	Clay
3-42M	Blue shale, very hard

Poor supply of water, only producing 30 gallons per hour, water strike at 13M







BH4.

Drilling date: 13/07/23

0-2M	Clay
2-7M	Soft brown rock
6-48.7M	Blue shale, very hard

Poor supply of water, only producing 40 gallons per hour, water strike at 9M







BH5.

Drilling date: 14/07/23

0-2M	Clay
2-7M	Very soft brown rock
7-9M	Blue shale, very hard

Poor supply of water, only producing 60 gallons per hour, water strike at 9M

# **BOREHOLE LOG**



# Borehole Log - BH6

# Geology encountered

Depth (m)	Geology
0-4	Brown, gravelly, slightly sandy, silt/clay
4 - 20	Hard bedrock
20-24	Soft bedrock
24-37	Hard bedrock
37	End of Borehole
At 12m	Water Strike

According to drillers, this well was producing ca. 400 gallons per hour

# **BOREHOLE LOG**



# Borehole Log - BH7

# Geology encountered

Depth (m)	Geology	
0-3	Light brown, very sandy, gravelly clay	
3-7	Hard bedrock	
7-8	Soft bedrock	
8-9	Hard bedrock	
9-10	Soft bedrock	
10-17.5	Hard bedrock	
17.5-18	Soft bedrock	
18-37	Hard bedrock	
37	End of Borehole	
At 7m	Water Strike	
At 14m	Water Strike	

According to drillers, this well was producing ca. 250 gallons per hour

PECENED. 29012025

# PRCENED. 29/07/2025





Water Framework Directive
Assessment Report

Proposed Quarry Re-Commencement and Extension

Herbie Stephenson Limited
Deerpark, Donard Co. Wicklow







Ground Floor – Unit 3 Bracken Business Park Bracken Road, Sandyford Dublin 18, D18 V32Y Tel: +353-1-567 76 55

Tel: +353- 1- 567 76 55 Email: enviro@mores.ie

Title: Water Framework Directive Assessment Report, Proposed Quarry Re-Commencement and Extension, Herbie Stephenson Limited, Deerpark, Donard Co. Wicklow

Job Number: E2123

Prepared By: Enrique Garcia Signed: \_\_\_\_

Approved By: Kenneth Goodwin Signed:

# **Revision Record**

Issue No.	Date	Description	Remark	Prepared	Checked	Approved
01	21/05/24	Report	Final	EG	NM	KG
02	23/01/25	Report	Final	EG	DT	KG

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# Water Framework Directive Assessment Report Proposed Quarry Re-Commencement and Extension Herbie Stephenson Limited Deerpark, Donard Co. Wicklow

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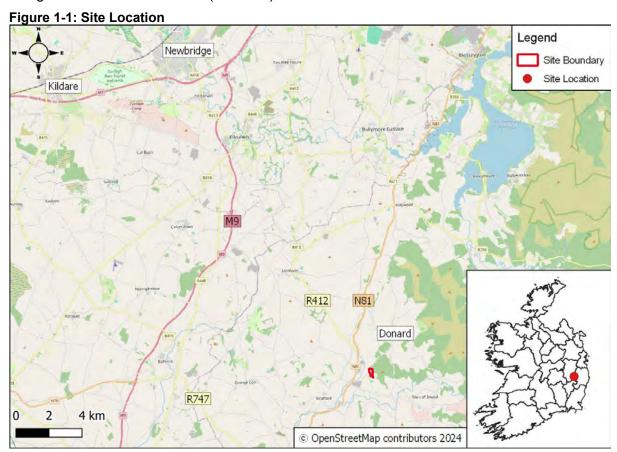
# 1 INTRODUCTION

# 1.1 Background

Malone O'Regan Environmental ('MOR Environmental') was commissioned by Herbie Stephenson Limited ('the Applicant') to undertake a Water Framework Directive Assessment in support of a planning application to Wicklow County Council ('WCC') for the proposed commencement of quarrying at an old rock quarry in Deerpark, Donard, Co. Wicklow, to a level of 165metres above Ordnance Datum ('mAOD'), along with the extension of the quarry into reserves to the south and east of the old quarry (the 'Proposed Development'). Please see the main Environmental Impact Assessment Report ('EIAR') for further details.

This Assessment aims to ascertain whether the project has the potential to impact waterbodies in such a way as to result in a deterioration in that waterbody's status under the Water Framework Directive. If such impacts are found to be possible, then mitigation must be put in place.

The Proposed Development will be located on a site covering an area of circa ('ca.') 8.1 hectares ('ha') within the townland of Deerpark and Donaghmore Co Wicklow (Ordnance Survey Ireland Grid Reference ITM 692022, 695358). Refer to the redline boundary presented in Figure 1-1 below for context ('the Site'). The Site is located ca. 2.4km southwest of Donard.



# 1.2 Regulatory Context Overview

# 1.2.1 EU Legislation - Water Framework Directive

PECENED The Water Framework Directive (WFD) (2000/60/EC) [1], as amended by Directives 2008/105/EC and 2013/39/EU, requires EU Member States to protect and improve water quality. It applies to all surface waters (defined as inland waters, both standing and flowing and includes rivers, lakes, reservoirs, streams and canals), groundwater, transitional (estuarine) and coastal waters. This includes both natural and "artificial and heavily modified bodies of water" ('artificial' is defined in Article 2(8) as 'a body of surface water created by human activity' and 'heavily modified' is defined in Article 2(9) as 'a body of surface water which as a result of physical alternations by human activity is substantially changed in character'.).

The long-term aim of the Directive is for all ground and surface waters within the EU to achieve 'good' status (see section 1.4 below). The WFD was given legal status in Ireland via the European Communities (Water Policy) Regulations 2003 (S.I. 722/2003), as amended.

Article 1 of the Directive sets out that the purpose of the Directive is to establish a framework which "prevents further deterioration and protects and enhances the status of aquatic ecosystems", "promotes sustainable water use" and "aims at enhanced protection and improvement of the aquatic environment inter alia through specific measures for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of priority hazardous substances".

# Article 3 of the Directive states that:

- Member States shall identify the individual river basins lying within their national territory and, for the purposes of this Directive, shall assign them to individual river basin districts. Small river basins may be combined with larger river basins or joined with neighbouring small basins to form individual river basin districts where appropriate. Where groundwaters do not fully follow a particular river basin, they shall be identified and assigned to the nearest or most appropriate river basin district. Coastal waters shall be identified and assigned to the nearest or most appropriate river basin district or districts.
- 3. Member States shall ensure that a river basin covering the territory of more than one Member State is assigned to an international river basin district. At the request of the Member States involved, the Commission shall act to facilitate the assigning to such international river basin districts.
- Member States shall ensure that the requirements of this Directive for the 4. achievement of the environmental objectives established under Article 4, and in particular all programmes of measures are coordinated for the whole of the river basin district. For international river basin districts the Member States concerned shall together ensure this coordination and may, for this purpose, use existing structures stemming from international agreements. At the request of the Member States involved, the Commission shall act to facilitate the establishment of the programmes of measures.
- 5. Where a river basin district extends beyond the territory of the Community, the Member State or Member States concerned shall endeavour to establish appropriate coordination with the relevant non-Member States, with the aim of achieving the objectives of this Directive throughout the river basin district. Member States shall ensure the application of the rules of this Directive within their territory."

Article 4 of the Directive sets out environmental objectives. In relation to sufface water, Article 4(1)(a) states that:

- "(i) Member States shall implement the necessary measures to prevent the deterioration of the status of all bodies of surface water...
- (ii) Member States shall protect, enhance and restore all bodies of surface water, subject to the application of subparagraph (iii) for artificial and heavily modified bodies of water, with the aim of achieving good surface water status at the latest 15 years after the date of entry into force of this Directive...
- (iii) Member States shall protect, enhance and restore all artificial and heavily modified bodies of water with the aim of achieving good ecological potential and good surface water chemical status at the latest 15 years after the date of entry into force of this Directive..."

Article 4(1)(b) places the same obligation to prevent deterioration in relation to groundwater and in addition, places an obligation to:

"protect, enhance and restore all bodies of groundwater, ensure a balance between abstraction and recharge of groundwater, with the aim of achieving good groundwater status at the latest 15 years after the date of entry into force of this Directive..."

Article 4(7) states that Member States will not be in breach of the Directive when failure to achieve good groundwater / ecological status / ecological potential is the result of new modifications to the physical characteristics of a surface water body / alterations to the level of a groundwater body, or failure to prevent deterioration from 'high' to 'good' status is the result of new sustainable human development activities and:

- all practicable steps are taken to mitigate the adverse impact;
- the reasons for the modifications / alterations are set out in the river basin management plan;
- the reasons for the modifications / alternations are of over-riding public interest/the benefits of achieving good status are outweighed by the benefits of the modifications/alterations; and,
- the benefits of the medications / alternations cannot, for reasons of technical feasibility or disproportionate cost, be achieved by other means, which are a significantly better environmental option.

Article 5(1) requires that each Member State:

"ensure that for each river basin district or for the portion of an international river basin district falling within its territory:

an analysis of its characteristics

a review of the impact of human activity on the status of surface waters and on groundwater and

an economic analysis of water use

is undertaken according to the technical specifications set out in Annexes II and III and that it is completed at the latest four years after the date of entry into force of this Directive."

Article 6 of the WFD requires Member States to create and maintain registers of all those areas within a river basin district which have been designated as requiring special protection for their groundwater, surface water, habitats or dependant species. The register is required to include all water bodies identified in Article 7(1) and all waters listed in Annex IV.

Article 7(1) requires Member States to identify within each river basin:

"all bodies of water used for the abstraction of water intended for human consumption providing more than 10m3 a day as an average or serving more than 50 persons and those bodies of water intended for such future use.

Member States shall monitor, in accordance with Annex V, those bodies of water which according to Annex V provide more than 100m3 a day as an average."

Annex IV lists the relevant protected areas as:

- i. "Areas designated for the abstraction of water intended for human consumption under Article 7;
- ii. areas designated for the protection of economically significant aquatic species;
- iii. bodies of water designated as recreational waters, including areas designated as bathing waters under Directive 76/160/EEC<sup>1</sup>;
- iv. nutrient-sensitive areas, including areas designated as vulnerable zones under Directive 91/676/EEC<sup>2</sup> and areas designated as sensitive areas under Directive 91/271/EEC<sup>3</sup> and
- v. areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 92/43/EEC<sup>4</sup> and Directive 79/409/EEC<sup>5</sup>."

Article 11 requires each Member State to establish a "programme of measures" to achieve the objectives set out in Article 4.

# 1.2.2 National Policy

Since 2010, the Government of Ireland has created River Basin Management Plans ('RBMPs') which operate on a renewing six-year cycle. The purpose of these RBMPs is to set targets to address water quality issues, including the protection, improvement and sustainable management of the water environment, in line with the WFD. The first WFD cycle ran from 2009-2015, and the second cycle operated from 2016-2021. The current (third) cycle will run from 2022-2027. A Draft plan was published in September 2021, with public consultation on this Draft closing on 31st March 2022, but a final plan has yet to be published [2].

The first cycle of RBMPs (2010-2015) were developed separately but in close cooperation with the relevant authorities in Northern Ireland, and as a result, all the water environments in Ireland, plus those shared with Northern Ireland, were assessed in unison. The second cycle (2016-2021) [3] plans for Ireland and Northern Ireland were produced under differing timelines, although coordination still occurred in terms of the implementation of the plans. Coordination is ongoing during the development and implementation of the third cycle (2022-2027).

Both jurisdictions carry full responsibility for ensuring the implementation of all WFD measures in their national territory, including any part of an International River Basin District that lies within their national territory. Following the 2016 referendum in the UK on EU withdrawal, the Second River Basin Management Plan (2016-2021) included provisions for the North-South

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<sup>&</sup>lt;sup>1</sup> The Bathing Water Directive

<sup>&</sup>lt;sup>2</sup> The Nitrates Directive

<sup>&</sup>lt;sup>3</sup> The Urban Wastewater Treatment Directive

<sup>&</sup>lt;sup>4</sup> The Habitats Directive

<sup>&</sup>lt;sup>5</sup> The Birds Directive

Water Framework Directive Coordination Group to oversee the management of shared water bodies [3].

In order to manage the specific cross-border WFD issues that existed prior to the withdrawal of the United Kingdom from the EU, the Draft 2022-2027 RBMP sets out four River Basin Districts (RBDs) across the island of Ireland. The Ireland RBD comprises the majority of the Republic of Ireland, with two cross-border/international districts (the Northwestern RBD and the Neagh Bann RBD) covering parts of the Republic of Ireland and Northern Ireland [2]. The Northeastern RBD lies fully within Northern Ireland.

#### 1.3 Assessment Criteria

For the following assessments, EPA Interim Guideline Values ('IGV') are utilised for the purposes of assessing chemical status in the absence of suitable legislative EQS limits.

# 1.3.1 Surface Water Quality Assessment

Under the WFD [1], surface water bodies are defined as either:

- Rivers:
- Lakes;
- Transitional waters;
- · Coastal waters,
- · Artificial surface water bodies; and,
- Heavily modified surface water bodies.

Each natural surface water body is assessed on its ecological status and its chemical status. Ecological status is assessed based on the following categories, with each category receiving a rating of "High," "Good," "Moderate," "Poor" or "Bad":

- Biological quality (aquatic flora and fauna);
- Physico-chemical quality (temperature, oxygenation, nutrient conditions); and,
- Hydromorphological quality (waterflow, sediment composition and movement, riverbank structure etc).

The overall ecological status is based on the lowest of the three individual categories.

In the case of artificial and heavily modified waters, ecological potential status is assessed similarly to the ecological status above but is rated as "Maximum," "Good," "Moderate," "Poor", or "Bad" ecological potential instead. In general terms, 'maximum ecological potential' means that the water body is as close as possible to a comparable surface water body, with the only differences being those directly attributed to the artificial or modified nature of the water body.

Chemical status is given one of two ratings: 'Good' or 'Failing to Achieve Good.' For an assessment of 'Good,' no substance listed in the S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009 (as amended) ('SWAC') [4] may be found in concentrations above the relevant EQS limits.

The overall chemical status of a waterbody is determined by the lowest status found to apply.

# 1.3.2 Groundwater Quality Assessment

Groundwater is awarded either "Good" or "Poor" status. Groundwater is assessed based on its chemical and quantitative status.

Good chemical status of a groundwater body requires the entry of hazardous substances and saline intrusion into the groundwater to be prevented and the presence of other pollutants to

be below the limits within S.I. No. 9/2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010 (as amended) [5]. Concentrations of pollutants must also not be of such a concentration as to impact the ecological or chemical status of associated surface waters or to damage linked terrestrial ecosystems.

Quantitative status is assessed based on whether or not the available groundwater resource is being reduced by the long-term rate of annual abstraction and is rated as "Good" or "Poor."

# 2 METHODOLOGY AND SCOPE

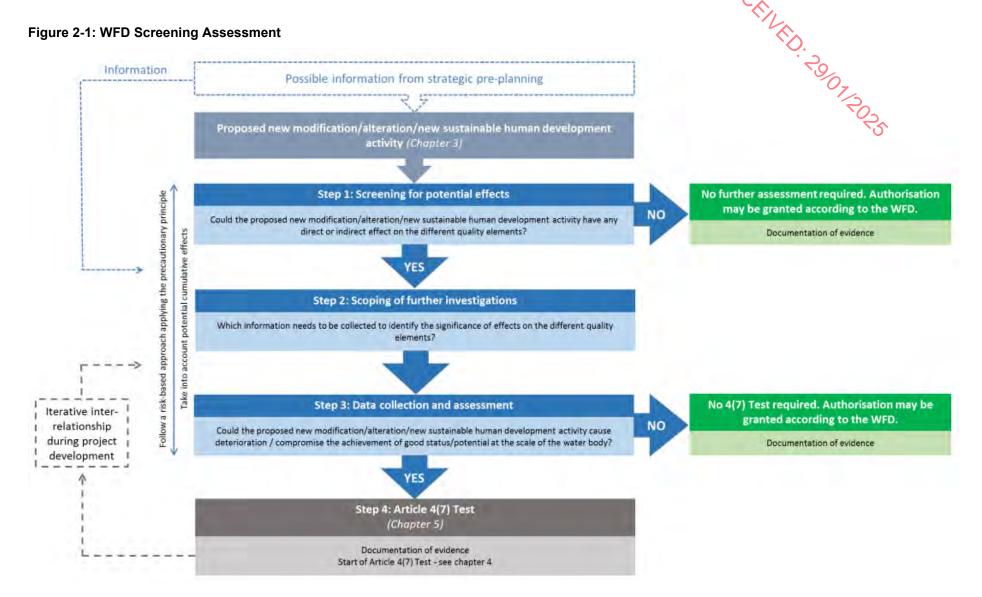
In order to assist in the implementation of the WFD, EU member states, alongside Norway and the European Commission, developed a "Common Implementation Strategy" ('CIS') in May 2001. This CIS was designed to provide coherent and comprehensible guidelines aimed at achieving the aims of WFD.

Figure 4 of the CIS Guidance Document 36 – "Exemptions to the Environmental Objectives" according to Article 4(7)" [6] provides an outline of an approach to WFD Assessments. This, reproduced in Figure 2-1 below, breaks the assessment down into the following sequential steps:

- Screening for Potential Effects Determine whether the Project could have any direct or indirect effect on the different quality elements relevant to the WFD;
- Scoping of Further Investigations Outline the information required to determine the significance of any effect on the relevant quality elements; and,
- Data Collection and Assessment Assess whether any effect could cause deterioration or compromise the status / potential status of a water body.

If the project is determined to compromise or deteriorate the status / potential status of a waterbody, then an "Article 4(7) Test" is required. The project can only be authorised if the conditions as outlined under Article 4(7) a) to d) (shown in Chapter 1.3.1) are fulfilled. If the conditions are not fulfilled, the project cannot be authorised according to the WFD. Assessment under Article 4(7) is summarised in Figure 6 of CIS Guidance Document 36, reproduced as Figure 2-2 below.

If no impacts are identified, then no Article 4(7) assessment is required, and the project may be authorised according to the WFD.



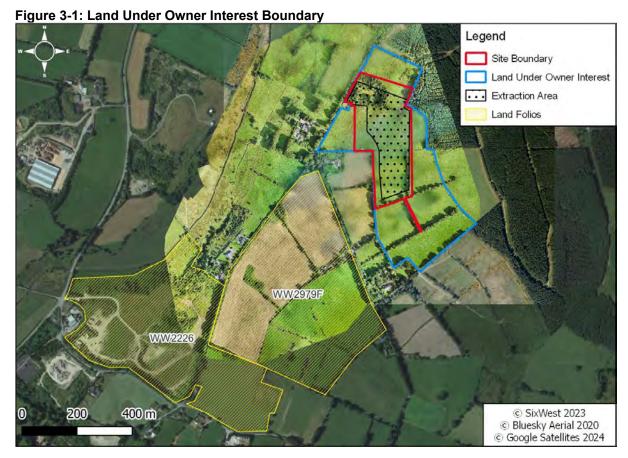
## 3 SITE CONTEXT AND STUDY AREA

# 3.1 Existing Development

The Site was a pre-1963 quarry development which sought, and was granted, planning in 1991 on ca. 2.5ha (Planning Ref. 90/006374) for a period of five years. Operations ceased following the expiry of the planning permission. The quarry was registered under S261 of Planning and Development Act as QY/28 in Wicklow and identified as a basalt rock quarry.

Planning was sought to re-open the quarry in 2021 (Planning Ref. 21/1472) with a site area of ca. 2.4ha and a pit floor of 165mAOD. The application was refused by the Local Authority on the grounds that a sub-threshold EIAR and a Stage 2 NIS should have been supplied as part of the planning application.

The Site comprises the old quarry and the proposed extension lands, primarily to the south and southeast. The proposed extension lands comprise areas of scrub and improved agricultural grassland. This is a greenfield area with no history of planning applications on the WCC planning portal [7]. The northern area of the Site is located within the old quarry. This area has been completely stripped of overburden. To date, quarrying activities within this area have extracted material to a depth of ca. 173mAOD. The entrance to the old quarry, located adjacent to the local road (the L4320-0), lies at a level with the road at ca. 166-167mAOD.



# 3.1.1 Surface Water Monitoring

Surface water monitoring was carried out on the 15<sup>th</sup> and 18<sup>th</sup> January 2024 across four monitoring locations – an upflow land drain (SW01), a downflow section of the CARRIGOWER\_020 waterbody (SW02), a downflow land drain (SW03) and an upflow section of the CARRIGOWER\_020 waterbody (SW04). Three samples were collected on the 15<sup>th</sup> of January (SW01-SW03) and one sample was collected on the 18<sup>th</sup> January (SW04).

The laboratory results were compared with the relevant Surface Water Acceptance Criteria (SWAC) within the European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009 as amended). All analytical results reported concentrations at all sapling locations below the SWAC limits.

# 3.1.2 Groundwater Monitoring

No historic groundwater monitoring data was available for the Site. One groundwater sample was collected for each of the onsite wells (BH01 – BH07) between the 8<sup>th</sup> and 15<sup>th</sup> January 2024. Water purging was performed during the sampling of the wells to allow a representative sample of the aquifer beneath the Site to be collected. Groundwater level measurements taken during the monitoring events indicate a groundwater gradient (flow direction) across the Site is generally east to west.

One exceedance of Groundwater Acceptance Criteria ('GAC') dissolved nickel limits (15mg/l) was detected at BH03 (15mg/l). One exceedance of lower GAC total ammonium (mg N/l) limits (0.065mg/l) was detected at BH03 (0.12mg/l). No exceedances of the GAC limits were detected at the other onsite wells during the monitoring event.

Three exceedances below the lower IGV pH limit (6.5 units) were detected during the monitoring at BH02 (6.19 units), BH03 (6.43 units) and BH06 (6.41 units). No exceedances of the IGV limits were detected at the other onsite wells during the monitoring event.

These values represent ambient conditions within the groundwater body, as the Site is currently under agricultural use.

### 3.2 Proposed Development

The Proposed Development covers an area of ca. 8.1ha., extending from the old quarry at Deerpark into the greenfield extension lands to the east and south. The Site is located ca. 2.4km southwest of Donard town via Donard Mountain Road and the L4317. Therefore, the Site is centrally positioned within the wider N81 corridor.

The Proposed Development will involve the stripping of existing overburden to access the underlying rock within the proposed extraction area. Overburden removed will be used to construct peripheral screening berms along the boundaries of the Site. Berms will be stabilised through planting with native species. To minimise the area of exposed ground, the removal of soils and overburden will be done on a phased basis, as required by the guarry operator.

Initial works will consist of smaller controlled blasts releasing smaller quantities of aggregate from the targeted working face. Following this, the quarry will move into phase one production, with the blasting of the existing old quarry rock face and the extension of the quarry to the east. Industry-standard blasting methods will be utilised at predetermined times. These are proposed to occur at an average rate of twelve blasts per year to produce broken rock. The quarry will operate a series of 15m high benches.

The Proposed Development will operate as a dry processing quarry, including activities such as rock crushing, screening, stockpiling and periodic rock breaking. All processing and aggregate storage will occur within the quarry floor and extracted material will be stockpiled short-term on-site, prior to loading and transportation to customers.

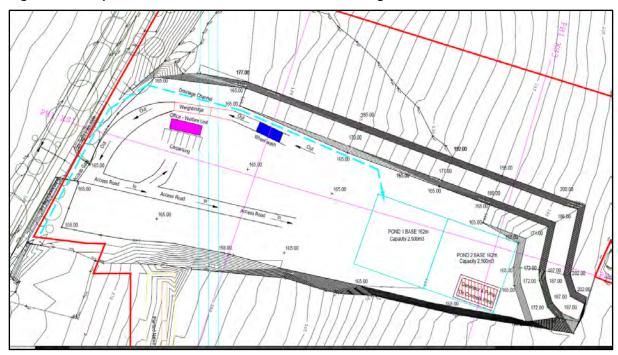
The Site has a sloping topography, dropping from a high ground level of ca 220mOD on the east to a low point of ca. 164mOD along the local road boundary. In order to develop the Site to the quarry floor level of 165mOD, up to three benches of 15m will be required on the eastern section of the Site.

The Proposed Development will be a re-commissioning and extension of the historic quarrying activities. As such, the Proposed Development will incorporate blasting, crushing, screening and stockpiling of materials into its operational phase and provide additional employment.

The Proposed Development will install ancillary infrastructure within the old quarry area including (Refer to Figure 3-2):

- Site office;
- Welfare facilities;
- Weighbridge;
- Wheel wash;
- Crushing and screening equipment; and,
- Storage.

Figure 3-2: Proposed Site Infrastructure - - Extract Drawing No. MD241119-09



During the final stages of Phase 1 development, a water management pond system will be developed on the eastern floor. These ponds will be ca. 3m lower than the pit floor and will allow for quarry floor water to flow into the first pond. Controlled flow into the second pond will occur, to improve settlement of any entrained dusts. Inflow of water, both from groundwater and rainwater, will be managed typically through evapotranspiration to the ground. Most quarry floor water will be collected stormwater. Occasional storm events will require water management. A placement for a pump and generator is therefore facilitated to allow for water to be removed from the Site to the local land drains to the south of the Site, which flow through existing ditches to a field further south of the Site. This pond and land are owned by the same landowner as the Site.

A main office / welfare unit within the quarry will provide welfare facilities for the Site. This building contains a cafeteria, toilet and sink. There will be no mains water connection onsite. Drinking water will be provided via container. Welfare water will be provided via a container.

Car parking facilities for onsite personnel and hauliers will be constructed within the old guarry, as part of the Proposed Development. Car spaces will be designated by the office unit.

A wheel wash and weighbridge will be constructed within the old quarry area near the quarry entrance. Water for the wheel wash will be provided via an onsite well. The wheel wash water will be recycled for further use. The wheel wash will be cleaned out regularly, with sludge removed off-site in accordance with the requirements of the relevant waste legislation.

Hardstanding will be constructed on either side of the wheel wash and weighbridge to mitigate track-out from HGVs. Moreover, a road sweeper will be available to clean the public roads as required. This will be determined from visual inspections.

### 3.2.1 Construction Phase

The Construction Phase relates to the preparation of the old quarry for aggregate processing activities. The initial work within the old quarry will include:

- the clearing of vegetation;
- reduction on the floor level; and,
- preparing the face for blasting.

In tandem with these preparation works the quarry area adjacent to the local road will be improved to provide for the following:

- a modern site entrance off the local road;
- positioning of an office with welfare, weighbridge, wheel wash and parking; and,
- a woodland area will also be planted to the north of the Site within the lands under owner interest to compensate for vegetation clearance works.

Prior to each phase of operational development, the topsoil and overburden will need to be removed. This material will be utilised in the creation of the boundary embankments/berms and planted with native species to stabilise the berm. To minimise the area of exposed ground, the removal of soils and overburden will be done before the need for a new phase of extraction. Plant for the overburden removal will primarily include the use of an excavator and wheel loaders. This phase will result in an exposed rock outcropping.

### 3.2.2 Operational Phase

The Operational Phase will include the following activities:

- Drilling and blasting of the rock face;
- The crushing and screening of aggregate by size / weight, including the placement of aggregate within stockpiles; and,
- The haulage of aggregate from the Site.

# 3.2.2.1 On-site Water

A main office / welfare unit within the quarry will provide welfare facilities for the Site. This building contains a cafeteria, toilet and sink. There will be no mains water connection on-site. Drinking water will be provided via container. Welfare water will be provided via an on-site well. Wastewater produced by these facilities will be retained on-site, which will be specifically constructed for the facility. This system will be emptied on an as-needed basis by appropriately qualified waste contractors. No foul discharge to ground or water will arise at the Site.

Currently, the Site is not directly bounded by any land drains or streams / rivers. Rainwater across the Site percolates to the ground. A drainage channel along the vehicular entrance connects to the water management system to prevent water from leaving the Site.

Generally, within the Site, water arising from the Proposed Development will consist of groundwater seepage and rainwater. Two water management ponds of ca. 2,500m<sup>3</sup> each will be developed during Phase 1 works to allow water on the ground of the quarry to drain into. Each pond will be ca. 3m lower than the quarry floor.

The seepage into the Proposed Development and rainfall is predicted to be of low volume. However, periodic pumping of water from the water management ponds to prevent overflow of water management ponds on-site via an overground pipe to the land drain and evaporation will be sufficient to offset these incoming flows. Where water is pumped into the land drainage, it will ultimately reach an existing pond situated in a family member's field to the south of the Site.

