ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR)

PERMISSION FOR THE EXTRACTION OF SAND & GRAVEL
AT
ROOSKAGH TOWNLAND,
BELLANAMULLIA (BEALNAMULLA),
ATHLONE,
CO. ROSCOMMON

Applicant:

Mr. Eamon Harney

Issued 16th September 2022

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

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PREAMBLE

SCOPE OF THE ENVIRONMENTAL IMPACT ASSESSMENT

Environmental Impact Assessment will be carried out by Roscommon County Council using the information and findings included in the EIAR. The planning and development regulations require the preparation of an EIAR and the scope has been the subject of consultation with Roscommon County Council and the Environmental Authorities

was undertaken in accordance with the current EIAR regulations as amended. These regulations provide an indication of the need for an EIAR. The proposed development requires for Environmental Impact Assessment report and the scope has been agreed with Roscommon County Council arising out of preplanning consultation in accordance with the current EIA and Planning regulations.

Each report from various topics considers the following:

- ✓ Baseline studies
- ✓ Identification of potential impacts
- ✓ Evaluation and significance of those impacts
- ✓ Mitigation measures where required

The purpose of the mitigation measures is to ensure the that the development could be undertaken without creating any significant or unacceptable adverse impacts on the environment.

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PLANNING POLICY FRAMEWORK

The subject site is within the administrative area of Roscommon County Council and the current County Development Plan 2014 to 2020 Our assessment demonstrates that the proposed development accords with the policies of the County development plan.

By their nature, aggregates can only be worked where they occur. The cost of haulage affects economic competitiveness in this sector and accordingly the extractive industries seek to locate in proximity to developing settlements and major existing and proposed roads, thus minimising haulage costs. Extractive industries can also give rise to detrimental environmental and residential amenity effects including traffic congestion, dust, noise/vibration, water pollution, visual intrusion and the effects on local road networks may also be significant. It is recognised extractive industry has an important function in the economy of the county and, furthermore, that the rural based nature of the quarrying/extractive industries offers opportunities for part-time farming to continue with quarrying providing valuable off-farm income. The Council recognises the importance to the economy of County Roscommon of mapping and identification of areas with aggregate potential, both in terms of cost-effective aggregates and avoiding sterilisation of resources. The Council will seek to identify the location of major aggregate deposits and will safeguard valuable un-worked deposits for future extraction. The Council seeks to ensure that the extractive and concrete products industry follows an environmental code of practice, in order to minimise potential adverse impacts on the environment and local communities. In considering development applications relating to existing or proposed quarries, the Council will take full account of; 'Quarries and Ancillary Activities: Guidelines for Planning Authorities' (DECLG, 2004). When considering quarry and associated developments, the Council will have regard to the protection of residential and natural amenities, the prevention of pollution and the safeguarding of aquifers and groundwater. The development of new quarries will be strictly controlled in areas of high landscape value, on European sites, Natural Heritage Areas (NHAs), Nature Reserves or other areas of importance for the conservation of flora and fauna, or in areas of significant archaeological potential. The policy framework for the development of quarries is set out in sections 6.5 and 12.21 of the county development plan.

- Economic Development Roscommon County Development Plan 2014-2020
- Page 69 Policies in relation to Mineral Extraction and Quarries
- Policy 3.53 Protect all known unworked deposits from development that might limit their scope for extraction.

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- Policy 3.54 Ensure adequate supplies of aggregate resources to meet future growth needs of the Country, facilitate the exploitation of such resources where there is a proven need and market opportunity for such minerals or aggregates, and ensure that this exploitation of resources does not adversely affect the environment or adjoining existing land uses.
- Policy 3.55 Encourage the reuse of worked out quarries for recreational, appropriate commercial, ecological, and other uses, following appropriate restoration.
- Policy 3.56 Require development proposals on or in the proximity of quarry sites, to carry out appropriate investigations into the nature and extent of old quarries (where applicable). Such proposals shall also investigate the nature and extent of soil and groundwater contamination and the risks associated with site development works together with appropriate mitigation.
- Policy 3.57 Protect areas of geomorphologic interest, groundwater and important aquifers, important archaeological features and Natural Heritage Areas from inappropriate development.
- Policy 3.58 Have regard to evolving best environmental management practice as set out in Environmental Protection Agency (EPA) Guidelines 'Environmental Management in the Extractive Industry: Non-Scheduled Minerals'
- Policy 3.59 Ensure that the extractives industry minimises adverse impacts on the road network in the area and that the appropriate cost of road improvements which are necessary to facilitate extractive industries are borne by the industry itself
- Policy 3.60 Ensure that the extraction of minerals or aggregates does not adversely impact on residential or environmental amenity of the landscape including the safeguarding of aquifers and groundwater resources.
- Policy 3.61 Ensure that all projects associated with the extractive industry carry out screening for Appropriate Assessment in accordance with Article 6(3) of the Habitats Directive, where required. Objectives in relation to Mineral Extraction and Quarries

It is important to note about the proposed development the following should be considered that there is no available sand in the Athlone area. The closest sand pits in the region are in Dunmore in County Galway and Rochfordbridge, County Westmeath. Each of these sources are outside the County of Roscommon and is at least 50 KM from Athlone.

Two separate planning permission in Athlone town has planning permission for more than 1,000 homes which both are about to commence in the near future. The demands created by these projects alone will

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CHAPTER 1

INTRODUCTION

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INTRODUCTION

1.1 This Environmental Impact Assessment Report (EIAR) provides supporting information to accompany a planning application to Roscommon County Council submitted by Eamon Harney, in respect of his land at Rooskagh townland, Bellanamullia (Bealnamulla), Athlone, Co.Roscommon

1.2 The application site extends to 6.96 hectares – refer to Appendix 1

1.3 The proposed development being applied for under this current planning application is shown in Appendix 1 and will consist of

- The excavation of 466,766 cubic meters of sand and gravel over 10 years.
- Excavation over the area to a general depth varying from 49m along the eastern boundary to a depth of approximately 51m AOD on the western boundary.

1.4 The EIAR is made in accordance with the requirements of Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment and transposing national legislation.

THE SITE

SITE LOCATION

1.5 The lands which are the subject of this application comprise c6.96 hectares and are in the townlands of Rooskagh townland, Bellanamullia (Bealnamulla), Athlone, Co. Roscommon (refer to Appendix 1). The ITM coordinates for the site are 597459, 741237. The proposed development is located wholly within the red line.

1.6 The lands proposed for the extraction of sand / gravel is accessed via a private road and enters onto the L2025 which is an authorised access. The proposed access is used by the concrete plant to the north and generally lands to the south. The site occupies ground with elevations ranging between 49mOD and 72.23m OD

SITE DESCRIPTION

1.7 The proposed operations comprise of the stripping and storing of existing topsoil & extraction of sand and gravel; processing (crushing and screening) of the sand & gravel to

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produce aggregates for use in the manufacture of value-added products for road construction, production of concrete products and site development works. It is intended to return the extracted area to agricultural land use following completion of extraction.

1.8 The application site relates to the site area only. Material extracted from the proposed land area is processed within the proposed extraction area using mobile processing plant. The initial area close to the entrance (Phase 1) that contains the site infrastructure will be stripped of topsoil and stockpiled on site. The initial sand and gravel will be sold to the agricultural industry for haul roads. This extracted material will not require screening and washing. This will enable the site infrastructure to be put in place. This area is also an area where there is some impermeable silt that can be used in the lining of the surface water lagoon.

SITE ACCESS

1.9 The site is located approximately 1km from Bellanamullia (Bealnamulla) and is accessed by the L2025.

1.10 The proposed lands and the processing area are located just south of the Kildea Concrete plant. These lands are strategically located for furnishing materials to the local market in particular the Athlone Area. Find attached a letter (refer to Appendix 1) from Kildea Concrete (site to the North) where an agreement has been reached subject to planning permission that Kildea concrete will take large proportion of sand for use in the manufacturing of their concrete products. This will be a planning gain in that this will result raw material entering the Kildea Concrete without the need to enter on to the public road network and will remove a substantial number of trucks from the public road network. It will also lead to cheaper raw materials, cleaner environment less emissions greater traffic safety less HGVs on the public roads in the environs. This is a sustainableform of development.

1.11 The access to the proposed site will be via a private road with shared access with Kildea Concrete and will enter on the public road approximately 172 metres from the northeast corner of the proposed sand & gravel pit.

1.12 All traffic enters the site via the site office and weighbridge and runs over a macadam road surface up to the infrastructure area in the centre of the processing area.

1.13 All traffic exits the site via the weighbridge (located at the site office).

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SURROUNDING LAND USE

1.14 The site area is surrounded by agricultural lands (improved agricultural grassland and arable), private dwellings and concrete batching plant.

1.15 Residences within the general area consist of one-off rural houses, farmsteads with some ribbon development along the local road network – refer to EIAR Chapter 4 Population and Human Health.

THE APPLICANT

1.16 The applicant, Mr Eamon Harney is the landowner and proposes if permission is granted to develop the facility in due course.

EIA SCREENING

1.17 Part 1 and Part 2 of Schedule 5 of the Planning and Development Regulations 2001 (as amended) set out the forms of development that require an environmental impact assessment report (EIAR).

1.18 Paragraph 2 of Part 2 of Schedule 5 refers to extractive industry and part (b) of that section states that the following requires an EIA.

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

1.20 The proposed extraction area of c6.96 Ha is greater than the default area of 5Ha for a mandatory EIA. On this basis the extraction area of the quarry exceeds the area stated under Part 2 and an EIAR is required.

EIA SCOPING

1.21 In preparing this Environmental Impact Assessment Report, consultations were had with organisations and agencies including:

- Roscommon County Council (Planning / Road & Environment Section). See attached Appendix 1 for RCC EIAR Scoping Report.
- Geological Survey of Ireland (to discuss geological heritage)
- National Parks and Wildlife Service (in respect of designated natural heritage sites).

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1.22 A pre-planning consultation meeting was held between officials of Roscommon County Council and Engineers from Collins Boyd along with the client Eamon Harney.

1.23 Other consultations and informal discussions held by contributors in undertaking their environmental impact assessments are detailed in the specialist environmental sections of the EIAR, together with details of relevant archives and documentation held by state agencies and organisations.

DIFFICULTIES ENCOUNTERED WITH EIAR COMPLICATION

1.24 This Environmental Impact Assessment Report was compiled on the basis of published regional and local data and site-specific field surveys. In general, no difficulties were encountered in compiling the required information. However, incidences where there were issues in accessing data are detailed in the various chapters.

ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR)

1.25 The principal objectives of an Environmental Impact Assessment Report are to:

- Identify and /or predict the significant effects / impacts of a development.
- Identify what mitigation measures should be incorporated into the development toeliminate or reduce the impacts.
- Interpret and communicate the above information on the impact of the proposeddevelopment, in both technical and non-technical terms.
- Assist the Planning Authority in the decision-making process with respect to the associated planning application.

FORMAT OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR)

1.26 The EIAR shall identify, describe, and assess in an appropriate manner, in the light of each individual case the direct and indirect significant effects of a project on the following factors,

(a) Population and public health

(b) Biodiversity with particular reference to species and habitats protected under directives 92/43 EEC and2009/147/EC

(c) Land, soil, water, air & climate

(d) Material assets, cultural heritage and the landscape

(e) The interactions between the above

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1.27 In preparing this document the contributors had regard to the Guidelines on the Information to be contained in EIAR published by the EPA in May 22. They also had regard to 2014/52/EU the directive on the Assessment of the effects of certain public and private projects on the environment (EIA Directive). The EIAR is sub-divided into fifteen parts. As an overview, they comprise of:

Chapter 1: Introduction / Screening / Scoping

An introduction to the development and a brief explanation of the aims and format of the EIAR. It also identifies the various professional consultants who have contributed to this EIAR and the screening / scoping process carried out.

1.28 Chapter 2: Project Description provides:

- details of the physical characteristics of the whole project, including, where relevant, demolition works, the land-use requirements during construction and operation as well asother works that are integral to the project.
- the main characteristics of the operational phase of the project e.g., nature and quantity of materials and natural resources.
- residues and emissions produced duringthe construction, operational and restoration phases of the proposed development.

Chapter 3: Alternatives

1.29 Chapter 3 provides a description of the reasonable alternatives studied by the applicant, 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.

Chapters 4 – 15

1.30 These Chapters provide detailed information on all aspects of the existing (baseline) environment, identifies, describes, and presents and assessment of the likely significant impacts of the proposed project on the environment, recommends mitigation and monitoring measures to reduce or alleviate these impacts and describes the residual impacts and conclusions. They are grouped under the following Chapters:

- Chapter 4 Population and Human Health
- Chapter 5 Biodiversity
- Chapter 6 Land, soils & Geology

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- Chapter 7 Water
- Chapter 8 Air
- Chapter 9 Climate
- Chapter 10 Noise & Vibration
- Chapter 11 Material Assets
- Chapter 12 Cultural Heritage
- Chapter 13 Landscape
- Chapter 14 Traffic & Transport
- Chapter 15 Interactions

1.31 The associated references, plates, figures and appendices are provided at the end of each Chapter 1 – 15

1.32 A "Non-Technical Summary of the Environmental Impact Statement", incorporating the above chapters, is provided as a separate and self-contained document

CONTRIBUTORS

1.33 Mr.Eamon Harney appointed Collins Boyd Engineers & Architects to prepare this Environmental Impact Assessment Report (EIAR) in support of its Planning Application for the proposed development at Rooskagh townland, Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

1.34 The contributors who have assisted in the preparation of this EIAR are identified in Table 1-1 below. Each contributor has the appropriate qualifications, experience, and competence for their topic

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TABLE 1 – 1 LIST OF CONTRIBUTORS

TOPIC	CONTRIBUTOR	COMPANY
Introduction	Eamon Collins Chartered Engineer FIEI	Collins Boyd Engineers& Architects
Description of Development	Eamon Collins Chartered Engineer FIEI	Collins Boyd Engineers& Architects
Alternatives	Eamon Collins Chartered Engineer FIEI	Collins Boyd Engineers& Architects
Population and Human Health	Eamon Collins Chartered Engineer FIEI	Collins Boyd Engineers& Architects
Biodiversity	Noreen Mc LoughlinMSc	Whitehall Environmental
Land, Soils and Geology	Darragh Musgrave Senior Geo Environmental Scientist	Viridus Consulting Ltd
Water	Darragh Musgrave Senior Geo Environmental Scientist	Viridus Consulting Ltd
Air	Mervyn Keegan B.S.c M.S.c MIoA	Aona Environmental
Climate	Mervyn Keegan B.S.c M.S.c MIoA	Aona Environmental
Noise and Vibration	Mervyn Keegan B.S.c M.S.c MIoA	Aona Environmental
Material Assets	Stephen Boyd Chartered Engineer MIEI	Collins Boyd Engineers& Architects
Cultural Heritage	Martin Byrne	Byrne Mullins & Associates
Landscape	Ronan Mac Diarmada	Ronan Mac Diarmada & Associates
Traffic and Transport	Dermot Donovan	Roadplan Consulting Ltd
Co-ordination of EIA	Eamon Collins Chartered Engineer FIEI	Collins Boyd Engineers& Architects

1.35 Each contributor has been fully briefed about the proposal and the background to it. They have also visited the site and are familiar with the local environment.

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1.36 Collins Boyd Engineers & Architects have been preparing Environmental Impact Assessment reports(previously EIS) relating to quarry developments since implementation of the EIA Directive in 1990.

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CHAPTER 2

PROJECT DESCRIPTION

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PROPOSED DEVELOPMENT

DEVELOPMENT OVERVIEW

OPERATIONAL PHASE (SAND & GRAVEL EXTRACTION AND PROCESSING)

2.1 The proposed development being applied for under this current planning application is shown in Appendix 2.

- Extraction of sand and gravel with processing of the extracted material in preparation for use in the construction industry.

2.2 Sand and gravel extracted from the lands will be processed within the lands/site.

RESTORATION

2.3 Upon the cessation of extraction operations it is proposed to return the worked lands to agricultural uses.

2.4 Where feasible, restoration of exhausted and redundant areas will be carried out at the earliest opportunity. However, it is envisaged that the majority of restoration proposals will be carried out after extraction operations at the site have ceased.

AGGREGATE RESERVE ASSESSMENT

2.5 The total recoverable reserve of sand & gravel from within the proposed extraction area is assessed at c 466,766m3

DURATION OF EXTRACTION

2.6 An outline of the proposed extraction plan and the final ground level contours is shown in Figure 2-1.

Table 2-1 Material Quantities

Material	Quantity
Topsoil / Overburden	8,300 m³
Sand & gravel	466.766 m3

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2.7 The duration of quarrying activities at the application site will largely be dictated by the rateat which approximately 466,766m3 of material is extracted from the site. There are many factors which will influence this, including, but not limited to the:

- Prevailing economic climate and related construction industry output
- Distance of construction projects from the facility (and scale of activity)
- Demand for quarry related products.

2.8 In light of these and other variables, calculation of intake rates and duration is not an exact science. It is anticipated that the average annual extraction rate will be m3

A planning permission duration of 10 years is sought for the extraction and processing period and a further 2 years to complete final restoration of the site.

SITE SCREENING

2.9 Given the location and topography of the site it is unlikely that this development will be unduly prominent given that Kildea concrete is to the north of the site and it will be screened as per the landscape assessment mitigation measures.

REMOVAL OF TOPSOIL AND OVERBURDEN SOILS

2.10 Any topsoil and overburden from the site will be stockpiled and will be used in the restoration of the quarry in a phased basis in order to return the application area to agricultural uses.

SITE DRAINAGE

2.11 A hydrological / hydrogeological assessment has been carried out taking into consideration the existing water regime at the site. It addresses mitigation measures to eliminate and/or minimise the potential impacts, if any, on surface water and groundwater – refer to Chapter 7 - Water

STABILITY OF THE QUARRY

2.12 Industry standard slope angles, bench heights, and bench widths will be used for extraction operations at the site, and this will be assessed in conjunction with the nature of the materials extracted.

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METHOD OF EXTRACTION

2.13 The material will be extracted by means of excavators and dump trucks and **no blasting** will be required as the material is sand and gravel. The invert of the extraction will ensure there is a buffer of 2-3 meters above the high water table. Rock inverts are indicated in the 4 boreholes drilled on site used to establish water table, rock levels, physical & chemical information relating to the underlying materials. This information allows the various experts make informed decisions based on science and engineering.

PROCESSING METHODS

2.14 The processing of the extracted sand & gravel, into aggregate products, will consist of crushing and screening by mobile processing plant within the application area. The operation of crushing will occur one every 6 weeks and will last for a two-week period which will occur every two months.

QUARRY WORKING HOURS

2.15 In accordance with industry guidelines quarry operations will be carried out between 8.00 – 18.00hrs Monday to Friday; or from 09.00 – 17.00 hrs Saturday. The quarry will not operate on Sundays or Bank Holidays, except in emergency situations and with the consent of the local authority.

EMPLOYMENT

2.16 The proposed development will provide employment of up to 6 people directly on-site, in addition to up to 40 indirect employees such as crushing contractors, HGV drivers, maintenance contractors, etc

2.17 The development of the site is consistent with the policies set out in the National Planning Guidelines for the sector; and the 2022-2028 Roscommon County Development plan, which recognise the requirement for:

- A secure supply of construction aggregates and related products is necessary for the continued development of the region

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- Proven aggregate reserve needed to be safeguarded for future extraction
- "Best environmental management practice" to be implemented within quarry developments.

SITE INFRASTRUCTURE

SITE ACCESS

2.18 The quarry extraction area is accessed via the local road L2025 and travel approximately 172m along a shared access where all traffic will enter the proposed lands.

SITE SECURITY

2.19 Vehicular access to the application site is from a Local Road L2025 that is c. 172meters east of the access point to the public road. There is no other vehicular access to the application site. The access gate is locked outside operational hours.

2.20 At the present time, the property boundary is secured by post and wire fencing and/or hedgerow. fencing works will be made secure on the grant of planning permission.

SITE ROADS, PARKING AND HARDSTANDING AREAS

2.21 All HGVs utilising the quarry will be confined within the Applicant's landholding.

- Trucks turn into site from the local road and access the site as described above.

2.22 Adequate car parking provision for employees and visitors is indicated on the site layout plan. Truck parking is provided on site as indicated on the site layout drawing.

WEIGHBRIDGE

2.23 In order to track and record the amount of material exiting the quarry, all HGV traffic is directed across the proposed weighbridge, the location of which are also indicated on the Proposed Site Layout Plan Sheet 1 (refer to Appendix 2).

OFFICES AND ANCILLARY FACILITIES

2.24 Ancillary facilities at the adjoining site include the main office, weighbridge & weighbridge office, canteen,toilets, refuelling pad, surface water lagoon, well, car parking

UTILITIES AND SERVICES

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2.25 Electrical power will be provided to the site via mains supply. Electricity will provide the principal source of energy for office lighting and heating.

2.26 Site based staff at the application site are contactable by mobile phone, landline and email and broadband connections to the stie office are provided via a mobile network.

2.27 On -Site wastewater will be collected from toilets & sinks in an impermeable holding tank with an alarm linked to a scada system. The contents of the tank will be emptied weekly and will be taken by a waste collector to a licensed/permitted waste facility for treatment. The treatment will consist of storage only and effluent will be transported by a registered waste collector for treatment offsite (refer to Appendix 2).

2.28 Potable water is provided to the site via a connection to the public water supply. There is a currently a waterservice on the site. Water consumption for staff will be 240 litres per day and this will be taken off the public water supply. The water used for the weighbridge and washing of sand will be constantly recycled from the surface water lagoon. This will need to be topped up because water will remain on trucks wheels and under carriage leaving the wheel wash area and water on the aggregates from washing, this would amount 300 litres daily. This proposed development will utilise less water daily than a single dwelling house.

2.29 Given the lack of combustible waste materials at this site, it is considered highly unlikely that a fire will break out during quarry operations. A range of fire extinguishers (water, foam and CO2) will be kept at the site office to deal with any localised small-scale fires which might occur. Additional fire-fighting capacity can be provided by storing water in a mobile bowser on unsealed hardstand areas around the infrastructure area. A fire safety certificate will be obtained for the proposed premises and a fire safety management plan will be prepared in conjunction with this and the operation of the quarry.

LIGHTING

2.30 Sufficient lighting is provided at the site to ensure safe operations during winter periods. Refer to Appendix 2 for details and specifications on proposed site lighting.

FUEL AND OIL STORAGE

2.31 Fuel oil will be delivered to site via fuel truck and mobile machines will fuel atop an impermeable fuel pad as shown on the site infrastructure drawing and the mobile crusher during its presence will be fuelled in-situ within the extraction area. All precautions such as training

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spill kits will be in place to ensure no risk to the environment.

LANDSCAPE AND BOUNDARY TREATMENT

2.32 Secure stock proof fencing will be erected at the quarry site along all perimeter boundaries, where required. Prior to any development within the permitted extraction area a survey of the entire property boundary will be undertaken and where necessary, new boundary fencing will be erected, existing fencing will be repaired and/or replaced and hedgerows will be strengthened or fortified by additional planting. There will be a weld mesh fence installed around the surface water lagoon and the well sump as indicated on the site infrastructure plan.

WASTE MANAGEMENT

EXTRACTIVE WASTE MANAGEMENT

2.33 Almost all products and by – products arising from the aggregate processing have commercial value. Any waste materials from the site are stored, collected, recycled and or disposed of in accordance with any requirements of Roscommon County Council.

GENERAL WASTE MANAGEMENT

2.34 The client will operate in accordance with the current codes of practice and the current waste management regulations. The guidelines states:
"minimise production of waste and where appropriate consider its beneficial use including recycling. The facility operator will deal with all waste in accordance with the relevant legislation and other controls in place, including using waste contractors with valid Waste Collection Permits.

2.35 Potential waste produced and the measures used to control it are described as follows:-

- Domestic Style Waste (Canteen Waste) – domestic waste generated at the offices and employee's facility will be collected by a licensed waste collection contractor, bi-weekly.

ENVIRONMENTAL CONTROLS

GENERAL

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2.36 Extraction, processing and ultimately restoration activities at the application site require a number of environmental controls to eliminate or minimise the potential nuisance to the public arising from the extraction and processing operations. The environmental control measures required at the site are outlined in the relevant EIAR Chapters.

2.37 Any additional control measures, which may be instructed on foot of the proposed planning application will also be implemented.

BIRD CONTROL

2.38 As the process of sand & gravel extraction is free of putrescible (food/kitchen) waste, site activities are unlikely to attract scavenging birds such as gulls and crows for the duration of works. Accordingly, it is not intended to implement any specific bird control measures on site.

TRAFFIC CONTROL

2.39 As the planning application relates to the extraction of sand and gravel all traffic will use the private road and use the local road L2025 on entering and exiting the site. The intensity of traffic can be controlled by the site office and there will be no queueing on the public road. Access along the private road is agreed between the land owners and these are formalised though right of way agreements (refer to letter in Appendix 2), demonstrating rights of way to traverse private road. The private access road will be widened to give a six metre wide carriage way and finished with a dense bitumen macadam surface.

LITTER CONTROL

2.40 As the proposed development will be largely free of litter, the daily operational activities are unlikely to give rise to problems with windblown litter. Accordingly, there is no requirement to implement ay specific litter control measures at the site.

2.41 In the unlikely event that any litter waste is identified, it will be immediately removed off- site to anauthorised waste disposal or recovery site.

Odour Control

2.42 As sand and gravel extraction activities at the site are not biodegradable and do not therefore emit odorous gases, site activities do not give rise to odour nuisance. No odour control is required.

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VERMIN CONTROL

2.43 As the proposed development is free of putrescible (food / kitchen) waste, on-site activities will not attract vermin for the duration of the extraction or subsequent restoration operations. Accordingly, no specific vermin control measures are required.

FIRE CONTROL

2.44 In the unlikely event that a fire does occur, the local fire stations in Athlone town will be contacted and emergency response procedures will be implemented. Fire extinguishers (water and foam) are provided at all offices to deal with any small outbreaks which may occur. A fire safety Certificate will be obtained from Roscommon County Council for the office subject to planning permission.

DUST GENERATION AND CONTROL

2.45 In dry, windy weather conditions, site activities may give rise to dust blows across and beyond the existing or planned development site areas.

2.46 The incidence of fugitive dust outside of the operation is reduced by some of the mobile crushing and screening plant being located within the quarry void. Generation of fugitive dust is generally limited to periods of very low rainfall (refer to Chapter 8 – Air Quality). Dust generation occurs from three main sources.

- Point sources – such as operating plant and machinery
- Line sources – such as roads and conveyors
- Dispersed Sources– such as quarry floors and stockpiles

2.47 In order to control dust emissions, the following measures will be implemented: -

- Water will be sprayed from a tractor drawn bowser on dry exposed surfaces and stockpiles (paved roads, unsealed haul roads and hardstand areas)
- Provision of a fixed sprinkler system along the internal road from the site access to the office.
- Areas of bare or exposed soils will, insofar as practicable, be kept to a minimum.
- The amount of dust or fines carried onto the public road network will be reduced by periodic sweeping of internal paved site roads and surrounding public roads as required.
- Emission of fugitive dust from machinery such as processing plant will be minimised by utilising dust suppression and by locating such plant within the quarry area.

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2.48 Dust deposition monitoring will be carried out when the quarry is operational as part of the environmental monitoring programme. Monitoring results will be submitted to Roscommon County Council on an annual basis – refer to EIAR Chapter 8.

2.49 Mitigation measures are provided in accordance with the DoEHLG (2004) guidelines for the sector and EPA (2006) , refer to EIAR Chapter 8.

NOISE GENERATION AND CONTROL

2.50 The sources of noise located within the planning application area are primarily related to machinery / plant operation.

2.51 The potential for noise generation from the planning application area is reduced by locating some of the mobile crushing and screening plant at the lowest practical level. This means that the potential for noise generation from activities associated with the operation of the plant such as movement of vehicles and maintenance will be reduced – refer to Chapter 10.

2.52 In addition to the above the following good house-keeping measures are put in place to reduce noise emitted from plant and machinery as much as possible.

- All machinery used will be CE certified for compliance with EU noise control limits
- The machinery will be regularly maintained. This includes regularly checking any muffler systems and servicing or replacing as required. It also ensures any loose or damaged panels or covers that suppress noise is fixed or replaced immediately.
- If there are further noise-reducing modifications available for any machinery, they will be fitted wherever practical (eg: rubber decked screens, rubber chute linings etc)
- Haul road grades are kept as low as possible (</= 1:10) to reduce engine / brake noise from heavy vehicles.

2.53 Mitigation measures are provided in accordance with the DoEHLG (2004) and EPA (2006) guidelines for the sector.

2.54 There will be a noise monitoring programme at the site (when operational) and ongoing noise monitoring is carried out as part of the environmental monitoring programme. Monitoring results will be submitted to Roscommon County Council on an annual basis. It is intended that noise monitoring will be carried out in conjunction with adjoining development.

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ENVIRONMENTAL MONITORING

GENERAL

2.55 The site will have an environmental monitoring programme on site (when operational) - Water, noise & dust monitoring will be carried out on a regular basis, to demonstrate that the development is not having an adverse impact on the surrounding environment.

WATER MONITORING

2.56 Four water monitoring wells were installed as part of the Hydrogeological assessments, and these will be monitored by an independent lab and the results will be submitted to Roscommon County Council as required for review and comment.

PROPOSED FINAL RESTORATION

PROPOSED RESTORATION SCHEME

2.57 The restoration scheme for the planning application area is shown on the restoration plan in Appendix 2.

2.58 The application area will be restored to agricultural use which is one of the beneficial after uses listed in the EPA Guidelines "Environmental Management in the Extractive Industry" (2006) This will be achieved by the following measures:

- The application area will be covered with the stockpiled and reseeded as grassland
- All existing boundary fences and hedgerows will be retained to ensure that the site is secure.
- All plant and machinery will be removed from the quarry void.

2.59 The restoration works will be carried out in accordance with the EPA Guidelines (2006).

SITE MANAGEMENT AND SUPERVISION

2.60 The worked-out areas will be restored to agricultural use and ultimately used for livestock grazing. Relevant staff will be briefed on the scheme and will be adequately supervised / controlled. A system of record keeping for the key restoration activities will be put in place.

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LONG TERM SURFACE WATER AND GROUNDWATER

2.61 Surface water will percolate to ground. There will be a buffer of 2-3 metres between the invert of the extraction and the highest water table (refer to site sections in Appendix 2).

DECOMMISSIONING OF PLANT AND MACHINERY

2.62 Redundant structures, plant equipment and stockpiles will be removed from site on permanent cessation of extraction activity. Machinery and buildings will either be utilised by our client on other sites or be sold as working machinery or scrap.

2.63 As part of the overall decommissioning process, all fuel, oil storage and septic / effluent treatment tanks within the existing site will be removed from the site by a licensed waste contractor.

Therefore, there will be no potential for fuel, oil or sewage to cause long-term water pollution following completion of extraction activities.

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CHAPTER 3

ALTERNATIVES

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CONSIDERATION OF REASONABLE ALTERNATIVES

INTRODUCTION

This chapter has been prepared using the EPA's Guidelines on Information to be contained in an EIAR published in 2022. The directive requires an EIAR to contain a description of the reasonable alternatives studied by the applicant which are relevant to the proposed project and an indication of the main reasons for selecting the chosen option. An analysis of high level strategic alternatives cannot be reasonably expected in a project level EIAR.

3.1 CONSIDERATION OF ALTERNATIVES

In the consideration of alternatives the applicant/landowner examined all the land in his ownership which have aggregate resources. The landowner owns over 20Ha in the immediate vicinity of the proposed site and a further 10Ha to the south west off the L2026 in the townland of Curraghaleen. This latter parcel of land is improved grassland adjacent to peat deposits and is not rich in gravel resources. It is the intention of the applicant to continue farming this land and the land of the proposed quarry when extraction ceases.

The site chosen for the project has characteristics of farm diversification as a temporary use is proposed even if it will last for approximately ten years. The profits from the quarry activities will ultimately be reinvested in the applicants farming enterprises.

3.2 PROPOSED LEVELS

The proposed planning application is for the extraction of 466,766 m3 of material down to a level of 49-51O.D. The area chosen has the following favourable attributes

- Proven quantities of materials (see Chapter 2)
- Adequate access to the public road network currently being used by HGVs (see chapter 14).
- Low development costs because there will not be a requirement for blasting or work below the GWT (see site investigation report)
- Best practice industry standards will be used to process materials.
- The proximity of the lands to the Regional Growth Centre of Athlone.

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- Proximity to the concrete batching plant to the north.

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3.3 DO NOTHING ALTERNATIVE

If quarrying does not occur the lands will remain in agricultural use and the existing environmental impacts will continue.

3.4 ALTERNATIVE SOURCES

The use of sand and gravel will continue to be used in construction. In this area the land based sourcing of materials has less environmental impacts that recycling waste or sourcing marine based material. The former because the acceptance criteria in the industry are not widely accepted or applicable and the latter because of distance and the nature of the material containing salts etc. It is also the case that it is only in large urban centres that sufficient quantities of secondary material would be available, and this is not the case in rural areas of Roscommon/Westmeath despite the proximity to Athlone. The deposits that are available on this land in Rooskagh or similar areas will continue to be the source of construction aggregates for the medium term and certainly for the expected lifetime of the quarry.

3.5 ALTERNATIVE SITES/LAYOUTS

The landowner considered the potential for extraction over his entire landholding and different configurations and layouts within the landholding. The applicant also considered alternative access to the site from the West. The alternative layouts comprised an excavation area of 20Ha but this would only allow depths of 2m to be achieved before interference with the water table became a feature of the work. The extraction over the entire holding would result in works that are in proximity to more dwellings and animal housing units. The sequencing of the quarry development was one of the factors in the control of the application and the final proposal of working from east to west in 5 phases allows the development to maximise mitigation from noise and dust at the nearest existing dwelling to the north west of the site. It is proposed to provide similar protections to this dwelling as exist presently in order to protect its amenity. The site finally chosen omitted lands close to an existing dwelling from development and included the proposed construction of bunds and dense boundary planting to protect the residential amenity. The applicant also considered excavation to below the levels chosen and winning the aggregates that could be won from the bedrock. This option was not selected as it would

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1.36 Collins Boyd Engineers & Architects have been preparing Environmental Impact Assessment reports(previously EIS) relating to quarry developments since implementation of the EIA Directive in 1990.

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CHAPTER 2

PROJECT DESCRIPTION

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POPULATION AND HUMAN HEALTH

4.1 INTRODUCTION

This report examines the effects of a proposed sand and gravel quarry at Rooskagh, Bellanamullia (Bealnamulla), Co. Roscommon on population and human health.

4.2 DESCRIPTION

The description of the proposed development is outlined in detail in Chapter 2 and this should be read in conjunction with this Chapter.

4.3 TECHNICAL GUIDANCE

The EPA Guidelines from 2022 on the Information to be contained in EIAR were used as a reference in compiling this Chapter. The Chapter will consider population, employment, amenity, and human health in the context of the environmental factors examined elsewhere in this report.

4.4 CONSULTATIONS

There were no consultations undertaken in relation to this chapter.

4.5 AUTHOR

This chapter was prepared by Mr. Eamon Collins Chartered Engineer who is a director with Collins Boyd Engineering and has more than 20 years' experience in managing and accessing extractive industry projects.

4.6 LIMITATIONS ON INFORMATION

There were no difficulties encountered in preparing this chapter

4.7 EIA DIRECTIVES

The previous EIA directives (1985/2011) refer to human health and include 'human beings' as the corresponding environmental factor. The 2014 directive amends this factor to population and human health. The concept of human health should be considered in the context of other environmental factors

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examined in the EIAR. Standards used in assessing dose, risk or exposure are informed by medical and scientific investigation. This is the methodology through which protection criteria relating to the environment relates to human health.

4.8 STUDY AREA

This study includes the application site and the surrounding areas. The review of the population is based on the Electoral Divisions in the area and include Ballynamona and Rooskagh / Bellanamullia (Bealnamulla). The Census figures from 2011 and 2016 in form the analysis. These are the most up to date figures and as the 2021 census has been postponed due to the pandemic and the figures from the 2022 census have not been fully published, they will remain the best available information for the moment.

4.9 RECEIVING ENVIRONMENT

The study area has been outlined above in relation to population. In addition, it is proposed to examine the dwellings and other buildings in the vicinity of the application site. The sources of information used for this include

- Roscommon County Development Plan 2022-2028
- The other relevant chapters of this Report
- CSO Census 2011/2016
- OSI Mapping
- Myplan.ie

This site is located southwest of Athlone in the townland of Rooskagh which comprises disperse residential settlement and farm buildings. There is an existing concrete batching plant immediately to the north of this site. The lands, as previously outlined, are in agricultural use and aside from the uses referenced immediately above are surrounded by similar lands

4.10 ENVIRONMENTAL DESIGNATIONS

The site is not within or adjacent to any designated sites. There are 17 Natura 2000 sites within 15km of the site, these are detailed in chapter 5 of the EIAR. The proposed site is not within or adjacent to any NHAs or any pNHA. There are 6 such sites within 10km of the proposed site and these are outlined in chapter 5 of the EIAR.

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There are no recorded monuments within or adjacent to the site and after the investigations carried out indicate that it is unlikely that the proposed development will have any impact on archaeology in the area.

There are no buildings on the NIAH or structures on the RPS in the vicinity of the site and the proposed development will not have impact on the built heritage of the area.

4.11 POPULATION

The review of the population is based on the Electoral Division of Rooskagh / Bellanamullia (Bealnamulla)and Ballynamona, the site is located in the latter. The former is an adjoining division which has many of the rural characteristics of its neighbour and is used for comparison. The area is also examined in the context of the County Population and the intercensal trends.

Table 4.1 - Population

	2011	2016	% Change
Ballynamona	538	506	- 5.9
Rooskagh/Bellanmullia (Bealnamulla)	394	413	+ 4.8
Roscommon	64.065	64,544	+0.007
North West Region	837,350	847,442	+ 1.2
Ireland	4,588,252	4,761,865	+3.8

The Census shows that population changes in Ballynamona are significantly different to neighbouring Rooskagh / Bellanamullia (Bealnamulla), but when taken in unison are typical of the County average, very small fluctuations between 2011 and 2016. The county figures indicate that very little change occurred in Roscommon, and that the regional changes, whilst small, are concentrated in the urban areas as regards population growth.

4.12 EMPLOYMENT

The Live Register records persons who are receiving Jobseekers Allowance or Benefit. The figures are based at county level or Social Protection offices. The figures set out below in Table 4.2 show the data

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from April 2016, February 2020 and April 2021. The February 2020 figures were chosen as those were the last records unaffected by COVID. It can be seen that the live register figures have remained stable since that date due to state intervention in the Labour market to maintain the status quo during COVID and it appears they have been successful in this regard.

Table 4.2 - Live Register Numbers

Date	Location	Persons Registered
April 2016	County Roscommon	3019
February 2020	County Roscommon	2028
April 2021	County Roscommon	1816
April 2016	Athlone	3268
February 2020	Athlone	1735
April 2021	Athlone	1708

The live register figures declined steadily between April 2016 and February 2020. This accords with the national trends and is indicative of a healthy labour market over that period. The figures have remained relatively stable since then indicative of the stagnation caused by COVID and government interventions in the market.

Table 4.3 below examined the employment characteristics of the areas in the vicinity of the proposed quarry.

Table 4.3 – Population by Occupation

Location	Ballynamona	Rooskagh / Bellanamullia (Bealnamulla)	County Roscommon
Occupation	No./ %	No./ %	No./ %
Managers, Directors, Senior Officials	20/8.5	5/2.6	1975/6.8
Professionals	34/14.4	26/13.3	4,400/15.0
Associate Professionals and Technical Occupations	27/11.4	21/10.8	2827/9.7

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Administrative and Secretarial	25/10.6	13/6.7	3035/10.4
Skilled Trades	50/21.2	54/27.7	5640/19.3
Caring, leisure and other services	23/9.7	14/7.2	2445/8.4
Sales and Customer Services	8/3.4	13/6.7	1822/6.2
Process Plant and Machine Operative	18/7.6	24/12.3	2514/8.6
Elementary	14/5.9	10/5.1	2293/7.8
Not Stated	17/7.2	15/7.7	2302/7.9

Table 4.4 – Persons at work by Industry

Location	Ballynamona	Rooskagh / Bellanamullia (Bealnamulla)	County Roscommon
Industry	No. /%	No. /%	No. / %
Agriculture, Forestry	21/9.6	35/19.6	2311/8.9
Building Construction	12/5.5	07/3.9	1492/5.8
Manufacturing	26/11.9	23/12.9	3317/12.8
Commerce	32/14.7	30/16.9	5215/20.2
Transport and Communication	16/7.3	11/6.2	1404/5.4
Public Administration	14/6.4	13/7.3	2161/8.4
Professional Services	62/28.4	38/21.3	6264/24.2
Other	35/16.1	21/11.8	3655/14.2

The figures show that the Labour Market and the range of occupations in the chosen electoral divisions are typical of the profiles for same in County Roscommon. There are some notable differences between the two electoral divisions in relation to Senior Managers which have a higher presence in Ballynamona probably due to proximity to Athlone and more agricultural workers in Rooskagh / Bellanamullia (Bealnamulla) probably due to distance from Athlone and its larger area.

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4.13 SENSITIVE RECEPTORS.

The existing uses are shown on Fig 4.1 and the centre of the site is indicated by a red *. The proposed site is close to a dwelling to the north west of the proposed quarry. The site layout has been revised as part of the consideration of alternatives to omit an area in the north west corner of the site from productive purposes construct bunds to reinforce the separation and reinforced planting on the boundaries. There are some isolated dwellings to the North and East on L2025 and some ribbon type residential development on roads L2025 and L2026 to the West. There is a commercial development immediately to the North of the proposed site, a concrete batching plant, as previously referenced in chapter 2. There is a primary school 1.3km to the East of the site at the junction of the R362 and L2025. The green dots which indicate residential and business use have only residential use on the planning register so it is reasonable to assume that they are all small scale and ancillary to residential use.

4.14. IMPACT ASSESSMENT AND METHODOLOGY

The evaluation of the effects on employment and human health will be a qualitative process based on the qualitative and quantitative analysis of the environmental factors examined in other chapters using the experience and professional judgement of the author.

4.15 EMPLOYMENT

The proposed development will provide direct employment for 6 persons and indirect employment for up to 40 persons. The latter group will include hauliers, machinery maintenance and service providers and will contribute directly to the local economy and to a lesser extent the regional economy of Athlone through the supply of construction materials. These are medium term positive effects which will remain for the duration of the extraction process. It is anticipated that on cessation the present activity on the lands will return in the form of agricultural employment.

4.16 HUMAN HEALTH

The key pathways to human health are soil, water, air and noise and these are all factors which are examined throughout the document, Chapter 6 on soils, Chapter 7 on water, Chapter 8 on air and Chapter 10 on noise. On the basis of the findings and mitigation proposals in these chapters it is

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expected that there will be no adverse significant impacts during the extraction and restoration phases of the proposed development. The extraction phase will generate dust and noise from excavation, processing and the transport of material within and off the site. Following restoration, the impacts on human health will return to the level of impacts present today. The proposed mitigation measures for the operational phase are outlined below.

4.17 UNPLANNED EVENTS

Unplanned events include matters such as fire, landslides, traffic accidents (including discharges from same), floods or equipment failure. The EIA directive identifies major accidents or natural disasters (flooding, earthquakes) when considering unplanned events. The proposed development because of its scale and the type of operations being planned has a low risk of unplanned events. The processing that will occur (crushing and screening) only uses the natural materials from the site and no chemicals or other materials are added to the process. The established techniques and regulations will further reduce risk. The risks such as they are will not transfer to areas outside the site.

Chapter 7 examines spillage and their impacts on water resources.
The traffic assessment considers that the existing road network has the capacity to accommodate the vehicle movements associated with the proposed development. The environmental risks from traffic accidents are therefore small and will not have significant impacts on employment or human health.

4.18 CUMULATIVE IMPACTS

An examination of the planning register over the last 5 years, Fig. 4.2 indicates that there is a proposal to construct a large solar farm on lands to the south of the proposed quarry, planning reference 20/36. It is unlikely that this proposed development will receive any impacts from the proposed quarry. The remaining applications comprise small residential development (mostly extensions) and a number of applications for temporary classrooms for the school to the north east of the site in Cloonakille. It is considered that the cumulative impacts on population and human health include traffic, this is discussed in chapter 14, noise Chapter 10 and Air Chapter 8

4.19 MITIGATION MEASURES

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The mitigation measure pertinent to population and human health have been identified elsewhere in this report in particular chapters 6, 7, 8, 10 and 14. The mitigation process follows the accepted principles of avoid, prevent, reduce and as a last resort substitute. The mitigation proposed is outlined below:

Table 4.5 - Mitigation

Factor	**Mitigation Measures**
Soil	Topsoil will be stored safely for future reuse and restoration of the site. Berms and slide slopes will be seeded and planted with grass. No topsoil will be taken off site.
Water	Ground water monitoring of wells on site as part of environmental management plan All oils and fuels to be stored in a bunded location Plant maintenance will be recorded and only serviced on site in vicinity of site office where discharges will be treated by a petrol/oil interceptor. Spill kits will be available and site personnel trained in their proper use. The settlement lagoon will capture and reduce suspended solids from entering the drainage systems.
Dust/Air	Minimise drop heights when handling materials and avoid working in very windy conditions.

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	Use water during periods of dry weather to moisten surfaces and stockpiles. Minimise haul routes and unnecessary handling of materials. Restrict vehicle speeds during production and manage visiting traffic. Strengthen hedgerows on perimeter. Construct perimeter mounds and berms. Provide berms and screen planting on perimeters.
Noise	All plant to comply with EC directive 86/662/EEC in relation to emission levels. Planned maintenance program for all machinery, records to be part of environmental management plan. Working hours restricted from 8.00 to 18.00 hours.
Traffic	Speed limit signs on approaches and in parking areas. Surfaced areas to be maintained in good condition

4.20 RESIDUAL IMPACTS

The operational phase will benefit from the mitigation measures outlined above. The residual impacts are those which remain after mitigation has occurred.

There will be a loss of agricultural land and soil for the duration of the quarrying. There will be no significant effects on the water table if the designed treatment systems operate as expected. There will be dust deposition on adjoining lands which is expected to be within acceptable limits. The noise generated will be during normal working hours and will be of a type prevalent in the vicinity and its impacts will be small.

4.21 MONITORING

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The monitoring in relation to population and human health will be as described in chapters 6,7,8 and 10 and will form part of the environmental management plan if required which will be submitted to the Council on an annual basis in the event that development consent is obtained.

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Figure 4.1 – Uses in Vicinity.

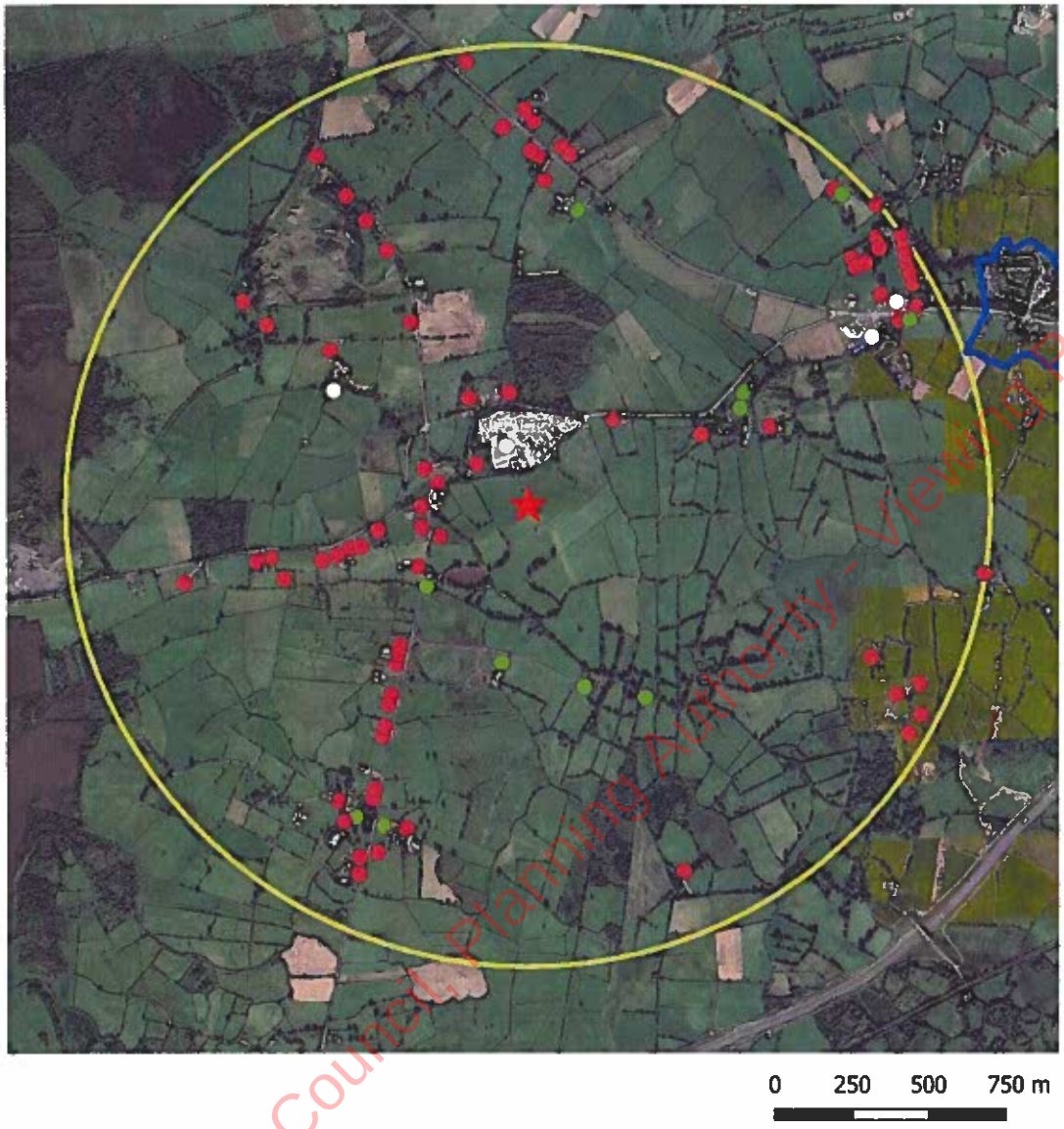

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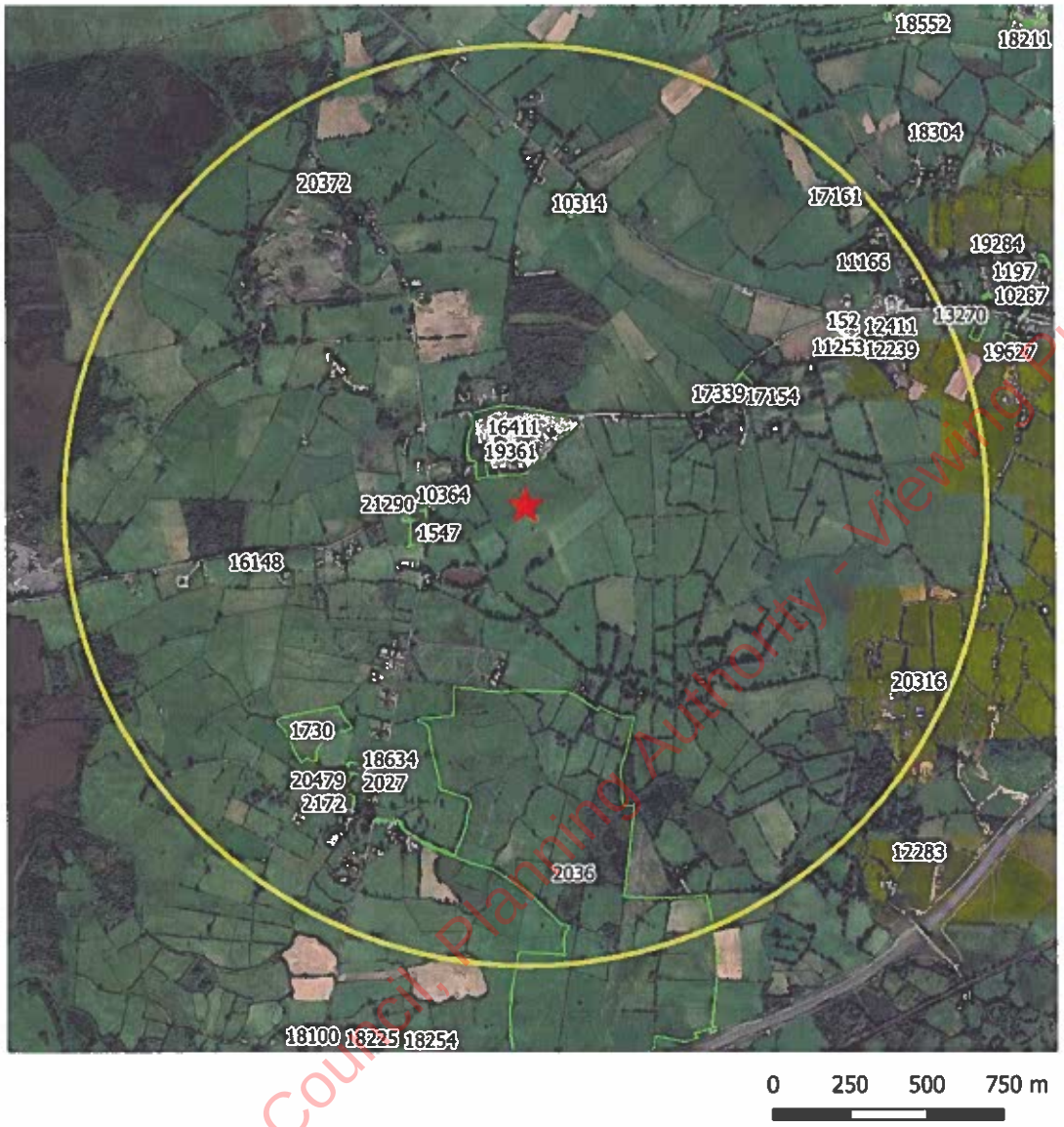
Figure 4.2 – Planning Permissions



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CHAPTER 5

BIODIVSERSITY

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PROVISION OF INFORMATION FOR APPROPRIATE ASSESSMENT SCREENING FOR A PROPOSED DEVELOPMENT AT ROOSKAGH, BEALNAMULLA, ATHLONE, CO. ROSCOMMON

Mr Eamon Harney
c/o Collins Boyd Engineering Ltd
Galway Road
Roscommon
Co. Roscommon

July 2022

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1 INTRODUCTION

1.1 BACKGROUND

A comprehensive assessment of the potential effects of a proposed development at Rooskagh, Bealnamulla, Athlone, Co. Roscommon on Natura 2000 sites was carried out in July 2022 by Noreen McLoughlin, MSc, MCIEEM of Whitehill Environmental. This assessment allowed areas of potential ecological value and potential ecological constraints associated with this proposed development to be identified and it also enabled potential ecological effects associated with the proposed development on designated sites to be assessed.

The location of the proposed development is within 15km of sites designated under European Law. As such and in accordance with Article 6(3) of the EU Habitat's Directive (Council Directive 92/43/EEC) regarding Appropriate Assessment, this screening exercise for Appropriate Assessment was carried out in order to identify whether any significant impacts on designated sites are likely.

This report contains information required by the competent authority (in this instance the Roscommon County Council) to undertake a screening for Appropriate Assessment. It is the responsibility of the competent authority to make a decision as to whether or not the proposed development is likely to have significant effects on European Sites, either individually or in combination with other plans or projects. In accordance with the Legislation and National Guidance, the competent authority should issue an AA Screening Determination, which should set out their decision regarding AA, including the main reasons and considerations on which the determination is based.

1.2 REGULATORY CONTEXT

The Birds Directive (Council Directive2009/147/EC) recognises that certain species of birds should be subject to special conservation measures concerning their habitats. The Directive requires that Member States take measures to classify the most suitable areas as Special Protection Areas (SPAs) for the conversation of bird species listed in Annex 1 of the Directive. SPAs are selected for bird species (listed in Annex I of the Birds Directive), that are regularly occurring populations of migratory bird species and the SPA areas are of international importance for these migratory birds.

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The EU Habitats Directive (92/43/EEC) requires that Member States designate and ensure that particular protection is given to sites (Special Areas of Conservation) which are made up of or support particular habitats and species listed in annexes to this Directive.

Articles 6(3) and 6(4) of this Directive also call for the undertaking of an Appropriate Assessment for plans and projects not directly connected with or necessary to the management of, but which are likely to have a significant effect on any European designated sites (i.e. SACs and SPAs).

The Water Framework Directive (WFD) (2000/60/EC), which came into force in December 2000, establishes a framework for community action in the field of water policy. The WFD was transposed into Irish law by the European Communities (Water Policy) Regulations 2003 (S.I. 722 of 2003). The WFD rationalises and updates existing legislation and provides for water management on the basis of River Basin Districts (RBDs). RBDs are essentially administrative areas for coordinated water management and are comprised of multiple river basins (or catchments), with cross-border basins (i.e. those covering the territory of more than one Member State) assigned to an international RBD. The aim of the WFD is to ensure that waters achieve at least good status by 2027 and that status does not deteriorate in any waters.

Appropriate Assessment and the Habitats Directive

Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora – the 'Habitats Directive' - provides legal protection for habitats and species of European importance. Article 2 of the Directive requires the maintenance or restoration of habitats and species of European Community interest, at a favourable conservation status. Articles 3 - 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as *Natura 2000*. Natura 2000 sites are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/EEC).

Articles 6(3) and 6(4) of the Habitats Directive sets out the decision-making tests for plans or projects affecting Natura 2000 sites. Article 6(3) establishes the requirement for Appropriate Assessment:

> Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the

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site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public."

Article 6(4) deals with the steps that should be taken when it is determined, as a result of appropriate assessment, that a plan/project will adversely affect a European site. Issues dealing with alternative solutions, imperative reasons of overriding public interest and compensatory measures need to be addressed in this case.

Article 6(4) states:

"If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.

Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest."

The Appropriate Assessment Process

The aim of Appropriate Assessment is to assess the implications of a proposal in respect of a designated site's conservation objectives.

The 'Appropriate Assessment' itself is an assessment which must be carried out by the competent authority which confirms whether the plan or project in combination with other plans and projects will have an adverse impact on the integrity of a European site.

Screening for Appropriate Assessment shall be carried out by the competent authority as set out in Section 177U(1) and (2) of the Planning and Development Act 2000 (as amended) as follows:

(1) A screening for appropriate assessment of a draft Land use plan or application for consent for proposed development shall be carried out by the competent authority to

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assess, in view of best scientific knowledge, if that Land use plan or proposed development, individually or in combination with another plan or project is likely to have a significant effect on the European site.

(2) A competent authority shall carry out a screening for appropriate assessment under subsection (1) before—

(a) a Land use plan is made including, where appropriate, before a decision on appeal in relation to a draft strategic development zone is made, or

(b) consent for a proposed development is given.'

The competent authority shall determine that an Appropriate Assessment is not required if it can be excluded, that the proposed development, individually or in combination with other plans or project will have a significant effect on a European site.

Where the competent authority cannot exclude the potential for a significant effect on a European site, an Appropriate Assessment shall be deemed required.

Where an Appropriate Assessment is required, the conclusions of the Appropriate Assessment Report (Natura Impact Statement (NIS)) should enable the competent authority to ascertain whether the plan or proposed development would adversely affect the integrity of the European site. If adverse impacts on the integrity of a European site cannot be avoided, then mitigation measures should be applied during the appropriate assessment process to the point where no adverse impacts on the site remain. Under the terms of the Habitats Directive consent can only be granted for a project if, as a result of the appropriate assessment either (a) it is concluded that the integrity of any European sites will not be adversely affected, or (b) after mitigation, where adverse impacts cannot be excluded, there is shown to be an absence of alternative solutions, and there exists imperative reasons of overriding public interest for the project should go ahead.

Section 177(V) of the Planning and Development Act 2000 (as amended) outlines that the competent authority shall carry out the Appropriate Assessment, taking into account the Natura Impact Statement (amongst any other additional or supplemental information). A determination shall then be made by the competent authority in line with the requirements of Article 6(3) of the Habitats Directive as to whether the plan or proposed development would adversely affect the integrity of a European site, prior to consent being given.

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2 METHODOLOGY

2.1 APPROPRIATE ASSESSMENT

This Statement of Screening for Appropriate Assessment (Stage 1) has been prepared with reference to the following:

- European Commission (2018). Managing Natura 2000 Sites: The Provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.
- European Commission (2021). Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.
- European Commission (2006). Nature and Biodiversity Cases: Ruling of the European Court of Justice.
- European Commission (2007). Clarification of the Concepts of: Alternative Solution, Imperative Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence, Opinion of the Commission.
- Department of Environment, Heritage and Local Government (2009). Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities.

The EC Guidance sets out a number of principles as to how to approach decision making during the process. The primary one is 'the precautionary principle' which requires that the conservation objectives of Natura 2000 should prevail where there is uncertainty.

When considering the precautionary principle, the emphasis for assessment should be on objectively demonstrating with supporting evidence that:

- There will be no significant effects on a Natura 2000 site;
- There will be no adverse effects on the integrity of a Natura 2000 site;
- There is an absence of alternatives to the project or plan that is likely to have an adverse effect to the integrity of a Natura 2000 site; and
- There are compensation measures that maintain or enhance the overall coherence of Natura 2000.

This translates into a four stage process to assess the impacts, on a designated site or species, of a policy or proposal.

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The EC Guidance states that "each stage determines whether a further stage in the process is required". Consequently, the Council may not need to proceed through all four stages in undertaking the Appropriate Assessment.

The four-stage process is:

Stage 1: Screening – The process which identifies the likely impacts upon a Natura 2000 site of a project or plan, either alone or in combination with other projects or plans, and considers whether or not these impacts are likely to be significant;

Stage 2: Appropriate Assessment – The consideration of the impact on the integrity of the Natura 2000 site of the project or plan, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts;

Stage 3: Assessment of Alternative Solutions – The process which examines alternative ways of achieving objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site;

Stage 4: Assessment where no alternative solutions exist and where adverse impacts remain – An assessment of the compensatory measures where, in the light of an assessment of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed.

In complying with the obligations set out in Articles 6(3) and following the guidelines described above, this screening statement has been structured as a stage by stage approach as follows:

- Description of the proposed project;
- Identification of the Natura 2000 sites close to the proposed development;
- Identification and description of any individual and cumulative impacts on the Natura 2000 sites likely to result from the project;
- Assessment of the significance of the impacts identified above on site integrity. Exclusion of sites where it can be objectively concluded that there will be no significant effects;
- Description of proven mitigation measures.

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2.2 Statement of Competency

This AA Screening report was carried out by Noreen McLoughlin, BA, MSc, MCIEEM. Noreen has an honours degree in Zoology and an MSc in Freshwater Ecology from Trinity College, Dublin and she has been a full member of the Chartered Institute of Ecology and Environmental Management for over 15 years. Noreen has over 16 years' experience as a professional ecologist in Ireland.

2.3 Desk Studies & Consultation

Information on the site and the area of the proposed development was studied prior to the completion of this statement. The following data sources were accessed in order to complete a thorough examination of potential impacts:

- National Parks and Wildlife Service - Aerial photographs and maps of designated sites, information on habitats and species within these sites and information on protected plant or animal species, conservation objectives, site synopses and standard data forms for relevant designated sites.
- Environmental Protection Agency (EPA)- Information pertaining to water quality, geology and licensed facilities within the area;
- Myplan.ie – Mapped based information;
- National Biodiversity Data Centre (NBDC) – Information pertaining to protected plant and animal species within the study area;
- Bing maps & Google Street View – High quality aerials and street images;
- Collins Boyd Engineering Ltd – Plans and Information Pertaining to the Development;
- Roscommon County Council – Information on planning history in the area for the assessment of cumulative impacts.

2.4 Assessment Methodology

The proposed development was assessed to identify its potential ecological impacts and from this, the Zone of Influence (ZoI) of the proposed development was defined. Based on the potential impacts and their ZoI, the Natura 2000 sites potentially at risk from direct, indirect or in-combination impacts were identified. The assessment considered all potential impact sources and pathways connecting the proposed development to Natura 2000 sites, in view of the conservation objectives supporting the favourable conservation condition of the site's Qualifying Interests (QIs) or Special Conservation Interests (SCIs).

The conservation objectives relating to each Natura 2000 site and its QIs/SCIs are cited generally for SACs as "to maintain or restore the favourable conservation condition of the

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Annex I habitat(s) and/or Annex II species for which the SAC has been selected", and for SPAs "to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA".

As defined in the Habitat's Directive, the favourable conservation status of a habitat is achieved when:

- Its natural range and area it covers within that range is stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future;

The favourable conservation status of a species is achieved when:

- The population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future;
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Where site-specific conservation objectives (SSCOs) have been prepared for a European site, these include a series of specific attributes and targets against which effects on conservation condition, or integrity, can be measured. Where potential significant effects are identified, then these SSCOs should be considered in detail.

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3 SCREENING

3.1 DEVELOPMENT DESCRIPTION

Mr Eamon Harney has indicted his intention to shortly apply to Roscommon County Council for planning permission for the development of a quarry on a 6.9ha site on his lands at Rooskagh, Bealnamulla, Athlone, Co. Roscommon. The proposed development will consist of:

The extraction of sand, stone & gravel over an extraction area of 4.90 hectares (volume to be extracted = 466,766m³ approximately) over a 10 year period, screening/processing of stone, sand & gravel from the site using mobile plant, construction of offices (33m²), welfare facilities (9m²), well, water settlement pond (area 2,020 m²), weighbridge, wheel-wash, entrance, set down area, carparking, truck parking, refuelling pad, petrol oil interceptor, fencing, landscaping/screening, signage, lighting, wastewater storage tank for site offices, and all other ancillary works. The land will be restored to agricultural lands on the completion of the extraction of sand, stone and gravel.

An extract from the planning drawings showing proposed phases and topography of the site is shown in Figure 1.

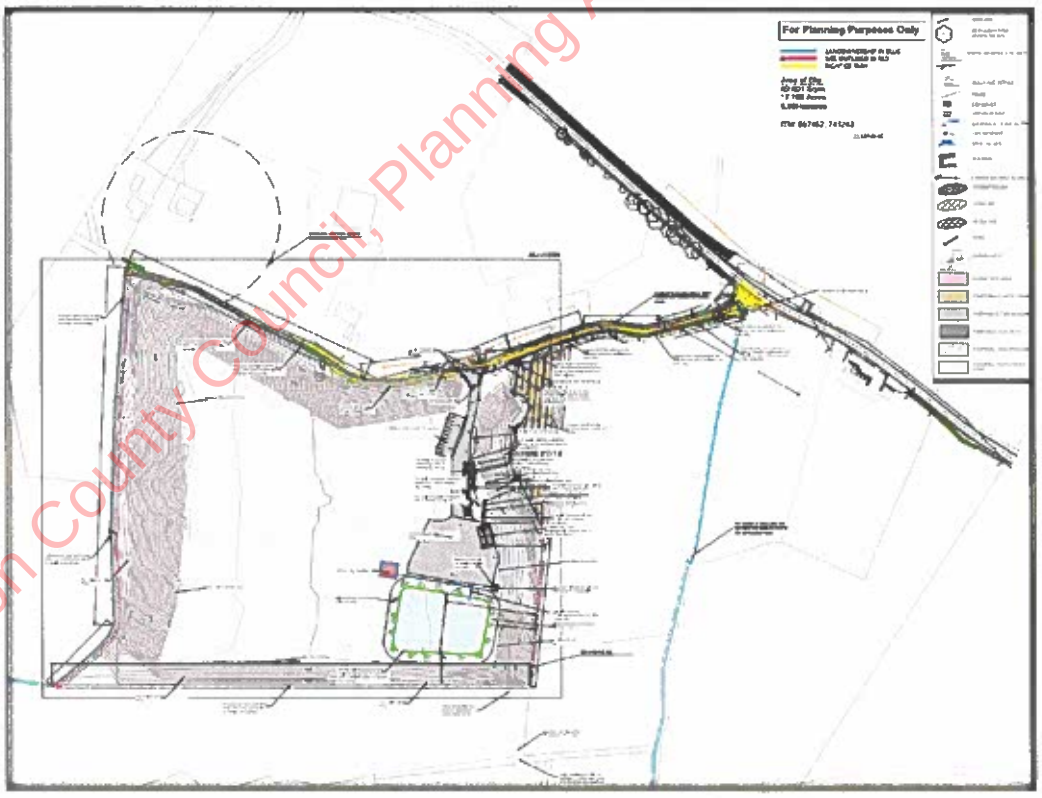

Figure 1- Plan Showing Topography and Proposed Phases (Prepared by Collins Boyd Engineering)

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Proposed Works

The proposed operation will involve the stripping and storing of existing topsoil and extraction of sand and gravel; processing (crushing and screening) of the sand & gravel to produce aggregates for use in the manufacture of value-added products for road construction, production of concrete products and site development works.

The material will be extracted by means of excavators and dump trucks and no blasting will be required as the material is sand and gravel. The processing of the extracted sand & gravel, into aggregate products, will consist of crushing and screening by mobile processing plant within the application area. In accordance with industry guidelines quarry operations will be carried out between 8.00 – 18.00hrs Monday to Friday; or from 09.00 – 17.00 hrs Saturday. The quarry will not operate on Sundays or Bank Holidays, except in emergency situations. The proposed development will provide employment of up to 6 people directly on-site, in addition to a number of indirect employees such as crushing contractors, HGV drivers, maintenance contractors, etc.

The development of the site is consistent with policies in the National Planning Framework, the Regional Spatial and Economic Strategy and the County development Plan. It is the overall policy objective that quarrying is carried out in a manner which minimises environmental impacts (including those on Natura 2000 sites) and emphasises appropriate restoration.

It is intended to return the land to agricultural use following completion of extraction. The application site relates to the extraction area only. Material extracted from the proposed land area is processed within the proposed extraction area using mobile processing plant. Ancillary facilities at the site include the offices, weighbridge & office, canteen, toilets, bunded fuel storage areas and a garage / workshop & waste water treatment system. These facilities are located within the site area.

There will be no surface water discharges from the quarry site. All wash water is to be recycled and held in a water settlement pond in the south-eastern corner of the site. Any water falling on the site will percolate to ground.

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3.2 Site Location and Surrounding Environment

The application site is approximately 6.96 hectares in area. It is located in a rural area, in the townland of Rooskagh. It is approximately 1.8km west of Bellanamullia and 6.1km west of Athlone. The lands will be accessed via the creation of an entrance off a private road that services the existing Kildea Concrete plant. This private road is just off a local, third class road (L2025). The site is partially bounded to the north by the private road and to the west, south and east by agricultural land.

The main habitats around the site were assessed using aerial photographs and during a drive through around the local area. The site is surrounded by the rural and agricultural habitats. Agriculture is the dominant land use in the area and improved and semi-improved grasslands are the dominant habitats locally. Other habitats represented in the area include wet grasslands, hedgerows, treelines and watercourses. Site location maps are shown in Figures 2 and 3, whilst an aerial photograph of the site is presented in Figure 4.

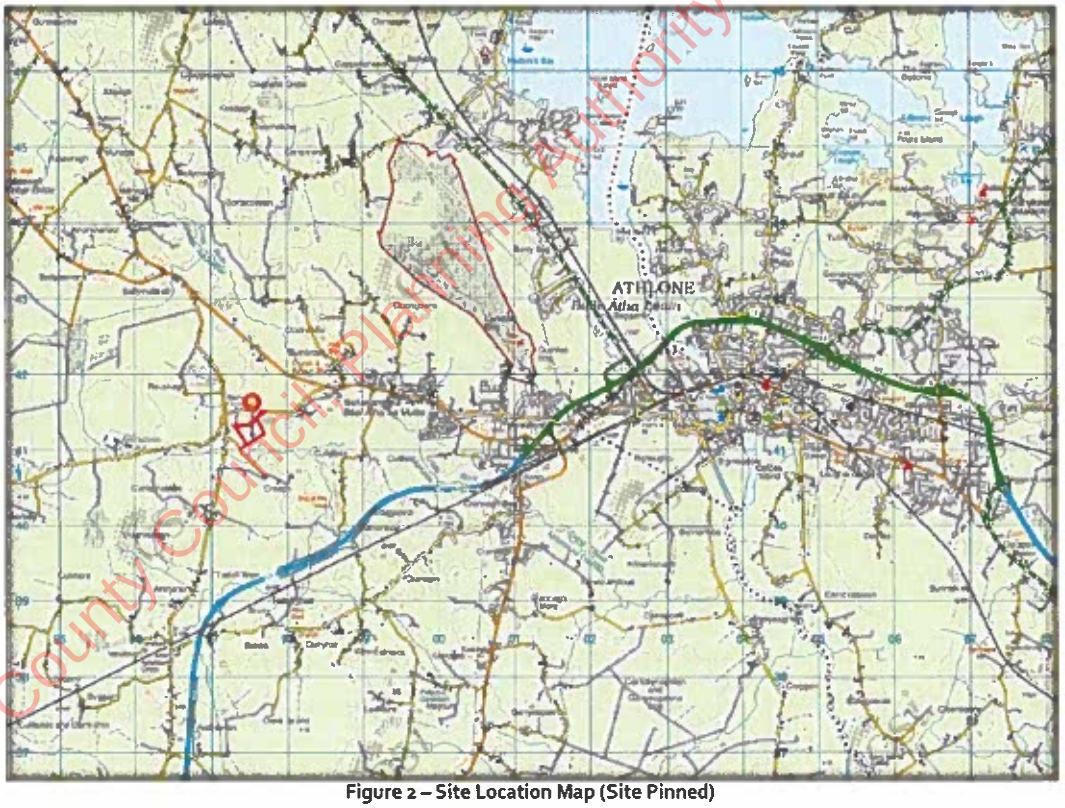

Figure 2 – Site Location Map (Site Pinned)

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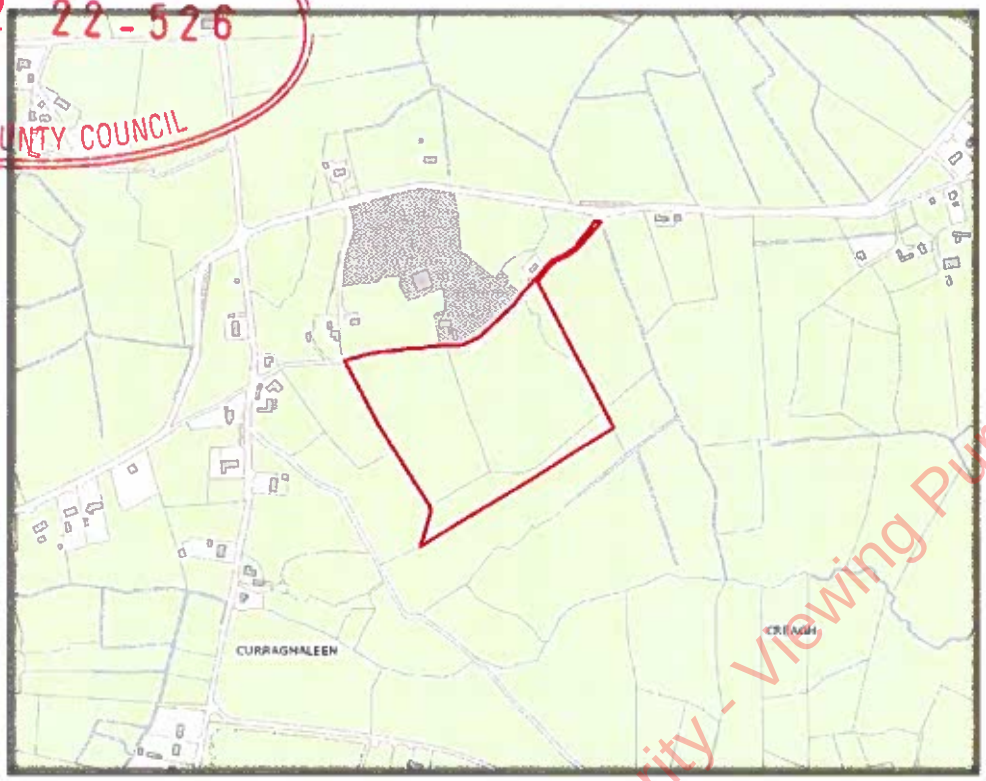

Figure 3 – Site Location Map (Site Outlined in Red)

HABITATS WITHIN THE APPLICATION SITE

No part of the site lies within nor is it adjacent to any area that is designated for nature conservation purposes. The site consists of one large and open field, that is characterised by a large hill at its centre. The ground is firm and well drained throughout and there are no vegetative indicators of poor drainage on the site. The dominant habitat within the application site is improved agricultural grassland (GA1) that is normally grazed by cattle. Hedgerows (WL1) and treelines (WL2) form the site boundaries.

The grassland habitat within the site is dominated by improved agricultural grassland (GA1) which is generally species poor and dominated by grass species including meadow grasses (*Poa* sp.) and fescues (*Festuca* sp). Typical broadleaved species associated with this habitat were noted and included broadleaved dock *Rumex obtusifolius*, meadow buttercup *Ranunculus acris*, mouse ear *Cerastium fontanum* and ragwort *Jacobaea vulgaris*. Prior to the intensification of agriculture on the site which involved seeding and regular fertilisation, it is likely that the site was a calcareous grassland (Dry Calcareous and Neutral Grassland habitat GS1) and elements of this habitat remain sparsely evident in certain areas of the field, most commonly around the field margins and on the steep edges of the hill where fertiliser application is less intense. Species noted and recorded from these areas include yarrow *Achillea millefolium*, dovesfoot cranesbill *Geranium molle*, eyebright *Euphrasia officinalis*, burnet saxifrage *Pimpinella saxifraga* and hairy sedge *Carex hirts*.

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The boundaries of the site are mostly defined by hedgerows (WL1), treelines (WL2), fences and dry stone walls (BL1).

Water Features and Quality

The application site lies within the Upper Shannon Hydrometric Area, Catchment and Sub-Catchment. It is divided into two Sub Basins, i.e., the Cross (Roscommon) Sub-Basin to the west and the Mihanboy Sub-Basin in the east. There are no surface water features within or immediately adjacent to the application site. There are drains approximately 102m north-east and 76m south-east of the application site. These drains lead towards a tributary of the Mihanboy Stream, which is 209m south of the site. This stream flows east to join the Mihanboy and this stream then flows north-east to join the Cross River. The Cross River flows south / south-east towards its confluence with the River Shannon near Carricknaghtan.

The EPA have classified the ecological status of the watercourses that are close to the application site as moderate. The River Cross is also of moderate status. The River Shannon at points upstream and downstream of the River Cross has been classed as poor. Under the requirements of the Water Framework Directive in Ireland, this is unsatisfactory and good status should be achieved in all these watercourses within a specified time period.

Figure 4 – Aerial Photograph of the Sites (Outlined in Red) and its Surrounding Habitats © Bing

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3.3 NATURA 2000 SITES IDENTIFIED

In accordance with the guidelines issued by the Department of the Environment and Local Government, a list of Natura 2000 sites within 15km of the proposed development have been identified and described according to their site synopses, qualifying interests and conservation objectives. In addition, any other sites further than this, but potentially within its zone of interest were also considered. The zone of impact may be determined by an assessment of the connectivity between the application site and the designated areas by virtue of hydrological connectivity, atmospheric emissions, flight paths, ecological corridors etc.

For significant effects to arise, there must be a potential impact facilitated by having a *source*, i.e., the proposed development and activities arising out of its construction or operation, a *receptor*, i.e., the European site and its qualifying interests and a subsequent *pathway* or *connectivity* between the source and receptor, e.g., a water course. The likelihood for significant effects on the European site will largely depend on the characteristics of the source (e.g., nature and scale of the construction works), the characteristics of the existing pathway and the characteristics of the receptor, e.g., the sensitivities of the Qualifying Interests (habitats or species) to changes in water quality. .

There are seventeen Natura 2000 designated sites within 15km of the application site. These designated areas and their closest points to the proposed development site are summarised in Table 1 and a map showing their locations relative to the application sites are shown in Figure 5. A full description of these sites can be read on the website of the National Parks and Wildlife Service (npws.ie).

Site Name & Code	Distance	Qualifying Interests	Potential Effects?
Castlesampson Esker SAC 001625	2.5km west	• Turloughs • Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	*No hydrological connectivity between the application site and this SAC, therefore there is no potential for significant effects to arise on this site.*
Ballynamona Bog and Corkip Lough SAC 002339	3km north-west	• Active raised bogs • Degraded raised bogs still capable of natural regeneration • Turloughs • Bog woodland • Depressions on peat substrates of the	*No hydrological connectivity between the application site and this SAC, therefore there is no potential for significant effects to arise on this site.*

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		Rhynchosporion	
Lough Ree SPA 004064	5km east	• Whooper Swan (*Cygnus Cygnus)* • Wigeon *(Anas penelope)* • Teal (*Anas crecca*) • Mallard (*Anas platyrhynchos*) • Shoveler (*Anas clypeata*) • Tufted Duck (*Aythya fuligula*) • Common Scoter (*Melanitta nigra)* • Goldeneye (*Bucephala clangula)* • Little Grebe (*Tachybaptus ruficollis)* • Coot (*Fulica atra)* • Golden Plover (*Pluvialis apricaria)* • Lapwing (*Vanellus vanellus)* • Common Tern (*Sterna hirundo)* • Wetlands	*No hydrological connectivity between the application site and this SPA, therefore there is no potential for significant effects to arise on this site.*
Lough Ree SAC 000440	5km east	• Otter (*Lutra lutra*) • Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation • Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco Brometalia*) • Degraded raised bogs still capable of natural regeneration • Alkaline fens • Limestone pavements • Alluvial forests with *Alnus glutinosa* and *Fraxinus* excelsior (Alno-Padion, *Alnion incanae, Salicion albae* • Bog woodland	*No hydrological connectivity between the application site and this SAC, therefore there is no potential for significant effects to arise on this site.*
River Shannon Callows SAC *000216*	5.2km south-east	• Otter (*Lutra lutra*) • Molinia meadows on calcareous, peaty or clavey-silt-laden soils (*Molinion caeruleae*) • Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*)	*The application site is within the same catchment as the Cross River, which eventually leads to this SAC. However, there are no watercourses on site and during quarrying*

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		• Limestone pavements • Alluvial forests with *Alnus glutinosa* and *Fraxinus* excelsior (Alno-Padion, *Alnion incanae, Salicion albae*)	*there will be emissions to the River Cross or any other watercourse. Therefore, significant effects upon this SAC and its QIs arising from the proposed works will not arise.*
Middle Shannon Callows SPA *004096*	5.2km south-east	• Whooper Swan (*Cygnus cygnus)* • Wigeon (*Anas penelope*) • Corncrake (*Crex crex*) • Golden Plover (*Pluvialis apricaria*) • Lapwing (*Vanellus vanellus*) • Black-tailed godwit *(Limosa limosa)* • Black-headed gull (*Chroicocephalus ridibundus*) • Common Tern (*Sterna hirundo)* • Wetlands & Waterbirds	*The application site is within the same catchment as the Cross River, which eventually leads to this SPA. However, there are no watercourses on site and during quarrying there will be emissions to the River Cross or any other watercourse. Therefore, significant effects upon this SPA and its QIs arising from the proposed works will not arise.*
Lough Funshinagh SAC 000611	8.8km north-west	• Turloughs • Rivers with muddy banks with *Chenopodion 18ubric* p.p. and *Bidention* p.p. vegetation	*No hydrological connectivity between the application site and this SAC, therefore there is no potential for significant effects to arise on this site.*
Crosswood Bog SAC *002337*	10.1km east	• Active raised bogs • Degraded raised bogs still capable of natural regeneration	*No hydrological connectivity between the application site and this SAC, therefore there is no potential for significant effects to arise on this site.*
Killeglan Grassland SAC 002214	10.4km west	• Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	*No hydrological connectivity between the application site and this SAC, therefore there is no potential for significant effects to arise on this site.*
Lough Croan Turlough SAC 000610	10.8km north-west	• Turloughs	*No hydrological connectivity between the application site and this SAC, therefore there is no potential for significant effects to arise on this site.*

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Pilgrim's Road Esker SAC 001776	10.9km south-east	• Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	*No hydrological connectivity between the application site and this SAC, therefore there is no potential for significant effects to arise on this site.*
Lough Croan Turlough SPA 004139	10.9km north-west	• Shoveler (*Anas clypeata*) • Golden Plover(*Pluvialis apricaria*) • Greenland White-fronted Goose(*Anser albifrons flavirostris*) • Wetlands and waterbirds	*No hydrological connectivity between the application site and this SPA, therefore there is no potential for significant effects to arise on this site.*
Mongan Bog SAC 000580	11.1km south-east	• Active raised bogs • Degraded raised bogs still capable of natural regeneration • Depressions on peat substrates of the Rhynchosporion	*No hydrological connectivity between the application site and this SAC, therefore there is no potential for significant effects to arise on this site.*
Mongan Bog SPA 004017	11.5km south-east	• Greenland White-fronted Goose(*Anser albifrons flavirostris*)	*No hydrological connectivity between the application site and this SPA, therefore there is no potential for significant effects to arise on this site.*
River Suck Callows SPA 004097	12.4km west	• Whooper Swan (*Cygnus cygnus*) • Wigeon (*Anas penelope*) • Golden Plover (*Pluvialis apricaria*) • Lapwing (*Vanellus vanellus*) • Greenland White-fronted Goose (*Anser albifrons flavirostris*) • Wetland and Waterbirds	*No hydrological connectivity between the application site and this SPA, therefore there is no potential for significant effects to arise on this site.*
Fin Lough (Offaly) SAC 000576	12.7km south-east	• Geyer's Whorl Snail *Vertigo geyeri* • Alkaline fens	*No hydrological connectivity between the application site and this SAC, therefore there is no potential for significant effects to arise on this site.*
Carn Park Bog SAC *002336*	12.8km east	• Active raised bogs • Degraded raised bogs still capable of natural regeneration	*No hydrological connectivity between the application site and this SAC, therefore*

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			there is no potential for significant effects to arise on this site.

Table 1 – Natura 2000 Sites Within 15km of the Proposed Site

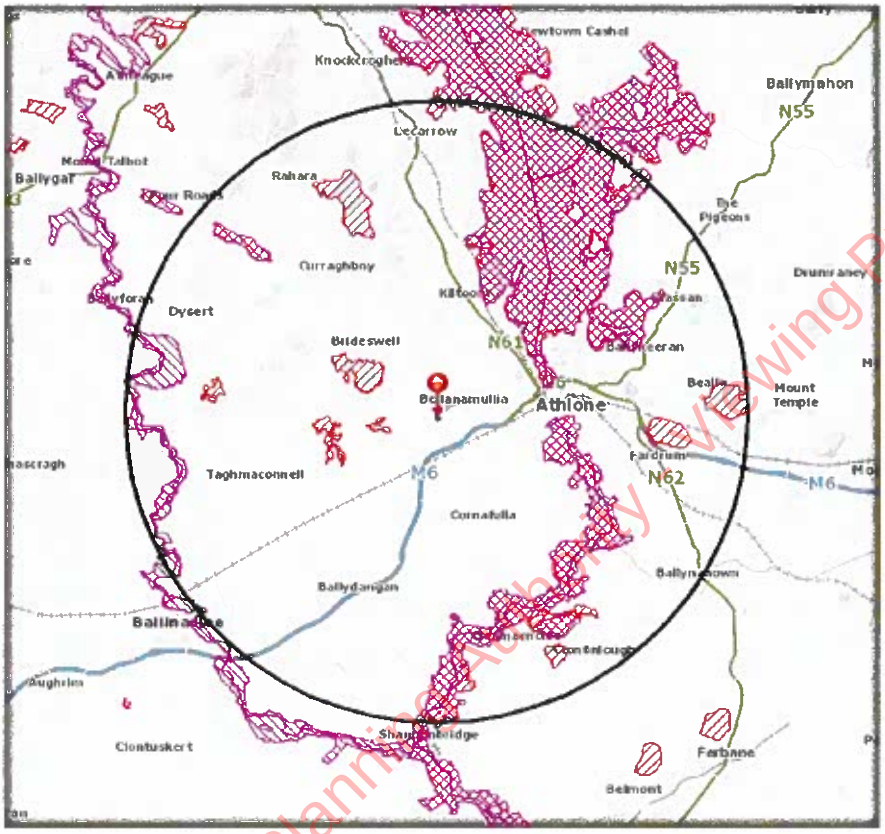

Figure 5 – The Application Site (Pinned) in relation to the Natura 2000 Sites within 15km. SACs – Red Hatching; SPAs – Pink Hatching

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3.4 Impact Assessment

The potential significant effects of the proposed development on the Natura 2000 sites identified above are described below.

Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on nearby Natura 2000 site:
The proposed development involves the commencement of quarrying activities at a field in Bealnamulla, Athlone, Co. Roscommon. There are no individual elements of the proposed project that are likely to give rise to significant negative effects on any of these aforementioned sites or the QIs for which they are designated. There will be no direct, indirect or cumulative effects upon any designated site arising from the operation of the proposed development. There is no connectivity between the application site and any designated area and there will be no significant effects upon the Qualifying Interests of any Natura 2000 site.
Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the nearby Natura 2000 sites by virtue of:
Size and scale: Given the small size and scale of the development in relation to the overall size of the designated sites identified, the likelihood of any direct, indirect or cumulative effects on these designated sites arising from the operation of the proposed development is low. **Land-take:** There will be no land-take from any designated site. There will be no interference with the boundaries of any designated site. **Distance from Natura 2000 site or key features of the site:** There are seventeen Natura 2000 sites within 15km of the application sites. The closest of these is Castlesampson Esker SAC and this is 2.5km west of the application site. There is no connectivity between the application site and this SAC and in this instance this distance is sufficient to ensure that significant effects will not arise upon this or any other designated site. **Resource requirements (water abstraction etc.):** No resources will be taken from any Natura 2000 site and there are no resource requirements that will impact upon any designated site. **Emissions:** There are no watercourses on site and therefore emissions into water during the quarrying activities will not arise. There will be no direct or indirect emissions to any Natura 2000 site or watercourse leading to any Natura 2000 site, specifically the Middle Shannon Callows SPA and the River Shannon Callows SAC. There will be a toilet facility on the site and waste will be stored in a 5000l storage tank. This will be emptied as required by a registered contractor for treatment in a registered waste water treatment plant and no emissions to ground will occur. **Excavation requirements:** There will be no excavation works in any designated area. **Transportation requirements:** There will be no additional transportation requirements resulting

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from the proposed development and associated works that will have any impact upon the Natura 2000 sites identified.

In-Combination / Cumulative Impacts: The proposed application was considered in combination with other developments or proposed developments in the Bealnamulla/Athlone area. A number of other developments (domestic / commercial) have been granted planning permission in this area in the preceding five years. To the immediate north of the application site at the concrete plant, planning permission has been recently granted by An Bord Pleanála upon appeal for the retention of works involving the extension of a concrete slab (Planning Ref 19/361). This application was accompanied by an AA screening report. The current proposal at Bealnamulla will have no significant effects upon Natura 2000 sites with considered in combination with other developments that have been properly screened for AA or where AA has been carried out and mitigation recommended.

Any future individual application that has the potential to impact upon a Natura 2000 site will be subject to Appropriate Assessment as required under Articles 6(3) of the Habitats Directive. The proposed development will have no impacts upon any designated site when it is considered in-combination with other developments that have been properly screened for AA or where mitigation has been carried out as part of an NIS.

Duration of construction, operation, decommissioning etc: The proposed lifespan of the quarry is ten years.

Describe any likely changes to the nearby Natura 2000 sites arising as a result of:

Reduction of habitat area: The proposed development lies outside the boundaries of the Natura 2000 sites identified in Section 3.3. There will be no reduction of designated habitat area within any SAC or SPA. There will be no effects upon the habitat qualifying interests of any designated site.

Disturbance to key species: There will be no direct or indirect disturbance to any species listed in Annex I of the Birds Directive or Annex II of the Habitats Directive. The proposed application site does not provide suitable or significant ex-situ habitat for any of the species listed as QIs of Natura 2000 sites within 15km.

Habitat or species fragmentation: There will be no habitat or species fragmentation within any SAC or SPA. No ecological corridors between the proposed site and the Natura 2000 sites identified will be damaged or destroyed.

Reduction in species density: There will be no reduction in species density within any SAC and SPA.

Changes in key indicators of conservation value (water quality etc.): There will be no negative impacts upon surface or ground water quality within any SAC or SPA.

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Describe any likely impacts on the nearby Natura 2000 sites as a whole in terms of:
Interference with the key relationships that define the structure or function of the site: It is not considered likely that there will be any impacts on the key relationships that define the structure or function of the Natura 2000 sites identified.
Provide indicators of significance as a result of the identification of effects set out above in terms of:
Loss - Estimated percentage of lost area of habitat: None **Fragmentation:** None **Disruption & disturbance:** None **Change to key elements of the site** (e.g. water quality etc.): None

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3.5 Finding of No Significant Effects

Finding of No Significant Effects Report Matrix	
Name of project	Development of a Quarry at Bealnamulla, Co. Roscommon
Name and location of Natura 2000 site	There are seventeen Natura 2000 sites within 15km of the application sites. The closest of these is Castlesampson Esker SAC and this is 2.5km west of the application site. There is no connectivity between the application site and this SAC and in this instance this distance is sufficient to ensure that significant effects will not arise upon this or any other designated site.
Description of project	The excavation of 603,200m3 of sand and gravel over a period of ten years
Is the project directly connected with or necessary to the management of the site?	No
Are there other projects or plans that together with project being assessed could affect the site?	No
The Assessment of Significance of Effects	
Describe how the project is likely to affect the Natura 2000 site	Having regard to the location, nature and scale of the proposed development, it is considered that there is no potential for significant effects either from the proposed development on its own or in combination with other plans and projects.
Explain why these effects are not considered significant	Not applicable as there is no potential for negative impacts
Describe how the project is likely to affect species designated under Annex II of the Habitats Directive.	No impacts likely
Data Collected to Carry out the Assessment	
Who carried out the assessment	Noreen McLoughlin, MSC, MCIEEM. Consultant Ecologist
Sources of data	NPWS, EPA, National Biodiversity Data Centre, Roscommon County Council
Level of assessment completed	Stage1 Appropriate Assessment Screening
Where can the full results of the assessment be accessed and viewed	Full results included

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4 Appropriate Assessment Conclusion

In accordance with Article 6(3) of the Habitats Directive, the relevant case law, established best practice and the precautionary principle, this AA Screening Report has examined the details of the project in relation to the relevant Natura 2000 sites within 15km of the application site.

At this stage of the AA process, it is for the competent authority, i.e., Roscommon County Council, to carry out the screening for AA and to reach one of the following determinations:

a) AA of the proposed development is required if it cannot be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or projects, will not have a significant effect on any European sites;

b) AA of the proposed development is not required if it can be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or projects, will not have a significant effect on any European sites.

It is of the opinion of the author that an AA of the proposed development is not required as significant effects upon all designated sites identified within 15km can be ruled out.

Noreen Mc Loughlin

Noreen McLoughlin, MSc, MCIEEM.
Ecologist.

(PI Insurance details available on request)

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CHAPTER 6

LAND, SOILS AND GEOLOGY

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6. Land/Soils (Geology)

6.1 Introduction

Viridus Consulting Ltd., (VCL) were appointed by Collins Boyd Engineers, to complete the Land and Soils (Geology) Chapter of the Environmental Impact Assessment Report (EIAR), to accompany the planning application for the proposed development of a Sand and Gravel Quarry at lands in the Townland of Rooskagh, near Bellanamullia (Bealnamulla) on the outskirts of Athlone in Co. Roscommon, on behalf of the landowner, Mr. Eamonn Harney.

The quarry development plan for the site involves the annual extraction and processing of about 46,676m^3 of natural, glacially derived deposits of inert sandy, gravelly, boulder clays. This will result in about 466,766m^3 tonnes of aggregate material being excavated from the site over a 10 year period. The works are designed to be 'dry' and completed above the natural water table.

The geological and environmental assessment work was completed by Mr. Darragh Musgrave, Senior Geo-Environmental Scientist at Viridus Consulting Ltd and Mr. Andy Garne, Senior Geo-technical Consultant at Garne Geotechnical Services.

6.1.1 Author Information and Competency

Darragh has an honours degree in Geology (Earth Science) from the National University of Ireland Galway, (NUIG 1992) and a Higher Diploma in Environmental Protection from the Institute of Technology Sligo (ITS 2006). He has over 28 years' experience working in the geological, geotechnical and environmental sector and has previously completed Environmental Impact Assessments and Reports for numerous quarries, infrastructure and residential development projects.

Andy Garne has an honours degree in Geology from the University of Newcastle upon Tyne and a Masters in Engineering Geology from Portsmouth University. He has over 30 years industry experience which includes geotechnical earthworks designs, contaminated land assessments, slope stability assessments, EIS geology and hydrogeology reports, site investigation design, procurement and supervision, soil & rock-core logging, laboratory scheduling and writing of geotechnical reports.

6.1.2 Reference to Guidelines Relevant to Discipline

The Land and Soils (Geology) Chapter for the EIAR follows the recent guidelines outlined in Directive 2014/52/EU and Annex IV amendments, as well as the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 and the Irish Environmental Protection Agency (EPA) document, Guidelines on the information to be contained within an EIAR, (2022).

The work also is cognisance of the two Environmental Impact Statement (EIS), EPA draft guideline documents, from September 2015, which outline the process of preparation and the content required for an EIS. The assessment work also follows the Institute of Geologists of Ireland (IGI) Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of EISs, (IGI April 2013), and National Roads Authority (NRA) Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes, (NRA 2008).

6.1.3 Methodology

The methodology and scope of the assessment involved the completion of a Desk Study, and Site Walkover, including the collation and review of available information pertaining to the site including previous environmental studies or databases relevant to the local area including the following:

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- Res & Trial Pit Survey of Sand & Gravel Site, Magazine Rd., Roscommon, BRG Ltd. 2005,
- Ordinance Survey of Ireland, (OSI) On-line Maps & Aerial Photographs, (www.geohive.ie),
- Geological Survey of Ireland (GSI) On-line Geological Datasets, (www.gsi.ie),
- Teagasc/Cranfield Soil Mapping On-line Data sets, (www.teagasc.ie/soils),
- Environmental Protection Agency (EPA) On-line Mapping, (https://gis.epa.ie/EPAMaps),
- Appropriate Assessment (AA), Kildea Concrete Plant Retention, Kingfisher Env, Feb, 2020,
- Rooskagh Quarry EIAR Scoping Report, Roscommon County Council, February 2021,
- EIAR carried out on application 21/463 Roscommon County Council, August 2021.

The Site Walkover reconnaissance work was undertaken by VCL on Tuesday the 27th April 2021, which enabled the visual examination of the geological, geomorphological and land use characteristics of the site and its setting in the locality. It also allowed a visual assessment of the proposed borehole locations to be made both in terms of their position on the site and access for the drilling rig.

As part of the site assessment four new boreholes were drilled by Priority Geotechnical (PGL) in late April 2021 around the perimeter of the proposed site in-order to establish the water table and possibly bedrock depths and also to install standpipes to enable groundwater samples to be undertaken.

In this chapter of the EIAR the existing baseline conditions and character of the land, soil and geological characteristics of the site are presented and the potential impacts anticipated from the development are identified and discussed. Mitigation measures are proposed, residual impacts are assessed, and any relevant monitoring options are considered.

This chapter should also be read in conjunction with Chapter 2 (Project Description), Chapter 7 (Water), Chapter 13 (Landscape), Chapter 15 (Interactions Summary).

Consultation was carried out with the relevant bodies by the project planning co-ordinator, including The Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media, Roscommon Co. Co., the GSI, An Board Pleanála and the EPA. A summary of the third-party responses received are included in Chapter 1 of the EIAR and presented in the Appendices.

6.1.4 Difficulties Encountered in Compiling Information

There were no difficulties encountered in the compilation of this chapter of the EIAR.

6.2 Description of Existing Environment

The detailed description of the quarry development and proposed activities are provided in Chapter 1 (Introduction) and Chapter 2 (Project Description).

6.2.1 Site Location and Setting

The proposed Rooskagh Sand & Gravel Quarry occupies a large open greenfield site, located approximately two kilometres (km) southwest of Bellanamullia (Bealnamulla) village and 6.5km west of the centre of Athlone Town in Co. Roscommon. The site is accessed via the R362 regional road and a short lane off the local L2025 third class road.

The site, which covers an area of 6.96 hectares has a roughly square or diamond shape with the existing access into the north-eastern corner through an existing farm gate. It is located in a relatively rural setting except for the existing Kildea concrete works which are situated in the land adjacent to its northern boundary. Open agricultural grassland fields border the site on its

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western, southern and eastern sides. There are a number of individual residential properties and farmyards situated off the third-class roads over to the northwest, west and southwest. Apart from one residence near the NW corner of the development area the properties are over 100m to about 500m away from the site. Refer to the site location plan presented in Appendix 6.0.

6.2.2 Land Use and Topography

Apart from the Kildea concrete works the land use in the local area is dominantly agricultural consisting of grassland fields. The history of the site itself is one of agricultural use with the old OSI 1840's six-inch (6") scale and early 1900's 25" scale Map Surveys showing the existing field boundaries on the site established at that time. An old road, which is now quite overgrown and disused, forms the northern boundary of the site. Stone walls and access gates are still visible along this boundary. There were a number of buildings shown close to the north and south sides of the site which are now gone while most of the current builds are new. Refer to the OSI Mapping presented in Appendix 6.1.

Previously the site was made up of two or three agricultural fields separated by hedges and fencing. The site area is now used as one open field area which can be fenced-off as necessary. Some individual trees from the historic hedge lines remain. The old OSI aerial photos show the land area under grassland and the development of the adjacent concrete works from a small quarry area visible in the early 1990's. Most of the local residences built along the local roads are reasonably recent. Refer to the Old OSI Aerial Photographs presented in Appendix 6.2.

The proposed quarry site occupies a distinctive hill topography which is rises westwards from the base of the slope, from the access gate in the north-east corner at about 48m, and along the eastern boundary which has a ground height of between 48m to 53m in the south-eastern corner. The highest point, at about 72m is formed by a distinctive cone shaped peak feature which is located just to the south of the central part of the site area. A ridge of high ground runs south westwards from the central high point to the western boundary at a height of 67.5m.

The topography slopes steeply from the high point and the ridge of high ground downwards to the south with the southern boundary ranging in height from 52m in the south-east corner to about 60m in the south-west corner. Similarly, the ground slopes downwards in a northern direction from the central high point and ridge with the ground heights along the northern boundary ranging from 48m in the north east corner up to about a height of 60.5m in the central part of the northern boundary before it slopes down to a height of about 57.5m in the north-west corner. There is a farm access gate in the northwest corner which connects to the old road.

A detailed topography map of the site is presented in Appendix 6.0 and the larger scale topographical map of the wider locality from the GSI web site is presented in Appendix 6.4.

6.2.3 Soils and Subsoils

Topsoil and Subsoils (Quaternary sediments) in the Midlands of Ireland were deposited during or after the last ice age by the Devensian (Midlandian) ice sheet (C. Delaney 2002) that occurred in this part of the country and essentially comprise the unconsolidated natural mixes and variable thicknesses, of fine clay, silt and sand and variable quantities of courser gravel, cobble and boulder size stone materials. These deposits typically cover the underlying bedrock except where soils are absent and natural exposures of bedrock occur. The geomorphology of the Midlands is dominated by glacial and associated meltwater deposits, such as Esker Ridges, Kames, Outwash Fans, Moraines and Drumlines.

The study area is located on the eastern end of a sharp crested ridge or esker feature which is part of the Athlone Esker System. This dendritic esker system consists of a series of steep-

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sided sharp crested ridges with minor flat-topped and fan-shaped areas, (C. Delany 2002). This east - west trending glacial deposition system extends over 20km on the east and west side of the River Shannon on the south side of Lough Ree and follows the orientation of the main Midland Eskers, (such as the Esker Riada, Moate and Clara Eskers). The study area is located about a kilometre to the south, south-east, of another large glacial esker system known as the Rooskagh Esker which as a roughly north-south trend. Refer to the drawing of 'Eskers and Kames in the Lough Ree Area' presented in Appendix 6.3.

The word 'Esker' is an anglicisation of the Gaelic word 'eiscir' which translates to 'ridge' and its origin is not surprising given their abundance throughout the Irish Midlands. The eskers are formed as meltwater deposits laid down within, or at the exit from, an ice-walled channel. Their formation is most likely to occur when ice is thin and slow moving and is associated with ice sheet retreat. The geomorphology (shape), extent and content of the esker and associated glacial deposits, are indicative of the type of ice sheet retreat occurring, (C. Delaney 2000). The steep sided esker 'ridge' features are considered to be formed within water filled tunnels beneath, above or within the melting ice sheet. These tunnels fill with sediments and when the ice melted they remained as sandy or gravelly ridges, typically with long winding sinuous shapes. (Tubridy 2006).

Internally, eskers are composed of a wide variety of materials ranging from fine lacustrine silts and clays, sorted silts, sands, gravels and large boulders. These sediments are typically interbedded and highly variable over short distances with sand and gravel beds often having up to 5% to 10% silt and clay. Large boulders and rocks, clayey or silty units often form considerable portions of single ridges or segments, (Tubridy 2006). Refer to the drawings and photos of eskers presented in Appendix 6.3.

The GSI Mapping identifies the site area as being in an area of Hummocky Glaciofluvial Esker Sediments Physiography. The GSI Physiography Mapping indicates that the site occupies the eastern end of the esker ridge feature which runs from West to East through the centre of the site, with its ending at the eastern boundary of the development area. The ester is described as being composed of 'Gravel of basic reaction'. The surrounding soils within the development area are described as 'Gravels derived from limestone', while the land area along and to the east of the sites eastern boundary is shown as being underlain by 'Tills derived from Limestone'. Outside the site boundary sediment deposits related to other eskers, gravels, till and peat areas and lacustrine systems are identified. Refer to the GSI Geomorphology and Quaternary Soil Mapping presented in Appendix 6.4.

The recent EPA/Teagasc Soil Information System (SIS) soil mapping indicates that the local area, including the proposed quarry site, has a 'Mullabane (1100MB)' Soil Association that is described as "coarse loamy drift with limestone" and which are widely distributed in the area and nationally. Refer to the Teagasc Soil Mapping information presented in Appendix 6.4.

A site-specific assessment on the potential for sand and gravel to be present on the proposed quarry site was completed for the landowner in June 2005. A combined Geophysical Resistivity Survey and Trial Pit Excavations were completed on the site by BRG Ltd. The technique used was 2D Resistivity and consisted of five 240m long (Line's A to Line E) and one 120m long (Line F) survey lines, with a 5m spacing between the resistivity electrodes. The lines themselves were spaced, at most 50m apart and were orientated roughly NE-SW, along the long axis of the site, following the orientation of the esker ridge. A total of nine trial pits were also excavated to depths of 3m to 5m around the site area. Refer to the Resistivity Lines and Pit Locations Figure presented in Appendix 6.5. A summary of the sediments recorded by trail pitting excavations is presented in Table 6.1.

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TP ID	Description (BRG Ltd.)
P1	0 - 0.5m Overburden 0.5 ~ 4m Gravel (dirty boulder).
P2	0 - 0.6m Overburden 0.6 ~ 4m Gravel (good clean).
P3	0 - 3m to 4m Boulder Clay. Good strong gravel below.
P4	0 to 5m Boulder Clay.
P5	0 - 0.05m Overburden. 0.05 – 1m to 2m Sand (good clean), 2m to 5m clayey sand.
P6	0 – 1m Overburden. 1m to 4m Sand (good clean)
P7	0 – 0.7m Overburden. 0.7 – 4m to 5m Good clean gravelly material.
P8	Boulder Clay to base (not specified) – no gravel.
P9	Good clean gravelly material.

Table 6.1: Summary of trail pit excavations from BRG Report from June 2005.

Some site photographs of the excavations are included with the BRG report and a selection of these are presented in Appendix 6.5. The trial pit data was used to assist BRG with the interpretation of the resistivity results which are presented in full in Appendix 6.5 and summarised in Table 6.2.

2D Res Line	**Summary of BRG Interpretation** (distances are the lengths along the survey line).
Line A	0 to 140m correlates with gravels seen in P1 are modelled up to ~16m. Overburden depths vary. Conductive zone at 170m correlates with Boulder Clays seen in P4. The low resistivity zone across the base could be interpreted as argillaceous Ltsn or a clay rich horizon.
Line B	Good clean gravels identified in P3 are reflected to depths of 10m to 20m from 0 to 125m. Conductive zone at 135m correlates with Boulder Clays seen in the upper part of P3 which over lays good strong gravels. The base of low resistivity may reflect argillaceous limestone or a clay rich horizon.
Line C	Most of the line is interpretated to have up to 12m of sands and gravels as intersected in Pit 5 at station 200m with more clayey sandy material below.
Line D	Good thick gravels and sands, as seen in Pits 6 & 7, are interpreted along most of this line, (up to 15m in the NE to 10m in the SW). Varying thickness (0.5 – 5m) in overburden clays from station 130m to 175m may be encountered. A less resistive lower layer is possibly bedrock argillites or clays.
Line E	Located at the base of the hill on the southern side of the site – poor contact of the electrodes with the ground may have given rise to anomalous results here?
Line F	A shorter spread 0 to 120m was completed in the NW part of the site. Overburden at stations 0m to 30m and 80m to 100m appear to be as much as 5m deep. A more resistive zone was identified at depth which correlate to sands/gravels seen on other lines and in the trial pits.

Table 6.2: Summary of 2D Resistivity Survey Line Data from BRG Report from June 2005.

The conclusions of the BRG Ltd., report identify that the resistivity profiles concur with the complexity of the results from the trial pits completed on the site. Overburden and boulder clay horizons undulate across the site, as do the sands and gravels. While the survey does not enable sands and gravels to be differentiated it does confirm that they appear to be extensive and extend to thicknesses of 8-20m.