This pond is not a surface waterbody recognised by the EPA under the Water Framework Directive and, as such, is not assigned a quality or risk status. It is noted to have shallow pools of water and limited flow from the connection to land drainage in the most recent survey of the pond. The estimated area of the pond is approximately 0.4ha.

A review of aerial photography and details from a previous survey of the pond indicate that the water level fluctuate. Additionally, the groundwater vulnerability beneath the pond area is identified as "High", and therefore it is likely that the pond is percolating to groundwater. Given the above information, the pond represents a pathway to groundwater rather than surface water in the area, with the pond itself not recognised by the EPA as a waterbody.

# 3.2.2.2 Preparation for Blasting

A drill rig will be positioned on the top of the bench that will be the subject of the blast. A pattern of holes, generally in staggered rows, will be drilled to a predetermined specified depth and diameter. The drillholes, to be specified by the Blasting Specialist, will be dependent upon the size of the blast to be generated, the rock encountered, and the condition of the rock to be blasted (known fracturing, or changes in type). This preparatory work will typically last for several days.

The Blasting Specialist will notify the supplier of the explosives, arrange the delivery and the date of the blast. An application must be made to the Gardai for a licence for the blast.

All residents within 500m from the Site boundary will be notified of the proposed blast date, including details for contacting the Site in the event of pre-blast enquiries or post-blast submissions.

## **3.2.2.3 Blasting**

On the date of the blast, the Blasting Specialist will place the necessary quantity of explosive at the pre-determined depth and position, and back-fill ('stem') each hole with small grit.

A safety zone will be established, where all personnel, plant and equipment will be removed from this zone. The safety zone will be specified by the Blasting Specialist and will be enforced by the Site Manager. Typically, no other operations on the Site within the blast zone will occur during a planned blast event.

As noted in Chapter 11 below, during a blast event, vibration and air-over pressure monitoring will occur at the closest receptor(s).

# 3.2.2.4 Crushing & Stockpiling of Aggregate

The broken rock will be transported by wheeled loaders to the mobile primary crushing and screening plant which will follow the working face within the quarry. This will break the rock into pre-selected sizes / grades, generating aggregate stockpiles of graded rock.

# 3.2.2.5 Phases of the Proposed Development

Aggregate will be exported from the Site by heavy goods vehicles ('HGVs'). An average extraction rate of ca. 200,000 tonnes of aggregate material will be excavated from the Site annually. This extraction rate has been used to determine the daily traffic volumes associated with the Proposed Development.



### Phase 1

Phase 1 will see the development of the old quarry to its original planned extent and depth, and the creation of the water management system. An estimated reserve of ca. 186,000m<sup>3</sup> (ca. 14%) of total will be extracted in this phase of work.

### Phase 2

Phase 2 will extend the quarry south along the western boundary. This phase will be on the lower elevation ground and will benefit from the berm creation to the west. An estimated reserve of ca. 525,000m³ (ca. 41%) of total will be extracted in this phase of work.

### Phase 3

Phase 3 will complete the southern extent of the Proposed Development along the western boundary. The western berms will be established with tree development improving the visual screening. An estimated reserve of ca. 572,500m³ (ca. 45%) of total will be extracted in this phase of work.

Although each phase of development is shown as a distinct element, operationally it will be necessary to commence the next phase prior to the completion of a phase of development. These phases may occur chronologically or not depending on the life stage of the quarry. This will ensure blasting occurs onto a quarry floor below it of ca. 15m depth, along with requirements for safe haulage routes.

### 3.2.3 Restoration Phase – Site Closure

Restoration Plan is submitted as part of this application. This plan outlines the proposed restoration measures for each phase of the Proposed Development alongside the measures to be undertaken once operations have ceased. During the operational phase, planting along

the berms and within the woodland habitats will become established, thereby reducing the overall impact (i.e. dust, visual, flora and fauna).

Once operations have ceased, the Restoration Plan will provide a mosaic of habitats, including woodland areas, retained and re-planted treelines, a species-rich grassland suitable for agricultural use, ponds, bare ground scrapes / unvegetated quarry benches and areas of recolonising bare ground where natural succession and regeneration will occur over time.

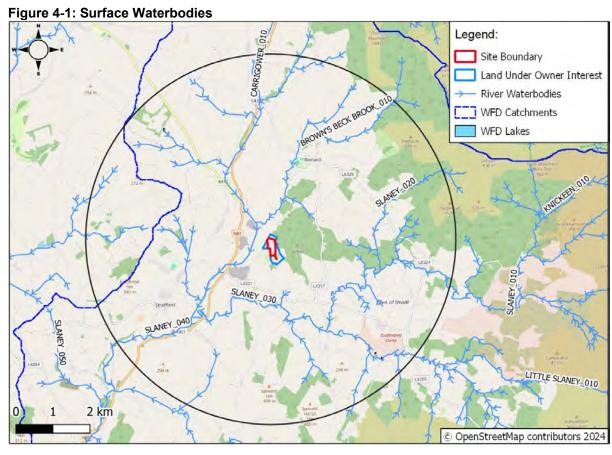
# 4 STUDY AREA SCREENING

For the purposes of this screening assessment, information available on or through the EPA maps [8] was utilised throughout. Specific data on the quality status of waterbodies was gathered from datasets available on catchments.ie [9].

### 4.1 Surface Water

Surface water bodies were screened to a radius of 5km from the Site boundary. Impacts from the Proposed Development are unlikely to extend beyond this distance, given the size and nature of the development.

Figure 4-1 below shows all the surface waterbodies and sub-catchment boundaries within 5km of the Site. The closest EPA surface waterbody is the CARRIGOWER\_020 waterbody, located ca. 330m west of the Site. The CARRIGOWER\_020 waterbody flows into the SLANEY\_040 waterbody ca. 2.9km downflow of the CARRIGOWER\_020 waterbody's closest point to the Site. There is no direct connection from the Site to any surface water features.



Given the proximity of the Site to CARRIGOWER\_020 and the groundwater flow direction underneath the Site, further consideration will be given to the CARRIGOWER\_020 river waterbody to ensure compliance. Surface waterbodies upflow of the CARRIGOWER\_020 waterbody have been screened out.

Status (2016 - 2021) Length Name **EPA Code** Risk (km) Physio-Hydro-**Ecological** Chemical morphological River Waterbody **CARRIGOWER** IE\_SE\_12C060600 Not At 11.56 Good \_020 Risk Not At SLANEY 040 IE SE 12S020600 22.74 High Risk

# Table 4-1: Surface Waterbodies Downflow of Site

# 4.2 Groundwater

Groundwater bodies ('GWB') were screened to a radius of 5km from the Site boundary. Effects from the Proposed Development will unlikely extend beyond this distance, based on professional judgment, given the size and nature of the development compared to the extent of the GWB. Figure 4-2 below shows all the GWBs within 5km of the Site, with details of groundwater bodies presented in Table 4-2 below.

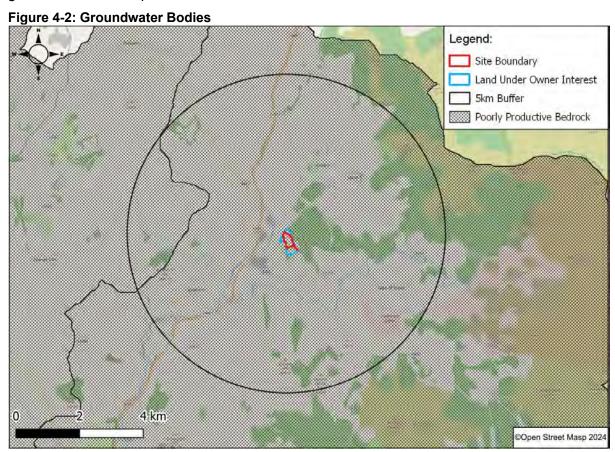


Table 4-2: Groundwater Waterbodies within 5km of Site

Name	EDA Codo	Toma	Area	Sta	Diek	
	EPA Code	Туре	(km²)	Quantitative	Chemical	Risk
Ballyglass	IE_SE_G_011	Poorly productive bedrock	-	Good	Good	At Risk
New Ross	IE_SE_G_152	Poorly productive bedrock	-	Good	Good	Not At Risk

There is a pathway for transport of contamination to enter the "At Risk" Ballyglass GWB via groundwater flow, which could degrade the water quality of the already pressured GWB (see Section 4.5). Therefore, the Ballyglass GWB should be screened in for further assessment.

### 4.3 Protected Sites

# 4.3.1 European Designated Sites

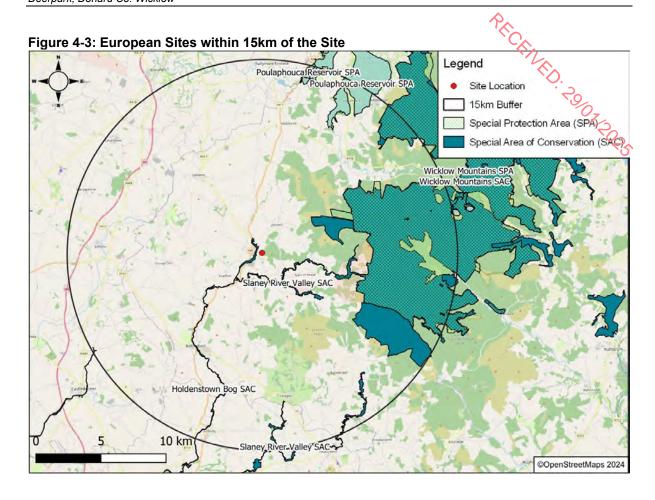
Within 15km of the Site, there are five European Designated Sites: three Special Areas of Conservation ('SAC') and two Special Protection Areas ('SPA') – see Figure 4-3 below. As acknowledged in the Office of Public Works ('OPR') Appropriate Assessment Screening for Development Management guidelines [14], 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. Further, any European site lacking a hydrological connection to the Proposed Development will be screened out, as in the absence of any direct impact pathway, the Proposed Development lacks the capacity to affect unconnected European sites.

No direct hydrological connection (i.e. direct discharge into a European site) between the Site and any of the European sites was identified. Effects arising from the Proposed Development will decrease with distance from the discharge – assessment beyond 15km will not be considered.

Table 4-3: Hydrologically Connected European Sites within 15km of the Site

Name	Code	Direct Distance	Direction from Site	Nature of Hydrological Connection				
Special Areas of Conservation ('SAC')								
Slaney River Valley SAC	000781	328m	W	Given the proximity of the Site to the CARRIGOWER_020 river waterbody and the groundwater flow direction underneath the Site, further consideration will be given to the Slaney River Valley SAC to ensure compliance.				

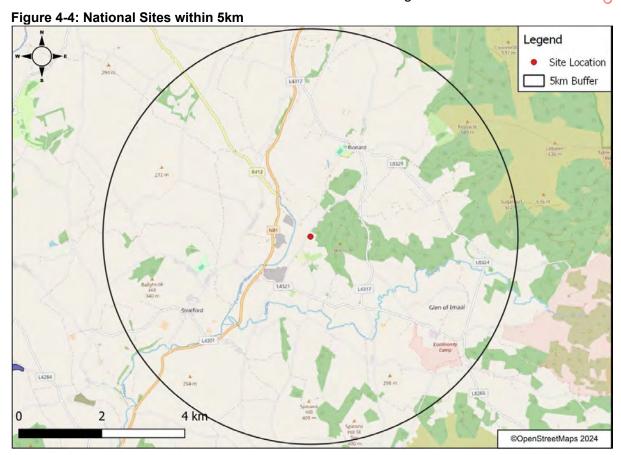
Note the SAC is not considered to be a groundwater-dependent SAC by the National Parks and Wildlife Service ('NPWS') site synopsis or conservation objectives [10].



# 4.3.2 Nationally Designated Conservation Sites

The Nutrient Sensitive Areas, Natural Heritage Areas ('NHAs') and proposed Natural Heritage Areas (pNHAs') within a 5km radius of the Site have been considered. Potential effects arising from the Proposed Development will decrease with distance from the discharge. Therefore, the assessment beyond 5km will not be considered.

No National sites are identified within 5km of the Site. See Figure 4-4 below.



# 4.4 Flood Risk Assessment ('FRA')

The OPW's Catchment Flood Risk Assessment and Management ('CFRAM') maps [11], Flood Hazard Mapping, along with historical mapping (i.e. 6" and 25" base maps) were reviewed to assess flood risk in the area of the Site.

CFRAM mapping has been completed for the Site and shows that the Site is not located within any fluvial or pluvial flood zones. There are drainage district channels and benefitted lands located west of the Site, following the course of the CARRIGOWER\_020 waterbody. There is no identification of areas that are "prone to flooding" on the available historical 6" or 25" (inch) within the Site boundary.

One flood event and one recurring flood incident was identified within the vicinity of the Site from the Office of Public Works ('OPW's') Flood Hazard Mapping. The flood event is located 2.4km northeast of the Site, occurring in Donard Village. The event is undated, though occurred before 2005, with the source listed as "runoff". Remediation works are noted to have occurred in 2004; however, no other details are available on the OPW website. The recurring flood event is located 1km southwest of the Site, with the source listed as "river". The OPW notes that the flooding covers lands on both sides of the N81 road.

# 4.5 Groundwater Usage

From the GIS database, there are eight groundwater boreholes within a 2km visinity of the Site, as shown in Table 4-4 below:

**Table 4-4: Available Groundwater Well Information** 

Borehole ID	Centre Distance from Site	Grid Reference (Irish Grid)	Well Type	Source Use	Total Depth (m)	Townland	Yield (m³ per day)
2919SWW004	1.62km SE	292950 193750	Dug well	Domestic only	1.5	Davidstown	-
2919SWW005	1.73km SE	292950 193690	Dug well	Domestic only	2.1	Davidstown	-
2919SWW006	1.68km SE	292950 193660	Dug well	Domestic only	0.9	Davidstown	-
2919SWW011	1.54km SE	293560 194440	Dug well	None listed	0.9	Kelshamore	-
2919SWW008	1.81km SW	290120 194580	Dug well	None listed	10.7	Randalstown	33
2919SWW010	1.73km NW	290280 196200	Dug well	None listed	3.7	Whitestown Upper	-
2919SWW022	2.37km NW	290260 197300	Borehole	Domestic only	43.6	Raheen	55
2919SWW025	1.24km SW	291060 194280	Borehole	Domestic only	39.6	Castleruddery Lower	30

Groundwater abstraction on-site will be restricted to a single well that will act as a water supply for the welfare facilities and as a water supply for the wheel wash during periods off prolonged dry weather. However, these activities will be supplemented by water held within the water management ponds on-site, therefore cumulative/in-combination impacts on groundwater as a result of abstraction are not predicted to occur.

## 4.6 Water Pressures

The EPA has identified significant pressures for waterbodies that are "At Risk" of not meeting their water quality objectives under the WFD. Significant pressures are those pressures which need to be addressed in order to improve water quality. From the data presented on the EPA maps, there are no significant water pressures within 5km of the Site for surface waters in the Slaney\_SC\_010

Table 4-5 below summarises these pressures.

Table 4-5: EPA Water Pressures on Groundwater Waterbodies 5km from Site

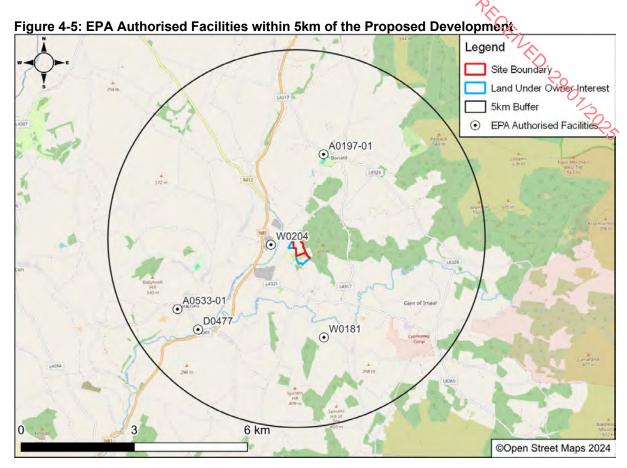
Waterbody / Pressure	Anthropogenic
Ballyglass	$\checkmark$

# 4.7 Licensed Facilities/Developments

Based on EPA maps, there are five facilities within 5km of the Proposed Development which hold EPA-issued licenses or other types of permits, as shown in Table 4-6 and Figure 4-5 below:

Table 4-6: Facilities / Developments within 5km of the Proposed Development

			thin 5km of the Propos		
ID	Authorisation Type	Distance from Site	Activity Class	Relevant Emissions / Controls	Current Status
		Wa	ter Discharge Facilities		
D0477	WWDA	ca. 2.9km SW	2 – Secondary Treatment	-	Withdrawn
A0533-01	Waste Water Discharge Certificate of Authorisation ('WWDCA')	ca. 2.8km W	2 – Secondary Treatment	Primary settlement followed by percolating filtration – discharge to surface water and groundwater	Certified
A0197-01	Waste Water Discharge Certificate of Authorisation ('WWDCA')	ca. 1.4km N	2 – Secondary Treatment	Effluent from the septic tank is pumped to an adjacent willow plantation at Irishtown East for biofiltration. Emissions to water (groundwater and stormwater overflow)	Certified
	_	Was	te Management Facilities		
W0181	Waste	ca. 2.1km S	Activities associated with the cleanup of an unauthorised landfill of approximately 10,000 tonnes of mixed construction, chemical, municipal, hospital, and hazardous clinical waste	Landfill gas emissions No direct emissions to groundwater Emissions to surface water	Licensed
		Indus	strial Emissions Facilities	\$	
W0204	Industrial Emission License ('IEL')	ca. 380m W	11.4 (a)(ii) – Waste Activities associated with the cleanup and remediation of an unauthorised landfill of approximately 240,000 tonnes of mixed construction and commercial waste	Emissions to air Noise emissions Landfill gas emissions	Licensed



# 4.8 Final Screening

Given the pressures and hydrological connectivity of the waterbodies discussed above, waterbodies can be categorised into either requiring further assessment or not requiring further assessment; see Table 4-7 and Table 4-8 below.

No surface waterbodies were identified as having direct connectivity with the Proposed Development, though, due to proximity a number of features have been consideration in this screening stage.

### Note:

An overall quality status for waterbodies is assigned by the EPA based on a combination of the statuses shown in Tables 4-1 and 4-2 above. To remain consistent with the most recent data as presented by the EPA, the overall quality status presented below is taken from the 2016-2021 quality status assigned to each water body on the EPA maps web viewer [8].

Table 4-7: Screening Table

Table 4- <mark>7</mark> : Screening	Table							
Name	Quality Status (Overall)	Risk	Further Assessment?	Justification				
Surface Waterbody				To the second se				
CARRIGOWER_020	Good	Not At Risk	Yes	There is no direct hydrological connection between the Proposed Development and this waterbody. An indirect connection from the Proposed Development to this waterbody would occur from water management and overflow ponds percolating to groundwater, with this groundwater then flowing towards and into the river waterbody. However, this waterbody is a secondary receptor to effects on groundwater from the Proposed Development and as such, some degree of attenuation will occur over the pathway, and some effects, such as those arising from suspended solids, will be scoped out entirely.  Given the connectivity via groundwater to the Proposed Development, combined with the SAC associated with the waterbody, the CARRIGOWER_020 waterbody is screened in for further assessment.				
SLANEY_040	High	Not At Risk	No	The SLANEY_040 is located downflow of the CARRIGOWER_020, hence effects on the SLANEY_040 will be attenuated over distance relative to the CARRIGOWER_020 waterbody. Given the indirect connectivity via groundwater between the CARRIGOWER_020 and the Proposed Development is already attenuating some effects from the Proposed Development, the SLANEY_040 waterbody is screened out of further assessment.				
Groundwater Waterbod	у							
Ballyglass	Good	At Risk	Yes	There is a link between the Site and GWB there percolation to ground from water management and overflow ponds - further assessment is required to determine any potential risk to groundwater quality status.				

Table 4-8: Screening Table - Protected Sites

Name	Hydrologically connected to the Site?	Relevant Associated Water Bodies	Further Assessment?	Justification
Slaney River Valley SAC	Yes	CARRIGOWER_020 and SLANEY_040	Yes	Given the close proximity of the Proposed Development and the screening in of the CARRIGOWER_020, the Slaney River Valley SAC will be screened into further assessment.

# 5 IMPACT ASSESSMENT

# 5.1 CARRIGOWER\_020

Table 5-1: CARRIGOWER\_020 Impact Assessment

Receptor	Potential Effect from Site	Potential Effect of Proposed Development	Mitigation Required?
Hydromorphology quality	No	No works are proposed in or directly adjacent to the river waterbody.  There are no predicted direct discharge resulting from the Proposed Development, with connectivity occurring through a groundwater flow pathway. Therefore, it is determined that there are no hydromorphological quality changes expected within the waterbody due to the Proposed Development.	No
Biological quality	No	No works are proposed in or directly adjacent to the river waterbody; therefore, there will be no direct risk to habitats or species within.  With connectivity occurring through a groundwater flow pathway suspended solids will be filtered out before reaching the waterbody and therefore cannot affect biological quality. As such, it is determined that there are no biological quality changes expected within the waterbody due to the Proposed Development.	No
Physico-Chemical quality	Yes	The potential release of hydrocarbons or explosive residues utilised during the operation of the Proposed Development would result in a significant negative effect on groundwater in the locality. As groundwater is connected to this waterbody the Proposed Development is considered a potential hazard to physio-chemical quality of this waterbody. It is predicted that these effects will be significant and as such mitigation measures will be required.  The potential risk would persist until the Site ceases operation, but proper mitigation, implemented to manage and control pollutants entering groundwater, would reduce the likelihood of an incident, limiting the risk posed to waterbody chemical status to an acceptable level.	Yes
Slaney River Valley SAC	Yes	As the Slaney River Valley SAC associated with the CARRIGOWER_020 waterbody, negative effects on the quality of the waterbody will also effect the SAC. Given an identified negative effect on the physio-chemical quality of this waterbody, mitigation will be required to prevent effects arising on the SAC.	Yes

# 5.2 Ballyglass GWB

Table 5-2: Ballyglass GWB Impact Assessment

Receptor	Potential Impact from Site	Potential Impact of Proposed Development	Mitigation Required?
Quantitative quality	No	Minimal abstraction works are proposed as part of the Proposed Development, with water supply to be supplemented by water management ponds onsite. Therefore, no quantitative impacts are predicted to occur.	No further assessment required.
Chemical quality	Yes	The potential release of hydrocarbons or explosive residues utilised during the operation of the Proposed Development would result in a significant negative effect on groundwater in the locality. The potential risk would persist until the Site ceases operation, but proper mitigation, implemented to manage and control pollutants entering groundwater, would reduce the likelihood of an incident, limiting the risk posed to waterbody chemical status to an acceptable level.	Mitigation measures required.

# 5.3 Mitigation Measures

During preparatory and operational works at the Proposed Development, the usage of fuel-powered equipment and machinery will be required. In order to limit the risk of contamination from these materials, mitigation measures will be in accordance with the EPA (2006) Environmental Management Guidelines: Environmental Management in the Extractive Industry (Non-Scheduled Minerals) [12], whereby:

- Items of plant and machinery will be refuelled by a mobile fuel bowser by a competent person utilising adequately sized and positioned drip trays;
- Absorbent sands and a full spill kit system will be adjacent to all refuelling operations;
- The wheel wash will be serviced and maintained, including the removal of sediment off-site periodically by a permitted contractor to a licensed facility, to prevent the release of finer sediment, fuels and greases that accumulate over time;
- Unauthorised access is prevented in so far as possible; and,
- Any hazardous waste, such as waste oils, generated on-site will be collected in leakproof containers and stored on-site in designated areas to be collected and recycled / disposed of by an authorised waste contractor in accordance with the relevant waste regulations.

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

- Silt fencing will be installed where required to prevent the erosion of berms;
- Preventative maintenance and relevant maintenance logs will be kept for all on-site plant and equipment, including the generator associated with the water management system pump;
- Procedures and contingency plans will be set up to deal with emergency accidents or spills;
- Lubricants and hydraulic fluids for screening equipment used on the Site will be carefully handled to avoid spillage, properly secured against unauthorized access or vandalism, and provided will spill containment according to best practice codes;
- Any spillage of fuel, lubricants or hydraulic oils will be immediately contained, and the contaminated soil removed from the Site and appropriately disposed of;
- Any pumping from the water management ponds into the land drainage system leading to the overflow pond will be restricted to agricultural rates;
- The generator for the pumping system will be appropriately bunded to limit a potential leak of fuel or lubricant into the water management ponds;
- The water management ponds will be inspected weekly and quarterly to screen for the presence of hydrocarbons in the tanks:
  - If hydrocarbon contamination is detected, any pumping of water to discharge from the ponds will cease. The installed pump will be inspected and will be cleaned/undergo maintenance to remove any residual hydrocarbons before it is returned to use; and,
  - As soon as feasible, any contaminated water will be removed from the ponds using a separate pump and stored on-site in secure containers for collection by an appropriately qualified waste contractor.
- The water management ponds will be inspected visually prior to pumping.

#### CONCLUSIONS 6

The Proposed Development has the potential to effect three waterbodies:

- PRICENED. The CARRIGOWER\_020 river waterbody ("Good" WFD quality status); and;
- The Ballyglass groundwater waterbody ("Good" WFD quality status).

The Ballyglass GWB is considered 'at risk' of not achieving WFD objectives of achieving 'Good' status. The CARRIGOWER 020 risk status is currently 'not at risk'.

Without mitigation, it was predicted that the Proposed Development will have any negative effect on the Ballyglass waterbody, in the event of an accidental spill / release of hydrocarbons, which in turn would negatively affect the CARRIGOWER 020 waterbody through a groundwater connection. Mitigation measures were proposed to reduce the likelihood of such a release and to provide an appropriate response in the event of such a release to limit its magnitude. Therefore, with full implementation of the mitigation measures, no change in quality status was predicted for those waterbodies.

The Slaney River Valley SAC is the only protected sites which is hydrologically connected to the Site and screened into the impact assessment. As the SAC is associated with the CARRIGOWER 020 waterbody, negative effects are only predicted in the event of an accidental spill / release of hydrocarbons. As such, with full implementation of the mitigation measures, no effects were predicted for these protected sites.

As such, it can be concluded that the Proposed Development will not:

- Jeopardise the achievement of:
  - o good quality status;
  - good chemical status; or,
  - good ecological potential

for any directly or indirectly connected groundwater or surface waterbody;

- Contribute to the risk of any directly or indirectly connected waterbody from failing to achieve "Good" status within the next cycle of the Water Framework Directive monitoring; and,
- Degrade the ecological quality of the protected sites associated with connected waterbodies nor jeopardise the goals and/or targets set out for these protected sites.

Therefore, the Proposed Development will not compromise the objectives and requirements of the WFD within the local area and within the river basin district or the ability of any waters to meet the objectives of the WFD and transposing legislation.

#### 7 REFERENCES

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- [3] Government of Ireland, "River Basin Management Plan for Ireland 2016 2021," Gol, 2017.
- [4] Government of Ireland, "S.I. No. 272/2009 European Communities Environmental Objectives (Surface Waters) Regulations 2009," Houses of the Oireachtas, Dublin, 2009.
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- [12] EPA, "Environmental Management Guidelines, Environmental Management in the Extractive Industry (Non-Scheduled Minerals)," Environmental Protection Agency, Wexford, 2006.