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The site investigation report mentions that at the time of the survey (June 2005) there was an existing sand/gravel operation currently working across the access lane to the north of the site. This area is now occupied by the Kildea Concrete Plant works and while no quarrying is ongoing there are some very good outcrops of the local overburden due to historic and recent excavations completed to create working space at the facility.

Some extensive excavations have recently (within the last five years) been completed on the south side of the Kildea Concrete site which is directly adjacent to the proposed quarry site. It is assumed that the type of sediments exposed in these excavations will be similar to the material underlying the proposed quarry site. The excavations were observed as part of the VCL walkover of the site and were found to be dominantly composed of thick sequences of boulder clay with interbedded horizons and lenses of sands and gravels. Some photographs of the exposed excavation faces from the VCL Site Walkovers are presented in Appendix 6.6.

As part of the site EIAR assessment four new boreholes (MW1 to MW4) were drilled on the boundaries of the proposed area in order to confirm the depth of the groundwater table under the site and to install standpipes which would enable long term groundwater level monitoring and sampling. The open hole air rotary drilling technique used does not allow for a detailed record of the soft over burden sediments to be recorded but a general description is given on the drilling logs, as is an interpretation of the bedrock depth, if encountered. A summary of the borehole data is presented in Table 6.3 and the borehole logs are presented in the appendices to Chapter 7 - Water.

BH ID	BH Location	Sandy Gravel & Gravelly Sand	Fine or Coarse Sand	Clayey Gravelly Sand	Limestone Bedrock	BH End
MW1	Eastern Boundary	0 - 7.4m			7.4m	7.7m
MW2	Southern Boundary	0 - 4.1m	4.1-9.5m	9.5 – 20.1	none	20.1m
MW3	Western Boundary	10.2 – 21m	0–10.2m		21m	28m
MW4	Northern Boundary	0 – 4.5m		4.5 – 16m	none	16m

Table 6.3: Summary of BH lithologies & depths from openhole rotary drilling. PGL April 2021.

The borehole drilling identified thick sequences of variable glacial deposits in the site area over lying limestone bedrock. Groundwater levels were identified during the subsequent water sampling at a depth of 48.5m in the western boundary and 46m on the eastern boundary. The groundwater assessment for the development is included in Chapter 7.

6.2.4 Bedrock Geology

The area under the proposed quarry site, and across much of Roscommon, is identified by the current GSI on-line bedrock maps as being underlain by the Lower Carboniferous aged Dinantian Pure Bedded Limestone (DPBL) comprising of Undifferentiated Visean Shelf Limestones (VIS). Refer to the GSI Bedrock Mapping presented in Appendix 6.7.

These limestones, while widespread in County Roscommon and the Irish midlands are categorized as undifferentiated due to the lack of exposure, (as they are covered by glacial sediments), and available drilling information in the region. The uniform nature of these beds both across wide areas and vertically in thickness makes it difficult to map different geological formations. Available quarry and borehole logs indicate that the VIS limestones are dominantly

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well bedded and form horizontal layers of a remarkably uniform nature. They were originally deposited as 'shelf limestones' in a shallow warm tropical marine environment which covered Ireland at the time and the presence of marine fossils such as shells and corals in the bedrock reflects this.

Limestone Units identified in Roscommon include the Croghan, Ballymore, Oakport and Kilbryan Formations. These typically consist of fine to coarse grained bioclastic limestones with occasional cherts. Horizons of fine black calcareous mudstone also occur in the older Kilbryan Formation.

There are no bedrock outcrops identified by the GSI mapping in the local area and no bedrock core was recovered by the air rotary drilling so no identification of the limestone type under the site was possible. Limestone bedrock was encountered by the drilling at about 8m below ground level (bgl) on the eastern end of the site (MW1) and at about 21m bgl at the western side of the site, (MW3). No bedrock was encountered at 20m bgl and 17m bgl in the boreholes drilled on the southern (MW2) and Northern (MW4) boundaries. Refer to the borehole logs presented in Appendix 7.

Older Carboniferous Limestones, The Waulsortian Formation (WA) are identified by the regional GSI mapping about 1.5km to the southeast of the site area. Refer to the GSI Bedrock Mapping included in Appendix 6.7.

6.2.5 Soft or Unstable Ground and Geo-Hazards

The Dinantian Pure Bedded Limestone (DPBL) bedrock are known to be karstified. The GSI Karst Mapping does not identify any features in the site area or general locality. Refer to the GSI Karst Map presented in Appendix 6.7.

There is no evidence that potentially soft or unstable materials such as peat, lacustrine clays or alluvial silts or muds are present in any part of the site or local area.

The GSI has developed a database of historical landslides and landslide susceptibility in Ireland. This database indicates that no recorded landslide events lie within or in the general locality of the study area. The whole site area is considered to have a low landslide susceptibility. Refer to the GSI Map in Appendix 6.7.

The natural fluvioglacial esker sands and gravels underlying the site tend to be very compacted, well drained, and stable once excavated. The high exposures of glacial boulder clay evident on the Kildea Concrete site are stable at a steep angle. Some benching of the slope has been included to improve the slope stability of the higher faces.

There is potential for lenses of pure sands or gravels to 'unravel' when exposed on a steep slope and also for individual boulders to be weathered out of the deposits and for these materials to roll down the slope but simple mitigations, such as shallow trap trenches and or foot walls, would prevent this debris from spreading from the base of the slope. The Kildea site have a row of large concrete blocks at the base of the exposed slopes which have been recently excavated on their site. Refer to the site photographs presented in Appendix 6.6.

6.2.6 Legacy Landfills and Contaminated Sites

In 1996 the Environmental Protection Agency (EPA) began licensing certain activities in the waste sector. These include landfills, transfer stations, hazardous waste disposal and other significant waste disposal and recovery activities. The EPA website shows that there are no licensed waste facilities in the general area.

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6.2.7 EPA Industrial Emission (IE) Licensed Facilities

The EPA has been licensing certain large-scale industrial and agriculture activities since 1994 and since 2003 this had been done under the Integrated Pollution Prevention Control (IPPC) Directive and more recently the Industrial Emission (IE) Licencing system. A review of their On-line mapping resource shows that there are no EPA licensed facilities near the study area.

6.2.8 EPA Economic Geology and Geological Heritage Sites

A review of the on-line GSI and EPA web mapping indicates that there are a number of other active or historical sand and gravel quarries in the locality (within 5km) all developed on the West to East trending, similar fluvio-glacial deposits that form the Athlone Esker system. Refer to the GSI quarry location mapping presented in Appendix 6.7.

The GSI identify that the area has a High to Very High Potential for Aggregate Resources. Refer to the GSI Aggregate Resource Mapping presented in Appendix 6.7.

The GSI identify the Castlesampson Esker (IGH7), which forms the western end of the Athlone Esker system and is about 3km West of the proposed study area, as a Geological Heritage Site. The Castlesampson esker is designated as an excellent example of a complex, multi-crested esker comprised of numerous beads. The proposed site is not part of a designated feature.

Refer to the GSI Geological Heritage Site Map and IGH7 Report presented in Appendix 6.8.

6.2.9 Areas of Scientific Interest

A review of the EPA and National Park & Wildlife Service (NPWS) on-line databases indicates that some of the Castlesampson Esker Area, located about 2.5km to the west of the site area, is a Proposed Natural Heritage Area (pNHA) and designated Special Area of Conservation (SPA), (Ref No. 001625).

The ecological aspects of the project are discussed in more detail in Chapter 5 – Biodiversity.

6.2.10 Groundwater

All the proposed sand and gravel extraction is to be done above the water table and the site is to be operated as a 'dry' quarry. The groundwater table was identified at depths of 46m (east side) to 49m (west side) bgl in the boreholes drilled on the site for the hydrogeological assessment. The proposed excavation depth is 49m (east side) rising to 52m (west side) so that the floor of the quarry does not intersect the water table and a thickness of natural unsaturated material is maintained between the quarry floor and the underlying water table.

The groundwater (hydrogeology) assessment of the site is included in Chapter 7 - Water.

6.2.11 Conceptual Site Model

As per the IGI Guidance recommendations a Conceptual Site Model (CSM) has been conceived for the site examining the interaction of the project with the geological environmental. The main interaction is the excavation of the unconsolidated fluvio-glacial inter-bedded boulder clays and sand and gravel deposits through the formation of a new quarry followed by the site's restoration to agricultural use.

The proposed site layout has the sites car parking, office, welfare facilities, weigh bridge, water settlement pond and wheel wash at the eastern end of the site, near the existing main access point. (Detailed drawings of this infrastructure are included in Appendix 7.10 of Chapter 7.)

The excavation will progress above the water table from the East side of the site to the West end of the site in a number of phases with about 466,766m^3 of material to be removed over 10 years.

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No machinery service or storage sheds are proposed as this will be done locally off site at another location. Similarly, rock crushing equipment will only be brought to site periodically to create aggregate from the large boulders which will be segregated out during the excavation works.

Refer to the Site Layout Plan, Cross Sections, Excavation Phases included in Appendix 6.9.

6.2.12 Type of Land and Soil/Geological Environment

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

Type A - Passive Geological/Hydrogeological Environment.

This is based on the fact that the area is occupied by a well-defined sand and gravel glacial outwash deposit underlain at depth by competent limestone bedrock which is a historically stable geological environment. The underlying limestone units are classified as a regionally important aquifer.

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

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

Based on the NRA 2008 matrices, (Tables C2 of the IGI Guidelines), the importance of the land and soil/geological attributes of the Rooskagh Quarry site are rated as High to Medium/Low to Low. The highest rating is given for its potential for aggregate extraction. See Table 6.4.

Attribute	Criteria	Typical Example	Importance
Topsoil	Attribute has Low quality significance as moderately fertile soil, with steep topography suitable for grassland use.	Thin, moderate fertility well drained soils.	Low
Sand & Gravels	Attribute has a high-quality aggregate resource potential for a moderate size quarry development.	Moderate sized extractable sand & gravel resource	High
Bedrock Resource	Attribute has a low quality significance or value on a local scale	Very common limestone rock which is sub-economic for extraction	Low
Geological Heritage	Attribute has a medium to low quality significance or value on a county scale	Part of extensive esker system with no geological heritage designation.	Medium/Low

Table 6.4: Criteria for Rating Site Attributes

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Based on the rating of the site attributes the soil and subsoil profile is identified as having a High to Medium/Low to Low Importance as it represents a moderate sized potentially economically extractable sand and gravel aggregate resource situated above the water table.

The agricultural and geological heritage attributes are very common on a local and county wide scale, are not designated and are considered to be of Low Importance. The long-term post quarrying end use of the site is for it to be re-used for agricultural grassland, so there will be no long-term attribute loss in this regard.

6.2.14 Activities Associated with the Proposed Development

As per Step 4 and Figure 2 of the IGI Guidelines a range of Generic Activities that can potentially interact and impact with the geological /hydrogeological /environment are presented in the Activities /Environment Matrix. The activity which is associated with the proposed development of the quarry relates to; **EARTHWORKS,** and this activity will be completed in a Type A (Passive) geological environment. A copy of the IGI Matrix - Figure 2 is presented in Appendix 6.10.

Site specific site investigations in the form of geophysical surveys, trial holes and boreholes have been used to characterise the nature and thickness of the soil/subsoil deposits and the depth to groundwater and bedrock under the site. It is proposed to complete the quarrying earthworks and re-instatement of the site in a way which will enable an orderly and structured excavation and restoration. Excavation works will proceed from the eastern end of the site towards the western boundary. Reinstatement of worked areas will commence as soon as is practical after quarrying.

6.2.15 Re-instatement Phase Backfilling Activities

The re-instatement of the site will be completed by the covering of the new quarry floor area in a controlled manner with inert soil. The proposed ground level will roughly match that of the lands to the east of the site allowing easy access for farm machinery and grassland agricultural use.

The top edge of the excavation will end three metres away from the site boundary and the excavations will be completed at a 1:1.5 slope angle. Benching will be allowed for in the higher excavation faces at the western end of the quarry to improve stability. A shallow catch trench can be completed near the toe of the newly exposed slope to prevent debris rolling onto the quarry floor area during the excavation works. A thin covering of topsoil will be used to cover the slopes in order to promote vegetation, reduce runoff and improve stability. A hedge line will be completed on the new quarry slopes as outlined in the detailed planting scheme presented in the projects restoration plan.

The proposed site is located on the eastern end of a short esker feature and there may be academic interest in examining the quaternary deposits as they are exposed and excavated so that the depositional history and environment in which they were deposited can be more clearly understood.

6.2.16 Operational Activities

The proposed long-term activities related to the land and soil elements on the site will relate to its use for agriculture. These activities will commence in a phased manner as the restoration works progress.

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6.3 Impact Assessment and Determination

The potential impact of the proposed development on the land and soils/geology is primarily the extraction of inert soils/subsoils comprising of fluvio-glacial boulder clay and sand and gravel deposits.

The ground level will be lowered across most the site area as the eastern end of the small hill like esker feature is quarried. This will decrease the depth of overburden over the underlying bedrock and water table, which will increase the vulnerability of the groundwater to potential surface contamination.

The extraction/quarrying phase will create on-site transport requirements and potential on-site sediment management issues in terms of potential dust generation and suspended sediment runoff in surface water. There will also be risk of soil contamination from oil or fuel leaks from machines and vehicles on the site.

The proposed access road, carpark area, office and welfare buildings, weigh bridge, wheel wash and surface water pond will be decommissioned once the quarrying activities are completed.

6.3.1 Impact Assessment Methodology

An analysis of the predicted impacts or effect of the proposed back filling on the land and soils/geology during and after the quarrying (construction) phase, as per Annex IV of Directive 2014/52/EU, EPA EIAR Guidance Document, (2022), NRA Guidance (2008/9) and Appendix C of the IGI EIS Preparation Guidelines (IGI 2013), is presented in the following section.

The impact assessment was undertaken using the following considerations:

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

The rating of the potential 'Magnitude of Impacts' at EIAR stage are defined by the NRA guidance (2008), which includes typical examples, as outlined in Table 6.5.

Impact Magnitude	Criteria	Typical Example
Large Adverse	Results in loss of attribute and/or quality and integrity of attribute	Irreversible loss of high proportion of local high fertility soils Removal of entirety of geological heritage feature Requirement to excavate and replace a high proportion of peat, organic soils and/or soft mineral soils
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Irreversible loss of moderate proportion of local high fertility soils. Removal of part of geological heritage feature Loss of moderate portion of future quarry or pit reserves.

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Small Adverse	Results in minor impact on integrity or attribute or loss of small part of attribute	Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils. Removal of small part of geological heritage feature Sub-economic extractable mineral or rock resource.
Negligible	Results in an impact on attribute but insignificant magnitude to affect either use or integrity	No measurable changes in attributes.

Table 6.5 Criteria for Rating Land/Soil Impact Magnitude at EIS Stage**
(**Data sourced from Box 5.1 of the NRA 2009 EIA Guidelines Page 103 & IGI Guidelines Table C4).

The potential impact magnitude of the development of the Rooskagh Quarry would be considered to be 'Negligible' for the land/soils geological attributes as while there would be the permanent removal of a small portion of part of an esker feature it is not a geological heritage feature, there will be no impact on the existing bedrock or long-term use of the land for agriculture.

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

The rating of potential environmental impacts on the land/soil (Geological) environment can be assessed based on the matrix presented in Table 6.6, which takes account of both (1) the Importance of an Attribute and (2) the Magnitude of the Potential Environmental Impacts of the proposed development on it. The criteria apply to potential impacts during both the development/construction and operational phases.

		Magnitude of Impact (Table 6.5)			
		Negligible	**Small Adverse**	**Moderate Adverse**	**Large Adverse**
Importance of Attribute (Table 6.4)	**Extremely High**	Imperceptible	Significant	Profound	Profound
	Very High	Imperceptible	Moderate/ Significant	Significant/Profound	Profound
	High	Imperceptible	Slight/Moderate	Moderate/Significant	Significant/ Profound
	Medium	Imperceptible	Slight/Not Significant	Moderate	Significant
	Low	Imperceptible	Imperceptible	Slight	Slight/ Moderate

Table 6.6 Rating of Significant Environmental Impacts at EIA Stage***
(***Based on NRA Guidelines (2009) – Box 5.4 Page 106 and IGI Guidelines Table C6).

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

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The Rooskagh Quarry development would result in a Negligible Impact, on the High to Low importance geological attributes, as all potential impacts would have insufficient magnitude to effect either its use or integrity. The High Value geological attribute of the site is as a potential quarry aggregate resource.

The descriptions of the 'Significance of an Impact' used are as presented in the EPA EIAR Guidelines 2022 – Table 3.4. (The word 'effect' is used interchangeably with the work 'impact' in the EPA EIAR guidelines).

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

Table 6.7 Describing the Significance and Quality of Potential Effects for EIARs

For the proposed Rooskagh Quarry Development the rating of Significant Environmental Impacts would be considered 'Imperceptible to Not Significant' with Neutral Quality effects regarding the bedrock and subsoils and potentially Positive Quality effects regarding the economic use of the resource and ultimate site end use as agricultural land.

- Types of Predicted Impacts: These are described as 'Do Nothing', Cumulative, Indeterminable, Irreversible, Residual, Synergistic or 'Worse Case' scenarios. (These are examined in Section 5.4).

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6.4 Predicted Impacts

6.4.1 Do Nothing

In the scenario of the quarry development not progressing then the potential sand and gravel reserves will not be excavated, and the area will remain as a hilly agricultural grass land fields.

6.4.2 Development Phase

The nature of the proposed Rooskagh Quarry Development will result in a number of potential direct and indirect quarrying (construction) phase related impacts. These are identified as;

- the proposed excavation of the inert fluvio-glacial boulder clay, sand and gravel materials and related quarrying earthwork activities,
- sediment runoff from work areas,
- potential occurrence of unstable soil from quarry faces,
- fuel spills from site machinery

6.4.2.1 The proposed quarrying of natural sediments from the site.

The proposed quarrying works will change the ground levels and the local topography across the site. Decreasing the ground height from the eastern boundary westwards. This will remove the steep hill feature and lower the ground levels to match those at the eastern end of the site. The rise in ground levels and slope feature will move to the western end of the field which forms the site boundary. It will provide flatter more consistent gradient in the site area, suitable for agricultural activities, but will remove the natural end of this esker feature. This will have a PERMANENT impact but one which would not be considered to negatively affect the overall geological character of the area and would be considered to have an INPERCEPIBLE NEUTRAL quality impact on the soil/Land attribute.

6.4.2.2 Sediment Runoff from Work Areas

The potential occurrence of suspended sediments in rainfall runoff from earthwork areas is likely. However, there is good drainage through the naturally permeable sediments so much water will naturally percolate to ground. An internal surface water drainage and management system will be established within the quarry and surface water will not be able leave the work area without collecting in the sites surface water settlement pond system prior to its re-use as wash water or percolation to ground. As no suspended solids will leave site and all waters will ultimately percolate to ground, as is currently the case, the potential impact is considered INPERCEPIBLE and NEUTRAL.

6.4.2.3 The Occurrence of Unstable Soil or Quarry Faces

The creation of unsupported soil stockpiles could lead to stability risks in the imported sediments this effect would be BRIEF to TEMPORATY with an INPERCEPIBLE NEUTRAL site impact. The creation of steep exposed quarry faces as the excavations approach the western and northwestern sides of the site could pose a slope stability risk if they are no constructed properly. This would be a LONG TERM to PERMANENT NEGATIVE effect, however having a maximum slope of 1:1.5, adequate benching, toe barriers and re-soiling for vegetation cover will mitigate any slope instability risks.

6.4.2.4 Fuel Spills

The activity of plant and machinery and plant equipment operating in the quarry area could result in small scale fuel spills to the ground surface. This would be a potential TEMPORARY or SHORT TERM NEGATIVE impact if an accidental oil or fuel spills were to occur onto the exposed subsoils on the quarry floor.

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6.4.3 Re-instatement Phase

There are considered to be no operational phase impacts as there will be no interaction with the land and geological elements once the site area is fully restored and back in agricultural use. The following of good agricultural practices will ensure that the soil horizon is maintained and enhanced for grassland.

6.4.4 Risk of Major Accident and Disasters

Possible scenarios which may create a serious pollution or accident risk would include the loss of bulk fuel or oils during re-fueling machinery during quarrying or the collapse of large unsupported soil stockpiles and/or the failure of steep quarry faces around the western and northern edges of the site.

The accidental loss of fuel from active machinery in the development or the spillage of fuel during the re-fueling of construction machinery would be considered to pose an environmental risk. This would impact on the soil/subsoil quality which could, if left unmanaged, impact on the water quality of the aquifer under the site. In either case the potential volume of fuel loss would be relatively small in the 10's rather than 100's of liters and the duration of the impact would be temporary to short term.

The other potential 'worst case scenario' would involve the collapse of soil from a stockpile or exposed excavation face which could pose a human health risk for operators working on the site. It is considered that this scenario would be very unlikely once stockpile heights and their location are managed and any steep excavations are minimized. Slope stability in sediment quarries does not pose the same human health risks as those posed in rock quarries.

The potential for a major accident or disaster to occur with regard to the soil and geology attribute is considered very unlikely, especially if stockpile heights and steep excavation faces are controlled during the quarrying phase. During the landscaping phase, the remediation of unstable quarry faces can be undertaken if any visible signs of soil failures or slope subsidence, such as settlement or tension cracks, are observed.

6.4.5 Cumulative Impacts

The potential cumulative impacts of some of the other construction and infrastructure projects in the planning system in this part of County Roscommon which were considered include:

- The presence of the existing Kildea Concrete plant immediately to the north of the site,

The cumulative operational impacts of these projects are considered insignificant as the scale and footprint of the development areas is extremely small when compared to the soil and geological attributes which are very widespread both in a local and regional context and no significant cumulative adverse impacts are anticipated to occur. There may be operational and commercial benefits of having a potential aggregate user located so close to the aggregate source.

The sensitivity and value of the receiving environment combined with the magnitude and duration of the potential impact defines the environmental significance of the effect and is examined both before and after the application of mitigation measures. Generally, the more significant and long term the impact the more difficult it is to mitigate it.

While the magnitude of the potential long-term impact on the land and soil/geology from the development are considered to be negligible there are potential brief to temporary or short term

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impacts that may arise during the quarrying works that could cause environmental risks. As with any quarrying site there are a number of mitigation measures that would help eliminate and/or reduce the occurrence of these potential impacts.

6.5.1 Quarrying Phase MitigationsNew work areas should only be extended as the active areas are finished so that the working surface area of exposed materials is kept to a minimum. This is the most effective way of preventing the release of dust in dry weather and suspended sediments in wet conditions. Potential impacts are therefore avoided.

- Limiting access roads to only the active quarry work areas will limit the potential amount of dust or sediment runoff generated on the site and will limit soil compaction occurring in other areas.
- Dust can be reduced by damping down of the works areas and especially along roads and access tracks where vehicle activity increases the generation of dust and fine particulates.
- A designated carparking area will be established by the existing access gate. The quarry infrastructure will include a designated office, weigh bridge and wheel wash.
- Designated stockpile areas for the temporary storage of topsoil, subsoils and rock material will be established. Stockpile heights will be kept to a minimum to prevent slope instability.
- Any finished quarried areas should be landscaped and re-grassed as soon as possible after completion to limit the potential for dust and surface water generation from those areas.
- Activity of plant equipment and machinery operating in the quarrying area could result in small scale fuel or oil spills to ground - mitigating against accidental leaks and spillages during the works will involve implementing good practices including regular plant maintenance, adequate bunding for storage containers, refuelling in designated areas, operator training, etc.
- All fuel storage areas on the site will be sufficiently bunded and any mobile bowsers used on site will be double skinned. Bunds sufficiently large to fully contain accidental spills will be provided around all tanks/storage areas containing harmful substances.
- Spill kit materials will be maintained on site and site staff trained in the response to accidental spills and the use of clean up materials.
- Good housekeeping (site clean-ups, use of disposal bins, etc.) around the site and proper use of storage and disposal facilities for lubricants fuels, oils and other waste streams will be used.
- The site should follow relevant environmental guidelines such as the EPA 'Environmental Management in the Extractive Industry: Non-Scheduled Minerals' (2006), the CIRIA C692 Environmental Good Practice on Site (3rd ed) 2010 and Concrete Industry Federation (CIF) Good Environmental Practice Guidelines.

6.5.2 Restoration Phase

The site will be returned for agricultural use with all quarry infrastructure removed from the locality.

6.5.3 Monitoring

Visual inspection of the excavated quarry faces will be undertaken as works progress to check the nature of the aggregates being exposed and to ensure no slope stability issues are occurring.

6.6 Residual Impacts

With the importance of the land and soils/geology attribute's being 'High to Low' and the potential Magnitude of Impact as 'Negligible' then the potential impacts are rated as 'Imperceptible'.

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The potential residual impacts are those that will occur after the proposed mitigation measures have taken effect. The mitigation measures described will further reduce the potential for any significant brief to temporary or short-term environmental impacts occurring during the site's excavation.

No significant residual impacts from the agricultural end use of the land area are anticipated.

No significant residual impacts are predicted for the land and soils/geology aspects of the proposed development. The consideration of cumulative projects does not change the residual impact rating.

A summary assessment of the predicted impacts, mitigation measures, monitoring and residual impacts during the backfilling and operational phase are shown in Table 6.8.

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Feature		Impact Assessment Operational					
Name	**Importance**	**Magnitude of Impact**	**Criteria for Impact Assessment**	**Significance of Impact**	**Duration of Impact**	**Mitigation Measure**	**Residual Impact**
Top Soil	Low	Negligible	Removal of thin topsoil cover as quarrying progresses.	Imperceptible	Long term to Permanent	Re-use of topsoil in landscaping around the site and for the final agricultural end use of the lands.	Imperceptible
Soil and Subsoils.	Low	Negligible	Potential for dust and fine particles generated due to excavations & segregation of aggregate materials.	Imperceptible	Temporary	Limit exposed areas & machinery routes, damping down of work areas as necessary, especially in dry weather.	Imperceptible
Original sands & gravels on site	High (natural sand&gravel resource)	Negligible	Viable sand & gravel quarry resource.	Imperceptible	Long Term	Extraction of sand and gravel aggregate resource on the site will provide economic benefit to locality.	Imperceptible
Original Esker Feature	Medium/ Low	Negligible	Removal of end of esker – not designated heritage feature – part of large Athlone Esker System and common glacial deposits.	Imperceptible	Permanent	Removal of eastern end of esker braid feature – access of exposed sediments to academic experts will help understand how such glacial features were formed.	Imperceptible
Soil and Subsoils.	Low	Negligible	Potential for soil contamination due to leaks from machinery on site.	Imperceptible	Temporary to Short Term	Good housekeeping, fuel filling and vehicle maintenance. Spill kits and staff training.	Imperceptible
Bedrock Strata	Low (common Visean Shelf Limestone)	Negligible	No bedrock excavation is proposed.	Imperceptible	None	Ensuring bedrock is covered by natural sediments and not exposed or quarried.	Imperceptible

Table 6.8 Predicted Land and Soil/Geological Impacts for the Rooskagh Quarry Works, Bellanamulla, Co. Roscommon.

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APPENDICES:

Appendix 6.0 – Collins Boyd – Site Location & Detailed Topography Map

Appendix 6.1 – OSI Historic Maps

Appendix 6.2 – OSI Old Aerial Photos

Appendix 6.3 – C. Delaney Athlone Esker System Figure

Appendix 6.4 – GSI Soil Mapping, (Geomorphology, Contours, Quaternary Soils, Aggregate Potential)

Appendix 6.5 – BRG Resistivity & Trial Pit Survey 2005

Appendix 6.6 – VCL Site Walkover Photos of Site Area & Kildea Concrete Plant Boundary Excavations

Appendix 6.7 - GSI Bedrock Mapping, (Bedrock, Karst, Slope Stability)

Appendix 6.8 – GSI Geological Heritage Mapping & Report

Appendix 6.9 – Collins Boyd - Site Layout, Cross Sections & Reinstatement Plans

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CHAPTER 7

HYDROLOGY AND HYDROGEOLOGY (WATER)

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7. Hydrology and Hydrogeology (Water)

7.1 Introduction

Viridus Consulting Ltd., (VCL) were appointed by Collins Boyd Engineers, to complete the Hydrology & Hydrogeology (Water) Chapter of the Environmental Impact Assessment Report (EIAR), to accompany the planning application for the proposed development of a Sand and Gravel Quarry at lands in the Townland of Rooskagh, near Bellanamullia (Bealnamulla), on the western side of Athlone in Co. Roscommon, on behalf of the landowner, Mr. Eamonn Harney.

The quarry development plan for the site involves the extraction and processing of about 466,766m^3 of natural, glacially derived deposits of inert sandy, gravelly, boulder clays. The quarry is to be 'dry' and completed above the natural water table.

The water related environmental assessment work was completed by Mr. Darragh Musgrave, Senior Geo-Environmental Scientist at VCL.

7.1.1 Author Information and Competency

Darragh has an honours degree in Geology (Earth Science) from the National University of Ireland Galway, (NUIG 1992) and a Higher Diploma in Environmental Protection from the Institute of Technology Sligo (ITS 2006). He has over 30 years' continuous experience working in the geological, hydrogeological, hydrological and environmental sector and has completed Environmental Impact Assessments and Reports for numerous, quarry, infrastructure and residential developments.

Darragh has been appointed to assess, the Water, (Hydrology and Hydrogeology) elements of the EIAR for the proposed Rooskagh Quarry development.

7.1.2 Reference to Guidelines Relevant to Discipline

The Water Chapter for the EIAR follows the recent guidelines outlined in Directive 2014/52/EU and Annex IV amendments, as well as the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 and the Irish Environmental Protection Agency (EPA) document, Guidelines on the information to be contained within an EIAR, (2022).

The work also is cognisance of the two Environmental Impact Statement (EIS), EPA draft guideline documents, from September 2015, which outline the process of preparation and the content required for an EIS. The assessment work also follows the Institute of Geologists of Ireland (IGI) Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of EISs, (IGI April 2013), and National Roads Authority (NRA) Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes, (NRA 2008).

7.1.3 Methodology

The methodology and scope of the assessment involved the completion of a Desk Study and Site Walkovers, the installation of new monitoring boreholes and groundwater sampling.

The Desk Study work included the collation and review of available information pertaining to the site such as any hydrological studies or databases relevant to the locality, including the following:

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- Environmental Protection Agency (EPA) Envision and Water Quality Data website, (www.epa.ie),
- EPA Catchment Maps, (www.catchments.ie),
- Office of Public Works (OPW) National Flood Hazard Mapping Web site (www.floodinfo.ie)
- Ordinance Survey of Ireland, (OSI) On-line Maps and Aerial Photographs, (www.geohive.ie),
- Geological Survey of Ireland (GSI) On-line Geological Datasets, (www.gsi.ie/mapping.htm),
- Appropriate Assessment (AA), Kildea Concrete Plant Retention, Kingfisher Env, Feb. 2020.
- Rooskagh Quarry EIAR Scoping Report, Roscommon County Council, February 2021.
- EIAR carried out on application 21/463 Roscommon County Council, August 2021.

The Site Walkover reconnaissance work was undertaken by VCL on Tuesday the 27th April 2021, which enabled the visual examination of the geological, geomorphological and land use characteristics of the site and its setting in the locality. It also allowed a visual assessment of the proposed borehole locations to be made both in terms of their position on the site and access for the drilling rig.

As part of the site assessment four new boreholes were drilled by Priority Geotechnical (PGL) in late April 2021 around the perimeter of the proposed site in-order to establish the water table and possibly bedrock depths and also to install standpipes to enable groundwater samples to be undertaken.

Groundwater sampling of three of the four boreholes was completed to assess the existing groundwater quality by VCL on Wednesday the 19th of May 2021. Groundwater depths were recorded in all four boreholes on this date.

In this chapter the existing baseline conditions and character of the hydrological and hydrogeological characteristics of the site and local catchment are presented and the anticipated potential impacts from the proposed development are identified and discussed. Mitigation measures are proposed, residual impacts are assessed, and any relevant monitoring options are considered.

This chapter should also be read in conjunction with Chapter 2 (Project Description), Chapter 6 (Land/Soils - Geology), Chapter 13 (Landscape), Chapter 15 (Interactions Summary).

Consultation was carried out with the relevant bodies by the project planning co-ordinator, including The Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media, Roscommon Co. Co., the GSI, An Board Pleanála and the EPA. A summary of the third-party responses received are included in Chapter 1 of the EIAR and presented in the Appendices.

7.1.4 Difficulties Encountered in Compiling Information

There were no difficulties encountered in the compilation of the information required for this chapter.

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7.2 Description of Existing Environment

The detailed description of the quarry development and proposed activities are provided in Chapter 1 (Introduction) and Chapter 2, (Project Description).

7.2.1 Site Location and Setting

The proposed Rooskagh Sand & Gravel Quarry occupies a large open greenfield site, located approximately two kilometres (km) southwest of Bellanamullia (Bealnamulla) Village and 6.5km west of the centre of Athlone Town in Co. Roscommon. The site is accessed via the R362 regional road and a short lane off the local L2025 third class road. Refer to the site location plan presented in Appendix 6.0.

The site, which covers an area of 6.96 hectares has a roughly square or diamond shape with the existing access into the north-eastern corner through an existing farm gate. It is located in a relatively rural setting except for the existing Kildea concrete works which are situated in the land adjacent to its northern boundary. Open agricultural grassland fields border the site on its western, southern and eastern sides. There are no surface water drainage features, such as streams, ditches or channels in the site area. There are a number of individual residential properties and farmyards situated off the third-class roads over to the northwest, west and south west. Apart from one residence near the NW corner of the development area the properties are over 100m to about 500m away from the site.

7.2.2 Topography and Drainage

The proposed quarry site occupies a distinctive hill topography which is rises westwards from the base of the slope, from the access gate in the north-east corner at about 48m, and along the eastern boundary which has a ground height of between 48m to 53m in the south-eastern corner. The highest point, at about 72m is formed by a distinctive cone shaped peak feature which is located just to the south of the central part of the site area. A ridge of high ground runs south westwards from the central high point to the western boundary at a height of 67.5m. This ridge represents part of a natural esker feature.

The topography slopes steeply from the high point and the ridge of high ground downwards to the south with the southern boundary ranging in height from 52m in the south-east corner to about 60m in the south-west corner. Similarly, the ground slopes downwards in a northern direction from the central high point and ridge with the ground heights along the northern boundary ranging from 48m in the north east corner up to about a height of 60.5m in the central part of the northern boundary before it slopes down to a height of about 57.5m in the north-west corner. There is a farm access gate in the northwest corner which connects to the old track that runs along the northern boundary.

A detailed topography map of the site is presented in Appendix 6.0 and the larger scale topographical mapping of the locality from the GSI web site is presented in Appendix 7.1.

There are no surface water drainage features within the site area as the soil type is comprised of well drained fluvio-glacial sediments made up of boulder clays, sands and gravels and therefore there is very good natural percolation to ground occurring in the site area.

The nearest drainage features are drainage ditches located about 90m to 130m away to the east and about 70m to 90m to the south of the site boundary. Refer to OSI and EPA Mapping of the local hydrological system presented in Appendix 7.1.

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7.2.3 Local Hydrological Catchments

The site is located within the area defined by the EPA as the Water Framework Directive (WFD) Upper Shannon (Mid Shannon) Catchment, (Hydrometric Area 26G) which is comprised of three sub catchments which contain 13 river water bodies and eight groundwater bodies. The relevant sub catchment for the site area is the Shannon (Upper)_SC-100. The main drainage system in this sub catchment is the Cross River which drains the karstified part of the catchment from Lough Funshinagh to Athlone and joins the River Shannon. Refer to the EPA Catchments Report in Appendix 7.2

The study area is located within the smaller sub-catchment of the Mihanboy_010 River Water Body which flows from west to east about 200m to the south and roughly parallel to the southern boundary of the site. The EPA River body code is IE_SH_26MO40200 and the Segment Code is 26_318.

This stream section joins another branch of the Mihanboy watercourse about 600m to the south east of the site before it flows north eastwards for about another 1.4km before it joins the Cross (Roscommon)_030 river system. See the EPA Catchment Maps in Appendix 7.3.

The Cross River is the main watercourse in the area of the west of Athlone and Lough Ree. It flows south eastwards through Bellanamulla village and under the M6 motorway, railway line and Galway Road to the River Shannon which it joins about 2km south of Athlone. Refer to the EPA Catchment Maps presented in Appendix 7.3.

There is no direct connection between the site and these waterbodies as all local drainage percolates to ground. The nearest drains are manmade ditches which were very overgrown and stagnant when inspected by VCL during the site walkovers. There was no water flow, and they were not sampled. Refer to the site walkover photos presented in Appendix 7.4.

7.2.4 EPA Water Quality Status

The WFD River Water Body Bio-Status 2013 to 2018 identifies that the Mihanboy_010 watercourse had a 'Moderate Status' indicating moderate water quality, (EPA micro invertebrate Q-Value Score of 3-4). The rating is based on the EPA downstream monitoring point at Bellanamullia just upstream of the confluence of the Mihanboy and Cross Rivers at National Monitoring Station Ref RS26MO40200. Refer to the EPA Water Quality Mapping presented in Appendix 7.3.

The Cross River is also classified as being of 'Moderate Status' at both points where it passes under the Galway Road (R446) south of Doyle's Bridge (Station Ref: RS26C1003400) and just upstream of its confluence with the River Shannon, (station Ref: RS26C100400).

The WFD River Water Body 3rd Cycle (2021-2027) identifies both the Mihanboy_010 and Cross River water bodies having an 'At Risk' Status due to the water body quality being ranked as 'Moderate Status' and 'at risk' of not achieving the 'High Status' required. This is consistent with the risk status from the previous monitoring cycle. The main pressures effecting the water courses in this area relate to hydromorphological and extractive activities associated with the extraction and drainage management of peat deposits.

Significant hydromorphology pressures are subcategorised into channelization, embankment, dams, barriers, weirs, locks, culverts, land drainage, overgrazing, bank erosion and alteration to the physical environment of the watercourse. Impacts from extractive industry activities include potential sediment/siltation pollution and alteration to the physical environment.

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7.2.5 Hydrogeology and Aquifer Classification

Aquifers are described as "bodies of saturated geological materials that both store and transmit important quantities of water", (Young 2007). Given that a groundwater supply suitable for domestic use can be derived from nearly all the bedrock types in Ireland and this would be deemed an "important quantity of water", nearly the whole county is considered by the EPA to be underlain by a potential "aquifer". The GSI has devised a system for classifying the aquifers in Ireland based on the hydrogeological characteristics of the overburden or bedrock as well as the potential size and productivity of the groundwater resource.

Groundwater in Ireland is primarily derived from open fracture or fissures in the bedrock which is identified as secondary permeability rather than groundwater coming from pores or openings in the rock fabric, or from pores in unconsolidated sands and gravels, which is identified as primary permeability. The GSI aquifer classification depends on a number of parameters including, the aerial extent (km^2), well yield (m^3/d), specific capacity ($m^3/d/m$), aquifer transmissivity (m^2/d) and groundwater flow.

As described in Chapter 6 the site locality is overlain by deep fluvio-glacial interbedded boulder clay silt, sand and gravel deposits. These are based around a local esker feature, the eastern end of which terminates in the site area. This portion of the esker and the surrounding gravels form the aggregate resource which is proposed to be extracted by the quarry. Refer to the GSI Soil and Subsoil descriptions in Chapter 6 and the Maps presented in Appendix 6.4.

The overburden gravel deposits in the site area and general locality are not identified by the GSI or EPA mapping as a potential groundwater aquifer which implies that their water bearing capacity is not of local or regional significance. The esker ridge forms an area of raised topography in the local area which is above the water table and therefore does not form an aquifer.

The site-specific borehole drilling on the site indicated that the sands and gravels are in direct connection with the groundwater which overlies the underlying limestone bedrock.

There was about 5m of saturated gravels on top of the bedrock in MW1 drilled at the eastern end of the site and less than 2m of saturated graves over the bedrock in MW3 at the western end of the site.

The general locality and whole site area are identified by the GSI mapping as being underlain by carboniferous aged Visean Shelf Limestones (VIS) which are hydro-stratigraphically classified as undifferentiated Dianantian Pure Bedded Limestones (DPBL). These thick bedrock sequences tend to be massive and thickly bedded, with a shallow dipping orientation and karstified. These geological units are classified by the GSI as a "Regionally Important Aquifer with karstic (conduit) flow", (Rkc). Refer to the bedrock description included in Chapter 6 and Geological Maps included in Appendix 6.7.

Based on the classification parameters there are a number of general characteristics that can be assigned to the different Aquifer Types in Ireland. Regionally Important Aquifers are dominated by pure fractured limestones that tend to comprise regional groundwater flow systems; and by high yielding productive wells (>400m^3/day) and springs (flows >25L/sec). These areas tend to have a relatively low drainage density with high base flow to rivers. (From the GSI/EPA Irish Aquifer Properties Manual & Guide, 2015).

The EPA identify the local area as underlain by the Funshinagh Groundwater Body (WFD

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Code IE_SH_G_091), which is described as regionally productive bedrock with a Good Water Status which is identified as being 'At Risk' of not maintaining that status for the WFD 3rd Cycle due to Anthropogenic pressures. Impacts from anthropogenic pressures may include nutrient, chemical, microbiological etc. Refer to the EPA aquifer and water status maps presented in Appendix 7.3.

No large groundwater abstractions or water supplies or GSI Groundwater Source Protection Schemes are identified in the general proximity (within 5km) of the proposed site area. The GSI Borehole Database does not identify any boreholes in the vicinity of the site however there is one on the adjacent Kildea Concrete Plant site which provides process water for that facility.

7.2.6 Site Hydrogeology

As part of the site assessment works four new monitoring boreholes were drilled on the boundaries of the proposed site area to quantify the groundwater level and where possible the depth to bedrock. These boreholes were drilled for sampling on the proposed Rooskagh Quarry Site. These are identified as MW1, (east), MW2 (south), MW3 (west) and MW4 (north) respectively. A summary of the groundwater data is presented in Table 7.1. The borehole location plan and drilling logs for the four new boreholes are presented in Appendix 7.5.

BH ID:	BH Depth:	GW Level (mBGL)	GW Level (mOD) 19th May	Notes:
MW1	7.70m	2.44m	46.05m	Located in low part of site by eastern boundary.
MW2	20.10m	12.49	47.30m	Located on southern boundary.
MW3	21.00m	19.23m	48.51m	Located on top of esker ridge by western boundary.
MW4	16.00m	12.21m	48.73m	Located on high ground on northern boundary.

Table 7.1 Summary of Rooskagh Quarry Monitoring Locations.

Water samples were acquired by VCL from three of the boreholes MW1, MW3 and WW3 on Wednesday 19th May 2021 to establish baseline water quality as part of the EIAR assessment.

The groundwater samples were sent to an independent accredited laboratory for testing for a range of indicator water quality parameters and the groundwater quality was found to be good. The groundwater sample logs, and laboratory results are presented in Appendix 7.6. Photographs of the borehole locations are included with the site walkover in Appendix 7.4.

7.2.7 Groundwater Vulnerability

The vulnerability of a groundwater body is the term used to describe the ease with which the groundwater in the area can be contaminated by human activities. The vulnerability is determined by many factors including the speed at which the contamination can enter the aquifer, the quantity of contaminants and the capacity of the deposits overlying the bedrock to attenuate contaminants. These factors in turn are based on the type, thickness and permeability of the subsoils, e.g., groundwater in bedrock which has a thick cover of low permeability clay is less vulnerable than the groundwater in bedrock which is exposed at the surface.

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

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Vulnerability Rating	Hydrogeological Conditions				
	Subsoil Permeability (Type) & Thickness			Unsaturated Zone	Karst Features
	High Permeability (sand/gravel)	Moderate permeability (e.g. sandy subsoil)	Low permeability (e.g. clayey subsoil, clay, peat)	(sand/gravel aquifers only)	(<30m radius)
Extreme (E)	0 – 3.0m	0 – 3.0m	0 – 3.0m	0 – 3.0m	-
High (H)	>3.0m	3.0 – 10.0m	3.0 – 5.0m	>3.0m	N/A
Moderate(M)	N/A	>10.0m	5.0–10.0m	N/A	N/A
Low (L)	N/A	N/A	>10.0m	N/A	N/A

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

Table 7.2: GSI Groundwater Vulnerability Mapping Guidelines (DoELG 1999)

Regional Groundwater Vulnerability Maps have been produced for the country by the GSI (in association with the local county councils), and these have six classifications. 'Extreme' and 'Extreme rock near surface' or 'karst' are those areas most at risk from contamination and mitigation measures should be put in place for their protection. Areas classified as having 'High' vulnerability are less vulnerable to contamination; however, they still need a certain measure of protection. 'Low' vulnerability areas have natural protection in place and mitigation measures do not need to be put in place. In areas which have been classified as 'High-Low' only an interim study has taken place.

The GSI Vulnerability Mapping in the site area has identified A High (H) Vulnerability rating over the whole study areas with Moderate Vulnerability (M) areas of less permeable ground, (M), identified outside the eastern boundary. This indicates a subsoil thickness cover of greater than 3m of highly permeable material, or 3m to 10m of moderately permeable material across the site area.

Based on the available site investigation data this classification is considered accurate for the site as the sand and gravel material would be highly permeable. There may be areas of thick (>10) sequences of less permeable boulder clays, but the interbedded nature of the sediments would limit this. Refer to the GSI Vulnerability Mapping presented in Appendix 7.7.

The excavation of the natural deposits across the site area will decrease the depth of the protective sediment material. If the depth of unsaturated material left over the bedrock is brought to less than 3m then the sites groundwater vulnerability classification will change from High to Extreme.

7.2.8 Groundwater Flow Direction

The direction of natural groundwater movement is principally influenced by topography and the groundwater table is generally a subdued reflection of the ground surface. The groundwater levels recorded from the four boreholes on the Rooskagh Quarry site are presented in Table 7.1 and an interpreted groundwater contour map is presented in Appendix 7.8.

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The water-table heights indicate that the groundwater gradient flows from the west-northwest towards the east-southeast. This follows the general topography of the locality around the site as well as the wider regional topography and the drainage direction of the Cross River water course.

While there are no springs or obvious groundwater discharge systems in the locality It is likely that the area would provide some base flow to the Cross River catchment via the underlying limestones.

7.2.9 Groundwater Interaction

No groundwater abstraction or dewatering is proposed or required to enable access to the sand and gravel resource at the Rooskagh Quarry site and all excavations and extraction work will be undertaken at least 3m above the natural water table. Refer to the cross sections presented in Appendix 6.9.

Groundwater monitoring in the existing boreholes will enable the long term water table depth and possible seasonal fluctuations to be quantified before the proposed excavations progress to the western half of the site area where the water table has been shown to be slightly higher than that recorded on the eastern side of the site.

The only planned interaction with the water table is the creation of a shallow sump on the eastern boundary to provide wash water to the quarry operation. This is proposed be a shallow (<5m) sump which will intersect the top of the water table in the area, (which was identified at 2.5m bgl in MW1) and will periodically pump water from the top of the water table so as not create any significant draw down outside the immediate area around the sump.

The aggregate and wheel washing equipment proposed for the will recycle the majority of the water used and any runoff will drain to a settlement and holding pond located in the south eastern corner of the site. Water will be recirculated from this holding pond for site use, further reducing the requirement of groundwater use on the site.

7.2.10 Rainfall and Groundwater Recharge

The total Standard Average Annual Rainfall (SAAR), from Met Eireann for the 1981 to 2010 period for the Athlone area, (as per the Irish Grid Area Easting 197000 and Northing 241000), is 972mm.

The GSI identify the Effective Rainfall (ER) as 565.3mm/yr for the locality and the annual recharge capacity as 481mm/yr with an 85% recharge coefficient. See the GSI Recharge Map in Appendix 7.7.

No measurable change in groundwater recharge characteristics are anticipated to arise from the proposed quarry works.

7.2.11 Flooding History & Storm Water Management

The Office of Public Works (OPW) operates the National Flood Hazard Mapping websites (www.floodmaps.ie) (now replaced by www.floodinfo.ie), which has collated the records of historic flooding events throughout Ireland and presents information on all the ongoing flooding assessments and plans currently ongoing. The OPW records do not show any historic flood points on the site or in the general locality of the site. Refer to the OPW Flood Mapping presented in Appendix 7.9.

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The Cross River system has been extensively studied as part of the Strategic Flood Risk Assessment (RPS July 2016) for the Athlone West (Monksland/Bellanamullia) Local Area Plan 2016 – 2022. While the site is just outside the study area of this assessment no flooding issues are identified in the catchment of the Mihanboy watercourse. Similarly, the River Shannon Catchment Flood Risk Assessment Maps (CFRAMs) for the Mihanboy River do no identify flood risks until its junction with the Cross River south of Bellanamullia. Refer to the Shannon CFRAMS Map included in Appendix 7.9.

There will be no noticeable change to the runoff characteristics of the site and all surface water will either percolate to ground (as is the current situation) with any excess channelled to the site sump for re-use. The nearest surface water drains/ditches are across open fields at least 70m to 100m away from the eastern and northern boundaries of the site so the potential for direct runoff to occur is extremely unlikely. Therefore, no change in local flood risk or the hydrology of the area is anticipated.

7.2.12 Conceptual Site Model

A conceptual site model (CSM) represents the characteristics of a site, in graphic or diagrammatic form, and shows the possible relationships between potential contaminates (source), pathways (pollutant linkages), and receptors (environmental targets).

A number of Cross Sections of the site are given with the Layout Plan presented in Appendix 6.9. These show the proposed excavation area and depth to groundwater and bedrock. Other site layout, infrastructure and reinstatement plans are included in Appendix 7.10.

The main risks to waters from the quarry development and operational works are via pollutants, such as fuel (hydrocarbon) losses to ground entering the hydrological cycle via the groundwater or by surface water runoff contaminated by fine sediments or hydrocarbons, directly impacting the local surface water regime. It is proposed to contain, store and then remove any wastewater from the site's welfare facilities so no water treatment or percolation management is required for sewage. Refer to the proposed wastewater storage design presented in Appendix 7.10.

The potential long-term changes to the water environment relate to changes to topography and the surface water drainage, an increase in groundwater vulnerability due to decreased soil and subsoil cover over the aquifer and once reinstated, the normal agricultural use risks such as over application of chemicals, fertilizers and/or slurry.

7.2.13 Type of Environment

As outlined in Chapter 6, Step 3 of the IGI Guidelines recommends that the type of Geological and Hydrogeological Environment are assessed. Based on the stable geology and locally important aquifer classification the site is deemed to have a:

Type A - Passive Geological/Hydrogeological Environment.

The activities associated with the Rooskagh Quarry development relate to Earthworks and Excavation of naturally occurring Inert Materials Above the Water Table.

The development work and soil/subsoil removal will create on-site transport and sediment management issues in terms of potential dust and suspended sediment generation. It is important to note that there is no uncontrolled connection between the surface water and the local drainage ditches which form part of the Mihanboy watercourse, and no discharges or runoff are proposed. The proposed extraction area is 4.9 hectares within the 6.96 hectare site.

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The extent of development work will be managed by completing the works in a number of distinct phases which will enable an orderly and structured site excavation. The quarrying will start in the eastern side of the site and progress further west and north-west wards towards the western part of the site. Refer to the Landscape Plan and Site Figures included in Chapter 13.

In the entrance area any hard surfaces such as car parking areas will be drained to a suitable interceptor to prevent any risk of polluted discharge to ground occurring.

7.3 Impact Assessment and Determination

The potential impact of the proposed development on the hydrological and hydrogeological regime is primarily short-term pollution risks during the development and excavation works with longer term changes in topography which will affect the long term surface water runoff and aquifer vulnerability.

The excavation of inert soil/subsoil during the operational phase will create on-site transport requirements and the potential for on-site pollution management issues in terms of potential fuel spills to ground which could percolate to the groundwater and suspended sediment runoff.

7.3.1 Rating Site Attribute Importance

For rating the Site Importance of the hydrological attributes, the guidance follows the NRA use of five importance criteria – Extremely High, Very High, High, Medium and Low depending on the attribute quality.

The water attributes that are relevant to Rooskagh Quarry site are the underlying aquifer, and the Mihanboy watercourse located to the south of the site. The Mihanboy Stream is a tributary of the Cross River which flows to the River Shannon south of Athlone. The site importance criteria, with examples, are applied to the Rooskagh Quarry site and presented in Table 7.3.

Importance	Criteria	Typical Example	Rooskagh Quarry Site
Extremely High	Attribute has a high quality or value on an international scale.	River, wetland or surface water body ecosystem protected by E.U Legislation e.g. Salmonoid River or SAC/SPA	No – rainfall on the site is proposed to drain to ground with any runoff retained in the pond or sump containment systems.
Very High	Attribute has a high quality or value on a regional or national scale.	River, Wetland or Surface Water body ecosystem protected by national legislation e.g. pNHA, Regionally Important Aquifer with multiple wells, Potable Water Supply >2500 homes	No – water from the site is not supporting any national water feature or a protected water ecosystem. Regionally important aquifer – but no large supply wells in local area.
High	Attribute has a high quality or value on a local scale	Salmon Fishery, Regionally Important Aquifer, Potable Water Supplying >1000 homes.	Yes – Regionally Important Aquifer (Conduit) Karst Flows. No large water supplies in area.

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Medium	Attribute has a medium quality or value on a local scale	Coarse Fishery, Locally Important Aquifer Local potable water supply to >50 homes.	No – Regionally Important Aquifer under site area with use by some local well supplies.
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer Local potable supply <50 home.	Yes – small stream about 200m from site with no direct surface water connectivity to the site.

Table 7.3 Criteria for rating Site Importance for Hydrological & Hydrogeological Elements at EIS stage.

As per the relevant guidelines for hydrological/hydrogeological attributes the bedrock aquifer classification of Regionally Important gives the site a groundwater rating of High Importance. The upper reaches of one part of the local Mihanboy watercourse would be considered as an attribute of Low Importance as there is no fishing, ecological or water supply importance to it in this area. Also, there is no direct drainage connectivity or potential discharges from the site to the watercourse so the developments potential to impact on the attribute would be very unlikely.

The size of the site (<7ha) is insignificant in terms of the catchment area of the Mihanboy and Cross River systems both in terms of pollution threat and/or flooding risk.

7.3.2 Impact Assessment Methodology

An analysis of the predicted impacts or effect of the proposed Rooskagh Quarry development on the hydrological (water) system during and after the excavation phase, as per Annex IV of Directive 2014/52/EU, EPA EIAR Guidance Document, (2022) and NRA Guidance (2008/9) and Appendix C of the IGI EIS Preparation Guidelines (IGI 2013), is presented in this section.

- **Quality of an Impact:** Described as being Positive, Neutral or Negative.
- **Duration of Impact:** The duration of each impact was considered to be either brief, temporary, short-term, medium-term, long-term or a permanent impact. Brief construction impacts are considered to last a day or so, Temporary impacts last less than one year. Short-term impacts are seen as impacts lasting one to seven years. Medium-term impacts are impacts lasting seven to 15 years. Long-term impacts are impacts lasting 15 to 60 years and Permanent impacts are impacts lasting over 60 years.
- **Magnitude of an Impact:** The significance of each impact was considered as having either an Imperceptible, Slight, Moderate, Significant or Profound effect.

The rating of the potential magnitude and significance of impacts at EIS stage are defined by the NRA guidance (2008 – Boxes 5.2 & 5.3), which includes typical examples, as outlined in Table 7.4.

Impact Magnitude	Criteria	Typical Example
Large Adverse	Results in loss of attribute and/or quality and integrity of attribute	Loss or extensive change to a water body or dependent habitat. Increase of predicted flood level >100mm. Removal of large proportion of aquifer, or changes to aquifer resulting in extensive change to existing water supply or river base flow.

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

Table 7.4 Criteria for rating Hydrology and Hydrogeology impact magnitude at EIS stage. (After Table C4 of the IGI 2013 and NRA 2008 Guidelines),

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

The descriptions of the 'Significance of an Impact' used are as presented in the EPA EIAR Guidelines 2022 – Table 3.4. (The word 'effect' is used interchangeably with the work 'impact' in the EPA EIAR guidelines).

Significance of Effect	Criteria	Quality
Imperceptible	An effect capable of measurement but without significant consequences.	Positive/Negative/Neutral
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.	Positive/Negative/Neutral
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.	Positive/Negative/Neutral
Moderate	An effect that alters the character of the environment in a manner which is consistent with existing and emerging trends.	Positive or Negative

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Significance of Effect	Criteria	Quality
Significant	An effect which by its character magnitude duration or intensity alters most of a sensitive aspect of the environment.	Positive or Negative
Very Significant	An effect which by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.	Positive or Negative
Profound	An effect which obliterates sensitive characteristics	Negative Only

Table 7.5 Describing the Significance and Quality of Potential Effects for EIARs

The rating of potential environmental impacts on the hydrological and hydrogeological (Water) environment can also be assessed based on the matrix presented in Table 7.6, which takes account of both the importance of an attribute and the magnitude of the potential environmental impacts of the proposed development on it. The criteria apply to potential impacts during both the re-instatement and operational phases.

		Magnitude of Impact (Table 6.5)			
		Negligible	Small Adverse	Moderate Adverse	Large Adverse
Importance of Attribute (Table 6.4)	Extremely High	Imperceptible	Significant	Profound	Profound
	Very High	Imperceptible	Moderate/ Significant	Significant/ Profound	Profound
	High	Imperceptible	Slight/ Moderate	Moderate/ Significant	Significant/ Profound
	Medium	Imperceptible	Slight/Not Significant	Moderate	Significant
	Low	Imperceptible	Imperceptible	Slight	Slight/ Moderate

Table 6.7 - Rating of Significant Environmental Impacts at EIA Stage***
(***Based on NRA Guidelines (2009) – Box 5.4 Page 106).

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

- **Type of Impact:** These are described as 'Do Nothing', Construction, Operational, Cumulative, Synergistic or 'Worse Case' scenarios, which look at Major Accident Risks. (These are examined in Section 6.4).

7.4 Predicted Impacts

7.4.3 Do Nothing

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In the 'Doing Nothing' scenario with the quarry development not progressing then the land in the quarry area will remain as undulating soils/sand and gravel material in agricultural use for the long term. The groundwater will remain highly vulnerable, and surface drainage will remain the same.

7.4.4 Development/Quarrying Phase

The nature of the proposed Rooskagh Quarry development and excavation works will result in a number of potential direct and indirect operational phase impacts with regard to hydrological and hydrogeological aspects including:

- Excavation Earth Works and Operating Plant Activity
- Changes to the Ground levels and Site Topography
- Suspended Sediment Runoff During Earthworks
- Increase in Groundwater Aquifer Vulnerability

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7.4.4.1 Excavation Earth Work and Quarry Plant Activity

The activity of plant and machinery and quarry equipment operating for the site development and excavation works could result in small scale fuel spills to the ground surface. This would be a potential TEMPORARY to SHORT-TERM NEGATIVE impact on the subsoil in the immediate area and possibly underlying groundwater quality if a small accidental spill were to occur. The scale and temporary nature of such an impact would not of a sufficient magnitude to affect either the use or integrity of the aquifer and there is no direct connectivity to the local watercourses so the impact magnitude would be considered NEGLIGIBLE.

7.4.4.2 Changes to the Ground Levels and Site Topography

The changes to the local topography that the quarry development and excavation works involves will change the rate and direction of the surface water runoff in the site area. The resulting changes will generally result in less steep and undulating surfaces around the site and a more even, gently sloped open field topography. This impact will be PERMANENT in areas of the site where it occurs but will not create a significant overall change to the wider topography or site runoff characteristics and is considered to be a LONG TERM POSITIVE NEGLIGIBLE quality impact.

7.4.2.3 Suspended Sediment Runoff During Quarry Works

The potential occurrence of suspended sediments in rainfall runoff from earthwork activities in the excavation areas will only pose an environmental risk if the site was directly connected to the local watercourse. The nature of the current site activity with silty wash water created, managed and controlled as part of the quarrying and aggregate preparation process, controlled movement of water around the site, the development of a new surface water ponds and only controlled and limited pumping of a shallow groundwater sump means that this activity does not pose an environmental risk and would have a NEUTRAL NEGLIGIBLE quality impact.

7.4.2.4 Groundwater Flow Direction, Aquifer Potential & Vulnerability

There are no groundwater abstractions or dewatering works required to allow the extraction of the aggregate resource. The only interaction will be the development of a shallow sump into the surface of the water table to provide small intermittent volumes of wash water so there will be no change to the existing groundwater flow direction or aquifer potential. This effect would be a NEUTRAL NEGLIGIBLE quality impact.

The excavation works will decrease the depth of subsoil over the underlying bedrock which will increase the sites aquifer vulnerability. However, a horizon of at least 3m thickness of unsaturated natural sediments is proposed to be left below the quarry floor so the existing

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classification of the sites High Vulnerability will not change. The increased vulnerability is considered to be a LONG TERM NEGATIVE NEGLIGIBLE quality impact.

7.4.2.5 Groundwater & Surface Water Quality

The sites wastewater will be retained in a sealed container and removed off site, so no water treatment or percolation system is required. No discharges will occur from the site so no impacts will occur.

7.4.5 Reinstatement Phase

The proposed Rooskagh Quarry reinstatement will result in the site area being re-turned to an agricultural use similar to how it is used today. The lowering of the topography will facilitate easier access to the site area for farm machinery and animal husbandry.

The current or future land use for agricultural activities could have a NEGATIVE impact if good agricultural practices are not followed and there is excessive spreading of fertilizers and farm slurries.

Movement of nitrates, bacteria, phosphates or other chemicals to the groundwater has the potential to create SHORT TERM impacts on local groundwater users or LONG TERM impacts on the overall aquifer status.

7.4.6 Risk of Major Accidents and Disasters

There is no risk of major accidents or disasters occurring due to the water attributes.

In terms of Human Health, a possible drinking water risk would occur if pollutants such as hydrocarbons entered the groundwater at high concentrations and impacted local potable water supplies. These risks are considered as very unlikely as the potential volumes of hydrocarbons on site are small and there will be a thick depth of unsaturated subsoils protecting the underlying aquifer from surface activities during and after the quarry operation.

7.4.7 Cumulative Impacts

The potential cumulative impact of the ongoing activity at the adjacent Kildea Concrete Plant works located immediately to the north of the site was considered for the Rooskagh Quarry works. The cumulative impacts of this project are considered insignificant as the Kildea site is a different surface water catchment area and is also 'dry' operation with no interaction with the under lying aquifer apart from using an on-site borehole to provide wash and process water to the site.

No cumulative impacts to the water attribute are envisaged.

7.4.8 Rating of Significant Environmental Impacts

As described in the previous sections and based on the criteria outlined in Tables 7.4 and Table 7.5 the potential impact of the proposed Rooskagh Quarry development would be considered to be 'Negligible' with 'Imperceptible' effects for the attributes of the underlying aquifer and local watercourses. While considered unlikely, if the development did potentially have a small fuel spill or surface water runoff event the result may impact on the attribute but would be of insufficient magnitude to effect either its use or integrity. A summary of the Impact Magnitude is presented in Table 7.7.

Attribute	Importance	Potential Incidence	Impact Magnitude

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Regionally Important Aquifer	High	Small spill of fuel to ground during development or operational phase	Negligible
Regionally Important Aquifer	High	Abstraction of groundwater for process water use during the sites operation.	Negligible
Site Runoff to Small Watercourses	Low	No direct connection to the local drainage ditches and watercourse from site area exits. Water would have to flow for over at least 70m of a large level field before reaching a local drainage ditch.	Negligible

Table 7.7 Criteria for rating Hydrology and Hydrogeology impact magnitude at EIS stage.

As shown in risk matrix in Table 7.7, (which is based on Table C6 of the IGI Guidelines, Rating of Significant Environmental Impacts at EIS Stage (Box 5.4 of NRA 2008)), with the Importance of the hydrological attribute's being 'High' and the Magnitude of Impact as 'Negligible' then the Rating of Significant Environmental Impacts on the Water Attribute would be considered to be 'Imperceptible'.

7.5 Mitigation Measures

7.5.3 Development and Operational Phase Mitigation Measures

While the magnitude of the potential impacts on the water attributes from the development are considered to be negligible, a number of potential brief to temporary or short-term development impacts may arise during the development and operational stages that could cause environmental risk. There are a number of mitigation measures that would help eliminate and/or reduce the risk of these potential impacts occurring. These are outlined below and should be included in the sites Environmental Management Plan (EMP) and all other environmental management plans for the site.

- The areas where the excavation of unconsolidated soil and subsoils is undertaken within each phase of the quarry should be kept to a minimum and extended when the initial excavation areas have been levelled and landscaped. Keeping the surface area of exposed soils in the quarry areas to a minimum is the most effective way of preventing the release of dust in dry weather and suspended sediments during or after wet conditions. Potential dust and suspended solids runoff impacts are therefore reduced or avoided.
- Limiting activities to work areas and not allowing machinery back into completed areas will ensure that there is less sediment runoff generated and no soil compaction will occur in those areas.
- Designated roadways and internal access/construction routes should be clearly designated and fenced off in order to prevent uncontrolled tracking of vehicles across the re-instated and landscaped areas. This will help reduce the surface area of disturbed ground which will limit the potential for soil compaction, sediment runoff or dust generation. Similarly, the soil covering of the final excavation faces should be completed and seeded as early as possible to limit surface water runoff and loose materials falling onto the quarry floor.
- Designated car parking, office, welfare, wheel wash, weigh bridge and stockpile areas will be developed and no fuel storage and/or vehicle servicing is proposed for the site as that will be done off-site.

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- Any sediment laden runoff should be channeled through the existing quarry drainage system to the southeastern corner pond for re-use as wash water on the site. Raw groundwater use is to be minimized.
- Activity of plant equipment and machinery operating in the quarry area could result in small scale fuel spills to ground - mitigating against accidental leaks and spillages during the development will involve implementing good practices including regular plant maintenance, use of drip trays, adequate bunding for storage containers, refuelling in designated areas etc.
- All temporary fuel storage areas on the site are sufficiently bunded and any mobile bowsers used on site will be double skinned. No large tanks/storage areas containing harmful substances are proposed for the site.
- Spill kit materials will be maintained on site and site staff trained in the response to accidental spills and the use of clean up materials.
- Good housekeeping (site clean-ups, use of disposal bins, etc.) around the site and proper use of storage and disposal facilities for lubricants fuels and oils will be used.
- Best practice environmental guidance will be incorporated into the Environmental Management Plan for the development.

7.5.4 End Use Phase Mitigation

Agricultural best practice in terms of fertilizer applications and slurry spreading should be followed to ensure no impact on the underlying aquifer occurs. The existing hedge lines around the old road on the northern boundary of the site and in the north-eastern area of the site should be retained to maintain local drainage patterns but as important local habitats bio-diversity area.

7.5.5 Monitoring

The site has installed four new groundwater monitoring boreholes and it is recommended that groundwater levels are recorded on a monthly basis so that a long-term record of the depth of the water table and possible seasonal fluctuations under the site can be established.

No additional environmental water monitoring for the quarry works are proposed.

7.6 Residual Impacts

With the importance of the Water attribute's being 'High' for Groundwater and 'Low' for Surface Water and the potential Magnitude of Impact determined as 'Negligible' for both surface water and groundwater, then the potential impacts of the project are rated as 'Imperceptible'.

The potential residual impacts are those that will occur after the proposed mitigation measures have taken effect. The mitigation measures described will further reduce the potential for any significant brief to temporary or long-term environmental impacts occurring during or after the quarry operation.

The consideration of cumulative projects does not change the residual impact rating.

A summary assessment of the predicted impacts, mitigation measures, monitoring and residual impacts during the development and operational phase are shown in Table 7.8.

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Attribute Description	Attribute Importance	Magnitude of Impact	Criteria for Impact Assessment	Duration of Impact	Significance of Impact	Mitigation Measure	Residual Impact
Regionally Important Aquifer	High	Negligible	Potential for contamination of aquifer due to accidental spillages of hydrocarbons to ground.	Temporary to Short Term	Imperceptible	No bulk fuel storage areas on site and good operational practices will be in place to ensure that the potential for accidental spills and risk of GW contamination during fuelling is minimised.	Imperceptible
Regionally Important Aquifer	High	Negligible	No interaction with the natural groundwater table is required for the aggregate extraction work.	None	Imperceptible	Long term monthly groundwater monitoring will enable seasonal variations in the water table to be determined to ensure 3m of natural material retained under the quarry floor.	Imperceptible
Regionally Important Aquifer	High	Negligible	A small shallow sump is to be installed to provide wash water. Periodic low volumes of water will be used but no effects on groundwater flow, quality or resource potential are anticipated.	Medium to Long Term	Imperceptible	Use of equipment which re-cycles wash water and use of water retained in the sites settlement pond will reduce the need for raw groundwater to be used.	Imperceptible
Regionally Important Aquifer	High	Negligible	Over application of agricultural fertilizers and farm slurries during the sites future use	Medium to Long Term	Imperceptible	Good agricultural practices and fertilizer management will prevent this impact.	Imperceptible
Small Local Watercourses	Low	Negligible	Potential for impact on local field ditch/drains or watercourse due to suspended sediment or contaminated runoff from site.	Temporary	Imperceptible	There is no surface water drainage off site with runoff having to cross level open ground to get to the local drains over 70m to 100m away.	Imperceptible

Table 7.8 Predicted Hydrological and Hydrogeological Impacts for the Rooskagh Quarry Development, Ballanamulla, Athlone Co. Roscommon.

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7.7 References

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APPENDICES:

Appendix 7.1 – OSI Contour and Drainage Mapping

Appendix 7.2 – WFD Shannon Catchment Mapping

Appendix 7.3 – EPA Drainage Mapping

Appendix 7.4 – VCL Site Walkover Photos

Appendix 7.5 – Borehole Location Plan and Borehole Drilling Logs

Appendix 7.6 – VCL GW Sampling Logs and Laboratory Results

Appendix 7.7 - GSI Aquifer Mapping

Appendix 7.8 – Groundwater Flow Direction Drawing

Appendix 7.9 – OPW Flood Mapping

Appendix 7.10 – Collins Boyd - Site Layout, Pond Section, Wheel Wash & Wastewater Storage Plans

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CHAPTER 8

AIR QUALITY AND DUST

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8.0 AIR QUALITY & DUST

8.1 Introduction

This Air Quality & Dust Impact Assessment has been prepared to accompany a planning application to Roscommon County Council for the proposed commencement of the excavation of sand and gravel on a greenfield site at Rooskagh Townland, Bellanamullia (Bealnamulla), Athlone Co. Roscommon.

This report has been prepared by Mervyn Keegan of AONA Environmental Consulting Ltd. to be included as a section within the EIAR. Mervyn Keegan is a Director of the environmental consultancy, AONA Environmental Consulting Ltd. Mervyn Keegan's areas of professional expertise are in Noise Control & Acoustics and Air Quality & Odour consultancy, including Air Quality & Climate impact assessment and mitigation design. Mervyn Keegan has over 20 years of environmental consultancy experience. Mervyn is a full member of the Institute of Acoustics, with a Bachelor of Science Degree (Applied Sciences), a Master of Science Degree (Environmental Science) and a Diploma in Acoustics in Noise Control. AONA Environmental Consulting Ltd. is an independent consultancy specialising in Environmental Impact Assessment and Licensing. Mervyn Keegan has prepared in excess of ten Noise & Vibration and Air Quality & Climate impact assessments annually for quarry developments in the Republic of Ireland, Northern Ireland and the UK in the last 15 years and is an expert in the awareness and understanding of the relevant legislation and guidance that pertains to best practise in such assessments. Mervyn Keegan has appeared as an Expert Witness at oral hearings, public inquiries and legal hearings. Mervyn Keegan has produced Noise, Air Quality & Odour Impact Assessment reports to assess the impacts of a range of development types including roads, residential developments, industrial developments, quarries and mines and wind energy developments amongst others.

The development will involve the extraction of sand, stone & gravel over an extraction area of 4.90 hectares (volume to be extracted = 466,766m³ approximately) over a 10 year period, screening/processing of stone, sand & gravel from the site using mobile plant, construction of offices (33m²), welfare facilities (9m²), well, water settlement pond (area 2,020 m²), weighbridge, wheel wash, entrance, set down area, carparking,

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truck parking, refuelling pad, petrol oil interceptor, fencing, landscaping/screening, signage, lighting, wastewater storage tank for site offices, and all other ancillary works. The land will be restored to agricultural lands on the completion of the extraction of sand, stone and gravel.

The proposed development site is a greenfield site in the townland of Rooskagh, approximately 1 km north from Bealanmulla and is accessed by the L2025. The proposed lands and the processing area are located just south of the Kildea Concrete plant. The access to the proposed site will be via a private road with shared access with Kildea Concrete and will enter onto the L2025 approximately 172 metres from the north east corner of the proposed gravel and sand pit. The precise location of the site application boundary, proposed extraction area and site location relative to residential properties in the area are presented in the Project Description Chapter of this EIAR.

The proposed operations will comprise the stripping and storing of existing topsoil and extraction of sand and gravel to produce aggregates for use in the manufacture of value-added products for road construction, production of concrete products and site development works. Materials extracted from the proposed land area is processed within the proposed extraction area using mobile processing plant. Sand and gravel will be extracted by means of excavators and dump trucks.

The proposal will seek to provide ancillary facilities at the site including offices, weighbridge and office, canteen, toilets, bunded fuel storage areas and a garage/workshop and wastewater treatment system, all on site. In accordance with industry guidelines quarry operations will be carried out between 8.00 – 18.00hrs Monday to Friday; or from 09.00 – 17.00 hrs Saturday. The sandpit will not operate on Sundays or Bank Holidays, except in emergency situations. The proposed development will provide employment of up to 6 people directly on-site, in addition to several indirect employees such as crushing contractors, HGV drivers, maintenance contractors, etc.

The development of the sandpit is proposed to proceed in a westerly direction with Phase one of the first two years worked in 10 metre benches. The following four phases will be in two-year intervals.

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8.2 Methodology

8.2.1 Impact Assessment Methodology

This assessment of the potential air quality & dust impact has been undertaken with reference to the Quarries and Ancillary Activities Guidelines for Planning Authorities (April 2004) as published by the Department of the Environment, Heritage and Local Government and cognisance to the Guidance on the Assessment of Mineral Dust Impacts for Planning (May 2016 (v1.1)) as published by the Institute of Air Quality Management (IAQM).

8.2.2 Relevant Guidelines & Standards

The Quarries and Ancillary Activities, Guidelines for Planning Authorities states that following with regard to the control of dust;

"There are currently no Irish statutory standards or EPA guidelines relating specifically to dust deposition thresholds for inert mineral/aggregate dust. (See, however, the Air Quality Standards Regulations 2002 for measurement standards). There are a number of methods to measure dust deposition (such as the Frisbee method) but only the German TA Luft Air Quality Standard relates a specific method (i.e. Bergerhoff) of measuring dust deposition with dust nuisance. On this basis it is recommended that the following TA Luft dust deposition limit value be adopted at site boundaries near quarry developments:

- *Total dust deposition (soluble and insoluble): 350 milligram per square metre per day (when averaged over a 30-day period).*

Best practice dust control measures should be proposed by the applicant".

On the basis of the above, the following limits apply to the operation of the sandpit and associated manufacturing activities and will continue to apply during the proposed development;

Total dust deposition (soluble and insoluble): 350 mg/m²/day (when averaged over a 30-day period).

8.2.3 Dust Deposition Impact Assessment

In quarries, dust typically becomes airborne due to the action of wind on material stockpiles and other dusty surfaces, or when thrown up by mechanical action, for

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example the movement of tyres on a dusty road or activities such as blasting, drilling, screening, etc. There are many types of particulate matter (PM) that are included in the definition of dust, including variations in terms of size and chemical composition.

A basic classification of particles may be made into those that are easily deposited and those that remain suspended in the air for long periods. This division is useful as deposited dust is usually the coarse fraction of particulates that causes dust annoyance, whereas suspended particulate matter is implicated more in exposure impacts.

Airborne particles have a large range of diameters, from nano-particles and ultrafine particles (diameters less than 0.1µm) to the very large particles with diameters up towards 100µm. There is no clear dividing line between the sizes of suspended particulates and deposited particulates, although particles with diameters >50 µm tend to be deposited quickly and particles of diameter <10 µm have an extremely low deposition rate in comparison. Therefore, the size of suspended and deposited dust particles affects their distribution and as such requires two very different approaches to sampling these fractions.

Large particles (100µm diameter) are likely to settle within 5-10m of their source under a typical mean wind speed of 4-5 m/s, and particles between 30-100 µm diameter are likely to settle within 100m of the source. Smaller particles, particularly those <10 µm in diameter, have a greater potential to have their settling rate impeded by atmospheric turbulence and to be transported further from their source. Dust emissions are exacerbated by dry weather and high wind speeds. Therefore, the dust deposition impact depends on the wind direction and the relative location of the dust source and receptor.

PM_{10} is the fraction of airborne (suspended) PM which contains particles of diameter less than 10µm. PM_{10} includes all particles, of different sizes and types, which are relevant for potential health effects. PM_{10} can penetrate deep into the respiratory system increasing the risk of respiratory and cardiovascular disorders.

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Dust emissions can arise as a result of operational activities, and /or wind erosion of exposed surfaces. The amount of dust that is raised is highly dependent upon a number of interrelated factors, which include:

- The nature of the material;
- The prevailing meteorological conditions;
- The activities being undertaken;
- The influence of any on site mitigation measures.

The prevailing meteorological conditions can have a significant effect on the potential for dust propagation from a minerals site. Wind speed (and direction) and precipitation are of particular importance and dust can be carried from a source towards receptors (such as nearby homes and other businesses) according to the strength and direction of wind. Precipitation is recognised to suppress dust and 0.2 mm of antecedent rainfall is considered sufficient to suppress windblown dust for a number of hours. Therefore, it can be assumed that during the drier months of the year, there is the potential for dust deposition rates to be higher than the annual average dust deposition rate. In order to establish an accurate existing baseline dust deposition level in the area, a 12-month dust deposition survey typically needs to be carried out.

There is no continuous meteorological monitoring station located in or close to the Rooskagh sandpit site. However, Met Eireann wind speed, wind direction and rainfall monitoring data are available from various weathers stations indicative of the meteorological conditions that are experienced at the Rooskagh sandpit site.

Wind Direction and Speed

Analysis of the monitoring data from the meteorological station at Birr weather station 37km south-south-east of the proposed site shows that the dominant wind direction is from the SE-S-SW quadrant as presented in Figure 8.1. Meteorological monitoring data from 1955 to 2008 indicates that the prevailing wind direction is from the south-west with an average wind speeds 5-6 m/s which equates to a moderate breeze.

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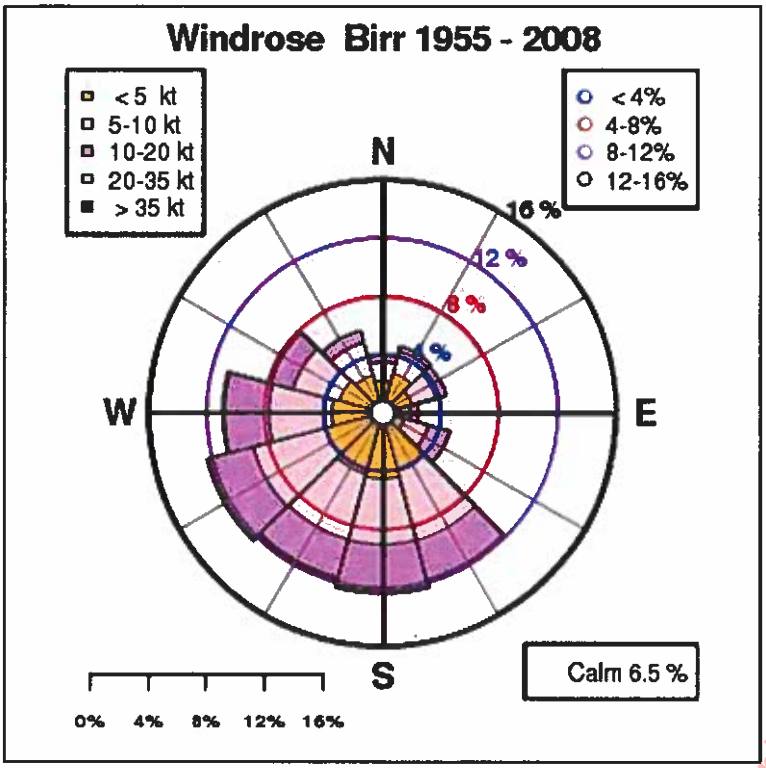
Figure 8.1: Dominant wind direction at Birr (1955 to 2008).



The windrose from the Met Eireann Birr station, as presented clearly exhibits that the prevailing wind direction in the area from 1956 to 2008 is from a south-westerly direction. This is the most up-to-date available data on the Met Eireann webpage.

The meteorological data shown below is recorded Met Eireann data from the Mullingar AWS situated to the west of Mullingar, Co. Westmeath. Wind speed and Wind Direction are recorded at the station, located at 53°32'14" N, 07°21'44" W. This is the nearest representative meteorological station to the proposed application site.

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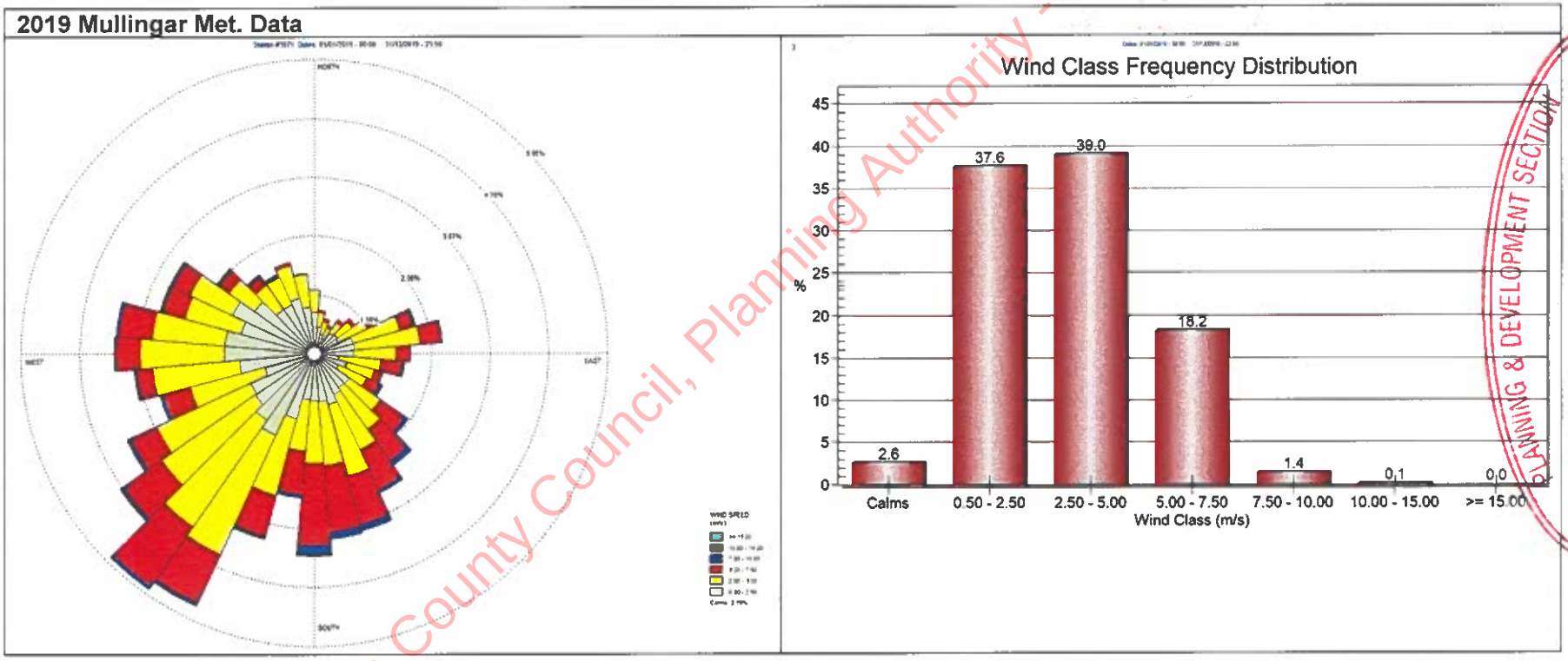
Mullingar Met Station 2019 – 2021 met data – wind direction and wind speed frequency distribution.

Data recorded at nearest representative meteorological station to the proposed application site - approx. 40 Km east of the application site.

As shown, the wind direction is predominantly from the south-west. This is the widely recorded, reported and accepted prevailing wind direction across the island of Ireland.

For approximately 70-75% of the time, the wind speed ranges from 0.5 m/s - 5 m/s. Calm conditions were recorded to occur for <3% of the year, with the remaining wind speeds ranging from 5 m/s - >15m/s.

2019 Mullingar Met. Data



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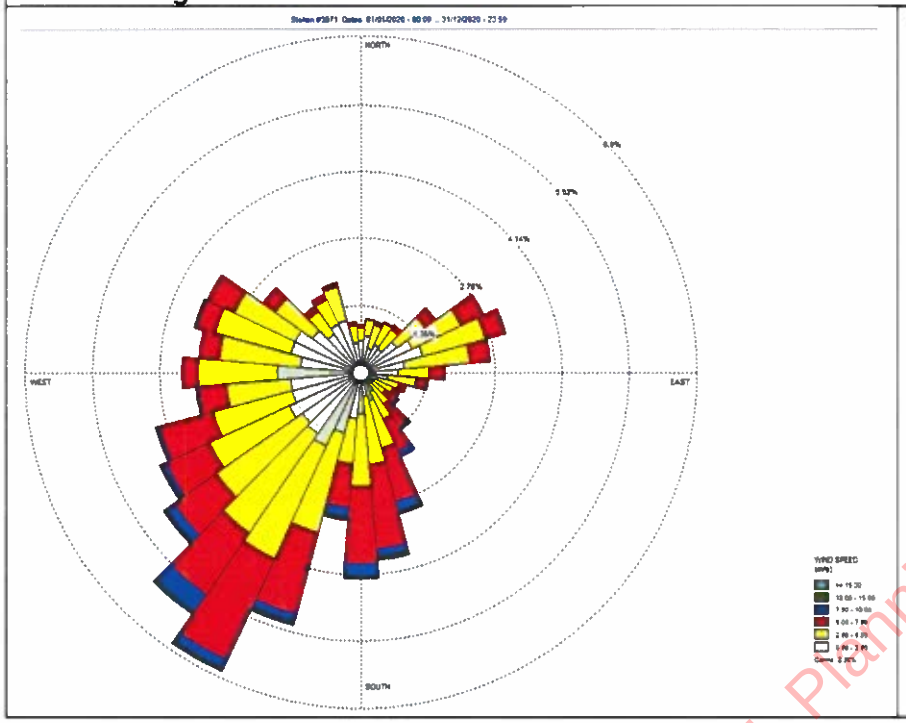
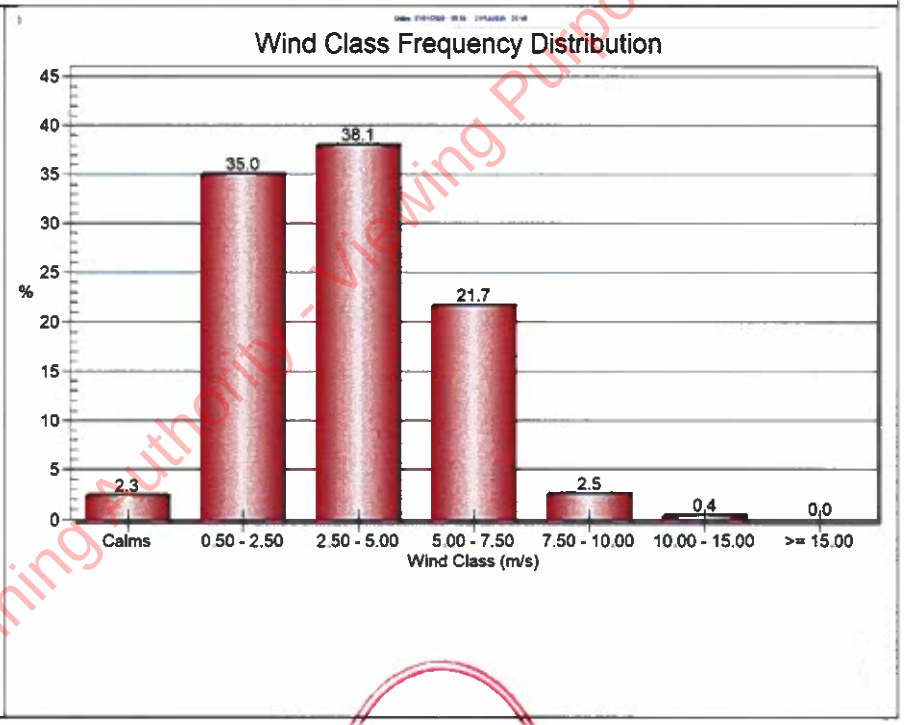
2020 Mullingar Met. Data





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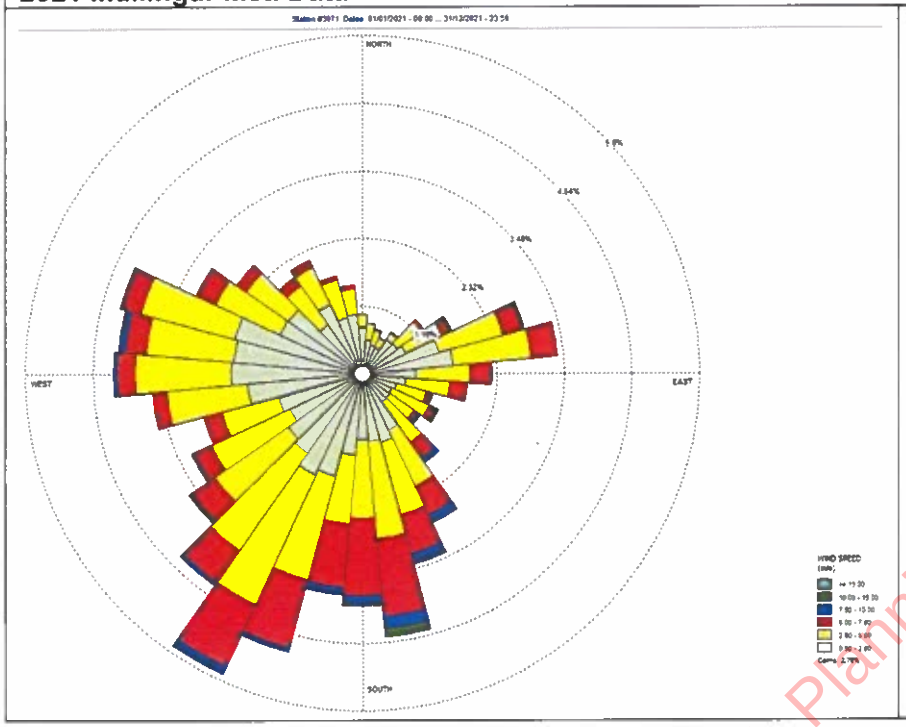
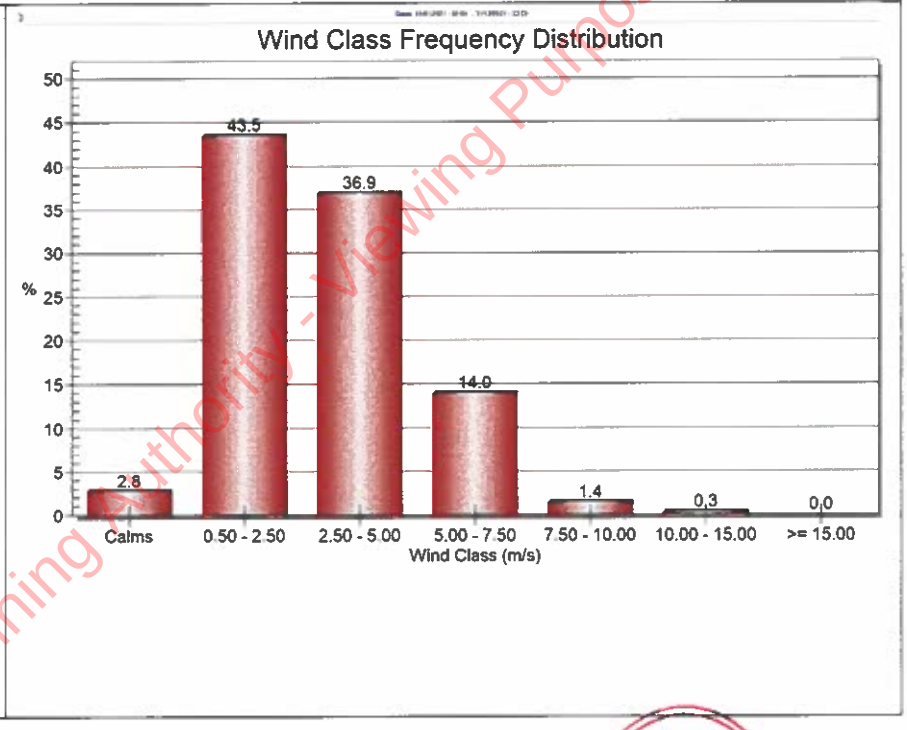
2021 Mullingar Met. Data





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Rainfall

The monthly average rainfall statistics at Athlone OPW weather station ~6.5km east of the proposed site from 2018 to 2020 are presented in Table 8.1. This indicates that the relatively drier months of the year occur in the Spring/Summer. During the winter months, the rainfall will be commonly associated with Atlantic frontal depressions, whereas during the summer months high rainfall amounts will tend to be associated with intense thundery showers. Met Eireann also indicates that following high volume rainfall amounts in proximity to the site location (197520, 241240)

Easting	*Northing*	*Annual Average Rainfall (mm)*
197000	241000	972 mm

There is also a reported rainfall total in excess of 0.254mm on 190 days per annum.

Table 8.1: Total rainfall in millimetres at Athlone OPW Site (2018 – 2020).

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Annual Precipitation
2020	61.7	193.0	61.7	41.3	14.1	78.6	103.8	115.3	62.7	134.6	86.2	90.8	1043.8
2019	43.1	41.2	152.2	54.8	31.6	73.5	47.9	171.1	110.0	70.8	80.0	82.8	959.0
2018	152.9	46.9	40.9	47.7	47.5	31.7	25.1	70.2	44.3	32.5	62.3	91.1	693.1
Mean Monthly Precipitation	96.93	91.15	84.93	47.93	31.07	61.27	58.93	118.87	72.3	79.3	76.17	88.23	

Temperature

Mean and absolute yearly meteorological temperature data at Athleague weather station ~17.5 km south-south-east of the proposed site from 2018 to Dec 2020) are presented in Table 8.2. This indicates an increase in temperatures.

Table 8.2: Maximum and minimum temperature at Athleague weather station (2018 – 2021.

Year	Mean Max Air Temp. (C)	Mean Min Air Temp. (C)	Absolute Max. Air Temp (C)	Absolute Min. Air Temp (C)
2020	13.65	6.03	29.5	-2.5
2019	13.58	6.2	23.9	-2.5
2018	13.2	6.55	25.9	-5.9

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8.3 Assessment of Baseline Conditions

8.3.1 Baseline Air Quality Data

The background air quality in the area of the development is recognised to be of very good quality and the site is located in the 'Zone D' area, as denoted by the EPA. The EPA has divided the country into zones for the assessment and management of air quality. The zones adopted in Ireland are Zone A, the Dublin conurbation; Zone B, the Cork conurbation; Zone C, comprising 21 large towns in Ireland with a population >15,000; and Zone D, the remaining area of Ireland. Concentrations of air quality pollutants in Zone D are very low and well below the relevant air quality limit values.

The Environmental Protection Agency's Air Quality Index for Health (AQIH) provides a scaled number from one to ten that identifies the current air quality currently in a region and whether or not this might affect human health. A reading of ten means the air quality is very poor and a reading of one to three inclusive means that the air quality is good. The AQIH indicates that the area surrounding the Rooskey sandpit site is in an area of good air quality (Rural West – 3 Good).

An EPA air quality station in Athlone (Grid Ref 53.4243°N, -7.9374°E ~ 6.5km east of proposed site, monitors particulate matter (PM_{10} and $PM_{2.5}$).

Table 8.3 outlines the average values for Particulate Matter (PM_{10}) and $PM_{2.5}$) concentrations for each month, January to April 2021.

Table 8.3: Air Quality Levels at Athlone, Co. Westmeath (January – May 2021)

Month	PM_{10} µg /m^3	$PM_{2.5}$ µg /m^3
January	20.65	18.54
February	13.71	10.80
March	15.77	12.94
April	14.48	11.05
May (to date 21.5.2021)	7.96	5.59
Annual Mean	40 µg/m^3	20 µg/m^3

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Table 8.3 outlines that the limit values for Particulate Matter (PM_{10}) and $PM_{2.5}$) have not been breached from January to May 2021.

The surrounding lands can be characterised as suburban to rural in nature with land uses in the area identified as agricultural, extractive, industrial and single house residential. The extractive industry is an established land use in the surrounding area with Kildea Concrete located immediately north of the proposed site and other quarries <4km west of the proposed site just off the L2025. Background air quality and dust deposition rates are influenced by these quarries as well as existing local traffic and agricultural activities, etc.

Figure 8.2: Potential existing dust sources in proximity to the proposed Rooskagh sandpit.

8.4 Predicted Impacts from the Proposed Development

8.4.1 Construction Impacts

A short-term construction phase will include the construction of the proposed site access, car parking area as well as portable offices and structures on the site. This phase of the development will last for no more than 3 - 6 months. The short-term construction phase will have a slight to minor dust impact as the area of the proposed offices is in excess of 200m from the nearest residential property and the construction works will be temporary in nature.

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8.4.2 Operational Impacts

Dust emissions

The assessment to consider the impacts that can be expected to occur in the future as a result of the development of sandpit site include the stripping of topsoil, the excavation of sand and gravel, the crushing and screening of aggregates, and the transport of sand, gravel and finished products (point emissions). Wind can carry dust particles well beyond the site boundaries, and fine materials from lorries can be deposited along public roads (fugitive emissions). This considers the significant effects, or impacts, that can reasonably be expected to occur as a result of excavations and the operation of the ancillary processes and buildings.

The extraction of sand and gravel using conventional techniques and mineral reduction using mobile crushing and screening with associated HGV traffic movements will result in dust deposition rates typically experienced in proximity to a sandpit site. It is reasonable to expect that future dust deposition rates from windblown dust will be attenuated by the progression of the sandpit face.

The processing operations on the site will include crushing, screening, washing, stockpiling activities and vehicle movements. These items of plant and processes will be located on the sandpit floor and the distance from the plant items to the site boundary and the depth below existing ground level will significantly reduce the potential for dust emissions from the site. In addition, the stockpile area will be located west of the topsoil storage area which will further assist in containing dust emissions within the site boundaries. The conveyors on the crushing plant will be covered to prevent dust escaping. Washing of the quarried sand and gravel will have insignificant dust emissions associated with this process. The contribution of the crushing, screening and transfer operations to ambient dust, PM_{10} and $PM_{2.5}$ concentrations in the area will be minimal because of the particle size of the dust that will be generated by the crushing and screening operations will be substantially larger than 10 µm. Frequent wetting of surfaces will also occur as required to suppress dusts emissions during dry and windy weather.

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Wind speed and direction have the greatest potential impact on dust deposition rates in proximity to the site. As outlined above, the predominant wind direction is from the south-west, with winds from the south-easterly to southerly to south-westerly to westerly direction occurring most frequently. The nearest properties are to the west of the site and are therefore upwind of the prevailing wind direction. Hence, it is unlikely that such properties will experience a significant dust impact. The nearest property to the north-east and east of the site, i.e. downwind of the prevailing wind direction is relatively remote from the proposed sandpit extraction area at greater than 250m and therefore, the property is unlikely to experience a significant dust impact at such a distance.

It is considered that the increase in risk of elevated dust impacts in the vicinity of the proposed extraction area will be negligible for all receptors. An increased risk of dust impact is unlikely due to the sandpit operations and extraction area moving in a westerly direction and hence, away from the nearest properties that are downwind of the prevailing wind direction. The sandpit walls and screening bunds will provide increased dust mitigating effects. As outlined below, there will be extensive dust mitigation measures adopted and implemented on site and therefore, the risk of nuisance dust impacts occurring is considered unlikely.

The operations on the Rooskagh sandpit site and associated dust mitigation measures will be implemented so that the dust deposition impacts will not result in an exceedance of the 350 mg/m^2/day limit at the Rooskagh sandpit boundary.

The DoEHLG guidance outlines that *"residents living in proximity to quarries can potentially be affected by dust up to 0.5km from the source, although continual or severe concerns about dust are most likely to be experienced within about 100m of the dust source"*. The main potential source of dust from the sandpit site will be from the extraction area with its associated sandpit face excavation, crushing & screening and loading & HGV movements operations. In terms of closest proximity to residential properties, the above outlined activities will take place no closer than 250m from the nearest residential properties to the north-east of the extraction area, 50m from the nearest residential properties to the north of the extraction area, 120m from the

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nearest residential properties to the west of the extraction area and 400m from the nearest residential properties to the south of the extraction area.

Dust deposition impacts from de-commissioning of the sandpit site may result in short-term dust deposition impacts. Such activities will include movement of stockpiles, internal bund construction, restorative planting works, de-commissioning of plant and equipment, etc. Typically, such works will be carried out during an 8 week window per annum with 2 years sought to complete final restoration of the site. These short-term works will be implemented in accordance with the proposed restoration concept for the site.

It is worthy of note that the IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning (May 2016 v1.1) states the following with regards to the wet extraction of sand and gravel;

- *"From the experience of the Working Group, adverse dust impacts from sand and gravel sites are uncommon beyond 250 m and beyond 400 m from hard rock quarries measured from the nearest dust generating activities".*
- *"The type of material being extracted and processed can have a significant influence on potential emissions. Sand and gravel deposits may possess an inherently high moisture content, which can cause particles to adhere and thereby affords a high degree of natural mitigation. However, this does not negate the potential for fugitive emissions from this material if it dries out, especially during high wind conditions. Conversely, the extraction and processing of hard rock such as granites and limestone can more readily generate dust, which requires appropriate mitigation".*
- *"Extraction of material with a high moisture content, such as sand and gravel, can potentially generate a smaller impact than the percussive processes associated with hard rock".*

Therefore, as outlined, significant dust impacts are not as prevalent from sand and gravel quarries (such as is proposed in this development). It is outlined clearly in the proposed mitigation measures section that the applicant will employ extensive dust mitigation measures including the use of water bowser, as required.

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It is worthy of note that the IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning (May 2016 v1.1) states the following with regards to the modelling of dust emissions from quarries;

- *"Computer modelling techniques can be used to understand how dust could disperse from a site. Alternatively, a more qualitative approach, relying on professional judgment, could be used...". Detailed dispersion modelling of dust impacts from minerals sites in the UK is extremely rare and is not generally recommended by the IAQM given the lack of accurate UK emissions data for this sector".*
- *"The collective view of the IAQM Working Group is that it is currently inappropriate to use a quantitative modelling approach to predict the impact in most cases and a qualitative risk-based approach using the S-P-R concept should usually suffice. This is primarily due to a lack of UK derived emission factors for minerals sites that could be used for modelling".*

Despite the reservations of the IAQM with regards to dust dispersion modelling as outlined above, AONA Environmental has completed a detailed dust dispersion modelling assessment using dust emission rates that have been calculated using the equations from the USEPA AP-42 document. See attached Dust Dispersion Modelling Report in Appendix 8.A, which assesses the potential worst-case dust impact at the receptor properties within 500m of the site boundary. This report is based on the use of the EPA approved *Aermod* modelling software, and clearly exhibits that there will be no significant dust impact from the proposed sand and gravel quarry development.

Cumulative Dust Impacts

Kildea Concrete is located on the lands directly north of the proposed quarry site. The Kildea Concrete site was established in the early 1990's and produces ready mix concrete, concrete blocks and a range of precast products for distribution all over the UK and Ireland. No actual quarrying takes place on the site with all aggregate transported to the site for production purposes. The site is constructed entirely on hardstand with appropriate site maintenance, cleaning and dust attenuation measures

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employed as necessary. The production of ready mix concrete, concrete blocks and a range of precast products are all wet processes which are inherently dust-free. Some stockpile storage is undertaken on site so these are potential dust sources. Also, the movement of lorries on site across the haul routes on the Kildea Concrete site are also a potential dust source.

In close proximity to the access road, entrance to the site and the vegetation in the surrounding area there is no evidence of any significant existing dust impact in the area. The potential dust impact of the Kildea Concrete site (i.e. the baseline in the area) has been assessed using the *Aermod* modelling software. The cumulative impact of the Kildea Concrete site and the proposed sand and gravel quarry has also been assessed. See attached Dust Dispersion Modelling Report (Appendix 8.A) which indicates there will be no significant cumulative dust impact of the Kildea Concrete site and the proposed sand and gravel quarry.

Vehicular emissions

On the basis of the predicted traffic flows, an Air Quality Impact Assessment due to traffic generated by the development is not required. This is on account of the relatively low traffic flows that will be generated by the proposed sandpit development and the fact that the project is not within an Air Quality Management Area (AQMA) and the existing local air quality is of good quality. This conclusion is based on Table 8.4 below which is extracted directly for the Land-Use Planning & Development Control: Planning For Air Quality (January 2017). This Guidance is from Environmental Protection UK and the Institute of Air Quality Management for the consideration of air quality within the land-use planning and development control processes.

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Table 8.4: Extract from EPUK / IEMA Guidance 2017: Indicative criteria for requiring an air quality assessment.

The development will:	**Indicative Criteria to Proceed to an Air Quality Assessment:**
1. Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV = cars and small vans	A change of LDV flows of: - more than 100 AADT within or adjacent to an AQMA - more than 500 AADT elsewhere.
2. Cause a significant change in ***Heavy Duty Vehicle (HDV) flows*** on local roads with relevant receptors. (HDV = goods vehicles + buses >3.5t gross vehicle weight).	***A change of HDV flows of:*** - more than 25 AADT within or adjacent to an AQMA ***- more than 100 AADT elsewhere.***

Therefore, it is considered that the actual change in traffic flows will be significantly less than 100 AADT flows per day, this development will be is insignificant against the IAQM and EPUK criteria. Therefore, traffic emissions associated with the development will be of negligible significance.

8.5 Mitigation Measures

The following dust mitigation measures will be employed to minimise operational dust impacts. The aim of these mitigation measures is to minimise the release of dust to the environment. Outlined in detail below are the dust suppression measures which will be employed at the Rooskagh sandpit site.

8.5.1 Operational Dust Mitigation Measures:

Mitigation measures are provided in accordance with the DoEHLG (2004) guidelines and EPA (2006) Environmental Management Guidelines for the sector, EPA (2006).

- The site manager will have overall responsibility for ensuring that operations within the Rooskagh sandpit site comply with the requirements of any planning authorisation.
- The site will operate a suitable water bowser and will have an associated water supply to allow for dampening down of the site when windblown dust from its surface arises.

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- The occurrence of potential wind-blown dust will be weather dependent but suitable facilities will be available to minimise windblown dust from the site surfaces.
- A tractor drawn water bowser will be available for use on site as and when needed.
- Although the site access road northeast of the site is up wind of operations, a fixed sprinkler system along this road will allow for dampening down when windblown dust from its surface arises.
- The dust mitigation measures will be undertaken in accordance with an Environmental Management System and dust and air quality mitigation measures will be adhered to on site.

As the site is yet to be operational the site does not have an EMS. The EMS for the proposed sandpit development will include dust mitigation measures as follows;

Overburden stripping / placement management.

- Roadways and other areas where vehicles are regularly moving will be kept clean, by sweeping or by wetting;
- When loading vehicles, the following procedures will be adhered to:
    - No overloading of vehicles or containers resulting in either peaks of cargo or overspill onto the working areas or roadways.
    - Keep fall heights of the material into the transport vehicles to a minimum.
- Strictly applied, suitable on-site speed limits will be set, displayed and observed for the movement of all vehicles (10 mph)

Access Roads, Site Roads and Vehicles Loading Activities & Movements:

The objective of the procedures will be to minimise the creation and release of dust generated by transportation activities carried out during both access to and movements within the site. This includes minimising dust from transport vehicles entering and leaving the facility.

- Regular attention will be paid to cleaning dust material from all roadways, hard surfaced areas and working areas of the facility. Dust from cleanup will be re-

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incorporated into the stockpile. This will be done during every lull in operations and at the end of each working period.

- Roadways and other areas where vehicles are regularly moving will be kept clean, by sweeping or by wetting;
- When loading vehicles, the following procedures will be adhered to:
    - No overloading of vehicles or containers resulting in either peaks of cargo or overspill onto the working areas or roadways.
    - Keep fall heights of the material into the transport vehicles to a minimum.
- Strictly applied, suitable on-site speed limits will be set, displayed and observed for the movement of all vehicles (10 mph)
- A suitable underbody and wheel wash will be provided. This will be surrounded by a smooth hard surface extending to the site exit. All vehicles will pass through and spend sufficient time for effective cleaning in the washing facility before leaving the site. Supervision will be provided to ensure that this is carried out effectively.

Stockpiling Operations

The aims of these procedures will be to ensure that materials are stockpiled only within the designated process working areas and any potential release of dust to atmosphere will be minimised.

- Unloading of materials will be carefully undertaken to ensure minimum exposure to winds, thereby reducing dust emission to air.
- The aims of the stockpiling procedure will be to ensure that management of the stockpile is conducted in such a way that releases of dust to atmosphere will be minimised.
- Stockpile areas will be clearly and physically delineated to deter vehicles from running over mineral extract at the stock edge.
- Stockpiles will be managed to ensure that the profile of material will minimise wind whipping.
- During any stockpiling, stockpiles will be profiled and compacted by flattening out peaks and ridges and when partially worked, will be re-contoured to prevent ridges or overhanging falls.

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- Whenever possible, settled stockpiles will be not be broken into when the wind is likely to lift newly exposed dry dust. When this is unavoidable, effective dust control methods will be implemented.
- Prior to carrying out any stock handling operations, the dust suppression equipment will be checked to ensure that it is working properly.

8.5.2 Monitoring & Reporting

- A high standard of housekeeping will be maintained on site.
- Systems for monitoring processes, responding to and reporting pollution incidents will be devised by the Operator. This information will be kept in a logbook, together with information regarding equipment failure, periods of significant dust emissions off-site and the inspection of roadways, together with any remedial action taken.
- Any complaints received from neighbouring properties will be logged and appropriate actions will be taken to reduce the potential for further complaint.

8.5.3 Periodic Dust Monitoring (if required)

Dust deposition monitoring will be carried out, when the sandpit is operational, as part of the environmental monitoring programme, if deemed to be required.

If dust deposition monitoring is carried out, the monitoring results will be submitted to Roscommon County Council on an annual basis. If the level of dust is found to exceed the dust deposition limits (350 mg/m^2/day), at the perimeter of the site, immediate action will be taken, and additional mitigation measures will be incorporated to control any dust emission.

Such dust deposition monitoring surveys will be undertaken in accordance with the procedure in Standard Method VDI 2119 – *'Measurement of Dustfall, Determination of Dustfall using Bergerhoff Instrument (Standard Method) German Institute'*. The dust deposition monitoring surveys will comprise of positioning of four Bergerhoff Dust Deposit Gauges at the selected and agreed locations for a period of 30 (+- 2) days. After the exposure period is complete, the gauges will be removed from the site and transported to an accredited laboratory under a strict chain of custody for analysis.

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The samples will be evaporated down and the dry residue, and the total dust content determined gravimetrically and the result will be reported in mg/sample. Results will be expressed as a dust deposition rate in mg/m^2/day in accordance with the relevant standard and DoEHLG suggested limit value.

8.6 Conclusions

The potential for significant dust arising from the proposed development to include all phases of the proposed development life cycle to include site preparation, construction, operation, and restoration have been considered.

The extraction of sand and gravel and processing into aggregate products using mobile crushing and screening with associated HGV traffic movements at the Rooskagh sandpit site has been assessed. It is considered that the potential for dust impact is limited to the immediate vicinity of the excavation activities, with the proposed dust suppression measures in operation, because of the quarried materials predominantly coarse nature. The potential for nuisance dust impacts is considered to be negligible at the nearest sensitive receptors.

Dust deposition monitoring will be undertaken and dust deposition rates at the site boundary in proximity to the nearest residential receptors will be maintained below the recommended levels provided for in the DOEHLG 2004 guidelines though the use of the dust mitigation procedures outlined. It is reasonable to assume that the dust mitigation procedures outlined above will ensure continued compliance with Licence conditions at the site.

Any residual dust deposition impacts resulting from the future de-commissioning and restoration of the sandpit will be of a short duration and all potential dust impacts from the Rooskagh sandpit site are considered to be reversible i.e. the risk of impact will cease on completion of extraction and restoration of the site.

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Appendix 8.A

Dust Dispersion Modelling Report which assesses the potential worst-case dust impact at the receptor properties within 500m of the site boundary.

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1 Introduction

AONA Environmental Consulting Ltd. (AONA Environmental) was commissioned by Mannions Quarry to complete dispersion modelling of the dust releases from the proposed Sand & Gravel quarry development at Bealnamulla, Athlone.

The development will involve the extraction of sand, stone & gravel over an extraction area of 4.90 hectares (volume to be extracted = 466,766m³ approximately) over a 10 year period, screening/processing of stone, sand & gravel from the site using mobile plant, construction of offices (33m²), welfare facilities (9m²), well, water settlement pond (area 2,020 m²), weighbridge, wheel wash, entrance, set down area, carparking, truck parking, refuelling pad, petrol oil interceptor, fencing, landscaping/screening, signage, lighting, wastewater storage tank for site offices, and all other ancillary works. The land will be restored to agricultural lands on the completion of the extraction of sand, stone and gravel.

This has involved preparing dust dispersion models for the proposed quarry development. The dust dispersion modelling assessments of fugitive and area emissions from a range of operational dust sources including the proposed sand and gravel quarry extraction area, haul road traffic and sand and gravel stockpiles has been undertaken. The dispersion modelling has allowed for the assessment of potential dust concentration and dust deposition impacts on Human and Ecological Receptors in proximity to the proposed quarry development at Bealnamulla, Athlone.

2 Relevant Legislation, Standards & Guidelines

2.1 Ambient Dust Concentration Guidelines

The relevant European Air Quality Standards taken from Directive 2008/50/EU with regards to particulates (including PM_{10} & $PM_{2.5}$) outline limit values for the protection of human health as presented in Table 1. PM_{10} refers to particles with a diameter of less than 10 µm. When inhaled, they can penetrate the lungs and have significant adverse effects on human health. Fine particulate matter ($PM_{2.5}$) refers to particles with a diameter of less than 2.5 µm. These particles can penetrate deep into the respiratory ducts and are very harmful to health.

Table 1: The European Air Quality Standards Regulations for Particulates (PM_{10} & $PM_{2.5}$)

Pollutant	Concentration	Averaging period	Permitted exceedances / year
PM_{10}	50 µg/m³	24 hours	35
	40 µg/m³	1 year	-
Fine particles ($PM_{2.5}$)	25 µg/m³ Note 1	1 year	-

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2.2 Dust Deposition Guidelines

Dust particles can be classified into those that are easily deposited and those that remain suspended in the air for long periods. This division is useful as deposited dust is usually the coarse fraction of particulates that causes dust annoyance, whereas suspended particulate matter is implicated more in exposure impacts.

Airborne particles have a large range of diameters, from nano-particles and ultrafine particles (diameters less than 0.1µm) to the very large particles with diameters up towards 100µm. There is no clear dividing line between the sizes of suspended particulates and deposited particulates, although particles with diameters >50 µm tend to be deposited quickly and particles of diameter <10 µm (PM_{10}) have an extremely low deposition rate in comparison. Therefore, the size of suspended and deposited dust particles affects their distribution and as such requires two different approaches to sampling these fractions. As stated above, PM_{10} and $PM_{2.5}$ particles can penetrate deep into the respiratory system increasing the risk of respiratory and cardiovascular disorders. Total Suspended Particles (TSP) is the term used when referring to larger particles which do not have a specified size limit. It is common for TSP to be measured alongside PM_{10} and $PM_{2.5}$ particularly at industrial sites when dust monitoring is undertaken.

Particulate matter can emanate from natural and anthropogenic sources. Natural sources include sea salt, forest fires, pollen and moulds. Natural sources are unregulated and harder to control. Anthropogenic sources can be regulated and understanding the sources of particulate matter is very important. PM_{10} is most commonly associated with road dust and construction activities. Wear and tear of brakes and tyres on vehicles and crushing activities at construction sites can all contribute to a rise in PM_{10}. $PM_{2.5}$ is associated with fuel burning, industrial combustion processes and vehicle emissions. Larger particles (100µm diameter) are likely to settle within 5-10m of their source under a typical mean wind speed of 4-5 m/s, and particles between 30-100 µm diameter are likely to settle within 100m of the source. Smaller particles, particularly those <10 µm in diameter, i.e. PM_{10}, have a greater potential to have their settling rate impeded by atmospheric turbulence and to be transported further from their source. Dust emissions are exacerbated by dry weather and high wind speeds. Therefore, the impact of dust also depends on the wind direction and the relative location of the dust source and receptor.

Currently no statutory standards or limits exist for the assessment of dust deposition and its tendency for causing nuisance. Similarly, no statutory air quality criterion has been set at a European, National or World Health Organisation (WHO) level, although a range of national 'yardstick' criteria from many countries is found in literature. The dust deposition rate criteria typically set out by Irish authorities for '*nuisance*' is 350 mg/m²/day as an annual average when measured using a Bergerhoff gauge.

In terms of the protection of the sensitive ecological habitats, the United Kingdom Institute of Air Quality Management (IAQM) *Guidance on the Assessment of Mineral Dust Impacts for Planning* (2016) states that professional judgement is required to identify where on the spectrum between high and low sensitivity a receptor lies, taking into account the likely effect and the value of the ecological asset. A habitat may be highly valuable but not sensitive, alternatively it may be less valuable but more sensitive to dust deposition. For the sensitivity of ecosystems to dust deposition the IAQM recommends that an ecologist is consulted to determine the potential effects on plant communities. The IAQM guidance defines high, medium and low sensitivity receptors as follows;

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High sensitivity receptor –

- locations with an international designation and the designated features may be affected by dust soiling.
- locations where there is a community of a particular dust sensitive species such as vascular species.
- an indicative example is a Special Area of Conservation (SAC) designated for acid heathlands adjacent to a minerals development releasing alkaline dusts.

Medium sensitivity receptor –

- locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown;
- nationally designated site and the designated features may be affected by dust deposition; or indicative examples include Sites of Special Scientific Interest (SSSIs) or a local wildlife sites with very specific sensitivities.

Low sensitivity receptor –

- locations with a local designation where the features may be affected by dust deposition.
- an indicative example is a local Nature Reserve with dust sensitive features.

In 2005, the UK Highways Agency released an Interim Advice Note 61/05 '*Guidance for Undertaking Environmental Assessment of Air Quality for Sensitive Ecosystems in Internationally Designated Nature Conservation Sites and SSSIs*' as a supplement to the Design Manual for Roads and Bridges (DMRB) Guidelines. This interim guidance states that dust or particles falling onto plants can physically smother the leaves affecting photosynthesis, respiration and transpiration. The literature suggests that the most sensitive species appear to be affected by dust deposition at levels above 1,000 mg/m^2/day which is higher than the level at which most dust deposition may start to cause a perceptible nuisance to humans. As such, once dust deposition rates are maintained within the guidelines for human nuisance the impact of dust deposition on sensitive ecosystems is considered negligible.

Therefore, the following dust limits have been used in the assessment of predicted dust concentration and dust deposition levels from each of the options assessed;

- PM_{10} 24 Hour Mean concentration limit = 50 µg/m^3 not to be exceeded more than 35 times a calendar year
- PM_{10} Annual Mean concentration limit = 40 µg/m^3
- $PM_{2.5}$ Annual Mean concentration limit = 20 µg/m^3
- Dust Deposition Rate limit affecting human receptors = 350 mg/m^2/day (averaged over a 30+/-2 day period).
- Dust Deposition Rate limit affecting sensitive ecological receptors = 1,000 mg/m^2/day

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3 Methodology

3.1 Assessment Methodology

3.1.1 Dispersion Modelling Methodology:

In order to determine the potential dust impacts arising from the operation of the proposed quarry site, *Aermod* dispersion modelling software has been used. The dispersion modelling has been prepared in accordance with the methodology outlined in the Irish EPA Air Dispersion Modelling from Industrial Installations Guidance Note (AG4) (2020) and the UK DEFRA Local Air Quality Management Technical Guidance LAQM.TG(16) (2021).

Estimates of atmospheric dispersion and the resultant downwind concentrations of pollutants can be predicted through the use of mathematical models to assess the impacts from airborne releases based on the following parameters;

- Source emission characteristics including emission rate of pollutant, velocity of discharge, height of discharge and temperature of the release,
- Prevailing atmospheric conditions including wind speed, direction, cloud cover, precipitation, ambient temperature and the depth of the mixing layer, and
- Topography and local surface conditions

Aermod is a widely recognised and approved dispersion model used to predict pollutant concentrations from a wide range of sources that are present at typical industrial facilities. The *Aermod* model accepts hourly meteorological data to define the conditions for plume rise, transport, diffusion and deposition. It estimates the concentration or deposition value for each source and receptor combination for each hour of input meteorology and calculates user-selected short term averages. Since most air quality standards are stipulated as averages or percentiles, *Aermod* allows further analysis of the results for comparison purposes.

Percentile analysis for emissions is calculated for the maximum averages using the *Aermod* -percent post-processing utility. This utility calculates the maximum concentration of a pollutant from all receptors at a specific percentile, for a specific period. Employing the percentile method facilitates the omission of unusual short-term meteorological events that may cause elevated pollutant concentrations and hence a more accurate representation of the likely average pollutant concentrations over an averaging period.

The dust impact assessment has referenced realistic background particulate (PM_{10} & $PM_{2.5}$) concentrations for the area of the quarry development and the dispersion modelling results have been compared against the relevant Ambient Air Quality Standards.

Time Averaging and Percentiles

Appropriate time averaging and percentiles have been calculated in terms of the PM_{10} concentration limit values and criteria detailed in the air quality standards as outlined in Table 1. For example, short-term PM_{10} impacts have been calculated and presented as a 90.41th percentile of maximum 24-hour average concentrations, i.e. 35 exceedances of the relevant limit value of 50 µg/m^3 allowed per annum. The results of the air dispersion modelling study have been compared against the relevant Air Quality limit values.

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Building Downwash Effects

Buildings can affect the local mechanical turbulence around the point of release. Air moving over buildings increases in velocity and can cause downwash downwind of the source. Releases can be partly or wholly entrained into the building slip-stream leading to occasional elevated local ground level concentrations when wind direction increases the influence of nearby buildings on dispersion of the plume. Due to this fact, process stack heights as well as building dimensions, shape and orientations have been incorporated into the model. *Aermod* includes algorithms to model the effects of building downwash on emissions from nearby or adjacent point sources. The proposed plans and elevations of the proposed site layout have been provided to AONA Environmental.

Surface Roughness & Land Use Characteristics

The surface roughness conditions in the vicinity of the site have been adjusted for the rural surroundings in the *Aermod* model. Appropriate Albedo, Bowen Ratio and Surface Roughness values have been determined for the model in terms of local land uses.

Land Type is grassland 0°-360° around the proposed site.

Annual Average Values;

- Albedo 0.29
- Bowen Ratio 0.925
- Surface Roughness 0.04025

Meteorological Data

Hourly sequential meteorological data from the nearest representative meteorological station with continuous recording of meteorological data (Mullingar, located approximately 45 Km east of the proposed quarry site) for 2019, 2020 and 2021 was used in the dispersion model (See Figure 1). The meteorological data is appropriate for use as it is representative of meteorological conditions in the area of the proposed quarry development. This clearly exhibits that the wind direction is predominantly from the south-west. This is the widely recorded, reported and accepted prevailing wind direction across the island of Ireland.

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Figure 1: Graphical representation of the meteorological data used in the dispersion model

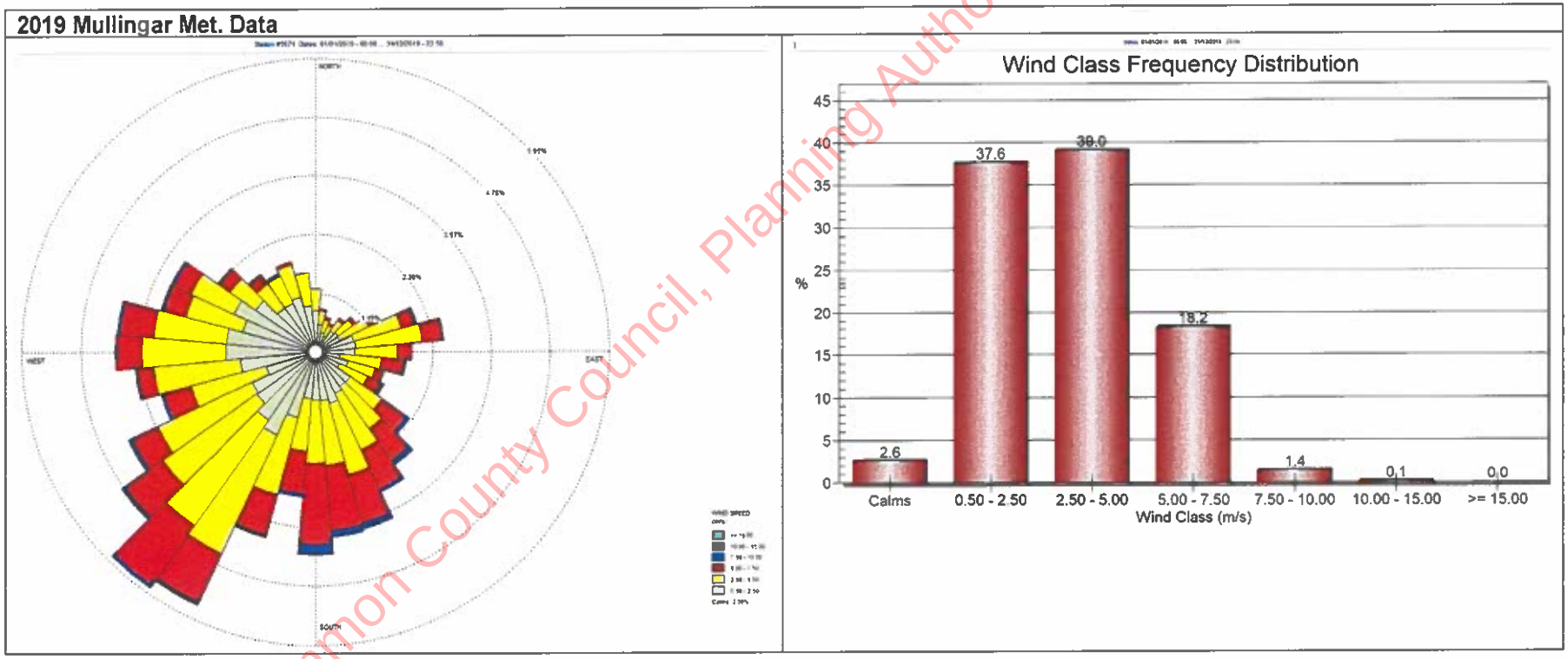
Mullingar Met Station

2019 – 2021 met data – wind direction and wind speed frequency distribution.

Data recorded at nearest representative meteorological station to the proposed application site - approx. 45 Km east of the application site.

As per the facts already stated in the EIAR documentation, the wind direction is predominantly from the south-west. This is the widely recorded, reported and accepted prevailing wind direction across the island of Ireland.

For approximately 70-75% of the time, the wind speed ranges from 0.5 m/s - 5 m/s. Calm conditions were recorded to occur for <3% of the year, with the remaining wind speeds ranging from 5 m/s - >15m/s.



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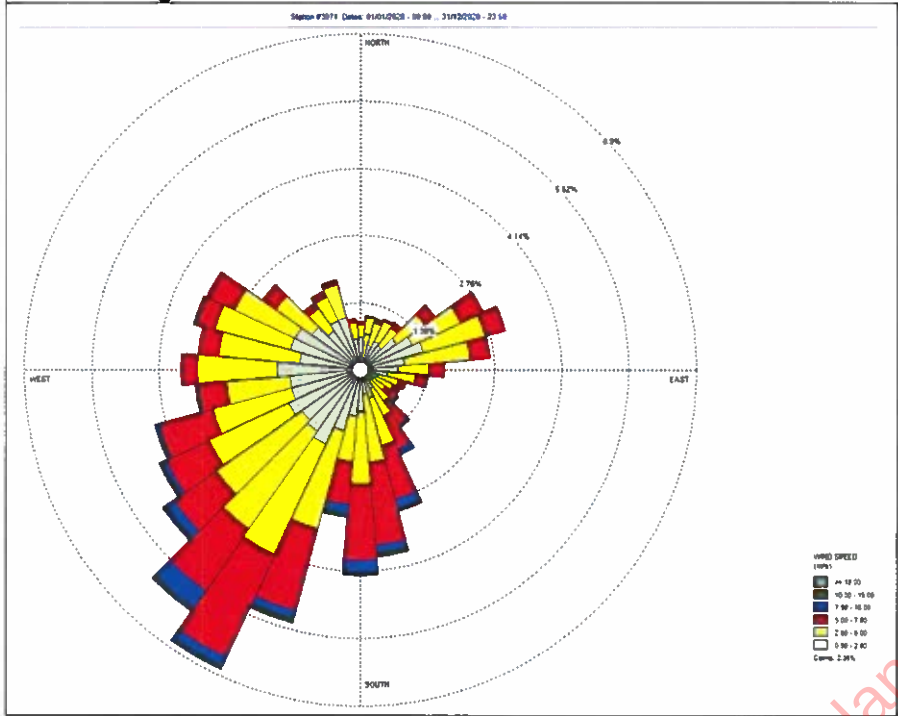
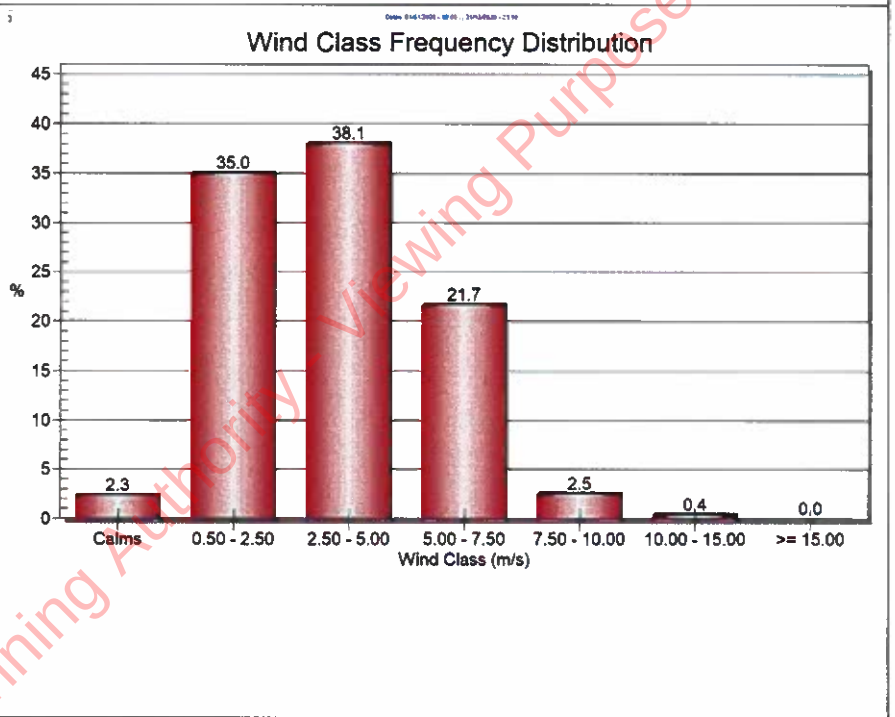
2020 Mullingar Met. Data





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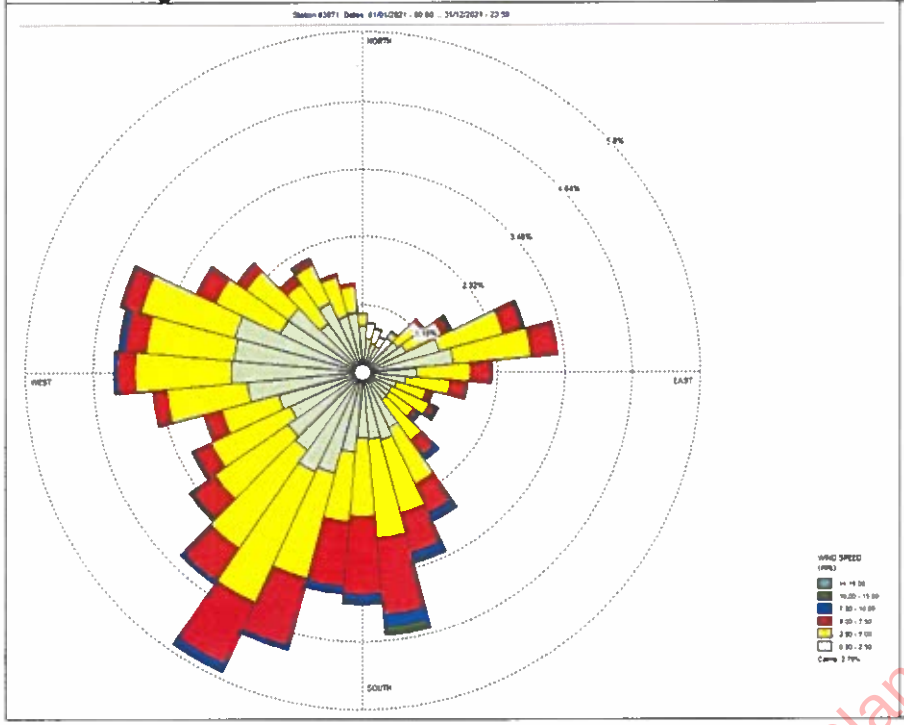
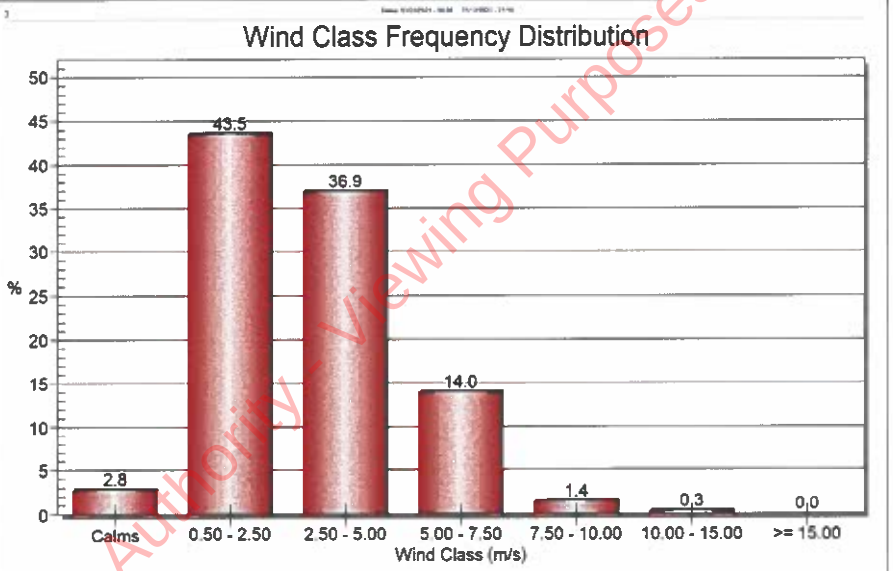
2021 Mullingar Met. Data





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3.2 Receptors & Cartesian Grids

The *Aermod* model calculates pollutant concentrations at receptor points in the vicinity of the modelled emission points. The grid coordinates for the 22 nearest sensitive human receptor locations in proximity to the proposed quarry site have been determined and selected for specific reporting of the potential dust impact. These sensitive receptor locations are within approximately 1 km of the proposed quarry site and are located to the north, west, south and east of the proposed quarry site. It can be assumed that all other residential receptors located further from the proposed quarry site than these locations will experience a lesser dust impact than those listed in Table 2.

Table 2: Dust sensitive human receptor locations in proximity to the proposed quarry site input to the dispersion model (See Figure 2).

Description	Grid Coordinate	
	X (m)	Y (m)
SR1	197442.4	241595.7
SR2	197316.5	241581.9
SR3	197338.2	241361.4
SR4	197168.3	241354.2
SR5	197217.1	241298.1
SR6	197195.4	241233.7
SR7	197161.7	241243.3
SR8	197026.1	241150
SR9	197166.5	241156
SR10	197223.7	241130.1
SR11	197156.3	241032.5
SR12	197184.6	240970.4
SR13	196971.9	241090.9
SR14	196950.2	241074
SR15	196905.7	241045.7
SR16	197089.4	240778.9
SR17	197087	240745.1
SR18	197085.8	240702.4
SR19	197429.2	240713.8
SR20	197691.2	240633.1
SR21	198070.1	241453
SR22	197780.4	241506.6

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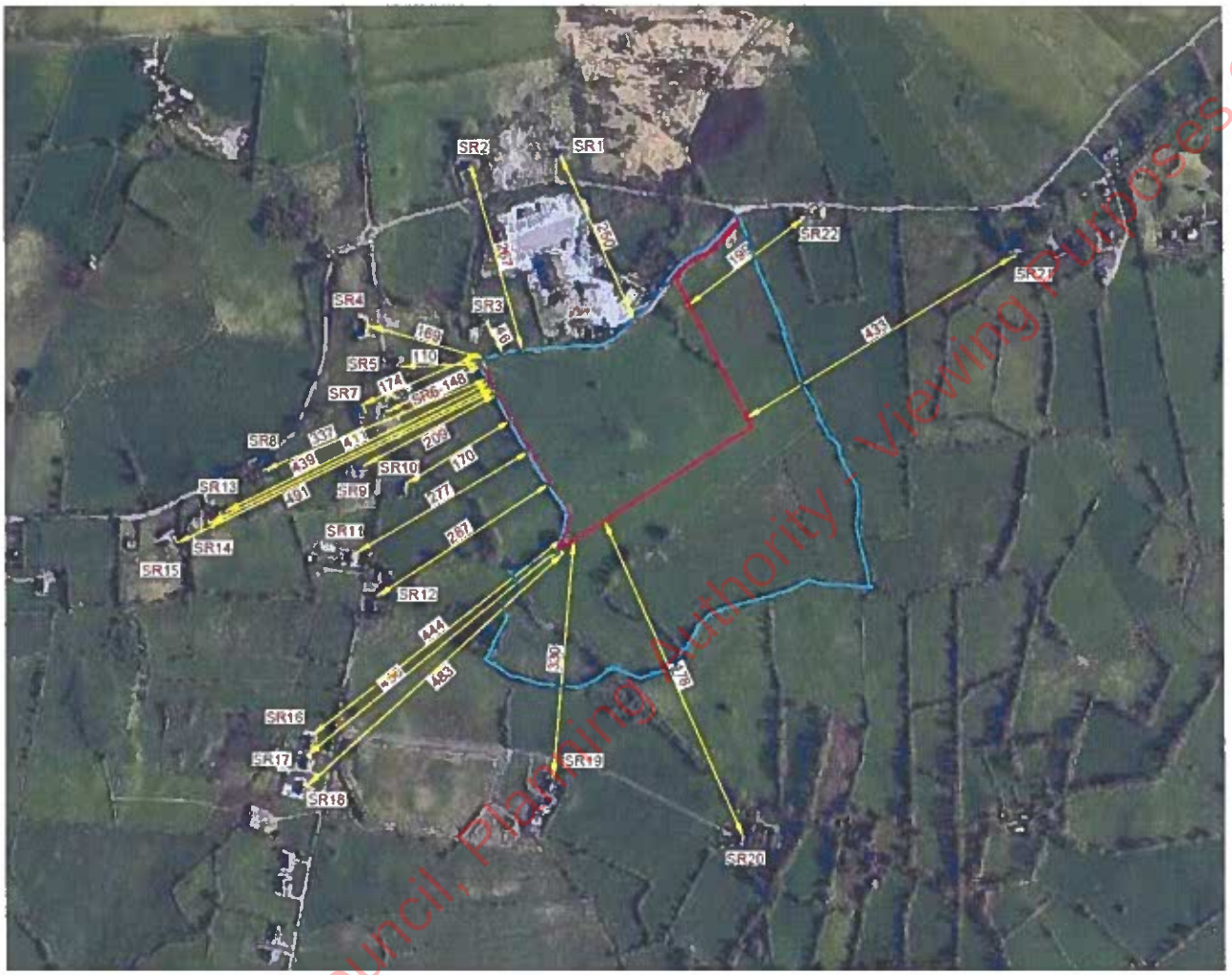
Ground level pollutant concentrations were also predicted at every node on a Cartesian grid as follows;

- Cartesian Grid 1 – 2,400m x 1,600m @ 100m spacing centre coordinates of 197515, 241215
- Cartesian Grid 2 – 1,000m x 1,000m @ 100m spacing centre coordinates of 197515, 241215

Figure 2: Nearest sensitive human receptor locations in proximity to the proposed quarry site input to the air quality prediction model.



The nearest boundary of the adjacent ecologically designated Special Areas of Conservation and sensitive habitats are in excess of 2 Km from the proposed quarry site. The nearest ecologically designated are shown in Figure 3. At a distance in excess of 2 Km from the proposed quarry site there will be no significant dust deposition impact at ecologically sensitive receptors.

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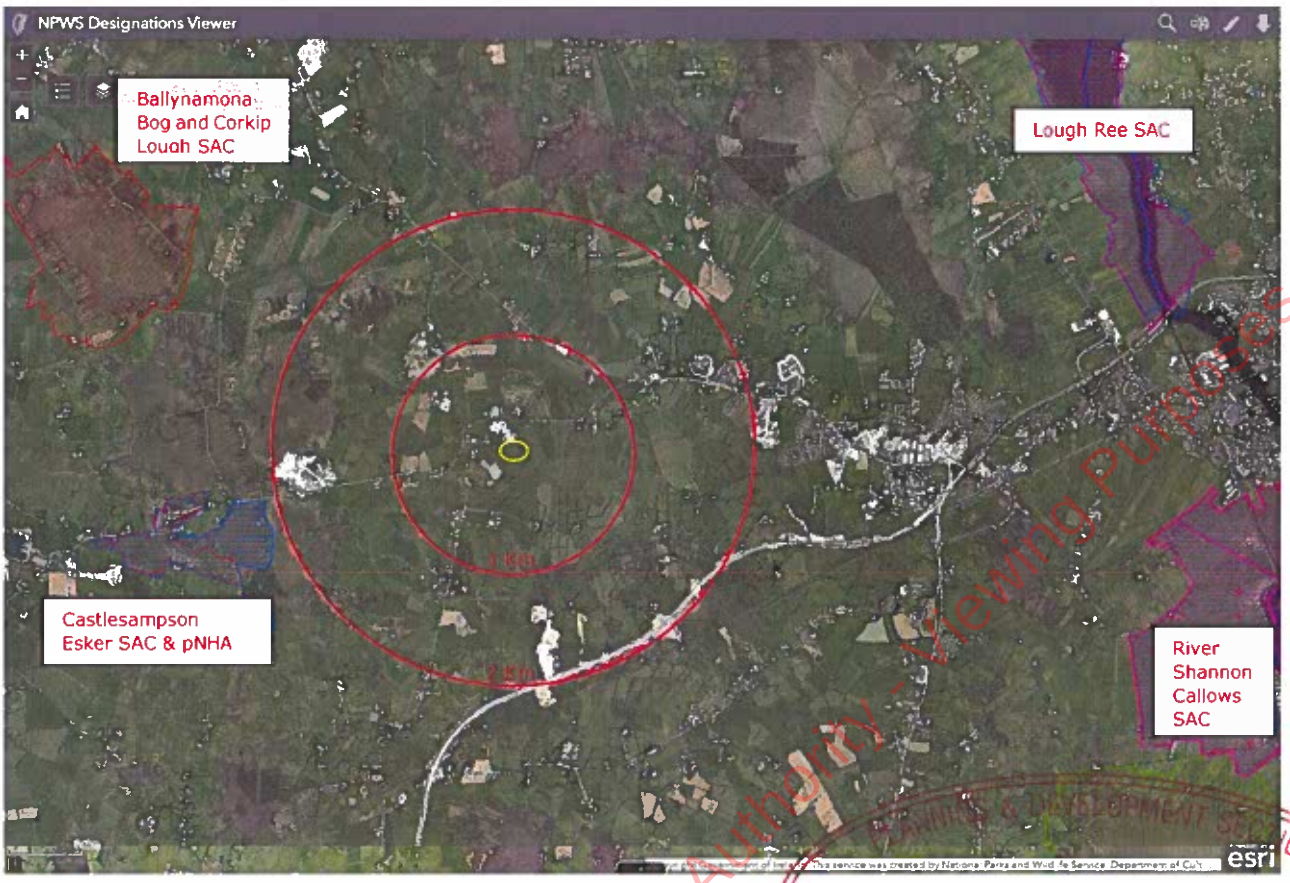
Figure 3: Nearest sensitive ecological receptor locations in proximity to the proposed quarry site.



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3.3 Significance of Potential Environmental Effects

Describing the Impact:

The rationale for describing the impact of the proposed development is derived from the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) guidance (EPUK & IAQM) "Land-Use Planning & Development Control: Planning for Air Quality (January 2017). There is a two-stage process to be followed in the assessment of air quality impacts on human receptors;

- a qualitative or quantitative description of the impacts on local air quality arising from the development; and
- a judgement on the overall significance of the effects of any impacts

The suggested framework for describing the impacts is set out in Table 6.3 of the EPUK & IAQM guidance document and is shown in Table 3 below. The term Air Quality Assessment Level (AQAL) has been adopted as it covers all pollutants, i.e. those with and without formal standards. AQAL is used to include air quality objectives or limit values where these exist. The Environment Agency uses a threshold criterion of 10% of the short term AQAL as a screening criterion for the maximum short-term impact. The EPUK & IAQM guidance adopts this as a basis for defining an impact that is sufficiently small in magnitude to be regarded as having an insignificant effect.

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Table 3: Impact descriptors for individual receptors

Long term average Concentration at Receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Moderate
103-109% f AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

Explanation

1. AQAL = Air Quality Assessment Level, which may be an air quality objective, EU limit or target value, or an Environment Agency 'Environmental Assessment Level (EAL)'.

2. The Table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impact falls within. The user is encouraged to treat the numbers with recognition of their likely accuracy and not assume a false level of precision. Changes of 0%, i.e. less than 0.5% will be described as Negligible.

3. The Table is only designed to be used with annual mean concentrations.

4. Descriptors for individual Receptors only; the overall significance is determined using professional judgement (see Chapter 7). For example, a 'moderate' adverse impact at one Receptor may not mean that the overall impact has a significant effect. Other factors need to be considered.

5. When defining the concentration as a percentage of the AQAL, use the 'without scheme' concentration where there is a decrease in pollutant concentration and the 'with scheme;' concentration for an increase.

6. The total concentration categories reflect the degree of potential harm by reference to the AQAL value. At exposure less than 75% of this value, i.e. well below, the degree of harm is likely to be small. As the exposure approaches and exceeds the AQAL, the degree of harm increases. This change naturally becomes more important when the result is an exposure that is approximately equal to, or greater than the AQAL.

7. It is unwise to ascribe too much accuracy to incremental changes or background concentrations, and this is especially important when total concentrations are close to the AQAL. For a given year in the future, it is impossible to define the new total concentration without recognising the inherent uncertainty, which is why there is a category that has a range around the AQAL, rather than being exactly equal to it.

Assessing Significance:

The rationale for the assessment of significance is derived from the EPUK & IAQM Guidance (paragraphs 7.1-7.12 referring to Table 6.3) and relates to Table 3 above.

Impacts on air quality, whether adverse or beneficial, will have an effect on human health that can be judged as 'significant' or 'not significant'. An 'impact' is the change in the concentration of an air pollutant, as experienced by a Receptor. This may have an 'effect' on the health of a human Receptor, depending on the severity of the impact and other factors that may need to be taken into account. The impact descriptors set out in Table 3 are not, of themselves, a clear and unambiguous guide to reaching a conclusion on significance. These impact descriptors are intended for application at a series of individual Receptors. Whilst it may be that there are 'slight', 'moderate' or 'substantial' impacts at one or more Receptors, the overall effect may not necessarily be judged as being significant in some circumstances.

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Any judgement on the overall significance of effect of a development will need to take into account such factors as:

- the existing and future air quality in the absence of the development;
- the extent of current and future population exposure to the impacts; and
- the influence and validity of any assumptions adopted when undertaking the prediction of impacts.
- Other factors may be relevant in individual cases.

3.4 Background Air Quality

The EPA has divided the country into zones for the assessment and management of air quality. The zones adopted in Ireland are Zone A, the Dublin conurbation; Zone B, the Cork conurbation; Zone C, comprising 21 large towns in Ireland with a population >15,000; and Zone D, the remaining area of Ireland. The background air quality in the area of the development is of very good quality and the site is located in 'Zone D' as denoted by the EPA. Therefore, a worst-case background PM_{10} concentration of 10 µg/m³ and a worst-case background $PM_{2.5}$ Concentration of 5 µg/m³ has been used in the assessment, i.e. 20% of the relevant Air Quality Standard annual mean limit value.

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4 Emission Rates

4.1 Dust Source Emission Rates

AONA Environmental has calculated a range of emission rates from the potential dust sources on the proposed quarry site and from the adjacent Kildea Concrete Products Manufacturing site. .

The USEPA AP-42 Compilation of Air Pollutant Emissions Factors have been used to determine dust emission rates from the unpaved haul roads on the site using the equation from AP-42, Section 13.2.2; Unpaved Roads. The potential dust emissions from the stockpiles took into account handling of the material and wind erosion of the stockpile surfaces. The dust emissions depend on the mean wind speed in the area and the material moisture content of the stockpile, according to the equation EPA, 2006b.

Dust Deposition Rates

The dust deposition rate in the dispersion models have been based on the following assumptions in relation to particle density, moisture content and particle size distribution. In the dust deposition dispersion model, based on the fact that this is a proposed sand and gravel quarry, it has been assumed that 10% or more particles emitted will have a diameter >10 microns (µm) with a mass fraction and particle density as follows;

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Particle Diameter (µm)	Mass Fraction (0-1)	Particle Density (g/cm^3)
1	0.05	1.7
10	0.15	1.7
50	0.3	1.7
100	0.5	1.7

The dust emission rate calculations are presented in Annex A.

Table 4: Dust emission rates used in the dust dispersion model.

Description	Source	Annual Average		
		$PM_{2.5}$	PM_{10}	TSP
Haul Road on proposed quarry site Note 1	Haul Road g/s	0.002	0.022	0.060
Haul Road on Kildea Concrete site Note 2	Haul Road g/s	0.001	0.011	0.035
Proposed quarry site Sand Stockpile Wind Note 3	Wind erosion g/m^2/s	0.0000044	0.0000109	0.0000218
Proposed quarry site Gravel Stockpile Wind Note 3	Wind erosion g/m^2/s	0.0000015	0.0000036	0.0000073
Kildea Concrete Stockpile Wind Note 4	Wind erosion g/m^2/s	0.0000044	0.0000109	0.0000218

Note 1: Proposed Quarry Site Haul trucks will travel across unpaved haul routes with 50% dust suppression during summer months and 95% dust suppression during winter months.

Note 2: Kildea Concrete Site Haul trucks travel across paved haul routes with 75% dust suppression but realistically will have 100% dust suppression during winter.

Note 3: Proposed Quarry Site Sand & Gravel Stockpiles will have 50% dust suppression but realistically will have 100% dust suppression during rainy days.

Note 4: Kildea Concrete Stockpiles will have 50% dust suppression but realistically will have 100% dust suppression during rainy days.

5 Impact Assessment

5.1 Dust Impact Assessment

As outlined above, AONA Environmental has undertaken dust dispersion modeling for the following scenarios;

1. The adjacent Kildea Concrete site, i.e. *the baseline*. [Note; The location of existing paved road haul routes from the site access, through the site and the processing and stockpile areas have allowed for determination of an annual average emission calculation. The areas of the site where the inherently wet process of block making takes place has not been assessed as it is a low potential dust source in a concrete block yard].
2. The proposed quarry site layout for the planned sand & gravel extraction, i.e. *the proposed development*. [The location of planned haul routes from the quarry face to the processing and stockpile area have been assumed to allow for annual average emission calculation]
3. A cumulative assessment of the dust potential from the proposed quarry site layout and the adjacent Kildea Concrete site, i.e. *the cumulative scenario.*

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The results of the predicted PM_{10} & $PM_{2.5}$ particulate concentrations and the Total Suspended Particulate (TSP) dust deposition rates are presented and discussed below.

5.1.1 Predicted PM_{10} Concentrations at Receptor Locations

Table 5 outlines the predicted annual mean PM_{10} concentrations at sensitive receptors in proximity to the proposed sand and gravel quarry site, due to emissions from *the baseline, the proposed development* and *the cumulative scenario*. The worst-case Predicted Environmental Concentration (PEC) is 31.3% of the air quality standard limit value with no predicted exceedance of the relevant air quality standards.

Table 6 outlines the predicted 90.41th %ile of 24 Hour PM_{10} concentrations at sensitive receptors in proximity to the proposed sand and gravel quarry site, due to emissions from *the baseline, the proposed development* and *the cumulative scenario*. The worst-case Predicted Environmental Concentration (PEC) is 32.3% of the air quality standard limit value with no predicted exceedance of the relevant air quality standards.

Tables 5 & 6 outline that the predicted annual mean and 24-hour PM_{10} concentrations at sensitive receptors in proximity to the proposed quarry site will result in 'negligible' impact at the nearest sensitive receptors in proximity to the proposed quarry site when assessed against the rationale for describing the impact of the proposed development derived from the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) guidance (EPUK & IAQM) "Land-Use Planning & Development Control: Planning for Air Quality (January 2017).

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Table 5: Predicted Annual Mean PM_{10} concentrations at sensitive receptors in proximity to the proposed quarry site.

Annual Mean PM_{10} Concentration								
Receptor No.	Kildea Concete Only, i.e. *the baseline* (Aermod Fig. 1)	Proposed Quarry Only, i.e. *the proposed development* (Aermod Fig. 2)	Cumulative Impact (Aermod Fig. 3)	Background PM_{10} Concentration ug/m^3	AQS Limit Value ug/m^3	PC %age of limit value	PEC %age of limit value	Significance of Cumulative Impact
1	0.94	0.66	1.60	10	40	3.99%	29.0%	Negligible
2	0.38	0.43	0.81	10	40	2.03%	27.0%	Negligible
3	0.61	0.80	1.40	10	40	3.51%	28.5%	Negligible
4	0.25	0.33	0.58	10	40	1.44%	26.4%	Negligible
5	0.25	0.45	0.70	10	40	1.76%	26.8%	Negligible
6	0.18	0.43	0.61	10	40	1.52%	26.5%	Negligible
7	0.17	0.37	0.54	10	40	1.36%	26.4%	Negligible
8	0.09	0.21	0.30	10	40	0.75%	25.8%	Negligible
9	0.13	0.34	0.46	10	40	1.16%	26.2%	Negligible
10	0.13	0.39	0.52	10	40	1.29%	26.3%	Negligible
11	0.08	0.21	0.29	10	40	0.73%	25.7%	Negligible
12	0.06	0.18	0.24	10	40	0.61%	25.6%	Negligible
13	0.07	0.16	0.24	10	40	0.59%	25.6%	Negligible
14	0.07	0.15	0.22	10	40	0.54%	25.5%	Negligible
15	0.06	0.13	0.19	10	40	0.47%	25.5%	Negligible
16	0.03	0.09	0.12	10	40	0.29%	25.3%	Negligible
17	0.03	0.08	0.10	10	40	0.26%	25.3%	Negligible
18	0.03	0.06	0.09	10	40	0.23%	25.2%	Negligible
19	0.06	0.12	0.17	10	40	0.43%	25.4%	Negligible
20	0.07	0.15	0.22	10	40	0.56%	25.6%	Negligible
21	0.29	0.37	0.66	10	40	1.66%	26.7%	Negligible
22	0.99	1.54	2.53	10	40	6.32%	31.3%	Negligible
Max.	0.99	1.54	2.53					
%age of Limit Value	2.46%	3.86%	6.32%					

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Table 6: Predicted 90.41th %ile of 24 Hour PM_{10} concentrations at sensitive receptors in proximity to the proposed quarry site.

90.41th %ile of 24 Hour PM_{10} Concentration								
Receptor No.	Kildea Concete Only, i.e. *the baseline* (Aermod Fig. 4)	Proposed Quarry Only, i.e. *the proposed development* (Aermod Fig. 5)	Cumulative Impact (Aermod Fig. 6)	Background PM_{10} Concentration ug/m^3	AQS Limit Value ug/m^3	PC %age of limit value	PEC %age of limit value	Significance of Cumulative Impact
1	2.69	1.91	4.65	10	50	9.30%	29.3%	Negligible
2	1.11	1.06	2.20	10	50	4.40%	24.4%	Negligible
3	3.52	2.49	5.70	10	50	11.40%	31.4%	Negligible
4	1.49	1.10	2.54	10	50	5.08%	25.1%	Negligible
5	1.60	1.71	3.37	10	50	6.74%	26.7%	Negligible
6	0.95	2.09	2.99	10	50	5.97%	26.0%	Negligible
7	1.06	1.77	2.71	10	50	5.42%	25.4%	Negligible
8	0.48	1.21	1.82	10	50	3.64%	23.6%	Negligible
9	0.54	1.93	2.66	10	50	5.33%	25.3%	Negligible
10	0.51	2.16	2.85	10	50	5.69%	25.7%	Negligible
11	0.32	1.03	1.36	10	50	2.71%	22.7%	Negligible
12	0.26	0.61	1.03	10	50	2.05%	22.1%	Negligible
13	0.38	1.01	1.41	10	50	2.82%	22.8%	Negligible
14	0.36	0.92	1.34	10	50	2.68%	22.7%	Negligible
15	0.32	0.81	1.12	10	50	2.25%	22.2%	Negligible
16	0.12	0.33	0.47	10	50	0.94%	20.9%	Negligible
17	0.10	0.27	0.44	10	50	0.88%	20.9%	Negligible
18	0.08	0.24	0.37	10	50	0.74%	20.7%	Negligible
19	0.19	0.44	0.63	10	50	1.25%	21.3%	Negligible
20	0.19	0.44	0.63	10	50	1.27%	21.3%	Negligible
21	0.99	1.10	2.06	10	50	4.11%	24.1%	Negligible
22	2.86	3.76	6.16	10	50	12.33%	32.3%	Negligible
Max.	3.52	3.76	6.16					
%age of Limit Value	5.72%	7.53%	12.33%					

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5.1.2 Predicted Annual Mean $PM_{2.5}$ Concentrations at Receptor Locations

Table 7 outlines the predicted annual mean $PM_{2.5}$ concentrations at sensitive receptors in proximity to the proposed sand and gravel quarry site, due to emissions from *the baseline, the proposed development* and *the cumulative scenario*. The worst-case Predicted Environmental Concentration (PEC) is 31.3% of the air quality standard limit value with no predicted exceedance of the relevant air quality standards.

Table 7 outlines that the predicted annual mean $PM_{2.5}$ concentrations at sensitive receptors in proximity to the proposed quarry site will result in 'negligible' impact at the nearest sensitive receptors in proximity to the proposed quarry site when assessed against the rationale for describing the impact of the proposed development derived from the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) guidance (EPUK & IAQM) "Land-Use Planning & Development Control: Planning for Air Quality (January 2017).

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Table 7: Predicted Annual Mean $PM_{2.5}$ concentrations at sensitive receptors in proximity to the proposed quarry site.

Annual Mean $PM_{2.5}$ Concentration								
Receptor No.	Kildea Concete Only, i.e. *the baseline* (Aermod Fig. 7)	Proposed Quarry Only, i.e. *the proposed development* (Aermod Fig. 8)	Cumulative Impact (Aermod Fig. 9)	Background PM_{10} Concentration ug/m^3	AQS Limit Value ug/m^3	PC %age of limit value	PEC %age of limit value	Significance of Cumulative Impact
1	0.94	0.66	1.60	5	25	6.39%	26.4%	Negligible
2	0.38	0.43	0.81	5	25	3.25%	23.3%	Negligible
3	0.61	0.80	1.40	5	25	5.62%	25.6%	Negligible
4	0.25	0.33	0.58	5	25	2.30%	22.3%	Negligible
5	0.25	0.45	0.70	5	25	2.81%	22.8%	Negligible
6	0.18	0.43	0.61	5	25	2.44%	22.4%	Negligible
7	0.17	0.37	0.54	5	25	2.17%	22.2%	Negligible
8	0.09	0.21	0.30	5	25	1.21%	21.2%	Negligible
9	0.13	0.34	0.46	5	25	1.85%	21.9%	Negligible
10	0.13	0.39	0.52	5	25	2.07%	22.1%	Negligible
11	0.08	0.21	0.29	5	25	1.17%	21.2%	Negligible
12	0.06	0.18	0.24	5	25	0.98%	21.0%	Negligible
13	0.07	0.16	0.24	5	25	0.94%	20.9%	Negligible
14	0.07	0.15	0.22	5	25	0.87%	20.9%	Negligible
15	0.06	0.13	0.19	5	25	0.76%	20.8%	Negligible
16	0.03	0.09	0.12	5	25	0.47%	20.5%	Negligible
17	0.03	0.08	0.10	5	25	0.42%	20.4%	Negligible
18	0.03	0.06	0.09	5	25	0.36%	20.4%	Negligible
19	0.06	0.12	0.17	5	25	0.69%	20.7%	Negligible
20	0.07	0.15	0.22	5	25	0.89%	20.9%	Negligible
21	0.29	0.37	0.66	5	25	2.66%	22.7%	Negligible
22	0.99	1.54	2.53	5	25	10.12%	30.1%	Negligible
Max.	0.99	1.54	2.53					
%age of Limit Value	3.94%	6.17%	10.12%					

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5.1.3 Predicted Dust Deposition Rates at Receptor Locations

Table 8 outlines the predicted Dust Deposition Rates (mg/m²/day) at sensitive receptors in proximity to the proposed quarry site. Table 8 indicates that the emissions from *the baseline, the proposed development* and *the cumulative scenario* will not result in an exceedance of the Irish authorities dust deposition rate criteria for 'nuisance' of 350 mg/m²/day as an annual average. The highest predicted cumulative dust deposition rate has been predicted at 1.23% of the dust deposition rate criteria for 'nuisance' at the nearest residential properties.

Table 8: Predicted Annual Mean Dust Deposition Rate (mg/m²/day) at sensitive receptors in proximity to the proposed quarry site.

Receptor No.	Kildea Concete Only, i.e. *the baseline* (Aermod Fig. 10)	Proposed Quarry Only, i.e. *the proposed development* (Aermod Fig. 11)	Cumulative Impact (Aermod Fig. 12)
1	1.91	1.08	2.99
2	0.56	0.62	1.18
3	0.95	1.25	2.19
4	0.29	0.40	0.70
5	0.31	0.57	0.87
6	0.19	0.54	0.74
7	0.19	0.45	0.64
8	0.09	0.25	0.34
9	0.12	0.43	0.55
10	0.11	0.51	0.62
11	0.07	0.23	0.29
12	0.05	0.17	0.23
13	0.07	0.19	0.26
14	0.06	0.17	0.23
15	0.05	0.14	0.20
16	0.03	0.07	0.10
17	0.03	0.07	0.09
18	0.02	0.06	0.08
19	0.04	0.11	0.15
20	0.05	0.12	0.17
21	0.29	0.47	0.75
22	1.70	2.61	4.31
Max.	1.91	2.61	4.31
%age of Limit Value	0.49%	0.75%	1.23%
Dust Deposition Limit Value = 350 mg/m²/day			

The predicted Dust Deposition Rates (mg/m²/day) the nearby human receptor location indicates that there will be no significant impact at ecological sensitive receptors located in excess of 2 Km from the proposed quarry site. There will be no exceedance of the dust deposition rate limit at sensitive ecological receptors of 1,000 mg/m²/day.

6 Conclusions

Aermod dispersion modelling software has been used to predict the annual mean and 24 hour PM_{10} concentrations, the annual mean $PM_{2.5}$ concentrations and the dust deposition rates at sensitive receptors in proximity to the proposed quarry site.

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The impact of dust deposition, PM_{10} and $PM_{2.5}$ concentrations on sensitive receptor locations in proximity to the site is considered negligible when assessed against the rationale for describing the impact of the proposed development derived from the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) guidance (EPUK & IAQM) "Land-Use Planning & Development Control: Planning for Air Quality (January 2017).

The proposed sand and gravel quarry development will not result in an exceedance of the recommended Dust Deposition Rate limit for sensitive receptors of 350 mg/m^2/day or the Air Quality Standard limit values for PM_{10} or $PM_{2.5}$.

The findings of this dispersion modelling study echo the IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning www.iaqm.co.uk May 2016 (v1.1) which states *"that adverse dust impacts from sand and gravel sites are uncommon beyond 250 m and beyond 400 m from hard rock quarries measured from the nearest dust generating activities. In the absence of other information it is commonly accepted that the greatest impacts will be within 100 m of a source and this can include both large (>30 µm) and small dust particles. The greatest potential for high rates of dust deposition and elevated PM_{10} concentrations occurs within this distance. Intermediate-sized particles (10 to 30 µm) may travel up to 400 m, with occasional elevated levels of dust deposition and PM_{10} possible. Particles less than 10µm have the potential to persist beyond 400 m but with minimal significance due to dispersion"*.

It is accepted that sand and gravel deposits typically possess an inherently high moisture content, which can cause particles to adhere and thereby affords a high degree of natural mitigation. Therefore, if the sand and gravel material dries out during dry and high wind conditions the applicant will use a water bowser on site (as per typical quarry practise) to ensure that the appropriate mitigation measures will reduce and eliminate dust impacts off site.

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ANNEX A

Dust Emission Rate Calculations

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DUST EMISSION RATE CALCULATIONS

Haul Road on proposed quarry site

Mannions Quarry Bealnamulla, Athlone - Haul Road Emission Rates - April 2022
USEPA AP-42 Equations
equation from AP-42, Section 13.2.2; Unpaved Roads

Dust from Unpaved Roads across quarry area:

UNPAVED ROADS $E = k \times 0.2495 \times (s/12)^a \times (W/3)^b$

PAVED ROADS $E = (k \times 281.9 \times (s/12)^a \times (S/30)^d / (M/0.5)^c - C) \times ((365 - p)/p)$

Constant	Industrial Roads			Public Roads		
	$PM_{2.5}$	PM_{10}	PM_{30}*	$PM_{2.5}$	PM_{10}	PM_{30}*
k (lb/VMT)	0.15	1.5	4.9	0.18	1.8	6
a	0.9	0.9	0.7	1	1	1
b	0.45	0.45	0.45	-	-	-
c	-	-	-	0.2	0.2	0.2
d	-	-	-	0.5	0.5	0.5

Emission Factor	Surface Silt Content (%)	Mean Vehicle Weight		Mean Vehicle Speed		Mean No. of Wheels	Surface Moisture Content (%)
		Mg	Tonnes	Km/hr	Mph		
Industrial Roads	1.8 - 25.2	1.8 - 260	2 - 290	8 - 69	5 - 43	4 - 17	0.03 - 13
Public Roads	1.8 - 35	1.4 - 2.7	1.5 - 3	16 - 88	20363.00	17624.00	0.03 - 13

Particle Size Rating	C, emission factor for vehicle fleet exhaust, brake wear & tyre wear (g/VMT)	C, emission factor for vehicle fleet exhaust, brake wear & tyre wear (lb/VMT)
$PM_{2.5}$	0.10148	0.00036
PM_{10}	0.13249	0.00047
PM_{30}*	0.13249	0.00047

Emission Factor - Kg/VKT

	PM2.5	PM10	TSP
UNPAVED ROADS	0.303	3.028	8.235

30	%	s = percentage of surface material silt content (%)
50		W = mean vehicle weight (tonnes) - Cat 740 - Loaded 74t / Unloaded 34.4t
15	%	M = surface material moisture content (%) - moisture content 15%
13	mph	S = mean vehicle speed (mph) - estimated to be 13 mph = 20 Kph
		C = emission factor for vehicle fleet exhaust, brake wear & tyre wear.
190	days	p = number of days with at least 0.254 mm of precipitation per year. The number of days in a year with at least 0.254 mm of precipitation = 190 (Met Eireann Data)

Where:
E = Emission factor (g/VKT)
k ,a, b = Empirical constants (see table below)
281.9 = conversion factor from lb/VMT to g/VKT

Emission Rate - Kg/s

	PM2.5	PM10	TSP			
UNPAVED ROADS	0.00001	0.00007	0.00019	5	Km	Haul truck travels 250m 20 times / day
UNPAVED ROADS	0.00002	0.00018	0.00048	5	Km	Haul truck travels 250m 20 times / day

To determine the Emission rate (g/s) to be used in the dust dispersion model the following equation has been used;
Emission Rate (g/s) = Emission Factor (g/VKT) x VKT/day x (1 day/24) x (1 hour/ 3600)

WITH ABATEMENT DUE TO DUST SUPPRESSION

Emission Rate - g/s	PM2.5	PM10	TSP			
Summer	0.004	0.035	0.095	50%	%	It has been assumed that water spraying will be applied for all the haul roads. 0% - Dust suppression efficiency - 50% for level 1 watering (2 litres/m2/h), 75% for level 2 watering (> 2 litres/m2/h)
Winter	0.001	0.009	0.024	95%	%	0% - Dust suppression efficiency - 95% in Winter
Average	0.002	0.022	0.060			

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Haul Road on Kildea Concrete site

Mannions Quarry Bealnamulla, Athlone - Haul Road Emission Rates - April 2022
USEPA AP-42 Equations
Emission Factor Documentation for AP-42, Section 13.2.1 Paved Roads

Dust from Paved Roads:

UNPAVED ROADS E = k x 281.9 x (s/12)a x (W/3)b x ((365 - p)/p)

PUBLIC ROADS E = (k x 281.9 x (s/12)a x (S/30)d / (M/0.5)c - C) x ((365 - p)/p)

Constant	Industrial Roads			Public Roads		
	$PM_{2.5}$	PM_{10}	PM_{30}*	$PM_{2.5}$	PM_{10}	PM_{30}*
k (lb/VMT)	0.15	1.5	4.9	0.18	1.8	6
a	0.9	0.9	0.7	1	1	1
b	0.45	0.45	0.45	-	-	-
c	-	-	-	0.2	0.2	0.2
d	-	-	-	0.5	0.5	0.5

Emission Factor	Surface Silt Content (%)	Mean Vehicle Weight		Mean Vehicle Speed		Mean No. of Wheels	Surface Moisture Content (%)
		Mg	Tonnes	Km/hr	Mph		
Industrial Roads	1.8 - 25.2	1.8 - 260	2 - 290	8 - 69	5 - 43	4 - 17	0.03 - 13
Public Roads	1.8 - 35	1.4 - 2.7	1.5 - 3	16 - 88	20363.00	17624.00	0.03 - 13

Particle Size Rating	C, emission factor for vehicle fleet exhaust, brake wear & tyre wear (g/VMT)	C, emission factor for vehicle fleet exhaust, brake wear & tyre wear (lb/VMT)
$PM_{2.5}$	0.10148	0.00036
PM_{10}	0.13249	0.00047
PM_{30}*	0.13249	0.00047

Emission Factor - g/VKT

	PM2.5	PM10	TSP
PAVED ROADS	18.0	183.8	612.6

20	%	s = percentage of surface material silt content (%) - assumed to be 20%
50	T	W = mean vehicle weight (tonnes) - Cat 740 - Loaded 74t / Unloaded 34.4t
5	%	M = surface material moisture content (%) - moisture content 15%
13	mph	S = mean vehicle speed (mph) - estimated to be 13 mph = 20 Kph
		C = emission factor for vehicle fleet exhaust, brake wear & tyre wear.
190	days	p = number of days with at least 0.254 mm of precipitation per year. The number of days in a year with at least 0.254 mm of precipitation = 190 (Met Eireann Data)

Where:
E = Emission factor (g/VKT)
k ,a, b = Empirical constants (see table below)
281.9 = conversion factor from lb/VMT to g/VKT

Emission Rate - g/s

	PM2.5	PM10	TSP
PAVED ROADS	0.004	0.043	0.142

To determine the Emission rate (g/s) to be used in the dust dispersion model the following equation has been used;
Emission Rate (g/s) = Emission Factor (g/VKT) x VKT/day x (1 day/24) x (1 hour/ 3600)

20	Km	Haul truck travels 250m 80 times / day
		Paved Road - 250m x 40 2-way trips per day = 20 Km/day

WITH 75% ABATEMENT DUE TO DUST SUPPRESSION

Emission Rate - g/s

	PM2.5	PM10	TSP
PAVED ROADS	0.001	0.011	0.035

		Water spraying will be applied for all the haul roads.
75%	%	The dust suppression efficiency is assumed to be 75%

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Proposed quarry site Sand Stockpile Wind

Mannions Quarry Bealnamulla, Athlone - Stockpile Dust Emission Rates

USEPA AP-42 Equations

Dust from Stockpiles

The dust emissions from the ore stockpile took into account handling of the material and wind erosion of the ore stockpile surfaces. The dust emissions depend on the mean wind speed in the area and the material moisture content of the pile, according to the following equation (EPA, 2006b):

Wind Blown Erosion on Sand Stockpiles:

The dust emission due to the surface wind erosion was calculated with the following equation (Cowherd et al, 1988).

$E_{TSP} = 1.9k \times (s/1.5) \times 365 \times (365 - p / 235) \times (f/15)$

Where:

E_{TSP} = TSP emission factor per hour of operation (kg/ha/y)

k = Emission coefficient:

$PM_{2.5}$ fraction: 0.2 P 4-7 Control of Fugitive Dust Cowherd et al	0.2	
PM_{10} fraction: 0.5 P 4-7 Control of Fugitive Dust Cowherd et al	0.5	
TSP fraction: 1 P 4-7 Control of Fugitive Dust Cowherd et al	1	
s = percentage of silt content in material	30	%
p = number of days with at least 0.254 mm of precipitation per year =	190	Days
f = percentage of time that wind speed is greater than 5.4 m/s	20	%

Taken from Met Station Wind Data

NOTE: Worst-case as rainfall will prevent wind blown dusts for >6 months of year.

How many days does it rain in Athlone?

In Athlone, during the entire year, the rain falls for **191.7 days** and collects up to **375mm (14.76")** of precipitation.
https://www.weather-atlas.com/

Emission Factor - Kg/Ha/Year

PM2.5	PM10	TSP
2754.3	6885.8	13771.6

Emission Factor - g/m2/Year

PM2.5	PM10	TSP
275.4	688.6	1377.2

Emission Factor - g/m2/s

PM2.5	PM10	TSP
0.0000087	0.0000218	0.0000437

WITH 50% ABATEMENT DUE TO DUST SUPPRESSION

Emission Rate - g/m2/s		
PM2.5	PM10	TSP
0.0000044	0.0000109	0.0000218

50%

The dust suppression efficiency is assumed to be 50%
Realistically, there will be a 100% dust suppression during Winter

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Proposed quarry site Gravel Stockpile Wind

Wind Blown Erosion on Gravel Stockpiles:

The dust emission due to the **surface wind erosion** was calculated with the following equation (Cowherd et al, 1988).

$E_{TSP} = 1.9k \times (s/1.5) \times 365 \times (365 - p / 235) \times (f/15)$

Where:

E_{TSP} = *TSP emission factor per hour of operation (kg/ha/y)*

k = Emission coefficient:

$PM_{2.5}$ *fraction: 0.2 P 4-7 Control of Fugitive Dust Cowherd et al*	0.2	
PM_{10} *fraction: 0.5 P 4-7 Control of Fugitive Dust Cowherd et al*	0.5	
TSP fraction: 1 P 4-7 Control of Fugitive Dust Cowherd et al	1	
s = percentage of silt content in material	10	%
p = number of days with at least 0.254 mm of precipitation per year =	190	Days
f = percentage of time that wind speed is greater than 5.4 m/s	20	%

Taken from Met Station Wind Data

NOTE: Worst-case as rainfall will prevent wind blown dusts for >6 months of year.

Emission Factor - Kg/Ha/Year

PM2.5	PM10	TSP
918.1	2295.3	4590.5

Emission Factor - g/m2/Year

PM2.5	PM10	TSP
91.8	229.5	459.1

Emission Factor - g/m2/s

PM2.5	PM10	TSP
0.0000029	0.0000073	0.0000146

WITH 50% ABATEMENT DUE TO DUST SUPPRESSION

Emission Rate - g/m2/s

PM2.5	PM10	TSP
0.0000015	0.0000036	0.0000073

50%

The dust suppression efficiency is assumed to be 50%
Realistically, there will be a 100% dust suppression during Winter

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Kildea Concrete Stockpile Wind

Mannions Quarry Bealnamulla, Athlone - Stockpile Dust Emission Rates

USEPA AP-42 Equations

Dust from Stockpiles

The dust emissions from the ore stockpile took into account handling of the material and wind erosion of the ore stockpile surfaces. The dust emissions depend on the mean wind speed in the area and the material moisture content of the pile, according to the following equation (EPA, 2006b):

Wind Blown Erosion on Sand Stockpiles:

The dust emission due to the surface wind erosion was calculated with the following equation (Cowherd et al, 1988).

$E_{TSP} = 1.9k \times (s/1.5) \times 365 \times (365 - p / 235) \times (f/15)$

Where:

E_{TSP} = TSP emission factor per hour of operation (kg/ha/y)

k = Emission coefficient:

$PM_{2.5}$ fraction : 0.2 P 4-7 Control of Fugitive Dust Cowherd et al	0.2	
PM_{10} fraction : 0.5 P 4-7 Control of Fugitive Dust Cowherd et al	0.5	
TSP fraction : 1 P 4-7 Control of Fugitive Dust Cowherd et al	1	
s = percentage of silt content in material	30	%
p = number of days with at least 0.254 mm of precipitation per year =	190	Days
f = percentage of time that wind speed is greater than 5.4 m/s	20	%

Taken from Met Station Wind Data

NOTE: Worst-case as rainfall will prevent wind blown dusts for >6 months of year.

How many days does it rain in Athlone?

In Athlone, during the entire year, the rain falls for **191.7 days** and collects up to **375mm (14.76")** of precipitation.
https://www.weather-atlas.com/

Emission Factor - Kg/Ha/Year

PM2.5	PM10	TSP
2754.3	6885.8	13771.6

Emission Factor - g/m2/Year

PM2.5	PM10	TSP
275.4	688.6	1377.2

Emission Factor - g/m2/s

PM2.5	PM10	TSP
0.0000087	0.0000218	0.0000437

WITH 50% ABATEMENT DUE TO DUST SUPPRESSION

Emission Rate - g/m2/s

PM2.5	PM10	TSP
0.0000044	0.0000109	0.0000218

50%

The dust suppression efficiency is assumed to be 50%
Realistically, there will be a 100% dust suppression during Winter

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ANNEX B

Aermod Dust Dispersion Model Outputs

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1 Introduction

AONA Environmental Consulting Ltd. (AONA Environmental) was commissioned to complete dispersion modelling of the dust releases from the proposed Sand & Gravel quarry development at Bealnamulla, Athlone.

The development will involve the extraction of sand, stone & gravel over an extraction area of 4.90 hectares (volume to be extracted = 466,766m³ approximately) over a 10 year period, screening/processing of stone, sand & gravel from the site using mobile plant, construction of offices (33m²), welfare facilities (9m²), well, water settlement pond (area 2,020 m²), weighbridge, wheel wash, entrance, set down area, carparking, truck parking, refuelling pad, petrol oil interceptor, fencing, landscaping/screening, signage, lighting, wastewater storage tank for site offices, and all other ancillary works. The land will be restored to agricultural lands on the completion of the extraction of sand, stone and gravel.

This has involved preparing dust dispersion models for the proposed quarry development. The dust dispersion modelling assessments of fugitive and area emissions from a range of operational dust sources including the proposed sand and gravel quarry extraction area, haul road traffic and sand and gravel stockpiles has been undertaken. The dispersion modelling has allowed for the assessment of potential dust concentration and dust deposition impacts on Human and Ecological Receptors in proximity to the proposed quarry development at Bealnamulla, Athlone.

2 Relevant Legislation, Standards & Guidelines

2.1 Ambient Dust Concentration Guidelines

The relevant European Air Quality Standards taken from Directive 2008/50/EU with regards to particulates (including PM_{10} & $PM_{2.5}$) outline limit values for the protection of human health as presented in Table 1. PM_{10} refers to particles with a diameter of less than 10 µm. When inhaled, they can penetrate the lungs and have significant adverse effects on human health. Fine particulate matter ($PM_{2.5}$) refers to particles with a diameter of less than 2.5 µm. These particles can penetrate deep into the respiratory ducts and are very harmful to health.

Table 1: The European Air Quality Standards Regulations for Particulates (PM_{10} & $PM_{2.5}$)

Pollutant	Concentration	Averaging period	Permitted exceedances / year
PM_{10}	50 µg/m³	24 hours	35
	40 µg/m³	1 year	-
Fine particles ($PM_{2.5}$)	25 µg/m³ Note 1	1 year	-

2.2 Dust Deposition Guidelines

Dust particles can be classified into those that are easily deposited and those that remain suspended in the air for long periods. This division is useful as deposited dust is usually the coarse fraction of particulates that causes dust annoyance, whereas suspended particulate matter is implicated more in exposure impacts.

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Airborne particles have a large range of diameters, from nano-particles and ultrafine particles (diameters less than 0.1µm) to the very large particles with diameters up towards 100µm. There is no clear dividing line between the sizes of suspended particulates and deposited particulates, although particles with diameters >50 µm tend to be deposited quickly and particles of diameter <10 µm (PM_{10}) have an extremely low deposition rate in comparison. Therefore, the size of suspended and deposited dust particles affects their distribution and as such requires two different approaches to sampling these fractions. As stated above, PM_{10} and $PM_{2.5}$ particles can penetrate deep into the respiratory system increasing the risk of respiratory and cardiovascular disorders. Total Suspended Particles (TSP) is the term used when referring to larger particles which do not have a specified size limit. It is common for TSP to be measured alongside PM_{10} and $PM_{2.5}$ particularly at industrial sites when dust monitoring is undertaken.

Particulate matter can emanate from natural and anthropogenic sources. Natural sources include sea salt, forest fires, pollen and moulds. Natural sources are unregulated and harder to control. Anthropogenic sources can be regulated and understanding the sources of particulate matter is very important. PM_{10} is most commonly associated with road dust and construction activities. Wear and tear of brakes and tyres on vehicles and crushing activities at construction sites can all contribute to a rise in PM_{10}. $PM_{2.5}$ is associated with fuel burning, industrial combustion processes and vehicle emissions. Larger particles (100µm diameter) are likely to settle within 5-10m of their source under a typical mean wind speed of 4-5 m/s, and particles between 30-100 µm diameter are likely to settle within 100m of the source. Smaller particles, particularly those <10 µm in diameter, i.e. PM_{10}, have a greater potential to have their settling rate impeded by atmospheric turbulence and to be transported further from their source. Dust emissions are exacerbated by dry weather and high wind speeds. Therefore, the impact of dust also depends on the wind direction and the relative location of the dust source and receptor.

Currently no statutory standards or limits exist for the assessment of dust deposition and its tendency for causing nuisance. Similarly, no statutory air quality criterion has been set at a European, National or World Health Organisation (WHO) level, although a range of national 'yardstick' criteria from many countries is found in literature. The dust deposition rate criteria typically set out by Irish authorities for '*nuisance*' is 350 mg/m^2/day as an annual average when measured using a Bergerhoff gauge.

In terms of the protection of the sensitive ecological habitats, the United Kingdom Institute of Air Quality Management (IAQM) *Guidance on the Assessment of Mineral Dust Impacts for Planning* (2016) states that professional judgement is required to identify where on the spectrum between high and low sensitivity a receptor lies, taking into account the likely effect and the value of the ecological asset. A habitat may be highly valuable but not sensitive, alternatively it may be less valuable but more sensitive to dust deposition. For the sensitivity of ecosystems to dust deposition the IAQM recommends that an ecologist is consulted to determine the potential effects on plant communities. The IAQM guidance defines high, medium and low sensitivity receptors as follows;

High sensitivity receptor –

- locations with an international designation and the designated features may be affected by dust soiling.
- locations where there is a community of a particular dust sensitive species such as vascular species.

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- an indicative example is a Special Area of Conservation (SAC) designated for acid heathlands adjacent to a minerals development releasing alkaline dusts.

Medium sensitivity receptor –

- locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown;
- nationally designated site and the designated features may be affected by dust deposition; or indicative examples include Sites of Special Scientific Interest (SSSIs) or a local wildlife sites with very specific sensitivities.

Low sensitivity receptor –

- locations with a local designation where the features may be affected by dust deposition.
- an indicative example is a local Nature Reserve with dust sensitive features.

In 2005, the UK Highways Agency released an Interim Advice Note 61/05 '*Guidance for Undertaking Environmental Assessment of Air Quality for Sensitive Ecosystems in Internationally Designated Nature Conservation Sites and SSSIs*' as a supplement to the Design Manual for Roads and Bridges (DMRB) Guidelines. This interim guidance states that dust or particles falling onto plants can physically smother the leaves affecting photosynthesis, respiration and transpiration. The literature suggests that the most sensitive species appear to be affected by dust deposition at levels above 1,000 mg/m²/day which is higher than the level at which most dust deposition may start to cause a perceptible nuisance to humans. As such, once dust deposition rates are maintained within the guidelines for human nuisance the impact of dust deposition on sensitive ecosystems is considered negligible.

Therefore, the following dust limits have been used in the assessment of predicted dust concentration and dust deposition levels from each of the options assessed;

- PM_{10} 24 Hour Mean concentration limit = 50 µg/m³ not to be exceeded more than 35 times a calendar year
- PM_{10} Annual Mean concentration limit = 40 µg/m³
- $PM_{2.5}$ Annual Mean concentration limit = 20 µg/m³
- Dust Deposition Rate limit affecting human receptors = 350 mg/m²/day (averaged over a 30+/-2 day period).
- Dust Deposition Rate limit affecting sensitive ecological receptors = 1,000 mg/m²/day

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3 Methodology

3.1 Assessment Methodology

3.1.1 Dispersion Modelling Methodology:

In order to determine the potential dust impacts arising from the operation of the proposed quarry site, *Aermod* dispersion modelling software has been used. The dispersion modelling has been prepared in accordance with the methodology outlined in the Irish EPA Air Dispersion Modelling from Industrial Installations Guidance Note (AG4) (2020) and the UK DEFRA Local Air Quality Management Technical Guidance LAQM.TG(16) (2021).

Estimates of atmospheric dispersion and the resultant downwind concentrations of pollutants can be predicted through the use of mathematical models to assess the impacts from airborne releases based on the following parameters;

- Source emission characteristics including emission rate of pollutant, velocity of discharge, height of discharge and temperature of the release,
- Prevailing atmospheric conditions including wind speed, direction, cloud cover, precipitation, ambient temperature and the depth of the mixing layer, and
- Topography and local surface conditions

Aermod is a widely recognised and approved dispersion model used to predict pollutant concentrations from a wide range of sources that are present at typical industrial facilities. The *Aermod* model accepts hourly meteorological data to define the conditions for plume rise, transport, diffusion and deposition. It estimates the concentration or deposition value for each source and receptor combination for each hour of input meteorology and calculates user-selected short term averages. Since most air quality standards are stipulated as averages or percentiles, *Aermod* allows further analysis of the results for comparison purposes.

Percentile analysis for emissions is calculated for the maximum averages using the *Aermod* -percent post-processing utility. This utility calculates the maximum concentration of a pollutant from all receptors at a specific percentile, for a specific period. Employing the percentile method facilitates the omission of unusual short-term meteorological events that may cause elevated pollutant concentrations and hence a more accurate representation of the likely average pollutant concentrations over an averaging period.

The dust impact assessment has referenced realistic background particulate (PM_{10} & $PM_{2.5}$) concentrations for the area of the quarry development and the dispersion modelling results have been compared against the relevant Ambient Air Quality Standards.

Time Averaging and Percentiles

Appropriate time averaging and percentiles have been calculated in terms of the PM_{10} concentration limit values and criteria detailed in the air quality standards as outlined in Table 1. For example, short-term PM_{10} impacts have been calculated and presented as a 90.41th percentile of maximum 24-hour average concentrations, i.e. 35 exceedances of the relevant limit value of 50 µg/m^3 allowed per annum. The results of the air dispersion modelling study have been compared against the relevant Air Quality limit values.

Building Downwash Effects

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Buildings can affect the local mechanical turbulence around the point of release. Air moving over buildings increases in velocity and can cause downwash downwind of the source. Releases can be partly or wholly entrained into the building slip-stream leading to occasional elevated local ground level concentrations when wind direction increases the influence of nearby buildings on dispersion of the plume. Due to this fact, process stack heights as well as building dimensions, shape and orientations have been incorporated into the model. *Aermod* includes algorithms to model the effects of building downwash on emissions from nearby or adjacent point sources. The proposed plans and elevations of the proposed site layout have been provided to AONA Environmental.

Surface Roughness & Land Use Characteristics

The surface roughness conditions in the vicinity of the site have been adjusted for the rural surroundings in the *Aermod* model. Appropriate Albedo, Bowen Ratio and Surface Roughness values have been determined for the model in terms of local land uses.

Land Type is grassland 0°-360° around the proposed site.

Annual Average Values;

- Albedo 0.29
- Bowen Ratio 0.925
- Surface Roughness 0.04025

Meteorological Data

Hourly sequential meteorological data from the nearest representative meteorological station with continuous recording of meteorological data (Mullingar, located approximately 45 Km east of the proposed quarry site) for 2019, 2020 and 2021 was used in the dispersion model (See Figure 1). The meteorological data is appropriate for use as it is representative of meteorological conditions in the area of the proposed quarry development. This clearly exhibits that the wind direction is predominantly from the south-west. This is the widely recorded, reported and accepted prevailing wind direction across the island of Ireland.

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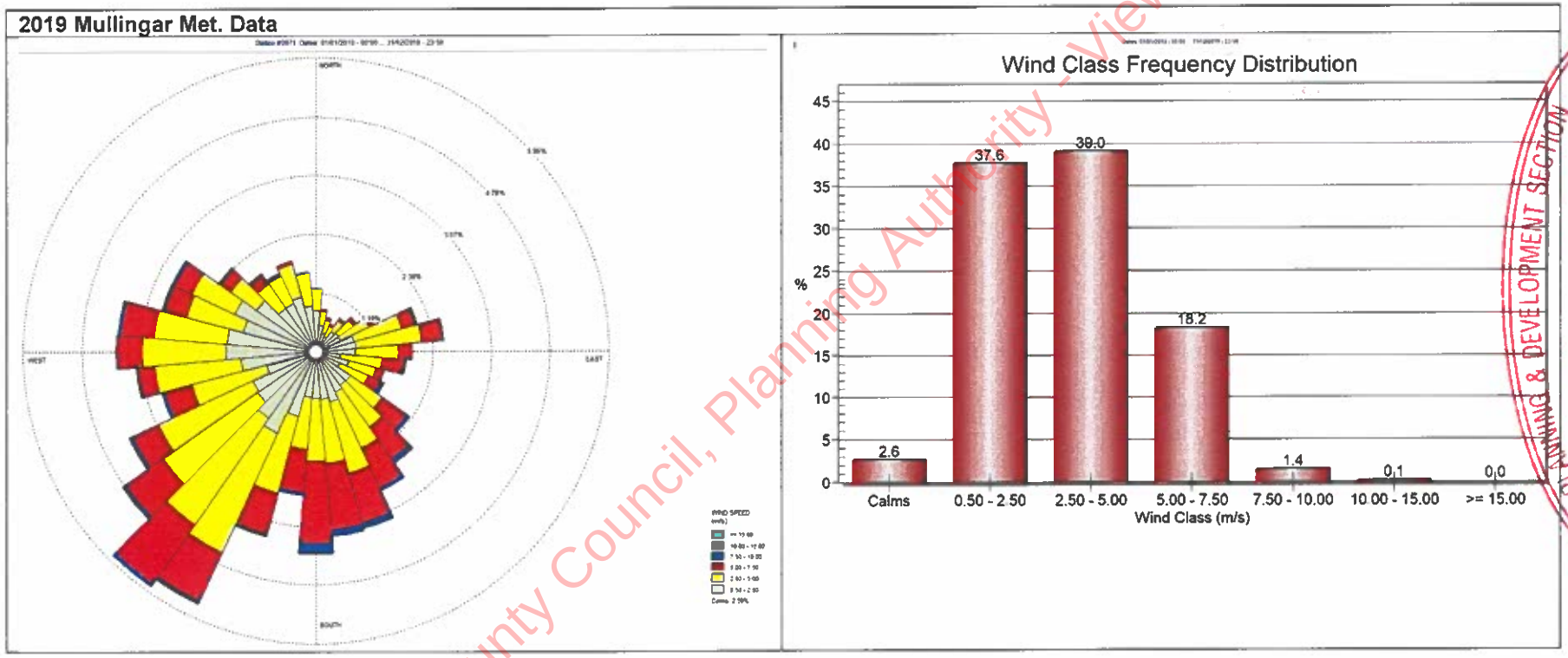
Figure 1: Graphical representation of the meteorological data used in the dispersion model

Mullingar Met Station
2019 – 2021 met data – wind direction and wind speed frequency distribution.
Data recorded at nearest representative meteorological station to the proposed application site - approx. 45 Km east of the application site.
As per the facts already stated in the EIAR documentation, the wind direction is predominantly from the south-west. This is the widely recorded, reported and accepted prevailing wind direction across the island of Ireland.

For approximately 70-75% of the time, the wind speed ranges from 0.5 m/s - 5 m/s. Calm conditions were recorded to occur for <3% of the year, with the remaining wind speeds ranging from 5 m/s - >15m/s.



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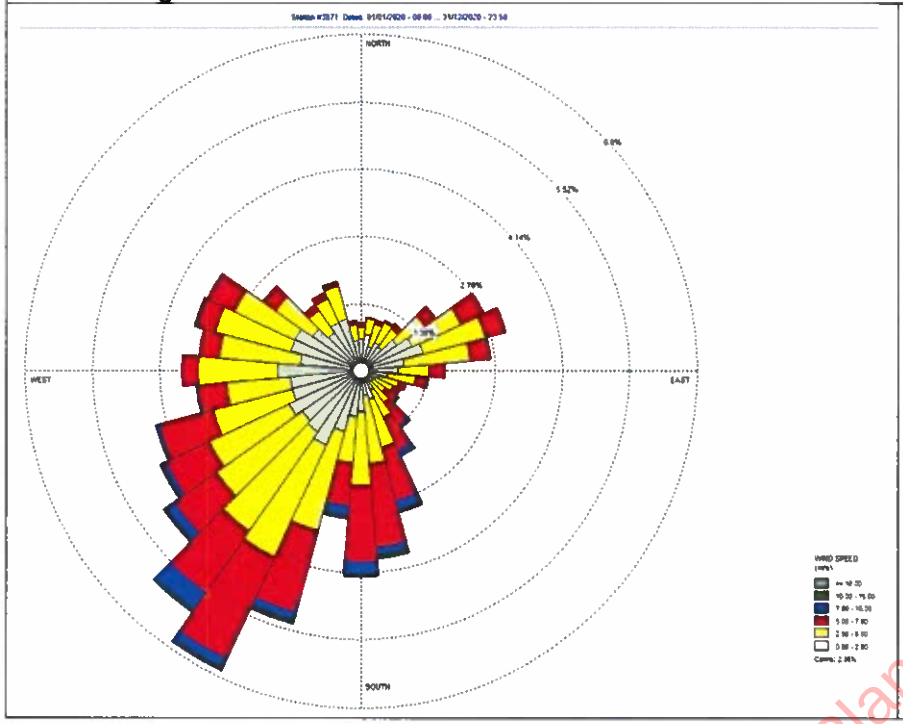
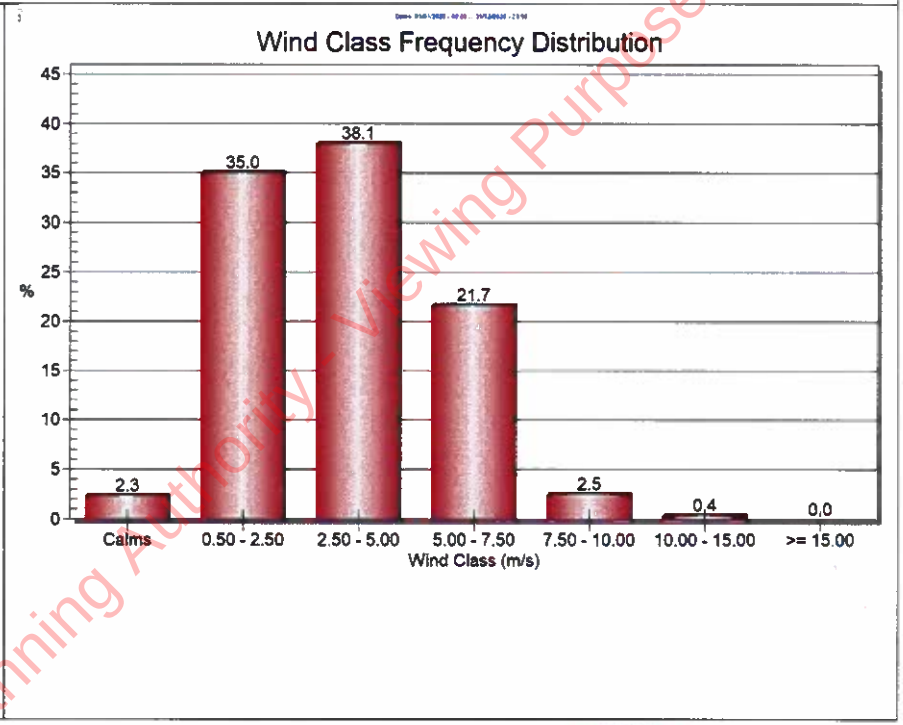
2020 Mullingar Met. Data





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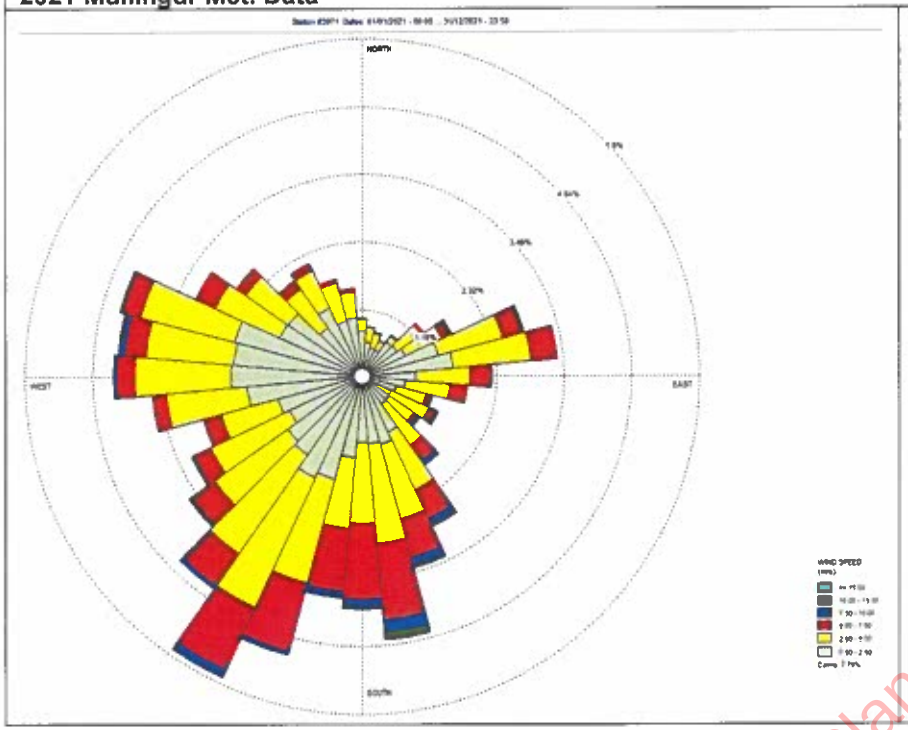
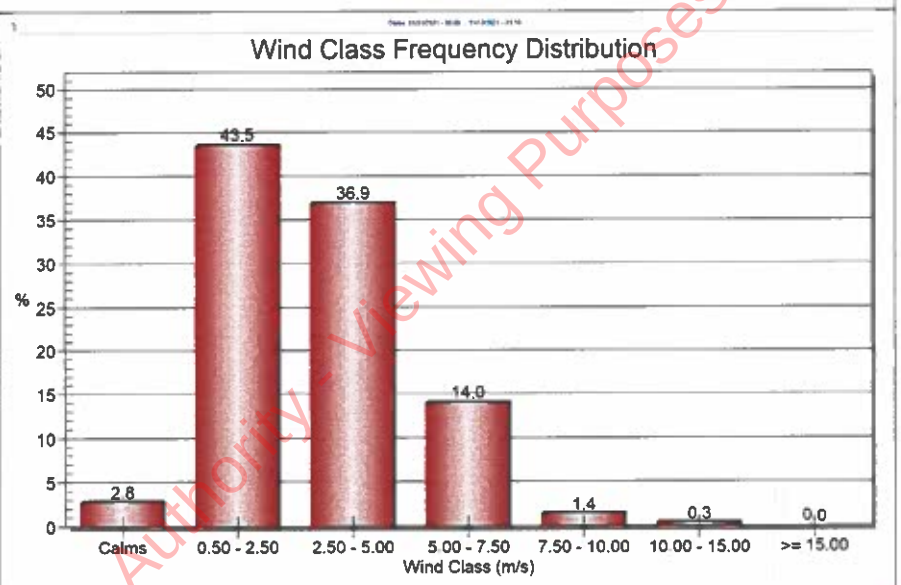
2021 Mullingar Met. Data





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3.2 Receptors & Cartesian Grids

The *Aermod* model calculates pollutant concentrations at receptor points in the vicinity of the modelled emission points. The grid coordinates for the 22 nearest sensitive human receptor locations in proximity to the proposed quarry site have been determined and selected for specific reporting of the potential dust impact. These sensitive receptor locations are within approximately 1 km of the proposed quarry site and are located to the north, west, south and east of the proposed quarry site. It can be assumed that all other residential receptors located further from the proposed quarry site than these locations will experience a lesser dust impact than those listed in Table 2.

Table 2: Dust sensitive human receptor locations in proximity to the proposed quarry site input to the dispersion model (See Figure 2).

Description	Grid Coordinate	
	X (m)	Y (m)
SR1	197442.4	241595.7
SR2	197316.5	241581.9
SR3	197338.2	241361.4
SR4	197168.3	241354.2
SR5	197217.1	241298.1
SR6	197195.4	241233.7
SR7	197161.7	241243.3
SR8	197026.1	241150
SR9	197166.5	241156
SR10	197223.7	241130.1
SR11	197156.3	241032.5
SR12	197184.6	240970.4
SR13	196971.9	241090.9
SR14	196950.2	241074
SR15	196905.7	241045.7
SR16	197089.4	240778.9
SR17	197087	240745.1
SR18	197085.8	240702.4
SR19	197429.2	240713.8
SR20	197691.2	240633.1
SR21	198070.1	241453
SR22	197780.4	241506.6

Ground level pollutant concentrations were also predicted at every node on a Cartesian grid as follows;

- Cartesian Grid 1 – 2,400m x 1,600m @ 100m spacing centre coordinates of 197515, 241215
- Cartesian Grid 2 – 1,000m x 1,000m @ 100m spacing centre coordinates of 197515, 241215

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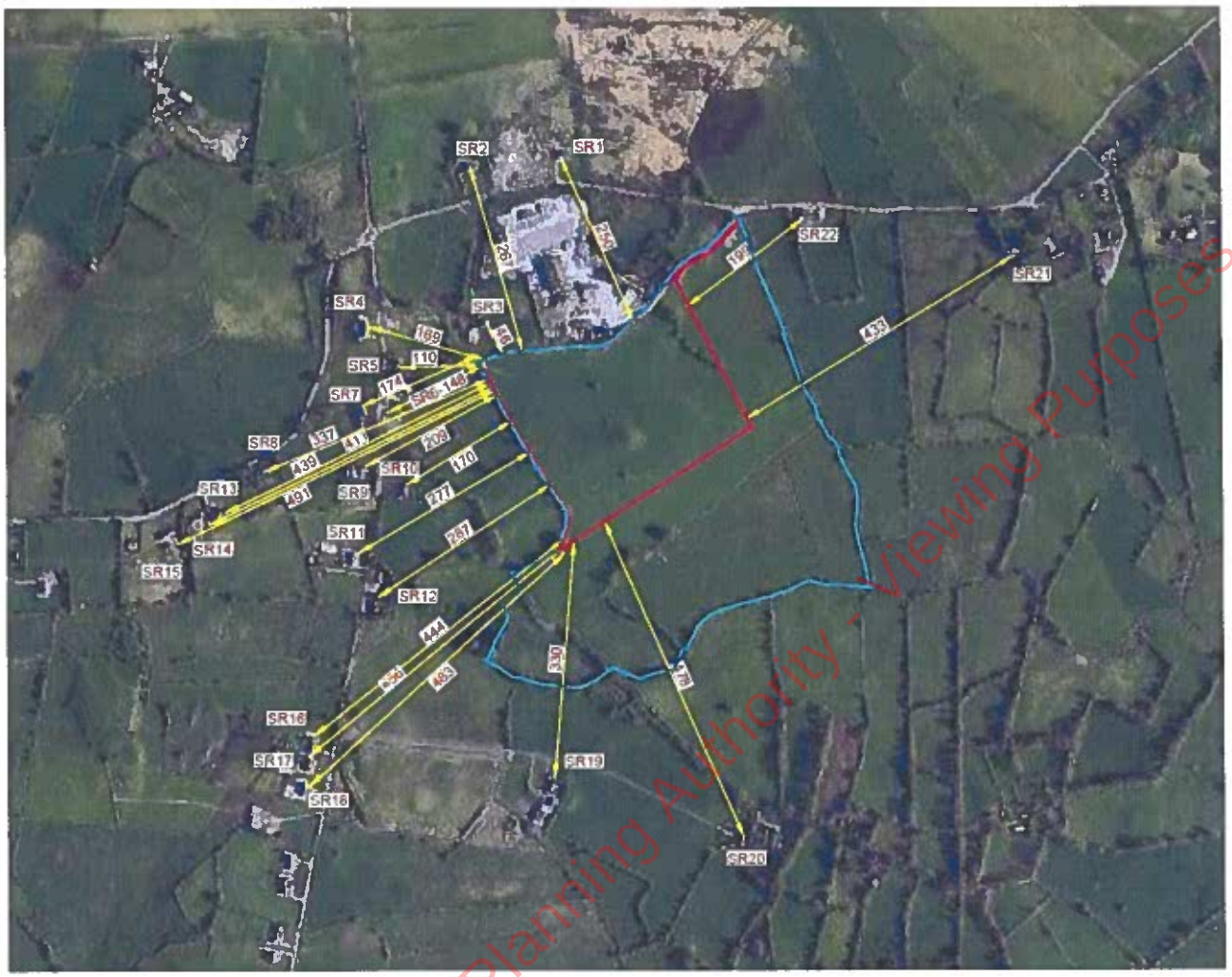
Figure 2: Nearest sensitive human receptor locations in proximity to the proposed quarry site input to the air quality prediction model.



The nearest boundary of the adjacent ecologically designated Special Areas of Conservation and sensitive habitats are in excess of 2 Km from the proposed quarry site. The nearest ecologically designated are shown in Figure 3. At a distance in excess of 2 Km from the proposed quarry site there will be no significant dust deposition impact at ecologically sensitive receptors.

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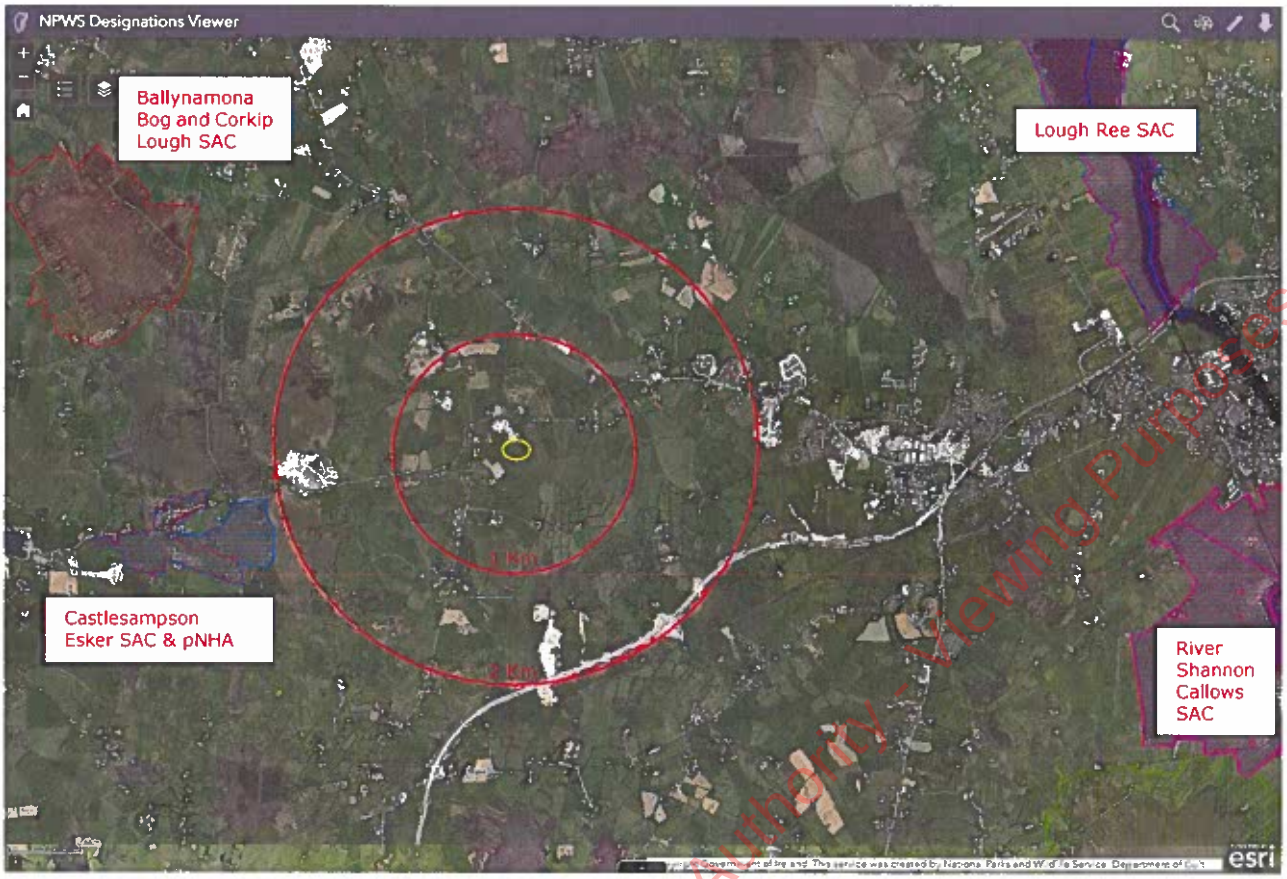
Figure 3: Nearest sensitive ecological receptor locations in proximity to the proposed quarry site.



3.3 Significance of Potential Environmental Effects

Describing the Impact:

The rationale for describing the impact of the proposed development is derived from the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) guidance (EPUK & IAQM) "Land-Use Planning & Development Control: Planning for Air Quality (January 2017). There is a two-stage process to be followed in the assessment of air quality impacts on human receptors;

- a qualitative or quantitative description of the impacts on local air quality arising from the development; and
- a judgement on the overall significance of the effects of any impacts

The suggested framework for describing the impacts is set out in Table 6.3 of the EPUK & IAQM guidance document and is shown in Table 3 below. The term Air Quality Assessment Level (AQAL) has been adopted as it covers all pollutants, i.e. those with and without formal standards. AQAL is used to include air quality objectives or limit values where these exist. The Environment Agency uses a threshold criterion of 10% of the short term AQAL as a screening criterion for the maximum short-term impact. The EPUK & IAQM guidance adopts this as a basis for defining an impact that is sufficiently small in magnitude to be regarded as having an insignificant effect.

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Table 3: Impact descriptors for individual receptors

Long term average Concentration at Receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Moderate
103-109% f AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

Explanation
1. AQAL = Air Quality Assessment Level, which may be an air quality objective, EU limit or target value, or an Environment Agency 'Environmental Assessment Level (EAL)'.
2. The Table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impact falls within. The user is encouraged to treat the numbers with recognition of their likely accuracy and not assume a false level of precision. Changes of 0%, i.e. less than 0.5% will be described as Negligible.
3. The Table is only designed to be used with annual mean concentrations.
4. Descriptors for individual Receptors only; the overall significance is determined using professional judgement (see Chapter 7). For example, a 'moderate' adverse impact at one Receptor may not mean that the overall impact has a significant effect. Other factors need to be considered.
5. When defining the concentration as a percentage of the AQAL, use the 'without scheme' concentration where there is a decrease in pollutant concentration and the 'with scheme;' concentration for an increase.
6. The total concentration categories reflect the degree of potential harm by reference to the AQAL value. At exposure less than 75% of this value, i.e. well below, the degree of harm is likely to be small. As the exposure approaches and exceeds the AQAL, the degree of harm increases. This change naturally becomes more important when the result is an exposure that is approximately equal to, or greater than the AQAL.
7. It is unwise to ascribe too much accuracy to incremental changes or background concentrations, and this is especially important when total concentrations are close to the AQAL. For a given year in the future, it is impossible to define the new total concentration without recognising the inherent uncertainty, which is why there is a category that has a range around the AQAL, rather than being exactly equal to it.

Assessing Significance:

The rationale for the assessment of significance is derived from the EPUK & IAQM Guidance (paragraphs 7.1-7.12 referring to Table 6.3) and relates to Table 3 above.

Impacts on air quality, whether adverse or beneficial, will have an effect on human health that can be judged as 'significant' or 'not significant'. An 'impact' is the change in the concentration of an air pollutant, as experienced by a Receptor. This may have an 'effect' on the health of a human Receptor, depending on the severity of the impact and other factors that may need to be taken into account. The impact descriptors set out in Table 3 are not, of themselves, a clear and unambiguous guide to reaching a conclusion on significance. These impact descriptors are intended for application at a series of individual Receptors. Whilst it may be that there are 'slight', 'moderate' or 'substantial' impacts at one or more Receptors, the overall effect may not necessarily be judged as being significant in some circumstances.

Any judgement on the overall significance of effect of a development will need to take into account such factors as:

- the existing and future air quality in the absence of the development;
- the extent of current and future population exposure to the impacts; and
- the influence and validity of any assumptions adopted when undertaking the prediction of impacts.
- Other factors may be relevant in individual cases.

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3.4 Background Air Quality

The EPA has divided the country into zones for the assessment and management of air quality. The zones adopted in Ireland are Zone A, the Dublin conurbation; Zone B, the Cork conurbation; Zone C, comprising 21 large towns in Ireland with a population >15,000; and Zone D, the remaining area of Ireland. The background air quality in the area of the development is of very good quality and the site is located in 'Zone D' as denoted by the EPA. Therefore, a worst-case background PM_{10} concentration of 10 µg/m³ and a worst-case background $PM_{2.5}$ Concentration of 5 µg/m³ has been used in the assessment, i.e. 20% of the relevant Air Quality Standard annual mean limit value.

4 Emission Rates

4.1 Dust Source Emission Rates

AONA Environmental has calculated a range of emission rates from the potential dust sources on the proposed quarry site and from the adjacent Kildea Concrete Products Manufacturing site. .

The USEPA AP-42 Compilation of Air Pollutant Emissions Factors have been used to determine dust emission rates from the unpaved haul roads on the site using the equation from AP-42, Section 13.2.2; Unpaved Roads. The potential dust emissions from the stockpiles took into account handling of the material and wind erosion of the stockpile surfaces. The dust emissions depend on the mean wind speed in the area and the material moisture content of the stockpile, according to the equation EPA, 2006b.

Dust Deposition Rates

The dust deposition rate in the dispersion models have been based on the following assumptions in relation to particle density, moisture content and particle size distribution. In the dust deposition dispersion model, based on the fact that this is a proposed sand and gravel quarry, it has been assumed that 10% or more particles emitted will have a diameter >10 microns (µm) with a mass fraction and particle density as follows;

Particle Diameter (µm)	Mass Fraction (0-1)	Particle Density (g/cm³)
1	0.05	1.7
10	0.15	1.7
50	0.3	1.7
100	0.5	1.7

The dust emission rate calculations are presented in Annex A.

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Table 4: Dust emission rates used in the dust dispersion model.

Description	Source	Annual Average		
		$PM_{2.5}$	PM_{10}	TSP
Haul Road on proposed quarry site Note 1	Haul Road g/s	0.002	0.022	0.060
Haul Road on Kildea Concrete site Note 2	Haul Road g/s	0.001	0.011	0.035
Proposed quarry site Sand Stockpile Wind Note 3	Wind erosion $g/m^2/s$	0.0000044	0.0000109	0.0000218
Proposed quarry site Gravel Stockpile Wind Note 3	Wind erosion $g/m^2/s$	0.0000015	0.0000036	0.0000073
Kildea Concrete Stockpile Wind Note 4	Wind erosion $g/m^2/s$	0.0000044	0.0000109	0.0000218

Note 1: Proposed Quarry Site Haul trucks will travel across unpaved haul routes with 50% dust suppression during summer months and 95% dust suppression during winter months.

Note 2: Kildea Concrete Site Haul trucks travel across paved haul routes with 75% dust suppression but realistically will have 100% dust suppression during winter.

Note 3: Proposed Quarry Site Sand & Gravel Stockpiles will have 50% dust suppression but realistically will have 100% dust suppression during rainy days.

Note 4: Kildea Concrete Stockpiles will have 50% dust suppression but realistically will have 100% dust suppression during rainy days.

5 Impact Assessment

5.1 Dust Impact Assessment

As outlined above, AONA Environmental has undertaken dust dispersion modeling for the following scenarios;

1. The adjacent Kildea Concrete site, i.e. *the baseline*. [Note: The location of existing paved road haul routes from the site access, through the site and the processing and stockpile areas have allowed for determination of an annual average emission calculation. The areas of the site where the inherently wet process of block making takes place has not been assessed as it is a low potential dust source in a concrete block yard].
2. The proposed quarry site layout for the planned sand & gravel extraction, i.e. *the proposed development*. [The location of planned haul routes from the quarry face to the processing and stockpile area have been assumed to allow for annual average emission calculation]
3. A cumulative assessment of the dust potential from the proposed quarry site layout and the adjacent Kildea Concrete site, i.e. *the cumulative scenario*.

The results of the predicted PM_{10} & $PM_{2.5}$ particulate concentrations and the Total Suspended Particulate (TSP) dust deposition rates are presented and discussed below.

5.1.1 Predicted PM_{10} Concentrations at Receptor Locations

Table 5 outlines the predicted annual mean PM_{10} concentrations at sensitive receptors in proximity to the proposed sand and gravel quarry site, due to emissions from *the baseline, the proposed development* and *the cumulative scenario*. The worst-case Predicted Environmental Concentration (PEC) is 31.3% of the air quality standard limit value with no predicted exceedance of the relevant air quality standards.