PECENED. 29/07/2025



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Malone O'Regan Ground Floor - Unit 3 Bracken Business Park Bracken Road Sandyford Dublin 18 Ireland D18 V4K6







Attention: Nuria Manzanas

Date: 29th January, 2024

Your reference : E2123

Our reference : Test Report 24/660 Batch 1

Deerpark Quarry Location:

Date samples received : 16th January, 2024

Status: Final Report

202401291439 Issue:

Ten samples were received for analysis on 16th January, 2024 of which ten were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon - Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 26.716 kg of CO2

Scope 1&2&3 emissions - 63.136 kg of CO2

Authorised By:

**Bruce Leslie** 

Project Manager

Please include all sections of this report if it is reproduced

Malone O'Regan Client Name:

E2123 Reference:

Location: Deerpark Quarry Contact: Nuria Manzanas

Report: Liquid

EMT Job No: 24/660 **Liquids/products:** V=40ml vial, G=glass bottle, P=plastic bottle H=H<sub>2</sub>SO<sub>4</sub>, Z=ZnAc, N=NaOH, HN=HNO<sub>3</sub>

EMT Job No:	24/660						$H=H_2SO_4$ ,	Z=ZnAc, N=	NaOH, HN=	∙HN0 <sub>3</sub>			
EMT Sample No.	1-8	9-16	17-24	25-32	33-40	41-48	49-56	57-60	61-64	65-68	<b>%</b>		
Sample ID	BH01	BH02	BH03	BH04	BH05	BH06	BH07	SW01 LAND DRAIN UPSTREAM	SW02 DOWNSTREA M	SW03 LAND DRAIN DOWNSTREA M	.50	07	
Depth											Please se	e attached 1	otes for all
COC No / misc												ations and a	
Containers	V H HN N P G	H HN P BOD	H HN P BOD	H HN P BOD									
Sample Date	15/01/2024	08/01/2024	10/01/2024	09/01/2024	11/01/2024	09/01/2024	10/01/2024	15/01/2024	15/01/2024	15/01/2024			
Sample Type					Ground Water				Surface Water				
Batch Number	1	1	1	1	1	1	1	1	1	1			
											LOD/LOR	Units	Method No.
Date of Receipt			16/01/2024	16/01/2024		16/01/2024		16/01/2024	16/01/2024	16/01/2024			
Dissolved Aluminium#	<20	<20	<20	108	<20	<20	<20	-	-	-	<20	ug/l	TM30/PM14
Dissolved Arsenic*	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	3.0	4.6	<2.5	<2.5	ug/l	TM30/PM14
Dissolved Barium #	114	39	31	19	47	58	45	-	-	-	<3	ug/l	TM30/PM14
Dissolved Boron	12	<12	<12	<12	<12	<12	<12	-	-	-	<12	ug/l	TM30/PM14
Dissolved Cadmium#	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM30/PM14
Dissolved Calcium#	44.1	10.5	14.9	21.5	12.0	13.3	12.8		- 44.5		<0.2	mg/l	TM30/PM14
Total Dissolved Chromium #	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	ug/l	TM30/PM14
Dissolved Copper#	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/l	TM30/PM14
Total Dissolved Iron #	47	<20	<20	166	2062	<20	<20	-	-	-	<20	ug/l	TM30/PM14 TM30/PM14
Dissolved Lead #	<5 5.3	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM30/PM14
Dissolved Magnesium   Dissolved Manganese   #	5.3 261	2.8	2.8 247	3.4	2.4 225	3.0 5	2.8	-	-	-	<0.1 <2	mg/l	TM30/PM14
Dissolved Manganese Dissolved Mercury#	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l ug/l	TM30/PM14
Dissolved Nickel #	2	<2	15	2	4	<2	<2	<2	<2	<2	<2	ug/l	TM30/PM14
Dissolved Nickel  Dissolved Potassium #	6.3	1.1	1.5	1.4	1.8	1.8	2.4	-	-	-	<0.1	mg/l	TM30/PM14
Dissolved Fotassium  Dissolved Selenium  #	<3	<3	<3	<3	<3	<3	<3	_	_	_	<3	ug/l	TM30/PM14
Dissolved Selement  Dissolved Sodium  #	9.6	7.8	12.5	9.5	8.2	8.1	9.6	_	_	_	<0.1	mg/l	TM30/PM14
Dissolved Uranium	<5	<5	<5	<5	<5	<5	<5	_	_	_	<5	ug/l	TM30/PM14
Dissolved Zinc #	5	9	6	13	13	6	13	<3	5	<3	<3	ug/l	TM30/PM14
Total Hardness Dissolved (as CaCO3)	133	38	49	68	40	46	44	-	-	-	<1	mg/l	TM30/PM14
MTBE#	<5	<5	<5	<5	<5	<5	<5	-	-	-	<5	ug/l	TM36/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5	-	-	-	<5	ug/l	TM36/PM12
Toluene #	<5	<5	<5	<5	<5	<5	<5	-	-	-	<5	ug/l	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5	-	-	-	<5	ug/l	TM36/PM12
m/p-Xylene#	<5	<5	<5	<5	<5	<5	<5	-	-	-	<5	ug/l	TM36/PM12
o-Xylene#	<5	<5	<5	<5	<5	<5	<5	-	-	-	<5	ug/l	TM36/PM12
TPH CWG													
Aliphatics												_	T1 10 2 7 2 2 2
>C5-C6 (HS_1D_AL)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM36/PM12
>C6-C8 (HS_1D_AL)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM36/PM12
>C8-C10 (HS_1D_AL)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM36/PM12
>C10-C12 (EH_CU_1D_AL)#	<5	<5	<5	<5	<5	<5	<5	-	-	-	<5	ug/l	TM5/PM16/PM30
>C12-C16 (EH_CU_1D_AL)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM5/PM16/PM30
>C16-C21 (EH_CU_1D_AL)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM5/PM16/PM30 TM5/PM16/PM30
>C21-C35 (EH_CU_1D_AL)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM5/PM16/PM30 TM5/PM16/PM30
>C35-C44 (EH_CU_1D_AL)  Total aliphatics C5-44 (EH_CU+HS_1D_AL)	<10 <10	-	-	-	<10	ug/l	TM5/PM16/PM30 TM5/TM58IPM12IPM16IPM30						
TOTAL BIPLIATION COMM (ET_CUTTO_ID_AL)	~10	×10	×10	10	×10	10	10	-	-	-	<10	ug/l	- HOY I MUSERPHINE PM/SO

Client Name: Malone O'Regan

Reference: E2123

Location:Deerpark QuarryContact:Nuria Manzanas

**EMT Job No:** 24/660

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle

H=H<sub>2</sub>SO<sub>4</sub>, Z=ZnAc, N=NaOH, HN=HNO<sub>3</sub>

EWI JOB NO.	2.7000						24,	,	114011, 1111				
EMT Sample No.	1-8	9-16	17-24	25-32	33-40	41-48	49-56	57-60	61-64	65-68	(S).		
Sample ID	BH01	BH02	BH03	BH04	BH05	BH06	ВН07	SW01 LAND DRAIN UPSTREAM	SW02 DOWNSTREA M	SW03 LAND DRAIN DOWNSTREA M	.50	07	
Depth											Please se	e attached n	otes for all
COC No / misc												ations and a	
Containers	V H HN N P G	V H HN N P G	VHHNNPG	VHHNNPG	V H HN N P G	V H HN N P G	VHHNNPG	H HN P BOD	H HN P BOD	H HN P BOD			
Sample Date					11/01/2024								
-													
Sample Type	Ground Water	Surface Water	Surface Water	Surface Water		1							
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method
Date of Receipt	16/01/2024	16/01/2024	16/01/2024	16/01/2024	16/01/2024	16/01/2024	16/01/2024	16/01/2024	16/01/2024	16/01/2024	LODILOIT	Onno	No.
TPH CWG													
Aromatics													
>C5-EC7 (HS_1D_AR)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM36/PM12
>EC7-EC8 (HS_1D_AR)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	<5	<5	<5	<5	<5	<5	<5	-	-	-	<5	ug/l	TM5/PM16/PM30
>EC12-EC16 (EH_CU_1D_AR)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM5/PM16/PM30
>EC16-EC21 (EH_CU_1D_AR)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM5/PM16/PM30
>EC21-EC35 (EH_CU_1D_AR)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM5/PM16/PM30
>EC35-EC44 (EH_CU_1D_AR)	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM5/PM16/PM30
Total aromatics C5-44 (EH_CU+HS_1D_AR)	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM5/TM96/PM12/PM16/PM30
Total aliphatics and aromatics(C5-44) (EH_CU+HS_1D_Total)	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM5/TM36/PM12/PM16/PM30
PCBs (Total vs Aroclor 1254)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-	<0.2	ug/l	TM17/PM30
Fluoride	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	-	-	-	<0.3	mg/l	TM173/PM0
Sulphate as SO4 #	8.8	6.1	5.6	6.8	4.4	3.6	5.4	17.4 <sub>AA</sub>	18.8 <sub>AA</sub>	19.1 <sub>AA</sub>	<0.5	mg/l	TM38/PM0
Chloride #	11.2	13.2	20.1	17.5	7.5	10.7	13.6	10.3	11.6	14.0	<0.3	mg/l	TM38/PM0
Nitrate as NO3 #	33.7	16.3	11.2	10.1	4.1	19.5	12.5	-	-	_	<0.2	mg/l	TM38/PM0
Nitrite as NO2#	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	<0.02	mg/l	TM38/PM0
Ortho Phosphate as PO4#	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	-	-	-	<0.06	mg/l	TM38/PM0
Ortho Phosphate as P #	-	-	-	-	-	-	-	<0.03	<0.03	<0.03	<0.03	mg/l	TM38/PM0
Total Cyanide <sup>#</sup>	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	<0.01	mg/l	TM89/PM0
Ammoniocal Nitrogon on NI#	<0.03	<0.03	0.12	0.07	0.05	<0.03	<0.03				<0.03	ma/l	TM38/PM0
Ammoniacal Nitrogen as N <sup>#</sup> Ammoniacal Nitrogen as NH3 <sup>#</sup>		-0.03	0.12	- 0.07	0.03	-0.03	-	<0.030	<0.030	<0.030	<0.030	mg/l mg/l	TM38/PM0
7 tillionadar Madgell ad Milo								0.000	0.000	0.000	0.000	9.	11110071 1110
Total Alkalinity as CaCO3#	156	40	48	74	62	48	54	-	-	-	<1	mg/l	TM75/PM0
Carbonate Alkalinity as CaCO3	<1	<1	<1	<1	<1	<1	<1	-	-	-	<1	mg/l	TM75/PM0
Bicarbonate Alkalinity as CaCO3 (water soluble)	156	40	48	74	62	48	54	-	-	-	<1	mg/l	TM75/PM0
BOD (Settled)#	-	-	-	-	-	-	-	<1	<1	<1	<1	mg/l	TM58/PM0
COD (Settled)#	-	-	-	-	-	-	-	<7	10	9	<7	mg/l	TM57/PM0
Electrical Conductivity @25C #	347	141	177	209	135	153	151	165	299	157	<2	uS/cm	TM76/PM0
pH#	6.97	6.19	6.43	6.63	6.63	6.41	6.51	6.69	7.69	7.72	<0.01	pH units	TM73/PM0
Silica	8.70	10.00	6.60	9.50	10.50	12.90	10.30	-	-	-	<0.01	mg/l	TM52/PM0
Total Organic Carbon <sup>#</sup>	<2	<2	<2	<2	<2	<2	-	-	-	-	<2	mg/l	TM60/PM0
Total Dissolved Solids #	197	86	93	114	83	109	99	93	173	97	<35	mg/l	TM20/PM0
Total Nitrogen	8.1	3.7	3.1	2.3	1.6	4.4	3.4	3.3	3.7	1.7	<0.5	mg/l	TM38/TM125/PM0
Total Suspended Solids #	-	-	-	-	-	-	-	<10	<10	<10	<10	mg/l	TM37/PM0
			<u> </u>	<u> </u>									

Notification of Deviating Samples

Client Name: Malone O'Regan

**Reference:** E2123

Location: Deerpark Quarry
Contact: Nuria Manzanas

ontac	mact: Nuna Manizarias									
EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason				
	No deviating sample report results for job 24/660									

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

### NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

**EMT Job No.:** 24/660

#### **SOILS and ASH**

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCI (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

#### **WATERS**

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

### **STACK EMISSIONS**

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

### **DEVIATING SAMPLES**

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

### **SURROGATES**

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

### **DILUTIONS**

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

### **BLANKS**

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

24/660 EMT Job No.:

#### NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact . 20/07/2025 the laboratory if further details are required of the circumstances which have led to the removal of accreditation. Laboratory records are kept for a period of no less than 6 years.

### REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

#### **Measurement Uncertainty**

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

### **Customer Provided Information**

Sample ID and depth is information provided by the customer.

### Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).

Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

# ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
В	Indicates analyte found in associated method blank.
DR	Dilution required.
М	ISO17025 (SANAS Ref No.T0729) accredited - South Africa Indicates analyte found in associated method blank.  Dilution required.  MCERTS accredited.  Not applicable  No Asbestos Detected.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
СО	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
ТВ	Trip Blank Sample
ОС	Outside Calibration Range
AA	x20 Dilution

## **HWOL ACRONYMS AND OPERATORS USED**

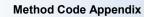
HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	Extractable Hydrocarbons - i.e. everything extracted by the solvent.  Clean-up - e.g. by florisil, silica gel.  GC - Single coil gas chromatography.  Aliphatics & Aromatics.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

**EMT Job No**: 24/660



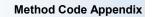
Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MOERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			300	
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details				
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID coelutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM37	Solids (TSS) and Volatile Suspended Solids (VSS). Sample is filtered through a 1.5um pore size glass fibre filter and the resulting residue is dried and weighed at 105°C for TSS and Volatile Suspended Solids (TSS) and Volatile Suspended Solids (VSS). Sample is filtered through a 1.5um pore size glass fibre filter and the resulting residue is dried and weighed at 105°C for TSS and ESSS (SS).	PM0	No preparation is required.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes			

**EMT Job No:** 24/660



Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MOERTS (UK Goils Only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38/TM125	Total Nitogen/Organic Nitrogen by calculation	PM0	No preparation is required.			SO	
TM52	Silica determination by reaction with Amino Acid F Reagent, Citric acid and Molybdate Reagent which is analysed spectrophotometrically.	PM0	No preparation is required.				
TM57	Modified US EPA Method 410.4. (Rev. 2.0 1993) Comparable with ISO 15705:2002. Chemical Oxygen Demand is determined by hot digestion with Potassium Dichromate and measured spectrophotometerically.	PM0	No preparation is required.	Yes			
TM58	APHA SMEWW 5210B:1999 22nd Edition. Comparible with ISO 5815:1989.  Measurement of Biochemical Oxygen Demand. When cBOD (Carbonaceous BOD) is requested a nitrification inhibitor is added which prevents the oxidation of reduced forms of nitrogen, such as am	PM0	No preparation is required.	Yes			
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.				
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
ТМ76	Modified US EPA method 120.1 (1982). Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes			

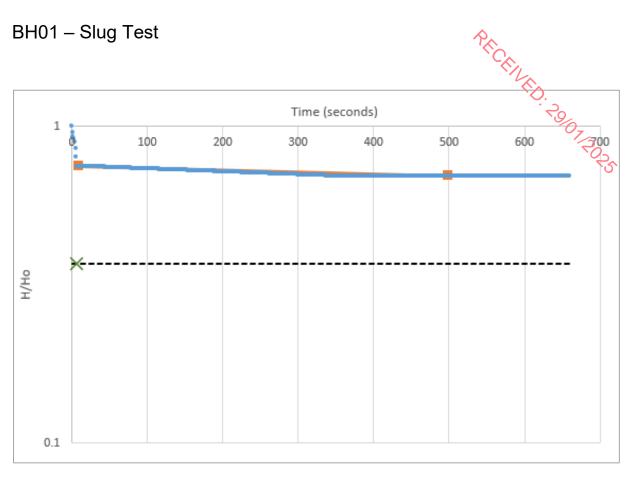
**EMT Job No**: 24/660



Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MOERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			300	

PECENED. 29/07/2025

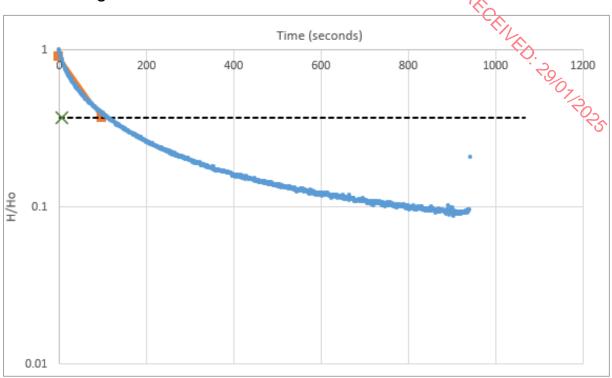
BH01 – Slug Test



2.85mbtoci Rest water level:

Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	0.85	2	1
150	1.3936	1.4564	0.7282
350	1.4533	1.3967	0.69835
650	1.46	1.39	0.695
Hydraulic conductivity	К	m/s	1.55E-07
		m/d	1.34E-02

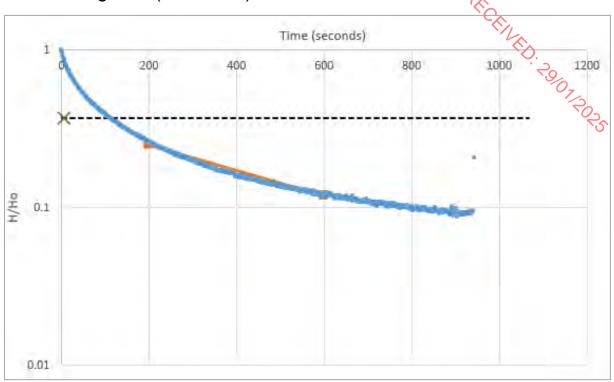
BH02 – Slug Test



Rest water level: 8.48mbtoci

Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	8.268	0.212	1
175	8.4189	0.0611	0.288207547
350	8.4427	0.0373	0.175
620	8.4549	0.0251	0.1183
850	8.4599	0.02	0.0948
1000	14.7215	-6.241	-29.44
Hydraulic conductivity	К	m/s	1.57E-05
		m/d	1.36E+00

# BH02 – Slug Test (Extra Line)



Rest water level:	8.48mbtoci		
Time (seconds)	Water level (mbd)	H (m)	Н/Но
0	8.268	0.212	1
150	8.4141	0.0659	0.3108
230	8.4296	0.0504	0.2377
420	8.4469	0.0331	0.1561
700	8.457	0.023	0.1084
1000	14.7215	-6.2415	-29.441
	К	m/s	3.21E-06
Hydraulic conductivity		m/d	2.77E-01

BH03 – Slug Test



2.2 m below datum (mbd) Rest water level:

Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	0.6368	1.5632	1
610	0.8444	1.3556	0.867195496
1180	0.9595	1.2405	0.7935
1690	1.0488	1.1512	0.7364
2800	1.204	0.996	0.6371
3200	1.2512	0.9488	0.6069
4950	1.4169	0.7831	0.5009
	К	m/s	1.82E-07
Hydraulic conductivity		m/d	1.57E-02

BH04 – Slug Test

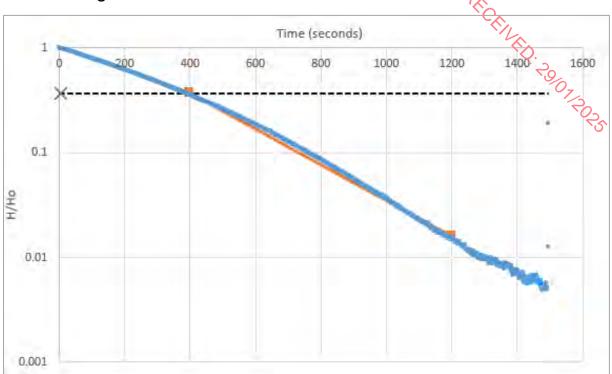


Rest water level:

4.85 m below datum (mbd)

			, ,
Time (seconds)	Water level (mbd)	H (m)	Н/Но
Time (seconds)	water level (ilibu)	п (ш)	п/по
0	3.1891	1.6609	1
325	3.3492	1.5008	0.9036
690	3.458	1.392	0.8380
1425	3.6517	1.1983	0.7214
3300	3.9987	0.8513	0.5125
4970	4.2225	0.6275	0.3778
	К	m/s	2.61E-07
Hydraulic conductivity		m/d	2.25E-02

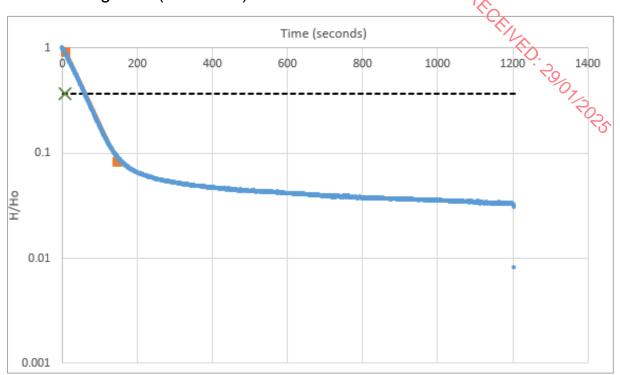
BH05 – Slug Test



Rest water level: 3.05 m below datum (mbd)

Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	2.3333	0.7167	1
240	2.6494	0.4006	0.5589
385	2.7839	0.2661	0.3712
660	2.9434	0.1066	0.1487
900	3.0096	0.0404	0.0563
1480	3.0461	0.0039	0.0054
	к	m/s	4.13E-05
Hydraulic conductivity		m/d	3.57E+00

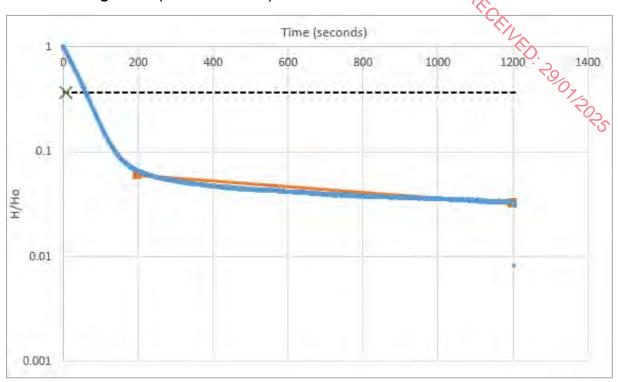
BH06 – Slug Test (First Test)



Rest water level: 3.83 m below datum (mbd)

Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	2.6835	1.1465	1
195	3.7528	0.0772	0.0673
375	3.7743	0.0557	0.0485
750	3.7859	0.0441	0.0384
1070	3.7912	0.0388	0.0338
	K	m/s	3.02E-05
Hydraulic conductivity		m/d	2.61E+00

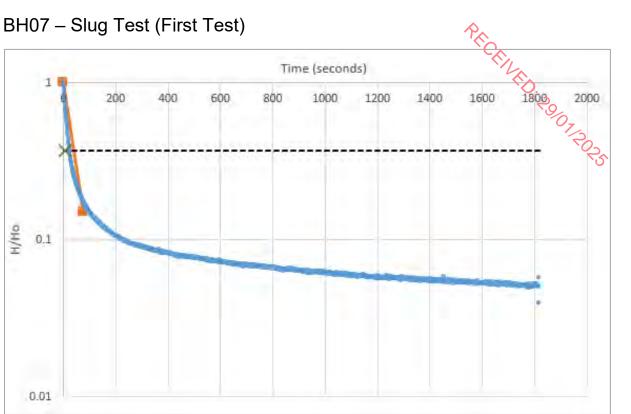
BH06 – Slug Test (Second Test)



Rest water level: 3.83 m below datum (mbd)

Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	2.6835	1.1465	1
180	3.7485	0.0815	0.0710
430	3.7768	0.0532	0.0464
820	3.7866	0.0434	0.0378
1075	3.7908	0.0392	0.0341
	K	m/s	1.10E-06
Hydraulic conductivity		m/d	9.49E-02

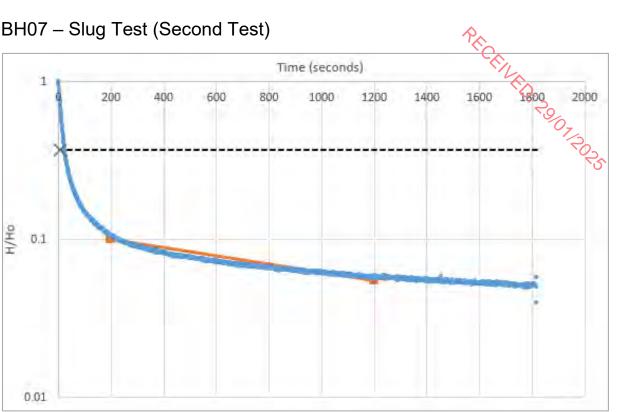
BH07 – Slug Test (First Test)



5.57 m below datum (mbd) Rest water level:

Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	4.9449	0.6251	1
200	5.5041	0.0659	0.1054
480	5.5207	0.0493	0.0788
950	5.5314	0.0386	0.061
1050	5.5317	0.0383	0.0612
1740	5.5381	0.0319	0.0510
	К	m/s	3.96E-05
Hydraulic conductivity		m/d	3.42E+00

BH07 – Slug Test (Second Test)



5.57 m below datum (mbd) Rest water level:

Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	4.9449	0.6251	1
155	5.4948	0.0752	0.1203
620	5.5255	0.0445	0.0711
1060	5.532	0.038	0.0607
1600	5.5371	0.0329	0.0526
Hydraulic conductivity	К	m/s m/d	9.24E-07 7.98E-02

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INPUT		
Construction:		
Casing dia. (d <sub>c</sub> )	0.15	Meter
Annulus dia. (d <sub>w</sub> )	0.15	Meter
Screen Length (L)	31	Meter
Depths to:		
water level (DTW)	8.52	Meter
Top of Aquifer	0	Meter
Base of Aquifer	37	Meter
Annular Fill:		
across screen	Open Hole	
above screen	Open Hole	
Aquifer Material	Shale	

Local ID: Deerpark
Date: ########
Time: 00:00

**COMPUTED** 

Aquifer thickness = 28 Meter

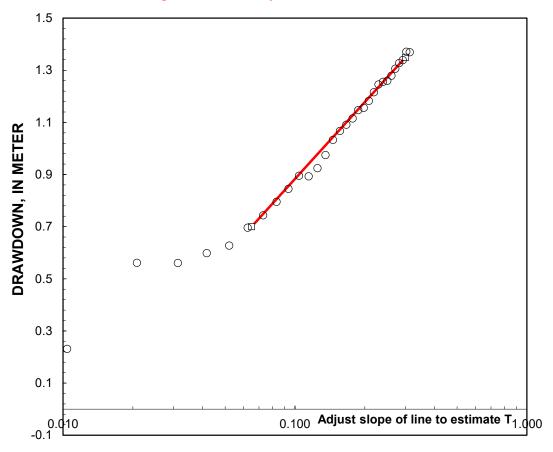
Slope = 0.29828 Meter/log10

Input is consistent.

K = 0.28 Meter/Day T = 8.1 Meter²/Day

FLOW RATE 30 liters/min

K= 0.28 is greater than likely maximum of 0.0000305 for Shale



TIME, Hour:Minute:Second

REMARKS: Cooper-Jacob analysis of single-well aquifer test

	Reduced Data	
	Time,	Water Level
Entry	Date Hr:Min:Sec	Meter
1	1/0/00 0:00:00	16.95
2	1/0/00 0:15:00	16.71
3	1/0/00 0:30:00	16.38
4	1/0/00 0:45:00	16.38
5	1/0/00 1:00:00	16.35
6	1/0/00 1:15:00	16.32
7	1/0/00 1:30:00	16.25
8	1/0/00 1:45:00	16.20
9	1/0/00 2:00:00	16.15
10	1/0/00 2:15:00	16.10
11	1/0/00 2:30:00	16.05
12	1/0/00 2:45:00	16.05
13	1/0/00 3:00:00	16.02
14	1/0/00 3:15:00	15.97
15	1/0/00 3:30:00	15.91
16	1/0/00 3:45:00	15.88
17	1/0/00 4:00:00	15.85
18	1/0/00 4:15:00	15.83
19	1/0/00 4:30:00	15.80
20	1/0/00 4:45:00	15.79
21	1/0/00 5:00:00	15.76
22	1/0/00 5:15:00	15.73
23	1/0/00 5:30:00	15.70
24	1/0/00 5:45:00	15.69
25	1/0/00 6:00:00	15.69
26	1/0/00 6:15:00	15.67
27	1/0/00 6:30:00	15.64
28	1/0/00 6:45:00	15.62
29	1/0/00 7:00:00	15.61
30	1/0/00 7:15:00	15.57

RECEINED. 20107 ROSS

INPUT						
Construction:						
Casing dia. (d <sub>c</sub> )	0.15	Meter				
Annulus dia. (d <sub>w</sub> )	0.15	Meter				
Screen Length (L)	49	Meter				
Depths to:						
water level (DTW)	5.3	Meter				
Top of Aquifer	0	Meter				
Base of Aquifer	49	Meter				
Annular Fill:						
across screen	Open Hole					
above screen Open Hole						
Aguifer Material	Shale					

FLOW RATE

Local ID: Deerpark
Date: ########
Time: 00:00

## **COMPUTED**

Aquifer thickness = 44 Meter

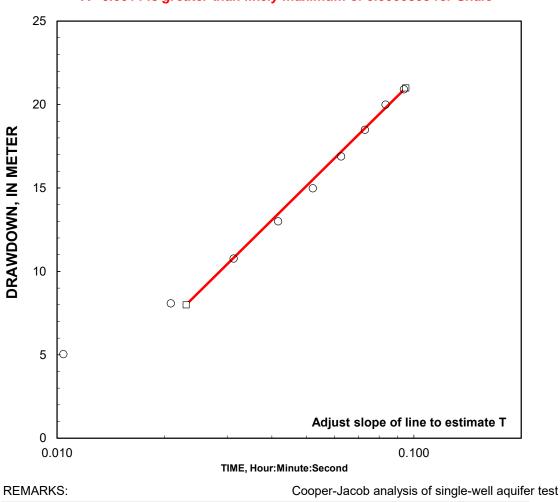
Slope = 6.432512 Meter/log10

Input is consistent.