Table 6 outlines the predicted 90.41th %ile of 24 Hour PM_{10} concentrations at sensitive receptors in proximity to the proposed sand and gravel quarry site, due to emissions from *the baseline, the proposed development* and *the*

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cumulative scenario. The worst-case Predicted Environmental Concentration (PEC) is 32.3% of the air quality standard limit value with no predicted exceedance of the relevant air quality standards.

Tables 5 & 6 outline that the predicted annual mean and 24-hour PM_{10} concentrations at sensitive receptors in proximity to the proposed quarry site will result in 'negligible' impact at the nearest sensitive receptors in proximity to the proposed quarry site when assessed against the rationale for describing the impact of the proposed development derived from the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) guidance (EPUK & IAQM) "Land-Use Planning & Development Control: Planning for Air Quality (January 2017).

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Table 5: Predicted Annual Mean PM_{10} concentrations at sensitive receptors in proximity to the proposed quarry site.

Annual Mean PM_{10} Concentration								
Receptor No.	Kildea Concete Only, i.e. *the baseline* (Aermod Fig. 1)	Proposed Quarry Only, i.e. *the proposed development* (Aermod Fig. 2)	Cumulative Impact (Aermod Fig. 3)	Background PM_{10} Concentration ug/m^3	AQS Limit Value ug/m^3	PC %age of limit value	PEC %age of limit value	Significance of Cumulative Impact
1	0.94	0.66	1.60	10	40	3.99%	29.0%	Negligible
2	0.38	0.43	0.81	10	40	2.03%	27.0%	Negligible
3	0.61	0.80	1.40	10	40	3.51%	28.5%	Negligible
4	0.25	0.33	0.58	10	40	1.44%	26.4%	Negligible
5	0.25	0.45	0.70	10	40	1.76%	26.8%	Negligible
6	0.18	0.43	0.61	10	40	1.52%	26.5%	Negligible
7	0.17	0.37	0.54	10	40	1.36%	26.4%	Negligible
8	0.09	0.21	0.30	10	40	0.75%	25.8%	Negligible
9	0.13	0.34	0.46	10	40	1.16%	26.2%	Negligible
10	0.13	0.39	0.52	10	40	1.29%	26.3%	Negligible
11	0.08	0.21	0.29	10	40	0.73%	25.7%	Negligible
12	0.06	0.18	0.24	10	40	0.61%	25.6%	Negligible
13	0.07	0.16	0.24	10	40	0.59%	25.6%	Negligible
14	0.07	0.15	0.22	10	40	0.54%	25.5%	Negligible
15	0.06	0.13	0.19	10	40	0.47%	25.5%	Negligible
16	0.03	0.09	0.12	10	40	0.29%	25.3%	Negligible
17	0.03	0.08	0.10	10	40	0.26%	25.3%	Negligible
18	0.03	0.06	0.09	10	40	0.23%	25.2%	Negligible
19	0.06	0.12	0.17	10	40	0.43%	25.4%	Negligible
20	0.07	0.15	0.22	10	40	0.56%	25.6%	Negligible
21	0.29	0.37	0.66	10	40	1.66%	26.7%	Negligible
22	0.99	1.54	2.53	10	40	6.32%	31.3%	Negligible
Max.	0.99	1.54	2.53					
%age of Limit Value	2.46%	3.86%	6.32%					

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Table 6: Predicted 90.41th %ile of 24 Hour PM_{10} concentrations at sensitive receptors in proximity to the proposed quarry site.

90.41th %ile of 24 Hour PM_{10} Concentration								
Receptor No.	Kildea Concete Only, i.e. *the baseline* (Aermod Fig. 4)	Proposed Quarry Only, i.e. *the proposed development* (Aermod Fig. 5)	Cumulative Impact (Aermod Fig. 6)	Background PM_{10} Concentration ug/m^3	AQS Limit Value ug/m^3	PC %age of limit value	PEC %age of limit value	Significance of Cumulative Impact
1	2.69	1.91	4.65	10	50	9.30%	29.3%	Negligible
2	1.11	1.06	2.20	10	50	4.40%	24.4%	Negligible
3	3.52	2.49	5.70	10	50	11.40%	31.4%	Negligible
4	1.49	1.10	2.54	10	50	5.08%	25.1%	Negligible
5	1.60	1.71	3.37	10	50	6.74%	26.7%	Negligible
6	0.95	2.09	2.99	10	50	5.97%	26.0%	Negligible
7	1.06	1.77	2.71	10	50	5.42%	25.4%	Negligible
8	0.48	1.21	1.82	10	50	3.64%	23.6%	Negligible
9	0.54	1.93	2.66	10	50	5.33%	25.3%	Negligible
10	0.51	2.16	2.85	10	50	5.69%	25.7%	Negligible
11	0.32	1.03	1.36	10	50	2.71%	22.7%	Negligible
12	0.26	0.61	1.03	10	50	2.05%	22.1%	Negligible
13	0.38	1.01	1.41	10	50	2.82%	22.8%	Negligible
14	0.36	0.92	1.34	10	50	2.68%	22.7%	Negligible
15	0.32	0.81	1.12	10	50	2.25%	22.2%	Negligible
16	0.12	0.33	0.47	10	50	0.94%	20.9%	Negligible
17	0.10	0.27	0.44	10	50	0.88%	20.9%	Negligible
18	0.08	0.24	0.37	10	50	0.74%	20.7%	Negligible
19	0.19	0.44	0.63	10	50	1.25%	21.3%	Negligible
20	0.19	0.44	0.63	10	50	1.27%	21.3%	Negligible
21	0.99	1.10	2.06	10	50	4.11%	24.1%	Negligible
22	2.86	3.76	6.16	10	50	12.33%	32.3%	Negligible
Max.	3.52	3.76	6.16					
%age of Limit Value	5.72%	7.53%	12.33%					

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5.1.2 Predicted Annual Mean $PM_{2.5}$ Concentrations at Receptor Locations

Table 7 outlines the predicted annual mean $PM_{2.5}$ concentrations at sensitive receptors in proximity to the proposed sand and gravel quarry site, due to emissions from *the baseline, the proposed development* and *the cumulative scenario.* The worst-case Predicted Environmental Concentration (PEC) is 31.3% of the air quality standard limit value with no predicted exceedance of the relevant air quality standards.

Table 7 outlines that the predicted annual mean $PM_{2.5}$ concentrations at sensitive receptors in proximity to the proposed quarry site will result in 'negligible' impact at the nearest sensitive receptors in proximity to the proposed quarry site when assessed against the rationale for describing the impact of the proposed development derived from the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) guidance (EPUK & IAQM) "Land-Use Planning & Development Control: Planning for Air Quality (January 2017).

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Table 7: Predicted Annual Mean $PM_{2.5}$ concentrations at sensitive receptors in proximity to the proposed quarry site.

Annual Mean $PM_{2.5}$ Concentration								
Receptor No.	Kildea Concete Only, i.e. *the baseline* (Aermod Fig. 7)	Proposed Quarry Only, i.e. *the proposed development* (Aermod Fig. 8)	Cumulative Impact (Aermod Fig. 9)	Background PM_{10} Concentration ug/m^3	AQS Limit Value ug/m^3	PC %age of limit value	PEC %age of limit value	Significance of Cumulative Impact
1	0.94	0.66	1.60	5	25	6.39%	26.4%	Negligible
2	0.38	0.43	0.81	5	25	3.25%	23.3%	Negligible
3	0.61	0.80	1.40	5	25	5.62%	25.6%	Negligible
4	0.25	0.33	0.58	5	25	2.30%	22.3%	Negligible
5	0.25	0.45	0.70	5	25	2.81%	22.8%	Negligible
6	0.18	0.43	0.61	5	25	2.44%	22.4%	Negligible
7	0.17	0.37	0.54	5	25	2.17%	22.2%	Negligible
8	0.09	0.21	0.30	5	25	1.21%	21.2%	Negligible
9	0.13	0.34	0.46	5	25	1.85%	21.9%	Negligible
10	0.13	0.39	0.52	5	25	2.07%	22.1%	Negligible
11	0.08	0.21	0.29	5	25	1.17%	21.2%	Negligible
12	0.06	0.18	0.24	5	25	0.98%	21.0%	Negligible
13	0.07	0.16	0.24	5	25	0.94%	20.9%	Negligible
14	0.07	0.15	0.22	5	25	0.87%	20.9%	Negligible
15	0.06	0.13	0.19	5	25	0.76%	20.8%	Negligible
16	0.03	0.09	0.12	5	25	0.47%	20.5%	Negligible
17	0.03	0.08	0.10	5	25	0.42%	20.4%	Negligible
18	0.03	0.06	0.09	5	25	0.36%	20.4%	Negligible
19	0.06	0.12	0.17	5	25	0.69%	20.7%	Negligible
20	0.07	0.15	0.22	5	25	0.89%	20.9%	Negligible
21	0.29	0.37	0.66	5	25	2.66%	22.7%	Negligible
22	0.99	1.54	2.53	5	25	10.12%	30.1%	Negligible
Max.	0.99	1.54	2.53					
%age of Limit Value	3.94%	6.17%	10.12%					

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5.1.3 Predicted Dust Deposition Rates at Receptor Locations

Table 8 outlines the predicted Dust Deposition Rates (mg/m²/day) at sensitive receptors in proximity to the proposed quarry site. Table 8 indicates that the emissions from *the baseline, the proposed development* and *the cumulative scenario* will not result in an exceedance of the Irish authorities dust deposition rate criteria for 'nuisance' of 350 mg/m²/day as an annual average. The highest predicted cumulative dust deposition rate has been predicted at 1.23% of the dust deposition rate criteria for 'nuisance' at the nearest residential properties.

Table 8: Predicted Annual Mean Dust Deposition Rate (mg/m²/day) at sensitive receptors in proximity to the proposed quarry site.

Receptor No.	Kildea Concete Only, i.e. *the baseline* (Aermod Fig. 10)	Proposed Quarry Only, i.e. *the proposed development* (Aermod Fig. 11)	Cumulative Impact (Aermod Fig. 12)
1	1.91	1.08	2.99
2	0.56	0.62	1.18
3	0.95	1.25	2.19
4	0.29	0.40	0.70
5	0.31	0.57	0.87
6	0.19	0.54	0.74
7	0.19	0.45	0.64
8	0.09	0.25	0.34
9	0.12	0.43	0.55
10	0.11	0.51	0.62
11	0.07	0.23	0.29
12	0.05	0.17	0.23
13	0.07	0.19	0.26
14	0.06	0.17	0.23
15	0.05	0.14	0.20
16	0.03	0.07	0.10
17	0.03	0.07	0.09
18	0.02	0.06	0.08
19	0.04	0.11	0.15
20	0.05	0.12	0.17
21	0.29	0.47	0.75
22	1.70	2.61	4.31
Max.	1.91	2.61	4.31
%age of Limit Value	0.49%	0.75%	1.23%
Dust Deposition Limit Value = 350 mg/m²/day			

The predicted Dust Deposition Rates (mg/m²/day) the nearby human receptor location indicates that there will be no significant impact at ecological sensitive receptors located in excess of 2 Km from the proposed quarry site. There will be no exceedance of the dust deposition rate limit at sensitive ecological receptors of 1,000 mg/m²/day.

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6 Conclusions

Aermod dispersion modelling software has been used to predict the annual mean and 24 hour PM_{10} concentrations, the annual mean $PM_{2.5}$ concentrations and the dust deposition rates at sensitive receptors in proximity to the proposed quarry site.

The impact of dust deposition, PM_{10} and $PM_{2.5}$ concentrations on sensitive receptor locations in proximity to the site is considered negligible when assessed against the rationale for describing the impact of the proposed development derived from the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) guidance (EPUK & IAQM) "Land-Use Planning & Development Control: Planning for Air Quality (January 2017).

The proposed sand and gravel quarry development will not result in an exceedance of the recommended Dust Deposition Rate limit for sensitive receptors of 350 mg/m^2/day or the Air Quality Standard limit values for PM_{10} or $PM_{2.5}$.

The findings of this dispersion modelling study echo the IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning www.iaqm.co.uk May 2016 (v1.1) which states *"that adverse dust impacts from sand and gravel sites are uncommon beyond 250 m and beyond 400 m from hard rock quarries measured from the nearest dust generating activities. In the absence of other information it is commonly accepted that the greatest impacts will be within 100 m of a source and this can include both large (>30 µm) and small dust particles. The greatest potential for high rates of dust deposition and elevated PM_{10} concentrations occurs within this distance. Intermediate-sized particles (10 to 30 µm) may travel up to 400 m, with occasional elevated levels of dust deposition and PM_{10} possible. Particles less than 10µm have the potential to persist beyond 400 m but with minimal significance due to dispersion".*

It is accepted that sand and gravel deposits typically possess an inherently high moisture content, which can cause particles to adhere and thereby affords a high degree of natural mitigation. Therefore, if the sand and gravel material dries out during dry and high wind conditions the applicant will use a water bowser on site (as per typical quarry practise) to ensure that the appropriate mitigation measures will reduce and eliminate dust impacts off site.

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ANNEX A

Dust Emission Rate Calculations

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DUST EMISSION RATE CALCULATIONS

Haul Road on proposed quarry site

Mannions Quarry Beainamulla, Athlone - Haul Road Emission Rates - April 2022

USEPA AP-42 Equations

equation from AP-42, Section 13.2.2; Unpaved Roads

Dust from Unpaved Roads across quarry area:

UNPAVED ROADS $E = k \times 0.2495 \times (s/12)a \times (W/3)b$

PAVED ROADS $E = (k \times 281.9 \times (s/12)a \times (S/30)d / (M/0.5)c - C) \times ((365 - p)/p)$

Constant	Industrial Roads			Public Roads		
	$PM_{2.5}$	PM_{10}	PM_{30}*	$PM_{2.5}$	PM_{10}	PM_{30}*
k (lb/VMT)	0.15	1.5	4.9	0.18	1.8	6
a	0.9	0.9	0.7	1	1	1
b	0.45	0.45	0.45	-	-	-
c	-	-	-	0.2	0.2	0.2
d	-	-	-	0.5	0.5	0.5

Emission Factor	Surface Silt Content (%)	Mean Vehicle Weight		Mean Vehicle Speed		Mean No. of Wheels	Surface Moisture Content (%)
		Mg	Tonnes	Km/hr	Mph		
Industrial Roads	1.8 – 25.2	1.8 - 260	2 – 290	8 – 69	5 – 43	4 - 17	0.03 – 13
Public Roads	1.8 - 35	1.4 – 2.7	1.5 - 3	16 - 88	20363.00	17624.00	0.03 - 13

Particle Size Rating	C, emission factor for vehicle fleet exhaust, brake wear & tyre wear (g/VMT)	C, emission factor for vehicle fleet exhaust, brake wear & tyre wear (lb/VMT)
$PM_{2.5}$	0.10148	0.00036
PM_{10}	0.13249	0.00047
PM_{30}*	0.13249	0.00047

Emission Factor - Kg/VKT

	PM2.5	PM10	TSP
UNPAVED ROADS	0.303	3.028	8.235

30	%	s = percentage of surface material silt content (%)
50		W = mean vehicle weight (tonnes) - Cat 740 - Loaded 74t / Unloaded 34.4t
15	%	M = surface material moisture content (%) - moisture content 15%
13	mph	S = mean vehicle speed (mph) - estimated to be 13 mph = 20 Kph
		C = emission factor for vehicle fleet exhaust, brake wear & tyre wear.
190	days	p = number of days with at least 0.254 mm of precipitation per year. The number of days in a year with at least 0.254 mm of precipitation = 190 (Met Eireann Data)

Where:
E = Emission factor (g/VKT)
k ,a, b = Empirical constants (see table below)
281.9 = conversion factor from lb/VMT to g/VKT

Emission Rate - Kg/s

To determine the Emission rate (g/s) to be used in the dust dispersion model the following equation has been used;
Emission Rate (g/s) = Emission Factor (g/VKT) x VKT/day x (1 day/24) x (1 hour/ 3600)

	PM2.5	PM10	TSP			
UNPAVED ROADS	0.00001	0.00007	0.00019	5	Km	Haul truck travels 250m 20 times / day
UNPAVED ROADS	0.00002	0.00018	0.00048	5	Km	Haul truck travels 250m 20 times / day

WITH ABATEMENT DUE TO DUST SUPPRESSION

Emission Rate - g/s	PM2.5	PM10	TSP
Summer	0.004	0.035	0.095
Winter	0.001	0.009	0.024
Average	0.002	0.022	0.060

It has been assumed that water spraying will be applied for all the haul roads.

50%	%	0% - Dust suppression efficiency - 50% for level 1 watering (2 litres/m2/h), 75% for level 2 watering (> 2 litres/m2/h)
95%	%	0% - Dust suppression efficiency - 95% in Winter

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Haul Road on Kildea Concrete site

Mannions Quarry Bealnamulla, Athlone - Haul Road Emission Rates - April 2022

USEPA AP-42 Equations

Emission Factor Documentation for AP-42, Section 13.2.1 Paved Roads

Dust from Paved Roads:

UNPAVED ROADS $E = k \times 281.9 \times (s/12)a \times (W/3)b \times ((365 - p)/p)$

PUBLIC ROADS $E = (k \times 281.9 \times (s/12)a \times (S/30)d / (M/0.5)c - C) \times ((365 - p)/p)$

Constant	Industrial Roads			Public Roads		
	$PM_{2.5}$	PM_{10}	PM_{30}*	$PM_{2.5}$	PM_{10}	PM_{30}*
k (lb/VMT)	0.15	1.5	4.9	0.18	1.8	6
a	0.9	0.9	0.7	1	1	1
b	0.45	0.45	0.45	-	-	-
c	-	-	-	0.2	0.2	0.2
d	-	-	-	0.5	0.5	0.5

Emission Factor	Surface Silt Content (%)	Mean Vehicle Weight		Mean Vehicle Speed		Mean No. of Wheels	Surface Moisture Content (%)
		Mg	Tonnes	Km/hr	Mph		
Industrial Roads	1.8 - 25.2	1.8 - 260	2 - 290	8 - 69	5 - 43	4 - 17	0.03 - 13
Public Roads	1.8 - 35	1.4 - 2.7	1.5 - 3	16 - 88	20363.00	17624.00	0.03 - 13

Particle Size Rating	C_i emission factor for vehicle fleet exhaust, brake wear & tyre wear (g/VMT)	C_i emission factor for vehicle fleet exhaust, brake wear & tyre wear (lb/VMT)
$PM_{2.5}$	0.10148	0.00036
PM_{10}	0.13249	0.00047
PM_{30}*	0.13249	0.00047

Emission Factor - g/VKT

	PM2.5	PM10	TSP			
PAVED ROADS	18.0	183.8	612.6	20	%	s = percentage of surface material silt content (%) - assumed to be 20%
				50	T	W = mean vehicle weight (tonnes) - Cat 740 - Loaded 74t / Unloaded 34.4t
				5	%	M = surface material moisture content (%) - moisture content 15%
				13	mph	S = mean vehicle speed (mph) - estimated to be 13 mph = 20 Kph
						C = emission factor for vehicle fleet exhaust, brake wear & tyre wear.
				190	days	p = number of days with at least 0.254 mm of precipitation per year. The number of days in a year with at least 0.254 mm of precipitation = 190 (Met Eireann Data)

Where:
E = Emission factor (g/VKT)
k ,a, b = Empirical constants (see table below)
281.9 = conversion factor from lb/VMT to g/VKT

Emission Rate - g/s

To determine the Emission rate (g/s) to be used in the dust dispersion model the following equation has been used;
Emission Rate (g/s) = Emission Factor (g/VKT) x VKT/day x (1 day/24) x (1 hour/ 3600)

	PM2.5	PM10	TSP			
PAVED ROADS	0.004	0.043	0.142	20	Km	Haul truck travels 250m 80 times / day
						Paved Road - 250m x 40 2-way trips per day = 20 Km/day

WITH 75% ABATEMENT DUE TO DUST SUPPRESSION

Emission Rate - g/s

	PM2.5	PM10	TSP			
PAVED ROADS	0.001	0.011	0.035	75%	%	Water spraying will be applied for all the haul roads. The dust suppression efficiency is assumed to be 75%

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Proposed quarry site Sand Stockpile Wind

Mannions Quarry Bealnamulla, Athlone - Stockpile Dust Emission Rates

USEPA AP-42 Equations

How many days does it rain in Athlone?

In Athlone, during the entire year, the rain falls for **191.7 days** and collects up to **375mm (14.76")** of precipitation.

https://www.weather-atlas.com/

Dust from Stockpiles

The dust emissions from the ore stockpile took into account handling of the material and wind erosion of the ore stockpile surfaces. The dust emissions depend on the mean wind speed in the area and the material moisture content of the pile, according to the following equation (EPA, 2006b):

Wind Blown Erosion on Sand Stockpiles:

The dust emission due to the **surface wind erosion** was calculated with the following equation (Cowherd et al, 1988).

$E_{TSP} = 1.9k \times (s/1.5) \times 365 \times (365 - p / 235) \times (f/15)$

Where:

E_{TSP} = TSP emission factor per hour of operation (kg/ha/y)

k = Emission coefficient:

$PM_{2.5}$ fraction: 0.2 P 4-7 Control of Fugitive Dust Cowherd et al	0.2	
PM_{10} fraction: 0.5 P 4-7 Control of Fugitive Dust Cowherd et al	0.5	
TSP fraction: 1 P 4-7 Control of Fugitive Dust Cowherd et al	1	
s = percentage of silt content in material	30	%
p = number of days with at least 0.254 mm of precipitation per year =	190	Days
f = percentage of time that wind speed is greater than 5.4 m/s	20	%

Taken from Met Station Wind Data

NOTE: Worst-case as rainfall will prevent wind blown dusts for >6 months of year.

Emission Factor - Kg/Ha/Year

PM2.5	PM10	TSP
2754.3	6885.8	13771.6

Emission Factor - g/m2/Year

PM2.5	PM10	TSP
275.4	688.6	1377.2

Emission Factor - g/m2/s

PM2.5	PM10	TSP
0.0000087	0.0000218	0.0000437

WITH 50% ABATEMENT DUE TO DUST SUPPRESSION

Emission Rate - g/m2/s		
PM2.5	PM10	TSP
0.0000044	0.0000109	0.0000218

50%

The dust suppression efficiency is assumed to be 50%

Realistically, there will be a 100% dust suppression during Winter

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Proposed quarry site Gravel Stockpile Wind

Wind Blown Erosion on Gravel Stockpiles:

The dust emission due to the surface wind erosion was calculated with the following equation (Cowherd et al, 1988).

$E_{TSP} = 1.9k \times (s/1.5) \times 365 \times (365 - p / 235) \times (f/15)$

Where:

E_{TSP} = *TSP emission factor per hour of operation (kg/ha/y)*

k = Emission coefficient:

$PM_{2.5}$ *fraction: 0.2 P 4-7 Control of Fugitive Dust Cowherd et al*	0.2	
PM_{10} *fraction: 0.5 P 4-7 Control of Fugitive Dust Cowherd et al*	0.5	
TSP fraction: 1 P 4-7 Control of Fugitive Dust Cowherd et al	1	
s = percentage of silt content in material	10	%
p = number of days with at least 0.254 mm of precipitation per year =	190	Days
f = percentage of time that wind speed is greater than 5.4 m/s	20	%

Taken from Met Station Wind Data

NOTE: Worst-case as rainfall will prevent wind blown dusts for >6 months of year.

Emission Factor - Kg/Ha/Year

PM2.5	PM10	TSP
918.1	2295.3	4590.5

Emission Factor - g/m2/Year

PM2.5	PM10	TSP
91.8	229.5	459.1

Emission Factor - g/m2/s

PM2.5	PM10	TSP
0.0000029	0.0000073	0.0000146

WITH 50% ABATEMENT DUE TO DUST SUPPRESSION

Emission Rate - g/m2/s

PM2.5	PM10	TSP
0.0000015	0.0000036	0.0000073

50%

The dust suppression efficiency is assumed to be 50%
Realistically, there will be a 100% dust suppression during Winter

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Kildea Concrete Stockpile Wind

Mannions Quarry Bealnamulla, Athlone - Stockpile Dust Emission Rates

USEPA AP-42 Equations

How many days does it rain in Athlone?
In Athlone, during the entire year, the rain falls for **191.7 days** and collects up to **375mm (14.76")** of precipitation.
https://www.weather-atlas.com/

Dust from Stockpiles

The dust emissions from the ore stockpile took into account handling of the material and wind erosion of the ore stockpile surfaces. The dust emissions depend on the mean wind speed in the area and the material moisture content of the pile, according to the following equation (EPA, 2006b):

Wind Blown Erosion on Sand Stockpiles:

The dust emission due to the **surface wind erosion** was calculated with the following equation (Cowherd et al, 1988).

$E_{TSP} = 1.9k \times (s/1.5) \times 365 \times (365 - p / 235) \times (f/15)$

Where:

E_{TSP} = TSP emission factor per hour of operation (kg/ha/y)

k = Emission coefficient:

$PM_{2.5}$ fraction: 0.2 P 4-7 Control of Fugitive Dust Cowherd et al	0.2		
PM_{10} fraction: 0.5 P 4-7 Control of Fugitive Dust Cowherd et al	0.5		
TSP fraction: 1 P 4-7 Control of Fugitive Dust Cowherd et al	1		
s = percentage of silt content in material	30	%	
p = number of days with at least 0.254 mm of precipitation per year =	190	Days	
f = percentage of time that wind speed is greater than 5.4 m/s	20	%	

Taken from Met Station Wind Data

NOTE: Worst-case as rainfall will prevent wind blown dusts for >6 months of year.

Emission Factor - Kg/Ha/Year

PM2.5	PM10	TSP
2754.3	6885.8	13771.6

Emission Factor - g/m2/Year

PM2.5	PM10	TSP
275.4	688.6	1377.2

Emission Factor - g/m2/s

PM2.5	PM10	TSP
0.0000087	0.0000218	0.0000437

WITH 50% ABATEMENT DUE TO DUST SUPPRESSION

Emission Rate - g/m2/s		
PM2.5	PM10	TSP
0.0000044	0.0000109	0.0000218

50% The dust suppression efficiency is assumed to be 50%
Realistically, there will be a 100% dust suppression during Winter

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ANNEX B

Aermod Dust Dispersion Model Outputs

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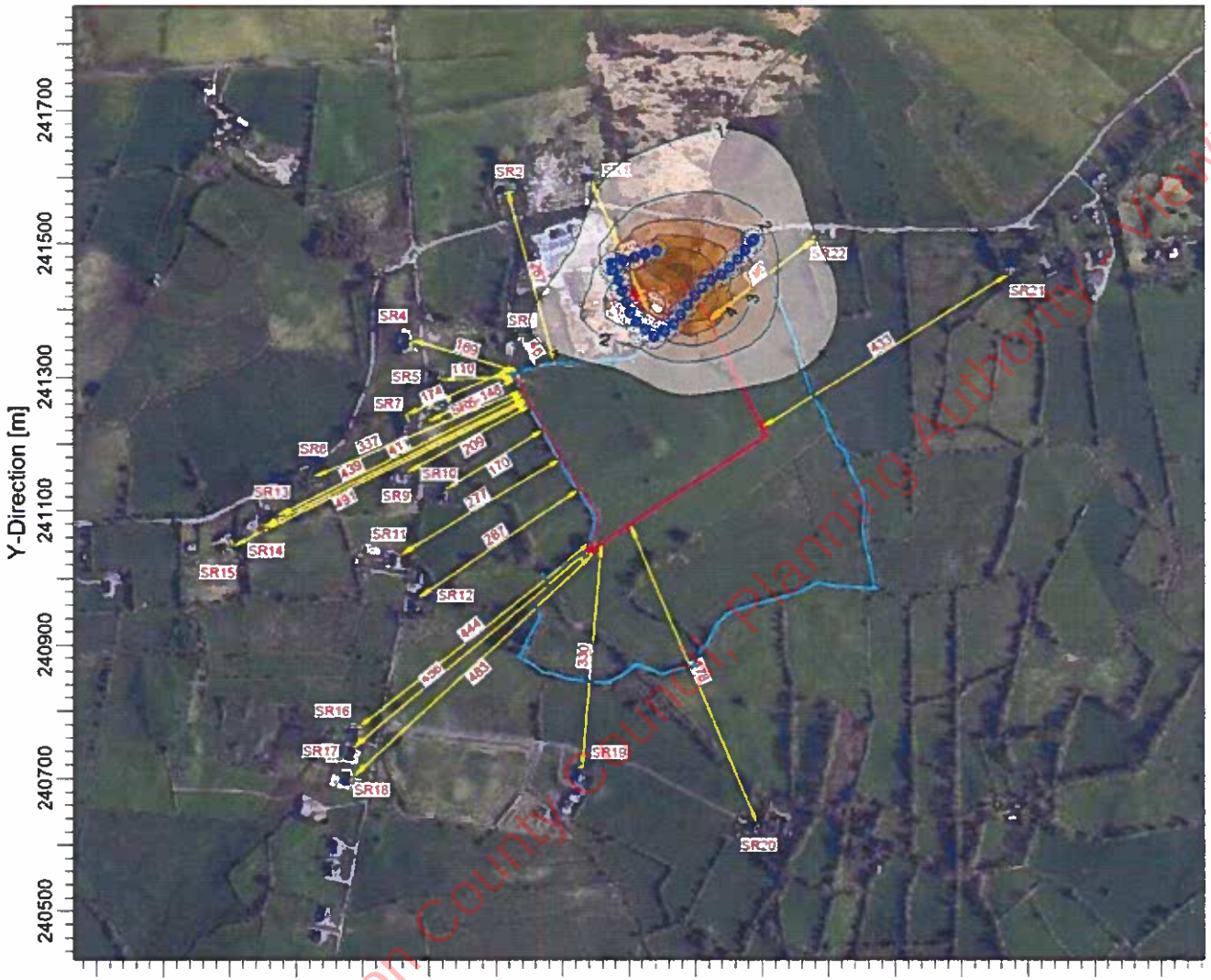
PROJECT TITLE:

Figure 1: Proposed Sand & Gravel Quarry, Bealnamulla, Athlone.
Predicted Anual Mean PM10 concentrations at sensitive receptors in proximity to the proposed quarry site.



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 1 YEARS FOR SOURCE GROUP: ALL
Max: 6.15 [ug/m^3] at (197565.00, 241465.00)

ug/m^3
6.15
6.00
5.00
4.00
3.00
2.00
1.00

COMMENTS:
Kildea Concete Only, i.e. the baseline

SOURCES:
2

RECEPTORS:
2128

OUTPUT TYPE:
Concentration

MAX:
6.15 ug/m^3

COMPANY NAME:
AONA Environmental Consulting Ltd.

MODELER:
MK

DATE:
08/08/2022

SCALE: 1:10,000
0 0.3 km

PROJECT NO.:
ENV-7045

AERMOD View - Lakes Environmental Software

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PLANNING & DEVELOPMENT SECTION
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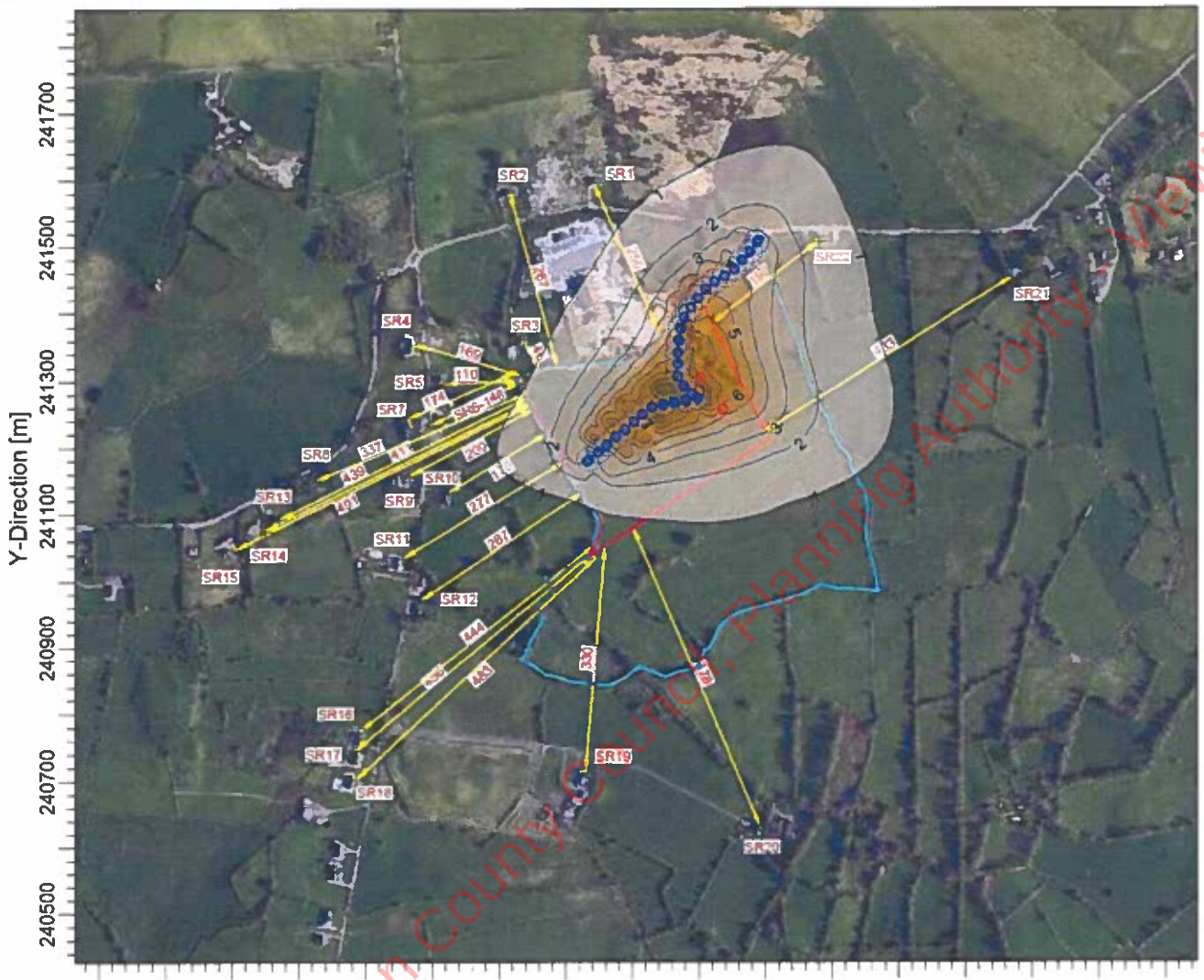
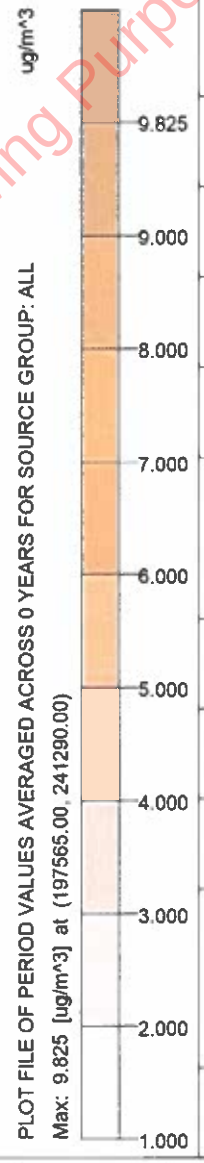
Roscommon County Council, Planning Authority - Viewing Purposes Only!

PROJECT TITLE:

Figure 2: Proposed Sand & Gravel Quarry, Bealnamulla, Athlone.
Predicted Annual Mean PM10 concentrations at sensitive receptors in proximity to the proposed quarry site.





COMMENTS:
Proposed Quarry Only, i.e. the proposed development

SOURCES:
4

RECEPTORS:
2128

OUTPUT TYPE:
Concentration

MAX:
9.825 ug/m^3

COMPANY NAME:
AONA Environmental Consulting Ltd.

MODELER:
MK

DATE:
08/08/2022

SCALE: 1:10,000
0 0.3 km

PROJECT NO.:
ENV-7045

AERMOD View - Lakes Environmental Software

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PLANNING & DEVELOPMENT SECTION
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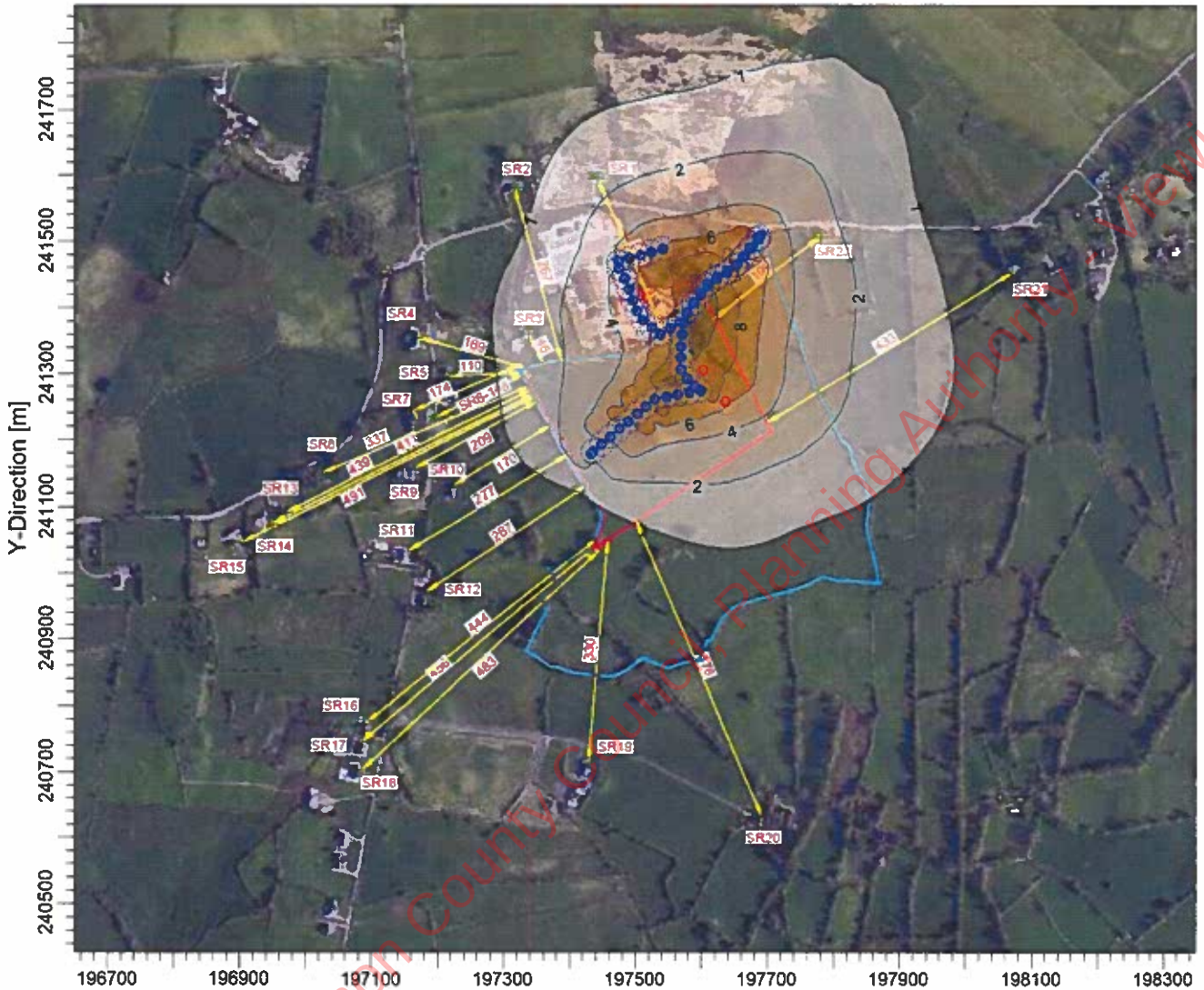
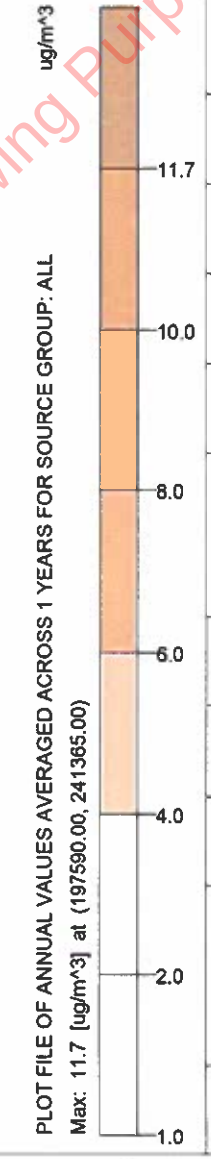
ROSCOMMON COUNTY COUNCIL

PROJECT TITLE:

Figure 3: Proposed Sand & Gravel Quarry, Bealnamulla, Athlone.
Predicted Annual Mean PM10 concentrations at sensitive receptors in proximity to the proposed quarry site.





COMMENTS:
Cumulative Impact

SOURCES:
6

RECEPTORS:
2128

OUTPUT TYPE:
Concentration

MAX:
11.7 ug/m^3

COMPANY NAME:
AONA Environmental Consulting Ltd.

MODELER:
MK

DATE:
08/08/2022

SCALE: 1:10,000
0 0.3 km

PROJECT NO.:
ENV-7045

AERMOD View - Lakes Environmental Software

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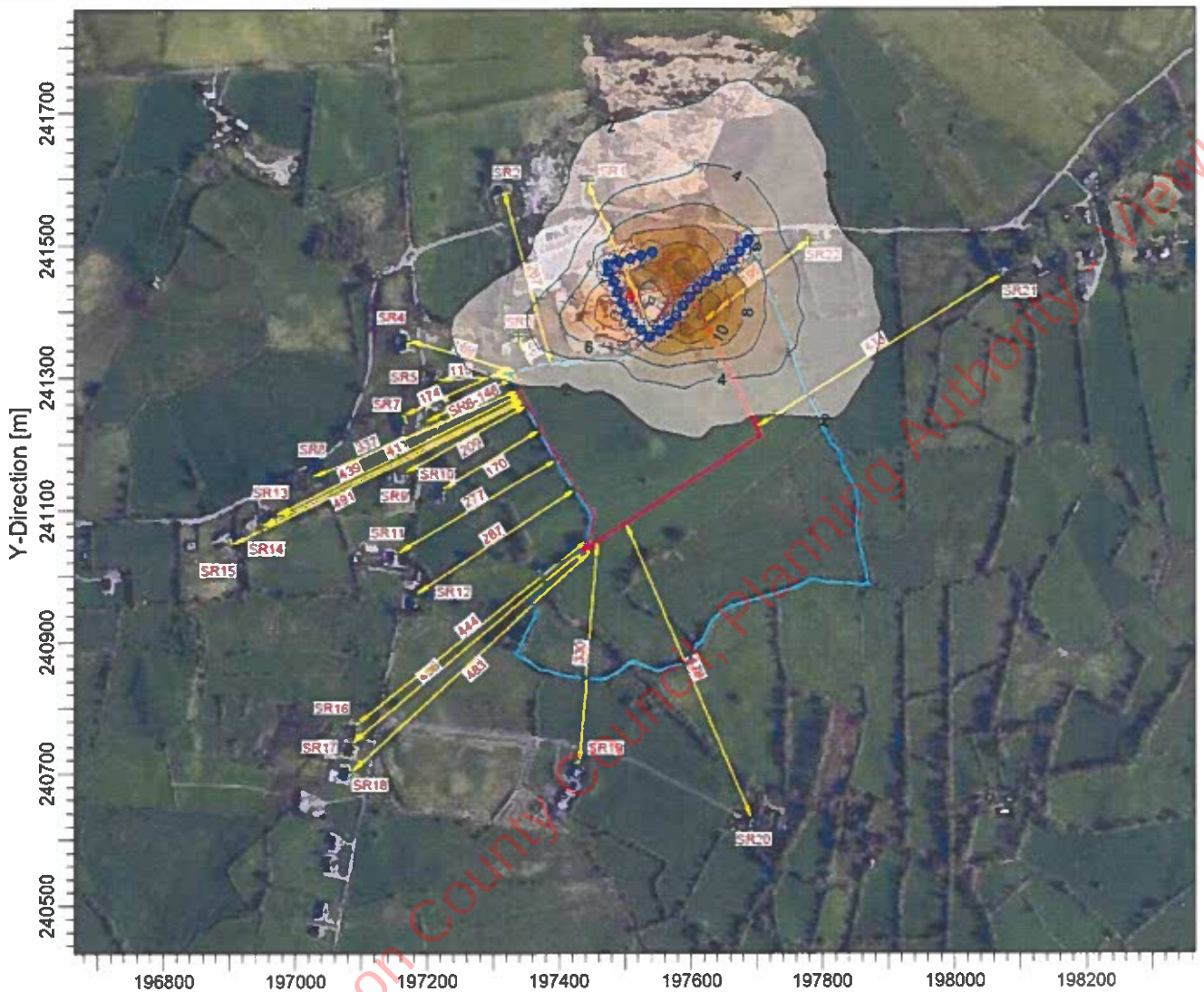
PROJECT TITLE:

Figure 4: Proposed Sand & Gravel Quarry, Bealnamulla, Athlone.
Predicted 90.41th %ile of 24 Hour PM10 concentrations at sensitive receptors in proximity to the proposed quarry site.



COMMENTS:
Kildea Concete Only, i.e. the baseline

SOURCES:
2

RECEPTORS:
2128

OUTPUT TYPE:
Concentration

MAX:
14.2 ug/m^3

COMPANY NAME:
AONA Environmental Consulting Ltd.

MODELER:
MK

DATE:
08/08/2022

SCALE: 1:10,000
0 0.3 km

PROJECT NO:
ENV-7045

AERMOD View - Lakes Environmental Software

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PLANNING & DEVELOPMENT SECTION
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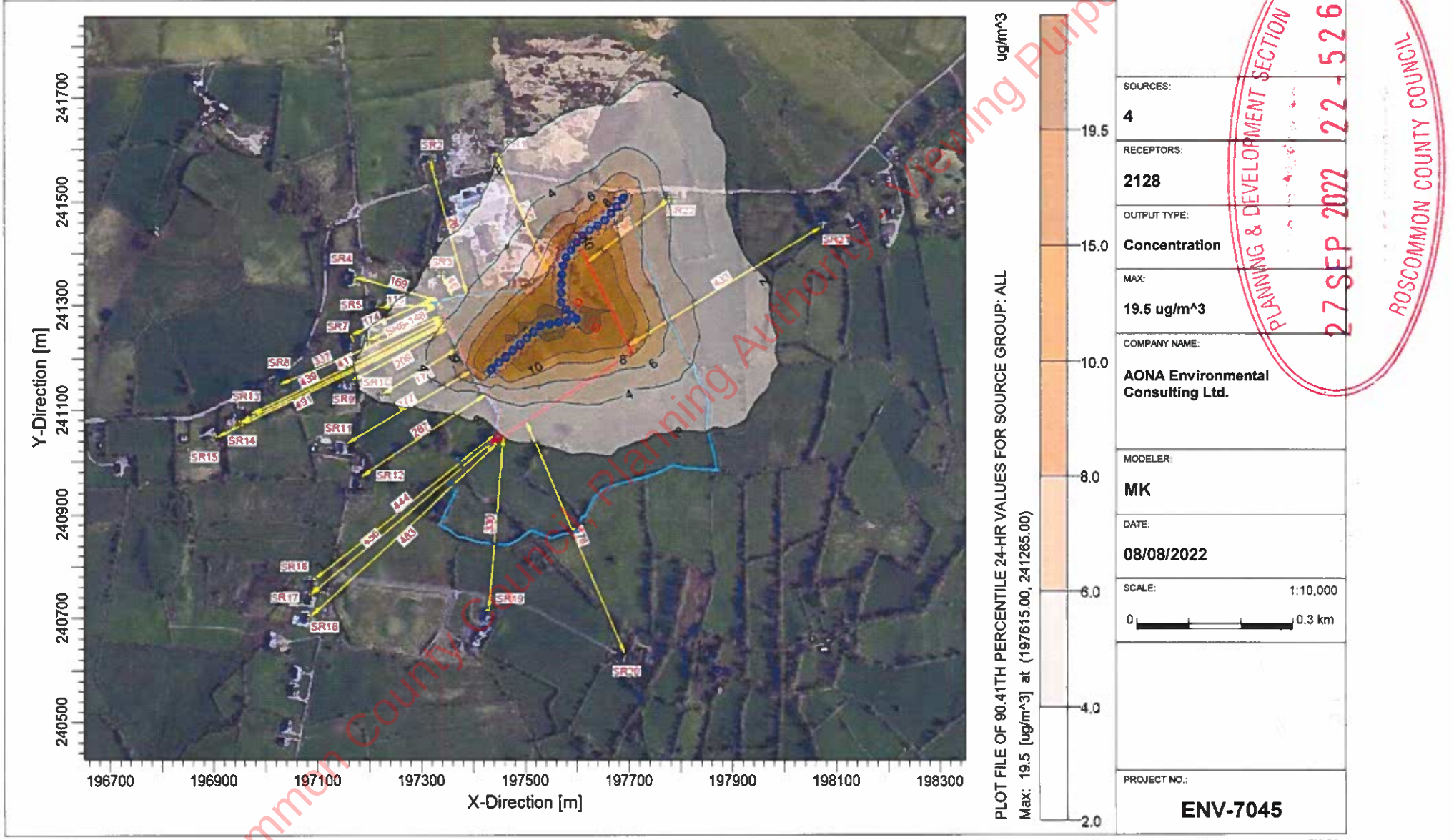
PROJECT TITLE:

Figure 5: Proposed Sand & Gravel Quarry, Bealnamulla, Athlone.
Predicted 90.41th %ile of 24 Hour PM10 concentrations at sensitive receptors in proximity to the proposed quarry site.



COMMENTS:
Proposed Quarry Only, i.e. the proposed development

SOURCES:
4

RECEPTORS:
2128

OUTPUT TYPE:
Concentration

MAX:
19.5 ug/m^3

COMPANY NAME:
AONA Environmental Consulting Ltd.

MODELER:
MK

DATE:
08/08/2022

SCALE: 1:10,000
0 0.3 km

PROJECT NO.:
ENV-7045

AERMOD View - Lakes Environmental Software

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PLANNING & DEVELOPMENT SECTION
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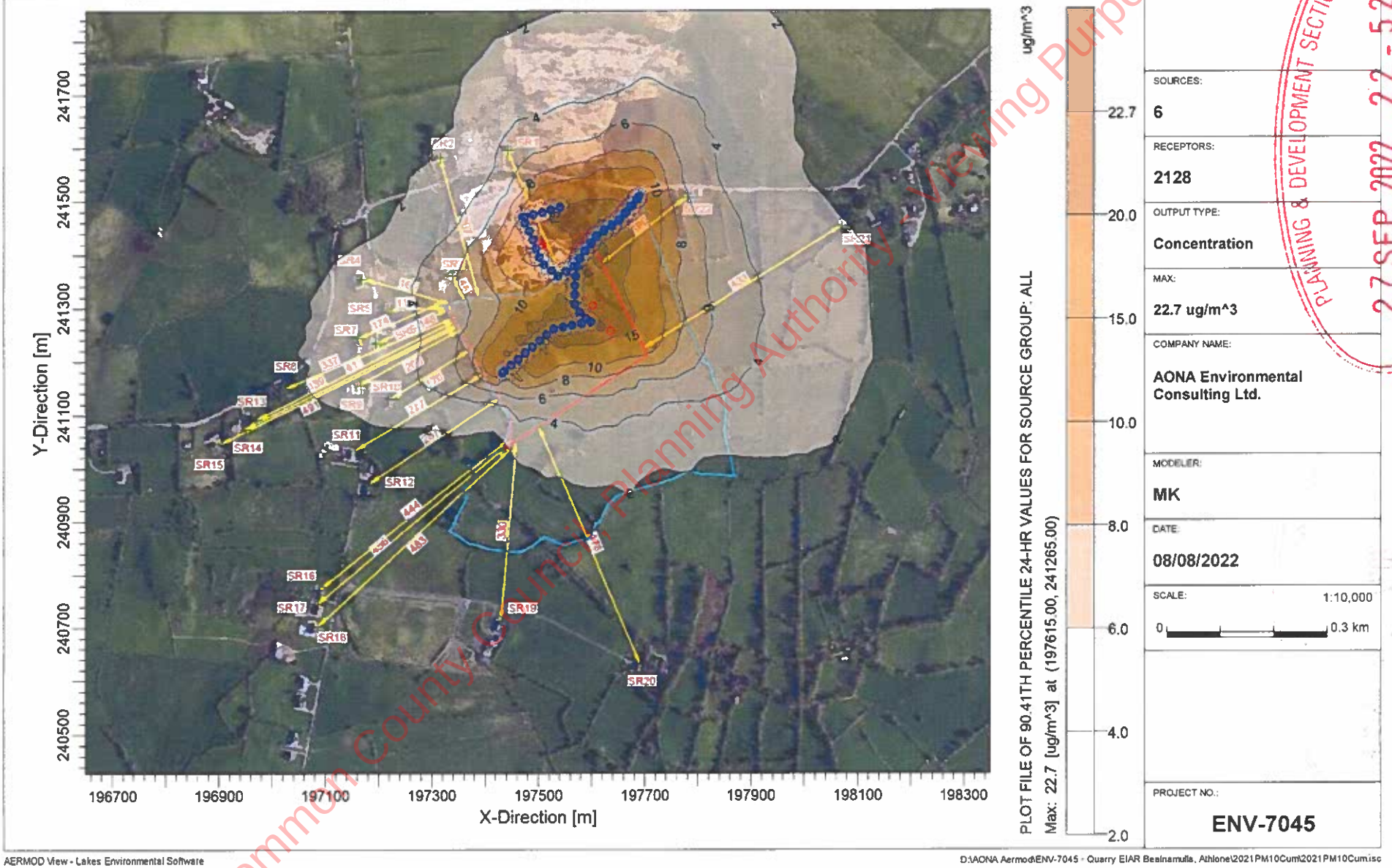
Roscommon County Council, Planning Authority - Viewing Purposes Only!

PROJECT TITLE:

Figure 6: Proposed Sand & Gravel Quarry, Bealnamulla, Athlone.
Predicted 90.41th %ile of 24 Hour PM10 concentrations at sensitive receptors in proximity to the proposed quarry site.



COMMENTS:
Cumulative Impact

SOURCES:
6

RECEPTORS:
2128

OUTPUT TYPE:
Concentration

MAX:
22.7 ug/m^3

COMPANY NAME:
AONA Environmental Consulting Ltd.

MODELER:
MK

DATE:
08/08/2022

SCALE: 1:10,000
0 0.3 km

PROJECT NO.:
ENV-7045

AERMOD View - Lakes Environmental Software

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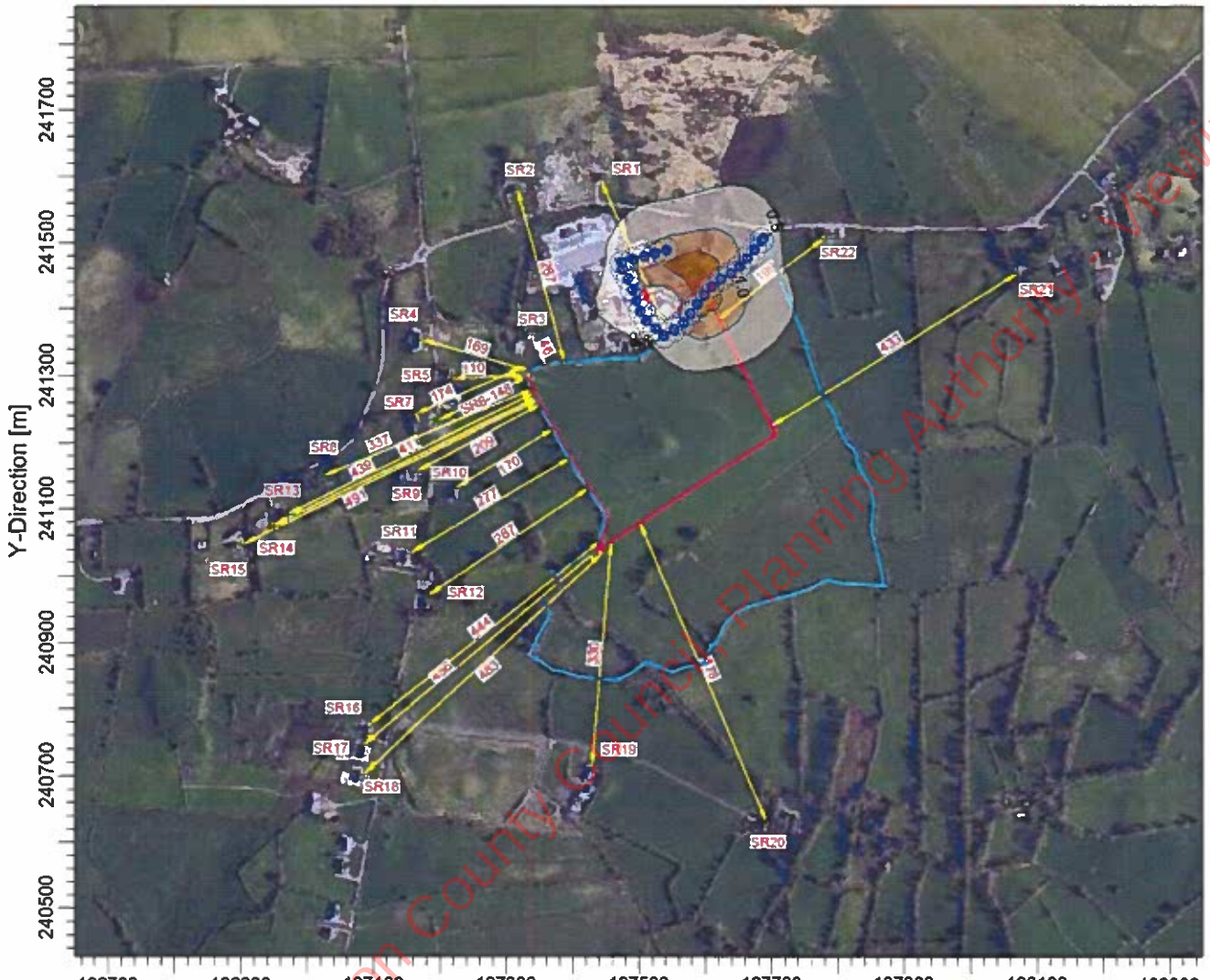
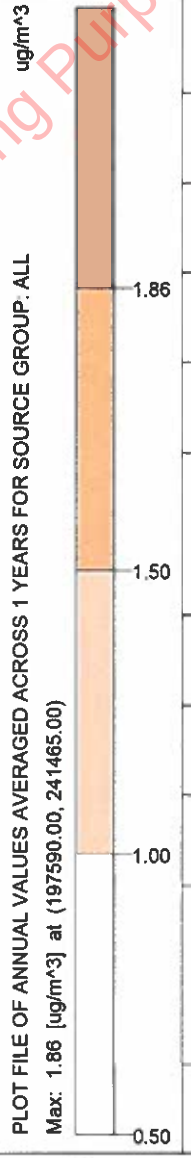
PROJECT TITLE:

Figure 7: Proposed Sand & Gravel Quarry, Bealnamulla, Athlone.
Predicted Annual Mean PM2.5 concentrations at sensitive receptors in proximity to the proposed quarry site.





COMMENTS:
Kildea Concete Only, i.e. the baseline

SOURCES:
2

RECEPTORS:
2128

OUTPUT TYPE:
Concentration

MAX:
1.86 ug/m^3

COMPANY NAME:
AONA Environmental Consulting Ltd.

MODELER:
MK

DATE:
08/08/2022

SCALE: 1:10,000
0 0.3 km

PROJECT NO.:
ENV-7045

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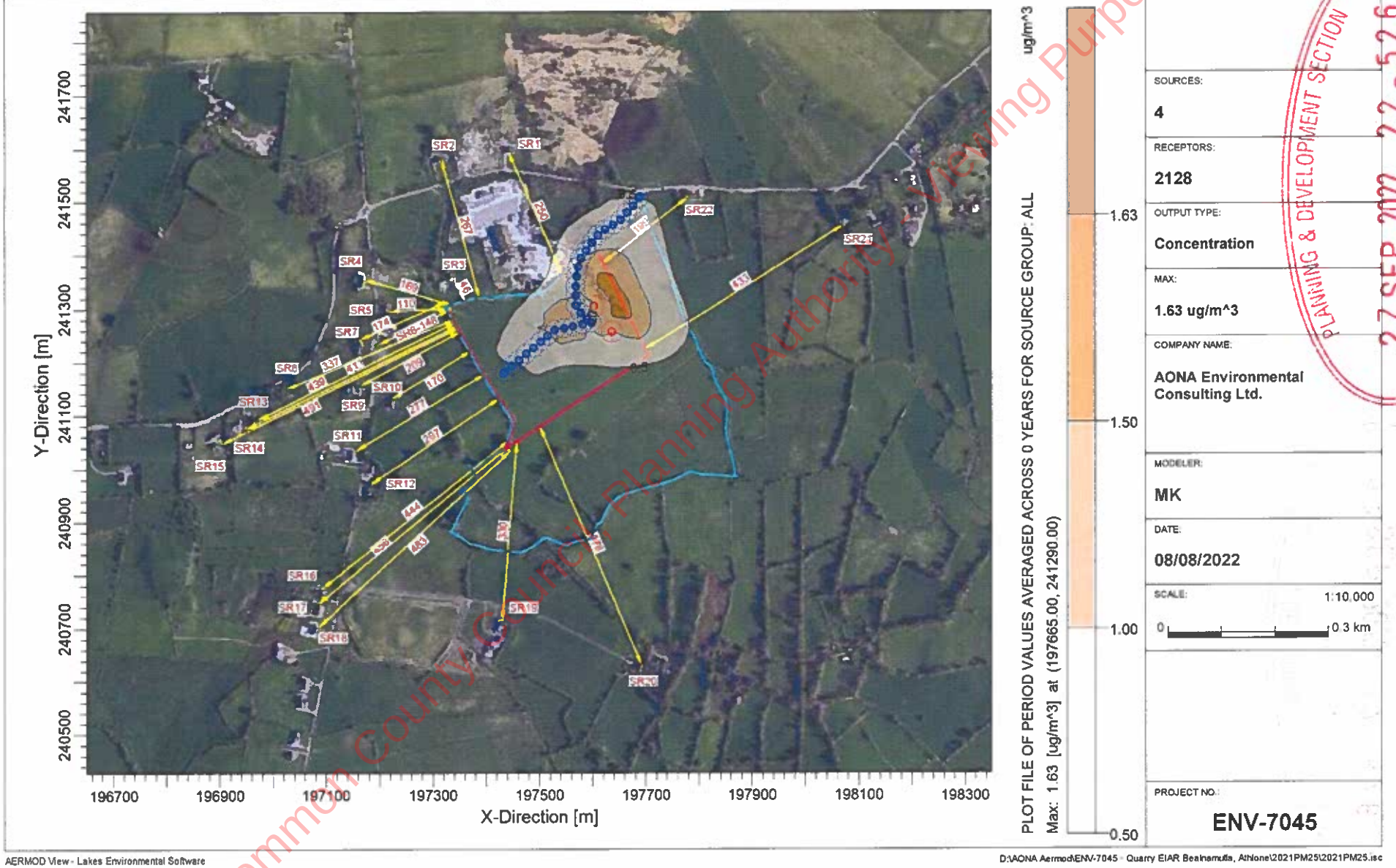
PROJECT TITLE:

Figure 8: Proposed Sand & Gravel Quarry, Bealnamulla, Athlone.
Predicted Annual Mean PM2.5 concentrations at sensitive receptors in proximity to the proposed quarry site.



COMMENTS:
Proposed Quarry Only, i.e. the proposed development

SOURCES:
4

RECEPTORS:
2128

OUTPUT TYPE:
Concentration

MAX:
1.63 ug/m^3

COMPANY NAME:
AONA Environmental Consulting Ltd.

MODELER:
MK

DATE:
08/08/2022

SCALE: 1:10,000
0 0.3 km

PROJECT NO.:
ENV-7045

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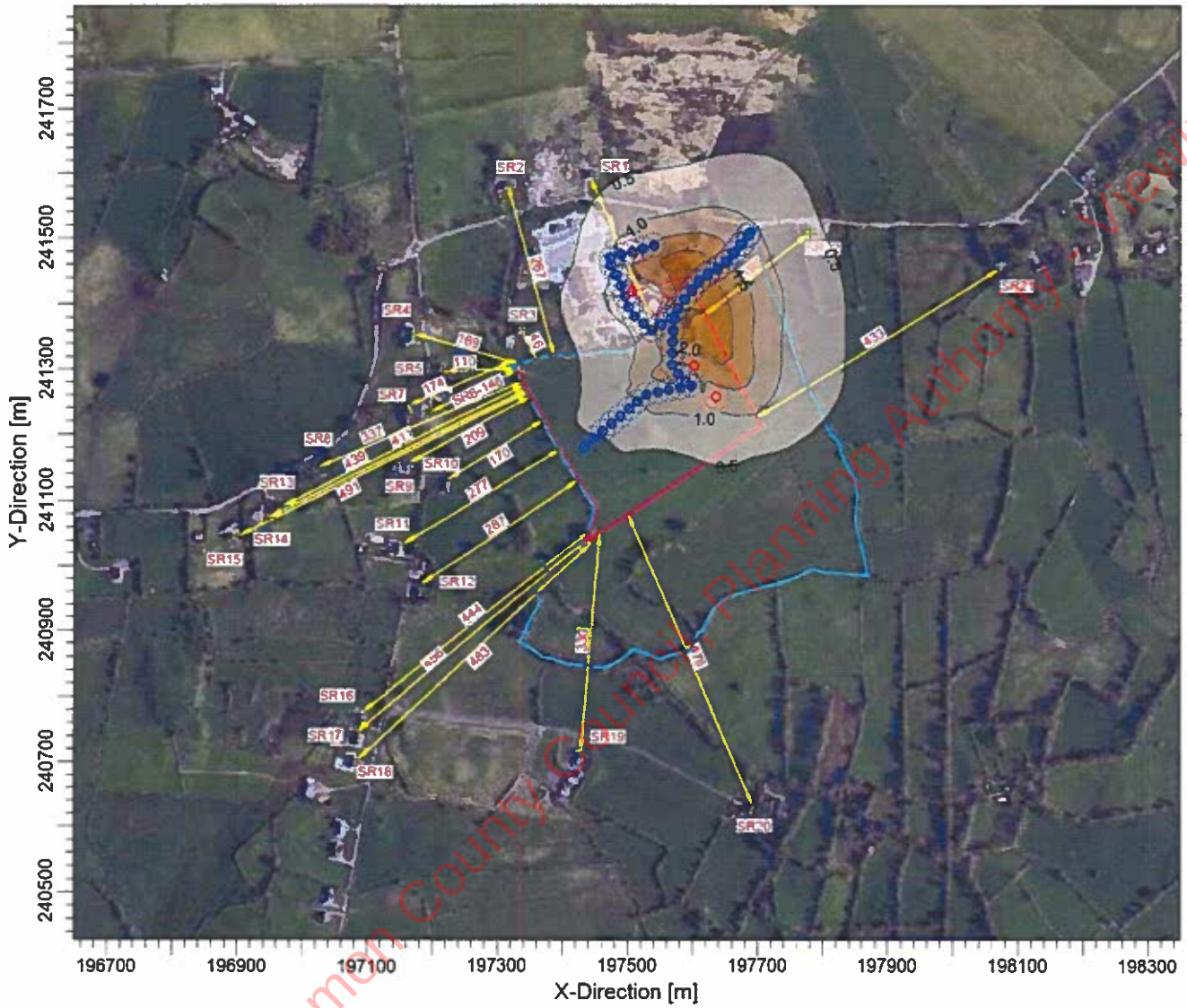
ROSCOMMON COUNTY COUNCIL

PROJECT TITLE:

Figure 9: Proposed Sand & Gravel Quarry, Bealnamulla, Athlone.
Predicted Annual Mean PM2.5 concentrations at sensitive receptors in proximity to the proposed quarry site.



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 1 YEARS FOR SOURCE GROUP: ALL
Max: 2.53 [ug/m^3] at (197590.00, 241390.00)

ug/m^3
2.53
2.50
2.00
1.50
1.00
0.50

COMMENTS:
Cumulative Impact

SOURCES:
6

RECEPTORS:
2128

OUTPUT TYPE:
Concentration

MAX:
2.53 ug/m^3

COMPANY NAME:
AONA Environmental Consulting Ltd.

MODELER:
MK

DATE:
08/08/2022

SCALE:
1:10,000
0 0.3 km

PROJECT NO.:
ENV-7045

AERMOD View - Lakes Environmental Software

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PLANNING & DEVELOPMENT SECTION
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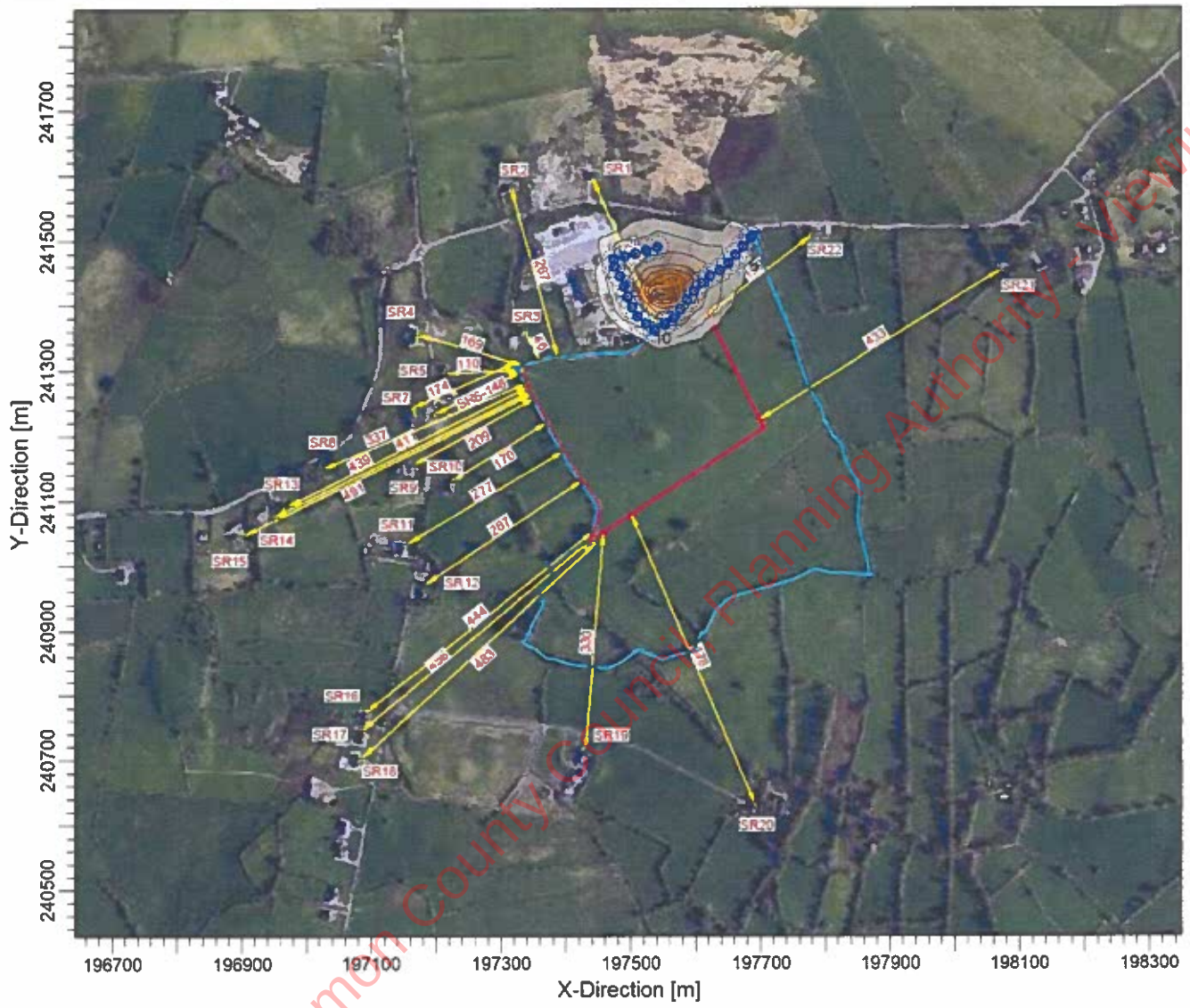
PROJECT TITLE:

Figure 10: Proposed Sand & Gravel Quarry, Bealnamulla, Athlone. Predicted Annual Mean Dust Deposition Rate (g/m2) at sensitive receptors in proximity to the proposed quarry site. (to convert to mg/m2/day, multiply by 1,000 and divide by 365)



COMMENTS:
Kildea Concete Only, i.e. the baseline

SOURCES:
2

RECEPTORS:
2128

OUTPUT TYPE:
Total Depos.

MAX:
182 g/m^2

COMPANY NAME:
AONA Environmental Consulting Ltd.

MODELER:
MK

DATE:
08/08/2022

SCALE: 1:10,000
0 0.3 km

PROJECT NO.:
ENV-7045

AERMOD View - Lakes Environmental Software

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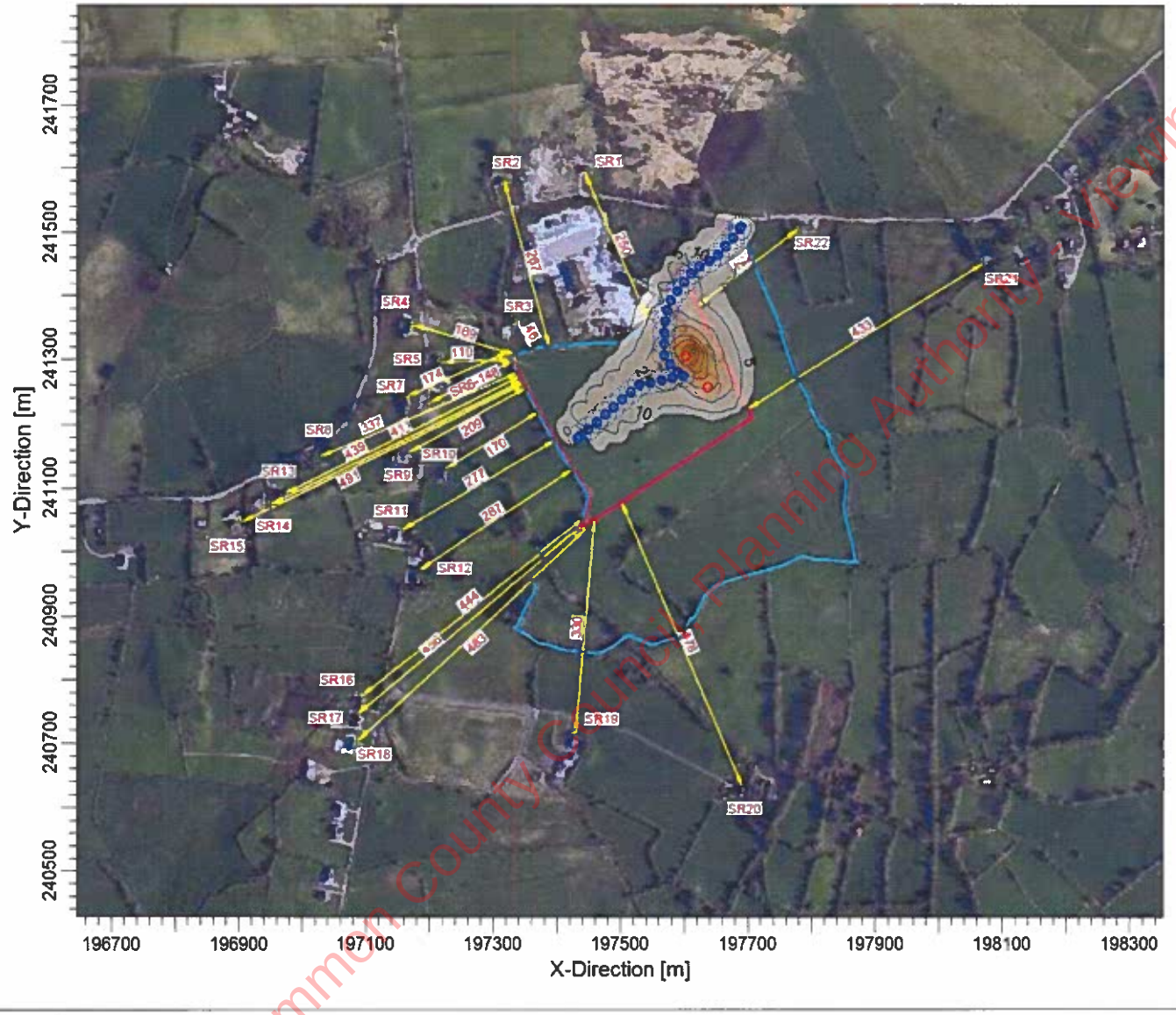
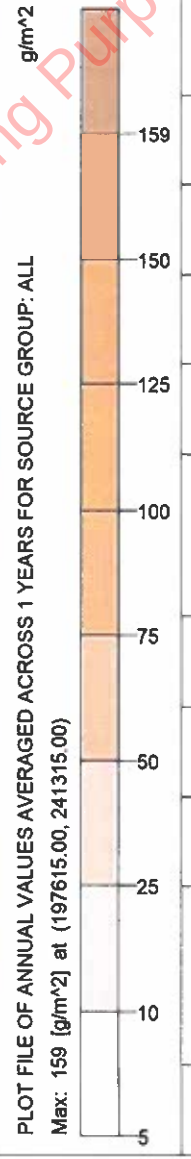
PROJECT TITLE:

Figure 11: Proposed Sand & Gravel Quarry, Bealnamulla, Athlone. Predicted Annual Mean Dust Deposition Rate (g/m2) at sensitive receptors in proximity to the proposed quarry site. (to convert to mg/m2/day, multiply by 1,000 and divide by 365)





COMMENTS:
Proposed Quarry Only, i.e. the proposed development

SOURCES:
4

RECEPTORS:
2128

OUTPUT TYPE:
Total Depos.

MAX:
159 g/m^2

COMPANY NAME:
AONA Environmental Consulting Ltd.

MODELER:
MK

DATE:
08/08/2022

SCALE: 1:10,000
0 0.3 km

PROJECT NO.:
ENV-7045

AERMOD View - Lakes Environmental Software

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PLANNING & DEVELOPMENT SECTION
27 SEP 2022
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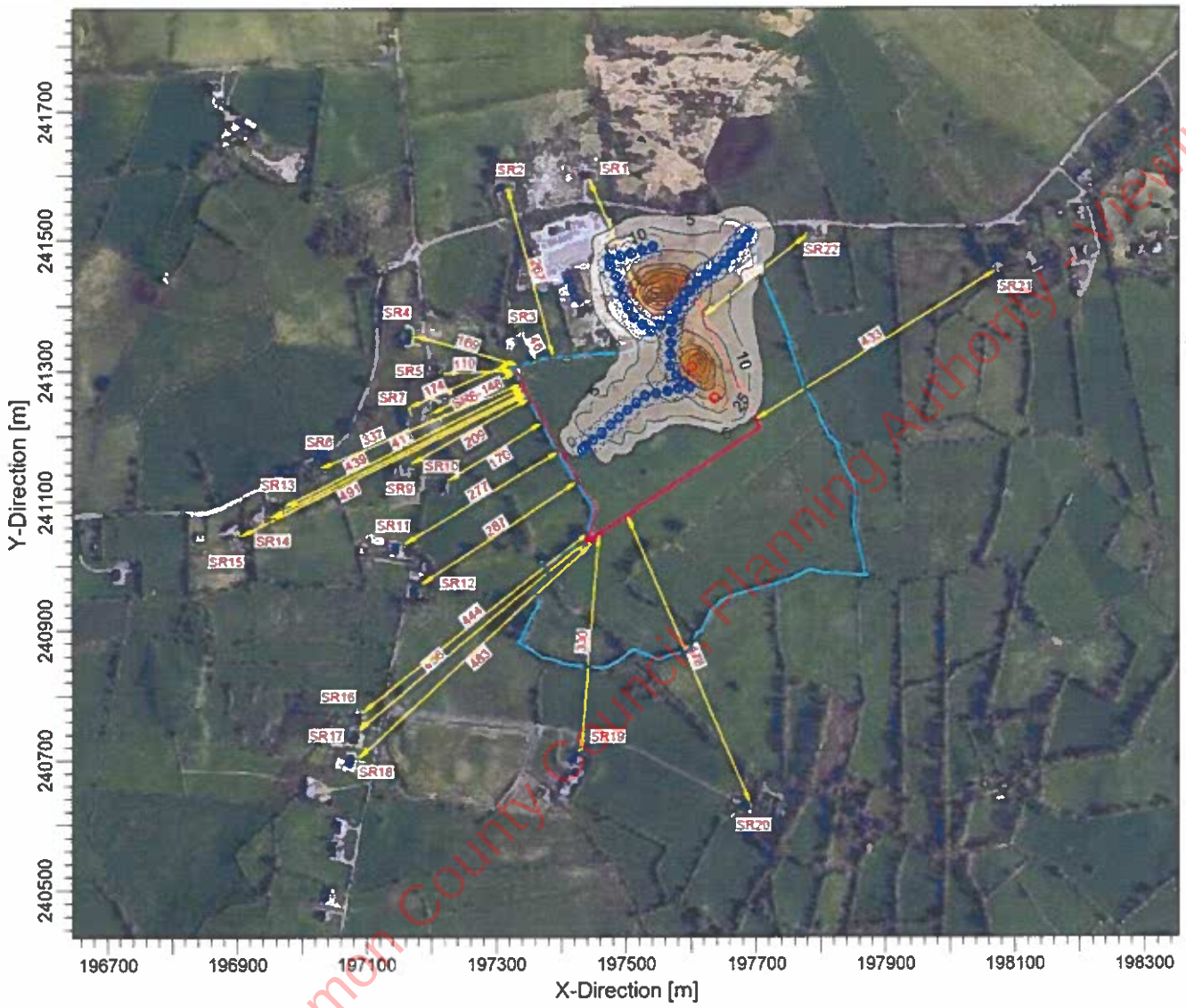
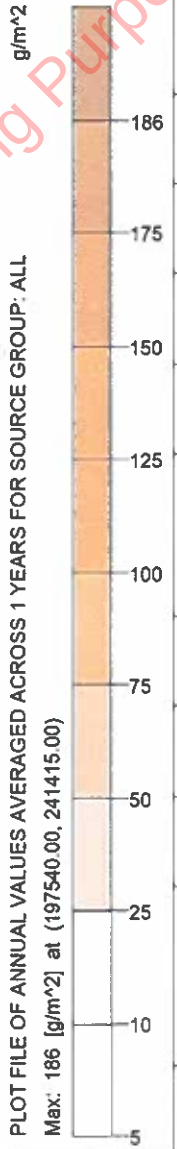
ROSCOMMON COUNTY COUNCIL

PROJECT TITLE:

Figure 12: Proposed Sand & Gravel Quarry, Bealnamulla, Athlone. Predicted Annual Mean Dust Deposition Rate (g/m2) at sensitive receptors in proximity to the proposed quarry site. (to convert to mg/m2/day, multiply by 1,000 and divide by 365)





PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 1 YEARS FOR SOURCE GROUP: ALL

Max: 186 [g/m^2] at (197540.00, 241415.00)

COMMENTS:
Cumulative Impact

SOURCES:
6

RECEPTORS:
2128

OUTPUT TYPE:
Total Depos.

MAX:
186 g/m^2

COMPANY NAME:
AONA Environmental Consulting Ltd.

MODELER:
MK

DATE:
08/08/2022

SCALE: 1:10,000
0 0.3 km

PROJECT NO.:
ENV-7045

AERMOD View - Lakes Environmental Software

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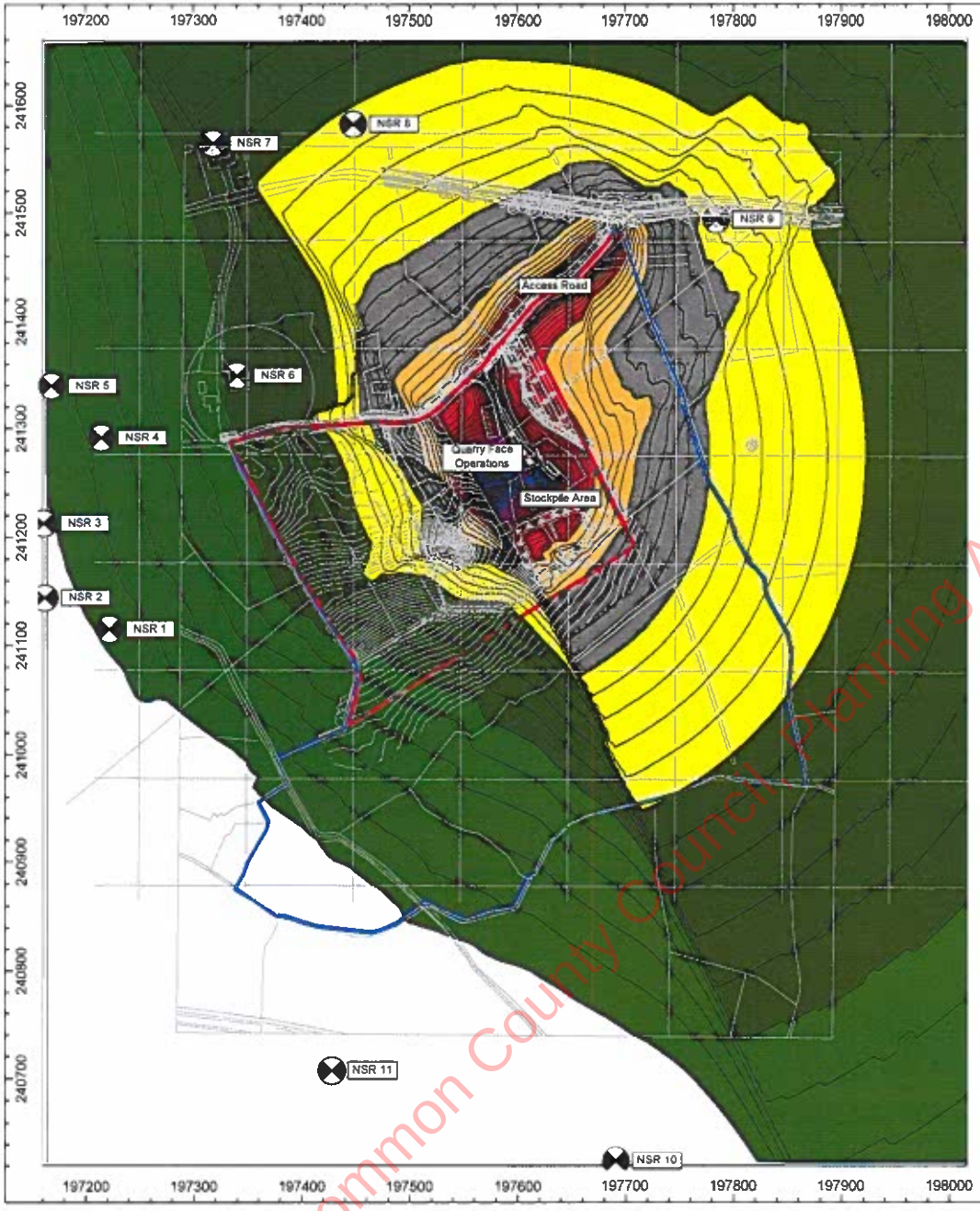

Client:
Proposed Sandpit at Rooskagh, Bealnamulla, Athlone, Co. Roscommon.

Project:
Noise Impact Assessment.

Prepared by:
AONA Environmental Consulting Ltd.
www.aonaenvironmental.ie

Project Number:
ENV-7045

Drawing Title / Scenario:
Predicted Noise Levels, Phase 1.

Drawing Number:
Figure 10.2

- > 35.0 dB
- > 40.0 dB
- > 45.0 dB
- > 50.0 dB
- > 55.0 dB
- > 60.0 dB
- > 65.0 dB
- > 70.0 dB
- > 75.0 dB
- > 80.0 dB
- > 85.0 dB

Scale : Not to scale

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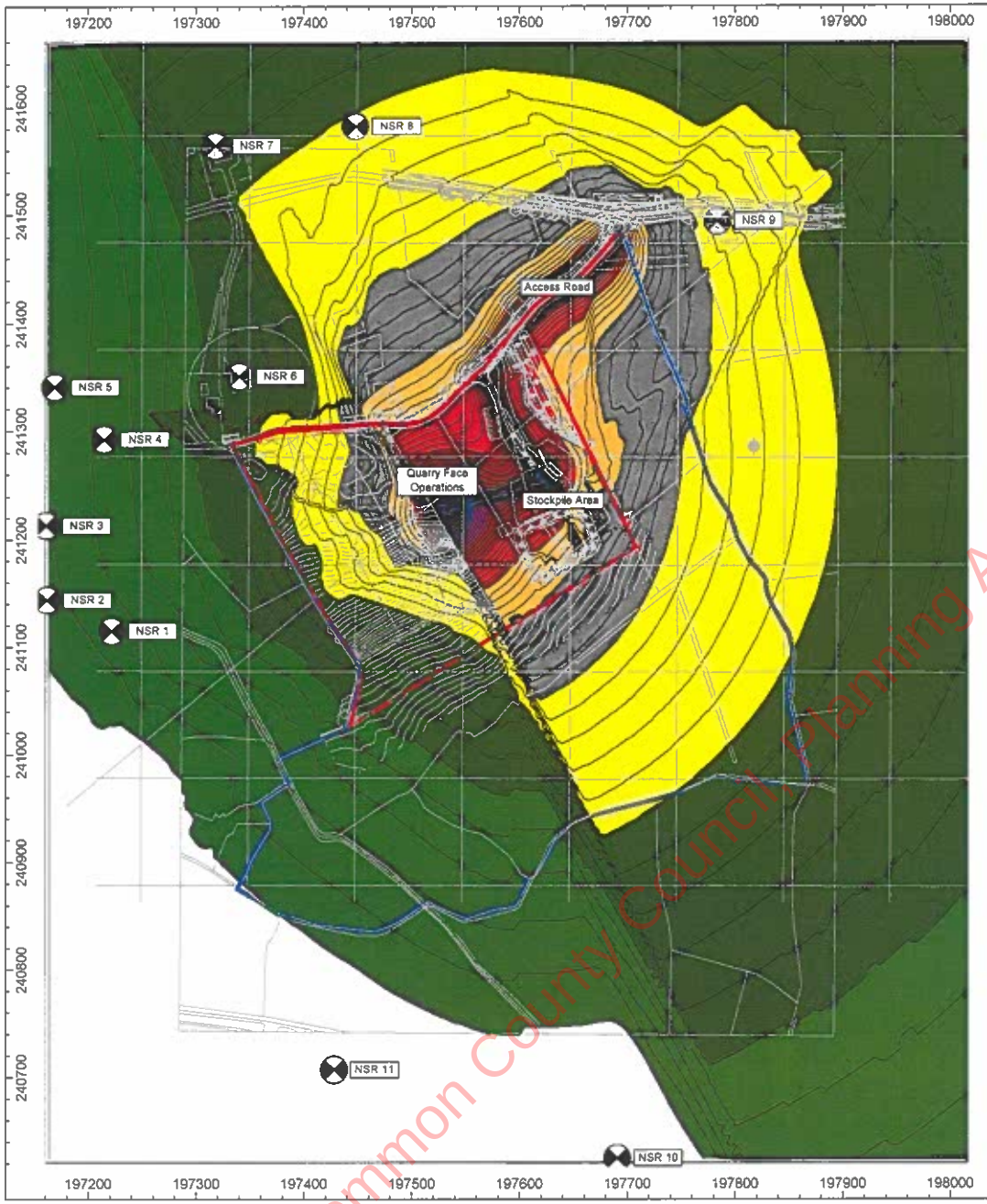

PLANNING & DEVELOPMENT SECTION
27 SEP 2022
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Client:
Proposed Sandpit at Rooskagh, Bealnamulla, Athlone, Co. Roscommon.

Project:
Noise Impact Assessment.

Prepared by:
AONA Environmental Consulting Ltd.
www.aonaenvironmental.ie

Project Number:
ENV-7045

Drawing Title / Scenario:
Predicted Noise Levels, Phase 2.

Drawing Number:
Figure 10.3

- > 35.0 dB
- > 40.0 dB
- > 45.0 dB
- > 50.0 dB
- > 55.0 dB
- > 60.0 dB
- > 65.0 dB
- > 70.0 dB
- > 75.0 dB
- > 80.0 dB
- > 85.0 dB

Scale : Not to scale

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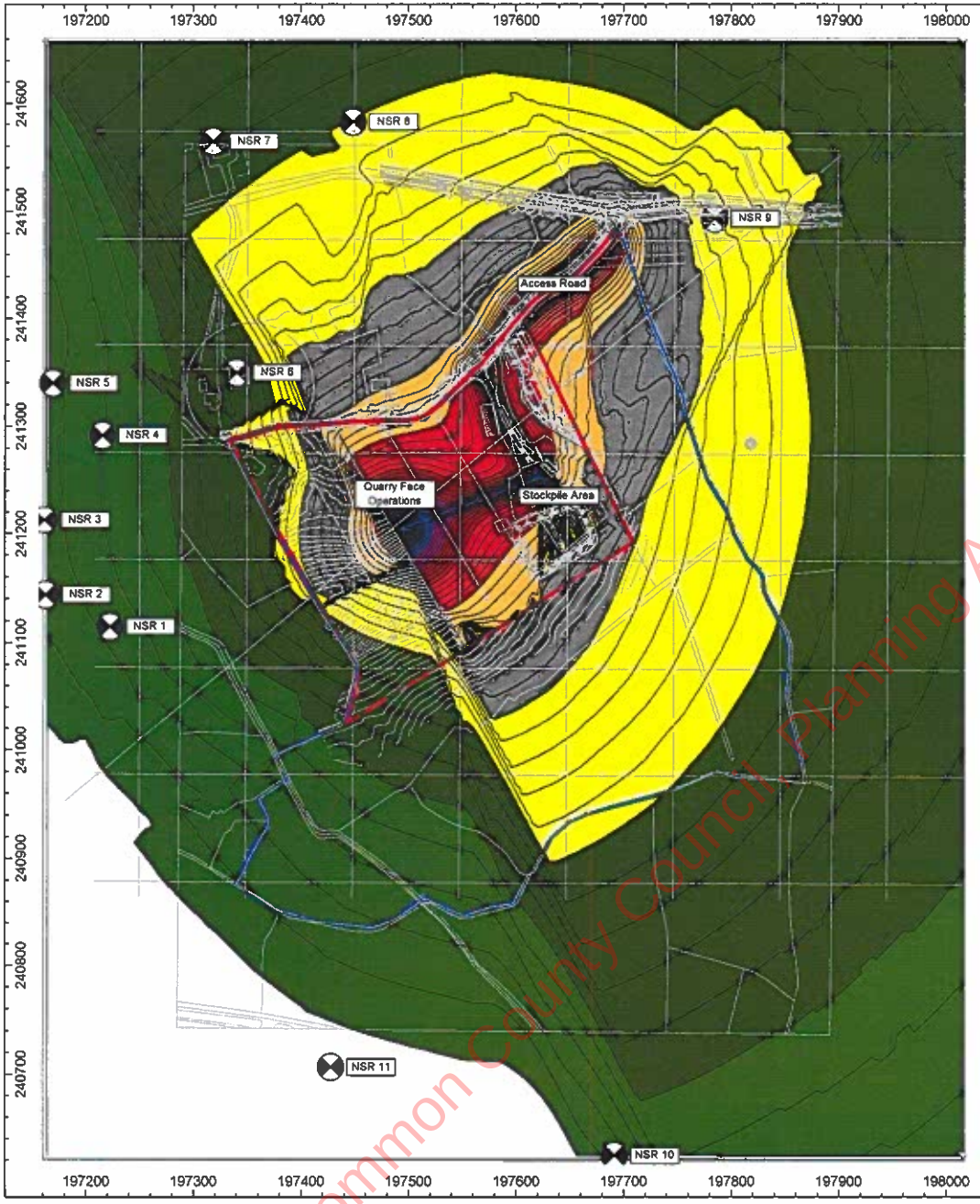

Client:
Proposed Sandpit at Rooskagh, Bealnamulla, Athlone, Co. Roscommon.

Project:
Noise Impact Assessment.

Prepared by:
AONA Environmental Consulting Ltd.
www.aonaenvironmental.ie

Project Number:
ENV-7045

Drawing Title / Scenario:
Predicted Noise Levels, Phase 3.

Drawing Number:
Figure 10.4

- > 35.0 dB
- > 40.0 dB
- > 45.0 dB
- > 50.0 dB
- > 55.0 dB
- > 60.0 dB
- > 65.0 dB
- > 70.0 dB
- > 75.0 dB
- > 80.0 dB
- > 85.0 dB

Scale : Not to scale

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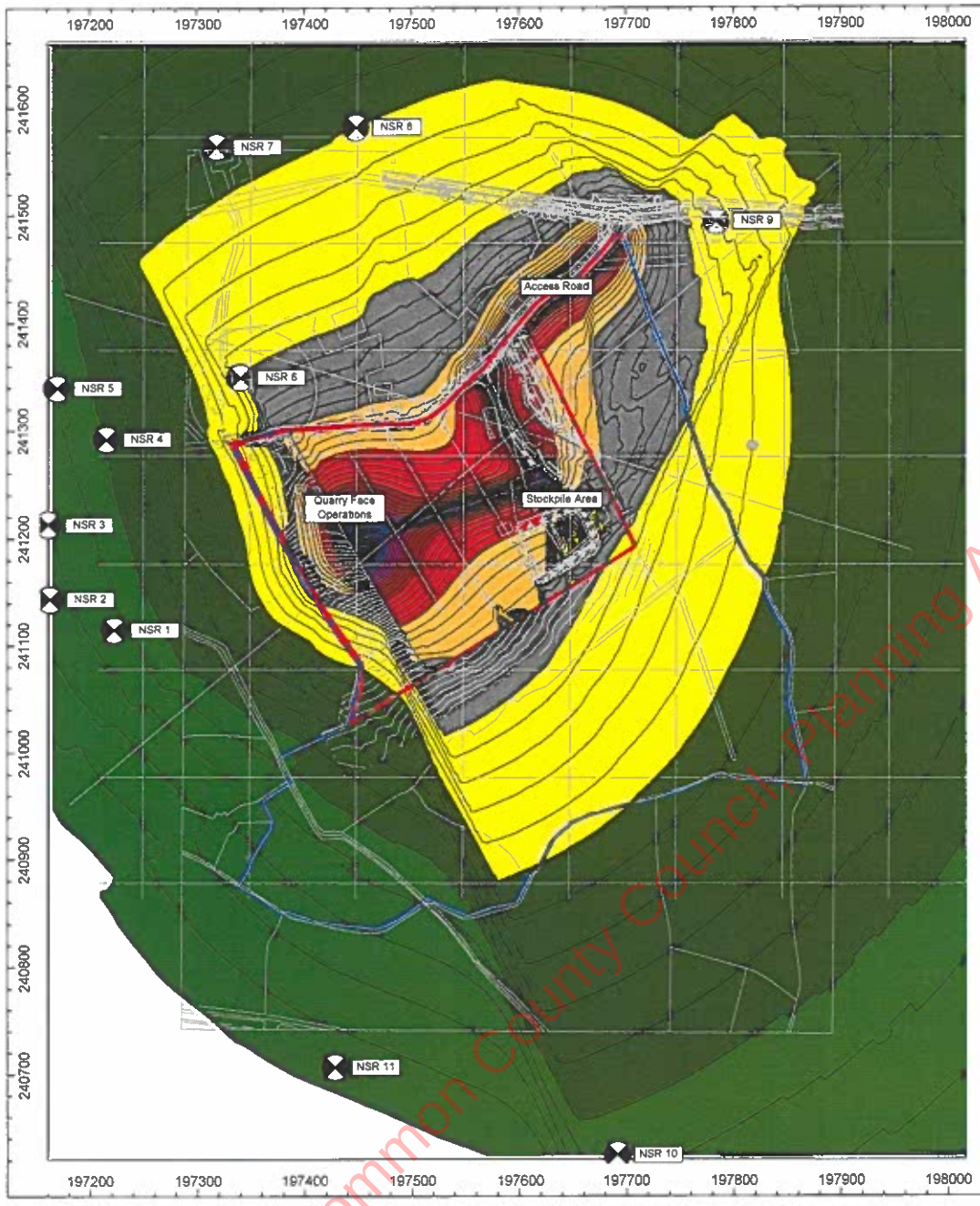

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Client:
Proposed Sandpit at Rooskagh, Bealnamulla, Athlone, Co. Roscommon.

Project:
Noise Impact Assessment.

Prepared by:
AONA Environmental Consulting Ltd.
www.aonaenvironmental.ie

Project Number:
ENV-7045

Drawing Title / Scenario:
Predicted Noise Levels, Phase 4.

Drawing Number:
Figure 10.5

- > 35.0 dB
- > 40.0 dB
- > 45.0 dB
- > 50.0 dB
- > 55.0 dB
- > 60.0 dB
- > 65.0 dB
- > 70.0 dB
- > 75.0 dB
- > 80.0 dB
- > 85.0 dB

Scale : Not to scale

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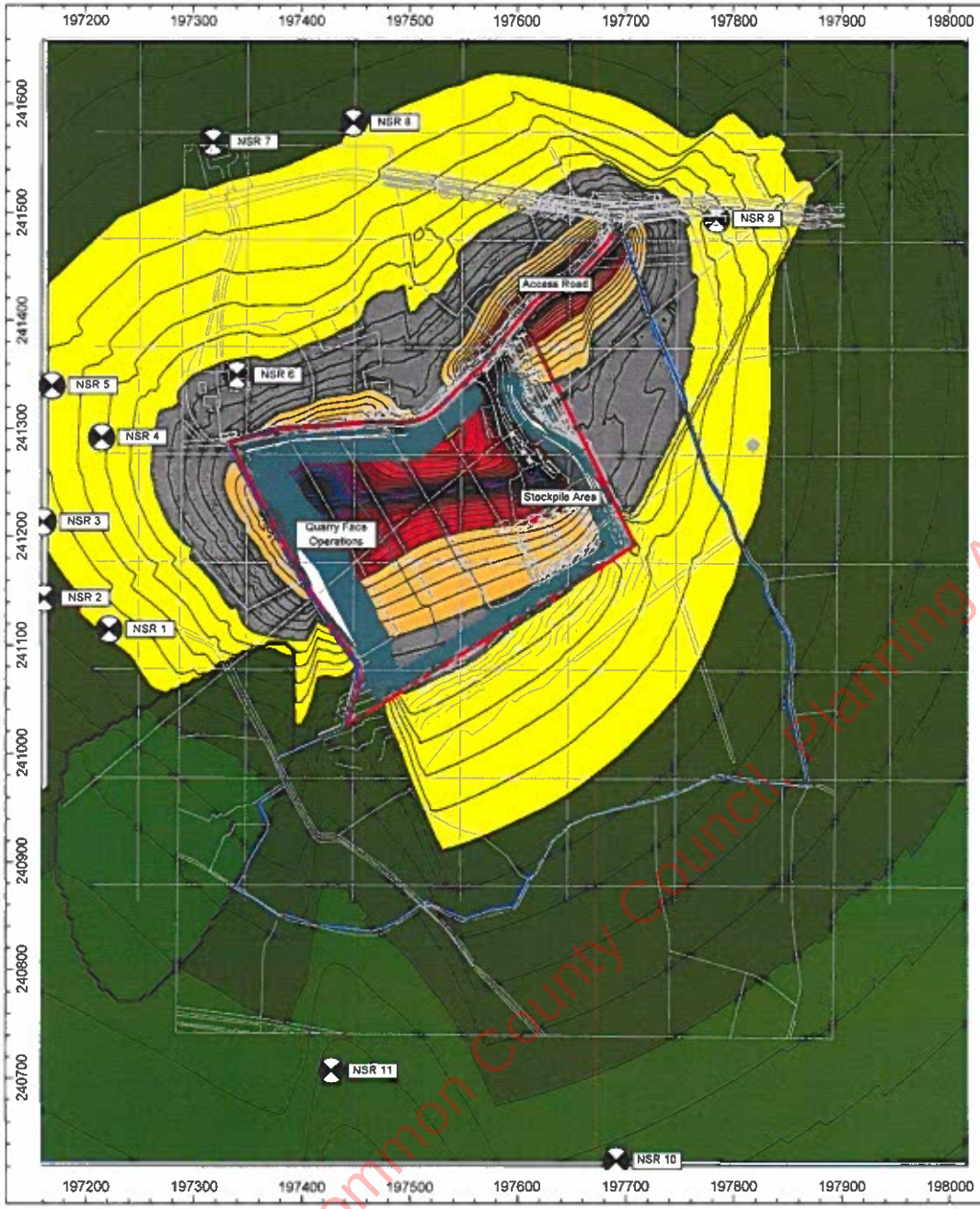

Client:
Proposed Sandpit at Rooskagh, Bealnamulla, Athlone, Co. Roscommon.

Project:
Noise Impact Assessment.

Prepared by:
AONA Environmental Consulting Ltd.
www.aonaenvironmental.ie

Project Number:
ENV-7045

Drawing Title / Scenario:
Predicted Noise Levels, Phase 5.

Drawing Number:
Figure 10.6

- > 35.0 dB
- > 40.0 dB
- > 45.0 dB
- > 50.0 dB
- > 55.0 dB
- > 60.0 dB
- > 65.0 dB
- > 70.0 dB
- > 75.0 dB
- > 80.0 dB
- > 85.0 dB

Scale : Not to scale

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CHAPTER 9

CLIMATE

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9.0 CLIMATE

9.1 Introduction

This Climate Impact Assessment has been prepared to accompany a planning application to Roscommon County Council submitted for the proposed commencement of the excavation of sand and gravel on a greenfield site at Rooskagh Townland, Bellanamullia (Bealnamulla), Athlone Co. Roscommon.

This report has been prepared by Mervyn Keegan of AONA Environmental Consulting Ltd. to be included as a section within the EIAR. Mervyn Keegan's professional credentials are outlined in Chapter 8 – Air Quality & Dust.

This report primarily addresses potential climate related impacts from the proposed development. The development will involve the extraction of sand, stone & gravel over an extraction area of 4.90 hectares (volume to be extracted = 466,766m³ approximately) over a 10 year period, screening/processing of stone, sand & gravel from the site using mobile plant, construction of offices (33m²), welfare facilities (9m²), well, water settlement pond (area 2,020 m²), weighbridge, wheel wash, entrance, set down area, carparking, truck parking, refuelling pad, petrol oil interceptor, fencing, landscaping/screening, signage, lighting, wastewater storage tank for site offices, and all other ancillary works. The land will be restored to agricultural lands on the completion of the extraction of sand, stone and gravel.

The proposed operations will comprise the stripping and storing of existing topsoil and extraction of sand and gravel to produce aggregates for use in the manufacture of value-added products for road construction, production of concrete products and site development works. Materials extracted from the proposed land area is processed within the proposed extraction area using mobile processing plant. Sand and gravel will be extracted by means of excavators and dump trucks. Machinery and equipment proposed includes:

- **Primary Screen** – Powerscreen Warrior 1400X

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- **Screening & Washing plant** – Terex Washing Systems M2100 Screener and FM120C Sand Recovery Unit
- **Crushing plant** – Jaw Crusher Powerscreen 400X (New) and Cone Crusher Powerscreen 1000SR
- **Dust Suppression** – 2 X AQ45 Static Terex Aquamist Dust Suppression Units
- **Loading Shovel** – Volvo L180H
- **Excavator** – Komatsu PC360-11

The proposed lands and the processing area are located just south of the Kildea Concrete plant. Other quarries are in close vicinity to the proposed development, namely Mannion Quarries which is <4km west of the proposed site.

This section of the report assesses the regional climate in the vicinity of the proposed sandpit and assesses any impact that the development may have with regards to climate. Climate can be thought of as the 'average weather over a period of time and so refers to temperature, rainfall and wind. Climate change is a significant change on the average weather or climate that region experiences. Climate change can be caused by a natural factors such as variations in solar intensity or volcanic eruptions. The term climate change is now generally used to refer to changes in our climate due to the build-up of Greenhouse Gases (GHGs) in the atmosphere. The build-up of GHG's is caused by excess emissions due to certain human activities, like burning fossil fuels for energy, transport and heating.

Day to day activities undertaken at the application site will contribute to greenhouse gas emissions associated with vehicles and plant operating at the pit. Vehicle and plant emissions cannot be eliminated but measures implemented by the operator will go some way to reducing emissions.

9.2 Legislation Framework

International and EU climate change policy has evolved over the last five decades with world leaders meeting to agree how to address the threats posed by climate change. Ireland's national climate policy and legislation have evolved and strengthened in recent years.

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Ireland is party to the Kyoto Protocol, which is an international agreement that sets limitations and reduction targets for greenhouse gases for developed countries. It is a protocol to the United Nations Framework for the Convention on Climate Change (UNFCCC). The Kyoto Protocol came into effect in 2005, as a result of which, emission reduction targets agreed by developed countries, including Ireland, are now binding. Under the Kyoto Protocol, Ireland agreed to limit total national greenhouse gas emissions to 314.2 Mtonnes of CO_2 eq over the five year period 2008 – 2012 which is equivalent to 62.8 Mtonnes of CO_2 eq per annum. The Kyoto Protocol limit was calculated being as 13% above Ireland's 1990 baseline value which was established and fixed at 55.61 Mtonnes of CO_2 eq. In December 2012, the Kyoto Protocol was amended by the parties to the Kyoto Protocol. During the second commitment period, parties committed to reduce GHG emissions by at least 18 percent below 1990 levels in the eight-year period from 2013 to 2020; however, the composition of parties in the second commitment period differed from the first. This placed binding targets on Ireland in climate change, with penalties for non-compliance.