K = 0.0014 Meter/Day T = 0.063 Meter<sup>2</sup>/Day

K= 0.0014 is greater than likely maximum of 0.0000305 for Shale

5 liters/min



REMARKS: Cooper-Jacob analysis of single-well aquif

	Reduced Data	
	Time,	Water Level
Entry	Date Hr:Min:Sec	Meter
1	1/0/00 0:00:00	21.41
2	1/0/00 0:15:00	16.36
3	1/0/00 0:30:00	13.32
4	1/0/00 0:45:00	10.63
5	1/0/00 1:00:00	8.40
6	1/0/00 1:15:00	6.43
7	1/0/00 1:30:00	4.51
8	1/0/00 1:45:00	2.92
9	1/0/00 2:00:00	1.41



## **INPUT**

Construction:					
Casing dia. (d <sub>c</sub> )	0.15	Meter			
Annulus dia. (d <sub>w</sub> )	0.15	Meter			
Screen Length (L)	10.66	Meter			
Depths to:					
water level (DTW)	3.38	Meter			
Top of Aquifer	0	Meter			
Base of Aquifer	10.66	Meter			
Annular Fill:					
across screen Open Hole					
above screen Open Hole					
Aquifer Material Shale					

Local ID: Deerpark

Date: ######## Time: 00:00

## **COMPUTED**

Aquifer thickness = 7.3 Meter

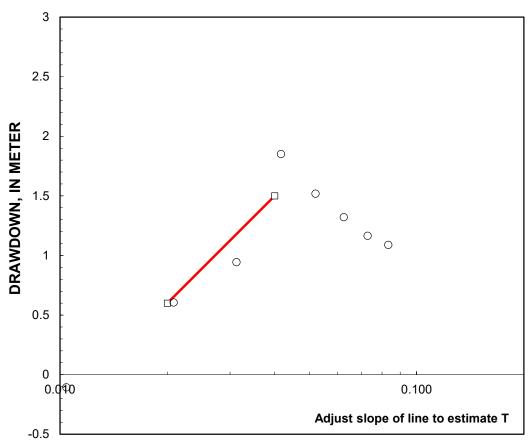
Slope = 0.911271 Meter/log10

#### Input is consistent.

K =	0.036 Meter/Day
T =	0.27 Meter <sup>2</sup> /Day

FLOW RATE 3 liters/min

K= 0.036 is greater than likely maximum of 0.0000305 for Shale



#### TIME, Hour:Minute:Second

#### **REMARKS:**

Cooper-Jacob analysis of single-well aquifer test

Can not be analysed as it will give negative slope

Reduced Data				
	Time,	Water Level		
Entry	Date Hr:Min:Sec	Meter		
1	1/0/00 0:00:00	3.04		
2	1/0/00 0:15:00	3.14		
3	1/0/00 0:30:00	2.43		
4	1/0/00 0:45:00	2.09		
5	1/0/00 1:00:00	1.18		
6	1/0/00 1:15:00	1.52		
7	1/0/00 1:30:00	1.71		
8	1/0/00 1:45:00	1.87		



#### **INPUT** Casing dia. (d<sub>c</sub>) 0.15 Meter Annulus dia. (dw) 0.15 Meter Screen Length (L) 37 Meter 3.92 Meter water level (DTW) 0 Meter

37 Meter

Top of Aquifer Base of Aquifer

Annular Fill:

Depths to:

Construction:

across screen -- Open Hole above screen -- Open Hole Aquifer Material -- Shale

FLOW RATE 25 liters/min Local ID: Deerpark

Date: ######## Time: 00:00

## COMPUTED

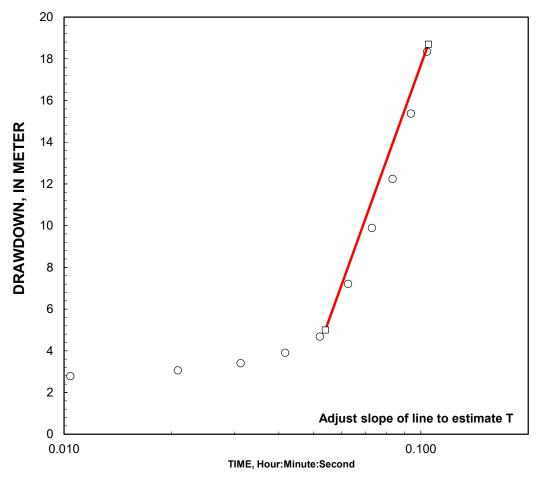
Aquifer thickness = 33 Meter

14.45923 Meter/log10

Input is consistent.

K = 0.0042 Meter/Day T = 0.14 Meter<sup>2</sup>/Day

K= 0.0042 is greater than likely maximum of 0.0000305 for Shale



#### **REMARKS:**

Cooper-Jacob analysis of single-well aquifer test

We measured 30l/mi for 3 times. 18l/min one time ad 8l/mi the last time - used 25l/mi as the average for this test

Reduced Data				
	Time,	Water Level		
Entry	Date Hr:Min:Sec	Meter		
1	1/0/00 0:00:00	21.07		
2	1/0/00 0:15:00	18.29		
3	1/0/00 0:30:00	18.01		
4	1/0/00 0:45:00	17.67		
5	1/0/00 1:00:00	17.17		
6	1/0/00 1:15:00	16.39		
7	1/0/00 1:30:00	13.86		
8	1/0/00 1:45:00	11.18		
9	1/0/00 2:00:00	8.83		
10	1/0/00 2:15:00	5.70		

PRICEINED: 20/07/2025

	INPUT		
Construction:			
Casing dia. (d <sub>c</sub> )	0.15 Meter		
Annulus dia. (d <sub>w</sub> )	0.15 Meter		
Screen Length (L)	31 Meter		
Depths to:			
water level (DTW)	5 Meter		
Top of Aquifer	5 Meter		
Base of Aquifer	37 Meter		
Annular Fill:			
across screen	Open Hole		
above screen Open Hole			
Aquifer Material	Shale		

Local ID: Deerpark
Date: ########
Time: 00:00

## **COMPUTED**

Aquifer thickness = 32 Meter

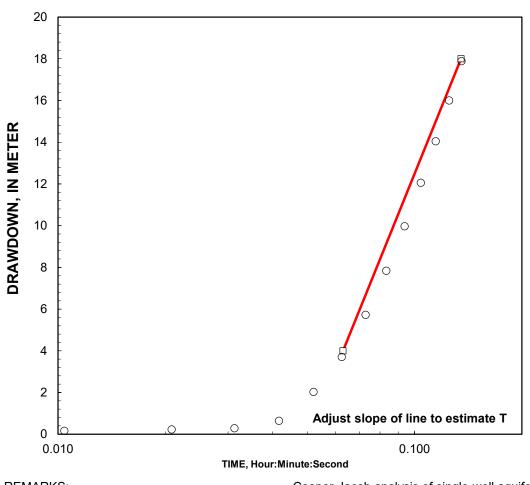
Slope = 12.89211 Meter/log10

#### Input is consistent.

K =	0.002 Meter/Day
T =	0.062 Meter <sup>2</sup> /Day

FLOW RATE 10 liters/min

K= 0.002 is greater than likely maximum of 0.0000305 for Shale



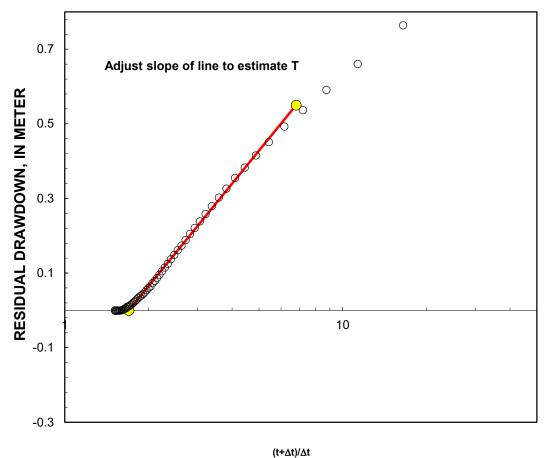
REMARKS: Cooper-Jacob analysis of single-well aquifer test

	Reduced Data	
	Time,	Water Level
Entry	Date Hr:Min:Sec	Meter
1	1/0/00 0:00:00	20.22
2	1/0/00 0:15:00	20.05
3	1/0/00 0:30:00	19.99
4	1/0/00 0:45:00	19.93
5	1/0/00 1:00:00	19.58
6	1/0/00 1:15:00	18.19
7	1/0/00 1:30:00	16.51
8	1/0/00 1:45:00	14.49
9	1/0/00 2:00:00	12.38
10	1/0/00 2:15:00	10.25
11	1/0/00 2:30:00	8.17
12	1/0/00 2:45:00	6.17
13	1/0/00 3:00:00	4.22

PRICHNED: 20 OT 2025

# PECENED. 201012025

WELL ID: BH02 Local ID: Deerpark **INPUT** Date: ####### Construction: Time: 00:00 Casing dia. (d<sub>c</sub>) 0.15 Meter Annulus dia. (dw) **COMPUTED** 0.15 Meter Screen Length (L) 31 Meter Depths to: Aquifer thickness = 28 Meter water level (DTW) 8.52 Meter Top of Aquifer 0 Meter 0.278444 Meter/log10 Base of Aquifer 37 Meter Input is consistent. Annular Fill: across screen -- Open Hole above screen -- Open Hole K = 0.3 Meter/Day Aquifer Material -- Fractured Igneous and T = 8.7 Meter<sup>2</sup>/Day FLOW RATE 30 liters/min

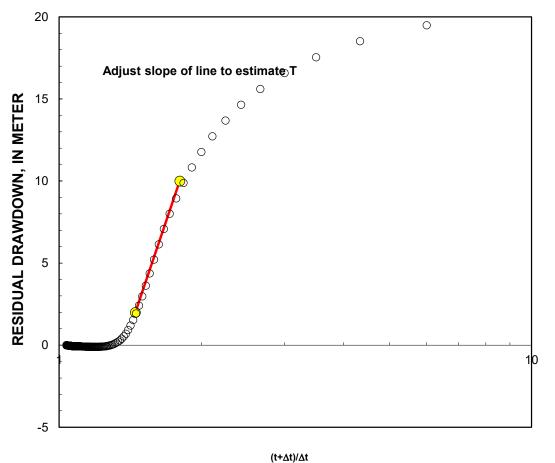


REMARKS: Cooper-Jacob recovery analysis of single-well aquifer test

	5			•	P	
	Reduced Data	\\/_ <del>+</del>		T:	)	
	Time,	Water Level		Time,	Water Level	
Entry	Date Hr:Min:Sec	Meter	Entry	Date Hr:Min:Sec	Meter	
1	1/0/00 0:00:00	17.18	51	1/0/00 20:00:00	17.18	)
2	1/0/00 7:45:00	15.80	52	1/0/00 20:15:00	17.18	0-
3	1/0/00 8:00:00	16.24	53	1/0/00 20:30:00	17.18	1/3
4	1/0/00 8:15:00	16.42	54	1/0/00 20:45:00	17.18	100
5	1/0/00 8:30:00	16.52	55	1/0/00 21:00:00	17.18	131
6	1/0/00 8:45:00	16.59	56	1/0/00 21:15:00	17.18	
7	1/0/00 9:00:00	16.65	57	1/0/00 21:30:00	17.18	
8	1/0/00 9:15:00	16.69	58	1/0/00 21:45:00	17.18	
9	1/0/00 9:30:00	16.73	59	1/0/00 22:00:00	17.18	
10	1/0/00 9:45:00	16.77	60	1/0/00 22:15:00	17.18	
11	1/0/00 10:00:00	16.80	61	1/0/00 22:30:00	17.18	
12	1/0/00 10:15:00	16.83				
13	1/0/00 10:30:00	16.86				
14	1/0/00 10:45:00	16.88				
15	1/0/00 11:00:00	16.90				
16	1/0/00 11:15:00	16.92				
17	1/0/00 11:30:00	16.94				
18	1/0/00 11:45:00	16.96				
19	1/0/00 12:00:00	16.98				
20	1/0/00 12:15:00	16.99				
21	1/0/00 12:30:00	17.01				
22	1/0/00 12:45:00	17.02				
23	1/0/00 13:00:00	17.03				
24	1/0/00 13:15:00	17.05				
25	1/0/00 13:30:00	17.06				
26	1/0/00 13:45:00	17.07				
27	1/0/00 14:00:00	17.08				
28	1/0/00 14:15:00	17.09				
29	1/0/00 14:30:00	17.10				
30	1/0/00 14:45:00	17.10				
31	1/0/00 15:00:00	17.11				
32	1/0/00 15:15:00	17.12				
33	1/0/00 15:30:00	17.12				
34 35	1/0/00 15:45:00	17.13				
	1/0/00 16:00:00 1/0/00 16:15:00	17.13 17.14				
36 37		17.14 17.14				
3 <i>1</i> 38	1/0/00 16:30:00 1/0/00 16:45:00	17.14 17.15				
38 39		17.15 17.15				
39 40	1/0/00 17:00:00	17.15 17.15				
41	1/0/00 17:15:00 1/0/00 17:30:00	17.15 17.16				
42	1/0/00 17:30:00	17.16				
42 43	1/0/00 17:45:00	17.16				
43 44	1/0/00 18:00:00	17.16				
44 45	1/0/00 18:15:00	17.17 17.17				
45 46	1/0/00 18:45:00	17.17 17.17				
40 47	1/0/00 18:45:00	17.17				
48	1/0/00 19:00:00	17.17				
49	1/0/00 19:15:00	17.17				
<del>49</del> 50	1/0/00 19:30:00	17.18				
50	1/0/00 13.43.00	17.10				

#### WELL ID: BH04 Local ID: Deerpark **INPUT** Date: ####### Construction: Time: 00:00 Casing dia. (d<sub>c</sub>) 0.15 Meter Annulus dia. (dw) **COMPUTED** 0.15 Meter Screen Length (L) 49 Meter Depths to: Aquifer thickness = 44 Meter water level (DTW) 5.3 Meter Top of Aquifer 0 Meter 25.96681 Meter/log10 Base of Aquifer 49 Meter Input is consistent. Annular Fill: across screen -- Open Hole above screen -- Open Hole 0.00035 Meter/Day Aquifer Material -- Shale T = 0.016 Meter<sup>2</sup>/Day FLOW RATE 5 liters/min

K= 0.00035 is greater than likely maximum of 0.0000305 for Shale



REMARKS: Cooper-Jacob recovery analysis of single-well aquifer test

	Reduced Data				· C
	Time,	Water Level		Time,	Water Level
Entry	Date Hr:Min:Sec	Meter	Entry	Date Hr:Min:Sec	Meter
1	1/0/00 0:00:00	22.94	51	1/1/00 3:15:00	23.01
2	1/0/00 2:45:00	2.47	52	1/1/00 3:45:00	23.01
3	1/0/00 3:15:00	4.42	53	1/1/00 4:15:00	23.01
4	1/0/00 3:45:00	6.37	54	1/1/00 4:45:00	23.01
5	1/0/00 4:15:00	8.29	55	1/1/00 5:15:00	23.01
6	1/0/00 4:45:00	10.21	56	1/1/00 5:45:00	23.01
7	1/0/00 5:15:00	12.12	57	1/1/00 6:15:00	23.00
8	1/0/00 5:45:00	14.00	58	1/1/00 6:45:00	23.00
9	1/0/00 6:15:00	15.86	59	1/1/00 7:15:00	23.00
10	1/0/00 6:45:00	17.73	60	1/1/00 7:45:00	23.00
11	1/0/00 7:15:00	19.31	61	1/1/00 8:15:00	23.00
12	1/0/00 7:45:00	20.52	62	1/1/00 8:45:00	23.00
13	1/0/00 8:15:00	21.41	63	1/1/00 9:15:00	23.00
14	1/0/00 8:45:00	22.02	64	1/1/00 9:45:00	23.00
15	1/0/00 9:15:00	22.41	65	1/1/00 10:15:00	23.00
16	1/0/00 9:45:00	22.64	66	1/1/00 10:45:00	23.00
17	1/0/00 10:15:00	22.79	67	1/1/00 11:15:00	23.00
18	1/0/00 10:45:00	22.88	68	1/1/00 11:45:00	23.00
19	1/0/00 11:15:00	22.94	69	1/1/00 12:15:00	23.00
20	1/0/00 11:45:00	22.98	70	1/1/00 12:45:00	23.00
21	1/0/00 12:15:00	23.00	71	1/1/00 13:15:00	22.99
22	1/0/00 12:45:00	23.02	72	1/1/00 13:45:00	22.99
23	1/0/00 13:15:00	23.03	73	1/1/00 14:15:00	22.99
24	1/0/00 13:45:00	23.03	74	1/1/00 14:45:00	22.99
25	1/0/00 14:15:00	23.04	75	1/1/00 15:15:00	22.99
26	1/0/00 14:45:00	23.04	76	1/1/00 15:45:00	22.99
27	1/0/00 15:15:00	23.04	77	1/1/00 16:15:00	22.99
28	1/0/00 15:45:00	23.04	78	1/1/00 16:45:00	22.99
29	1/0/00 16:15:00	23.04	79	1/1/00 17:15:00	22.99
30	1/0/00 16:45:00	23.04	80	1/1/00 17:45:00	22.99
31	1/0/00 17:15:00	23.04	81	1/1/00 18:15:00	22.99
32	1/0/00 17:45:00	23.04	82	1/1/00 18:45:00	22.99
33	1/0/00 18:15:00	23.04	83	1/1/00 19:15:00	22.99
34	1/0/00 18:45:00	23.03	84	1/1/00 19:45:00	22.99
35	1/0/00 19:15:00	23.03	85	1/1/00 20:15:00	22.98
36	1/0/00 19:45:00	23.03	86	1/1/00 20:45:00	22.98
37	1/0/00 20:15:00	23.03	87	1/1/00 21:15:00	22.98
38	1/0/00 20:45:00	23.03	88	1/1/00 21:45:00	22.98
39	1/0/00 21:15:00	23.02	89	1/1/00 22:15:00	22.98
40	1/0/00 21:45:00	23.02	90	1/1/00 22:45:00	22.98
41	1/0/00 22:15:00	23.02	91	1/1/00 23:15:00	22.98
42	1/0/00 22:45:00	23.02	92	1/1/00 23:45:00	22.98
43	1/0/00 23:15:00	23.02	93	1/2/00 0:15:00	22.98
44	1/0/00 23:45:00	23.02	94	1/2/00 0:45:00	22.97
45 46	1/1/00 0:15:00	23.02	95 06	1/2/00 1:15:00	22.97
46 47	1/1/00 0:45:00	23.01	96 07	1/2/00 1:45:00	22.97
47 40	1/1/00 1:15:00	23.01	97	1/2/00 2:15:00	22.97
48	1/1/00 1:45:00	23.01	98	1/2/00 2:45:00	22.97
49 50	1/1/00 2:15:00	23.01 23.01	99 100	1/2/00 3:15:00	22.97
50	1/1/00 2:45:00	23.01	100	1/2/00 3:45:00	22.97

	INPUT				
Construction:					
Casing dia. (d <sub>c</sub> )	0.15	Meter			
Annulus dia. (d <sub>w</sub> )	0.15	Meter			
Screen Length (L)	10.66	Meter			
Depths to:					
water level (DTW)	3.38	Meter			
Top of Aquifer	0	Meter			
Base of Aquifer	10.66	Meter			
Annular Fill:					
across screen	Open Hole	!			
above screen	Open Hole				
Aquifer Material	Fractured I	gneous and			
ELOW/ DATE	2.75	litore/min			

Local ID: Deerpark
Date: ########
Time: 00:00

COMPUTED

Aquifer thickness = 7.3 Meter

Slope = 0.015319 Meter/log10

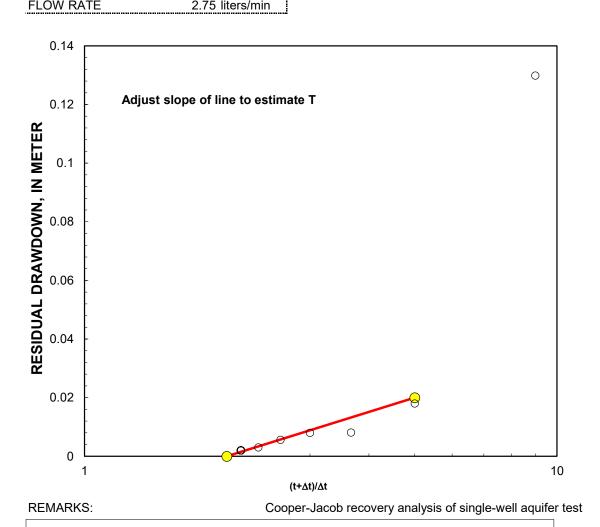
Input is consistent.

2 Meter/Day

14 Meter<sup>2</sup>/Day

K =

T =



Reduced Data					
	Time,	Water Level			
Entry	Date Hr:Min:Sec	Meter			
1	1/0/00 0:00:00	3.43			
2	1/0/00 2:00:00	2.65			
3	1/0/00 2:15:00	3.30			
4	1/0/00 2:30:00	3.41			
5	1/0/00 2:45:00	3.42			
6	1/0/00 3:00:00	3.42			
7	1/0/00 3:15:00	3.42			

1/0/00 3:30:00

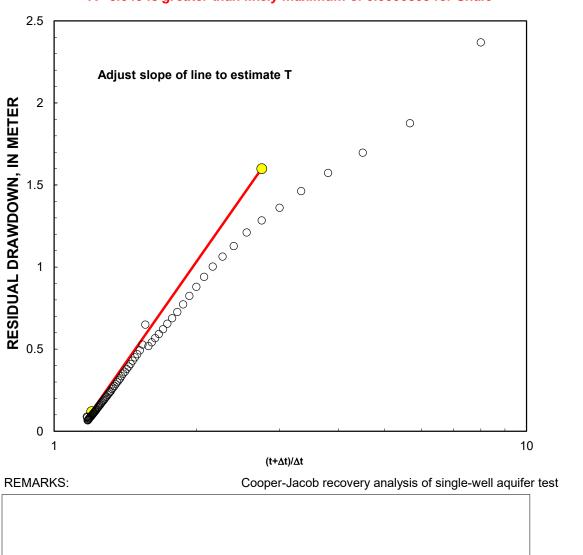
3.43

8



WELL ID: BH06 Local ID: Deerpark **INPUT** Date: ######## Construction: Time: 00:00 Casing dia. (d<sub>c</sub>) 0.15 Meter **COMPUTED** Annulus dia. (dw) 0.15 Meter Screen Length (L) 37 Meter Depths to: Aquifer thickness = 33 Meter 3.92 Meter water level (DTW) Top of Aquifer 0 Meter Slope = 1.25254 Meter/log10 Base of Aquifer 37 Meter Input is consistent. Annular Fill: across screen -- Open Hole above screen -- Open Hole K = 0.049 Meter/Day Aquifer Material -- Shale T = 1.6 Meter<sup>2</sup>/Day FLOW RATE 25 liters/min

K= 0.049 is greater than likely maximum of 0.0000305 for Shale



	Reduced Data				'KCA
	Time,	Water Level		Time,	Water Level
Entry	Date Hr:Min:Sec	Meter	Entry	Date Hr:Min:Sec	Meter
1	1/0/00 0:00:00	21.07	51	1/0/00 15:45:00	20.87
2	1/0/00 3:30:00	11.01	52	1/0/00 16:00:00	20.88
3	1/0/00 3:45:00	17.27	53	1/0/00 16:15:00	20.88
					7
4	1/0/00 4:00:00	18.71	54	1/0/00 16:30:00	20.89
5	1/0/00 4:15:00	19.20	55	1/0/00 16:45:00	20.90
6	1/0/00 4:30:00	19.38	56 57	1/0/00 17:00:00	20.90
7	1/0/00 4:45:00	19.50	57	1/0/00 17:15:00	20.91
8	1/0/00 5:00:00	19.61	58	1/0/00 17:30:00	20.91
9	1/0/00 5:15:00	19.71	59	1/0/00 17:45:00	20.92
10	1/0/00 5:30:00	19.79	60	1/0/00 18:00:00	20.93
11	1/0/00 5:45:00	19.86	61	1/0/00 18:15:00	20.93
12	1/0/00 6:00:00	19.95	62	1/0/00 18:30:00	20.94
13	1/0/00 6:15:00	20.01	63	1/0/00 18:45:00	20.94
14	1/0/00 6:30:00	20.07	64	1/0/00 19:00:00	20.95
15	1/0/00 6:45:00	20.13	65	1/0/00 19:15:00	20.95
16	1/0/00 7:00:00	20.19	66	1/0/00 19:30:00	20.96
17	1/0/00 7:15:00	20.25	67	1/0/00 19:45:00	20.96
18	1/0/00 7:30:00	20.30	68	1/0/00 20:00:00	20.96
19	1/0/00 7:45:00	20.35	69	1/0/00 20:15:00	20.97
20	1/0/00 8:00:00	20.39	70	1/0/00 20:30:00	20.97
21	1/0/00 8:15:00	20.42	71	1/0/00 20:45:00	20.98
22	1/0/00 8:30:00	20.45	72	1/0/00 21:00:00	20.98
23	1/0/00 8:45:00	20.48	73	1/0/00 21:15:00	20.98
24	1/0/00 9:00:00	20.51	74	1/0/00 21:30:00	20.99
25	1/0/00 9:15:00	20.53	75	1/0/00 21:45:00	20.99
26	1/0/00 9:30:00	20.56	76	1/0/00 22:00:00	20.99
27	1/0/00 9:45:00	20.42	77	1/0/00 22:15:00	21.00
28	1/0/00 10:00:00	20.55	78	1/0/00 22:30:00	21.00
29	1/0/00 10:15:00	20.58	79	1/0/00 22:45:00	21.00
30	1/0/00 10:30:00	20.61	80	1/0/00 23:00:00	21.01
31	1/0/00 10:45:00	20.62	81	1/0/00 23:15:00	21.01
32	1/0/00 11:00:00	20.64	82	1/0/00 23:30:00	20.99
33	1/0/00 11:15:00	20.66			
34	1/0/00 11:30:00	20.68			
35	1/0/00 11:45:00	20.70			
36	1/0/00 12:00:00	20.71			
37	1/0/00 12:15:00	20.72			
38 39	1/0/00 12:30:00	20.74			
39 40	1/0/00 12:45:00 1/0/00 13:00:00	20.75 20.77			
41	1/0/00 13:00:00	20.77			
42	1/0/00 13:15:00	20.78			
43	1/0/00 13:30:00	20.79			
43 44	1/0/00 13:45:00	20.81			
4 <del>4</del> 45	1/0/00 14:05:00	20.82			
46	1/0/00 14:15:00	20.83			
47	1/0/00 14:35:00	20.84			
48	1/0/00 14:43:00	20.85			
49	1/0/00 15:00:00	20.85			
<del>5</del> 0	1/0/00 15:10:00	20.86			
00	170700 10.00.00	20.00			

WELL ID: BH07 Local ID: Deerpark **INPUT** Date: ####### Construction: Time: 00:00 Casing dia. (d<sub>c</sub>) 0.15 Meter Annulus dia. (dw) **COMPUTED** 0.15 Meter Screen Length (L) 31 Meter Depths to: Aquifer thickness = 32 Meter water level (DTW) 5 Meter Top of Aquifer 5 Meter 0.197823 Meter/log10 Base of Aquifer 37 Meter Input is consistent. Annular Fill: across screen -- Open Hole above screen -- Open Hole K = 0.13 Meter/Day Aquifer Material -- Shale T = 4.1 Meter<sup>2</sup>/Day FLOW RATE 10 liters/min K= 0.13 is greater than likely maximum of 0.0000305 for Shale 1 Adjust slope of line to estimate T 8.0 RESIDUAL DRAWDOWN, IN METER 0.6 0 0.4 0.2 0 10 100 -0.2 (t+∆t)/∆t REMARKS: Cooper-Jacob recovery analysis of single-well aquifer test

Water Level Meter

20.44

20.44

20.44

20.45

20.45 20.45

20.45

20.45

20.45 20.45

20.45

20.45

20.45 20.45

20.45

20.44

Entr.	Reduced Data Time, Date Hr:Min:Sec	Water Level	Entr	Time, Date Hr:Min:Sec
Entry 1	1/0/00 0:00:00	Meter 20.44	Entry 51	1/0/00 15:45:00
2	1/0/00 3:30:00	5.54	52	1/0/00 15:45:00
3	1/0/00 3:35:00	14.16	53	1/0/00 16:00:00
4 5	1/0/00 4:00:00 1/0/00 4:15:00	19.84 20.07	54 55	1/0/00 16:30:00 1/0/00 16:45:00
6	1/0/00 4:10:00	20.12	56	1/0/00 17:00:00
7	1/0/00 4:45:00	20.15	57	1/0/00 17:15:00
8	1/0/00 5:00:00	20.19	58	1/0/00 17:30:00
9	1/0/00 5:15:00	20.21	59	1/0/00 17:45:00
10	1/0/00 5:30:00	20.23	60	1/0/00 18:00:00
11	1/0/00 5:45:00	20.25	61	1/0/00 18:15:00
12	1/0/00 6:00:00	20.28	62	1/0/00 18:30:00
13	1/0/00 6:15:00	20.29	63	1/0/00 18:45:00
14 15	1/0/00 6:30:00 1/0/00 6:45:00	20.31 20.32	64 65	1/0/00 19:00:00 1/0/00 19:15:00
16	1/0/00 7:00:00	20.32	66	1/0/00 19:13:00
17	1/0/00 7:15:00	20.34	00	170700 10.00.00
18	1/0/00 7:30:00	20.35		
19	1/0/00 7:45:00	20.36		
20	1/0/00 8:00:00	20.36		
21	1/0/00 8:15:00	20.37		
22 23	1/0/00 8:30:00 1/0/00 8:45:00	20.37 20.37		
23 24	1/0/00 9:00:00	20.38		
25	1/0/00 9:15:00	20.38		
26	1/0/00 9:30:00	20.38		
27	1/0/00 9:45:00	20.38		
28	1/0/00 10:00:00	20.39		
29 30	1/0/00 10:15:00 1/0/00 10:30:00	20.39 20.39		
31	1/0/00 10:30:00	20.39		
32	1/0/00 11:00:00	20.39		
33	1/0/00 11:15:00	20.39		
34	1/0/00 11:30:00	20.39		
35	1/0/00 11:45:00	20.39		
36 37	1/0/00 12:00:00 1/0/00 12:15:00	20.39 20.40		
38	1/0/00 12:13:00	20.40		
39	1/0/00 12:45:00	20.40		
40	1/0/00 13:00:00	20.40		
41	1/0/00 13:15:00	20.40		
42	1/0/00 13:30:00	20.40		
43	1/0/00 13:45:00	20.41		
44 45	1/0/00 14:00:00 1/0/00 14:15:00	20.41 20.41		
45 46	1/0/00 14:15:00	20.42		
47	1/0/00 14:45:00	20.42		
48	1/0/00 15:00:00	20.43		
49	1/0/00 15:15:00	20.43		
50	1/0/00 15:30:00	20.44		

20.44

50

1/0/00 15:30:00

PRCENED. 29/07/2025

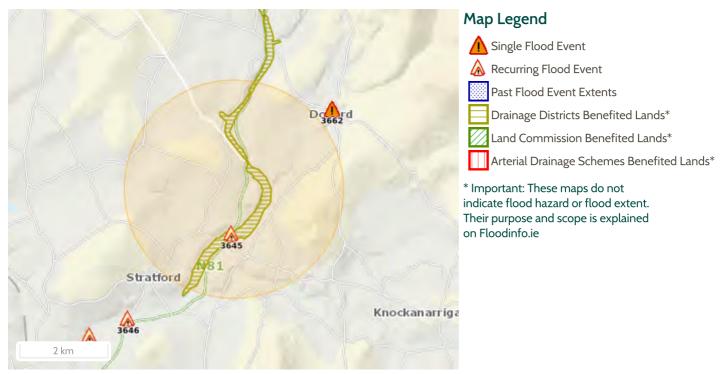
# Past Flood Event Local Area Summary Report



Report Produced: 30/4/2024 16:04

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.

This report has been downloaded from www.floodinfo.ie (the "Website"). The users should take account of the restrictions and limitations relating to the content and use of the Website that are explained in the Terms and Conditions. It is a condition of use of the Website that you agree to be bound by the disclaimer and other terms and conditions set out on the Website and to the privacy policy on the Website.



1 Results

Name (Flood_ID)	Start Date	<b>Event Location</b>		
1. 🛕 Little Slaney Whitestown Recurring (ID-3645)	n/a	Approximate Point		
Additional Information: Reports (2) Press Archive (0)				

PECENED. 201012025



**Element Materials Technology** 

Unit 3 Deeside Point

Zone 3

Deeside Industrial Park

Deeside CH5 2UA P: +44 (0) 1244 833780

F: +44 (0) 1244 833781



Malone O'Regan Ground Floor - Unit 3 Bracken Business Park Bracken Road Sandyford Dublin 18 Ireland D18 V4K6







Attention: Nuria Manzanas

Date: 29th January, 2024

Your reference : E2123

Our reference : Test Report 24/660 Batch 1

Deerpark Quarry Location:

Date samples received : 16th January, 2024

Status: Final Report

202401291439 Issue:

Ten samples were received for analysis on 16th January, 2024 of which ten were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon - Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 26.716 kg of CO2

Scope 1&2&3 emissions - 63.136 kg of CO2

Authorised By:

**Bruce Leslie** 

Project Manager

Please include all sections of this report if it is reproduced

Client Name: Malone O'Regan

E2123 Reference:

EMT Sample No.

Location: Deerpark Quarry Contact: Nuria Manzanas

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle H=H<sub>2</sub>SO<sub>4</sub>, Z=ZnAc, N=NaOH, HN=HNO<sub>3</sub>

Report: Liquid

24/660 EMT Job No:

9-16

17-24

25-32

33-40

1-8

49-56 57-60 61-64

											Ö. ,		
Sample ID	BH01	BH02	BH03	BH04	BH05	BH06	BH07	SW01 LAND DRAIN UPSTREAM	SW02 DOWNSTREA M	SW03 LAND DRAIN DOWNSTREA M	79	07	
Depth											Di	e attached n	-4 <b>f</b> !!
COC No / misc												ations and a	
Containers	VHHNNPG	H HN P BOD	H HN P BOD	H HN P BOD									
Sample Date	15/01/2024	08/01/2024	10/01/2024	09/01/2024	11/01/2024	09/01/2024	10/01/2024	15/01/2024	15/01/2024	15/01/2024			
Sample Type	Ground Water	Surface Water	Surface Water	Surface Water									
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	l locito	Method
Date of Receipt	16/01/2024	16/01/2024	16/01/2024	16/01/2024	16/01/2024	16/01/2024	16/01/2024	16/01/2024	16/01/2024	16/01/2024	LOD/LOR	Units	No.
Dissolved Aluminium#	<20	<20	<20	108	<20	<20	<20	-	-	-	<20	ug/l	TM30/PM14
Dissolved Arsenic#	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	3.0	4.6	<2.5	<2.5	ug/l	TM30/PM14
Dissolved Barium <sup>#</sup>	114	39	31	19	47	58	45	-	-	-	<3	ug/l	TM30/PM14
Dissolved Boron	12	<12	<12	<12	<12	<12	<12	-	-	-	<12	ug/l	TM30/PM14
Dissolved Cadmium#	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM30/PM14
Dissolved Calcium <sup>#</sup>	44.1	10.5	14.9	21.5	12.0	13.3	12.8	-	-	-	<0.2	mg/l	TM30/PM14
Total Dissolved Chromium #	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	ug/l	TM30/PM14
Dissolved Copper#	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/l	TM30/PM14
Total Dissolved Iron #	47	<20	<20	166	2062	<20	<20	-	-	-	<20	ug/l	TM30/PM14
Dissolved Lead #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM30/PM14
Dissolved Magnesium#	5.3	2.8	2.8	3.4	2.4	3.0	2.8	-	-	-	<0.1	mg/l	TM30/PM14
Dissolved Manganese #	261	<2	247	31	225	5	22	-	-	-	<2	ug/l	TM30/PM14
Dissolved Mercury#	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM30/PM14
Dissolved Nickel#	2	<2	15	2	4	<2	<2	<2	<2	<2	<2	ug/l	TM30/PM14
Dissolved Potassium#	6.3	1.1	1.5	1.4	1.8	1.8	2.4	-	-	-	<0.1	mg/l	TM30/PM14
Dissolved Selenium#	<3	<3	<3	<3	<3	<3	<3	-	-	-	<3	ug/l	TM30/PM14
Dissolved Sodium#	9.6	7.8	12.5	9.5	8.2	8.1	9.6	-	-	-	<0.1	mg/l	TM30/PM14
Dissolved Uranium	<5	<5	<5	<5	<5	<5	<5	-	-	-	<5	ug/l	TM30/PM14
Dissolved Zinc #	5	9	6	13	13	6	13	<3	5	<3	<3	ug/l	TM30/PM14
Total Hardness Dissolved (as CaCO3)	133	38	49	68	40	46	44	-	-	-	<1	mg/l	TM30/PM14
MTBE#	<5	<5	<5	<5	<5	<5	<5	-	-	-	<5	ug/l	TM36/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5	-	-	-	<5	ug/l	TM36/PM12
Toluene #	<5	<5	<5	<5	<5	<5	<5	-	-	-	<5	ug/l	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5	-	-	-	<5	ug/l	TM36/PM12
m/p-Xylene#	<5	<5	<5	<5	<5	<5	<5	-	-	-	<5	ug/l	TM36/PM12
o-Xylene#	<5	<5	<5	<5	<5	<5	<5	-	-	-	<5	ug/l	TM36/PM12
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM36/PM12
>C6-C8 (HS_1D_AL)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM36/PM12
>C8-C10 (HS_1D_AL)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM36/PM12
>C10-C12 (EH_CU_1D_AL)#	<5	<5	<5	<5	<5	<5	<5	-	-	-	<5	ug/l	TM5/PM16/PM30
>C12-C16 (EH_CU_1D_AL)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM5/PM16/PM30
>C16-C21 (EH_CU_1D_AL)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM5/PM16/PM30
>C21-C35 (EH_CU_1D_AL)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM5/PM16/PM30
>C35-C44 (EH_CU_1D_AL)	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-44 (EH_CU+HS_1D_AL)	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM5/TM36/PM12/PM16/PM30

Client Name: Malone O'Regan

Reference: E2123

Location:Deerpark QuarryContact:Nuria Manzanas

**EMT Job No:** 24/660

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle

H=H<sub>2</sub>SO<sub>4</sub>, Z=ZnAc, N=NaOH, HN=HNO<sub>3</sub>

EWI JOB NO.	2.7000						24,	,	114011, 1111					
EMT Sample No.	1-8	9-16	17-24	25-32	33-40	41-48	49-56	57-60	61-64	65-68	(S).			
Sample ID	BH01	BH02	BH03	BH04	BH05	BH06	ВН07	SW01 LAND DRAIN UPSTREAM	SW02 DOWNSTREA M	SW03 LAND DRAIN DOWNSTREA M	.50	207		
Depth											Please se	e attached n	otes for all	
COC No / misc												ations and a		
Containers	V H HN N P G	V H HN N P G	VHHNNPG	VHHNNPG	V H HN N P G	V H HN N P G	VHHNNPG	H HN P BOD	H HN P BOD	H HN P BOD				
Sample Date					11/01/2024									
-														
Sample Type	Ground Water	Surface Water	Surface Water	Surface Water		1								
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method	
Date of Receipt	16/01/2024	16/01/2024	16/01/2024	16/01/2024	16/01/2024	16/01/2024	16/01/2024	16/01/2024	16/01/2024	16/01/2024	LODILOIT	Onno	No.	
TPH CWG														
Aromatics														
>C5-EC7 (HS_1D_AR)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM36/PM12	
>EC7-EC8 (HS_1D_AR)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM36/PM12	
>EC8-EC10 (HS_1D_AR)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM36/PM12	
>EC10-EC12 (EH_CU_1D_AR)#	<5	<5	<5	<5	<5	<5	<5	-	-	-	<5	ug/l	TM5/PM16/PM30	
>EC12-EC16 (EH_CU_1D_AR)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM5/PM16/PM30	
>EC16-EC21 (EH_CU_1D_AR)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM5/PM16/PM30	
>EC21-EC35 (EH_CU_1D_AR)#	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM5/PM16/PM30	
>EC35-EC44 (EH_CU_1D_AR)	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM5/PM16/PM30	
Total aromatics C5-44 (EH_CU+HS_1D_AR)	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM5/TM96/PM12/PM16/PM30	
Total aliphatics and aromatics(C5-44) (EH_CU+HS_1D_Total)	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10	ug/l	TM5/TM36/PM12/PM16/PM30	
PCBs (Total vs Aroclor 1254)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-	<0.2	ug/l	TM17/PM30	
Fluoride	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	-	-	-	<0.3	mg/l	TM173/PM0	
Sulphate as SO4 #	8.8	6.1	5.6	6.8	4.4	3.6	5.4	17.4 <sub>AA</sub>	18.8 <sub>AA</sub>	19.1 <sub>AA</sub>	<0.5	mg/l	TM38/PM0	
Chloride #	11.2	13.2	20.1	17.5	7.5	10.7	13.6	10.3	11.6	14.0	<0.3	mg/l	TM38/PM0	
Nitrate as NO3 #	33.7	16.3	11.2	10.1	4.1	19.5	12.5	-	-	_	<0.2	mg/l	TM38/PM0	
Nitrite as NO2#	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	<0.02	mg/l	TM38/PM0	
Ortho Phosphate as PO4#	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	-	-	-	<0.06	mg/l	TM38/PM0	
Ortho Phosphate as P #	-	-	-	-	-	-	-	<0.03	<0.03	<0.03	<0.03	mg/l	TM38/PM0	
Total Cyanide <sup>#</sup>	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	<0.01	mg/l	TM89/PM0	
Ammoniocal Nitrogon on NI#	<0.03	<0.03	0.12	0.07	0.05	<0.03	<0.03				<0.03	ma/l	TM38/PM0	
Ammoniacal Nitrogen as N <sup>#</sup> Ammoniacal Nitrogen as NH3 <sup>#</sup>		-0.03	0.12	- 0.07	0.03	-0.03	-	<0.030	<0.030	<0.030	<0.030	mg/l mg/l	TM38/PM0	
7 tillionadar Madgell ad Milo								0.000	0.000	0.000	0.000	9.	11110071 1110	
Total Alkalinity as CaCO3#	156	40	48	74	62	48	54	-	-	-	<1	mg/l	TM75/PM0	
Carbonate Alkalinity as CaCO3	<1	<1	<1	<1	<1	<1	<1	-	-	-	<1	mg/l	TM75/PM0	
Bicarbonate Alkalinity as CaCO3 (water soluble)	156	40	48	74	62	48	54	-	-	-	<1	mg/l	TM75/PM0	
BOD (Settled)#	-	-	-	-	-	-	-	<1	<1	<1	<1	mg/l	TM58/PM0	
COD (Settled)#	-	-	-	-	-	-	-	<7	10	9	<7	mg/l	TM57/PM0	
Electrical Conductivity @25C #	347	141	177	209	135	153	151	165	299	157	<2	uS/cm	TM76/PM0	
pH#	6.97	6.19	6.43	6.63	6.63	6.41	6.51	6.69	7.69	7.72	<0.01	pH units	TM73/PM0	
Silica	8.70	10.00	6.60	9.50	10.50	12.90	10.30	-	-	-	<0.01	mg/l	TM52/PM0	
Total Organic Carbon <sup>#</sup>	<2	<2	<2	<2	<2	<2	-	-	-	-	<2	mg/l	TM60/PM0	
Total Dissolved Solids #	197	86	93	114	83	109	99	93	173	97	<35	mg/l	TM20/PM0	
Total Nitrogen	8.1	3.7	3.1	2.3	1.6	4.4	3.4	3.3	3.7	1.7	<0.5	mg/l	TM38/TM125/PM0	
Total Suspended Solids #	-	-	-	-	-	-	-	<10	<10	<10	<10	mg/l	TM37/PM0	
			<u> </u>											

Notification of Deviating Samples

Client Name: Malone O'Regan

**Reference:** E2123

Location: Deerpark Quarry
Contact: Nuria Manzanas

Contact: Nulla Malizalias							
EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason	
					No deviating sample report results for job 24/660	- Br	

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

### NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

**EMT Job No.:** 24/660

### **SOILS and ASH**

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCI (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

### **WATERS**

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

### STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

### **DEVIATING SAMPLES**

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

### **SURROGATES**

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

### **DILUTIONS**

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

### **BLANKS**

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

24/660 EMT Job No.:

### NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact . 20/07/2025 the laboratory if further details are required of the circumstances which have led to the removal of accreditation. Laboratory records are kept for a period of no less than 6 years.

### REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

### **Measurement Uncertainty**

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

### **Customer Provided Information**

Sample ID and depth is information provided by the customer.

### Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).

Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

### ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
В	Indicates analyte found in associated method blank.
DR	Dilution required.
М	ISO17025 (SANAS Ref No.T0729) accredited - South Africa Indicates analyte found in associated method blank.  Dilution required.  MCERTS accredited.  Not applicable  No Asbestos Detected.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
СО	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
ТВ	Trip Blank Sample
ОС	Outside Calibration Range
AA	x20 Dilution

### **HWOL ACRONYMS AND OPERATORS USED**

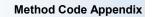
HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	Extractable Hydrocarbons - i.e. everything extracted by the solvent.  Clean-up - e.g. by florisil, silica gel.  GC - Single coil gas chromatography.  Aliphatics & Aromatics.  Aliphatics only.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.



Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MOERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			300	
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details				
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID coelutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM37	Solids (TSS) and Volatile Suspended Solids (VSS). Sample is filtered through a 1.5um pore size glass fibre filter and the resulting residue is dried and weighed at 105°C for TSS and Volatile Suspended Solids (TSS) and Volatile Suspended Solids (VSS). Sample is filtered through a 1.5um pore size glass fibre filter and the resulting residue is dried and weighed at 105°C for TSS and ESSS (SS).	PM0	No preparation is required.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes			



Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MOERTS (UK Goils Only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38/TM125	Total Nitogen/Organic Nitrogen by calculation	PM0	No preparation is required.			SOC	
TM52	Silica determination by reaction with Amino Acid F Reagent, Citric acid and Molybdate Reagent which is analysed spectrophotometrically.	PM0	No preparation is required.				
TM57	Modified US EPA Method 410.4. (Rev. 2.0 1993) Comparable with ISO 15705:2002. Chemical Oxygen Demand is determined by hot digestion with Potassium Dichromate and measured spectrophotometerically.	PM0	No preparation is required.	Yes			
TM58	APHA SMEWW 5210B:1999 22nd Edition. Comparible with ISO 5815:1989.  Measurement of Biochemical Oxygen Demand. When cBOD (Carbonaceous BOD) is requested a nitrification inhibitor is added which prevents the oxidation of reduced forms of nitrogen, such as am	PM0	No preparation is required.	Yes			
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.	Yes			
ТМ73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.				
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
TM76	Modified US EPA method 120.1 (1982). Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes			_



Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MOERTS (UK Goils Only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			2025	



Unit 3 Deeside Point

Zone 3

Deeside Industrial Park

Deeside CH5 2UA P: +44 (0) 1244 833780

F: +44 (0) 1244 833781



Malone O'Regan Ground Floor - Unit 3 Bracken Business Park Bracken Road Sandyford Dublin 18 Ireland D18 V4K6







Attention: Nuria Manzanas

Date: 29th January, 2024

Your reference : E2123

Our reference : Test Report 24/915 Batch 1

Deepark Quarry Location:

Date samples received : 19th January, 2024

Status: Final Report

202401291455 Issue:

One sample was received for analysis on 19th January, 2024 and was scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon - Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 1.738 kg of CO2

Scope 1&2&3 emissions - 4.106 kg of CO2

Authorised By:

Liza Klebe

**Project Co-ordinator** 

Please include all sections of this report if it is reproduced

Malone O'Regan Client Name:

E2123 Reference:

Location: Deepark Quarry Nuria Manzanas Contact:

**Liquids/products:** V=40ml vial, G=glass bottle, P=plastic bottle H=H<sub>2</sub>SO<sub>4</sub>, Z=ZnAc, N=NaOH, HN=HNO<sub>3</sub>

Report: Liquid

Contact: EMT Job No:	Nuria Manza 24/915	nas			Liquids/pro	oducts: V= Z=ZnAc, N=	40ml vial, G NaOH, HN=	ottle, P=plastic bottle			
EMT Sample No.	1-4							<b>%</b> .			
Sample ID	SW04 UPTREAM							Please see attached notes for a			
Depth								Please se	e attached n	otes for all	
COC No / misc								abbrevi	ations and a	cronyms	
	H HN P BOD										
Sample Date											
Sample Type											
Batch Number								LOD/LOR	Units	Method No.	
Date of Receipt								-0.5		TM00/DM444	
Dissolved Arsenic# Dissolved Cadmium#	3.2 <0.5							<2.5 <0.5	ug/l ug/l	TM30/PM14 TM30/PM14	
Total Dissolved Chromium #	<1.5							<1.5	ug/l	TM30/PM14	
Dissolved Copper#	<7							<7	ug/l	TM30/PM14	
Dissolved Lead #	<5							<5	ug/l	TM30/PM14	
Dissolved Mercury#	<1							<1	ug/l	TM30/PM14	
Dissolved Nickel #	<2							<2	ug/l	TM30/PM14	
Dissolved Zinc#	4							<3	ug/l	TM30/PM14	
Sulphate as SO4 #	8.7							<0.5	mg/l	TM38/PM0	
Chloride #	14.0							<0.3	mg/l	TM38/PM0	
Ortho Phosphate as P#	<0.03							<0.03	mg/l	TM38/PM0	
Ammoniacal Nitrogen as NH3 <sup>#</sup>	<0.030							<0.030	mg/l	TM38/PM0	
BOD (Settled)#	<1							<1	mg/l	TM58/PM0	
COD (Settled)#	<7							<7	mg/l	TM57/PM0	
Electrical Conductivity @25C#	322							<2	uS/cm	TM76/PM0	
pH#	7.23							<0.01	pH units	TM73/PM0	
Total Dissolved Solids <sup>#</sup> Total Nitrogen	174 3.8							<35 <0.5	mg/l mg/l	TM20/PM0 TM38/TM125/PM0	
Total Suspended Solids #	13							<10	mg/l	TM37/PM0	
	-							-	3		

Client Name: Malone O'Regan

Reference: E2123

Location: Deepark Quarry
Contact: Nuria Manzanas

### **Notification of Deviating Samples**

Contac	, l.	Nulla Man.	Zai ias			<u> </u>
EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
	•				No deviating sample report results for job 24/915	To.

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

### NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

**EMT Job No.:** 24/915

### **SOILS and ASH**

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It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCI (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

### **WATERS**

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

### STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

### **DEVIATING SAMPLES**

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

### SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

### **DILUTIONS**

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

### **BLANKS**

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

24/915 EMT Job No.:

### NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact . 20/07/2025 the laboratory if further details are required of the circumstances which have led to the removal of accreditation. Laboratory records are kept for a period of no less than 6 years.

### REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

### **Measurement Uncertainty**

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

### **Customer Provided Information**

Sample ID and depth is information provided by the customer.

### Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).

Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

### ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
В	ISO17025 (SANAS Ref No.T0729) accredited - South Africa  Indicates analyte found in associated method blank.  Dilution required.  MCERTS accredited.  Not applicable  No Ashestos Detected
DR	Dilution required.
М	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
со	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
ТВ	Trip Blank Sample
ОС	Outside Calibration Range

### **HWOL ACRONYMS AND OPERATORS USED**

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Extractable Hydrocarbons - i.e. everything extracted by the solvent.  Clean-up - e.g. by florisil, silica gel.  GC - Single coil gas chromatography.  Aliphatics & Aromatics.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.



Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UCoils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		Pozs	
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM37	2540D:1999 22nd Edition; VSS: USEPA 1684 (Jan 2001), USEPA 160.4 (1971) and SMEWW 2540E:1999 22nd Edition. Gravimetric determination of Total Suspended Solids (TSS) and Volatile Suspended Solids (VSS). Sample is filtered through a 1.5um pore size glass fibre filter and the resulting residue is dried and weighed at 105°C for TSS and ESSS (SS).	PM0	No preparation is required.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes			
TM38/TM125	Total Nitogen/Organic Nitrogen by calculation	PM0	No preparation is required.				
TM57	Modified US EPA Method 410.4. (Rev. 2.0 1993) Comparable with ISO 15705:2002. Chemical Oxygen Demand is determined by hot digestion with Potassium Dichromate and measured spectrophotometerically.	PM0	No preparation is required.	Yes			
TM58	APHA SMEWW 5210B:1999 22nd Edition. Comparible with ISO 5815:1989. Measurement of Biochemical Oxygen Demand. When cBOD (Carbonaceous BOD) is requested a nitrification inhibitor is added which prevents the oxidation of reduced forms of nitrogen, such as am	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM76	Modified US EPA method 120.1 (1982). Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			

## PECENED: 29/07/2025

PECENED. 29/01/2025

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### Appendix 9-1 Mineral Dust Risk Assessment Herbie Stephenson Limited Deerpark Donard, Co. Wicklow.

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### 1 DISAMENTIY DUST RISK ASSESSMENT

The IAQM Guidance aims to provide advice on robust and consistent good-practice approaches that can be used to assess the operational phase dust impacts from quarry activities. [1]

### 1.1 Identification of Sensitive Receptors

For the sensitivity of people and their property to dust soiling, the IAQM recommends the use of professional judgement to identify where on the spectrum between high and low sensitivity a receptor lies. The following classification was used to define a receptor with High, Medium or Low sensitivity to dust soiling:

### **High Sensitive Receptor**

- Users can reasonably expect enjoyment of a high level of amenity; and,
- the appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land.

Indicative examples of a high-sensitivity receptor included dwellings, medium- and long-term carparks and car showrooms.

### **Medium Sensitive Receptor:**

- Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home;
- The appearance, aesthetics or value of their property could be diminished by soiling; and,
- The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land

Indicative examples include parks, and places of work.

### **Low Sensitivity Receptor**

- The enjoyment of amenity would not reasonably be expected;
- There is a property that would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; and,
- There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land.

Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short-term car parks and roads.

### 1.2 Determining the Residual Source of Emissions

The following examples show the residual source emissions for a number of activities, illustrating the factors that may be considered when determining the potential impact.

Figure 1-1: Site Preparation/ Restoration

LARGE	SMALL
Large working area	Small working area
High bunds	Lowbunds
High volume of material movement	Low volume of material movement
High no. heavy plant	Low no. heavy plant
Minimal seeding/sealing of bund surface	
Material of high dust potential	

An example of a large potential dust magnitude from site preparation/restoration may include factors such as a working area >10ha, bunds >8 m in height, >100,000 m³ material movement, >10 heavy plant simultaneously active, bunds un-seeded, fine grained and friable material. Conversely, a small potential dust magnitude may include a site with a working area <2.5ha, bunds <4m in height, <20,000 m³ material movement, <5 heavy plant simultaneously active, all bunds seeded, material with a high moisture content.

Figure 1-2: Mineral Extraction

LARGE	SMALL
Large working area	Small working area
High energy extraction methods	Low energy extraction methods
Material of high dust potential	
Potential high extraction rate	Low extraction rate

An example of a large potential dust magnitude from mineral extraction may include a working area >100 ha, drilling and blasting frequently used, dusty mineral of small particle size and/or low moisture content, 1,000,000 tpa extraction rate. A small potential magnitude may include working area <20 ha, hydraulic excavator, coarse material and/or high moisture content, <200,000 tpa extraction rate.

Figure 1-3: Materials Handling

LARGE	SMALL
High no, heavy plant	Low no. heavy plant
Unconsolidated/bare surface	Hard standing surface
Activities close to site boundary	Activities within quarry void
Material of high dust potential	

An example of a large potential dust magnitude from materials handling may include factors such as >10 loading plant within 50m of a site boundary, transferring material of a high dust potential and/or low moisture content on dry, poorly surfaced ground. Conversely, a small potential dust magnitude may include <5 plant, more than 100 m of a site boundary, within the quarry void or clean hardstanding, transferring material of low dust potential and/or high moisture content.