A crucial transition point was reached in December 2015 when 195 countries signed a global agreement to tackle climate change. This took place at the 21st Conference of the Parties (COP21) of the United Nations Framework Convention on Climate Change (UNFCCC) in Paris. The 'Paris agreement', as it is commonly called, sets out a long-term goal to put the world on track to limit global warming to well below 2 degrees centigrade above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 degrees. It aims to tackle 95% of global emissions through 188 Nationally Determined Contributions (NDCs). The agreement also places significant importance on actions needed, both nationally and globally, to help people adapt to climate change.

The *Climate Action and Low Carbon Development (Amendment) Bill 2020.* will set Ireland on course to become climate neutral by 2050. The key features of the Bill are:

- Places on a statutory basis a 'national climate objective', which commits to pursue and achieve no later than 2050, the transition to a climate resilient, biodiversity-rich, environmentally-sustainable and climate-neutral economy.

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- Carbon budgets including a provision for setting sectoral targets.
- Annually revised Climate Action Plan
- A National Long Term Climate Action Strategy will be prepared every five years.
- Strengthened role for Climate Change Advisory Council
- New oversight and accountability by Oireachtas
- Introduces a requirement for each local authority to prepare a Climate Action Plan

9.3 Irelands Situation on Climate Change

The EPA's role in addressing climate change challenges includes collating national greenhouse gas emissions and projections; regulating emissions from industrial sectors; supporting climate science research; supporting change in behaviour to promote a circular economy and facilitating the National Dialogue on Climate Action.

Finding of GHG emissions in 2019:

- Greenhouse gas (GHG) emissions in Ireland decreased 4.4% in 2019. The decrease in emissions are reflected in most sectors with the exception of a slight increase in commercial / public services. Despite the decrease, Ireland is still not on the pathway required to meet future targets and a climate neutral economy.
- The EPA produced final estimates of GHG emissions for the period 1990-2019 which indicate that Ireland exceeded its 2019 annual limit set under the EU's Effort Sharing Decision (ESD), 406/2009/EC by 6.85 Mt CO_2 eq.
- For 2019, total national GHG emissions are estimated to be 59.78 million tonnes carbon dioxide equivalent (Mt CO_2 eq). This is 4.4% lower (2.75 Mt CO_2 eq) than emissions in 2018.
- In 2019, emissions in the European Union's Emissions Trading Sector (ETS) decreased by 8.7% or 1.34 Mt CO_2 eq and ESD emissions decreased by 3.0% or 1.41 Mt CO_2 eq.

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- Agriculture and transport sectors accounted for 72.9% of total ESD emissions in 2019.
- Commercial services and public services sectors increased by 1.8% and 1.2% respectively in 2019.
- Emissions from the manufacturing combustion sector decreased by 0.1 Mt CO_2 eq or 2.0% in 2019 with the largest decrease coming from the food processing, beverages and tobacco sector where for the first time no coal was consumed within this sub-sector.
- The industrial processes sector emissions decreased by 1.3% or 0.03 Mt CO_2 eq, mainly due to decreased cement production. Mineral products subsector (including cement) process emissions decreased by 1.8% in 2019.
- Emissions from the waste sector decreased by 0.4% or 0.004 Mt CO_2 eq in 2019.
- Ireland's National Policy position is to reduce CO_2 emissions in 2050 by 80% on 1990 levels across the energy generation, built environment and transport sectors, with a goal of Climate neutrality in the agriculture and land-use sector. The 2019 emissions show a large decrease in energy generation as well as decreased emissions in the agriculture, transport and residential sectors. Emissions from commercial and public services sectors are heading in the wrong direction. Manufacturing combustion; includes combustion of fuels in Industry and construction, both in ETS and ESD.

The EU Effort Sharing regulation EU/2018/842 (ESR) established binding annual greenhouse gas emission targets for non-ETS sectors in Member States for the period 2021 to 2030. The ESR sets Ireland a target of 30% reduction in emissions by 2030 compared to 2005 levels. It is important to note that this target will be amended following the European Councils decision to increase ambition from its existing EU-wide 2030 target of a 40% reduction to at least 55%, compared to 1990 levels. Legislative proposals to implement the new EU 2030 target, including revising Member States existing targets for 2030, are expected to be presented by the European Commission by July 2021.

9.4 Regional and Local Climate

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The Irish climate is subject to strong maritime influences, the effects decreasing with increasing distance from the Atlantic coast. Climate data has been referenced from Climate-Data.org . This weather data was collected between 1999 and 2019. Graphs and Tables are generated using Copernicus Climate Change Service information between 1999 and 2019, shown in Figure 9.1, Figure 9.2 and Table 9.1 below.

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Figure 9.1: Athlone Climate Graph - Weather by Month (1999 to 2019) – Average Temperature & Rainfall.

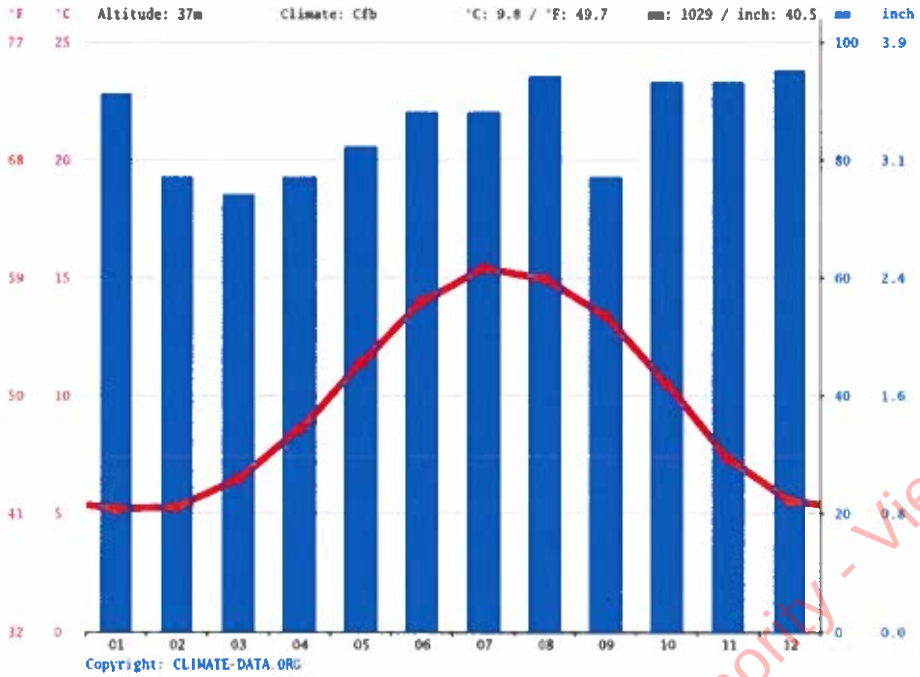

Figure 9.2: Athlone Average Temperature (1999 to 2019).

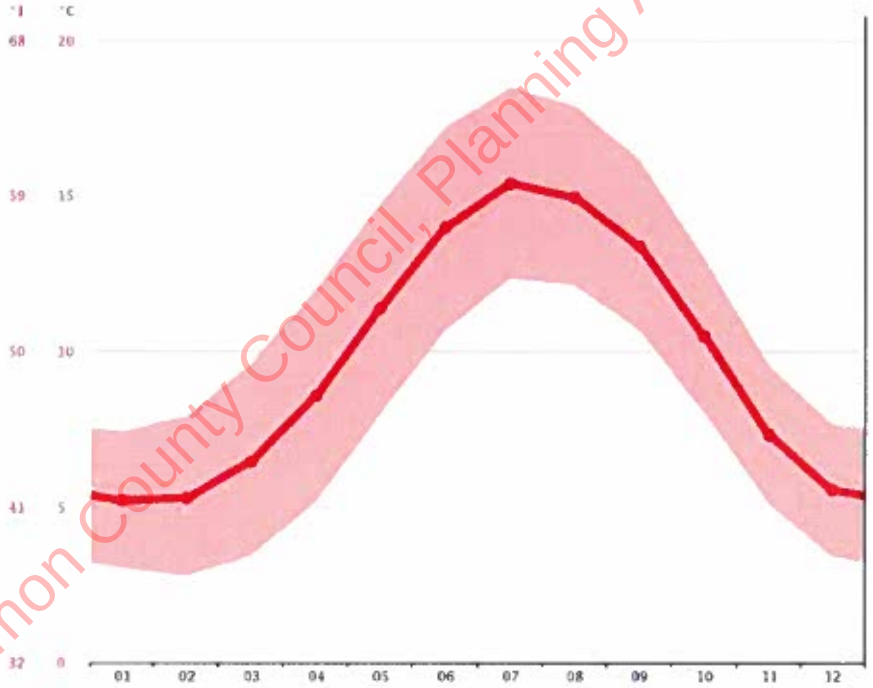

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Table 9.1: Athlone Weather by Month – Weather Averages

	January	February	March	April	May	June	July	August	Septem-ber	October	November	December
Avg. Temperature °C (°F)	5.2 °C (41.4) °F	5.3 °C (41.5) °F	6.5 °C (43.6) °F	8.6 °C (47.4) °F	11.4 °C (52.5) °F	14 °C (57.2) °F	15.4 °C (59.7) °F	14.9 °C (58.9) °F	13.4 °C (56.1) °F	10.5 °C (50.9) °F	7.3 °C (45.2) °F	5.5 °C (42) °F
Min. Temperature °C (°F)	3 °C (37.4) °F	2.8 °C (37) °F	3.4 °C (38.1) °F	5.2 °C (41.3) °F	8 °C (46.4) °F	10.7 °C (51.2) °F	12.3 °C (54.2) °F	12.1 °C (53.8) °F	10.7 °C (51.2) °F	8 °C (46.4) °F	5.1 °C (41.1) °F	3.4 °C (38.1) °F
Max. Temperature °C (°F)	7.4 °C (45.4) °F	7.9 °C (46.3) °F	9.6 °C (49.3) °F	12 °C (53.6) °F	14.8 °C (58.6) °F	17.2 °C (63) °F	18.5 °C (65.3) °F	17.9 °C (64.2) °F	16.2 °C (61.1) °F	13 °C (55.4) °F	9.5 °C (49.2) °F	7.7 °C (45.8) °F
Precipitation / Rainfall mm (in)	91 (3.6)	77 (3)	74 (2.9)	77 (3)	82 (3.2)	88 (3.5)	88 (3.5)	94 (3.7)	77 (3)	93 (3.7)	93 (3.7)	95 (3.7)
Humidity(%)	88%	83%	79%	76%	75%	74%	77%	79%	81%	84%	87%	88%
Rainy days (d)	11	10	10	10	11	10	11	11	10	10	10	11
avg. Sun hours (hours)	3.1	3.7	4.4	5.7	6.4	6.3	5.5	5.1	4.2	3.9	3.5	3.0

Athlone is 37m above sea level. The climate in Athlone is warm and temperate. The rainfall in Athlone is significant, with precipitation even during the driest month. According to Köppen and Geiger, this climate is classified as Cfb (Temperate oceanic climate). The temperatures average 9.8 °C | 49.7 °F. The annual rainfall is 1029 mm | 40.5 inch. July is the warmest month of the year. The temperature in July averages 15.4 °C | 59.7 °F. At 5.2 °C | 41.4 °F on average, January is the coldest month of the year. There is a difference of 21 mm | 1 inch of precipitation between the driest and wettest months. The variation in annual temperature is around 10.2 °C | 18.3 °F.

There is no continuous meteorological monitoring station located in or close to the Rooskagh sandpit site. However, Met Eireann wind speed, wind direction and rainfall monitoring data is available from various weathers stations indicative of the meteorological conditions that are experienced at the Rooskagh sandpit site. See Chapter 8 Air Quality & Dust for this information.

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9.5 Operational Phase Impacts

9.5.1 Vehicle Emissions

The movement of all vehicles and particularly heavy commercial vehicles and operation of plant such as excavators and processing plant will generate exhaust emissions (e.g. CO_2 and N_2O) which cannot be eliminated as for material to be

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extracted and processed, plant and vehicles need to operate. Emissions associated with the development are assessed as having a slight impact over a long term period.

9.5.2 Cumulative Impact

The application area must also be considered in association with other developments located within or close to the application site. The application area is immediately south of Kildea Concrete and in the vicinity of working quarries west of the site such as Mannion Quarries. The operation of plant and machinery in this area will also contribute to greenhouse gas emissions into the atmosphere. Other contributors of CO_2 emissions within the study area will be associated with road traffic on the surrounding road system in the vicinity.

Emissions associated with this proposed development are assessed as having a slight impact over a long-term period.

It is likely that there will be a cumulative impact on the local climate as a result of activities associated with this application and other activities taking place in the vicinity due to the high level of activity in the area which is likely to generate significant emissions.

9.6 Mitigation Measures

The following measures should be practiced at the proposed development during the operational phase of the development in order to limit the effects of the development on the local and regional climate:

- Strict adherence to 'good site/engineering practices' (e.g. all vehicles and plant will be switched off when not in use) which will minimise the generation of any unnecessary air emissions.
- Plant should be serviced regularly to ensure efficient fuel consumption.
- Energy audits should be undertaken at the pit in order to reduce energy requirements.
- When purchasing plant, preference should be given to plant which has low emissions.

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CHAPTER 10

NOISE AND VIBRATION

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10.0 NOISE AND VIBRATION

10.1 Introduction

This Noise & Vibration Impact Assessment has been prepared to accompany a planning application to Roscommon County Council submitted by Eamonn Harney for the proposed commencement of the excavation of sand and gravel on a greenfield site at Rooskagh Townland, Bellanamullia (Bealnamulla), Athlone Co. Roscommon.

This report has been prepared by Mervyn Keegan of AONA Environmental Consulting Ltd. to be included as a section within the EIAR. Mervyn Keegan is a Director of the environmental consultancy, AONA Environmental Consulting Ltd. Mervyn Keegan's areas of professional expertise are in Noise Control & Acoustics and Air Quality & Odour consultancy, including impact assessment and mitigation design. Mervyn Keegan has over 22 years of environmental consultancy experience. Mervyn is a full member of the Institute of Acoustics, with a Bachelor of Science Degree (Applied Sciences), a Master of Science Degree (Environmental Science) and a Diploma in Acoustics in Noise Control. AONA Environmental Consulting Ltd. is an independent consultancy specialising in Environmental Impact Assessment and Licensing. Mervyn Keegan has prepared in excess of ten Noise & Vibration and Air Quality & Climate impact assessments annually for quarry developments in the Republic of Ireland, Northern Ireland and the UK in the last 15 years and is an expert in the awareness and understanding of the relevant legislation and guidance that pertains to best practise in such assessments. Mervyn Keegan has appeared as an Expert Witness at oral hearings, public inquiries and legal hearings. Mervyn Keegan has produced Noise, Air Quality & Odour Impact Assessment reports to assess the impacts of a range of development types including roads, residential developments, industrial developments, quarries and mines and wind energy developments among others.

The Noise & Vibration Impact Assessment has addressed the development of the sandpit including the extraction of sand and gravel and mineral reduction using mobile crushing and screening as well as noise from the associated stockpiling and traffic movements.

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The development will involve the extraction of sand, stone & gravel over an extraction area of 4.90 hectares (volume to be extracted = 466,766m³ approximately) over a 10 year period, screening/processing of stone, sand & gravel from the site using mobile plant, construction of offices (33m²), welfare facilities (9m²), well, water settlement pond (area 2,020 m²), weighbridge, wheel wash, entrance, set down area, carparking, truck parking, refuelling pad, petrol oil interceptor, fencing, landscaping/screening, signage, lighting, wastewater storage tank for site offices, and all other ancillary works. The land will be restored to agricultural lands on the completion of the extraction of sand, stone and gravel.

The proposed development site is a greenfield site in the townland of Rooskagh, approximately 1 km north from Bealanmulia and is accessed by the L2025. The proposed lands and the processing area are located just south of the Kildea Concrete plant. The access to the proposed site will be via a private road with shared access with Kildea Concrete and will enter onto the L2025 approximately 172 metres from the north east corner of the proposed gravel and sand pit. The precise location of the site application boundary, proposed extraction area and site location relative to residential properties in the area are presented in the Project Description Chapter of this EIAR.

The proposed operations will comprise the stripping and storing of existing topsoil and extraction of sand and gravel to produce aggregates for use in the manufacture of value-added products for road construction, production of concrete products and site development works. Materials extracted from the proposed land area is processed within the proposed extraction area using mobile processing plant. Sand and gravel will be extracted by means of excavators and dump trucks. The machinery and equipment proposed for use includes:

- **Primary Screener** – Powerscreen Warrior 1400X
- **Screening plant** – Terex Washing Systems M2100 Screener and FM120C Sand Recovery Unit
- **Crushing plant** – Jaw Crusher Powerscreen 400X (New) and Cone Crusher Powerscreen 1000SR

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- **Dust Suppression** – 2 X AQ45 Static Terex Aquamist Dust Suppression Units
- **Loading Shovel** – Volvo L180H
- **Excavator** – Komatsu PC360-11

The proposal will seek to provide ancillary facilities at the site including offices, weighbridge and office, canteen, toilets, bunded fuel storage areas and a garage/workshop and wastewater treatment system, all on site. In accordance with industry guidelines sandpit operations will be carried out between 08.00 – 18.00hrs Monday to Friday; or from 09.00 – 17.00 hrs Saturday. The sandpit will not operate on Sundays or Bank Holidays, except in emergency situations. The proposed development will provide employment of up to 6 people directly on-site, in addition to several indirect employees such as crushing contractors, HGV drivers, maintenance contractors, etc.

The development of the sandpit is proposed to proceed in a westerly direction with Phase one of the first two years worked in 10 metre benches. The following four phases will be in two-year intervals.

10.2 Methodology

10.2.1 Impact Assessment Methodology

The assessment of the noise and vibration impacts has been undertaken as follows:

- A baseline noise survey was undertaken in proximity to the nearest residential properties to the site on 24th May 2021, to assist in establishing the background noise levels in the area.
- Noise levels have previously been recorded in close proximity to similar quarry activities and noise sources that will be on-going in the proposed sandpit site. Subsequently, an accurate sound power level for these specific noise sources has been determined to allow for accurate noise prediction modelling of the future noise impact from the sandpit site.

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- A prediction of the specific noise levels at the surrounding residential properties from the proposed sandpit activities and noise sources in the proposed sandpit site using CadnaA noise prediction software has been undertaken.
- A comparison of the predicted noise levels at the surrounding residential properties (Noise Sensitive Receptors [NSR's]) with the relevant Quarries and Ancillary Activities, Guidelines for Planning Authorities, April 2004, Department of the Environment, Heritage and Local Government. (DoEHLG Guidance) has been undertaken.

10.2.2 Relevant Guidelines & Standards

The noise and vibration impact assessment has been undertaken with regard to the following established standards and guidelines to determine the impact of the proposed sandpit site activities on the surrounding noise environment and assess for the potential for noise disturbance at existing noise sensitive receivers in the locality:

- Quarries and Ancillary Activities, Guidelines for Planning Authorities, April 2004, Department of the Environment, Heritage and Local Government. (DoEHLG Guidance)
- Environmental Management Guidelines Environmental Management in the Extractive Industry (Non-Scheduled Minerals), Environmental Protection Agency (2006).
- EPA – Guidelines on the Information to be Contained In Environmental Impact Assessment Reports - 2022

The Quarries and Ancillary Activities, Guidelines for Planning Authorities states the following with regard to the control of noise and blasting;

'Control of noise: Noise-sensitive uses in the vicinity of a quarry, such as dwellings, schools, hospitals, places of worship or areas of high amenity, require that the amount of noise be minimised. The sensitivity to noise is usually greater at night-time (20.00 to 08.00) than during the day, by about 10 dB(A). Many quarries are situated in areas of low background noise and it is appropriate to consider this when setting noise limits. In general, it can be expected that complaints will result where the noise from quarrying and associated activities are between 5 to 10 dB above the background noise levels.

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In areas of higher background noise levels, the EPA recommends that ideally, if the total noise level from all sources is taken into account, the noise level at sensitive locations should not exceed a L_{Aeq} (1 hour) of 55 dB(A) by daytime and a L_{Aeq} (15 minutes) of 45 dB(A) by night-time. Audible tonal or impulsive components in noise emissions (e.g. the reversing siren on a lorry, required for safety reasons) can be particularly intrusive, and such components should be minimised at any noise-sensitive location.

It may be necessary to raise the noise limits to allow temporary but exceptionally noisy phases in the extraction process, or for short-term construction activity which cannot meet the limits set for routine operations, e.g. the construction of baffle mounds, which bring long-term environmental benefits.

The developer may be required to carry out noise surveys to measure noise levels at the site boundary near sensitive locations, as agreed in advance with the planning authority. Surveys should be carried out in accordance with the EPA's "Environmental Noise Survey – Guidance Document" (2003). Noise monitoring should be carried out on a quarterly basis (or as otherwise agreed), and commenced prior to the commencement of development. The results should be reported to the planning authority within 3 weeks (or as agreed). 95% of all noise measured shall comply with the specified limit values. No individual noise measurement should exceed the limit values by more than 2 dB(A).

As outlined in the Environmental Management Guidelines Environmental Management in the Extractive Industry (Non-Scheduled Minerals), Environmental Protection Agency (2006), the Environmental Protection Agency (EPA) has produced a Guidance Note for Noise in Relation to Scheduled Activities (EPA, 1996). It deals in general terms with the approach to be taken in the measurement and control of noise and provides advice in relation to the setting of noise Emission Limit Values (ELV) and compliance monitoring. In relation to quarry developments and ancillary activities, it is recommended that noise from the activities on site shall not exceed the following noise ELVs at the nearest noise-sensitive receptor:

- Daytime: 08:00–20:00 h $L_{Aeq\ (1\ h)}$ = 55 dB(A)
- Night-time: 20:00–08:00 h $L_{Aeq\ (1\ h)}$ = 45 dB(A)

Note:

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- 95% of all noise levels shall comply with the specified limit value(s). No noise level shall exceed the limit value by more than 2 dB(A).
- On-site activities should be permitted during night-time hours where they comply with the noise ELVs (e.g. heating up of asphalt plants, loading of materials).
- Where existing background noise levels are very low, lower noise ELVs may be appropriate.
- Audible tones or impulsive noise should be avoided at night.
- It is also appropriate to permit higher noise ELVs for short-term temporary activities such as construction of screening bunds, etc., where these activities will result in a considerable environmental benefit.

On the basis of the above, the following noise limits are suggested for the operation of the sandpit site, including the extraction of sand and gravel and mineral reduction using mobile crushing and screening as well as noise from the associated structures and processes in the proposed development.

The suggested noise limits for the proposed development based on the above are as follows;

The equivalent sound levels attributable to all on-site operations associated with the development shall not exceed 55 dB(A) L_{eq} over a continuous one hour period between 0700 hours and 1900 hours on Monday to Friday inclusive, and 0700 hours and 1400 hours on Saturday, when measured at any noise sensitive receptor. Sound levels shall not exceed 45 dB(A) at any other time.

10.2.3 CadnaA Noise Prediction Modelling Methodology

CadnaA noise prediction software has been developed to allow detailed noise predictions to be undertaken in accordance with:

- ISO 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2 General methods of calculation.

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- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Noise

The CadnaA noise prediction model allows for noise from all sources entered into the model to be undertaken simultaneously. The noise model can take topographical effects, ground absorption, screening effects, reflections and focusing effects, among others, into consideration. The modelling software calculates noise levels based on the emission parameters and spatial settings that are entered. The model calculates the propagation of the sound from each noise source and produces a noise level contour map and graphics in proximity to a facility with colour coded noise level contours. Model parameters, sources, and settings have been incorporated into the model as detailed in Table 10.1. The noise model has been produced with reference to actual noise readings taken in proximity to similar actual noise sources that are proposed to be used on the sandpit site. This approach has ensured that the predicted noise levels will be accurately representative of the future on site operations and provide an accurate verifiable prediction at all noise sensitive receptors in the vicinity of the proposed sandpit site. Thus, the noise prediction model provides an appropriate level of confidence when assessing specific noise impact from the proposed development of the sandpit site.

Table 10.1: Summary of Modelling Parameters, Sources and Assumptions

Parameter	Source	Details
Horizontal distances – sandpit and surrounding area	Collins Boyd	Scaled drawings in AutoCAD format.
Sandpit Dimensions	Collins Boyd	Scaled drawings in AutoCAD format.
Receiver Locations	AONA Environmental	In outdoor amenity areas adjacent to nearest residential properties @ 1.5m height.
Plant types, location & Sound Power Level.	Collins Boyd	Source noise measurements were undertaken in close proximity to plant and equipment and within buildings on site. This allowed for an accurate Sound Power Level L_w to be assigned to active plant.
Ground Absorption	AONA Environmental	A Ground Absorption Rate – G = 0.5 has been used in the model, which is appropriate for the surrounding land type.

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Specific sound level measurements have previously been undertaken by AONA Environmental in close proximity to the main future noise sources such as HGV movements, crushing & screening equipment, loaders and excavation equipment at the similar operational sand and gravel quarries. The same noise sources will operate on the proposed sandpit site. These sound level measurements in close proximity to the main noise sources have been undertaken to ensure an accurate sound level prediction is provided. This has allowed for the generation of accurate sound power levels for all main noise sources on the proposed sandpit site.

For the purposes of noise impact assessment, the Sound Power Level (L_W) for each source was determined by measuring the Sound Pressure Level (L_P) at a specific distance from the noise source and assuming a Directivity Index (Q) of 2, i.e. hemispherical propagation, using the following equation;

$$L_W = L_p + \left|10 \cdot \log\left(\frac{Q}{4\pi \cdot r^2}\right)\right|$$

For the purposes of this prediction exercise, a number of assumptions have been made and the following plant 'on-time' assumptions have been used in the calculations based on observations at typical existing operational sand and gravel quarries. The height of each modelled sound source has also been based on site observations and for mobile plant a representative height has been selected according to the activity being undertaken. The sound power level (Lw) of the noise sources included in the noise prediction model are outlined in Table 10.2.

Table 10.2: Sound Power Levels used in the noise prediction model.

Moving Line Sources from site entrance to the sandpit face and Stockpiling area:

Source	Lw dB(A)		Moving Pt. Src	
	Type	Value	Number per hour	Speed (km/h)
HGV Movements to and from sandpit Face and Stockpiling area	PWL-Pt	105	12	10

Point Sources at the sandpit face area and Stockpiling area:

Name	Lw dB(A)	**%age On-Time**
Mobile Crushing and Screening Plant	120.0	100%

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Loading Shovel – Volvo L180H	105.0	100%
Excavator – Komatsu PC360-11	105.0	100%

Point & Line Sources at the sandpit face area and Stockpiling area:

Source	Measurement Distance (m) from Source	A-Weighted L_p	Calculated Sound Power Level L_w dB(A)	%age On-Time
Loading Shovel picking up sand from stockpile (Point Source)	5	76.1	98	20%
Loading Shovel picking up gravel from stockpile (Point Source)	5	72.3	94	20%
Loading Shovel tipping above stockpile (Point Source)	5	74.8	97	20%

The access to the proposed site will be via a private road with shared access with Kildea Concrete and will enter on the public approximately 172 metres from the north east corner of the proposed sand & gravel pit. All traffic will enter the landholding via the site office and weighbridge and run over a macadam road surface up to the infrastructure area in the centre of the processing area. All traffic will exit the site via the weighbridge (located at the site office). For the purposes of the worst-case noise impact assessment, a traffic flow of 6 HGV vehicles per hour entering and exiting the site and 6 HGV vehicles per hour to and from the sandpit face to the stockpiling area has been assumed.

The noise prediction model has been prepared to assess the proposed extraction, mobile crushing & screening and stockpiling operations at the following noise sensitive receivers surrounding the sandpit site as outlined in Table 10.3.

Table 10.3: Location of noise sensitive receivers surrounding the sandpit site. (See Figure 10.1)

Name	Receiver Height (m)	Coordinates	
		X (m)	Y (m)
NSR 1	1.50	197222	241115
NSR 2	1.50	197162	241144
NSR 3	1.50	197161	241213

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NSR 4	1.50	197215	241292
NSR 5	1.50	197169	241340
NSR 6	1.50	197340	241350
NSR 7	1.50	197318	241565
NSR 8	1.50	197448	241583
NSR 9	1.50	197784	241494
NSR 10	1.50	197691	240625
NSR 11	1.50	197428	240707

10.3 Assessment of Baseline Noise Conditions

10.3.1 Baseline Noise Monitoring

AONA Environmental undertook a baseline noise survey in proximity to the Rooskagh sandpit site on 24th May 2021, to establish the background noise levels in the area. Noise measurements were conducted according to international standard ISO 1996 *Description and Measurement of Environmental Noise*. The measurements were made using a Cirrus Optimus Green Sound Level Meter. The sound level meter was orientated towards the dominant noise source during all measurements and was at a height of ~1.25m off the ground. A wind shield was used on the microphone throughout the survey and the sound level meter was calibrated before, during and after the survey. The Time Weighting used was Fast and the Frequency Weighting was A-weighted. The principal noise measurement parameter recorded during each survey was the equivalent continuous A-Weighted Sound Pressure Level, $L_{Aeq,\,T}$. A statistical analysis of the measurement results was also completed so that the percentile levels, $L_{AN,\,T}$, for N = 90% and 10% over specific measurement intervals were also recorded. The percentile levels represent the noise level in dB(A) exceeded for N% of the measurement time. The measurement parameters recorded during the baseline survey are defined as follows:

- L_{Aeq} is the A-weighted equivalent continuous steady sound level during the sample period and effectively represents an average value.
- L_{AMax} is the maximum A-weighted sound level measured during the sample period.

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- L_{AMin} is the minimum A-weighted sound level measured during the sample period.
- L_{A10} is the A-weighted sound level that is exceeded for 10% of the sample period and is used to quantify traffic noise.
- L_{A90} is the A-weighted sound level that is exceeded for 90% of the sample period and is used to quantify background noise in the absence of the main noise source.

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The meteorological conditions on the day of the surveys were as follows:

- Wind speed Light Breeze ~1-2m/sec
- Precipitation Dry
- Temperature 16°C
- Cloud cover Sunny, with sporadic cloud cover.

Table 10.4: Baseline noise monitoring results dB(A), in the vicinity of Rooskagh sandpit - 24th May 2021.

Location	Time	Duration	L_{Aeq}	L_{AMax}	L_{AMin}	L_{A10}	L_{A90}	Notes
NML 1	10:30	00:15:00	62.7	81.3	45.2	62.7	49.7	Kildea Concrete products site activity, road traffic, birdsong, and agricultural activities.
	10:45	00:15:00	63.3	83.6	43.9	62.6	48.9	
	11:00	00:15:00	63.2	82.2	41.5	62.5	47.1	
NML 2	11:24	00:15:00	61	82.9	31.6	57.9	35.6	Kildea Quarry activity, road traffic, birdsong, and agricultural activities.
	11:39	00:15:00	55.2	74.3	29	56.7	33.5	
	11:54	00:15:00	52.2	74.3	27.6	47.2	32.2	
	12:09	00:15:00	58.1	76.6	28.5	54.8	31.2	

The measured and reported L_{Aeq} noise levels in the table above do not necessarily mean that because these values are in excess of 55 dB(A) that the area already experiences noise levels due to the Kildea Concrete products site that are in excess of the DoEHLG Guidance limit value of 55 dB(A). The noise measurements were taken on public lands in proximity to the nearest houses but also in close proximity to the surrounding roads. The measured L_{Aeq} noise levels are influenced by the passing traffic on the surrounding road network as reported above. Therefore, the L_{A90} noise

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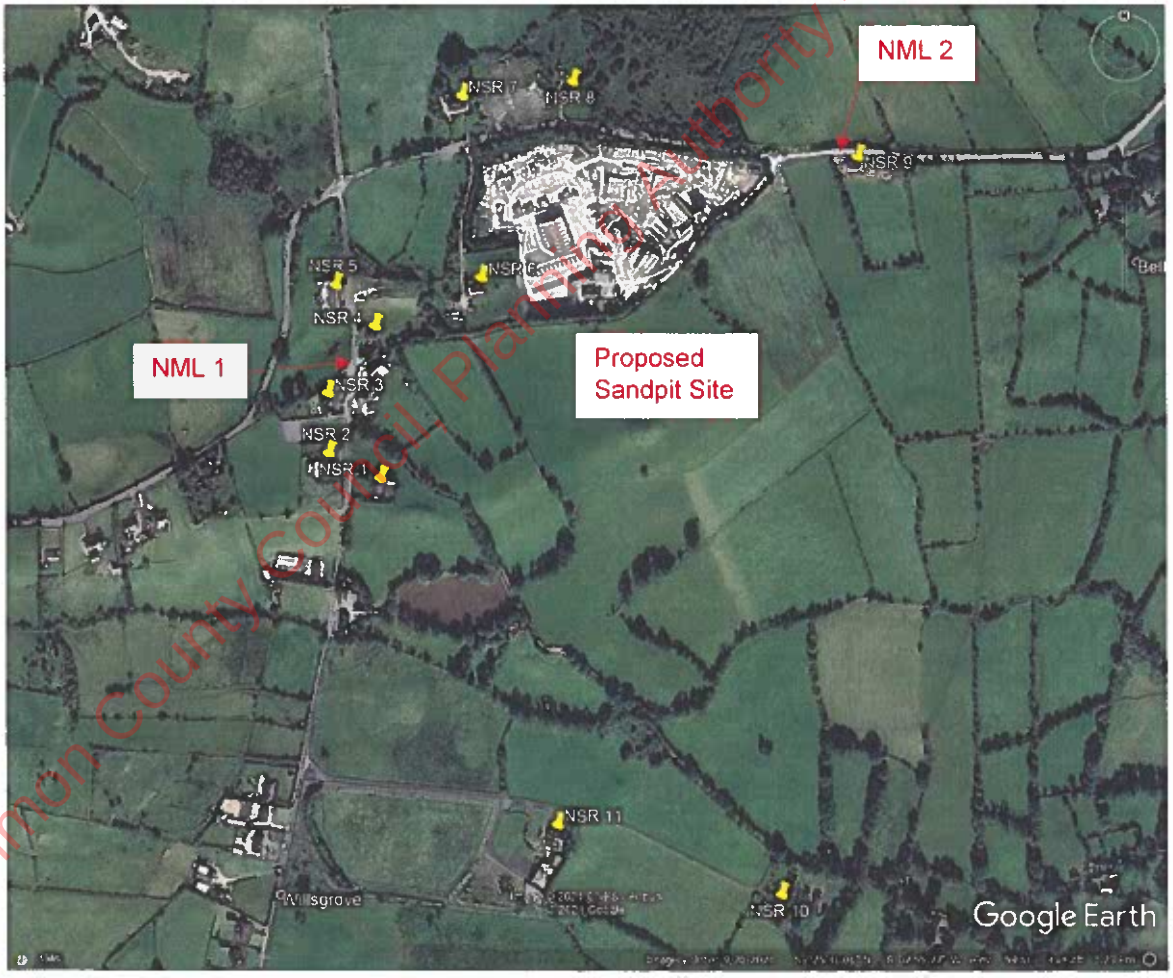
level parameter is representative of the existing continuous noise sources / activities from the Kildea Concrete products site.

The measured L_{A90} noise levels at NML 2 of approximately 35 dB L_{A90} indicate that the Kildea Concrete products site is not causing a significant noise impact at the nearest property to the north-east of the site, i.e. near to the proposed site access. The measured L_{A90} noise levels at NML 1 of approximately 49 dB L_{A90} was primarily influenced by passing road traffic, birdsong, and agricultural activities with the Kildea Concrete products not causing a significant noise impact at the nearest property to the west of the site.

Figure 10.1: Noise Monitoring Locations (NML) and Noise Sensitive Receivers (NSR) in proximity to the nearest residential properties to the Rooskagh sandpit site.



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10.4 Noise & Vibration Impacts

10.4.1 Construction Impacts

A short-term construction phase will include the construction of the proposed car parking and access road to the site as well as a small portable office. This phase of the development will last for no more than 3 - 6 months. The short-term construction phase will have a slight to minor noise impact as the area of the proposed access to the site is in excess of 220m from the nearest residential property and the construction works will be temporary in nature.

10.4.2 Predicted Noise Impact

A noise prediction model has been prepared to address the proposed extraction, development of the sandpit site including stockpiling operations and the results are presented in Table 10.5. It is expected that the number of years of operation will be approximately 10 years at an extraction rate of approximately 90,000 tonnes/year.

Noise levels have been predicted during periods when the excavation, mobile crushing & screening and loading & delivery operations are on-going in Phases 1 – 5 of the sandpit development. The predicted noise levels are indicative of continuous activity over a 1 hour period with an indicative location for the excavation, mobile crushing & screening and loading & delivery operations during each phase represented in the noise prediction models. From Phases 1 – 5, progressive sandpit face working locations have been modelled to show how the noise levels will change as the sandpit face progresses from phase to phase. The CadnaA noise model outputs are shown in Figures 10.2 – 10.6.

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Table 10.5: Predicted noise levels from the proposed the excavation, mobile crushing & screening and loading & delivery operations during each phase at the proposed Rooskagh sandpit site (See CadnaA Output Figures 10.2 – 10.6)

Name	Predicted Noise Level dB(A)				
	Phase 1 (Year 1 - 2)	Phase 2 (Year 2 - 4)	Phase 3 (Year 4 - 6)	Phase 4 (Year 6 - 8)	Phase 5 (Year 8 - 10)
NSR 1	35.3	36.5	37.3	38.6	45.3
NSR 2	31.2	32.4	33.4	37.5	44.1
NSR 3	31.4	32.5	33.3	38	45.3
NSR 4	36.3	37.3	38	40	47.8
NSR 5	35.6	36.3	36.8	39	46.2
NSR 6	40.3	41	42.8	50.1	50.7
NSR 7	43.1	43.8	43.8	44	44.2
NSR 8	45.4	45.3	45.1	45	44.9
NSR 9	48.9	48.5	48.3	48.1	48
NSR 10	32.8	32.9	36.4	39.4	38.7
NSR 11	32.4	33.4	34.3	35.4	37.6
DoEHLG Noise Limit	**55 dB(A)**				

As shown in Table 10.5, the predicted noise levels at the noise sensitive receiver locations due to the proposed excavation, mobile crushing & screening and loading & delivery operations during each phase are in accordance with a suggested noise limit of 55 dB(A) during the continuous activity over a 1 hour period. This noise level prediction includes an indicative location for the excavation, mobile crushing & screening, the loader & vehicle operations at the sandpit face and delivery of aggregates to the stockpiling area during each phase represented in the noise prediction models.

The maximum predicted noise level of 51.3 dB(A) at NSR 6 to the north of the site indicates that the cumulative noise from excavation, mobile crushing & screening, and loading operations will not have a significant noise impact at properties in proximity to the Rooskagh sandpit site relative to the DoEHLG noise limit of 55 dB(A) during daytime.

There will be no blasting undertaken on site and therefore, there will be no vibration or air-overpressure impact as a result of the operation of the sandpit.

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10.4.3 Cumulative Noise Impact

A cumulative noise impact at the nearest representative properties with the existing Kildea Concrete products site has been undertaken. The predicted cumulative noise level at the nearest representative properties NSR 4, NSR 6 and NSR 9 using the measured background noise level at NML 1 and NML 2 including noise from the active Kildea Concrete products site and the worst-case predicted noise level due to the proposed sandpit operations are as presented in Table 10.6. The predicted cumulative noise level at the nearest representative properties NSR 4, NSR 6 and NSR 9 is shown to be less than the DoEHLG Guidance limit value of 55 dB(A). At all other properties in the area a lower cumulative noise level will occur.

Table 10.6: Predicted cumulative noise level at NML 1 and NML 2 from the Kildea Concrete products site and the worst-case predicted noise level due to the proposed sandpit operations are as presented in

Location	Existing measured noise levels (influenced by Kildea Concrete site, road traffic, birdsong, and agricultural activities.	Predicted worst-case 1-hour noise levels due to proposed sandpit only	Cumulative 1-hour noise levels due to proposed sandpit & Kildea Concrete site only
NSR 4	~ 63 dB L_{Aeq} / 49 dB L_{A90} (measured at NML 1)	Phase 1 - 36.3 dB(A) Phase 2 - 37.3 dB(A) Phase 3 - 38 dB(A) Phase 4 - 40 dB(A) Phase 5 – 47.8 dB(A)	Phase 1 – 49.2 dB(A) Phase 2 – 49.3 dB(A) Phase 3 – 49.3 dB(A) Phase 4 – 49.5 dB(A) Phase 5 – 51.5 dB(A)
NSR 6	~ 63 dB L_{Aeq} / 49 dB L_{A90} (measured at NML 1)	Phase 1 – 40.3 dB(A) Phase 2 – 41 dB(A) Phase 3 – 42.8 dB(A) Phase 4 – 50.1 dB(A) Phase 5 – 50.7 dB(A)	Phase 1 – 49.5 dB(A) Phase 2 – 49.6 dB(A) Phase 3 – 49.9 dB(A) Phase 4 – 52.6 dB(A) Phase 5 – 52.9 dB(A)
NSR 9	~ 55 dB L_{Aeq} / 35 dB L_{A90} (measured at NML 2)	Phase 1 – 48.9 dB(A) Phase 2 – 48.5 dB(A) Phase 3 – 48.3 dB(A) Phase 4 – 48.1 dB(A)	Phase 1 – 49.1 dB(A) Phase 2 – 48.7 dB(A) Phase 3 - 48.5 dB(A) Phase 4 - 48.3 dB(A)

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		Phase 5 - 48 dB(A)	Phase ~~5 - 48.2 dB(A)~~
DoEHLG Guidance limit value		**55 dB(A) $L_{eq, 1\ Hour}$**	

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10.5 Mitigation Measures

The following mitigation measures will be employed to minimise operational impacts;

- Working hours during site operations will be restricted to daytime hours as outlined;
- An on-site speed limit will be enforced for all traffic. Drivers of vehicles will be advised of the speed limits through the erection of signs i.e. a typically recommended on site speed limit of 10 km/hr.
- Where practicable the use of quiet working methods will be selected and the most suitable plant will be selected for each activity, having due regard to the need for noise control.
- The sandpit operators will employ the best practicable means to minimise noise emissions and will comply with the general recommendations of BS 5228, 1997. To this end, the operators will use "*noise reduced*" plant and/or will modify their construction methods so that noisy plant is unnecessary.
- By positioning potentially noisy plant or operations as far as possible from noise sensitive receivers the transmission of sound can be minimised. For example, earth mounds and/or stacks of material can be used in such a way that they act as a physical barrier between the source and the receiver. Noise in the sandpit space will be attenuated by the sandpit sides.
- Vehicle reverse alarms will be silenced appropriately in order to minimise noise breakout from the site while still maintaining their effectiveness. All plant will be maintained in good working order. Where practicable, machines will be operated at low speeds and will be shut down when not in use.
- Employees working on the site will be informed about the requirement to minimise noise.
- It is recommended that should complaints be received from nearby residential properties periodic noise monitoring will be undertaken during works to determine noise levels at noise sensitive receivers. On the basis of the findings

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of such noise monitoring, appropriate noise mitigation measures should be implemented to reduce noise impacts. Where excessive noise exposure levels are recorded, further mitigation measures should be employed which may include temporary screening of the nearest receiver to on-site activities.

10.6 Noise Monitoring

Once operational, noise monitoring surveys will be undertaken at the Rooskagh sandpit site (if required). The noise monitoring surveys will be carried out to evaluate and assess that the noise impacts from the sandpit site activities will be in compliance with all relevant standards and in accordance with any relevant future Planning Conditions (subject to granting of planning permission).

The noise monitoring surveys will be conducted according to *ISO 1996-1, 2016 Acoustics – Description, Measurement and Assessment of Environmental Noise* and with reference to the 2016 EPA publication, *"Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4).*

No vibration monitoring surveys will be required.

10.7 Decommissioning Impacts

Should excavation and associated operations cease on the site, noise levels from de-commissioning of the structures on the Rooskagh sandpit site and / or the regrading of the benches in the extraction area will be short-term noise impacts. Such activities will be subject to a higher noise limit of 70 dB(A) as distinct from normal site operations. Such activities may include overburden removal, bund de-construction, restoration works, de-commissioning of plant and equipment, etc. Typically, such works will be carried out during an 8 week window per annum.

10.8 Conclusions

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Baseline noise monitoring surveys have been undertaken in proximity to the Rooskagh sandpit site. The noise monitoring data and subjective notes indicate that the existing noise levels are influenced by the existing Kildea Concrete operations, road traffic, birdsong and agricultural activities.

The potential noise impacts from the proposed sandpit activities and the associated operations in the Rooskagh sandpit site have been assessed using noise prediction modelling. The assessment indicates that the specific noise levels from the proposed sandpit activities including the associated stockpiling and vehicle movement operations will not give rise to any significant environmental impact and cumulatively do not exceed the guideline noise limit provided for in the DoEHLG 2004 guidance.

The predicted cumulative noise level at the nearest representative properties from the proposed operations at the sand and gravel quarry together with the existing Kildea Concrete products site has been shown to be less than the DoEHLG Guidance limit value of 55 dB(A).

The proposal for noise monitoring surveys to commence at the Rooskagh sandpit site (subject to the grant of planning permission) will ensure that the sandpit site activities will be operated in compliance with all relevant standards such as the DOEHLG 2004 recommended levels and in accordance with any relevant future Planning Conditions.

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CHAPTER 11

MATERIAL ASSETS

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MATERIAL ASSETS

11.1 INTRODUCTION

This Chapter examines the effects of the proposed development on material assets. The proposed development is described in detail in Chapter 2 and these chapters should be read in conjunction with each other. The proposed development includes the excavation, processing and transport of sand and gravel and construction materials within the site and externally. The excavation level will not go below 49.0-51.0 OD. A settlement lagoon and a WWTP (storage only) will be the primary designed treatment systems with the site.

11.2 SCOPE OF EXAMINATION

The EPA Advice notes describe material assets in the following matter – " Resources that are valued and that are intrinsic to specific places are called material assets. They may be of either human or natural origin and their value may arise for either economic or cultural reasons". The Planning and Development Regulations 2001-2020 include architectural, archaeological and cultural heritage as material assets. The EPA guidelines describe material assets as built services and infrastructure. The following are examined separately in this report, Chapters 12 Cultural Heritage and Chapter 14 Traffic have already examined these issues and they need not be considered further in this chapter. This section will assess the impacts on the following infrastructure – electricity/ telecommunications, gas, water, sewerage and waste management. Consultation was not undertaken as part of this process. The Author of this section is Mr. Stephen Boyd Chartered Engineer who has over 20 years' experience in designing and delivering infrastructure projects. There were no difficulties encountered in completing this chapter.

11.3 REGULATORY BACKGROUND

This chapter had regard to the Draft Guidelines on the Information to be contained in EIAR (EPA 2017). The study area is the vicinity of the proposed quarry. The desk top study used published information, knowledge of the applicant, the other sections of the EIAR and publicly available mapping. The sources of information include –

Roscommon County Development Plan 20140-2020

Draft Roscommon County Development Plan 20212-2027

My Plan.ie

OSI Maps including environmental layers

Environmental chapters of EIAR

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11.4 SITE DESCRIPTION

The application site is located to the west of Bellanamullia (Bealnamulla) off the L2025 in the townland of Rooskagh. The area is characterised by dispersed rural housing with a tendency towards ribbon development along the L2025 and L2026 in the vicinity. There is a dwelling and a concrete batching plant immediately towards the north of the site. There is a primary school 1.3km to the east of the site. The site is bounded by agricultural lands in the ownership of the applicant to the south, east and west.

11.5 BUILT SERVICES

The site can be readily serviced with electricity, there is a supply to the adjoining sites to the north. There is good mobile phone and broadband coverage in the area and these will be available to the proposed development. There is an existing water supply on site which is adequate to supply the proposed service buildings in the proposed development. There are existing private sewage treatment plants on the lands to the north, it is unlikely that the proposed development will affect their operation.

11.6 WASTE MANAGEMENT

There will not be any waste arising from the direct extraction of material from the proposed development. The topsoil will be stored on site for future reuse and restoration. All the remaining materials have some commercial value and will be sold for use off site.

All waste generated indirectly from the extraction processes such as batteries, oil filters, obsolete or broken-down plant, and waste generated from the office and canteen will be stored securely on site prior to collection by an approved waste collection agent. The generation of waste will therefore be temporary (duration of extraction) and slight in their effects on the environment. Following restoration, it is expected there will not be any effects from waste generated.

11.7 UNPLANNED EVENTS

This section should be read in conjunction with section 4.17 and its contents and conclusions are relevant to this chapter. There is no need to repeat them here aside from reference to adherence to HSA Quarry Safety Guidelines SHWW Quarries Regulations 2008 which should reduce the risk from instability of excavation and separation distances should offer protection to the integrity of roads and existing services.

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11.8 CUMULATIVE IMPACTS

An examination of the planning register over the last 5 years indicates that there is a proposal to build a large solar farm to the south of the proposed development (Application No. 20/36). It is unlikely that the construction or operation of the solar farm will suffer any adverse impacts from the proposed quarry. The existence of the quarry could have positive impacts on the construction of the farm due to its proximity as a source for construction materials. The other proposed developments comprise small scale residential development (mostly extensions) which are remote from the immediate vicinity of the quarry. The major impacts from the proposed development on material assets arise from traffic, this is examined in detail in chapter 14.

11.9 MITIGATION MEASURES

There are no significant impacts on built assets or waste management related to this proposed development that have not been mitigated elsewhere (refer chapter 14 – Traffic). There are no mitigation measures proposed.

11.10 RESIDUAL IMPACT ASSESSMENT

There are no residual impacts anticipated on the built assets or wasted management arising from the proposed development.

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CHAPTER 12

CULTURAL HERITAGE

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12. CULTURAL HERITAGE

12.1 Introduction

Cultural Heritage is defined by UNESCO as "the legacy of physical artefacts and intangible attributes of a group or society that are inherited from past generations, maintained in the present and bestowed for the benefit of future generations" (www.unesco.org/new/en/cairo/culture/tangible-cultural-heritage).

The Heritage Act (1995) contains a list of various aspects of heritage, including archaeological monuments and objects, architectural heritage, fauna, flora, geology, heritage gardens and parks, heritage objects, inland waterways, landscapes, monuments, seascapes, wildlife habitats, and wrecks.

In terms of the present project, Cultural Heritage is assumed to include all humanly created features on the landscape, including portable artefacts, which might reflect the prehistoric, historic, architectural, engineering and/or social history of the area.

12.1.1 Definition of Study Area

The subject development lands and an area of 500m surrounding such lands were determined to be the Study Area for Cultural Heritage. The extent of the Cultural Heritage Study Area was chosen to reflect an appropriate context for the development, beyond which it was considered that a development of this nature would have no direct/indirect impacts.

12.1.2 Assessment Methodology

The Cultural Heritage components of the study comprise the results of a survey and evaluation of selected sites of archaeological and architectural heritage architectural potential within, and in the immediate environs of, the proposed development area. The work generally consists of the results of a paper survey and field inspection. In addition, in terms of Archaeological Heritage, a programme of intrusive Archaeological Testing was undertaken (see Sections 12.3.2.5 and Appendix 12.2).

2.1.2.1 Paper Survey

As part of a documentary/cartographic search, the following principal sources were examined from which a list of sites and areas of Archaeological Heritage interest/potential was compiled:

- Record of Monuments and Places – Co. Roscommon (RMP)
- Sites and Monuments Record of the Archaeological Survey of Ireland (SMR) – www.archaeology.ie
- Topographical Files of the National Museum of Ireland
- Archaeological Excavations Summaries – www.excavations.ie
- Heritage Council Heritage Maps & Data – www.heritagemaps.ie

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- Historic maps and Aerial Photographic Archive of Ordnance Survey Ireland (OSI) – www.osi.ie
- National Inventory of Architectural Heritage (NIAH) – www.buildingsofireland.ie
- Documentary and cartographic source material (see Appendix 1)
- Roscommon County Development Plan 2022-2028 (RCDP)
- Heritage Council Data – www.heritagemaps.ie

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13.1.2.2 Site Inspection

A preliminary detailed field survey was undertaken in mid-April 2021, with a further inspection carried out in early-May 2021. These entailed a surface reconnaissance of the subject lands and inspections of the surrounding lands, where possible.

An attempt was also made to identify previously unrecorded sites of cultural heritage potential within, and in the immediate environs of, the proposed development area.

Sites/features of cultural heritage potential identified on the basis of the paper survey were inspected in an attempt to confirm their locations on the ground and to determine, if possible, their likely extent.

12.3 Receiving Environment

12.3.1 General Historical Background

The subject development site forms parts of the townland of Rooskagh, in the civil parish of St. Peters and barony of Athlone South (O.S. 6-inch map: Roscommon Sheet 51). The *Placenames Commission* (www.logainm.ie) notes that the Irish form of the townland name has yet to be confirmed although the *Ordnance Survey Parish Notebooks* (1837) state that it may derive from *Rüscadh* – 'ferny or marshy land'.

Evidence of prehistoric activity in the general region commences in the Neolithic period (*c.* 4000 BC – 2400 BC); such evidence includes the discovery of stone axe-heads from the River Shannon at Athlone, remains of a Megalithic/Portal Tomb at Mihanboy (SMR No: RO053-001). Bronze Age (*c.* 2400 BC – 500 BC) weapons and ornaments have been recovered from the Shannon at Athlone and excavations in advance of the construction of the Athlone – Ballinasloe section of the M6 revealed remains of a Fulacht Fiadh (SMR No: 052-032001), a Ring-Ditch (SMR No: 052-032001) and structural activity (SMR Nos: RO052-032002 & -032004) in the townland of Ardagawna (www.archaeology.ie; www.excavations.ie). Evidence for the Iron Age activity in the region is scant and is largely evident on some artefactual material from the Shannon at Athlone; pipe trench excavations at Bealnamulla exposed a layer of ash, charcoal and burnt soil which was completely excavated (Licence No:99E0014; M Byrne) and produced a C14 date of 335-290 BC (www.excavations.ie: 2000-773; 2002-861).

In the early medieval period, the area of county Roscommon formed part of the *Cóiced Ol nEchmacht*, which may be translated as the 'portion/fifth/province of the *Ol nEchmacht*',

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later described as the 'Kingdom of Connacht'. By A.D. 800 the Delbna Nuadat, a subject tribe of the Uí Maine of south Roscommon, was dominant in the region. Ringforts are indicative of secular settlement activity from around this period, while an ecclesiastical enclosure (SMR: 051-065003) and a holy well (SMR No: 051-066) at Drum may represent evidence for the introduction of Christianity to the region.

County Roscommon as an administrative division has its origins in the later medieval period. With the conquest and division of the 'Kingdom of Connacht' the Anglo-Normans, those districts in the east, comprising present County Roscommon and part of East Galway, were retained by King John and known as 'The King's Cantreds'.. These districts were leased to the native kings of Connacht and eventually became the county. The Uí Cheallaigh (O'Kelly; 'lords of Uí Maine'). In 1585 during the Tudor re-establishment of counties under the 'Composition of Connacht', Roscommon was established with the south-west boundary now along the River Suck. At this time the county was subdivided into six baronies; the barony of Athlone was created from the earlier medieval cantred of Tyrmany (Tír Maine) and was known by the English administration as O'Kellys Country and was divided into Athlone North and Athlone South after 1871 (Ó hAisbéil, 2018, 164).

By 1640 the lands in the barony had become more fragmented and, as well as the O'Kellys, the area was dominated by disjointed landholdings of the O'Fallons and O'Naughtons. Simmington (1949, 92) notes that in 1641 the lands at Russkagh were owned by Lord Wilmot but leased to Thomas Moidoon and described a 'carton' containing 125 plantation acres of profitable lands and 24 plantation acres of unprofitable land. The extent of the 'cartron' is indicated on the Civil Survey parish map of 1656-8 as plot 57 (**Figure 12.1**) and the associated 'terrier' describes that lands as comprising arable and woody pasture. The 1659 census records sixteen English and Lord Ranelagh is recorded as the owner in 1670 (www.downsurvey.tcd.ie).

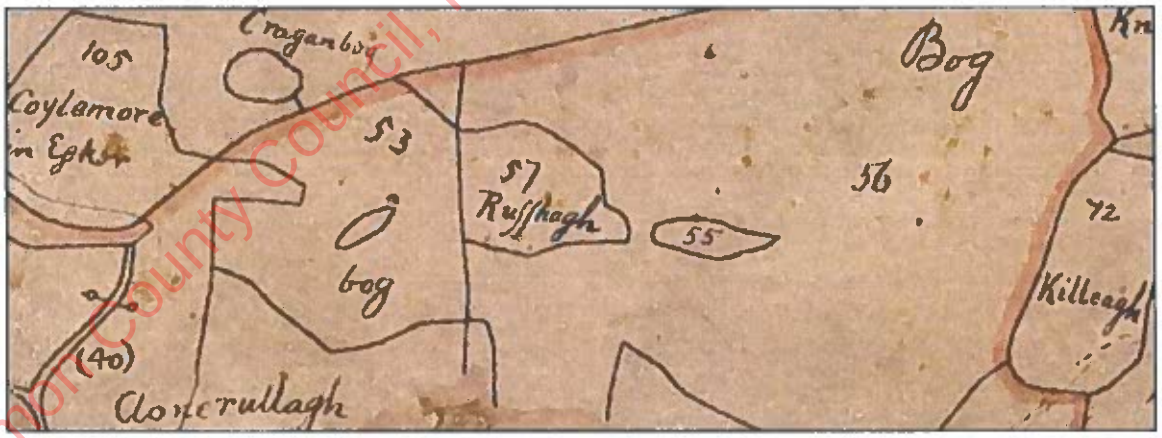

Figure 12.1 Extract from Civil Survey Map of 1656-8

Very little is recorded about the area in the eighteenth century although the road infrastructure is partially indicated by Taylor and Skinner (1777; **Figure 12.2**).

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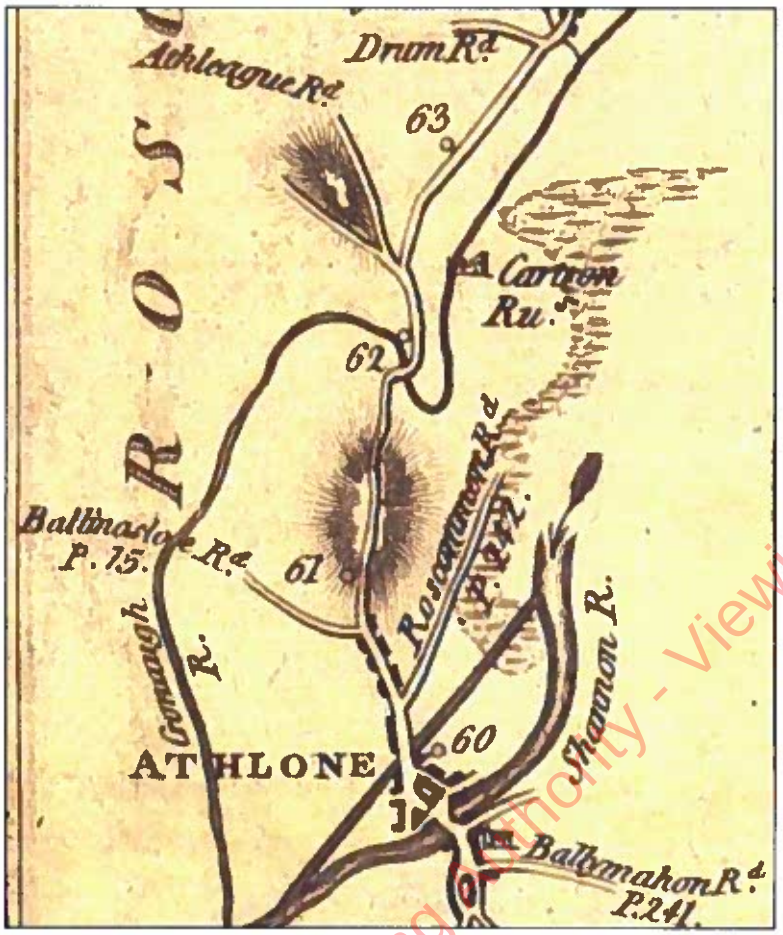

Figure 12.2 Extract from Taylor & Skinner, 1777 (Sheet 77)

Neither Griffiths map of 1814 (**Figure 12.3**), prepared for inclusion in the *Fourth Report of the Bog Commissioners [of Ireland] 1814*, and Griffiths Grand Jury Map of 1817 (**Figure 12.4**) name the modern settlement of Bealnamulla but do indicate Newtown, a small clachan-type settlement to the south, and east of the proposed development lands; in addition, both indicate that the existing overgrown laneway immediately outside the northern boundary to the site acted as a local road at this time.

Figure 12.3 Extract from Griffith - 1812

Figure 12.4 Extract from Griffith - 1817

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The Ordnance Survey map of 1837 indicates the settlement at Newtown and the settlement at Bealnamulla remains unnamed at this time (**Figure 12.5**); it also indicates a road positioned immediately outside the northern extent of the proposed development site. An enlarged extract from the 1837 map (**Figure 12.6**) indicates two structures (house and outbuilding?) in the north-eastern corner of the site and within a small field; a small section of the north-eastern site boundary, together with the entire length of the western boundary had been established by this time and a trackway is indicated leading through the western area of the site from the road to the north.

Figure 12.5 Extract for Ordnance Survey Map of 1837

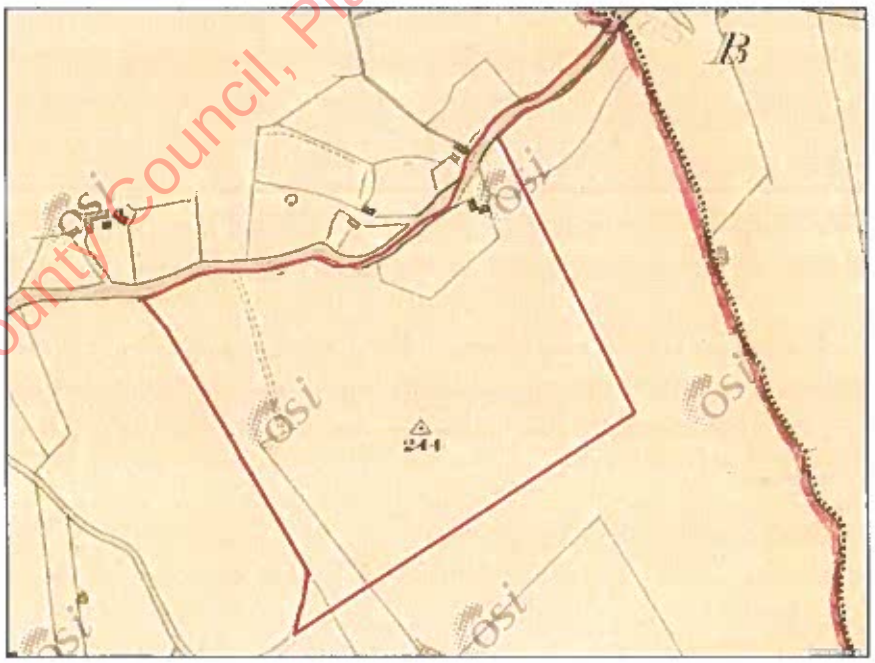

Plate 12.6 Enlarged Extract from Ordnance Survey Map of 1837 illustrating details of site

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Lewis (1837, 85 – 88) notes that "the living of St. Peter's [parish] is a perpetual curacy, in the diocese of Elphin, and in the patronage of the Bishop. The church, which is situated on the site of the ancient monastery of St. Peter {Athlone Town], was built in 1804, by aid of a gift of £500, and a loan of £300, from the late Board of First Fruits, and has been recently repaired by a grant of £344 from the Ecclesiastical Commissioners. The glebe-house was built at the same time by a loan of £312 and a gift of £100 from the same Board; the glebe comprises six acres, in three lots near the church…In the R. C. divisions the parish of St. Peter is united with that of Drum, and contains three chapels, besides a small religious house of the Augustinian order, now falling into decay".

The British Parliamentary Papers (1853) note that the population of Rooskagh in 1841 was 361 (178 males and 183 females) and that there were 68 inhabited houses; the 1851 population had decreased to 233 (128 males and 105 females), with 45 inhabited houses and a further 4 uninhabited.

Griffith's Valuation of 1858 (www.griffiths.askaboutireland.ie) notes that much of the lands at Rooskagh were owned by The Incorporated Society For Promoting Protestant Schools in Ireland, with the subject development lands forming part of a lager landholding leased by Michael Hannon; comprising 51 acres and 2 roods and including an office (outbuilding); the latter description indicates that one of the structures indicated in the 1837 map (**Figure 12.6** above) had either been removed or fallen into disrepair by this time.

The British Parliamentary Papers (1881, 301-2) state that the townland of Rooskagh had been leased by middlemen until 1850 when they came into the ownership of The Incorporated Society for Promoting Protestant Schools in Ireland upon termination of the leases. At this time the lands were found to be densely populated by "a wretchedly poor tenantry and the lands permanently injured by the repeated burning of the surface"; the 57 tenants were subsequently reduced to 35, the removed tenants "having been kindly and generously dealt with by the Society, and the lands rearranged amongst the remaining tenantry. There was great difficulty in having these arrangements carried out. The reluctance of the tenants to take land from which the former occupants had been dispossessed had to be overcome, and no doubt the lands were let at that time much below their value, and have remained so ever since. There are some very remarkable contrasts between the rent paid and the Poor Law valuation; for instance, Michael Hannon holds 96A, 1 R, 0P paying £39, 1*s,* 4*d,* the Poor Law valuation being £54, 5*s*". Hannon's lands, including that of the proposed development site, are described as being of "fair average quality". The Report describes the townland as having a "valuable tract of bog of 480 acres, much of which is very reclaimable…and there is a good fall for drainage and limestone and marl abound"; it also notes the Society had constructed some useful roads.

The 1892 Ordnance Survey 25-inch map (**Figure 12.7**) indicates a new public road to the north of the lands, largely replacing that positioned outside the northern site boundary and which had been realigned in the years following 1837; it is likely that the randomly-coursed, rubble-stone wall, with rubble coping, along the northern boundary was constructed by this time; the wall incorporates an entrance flanked by two rubble-stone piers with rubble

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pyramid-shaped capping and including a simple iron gate, probably made in a local forge (**Plate 12.1**). The map indicates that the northern section of the eastern site boundary, the western section of the southern boundary and the central internal boundary had been established by this time and that only one structure is indicated in the north-eastern corner.

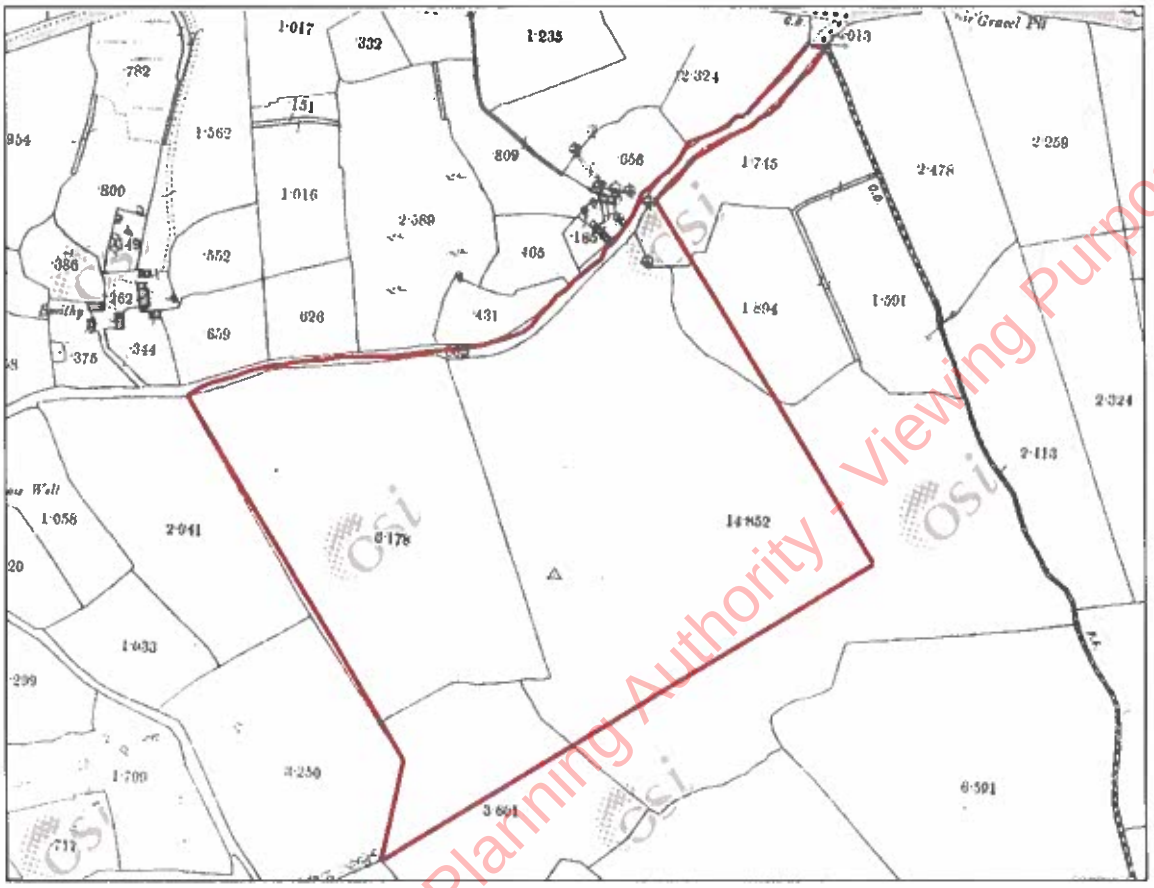

Figure 12.7 Extract from O.S. (25") map of 1892

Plate 12.1 Remains of late-19th century entrance along wall forming northern site boundary

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The Ordnance Survey map of 1915 (**Figure 12.8**) indicates that the structure in the north-eastern corner of the site had been removed by this time and that the eastern section of the southern boundary had been extended a little further eastwards; a contour-line is also illustrated within the eastern area of the site.

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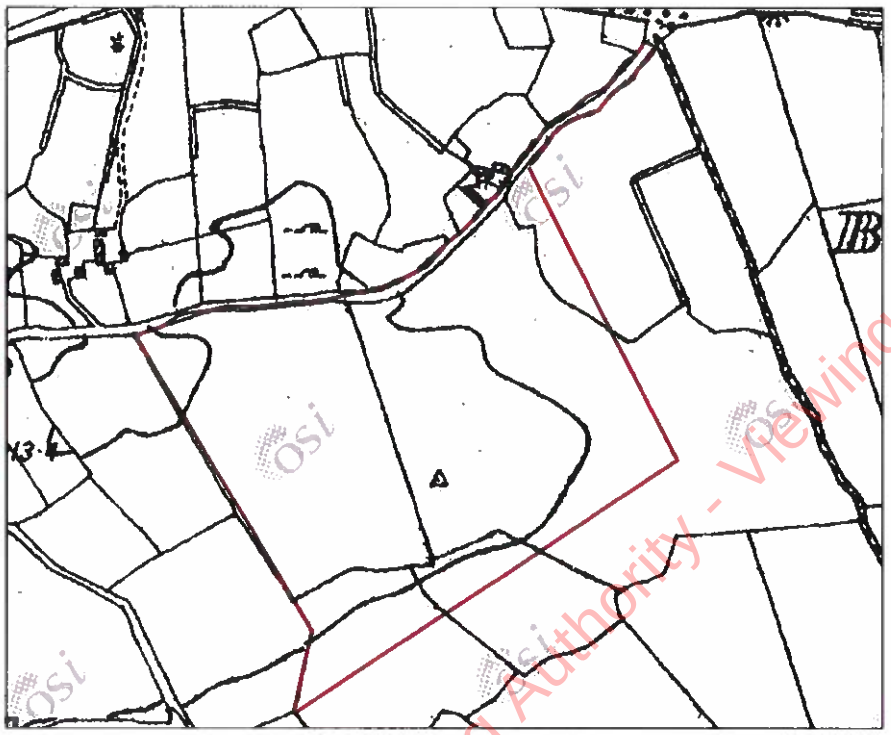

Figure 12.8 Extract from Ordnance Survey map of 1915

The laneway to the north of the site has fallen into disuse and is largely overgrown. In more recent times, the central field boundary has also fallen into disuse and stands to a general height of *c.* 30cm, while a concrete–making facility has been established to the north.

12.3.2 Archaeological Heritage

Archaeology is the study of past societies through their material remains and the landscapes they lived in. "The archaeological heritage consists of such material remains (whether in the form of sites and monuments or artefacts in the sense of moveable objects) and environmental evidence" (DoAHG 1999, p9).

Archaeological heritage comprises all material remains of past societies, with the potential to enhance our understanding of such societies. It includes the remains of features such as settlements, burials, ships and boats and portable objects of all kinds, from the everyday to the very special. It also includes evidence of the environment in which those societies lived. The terms "site" or "monument" are used generally to refer to fixed structures or areas of activity, as opposed to particular moveable objects. Historic wrecks are also part of the archaeological heritage (DHLG&H, 2021, 3).

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12.3.2.1 Statutory Protections

The statutory and administrative framework of development control in zone of archaeological potential or in proximity to recorded monuments has two main elements:

(a) Archaeological preservation and licensing under the National Monuments Acts and
(b) Development plans and planning applications under the Planning Acts.

12.3.2.1.1 National Monuments Acts

Section 12 (1) of the National Monuments (Amendment) Act, 1994 provides that the Minister for the Environment, Heritage and Local Government shall establish and maintain a record of monuments and places where the Minister believes there are monuments, such record to be comprised of a list of monuments and relevant places and a map or maps showing each monument and relevant place in respect to each county of the State. This is referred to as the 'Record of Monuments and Places' (RMP), and monuments entered into it are referred to as 'Recorded Monuments'.

Section 12(3) of the National Monuments (Amendment) Act 1994 provides for the protection of monuments and places in the record, stating that

"*When the owner or occupier (not being the Minister) of a monument or place which has been recorded under subsection (1) of this section or any person proposes to carry out, or to cause or permit the carrying out of, any work at or in relation to such monument or place, he shall give notice in writing of his proposal to carry out the work to the Minister and shall not, except in the case of urgent necessity and with the consent of the Minister, commence work for a period of two months after having given the notice.*

12.3.2.1.2 Roscommon County Development Plan 2022 - 2028

The following Archaeological Heritage Policy is set out in Section 9.7 of the Plan:

Policy BH 9.13	It is a policy objective of Roscommon County Council to: Secure the preservation (i.e. preservation in situ or, as a minimum, preservation by record) 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 securing such preservation Roscommon County Council will have regard to the advice and recommendations of the National Monuments Section of the Department of Housing, Local Government & Heritage.

12.3.2.2 Archaeological Inventory

There are no previously identified monuments located within, or in the immediate environs of, the subject development lands and no surface traces of archaeological potential were

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noted by a review of historic cartographic or aerial photographic sources or by a surface reconnaissance survey.

The closest archaeological monument/site to the extent of the lands is a Cist (SMR No: RO051-105; Creagh Td), located approx. 310m to the south; in addition there is a Redundant Record site (SMR No: RO051-020) located approx. 245m to the south – **Figure 12.9.** Neither of these monuments is included in the RMP, which was published for County Roscommon in 1997.

These are described as follows (from www.archaeology.ie):

RO051-105; Creagh Td; Cist
This is located on a rise in a low-lying undulating landscape; it was at one time close to the NW angle of a field and was preserved during land reclamation. This is a rectangular feature (dims 1.2m E-W; 1.1m N-S) defined by a stone at E (dims 1.2m N-S; 0.25m E-W; H 0.6m) and N (dims 0.8m E-W; 0.2m N-S; H 0.4m), and drystone walling at S. It is surrounded by an overgrown spoil mound (dims c. 8m E-W; c. 5m N-S; H c. 1m) [Date of upload: 24 August 2010}.

RO051-020; Creagh Td; Redundant Record
This is marked only on the 1915 ed. of the OS as a line of hachures (C c.30m E-SW) representing the scarping of the hillslope [Date of upload: 24 August 2010].

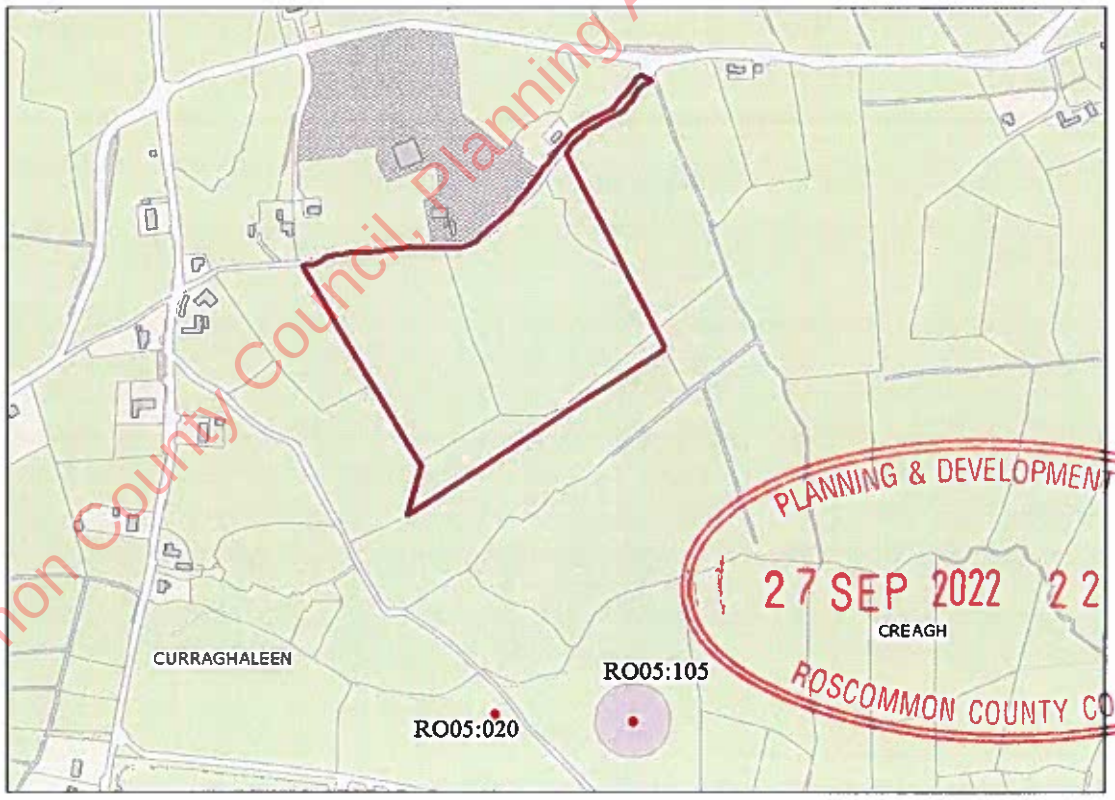

Figure 12.9 Locations of Archaeological Monuments within defined Cultural Heritage Study Area

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12.3.2.3 Archaeological Artefacts

No 'stray' artefacts are listed in the Topographical Registers of the National Museum of Ireland, as having been discovered from the site or immediate environs.

12.3.2.4 Results from previous documented relevant archaeological investigations

A search undertaken of the annual Archaeological Excavations Bulletin (www.excavations.ie) noted that no archaeological investigations have been reported as having been undertaken within the proposed development lands or wider Cultural Heritage Study Area.

12.3.2.5 Results of Archaeological Testing

A programme of Archaeological Testing was undertaken within the general extent of the proposed development lands in early May 2021; such testing was undertaken under licence (Ref: 21E0344) from the Department of Housing, Local Government and Heritage.

A total of seventeen test trenches were excavated within the general extent of the site, the locations of which are illustrated below in **Figure 12.10**. The locations of the trenches were largely based on the existing topographical nature of the site. All the trenches were 1.8m wide and their respective lengths were as follows:

Trench No.	Length	Trench No.	Length
T1	160m	T10	100m
T2	60m	T11	120m
T3	60m	T12	90m
T4	50m	T13	130m
T5	50m	T14	110m
T6	70m	T15	120m
T7	140m	T16	130m
T8	140m	T17	160m
T9	120m		

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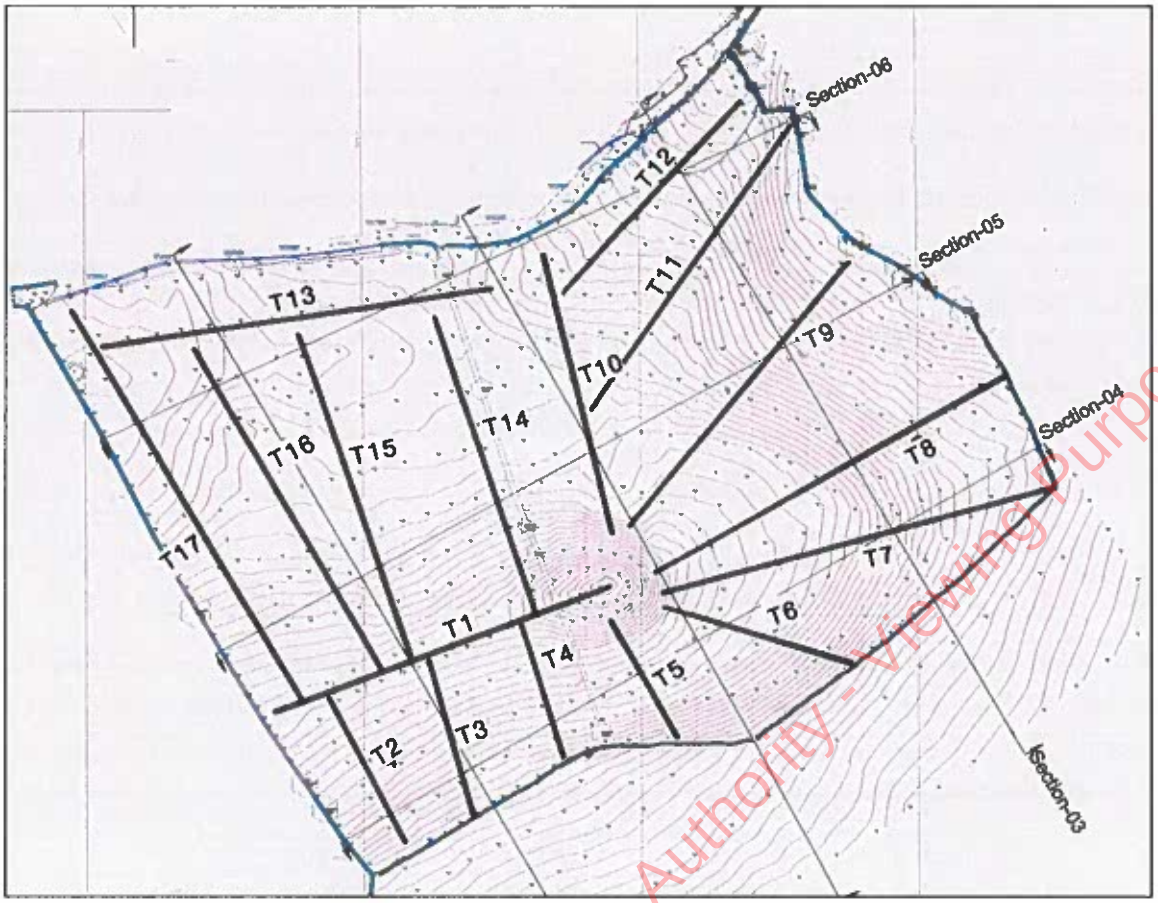

Figure 12.10 Centre-line Locations of Archaeological Test Trenches

A detailed account of the testing programme is included in Appendix 12.2. In summary, the results from the trenches were largely similar. The topsoil comprised moderately compact mid-brown silty clay, with moderate pebbles and cobbles dispersed randomly throughout; it was 100mm – 350mm in depth (deepest along northern, southern and eastern bases of sloping ground). For the greater area of the site, this lay directly upon firm, naturally-derived' orange/brown gravelly sandy-clay, grey gravelly sandy-clay, grey sand or orange/brown sand, all representing geologically-derived subsoils ; the topsoil lay upon light orange/brown or light grey firm marly clays in the north-western area of the site

No subsurface features of archaeological interest/potential were uncovered. Visual inspections of the topsoil during excavation and subsequent raking-through of the spoil did not result in the recovery of any artefacts of interest

12.3.3 Architectural Heritage

Architectural heritage has several definitions and meanings for people. A useful rule of thumb (which is actually the legal situation) is set out in the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999 which provides the following definition:

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(a) Structures and buildings together with their settings and attendant grounds, fixtures and fittings,

(b) Groups of such structures and buildings, and

(c) Sites, which are of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

12.3.3.1 Roscommon County Development Plan 2022-2028

Section 51 of the Planning and Development Act, 2000 (as amended) requires the Development Plan to include a record of structures. These structures form part of the architectural heritage of the County and are to be protected. The Council has drawn up this list, referred to as the Record of Protected Structures (RPS). The RPS is a section of the Development Plan in which each structure is given a reference number.

There are no structures listed in the RPS of the Development Plan as being located within the extent of the proposed development lands or in wider Cultural Heritage Study Area.

12.3.3.2 National Inventory of Architectural Heritage (NIAH)

The National Inventory of Architectural Heritage (NIAH) is a state initiative under the administration of the Department of Culture, Heritage and the Gaeltacht. It was established on a statutory basis under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. Its purpose is to identify, record, and evaluate the post-1700 architectural heritage of Ireland, uniformly and consistently as an aid in the protection and conservation of the built heritage. It is intended that the NIAH will provide the basis for the recommendations of the Minister for Culture, Heritage and the Gaeltacht to the planning authorities.

There are no structures identified by the NIAH as being located within the extent of the proposed development lands or in the wider Cultural Heritage Study Area.

12.4 Identification of Likely Significant Impacts

12.4.1 Impact Criteria

The following Table 12.1 (based on NRA, 2003, 21) provides the baseline criteria used to describe the impacts that the proposed development will have on Built Heritage Sites (Archaeological and Architectural Heritage).

	Direct	Indirect
Severe	Built Heritage site is within a proposed development area. Construction work will entail the removal of part or the entire	Built Heritage site is within a proposed development area. Construction works will entail the destruction of the visual context of

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	cultural heritage site.	the site or isolate it from associated groups or features.
Potentially Severe	Built Heritage site is adjacent to a proposed development area. There is potential for related remains being affected by development works.	Built Heritage site is adjacent to a proposed development area. Construction works will greatly injure the visual context of the site or isolate it from associated groups or features.
Moderate	Existing access to a built heritage site will be severed. Development works will affect the context of a cultural heritage site.	N/A
No Predicted	The proposed development will have no predicted impact.	N/A

Table 12.1 Criteria for Impact Assessment (Built Heritage)

12.4.2. Local History

The general historical background to the subject development area was introduced above in Section 12.3.1. In summary, there are no significant historical events associated with the proposed development lands which have the ability to be impacted upon by the proposed development.

It is noted that the existing late-nineteenth century boundary wall and former entrance feature, forming much of the northern site boundary, together with the overgrown former late-eighteenth/early-nineteenth century laneway positioned immediately outside the northern site boundary, will be retained as part of the development proposals.

Consequently, given the above, it is considered that in terms of Local History, no impacts of any significance are likely to occur as a result of the development proposals.

12.4.3 Archaeological Heritage

There are no previously identified monuments or features of archaeological interest located within, or in the immediate environs of, the subject proposed development lands, as noted above in Section 12.3.2 2, and no surface features of potential were noted by cartographic and aerial photographic interest or by a comprehensive surface reconnaissance survey of the subject lands and immediate environs. The closest archaeological monument/site to the extent of the lands is a Cist (SMR No: RO051-105; Creagh Td), located approx. 310m to the south; in addition there is a Redundant Record site (SMR No: RO051-020) located approx. 255m to the south – **Figure 12.9**. Neither of these monuments is included in the RMP, which was published for County Roscommon in 1997.

A programme of Archaeological Testing was undertaken within the greater extent of the subject proposed development lands in early-June 2021, as summarised above in Section 12.3.2.5 and described in Appendix 12.1. A total of seventeen test trenches, varying in length

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from 50m – 160m were excavated within the extent of the site. In summary, the results from the trenches were largely similar. The topsoil comprised moderately compact mid-brown silty clay, with moderate pebbles and cobbles dispersed randomly throughout; it was 100mm – 350mm in depth (deepest along northern, southern and eastern bases of sloping ground). For the greater area of the site, this lay directly upon firm, naturally-derived' orange/brown gravelly sandy-clay, grey gravelly sandy-clay, grey sand or orange/brown sand, all representing geologically-derived subsoils ; the topsoil lay upon light orange/brown or light grey firm marly clays in the north-western area of the site

No subsurface features of archaeological interest/potential were uncovered. Visual inspections of the topsoil during excavation and subsequent raking-through of the spoil did not result in the recovery of any artefacts of interest

Given the above, it is considered that the subject proposed development lands are of very low/negligible archaeological potential and it is predicted that the proposed development will not cause any impacts with respect to any features or monuments of archaeological heritage interest.

12.4.4 Architectural Heritage

As noted above in Sections 12.3.3.1 and 12.3.3.2, there are no structures listed in the Record of Protected Structures (RPS) of the Roscommon County Development Plan 2022-2028 or by the National Inventory of Architectural Heritage (NIAH) as being located within the site or wider Cultural Heritage Study Area.

Given the above, it is predicted that the proposed development will not cause any impacts with respect to any structures or features of architectural heritage interest.

12.5 Do Nothing Scenario

In terms of Cultural Heritage, in the event that the subject lands are not developed they will remain in agricultural use. Given the historical, archaeological and architectural heritage of the landholding, as described above in Section 13.4, no impacts in these respects will occur as a result of the development not proceeding.

12.6 Mitigation Measures

As discussed above in Section 13.4, it is considered that the development of the subject lands will not cause any impacts (direct, indirect/visual) to any monuments, structures or features of archaeological or architectural heritage interest or potential; likewise there are no significant historical events associated with the lands. Consequently it is not considered necessary to propose any mitigation measures.

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Character of potential impact	Mitigation measure
None in terms of Local History	No mitigation measures considered necessary
None in terms of Archaeological Heritage	No mitigation measures considered necessary
None in terms of Architectural Heritage	No mitigation measures considered necessary

Table 12.2 Table of Mitigation Measures

12.7 Residual Impacts

As noted above in Section 13.4, it is considered that the development of the subject site will not cause any impacts (direct, indirect/visual) to any monuments, structures or features of archaeological or architectural heritage interest or potential; likewise there are no significant historical events associated with the lands. Consequently, in terms of overall Cultural Heritage, it is considered that no Residual Impacts will occur as a result of the development proceeding as proposed.

12.8 Cumulative Impacts

The cumulative impact of the proposed development of the subject site, together with the proposals for the sites, as well as other existing and/or approved developments in the area was assessed by taking into account the existing baseline environment and the predicted impacts of this and other approved developments in the area. In addition, the cumulative effect of the development of the entire masterplan lands north of the Enfield Relief Road was considered.

It is not envisaged that any negative cumulative effects will occur with respect to Cultural Heritage assets as a results of the development of the subject site proceeding as proposed.

12.9 Interactions Arising

It is considered that the development will not have any impacts with respect to overall Cultural Heritage. Consequently, there will be no interactions with any other aspects of the environment.

12.10 Monitoring

It is not considered necessary that any monitoring is required at any stages of the proposed development.

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APPENDIX 12.2
ARCHAEOLOGICAL TESTING REPORT

Introduction
This report describes the results of a programme of Archaeological Testing undertaken with respect to a proposed quarry pit development on lands at Rooskagh, Bealnamulla, Co. Roscommon.

Requirement for Assessment
A Pre-Planning Scoping Submission made to Roscommon County Council resulted in a determination that a programme of Archaeological Testing should be undertaken as part of the Cultural Heritage element of the EIAR

Results of Archaeological Testing
A total of seventeen test trenches were excavated within the greater extent of the site, the locations of which are illustrated below in Figure 12.A. The locations of the trenches were largely based on the existing topographical nature of the site. All the trenches were 1.8m wide and their respective lengths were as follows:

Trench No.	Length	Trench No.	Length
T1	160m	T10	100m
T2	60m	T11	120m
T3	60m	T12	90m
T4	50m	T13	130m
T5	50m	T14	110m
T6	70m	T15	120m
T7	140m	T16	130m
T8	140m	T17	160m
T9	120m		

All trenches were excavated in spits of approximately 10cm by machine fitted with a toothless ditching bucket; the surface and edges of each spit was visually examined in advance of the excavation of the next and the resultant spoil was raked-through in an effort to increase the chances of artefact recovery. In all cases, the underlying geologically-derived subsoils were investigated to depth of up to 50cm.

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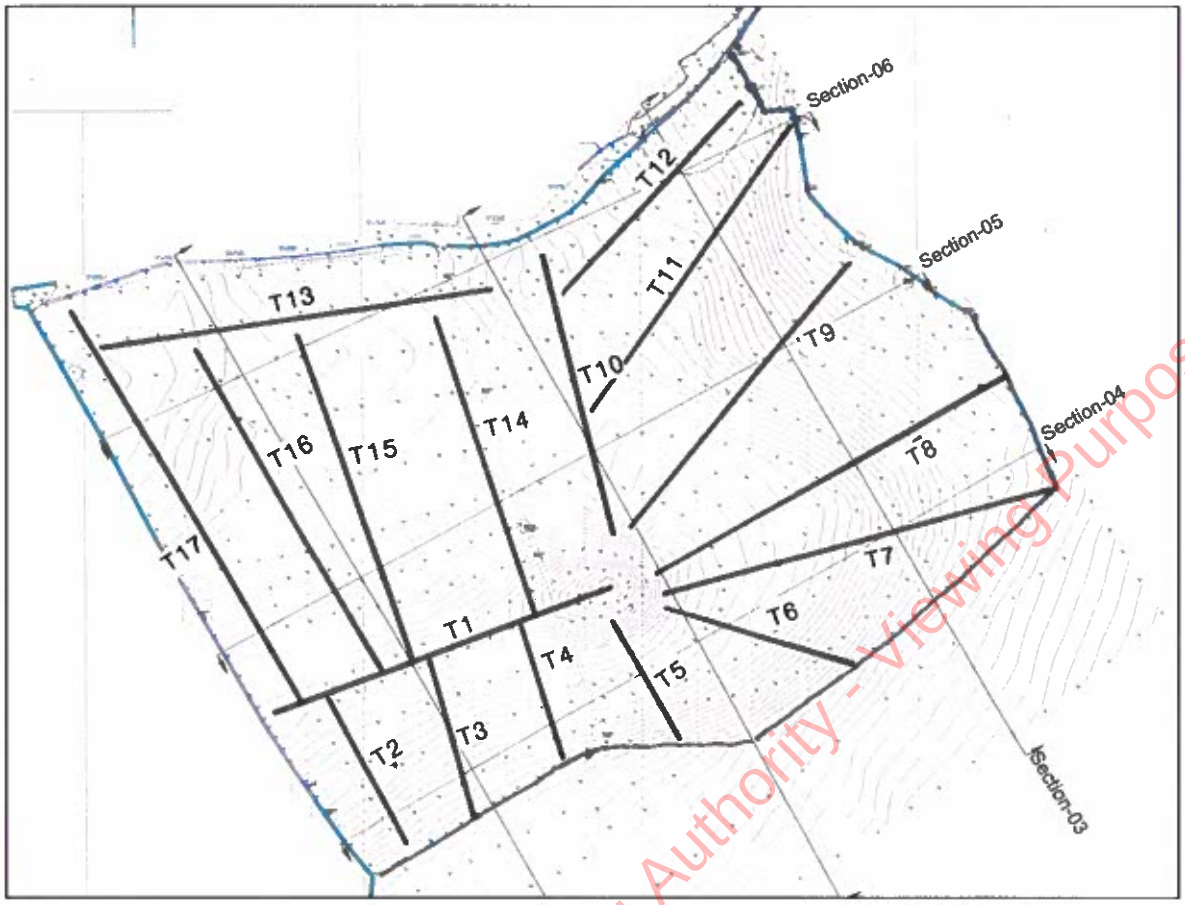

Figure 12.A Centre-line Locations of Archaeological Test Trenches

The results from the trenches were largely similar. The topsoil comprised moderately compact mid-brown silty clay, with moderate pebbles and cobbles dispersed randomly throughout; it was 100mm – 350mm in depth (deepest along northern, southern and eastern bases of sloping ground). For the greater area of the site, this lay directly upon firm, naturally-derived' orange/brown gravelly sandy-clay, grey gravelly sandy-clay, grey sand or orange/brown sand, all representing geologically-derived subsoils ; the topsoil lay upon light orange/brown or light grey firm marly clays at the northern ends of T15 – 17 and western area of T13.

Plates A – R below illustrate a representative selection of photographs of each trench

No subsurface features of archaeological interest/potential were uncovered. Visual inspections of the topsoil during excavation and subsequent raking-through of the spoil did not result in the recovery of any artefacts of interest

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Plate A T1 – eastern end looking west

Plate B T1 from west

Plate C T2 from south

Plate D T3 from south

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Plate E T4 from south

Plate F T5 from south

Plate G T6 from southeast

Plate H T7 (northern section) from east

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Plate I T8 (southern & central sections) from east

Plate J T9 (northern section) from east

Plate K T10 from north

Plate L T11 from east

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Plate M T12 from east

Plate N T13 from east

Plate O T14 from north

Plate P T15 from north

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Plate Q T16 from south

Plate R T17 from north

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CHAPTER 13

LANDSCAPE AND VISUAL IMPACT ASSESSMENT

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LANDSCAPE and VISUAL IMPACT ASSESSMENT

Proposed Quarry Development
At Rooskagh Td.,
Bellanamullia (Bealnamulla),
Athlone,
Co. Roscommon.

For:

Eamon Harney

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RMDA
LANDSCAPE ARCHITECTS + CONSULTANTS

1.0 THE LANDSCAPE and VISUAL IMPACT ASSESSMENT

1.1.0 Introduction

This Landscape and Visual Impact Assessment (LVIA) prepared by Ronan MacDiarmada & Associates Ltd (RMDA) was informed by a desktop study and a survey of the site and receiving environment in June 2020. The assessment is in accordance with the methodology prescribed in the Guidelines for Landscape and Visual Impact Assessment, 3rd edition, 2013 (GLVIA) published by the UK Landscape Institute and the Institute for Environmental Management and Assessment.

The report identifies and discusses the impact the proposed development at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon has on the existing Landscape or environment.

RMDA has been commissioned by Eamon Harney, to prepare a Landscape and Visual Impact Assessment to accompany a submission on the subject lands for a quarry at Bealnamulla.

This assessment should be read in conjunction with Images that have been prepared for the scheme (refer to the proposed views for photos in attached report), which should also be read in conjunction with this report.

Fig 01.- Landscape Masterplan.

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1.1.2 Statement of Authority

RMDA provides specialist landscape and visual services for projects from inception, through site/route selection, environmental impact assessment (EIA) and the planning process, to detailed design and construction. The company specialises in landscape character assessment (LCA) and landscape and visual impact assessment (LVIA) – for a wide variety of projects.

Ronan MacDiarmada is the chapter's main author, and Peter Lynch provided oversight and review. Ronan MacDiarmada, B. Agr. Sc. (Land. Hort.) is the director of Ronan MacDiarmada & Associates Ltd and is graduate of University College Dublin. He is a qualified Landscape Architect and a Corporate Member of the Irish Landscape Institute. He has specialised in Landscape and Visual Assessment (LVIA) and has over twenty years' experience in a range of projects, from large scale strategic design, master planning and detailed design to LVIA and landscape planning, including Strategic Housing Developments throughout Ireland.

1.2.0 Methodology Used

Landscape and Visual Assessment Methodology:
This assessment is based on the following guidelines:

- "Advice Notes on Current Practice in the preparation of Environmental Impact Statements", Environmental Protection Agency (2015)
- "Guidelines on the Information to the Contained in Environmental Impact Statements", Environmental Protection Agency (2002).
- "*Draft 2017 EPA Guidelines on Environmental Impact Assessment*", Environmental Protection Agency.
- "Advice Notes for Preparing Environmental Impact Statements" Draft (September 2015)
- *"Guidelines for Landscape and Visual Assessment"*, 3rd Ed., Landscape Institute and Institute of Environmental Management and Assessment, 2013.

The following Methodology was used in this assessment:

1. A desk top study of the proposed site and its environs, including reviewing aerial photography and ordinance survey documents.
2. A site survey was undertaken to determine the character of the landscape and the surrounding area, including site visits during the month of June 2021
3. An assessment of the proposed development was carried out by examining the layout plans, elevations, and sections to determine the impacts of the development.
4. An evaluation of these impacts was carried out in accordance with the criteria set out in the EPA guidelines.

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5. A review of statutory planning and other documentation to ascertain the local and wider significance; and visiting the site and surrounding area during the May & June 2021 and preparing a photographic record of views and landscape features.

1.2.1 Definition of Landscape

Ireland is a signatory to the European Landscape Convention (ELC). The ELC defines landscape as

'An area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors'.

This definition is important, as it defines that the landscape is not only a physical and visual amenity but provides for a range of functions. As a cultural resource, the interaction of man and landscape has formed the basis of much of our cultural heritage and values. The rhythms of the land as it was settled has informed what Rooskagh Td., Bellanamullia (Bealnamulla), Athlone is today. The landscape provides opportunities for passive and active recreation. It contributes to the sense of place, as over time and place various histories and interactions have formed a sense of place for the local populations. The landscape provides a historic record, it also is a resource for food production, sources of energy and in the natural cycle, oxygen, water. as the source for materials for living. The landscape has the ability to renew itself.

Bealnamulla and its environs is that of a rural setting and this is defined in GLVIA-2013 in the following manner (Section 2.2):

"Landscape is about the relationship between people and place. It provides the setting for our day to day lives. The term does not mean just special or designated landscapes and it does not only apply to the countryside"

1.2.2 Forces for Landscape Change

Landscape in Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon is not unchanging. It has changed with the settlement pattern over the last several hundred years. It has progressed from wilderness to agriculture and settlement. The patterns of settlement have been driven primarily by economic need and the requirement to provide shelter and a food resource. In this frame, it has to be accepted that change shall occur, and it requires finding an appropriate balance between economic, social and environmental forces and values.

In this the landscape proposals have focused on the existing hedgerows and the retention and augmentation of same. This is done to minimise visual impact, create and retain existing habitats. It is wished to retain the sense of

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value and place in the location in which local residents work and reside. This shall encourage the growth of community in Rooskagh Td., Bellanamullia (Bealnamulla), Athlone. Although the quarry may be new, it follows an existing pattern of development in the area, the landscape shall be respected in the form of retention of existing hedgerows and the reintroduction of habitat areas. The proposal is set back from the road and adjacent to an active plant that it is manufacturing concrete products.

Forces of Change

There has been considerable quarrying activity in the esker belt of this LCA, adjoining the boundary of LCA 34. This has brought about considerable landscape change. While the quarry pits themselves might be screened from public roads, the dust created by vehicles emerging from the quarry is clear and creates an adverse visual impact.

The proximity of this LCA to the large town of Athlone brings with it pressure for development, involving both single dwellings as well as commercial buildings.

1.2.3 Nature of Impacts

Impact on landscape arising from development has two distinct but closely related aspects. The first is impact in the form of change to character of the landscape that arises from the excavation of the existing landform and the proposed development into the existing context. The second aspect is the visual impact, which depends on the degree and nature of change in the visual environment. It is recognised that the combined impact on character and views will draw responses, the significance of which will be partly informed by an individual's subjective perception of how much the changes matter.

The assessment of landscape/Landscape and visual impacts include:

- Direct impacts upon specific landscape elements and buildings within and adjacent to the site.
- Effects on the overall pattern of the landscape elements that give rise to the character of the site and its surroundings.
- Impacts upon any special features or interests in or around the site.
- Direct impacts of the scheme upon views in the landscape.
- Overall impact on landscape character and visual amenity

In determining the Visual Impacts, the following definitions were used to assess the significance of the impacts:

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1.2.4 Impact Significance Criteria – Table 1

No Impact: There are no changes to views in the visual landscape.

Imperceptible Impact: An impact capable of measurement but without noticeable consequences.

Slight Impact: An impact which causes noticeable changes in the character of the environment without affecting its sensitivities.

Moderate Impact: An impact that alters the character of the environment in a manner that is consistent with existing and emerging trends.

Significant Impact: An impact which, by its character, magnitude, duration, or intensity alters a sensitive aspect of the environment.

Profound Impact: An impact which obliterates sensitive characteristics.

Terms used to describe Quality of visual impact: -

- Neutral Impact: A change which does not affect the quality of the landscape.
- Positive Impact: A change which improves the quality of the environment or landscape.
- Negative Impact: A change which reduces the quality of the environment or landscape.

1.2.5 Terms used to describe the Duration of visual impact: -Table 2

- Momentary Effects Seconds to Minutes
- Brief Effects Less than a day
- Temporary Effects Less than a year
- Short-term Effects Lasting 1 to 7 years
- Medium-term Effects Lasting 7 to 15 years
- Long-term Effects Lasting 15 to 60 years
- Permanent Effects Lasting over 60 years
- Reversible Effects Effects that can be undone
- Frequency of Effects Describe how often the effect will occur

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1.3.0 Receiving Environment

1.3.1 Description of the Receiving Environment

The proposed development is on Bealnamulla, and the site is approximately c. 6.72 hectares in size. There are currently no buildings on the site.

There are no immediate houses to the proposed development at this location, there are no protected structures on the site, with the nearest protected structure 1500m to the southeast of the site, Meehambee Dolmen. There shall be no impact upon this structure and visually cannot be seen from this location.

Fig. 02. - General Site Location and Study Area - Outlined in Red

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Image 01 . Front entrance to the Plant

Rooskagh Td., Bellanamullia (Bealnamulla), Athlone is characterised as an open field system with existing native hedgerows and occasional stone walls. The landform suddenly rises to a height of 72.00 to the centre of the subject site a rise from the access lane of 14 – and 18 m. There are several quarries in the local vicinity and the subject site is directly adjacent to a concrete plant.

It is envisaged that this quarry shall provide material for the production of concrete.

The local environment is known for Eskers and is the obvious reason for the quarry activity in the locality, providing raw material, gravel – stone for the construction industry.

The existing hedgerows and trees on the boundary shall be retained, however there is no grassland to be protected.

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1.3.2 Policy Context of Receiving Environment

Fig.03 *Roscommon LCA 35: Brideswell Esker Belt*

The subject site is located in the Landscape Character Area 35 – the Brideswell Esker Belt

The esker network in the landscape has amenity, heritage and cultural value.

Fig 04 – Detail of Esker Area – Subject Site in Red Dot

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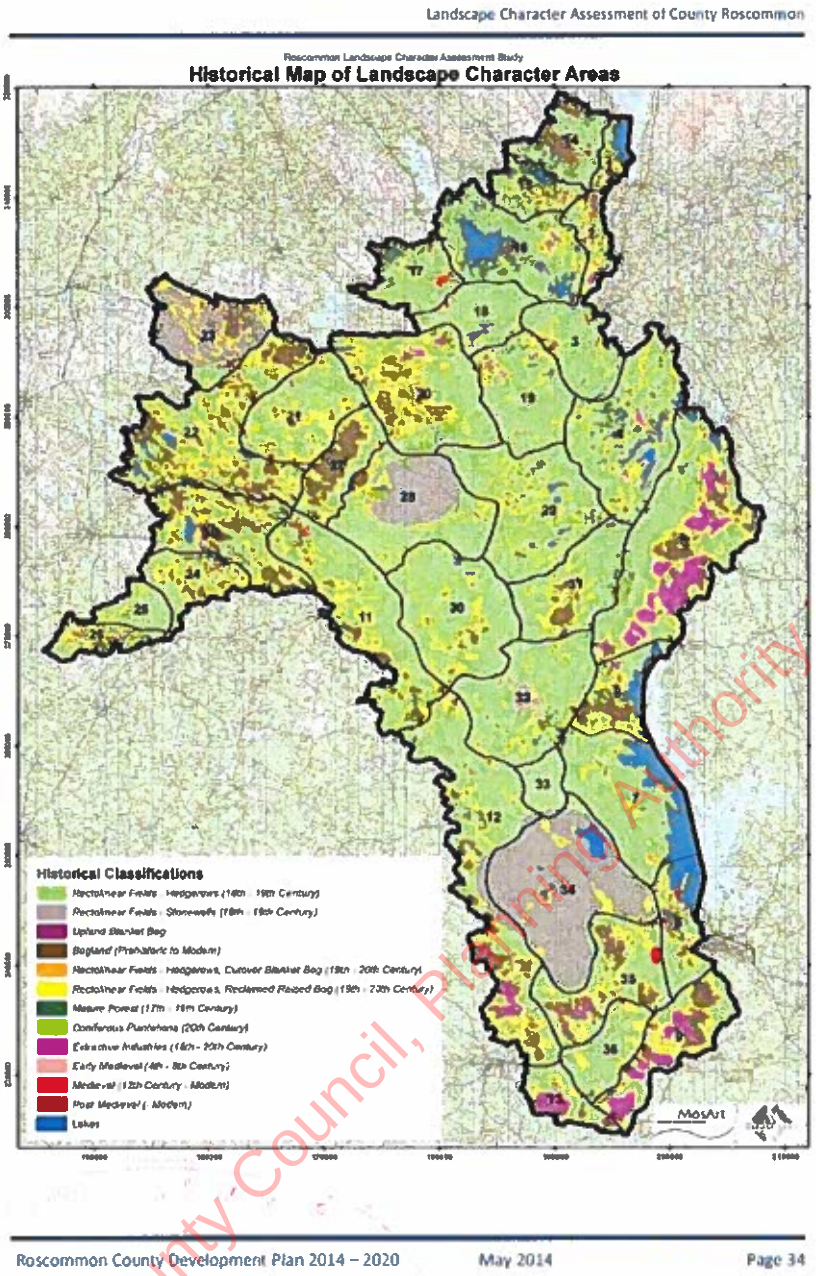
Fig 05 Roscommon LCA 35: Historical Map of Landscape Character Areas



The historical character of the subject site shows how the landscape has been shaped by the interaction of man & landscape over time. The field systems and walls are a direct result of this activity.

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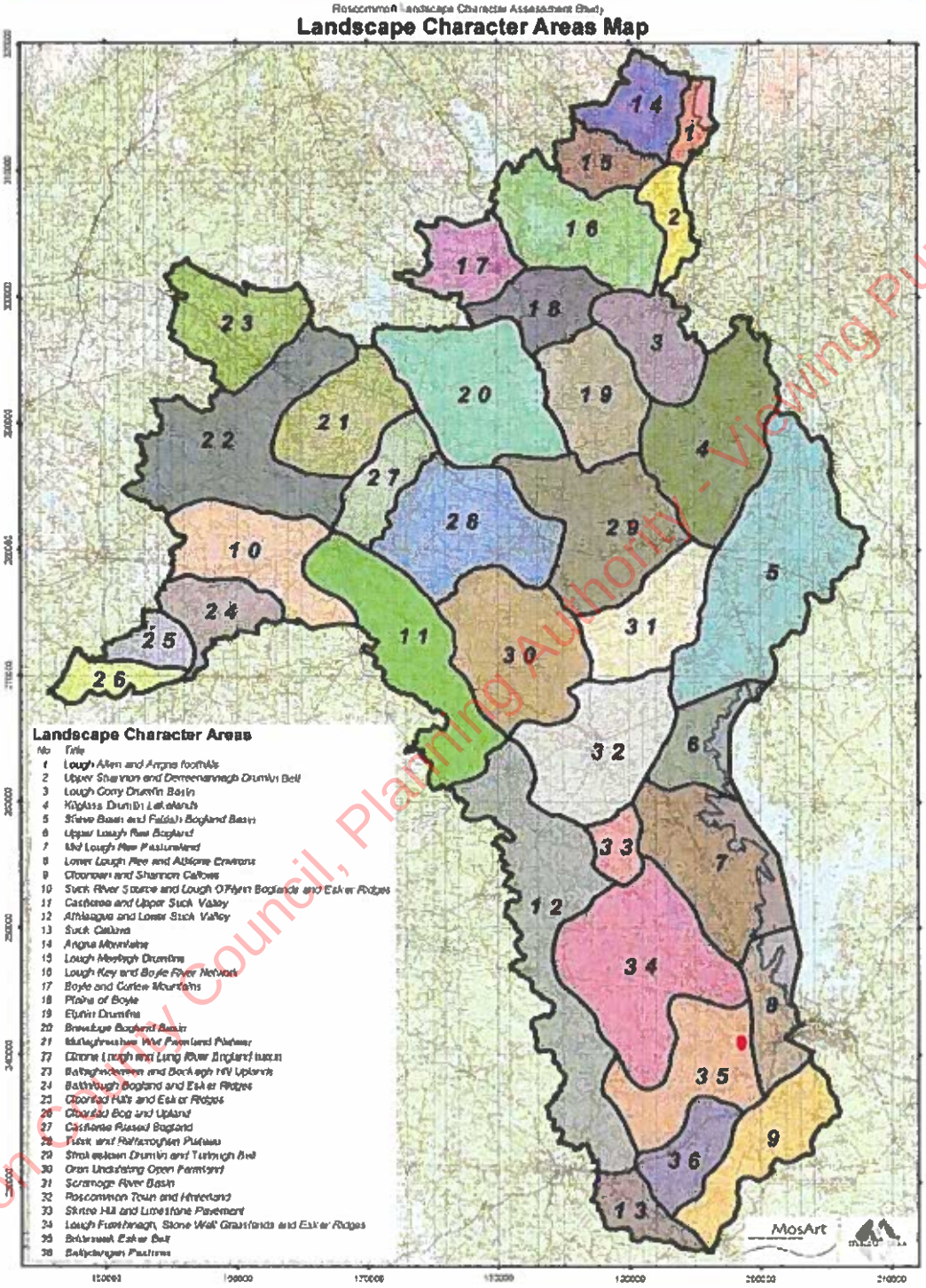
Fig. 06 Landscape Character Map



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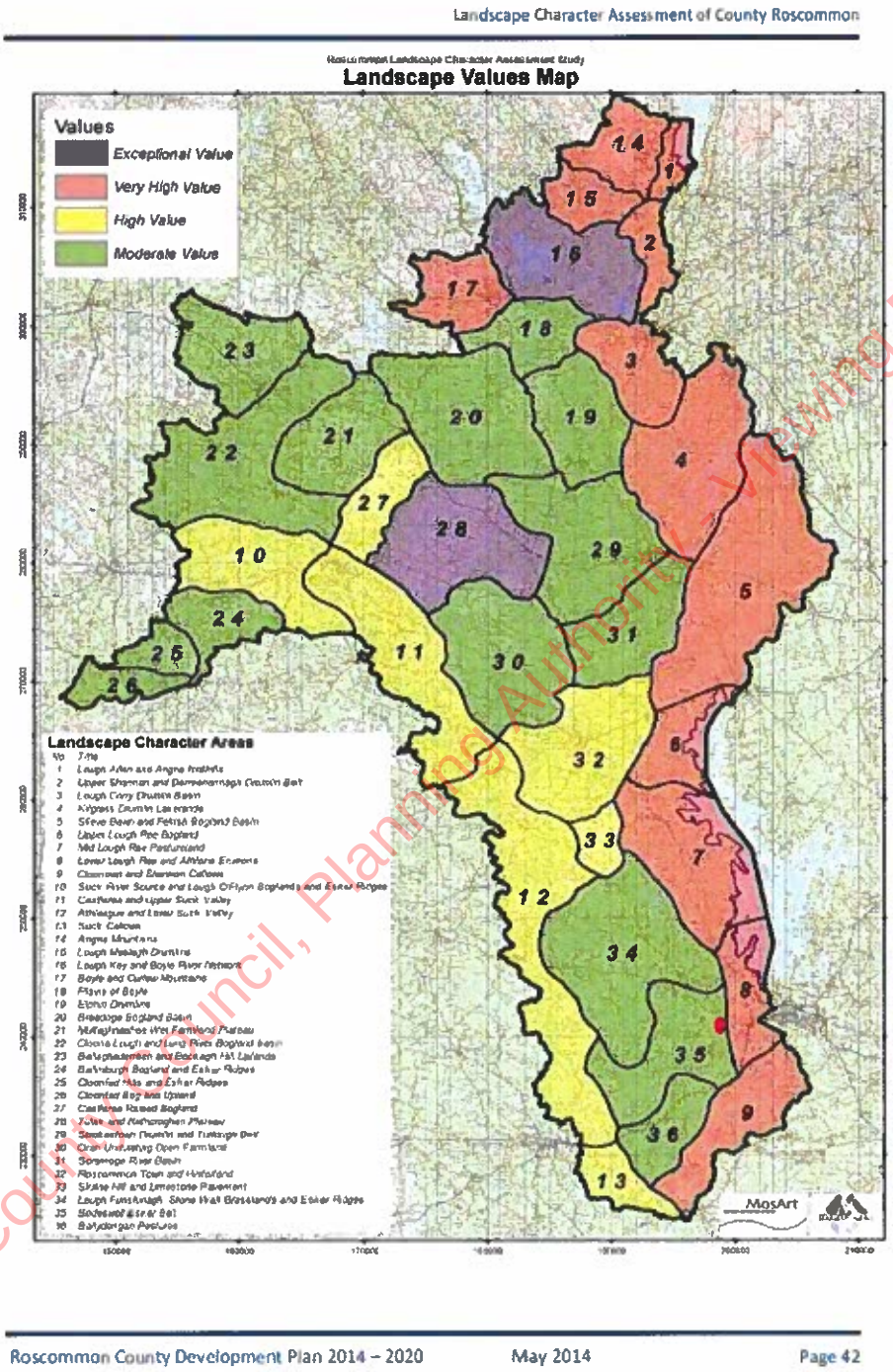
The subject site is located within the landscape character area of Brideswell Esker Belt.

Fig. 07 Landscape Values Map -



The landscape value for the location of the quarry is of moderate value. The field systems are bounded by native hedgerows and trees and occasional stone walls.

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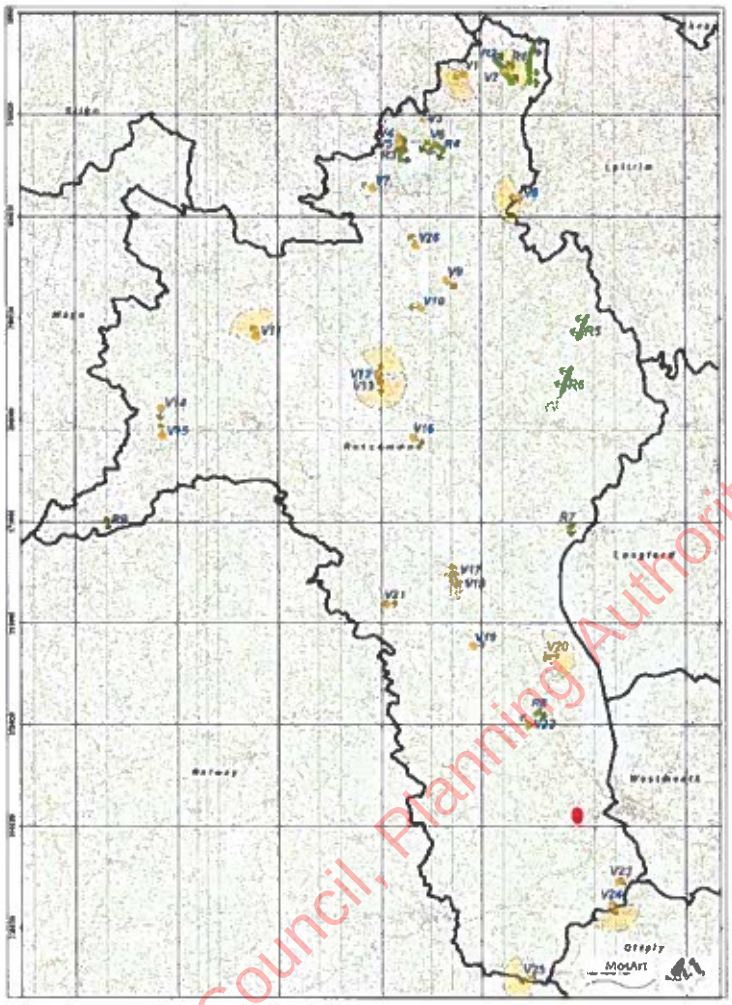
1.3.2 Protected Views

Fig 08 Roscommon Scenic Routes and Scenic Map

Roscommon Scenic Routes and Views Map



There are no protected views or scenic routes on or near the subject site.

1.3.3 Built Heritage.

The proposed lands at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone do not have buildings or archaeological items on the Record of protected Structures. The proposed has a moderate landscape value.

There is an existing stone wall along by the lane – although fairly insignificant, it shall be retained as part of the character of the area.

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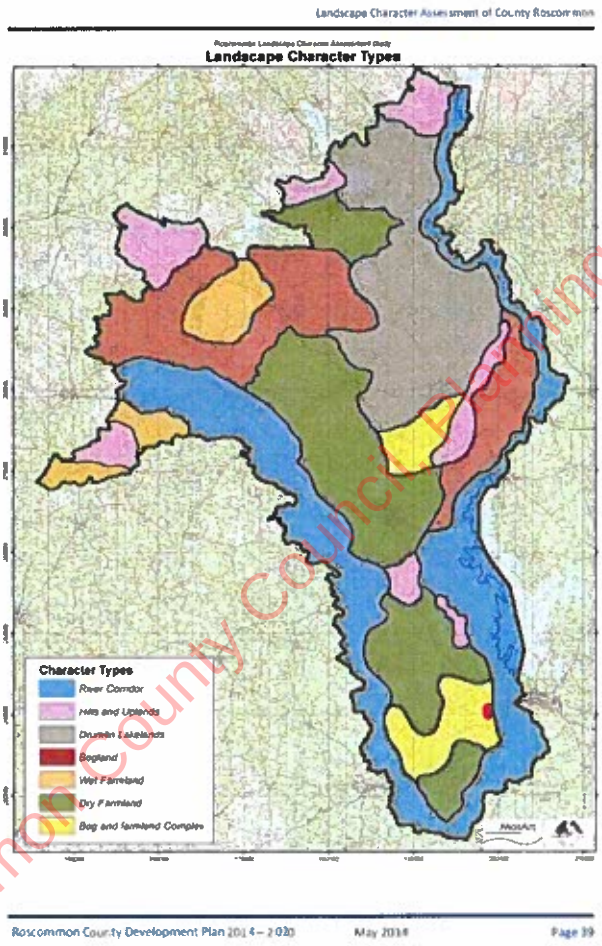
1.3.4 Implications of Development Plan Policy

The Development Plan identifies several Landscape Character Areas which should be considered as part of this Assessment. These include:

- Landform & Elevation Map of landscape Character Areas
- Historical Map of Landscape Character Areas
- Landscape Character Types
- Landscape Character Areas Map
- Landscape Values map
- Roscommon LCA35: Brideswell Esker Belt

The overall image of this landscape is one of bogs and eskers experiencing localised development pressure from nearby urban area of Athlone town.

Fig 09 Landscape Character Type



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1.4.0 Summary of Landscape Characteristics and Values

1.4.1 Landscape Values

The GLVIA Guidelines sets out the methodology for assigning landscape sensitivity. This is based on combining judgements on landscape value, and landscape susceptibility.

Landscape values are derived from both indications of value as seen in national and local policy, as well as other indications that a landscape or landscape element, is valued. The site has a landscape character of moderate value.

In addition to formal designations at international, nation and local level, the GLVIA refers to criteria which can help to describe landscape values in landscapes that are not covered by designations. These include the following:

- **Landscape Quality/Condition:** The location of the development is in a rural area; it is of moderate landscape value.

- **Cultural Heritage/Conservation value:** The proposed site is Roscommon LCA 35: Brideswell Esker Belt – and is not part of a conservation area.

- **Aesthetic/Scenic Quality**: The site is in located in a rural area directly adjacent to a concrete plant.

- **Perceptual aspects**: A landscape may be valued for its perceptual qualities, such as wildness or tranquillity. The site consists of a filed system with a rising landform to the centre of the site.

- **Public Accessibility and Recreation Value**: The site is in private ownership and not publicly accessible.

- These values can further be categorised in two ways – values which should be conserved, and those that provide opportunity for enhancement. It is proposed to reinforce the concept of field boundary system.

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1.4.2 Conservation Values

The conservation values indicate those aspects of the receiving environment which are sensitive and could be negatively impacted on by the proposed development. These values form the potential landscape and visual constraints to the proposed development.

Rooskagh Td., Bellanamullia (Bealnamulla), Athlone has no protected structures or protected views/prospects and is not located in a conservation area. There is a concrete plant directly to the North of the subject lands

The perimeter hedgerows shall all be retained and augmented. Where none is present, a new native hedgerow and trees shall be planted. A landscape buffer of 5 – 8m is also proposed along the entire perimeter of the subject site. This shall add to the landscape quality –and provide for habitat renewal - adding and increasing the level of habitat of the environment.

1.4.3 Enhancement Values

The enhancement values reflect change that is occurring in the landscape and its inherent robustness.
These include:

- The land is in this area has been traditionally used for Quarry development, with existing concrete adjacent to the proposed development.

- The proposed development retains and extend the existing hedgerows with a landscape buffer of native tree planting proposed along the perimeter of the site.

1.5.0 Characteristics of the Proposed Development

The proposed development shall broadly comprise of an excavated Quarry. It shall be excavated for material for construction purposes

The proposal shall be screened on all sides by existing hedgerows and trees. A further belt of trees and hedgerows shall be planted in a 5 – 8m wide belt surrounding the subject site.

The Soft Landscape proposals shall compliment the development aesthetically and functionally and shall tie in with the existing and surrounding landscape, providing Habitat spaces
It is intended to tie in with and assimilate the land into the local landscape befitting of its rural background, as follows:

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1. To provide(reintroduce) habita spaces with planting suitable to the local & new proposed environment.
2. To create new landscape features that will complement and enhance the Landscape.
3. To provide new landscape features in the form of a development that will significantly enhance and retain the character of the area.

1.5.0 Analysis

1.6.1 Likely Significant Impacts and Associated Mitigation Measures

1.6.2 Potential Visual Impact

The proposed development shall be negatively initially – this is dependent on the timing of the start of activities. It is recommended to plant the landscape buffer of trees and hedge as the first activity.

The visual impact close to the site, on the adjoining land shall be negative, however from a distance it shall be a temporary visual impact as the trees and landscape buffer respects the natural attributes of the site,

The boundary shall be a well planted and shall provide screening in a short period which shall be a positive visual impact which shall be long term.

1.6.3 Visual Impacts due to introduction of new structures & Buildings

There will be no introduction of any buildings. There shall be a protective security fence surrounding the entire boundary.

1.6.4 Visual Impacts due to access road

A small road is already in existence and shall be improved to provide access and egress for vehicles. There shall be no parking on the subject site and shall therefore will not impact upon the development. The main access road Bealnamulla is in existence already and therefore there shall be no impact on the Landscape.

1.6.5 Visual impacts due to telecommunications/power lines

On this site, the development shall be served from existing services, telecommunications, and power lines. The services on site shall be underground. The opportunity to organise and reduce the telecommunication and services shall be utilised to reduce the visual impact, if any of the development.

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1.6.6 Visual Impact of lighting

The lighting of the new development shall be limited and shall be typical of a similar quarry type. The lighting shall be for ongoing works and for security reasons. Refer to Appendix 2 for details and type of lighting proposed.

Internally the spaces shall be lit by individual columns, which shall not alter materially the visual character of the landscape. The lighting shall benefit the workers, providing ability to find their way in safety. However Therefore, the impact of lighting on the existing landscape shall be positive in the long term.

1.6.7 Visual Impact of Landscaping Proposals

The landscape proposals shall consist of.

1. Retention and augmentation of existing hedgerows and trees on the boundary of the proposed quarry.
2. Planting of an extensive 5 – 8m wide landscape buffer around the perimeter of the subject lands to provide screening for the subject site in keeping with the surrounding Landscape

The landscape proposals for the landscape buffer shall include for a range of native trees and hedges. The flowering of these plants shall enable bees to flourish but also increase the texture and colour in the landscape. The introduction of the trees and hedge shall provide for habitat renewal, and this shall be a positive and long-term visual impact.

1.7.0 Avoidance Remedial and Mitigation Measures

1.7.1 Construction Phase

The development of the quarry shall be carried out in an organised basis, with no construction, the main impact shall be on an operational basis.

There are no existing buildings on site, nor will any be constructed. The quarry shall be serviced from the existing plant. The proposal shall be in keeping with existing quarries in the area. The concrete plant, for which the quarry shall supply raw material for the service of the concrete plant.

1.7.2 Operational Phase

The mitigation measures, including measures taken during the design stage, which have evolved throughout the design process, that have been adopted in the proposed scheme and are detailed in the Landscape Plan, are as follows:

- The reintroduction of the native hedgerows and trees.
- The augmentation of existing hedgerows with native hedge planting.
- The provision of a landscape buffer of 5 – 8 m to surround the subject site

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- Native and pollinator species (as per The All-Ireland Pollinator Plan 2015 – 2020/ 2021 - 2025) planting for biodiversity may/shall be incorporated into the planting scheme

Operationally the quarry itself shall be screened from view, but noise and the movement of vehicles such as lorries and trucks shall be the main visual impact. However, the quarry shall be serving the adjacent concrete plant so this impact upon the landscape shall be slight as it will not affect the main carriageways in the area.

1.7.3 Waste handling areas

There shall be minimal need for bin storage, waste shall be collected locally, papers, wrapping and bottles, used by general operatives shall be collected locally and individually into a simple bin. The bin shall be placed in an area away from public view and shall be emptied when full.

1.7.4 Do Nothing Impact

Should the development not proceed it is likely that the site would remain in its present state, a field system. The landscape buffer and hedge and tree planting would not occur and the positive

At present the site is a field adjacent to an existing concrete plant

1.8.0 Landscape Impact Assessment Criteria

The following criteria are considered, when assessing the potential impacts on the Landscape resulting from a proposed development,

• Landscape/Landscape character, value and sensitivity.

• Magnitude of likely impacts.

• Significance of landscape effects.

The sensitivity of the Landscape to change is the degree to which a particular setting can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics. Landscape/Landscape Value and Sensitivity is classified using the following criteria set out in **Table 3**

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Table 3: Landscape/LandscapeValue and Sensitivity – Magnitude of Change

Sensitivity	Description
Very High	Areas where the Landscape character exhibits a very low capacity for change in the form of development. Examples of which are high value townscapes, protected at an international or national level (e.g., World Heritage Site), where the principal management objectives are likely to be protection of the existing character.
High	Areas where the Landscape character exhibits a low capacity for change in the form of development. Examples of which are high value townscapes, protected at a national or regional level, where the principal management objectives are likely to be considered conservation of the existing character.
Medium	Areas where the Landscape character exhibits some capacity and scope for development. Examples of which are townscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use.
Low	Areas where the Landscape character exhibits a higher capacity for change from development. Typically, this would include lower value, non-designated townscapes that may also have some elements or features of recognisable quality, where management objectives include, enhancement, repair and restoration.
Negligible	Areas of Landscape character that include derelict sites and degradation were there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of Landscape improvements and/or restoration.

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Impact Significance Matrix – Table 4.

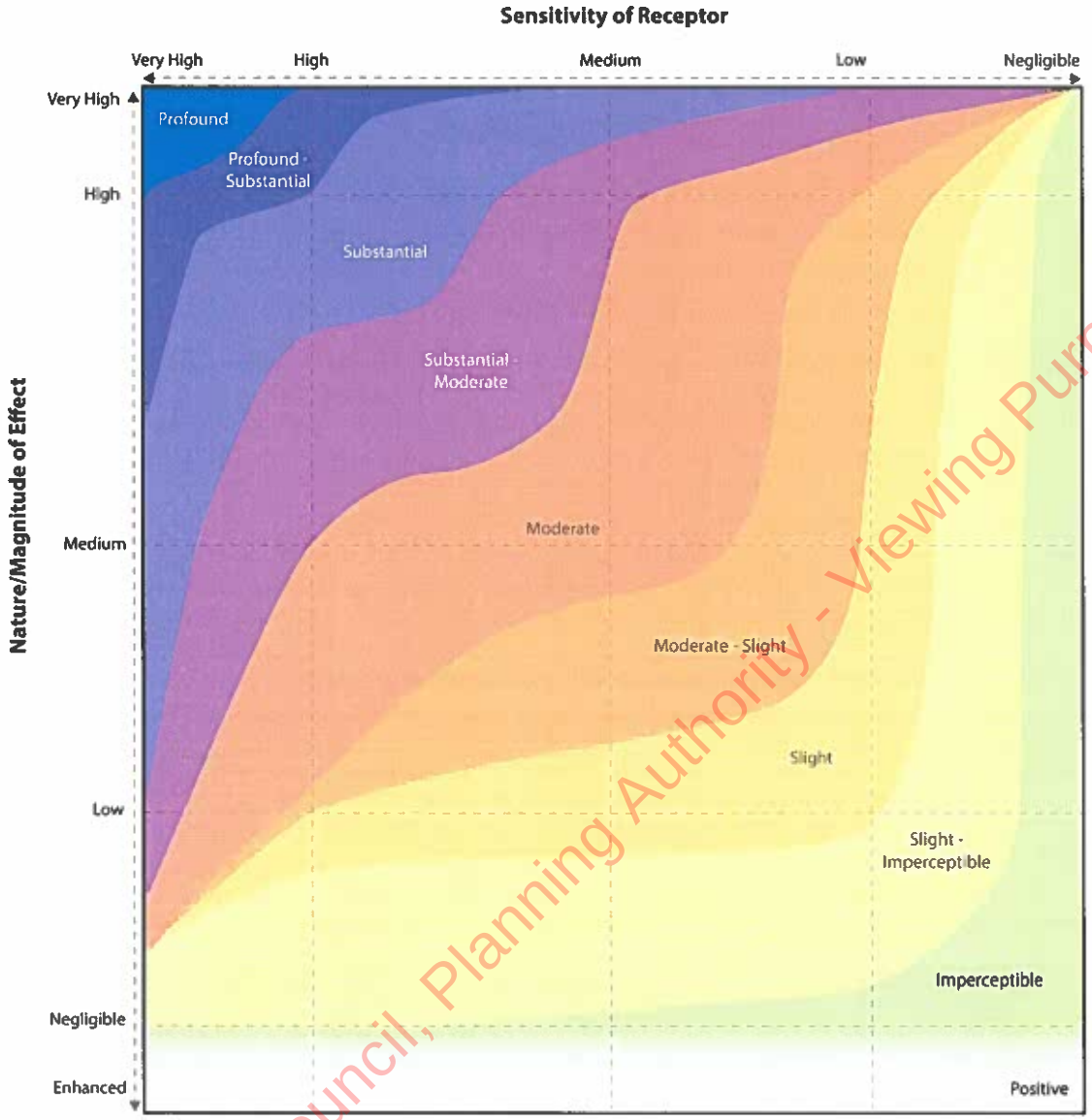

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Table 5: Assessment of Magnitude of Change for Landscape Receptors

Magnitude	Typical Criteria for Landscape Receptors
High	Major removal or addition of landscape features or removal of localised but unusual or distinctive landscape features and/or addition of new conspicuous features and elements which may alter the character of the landscape (with uncharacteristic features being negative and characteristic features being positive). Physical loss of landscape features that are not replaceable or are replaceable only in the long term.
Medium	Moderate removal or addition of landscape features and/or addition of new noticeable features and elements which would be clearly visible but would not alter the overall character of the landscape (with uncharacteristic features being negative and characteristic features being positive). Physical loss of landscape features that are replaceable in the medium term.
Low	Minor removal or addition of landscape features and/or addition of new discrete features and elements which would be perceptible within but would not alter the overall character of the landscape (with uncharacteristic features being negative and characteristic features being positive). Physical loss of landscape features that are readily replaceable in the short term.
Negligible	Barely perceptible removal or addition of landscape features would occur, and the development would be barely perceptible in visual/ character terms.

Fig 10. – Visual Receptors – Location 1 – 6

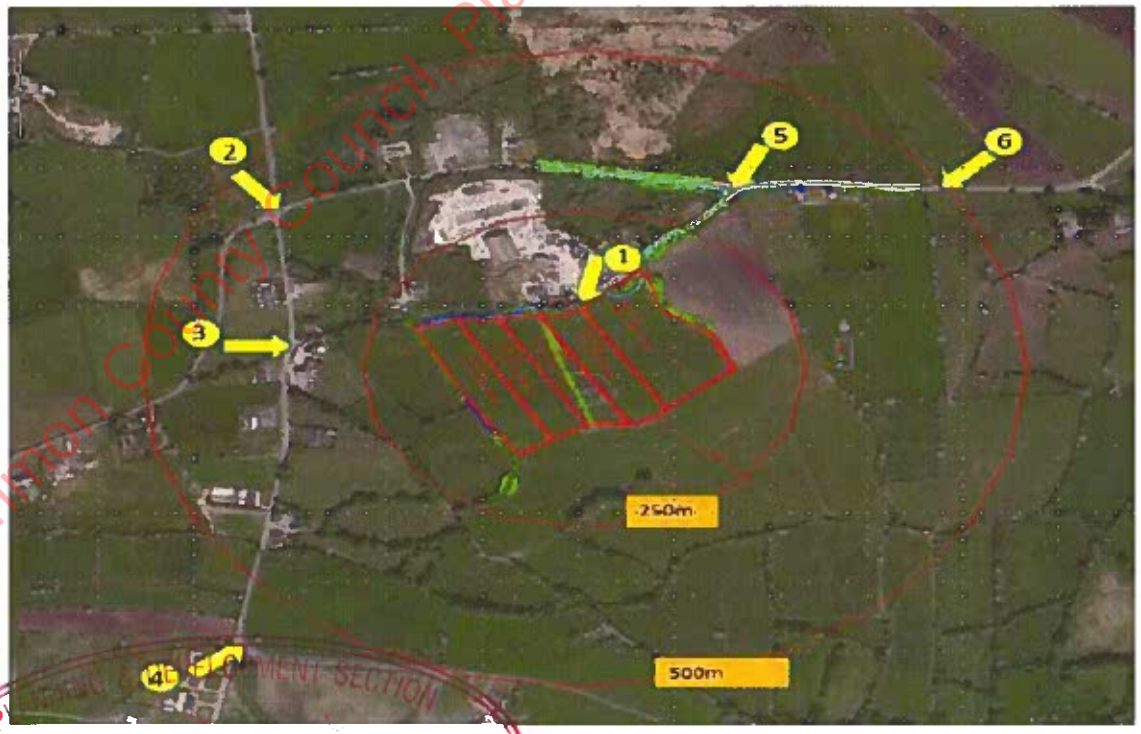

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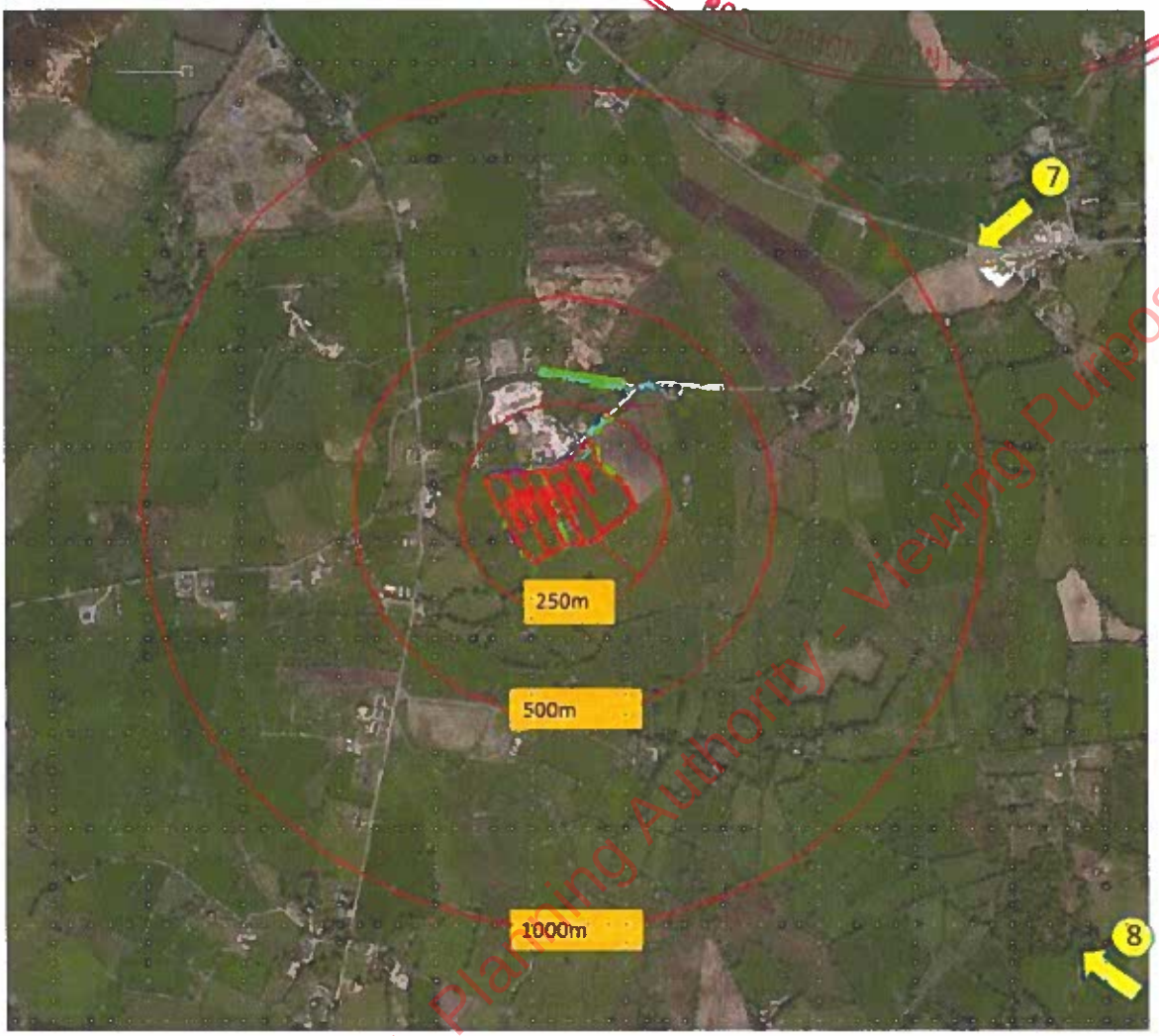
Fig 11. – Visual Receptors – Location 7 & 8



1.9.0 Visual Selector Interaction

The 8 no. visual receptors have been assessed and presented to the team. Through a process of dialogue in conjunction with the Collins Boyd, Consulting Engineers & RMDA Landscape Architects provided locations for the visual receptors. They represent the most significant and sensitive location points. They were based upon the sensitivity of the locations and typical criteria is listed below.

1.9.1 Sensitivity – susceptibility of Receptors.

A visual receptor is a human user of the landscape. The practice has adopted the principle that the sensitivity for each type of visual receptor is inherent to the nature of the activity they are undertaking rather than the view itself.

In accordance with the Institute of Environmental Management and Assessment ("IEMA") Guidelines for Landscape and Visual Assessment (3rd

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edition 2013) visual receptors most susceptible to changes in views and visual amenity are:

- *"Residents at home.*
- *People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views.*
- *Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience.*
- *Communities where views contribute to the landscape setting enjoyed by residents in the area.*
- *Travellers on road rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened".*

Visual receptors that are less susceptible to changes in views and visual amenity include.

- *"People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape.*
- *People at their place of work whose attention may be focussed on their work or activity, not their surroundings and where the setting is not important to the quality of working life".*

1.9.2 Sensitivity

A visual receptor is a human user of the landscape. The practice has adopted the principle that the sensitivity for each type of visual receptor is inherent to the nature of the activity they are undertaking rather than the view itself.

1.9.3 Images

8 x no images have been prepared surrounding the site to fully illustrate the physical and visual nature of the proposed development.

Table 5: Visual Receptor Sensitivity

Sensitivity	Typical Criteria for Visual Receptors
High	Users of Quarry properties, public rights of way, named viewpoints and scenic roads or railways. Users of cultural heritage features including World Heritage Sites, Registered Parks and Gardens, Scheduled Monuments, Listed Buildings and Conservation Areas where they are known to be tourist destinations or places used by local communities.
Medium	Users of public rights of way (urban or industrial areas) play areas, sporting and outdoor active recreational facilities and rural roads.

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Low	Users of office and employment areas, industrial areas and the main road and rail network.

View 1	
Existing View	Image 1. – Located at gate of Kildea concrete, on the lane Access, directly outside of the Plant - Looking South across subject Lands. There is no hedgerow in existence along by the road, therefore the visual impact in the short term shall be significant.
Proposed View	The image shows the existing field with no hedge. The planting of whips, Trees and Semi mature trees shall ameliorate the visual impact and with the landscape buffer of trees growth in 3 – 5 years it shall be neutral Landscape impact with a positive long term visual impact.
Visual Receptor Sensitivity	High
Magnitude of Change for Landscape Receptors	Moderate – Substantial
Significance of Effects	Moderate – Significant Impact
Duration	Short Term
Quality of Visual Impact	Negative in the short term, Neutral – positive medium term

View 2	
Existing View	Image 2. – Located at Junction of L2025 & L2026, Looking Southeast to Existing Quarry/Plant and Subject lands. The prominent landform of the subject site may still be seen. The boundary hedges sit the proposal into the landscape. The existing concrete plant may view as farm sheds and does not detract from the landscape.
Proposed	The landform - hill shall be removed a part of the quarry. The duration of works on the quarry surface shall determine the impact. The physical removal of the landform shall be noticeable; therefore, the landscape impact shall be moderate to significant. However once removed and the growth of trees shall absorb the subject site into the environment, the impact shall be slight to the short – medium term. The visual impact shall be negative in the short term and shall be neutral in medium to long term.

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Visual Receptor Sensitivity	Medium
Magnitude of Change for Landscape Receptors	Medium
Significance of Effects	Slight – Moderate Impact
Duration	Short - Term
Quality of Visual Impact	Negative in the short term - Neutral in the long term

View 3	
Existing View	Located at Farmyard on the L2026, Looking East to Existing Quarry/Plant and Subject lands. Back Lane leads to Quarry Located within 500m of the subject site.
Proposed	The image shows farm sheds and the existing field system The subject site is screened from view by existing vegetation and physical farm sheds. The Landscape impact shall be dependent on noise and dust from the operation of the quarry. As there are similar operations in the area and a concrete plant directly adjacent to the quarry, the impact shall be slight to moderate. Visually neutral and is screened from view. The visual impact shall be imperceptible – slight
Visual Receptor Sensitivity	Medium
Magnitude of Change for Landscape Receptors	Low
Significance of Effects	Slight
Duration	Short Term
Quality of Visual Impact	Neutral

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View 4	
Existing View	Located at Outside private House on L2026, Looking Northeast to Existing Quarry/Plant and Subject lands, 500m beyond the subject site.
Proposed	The image shows stone walls and the existing field system The subject site is screened from view by existing vegetation. The Landscape impact shall be dependent on noise and dust from the operation of the quarry. However, the distance from the quarry it is not seen as an issue therefore the landscape impact due to possible noise and increased traffic shall be imperceptible. There shall be no visual impact and therefore is neutral.
Visual Receptor Sensitivity	Medium
Magnitude of Change for Landscape Receptors	Low
Significance of Effects	Slight
Duration	Short Term
Quality of Visual Impact	Neutral

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View 5	
Existing View	Located at Entrance to Plant on the L2025, Looking Southwest to Existing Quarry/Plant to right and Subject lands to left
Proposed	The landform - hill shall be removed a part of the quarry. The duration of works on the quarry surface shall determine the impact. The physical removal of the landform shall be noticeable; therefore, the landscape impact shall be moderate to significant. However once removed and the growth of trees shall absorb the subject site into the environment, the impact shall be slight to the short – medium term. The visual impact shall be negative in the short term and shall be neutral in medium to long term.
Visual Receptor Sensitivity	High
Magnitude of Change for Landscape Receptors	Medium
Significance of Effects	Moderate Impact
Duration	Short - Term
Quality of Visual Impact	Negative in the short term - Neutral in the long term

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View 6	
Existing View	Located at the 500m distance from the subject site, on the L2025, Looking Southwest to Existing Quarry/Plant to right and Subject lands to left
Proposed	The landform - hill shall be removed a part of the quarry. The duration of works on the quarry surface shall determine the impact. The physical removal of the landform shall be noticeable; therefore, the landscape impact shall be moderate to significant. However once removed and the growth of trees shall absorb the subject site into the environment, the impact shall be slight to the short – medium term. The visual impact shall be negative in the short term and shall be neutral in medium to long term.
Visual Receptor Sensitivity	Medium
Magnitude of Change for Landscape Receptors	Medium
Significance of Effects	Slight – Moderate Impact
Duration	Short - Term
Quality of Visual Impact	Negative in the short term - Neutral in the long term

View 7	
Existing View	Located at the Junction on the L2025 and R362, beside Cloonakilla school (to the left), Looking South West to Existing Quarry/Plant to right and Subject lands to left
Proposed	The image shows wall of the school and the existing field system The subject site is screened from view by existing vegetation. The Landscape impact shall be dependent on noise and dust from the operation of the quarry. However, the distance from the quarry it is not seen as an issue therefore the landscape impact due to possible noise and increased traffic shall be imperceptible. There shall be no visual impact and therefore is neutral.
Visual Receptor Sensitivity	Medium
Magnitude of Change for Landscape Receptors	Low

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Significance of Effects	Slight - Imperceptible
Duration	Short Term
Quality of Visual Impact	Neutral

View 8	
Existing View	Located at Meehambee Dolmen, Looking Northwest, no visual impact present – 1500m from the subject site
Proposed	The image shows existing stone walls, the existing field system and associated hedgerows, and dense vegetation. The subject site is screened from view by existing vegetation. However, the distance from the quarry is 1.5Km therefore the landscape impact shall be no impact. There shall be no visual impact and therefore is neutral.
Visual Receptor Sensitivity	High
Magnitude of Change for Landscape Receptors	Low - Negligible
Significance of Effects	None
Duration	Momentary to None
Quality of Visual Impact	Neutral

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2.0.0 Monitoring

A Landscape Architect shall be appointed to oversee and monitor the project at construction & operational stage. They shall liaise with other project members in relation to the development of the proposal.

The landscape architect shall overview all hard & soft landscape works and liaise with resident engineer, project team and contractor. The landscape architect shall also inspect the trees; however, most of the monitoring works shall be during and post-civil construction stage. The landscape architect shall review and instruct on details of soft planting, trees and native hedge planting. There shall be a security fence that shall also be constructed to surround the proposal.

During the operational stage, the landscape Architect shall review the state of all planting and trees, The landscape architect shall review for period of 18 months, from practical completion of each stage the standard and quality of the materials and workmanship. A final certificate of completion shall be issued by the landscape architect in respect of this.

2.1.0 Interactions and Cumulative Impacts

Inter-relationships are the interaction /interrelations between the impacts and proposed mitigation for one discipline with another associated discipline.

2.1.1 Material Assets & Land – Property

There is 4 no houses within 300m of the subject site. Although the redevelopment of the site, initially shall be negative, the tree planting and hedgerows grow the visual impact shall be a positive impact. The impact on the surrounding property shall be short term. The existing concrete plant has established associated land use. The visual impact shall be ameliorated by the existing hedgerows and trees and shall be further enhanced by the proposed landscape buffer.

2.1.2 Biodiversity

There are existing trees and hedgerows on the subject site. There is an opportunity for the proposed planting to introduce pollinator species into the development. This is a positive landscape impact.
Internally a hedgerow shall be removed but the planting of the landscape buffer shall increase the number and range of native trees and plants in the area. This habitat renewal shall provide an environment for wildlife and flora

2.1.3 Population & Human Health

The visual impacts will arise for residents located close to the proposed quarry

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Any impacts shall be during the operational stage. Specific mitigation measures include the provision of fence around the quarry – to provide protection and a level of screening.

During the Operational phase of the quarry activity, landscape & visual impacts will reduce as the growth of the hedgerow shall screen the quarry. The tree and hedge planting respects the existing landscape boundaries in the local environment and increases the number and range of native plants in the local area.

The impacts of the new buffer planting shall be positive as it reinforces the character of the hedgerows and local field systems. The reintroduction of new habitat areas in the form of hedgerows and trees is a welcome and a positive visual impact.

2.1.4 Difficulties Encountered in Compiling

Rooskagh Td., Bellanamullia (Bealnamulla), Athlone is an open site with easy access to the site. There were no difficulties encountered on visiting the development area.

3.0.0 Conclusion

The visual impact of the development shall be over a period of time, i.e., during the operation of the quarry. The removal of landform and hedge shall be negative at first, due to the removal of the existing hedgerow and the landform in the middle of the site.

However, over time, as the proposed landscape measures mature, it shall present a greater landscape buffer and habitat than is currently in existence. The landscape works in the form of hedgerows and trees shall be a positive visual impact over the long term and with management it shall be remain during the lifetime of the quarry.

The character of the environment in the form of field system shall not change. The proposal is in line with emerging patterns of quarry developments in Bealnamulla and it shall provide a valuable resource for the adjoining concrete plant. The concrete plant has been in existence for some time, and it is located directly beside the proposed quarry, therefore providing an organised and efficient method of production. There shall be no long truck runs and therefore a reduced impact on the environment and landscape.

The impacts in the long term will be due to activity such as dust, which may be controlled. The road usage by lorries shall be controlled, as the quarry is adjacent to the concrete plant and therefore no trips are required to deliver

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material for the concrete plant. The landscape impact therefore may be controlled in this way.

Therefore, the impact upon the nature of the landscape/Landscape shall be moderate - significant in the short term, with slight impacts in the long term.

4.0.0 References

- Roscommon City County Development Plan 2014-2020
- Landscape Character Assessment of County Roscommon - Roscommon City County Development Plan 2014-2020
- Record of Protected Structures - Roscommon City County Development Plan 2014-2020.
- Advice Notes on Current Practice in the preparation of Environmental Impact Statements (1995)
- Guidelines on the Information to the Contained in Environmental Impact Statements (2002).
- Revised Guidelines on the information to be contained in Environmental Impact Statements Draft (September 2015)
- Guidelines On the Information to Be Contained in Environmental Impact Assessment Reports Draft (August 2017)
- Landscape Institute and Institute of Environmental Management & Assessment (2013). Guidelines for Landscape and Visual Impact Assessment.
- Planning and Development, Act 2000, as amended.
- EPA EIAR Guidelines (August 2017)

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CHAPTER 14

TRAFFIC AND TRANSPORT ASSESSMENT

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21044-01-001

PROPOSED SAND PIT AT ROOSKAGH TOWNLAND, BELLANAMULLIA (BEALNAMULLA), ATHLONE, Co. ROSCOMMON

Traffic Transport Assessment

for

Eamon Harney

August 2022

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ROADPLAN CONSULTING

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1 INTRODUCTION

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1 Introduction

1.1 INTRODUCTION

Roadplan Consulting has been commissioned by Collins Boyd Engineering on behalf of Eamon Harney to prepare a Traffic & Transport Assessment Report for the proposed sand pit at Rooskagh Townland, Bellanamullia (Bealnamulla) Athlone, Co. Roscommon.

In preparing this report, Roadplan Consulting has made reference to

- the 'Roscommon County Development Plan 2022 - 2028',
- 'The Institute of Highways and Transportation' Guidelines on the Preparation of Traffic Impact Assessments,
- the TII 'Transport Assessment Guidelines'
- the TII "National Traffic Model".

1.2 OBJECTIVES

The objective of this report is to examine the traffic implications associated with the proposed development in terms of how it can integrate with existing traffic in the area. The report will determine and quantify the impact that the restoration of the disused sand pit will have on the operational performance of the local road network and junctions, in particular the existing L2025 / Kildea Concrete Plant priority junction and the existing R362 / L2025 priority junction.

1.3 STUDY METHODOLOGY

The methodology adopted for this report is summarised as follows:

- Traffic counts were undertaken on the 14th of April 2021 during a 12-hour period (07:00 to 19:00). Count information was obtained at the existing L2025 / Kildea Concrete Plant priority junction and the existing R362 / L2025 priority junction.
- Existing Traffic Assessment – A spreadsheet model was created which contains the base year DO-NOTHING traffic count data described above. The traffic count data was used to develop a PICADY model of the junctions.
- Future Year Assessment – The estimated future year traffic volumes on the study area road network, as a result of the increase in background traffic was used to assess the future operational performance of the junction both at the year of opening of the development, 5 years and 10 years after opening.

1.4 STRUCTURE OF REPORT

Following this introduction, the report is set out as follows:

- Chapter 2 provides details of the proposed development;
- Chapter 3 provides an overview of the existing traffic conditions and the local road network, identifying any existing issues related to traffic flow or road infrastructure;
- Chapters 4 and 5 outline the analysis as described in the Study Methodology above. The analysis examines existing trip generation, distribution and resulting junction operational performance with the development in place;
- Chapter 6 addresses road safety; and
- Chapter 7 presents the conclusions and a summary of the report.

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2 PROPOSED DEVELOPMENT

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2 Proposed Development

2.1 SITE LOCATION

The sand pit is located in the townlands of Rooskagh, Bealnamulla, Athlone, Co. Roscommon. The site is bounded by Kildea Concrete Plant to the north and agricultural lands to the south, east and west as shown on Figure 1 'Site Location Map'.

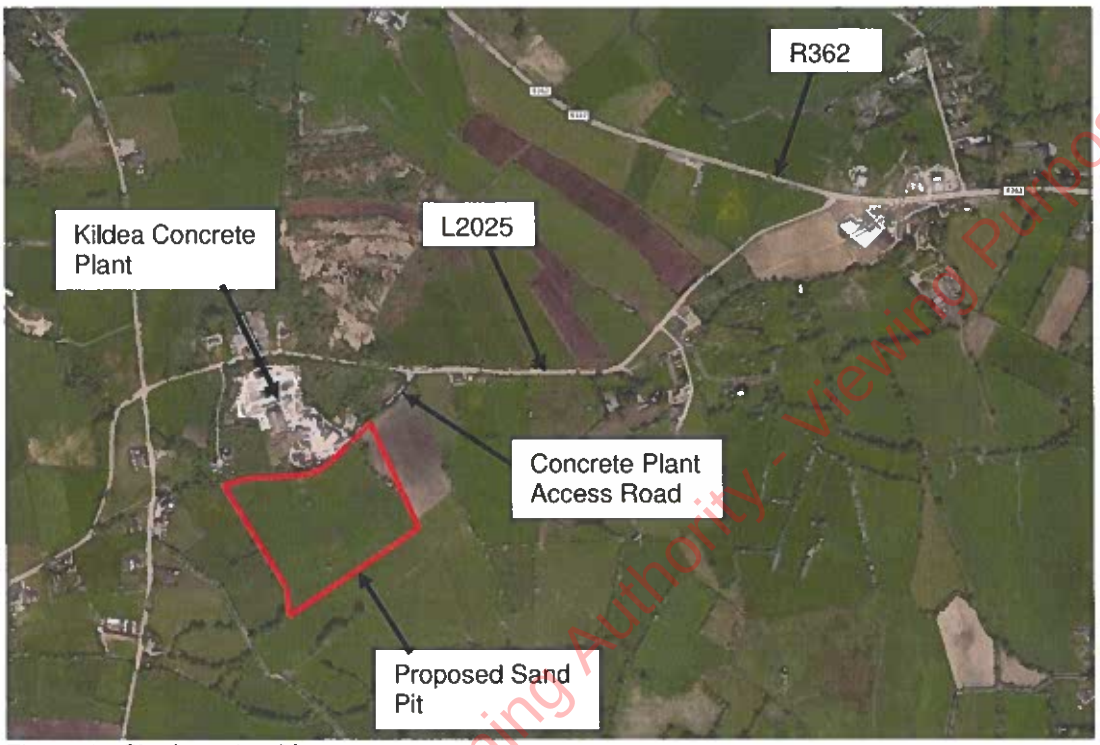

Figure 1: Site Location Map

2.2 EXISTING LAND USE

The site is currently in agricultural use.

2.3 DESCRIPTION OF PROPOSED DEVELOPMENT

The proposed site comprises of approximately 4.9 hectares. The lifespan of the sand pit will be 10 years. The proposed works will consist of the following:

- Extraction of approximately 466,766 cubic meters of sand and gravel material.
- Material inspection and quarantine areas,
- Wheel wash;
- Internal site access upgrade if required;
- Weighbridge;
- Mobile Office / welfare facility; and
- All ancillary site development infrastructure.

Access to the sand pit will be via the existing Kildea concrete plant priority junction onto the L2025. A layout of the proposed development and location of the access is shown on the Engineers drawings for the planning application which is contained in Appendix A – Drawings.

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3 EXISTING AND PROPOSED TRAFFIC CONDITIONS

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3 Existing and Proposed Traffic Conditions

3.1 EXISTING TRAFFIC FLOWS

Traffic counts were undertaken on the 14th of April 2021 during a 12-hour period. The count data is provided in Appendix B – Traffic Counts. Count information was obtained at the following junctions:

- the existing L2025 / Kildea Concrete Plant priority junction,
- the existing R362 / L2025 priority junction

The existing AM and PM peak hour traffic flows were abstracted from the traffic count and are shown in the following tables:

Existing L2025 / Kildea Concrete Plant Priority Junction

2021 AM Peak – Existing Flows

From / To	L2025 (east)	Concrete Plant	L2025 (west)	Totals
L2025 (east)	0	14	37	**51**
Concrete Plant	9	0	5	**14**
L2025 (west)	87	4	0	**91**
Totals	**96**	**18**	**42**	**156**

2021 PM Peak – Existing Flows

From / To	L2025 (east)	Concrete Plant	L2025 (west)	Totals
L2025 (east)	0	2	84	**86**
Concrete Plant	19	0	3	**22**
L2025 (west)	53	1	0	**54**
Totals	**72**	**3**	**87**	**162**

Existing R362 / L2025 Priority Junction

2021 AM Peak – Existing Flows

From / To	R362 (south)	L2025	R362 (north)	Totals
R362 (south)	54	53	85	**192**
L2025	97	0	3	**100**
R362 (north)	253	3	0	**256**
Totals	**404**	**56**	**88**	**548**

2021 PM Peak – Existing Flows

From / To	R362 (south)	L2025	R362 (north)	Totals
R362 (south)	0	84	243	**327**
L2025	66	0	5	**71**
R362 (north)	115	1	0	**116**
Totals	**181**	**85**	**248**	**514**

A summary of the count data for the peak hours is contained in Appendix C – Traffic Flow Sheets.

3.2 BASE TRAFFIC FLOWS

At the time of the traffic survey all school were fully operational. However, due to Covid-19 restrictions the traffic flows along the network are lower than normal. There is a TII traffic counter located of the N6, west of Junction 11 (TMU N06 060.0W).

The TII traffic counters indicated that the AADT flows on the N6 for 2020 was 21% lower than the AADT flows on the N6 for 2019. Therefore, in order to reflect the traffic flows under normal

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operational conditions i.e. (Covid-19 restrictions lifted) the traffic flows at the junctions during the AM and PM peak periods were factored up by 21%.

Full details of the revised traffic counts are provided in Appendix C – Traffic Flow Sheets.

3.3 EXISTING ROAD NETWORK

Access to the sand pit is via the existing L2025 local road.

The L2025 is a local primary road and serves local traffic travelling between the R362 regional road and the R357 regional road. The section of the L2025 local road at the access to the Kildea Concrete Plant which will provide access to the sand & gravel site is governed by an 80 km/h speed limit. The L2025 is a single carriageway varying in width from approximately 5.5m to 6m. The L2025 has a marked centreline and edge lines.

The existing access road to Kildea Concrete Plant will provide access to the sand pit. The existing access road is approximately 180m in length and 4.5m wide with pull-in areas to allow HGVs to pass.

3.4 ROAD COLLISIONS

Information on road collisions was taken from the Road Safety Authority website and is provided hereunder in Figure 2.

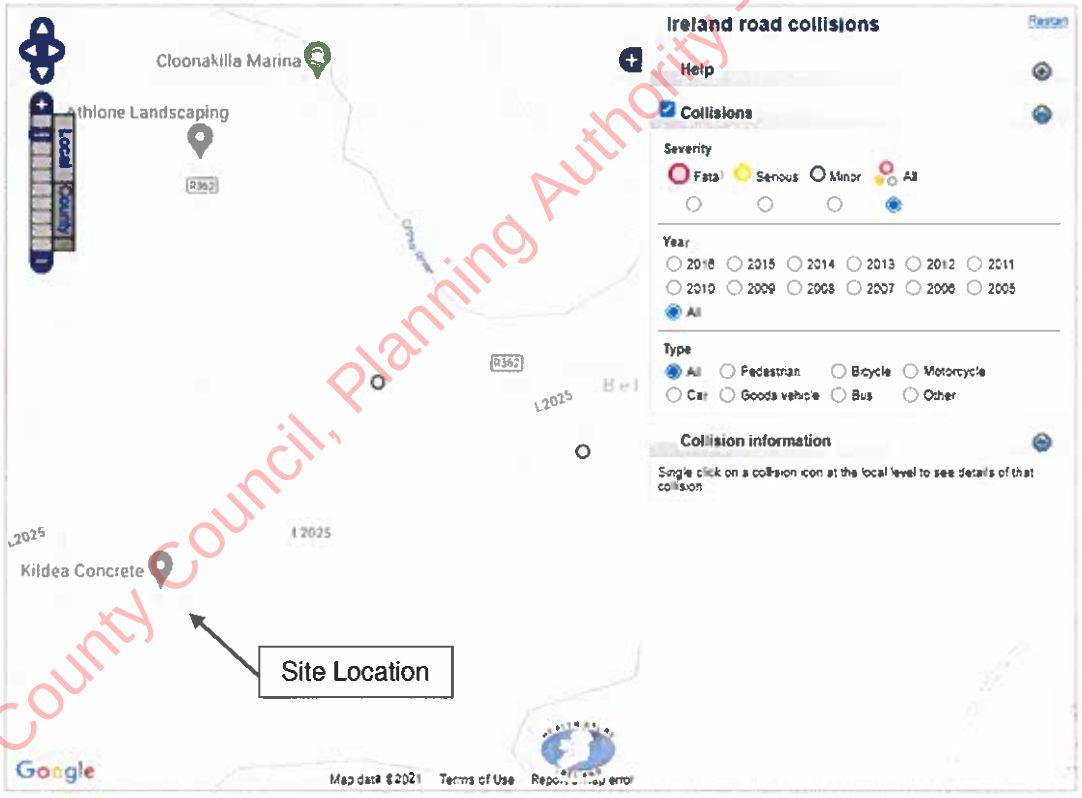

Figure 2: Road collisions

There have been no collisions at the location of the existing access to the Kildea Concrete Plant and at the existing R362 / L2025 priority junction over the period of twelve years (from 2005 to 2016).

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4 TRAFFIC GENERATION & TRIP DISTRIBUTION

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4 Traffic Generation and Trip Distribution

4.1 TRIP GENERATION

Roadplan Consulting has been informed by the client that the sand pit will extract approximately 870,000 tonnes of material over a 10-year period.

The sand pit will operate between 08:00 to 18:00 Monday to Saturday and approximately 300 days annually (based on 6 days a week for 50 weeks)

It is anticipated that the sand & gravel material will be extracted in 20 tonne consignments. The table below provides a forecast of the average weekly traffic that is anticipated to be generated by the proposed sand pit based 90,000 tonnes of material being extracted from the sand pit per annum.

	Volume (Tonnes)	Annual Loads (HGVs)	Average Daily Loads (HGVs)
OPERATION Sand & Gravel Material (20t)	90,000	4,500	15

The proposed development will operate approximately 11 hours per day. The proposed intake of material will generate a total of 15 trips per day. It should be noted that the predicted average daily loads could increase / decrease on a given day depending on demand, however it is anticipated that the average daily trips will be 15 trips per day.

Therefore, for a 1-hour period there will be approximately 4 movements (2 trips to & 2 trips from) per hour arriving and departing from the existing sand pit. The table below shows the expected AM and PM peak flows to and from the sand pit.

	Trips to Development	Trips from Development
AM Peak	4	4
PM Peak	4	4

It is anticipated that the sand pit will employ approximately 4 staff. Each staff member will travel separately to and from the sand pit. The table below shows the expected AM and PM peak staff flows to and from the sand pit.

	Trips to Development	Trips from Development
AM Peak	4	0
PM Peak	0	4

4.2 TRIP DISTRIBUTION

The access to the sand pit will be via the existing Kildea Concrete Plant access onto the L2025. Due to the location and nature of the development it is predicted that the additional HGV traffic generated by the sand pit will arrive / depart in a similar distribution to the traffic currently distributing at the existing Kildea Concrete Plant access.

The following diagrams show the existing traffic distribution percentage for the AM and PM peak at the existing L2025 / Kildea Concrete Plant priority junction and the existing R362 / L2025 priority junction.

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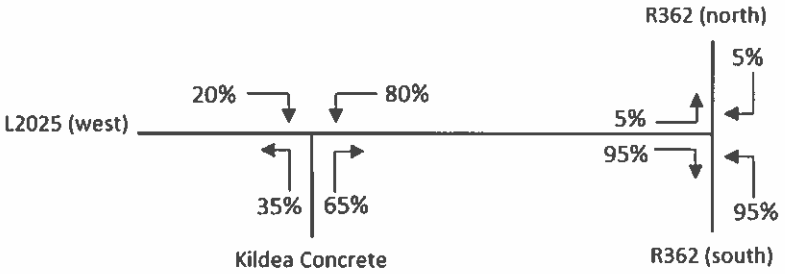
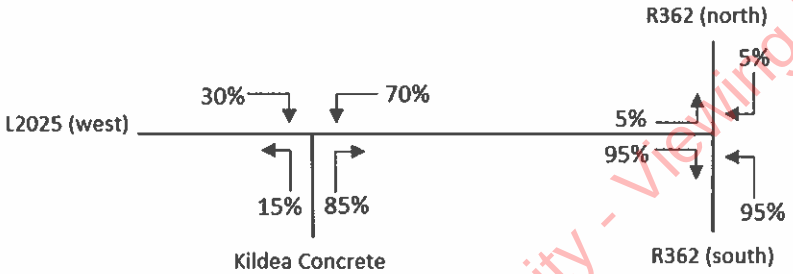
AM Peak - Development Trip Distribution (Percentage)

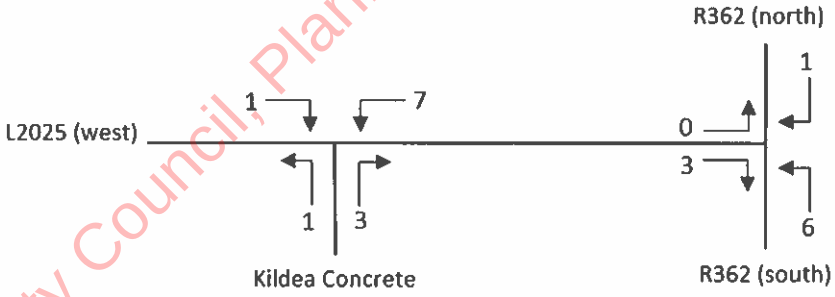


PM Peak - Development Trip Distribution (Percentage)

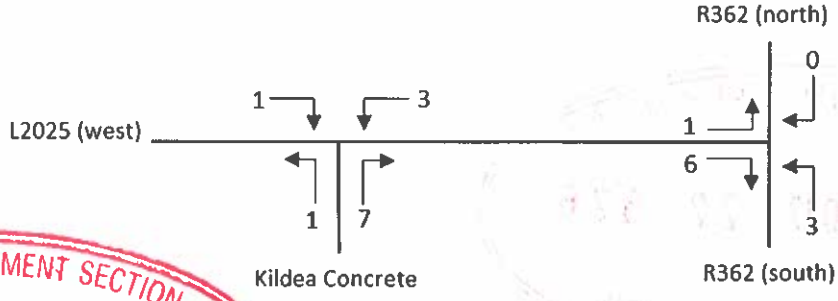


Using the proposed directional splits outlined above and the trips generated by the proposed development outlined in 4.1, the following diagrams show the turning movements of predicted development traffic at the the existing L2025 / Kildea Concrete Plant priority junction and the existing R362 / L2025 priority junction during the AM and PM peak hours:

AM Peak - Development Flows



PM Peak - Development Flows



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4.3 FUTURE YEAR TRAFFIC GROWTH

The TII issues a range of forecasts: low growth, medium growth and high growth. Due to the location and nature of the proposed development and given the recent economic expansion, we have used medium growth factors in our assessment.

The zone in which the site is located is number 251 in the TII National Traffic Model. The medium growth factors for each operational phase are as follows.

Zone	2021 Existing	2023 development operational	2028 5 years (dev. Operational)	2033 10 years (dev. Operational)
251	1.00	+2.66%	+9.71%	+12.04%

These percentages have been used to predict the increase in background traffic that will occur in future years. Full summary tables and predicted future traffic flows for 2023, 2028 and 2033 are included in Appendix C – Traffic Flow Sheets.

4.4 FUTURE DEVELOPMENTS

Planning has been granted for a future Solar Farm located to the west of the sand pit. Access to the Solar Farm is via the L2025. Once the Solar Farm is constructed the Solar Farm will not have staff on site during the operation stage. There will be 3-4 maintenances visits per year on site for the purpose of maintaining and checking the plant. The traffic generation during the operational stage will therefore be very small and will have an insignificant impact on the capacity of the L2025 and the proposed sand pit.

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5 OPERATIONAL ASSESSMENTS

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5 Operational Assessments

5.1 INTRODUCTION

A capacity assessment has been carried out on the following junctions:

- the existing L2025 / Kildea Concrete Plant priority junction
- the existing R362 / L2025 priority junction

5.2 L2025 / KILDEA CONCRETE PLANT PRIORITY JUNCTION

Capacity assessments have been undertaken using the computer program PICADY for the AM and PM peak hours.

The following tables summarise the existing situation and the effects that the development will have on this junction in 2023, 2028 and 2033 using the existing and predicted traffic flows shown in Appendix C – Traffic Flow Sheets. Full PICADY printouts are provided in Appendix D – PICADY Results.

The parameters shown in the tables are defined as follows:

Ratio of Flow to Capacity (RFC) is a factor indicating the flow on a junction arm relative to its capacity. An RFC of 1.0 means the junction has reached its ultimate capacity and an RFC of 0.85 means that the junction has reached its reserve capacity.

Avg. Queue is the average number of vehicles queued over the time period on the junction approach.

Queue delay is the average number of seconds delay to each vehicle in the time period.

Total Delay is the total number of vehicle hours of delay to all vehicles at the junction over the time period.

L2025 / Kildea Concrete Plant Priority Junction

Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
2021 Base Year	AM Peak	L2025 (east)	-	-	-
		Concrete Plant	0.05	0	9
		L2025 (west)	0.02	0	7
	PM Peak	L2025 (east)	-	-	-
		Concrete Plant	0.17	0	10
		L2025 (west)	0.00	0	0
2023 No Dev.	AM Peak	L2025 (east)	-	-	-
		Concrete Plant	0.05	0	9
		L2025 (west)	0.02	0	7
	PM Peak	L2025 (east)	-	-	-
		Concrete Plant	0.17	0	10
		L2025 (west)	0.00	0	0
2023 With Dev.	AM Peak	L2025 (east)	-	-	-
		Concrete Plant	0.07	0	9
		L2025 (west)	0.03	0	7
	PM Peak	L2025 (east)	-	-	-
		Concrete Plant	0.20	0	10
		L2025 (west)	0.01	0	6
2028 No Dev.	AM Peak	L2025 (east)	-	-	-
		Concrete Plant	0.05	0	9
		L2025 (west)	0.03	0	7
	PM Peak	L2025 (east)	-	-	-
		Concrete Plant	0.19	0	10
		L2025 (west)	0.00	0	0

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Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
2028 With Dev.	AM Peak	L2025 (east)	-	-	-
		Concrete Plant	0.07	0	9
		L2025 (west)	0.04	0	10
	PM Peak	L2025 (east)	-	-	-
		Concrete Plant	0.22	0	10
		L2025 (west)	0.01	0	6
2033 No Dev.	AM Peak	L2025 (east)	-	-	-
		Concrete Plant	0.05	0	9
		L2025 (west)	0.03	0	7
	PM Peak	L2025 (east)	-	-	-
		Concrete Plant	0.20	0	10
		L2025 (west)	0.00	0	0
2033 With Dev.	AM Peak	L2025 (east)	-	-	-
		Concrete Plant	0.07	0	9
		L2025 (west)	0.04	0	7
	PM Peak	L2025 (east)	-	-	-
		Concrete Plant	0.22	0	10
		L2025 (west)	0.01	0	6

At present the existing L2025 / Concrete Plant priority junction operates within capacity with no queues and minimal delays during the AM and PM peak hour.

In 2023, 2028 and 2033 with no development in place the junction will operate within capacity with no queues and minimal delays during the AM and PM peak hour

In 2023, 2028 and 2033 with development in place the junction will continue to operate within capacity with no queues and minimal delays during the AM and PM peak hour.

5.3 R362 / L2025 PRIORITY JUNCTION

Capacity assessments have been undertaken using the computer program PICADY for the AM and PM peak hours.

The following tables summarise the existing situation and the effects that the development will have on this junction in 2023, 2028 and 2033 using the existing and predicted traffic flows shown in Appendix C – Traffic Flow Sheets. Full PICADY printouts are provided in Appendix D – PICADY Results.

R362 / L2025 Priority Junction

Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
2021 Base Year	AM Peak	R362 (south)	-	-	-
		L2025	0.97	7	72
		R362 (north)	0.03	0	7
	PM Peak	R362 (south)	-	-	-
		L2025	0.19	0	8
		R362 (north)	0.00	0	0
2023 No Dev.	AM Peak	R362 (south)	-	-	-
		L2025	0.98	8	78
		R362 (north)	0.03	0	7
	PM Peak	R362 (south)	-	-	-
		L2025	0.20	0	9
		R362 (north)	0.00	0	0
2023 With Dev.	AM Peak	R362 (south)	-	-	-
		L2025	1.00	8	82
		R362 (north)	0.03	0	7
	PM Peak	R362 (south)	-	-	-
		L2025	0.21	0	9
		R362 (north)	0.00	0	0

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Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
2028 No Dev.	AM Peak	R362 (south)	-	-	-
		L2025	1.07	12	104
		R362 (north)	0.05	0	7
	PM Peak	R362 (south)	-	-	-
		L2025	0.22	0	9
		R362 (north)	0.00	0	0
2028 With Dev.	AM Peak	R362 (south)	-	-	-
		L2025	1.09	12	108
		R362 (north)	0.05	0	7
	PM Peak	R362 (south)	-	-	-
		L2025	0.23	0	9
		R362 (north)	0.00	0	0
2033 No Dev.	AM Peak	R362 (south)	-	-	-
		L2025	1.13	14	120
		R362 (north)	0.05	0	7
	PM Peak	R362 (south)	-	-	-
		L2025	0.23	0	9
		R362 (north)	0.00	0	0
2033 With Dev.	AM Peak	R362 (south)	-	-	-
		L2025	1.14	15	125
		R362 (north)	0.05	0	7
	PM Peak	R362 (south)	-	-	-
		L2025	0.24	0	9
		R362 (north)	0.00	0	0

At present the existing R362 / L2025 priority junction operates within capacity with no queues and minimal delays during the PM peak hour. In the AM peak hour, the junction is at capacity which results in queues and delays at the junction. This occurs during a 15-minute period between 09:00 and 09:15 and is a result of school traffic carrying out a U-turn at the existing R362 / L2025 priority junction.

In 2023, 2028 and 2033 with no development in place the junction will operate within capacity with no queues and minimal delays during the PM peak hour. In the AM peak hour, the junction is at capacity which results in queues and delays at the junction during a 15-minute period between 09:00 and 09:15.

In 2023, 2028 and 2033 with development in place the junction will operate within capacity with no queues and minimal delays during the PM peak hour. In the AM peak hour, the junction is at capacity which results in queues and delays at the junction during a 15-minute period between 09:00 and 09:15.

5.4 OPERATIONAL ASSESSMENTS – CONCLUSIONS

Junction analyses to assess the effects of traffic generated by the proposed development have been undertaken for the existing L2025 / Kildea Concrete Plant priority junction and the existing R362 / L2025 priority junction. The analysis shows that:

- The existing L2025 / Kildea Concrete Plant priority junction currently operates within capacity with no queues and minimal delays.
- The existing L2025 / Kildea Concrete Plant priority junction will operate within capacity with no queues and minimal delays when the development is operational in 2023, year of opening, 2028, five years after opening and in 2033, ten years after opening.
- The existing R362 / L2025 priority junction currently operates within capacity with no queues and minimal delays during the PM peak hour. In the AM peak hour, the junction is at capacity which results in queues and delays at the junction. This occurs during a 15-minute period between 09:00 and 09:15 and is a result of school traffic carrying out a U-turn at the existing junction.
- The existing R362 / L2025 priority junction will operate within capacity with no queues and minimal delays when the development is operational in 2023, year of opening, 2028,

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five years after opening and in 2033, ten years after opening during the PM peak hour. In the AM peak hour, the junction is at capacity which results in queues and delays at the junction during a 15-minute period between 09:00 and 09:15.

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6 ROAD SAFETY, PEDESTRIANS AND INTERNAL LAYOUT

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6 Road Safety and Internal Layout

6.1 ROAD SAFETY

The Design Manual for Roads and Bridges indicates that for an 80km/h speed limit a sightline of 160m at a 3m set-back shall be achieved in both directions.

At the existing access to the Kildea Concrete Plant a 160m sightline at a 3m set-back can be achieved in both directions. The visibility splay to the east and west of the existing access is measured from a 3m set-back to the nearside edge of the road.

A drawing showing the existing sightlines at the existing access to the Kildea Concrete Plant are shown on the Engineers Planning Application drawing which is contained in Appendix A - Drawings.

6.2 INTERNAL LAYOUT

The existing access road to the Kildea Concrete Plant will also provide access to the sand pit. The existing access road is approximately 180m in length and 4.5m wide with pull-in areas to allow HGVs to pass.

All loading of material will take place within the site off the public road. Space on site will allow the provision of a full turning circle for HGVs within the development thereby avoiding the need for HGVs to reverse onto the access road.

A wheel cleaner is required to prevent mud from being carried out onto the public road. A wheel cleaner will be installed at the site. Hand tools will be available on site for drivers to remove caked mud.

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7 CONCLUSIONS

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7 Conclusions

7.1 CONCLUSIONS

The main conclusions of this study are summarised as follows:

- The existing L2025 / Kildea Concrete Plant priority junction currently operates within capacity with no queues and minimal delays.
- The existing L2025 / Kildea Concrete Plant priority junction will operate within capacity with no queues and minimal delays when the development is operational in 2023, year of opening, 2028, five years after opening and in 2033, ten years after opening.
- The existing R362 / L2025 priority junction currently operates within capacity with no queues and minimal delays during the PM peak hour. In the AM peak hour, the junction is at capacity which results in queues and delays at the junction. This occurs during a 15-minute period between 09:00 and 09:15 and is a result of school traffic carrying out a U-turn at the existing junction.
- The existing R362 / L2025 priority junction will operate within capacity with no queues and minimal delays when the development is operational in 2023, year of opening, 2028, five years after opening and in 2033, ten years after opening during the PM peak hour. In the AM peak hour, the junction is at capacity which results in queues and delays at the junction during a 15-minute period between 09:00 and 09:15.
- A Sightline of 160m to the left and 160m to the right can be achieved at the existing Kildea Concrete Plant access which will provide access to the sand pit.
- A wheel cleaner will be installed at the site to prevent mud from being carried out onto the public road.

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APPENDICES

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APPENDIX A – DRAWINGS

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APPENDIX B – TRAFFIC COUNTS

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IDASO

Survey Name: 034 21100 Beahanmulla, Athlone

Site: Site 1

Location: N362 / I 2025

Date: Wed 14 Apr 2021

TIME	A => A										A => B										A => C									
	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	BUS	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	BUS	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	BUS	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	21	0	3	1	1	0	26	27.8	0	0	1	0	0	0	0	0	1	1
07:15	0	0	0	0	0	0	0	0	0	0	0	0	25	0	6	1	1	0	33	34.8	0	0	2	0	0	0	0	0	2	2
07:30	0	0	0	0	0	0	0	0	0	0	0	0	33	0	12	1	0	1	46	47.5	0	0	0	0	0	1	0	0	1	1.5
07:45	0	0	0	0	0	0	0	0	0	0	0	0	46	0	16	1	0	0	63	63.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	125	0	37	4	2	1	168	173.8	0	0	3	0	0	1	0	0	4	4.5
08:00	0	0	0	0	0	0	0	0	0	0	1	0	50	0	6	1	0	2	60	61.7	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	1	0	68	0	6	0	1	0	76	76.5	0	0	1	0	0	0	1	0	2	3.3
08:30	0	0	0	0	0	0	0	0	0	0	0	0	63	1	5	1	1	0	73	78.4	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	72	0	6	2	1	0	81	85.3	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	1	0	253	1	23	4	2	2	292	302.9	0	0	1	0	0	0	1	0	2	3.3
09:00	0	0	0	0	0	0	0	0	0	0	0	0	55	0	7	0	1	1	60	62.3	0	0	2	0	0	0	0	0	2	2
09:15	0	0	0	0	0	0	0	0	0	0	0	0	30	0	6	0	1	0	37	38.5	0	0	0	0	0	0	1	0	1	2.3
09:30	0	0	0	0	0	0	0	0	0	0	0	0	20	0	4	0	2	0	26	28.6	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0	0	0	23	1	7	0	0	0	31	31	0	0	0	0	1	0	0	0	1	1
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	128	1	24	0	4	1	154	160.2	0	0	2	0	1	0	1	0	4	5.3
10:00	0	0	0	0	0	0	0	0	0	0	0	0	13	0	3	0	1	0	17	19.3	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0	0	0	20	0	5	1	2	0	28	31.1	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	1	0	16	0	3	0	1	0	21	21.5	0	0	0	0	0	0	1	0	1	2.3
10:45	0	0	0	0	0	0	0	0	0	0	0	0	18	0	4	1	1	0	24	25.8	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	1	0	67	0	15	2	5	0	90	96.7	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0	20	0	5	1	1	0	27	28.8	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	1	0	17	0	1	1	0	0	20	19.7	0	0	0	0	0	0	1	0	1	2.3
11:30	0	0	0	0	0	0	0	0	0	0	0	0	17	1	4	3	1	0	26	28.8	0	0	0	0	0	0	1	0	1	2.3
11:45	0	0	0	0	0	0	0	0	0	0	1	0	13	1	6	3	1	0	25	27	0	0	0	0	0	0	1	0	1	2.3
H/TOT	0	0	0	0	0	0	0	0	0	0	2	0	67	2	16	8	3	0	98	104.3	0	0	0	0	0	0	3	0	3	6.9
12:00	0	0	0	0	0	0	0	0	0	0	0	0	13	0	2	2	0	0	17	18	0	0	1	0	0	0	0	0	1	1
12:15	0	0	0	0	0	0	0	0	0	0	0	0	17	0	8	2	1	0	28	30.3	0	0	0	0	0	0	2	0	2	4.6
12:30	0	0	0	0	0	0	0	0	0	0	0	0	19	0	3	1	2	0	25	27.1	0	0	0	0	0	1	1	0	2	3.8
12:45	0	0	0	0	0	0	0	0	0	0	0	0	18	0	4	1	0	0	23	23.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	66	0	17	6	3	0	92	98.9	0	0	1	0	0	1	3	0	5	9.4
13:00	0	0	0	0	0	0	0	0	0	0	1	0	16	0	4	0	1	0	22	22.5	0	0	0	0	0	1	0	0	1	1.5
13:15	0	0	0	0	0	0	0	0	0	0	1	0	14	0	2	1	0	0	18	17.7	0	0	0	0	0	0	0	0	0	0
13:30	0	0	1	0	0	0	0	0	0	0	0	0	16	0	3	2	1	0	22	24.3	0	0	0	0	1	1	1	0	4	6.3
13:45	0	1	1	0	0	0	0	0	0	0	0	0	21	0	5	1	0	0	27	27.5	0	0	2	0	0	1	3	0	6	10.4
H/TOT	0	1	1	0	0	0	0	0	0	0	2	0	67	0	14	4	2	0	89	92	0	0	2	0	1	4	4	0	11	18.2
14:00	0	0	0	0	0	0	0	0	0	0	0	0	22	0	4	0	1	0	27	28.3	0	0	0	0	0	1	0	0	1	1.5
14:15	0	0	0	0	0	0	0	0	0	0	0	0	21	0	6	0	2	0	29	28.6	0	0	0	0	0	0	1	0	1	2.3
14:30	0	0	0	0	0	0	0	0	0	0	0	0	18	0	4	0	0	0	23	23	0	0	1	0	1	0	1	0	3	4.3
14:45	0	0	0	0	0	0	0	0	0	0	0	0	27	0	5	1	1	0	34	35.8	0	0	1	0	0	0	1	0	2	3.3
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	88	0	19	1	4	0	113	116.7	0	0	2	0	1	1	3	0	7	11.4
15:00	0	0	0	0	0	0	0	0	0	0	0	0	30	0	4	1	2	0	37	40.1	1	0	1	0	0	0	1	0	3	3.5
15:15	0	0	0	0	0	0	0	0	0	0	0	0	13	0	3	1	0	1	17	18.3	0	0	0	0	0	0	2	0	2	4.6
15:30	0	0	0	0	0	0	0	0	0	0	0	0	17	0	4	1	0	0	22	22.9	0	0	0	0	0	2	1	0	3	5.3
15:45	0	0	0	0	0	0	0	0	0	0	0	0	21	1	5	0	0	0	27	27	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	81	1	15	3	2	1	104	108.1	1	0	1	0	0	2	4	0	8	13.4
16:00	0	0	0	0	0	0	0	0	0	0	0	0	19	0	3	2	0	0	24	25.4	0	0	0	0	0	0	1	0	1	2.3
16:15	0	0	0	0	0	0	0	0	0	0	0	0	14	1	2	1	0	0	18	19.8	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	19	0	3	0	0	0	22	24.4	0	0	0	0	0	0	1	0	1	2.3
16:45	0	0	0	0	0	0	0	0	0	0	0	0	24	0	8	2	0	2	36	40	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	76	1	23	5	0	2	114	125.3	0	0	0	0	0	1	0	0	2	5.6
17:00	0	0	0	0	0	0	0	0	0	0	0	0	25	0	4	0	2	1	33	31.8	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	18	1	3	1	0	0	24	24.1	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	1	0	28	0	3	1	1	0	34	35	0	0	1	0	0	0	0	0	1	1
17:45	0	0	0	0	0	0	0	0	0	0	0	0	17	0	5	0	0	0	24	27.4	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	1	0	88	1	15	2	3	1	111	117.7	0	0	1	0	0	0	0	0	1	1
18:00	0	0	0	0	0	0	0	0	0	0	1	0	16	0	6	0	1	0	24	24.5	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0	0	0	16	0	3	3	0	0	22	23.5	0	0	1	0	0	0	0	0	1	1
18:30	0	0	0	0	0	0	0	0	0	0	0	0	14	0	4	1	1	0	20	21.8	0	0	1	0	0	0	0	0	1	1
18:45	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	1	0	54	0	13	4	2	0	74	78.8	0	0	2	0	0	0	0	0	2	2
12 HOUR	0	1	0	0	0	0	0	0	0	0	12	0	1155	7	227	46	41	9	1499	1572	1	0	15	0	6	5	22	0	53	85.3

Roscommon County Council, Planning Authority - Viewing Purposes Only!

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

A => A										A => B										A => C									
P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	MV(BUS)	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	MV(BUS)	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	MV(BUS)	TOT	PCU
0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	1	1	2	0	0	6	0	0	0	0	1	7	8
0	0	4	0	4	0	1	1	10	12.3	0	0	0	0	0	0	0	0	0	0	0	0	6	0	2	0	0	0	8	8
0	0	9	0	1	0	3	2	15	20.9	0	0	1	0	0	0	0	0	1	1	0	0	3	0	0	0	0	0	3	3
0	0	7	0	1	2	3	0	13	17.9	0	0	0	0	0	0	0	1	1	2	0	0	4	0	0	0	2	0	6	8.6
0	0	27	0	6	2	7	3	45	58.1	0	0	1	0	0	0	0	2	3	5	0	0	19	0	2	0	2	1	24	27.6
0	0	12	0	4	0	3	0	19	22.9	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6	6
0	0	12	1	4	1	2	1	21	25.4	0	0	1	0	0	0	0	0	1	1	0	0	6	0	0	0	1	2	11	14.3
0	0	17	0	3	3	1	0	24	26.8	0	0	1	0	0	0	0	0	1	1	0	0	3	0	1	0	2	0	6	8.6
0	0	18	0	2	2	0	0	22	23	0	0	1	0	0	0	0	0	1	1	0	0	6	0	1	2	5	0	14	23.5
0	0	19	1	13	0	6	1	86	97.8	0	0	3	0	0	0	0	0	3	3	0	0	25	0	2	2	8	2	39	52.4
0	0	14	0	1	1	1	0	17	18.8	0	0	32	0	1	0	0	0	33	33	0	0	10	0	1	0	3	0	14	17.9
0	0	16	0	0	0	2	0	22	24.6	0	0	18	0	1	0	0	0	19	19	0	0	12	0	0	1	4	0	17	22.7
0	0	17	0	2	0	1	0	20	21.3	0	0	1	0	0	0	0	0	1	1	0	0	9	0	0	1	1	0	11	12.8
0	0	11	0	4	0	0	0	15	15	0	0	0	0	0	0	0	1	1	1	1	0	8	0	2	0	3	1	15	19.1
0	0	56	0	13	1	4	0	74	79.7	0	0	53	0	2	0	0	1	54	55	1	0	39	0	3	2	13	1	59	71.3
0	0	9	0	5	1	3	0	18	22.6	0	0	0	0	0	0	0	1	1	1	0	0	7	0	3	0	3	0	13	16.9
0	0	16	0	2	1	1	0	20	21.8	0	0	1	0	0	0	0	0	1	1	0	0	3	0	1	1	2	0	7	10.1
0	0	18	0	3	1	3	0	25	29.6	0	0	0	0	0	0	0	1	1	2	0	0	8	0	2	0	5	0	15	21.5
0	0	19	0	4	0	1	0	24	25.9	0	0	0	0	0	0	0	0	0	0	0	0	5	0	3	1	5	0	14	21
0	0	62	2	14	3	6	0	87	99.9	0	0	1	0	0	0	0	2	3	5	0	0	23	0	9	2	15	0	49	61.5
0	0	14	0	5	2	0	0	21	22	0	0	0	0	0	0	0	0	0	0	0	0	7	0	1	0	3	0	11	14.9
0	0	11	0	2	1	1	0	15	16.8	0	0	1	0	0	0	0	0	1	1	0	0	11	0	0	1	2	0	14	17.1
0	0	21	1	0	1	1	0	24	25.8	0	0	0	0	0	0	0	0	0	0	1	0	8	0	1	1	3	0	14	17.6
0	0	16	0	1	3	3	0	23	28.4	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	3	0	10	13.9
0	0	62	1	8	7	5	0	83	93	0	0	1	0	0	0	0	0	1	1	1	0	33	0	2	2	11	0	49	63.5
1	0	18	0	7	2	1	0	29	38.3	0	0	0	0	0	0	0	0	0	0	1	0	8	0	2	2	3	0	17	17.9
0	0	16	0	3	1	0	0	20	19.5	0	0	2	0	0	0	0	0	2	2	0	0	9	0	4	2	5	1	21	29.5
0	0	14	0	1	1	0	0	16	16.8	0	0	0	0	0	0	0	0	0	0	0	0	9	0	2	1	0	0	12	12.5
0	0	14	0	3	0	3	0	18	21.9	0	0	1	0	1	0	0	0	2	2	0	0	10	0	1	1	2	0	10	11.1
1	0	62	0	12	4	4	0	83	89.4	0	0	3	0	1	0	0	1	5	6	0	0	39	0	9	6	10	3	64	81
0	0	25	0	3	0	2	0	30	32.6	0	0	1	0	0	0	0	0	1	1	0	0	5	0	4	0	2	0	11	12.6
0	0	20	0	3	0	0	0	23	23	0	0	3	0	0	0	0	0	3	3	0	0	12	0	0	1	2	0	15	18.1
0	0	26	0	3	1	2	0	32	35.1	0	0	1	0	0	0	0	0	1	1	0	0	7	0	2	1	0	0	10	10.5
0	0	21	0	2	2	2	0	27	30.6	0	0	10	0	0	0	0	0	10	10	0	0	13	0	1	0	1	0	15	16.3
0	0	82	0	33	3	6	0	124	131.3	0	0	15	0	0	0	0	0	15	15	0	0	37	0	7	2	5	0	51	58.5
0	0	18	0	4	1	1	1	25	27.8	0	0	9	0	0	0	0	0	9	9	0	0	6	0	1	1	2	1	11	15.1
0	0	22	0	9	0	0	0	31	31	0	0	1	1	0	0	0	1	3	4	0	0	11	0	0	2	2	0	15	18.6
0	0	28	0	4	1	3	0	28	32.4	0	0	12	0	1	0	0	0	13	13	0	0	16	0	0	1	1	0	18	19.8
0	0	22	0	6	1	2	0	31	34.1	0	0	12	0	1	0	0	0	13	13	0	0	18	0	0	0	1	0	19	19.5
0	0	82	0	23	3	6	1	115	125.3	0	0	34	1	2	0	0	1	38	39	0	0	51	0	1	0	10	1	67	83
0	0	28	0	1	1	0	0	30	30.3	0	0	17	0	0	0	0	0	17	17	0	0	13	0	1	1	1	0	16	17.8
0	0	28	0	2	2	1	0	33	35.3	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	3	0	10	13.9
0	0	29	0	8	2	2	0	41	44.8	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	1	4	0	11	14.7
0	0	21	0	4	0	1	0	26	27.3	0	0	0	0	0	0	0	0	0	0	0	0	7	0	3	0	1	1	12	14.3
0	0	106	0	19	5	4	0	134	141.7	0	0	17	0	0	0	0	0	17	17	0	0	33	0	4	2	9	1	49	62.7
0	0	44	0	5	0	1	0	50	51.3	0	0	0	0	0	0	0	0	0	0	0	0	20	0	1	1	1	0	23	24.8
0	0	53	0	7	0	1	1	62	64.3	0	0	1	0	0	0	0	0	1	1	1	0	19	0	1	0	4	0	25	29.4
0	0	54	0	6	1	0	3	64	67.5	0	0	0	0	0	0	0	0	0	0	0	0	9	0	3	1	4	1	18	24.7
0	0	31	0	7	1	1	0	40	40.8	0	0	0	0	0	0	0	0	0	0	0	0	13	0	3	1	3	0	20	24.4
0	0	187	0	31	2	3	4	226	216.7	0	0	1	0	0	0	0	0	1	1	0	0	61	0	8	3	12	1	86	102.3
0	0	35	0	10	0	1	0	46	47.3	0	0	0	0	0	0	0	0	0	0	0	0	21	0	3	1	0	0	25	25.5
0	0	56	0	5	1	0	0	63	64	0	0	0	0	0	0	0	0	0	0	0	0	18	0	3	3	2	0	26	30.1
1	0	57	1	8	1	2	0	70	72.3	0	0	0	0	0	0	0	0	0	0	0	0	8	0	5	0	1	0	14	15.3
0	0	50	0	13	1	0	0	64	64.3	0	0	0	0	0	0	0	0	0	0	0	0	14	0	4	1	0	0	19	18.5
1	0	198	1	36	4	3	0	243	248.1	0	0	0	0	0	0	0	0	0	0	0	0	61	0	15	5	3	0	84	98.4
0	0	47	0	11	0	0	0	58	58	0	0	0	0	0	0	0	0	0	0	0	0	12	0	1	0	0	0	13	13
0	0	29	0	5	2	0	0	36	36	0	0	0	0	0	0	0	0	0	0	0	0	17	0	2	0	0	0	19	19
0	0	22	0	3	0	0	0	25	25	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	10	10
0	0	31	0	4	1	0	0	36	36.3	0	0	0	0	0	0	0	0	0	0	0	0	9	0	5	0	0	0	14	14
0	0	116	0	29	3	0	0	152	153.8	0	0	0	0	0	0	0	0	0	0	0	0	48	0	8	0	0	0	56	56
2	0	1314	3	293	43	54	9	1918	1930	0	0	127	1	5	0	0	7	140	142	2	0	468	0	78	30	95	8	675	819.4

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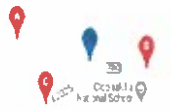

Google

C => A										C => B										C => C									
P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	SV(BUS)	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	SV(BUS)	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	SV(BUS)	TOT	PCU
0	0	0	0	0	0	0	0	0	0	0	0	5	0	1	1	1	0	8	9.8	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	5	0	1	0	2	0	8	10.6	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	1	0	1	2.3	0	0	15	0	2	1	2	0	20	23.1	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	7	0	1	2	2	1	13	17.6	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	1	0	1	2.3	0	0	32	0	5	4	7	1	49	61.1	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	1	1.5	0	0	10	0	2	1	4	0	17	22.7	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	15	0	1	0	3	0	19	22.8	0	0	0	0	0	0	0	0	0	0
0	0	0	0	1	0	1	0	2	5.3	0	0	17	0	1	0	4	0	22	27.2	0	0	0	0	0	0	0	0	0	0
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0	0	0	0	0	0	1	0	1	3.8	0	0	59	1	7	3	10	2	82	98.5	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	8	0	5	1	1	0	15	19.4	0	0	0	0	0	0	0	0	0	0
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0	0	0	0	0	0	1	0	1	2.3	0	0	9	0	1	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0
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0	0	0	0	0	0	1	0	1	2.3	0	0	7	0	2	2	9	0	20	32.7	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	1	0	1	2.3	0	0	11	0	1	1	2	0	15	18.1	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	1	0	1	2.3	0	0	9	0	1	2	3	0	15	15.9	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	2	0	2	4.6	0	0	29	0	11	2	9	0	51	63.7	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	1	3	0	9	12.1	0	0	0	0	0	0	0	0	0	0
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0	0	0	0	0	0	2	0	2	4.6	0	0	29	0	11	2	9	0	51	63.7	0	0	0	0	0	0	0	0	0	0
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0	0	0	0	0	0	1	0	1	2.3	0	0	11	0	1	1	2	0	15	18.1	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	1	0	1	2.3	0	0	9	0	1	2	3	0	15	15.9	0	0	0	0	0	0	0	0	0	0
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0	0	0	0	1	1	0	0	2	3.8	0	0	4	0	0	1	4	1	10	16.7	0	0	0	0	0	0	0	0	0	0
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0	0	1	0	0	0	1	0	2	3.3	0	0	9	0	1	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0
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0	0	6	0	0	3	1	0	10	14.8	0	0	32	0	7	4	7	0	50	61.3	0	0	0	0	0	0	0	0	0	0
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0	0	2	0	0	0	2	0	4	6.6	0	0	15	0	0	0	1	0	16	17.3	0	0	0	0	0	0	0	0	0	0
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0	0	1	0	0	0	0	0	1	1	0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0
0	0	3	0	0	0	0	0	3	3	0	0	27	0	1	0	0	0	28	28	0	0	0	0	0	0	0	0	0	0
0	0	17	0	2	5	24	0	48	81.7	2	0	467	1	60	33	96	8	671	818.7	0	0	0	0	0	0	0	0	0	0

Roscommon County Council, Planning Authority - Viewing Purposes Only!

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

IDASO

Survey Name: 034 21100 Bealnamulla, Athlone
Site: Site 2
Location: L2025 / Kildea Concrete
Date: Wed 14-Apr-2021

TIME	A => A P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	BUS	TOT	PCU	A => B P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	BUS	TOT	PCU	A => C P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	BUS	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	1	0	0	6	6.5	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	4	0	2	0	0	1	7	8	0	0	3	0	1	0	0	0	4	4
07:30	0	0	0	0	0	0	0	0	0	0	0	0	13	0	4	1	0	0	18	18.5	0	0	0	0	0	0	0	0	0	0
07:45	1	0	0	0	0	0	0	0	0	0	0	0	6	0	1	1	0	1	9	10.5	0	0	0	0	0	1	0	0	1	1.5
H/TOT	1	0	0	0	0	0	0	0	0	0	0	0	27	0	8	3	0	2	40	43.5	0	0	3	0	1	1	0	0	5	5.5
08:00	0	0	0	0	0	0	0	0	0	0	0	0	12	0	2	1	0	0	15	17.5	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	13	0	1	0	2	0	16	18.0	0	0	1	0	0	0	0	0	1	1
08:30	0	0	0	0	0	0	0	0	0	0	0	0	19	0	1	0	3	0	23	26.9	0	0	0	0	0	0	2	0	2	4.5
08:45	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	15	15	0	0	0	0	0	1	0	0	1	1
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	59	0	4	1	5	0	72	82.9	0	0	1	0	1	0	2	0	4	6.5
09:00	0	0	0	0	0	0	0	0	0	0	0	0	19	0	3	1	2	0	25	28.1	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0	0	19	0	0	1	3	1	24	29.4	0	0	0	0	0	0	1	0	1	2.5
09:30	0	0	0	0	0	0	0	0	0	0	0	0	11	0	1	0	1	0	13	14.3	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0	0	0	7	0	1	0	1	0	9	10.3	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	56	0	5	2	7	1	71	82.1	0	0	0	0	0	0	1	0	1	2.5
10:00	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	1	0	0	11	11.5	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0	0	0	6	0	1	1	2	0	10	13.1	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0	7	0	2	0	0	0	10	10	0	0	0	0	0	0	1	0	1	1.5
10:45	0	0	0	0	0	0	0	0	0	0	0	0	8	0	2	0	2	0	12	14.6	0	0	0	0	0	0	0	0	1	2.5
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	26	0	10	2	4	0	43	49.2	0	0	0	0	0	0	1	0	2	5.5
11:00	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	1	0	0	6	7.6	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	7	0	2	0	6	0	15	22.8	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	11	11	0	0	0	0	0	0	1	0	1	2.5
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H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	27	0	4	2	7	0	38	48.1	0	0	0	0	0	0	1	0	1	2.5
12:00	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	3	0	14	17.9	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	3	0	10	13.9	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	3	0	8	11.9	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	7	0	1	0	1	0	14	15.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	30	0	1	0	10	0	46	59	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	1	0	0	4	4.5	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	8	0	3	1	1	0	13	14.8	0	0	1	0	0	0	0	0	1	1
13:45	0	0	0	0	0	0	0	0	0	0	0	0	6	0	3	1	3	0	13	17.4	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	25	0	7	3	4	0	39	45.7	0	0	1	0	0	0	0	0	1	1
14:00	0	0	0	0	0	0	0	0	0	0	0	0	5	0	3	2	0	0	10	12.6	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0	0	0	7	0	1	1	0	0	9	9.5	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
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H/TOT	0	0	0	0	0	0	0	0	0	0	1	0	31	0	6	2	1	0	43	47.1	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	12	1	0	1	0	0	14	14.5	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	1	0	14	15.3	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	3	1	15	19.9	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	0	6	0	1	0	1	0	8	9.3	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	42	1	1	1	5	1	51	59	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	5	0	1	1	4	0	11	16.7	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	5	0	4	1	1	0	11	12.8	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	6	0	1	0	0	1	8	9	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	27	0	6	2	5	1	41	49.5	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	1	1	10	12.3	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	12	0	2	0	3	0	18	21.9	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	13	0	1	0	0	0	14	14	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	1	0	9	0	1	0	0	0	11	10.2	0	0	0	0	0	0	0	1	1	2.5
H/TOT	0	0	0	0	0	0	0	0	0	0	1	0	42	0	5	0	4	1	53	58.4	0	0	0	0	0	0	0	1	1	2.5
18:00	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	28	0	0	0	0	0	28	28	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	0	0	0	0	0	0	0	0	2	0	418	3	63	18	57	4	565	652.3	0	0	5	0	2	3	6	0	16	21.5

Roscommon County Council, Planning Authority – Viewing Purposes Only!

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

A => A										A => B										A => C									
P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	SV(BUS)	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	SV(BUS)	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	SV(BUS)	TOT	PCU
0	0	3	0	0	0	0	1	1	4	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3
0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	7	0	1	0	0	0	8	8
0	0	3	0	1	0	0	1	5	6	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	9	9
0	0	4	0	0	0	2	0	6	8.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1.5
0	0	12	0	1	0	2	2	17	21.5	0	0	0	0	0	0	0	0	0	0	0	0	10	0	1	1	0	0	12	12.5
0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
0	0	8	0	0	0	0	1	9	10	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	4	6.6
0	0	2	0	0	0	1	0	3	4.3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	1	0	4	5.3
0	0	7	0	1	0	3	0	11	14.9	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	4	5.6
0	0	21	0	1	0	4	1	27	33.2	0	0	0	0	0	0	0	0	0	0	0	0	6	0	2	1	4	0	13	18.7
0	0	10	0	1	0	2	0	12	15.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	4.6
0	0	8	0	0	0	1	0	10	11.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	4	8.4
0	0	9	0	0	0	1	0	10	11.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	3.8
0	0	7	0	2	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	4	7.6
0	0	35	0	3	0	4	0	42	47.2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	9	0	12	24.7
1	0	4	0	3	0	2	0	10	11.8	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	3.3
0	0	2	0	2	0	1	0	5	6.3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	4	5.8
0	0	7	0	1	0	1	0	9	10.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	9.2
0	0	7	0	2	0	4	0	13	19.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	4	7.1
1	0	28	0	8	0	0	0	37	40.8	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2	8	0	14	25.4
0	0	8	0	1	0	2	0	11	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2.3
0	0	10	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	3	6.1
0	0	4	0	1	1	1	0	7	8.8	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	3	0	5	8.9
1	0	5	0	0	0	2	0	8	9.8	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	3	4.3
1	0	27	0	2	1	5	0	36	42.2	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	7	0	0	12	21.6
0	0	9	0	3	1	3	0	14	19.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	3.8
1	0	7	0	2	0	3	0	12	15.9	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	4	9.2
0	0	10	0	3	1	0	0	14	14.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	3	4.8
0	0	11	0	1	0	2	0	14	16.6	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	3.2
0	0	37	0	7	2	8	0	54	65.4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	7	0	11	23.1
0	0	4	0	3	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	3	5.6
0	0	12	0	0	0	2	0	14	16.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1.5
0	0	6	0	2	1	0	0	9	9.5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	4	5.8
0	0	9	0	1	0	1	0	11	12.3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	4	7.9
0	0	31	0	6	3	0	0	41	49.4	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	6	0	0	12	29.8
0	0	7	0	0	0	1	1	9	11.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	4.8
0	0	7	0	0	0	1	0	8	9.3	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	1	2	0	4	7.1
0	0	15	0	1	0	1	0	17	18.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	3.8
0	0	16	0	0	0	1	0	17	18.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	11.5
0	0	45	0	1	0	4	1	51	57.2	0	0	1	0	0	0	0	0	1	1	0	0	1	0	1	3	9	0	14	27.2
0	0	20	0	0	0	1	0	21	22.3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	1	0	5	6.3
1	0	7	0	0	0	2	0	10	11.8	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	4	7.9
0	0	5	0	0	1	3	0	9	11.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2.3
0	0	7	0	3	0	1	0	11	14.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2.3
1	0	29	0	3	1	7	0	41	49.8	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	6	0	11	19.8
0	0	19	0	1	0	1	0	21	22.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2.3
0	0	14	0	1	1	2	0	18	21.1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	4	6.6
0	0	12	0	3	1	3	1	19	25.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	4.6
0	0	14	0	2	1	3	0	20	24.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	59	0	7	3	4	0	73	91.2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	5	0	7	13.5
0	0	20	0	2	1	0	0	23	23.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	19	0	3	1	3	1	27	31.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	11	0	4	1	1	0	17	17.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	13	0	4	1	0	0	18	18.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	65	0	23	5	3	0	96	90.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	12	0	1	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	18	0	1	0	0	0	19	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	11	0	0	0	0	0	11	11	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	9	0	5	0	0	0	14	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	50	0	7	0	0	0	57	57	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
5	0	429	0	59	17	37	5	548	649.2	0	0	2	0	0	0	0	0	2	2	0	0	32	0	11	14	61	0	118	204.3

Roscommon County Council, Planning Authority - Viewing Purposes Only!

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

C => A										C => B										C => C									
P/C	HGV	CAR	TAXI	LGV	OGV1	OGV2	BV(SD)	TOT	PCU	P/C	HGV	CAR	TAXI	LGV	OGV1	OGV2	BV(SD)	TOT	PCU	P/C	HGV	CAR	TAXI	LGV	OGV1	OGV2	BV(SD)	TOT	PCU
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	4.6	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	1	0	1	2.3	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	4	0	4	9.2	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	1	1	0	2	3.8	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	1	6	0	7	15.9	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	1	2	0	3	6.1	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	1	0	0	1	2.3	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	1	0	0	1	1.5	0	0	1	0	1	0	1	0	3	4.3	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	2	0	2	4.6	0	0	0	0	1	0	1	0	2	3.3	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	1	2	0	3	6.1	0	0	1	0	2	1	5	0	9	16	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	1	1	0	2	3.8	0	0	0	0	0	0	0	0	0	0
0	0	0	0	1	0	1	0	2	3.3	0	0	0	0	0	1	1	0	2	3.8	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	1	0	0	1	2.3	0	0	0	0	0	0	1	0	1	2.3	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	1	0	1	2.3	0	0	0	0	0	0	0	0	0	0
0	0	1	0	1	0	2	0	3	6.6	0	0	0	0	0	2	4	0	6	12.2	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	3	0	4	7.9	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	1	0	1	2.3	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	1	0	1	2.3	0	0	0	0	0	0	0	0	0	0
0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	2	0	2	4.6	0	0	0	0	0	0	0	0	0	0
0	0	1	0	1	0	0	0	2	2	0	0	2	0	0	0	7	0	9	18.1	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	1	0	0	1	2.3	0	0	1	0	0	1	3	0	5	9.8	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	1	0	0	1	1.5	0	0	1	0	0	1	2	0	4	7.4	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	1	3	0	4	8.4	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	1	0	0	2	3.3	0	0	1	0	1	0	4	0	6	10.2	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	1	2	0	4	7.1	0	0	3	0	1	3	13	0	20	36.1	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	1	2	0	3	6.1	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	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	1	2	0	3	6.1	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	1	1	3	5	9.4	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	1	1	0	0	1	0	1	3	7	0	12	23.9	0	0	0	0	0	0	0	0	0	0
0	0	1	0	1	0	0	0	2	2	0	0	0	0	0	0	1	0	1	2.3	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	2	0	2	4.6	0	0	0	0	0	0	0	0	0	0
0	0	2	0	0	0	0	0	2	2	0	0	1	0	0	0	2	0	3	6.8	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	4	9.8	0	0	0	0	0	0	0	0	0	0
0	0	3	0	1	0	0	0	4	4	0	0	3	0	1	1	4	0	10	18.3	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	2	0	2	4.6	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	3.5	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	1	1	0	2	3.8	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	1	2	0	3	6.1	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	3	5	0	8	17	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	2	0	2	4.6	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	1	0	0	1	2.3	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	1	0	0	1	2.3	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	1	0	0	1	2.3	0	0	1	0	1	0	1	0	3	4.3	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	2	0	2	4.6	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	1	0	1	2.3	0	0	4	0	1	0	4	0	11	18.8	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	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	1	0	0	1	2.3	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	0	0	0	0	0	1	1	0	2	3	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	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	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	0	1	0	0	0	2	2	0	0	11	0	3	0	0	0	15	34.2	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	4.6	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	0	0	0	0	0	0	0	0	0	0
0	0	2	1	0	0	0	0	3	3	1	0	15	0	3	0	0	0	19	38.2	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	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	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	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	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	5	0	4	2	0	0	23	34.4	1	0	30	0	11	14	90	0	136	290.1	0	0	0	0	0	0	0	0	0	0

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APPENDIX C – TRAFFIC FLOW SHEETS

Roscommon County Council, Planning Authority - Viewing Purposes Only!