Figure 1-4: Onsite Transportation

LARGE	SMALL
Use of unconsolidated haul roads	Use of Ponveyors
Unpaved haul roads	Paved har Droads
	Road surface of low dust potential
High no. HDV movements	Low no. HDV movements
High total length of haul roads	Low total length of haul roads
Uncontrolled vehicle speed	Controlled (low) vehicle speed

An example of a large potential dust magnitude from on-site transportation could include >250 movements in any one day on unpaved surfaces of potentially dusty material. A small potential magnitude may include the employment of covered conveyors used for the majority of the on-site transportation of material, <100 movements of vehicles per day, with surface materials of compacted aggregate, <500 m in length and a maximum speed of 15 mph.

Figure 1-5:Mineral Processing

LARGE	SMALL
Raw material of high dust potential	Raw material of low dust potential
End product of high dust potential	End product of low dust potential
Complex or combination of processes	Single process
High volume material processed.	Low volume material processed

An example of a large potential dust magnitude from mineral processing may include factors such as a mobile crusher and screener with concrete batching plant on-site, processing >1,000,000 tpa of material with a high dust potential and/or low moisture content e.g. hard rock. Conversely, a small potential dust magnitude may include a site with a fixed screening plant with effective design in dust control, processing <200,000 tpa of material with a low dust potential and/or high moisture content e.g. wet sand and gravel.

Figure 1-6: Stockpiles/Exposed Surfaces

LARGE	SMALL
Long term stockpile	Short term stockpile
Frequent material transfers	Infrequent material transfers
Material of high dust potential	
Ground surface unconsolidated/un-kept	Ground surface hardstanding/clean
Stockpiles close to site boundary	Stockpiles well within quarry void
Large areas of exposed surfaces	Small areas of exposed surfaces
High wind speeds/low dust threshold	Low wind speeds/high dust threshold

An example of a large potential dust magnitude from stockpiles and exposed surfaces could include a stockpile with a total exposed area >10 ha in an area exposed to high wind speeds located <50 m of the site boundary. Daily transfer of material with a high dust potential and/or low moisture content. Stockpile duration >12 months and quarry production >1,000,000 tpa. A small potential magnitude may include stockpile duration of <1 month with a total area <2.5 ha in an area of low wind speeds, located >100 m from the site boundary. Weekly transfers of material with a low dust potential and/or high moisture content. Quarry production <200,000 tpa.

Figure 1-7:Offsite Transportation

LARGE	SMALL
High No. HDV Movements	Low No. HDV Moyements
Unconsolidated Access Road.	Paved Acces Road
Limited/No Vehicle Cleaning Facilities	
Small Length of Access Road	

An example of a large potential dust magnitude from off-site transportation could include total HDV >200 movements in any one day on unsurfaced site access road <20 m in length with no HDV cleaning facilities. No road sweeper available. A small potential magnitude may include <25 HDV movements per day, paved surfaced site access road >50 m in length, with effective HDV cleaning facilities and procedures, the employment of an effective road sweeper.

### 1.3 Estimation of the Pathway Effectiveness

The site-specific factors considered to determine the Effectiveness of the Pathway were distance and direction of receptors relative to prevailing wind directions. Receptors were identified within 400m of the dust emission source. Table 1-1 shows the categorisation of the frequency of potential dust winds, based on the meteorological data from a nearby weather station.

Table 1-1: Categorisation of Frequency of Potential Dust Winds

Frequency Category	Criteria	
Infrequent	Frequency of winds (>5 m/s) from the direction of the dust source on dry days are less than 5%	
Moderately Frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 5% and 12%	
Frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 12% and 20%	
Very Frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are greater than 20%	

Table 1-2 below shows the categorisation of receptors, based on their distance to the dust emission source.

Table 1-2: Categorisation of Receptor Distance from Source

Distance Category	Criteria	
Distant	Receptor is between 200m and 400m from the dust source	
Intermediate	Receptor is between 100m and 200m from the dust source	
Close	Receptor is less than 100m from the dust source	

Table 1-3 below shows the determination of the Pathway Effectiveness based on the frequency of potentially dusty winds and the distance of the receptor from the dust emission source.

Table 1-3: Classification of the Pathway Effectiveness

		72		
Receptor Distance Category	Infrequent	Moderately Frequent	Frequent	Very Frequent
Close	Ineffective	Moderately Effective	Highly Effective	Highly Effective
Intermediate	Ineffective	Moderately Effective	Moderately Effective	Highly Effective
Distant	Ineffective	Ineffective	Moderately Effective	Moderately Effective

### 1.4 Estimation of the Dust Impact Risk and Effects

Table 1-4 shows the estimation of the Dust Impact Risk based on the Residual Source of Emission and Pathway Effectiveness classifications.

Table 1-4: Estimation of Dust Impact Risks

Pathway Effectiveness	Residual Source Emission		
	Small	Medium	Large
Highly Effective Pathway	Low Risk	Medium Risk	High Risk
Moderate Effective Pathway	Negligible Risk	Low Risk	Medium Risk
Ineffective Pathway	Negligible Risk	Negligible Risk	Low Risk

Table 1-5 below shows the estimate of the likely magnitude of Disamenity Effects based on the receptor sensitivity and the risk of dust impacts.

Table 1-5: Descriptors for magnitude of Dust Effects

Receptor Distance Category	Receptor Sensitivity			
	Low	Medium	High	
High Risk	Slight Adverse Effect	Moderate Adverse Effect	Substantial Adverse Effect	
Medium Risk	Negligible effect	Slight Adverse Effect	Moderate Adverse Effect	
Low Risk	Negligible effect	Negligible effect	Slight Adverse Effect	
Negligible Risk	Negligible effect	Negligible effect	Negligible effect	

2 REFERENCES

[1] IAQM, "Guidance on the Assessment of Mineral Dust Impacts for Planning," Institute of Air Quality Management London, 2016 Air Quality Management, London, 2016.

# PECENED: 29/07/2025



**Dust Management Plan** 

Proposed Quarry Re-Commencement and Extension Herbie Stephenson Limited

Deerpark, Donard, Co. Wicklow







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Job Number: E2123

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Checked By: David Dwyer Signed:

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### **Revision Record**

Issue No.	Date	Description	Remark	Prepared	Checked	Approved
01	21/05/24	Report	Final	KD	DD	KG
02	13/01/25	Report	Draft	CF	KG	KG
03	20/01/25	Report	Final	CF	DD	KG

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Malone O'Regan Environmental ('MOR Environmental') has prepared this report for the sole use of our client (as named on the front of the report) in accordance with the Client's instructions using all reasonable skill and competence and generally accepted consultancy principles. The report was prepared in accordance with the budget and terms of reference agreed with the Client and does not in any way constitute advice to any third party who is able to access it by any means. MOR Environmental excludes to the fullest extent lawfully permitted all liability whatsoever for any costs, liabilities or losses arising as a result of or reliance upon the contents of this report by any person or legal entity (other than the Client in accordance with the terms of reference). MOR Environmental has not verified any documents or information supplied by third parties and referred to herein in compiling this document and no warranty is provided as part of this document. No part of this report may be copied or reproduced without express written confirmation from MOR Environmental. Any methodology contained in this report is provided to the Client in confidence and must not be disclosed or copied to third parties without the prior written agreement of MOR Environmental. Disclosure of such information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests. Third parties who obtain access to this report by any means, including disclosure by the Client, will be subject to the Copyright and Third-Party Disclaimer contained herein.

### Dust Management Plan Proposed Quarry Re-Commencement and Extension Herbie Stephenson Limited Deerpark, Donard, Co. Wicklow

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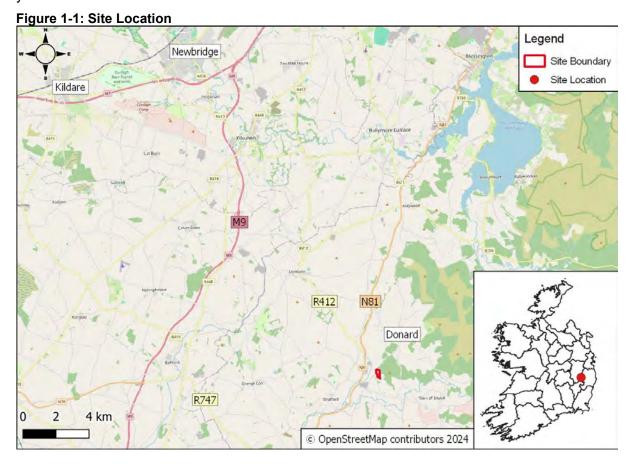
### 1 INTRODUCTION

Herbie Stephenson Limited ('the Applicant') has commissioned Malone O'Regan Environmental ('MOR Environmental') to develop a Dust Management Plan ("MP') to manage potential dust from activities associated with the proposed re-commencement and extension of quarrying at an old rock quarry in Deerpark, Donard, Co. Wicklow (the 'Proposed Development'). The DMP was prepared to form part of the planning application, to Wicklow County Council ('WCC') which outlines a comprehensive set of measures to mitigate dust generation and ensure compliance with environmental regulations.

The Proposed Development will be located on a site covering an area of circa ('ca.') 8.1 hectares ('ha') within the townland of Deerpark and Donaghmore Co Wicklow (Ordnance Survey Ireland Grid Reference ITM 692022, N 695358). Refer to the redline boundary presented in Figure 1-1 below for context ('the Site'). The Site is located ca. 2.4km southwest of Donard.

For the current land (Figure 1-2 below) under owner interest area refer to the blueline boundary presented below, which is ca. 20.5ha. The Site boundary is ca. 8.1ha in size, with an extraction area of ca. 5.01ha.

The Proposed Development will extract the Site to a depth of ca. 165mOD, one bench below the existing ground level within the old quarry floor, to obtain usable aggregate material. The Site has an estimated reserve of ca. 1,283,500m³ or 3,080,400 tonnes of aggregates. It is proposed to extract up to a maximum permitted output of 200,000 tonnes of aggregates per annum ('tpa') on average, giving a life span of operations within the extension of ca. 15.5 years.



### 1.1 Purpose

This document outlines the methodologies that will be utilised by the Applicant to minimise and manage dust during the extension of the Quarry.

### 1.2 Overview of Proposed Development

The Site has an estimated reserve of ca. 1,283,500m<sup>3</sup> or 3,080,400 tonnes of aggregates within a proposed extraction area of ca. 5.01ha.

The Proposed Development relates to the preparation of the old quarry for aggregate processing activities. Initial work within the old quarry involves the clearing of vegetation and reduction in the floor level in order to prepare the face for blasting. In tandem with these preparation works the quarry area adjacent to the local road will be improved to provide for a modern site entrance off the local road, positioning of an office with welfare, weighbridge, wheel wash and parking. Prior to each phase of operational development, the topsoil and overburden will need to be removed. This material will be utilised in the creation of the boundary embankments/berms and planted with native species to stabilise the berm. To minimise the area of exposed ground, the removal of soils and overburden will be done prior to the need for a new phase of extraction. Plant for overburden removal will primarily include the use of an excavator and wheel loaders. This phase will result in an exposed rock outcropping.

Industry standard blasting methods will be utilised to produce broken rock by opening a series of 15m high benches. A mobile crusher and screening plant will follow the operational face within the Site boundary. After this initial processing, blast rock which has undergone crushing / screening will be hauled off-site or stockpiled within the quarry. The quarry extension will be up to three benches deep when complete, depending upon existing ground elevation, bringing the finished ground level to ca.165mOD.

Extraction Area

© Sike Boundary

Land Under Owner Interest

Extraction Area

© SikWest 2023

© Bluesky Aerial 2020

E2123 - Malone O'Regan Environmental - Final

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### 1.3 Work Hours

Operational hours for the Site will be:

- Monday to Friday 08:00 to 18:00;
- Saturday 08:00 to 14:00; and,
- Sunday & Public Holidays closed.

### 1.4 Site Activities

The Site activities associated with the Site are summarised in Table 1-1 below.

**Table 1-1: Overview of Site Activities** 

Activity	Activity Details		
	<ul> <li>Preparation of the old quarry for aggregate processing activities;</li> <li>Vegetation clearance;</li> </ul>		
	<ul> <li>Improvements to the Site entrance and reduction in the floor level in order to prepare the face for blasting;</li> </ul>		
Site Preparation / Construction	Installation of prefab office with welfare, weighbridge, wheel wash and parking		
Phase	A woodland area will also be planted to the north of the Site;		
	<ul> <li>Stripping of existing overburden to access the underlying rock within the proposed extraction area;</li> </ul>		
	Construction of berms with overburden; and,		
	Construction/ preparation of haul routes.		
Operational Phase	Overview		
	<ul> <li>The proposed expansion will involve excavating up to three new benches, each 15 meters high;</li> </ul>		
	Rocks will be blasted, extracted, and crushed on-site;		
	A new safety fence will be built around the perimeter of the Site;		
	The estimated amount of rock available for extraction is approximately 3.08 million tonnes;		
	The quarry will operate within its an output range of 200,000 tonnes per year; and,		
	<ul> <li>The quarrying will take place above the groundwater table however groundwater will ingress in the quarry.</li> </ul>		
	Material Handling		
	Up to five heavy plant will be in operation at once;		
	<ul> <li>Main extraction area will be located ca. 155m from the nearest receptors to the west;</li> </ul>		
	<ul> <li>Rock will be low dust potential material with high moisture content due to ingress of groundwater through the rock along the quarry face;</li> </ul>		
	The haul routes within the quarry void will be hard rock unpaved, and material of low dust potential due to water content; and,		

PA

Activity	Activity Details		
	The estimated reserve within the Site is ca. reserve of ca. 1,283,500m³ or 3,080,400 tonnes of aggregates.		
	Onsite Transportation		
	On-site speed restrictions (15 kph) will be in place in order to limit the generation of fugitive dust emissions;		
	Wheel loaders will be used to transport materials; and,		
	<ul> <li>Hard rock unpaved haul routes will be used to transport materials from the quarry void.</li> </ul>		
	Stockpiling/exposed surfaces		
	<ul> <li>The resultant aggregate will be stockpiled temporarily onsite before being transported back to the Quarry for additional processing or will be transported offsite for direct use.</li> </ul>		
	Offsite transportation (i.e., HGVs leaving the site following deposition)		
	There will be up to 62 loads per day. i.e. (31 HGVs incoming and 31 HGVs outgoing) will be used per day for off-site transportation;		
	<ul> <li>HGVs will traverse from hard rock unpaved haul routes within the quarry void to hardstanding surfaces at the Site entrance; and,</li> </ul>		
	The HGVs will go through the wheel wash prior to leaving the Site.		
Restoration Phase	Overview		
	<ul> <li>During the operational phase, planting along the berms and within the woodland habitats will become established, thereby reducing the overall impact; and,</li> </ul>		
	Once operations have ceased, the restoration phase will provide a mosaic of habitats, including woodland areas, retained and re-planted treelines, a species-rich grassland, ponds, bare ground scrapes / unvegetated quarry benches and areas of recolonising bare ground where natural succession and regeneration will occur over time.		

### 2 MITIGATION MEASURES

The following mitigation measures will be implemented to minimise and manage dust emissions arising from the Site.

**Table 2-1: Mitigation Measures** 

General Mitigation Measures for the Entire Site (Construction, Operation and Restoration Phases)

### **Design Measures**

- Hedgerows surrounding the Site boundary will be enhanced during the Construction Phase and maintained during the Operational and Rehabilitation Phases. The hedgerows, once mature, should result in dense foliage;
- The materials initially excavated from the Site will be used to build embankments along the southern and western boundaries. The berms will be planted to stabilise the soil, reduce dust nuisance occurring, and once established will mitigate and significantly reduce the risk of disamenity dust leaving the Site boundary in the subsequent Operational Phase;
- Extraction of the Site will be done in phases which will help to reduce large areas of exposed soil
  which reduce risk of disamenity dust leaving the Site boundary;

### General Mitigation Measures for the Entire Site (Construction, Operation and Restoration Phases)

- A setback of 150m was put in place from the nearest sensitive receptor which will further educe risk
  of disamenity dust reaching receptors;
- Site entrance access road will consist of hardstanding minimising exposed surfaces;
- Exposed surfaces, e.g. topsoil and overburden storage mounds, will be planted with fast growing plants; and,
- HGVs exiting the Site will be via the existing wheel wash.

### **Construction / Operational / Restoration Measures**

The following mitigation measures will be implemented to minimise dust generation, during the Construction Phase/Operational Phases/Restoration Phases:

- Record all dust and air quality complaints, identify cause(s), take appropriate action;
- Complaints log will be maintained at the Site office, available for review at any reasonable time;
- Provide training to Site personnel on dust mitigation measures to be implemented at the Site;
- Complete regular inspections of Site works to ensure compliance with the DMP. The frequency of these inspections should be increased to coincide with activities where the risk of impact is higher during dry and/or windy conditions;
- Maintain good communication with the local community;
- Soil stripping and overburden handling will be avoided during dry and windy (>5.5m/s) conditions;
- Overburden will only be worked when it contains a high moisture content;
- Crushing and screening will take place within sheltered parts of the quarry to reduce the likelihood of transport of dust via wind;
- Dampen material during dry periods prior to crushing operation;
- Crushing and screening plant will be used within its design capacity;
- All plant and equipment will be subjected to routine preventative maintenance;
- · Materials will be dampened sufficiently during dry conditions;
- Dampen conveyers where required from fixed sprays or mobile bowser;
- Clearance of any spillage during extraction should be completed regularly to minimise accumulation of loose dry materials;
- Minimisation of drop heights will be maintained;
- Abrupt changes in direction will be avoided where possible;
- Regular clearing, grading and maintenance of haul routes will be conducted;
- Speed restrictions within and around the quarry (15 km/hr);
- Vehicles will be evenly loaded to reduce possibility of spillages;
- Dampen haul routes where required using a water bowser;
- Daily application of water to haul routes during dry conditions will be completed;
- HGVs will pass through wheel wash onto hardstanding prior to leaving the Site; and,
- Road sweepers will be utilised to maintain local roads on a need to basis.

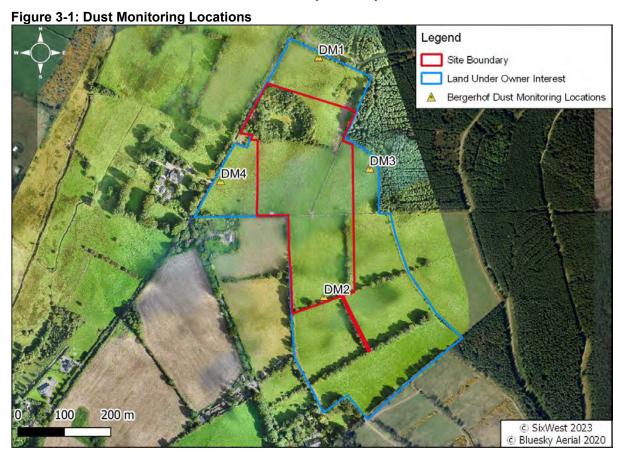
### 3 MONITORING

All monitoring works will be completed in accordance with the quarry industry guidelines;

- Department of Environmental Heritage and Local Community ('DoEHLG') —Quarries and Ancillary Activities: Guidelines for Planning Authorities, 2004 [1]; and,
- Environmental Protection Agency ('EPA') Environmental Management in the extractive industry (Non-Scheduled Minerals), 2006 [2].

The Site will complete Bergerhoff monitoring at four locations (DM1-DM4) in agreement with the local authority and in accordance with conditions of planning.

Monitoring should be completed on a monthly basis for 12 months of the year. The results of monitoring and measurement activities will be used to track performance, relevant operational controls and conformance with the Sites environmental objectives and planning conditions. These results will be submitted to local authority annually.



### **4 REPORTING REQUIREMENTS**

The monitoring report for dust deposition will detail the following information;

- Date of monitoring; and,
- Results for each location in mg/m²/day.

A summary report comparing the results to the limit value for the Site will be submitted quarterly or otherwise specified to the local authority.

- [1] DoEHLG, "Quarries and Ancillary Activities: Guidelines for Planning Authorities," Department of Environmental Heritage and Local Community, 2004.

  [2] EPA, "Environmental Management in the extract" Environmental Protection."

# AECHNED. Solonzos

### **CHARACTERISING CLIMATE HAZARDS**

### 1.1 Frequency of Climate Hazards according to Annex B [1]

Deerpark, Donard, Co. Wicklow								
1 CHARACTERISING CLIMATE HAZARDS  1.1 Frequency of Climate Hazards according to Annex B [1]  Table 1-1: Classifying the frequency of climate hazards  Frequency Occurrence in a Year Description								
Frequency	Frequency Occurrence in a Year	Description						
Very Frequent	>100%	Occurs several times in a single year						
Frequent	50 to 100%	Occurs once in a 1-to-2-year period						
Common	10 to 50%	Occurs once in a 2-to-10-year period						
Occasional	1 to 10%	Occurs once in a 10–100-year period						
Rare	<1%	occurs once in over 100 years						

### 1.2 Vulnerability Types

Table 1-2: Description of different vulnerability types [1]

Vulnerability Type	Frequency Occurrence in a Year
	Properties of an asset related to the structure or facilities
Physical Vulnerability	can exacerbate/reduce the impacts before, during, or after
	a hazard event e.g. poor design and the construction of
	building, provision of active cooling.
1 Trystodi Valiferability	or;
	The ability of a population/persons to access equipment or
	resources that can exacerbate/reduce the impacts before,
	during, or after a hazard event.

### 1.3 Level of Impacts

Table 1-3:Description of level of impacts [1]

Impact	Description	Level of Impact
0 1 1 1:	Widespread service failure with	_
Catastrophic	services unable to cope with wide-scale impacts	5
	Services seen to be in danger of	
Major	failing completely with	4
	severe/widespread decline in service provision	
Moderate	Service provision under severe pressure. Appreciable decline in	3

		PA
	service provision at a community level	C. C
Minor	Isolated but noticeable examples of service declines	2 290
Negligible	Appearance or threat but no actual impact on service provision	1 2025

### 1.4 Magnitude of Impact for Asset Damage Category

Table 1-4: Magnitude of impact relating to Asset Damage [1]

Risk Area	Negligible	Minor	Moderate	Major	Catastrophic
Asset Damage	Impact can be absorbed through normal activity	An adverse event that can be absorbed by taking business continuity action		A critical event that requires extraordinary/emergency business continuous actions	Disaster with the potential to lead to shutdown or collapse or loss of assets network

### 2 IDENTIFICATION OF CLIMATE HAZARDS

### 2.1 Wicklow County Council Climate Change Adaption Strategy

The Wicklow County Council Climate Change Adaption Strategy has evaluated the risks due to climate change using the following scale (Table 2-1 below) [2]. The Risk is measured as a product of the Consequence and Likelihood relating to hazards.

Table 2-1:Kilkenny County Council Risk Scale

Consequence Description	Consequence Score	Likelihood Description
Catastrophic	5	Widespread service failure with services unable to cope with wide-scale impacts. Irrecoverable environmental damage. Large numbers of serious injuries or loss of life.
Major	4	Services seen to be in danger of failing completely with severe/widespread decline in service provision and quality of life. Severe loss of environmental amenity. Isolated instances of serious injuries.
Moderate	3	Service provision under severe pressure. Appreciable decline in service provision at community level. Isolated but significant instances of environmental damage that could be reversed. Small number of injuries.
Minor	2	Isolated but noticeable examples of service decline. Minor environmental damage
Negligible	1	Appearance of threat but no actual impact on service provision.

### 2.2 ThinkHazard

ThinkHazard is a web-based tool enabling non-specialists to consider the impacts of disasters on new development projects, commissioned by the Global Facility for Disaster Reduction and Recovery [3]. Hazards are provided at a local administrative resolution and is based on the following scale (Table 2-2).

Table 2-2: Hazard Classification provided by ThinkHazard

Scale	Description
High	Users should be highly aware of potential severe damage from this hazard for the project location. Without taking measures to mitigate the hazard and risk, high levels of damage can be expected to occur within the project or human lifetime
Medium	Users should be aware of potentially damaging effects of this hazard for the project location. Potentially damaging events can be expected to occur within the project or human lifetime and measures to mitigate the hazard and risk should be considered.
Low	Potentially damaging events are less likely to occur within the project or human lifetime but are still possible. Measures to mitigate the hazard and risk would be prudent at critical locations.

P.

Very Low	Available data suggests that potentially damaging effects are unlikely to occur, on average, in the project or human lifetime.

### 2.3 Climate Change Adapt (European Commission)

The Climate -ADAPT platform is maintained by the European Commission and the European Environment Agency. Climate -ADAPT aims to support Europe in adapting to climate charge, helping users to access and share data. The platform includes a database that contains quality checked information and country-level reports [4].

At the time of writing, the Climate ADAPT platform does not provide a quantitative assessment on the level of risks associated with the potential hazards to a country.

### 2.4 Climate Hazards associated with the Proposed Development

Table 2-3 below highlights the hazards identified through desk-based research.

Table 2-3: Hazards identified as relevant from available resources

Source	Hazards Identified	Category of Risk (if applicable)		
Wicklow County Council Climate Change Adaption Strategy [2]	<ul> <li>Heatwaves;</li> <li>Cold weather;</li> <li>Dry Spells;</li> <li>Wind speeds;</li> <li>Flooding;</li> <li>Extreme Rainfall</li> </ul>	<ul> <li>Moderate;</li> <li>Major;</li> <li>Moderate;</li> <li>Moderate;</li> <li>Moderate;</li> <li>Moderate</li> </ul>		
ThinkHazard [3]	<ul> <li>Wildfire;</li> <li>River Flood;</li> <li>Urban Flood; and;</li> <li>Extreme Heat.</li> </ul>	<ul><li>Medium;</li><li>Low</li><li>Low;</li><li>Low</li></ul>		
Climate-ADAPT [4]	<ul> <li>Temperature (extreme highs and lows, wildfires);</li> <li>Winds (Storms);</li> <li>Water (Drought, Floods, Extreme Rainfall; and,</li> <li>Solid Mass.</li> </ul>	Not Identifiable		

### 3 REFERENCES

- [1] GOI, "Technical Annex B Climate Change Risk Assessment," Government of Ireland, Dublin, 2023.
- [2] Wicklow County Council, "Wicklow County Council Climate Change Adaption Strategy," Wicklow County Council, Wicklow, 2019.
- [3] GFDRR, "Think Hazard," Global Facility for Disaster Reduction and Recovery, 30 June 2020. [Online]. Available: https://thinkhazard.org/en/about. [Accessed 16 February 2023].
- [4] EC, "Climate Adapt," European Commission, 2023. [Online]. Available: https://climate-adapt.eea.europa.eu/#t-countries. [Accessed 16 08 2023].

### **APPENDIX 11**

PECENED. 2001/2028

PECENED. 29018085

### **APPENDIX 11-1**

### **Glossary of Acoustic Terminology**

### Abbreviation / Description Descriptor

A Weighted A time weighting given to noise values to amend the values to suit the human

ear response to the various frequency components of the sound.

Acoustic environment Sound from all sound sources as modified by the environment (BS ISO)

12913-1:2013).

Ambient sound Totally encompassing sound in a given situation at a given time, usually composed

of sound from many sources, near and far.

Note: The ambient sound comprises the residual sound and the specific sound

when present.

Ambient sound level,  $L_a =$ 

L<sub>Aeq, T</sub>

Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval,

Τ.

Note: the ambient sound level is a measure of the residual sound and the

specific sound when present.

Background sound level,

L<sub>A90</sub>. T

A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using

time weighting F and quoted to the nearest whole number of decibels.

dB (decibel) A relative unit of measurements, based on a logarithmic scale to describe the

ratio between the measured level and a reference or threshold level of 0dB.

Unless otherwise stated 0dB within this report is 2x10<sup>-5</sup> pascals (Pa).

Day A 24 hour period from midnight to midnight.

Daytime A 12 hour period between 07:00 – 19:00 hours, as per NG4

Evening-Time A 4 hour period between 19:00 – 23:00 hours, as per NG4

Equivalent continuous Aweighted sound pressure

level,  $L_{\text{Aeq},\,T}$ 

Value of the A-weighted sound pressure level in decibels of continuous steady sound that, within a specified time interval,  $T=t_2-t_1$ , has the same mean-squared sound pressure as a sound that varies with time, and is given the following equation:

$$L_{AeqT} = 10lg_{10} \left\{ (1/T) \int_{t_1}^{t_2} [p_A(t)^2/p_0^2] dt \right\}$$

where:

 $p_0$  is the reference sound pressure (20  $\mu Pa);$  and

p<sub>A</sub>(t) is the instantaneous A-weighted sound pressure (Pa) at time t

Note: The equivalent continuous A-weighted sound pressure level is quoted to

the nearest whole number of decibels.

Lan,T The Fast interval, A-Weighted noise level in the for the 'N' percentile of the

sampling interval 'T'.

LA10,T The A-Weighted noise level for the 10%ile of the sampling interval 'T', typically

utilised to represent peak noise events such as intermittent passing traffic.

LA90,T The A-Weighted noise level in the lower 90 percentile of the sampling interval

'T', excludes intermittent features typical of traffic. See also background sound

level.

LA95,T The A-Weighted noise level for the 95%ile of the sampling interval 'T'.

Representative of steady noise events at a monitoring location.

L <sub>Aeq,T</sub> The equivalent continuous sound level, used to describe the fluctuating noise	The	quivalent continuou	s sound level, us	ised to describe the	fluctuating noise i	1
--	-----	---------------------	-------------------	----------------------	---------------------	---

terms of a single noise level over the same sampling time period (T). Also see

ambient sound.

Day-evening-night equivalent level, calculated as: Lden

$$Lden = 10Log \frac{1}{24} \left[ 12*10 \frac{Lday}{10} + 4*10 \frac{Levening + 5}{10} + 8*10 \frac{Lnight + 10}{10} \right]$$

Where the L<sub>day</sub>, L<sub>evening</sub> and L<sub>night</sub> are as defined in ISO1996-2:1987, and for the duration of 12 hours, 4 hours and 8 hours respectively, are A-weighted long term Leq sound level.

Day equivalent level. A-weighted Leq sound level measured over the 12 hour Lday

period from 07:00 hours to 19:00 hours.

Evening equivalent level. A-weighted Leq sound level measured during the Levenina

evening period of 19:00 hours to 23:00 hours.

The maximum RMS A-Weighted sound pressure level occurring within a LAmax

specified time period.

Night equivalent level. A-weighted Leg sound level measured during the night Lnight

period of 23:00 hours to 07:00 hours.

Measurement time

interval, T<sub>m</sub>

total time over which measurements are taken.

Note: This may consist of the sum of a number of non-contiguous, short-term

measurement time intervals.

Rating level, LAr, Tr specific sound level plus any adjustment for the characteristic features of the

sound.

Reference time interval, Tr specified interval over which the specific sound level is determined.

Note: This is 1 h during the day from 07:00 h to 23:00 h and a shorter period

of 15 min at night from 23:00 h to 07:00 h

Residual sound ambient sound remaining at the assessment location when the specific

sound source is suppressed to such a degree that it does not contribute to

the ambient sound.

Residual sound level, L<sub>r</sub> =

 $L_{Aeq,T}$ 

equivalent continuous A-weighted sound pressure level of the residual sound

at the assessment location over a given time interval, T.

Specific sound level, Ls =

L<sub>Aeq,Tr</sub>

equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time

interval, Tr.

Specific sound source sound source being assessed.

Night-Time An 8 hour period between 23:00 - 07:00 hours, as per NG4

Noise Ambient The totally encompassing sound in a given situation at a given time, usually

composed of sound from many sources, near and far. Also see ambient sound.

Noise

The steady existing noise level present without contribution from any intermittent Background sources. The A-weighted sound pressure level of the residual noise at the

assessment position that is exceeded for 90 per cent of a given time interval, 'T'

(LAF90,T). Also see background sound level, LA90, T.

Noise Specific The sound arising from the source under investigation, disregarding all external

and residual sources. Also see specific sound source.

Noise Sensitive Receptor - an identified dwelling, amenity area, recreational zone **NSR** 

or other such place where a change in noise may result in a nuisance impact.

**RMS** Root Mean Squared, mathematical method to account for swells and troughs

within wave forms, such as sound.

Sound Power

Level (Lw)

The logarithmic measure of sound power in comparison to a referenced sound intensity level of one picowatt (1pW) per m2. Utilised to express the intensity at

source of a noise emission.

Sound Pressure

Level (LP)

Fluctuations in air pressure caused by the passage of a sound wave. The measurement of sound/noise through the use of a sound level meter, is a representation of these fluctuations in air pressure as they pass the instrument

microphone.

Time Weighting One of the averaging time for noise monitoring instrumentation:

F – Fast, instrument samples every 125 milliseconds; S – Slow, instrument samples every 1 second;

I – Impulsive, instrument samples every 35 milliseconds.

### Note:

Unless otherwise stated all broadband noise values are A-weighted with a fast response.

Where 0dB is referenced it refers to the threshold of hearing  $-2x10^{-5}$ Pa.

All 1/3 octave values are unweighted/linear. (z-weighted on the Bruel and Kjaer software)

### PECENED. 29/07/2025

E2123

Model:

PR Phase 3 1st bech - Scenario A Final - RFI - Area (main group) Moving source, for method Industrial noise - ISO 9613 Group: Listing of:

Name	Desc.	ISO H	ISO Terr.	HDef.	Weighting	Flow(D)	Flow(E)	Flow(N) Nvg.speed	_
Bulldozer	Bulldozer	0.75		Relative	A	70		10	
In	Trucks going onsite	0.75		Relative	A	31		<b>O</b> - 10	
Out	Trucks departing Site	0.75		Relative	A	31		10	

E2123

Group:

Input - Sources and Receivers - Scenario A

PR Phase 3 1st bech - Scenario A Final - RFI - Area Model:

(main group)

Moving source, for method Industrial noise - ISO 9613 Listing of:

Lw 8k\* Red 31 F 84.90 0.00 7.60 0.90 0.905 Lw 63 Max.dist. Lw 31 Lw 125 Lw 250 Lw 500 Lw 1k Lw 2k Lw 4k Red 63 Name Bulldozer 25.00 0.00 83.80 93.90 90.40 97.80 97.00 96.20 0.00 87.80 25.00 79.10 91.90 96.50 100.20 97.50 90.50 0.00 Out 25.00 0.00

E2123

PR Phase 3 1st bech - Scenario A Final - RFI - Area Model:

Group: Listing of:

(main group)
Moving source, for method Industrial noise - ISO 9613

Name	Red 125	Red 250	Red 500	Red 1k	Red 2k	Red 4k	Red 8k	
Bulldozer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
In	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Out	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

E2123

PR Phase 3 1st bech - Scenario A Final - RFI - Area Model:

(main group)

Group: Point sources, for method Industrial noise - ISO 9613 Listing of:

DI none Desc. Height Terrain L HDef. DI Horz Name Drilling Tracked mobile drilling rig - C.9.2 0.75 194.00 Relative Normal point source 0 Loader Wheeled loader - C.9.7 1.50 179.64 Relative Normal point source 0 1.50 Tracked excavator with breaker - C.9.11Excav 178.68 Relative Normal point source none 0 178.37 Relative Normal point source Crusher Semi mobile crusher - C.9.14 0 none

E2123
Input - Sources and Receivers - Scenario A

Model: Group: Listing of:	Final - RF (main gro		CENED										
Name	DI_Vert	DI(0)	DI(10)	DI(20)	DI(30)	DI(40)	DI(50)	DI(60)	DI(70)	DI(80)	DI(90)	DI(100)	DI(110)
Drilling	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	09	0.0
Loader	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	) <del>,</del> 0.0
Excav	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crusher	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	703.0

E2123 Input - Sources and Receivers - Scenario A

Model: Group: Listing of:	PR Phase Final - R (main gr Point so	,cx	CENED .								
Name	DI(120)	DI(130)	DI(140)	DI(150)	DI(160)	DI(170)	DI(180)	Ca(D)	Ca(E)	Ca(N)	Weighting No refl.
Drilling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	No
Loader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	AO NO
Excav	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	A No
Crusher	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	A No

E2123 Input - Sources and Receivers - Scenario A

PR Phase 3 1st bech - Scenario A Final - RFI - Area Model: (main group) Group: Point sources, for method Industrial noise - ISO 9613

Listing of: No building No ind.site Lw 31 Lw 125 Lw 63 Lw 250 Lw 500 Lw 1k Lw 8k Name No No 0.00 95.80 106.90 109.40 115.80 115.00 No No 89.80 106.40 109.80 114.00

2k Lw k 109.00 106.00 13.00 0' Drilling 99.90 99.90 100.90 102.90 Loader 96.90 113.00 196.90 107.00 94.90 92.80 92.80 104.40 107.40 115.00 113.00 116.20 112.20 Excav No No 113.80 Crusher No No 111.80

E2123 Input - Sources and Receivers - Scenario A

PR Phase 3 1st bech - Scenario A Final - RFI - Area Model:

(main group)

Group:

Point sources, for method Industrial noise - ISO 9613 Listing of:

RECEINED. 29/07/2025 Red 8k Red 31 Red 63 Red 125 Red 250 Red 500 Red 1k Red 2k Red 4k Name Drilling 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Loader 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Excav Crusher

E2123

Input Model: Group: Listing of		PR Phase 3 1st I Final - RFI - Are (main group) Receivers, for m	bech - Scenario a	) A					A.C.	EVED.	
Name	Desc	. Terrain L	HDef.	Height A	Height B	Height C	Height D	Height E	Height F	Façade	
NSR01		183.38	Relative	1.50	4.00					Yes	9
NSR02		168.98	Relative	1.50	4.00					Yes	0,
NSR03		158.17	Relative	1.50	4.00					Yes	1/3
NSR04		175.75	Relative	1.50	4.00					Yes	50-
NSR05		163.81	Relative	1.50	4.00					Yes	2
											0.

PECENED. 29018085

## **APPENDIX 11-2-2**

E2123

PR Phase 3 1st bech - Scenario B Final - RFI - Area Model:

(main group)
Moving source, for method Industrial noise - ISO 9613 Group: Listing of:

Name	Desc.	ISO H	ISO Terr.	HDef.	Weighting	Flow(D)	Flow(E)	Flow(N)vg.speed
Bulldozer	Bulldozer	0.75		Relative	A	70		10
In	Trucks going onsite	0.75		Relative	A	31		<b>0</b> 10
Out	Trucks departing Site	0.75		Relative	A	31		10

E2123

PR Phase 3 1st bech - Scenario B Final - RFI - Area Model:

(main group)

Group: Moving source, for method Industrial noise - ISO 9613 Listing of:

Lw 8k\* Red 31 F 84.90 0.00 7.60 0.90 0.905 Lw 63 Max.dist. Lw 31 Lw 125 Lw 250 Lw 500 Lw 1k Lw 2k Lw 4k Red 63 Name Bulldozer 25.00 0.00 83.80 93.90 90.40 97.80 97.00 96.20 0.00 87.80 25.00 79.10 91.90 96.50 100.20 97.50 90.50 0.00 Out 25.00 0.00

E2123

PR Phase 3 1st bech - Scenario B Final - RFI - Area Model:

Group: Listing of:

(main group)
Moving source, for method Industrial noise - ISO 9613

Name	Red 125	Red 250	Red 500	Red 1k	Red 2k	Red 4k	Red 8k
Bulldozer	0.00	0.00	0.00	0.00	0.00	0.00	0.00
In	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Out	0.00	0.00	0.00	0.00	0.00	0.00	0.00

E2123

PR Phase 3 1st bech - Scenario B Final - RFI - Area Model:

(main group)
Point sources, for method Industrial noise - ISO 9613 Group: Listing of:

					· · · · · · · · · · · · · · · · · · ·	<b>*</b>	
Name	Desc.	Height	Terrain L	HDef.	Type	. DI DI I	Horz
Loader	Wheeled loader - C.9.7	1.50	179.64	Relative	Normal point source	none	0
Excav	Tracked excavator with breaker - C.9.11	1.50	178.68	Relative	Normal point source	none	0
Crusher	Semi mobile crusher - C.9.14	1.50	178.37	Relative	Normal point source	none 🔧	0
							2-

E2123

PR Phase 3 1st bech - Scenario B Final - RFI - Area Model:

(main group)
Point sources, for method Industrial noise - ISO 9613 Group: Listing of:

DI Vert DI(0) DI(10) DI(20) DI(30) DI(40) DI(50) DI(60) DI(70) DI(80) DI(90) DI(110) Name Loader 0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.00 Excav 0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 ÷... 0 0.0 0.0 0.0 Crusher 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

E2123

PR Phase 3 1st bech - Scenario B Final - RFI - Area Model:

Group: Listing of:

(main group)
Point sources, for method Industrial noise - ISO 9613

Name	DI(120)	DI(130)	DI(140)	DI(150)	DI(160)	DI(170)	DI(180)	Ca(D)	Ca(E)	Ca(N)	Weighting No refl.
Loader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	No
Excav	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	A No
Crusher	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	A No

E2123

PR Phase 3 1st bech - Scenario B Final - RFI - Area Model:

(main group)
Point sources, for method Industrial noise - ISO 9613 Group: Listing of:

2k Lw 4k 106.00 113.00 107.00 Lw 63 No building No ind.site Lw 31 Lw 125 Lw 250 Lw 500 Lw 1k Lw 8k Name 96.90 106.90 Loader No No 89.80 99.90 106.40 109.80 114.00 100.90 104.40 102.90 107.40 113.80 111.80 Excav 92.80 115.00 94.90 Crusher No No 92.80 113.00

E2123 Input - Sources and Receivers - Scenario B

PR Phase 3 1st bech - Scenario B Final - RFI - Area Model:

(main group)
Point sources, for method Industrial noise - ISO 9613 Group: Listing of:

RECEINED. 29/07/2025 Red 31 Red 63 Red 125 Red 250 Red 500 Red 1k Red 2k Red 4k Red 8k Name Loader 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Excav 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Crusher 0.00 0.00

E2123

PR Phase 3 1st bech - Scenario B Final - RFI - Area (main group) Model:

Group:

	W.								
Desc.	Terrain L	HDef.	Height A	Height B	Height C	Height D	Height E	Height F	Façade
	183.38	Relative	1.50	4.00					Yes
	168.98	Relative	1.50	4.00					Yes O
	158.17	Relative	1.50	4.00					Yes
	175.75	Relative	1.50	4.00					Yes
	163.81	Relative	1.50	4.00					Yes
									0
	of: I	Desc. Terrain L 183.38 168.98 158.17 175.75	Receivers, for method Industria  Desc. Terrain L HDef.  183.38 Relative 168.98 Relative 158.17 Relative 175.75 Relative	### Receivers, for method Industrial noise - ISO 9    Desc.   Terrain L   HDef.   Height A	### Receivers, for method Industrial noise - ISO 9613    Desc.   Terrain L   HDef.   Height A   Height B	### Receivers, for method Industrial noise - ISO 9613    Desc.   Terrain L   HDef.   Height A   Height B   Height C	### Receivers, for method Industrial noise - ISO 9613    Desc.   Terrain L   HDef.   Height A   Height B   Height C   Height D	### Receivers, for method Industrial noise - ISO 9613    Desc.   Terrain L   HDef.   Height A   Height B   Height C   Height D   Height E	### Receivers, for method Industrial noise - ISO 9613    Desc.   Terrain L   HDef.   Height A   Height B   Height C   Height D   Height E   Height F

### PECENED: 29/07/2025

E2123

### Input - Sources and Receivers - Scenario C

Inpu		rces and Rece	ivers - S	cenario C					<b>A</b> .		
Model:	Fin	. Phase 3 1st bech - S nal - RFI - Area	cenario C						CA	,	
Group: Listing	`	nain group) oving source, for meth	nod Industrial	noise - ISO 96	13				1	(E)	
Name	Desc.		ISO H	ISO Terr.	HDef.	Weighting	Flow(D)	Flow(E)	Flow(N)	Avg.speed	Max.dist.
In	Trucks g	going onsite	0.75		Relative	A	31			10	25.00
Out	Trucks d	departing Site	0.75		Relative	A	31			607	25.00

E2123

### Input - Sources and Receivers - Scenario C

Model:

Group: Listing of:

PR Phase 3 1st bech - Scenario C Final - RFI - Area (main group) Moving source, for method Industrial noise - ISO 9613

					Lw 1k							
In	 79.10	87.80	91.90	96.50	100.20	97.50	90.50	83.60	0.00	0.00	00.00	0.00
Out	 								0.00	0.00	0.90	0.00

### E2123

### Input - Sources and Receivers - Scenario C

PR Phase 3 1st bech - Scenario C Final - RFI - Area Model:

(main group)
Moving source, for method Industrial noise - ISO 9613 Group: Listing of:

Name	Red 500	Red 1k	Red 2k	Red 4k	Red 8k
In	0.00	0.00	0.00	0.00	0.00
Out	0.00	0.00	0.00	0.00	0.00

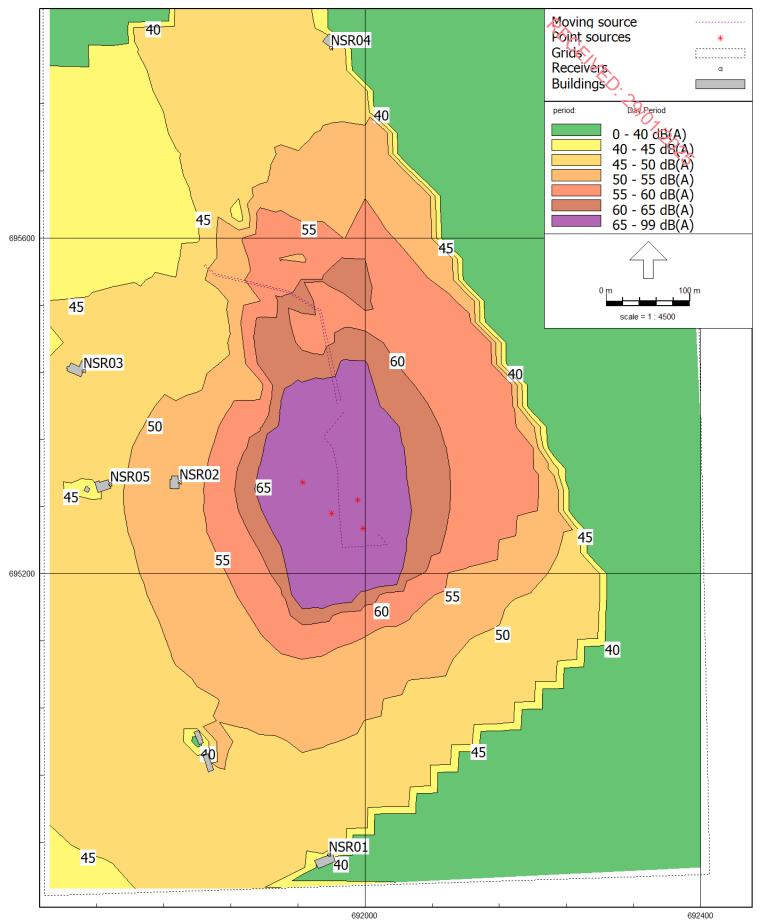
ARCRINED. 29/07/2025

E2123

Input	: - Sc	ources and	Receivers	s - Scenari	io C				PA		
Model:		PR Phase 3 1st b		C					C)	_	
Final - RFI - Area  Group: (main group) Listing of: Receivers, for method Industrial noise - ISO 9613						LED					
Name	Desc	. Terrain L	HDef.	Height A	Height B	Height C	Height D	Height E	Height F	Façade	)_
NSR01		183.38	Relative	1.50	4.00					Yes	9,
NSR02		168.98	Relative	1.50	4.00					Yes	107
NSR03		158.17	Relative	1.50	4.00					Yes	1/3
NSR04		175.75	Relative	1.50	4.00					Yes	500
NSR05		163.81	Relative	1.50	4.00					Yes	75

### PECENED. 201012025

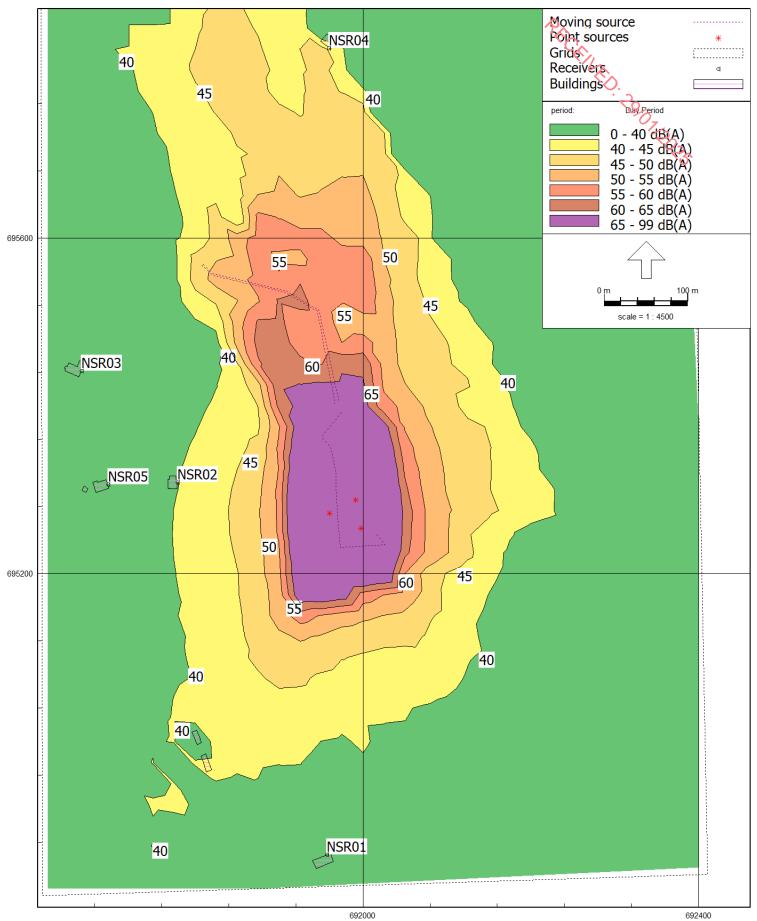
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PECENED. 29018085

## APPENDIX 11-3-2

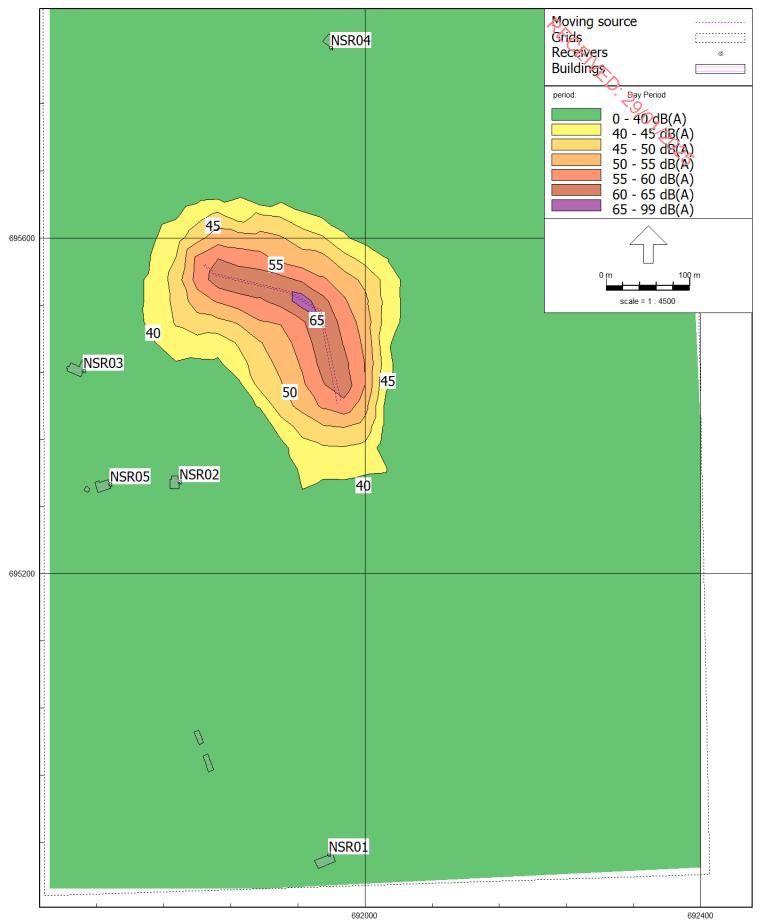
20 Jan 2025, 10:53



# APPENDIX 11-3-3

PECENED. 29018085

20 Jan 2025, 10:02



## PRCENED. 2010/2025

### E2123

### Results - Scenario A

Table of Results

Report: Model: LAeq: Group: Group Reduction: PR Phase 3 1st bech - Scenario A total results for receivers

(main group) No

Ivaille						
Receiver	Description	X	Y	Height	Day	
NSR01 A		691957.36	694865.55	1.50	46.1	_
NSR01 B		691957.36	694865.55	4.00	46.6	
NSR02 A		691778.97	695308.58	1.50	51.1	
NSR02 B		691778.97	695308.58	4.00	52.2	
NSR03_A		691664.83	695441.65	1.50	46.7	
NSR03_B		691664.83	695441.65	4.00	47.4	
NSR04_A		691959.82	695826.20	1.50	44.6	
NSR04_B		691959.82	695826.20	4.00	46.8	
NSR05_A		691696.35	695306.55	1.50	48.8	
NSR05 B		691696.35	695306.55	4.00	49.5	

ARCHINED. 29/07/2025

### PECENED. 29012025

### E2123

### Results - Scenario B

Table of Results

Report: Model: LAeq: Group: Group Reduction: PR Phase 3 1st bech - Scenario B total results for receivers

(main group) No

ivanie					
Receiver	Description	X	Y	Height	Day
NSR01 A		691957.36	694865.55	1.50	35.7
NSR01 B		691957.36	694865.55	4.00	36.2
NSR02 A		691778.97	695308.58	1.50	38.8
NSR02 B		691778.97	695308.58	4.00	39.8
NSR03_A		691664.83	695441.65	1.50	34.5
NSR03_B		691664.83	695441.65	4.00	34.9
NSR04 A		691959.82	695826.20	1.50	39.3
NSR04_B		691959.82	695826.20	4.00	43.4
NSR05 A		691696.35	695306.55	1.50	36.5
NSR05_B		691696.35	695306.55	4.00	36.9

ARCHINED. 29/07/2025

PECENED. 201012025

### E2123

### Results - Scenario C

Table of Results

Report: Model: LAeq: Group: Group Reduction: PR Phase 3 1st bech - Scenario C total results for receivers

(main group) No

Name					
Receiver	Description	X	Y	Height	Day
NSR01 A		691957.36	694865.55	1.50	15.5
NSR01 B		691957.36	694865.55	4.00	16.4
NSR02 A		691778.97	695308.58	1.50	23.6
NSR02_B		691778.97	695308.58	4.00	26.4
NSR03_A		691664.83	695441.65	1.50	32.0
NSR03_B		691664.83	695441.65	4.00	32.7
NSR04_A		691959.82	695826.20	1.50	24.6
NSR04_B		691959.82	695826.20	4.00	26.7
NSR05_A		691696.35	695306.55	1.50	26.7
NSRO5 B		691696 35	695306 55	4 00	27 3

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PECENED. 29018085

## **APPENDIX 11-4**

Noise Monitoring 2024

Appendix 11-4

May 24

### **NOISE CHARTS AND PLATES**

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The SLM is Type 1 and equipped with Frequency Analysis Software.

The monitoring equipment was calibrated prior to and following the measurement period using a:

BK 4231 field calibrator.

Broadband noise levels were measured using the A-weighted network, and a fast-sampling interval, unless otherwise stated.