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
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L2025 / Concrete Plant Priority Junction - AM Peak Hour

2021 AM Peak - Base Flows

	L2025 (east)	Concrete Plant	L2025 (west)	Totals
L2025 (east)	0	107	85	**192**
Concrete Plant	151	0	3	**154**
L2025 (west)	253	3	0	**256**
Totals	**404**	**110**	**88**	**602**

AM Peak - Development Flows

	L2025 (east)	Concrete Plant	L2025 (west)	Totals
L2025 (east)	0	6	0	**6**
Concrete Plant	3	0	0	**3**
L2025 (west)	0	1	0	**1**
Totals	**3**	**7**	**0**	**10**

2021 AM Peak - Base Flows (Existing Flows + 21%)

	L2025 (east)	Concrete Plant	L2025 (west)	Totals
L2025 (east)	0	129	103	**232**
Concrete Plant	183	0	4	**186**
L2025 (west)	306	4	0	**310**
Totals	**489**	**133**	**106**	**728**

2022 AM Peak - No Development (2021 Base Flows + 1.32%)

	L2025 (east)	Concrete Plant	L2025 (west)	Totals
L2025 (east)	0	131	104	**235**
Concrete Plant	185	0	4	**189**
L2025 (west)	310	4	0	**314**
Totals	**495**	**135**	**108**	**738**

2022 AM Peak - With Development

	L2025 (east)	Concrete Plant	L2025 (west)	Totals
L2025 (east)	0	137	104	**241**
Concrete Plant	188	0	4	**192**
L2025 (west)	310	5	0	**315**
Totals	**498**	**142**	**108**	**748**

2027 AM Peak - No Development (2021 Base Flows + 8.25%)

	L2025 (east)	Concrete Plant	L2025 (west)	Totals
L2025 (east)	0	140	111	**251**
Concrete Plant	198	0	4	**202**
L2025 (west)	331	4	0	**335**
Totals	**529**	**144**	**115**	**789**

2027 AM Peak - With Development

	L2025 (east)	Concrete Plant	L2025 (west)	Totals
L2025 (east)	0	146	111	**257**
Concrete Plant	201	0	4	**205**
L2025 (west)	331	5	0	**336**
Totals	**532**	**151**	**115**	**799**

2032 AM Peak - No Development (2021 Base Flows + 12.25%)

	L2025 (east)	Concrete Plant	L2025 (west)	Totals
L2025 (east)	0	145	115	**261**
Concrete Plant	205	0	4	**209**
L2025 (west)	344	4	0	**348**
Totals	**549**	**149**	**120**	**818**

2032 AM Peak - With Development

	L2025 (east)	Concrete Plant	L2025 (west)	Totals
L2025 (east)	0	151	115	**267**
Concrete Plant	208	0	4	**212**
L2025 (west)	344	5	0	**349**
Totals	**552**	**156**	**120**	**828**

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L2025 / Concrete Plant Priority Junction - PM Peak Hour

2021 PM Peak - Base Flows

0	L2025 (east)	Concrete Plant	L2025 (west)	Totals
L2025 (east)	0	84	242	326
Concrete Plant	65	0	5	70
L2025 (west)	111	1	0	112
Totals	**176**	**85**	**247**	**508**

PM Peak - Development Flows

	L2025 (east)	Concrete Plant	L2025 (west)	Totals
L2025 (east)	0	3	0	3
Concrete Plant	6	0	1	7
L2025 (west)	0	0	0	0
Totals	**6**	**3**	**1**	**10**

2021 PM Peak - Base F

	L2025 (east)	Concrete Plant	L2025 (west)	Totals
L2025 (east)	0	102	293	394
Concrete Plant	79	0	6	85
L2025 (west)	134	1	0	136
Totals	**213**	**103**	**299**	**615**

2022 PM Peak - No Development (2021 Base Flows + 1.32%)

	L2025 (east)	Concrete Plant	L2025 (west)	Totals
L2025 (east)	0	103	297	400
Concrete Plant	80	0	6	86
L2025 (west)	136	1	0	137
Totals	**216**	**104**	**303**	**623**

2022 PM Peak - With Development

	L2025 (east)	Concrete Plant	L2025 (west)	Totals
L2025 (east)	0	106	297	403
Concrete Plant	86	0	7	93
L2025 (west)	136	1	0	137
Totals	**222**	**107**	**304**	**633**

2027 PM Peak - No Development (2021 Base Flows + 8.25%)

	L2025 (east)	Concrete Plant	L2025 (west)	Totals
L2025 (east)	0	110	317	427
Concrete Plant	85	0	7	92
L2025 (west)	145	1	0	147
Totals	**231**	**111**	**324**	**665**

2027 PM Peak - With Development

	L2025 (east)	Concrete Plant	L2025 (west)	Totals
L2025 (east)	0	113	317	430
Concrete Plant	91	0	8	99
L2025 (west)	145	1	0	147
Totals	**237**	**114**	**325**	**675**

2032 PM Peak - No Development (2021 Base Flows + 12.25%)

	L2025 (east)	Concrete Plant	L2025 (west)	Totals
L2025 (east)	0	114	329	443
Concrete Plant	88	0	7	95
L2025 (west)	151	1	0	152
Totals	**239**	**115**	**335**	**690**

2032 PM Peak - With Development

	L2025 (east)	Concrete Plant	L2025 (west)	Totals
L2025 (east)	0	117	329	446
Concrete Plant	94	0	8	102
L2025 (west)	151	1	0	152
Totals	**245**	**118**	**336**	**700**

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R362 / L2025 Priority Junction - AM Peak Hour

2021 AM Peak - Base Flows

	R362 (south)	L2025	R362 (north)	Totals
R362 (south)	0	14	37	51
L2025	9	0	5	14
R362 (north)	87	4	0	91
Totals	**96**	**18**	**42**	**156**

AM Peak - Development Flows

	R362 (south)	L2025	R362 (north)	Totals
R362 (south)	0	7	0	7
L2025	3	0	1	4
R362 (north)	0	1	0	1
Totals	**3**	**8**	**1**	**12**

2021 AM Peak - Base Flows (Existing Flows + 21%)

	R362 (south)	L2025	R362 (north)	Totals
R362 (south)	0	17	45	62
L2025	11	0	6	17
R362 (north)	105	5	0	110
Totals	**116**	**22**	**51**	**189**

2022 AM Peak - No Development (2021 Base Flows + 1.32%)

	R362 (south)	L2025	R362 (north)	Totals
R362 (south)	0	17	45	63
L2025	11	0	6	17
R362 (north)	107	5	0	112
Totals	**118**	**22**	**51**	**191**

2022 AM Peak - With Development

	R362 (south)	L2025	R362 (north)	Totals
R362 (south)	0	24	45	70
L2025	14	0	7	21
R362 (north)	107	6	0	113
Totals	**121**	**30**	**52**	**203**

2027 AM Peak - No Development (2021 Base Flows + 8.25%)

	R362 (south)	L2025	R362 (north)	Totals
R362 (south)	0	18	48	67
L2025	12	0	7	18
R362 (north)	114	5	0	119
Totals	**126**	**24**	**55**	**204**

2027 AM Peak - With Development

	R362 (south)	L2025	R362 (north)	Totals
R362 (south)	0	25	48	74
L2025	15	0	8	22
R362 (north)	114	6	0	120
Totals	**129**	**32**	**56**	**216**

2032 AM Peak - No Development (2021 Base Flows + 12.25%)

	R362 (south)	L2025	R362 (north)	Totals
R362 (south)	0	19	50	69
L2025	12	0	7	19
R362 (north)	118	5	0	124
Totals	**130**	**24**	**57**	**212**

2032 AM Peak - With Development

	R362 (south)	L2025	R362 (north)	Totals
R362 (south)	0	26	50	76
L2025	15	0	8	23
R362 (north)	118	6	0	125
Totals	**133**	**32**	**58**	**224**

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R362 / L2025 Priority Junction - PM Peak Hour

2021 PM Peak - Base Flows

0	R362 (south)	L2025	R362 (north)	Totals
R362 (south)	0	0	84	84
L2025	18	0	3	21
R362 (north)	52	1	0	53
Totals	**70**	**1**	**87**	**158**

PM Peak - Development Flows

	R362 (south)	L2025	R362 (north)	Totals
R362 (south)	0	3	0	3
L2025	7	0	1	8
R362 (north)	0	1	0	1
Totals	**7**	**4**	**1**	**12**

2021 PM Peak - Base Flows (Existing Flows + 21%)

	R362 (south)	L2025	R362 (north)	Totals
R362 (south)	0	0	102	102
L2025	22	0	4	25
R362 (north)	63	1	0	64
Totals	**85**	**1**	**105**	**191**

2022 PM Peak - No Development (2021 Base Flows + 1.32%)

	R362 (south)	L2025	R362 (north)	Totals
R362 (south)	0	0	103	103
L2025	22	0	4	26
R362 (north)	64	1	0	65
Totals	**86**	**1**	**107**	**194**

2022 PM Peak - With Development

	R362 (south)	L2025	R362 (north)	Totals
R362 (south)	0	3	103	106
L2025	29	0	5	34
R362 (north)	64	2	0	66
Totals	**93**	**5**	**108**	**206**

2027 PM Peak - No Development (2021 Base Flows + 8.25%)

	R362 (south)	L2025	R362 (north)	Totals
R362 (south)	0	0	110	110
L2025	24	0	4	28
R362 (north)	68	1	0	69
Totals	**92**	**1**	**114**	**207**

2027 PM Peak - With Development

	R362 (south)	L2025	R362 (north)	Totals
R362 (south)	0	3	110	113
L2025	31	0	5	36
R362 (north)	68	2	0	70
Totals	**99**	**5**	**115**	**219**

2032 PM Peak - No Development (2021 Base Flows + 12.25%)

	R362 (south)	L2025	R362 (north)	Totals
R362 (south)	0	0	114	114
L2025	24	0	4	29
R362 (north)	71	1	0	72
Totals	**95**	**1**	**118**	**215**

2032 PM Peak - With Development

	R362 (south)	L2025	R362 (north)	Totals
R362 (south)	0	3	114	117
L2025	31	0	5	37
R362 (north)	71	2	0	73
Totals	**102**	**5**	**119**	**227**

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PLANNING & DEVELOPMENT SECTION
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APPENDIX D – PICADY RESULTS

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PLANNING & DEVELOPMENT SECTION
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Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896
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Filename: L2025-Kildea Concrete Plant Priority Junction.j9
Path: S:\Jobs\2021\21044 Bealnamulla Quarry, Athlone TIA\21044-01\Reports\Working\PICADY
Report generation date: 13/05/2021 15:45:44

»2021, AM
»2021, PM
»2022 no dev, AM
»2022 no dev, PM
»2022 with dev, AM
»2022 with dev, PM
»2027 no dev, AM
»2027 no dev, PM
»2027 with dev, AM
»2027 with dev, PM
»2032 no dev, AM
»2032 no dev, PM
»2032 with dev, AM
»2032 with dev, PM

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PLANNING & DEVELOPMENT SECTION
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Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	2021							
Stream B-AC	0.0	10.23	0.05	B	0.2	9.66	0.17	A
Stream C-AB	0.0	7.16	0.02	A	0.0	5.78	0.01	A
	2022 no dev							
Stream B-AC	0.0	10.25	0.05	B	0.2	9.66	0.17	A
Stream C-AB	0.0	7.16	0.02	A	0.0	5.78	0.01	A
	2022 with dev							
Stream B-AC	0.1	10.01	0.07	B	0.2	9.96	0.20	A
Stream C-AB	0.0	7.17	0.03	A	0.0	5.84	0.01	A
	2027 no dev							
Stream B-AC	0.1	10.43	0.06	B	0.2	9.86	0.19	A
Stream C-AB	0.0	7.08	0.03	A	0.0	5.77	0.01	A
	2027 with dev							
Stream B-AC	0.1	10.29	0.07	B	0.3	10.18	0.21	B
Stream C-AB	0.1	7.10	0.04	A	0.0	5.83	0.01	A
	2032 no dev							
Stream B-AC	0.1	10.47	0.06	B	0.2	10.02	0.20	B
Stream C-AB	0.0	7.08	0.03	A	0.0	5.75	0.01	A
	2032 with dev							
Stream B-AC	0.1	10.33	0.07	B	0.3	10.35	0.22	B
Stream C-AB	0.1	7.10	0.04	A	0.0	5.82	0.01	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	
Location	
Site number	
Date	13/05/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	ROADPLAN01\jbyrne
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perTimeSegment	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

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Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2021	AM	DIRECT	08:30	09:30	60	15	✓
D2	2021	PM	DIRECT	17:00	18:00	60	15	✓
D3	2022 no dev	AM	DIRECT	08:30	09:30	60	15	✓
D4	2022 no dev	PM	DIRECT	17:00	18:00	60	15	✓
D5	2022 with dev	AM	DIRECT	08:30	09:30	60	15	✓
D6	2022 with dev	PM	DIRECT	17:00	18:00	60	15	✓
D7	2027 no dev	AM	DIRECT	08:30	09:30	60	15	✓
D8	2027 no dev	PM	DIRECT	17:00	18:00	60	15	✓
D9	2027 with dev	AM	DIRECT	08:30	09:30	60	15	✓
D10	2027 with dev	PM	DIRECT	17:00	18:00	60	15	✓
D11	2032 no dev	AM	DIRECT	08:30	09:30	60	15	✓
D12	2032 no dev	PM	DIRECT	17:00	18:00	60	15	✓
D13	2032 with dev	AM	DIRECT	08:30	09:30	60	15	✓
D14	2032 with dev	PM	DIRECT	17:00	18:00	60	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

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2021, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.19	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.30			75.0	✓	0.00

Geometries for Arm C are measured opposite Arm B Geometries for Arm A (if relevant) are measured opposite Arm D

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.10	16	25

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/TS)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	125.007	0.090	0.227	0.143	0.325
1	B-C	161.520	0.098	0.247	-	-
1	C-B	154.349	0.236	0.236	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

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Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2021	AM	DIRECT	08:30	09:30	60	15	✓

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Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

08:30 - 08:45

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	5.00	4.00
	B	4.00	0.00	1.00
	C	28.00	2.00	0.00

08:45 - 09:00

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	5.00	13.00
	B	2.00	0.00	2.00
	C	18.00	1.00	0.00

09:00 - 09:15

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	2.00	16.00
	B	2.00	0.00	0.00
	C	30.00	0.00	0.00

09:15 - 09:30

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	5.00	12.00
	B	2.00	0.00	2.00
	C	29.00	1.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	16	12
	B	11	0	67
	C	5	33	0

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PLANNING & DEVELOPMENT SECTION
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Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-AC	0.05	10.23	0.0	B	3.75	15.00
C-AB	0.02	7.16	0.0	A	1.24	4.97
C-A					26.01	104.03
A-B					4.25	17.00
A-C					11.25	45.00

Main Results for each time segment

08:30 - 08:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	5.00	5.00	104.28	0.048	4.95	0.0	0.0	9.055	A
C-AB	2.52	2.52	134.76	0.019	2.50	0.0	0.0	6.804	A
C-A	27.48	27.48			27.48				
A-B	5.00	5.00			5.00				
A-C	4.00	4.00			4.00				

08:45 - 09:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	4.00	4.00	99.96	0.040	4.01	0.0	0.0	8.741	A
C-AB	1.17	1.17	125.81	0.009	1.18	0.0	0.0	7.158	A
C-A	17.83	17.83			17.83				
A-B	5.00	5.00			5.00				
A-C	13.00	13.00			13.00				

09:00 - 09:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	2.00	2.00	104.58	0.019	2.02	0.0	0.0	10.234	B
C-AB	0.00	0.00	116.01	0.000	0.01	0.0	0.0	0.000	A
C-A	30.00	30.00			30.00				
A-B	2.00	2.00			2.00				
A-C	16.00	16.00			16.00				

09:15 - 09:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	4.00	4.00	99.48	0.040	3.98	0.0	0.0	8.776	A
C-AB	1.28	1.28	134.01	0.010	1.27	0.0	0.0	6.830	A
C-A	28.72	28.72			28.72				
A-B	5.00	5.00			5.00				
A-C	12.00	12.00			12.00				

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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

2021, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.29	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D2	2021	PM	DIRECT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

17:00 - 17:15

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	0.00	28.00
	B	17.00	0.00	2.00
	C	12.00	0.00	0.00

17:15 - 17:30

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	0.00	33.00
	B	2.00	0.00	1.00
	C	22.00	0.00	0.00

17:30 - 17:45

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	0.00	19.00
	B	2.00	0.00	0.00
	C	17.00	0.00	0.00

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Demand (Veh/TS)

17:45 - 18:00

From \ To	A	B	C
A	0.00	0.00	22.00
B	0.00	0.00	0.00
C	12.00	1.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	10	3
B	6	0	20
C	5	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-AC	0.17	9.66	0.2	A	6.00	24.00
C-AB	0.01	5.78	0.0	A	0.27	1.08
C-A					15.73	62.92
A-B					0.00	0.00
A-C					25.50	102.00

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	19.00	19.00	111.75	0.170	18.80	0.0	0.2	9.663	A
C-AB	0.00	0.00	143.94	0.000	0.00	0.0	0.0	0.000	A
C-A	12.00	12.00			12.00				
A-B	0.00	0.00			0.00				
A-C	28.00	28.00			28.00				

17:15 - 17:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	3.00	3.00	113.21	0.027	3.18	0.2	0.0	7.997	A
C-AB	0.00	0.00	142.76	0.000	0.00	0.0	0.0	0.000	A
C-A	22.00	22.00			22.00				
A-B	0.00	0.00			0.00				
A-C	33.00	33.00			33.00				

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17:30 - 17:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	2.00	2.00	111.40	0.018	2.01	0.0	0.0	8.443	A
C-AB	0.00	0.00	146.08	0.000	0.00	0.0	0.0	0.000	A
C-A	17.00	17.00			17.00				
A-B	0.00	0.00			0.00				
A-C	19.00	19.00			19.00				

17:45 - 18:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0.00	0.00	111.07	0.000	0.02	0.0	0.0	0.000	A
C-AB	1.08	1.08	156.83	0.007	1.08	0.0	0.0	5.778	A
C-A	11.92	11.92			11.92				
A-B	0.00	0.00			0.00				
A-C	22.00	22.00			22.00				

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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
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2022 no dev, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.19	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D3	2022 no dev	AM	DIRECT	08:30	09:30	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

08:30 - 08:45

		To		
		A	B	C
From	A	0.00	5.00	4.00
	B	4.00	0.00	1.00
	C	28.00	2.00	0.00

Demand (Veh/TS)

08:45 - 09:00

		To		
		A	B	C
From	A	0.00	5.00	13.00
	B	2.00	0.00	2.00
	C	18.00	1.00	0.00

Demand (Veh/TS)

09:00 - 09:15

		To		
		A	B	C
From	A	0.00	2.00	16.00
	B	2.00	0.00	0.00
	C	31.00	0.00	0.00

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09:15 - 09:30

Demand (Veh/TS)

From \ To	A	B	C
A	0.00	5.00	12.00
B	2.00	0.00	2.00
C	29.00	1.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	16	12
B	11	0	67
C	5	33	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-AC	0.05	10.25	0.0	B	3.75	15.00
C-AB	0.02	7.16	0.0	A	1.24	4.97
C-A					26.26	105.03
A-B					4.25	17.00
A-C					11.25	45.00

Main Results for each time segment

08:30 - 08:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	5.00	5.00	104.28	0.048	4.95	0.0	0.0	9.055	A
C-AB	2.52	2.52	134.76	0.019	2.50	0.0	0.0	6.804	A
C-A	27.48	27.48			27.48				
A-B	5.00	5.00			5.00				
A-C	4.00	4.00			4.00				

08:45 - 09:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	4.00	4.00	99.96	0.040	4.01	0.0	0.0	8.741	A
C-AB	1.17	1.17	125.81	0.009	1.18	0.0	0.0	7.158	A
C-A	17.83	17.83			17.83				
A-B	5.00	5.00			5.00				
A-C	13.00	13.00			13.00				

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09:00 - 09:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	2.00	2.00	104.45	0.019	2.02	0.0	0.0	10.249	B
C-AB	0.00	0.00	116.01	0.000	0.01	0.0	0.0	0.000	A
C-A	31.00	31.00			31.00				
A-B	2.00	2.00			2.00				
A-C	16.00	16.00			16.00				

09:15 - 09:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	4.00	4.00	99.48	0.040	3.98	0.0	0.0	8.776	A
C-AB	1.28	1.28	134.01	0.010	1.27	0.0	0.0	6.830	A
C-A	28.72	28.72			28.72				
A-B	5.00	5.00			5.00				
A-C	12.00	12.00			12.00				

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PLANNING & DEVELOPMENT SECTION
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ROSCOMMON COUNTY COUNCIL

2022 no dev, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.29	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D4	2022 no dev	PM	DIRECT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

17:00 - 17:15

		To		
		A	B	C
From	A	0.00	0.00	28.00
	B	17.00	0.00	2.00
	C	12.00	0.00	0.00

Demand (Veh/TS)

17:15 - 17:30

		To		
		A	B	C
From	A	0.00	0.00	33.00
	B	2.00	0.00	1.00
	C	22.00	0.00	0.00

Demand (Veh/TS)

17:30 - 17:45

		To		
		A	B	C
From	A	0.00	0.00	20.00
	B	2.00	0.00	0.00
	C	17.00	0.00	0.00

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Demand (Veh/TS)

17:45 - 18:00

From \ To	A	B	C
A	0.00	0.00	22.00
B	0.00	0.00	0.00
C	12.00	1.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	10	3
B	6	0	20
C	5	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-AC	0.17	9.66	0.2	A	6.00	24.00
C-AB	0.01	5.78	0.0	A	0.27	1.08
C-A					15.73	62.92
A-B					0.00	0.00
A-C					25.75	103.00

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	19.00	19.00	111.75	0.170	18.80	0.0	0.2	9.663	A
C-AB	0.00	0.00	143.94	0.000	0.00	0.0	0.0	0.000	A
C-A	12.00	12.00			12.00				
A-B	0.00	0.00			0.00				
A-C	28.00	28.00			28.00				

17:15 - 17:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	3.00	3.00	113.21	0.027	3.18	0.2	0.0	7.997	A
C-AB	0.00	0.00	142.76	0.000	0.00	0.0	0.0	0.000	A
C-A	22.00	22.00			22.00				
A-B	0.00	0.00			0.00				
A-C	33.00	33.00			33.00				

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17:30 - 17:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	2.00	2.00	111.18	0.018	2.01	0.0	0.0	8.462	A
C-AB	0.00	0.00	145.84	0.000	0.00	0.0	0.0	0.000	A
C-A	17.00	17.00			17.00				
A-B	0.00	0.00			0.00				
A-C	20.00	20.00			20.00				

17:45 - 18:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0.00	0.00	111.07	0.000	0.02	0.0	0.0	0.000	A
C-AB	1.08	1.08	156.83	0.007	1.08	0.0	0.0	5.778	A
C-A	11.92	11.92			11.92				
A-B	0.00	0.00			0.00				
A-C	22.00	22.00			22.00				

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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
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2022 with dev, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.37	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D5	2022 with dev	AM	DIRECT	08:30	09:30	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

08:30 - 08:45

		To		
		A	B	C
From	A	0.00	7.00	4.00
	B	5.00	0.00	2.00
	C	28.00	3.00	0.00

Demand (Veh/TS)

08:45 - 09:00

		To		
		A	B	C
From	A	0.00	7.00	13.00
	B	3.00	0.00	2.00
	C	18.00	1.00	0.00

Demand (Veh/TS)

09:00 - 09:15

		To		
		A	B	C
From	A	0.00	4.00	16.00
	B	3.00	0.00	0.00
	C	31.00	0.00	0.00

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09:15 - 09:30

Demand (Veh/TS)

From \ To	A	B	C
A	0.00	6.00	12.00
B	2.00	0.00	2.00
C	29.00	1.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	16	12
B	11	0	67
C	5	33	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-AC	0.07	10.01	0.1	B	4.75	19.00
C-AB	0.03	7.17	0.0	A	1.56	6.24
C-A					26.19	104.76
A-B					6.00	24.00
A-C					11.25	45.00

Main Results for each time segment

08:30 - 08:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	7.00	7.00	102.86	0.068	6.93	0.0	0.1	9.375	A
C-AB	3.79	3.79	134.38	0.028	3.75	0.0	0.0	6.888	A
C-A	27.21	27.21			27.21				
A-B	7.00	7.00			7.00				
A-C	4.00	4.00			4.00				

08:45 - 09:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	5.00	5.00	100.99	0.050	5.02	0.1	0.1	9.112	A
C-AB	1.17	1.17	125.47	0.009	1.20	0.0	0.0	7.174	A
C-A	17.83	17.83			17.83				
A-B	7.00	7.00			7.00				
A-C	13.00	13.00			13.00				

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PLANNING & DEVELOPMENT SECTION
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09:00 - 09:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	3.00	3.00	104.30	0.029	3.02	0.1	0.0	10.012	B
C-AB	0.00	0.00	115.63	0.000	0.01	0.0	0.0	0.000	A
C-A	31.00	31.00			31.00				
A-B	4.00	4.00			4.00				
A-C	16.00	16.00			16.00				

09:15 - 09:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	4.00	4.00	99.42	0.040	4.00	0.0	0.0	8.601	A
C-AB	1.28	1.28	133.82	0.010	1.27	0.0	0.0	6.839	A
C-A	28.72	28.72			28.72				
A-B	6.00	6.00			6.00				
A-C	12.00	12.00			12.00				

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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

2022 with dev, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.68	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D6	2022 with dev	PM	DIRECT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

17:00 - 17:15

		To		
		A	B	C
From	A	0.00	1.00	28.00
	B	19.00	0.00	3.00
	C	12.00	1.00	0.00

Demand (Veh/TS)

17:15 - 17:30

		To		
		A	B	C
From	A	0.00	1.00	33.00
	B	4.00	0.00	1.00
	C	22.00	0.00	0.00

Demand (Veh/TS)

17:30 - 17:45

		To		
		A	B	C
From	A	0.00	1.00	20.00
	B	4.00	0.00	0.00
	C	17.00	0.00	0.00

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Demand (Veh/TS)

17:45 - 18:00

From \ To	A	B	C
A	0.00	0.00	22.00
B	1.00	0.00	0.00
C	12.00	1.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	10	3
B	6	0	20
C	5	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-AC	0.20	9.96	0.2	A	8.00	32.00
C-AB	0.01	5.84	0.0	A	0.54	2.17
C-A					15.71	62.83
A-B					0.75	3.00
A-C					25.75	103.00

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	22.00	22.00	111.90	0.197	21.76	0.0	0.2	9.960	A
C-AB	1.08	1.08	155.16	0.007	1.08	0.0	0.0	5.840	A
C-A	11.92	11.92			11.92				
A-B	1.00	1.00			1.00				
A-C	28.00	28.00			28.00				

17:15 - 17:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	5.00	5.00	110.88	0.045	5.19	0.2	0.0	8.476	A
C-AB	0.00	0.00	145.50	0.000	0.01	0.0	0.0	0.000	A
C-A	22.00	22.00			22.00				
A-B	1.00	1.00			1.00				
A-C	33.00	33.00			33.00				

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17:30 - 17:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	4.00	4.00	111.05	0.036	4.01	0.0	0.0	8.535	A
C-AB	0.00	0.00	145.59	0.000	0.00	0.0	0.0	0.000	A
C-A	17.00	17.00			17.00				
A-B	1.00	1.00			1.00				
A-C	20.00	20.00			20.00				

17:45 - 18:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	1.00	1.00	111.07	0.009	1.03	0.0	0.0	8.182	A
C-AB	1.08	1.08	156.83	0.007	1.08	0.0	0.0	5.778	A
C-A	11.92	11.92			11.92				
A-B	0.00	0.00			0.00				
A-C	22.00	22.00			22.00				

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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

2027 no dev, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.45	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D7	2027 no dev	AM	DIRECT	08:30	09:30	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

08:30 - 08:45

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	5.00	4.00
	B	4.00	0.00	1.00
	C	30.00	3.00	0.00

08:45 - 09:00

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	5.00	14.00
	B	3.00	0.00	3.00
	C	20.00	1.00	0.00

09:00 - 09:15

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	3.00	17.00
	B	3.00	0.00	0.00
	C	33.00	0.00	0.00

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09:15 - 09:30

Demand (Veh/TS)

From \ To	A	B	C
A	0.00	5.00	13.00
B	3.00	0.00	3.00
C	31.00	1.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	16	12
B	11	0	67
C	5	33	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-AC	0.06	10.43	0.1	B	5.00	20.00
C-AB	0.03	7.08	0.0	A	1.58	6.34
C-A					28.17	112.66
A-B					4.50	18.00
A-C					12.00	48.00

Main Results for each time segment

08:30 - 08:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	5.00	5.00	103.78	0.048	4.95	0.0	0.1	9.102	A
C-AB	3.85	3.85	136.23	0.028	3.81	0.0	0.0	6.794	A
C-A	29.15	29.15			29.15				
A-B	5.00	5.00			5.00				
A-C	4.00	4.00			4.00				

08:45 - 09:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	6.00	6.00	99.63	0.060	5.99	0.1	0.1	9.059	A
C-AB	1.19	1.19	127.16	0.009	1.22	0.0	0.0	7.078	A
C-A	19.81	19.81			19.81				
A-B	5.00	5.00			5.00				
A-C	14.00	14.00			14.00				

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09:00 - 09:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	3.00	3.00	103.66	0.029	3.02	0.1	0.0	10.430	B
C-AB	0.00	0.00	115.99	0.000	0.01	0.0	0.0	0.000	A
C-A	33.00	33.00			33.00				
A-B	3.00	3.00			3.00				
A-C	17.00	17.00			17.00				

09:15 - 09:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	6.00	6.00	99.17	0.061	5.98	0.0	0.1	8.979	A
C-AB	1.30	1.30	135.30	0.010	1.29	0.0	0.0	6.764	A
C-A	30.70	30.70			30.70				
A-B	5.00	5.00			5.00				
A-C	13.00	13.00			13.00				

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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

2027 no dev, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.41	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D8	2027 no dev	PM	DIRECT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

17:00 - 17:15

		To		
		A	B	C
From	A	0.00	0.00	30.00
	B	18.00	0.00	3.00
	C	13.00	0.00	0.00

Demand (Veh/TS)

17:15 - 17:30

		To		
		A	B	C
From	A	0.00	0.00	35.00
	B	3.00	0.00	1.00
	C	24.00	0.00	0.00

Demand (Veh/TS)

17:30 - 17:45

		To		
		A	B	C
From	A	0.00	0.00	21.00
	B	3.00	0.00	0.00
	C	18.00	0.00	0.00

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Demand (Veh/TS)

17:45 - 18:00

From \ To	A	B	C
A	0.00	0.00	24.00
B	0.00	0.00	0.00
C	13.00	1.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	10	3
B	6	0	20
C	5	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-AC	0.19	9.86	0.2	A	7.00	28.00
C-AB	0.01	5.77	0.0	A	0.27	1.09
C-A					16.98	67.91
A-B					0.00	0.00
A-C					27.50	110.00

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	21.00	21.00	111.81	0.188	20.77	0.0	0.2	9.862	A
C-AB	0.00	0.00	143.47	0.000	0.00	0.0	0.0	0.000	A
C-A	13.00	13.00			13.00				
A-B	0.00	0.00			0.00				
A-C	30.00	30.00			30.00				

17:15 - 17:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	4.00	4.00	111.16	0.036	4.19	0.2	0.0	8.335	A
C-AB	0.00	0.00	142.28	0.000	0.00	0.0	0.0	0.000	A
C-A	24.00	24.00			24.00				
A-B	0.00	0.00			0.00				
A-C	35.00	35.00			35.00				

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17:30 - 17:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	3.00	3.00	110.80	0.027	3.01	0.0	0.0	8.510	A
C-AB	0.00	0.00	145.60	0.000	0.00	0.0	0.0	0.000	A
C-A	18.00	18.00			18.00				
A-B	0.00	0.00			0.00				
A-C	21.00	21.00			21.00				

17:45 - 18:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0.00	0.00	110.49	0.000	0.03	0.0	0.0	0.000	A
C-AB	1.09	1.09	157.01	0.007	1.08	0.0	0.0	5.771	A
C-A	12.91	12.91			12.91				
A-B	0.00	0.00			0.00				
A-C	24.00	24.00			24.00				

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PLANNING & DEVELOPMENT SECTION
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2027 with dev, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.61	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D9	2027 with dev	AM	DIRECT	08:30	09:30	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

08:30 - 08:45

		To		
		A	B	C
From	A	0.00	7.00	4.00
	B	5.00	0.00	2.00
	C	30.00	4.00	0.00

Demand (Veh/TS)

08:45 - 09:00

		To		
		A	B	C
From	A	0.00	7.00	14.00
	B	4.00	0.00	3.00
	C	20.00	1.00	0.00

Demand (Veh/TS)

09:00 - 09:15

		To		
		A	B	C
From	A	0.00	5.00	17.00
	B	4.00	0.00	0.00
	C	33.00	0.00	0.00

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Demand (Veh/TS)

09:15 - 09:30

From \ To	A	B	C
A	0.00	6.00	13.00
B	3.00	0.00	3.00
C	31.00	1.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	16	12
B	11	0	67
C	5	33	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-AC	0.07	10.29	0.1	B	6.00	24.00
C-AB	0.04	7.10	0.1	A	1.91	7.63
C-A					28.09	112.37
A-B					6.25	25.00
A-C					12.00	48.00

Main Results for each time segment

08:30 - 08:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	7.00	7.00	102.42	0.068	6.93	0.0	0.1	9.418	A
C-AB	5.13	5.13	135.85	0.038	5.08	0.0	0.1	6.881	A
C-A	28.87	28.87			28.87				
A-B	7.00	7.00			7.00				
A-C	4.00	4.00			4.00				

08:45 - 09:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	7.00	7.00	100.30	0.070	7.00	0.1	0.1	9.345	A
C-AB	1.20	1.20	126.83	0.009	1.24	0.1	0.0	7.097	A
C-A	19.80	19.80			19.80				
A-B	7.00	7.00			7.00				
A-C	14.00	14.00			14.00				

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09:00 - 09:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	4.00	4.00	103.70	0.038	4.03	0.1	0.0	10.290	B
C-AB	0.00	0.00	115.62	0.000	0.01	0.0	0.0	0.000	A
C-A	33.00	33.00			33.00				
A-B	5.00	5.00			5.00				
A-C	17.00	17.00			17.00				

09:15 - 09:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	6.00	6.00	99.10	0.061	5.99	0.0	0.1	8.854	A
C-AB	1.30	1.30	135.11	0.010	1.29	0.0	0.0	6.772	A
C-A	30.70	30.70			30.70				
A-B	6.00	6.00			6.00				
A-C	13.00	13.00			13.00				

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PLANNING & DEVELOPMENT SECTION
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2027 with dev, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.79	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D10	2027 with dev	PM	DIRECT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

17:00 - 17:15

		To		
		A	B	C
From	A	0.00	1.00	30.00
	B	20.00	0.00	4.00
	C	13.00	1.00	0.00

Demand (Veh/TS)

17:15 - 17:30

		To		
		A	B	C
From	A	0.00	1.00	35.00
	B	5.00	0.00	1.00
	C	24.00	0.00	0.00

Demand (Veh/TS)

17:30 - 17:45

		To		
		A	B	C
From	A	0.00	1.00	21.00
	B	5.00	0.00	0.00
	C	18.00	0.00	0.00

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Demand (Veh/TS)

17:45 - 18:00

From \ To	A	B	C
A	0.00	0.00	24.00
B	1.00	0.00	0.00
C	13.00	1.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	10	3
B	6	0	20
C	5	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-AC	0.21	10.18	0.3	B	9.00	36.00
C-AB	0.01	5.83	0.0	A	0.55	2.18
C-A					16.95	67.82
A-B					0.75	3.00
A-C					27.50	110.00

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	24.00	24.00	111.84	0.215	23.73	0.0	0.3	10.184	B
C-AB	1.09	1.09	155.34	0.007	1.08	0.0	0.0	5.834	A
C-A	12.91	12.91			12.91				
A-B	1.00	1.00			1.00				
A-C	30.00	30.00			30.00				

17:15 - 17:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	6.00	6.00	109.64	0.055	6.21	0.3	0.1	8.720	A
C-AB	0.00	0.00	144.97	0.000	0.01	0.0	0.0	0.000	A
C-A	24.00	24.00			24.00				
A-B	1.00	1.00			1.00				
A-C	35.00	35.00			35.00				

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17:30 - 17:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	5.00	5.00	110.69	0.045	5.01	0.1	0.0	8.622	A
C-AB	0.00	0.00	145.35	0.000	0.00	0.0	0.0	0.000	A
C-A	18.00	18.00			18.00				
A-B	1.00	1.00			1.00				
A-C	21.00	21.00			21.00				

17:45 - 18:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	1.00	1.00	110.49	0.009	1.04	0.0	0.0	8.225	A
C-AB	1.09	1.09	157.01	0.007	1.08	0.0	0.0	5.771	A
C-A	12.91	12.91			12.91				
A-B	0.00	0.00			0.00				
A-C	24.00	24.00			24.00				

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Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.41	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D11	2032 no dev	AM	DIRECT	08:30	09:30	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

08:30 - 08:45

		To		
		A	B	C
From	A	0.00	5.00	4.00
	B	4.00	0.00	1.00
	C	31.00	3.00	0.00

Demand (Veh/TS)

08:45 - 09:00

		To		
		A	B	C
From	A	0.00	5.00	15.00
	B	3.00	0.00	3.00
	C	20.00	1.00	0.00

Demand (Veh/TS)

09:00 - 09:15

		To		
		A	B	C
From	A	0.00	3.00	18.00
	B	3.00	0.00	0.00
	C	34.00	0.00	0.00

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09:15 - 09:30

Demand (Veh/TS)

From \ To	A	B	C
A	0.00	5.00	14.00
B	3.00	0.00	3.00
C	33.00	1.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	16	12
B	11	0	67
C	5	33	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-AC	0.06	10.47	0.1	B	5.00	20.00
C-AB	0.03	7.08	0.0	A	1.60	6.39
C-A					29.15	116.61
A-B					4.50	18.00
A-C					12.75	51.00

Main Results for each time segment

08:30 - 08:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	5.00	5.00	103.67	0.048	4.95	0.0	0.1	9.111	A
C-AB	3.88	3.88	136.96	0.028	3.84	0.0	0.0	6.759	A
C-A	30.12	30.12			30.12				
A-B	5.00	5.00			5.00				
A-C	4.00	4.00			4.00				

08:45 - 09:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	6.00	6.00	99.44	0.060	5.99	0.1	0.1	9.078	A
C-AB	1.19	1.19	126.97	0.009	1.22	0.0	0.0	7.085	A
C-A	19.81	19.81			19.81				
A-B	5.00	5.00			5.00				
A-C	15.00	15.00			15.00				

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09:00 - 09:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	3.00	3.00	103.50	0.029	3.02	0.1	0.0	10.465	B
C-AB	0.00	0.00	115.79	0.000	0.01	0.0	0.0	0.000	A
C-A	34.00	34.00			34.00				
A-B	3.00	3.00			3.00				
A-C	18.00	18.00			18.00				

09:15 - 09:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	6.00	6.00	98.85	0.061	5.98	0.0	0.1	9.010	A
C-AB	1.32	1.32	136.60	0.010	1.31	0.0	0.0	6.708	A
C-A	32.68	32.68			32.68				
A-B	5.00	5.00			5.00				
A-C	14.00	14.00			14.00				

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Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.43	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D12	2032 no dev	PM	DIRECT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

17:00 - 17:15

		To		
		A	B	C
From	A	0.00	0.00	31.00
	B	19.00	0.00	3.00
	C	14.00	0.00	0.00

Demand (Veh/TS)

17:15 - 17:30

		To		
		A	B	C
From	A	0.00	0.00	37.00
	B	3.00	0.00	1.00
	C	24.00	0.00	0.00

Demand (Veh/TS)

17:30 - 17:45

		To		
		A	B	C
From	A	0.00	0.00	22.00
	B	3.00	0.00	0.00
	C	19.00	0.00	0.00

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Demand (Veh/TS)

17:45 - 18:00

From \ To	A	B	C
A	0.00	0.00	24.00
B	0.00	0.00	0.00
C	14.00	1.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	10	3
B	6	0	20
C	5	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-AC	0.20	10.02	0.2	B	7.25	29.00
C-AB	0.01	5.75	0.0	A	0.27	1.10
C-A					17.73	70.90
A-B					0.00	0.00
A-C					28.50	114.00

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	22.00	22.00	111.35	0.198	21.76	0.0	0.2	10.019	B
C-AB	0.00	0.00	143.23	0.000	0.00	0.0	0.0	0.000	A
C-A	14.00	14.00			14.00				
A-B	0.00	0.00			0.00				
A-C	31.00	31.00			31.00				

17:15 - 17:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	4.00	4.00	110.70	0.036	4.21	0.2	0.0	8.367	A
C-AB	0.00	0.00	141.81	0.000	0.00	0.0	0.0	0.000	A
C-A	24.00	24.00			24.00				
A-B	0.00	0.00			0.00				
A-C	37.00	37.00			37.00				

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17:30 - 17:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	3.00	3.00	110.44	0.027	3.01	0.0	0.0	8.537	A
C-AB	0.00	0.00	145.37	0.000	0.00	0.0	0.0	0.000	A
C-A	19.00	19.00			19.00				
A-B	0.00	0.00			0.00				
A-C	22.00	22.00			22.00				

17:45 - 18:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0.00	0.00	110.34	0.000	0.03	0.0	0.0	0.000	A
C-AB	1.10	1.10	157.66	0.007	1.09	0.0	0.0	5.747	A
C-A	13.90	13.90			13.90				
A-B	0.00	0.00			0.00				
A-C	24.00	24.00			24.00				

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Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.57	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D13	2032 with dev	AM	DIRECT	08:30	09:30	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

08:30 - 08:45

		To		
		A	B	C
From	A	0.00	7.00	4.00
	B	5.00	0.00	2.00
	C	31.00	4.00	0.00

Demand (Veh/TS)

08:45 - 09:00

		To		
		A	B	C
From	A	0.00	7.00	15.00
	B	4.00	0.00	3.00
	C	20.00	1.00	0.00

Demand (Veh/TS)

09:00 - 09:15

		To		
		A	B	C
From	A	0.00	5.00	18.00
	B	4.00	0.00	0.00
	C	34.00	0.00	0.00

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09:15 - 09:30

Demand (Veh/TS)

From \ To	A	B	C
A	0.00	6.00	14.00
B	3.00	0.00	3.00
C	33.00	1.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	16	12
B	11	0	67
C	5	33	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-AC	0.07	10.33	0.1	B	6.00	24.00
C-AB	0.04	7.10	0.1	A	1.92	7.69
C-A					29.08	116.31
A-B					6.25	25.00
A-C					12.75	51.00

Main Results for each time segment

08:30 - 08:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	7.00	7.00	102.33	0.068	6.93	0.0	0.1	9.428	A
C-AB	5.17	5.17	136.58	0.038	5.12	0.0	0.1	6.845	A
C-A	29.83	29.83			29.83				
A-B	7.00	7.00			7.00				
A-C	4.00	4.00			4.00				

08:45 - 09:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	7.00	7.00	100.10	0.070	7.00	0.1	0.1	9.365	A
C-AB	1.20	1.20	126.65	0.009	1.24	0.1	0.0	7.103	A
C-A	19.80	19.80			19.80				
A-B	7.00	7.00			7.00				
A-C	15.00	15.00			15.00				

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09:00 - 09:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	4.00	4.00	103.33	0.039	4.03	0.1	0.0	10.328	B
C-AB	0.00	0.00	115.42	0.000	0.01	0.0	0.0	0.000	A
C-A	34.00	34.00			34.00				
A-B	5.00	5.00			5.00				
A-C	18.00	18.00			18.00				

09:15 - 09:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	6.00	6.00	98.78	0.061	5.99	0.0	0.1	8.885	A
C-AB	1.32	1.32	136.41	0.010	1.31	0.0	0.0	6.717	A
C-A	32.68	32.68			32.68				
A-B	6.00	6.00			6.00				
A-C	14.00	14.00			14.00				

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Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.80	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D14	2032 with dev	PM	DIRECT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

17:00 - 17:15

		To		
		A	B	C
From	A	0.00	1.00	31.00
	B	21.00	0.00	4.00
	C	14.00	1.00	0.00

Demand (Veh/TS)

17:15 - 17:30

		To		
		A	B	C
From	A	0.00	1.00	37.00
	B	5.00	0.00	1.00
	C	24.00	0.00	0.00

Demand (Veh/TS)

17:30 - 17:45

		To		
		A	B	C
From	A	0.00	1.00	22.00
	B	5.00	0.00	0.00
	C	19.00	0.00	0.00

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Demand (Veh/TS)

17:45 - 18:00

From \ To	A	B	C
A	0.00	0.00	24.00
B	1.00	0.00	0.00
C	14.00	1.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	10	3
B	6	0	20
C	5	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-AC	0.22	10.35	0.3	B	9.25	37.00
C-AB	0.01	5.82	0.0	A	0.55	2.20
C-A					17.70	70.80
A-B					0.75	3.00
A-C					28.50	114.00

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	25.00	25.00	111.39	0.224	24.71	0.0	0.3	10.350	B
C-AB	1.10	1.10	155.76	0.007	1.09	0.0	0.0	5.818	A
C-A	13.90	13.90			13.90				
A-B	1.00	1.00			1.00				
A-C	31.00	31.00			31.00				

17:15 - 17:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	6.00	6.00	109.19	0.055	6.23	0.3	0.1	8.752	A
C-AB	0.00	0.00	144.44	0.000	0.01	0.0	0.0	0.000	A
C-A	24.00	24.00			24.00				
A-B	1.00	1.00			1.00				
A-C	37.00	37.00			37.00				

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17:30 - 17:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	5.00	5.00	110.32	0.045	5.01	0.1	0.0	8.651	A
C-AB	0.00	0.00	145.11	0.000	0.00	0.0	0.0	0.000	A
C-A	19.00	19.00			19.00				
A-B	1.00	1.00			1.00				
A-C	22.00	22.00			22.00				

17:45 - 18:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	1.00	1.00	110.34	0.009	1.04	0.0	0.0	8.237	A
C-AB	1.10	1.10	157.66	0.007	1.09	0.0	0.0	5.747	A
C-A	13.90	13.90			13.90				
A-B	0.00	0.00			0.00				
A-C	24.00	24.00			24.00				

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PLANNING & DEVELOPMENT SECTION
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ROSCOMMON COUNTY COUNCIL

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896
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Filename: R362-L2025 Priority Junction.j9
Path: S:\Jobs\2021\21044 Bealnamulla Quarry, Athlone TIA\21044-01\Reports\Working\PICADY
Report generation date: 13/05/2021 15:44:38

»2021, AM
»2021, PM
»2022 no dev, AM
»2022 no dev, PM
»2022 with dev, AM
»2022 with dev, PM
»2027 no dev, AM
»2027 no dev, PM
»2027 with dev, AM
»2027 with dev, PM
»2032 no dev, AM
»2032 no dev, PM
»2032 with dev, AM
»2032 with dev, PM

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Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	2021							
Stream B-C	0.0	27.02	0.03	D	0.0	6.72	0.03	A
Stream B-A	7.1	74.28	0.97	F	0.2	8.55	0.19	A
Stream C-AB	0.0	7.72	0.03	A	0.0	9.56	0.02	A
	2022 no dev							
Stream B-C	0.0	29.44	0.03	D	0.0	6.76	0.03	A
Stream B-A	7.7	78.15	0.98	F	0.2	8.68	0.20	A
Stream C-AB	0.0	7.71	0.03	A	0.0	9.57	0.02	A
	2022 with dev							
Stream B-C	0.0	30.65	0.03	D	0.0	6.79	0.04	A
Stream B-A	8.2	81.99	1.00	F	0.3	8.78	0.21	A
Stream C-AB	0.0	7.72	0.03	A	0.0	9.57	0.02	A
	2027 no dev							
Stream B-C	0.1	68.38	0.07	F	0.0	6.86	0.03	A
Stream B-A	11.6	103.56	1.07	F	0.3	8.97	0.22	A
Stream C-AB	0.1	7.56	0.05	A	0.0	9.48	0.02	A
	2027 with dev							
Stream B-C	0.1	79.92	0.08	F	0.0	6.88	0.04	A
Stream B-A	12.3	108.43	1.09	F	0.3	9.08	0.23	A
Stream C-AB	0.1	7.58	0.05	A	0.0	9.48	0.02	A
	2032 no dev							
Stream B-C	0.4	570.45	0.50	F	0.0	6.94	0.03	A
Stream B-A	14.2	129.97	1.12	F	0.3	9.23	0.23	A
Stream C-AB	0.1	7.50	0.05	A	0.0	9.41	0.02	A
	2032 with dev							
Stream B-C	0.6	1238.73	1.01	F	0.0	6.97	0.04	A
Stream B-A	15.1	138.32	1.14	F	0.3	9.33	0.24	A
Stream C-AB	0.1	7.52	0.05	A	0.0	9.41	0.02	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle

File summary

File Description

Title	
Location	
Site number	
Date	13/05/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	ROADPLAN01\jbyrne
Description	

PLANNING & DEVELOPMENT SECTION
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Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perTimeSegment	s	-Min	perMin

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Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2021	AM	DIRECT	08:30	09:30	60	15	✓
D2	2021	PM	DIRECT	17:00	18:00	60	15	✓
D3	2022 no dev	AM	DIRECT	08:30	09:30	60	15	✓
D4	2022 no dev	PM	DIRECT	17:00	18:00	60	15	✓
D5	2022 with dev	AM	DIRECT	08:30	09:30	60	15	✓
D6	2022 with dev	PM	DIRECT	17:00	18:00	60	15	✓
D7	2027 no dev	AM	DIRECT	08:30	09:30	60	15	✓
D8	2027 no dev	PM	DIRECT	17:00	18:00	60	15	✓
D9	2027 with dev	AM	DIRECT	08:30	09:30	60	15	✓
D10	2027 with dev	PM	DIRECT	17:00	18:00	60	15	✓
D11	2032 no dev	AM	DIRECT	08:30	09:30	60	15	✓
D12	2032 no dev	PM	DIRECT	17:00	18:00	60	15	✓
D13	2032 with dev	AM	DIRECT	08:30	09:30	60	15	✓
D14	2032 with dev	PM	DIRECT	17:00	18:00	60	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

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2021, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		22.94	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	R362 (south)		Major
B	L2025		Minor
C	R362 (north)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.50			110.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B	One lane plus flare	10.00	7.50	6.00	5.00	3.00	✓	2.00	27	150

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/TS)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	161.415	0.115	0.291	0.183	0.415
1	B-C	165.466	0.099	0.251	-	-
1	C-B	159.416	0.242	0.242	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments

Streams may be combined, in which case capacity will be adjusted

Values are shown for the first time segment only, they may differ for subsequent time segments

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PLANNING & DEVELOPMENT SECTION
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RECEIVED COMMON COUNTY COUNCIL

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2021	AM	DIRECT	08:30	09:30	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

08:30 - 08:45

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	8.00	29.00
	B	28.00	0.00	2.00
	C	88.00	0.00	0.00

08:45 - 09:00

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	21.00	27.00
	B	24.00	0.00	0.00
	C	100.00	0.00	0.00

09:00 - 09:15

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	57.00	21.00
	B	74.00	0.00	0.00
	C	73.00	2.00	0.00

09:15 - 09:30

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	44.00	27.00
	B	57.00	0.00	1.00
	C	45.00	1.00	0.00

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Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	64	19
	B	67	0	80
	C	13	75	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-C	0.03	27.02	0.0	D	0.75	3.00
B-A	0.97	74.28	7.1	F	45.75	183.00
C-AB	0.03	7.72	0.0	A	1.52	6.07
C-A					75.73	302.93
A-B					32.50	130.00
A-C					26.00	104.00

Main Results for each time segment

08:30 - 08:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	2.00	2.00	75.77	0.026	1.97	0.0	0.0	12.191	B
B-A	28.00	28.00	78.84	0.355	27.47	0.0	0.5	17.348	C
C-AB	0.00	0.00	102.71	0.000	0.00	0.0	0.0	0.000	A
C-A	88.00	88.00			88.00				
A-B	8.00	8.00			8.00				
A-C	29.00	29.00			29.00				

08:45 - 09:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	75.72	0.000	0.03	0.0	0.0	0.000	A
B-A	24.00	24.00	76.78	0.313	24.07	0.5	0.5	17.101	C
C-AB	0.00	0.00	99.53	0.000	0.00	0.0	0.0	0.000	A
C-A	100.00	100.00			100.00				
A-B	21.00	21.00			21.00				
A-C	27.00	27.00			27.00				

09:00 - 09:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	62.39	0.000	0.00	0.0	0.0	0.000	A
B-A	74.00	74.00	76.43	0.968	67.38	0.5	7.1	74.284	F
C-AB	4.39	4.39	134.03	0.033	4.35	0.0	0.0	6.938	A
C-A	70.61	70.61			70.61				
A-B	57.00	57.00			57.00				
A-C	21.00	21.00			21.00				

09:15 - 09:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	34.25	0.029	0.97	0.0	0.0	27.023	D
B-A	57.00	57.00	80.45	0.709	61.32	7.1	2.8	53.471	F
C-AB	1.67	1.67	113.43	0.015	1.70	0.0	0.0	7.723	A
C-A	44.33	44.33			44.33				
A-B	44.00	44.00			44.00				
A-C	27.00	27.00			27.00				

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PLANNING & DEVELOPMENT SECTION
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ROSCOMMON COUNTY COUNCIL

2021, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.12	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D2	2021	PM	DIRECT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

17:00 - 17:15

		To		
		A	B	C
From	A	0.00	30.00	56.00
	B	25.00	0.00	4.00
	C	39.00	0.00	0.00

Demand (Veh/TS)

17:15 - 17:30

		To		
		A	B	C
From	A	0.00	31.00	76.00
	B	22.00	0.00	0.00
	C	29.00	0.00	0.00

Demand (Veh/TS)

17:30 - 17:45

		To		
		A	B	C
From	A	0.00	17.00	83.00
	B	19.00	0.00	1.00
	C	40.00	1.00	0.00

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PLANNING & DEVELOPMENT SECTION
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17:45 - 18:00

Demand (Veh/TS)

From \ To	A	B	C
A	0.00	23.00	77.00
B	12.00	0.00	1.00
C	27.00	0.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	0	10
B	0	0	0
C	10	100	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-C	0.03	6.72	0.0	A	1.50	6.00
B-A	0.19	8.55	0.2	A	19.50	78.00
C-AB	0.02	9.56	0.0	A	0.42	1.67
C-A					33.58	134.33
A-B					25.25	101.00
A-C					73.00	292.00

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	4.00	4.00	141.15	0.028	3.97	0.0	0.0	6.558	A
B-A	25.00	25.00	131.44	0.190	24.77	0.0	0.2	8.421	A
C-AB	0.00	0.00	88.57	0.000	0.00	0.0	0.0	0.000	A
C-A	39.00	39.00			39.00				
A-B	30.00	30.00			30.00				
A-C	56.00	56.00			56.00				

17:15 - 17:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	133.89	0.000	0.03	0.0	0.0	0.000	A
B-A	22.00	22.00	128.48	0.171	22.02	0.2	0.2	8.455	A
C-AB	0.00	0.00	84.98	0.000	0.00	0.0	0.0	0.000	A
C-A	29.00	29.00			29.00				
A-B	31.00	31.00			31.00				
A-C	76.00	76.00			76.00				

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17:30 - 17:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	134.95	0.007	0.99	0.0	0.0	6.717	A
B-A	19.00	19.00	124.27	0.153	19.03	0.2	0.2	8.555	A
C-AB	1.67	1.67	100.11	0.017	1.65	0.0	0.0	9.140	A
C-A	39.33	39.33			39.33				
A-B	17.00	17.00			17.00				
A-C	83.00	83.00			83.00				

17:45 - 18:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	138.66	0.007	1.00	0.0	0.0	6.539	A
B-A	12.00	12.00	128.64	0.093	12.08	0.2	0.1	7.727	A
C-AB	0.00	0.00	100.86	0.000	0.02	0.0	0.0	9.565	A
C-A	27.00	27.00			27.00				
A-B	23.00	23.00			23.00				
A-C	77.00	77.00			77.00				

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2022 no dev, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		24.21	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D3	2022 no dev	AM	DIRECT	08:30	09:30	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

08:30 - 08:45

		To		
		A	B	C
From	A	0.00	9.00	29.00
	B	28.00	0.00	2.00
	C	89.00	0.00	0.00

Demand (Veh/TS)

08:45 - 09:00

		To		
		A	B	C
From	A	0.00	21.00	27.00
	B	25.00	0.00	0.00
	C	102.00	0.00	0.00

Demand (Veh/TS)

09:00 - 09:15

		To		
		A	B	C
From	A	0.00	58.00	21.00
	B	75.00	0.00	0.00
	C	74.00	2.00	0.00

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ROSCOMMON COUNTY COUNCIL

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PLANNING & DEVELOPMENT SECTION
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ROSCOMMON COUNTY COUNCIL

09:15 - 09:30

Demand (Veh/TS)

From \ To	A	B	C
A	0.00	44.00	27.00
B	58.00	0.00	1.00
C	45.00	1.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	64	19
B	67	0	80
C	13	75	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-C	0.03	29.44	0.0	D	0.75	3.00
B-A	0.98	78.15	7.7	F	46.50	186.00
C-AB	0.03	7.71	0.0	A	1.53	6.12
C-A					76.72	306.89
A-B					33.00	132.00
A-C					26.00	104.00

Main Results for each time segment

08:30 - 08:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	2.00	2.00	75.64	0.026	1.97	0.0	0.0	12.213	B
B-A	28.00	28.00	78.60	0.356	27.46	0.0	0.5	17.427	C
C-AB	0.00	0.00	102.44	0.000	0.00	0.0	0.0	0.000	A
C-A	89.00	89.00			89.00				
A-B	9.00	9.00			9.00				
A-C	29.00	29.00			29.00				

08:45 - 09:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	75.11	0.000	0.03	0.0	0.0	0.000	A
B-A	25.00	25.00	76.53	0.327	25.04	0.5	0.5	17.500	C
C-AB	0.00	0.00	99.53	0.000	0.00	0.0	0.0	0.000	A
C-A	102.00	102.00			102.00				
A-B	21.00	21.00			21.00				
A-C	27.00	27.00			27.00				

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09:00 - 09:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	61.98	0.000	0.00	0.0	0.0	0.000	A
B-A	75.00	75.00	76.19	0.984	67.83	0.5	7.7	78.147	F
C-AB	4.44	4.44	134.66	0.033	4.40	0.0	0.0	6.907	A
C-A	71.56	71.56			71.56				
A-B	58.00	58.00			58.00				
A-C	21.00	21.00			21.00				

09:15 - 09:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	31.51	0.032	0.97	0.0	0.0	29.438	D
B-A	58.00	58.00	80.45	0.721	62.70	7.7	3.0	58.091	F
C-AB	1.67	1.67	113.43	0.015	1.70	0.0	0.0	7.709	A
C-A	44.33	44.33			44.33				
A-B	44.00	44.00			44.00				
A-C	27.00	27.00			27.00				

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PLANNING & DEVELOPMENT SECTION
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ROSCOMMON COUNTY COUNCIL

2022 no dev, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.15	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D4	2022 no dev	PM	DIRECT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

17:00 - 17:15

From \ To	A	B	C
A	0.00	31.00	56.00
B	26.00	0.00	4.00
C	39.00	0.00	0.00

Demand (Veh/TS)

17:15 - 17:30

From \ To	A	B	C
A	0.00	32.00	77.00
B	22.00	0.00	0.00
C	29.00	0.00	0.00

Demand (Veh/TS)

17:30 - 17:45

From \ To	A	B	C
A	0.00	17.00	85.00
B	20.00	0.00	1.00
C	40.00	1.00	0.00

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PLANNING & DEVELOPMENT SECTION
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17:45 - 18:00

Demand (Veh/TS)

From \ To	A	B	C
A	0.00	23.00	78.00
B	12.00	0.00	1.00
C	27.00	0.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	0	10
B	0	0	0
C	10	100	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-C	0.03	6.76	0.0	A	1.50	6.00
B-A	0.20	8.68	0.2	A	20.00	80.00
C-AB	0.02	9.57	0.0	A	0.42	1.67
C-A					33.58	134.33
A-B					25.75	103.00
A-C					74.00	296.00

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	4.00	4.00	140.65	0.028	3.97	0.0	0.0	6.582	A
B-A	26.00	26.00	131.38	0.198	25.76	0.0	0.2	8.501	A
C-AB	0.00	0.00	88.41	0.000	0.00	0.0	0.0	0.000	A
C-A	39.00	39.00			39.00				
A-B	31.00	31.00			31.00				
A-C	56.00	56.00			56.00				

17:15 - 17:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	133.51	0.000	0.03	0.0	0.0	0.000	A
B-A	22.00	22.00	128.04	0.172	22.03	0.2	0.2	8.492	A
C-AB	0.00	0.00	84.65	0.000	0.00	0.0	0.0	0.000	A
C-A	29.00	29.00			29.00				
A-B	32.00	32.00			32.00				
A-C	77.00	77.00			77.00				

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17:30 - 17:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	134.05	0.007	0.99	0.0	0.0	6.763	A
B-A	20.00	20.00	123.65	0.162	20.01	0.2	0.2	8.685	A
C-AB	1.67	1.67	99.87	0.017	1.65	0.0	0.0	9.162	A
C-A	39.33	39.33			39.33				
A-B	17.00	17.00			17.00				
A-C	85.00	85.00			85.00				

17:45 - 18:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	138.37	0.007	1.00	0.0	0.0	6.553	A
B-A	12.00	12.00	128.32	0.094	12.09	0.2	0.1	7.750	A
C-AB	0.01	0.01	100.74	0.000	0.02	0.0	0.0	9.573	A
C-A	27.00	27.00			27.00				
A-B	23.00	23.00			23.00				
A-C	78.00	78.00			78.00				

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PLANNING & DEVELOPMENT SECTION
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2022 with dev, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		25.42	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D5	2022 with dev	AM	DIRECT	08:30	09:30	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

08:30 - 08:45

		To		
		A	B	C
From	A	0.00	11.00	29.00
	B	29.00	0.00	2.00
	C	89.00	1.00	0.00

Demand (Veh/TS)

08:45 - 09:00

		To		
		A	B	C
From	A	0.00	23.00	27.00
	B	26.00	0.00	0.00
	C	102.00	0.00	0.00

Demand (Veh/TS)

09:00 - 09:15

		To		
		A	B	C
From	A	0.00	59.00	21.00
	B	76.00	0.00	0.00
	C	74.00	2.00	0.00

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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
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09:15 - 09:30

Demand (Veh/TS)

From \ To	A	B	C
A	0.00	45.00	27.00
B	58.00	0.00	1.00
C	45.00	1.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	64	19
B	67	0	80
C	13	75	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-C	0.03	30.65	0.0	D	0.75	3.00
B-A	1.00	81.99	8.2	F	47.25	189.00
C-AB	0.03	7.72	0.0	A	2.12	8.49
C-A					76.38	305.51
A-B					34.50	138.00
A-C					26.00	104.00

Main Results for each time segment

08:30 - 08:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	2.00	2.00	74.70	0.027	1.97	0.0	0.0	12.371	B
B-A	29.00	29.00	77.96	0.372	28.43	0.0	0.6	17.975	C
C-AB	2.37	2.37	154.10	0.015	2.35	0.0	0.0	5.930	A
C-A	87.63	87.63			87.63				
A-B	11.00	11.00			11.00				
A-C	29.00	29.00			29.00				

08:45 - 09:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	74.29	0.000	0.03	0.0	0.0	0.000	A
B-A	26.00	26.00	76.30	0.341	26.04	0.6	0.5	17.931	C
C-AB	0.00	0.00	102.40	0.000	0.02	0.0	0.0	0.000	A
C-A	102.00	102.00			102.00				
A-B	23.00	23.00			23.00				
A-C	27.00	27.00			27.00				

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09:00 - 09:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	61.73	0.000	0.00	0.0	0.0	0.000	A
B-A	76.00	76.00	76.08	0.999	68.29	0.5	8.2	81.994	F
C-AB	4.45	4.45	134.48	0.033	4.40	0.0	0.0	6.888	A
C-A	71.55	71.55			71.55				
A-B	59.00	59.00			59.00				
A-C	21.00	21.00			21.00				

09:15 - 09:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	30.30	0.033	0.97	0.0	0.0	30.647	D
B-A	58.00	58.00	80.34	0.722	63.24	8.2	3.0	61.022	F
C-AB	1.68	1.68	113.23	0.015	1.70	0.0	0.0	7.722	A
C-A	44.32	44.32			44.32				
A-B	45.00	45.00			45.00				
A-C	27.00	27.00			27.00				

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2022 with dev, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.23	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D6	2022 with dev	PM	DIRECT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

17:00 - 17:15

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	32.00	56.00
	B	28.00	0.00	5.00
	C	39.00	0.00	0.00

17:15 - 17:30

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	33.00	77.00
	B	24.00	0.00	0.00
	C	29.00	0.00	0.00

17:30 - 17:45

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	18.00	85.00
	B	21.00	0.00	1.00
	C	40.00	1.00	0.00

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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

17:45 - 18:00

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	23.00	78.00
	B	13.00	0.00	1.00
	C	27.00	0.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	10
	B	0	0	0
	C	10	100	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-C	0.04	6.79	0.0	A	1.75	7.00
B-A	0.21	8.78	0.3	A	21.50	86.00
C-AB	0.02	9.57	0.0	A	0.42	1.67
C-A					33.58	134.33
A-B					26.50	106.00
A-C					74.00	296.00

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	5.00	5.00	140.26	0.036	4.96	0.0	0.0	6.650	A
B-A	28.00	28.00	131.06	0.214	27.73	0.0	0.3	8.688	A
C-AB	0.00	0.00	88.25	0.000	0.00	0.0	0.0	0.000	A
C-A	39.00	39.00			39.00				
A-B	32.00	32.00			32.00				
A-C	56.00	56.00			56.00				

17:15 - 17:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	132.81	0.000	0.04	0.0	0.0	0.000	A
B-A	24.00	24.00	127.93	0.188	24.03	0.3	0.2	8.665	A
C-AB	0.00	0.00	84.50	0.000	0.00	0.0	0.0	0.000	A
C-A	29.00	29.00			29.00				
A-B	33.00	33.00			33.00				
A-C	77.00	77.00			77.00				

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17:30 - 17:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	133.60	0.007	0.99	0.0	0.0	6.786	A
B-A	21.00	21.00	123.56	0.170	21.03	0.2	0.2	8.781	A
C-AB	1.67	1.67	99.76	0.017	1.65	0.0	0.0	9.173	A
C-A	39.33	39.33			39.33				
A-B	18.00	18.00			18.00				
A-C	85.00	85.00			85.00				

17:45 - 18:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	137.99	0.007	1.00	0.0	0.0	6.569	A
B-A	13.00	13.00	128.38	0.101	13.09	0.2	0.1	7.812	A
C-AB	0.01	0.01	100.76	0.000	0.02	0.0	0.0	9.571	A
C-A	26.99	26.99			26.99				
A-B	23.00	23.00			23.00				
A-C	78.00	78.00			78.00				

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2027 no dev, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		32.20	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D7	2027 no dev	AM	DIRECT	08:30	09:30	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

08:30 - 08:45

From \ To	A	B	C
A	0.00	9.00	31.00
B	30.00	0.00	3.00
C	96.00	0.00	0.00

Demand (Veh/TS)

08:45 - 09:00

From \ To	A	B	C
A	0.00	22.00	29.00
B	26.00	0.00	0.00
C	109.00	0.00	0.00

Demand (Veh/TS)

09:00 - 09:15

From \ To	A	B	C
A	0.00	62.00	22.00
B	80.00	0.00	0.00
C	79.00	3.00	0.00

PLANNING & DEVELOPMENT SECTION
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ROSCOMMON COUNTY COUNCIL

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PLANNING & DEVELOPMENT SECTION
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Demand (Veh/TS)

09:15 - 09:30

From \ To	A	B	C
A	0.00	47.00	29.00
B	62.00	0.00	1.00
C	48.00	1.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	64	19
B	67	0	80
C	13	75	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-C	0.07	66.38	0.1	F	1.00	4.00
B-A	1.07	103.56	11.6	F	49.50	198.00
C-AB	0.05	7.56	0.1	A	2.19	8.77
C-A					81.81	327.23
A-B					35.00	140.00
A-C					27.75	111.00

Main Results for each time segment

08:30 - 08:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	3.00	3.00	74.09	0.040	2.96	0.0	0.0	12.648	B
B-A	30.00	30.00	77.13	0.389	29.38	0.0	0.6	18.625	C
C-AB	0.00	0.00	102.04	0.000	0.00	0.0	0.0	0.000	A
C-A	96.00	96.00			96.00				
A-B	9.00	9.00			9.00				
A-C	31.00	31.00			31.00				

08:45 - 09:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	73.81	0.000	0.04	0.0	0.0	0.000	A
B-A	26.00	26.00	75.12	0.346	26.07	0.6	0.5	18.383	C
C-AB	0.00	0.00	98.86	0.000	0.00	0.0	0.0	0.000	A
C-A	109.00	109.00			109.00				
A-B	22.00	22.00			22.00				
A-C	29.00	29.00			29.00				

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09:00 - 09:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	61.40	0.000	0.00	0.0	0.0	0.000	A
B-A	80.00	80.00	74.47	1.074	68.97	0.5	11.6	103.560	F
C-AB	7.03	7.03	137.87	0.051	6.95	0.0	0.1	6.872	A
C-A	74.97	74.97			74.97				
A-B	62.00	62.00			62.00				
A-C	22.00	22.00			22.00				

09:15 - 09:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	14.03	0.071	0.93	0.0	0.1	68.384	F
B-A	62.00	62.00	79.32	0.782	69.06	11.6	4.5	97.010	F
C-AB	1.75	1.74	115.27	0.015	1.81	0.1	0.0	7.564	A
C-A	47.26	47.26			47.26				
A-B	47.00	47.00			47.00				
A-C	29.00	29.00			29.00				

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PLANNING & DEVELOPMENT SECTION
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2027 no dev, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.18	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D8	2027 no dev	PM	DIRECT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

17:00 - 17:15

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	33.00	60.00
	B	28.00	0.00	4.00
	C	42.00	0.00	0.00

17:15 - 17:30

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	34.00	83.00
	B	24.00	0.00	0.00
	C	31.00	0.00	0.00

17:30 - 17:45

Demand (Veh/TS)

		To		
		A	B	C
From	A	0.00	18.00	90.00
	B	21.00	0.00	1.00
	C	43.00	1.00	0.00

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PLANNING & DEVELOPMENT SECTION
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17:45 - 18:00

Demand (Veh/TS)

From \ To	A	B	C
A	0.00	25.00	84.00
B	13.00	0.00	1.00
C	29.00	0.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	0	10
B	0	0	0
C	10	100	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-C	0.03	6.86	0.0	A	1.50	6.00
B-A	0.22	8.97	0.3	A	21.50	86.00
C-AB	0.02	9.48	0.0	A	0.43	1.74
C-A					36.07	144.26
A-B					27.50	110.00
A-C					79.25	317.00

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	4.00	4.00	138.49	0.029	3.97	0.0	0.0	6.688	A
B-A	28.00	28.00	129.37	0.216	27.73	0.0	0.3	8.831	A
C-AB	0.00	0.00	87.41	0.000	0.00	0.0	0.0	0.000	A
C-A	42.00	42.00			42.00				
A-B	33.00	33.00			33.00				
A-C	60.00	60.00			60.00				

17:15 - 17:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	131.01	0.000	0.03	0.0	0.0	0.000	A
B-A	24.00	24.00	125.48	0.191	24.03	0.3	0.2	8.874	A
C-AB	0.00	0.00	83.31	0.000	0.00	0.0	0.0	0.000	A
C-A	31.00	31.00			31.00				
A-B	34.00	34.00			34.00				
A-C	83.00	83.00			83.00				

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17:30 - 17:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	132.17	0.008	0.99	0.0	0.0	6.860	A
B-A	21.00	21.00	121.35	0.173	21.03	0.2	0.2	8.973	A
C-AB	1.73	1.73	101.68	0.017	1.71	0.0	0.0	9.002	A
C-A	42.27	42.27			42.27				
A-B	18.00	18.00			18.00				
A-C	90.00	90.00			90.00				

17:45 - 18:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	136.11	0.007	1.00	0.0	0.0	6.660	A
B-A	13.00	13.00	125.83	0.103	13.10	0.2	0.1	7.991	A
C-AB	0.01	0.01	101.87	0.000	0.03	0.0	0.0	9.481	A
C-A	28.99	28.99			28.99				
A-B	25.00	25.00			25.00				
A-C	84.00	84.00			84.00				

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PLANNING & DEVELOPMENT SECTION
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2027 with dev, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		33.77	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D9	2027 with dev	AM	DIRECT	08:30	09:30	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

08:30 - 08:45

		To		
		A	B	C
From	A	0.00	11.00	31.00
	B	31.00	0.00	3.00
	C	96.00	1.00	0.00

Demand (Veh/TS)

08:45 - 09:00

		To		
		A	B	C
From	A	0.00	24.00	29.00
	B	27.00	0.00	0.00
	C	109.00	0.00	0.00

Demand (Veh/TS)

09:00 - 09:15

		To		
		A	B	C
From	A	0.00	63.00	22.00
	B	81.00	0.00	0.00
	C	79.00	3.00	0.00

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PLANNING & DEVELOPMENT SECTION
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Demand (Veh/TS)

09:15 - 09:30

From \ To	A	B	C
A	0.00	48.00	29.00
B	62.00	0.00	1.00
C	48.00	1.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	64	19
B	67	0	80
C	13	75	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-C	0.08	79.92	0.1	F	1.00	4.00
B-A	1.09	108.43	12.3	F	50.25	201.00
C-AB	0.05	7.58	0.1	A	2.83	11.30
C-A					81.42	325.70
A-B					36.50	146.00
A-C					27.75	111.00

Main Results for each time segment

08:30 - 08:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	3.00	3.00	73.05	0.041	2.96	0.0	0.0	12.831	B
B-A	31.00	31.00	76.49	0.405	30.34	0.0	0.7	19.247	C
C-AB	2.51	2.51	159.38	0.016	2.50	0.0	0.0	5.736	A
C-A	94.49	94.49			94.49				
A-B	11.00	11.00			11.00				
A-C	31.00	31.00			31.00				

08:45 - 09:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	72.93	0.000	0.04	0.0	0.0	0.000	A
B-A	27.00	27.00	74.89	0.361	27.08	0.7	0.6	18.861	C
C-AB	0.00	0.00	102.84	0.000	0.02	0.0	0.0	0.000	A
C-A	109.00	109.00			109.00				
A-B	24.00	24.00			24.00				
A-C	29.00	29.00			29.00				

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09:00 - 09:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	61.33	0.000	0.00	0.0	0.0	0.000	A
B-A	81.00	81.00	74.35	1.089	69.23	0.6	12.3	108.433	F
C-AB	7.04	7.04	137.69	0.051	6.96	0.0	0.1	6.858	A
C-A	74.96	74.96			74.96				
A-B	63.00	63.00			63.00				
A-C	22.00	22.00			22.00				

09:15 - 09:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	12.11	0.083	0.92	0.0	0.1	79.924	F
B-A	62.00	62.00	79.21	0.783	69.74	12.3	4.6	103.370	F
C-AB	1.75	1.75	115.06	0.015	1.81	0.1	0.0	7.578	A
C-A	47.25	47.25			47.25				
A-B	48.00	48.00			48.00				
A-C	29.00	29.00			29.00				

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PLANNING & DEVELOPMENT SECTION
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2027 with dev, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.26	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D10	2027 with dev	PM	DIRECT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

17:00 - 17:15

		To		
		A	B	C
From	A	0.00	34.00	60.00
	B	30.00	0.00	5.00
	C	42.00	0.00	0.00

Demand (Veh/TS)

17:15 - 17:30

		To		
		A	B	C
From	A	0.00	35.00	83.00
	B	26.00	0.00	0.00
	C	31.00	0.00	0.00

Demand (Veh/TS)

17:30 - 17:45

		To		
		A	B	C
From	A	0.00	19.00	90.00
	B	22.00	0.00	1.00
	C	43.00	1.00	0.00

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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
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17:45 - 18:00

Demand (Veh/TS)

From \ To	A	B	C
A	0.00	25.00	84.00
B	14.00	0.00	1.00
C	29.00	0.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	0	10
B	0	0	0
C	10	100	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-C	0.04	6.88	0.0	A	1.75	7.00
B-A	0.23	9.08	0.3	A	23.00	92.00
C-AB	0.02	9.48	0.0	A	0.43	1.74
C-A					36.07	144.26
A-B					28.25	113.00
A-C					79.25	317.00

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	5.00	5.00	138.06	0.036	4.96	0.0	0.0	6.760	A
B-A	30.00	30.00	129.05	0.232	29.70	0.0	0.3	9.032	A
C-AB	0.00	0.00	87.26	0.000	0.00	0.0	0.0	0.000	A
C-A	42.00	42.00			42.00				
A-B	34.00	34.00			34.00				
A-C	60.00	60.00			60.00				

17:15 - 17:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	130.29	0.000	0.04	0.0	0.0	0.000	A
B-A	26.00	26.00	125.36	0.207	26.03	0.3	0.3	9.064	A
C-AB	0.00	0.00	83.16	0.000	0.00	0.0	0.0	0.000	A
C-A	31.00	31.00			31.00				
A-B	35.00	35.00			35.00				
A-C	83.00	83.00			83.00				

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17:30 - 17:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	131.72	0.008	0.99	0.0	0.0	6.884	A
B-A	22.00	22.00	121.26	0.181	22.04	0.3	0.2	9.076	A
C-AB	1.73	1.73	101.57	0.017	1.71	0.0	0.0	9.012	A
C-A	42.27	42.27			42.27				
A-B	19.00	19.00			19.00				
A-C	90.00	90.00			90.00				

17:45 - 18:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	135.74	0.007	1.00	0.0	0.0	6.678	A
B-A	14.00	14.00	125.88	0.111	14.10	0.2	0.1	8.057	A
C-AB	0.01	0.01	101.89	0.000	0.03	0.0	0.0	9.478	A
C-A	28.99	28.99			28.99				
A-B	25.00	25.00			25.00				
A-C	84.00	84.00			84.00				

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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
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2032 no dev, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		43.42	E

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D11	2032 no dev	AM	DIRECT	08:30	09:30	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

08:30 - 08:45

		To		
		A	B	C
From	A	0.00	10.00	33.00
	B	31.00	0.00	3.00
	C	99.00	0.00	0.00

Demand (Veh/TS)

08:45 - 09:00

		To		
		A	B	C
From	A	0.00	23.00	30.00
	B	27.00	0.00	0.00
	C	113.00	0.00	0.00

Demand (Veh/TS)

09:00 - 09:15

		To		
		A	B	C
From	A	0.00	64.00	23.00
	B	83.00	0.00	0.00
	C	81.00	3.00	0.00

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09:15 - 09:30

Demand (Veh/TS)

From \ To	A	B	C
A	0.00	49.00	30.00
B	64.00	0.00	1.00
C	50.00	1.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	64	19
B	67	0	80
C	13	75	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-C	0.50	570.45	0.4	F	1.00	4.00
B-A	1.12	129.97	14.2	F	51.25	205.00
C-AB	0.05	7.50	0.1	A	2.24	8.98
C-A					84.51	338.02
A-B					36.50	146.00
A-C					29.00	116.00

Main Results for each time segment

08:30 - 08:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	3.00	3.00	72.77	0.041	2.96	0.0	0.0	12.882	B
B-A	31.00	31.00	76.25	0.407	30.34	0.0	0.7	19.342	C
C-AB	0.00	0.00	101.36	0.000	0.00	0.0	0.0	0.000	A
C-A	99.00	99.00			99.00				
A-B	10.00	10.00			10.00				
A-C	33.00	33.00			33.00				

08:45 - 09:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	72.72	0.000	0.04	0.0	0.0	0.000	A
B-A	27.00	27.00	74.30	0.363	27.07	0.7	0.6	19.096	C
C-AB	0.00	0.00	98.38	0.000	0.00	0.0	0.0	0.000	A
C-A	113.00	113.00			113.00				
A-B	23.00	23.00			23.00				
A-C	30.00	30.00			30.00				

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09:00 - 09:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	61.14	0.000	0.00	0.0	0.0	0.000	A
B-A	83.00	83.00	73.78	1.125	69.37	0.6	14.2	119.937	F
C-AB	7.19	7.19	139.01	0.052	7.11	0.0	0.1	6.821	A
C-A	76.81	76.81			76.81				
A-B	64.00	64.00			64.00				
A-C	23.00	23.00			23.00				

09:15 - 09:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	2.02	0.495	0.59	0.0	0.4	570.460	F
B-A	64.00	64.00	78.64	0.814	72.20	14.2	6.0	129.969	F
C-AB	1.79	1.79	116.35	0.015	1.85	0.1	0.0	7.500	A
C-A	49.21	49.21			49.21				
A-B	49.00	49.00			49.00				
A-C	30.00	30.00			30.00				

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2032 no dev, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.20	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D12	2032 no dev	PM	DIRECT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

17:00 - 17:15

		To		
		A	B	C
From	A	0.00	34.00	62.00
	B	29.00	0.00	4.00
	C	43.00	0.00	0.00

Demand (Veh/TS)

17:15 - 17:30

		To		
		A	B	C
From	A	0.00	35.00	86.00
	B	24.00	0.00	0.00
	C	33.00	0.00	0.00

Demand (Veh/TS)

17:30 - 17:45

		To		
		A	B	C
From	A	0.00	19.00	94.00
	B	22.00	0.00	1.00
	C	45.00	1.00	0.00

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17:45 - 18:00

Demand (Veh/TS)

From \ To	A	B	C
A	0.00	26.00	87.00
B	14.00	0.00	1.00
C	30.00	0.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	0	10
B	0	0	0
C	10	100	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-C	0.03	6.94	0.0	A	1.50	6.00
B-A	0.23	9.23	0.3	A	22.25	89.00
C-AB	0.02	9.41	0.0	A	0.45	1.78
C-A					37.55	150.22
A-B					28.50	114.00
A-C					82.25	329.00

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	4.00	4.00	137.41	0.029	3.97	0.0	0.0	6.742	A
B-A	29.00	29.00	128.46	0.226	28.71	0.0	0.3	8.997	A
C-AB	0.00	0.00	86.91	0.000	0.00	0.0	0.0	0.000	A
C-A	43.00	43.00			43.00				
A-B	34.00	34.00			34.00				
A-C	62.00	62.00			62.00				

17:15 - 17:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	130.04	0.000	0.03	0.0	0.0	0.000	A
B-A	24.00	24.00	123.99	0.194	24.05	0.3	0.2	9.010	A
C-AB	0.00	0.00	82.64	0.000	0.00	0.0	0.0	0.000	A
C-A	33.00	33.00			33.00				
A-B	35.00	35.00			35.00				
A-C	86.00	86.00			86.00				

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17:30 - 17:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	130.58	0.008	0.99	0.0	0.0	6.944	A
B-A	22.00	22.00	119.57	0.184	22.01	0.2	0.2	9.228	A
C-AB	1.78	1.78	102.78	0.017	1.76	0.0	0.0	8.909	A
C-A	44.22	44.22			44.22				
A-B	19.00	19.00			19.00				
A-C	94.00	94.00			94.00				

17:45 - 18:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	134.79	0.007	1.00	0.0	0.0	6.725	A
B-A	14.00	14.00	124.61	0.112	14.10	0.2	0.1	8.152	A
C-AB	0.01	0.01	102.58	0.000	0.03	0.0	0.0	9.413	A
C-A	29.99	29.99			29.99				
A-B	26.00	26.00			26.00				
A-C	87.00	87.00			87.00				

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2032 with dev, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		50.16	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D13	2032 with dev	AM	DIRECT	08:30	09:30	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

08:30 - 08:45

		To		
		A	B	C
From	A	0.00	12.00	33.00
	B	32.00	0.00	3.00
	C	99.00	1.00	0.00

Demand (Veh/TS)

08:45 - 09:00

		To		
		A	B	C
From	A	0.00	25.00	30.00
	B	28.00	0.00	0.00
	C	113.00	0.00	0.00

Demand (Veh/TS)

09:00 - 09:15

		To		
		A	B	C
From	A	0.00	65.00	23.00
	B	84.00	0.00	0.00
	C	81.00	3.00	0.00

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Demand (Veh/TS)

09:15 - 09:30

From \ To	A	B	C
A	0.00	50.00	30.00
B	64.00	0.00	1.00
C	50.00	1.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	64	19
B	67	0	80
C	13	75	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-C	1.01	1238.73	0.6	F	1.00	4.00
B-A	1.14	138.32	15.1	F	52.00	208.00
C-AB	0.05	7.52	0.1	A	2.90	11.58
C-A					84.11	336.42
A-B					38.00	152.00
A-C					29.00	116.00

Main Results for each time segment

08:30 - 08:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	3.00	3.00	71.68	0.042	2.96	0.0	0.0	13.088	B
B-A	32.00	32.00	75.61	0.423	31.29	0.0	0.7	20.013	C
C-AB	2.59	2.59	161.33	0.016	2.57	0.0	0.0	5.668	A
C-A	97.41	97.41			97.41				
A-B	12.00	12.00			12.00				
A-C	33.00	33.00			33.00				

08:45 - 09:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	71.79	0.000	0.04	0.0	0.0	0.000	A
B-A	28.00	28.00	74.07	0.378	28.08	0.7	0.6	19.615	C
C-AB	0.00	0.00	102.87	0.000	0.02	0.0	0.0	0.000	A
C-A	113.00	113.00			113.00				
A-B	25.00	25.00			25.00				
A-C	30.00	30.00			30.00				

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09:00 - 09:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	61.08	0.000	0.00	0.0	0.0	0.000	A
B-A	84.00	84.00	73.67	1.140	69.55	0.6	15.1	125.310	F
C-AB	7.20	7.20	138.83	0.052	7.12	0.0	0.1	6.805	A
C-A	76.80	76.80			76.80				
A-B	65.00	65.00			65.00				
A-C	23.00	23.00			23.00				

09:15 - 09:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	0.99	1.007	0.38	0.0	0.6	1238.730	F
B-A	64.00	64.00	78.53	0.815	72.85	15.1	6.2	138.321	F
C-AB	1.79	1.79	116.15	0.015	1.85	0.1	0.0	7.516	A
C-A	49.21	49.21			49.21				
A-B	50.00	50.00			50.00				
A-C	30.00	30.00			30.00				

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2032 with dev, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.28	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D14	2032 with dev	PM	DIRECT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
A		DIRECT	✓	100.000
B		DIRECT	✓	100.000
C		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/TS)

17:00 - 17:15

		To		
		A	B	C
From	A	0.00	35.00	62.00
	B	31.00	0.00	5.00
	C	43.00	0.00	0.00

Demand (Veh/TS)

17:15 - 17:30

		To		
		A	B	C
From	A	0.00	36.00	86.00
	B	26.00	0.00	0.00
	C	33.00	0.00	0.00

Demand (Veh/TS)

17:30 - 17:45

		To		
		A	B	C
From	A	0.00	20.00	94.00
	B	23.00	0.00	1.00
	C	45.00	1.00	0.00

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17:45 - 18:00

Demand (Veh/TS)

From \ To	A	B	C
A	0.00	26.00	87.00
B	15.00	0.00	1.00
C	30.00	0.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C
A	0	0	10
B	0	0	0
C	10	100	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/TS)	Total Junction Arrivals (Veh)
B-C	0.04	6.97	0.0	A	1.75	7.00
B-A	0.24	9.33	0.3	A	23.75	95.00
C-AB	0.02	9.41	0.0	A	0.45	1.79
C-A					37.55	150.21
A-B					29.25	117.00
A-C					82.25	329.00

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	5.00	5.00	136.96	0.037	4.96	0.0	0.0	6.816	A
B-A	31.00	31.00	128.15	0.242	30.69	0.0	0.3	9.205	A
C-AB	0.00	0.00	86.76	0.000	0.00	0.0	0.0	0.000	A
C-A	43.00	43.00			43.00				
A-B	35.00	35.00			35.00				
A-C	82.00	82.00			82.00				

17:15 - 17:30

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0.00	0.00	129.32	0.000	0.04	0.0	0.0	0.000	A
B-A	26.00	26.00	123.87	0.210	26.05	0.3	0.3	9.205	A
C-AB	0.00	0.00	82.48	0.000	0.00	0.0	0.0	0.000	A
C-A	33.00	33.00			33.00				
A-B	36.00	36.00			36.00				
A-C	86.00	86.00			86.00				

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17:30 - 17:45

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	130.13	0.008	0.99	0.0	0.0	6.969	A
B-A	23.00	23.00	119.48	0.193	23.03	0.3	0.2	9.334	A
C-AB	1.78	1.78	102.67	0.017	1.76	0.0	0.0	8.918	A
C-A	44.22	44.22			44.22				
A-B	20.00	20.00			20.00				
A-C	94.00	94.00			94.00				

17:45 - 18:00

Stream	Total Demand (Veh/TS)	Junction Arrivals (Veh)	Capacity (Veh/TS)	RFC	Throughput (Veh/TS)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	1.00	1.00	134.43	0.007	1.00	0.0	0.0	6.744	A
B-A	15.00	15.00	124.65	0.120	15.10	0.2	0.1	8.222	A
C-AB	0.01	0.01	102.60	0.000	0.03	0.0	0.0	9.411	A
C-A	29.99	29.99			29.99				
A-B	26.00	26.00			26.00				
A-C	87.00	87.00			87.00				

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CHAPTER 15

INTERACTIONS

SUMMARY

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INTRODUCTION

- The proposed development and the measures in place to mitigate them have been outlined in the EIAR. However, for any development with the potential for environmental impacts there is also the potential for interaction amongst these impacts. The result of these interactions may either exacerbate the magnitude of the impact or improve it. The interaction of impacts on the surrounding environment needs to be addressed as part of the Environmental Impact Assessment process.
- This Environmental Impact Assessment Report was prepared by Collins Boyd Engineers & Architects on behalf of Eamon Harney the client as an integrated document, rather than a collection of separate reports. The impactsthat arise as a result of the interaction between several aspects of the development have therefore been addressed in the main body of each EIAR section.

THE INTERACTION OF THE FOREGOING

- The interaction between the various environmental topics has been covered within each of the EIARSections, 4 through to 14, where relevant. For example, the interaction of geology and groundwaterhas been addressed in EIAR Chapter 7.
- The environmental components which might potentially be impacted by a development of this kind and at this location have been identified through the site assessment as follows:
  - Effects on land use and amenity;
  - Impacts on local sensitive receptors;
  - Loss of natural heritage and wildlife habitats and disturbance to flora and fauna;
  - Impacts on groundwater, soils and bedrock geology;
  - Nuisance potential and or public health effects due to noise, dust, odour or lighting emissions;
  - Impacts on local archaeology;
  - Change in visual character;
  - Impacts on material assets such as infrastructure or local utilities.
- A matrix method has been used, in which the environmental components addressed in the previoussections of this EIAR have been placed on both axes of a matrix, these interactions are summarised inTable 15-1 below.
- The purpose of the effects matrix is to identify potential interactions. Actual interactions and

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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

their significance are dealt with in the relevant chapter of the EIAR with a brief overview of some of the more pertinent interactions provided in this chapter.

Table 15-1 Impact Interaction and Interrelationships Matrix

	Biodiversity	Land, Soils& Geology	Water	Air Quality	Noise & Vibration	Landscape and Visual	Traffic	Cultural Heritage	Population & Human Health
Biodiversity									
Land, Soils &Geology									
Water									
Air Quality									
Noise & Vibration									
Landscape andVisual									
Traffic									
Cultural Heritage									
Population & Human Health									

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PLANNING & DEVELOPMENT SECTION
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POTENTIAL INTERACTIONS

BIODIVERSITY

- Potential interaction associated with the proposed landscape mitigation and restoration proposals are discussed in Chapter 5 (Biodiversity), Chapter 13 (Landscape) and Landscape Mitigation and Restoration (refer to Appendix 2).

WATER

- The potential impact of the recommencement of Sandpit activities and the aggregate processing area in relation to water and the potential interactions with other environmental topics are discussed in Chapter 5 (Biodiversity), Chapter 6 (Land, Soils and Geology) and Chapter 7 (Water).

AIR QUALITY

- The interaction of Climate (Chapter 9), Air Quality (Chapter 8) and Population and Human Health (Chapter 4) are discussed in the relevant chapters of the EIAR.
- The Air Quality Chapter presented in EIAR Chapter 8, indicates that with the implementation of industry standard air quality mitigation measures, no residual impacts will result from the proposeddevelopment. Therefore, the interaction is considered to be acceptable.

NOISE & VIBRATION

- The interaction between noise and population and human health is discussed in the relevant chapters of the EIAR.
- The Noise assessment, presented in EIAR Chapter 10, indicates that with the implementation of industry standard noise mitigation measures, no residual impacts will result from the proposed development. Therefore, the interaction is considered to be acceptable.

LANDSCAPE & VISUAL

- The potential interaction with Biodiversity discussed in Chapter 5 (Biodiversity), Chapter 13 (Landscape) and (Landscape Mitigation and Restoration).

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TRAFFIC

- Potential interactions associated with traffic movements from the proposed Sandpit development with the general population and air quality are addressed in the preceding sections of this chapter.

CULTURAL HERITAGE

- The proposed development area is existing agricultural land grazed by cattle during the summer months
- Potential interactions with other environmental topics (e.g. Land, Soils & Geology and Landscape & Visual) are limited. In addition, direct changes to this landscape would be very limited as the nature of the proposal comprises, for the most part, the proposed reduction in land levels in keeping with existing landscape. Visual effects at a selection of viewpoint locations were assessed and judged to be not significant.

POPULATION AND HUMAN HEALTH

- According to the relevant guidelines, human health should be considered in the context of the relevant environmental topics addressed by the EIAR. Also, effects on human health should be considered in relation to relevant pathways (such as air, soil and water) and should be considered inthe context of accepted standards for exposure, dose or risk.
- Human health is considered in the context of the relevant pathways, such as noise, air, soil and waterin the context of acceptable doses or limits. The EIAR shows that the Sandpit would operate within acceptable limits for noise and dust and potential effects on soil and water would be addressed through good practice and mitigation measures to avoid accidental spillages of fuel, etc. Water wouldbe discharge from the site in accordance similar to green field
- The key matters in relation to amenity are water, noise, dust, vibration, landscape and traffic. As stated above, the EIAR shows that the Sandpit would operate within acceptable levels for water, noise,dust and vibrations. From many locations, the changes to the landscape would not be visible or wouldnot be significant. The restoration of the Sandpit would be beneficial when compared against the existing baseline. The traffic assessment shows that the existing road junctions have sufficient capacity to accommodate the Sandpit traffic to 2032 and beyond.

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APPENDIX 1

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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
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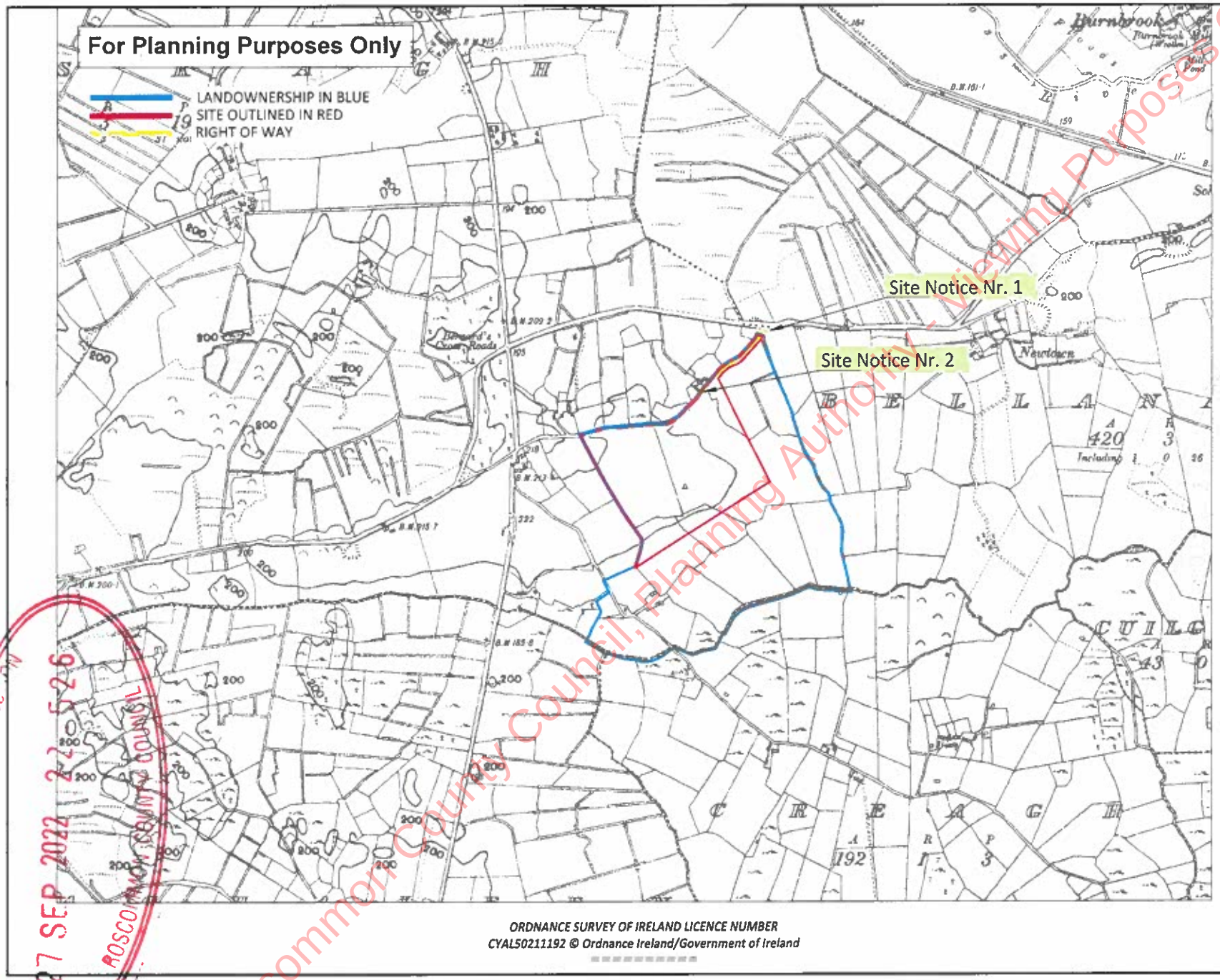

Description:
Historic 6" Latest Edition

Publisher / Source:
Ordnance Survey Ireland (OSI)

File Format:
Tagged Image File Format (TIFF)

File Name:
R_50188743_1.tif

Clip Extent / Area of Interest (AOI):
LLX,LLY= 594947.1164,737674.5325
URX,LRY= 600141.1164,737674.5325
ULX,ULY= 594947.1164,744684.5325
URX,URY= 600141.1164,744684.5325

Projection / Spatial Reference:
IRENET95_Irish_Transverse_Mercator

Centre Point Coordinates:
X,Y = 597544.1164,741179.5325

Data Extraction : 20-Jan-2021:

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N

Revisions

Rev	By	Date	Description
PLD	MD	16.09.22	Issued for Planning

Client:
Eamon Harney

collinsboyd
Galway Road
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F42 V344
Phone: 090 6634421
Fax: 090 6634423
Email: info@collinsboydeng.com

Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Site Location Map 1

Status	Planning
Date	15/07/2022
Scale	1:10,560 @ A4
Drawn by	CM

JOB No.	DRG No.	REV.
22.137	001	PLD

PLANNING & DEVELOPMENT SECTION
27 SEP 2022
ROSCOMMON COUNTY COUNCIL
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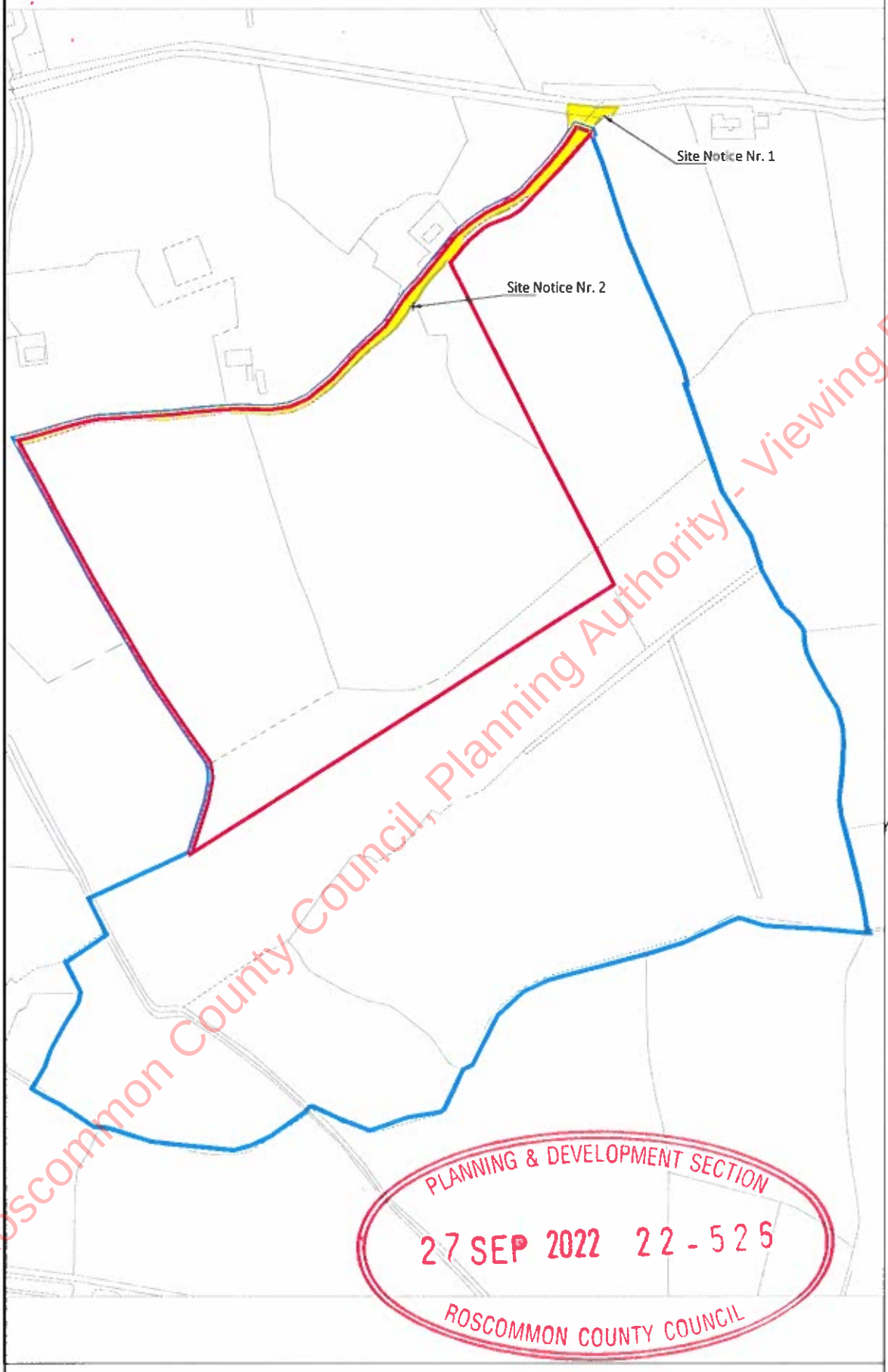
LANDOWNERSHIP IN BLUE
SITE OUTLINED IN RED
RIGHT OF WAY



Description:
Digital Cartographic Model (DCM)

Publisher / Source:
Ordnance Survey Ireland (OSi)

Data Source / Reference:
PRIME2

File Format:
Autodesk AutoCAD (DWG_R2013)

File Name:
v_50166743_1.dwg

Clip Extent / Area of Interest (AOI):
LLX,LLY= 597236.6164,740764.5325
LRX,LRY= 597851.6164,740764.5325
ULX,ULY= 597236.6164,741594.5325
URX,URY= 597851.6164,741594.5325

Projection / Spatial Reference:
Projection= IRENET95_Irish Transverse_Mercator

Centre Point Coordinates:
X,Y= 597544.1164,741179.5325

Reference Index:
Map Series | Map Sheets
1:5,000 | 3034
1:5,000 | 3102

Data Extraction Date:
Date= 20-Jan-2021

Source Data Release:
Product Version:
Version= 1.3

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Revisions			
Rev	By	Date	Description
PL0	MD	xx.22	Issued for Planning

Client:
Eamon Heney

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Email: info@collinsboydeng.com

Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td, Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Site Location Map 2

Status	Planning
Date:	15/07/2022
Scale:	1:2,500 @ A3
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	002	PL0

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-525
ROSCOMMON COUNTY COUNCIL

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ORDNANCE SURVEY OF IRELAND LICENCE NUMBER
CYAL50211192 © Ordnance Ireland/Government of Ireland

SCALE BAR 1:1,000

0 10m 20m 30m 40m 50m 60m 70m 80m 90m 100m

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LANDOWNERSHIP IN BLUE
SITE OUTLINED IN RED
RIGHT OF WAY

Area of Site:
69,381 Sq/m
17.2 Acres
6.938 Hectares

ITM: 597452, 741243

22.137-010C

22.137-010B

60m Buffer zone from adjacent property denoted thus.

01 02 03 04 05

Proposed new stock proof fence. Refer to boundary treatment layout for details of boundaries.

Proposed new weld mesh fence. Refer to boundary treatment layout for details of boundaries.

Bottom of slope denoted thus.

Top of slope denoted thus.

For details of proposed entrance walls refer to Site Entrance drawing 21.137-017.

Existing hedge to be removed/cut back as required to achieve required sight-lines within the landownership of the applicant.

Proposed entrance gate. Refer to site entrance drawing for details.

Staff and visitor car park

Wayleave marked in yellow. Refer to letter from solicitor for further details.

Location of site notice Nr. 1.

Existing road to be widened on the applicants road side to facilitate a 6m wide road.

Road centreline.

Location of site notice Nr. 2.

Roadside boundary to be set back 3m from metalled edge of existing road. Road to be extended to meet new boundary.

Proposed topsoil stockpile for re-use during reinstatement phase.

Small vehicles queuing area.

For details of lighting and lighting layout refer to specification attached to application.

For details of proposed office building, refer to drawing 21.137-030.

For details of proposed weighbridge, refer to drawing 22.137-019.

For details of proposed wastewater storage tank, refer to drawing 23.137-022.

For details of portable wheelwash, refer to drawing 22.137-018.

For details of proposed toilet building, refer to drawing 21.137-031.

For details of proposed soakaway, refer to drawing 21.137-020.

Inspection Manhole prior to discharge to soakpit.

For details of proposed silt trap manhole, refer to drawing 21.137-020.

For details of proposed re-fueling/petrol interceptor, refer to drawing 21.137-020.

Petrol interceptor refer to dwg. 22.137-020

Hardstanding gravelled area.

15 x 10 x 2 Dp. Soakaway to take overflow from settlement pond

Inspection Manhole on overflow outfall to soakaway

Soil embankment surrounding the settlement pond.

2m High weld mesh fencing surround settlement pond. New 6m wide gates to facilitate access on western end of pond.

Proposed well with manhole cover surrounded in concrete slab

Overflow pipe from settlement pond taken from clean water side

Soil embankment surrounding the settlement pond.

Top of slope denoted thus.

Site outlined in red.

Proposed Settlement Pond- Refer to Dwg. 22.137-021

For extents of lands under the control of the applicant refer to the site location maps.

Existing road to be widened on the applicants road side to facilitate a 6m wide road.

Existing hedge to be removed/cut back as required to achieve required sight-lines within the landownership of the applicant.

Section-01

Section-02

Section-03

Section-04

Section-05

GATEWAY
DECIDUOUS TREE DRAWN TO SIZE
SEWER MANHOLE & DETAILS
GULLY AND DETAILS
FENCE
ESB COVER
EIRCOM COVER
199.997 SPOTHEIGHT & ELEVATION
FIRE HYDRANT
STOP VALVES
BUILDING
ESB/EIRCOM POLE & CABLE
TREES/TREELINE
DITCHLINE
HEDGELINE
WALL
EMBANKMENT
EXTRACTION AREA
PROPOSED TOPSOIL STOCKPILE
PROPOSED TARMACADAM
PROPOSED CONCRETE
PROPOSED HARDSTANDING AREA
PROPOSED SETTLEMENT POND
STOCKPROOF POST & WIRE FENCE
2.4m HIGH WELDED MESH FENCE
OUTLINE OF EXTRACTION AREA

Notes:

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3. All works to be carried out in accordance with the current building control act and building regulations.
4. Clients are obliged to forward a commencement notice to the local authority at least 14 days prior to the commencement of any works on site.
5. Consultants to be informed immediately of any discrepancies before work proceeds.

NOT FOR CONSTRUCTION

N

Revisions

Rev	By	Date	Description
PL0	MD	16.09.22	Issued for Planning

Client:
Eamon Harney

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

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Phone: 090 6634421
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Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Proposed Site Masterplan

Status	Planning
Date:	July 2022
Scale:	1:1,000 @ A1
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	010A	PL0

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==========

For extents of site refer to proposed site masterplan 22.137-010A

For Planning Purposes Only

LANDOWNERSHIP IN BLUE
SITE OUTLINED IN RED
RIGHT OF WAY

Area of Site:
69,381 Sq/m
17.2 Acres
6.938 Hectares

ITM: 597452, 741243

SCALE BAR 1:500

0 10m 20m 30m 40m 50m 60m 70m 80m 90m 100m

GATEWAY
DECIDUOUS TREE DRAWN TO SIZE
SEWER MANHOLE & DETAILS
GULLY AND DETAILS
FENCE
ESB COVER
EIRCOM COVER
SPOTHEIGHT & ELEVATION
FIRE HYDRANT
STOP VALVES
BUILDING
ESB/EIRCOM POLE & CABLE
TREES/TREELINE
DITCHLINE
HEDGELINE
WALL
EMBANKMENT
EXTRACTION AREA
PROPOSED TOPSOIL STOCKPILE
PROPOSED TARMACADAM
PROPOSED CONCRETE
PROPOSED HARDSTANDING AREA
PROPOSED SETTLEMENT POND
STOCKPROOF POST & WIRE FENCE
2.4m HIGH WELDED MESH FENCE
OUTLINE OF EXTRACTION AREA
SIGHTLINES

60m Buffer zone from adjacent property denoted thus.

Proposed new stock proof fence. Refer to boundary treatment layout for details of boundaries.

For extents of lands under the control of the applicant refer to the site location maps.

Proposed new weld mesh fence. Refer to boundary treatment layout for details of boundaries.

Existing hedge to be removed/cut back as required to achieve required sight-lines within the landownership of the applicant.

Wayleave marked in yellow. Refer to letter from solicitor for further details.

Location of site notice Nr. 2.

For details of proposed entrance walls refer to Site Entrance drawing 21.137-017.

60m SIGHTLINE

Proposed entrance gate. Refer to site entrance drawing for details.

Roadside boundary to be set back 3m from metalled edge of existing road. Road to be extended to meet new boundary.

Staff and visitor car park

Small vehicles queuing area.

Proposed topsoil stockpile for re-use during reinstatement phase.

For details of lighting and lighting layout refer to specification attached to application.

Top of slope denoted thus.

Bottom of slope denoted thus.

For details of proposed weighbridge, refer to drawing 21.137-019.

For details of proposed office building, refer to drawing 22.137-030.

For details of proposed toilet building, refer to drawing 22.137-031.

For details of proposed soakaway, refer to drawing 21.137-020.

For details of proposed wastewater storage tank, refer to drawing 21.137-022.

For details of portable wheelwash, refer to drawing 21.137-018.

Petrol Interceptor

Hardstanding graveled area.

Inspection Manhole on overflow outfall to soakaway

For details of proposed silt trap manhole, refer to drawing 22.137-020.

For details of proposed re-fuelling/petrol interceptor, refer to drawing 21.137-020.

Stockpiling area.

15m x 10m x 2m Dp. Soakaway to take water from settlement tank overflow

Outline of Extraction area

Soil embankment surrounding the settlement pond.

2m High weld mesh fencing surround settlement pond. New 6m wide gates to facilitate access on western end of pond.

Proposed well with manhole cover surrounded in concrete slab refer to drawing 22.137-033

Overflow pipe from settlement pond taken from clean water side

2m High weld mesh fencing surrounding settlement pond.

Site outlined in red.

Section-05

Section-0

01 02 03 04 05

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5. Consultants to be informed immediately of any discrepancies before work proceeds.

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Revisions

Rev	By	Date	Description
PL0	MD	16.09.22	Issued for Planning

Client:
Eamon Harney

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

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Phone: 090 6634421
Fax: 090 6634423
Email: info@collinsboydeng.com

Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Proposed Site Layout Sheet 1

Status	Planning
Date:	July 2022
Scale:	1:500 @ A1
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	010B	PL0

0 10m 20m 30m 40m 50m 60m 70m 80m 90m 100m

SCALE BAR 1:500

For extents of site refer to proposed site masterplan 22.137-010A

For Planning Purposes Only

LANDOWNERSHIP IN BLUE
SITE OUTLINED IN RED
RIGHT OF WAY

Area of Site:
69,381 Sq/m
17.2 Acres
6.938 Hectares

ITM: 597452, 741243

22.137-010B

Section-05

90m SIGHTLINE

60m SIGHTLINE

For extents of lands under the control of the applicant refer to the site location maps.

Wayleave marked in yellow. Refer to letter from solicitor for further details.

Welded mesh fence

Existing hedge to be removed/cut back as required to achieve required sight-lines within the landownership of the applicant.