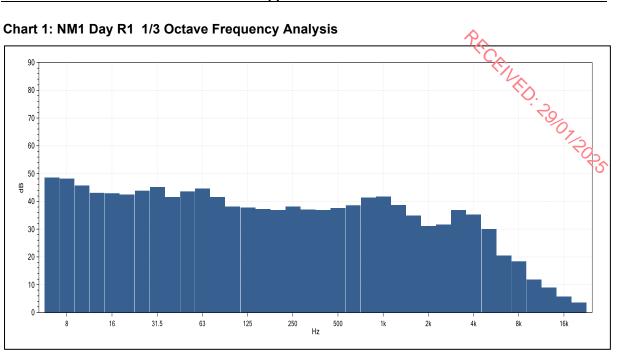
**Table 1: Calibration of the Sound Level Meter** 

SLM	Calib. Time	Calib. Input	Calib. Type	Sensitivity [mV/Pa]	dB Range]	Calibrator Used	Serial No.
NTI	29/06/2023 09:11	Top Socket	External reference	48.4	0-100	BK4231	2217952





Chart 1: NM1 Day R1 1/3 Octave Frequency Analysis





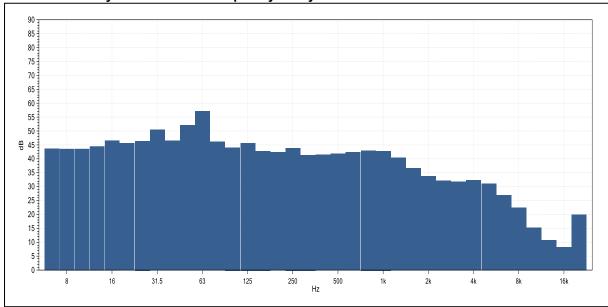






Chart 3: NM2 Day Run 1 1/3 Octave Frequency Analysis

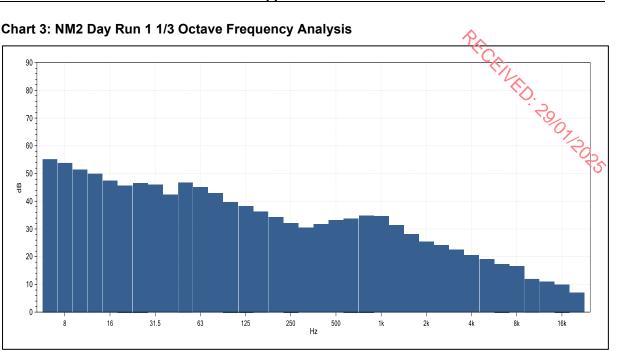


Chart 4: NM2 Day Run 2 1/3 Octave Frequency Analysis

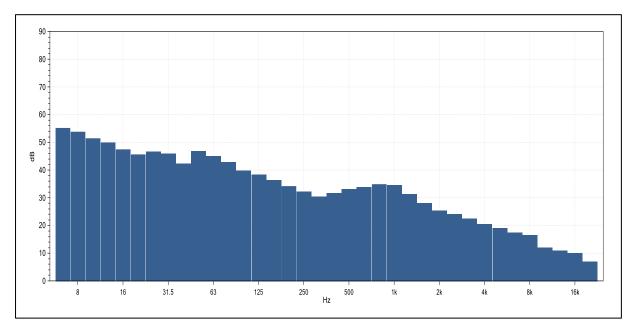
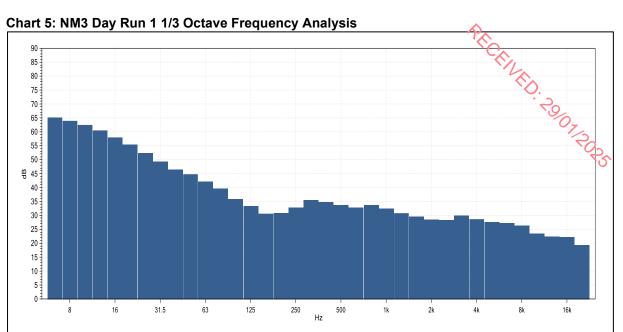
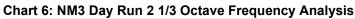






Chart 5: NM3 Day Run 1 1/3 Octave Frequency Analysis





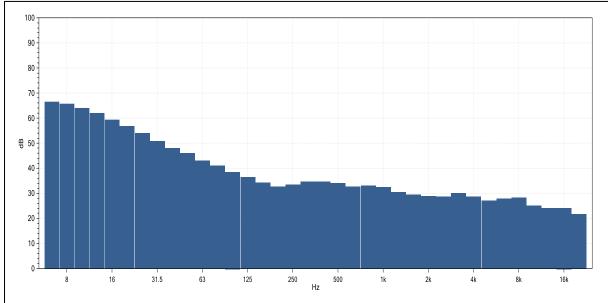
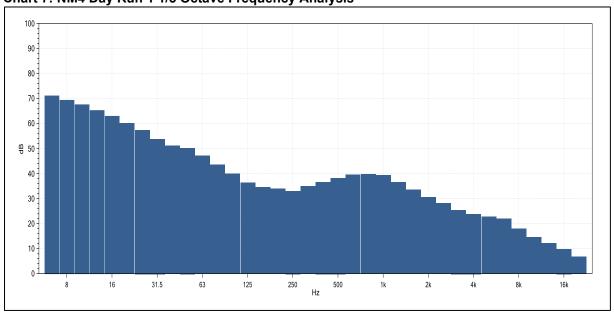
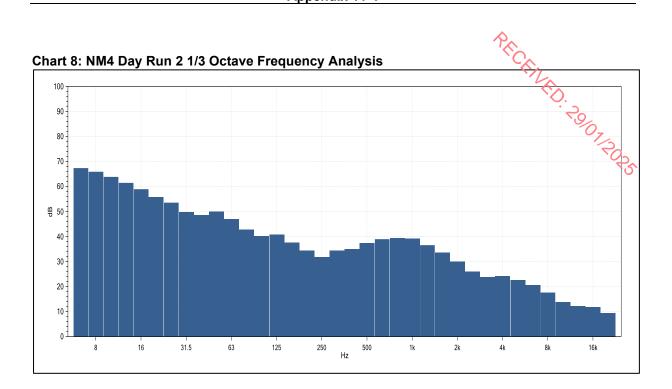


Plate 4: NM4 location



Chart 7: NM4 Day Run 1 1/3 Octave Frequency Analysis





PECENED. 29018085

## PRICENED: 29/07/2025

### **APPENDIX 13-1**

### RECORDED MONUMENTS IN THE STUDY AREA

WI021-002---- Ballylion Lower Enclosure

PROTED. 29/07. Situated on level ground overlooking a gentle SW-facing slope to the Carriggower River (300m. to the SW). Rectangular enclosure (dims. c. 35m x c. 45m) shown on the 1838 OS 6-inch map. Not visible at ground level.

### WI021-003---- Ballylion Lower Enclosure

Situated on a gentle SE-facing slope overlooking a steep drop to Donard Brook (100m to the SE). Circular enclosure (diam. c. 45m) shown on the 1838 OS 6-inch map. Not visible at ground level.

### WI021-016---- Whitestown Lower Redundant record

Listed in the SMR (1986) as 'Miscellaneous' on the basis that Whitestown House might be the location of a pre-1700 structure or castle site. There is no evidence of any archaeological material here.

### WI021-017001- Castleruddery Upper Cairn – unclassified

One of two unclassified cairns on a gentle W-facing slope overlooking a steeper slope with good views to W. Listed in the RMP (1986) as 'Hut sites - possible'. A subcircular area (diam. c. 13m NW-SE; c. 11m NE-SW) defined by a contiguous ring of large granite stones (L 1.5-1.8m) described by Leask (NMI/OPW Topographical files, undated) as a cairn circle comprising as many as 24 stones. Another unclassified cairn (WI021-017002-) lies 12m to the S. A third unclassified cairn (WI021-017003-) lies c. 140m to the NNE.

### WI021-017002- Castleruddery Upper Cairn – unclassified

One of two unclassified cairns on a gentle W-facing slope overlooking a steeper slope with good views to W. Listed in the RMP (1986) as 'Hut sites - possible'. A circular area (diam. c. 18m) defined by a number of granite stones. Another unclassified cairn (WI021-017001-) lies 12m to the N. A third unclassified cairn (WI021-017003-) lies c. 140m to the NNE.

### WI021-017003- Castleruddery Upper Cairn – unclassified

On top of a N-S ridge. A poorly preserved circular area (diam. 11.9m) defined by a number of granite stones. Two unclassified cairns (WI021-017001-, WI021-017002-) lie c. 140m to the SSW.

### WI021-018---- Deerpark Ringfort - rath

Situated on a gentle S/SE-facing terrace at a break in a marked slope in forestry. Circular area (diam. 28m; max. ext. diam. 41m) defined by an earthen bank (Wth 2-3.5m; H 0.2m-1.8m) and an external flat-bottomed fosse (Wth 3.5m; D 1-1.3m). There is a counterscarp bank (max. Wth 3m; max. ext. H 1.2m) SE-W-NE. The entrance (Wth 2m) consists of gaps in both banks and a causeway across the fosse at the W; three other gaps in the inner bank appear to be modern. There is a narrow fosse (max. Wth 1.8m; D 0.4m) inside the bank in the E quadrant. Inside this is another bank (Wth 3m; H 0.4m) attached to the fort bank at the SE and NE and curving inwards. It has a centrally placed gap (Wth 2m) and its purpose and date are unknown. No other internal features.

WI021-025---- Castleruddery Lower Castle - unclassified

On level ground on the summit of a flat-topped ridge. Listed as 'Castle possible, site' in the RMP (1995). Described in the OS Letters (O'Flanagan 1928, 91) as a former castle 'where Castleruddery House stands'. Not visible at ground level.

### WI021-026---- Castleruddery Lower Enclosure

Situated at the base of an elongated natural hollow. Circular platform (diam. 44m; H2-2.5m) with a slightly dished summit (diam. 36m) defined by a partly natural, wide flat-bottomed 'fosse'. No indication of a bank, entrance or internal features.

### WI021-029---- Castleruddery Lower Enclosure

Situated on level ground in gently undulating terrain. Circular enclosure visible as a cropmark on aerial photograph (CUCAP, BDR 29). Not visible at ground level

WI021-030---- Castleruddery Upper Delisted Not included in RMP or SMR.

### WI021-031---- Castleruddery Upper Designed landscape feature

On the summit of a low ridge with higher ground to the E and a steep slope to the W in an area with other designed landscape features (WI021-030----, 40m to the SW and WI021-084----, 110m to the NE). Listed in the SMR (1986) as a fish pond and named 'Lead pond' on the 1st ed. OS 6-inch map. A long rectangular area (max. dims. 110m x 22m) defined by a steep, wide, earthen bank (Wth 8m; H 1.6-2m) which also encloses the terminals. The sunken central area is c. 3.5m below the top of the banks and is flat.

### WI021-032---- Castleruddery Lower Stone circle - embanked

National Monument in state ownership No. 441. Situated on a natural rise with gentle slopes to S, W and E and overlooking the River Slaney (250m to the S). The stone circle (diam. 30m) consists of large boulders, originally contiguous, some standing upright and others erected on their long axis. The circle is largely intact at the N but is less well-preserved to the S. It consists of twenty-nine substantial stones and a number of smaller fragments with some loose boulders occurring in the interior which is otherwise featureless. Wedge marks and boreholes in several stones indicate deliberate destruction. The entrance (Wth 1.3m) appears to be between two exceptionally large quartz boulders (L 2.4m and 3m; Wth 1.2m and 1.8m) at the E. Abutting onto the outer face of the circle is an earthen bank (diam. 40m; Wth 4.5m; max. H 1m), the terminals of which encompass the quartz boulders of the entrance. Some boulders along the outer edge of the bank may indicate an outer revetment. To the E of the entrance (at 15.8m) is a single upright stone. A field bank cuts across the outer edge of the bank at the S. The site occurs centrally within a well-defined cropmark enclosure (diam. c. 80m; CUCAP, BDR039) defined by a fosse (Wth c. 4-5m). Between this and the earthen bank is a narrower cropmark defined by a trench or narrow fosse (diam. c. 50m; Wth c. 1m).

### WI021-035---- Kelshamore Ritual site - holy well

Situated on a marked S-facing slope in rocky terrain. Natural spring with no associated features still regarded locally as a holy well. The name means 'well of the rocks' (tobar na carraige).

### WI021-069001- Donaghmore Church

Situated on a gentle SE-facing slope overlooking the River Slaney. An early church is mentioned in the twelfth century and formed part of the diocesan lands of Glendalough. After 1216 it became part of an episcopal manor and was subsequently granted to the dean of St Patrick's in Dublin (MacNeill 1950, 128-9). The church appears to have formed part of a small borough (WI021-069002-). Not visible at ground level; the present church was erected in 1711. Test trenching (Excavation Licence 08E0068) carried out in 2008 to the S of the church did not reveal anything of archaeological significance.

EIAR Appendix 13-1 Deerpark Quarry Herbie Stephenson. Deerpark, Co. Wicklow

WI021-069003- Donaghmore Church

WI021-069003- Donaghmore Church
Situated on a gentle SE-facing slope overlooking the River Slaney. A rectangular graveyard (52m E-W; 48m N-S) which may be the site of an early church (WI021-069001-) associated 1-, ROOT ROOM with the borough of Donaghmore; the present church was erected in 1711.

### PECENED: 29/07/2025

### **APPENDIX 13-2**

### SITES IN THE SITES AND MONUMENTS RECORD (SMR) WITHIN THE STUDY AREA

WI021-081---- Ballylion Lower Ogham stone

This record relates to the original location of the ogham stone at Donard (WI021-004----). We was recorded by Price as originating 'just near' an uninscribed pillar stone (WI021-082----) in the townland of Ballylion Lower (Corlett and Weaver 2002, 541). Its original position is recorded by Macalister (1945, 52) as '1 foot 6 inches' (0.45m) from the standing stone. It is a rectangular block of stone (dims. 1.52m x 0.68m x 0.53m) now located in the village of Donard. Macalister (1897, 77) describes the inscription as 'much worn and damaged. . . After it turns on to the top *nothing definite can be stated'*. He read the inscription as IAQINI KOI MAQI MUC ...

WI021-084---- Castleruddery Upper Designed landscape feature

On level ground in a marshy area at the foot of a steep W-facing slope with higher ground on all sides. A rectangular feature defined by a wide bank (Wth 10m) with an external fosse at the NW end. Internally there are 6 pits in two rows of three, each joined to the next by a ditch. Another designed landscape feature (WI021-031----) lies c. 100 to the SW.

1

## PECENED. 29/07/2025

### Report on a Geophysical Survey at Deerpark, Donard, Co. Wicklow





By Jeff O'Neill
With contributions by Finn Melia
Detection Device Consent No.: 24R0466

For Herbie Stephenson Ltd

December 2024

AMS Job No.:

**Project Name:** 

TITLE PAGE

J3488

Deerpark, Donard, Co. Wicklow

Report on a Geophysical Survey at Deerpark, Donard, Co. Wicklow **Report Title:** 

**Client Name:** Herbie Stephenson Ltd

Townland Name(s): Deerpark, and Donaghmore

**Grid Reference (ITM):** 692024 695266

**Detection Consent No.:** 24R0466

Date of Survey: 23-24 September and 3 October 2024

**Report Status/Revision:** 1.5

**Revision Date:** 3 December 2024

Jeff O'Neill **Report Author:** 

**Contributor:** Finn Melia

**Technical Reviewer:** Dr James Bonsall

**Copyeditor:** Bryn Coldrick

**Approved By:** Dr James Bonsall

Date of Issue: 3 December 2024

File Name: J3488 Deerpark Geophysical Report v.1.5.docx

i

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Name	Organisation	Role
Jeff O'Neill AMS Ltd		Archaeological Geophysical Supervisor
Finn Melia	AMS Ltd	Archaeological Geophysical Surveyor
Herbie Stephenson	Herbie Stephenson Ltd	Client/Landowner Liaison

# **Executive Summary**

This report describes the results of an archaeological geophysical survey within Lands Made Available (LMA) at Deerpark, Donard, Co. Wicklow. The geophysical survey was required as part of an archaeological assessment.

The Study Area consists of 8.5 hectares in total, located in the townlands of Deerperk and Donaghmore, the survey was confined within the LMA.

The areas surveyed as part of this project yielded generally strong responses that revealed a range of possible archaeological features. In addition to commonly detected small pit-like features and historic field boundaries, approximately seven anomalies of potential archaeological significance were identified. These included large linears and curvilinears. However, the varying strengths of the magnetic contrasts suggest different levels of subsurface disturbances or material composition, complicating interpretations as the anomalies may be from archaeological, modern or natural origins.

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# **Abbreviations and Acronyms**

Abbreviation/Acronym	Definition
AMS	Archaeological Management Solutions
DIER	Database of Irish Excavation Reports
ECa	Electrical Conductivity
EMI	Electromagnetic Induction
ERa	Apparent Electrical Resistivity
ERI	Electrical Resistivity
GIS	Geographic Information System
НСР	Horizontal Coplanar
ITM	Irish Transverse Mercator
LMA	Lands Made Available
MSa	Apparent Magnetic Susceptibility
NIAH	National Inventory of Architectural Heritage
NMI	National Museum of Ireland
NMS	National Monuments Service
os	Ordnance Survey
SMR	Sites and Monuments Record
WMS	Web Map Service

# **Coordinate Reference System**

All grid coordinates in this report use the Irish Transverse Mercator (ITM) coordinate reference system unless otherwise stated.

# 1 Introduction

### 1.1 Project Background

This report describes the results of an archaeological geophysical survey carried out within Lands Made Available (LMA) at Deerpark, Donard, Co. Wicklow (Figure 1). The geophysical survey was required as part of an archaeological assessment for a proposed quarry extension.

The Study Area consists of 8.5 hectares in total, located in Deerpark and Donaghmore townlands and the surveys were confined within the LMA. Access to the lands for the purposes of the survey was arranged by agreement between the archaeological consultant, Herbie Stephenson Ltd and the landowners. The archaeological geophysical survey was undertaken on behalf of Herbie Stephenson Ltd and comprised electromagnetic induction (EMI) survey in areas of the proposed quarry extension.

#### 1.2 Site Location

The survey areas were located in the townlands of Deerpark and Donaghmore, Co. Wicklow (Figure 1). The maximum area investigated was approximately 8.5 hectares, spread across nine grassland fields (identified here as D-1 through to D-9).

### 1.3 Soils and Geology

The local soil consists of well-draining fine loamy drift with siliceous stones. The quaternary primarily comprises till derived from granites (through fields D-4 through to D-8), with the northernmost fields (D-1 through to D-3) comprised of bedrock outcrop or subcrop. The bedrock consists of andesite and andesitic tuff (Donard Andesite Member; GSI 2024).

### 1.4 Ordnance Survey Mapping

Historical mapping for the site indicates that the current field boundaries were all present on the earliest Ordnance Survey (OS) mapping, with few changes occurring since (Figure 5). In the survey area on the first-edition six-inch OS map, field D-3 had an additional division into two fields, while D-5 and D-6 were one field rather than the two they are presently (Figure 5).

### 1.5 Recorded Archaeological Sites

There are no archaeological sites listed in the Sites and Monuments Record (SMR) within the survey area (Figure 3). There are four SMR sites located within 500m of the survey areas (see Table 1 below and Figure 3).

Table 1. SMR sites located within 500m of the Geophysical Survey Area

Ref No.	Description	Townland	SMR ZoN Proximity	
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WI021-017003- Cairn - unclassified		Castleruddery Upper	Located 213m southwest of D-6
WI021-017001-	Cairn - unclassified	Castleruddery Upper	Located 347m southwest of D-6
WI021-017002-	Cairn - unclassified	Castleruddery Upper	Located 354m southwest of D-6
WI021-084	Designed landscape feature	Castleruddery Upper	Located 492m southwest of D-6

# 1.6 Purpose and Scope of the Assessment

The purpose of the geophysical survey was to identify any potential archaeological deposits that might be present in the survey area using the following objectives:

- Identify any geophysical anomalies of possible archaeological origin within the specified survey areas.
- Accurately locate these anomalies and present the findings in map form.
- Describe the anomalies and discuss their likely provenance in a written report.
- Incorporate all of the above in reports to the Client.
- Prepare and submit archives of the project data and reports.

# 1.7 NMI Topographical Finds

There are no stray finds recorded in the National Museum of Ireland's (NMI) online Finds Database, as available on Heritage Maps, within the immediate area of the proposed development.<sup>1</sup>

#### 1.8 Built Heritage

There are no sites listed on the National Inventory of Architectural Heritage (NIAH) or the Record of Protected Structures (RPS) within the survey areas.

<sup>&</sup>lt;sup>1</sup> https://heritagemaps.ie/WebApps/HeritageMaps/index.html this database only includes finds recorded in the National Museum of Ireland's (NMI) topographical files up to 2010 and is often found to be inaccurate and unreliable. [Accessed: 02 October 2024].

# 2 Methodology

### 2.1 Personnel

The survey was undertaken by Jeff O'Neill (Archaeological Geophysical Supervisor) and Einn Meila (Archaeological Geophysical Assistant). The methodology was approved by the Archaeological Licensing Section of the National Monuments Service (NMS) and Consent to use a Detection Device under Section 2 (2) of the National Monuments (Amendment) Act, 1987, was issued to Jeff O'Neill by the Minister for Housing, Local Government and Heritage: Consent No.: 24R0466. The report was written by Jeff O'Neill and Finn Melia.

### 2.2 Electromagnetic Induction Survey

The EMI technique has a long history of successfully identifying archaeology via the collection of inphase and quadrature data (Colani 1966; Colani & Aitken 1966; Howell 1966) to characterise the magnetic and conductivity properties of the underlying soil.

#### 2.2.1 Data Capture

The EMI data were acquired using a GF Instruments CMD Mini-Explorer (Bonsall et al. 2014). The instrument collected both quadrature (later referred to here as apparent electrical conductivity) data and inphase data simultaneously. An apparent electrical conductivity (or ECa) survey produces data which are the reciprocal of apparent electrical resistivity data. Thus, a high conductivity anomaly, such as that caused by a ditch, will produce a comparable low resistance anomaly. Inphase data respond to the magnetic content of the underlying soil, as such inphase data are similar to magnetic susceptibility data; it is referred to here as apparent magnetic susceptibility (MSa).

The horizontal coplanar (HCP) configuration (in the vertical dipole orientation or the 'full depth' range) was used (as opposed to the half depth range offered by the horizontal dipole orientation ('Low') option). The depth range for the vertical dipole (recording data from three levels simultaneously) is 0.5m, 1.0m and 1.8m below the sensor. Quadrature data were acquired in mS/m to a resolution of 0.1 mS/m, and the inphase data were acquired in ppt to a resolution of 0.1ppt.

The CMD Mini-Explorer was mounted on a cart and acquired data gridlessly connected to a Carlson BRX7 GNSS Smart Antenna RTK GPS, achieving a spatial resolution of 0.1m accuracy. The data were collected along traverses spaced 0.5m apart, with data collected every 0.3 seconds along the traverse. The data were collected in continuous mode by a time-based sample trigger connected via Bluetooth to the instrument and the RTK GPS. The data were stored in an automatic data logger and downloaded to a field computer.

#### 2.2.2 Data Processing

The ECa data were automatically converted to apparent electrical resistivity (or ERa) data in GF Instruments CMD PC download Software and are displayed in ohm metres. Both ERa and MSa data were gridded in Surfer to a spatial resolution of 0.5m x 0.25m.

#### 2.2.3 Data Visualisation

The data were brought into QGIS as a GeoTIFF for display and interpretation as greyscale images. The analysis of archaeological features using horizontal coplanar (HCP) conductivity and inphase derived data is somewhat complicated due to a signal polarity change. The polarity shift in HCP occurs at depths greater than 1m. This means that the polarity of data from HCP Level 3 at a depth of investigation of 1.8m is reversed, i.e., low conductivity/magnetic susceptibility anomalies appear high and vice versa. It is worth noting that this polarity change is an inherent characteristic of HCP coils and has been well documented over the last 50 years by various studies (Tabbagh 1986; Linford 1998). Despite this potential confusion, the polarity shift does not hinder the ability to differentiate between anomalous contrasts and background responses, and all the datasets presented still reveal clear archaeological features.

#### 2.3 Data Management, Processing, and Interpretation

This project used QGIS (Version 3.22.14) as a Geographical Information System (GIS) to manage the project. QGIS is an open-source GIS which can be used to create, edit, visualise, analyse and publish geospatial information.<sup>2</sup> This project used the long-term release version of the software (3.22.14) as the basic platform to access, view and analyse the geophysical visualisations produced in Magneto. QGIS also allowed us to compare the visualisations with other relevant geospatial databases, record the analysis through digitising the morphology and magnitude of anomalies identified, and output a table catalogue of this analysis and corresponding maps.

For the purposes of this project, the following datasets were also accessed and/or downloaded:

- Tailte Éireann historical maps and orthographic photographs of the Study Areas, viewed online;<sup>3</sup>
- Sites and Monuments Record (SMR) point and polygon vectors as a Web Map Service (WMS);<sup>4</sup>
- NIAH point vector (downloaded from www.archaeology.ie);

<sup>&</sup>lt;sup>2</sup> QGIS. Quantum GIS v3.22.14. <a href="https://www.qgis.org/en/site/">https://www.qgis.org/en/site/</a> [Accessed 10 October 2024].

<sup>&</sup>lt;sup>3</sup> Accessed from: https://maps.archaeology.ie/HistoricEnvironment/ [Accessed 8 October 2024].

<sup>&</sup>lt;sup>4</sup> SMR data accessed from: <a href="https://data.gov.ie/dataset/national-monuments-service-archaeological-survey-of-ireland">https://data.gov.ie/dataset/national-monuments-service-archaeological-survey-of-ireland</a> [Accessed 10 October 2024].

- Rivers and lakes as a WMS (downloaded from https://gis.epa.ie/GetData); CENED. 29/07/2025
- National soils database as a vector layer (downloaded from https://gis.epa.ie/GetData/Download);
- Townlands vector layer.<sup>5</sup>

The following vector layers were generated for the project:

- A polygon for the Survey Area.
- Polygons for each identified geophysical anomaly.

The dimensions of individual anomalies were calculated in QGIS using the measure tools. All anomalies are defined by polygons.

#### 2.4 Standards

The geophysical survey and report follow the recommendations outlined by relevant best practice guidance documents as a minimum standard (Bonsall et al. 2014; David et al. 2008; Gaffney et al. 2002; Schmidt et al. 2015). Geophysical data, shapefiles, figures and the text have been archived following the recommendations of the Archaeology Data Service (Schmidt & Ernenwein 2011). Raw geophysical data and GIS shapefiles are available in the archive.

<sup>&</sup>lt;sup>5</sup> Vector layer downloaded from: www.townlands.ie; townland names confirmed against the OS townlands list from https://data.gov.ie/dataset/townland.

# 3 Geophysical Survey Results

There were seven anomalies identified in the survey area, predominantly consisting of linear and curvilinear anomalies as well as some potential pit-like features. The weakly contrasting linear anomalies (such as D-4-Res-02 and D-5-In-01) are approximately 50m to 120m in length and may represent features such as ditches or boundaries from a pre-OS map field system. Their weak signal suggests they could be near-surface geological formations or subtle variations in the soil.

There were some field boundaries that were visible on all previous historical OS maps.

Curvilinear anomalies, such as D-6-Res-01, extends for 123m and may indicate larger features such as ditches or palaeochannels. However, the possibility of these being interference from modern elements like underground pipes cannot be ruled out.

Table 2. Electrical conductivity survey identified anomalies

Anomaly ID	Anomaly Type	Size	Description	Interpretation
D-2-Res- 01	? Archaeology	53m x 3m	Linear anomaly	This is a linear anomaly running north–south.
D-4-Res- 01	? Archaeology	56m x 4m	Curvilinear anomaly	This is a curvilinear anomaly running east—west.
D-4-Res- 02	? Archaeology	76m 3.5m	Faint Linear anomaly	This is a linear anomaly running in a northwest—southeast direction and may represent a possible ditch.
D-5-In-01	? Archaeology	112m x 6m	Faint linear anomaly	This is running in an east–west direction and may represent a possible ditch.
D-5-In-02	? Archaeology	108m x 4m	Faint linear anomaly	This is running in an east–west direction and may represent a possible ditch.
D-6-Res- 01	? Archaeology	123m x 42m	Faint curvilinear anomaly	This may represent a large ditch feature or possible geological disturbance.
D-6-In-02	? Archaeology	27m x 4.5m	Curvilinear anomaly	This is running in an east—west direction and may represent a possible ditch.

#### 4 Conclusions and Recommendations

The Electromagnetic Induction survey effectively characterised the extent of potential archaeological deposits across the site. The seven areas surveyed as part of this project yielded generally strong responses that revealed a range of possible archaeological features. In addition to commonly detected small pit-like features and historic field boundaries, seven anomalies of potential archaeological significance were identified.

Notable features include several curvilinear and rectilinear anomalies such as D-4-Res-01. These anomalies may indicate the presence of possible enclosing elements or may represent pre-OS field systems. Additionally numerous linear anomalies were also identified, such as D-2-Res-01 and D-5-In-02, which may represent ditches or pre-OS field systems.

In summary, this survey has identified a mix of anomalies that may represent potential archaeological features, modern disturbances, and natural geological formations. The varying strengths of the magnetic contrasts suggest different levels of subsurface disturbances or material composition, complicating interpretations as the anomalies may be from archaeological, modern or natural origins.

Please note that the National Monuments Service of the Department of Housing, Local Government and Heritage, the National Museum of Ireland and the local planning authority may issue recommendations/conditions.

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# **Figures**

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