For details of proposed entrance walls refer to Site Entrance drawing 22.137-017.

Road centreline.

Existing road to be widened on the applicants road side to facilitate a 6m wide road.

Existing hedge to be removed/cut back as required to achieve required sight-lines within the landownership of the applicant.

Existing hedge below level of vertical visibility splay which is measured at 1.05m off road level at each end in accordance with DN-GEO-03031

Location of site notice Nr. 2.

Roadside boundary to be set back 3m from metalled edge of existing road. Road to be extended to meet new boundary.

Proposed entrance gate. Refer to site entrance drawing for details, refer to dwg. 22.137-017

Stock Proof Fence

Staff and visitor car park.

Small vehicles queuing area.

For details of lighting and lighting layout refer to specification attached to application.

Proposed topsoil stockpile for re-use during reinstatement phase.

Top of slope denoted thus.

Bottom of slope denoted thus.

Site outlined in red.

For details of proposed weighbridge, refer to drawing 21.137-019.

For details of proposed office building, refer to drawing 21.137-030.

For details of proposed toilet building, refer to drawing 21.137-031.

For details of proposed soakaway, refer to drawing 21.137-020.

For details of proposed wastewater storage tank, refer to drawing 21.137-022.

Petrol Interceptor

For details of portable wheelwash, refer to drawing 21.137-018.

Hardstanding gravelled area.

For details of proposed silt trap manhole, refer to drawing 21.137-020.

For details of proposed re-fueling/petrol interceptor, refer to drawing 20.214-020.

GATEWAY
DECIDUOUS TREE DRAWN TO SIZE
SEWER MANHOLE & DETAILS
GULLY AND DETAILS
FENCE
ESB COVER
EIRCOM COVER
SPOTHEIGHT & ELEVATION
FIRE HYDRANT
STOP VALVES
BUILDING
ESB/EIRCOM POLE & CABLE
TREES/TREELINE
DITCHLINE
HEDGELINE
WALL
EMBANKMENT
EXTRACTION AREA
PROPOSED TOPSOIL STOCKPILE
PROPOSED TARMACADAM
PROPOSED CONCRETE
PROPOSED HARDSTANDING AREA
PROPOSED SETTLEMENT POND
STOCKPROOF POST & WIRE FENCE
2.4m HIGH WELDED MESH FENCE
OUTLINE OF EXTRACTION AREA
SIGHTLINES

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Revisions

Rev	By	Date	Description
PL0	MD	16.09.2022	Issued for Planning

Client:
Eamon Harney

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

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Fax: 090 6634423
Email: info@collinsboydeng.com

Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Proposed Site Layout Sheet 2

Status	For Planning
Date:	July 2022
Scale:	1:500 @ A1
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	010C	PL0

Roscommon County Council, Planning Authority - Viewing Purposes Only

KILDEA Concrete

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accounts@kildeaconcrete.com

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090-6493144

FIND US
Bealnamulla, Athlone,
Co Roscommon,
N37 XV88.

LEADING PRODUCERS OF CONCRETE BLOCKS, READYMIX CONCRETE & PRECAST PRODUCTS

10/08/2022

To Whom it may concern,

We are writing with regard to the application for a proposed Sand pit at Rooskey, Bealnamulla, Athlone, Co. Roscommon by Eamon Harney.

We would like to express our support for this proposal. We run our Readymix concrete, Concrete Blocks and Precast business directly adjacent to the proposed site of the new sandpit. We have a strong demand for the raw materials required in concrete production and as such it would be our intention to purchase a sizeable portion of the sand we require from this sandpit should the planning application be successful. Through the opening of this sandpit we feel it will have a positive impact on our business which employs almost 30 staff directly and many more indirectly.

Having a source adjacent to our production plant would also mean an immediate reduction in the number of truck movements daily as less external trucks would be transporting sand to our plant leading to less HGV trucks on the roads.

Although demand for our products remains strong, we have in recent times experienced a lessening of sand & gravel suppliers throughout the midlands region. Many of the companies we have dealt with in the past have ceased trading due to lack of access to raw materials. We believe having a source of raw material in our area will have a positive impact and are in support of the proposed application.

Best regards

Larry Kildea

Managing Director

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

Roscommon County Council, Planning Authority - Viewing Purposes Only!

From: Housing Eiaportal
To: Michael Daly
Subject: EIA Portal Confirmation Notice Portal ID 2022179
Date: 14 September 2022 14:35:00

Dear Michael,

An EIA Portal notification was received on 14/09/2022 in respect of this proposed application. The information provided has been uploaded to the EIA Portal on 14/09/2022 under EIA Portal ID number 2022179 and is available to view at http://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1.

Portal ID: 2022179

Competent Authority: Roscommon County Council

Applicant Name: Eamon Harney

Location: Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon.

Description: Extraction of sand, stone and gravel over a 10 year period, screening/ processing of stone, construction of offices (33sq. m) welfare facilities, well surface water lagoon, weightbridge, wheel wash, entrance, parking and all ancillary site works.

Linear Development: No

Date Uploaded to Portal: 14/09/2022

Regards

Hugh Wogan,

EIA Portal team

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

Teach an Chustaim, Baile Átha Cliath 1, D01 W6X0
Custom House, Dublin 1, D01 W6X0

T +353 (0) 1 888 2000

www.gov.ie/housing

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

Roscommon County Council, Planning Authority - Viewing Purposes Only!

APPENDIX 2

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

Roscommon County Council, Planning Authority - Viewing Purposes Only!

SCALE BAR 1:1,000

0 10m 20m 30m 40m 50m 60m 70m 80m 90m 100m

For Planning Purposes Only

LANDOWNERSHIP IN BLUE
SITE OUTLINED IN RED
RIGHT OF WAY

Area of Site:
69,381 Sq/m
17.2 Acres
6.938 Hectares

ITM: 597452, 741243

22.137-010C

22.137-010B

60m Buffer zone from adjacent property denoted thus.

01 02 03 04 05

Proposed new stock proof fence. Refer to boundary treatment layout for details of boundaries.

Proposed new weld mesh fence. Refer to boundary treatment layout for details of boundaries.

Bottom of slope denoted thus.

Top of slope denoted thus.

For details of proposed entrance walls refer to Site Entrance drawing 21.137-017.

Existing hedge to be removed/cut back as required to achieve required sight-lines within the landownership of the applicant.

Proposed entrance gate. Refer to site entrance drawing for details.

Staff and visitor car park

Wayleave marked in yellow. Refer to letter from solicitor for further details.

Location of site notice Nr. 1.

Existing road to be widened on the applicants road side to facilitate a 6m wide road.

Road centreline.

Location of site notice Nr. 2.

Roadside boundary to be set back 3m from metalled edge of existing road. Road to be extended to meet new boundary.

Proposed topsoil stockpile for re-use during reinstatement phase.

Small vehicles queuing area.

For details of lighting and lighting layout refer to specification attached to application.

For details of proposed office building, refer to drawing 21.137-030.

For details of proposed weighbridge, refer to drawing 22.137-019.

For details of proposed wastewater storage tank, refer to drawing 23.137-022.

For details of portable wheelwash, refer to drawing 22.137-018.

For details of proposed toilet building, refer to drawing 21.137-031.

For details of proposed soakaway, refer to drawing 21.137-020.

Inspection Manhole prior to discharge to soakpit.

For details of proposed silt trap manhole, refer to drawing 21.137-020.

For details of proposed re-fueling/petrol interceptor, refer to drawing 21.137-020.

Petrol interceptor refer to dwg. 22.137-020

Hardstanding gravelled area.

15 x 10 x 2 Dp. Soakaway to take overflow from settlement pond

Inspection Manhole on overflow outfall to soakaway

Soil embankment surrounding the settlement pond.

2m High weld mesh fencing surround settlement pond. New 6m wide gates to facilitate access on western end of pond.

Proposed well with manhole cover surrounded in concrete slab

Overflow pipe from settlement pond taken from clean water side

Soil embankment surrounding the settlement pond.

Top of slope denoted thus.

Site outlined in red.

Proposed Settlement Pond- Refer to Dwg. 22.137-021

For extents of lands under the control of the applicant refer to the site location maps.

Existing road to be widened on the applicants road side to facilitate a 6m wide road.

Existing hedge to be removed/cut back as required to achieve required sight-lines within the landownership of the applicant.

Section-01

Section-02

Section-03

Section-04

Section-05

GATEWAY
DECIDUOUS TREE DRAWN TO SIZE
SEWER MANHOLE & DETAILS
GULLY AND DETAILS
FENCE
ESB COVER
EIRCOM COVER
199.997 SPOTHEIGHT & ELEVATION
FIRE HYDRANT
STOP VALVES
BUILDING
ESB/EIRCOM POLE & CABLE
TREES/TREELINE
DITCHLINE
HEDGELINE
WALL
EMBANKMENT
EXTRACTION AREA
PROPOSED TOPSOIL STOCKPILE
PROPOSED TARMACADAM
PROPOSED CONCRETE
PROPOSED HARDSTANDING AREA
PROPOSED SETTLEMENT POND
STOCKPROOF POST & WIRE FENCE
2.4m HIGH WELDED MESH FENCE
OUTLINE OF EXTRACTION AREA

Notes:

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N

Revisions

Rev	By	Date	Description
PL0	MD	16.09.22	Issued for Planning

Client:
Eamon Harney

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

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Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Proposed Site Masterplan

Status	Planning
Date:	July 2022
Scale:	1:1,000 @ A1
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	010A	PL0

ORDNANCE SURVEY OF IRELAND LICENCE NUMBER CYAL50211192 © Ordnance Ireland/Government of Ireland
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Roscommon County Council Viewing Purposes Only

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==========

For extents of site refer to proposed site masterplan 22.137-010A

For Planning Purposes Only

LANDOWNERSHIP IN BLUE
SITE OUTLINED IN RED
RIGHT OF WAY

Area of Site:
69,381 Sq/m
17.2 Acres
6.938 Hectares

ITM: 597452, 741243

SCALE BAR 1:500

0 10m 20m 30m 40m 50m 60m 70m 80m 90m 100m

GATEWAY
DECIDUOUS TREE DRAWN TO SIZE
SEWER MANHOLE & DETAILS
GULLY AND DETAILS
FENCE
ESB COVER
EIRCOM COVER
SPOTHEIGHT & ELEVATION
FIRE HYDRANT
STOP VALVES
BUILDING
ESB/EIRCOM POLE & CABLE
TREES/TREELINE
DITCHLINE
HEDGELINE
WALL
EMBANKMENT
EXTRACTION AREA
PROPOSED TOPSOIL STOCKPILE
PROPOSED TARMACADAM
PROPOSED CONCRETE
PROPOSED HARDSTANDING AREA
PROPOSED SETTLEMENT POND
STOCKPROOF POST & WIRE FENCE
2.4m HIGH WELDED MESH FENCE
OUTLINE OF EXTRACTION AREA
SIGHTLINES

60m Buffer zone from adjacent property denoted thus.

Proposed new stock proof fence. Refer to boundary treatment layout for details of boundaries.

For extents of lands under the control of the applicant refer to the site location maps.

Proposed new weld mesh fence. Refer to boundary treatment layout for details of boundaries.

Existing hedge to be removed/cut back as required to achieve required sight-lines within the landownership of the applicant.

Wayleave marked in yellow. Refer to letter from solicitor for further details.

Location of site notice Nr. 2.

For details of proposed entrance walls refer to Site Entrance drawing 21.137-017.

60m SIGHTLINE

Proposed entrance gate. Refer to site entrance drawing for details.

Roadside boundary to be set back 3m from metalled edge of existing road. Road to be extended to meet new boundary.

Staff and visitor car park

Small vehicles queuing area.

Proposed topsoil stockpile for re-use during reinstatement phase.

For details of lighting and lighting layout refer to specification attached to application.

Top of slope denoted thus.

Bottom of slope denoted thus.

For details of proposed weighbridge, refer to drawing 21.137-019.

For details of proposed office building, refer to drawing 22.137-030.

For details of proposed toilet building, refer to drawing 22.137-031.

For details of proposed soakaway, refer to drawing 21.137-020.

For details of proposed wastewater storage tank, refer to drawing 21.137-022.

For details of portable wheelwash, refer to drawing 21.137-018.

Petrol Interceptor

Hardstanding graveled area.

Inspection Manhole on overflow outfall to soakaway

For details of proposed silt trap manhole, refer to drawing 22.137-020.

For details of proposed re-fuelling/petrol interceptor, refer to drawing 21.137-020.

Stockpiling area.

15m x 10m x 2m Dp. Soakaway to take water from settlement tank overflow

Outline of Extraction area

Soil embankment surrounding the settlement pond.

2m High weld mesh fencing surround settlement pond. New 6m wide gates to facilitate access on western end of pond.

Proposed well with manhole cover surrounded in concrete slab refer to drawing 22.137-033

Overflow pipe from settlement pond taken from clean water side

2m High weld mesh fencing surrounding settlement pond.

Site outlined in red.

Section-05

Section-0

01 02 03 04 05

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Revisions

Rev	By	Date	Description
PL0	MD	16.09.22	Issued for Planning

Client:
Eamon Harney

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

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Fax: 090 6634423
Email: info@collinsboydeng.com

Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Proposed Site Layout Sheet 1

Status	Planning
Date:	July 2022
Scale:	1:500 @ A1
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	010B	PL0

0 10m 20m 30m 40m 50m 60m 70m 80m 90m 100m

SCALE BAR 1:500

For extents of site refer to proposed site masterplan 22.137-010A

For Planning Purposes Only

LANDOWNERSHIP IN BLUE
SITE OUTLINED IN RED
RIGHT OF WAY

Area of Site:
69,381 Sq/m
17.2 Acres
6.938 Hectares

ITM: 597452, 741243

22.137-010B

Section-05

90m SIGHTLINE

60m SIGHTLINE

For extents of lands under the control of the applicant refer to the site location maps.

Wayleave marked in yellow. Refer to letter from solicitor for further details.

Welded mesh fence

Existing hedge to be removed/cut back as required to achieve required sight-lines within the landownership of the applicant.

For details of proposed entrance walls refer to Site Entrance drawing 22.137-017.

Road centreline.

Existing road to be widened on the applicants road side to facilitate a 6m wide road.

Existing hedge to be removed/cut back as required to achieve required sight-lines within the landownership of the applicant.

Existing hedge below level of vertical visibility splay which is measured at 1.05m off road level at each end in accordance with DN-GEO-03031

Location of site notice Nr. 2.

Roadside boundary to be set back 3m from metalled edge of existing road. Road to be extended to meet new boundary.

Proposed entrance gate. Refer to site entrance drawing for details, refer to dwg. 22.137-017

Stock Proof Fence

Staff and visitor car park.

Small vehicles queuing area.

For details of lighting and lighting layout refer to specification attached to application.

Proposed topsoil stockpile for re-use during reinstatement phase.

Top of slope denoted thus.

Bottom of slope denoted thus.

Site outlined in red.

For details of proposed weighbridge, refer to drawing 21.137-019.

For details of proposed office building, refer to drawing 21.137-030.

For details of proposed toilet building, refer to drawing 21.137-031.

For details of proposed soakaway, refer to drawing 21.137-020.

For details of proposed wastewater storage tank, refer to drawing 21.137-022.

Petrol Interceptor

For details of portable wheelwash, refer to drawing 21.137-018.

Hardstanding gravelled area.

For details of proposed silt trap manhole, refer to drawing 21.137-020.

For details of proposed re-fueling/petrol interceptor, refer to drawing 20.214-020.

GATEWAY
DECIDUOUS TREE DRAWN TO SIZE
SEWER MANHOLE & DETAILS
GULLY AND DETAILS
FENCE
ESB COVER
EIRCOM COVER
SPOTHEIGHT & ELEVATION
FIRE HYDRANT
STOP VALVES
BUILDING
ESB/EIRCOM POLE & CABLE
TREES/TREELINE
DITCHLINE
HEDGELINE
WALL
EMBANKMENT
EXTRACTION AREA
PROPOSED TOPSOIL STOCKPILE
PROPOSED TARMACADAM
PROPOSED CONCRETE
PROPOSED HARDSTANDING AREA
PROPOSED SETTLEMENT POND
STOCKPROOF POST & WIRE FENCE
2.4m HIGH WELDED MESH FENCE
OUTLINE OF EXTRACTION AREA
SIGHTLINES

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Revisions

Rev	By	Date	Description
PL0	MD	16.09.2022	Issued for Planning

Client:
Eamon Harney

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
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Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Proposed Site Layout Sheet 2

Status	For Planning
Date:	July 2022
Scale:	1:500 @ A1
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	010C	PL0

Roscommon County Council, Planning Authority - Viewing Purposes Only

NOTES:

- SITE OUTLINED IN RED
- LANDS IN CONTROL OF APPLICANT OUTLINED IN BLUE
- GRASSED AREA TO BE COVERED WITH MIN. 300mm OF TOPSOIL & SOWN WITH AGRICULTURAL SEED MIX
- SLOPED ENBANKMENTS & SITE PERIMETRE PLANTED AS PER LANDSCAPE ARCHITECTS PLAN
- 2.4m HIGH WELDED MESH FENCE
- TIMBER POST & SHEEP WIRE FENCE

Area of Site:
69,381 Sq/m
17.2 Acres
6.938 Hectares

ITM: 597452, 741243

For Planning Purposes Only

- LANDOWNERSHIP IN BLUE
- SITE OUTLINED IN RED
- RIGHT OF WAY

01

02

03

04

05

60m Buffer zone to protect the residential amenity of the adjacent property.

2.4m welded mesh fence

Entrance to be retained for agricultural use.

Site Notice Nr. 2

2.4m high welded mesh fence.

Wayleave marked in yellow. Refer to letter from solicitor for further details.

Top of bank denoted thus.

Bottom of bank denoted thus.

For extents of lands under the control of the applicant refer to the site location maps.

Proposed land to grade into meet existing levels.

Site outlined in red.

Section-0

Section

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Revisions

Rev	By	Date	Description
PL0	MD	16.09.22	Issued for Planning

Client:
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27 SEP 2022 22-526
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Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Proposed Restoration Plan

Status	Planning
Date:	August 2022
Scale:	1:500 @ A1
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	013	PL0

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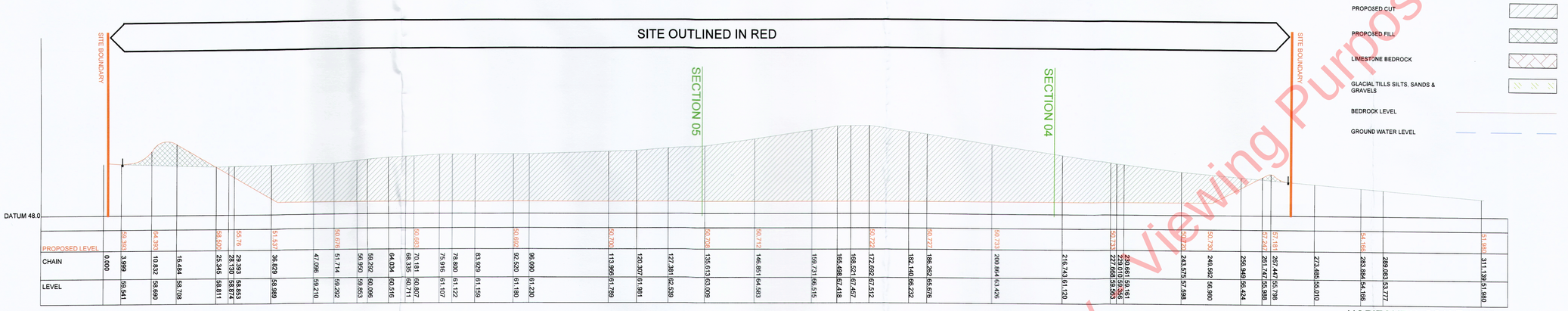
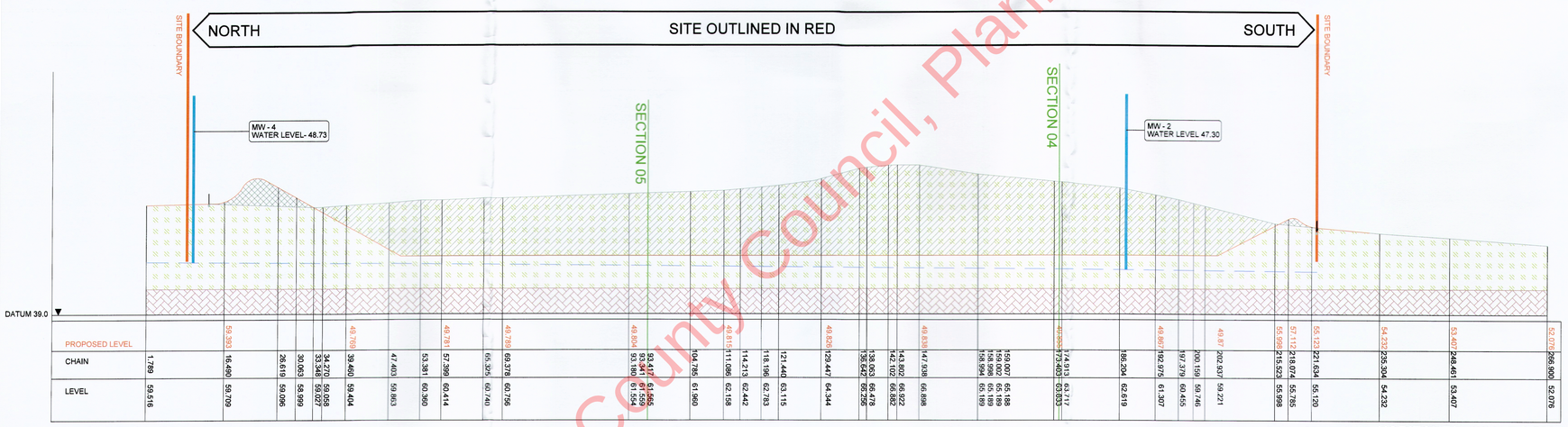


Section-01

HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:500



Section-02

HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:500

LEGEND

- PROPOSED FINISHED LEVEL
- EXISTING LEVEL
- PROPOSED CUT
- PROPOSED FILL
- LIMESTONE BEDROCK
- GLACIAL TILLS SILTS, SANDS & GRAVELS
- BEDROCK LEVEL
- GROUND WATER LEVEL

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27 SEP 2022 22-526
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Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Proposed Site Sections - Sheet 1

Status	For Planning
Date:	27/07/2022
Scale:	1:500 @ A1
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	014	PL0

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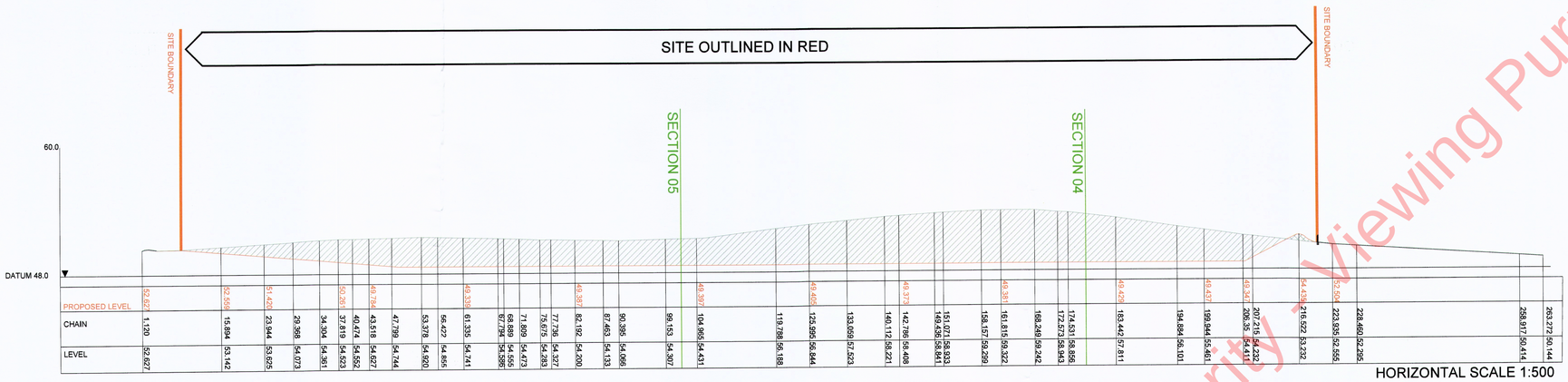
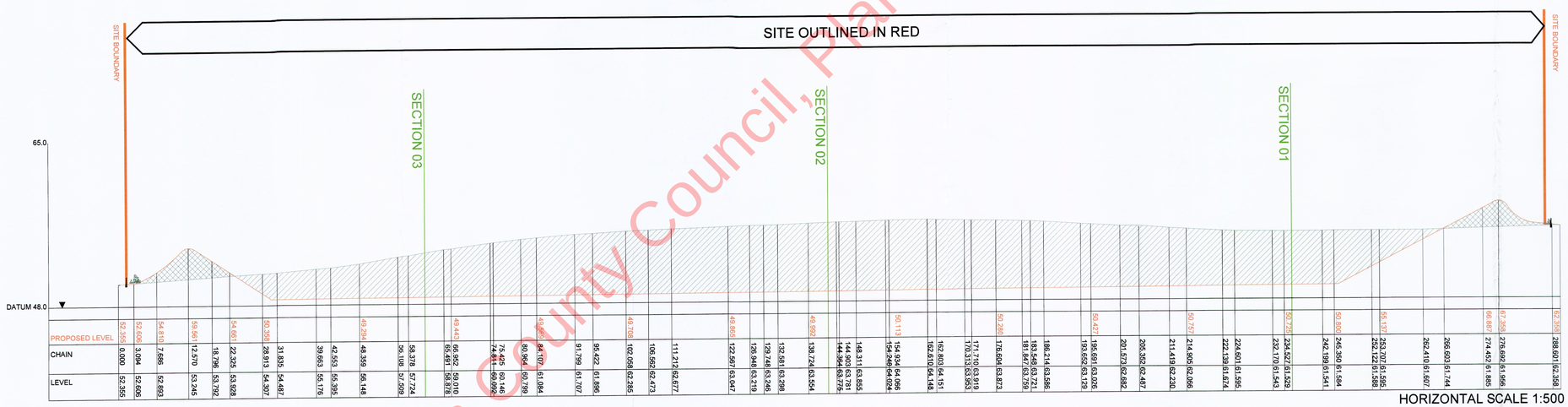


HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:500

Section-03



HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:500

Section-04

LEGEND

- PROPOSED FINISHED LEVEL
- EXISTING LEVEL
- PROPOSED CUT
- PROPOSED FILL
- LIMESTONE BEDROCK
- GLACIAL TILLS SILTS, SANDS & GRAVELS
- BEDROCK LEVEL
- GROUND WATER LEVEL

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Revisions

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PL0	MD	16.09.22	Issued for Planning

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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

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Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Proposed Site Sections - Sheet 2

Status	For Planning
Date:	27/07/2022
Scale:	1:500 @ A1
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	015	PL0

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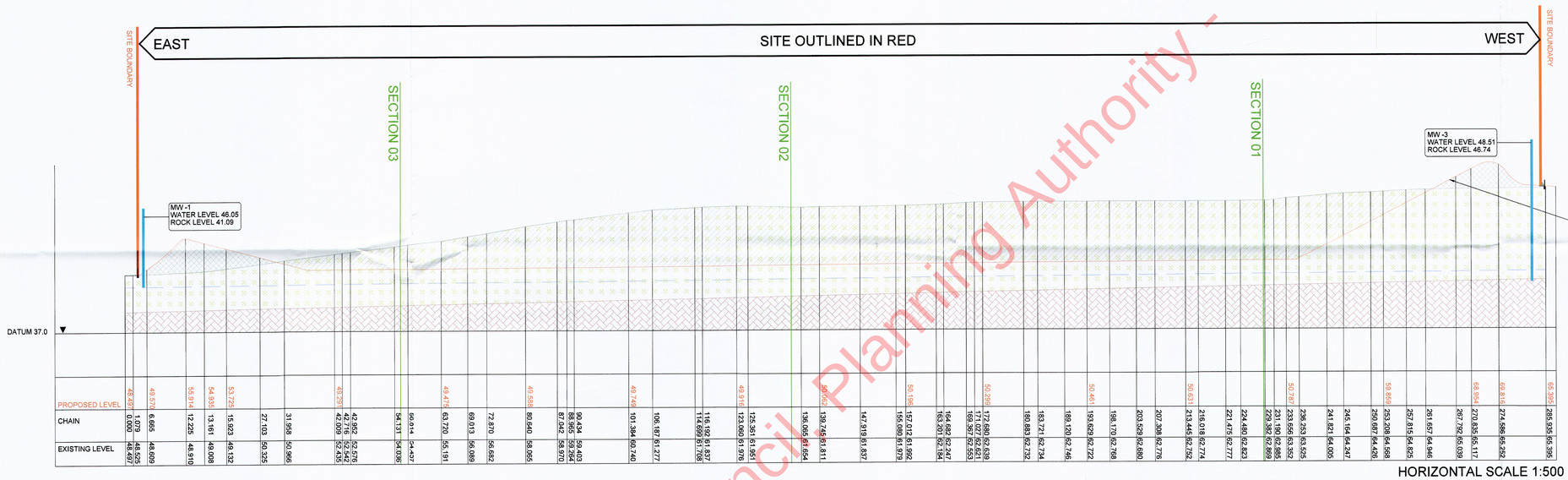

HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:500

Section-05

LEGEND

- PROPOSED FINISHED LEVEL
- EXISTING LEVEL
- PROPOSED CUT
- PROPOSED FILL
- LIMESTONE BEDROCK
- GLACIAL TILLS SILTS, SANDS & GRAVELS
- BEDROCK LEVEL
- GROUND WATER LEVEL

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Revisions

Rev	By	Date	Description
PL0	MD	16.09.22	Issued for Planning

Client:

Eamon Harney

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-516
ROSCOMMON COUNTY COUNCIL

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Job Title:

Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:

Proposed Site Section - Sheet 3

Status	For Planning
Date:	27/07/2022
Scale:	1:500 @ A1
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	016	PL0

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PROPERTY REGISTRATION AUTHORITY

County Roscommon Folio 11796F, 39715F

Grant dated the 15 day of July 2021

In consideration of €1.00, Kieran Patrick Gavin ("the Grantor") the registered owner of the property described in the First Schedule to this grant as beneficial owner hereby grants to S. Kildea & Sons Limited ("the Grantee") the owner of the property described in the Second Schedule to this grant and his licencees, successors in title, assigns, full right and liberty:

(i) to pass and repass over that part of the property described in the First Schedule coloured yellow and lettered "A" and "B" on the map annexed hereto at all times hereafter by day and by night on foot and with motor vehicles for all purposes connected with the use and enjoyment of the property in the Second Schedule.

(ii) to enter upon the property described in the First Schedule with workmen and others and all necessary equipment for the purposes of maintaining and repairing the said part of the property coloured yellow and lettered "A" and "B" on said map making good any damage thereby occasioned but not being responsible for any temporary inconvenience caused by any such work.

And the Grantor hereby assents to the registration of the right of way hereby granted as a burden on Folio 11796F of the Register of Freeholders County of Roscommon.

FIRST SCHEDULE
(The Servient Premises)

ALL THAT AND THOSE part of the property comprised in folio RN11796F, more particularly described on the map attached to this grant and shaded yellow and marked "A" and "B".

SECOND SCHEDULE
(The Dominant Premises)

ALL THAT AND THOSE all of the property comprised in folio RN39715F, RN20728F, RN16422F, RN24281F, RN12561F, and RN27364F.

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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

SIGNED and **DELIVERED** as a **DEED**
by the **GRANTOR**
in the presence of:

KIERAN GAVIN

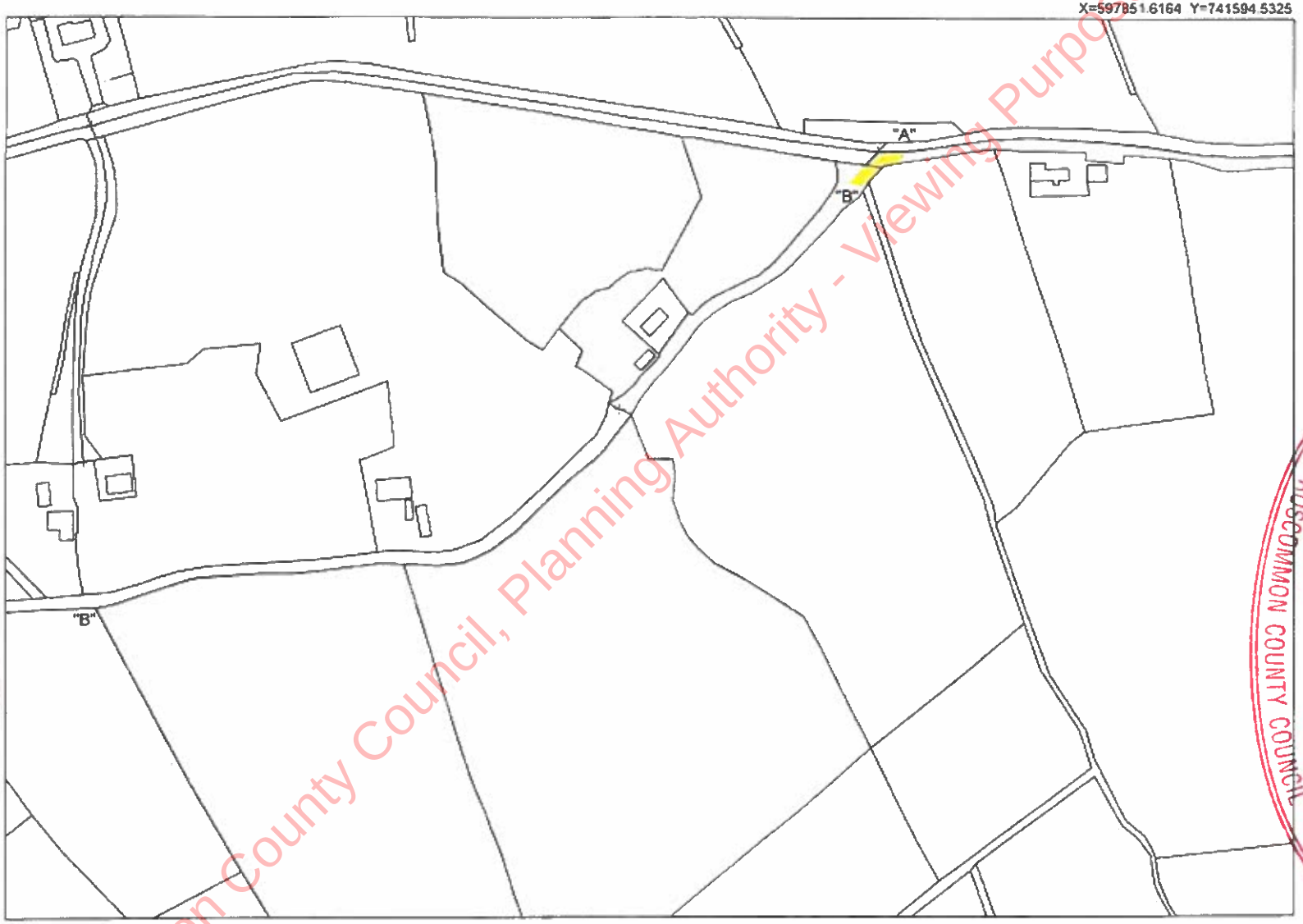
PRESENT when the common seal
of the **GRANTEE**
was affixed hereto:

DIRECTOR

DIRECTOR

Roscommon County Council, Planning Authority - Viewing Purposes Only!

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL



MAP 3
RIGHT OF WAY INDICATED IN YELLOW "A" to "B"

Scale 1:2000
OSI Licence No. EN0065221

Signed: _____

Date: _____

PLANNING & DEVELOPMENT SECTION
ROSCOMMON COUNTY COUNCIL
27 SEP 2022 22-526

Roscommon County Council, Planning Authority - Viewing Purposes Only!

PROPERTY REGISTRATION AUTHORITY

County Roscommon Folio 11796F.

Grant dated the 15 day of July 2021

In consideration of €1.00, Kieran Patrick Gavin ("the Grantor") the registered owner of the property described in the First Schedule to this grant as beneficial owner hereby grants to Eamon Harney ("the Grantee") the owner of the property described in the Second Schedule to this grant and his licencees, successors in title, assigns, full right and liberty:

(i) to pass and repass over that part of the property described in the First Schedule coloured yellow and lettered "A" and "B" on the map annexed hereto at all times hereafter by day and by night on foot and with motor vehicles for all purposes connected with the use and enjoyment of the property in the Second Schedule.

(ii) to enter upon the property described in the First Schedule with workmen and others and all necessary equipment for the purposes of maintaining and repairing the said part of the property coloured yellow and lettered "A" and "B" on said map making good any damage thereby occasioned but not being responsible for any temporary inconvenience caused by any such work.

And the Grantor hereby assents to the registration of the right of way hereby granted as a burden on Folio 117956F of the Register of Freeholders County of Roscommon.

FIRST SCHEDULE
(The Servient Premises)

ALL THAT AND THOSE part of the property comprised in folio RN11796F, more particularly described on the map attached to this grant and thereon shaded yellow and marked "A" and "B".

SECOND SCHEDULE
(The Dominant Premises)

ALL THAT AND THOSE all of the property comprised in folio RN15190.

SIGNED and DELIVERED as a DEED
by the **GRANTOR**
in the presence of:

KIERAN PATRICK GAVIN

SIGNED and DELIVERED as a DEED
by the **GRANTEE**
in the presence of:

EAMON HARNEY

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

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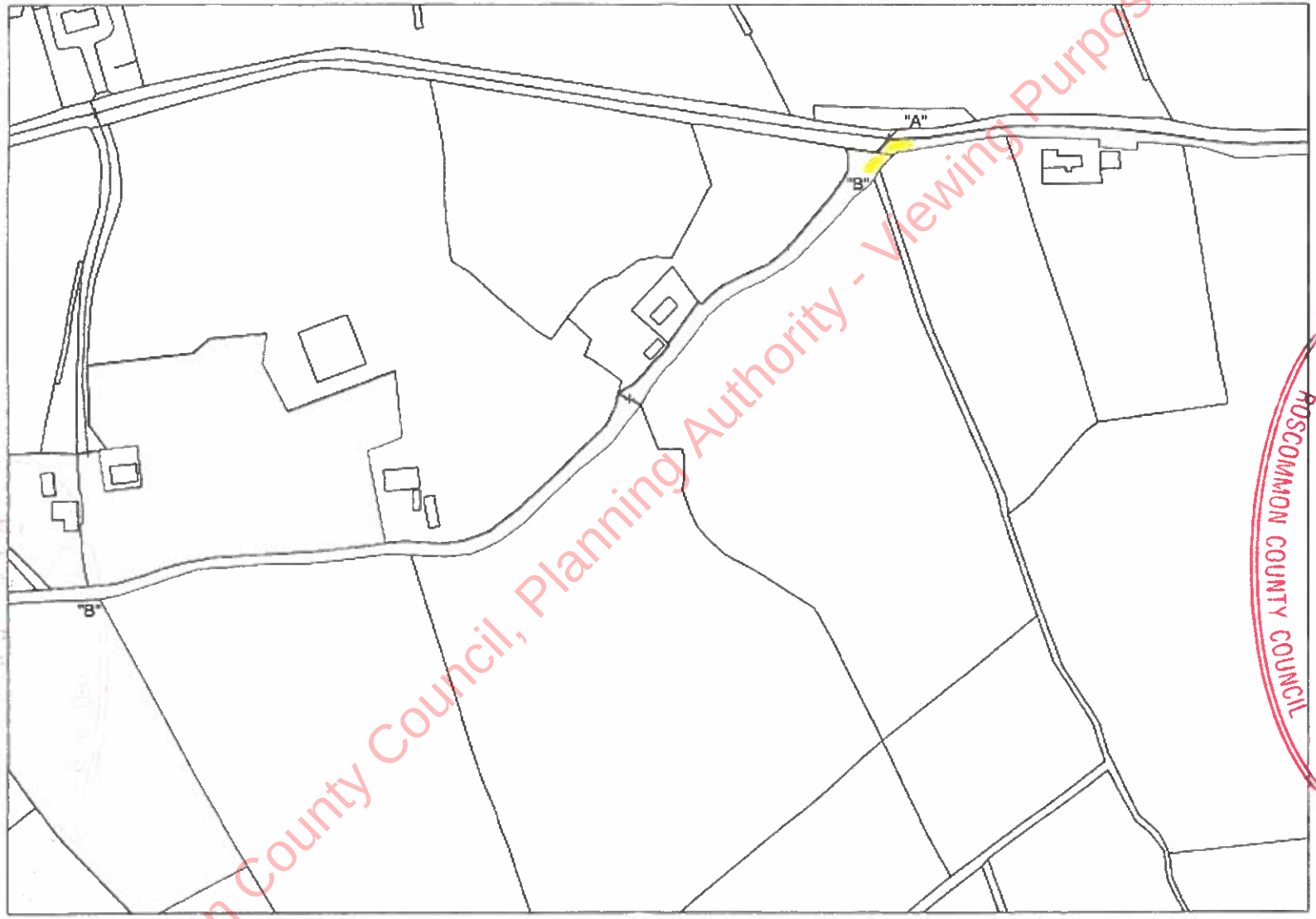

PLANNING & DEVELOPMENT SECTION
ROSCOMMON COUNTY COUNCIL
27 SEP 2022 22-526

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Signed: _____

MAP 3

RIGHT OF WAY INDICATED IN YELLOW "A" to "B"

Date: _____

Scale 1:2000

OSI Licence No. EN0065221

PROPERTY REGISTRATION AUTHORITY

County Roscommon Folio 39715F, 20728F, 16422F, 24281F, 12561F, 27364F, 15190

Grant dated the 15 day of July 2021

In consideration of €1.00, Eamon Harney ("the Grantor") the registered owner of the property described in the First Schedule to this grant as beneficial owner hereby grants to S. Kildea & Sons Limited ("the Grantee") the owner of the property described in the Second Schedule to this grant and his licencees, successors in title, assigns, full right and liberty:

(i) to pass and repass over that part of the property described in the First Schedule coloured pink and lettered "A" and "B" on the map annexed hereto at all times hereafter by day and by night on foot and with motor vehicles for all purposes connected with the use and enjoyment of the property in the Second Schedule.

(ii) to enter upon the property described in the First Schedule with workmen and others and all necessary equipment for the purposes of maintaining and repairing the said part of the property coloured pink and lettered "A" and "B" on said map making good any damage thereby occasioned but not being responsible for any temporary inconvenience caused by any such work.

And the Grantor hereby assents to the registration of the right of way hereby granted as a burden on Folio 15190 of the Register of Freeholders County of Roscommon.

FIRST SCHEDULE
(The Servient Premises)

ALL THAT AND THOSE part of the property comprised in folio RN15190 more particularly described on the map attached to this grant and shaded pink and marked "A" and "B".

SECOND SCHEDULE
(The Dominant Premises)

ALL THAT AND THOSE that part of the property comprised in Folios RN39715F, RN20728F 16422F, 24281F, 12561F and 27364F.

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SIGNED and **DELIVERED** as a **DEED**
by the **GRANTOR**
in the presence of:

EAMON HARNEY

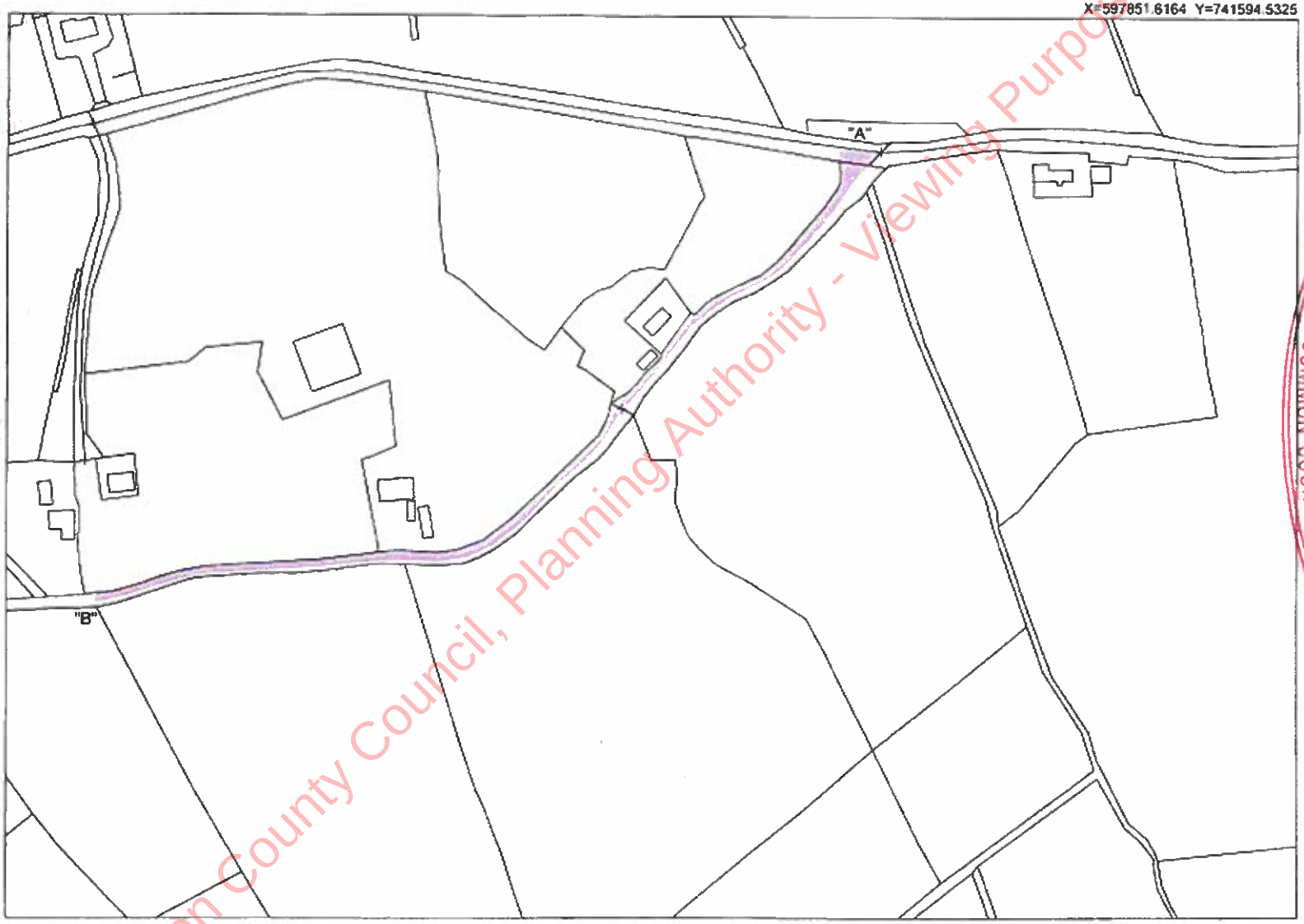
PRESENT when the common seal
of the **GRANTEE**
was affixed hereto:

DIRECTOR

DIRECTOR

Roscommon County Council, Planning Authority - Viewing Purposes Only!

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL



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MAP 2
RIGHT OF WAY INDICATED IN PINK "A" to "B"

Scale 1:2000
OSI Licence No. EN0065221

Signed: _____

Date: _____

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
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PROPERTY REGISTRATION AUTHORITY

County Roscommon Folio 39715F, 20728F, 16422F, 24281F, 12561F, 27364F, 15190

Grant dated the 15 day of July 2021

In consideration of €1.00, S. Kildea & Sons Limited ("the Grantor") the registered owner of the property described in the First Schedule to this grant as beneficial owner hereby grants to Eamon Harney ("the Grantee") the owner of the property described in the Second Schedule to this grant and his licencees, successors in title, assigns, full right and liberty:

(i) to pass and repass over that part of the property described in the First Schedule coloured blue and lettered "A" and "B" on the map annexed hereto at all times hereafter by day and by night on foot and with motor vehicles for all purposes connected with the use and enjoyment of the property in the Second Schedule.

(ii) to enter upon the property described in the First Schedule with workmen and others and all necessary equipment for the purposes of maintaining and repairing the said part of the property coloured blue and lettered "A" and "B" on said map making good any damage thereby occasioned but not being responsible for any temporary inconvenience caused by any such work.

And the Grantor hereby assents to the registration of the right of way hereby granted as a burden on Folios RN39715F, RN20728F 16422F, 24281F, 12561F and 27364F of the Register of Freeholders County of Roscommon.

FIRST SCHEDULE
(The Servient Premises)

ALL THAT AND THOSE that part of the property comprised in Folios RN39715F, RN20728F 16422F, 24281F, 12561F and 27364F, more particularly described on the map attached to this grant and shaded blue and marked with the letter "A" and "B".

SECOND SCHEDULE
(The Dominant Premises)

ALL THAT AND THOSE all of the property comprised in folio RN15190.

PLANNING & DEVELOPMENT SECTION
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Roscommon County Council, Planning Authority - Viewing Purposes Only!

PRESENT when the common seal
of the **GRANTOR**
was affixed hereto:

DIRECTOR

DIRECTOR

SIGNED and **DELIVERED** as a **DEED**
by the **GRANTEE**
in the presence of:

EAMON HARNEY

Roscommon County Council, Planning Authority - Viewing Purposes Only!

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
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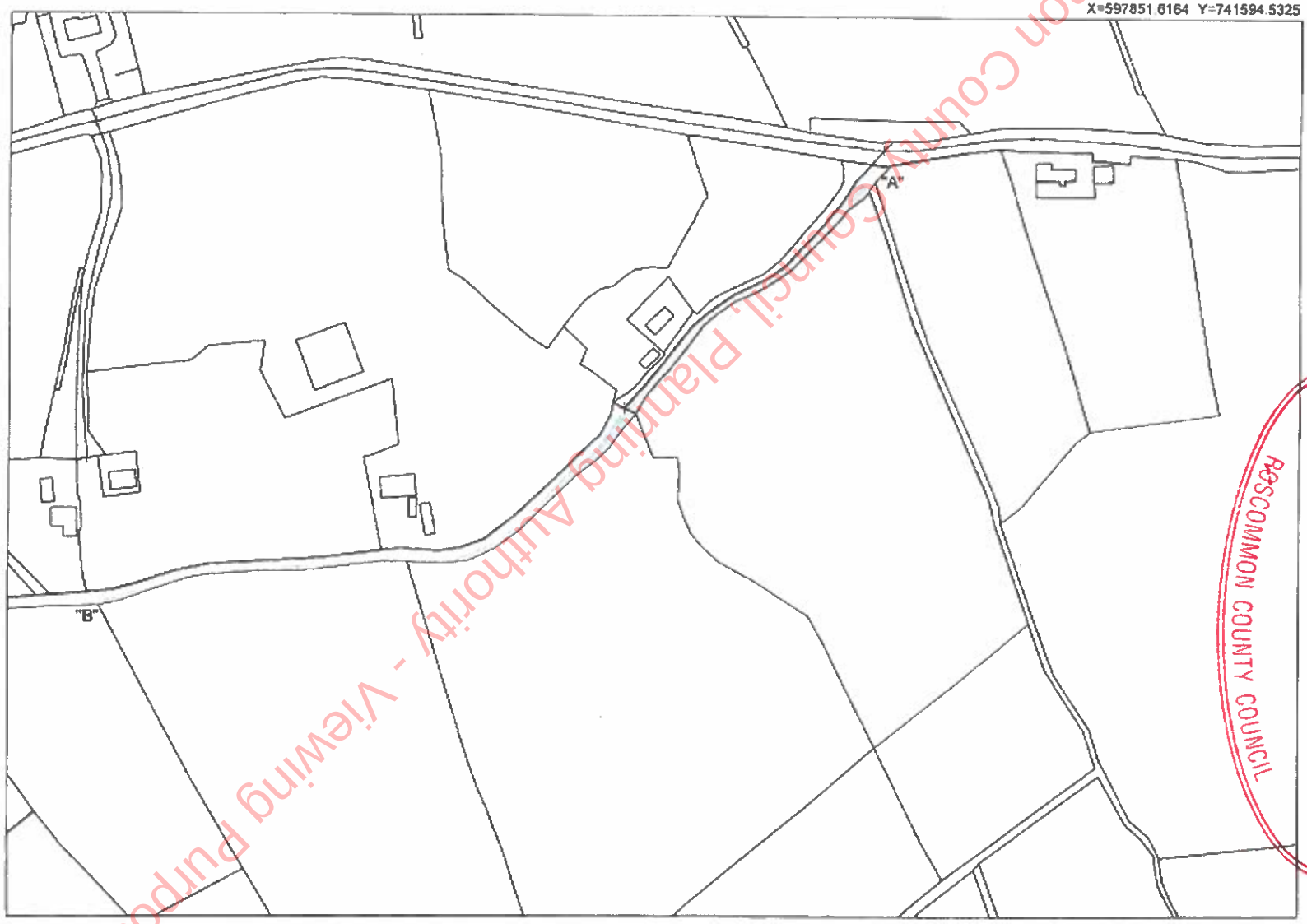

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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

Signed: _____

Date: _____

MAP 1

RIGHT OF WAY INDICATED IN BLUE "A" to "B"

Scale 1:2000

OSI Licence No. EN0065221

Offaly County Council
Áras an Chontae
Charleville Road
Tullamore
Co. Offaly
Telephone: 057 9357428
Email: contactus@nwcpo.ie

NWCPO
National Waste Collection Permit Office

WASTE COLLECTION PERMIT

Waste Management (Collection Permit) Regulations, 2007 as amended

Offaly County Council as the National Waste Collection Permit Office being a nominated authority under Section 34(1)(aa) of the Waste Management Act 1996, has granted a waste collection permit to:

Applicant Name:	**J F Henehan & Sons Ltd.** (herein called the permit holder)
Permit Number:	NWCPO-14-11475-02
Trading Address:	Loretto The Berries Kiltoom Athlone, Co. Roscommon
Registered Company Address:	Loretto The Berries Kiltoom Athlone, Co. Roscommon
Permit Holder Phone Number:	090 6492474 / 0868208054
Valid From:	21/01/2020
Valid to and Expires on	20/01/2025

This permit, issued to the aforementioned permit holder, is subject to the attached schedule of conditions.

Any non-compliance with the conditions of this permit is an offence under the Waste Management (Collection Permit) Regulations, 2007 as amended and Section 34(1) of the Waste Management Act 1996.

Signed: _____ Date: 21/01/20
Programme Manager

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REASON FOR THE DECISION

Offaly County Council as the National Waste Collection Permit Office is satisfied on the basis of the information made available by the applicant, that subject to compliance with the conditions of this permit the activity will not cause environmental pollution, and the grant of this permit is consistent with the objectives of the current National Hazardous Waste Management Plan and the objectives of the current Eastern-Midlands Region Waste Management Plan, Southern Region Waste Management Plan and/or Connacht-Ulster Region Waste Management Plan as applicable to the local authority areas where waste is collected.

In reaching this decision Offaly County Council as the National Waste Collection Permit Office, has considered the application and supporting documentation received from the applicant and valid submissions received from the relevant local authorities, the Environmental Protection Agency (EPA) and other parties.

APPEAL OF DECISION

The permit holder may appeal the decision of the NWCPO to grant this waste collection permit in accordance with section 34(9)(a) of the Waste Management Act 1996 to the judge of Tullamore District Court, it being in the District Court district in which the principal offices of Offaly County Council is situated, within one month of the "valid from" date of this permit.

INTERPRETATION

Unless otherwise specified, all terms in this permit should be interpreted in accordance with the definitions in the Waste Management Act 1996 (the Act), or Regulations made under the European Communities Act and its associated regulations (as may be amended or replaced from time to time) or as defined in this permit.

References to any enactment, statutory instrument (including any bye-law), each as defined by the Interpretation Act 2005, or a regulation, directive or decision of a European Union institution in this permit shall include amendments and replacements.

References in this permit to the NWCPO means Offaly County Council as the National Waste Collection Permit Office as the nominated authority for all regions under Section 34(1)(aa) of the Waste Management Act 1996 and pursuant to Article 4(2) of the Waste Management (Collection Permit) Regulations, 2007 as amended, or such other authority as may be nominated under this provision.

This permit and any condition imposed therein shall not relieve the permit holder of any statutory obligations.

Any non-compliance with the conditions of this permit is an offence under the Waste Management (Collection Permit) Regulations, 2007 as amended and section 34(1) of the Waste Management Act 1996.

Conditions subject to Fixed Payments Notices (FPN) (section 10B (1) of the Act), and those requiring the review of the permit under section 34A (2)(b) are identified in this permit.

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REVIEW OF PERMIT

An application for the review of this permit shall be made **prior to the expiry date of this permit** to the National Waste Collection Permit Office, Offaly County Council, Áras an Chontae, Charleville Road, Tullamore, Co. Offaly. Where an application is made for the review of this permit prior to the expiry date of this permit, this permit shall remain in force until a decision is made on the review application.

The NWCPO may at any time review this waste collection permit under section 34A of the Waste Management Act 1996 and will give notice in writing of such intention to the permit holder.

The NWCPO is required to initiate a review of this waste collection permit where:

i. The permit holder has been convicted of an offence prescribed under section 34(5) of the Act
ii. The local authority believes that the permit holder is contravening or has contravened a condition under section 34(7)(b) (other than 34(7)(b)(v)).
iii. The local authority believes that the permit holder is contravening or has contravened any three conditions other than those in (ii) during a five year period beginning on the date of the first such contravention.

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CONDITIONS

1. Scope of Permit

1.1 The permit holder shall:

i. Only collect the waste type(s) specified in Appendix A (List of Waste six-digit codes)
Fixed Payment Notice Condition (S34(7)(d)(i))
ii. Only transfer waste to the facilities specified in Appendix B
Fixed Payment Notice Condition (S34(7)(d)(ii))
iii. Only use vehicle(s) specified in Appendix C, and for household kerbside waste collection, only use vehicles listed in Appendix C Table 2
Fixed Payment Notice Condition (S34(7)(d)(iii))
iv. Only collect waste within the local authority areas specified in Appendix D

1.2 The permit holder shall not collect the waste types specified in Appendix A unless they have a facility specified in Appendix B that will accept that waste type from the permit holder.

1.3 The permit holder shall not collect waste where they have no vehicles specified in Appendix C. The permit holder shall not collect household kerbside waste where they have no vehicles specified in Appendix C Table 2.

1.4 The permit shall be read in conjunction with such bye-laws for the time being in force as referred to in condition 2.8 of this permit.

1.5 The permit holder shall give notice in writing to the NWCPO of any proposed changes in the waste collection activity in advance of any such change coming into effect. The permit holder shall obtain the written agreement of the NWCPO before implementing any such change. Any non-compliance with the conditions of this permit is an offence under the Waste Management (Collection Permit) Regulations, 2007 as amended and section 34(1) of the Waste Management Act 1996.

1.6 The permit holder shall maintain, and provide to the NWCPO; a business address, business phone number, business email address, business contact name, business contact address.

The permit holder shall maintain, and provide to the NWCPO details for a point of contact within the business including, a contact name, business contact address, business contact email and business contact phone number.

The permit holder shall notify the NWCPO in writing, within one week, of any change to these contact details or the permit holder's legal entity or business/trade name(s).

2. Management of the Activity

2.1 The permit holder shall not cause environmental pollution during the course of the waste collection activity to which this permit relates.

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2.2 The permit holder shall collect, transport, store, dispose of and/or recover waste in a manner so as to prevent pollution, contamination and deterioration of water, including groundwater, in accordance with The Water Framework Directive.

2.3 The permit holder shall identify all hazards associated with the waste being collected and shall be familiar with best practice regarding its safe movement and handling and shall adopt all necessary, reasonable and practicable safety measures accordingly.

2.4 The permit holder shall have in place a documented Emergency Response Procedure (ERP), which shall address any environmental emergency that may arise. This procedure shall provide for as a minimum, relevant contact details, an emergency response unit, replacement vehicles and clean-up equipment in order to minimise the effects of any environmental emergency. The permit holder shall maintain a copy of the ERP at the principal place of business of the permit holder and in each vehicle listed in Appendix C of this permit or such later revision of the said appendix that the NWCPO may issue.

2.5 The permit holder shall ensure that all operatives employed in the waste collection activity are familiar with and comprehend the conditions of this permit and the ERP.

2.6 The permit holder shall immediately clean up any spillage of waste which occurs in the course of the collection operation in a manner which will not cause environmental pollution. The permit holder shall carry an emergency spill-kit on each vehicle listed in Appendix C of this permit or such later revision of the said appendix as the NWCPO may issue, at all times, to deal with minor spillages.

2.7 All vehicles used for the collection of waste which has a liquid fraction (and where the waste is not contained within secondary sealed containers on the vehicle), shall have the seals containing the liquid fraction maintained in accordance with condition 3.3. These seals shall be visually inspected at least weekly and a record maintained of same. This record shall be made available to any authorised person(s) on request.

2.8 Where any local authority for the purposes of the proper management of waste and the prevention and control of environmental pollution has made bye-laws relating, inter alia, to the storage, presentation and/or segregation for the purpose of, and in the course of the collection of waste or for the recovery or disposal of waste in accordance with Part 19 of the Local Government Act, 2001 (in substitution for Part VII of the Local Government, 1994) or in accordance with section 35 of the Waste Management Act 1996 (hereinafter referred to as 'bye-laws'), the permit holder shall not collect waste in the functional area of the said local authority unless it has been stored, presented and/or segregated in accordance with the requirement of the said bye-laws.

2.9 Where waste has been source segregated prior to collection, the permit holder shall ensure that this fraction is separately collected in its entirety, not mixed with other waste types, and shall be transferred to a suitable authorised facility as listed in Appendix B of this permit and in accordance with the waste hierarchy and section 21A of the Act.

2.10 Without prejudice to its obligations under this permit, the permit holder shall at all times ensure that they carry on their waste collection activities in a manner that is consistent with the objectives of the current National Hazardous Waste Management Plan and with the objectives of the current Waste Management Plan(s) as applicable to the local authority area(s) where waste is collected.

2.11 The permit holder shall only transfer waste to the authorised facilities that have been notified in writing to the NWCPO, and where written consent has been issued by the NWCPO. Written consent consists of the inclusion of specified waste facilities in Appendix B of this permit or such later revision of the said appendix as the NWCPO may issue.

Fixed Payment Notice Condition (S34(7)(d)(ii)).

2.12 The permit holder shall ensure that waste collected under this permit is transferred to an authorised facility where there is in force a waste licence, waste facility permit, certificate of registration, Integrated Pollution Prevention Control licence or Industrial Emissions licence in relation to the carrying on of the activity concerned at that facility or other facilities as agreed by the NWCPO.

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2.13 The permit holder shall carry or cause to be carried at all times a full copy of this permit including the latest revision of all appendices on each vehicle listed in Appendix C. If presented in electronic format to authorised persons, the copy of the permit shall be fully accessible and legible to the satisfaction of the authorised person.

Fixed Payment Notice Condition (S34(7)(d)(iv)).

2.14 The permit holder shall ensure that any/all relevant person(s) who is/are likely to be in a position to direct or control the carrying on of the waste collection activity i.e. managers/supervisors, hold a relevant qualification in waste management or equivalent, or have received training specific to the collection of waste. Evidence of completing a short-term training course e.g. one-day course, specific to waste collection permitting will meet the requirement of this condition.

All relevant persons shall complete and provide evidence of completion of a training course to the satisfaction of the NWCPO within 12 months of the date of grant of this permit unless otherwise agreed with the NWCPO.

Persons responsible for records maintenance and reporting in accordance with condition 4.5, 4.6, 4.7 and 4.14 shall complete and provide evidence of completion of a training course to the satisfaction of the NWCPO within 12 months of the date of grant of this permit unless otherwise agreed with the NWCPO.

2.15 The permit holder shall include their permit number, permit holder name or trading name as identified on the front page of this permit, on all promotional material, website(s), social media, dockets and correspondence issued by the permit holder in accordance with this permit.

Fixed Payment Notice Condition (S34(7)(d)(v))

2.16 The permit holder shall ensure at all times that waste collection activities are carried out in accordance with the provisions of the Waste Directive.

2.17 The permit holder shall take steps to ensure that all or a specified proportion of waste collected by the permit holder, including any List of Waste type(s) or class or classes of such waste is source segregated, treated, recovered or otherwise disposed of to secure the objectives of all relevant Waste Management Plans and all National and EU waste targets.
In particular the permit holder shall ensure that waste is:

i. Where practicable and having regard to the waste hierarchy and section 21A of the Act, delivered to facilities where the preparation for reuse, recycling or recovery of the waste takes place.
ii. Presented, collected, handled and transported in a form, which enables any facility to which the waste is delivered, to comply with any specific conditions contained in, as the case may be, the waste licence, waste facility permit, certificate of registration, Integrated Pollution Prevention Control licence or Industrial Emissions licence, in relation to any performance targets or other limits or restrictions which have been established for the purpose of ensuring or encouraging the recycling or recovery of waste.

2.18 The permit holder shall ensure that where biowaste collected under this waste collection permit is transferred to a composting or biogas facility for the purpose of treatment and where animal by-products form all or part of that biowaste, that the facility has been approved in writing by the NWCPO for use by the permit holder and there is in force an appropriate veterinary authorisation issued by the Department of Agriculture, Food and the Marine in accordance with Article 10 (6) of the European Union (Animal By-Products) Regulations 2014 as amended.

2.19 Where the permit holder collects waste animal by-products; the collection, transport, storage, handling, processing, disposal and export of waste animal by-products shall be done in accordance with the rules set out in Regulation (EC) No. 1069/2009.

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3. Vehicles, Skips, Containers, Trailers and Receptacles

3.1 The permit holder shall only use the vehicles as have been notified in writing to the NWCPO and subsequently agreed, which are listed in Appendix C of this permit or such later revision of the said appendix as the NWCPO may issue, for the purposes of the activity to which this permit relates.

Fixed Payment Notice Condition (S34(7)(d)(iii)).

3.2 Vehicles listed in Appendix C shall not be included on any other waste collection permit at any one time other than a waste collection permit issued to the same legal entity for a different region.

3.3 All vehicles, skips, tankers, trailers, containers and receptacles used by the permit holder for the purposes of the activity to which this permit relates, shall be fit for purpose and maintained in a manner as not to cause environmental pollution.

3.4 Each vehicle (including leased or hired vehicles) used for the purposes of the activity to which the permit relates, shall be marked on the outside of the vehicle with the following information in clearly visible, legible, indelible lettering at least 70 millimetres high:

i. Name of the permit holder or trading name as identified on the front page of this permit and,
ii. Waste collection permit number as identified on the front page of this permit.

The last two digits of the permit number need not be included on the vehicle marking (01, 02, 03 etc). Trade plates or similar will suffice for leased or hired vehicles, provided the criteria above are met.

Fixed Payment Notice Condition (S34(7)(d)(v)).

3.5 Each skip (including skip bags), tanker and trailer used for the purposes to which this permit relates, unless otherwise approved by the NWCPO in writing, shall be marked on at least two sides with the following information in visible, legible and indelible lettering at least 70 millimetres high:

i. Name of the permit holder or trading name or waste collection permit number as identified on the front page of this permit.
ii. A unique identification number for the skip, tanker or trailer.

The last two digits of the permit number need not be included on the skip (including skip bags), tanker or trailer marking (01, 02, 03 etc).

Fixed Payment Notice Condition (S34(7)(d)(v))

3.6 The permit holder when using a skip (including skip bags) or other such receptacle for the purposes of the activity to which this permit relates, shall provide the hirer with a written agreement detailing:

i. The types of wastes which are permitted to be placed in the skip (including skip bags) or other such receptacle in accordance with Appendix A of this permit.
ii. That the skip will be removed as soon as is practicable after it has been loaded unless otherwise agreed in writing with the local authority.

3.7 The permit holder shall ensure that all consignments of waste are appropriately covered and managed during transit (including when parked) to prevent spillage, dust, litter or other nuisance. Any such incident shall be rectified as soon as is practicable to minimise environmental pollution.

3.8 The permit holder shall ensure that skips and other such receptacles left in a public place (as defined in the Litter Pollution Acts 1997 to 2009) shall carry reflectors or lighting so that they are

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clearly visible during a period when vehicles are required to be lighted.

3.9 The permit holder shall, notwithstanding the provisions of any bye-law made under section 72 of the Roads Act 1993, ensure that skips (including skip bags) and other such receptacles left on a public road shall be sited or deposited for no more than three days.

3.10 No skip, tanker, trailer or container used by the permit holder for the purposes of the activity to which this permit relates and which contains waste shall be left in a public place (as defined in the Litter Pollution Acts 1997 to 2009), other than where it is initially filled, unless it is on or attached to a mechanically propelled vehicle, which is in transit to an authorised facility listed in Appendix B of this permit or such later revision of the said appendix as the NWCPO may issue.

3.11 The permit holder shall ensure that all wheeled bins used for the collection of municipal waste shall comply with standard IS EN840 parts 1-6, unless otherwise agreed with the NWCPO.

3.12 The permit holder shall, where required by the NWCPO, fit all or specified vehicle(s) listed in Appendix C of this permit, with electronic tracking technology. This technology shall facilitate the surveillance operations of enforcement authorities in monitoring compliance with the waste collection permit conditions. The technology fitted shall include a GPS tracker on each and all vehicles used for the collection and transportation of waste and shall measure the location of the vehicles to an accuracy of not less than 10m. The technology shall include a back-office reporting system detailing all mapped routes, vehicle movements and destination facilities for at least the previous 12 months (records commencing from the date of commissioning of the system). Authorised persons shall be given full access to the back office system in accordance with section 14 of the Act and the back-office system shall have the functionality to export reports on vehicle movements as may be reasonably required by the authorised person. The back-office system shall ensure that the integrity of the data can be maintained and as such the permit holder shall not have access to amend or delete any data within the back-office reporting system which has been recorded by the electronic tracking technology.

4. Notification and Record Keeping

4.1 The permit holder shall notify the NWCPO in writing in relation to any conviction for an offence prescribed under Article 21 of the Waste Management (Collection Permit) Regulations, 2007 as amended, or any requirement of an order under the Waste Management Act 1996, within 5 working days of such conviction or the imposition of such a requirement.

4.2 The permit holder shall notify the NWCPO in writing in relation to any matter which may give rise to a permit holder not being considered a fit and proper person under Section 34D of the Act within five working days of such information being available and specifically the permit holder shall notify the NWCPO in relation to:

i. Where the permit holder or any person employed by him or her to direct or control the carrying on of the activity to which the waste collection permit relates or, as the case may be, may relate, has been convicted summarily of an offence under -
   a. Subsection (6) of section 32 consisting of a contravention of subsection (1) of that section, or
   b. Section 55(8) of the Act, or
   c. On indictment of an offence under this Act, the Environmental Protection Agency Acts 1992 to 2011, the Local Government (Water Pollution) Acts 1977 to 2007, or the Air Pollution Acts 1987 and 2011
   d. Where the permit holder has employed a person with the requisite technical knowledge or qualifications to satisfy criteria set out in section 34D of the Act and that person has ceased employment with the permit holder
   e.

ii. Where the permit holder is not in a position to meet financial commitments or liabilities that will be entered into or incurred by him or her in carrying on the activity to which the waste collection permit relates in accordance with the terms thereof or in consequence of ceasing to carry on that activity

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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
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Please note: Appendices are subject to change.

iii. The permit holder has had an order made against him or her under section 57 or 58 of the Act

4.3 The permit holder shall notify the relevant local authority (i.e. the local authority in whose area the incident occurs) immediately after the occurrence of any incident connected with the waste collection activity that caused or has the potential to cause environmental pollution or a threat to human health or where otherwise specified in these permit conditions. The permit holder shall include as part of the notification the date, time, location and a full description of the incident. The permit holder shall also send a written record of the incident to the NWCPO and relevant local authority within one week of the incident. This written record of the incident shall include the following information:

i. The date, time and location of the incident
ii. A full description of the incident
iii. Details of any measures taken to prevent or reduce environmental pollution or harm to human health which was caused or may be caused by the incident
iv. Details of steps taken to avoid recurrence of similar incidents.

4.4 The permit holder shall in the collection of waste (excluding household kerbside waste collected in accordance with condition 6.6 and hazardous waste collected in accordance with condition 6.4):

i. Use a docket system (electronic or written) to compile the records as outlined in condition 4.6.
ii. Ensure that each and every docket is completed with the information required in Condition 4.6 (parts i to x, excluding iii) before removing the waste from the site of origin.
iii. Ensure that an individual docket (electronic or written) accompanies each waste load on the vehicle, until control of the waste is transferred to an authorised facility specified in Appendix B of this permit or such later version of the appendix that the NWCPO may issue.
iv. Provide a copy of the completed docket (electronic or written) to the customer which includes all the information required in condition 4.6 (except 4.6 (iii) and (xi) where the docket is being provided at the time of collection).
v. Upon request by a local authority, present a completed docket (electronic or written) with the details specified under condition 4.6 of this permit (except 4.6 (iii) and (xi) where the load is in transit to the destination facility).

4.5 The permit holder shall maintain up-to-date summaries by electronic means, of the information in condition 4.6 in respect of waste collected by the permit holder in each calendar month. The dockets/records shall be maintained at the principal place of business for a period not less than seven years. These records shall be available for inspection at the principal place of business during normal working hours by authorised person(s) of any relevant local authority and any other person authorised under section 14 of the Waste Management Act 1996. The permit holder shall comply with the provisions of this condition unless otherwise agreed in writing by the NWCPO.

4.6 The permit holder shall compile and maintain specified records for the collection of waste, for a period not less than seven years. Records other than household kerbside waste shall include as a minimum the following:

i. List of Waste (LoW) code for each waste type and indicate whether or not the waste is hazardous
ii. Description of waste
iii. Quantity (in units of tonnes or litres) of waste collected
iv. The local authority area of origin of the waste
v. The name and address of the point of collection of the waste (including Eircode and NACE code where provided by the customer)
vi. The name, address and authorisation number of the waste facility to which the consignment of waste will be delivered
vii. The name and waste collection permit number of the permit holder
viii. Date and time of the waste collection
ix. Waste collection vehicle registration number

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x. Signature or electronic record of the vehicle driver
xi. Signature of a representative of the authorised waste facility or confirmation of the receipt of the waste from the authorised waste facility by electronic means or otherwise in writing.

4.7 The permit holder shall, not later than the 28th of February in each year, furnish to the NWCPO in such form as may be specified by the NWCPO, an Annual (Waste Data) Return (AR) in respect of waste collection activities carried out by the permit holder in the preceding calendar year or part thereof, as the case may be. The AR shall be a summary of the records maintained under condition 4.6 of the permit. The AR shall contain the following information in summary form, in respect of waste collected by the permit holder in the preceding calendar year:

i. Local authority area of origin of waste
ii. List of Waste (LoW) code for each waste type and indicate whether or not the waste is hazardous
iii. Description of waste
iv. Quantity (in tonnes) and units where specified of each waste type collected
v. Destination of waste (waste facility details)
vi. Country of destination (if exported abroad)
vii. The Transfrontier Shipment (TFS) notification number if the waste is exported abroad
viii. Details of the waste facility where waste was collected if waste is collected from a waste facility

The information specified above may be used for local, regional and national enforcement and reporting, and to produce community statistics on the generation, recovery and disposal of waste.

Fixed Payment Notice Condition (S34(7)(d)(vi))

4.8 A copy of all correspondence sent to and received from any local authority and the NWCPO regarding this waste collection permit shall be kept at the address of the principal place of business for at least seven years following the date on which the correspondence is sent or received respectively and shall be made available for inspection by any authorised person.

4.9 All communications from the permit holder to the NWCPO shall be addressed in writing by the permit holder to the following address: National Waste Collection Permit Office, Offaly County Council, Áras an Chontae, Charleville Road, Tullamore, Co. Offaly, or by email to contactus@nwcpo.ie unless otherwise specified. This condition does not apply in respect of the Annual Report as described in condition 4.7.

4.10 If requested by the NWCPO or a local authority, the permit holder shall provide details demonstrating how their waste collection activities are managed in accordance with the waste hierarchy and section 21A of the Act.

The permit holder shall, if requested by the NWCPO and in a format specified by the NWCPO, provide evidence to substantiate and justify that the charging mechanisms that the permit holder has decided to apply in the collection of waste are encouraging waste to be managed in accordance with the waste hierarchy and Section 21A of the Act.

4.11 If requested by the NWCPO or a local authority, the permit holder shall provide specified details demonstrating that they have valid Tax Clearance and appropriate and adequate policies of insurance in place.

4.12 The permit holder shall implement and maintain a customer complaint management system to the satisfaction of the NWCPO. If requested by the NWCPO, the permit holder shall provide details in relation to any complaint received by the permit holder and details of the steps taken to address the complaint.

If requested by the NWCPO, the permit holder shall implement and maintain an environmental management system in such format as may be specified by the NWCPO and if requested by the NWCPO, the permit holder shall submit documented procedures to the NWCPO for its approval at intervals as may be specified.

4.13 Upon request by the NWCPO, the permit holder shall provide details of collection routes, in a format as may be specified.

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The details may include:

i. A map indicating the geographical area being collected on given days
ii. The dates and types of waste being collected in geographical areas on given days
iii. The approximate starting and finishing times of collection routes.

4.14 The permit holder shall, if requested by the NWCPO, not later than the 28th February, 30th April, 31st July and 31st October of each year, furnish to the NWCPO in such form as may be specified by the NWCPO, a Quarterly (Waste Data) Report (QR) in respect of waste collection activities carried out by the permit holder in the preceding standard calendar quarter or part thereof, as the case may be. The QR shall be a summary of the records maintained under condition 4.6 and 6.6.21 (where applicable) of the permit. The QR shall contain the following information in summary form, in respect of waste collected by the permit holder in the preceding calendar quarter year:

i. Local authority area of origin of waste
ii. List of Waste (LoW) code for each waste type
iii. Description of waste (residual, recyclables, food/bio-waste, glass etc.)
iv. Quantity (in tonnes) of each waste type collected
v. The total number of non-household kerbside customers served with commercial kerbside waste collection service. Totals for each segregated fraction of waste (e.g. residual, recyclables, food & bio waste, glass) and the types of receptacles used, for each fraction reported, per each local authority functional area.
vi. The participation rate of customers for any and all fractions of waste, presented by customers within the previous reporting quarter.

The information specified above may be used for local, regional and national reporting including being used to produce community statistics on the generation, recovery and disposal of waste.

Fixed Payment Notice Condition (S34(7)(d)(vi))

5. Charges and Financial Provisions

5.1 The permit holder shall make payments to the local authority or the NWCPO to defray such costs as may reasonably be incurred by the local authority or NWCPO where the costs do not exceed the actual expenditure reasonably incurred by the authority in inspecting, monitoring, auditing, enforcing or otherwise performing any functions in relation to the activity.

5.2 The permit holder shall effect and maintain appropriate and adequate policies of insurance insuring them in respect of any liability on their part to pay damages or costs on account of injury to person(s) or property arising from the activities concerned.

5.3 Without prejudice to the foregoing, the minimum level of indemnity to be maintained by the permit holder shall be to a value not less than €6,500,000 for public liability insurance including cover for sudden and unforeseen pollution and €6,500,000 for third-party property damage motor insurance, in both cases noting an indemnity to Offaly County Council as the National Waste Collection Permit Office.

6. Conditions by Waste Type

6.1 Commercial and Industrial Waste

The permit holder is not authorised to collect this waste type

6.2 Construction & Demolition Waste

The permit holder is not authorised to collect this waste type

6.3 End of Life Vehicles

The permit holder is not authorised to collect this waste type

6.4 Hazardous Waste

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The permit holder is not authorised to collect this waste type

6.5 Bulky Municipal Waste

The permit holder is not authorised to collect this waste type

6.6 Household Waste (Door to Door Kerbside Collections)

The permit holder is not authorised to collect this waste type

6.7 Sludges for Agriculture and Septic Tank Waste

6.7.1 Sludges, including septic tank sludge shall be transferred to authorised facilities which are listed in Appendix B of this permit or such later revision of the said appendix as the NWCPO may issue.

6.7.2 Where sludges are recovered at landbanks it shall be in accordance with a Nutrient Management Plan, approved in writing by the relevant Local Authority under Section 66 of the Waste Management Act 1996 and the European Union (Good Agricultural Practice for Protection of Waters) Regulations, 2017. For the purpose of this condition a landbank covers lands used for spreading or treating waste with a consequential benefit for an agricultural activity or ecological system and shall be listed in Appendix B of this permit. Each Nutrient Management Plan shall specify an expiry date.

6.7.3 The permit holder shall ensure where wastes collected originate from an Integrated Pollution Prevention and Control (IPPC) licensed facility, that the waste shall be transported to authorised facilities listed in Appendix B, which are either;

i. Governed in accordance with the conditions of the IPPC licence and where written agreement has been received from the Environmental Protection Agency, or
ii. Operated in accordance with a Nutrient Management Plan approved in writing by the relevant Local Authority under Section 66 of the Waste Management Act 1996 and the European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2010 (S.I. 610 of 2010)

6.7.4 The permit holder shall be familiar with the requirements placed on holders of waste, arising from bye-laws made by any of the local authorities listed in Appendix D under Section 21 of the Local Government (Water Pollution) Acts 1977 as amended and shall keep a copy of all such bye-laws at the address of the principal place of business. The permit holder shall not spread waste on lands unless it is in accordance with the requirements of the bye-laws in force in the Local Authority area concerned.

6.7.5 Where a permit holder is collecting or transporting or depositing sewage sludge within the Cork County Council area, the permit holder shall, within three months of the date of grant of this permit, register on Cork County Council's Sewage Sludge Register System. The permit holder shall record specific details of each consignment of sewage sludge (as defined under the Waste Management (Use of Sewage Sludge in Agriculture) Regulations 1998 as amended) which he/she/it transports within Co. Cork and shall input these details into Cork County Council's central electronic database via the internet on a monthly basis unless otherwise agreed in writing with Cork County Council.

6.8 Waste Electrical and Electronic Equipment

The permit holder is not authorised to collect this waste type

6.9 Secondary movements of bulked or treated waste

6.9.1 Where a permit holder is transporting bulked or treated waste from a waste facility, where that waste facility is not the original source of the waste, the permit holder shall ensure that they have a full knowledge of the waste types that they are transporting, abide by their record keeping obligations and fully comply with the conditions of this permit. Permit holders are not relieved of any obligation under this permit even if they are transporting waste on behalf of a third party or other waste operator.

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For Information Purposes Only

6.10 Waste Tyres

The permit holder is not authorised to collect this waste type

6.11 Waste Batteries and Accumulators

The permit holder is not authorised to collect this waste type

6.12 Wastes from Incineration

The permit holder is not authorised to collect this waste type

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APPENDIX 6

Roscommon County Council, Planning Authority - Viewing Purposes Only!

PLANNING & DEVELOPMENT SECTION
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Rooskagh Quarry – EIAR Chapter 6 Land/Soils (Geology)

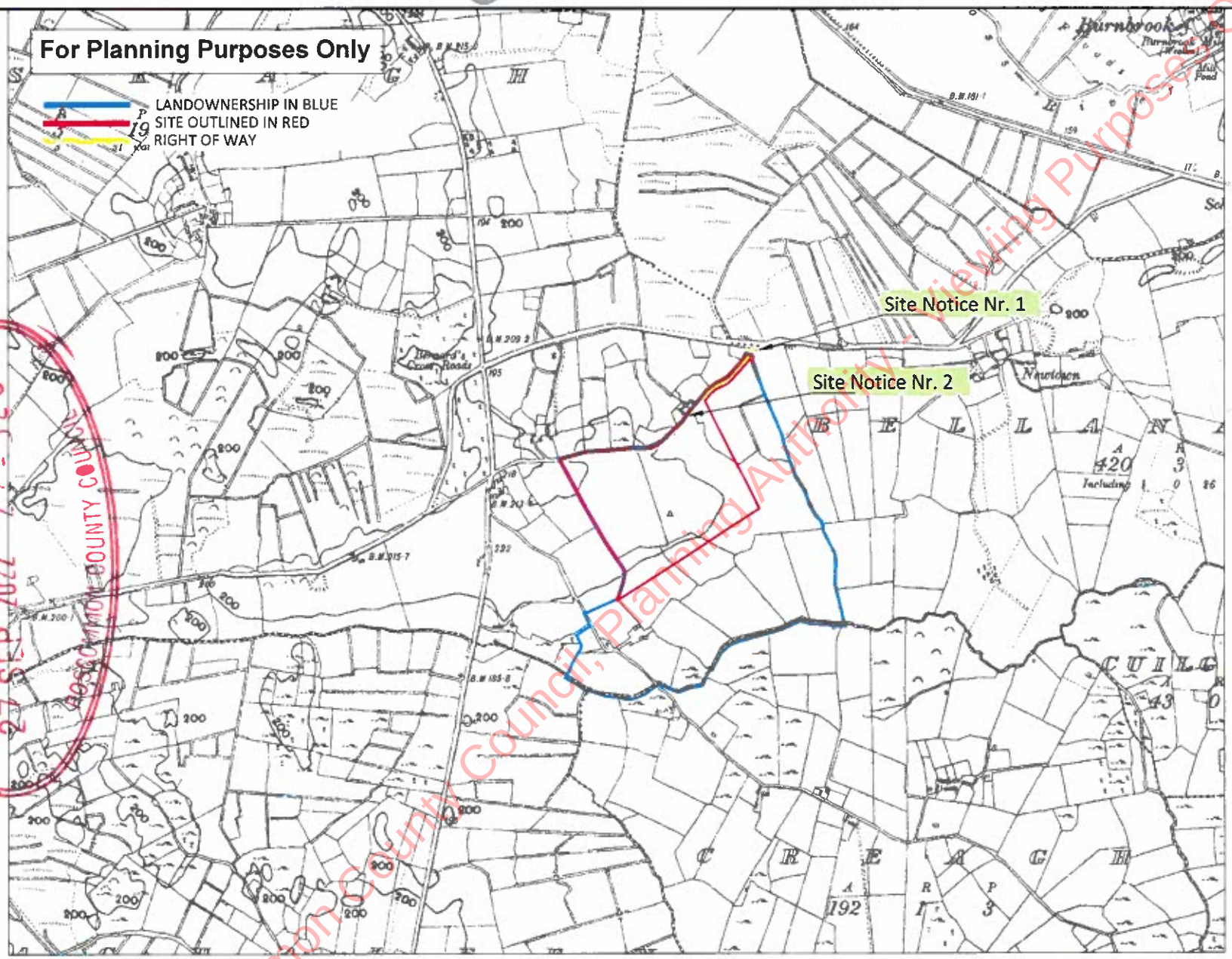
Appendix 6.0 – Site Location & Topography Map

Roscommon County Council, Planning Authority - Viewing Purposes Only!

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

For Planning Purposes Only

LANDOWNERSHIP IN BLUE
SITE OUTLINED IN RED
RIGHT OF WAY



PLANNING & DEVELOPMENT
27 SEP 2022
ROSCOMMON COUNTY COUNCIL

Description:
Historic 6" Latest Edition

Publisher / Source:
Ordnance Survey Ireland (OSi)

File Format:
Tagged Image File Format (TIFF)

File Name:
R_50186743_1.tif

Clip Extent / Area of Interest (AOI):
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URX,URY= 600141.1164,737674.5325
ULX,LRY= 594947.1164,744684.5325
URX,URY= 600141.1164,744684.5325

Projection / Spatial Reference:
IRENET95_Irish_Transverse_Mercator

Centre Point Coordinates:
X,Y = 597544.1164,741179.5325

Data Extraction : 20-Jan-2021:

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N

Revisions			
Rev	By	Date	Description
PL0	MD	16.09.22	Issued for Planning

Client:
Eamon Hamey

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Job Title
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamulla (Bealnamulla), Athlone, Co. Roscommon

Drawing Title
Site Location Map 1

Status	Planning
Date:	15/07/2022
Scale:	1:10,560 @ A4
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	001	PL0

ORDNANCE SURVEY OF IRELAND LICENCE NUMBER
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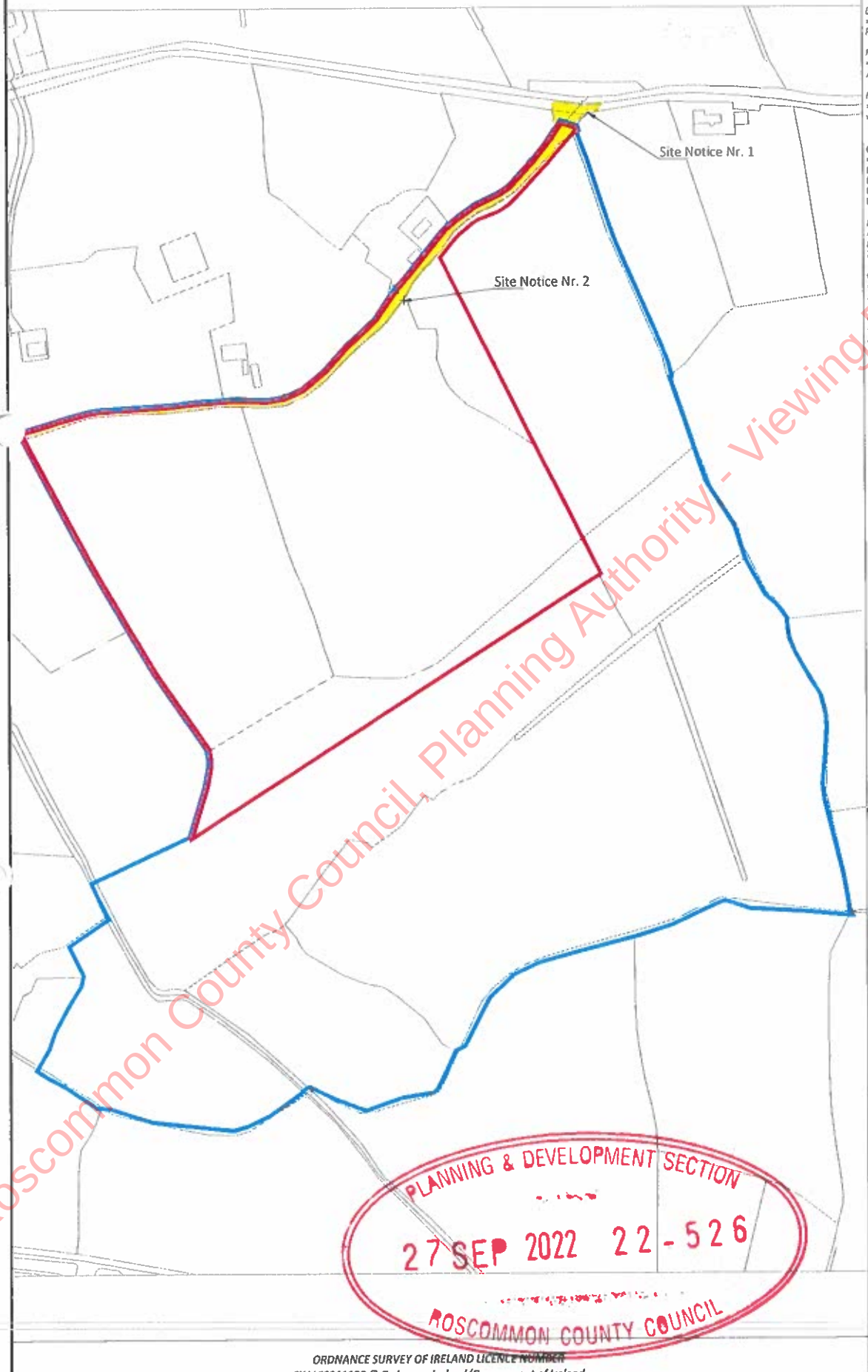
LANDOWNERSHIP IN BLUE
SITE OUTLINED IN RED
RIGHT OF WAY



Description:
Digital Cartographic Model (DCM)

Publisher / Source:
Ordnance Survey Ireland (OSi)

Data Source / Reference:
PRIME2

File Format:
Autodesk AutoCAD (DWG_R2013)

File Name:
v_50166743_1.dwg

Clip Extent / Area of Interest (AOI):
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LRX,LRY= 597851.6164,740764.5325
ULX,ULY= 597236.6164,741594.5325
URX,URY= 597851.6164,741594.5325

Projection / Spatial Reference:
Projection= IRENET95_Irish Transverse_Mercator

Centre Point Coordinates:
X,Y= 597544.1164,741179.5325

Reference Index:
Map Series | Map Sheets
1:5,000 | 3034
1:5,000 | 3102

Data Extraction Date:
Date= 20-Jan-2021

Source Data Release:
Product Version:
Version= 1.3

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N

Revisions			
Rev	By	Date	Description
P1.0	MD	19/09/22	Issued for Planning

Client:
Eamon Hanney

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Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Ballaghmullin (Ballaghmullin), Athlone, Co. Roscommon

Drawing Title:
Site Location Map 2

Status	Planning
Date:	15/07/2022
Scale:	1:2,500 @ A3
Drawn by:	CM

JOB No.	DRG No.	REV.
22.157	002	P1.0

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LANDOWNERSHIP IN BLUE
SITE OUTLINED IN RED
RIGHT OF WAY

Area of Site:
69,381 Sq/m
17.2 Acres
6.938 Hectares

ITM: 597452, 741243

60m Buffer zone from adjacent property denoted thus.

For extents of lands under the control of the applicant refer to the site location maps.

Wayleave marked in yellow. Refer to letter from solicitor for further details.

Site Notice Nr. 2

MW04
ToB = 61.372
GL = +60.937

MW03
ToB = 68.127
GL = +67.737

MW02
ToB = +60.296
GL = +59.790

MW01
ToB = + 48.982
GL = +48.489

Site outlined in red.

GATEWAY
DECIDUOUS TREE DRAWN TO SIZE
SEWER MANHOLE & DETAILS
GULLY AND DETAILS
FENCE
ESB COVER
EIRCOM COVER
199.997 SPOTHEIGHT & ELEVATION
FIRE HYDRANT
STOP VALVES
BUILDING
ESB/EIRCOM POLE & CABLE
TREES/TREELINE
DITCHLINE
HEDGELINE
WALL
EMBANKMENT
BOREHOLE LOCATIONS

Notes:

1. This drawing is the copyright of Collins Boyd Engineering Ltd. It is a confidential document and must not be copied, used or its contents divulged without prior written permission.
2. DO NOT SCALE, use figured dimensions only, if in doubt ask. All dimensions to be checked by contractor on site, any errors or discrepancies to be reported to the Architects.
3. All works to be carried out in accordance with the current building control act and building regulations.
4. Clients are obliged to forward a commencement notice to the local authority at least 14 days prior to the commencement of any works on site.
5. Consultants to be informed immediately of any discrepancies before work proceeds.

NOT FOR CONSTRUCTION

Revisions

Rev	By	Date	Description
PL0	MD	16.09.22	Issued for Planning

Client:
Eamon Harney

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
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Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Topographical Survey Sheet 1

Status	For Planning
Date:	August 2022
Scale:	1:500 @ A1
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	005B	PL0

Roscommon County Council Planning Authority - Viewing Purposes Only!

Rooskagh Quarry – EIAR Chapter 6 Land/Soils (Geology)

Appendix 6.1 – Historic OSI Mapping

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PLANNING & DEVELOPMENT SECTION
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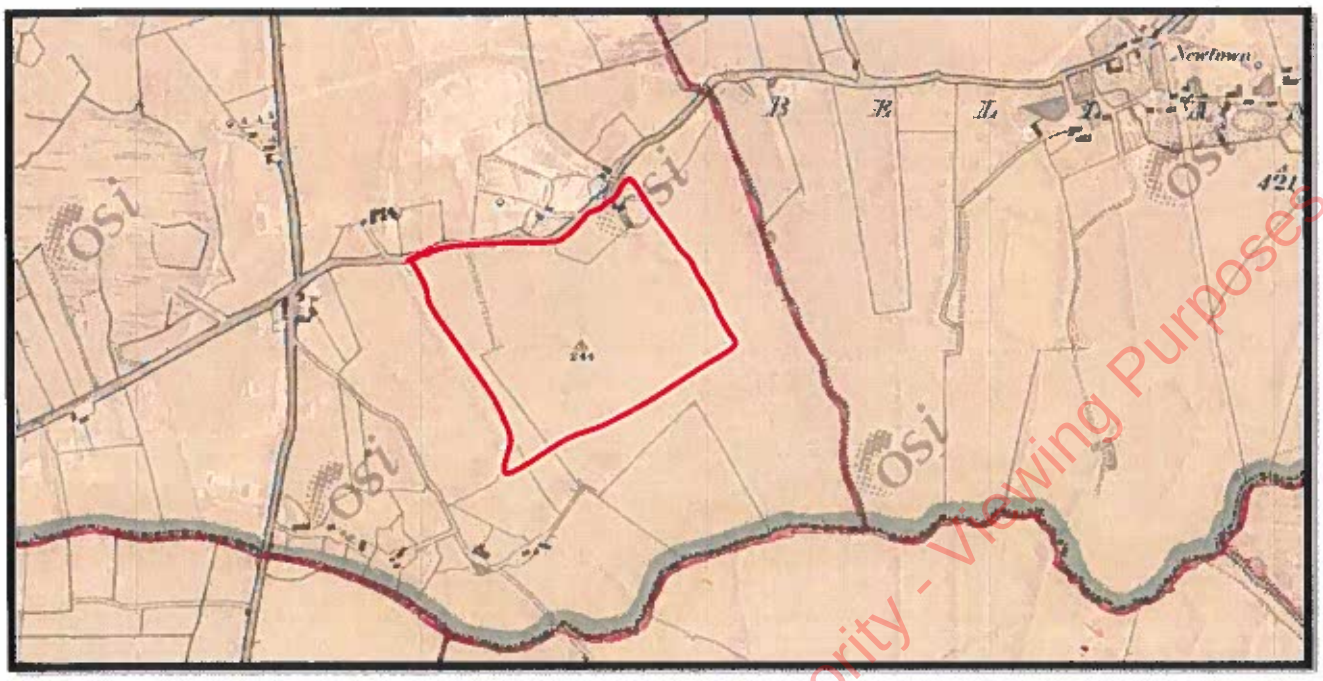

Image 01:- Old OSI Six Inch Sheet 1840's Mapping of site area with modern aerial photo background. (Approximate site boundary shown by red line.)

Image 02: Old 25" early 1900's OSI Mapping of site area with modern aerial photo background. (Approximate site boundary shown by red line.)

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Rooskagh Quarry – EIAR Chapter 6 Land/Soils (Geology)

Appendix 6.2 – OSI Old Aerial Photographs

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Image 03: OSI Aerial Photograph from 1995 with OSI contours. (Approximate site area shown by red boundary.)

Image 04: OSI Aerial Photograph from 2000 with OSI contours. (Approximate site area shown by red boundary.)

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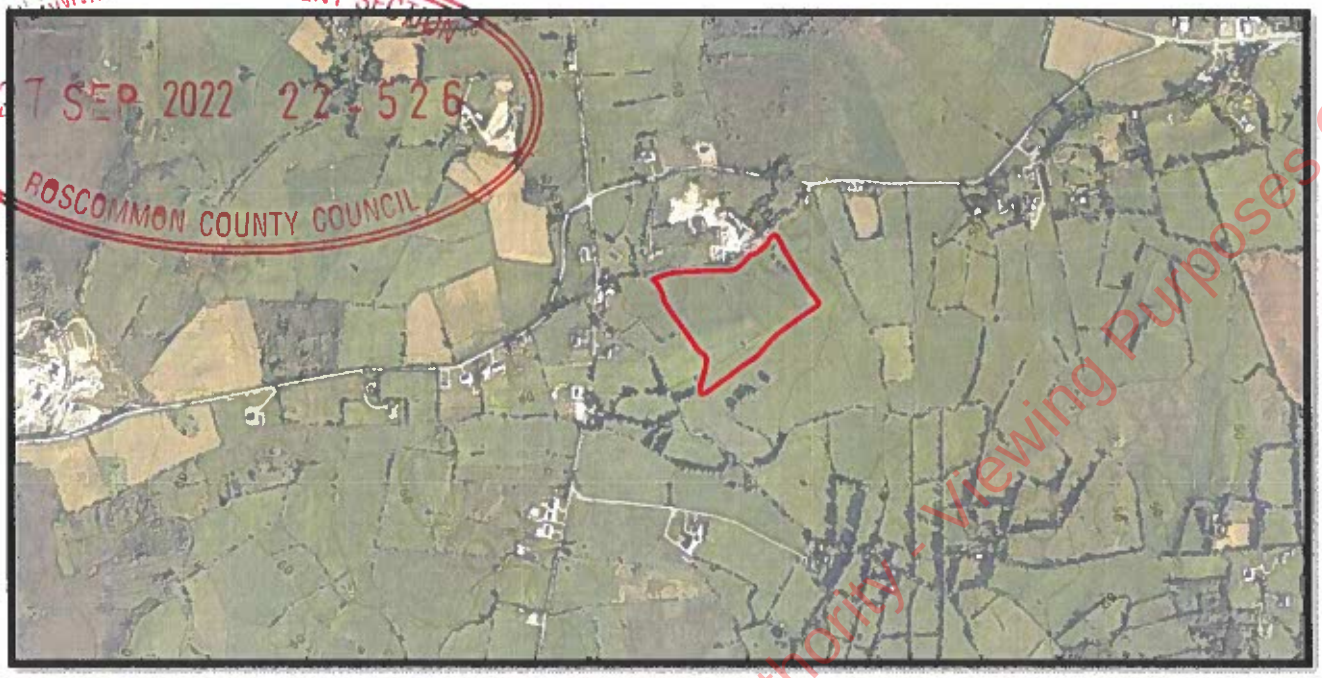

Image 05: OSI Aerial Photograph from 2005 with OSI contours. (Approximate site area shown by red boundary.)

Image 06: OSI Aerial Photograph from 2012 with OSI contours. (Approximate site area shown by red boundary.)

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Image 07: Recent Google Aerial Photograph. (Approximate site area shown by red boundary.)

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Rooskagh Quarry – EIAR Chapter 6 Land/Soils (Geology)

Appendix 6.3 – Irish Midland & Athlone Esker Mapping

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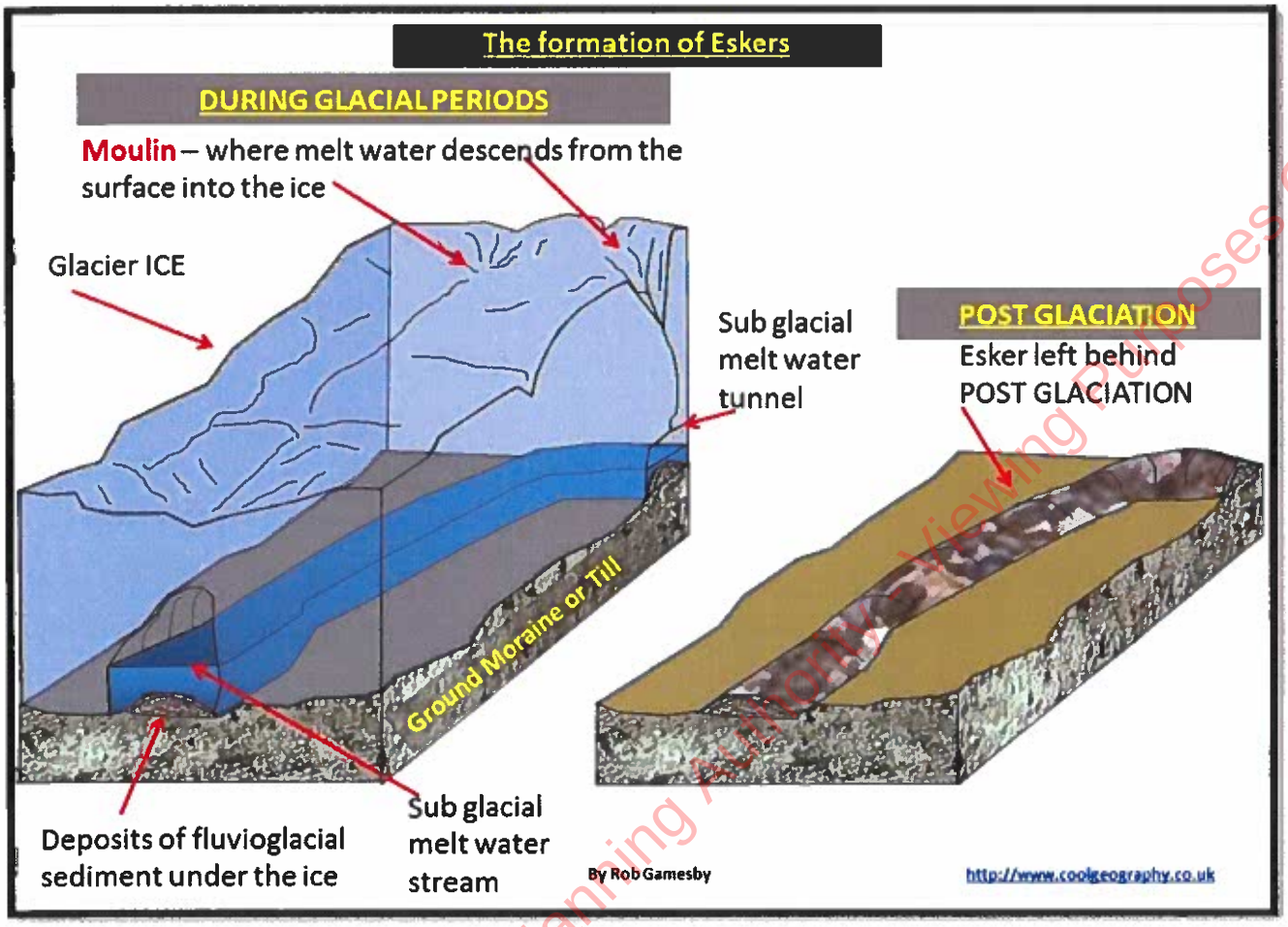
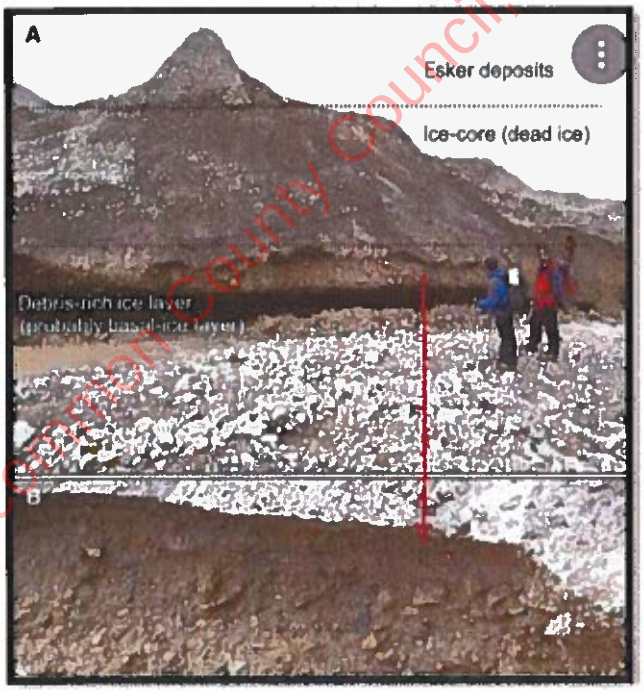


See below a picture of an active esker environment– note how the peak in the photograph (identified as esker deposits) is similar to the peaked hilltop at the end of the esker ridge on the proposed Rooskagh Quarry site.



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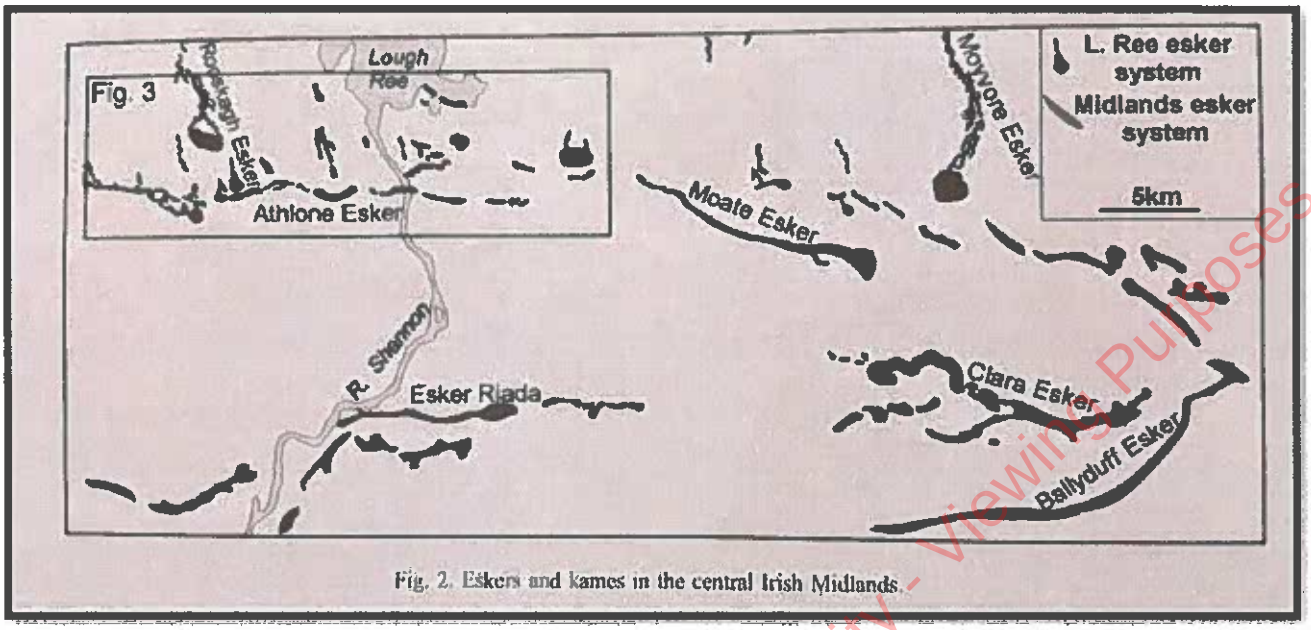

Image 08: Eskers and Kames in the central Irish Midlands, (from C. Delaney – Sedimentary Geology 149 (2002)).

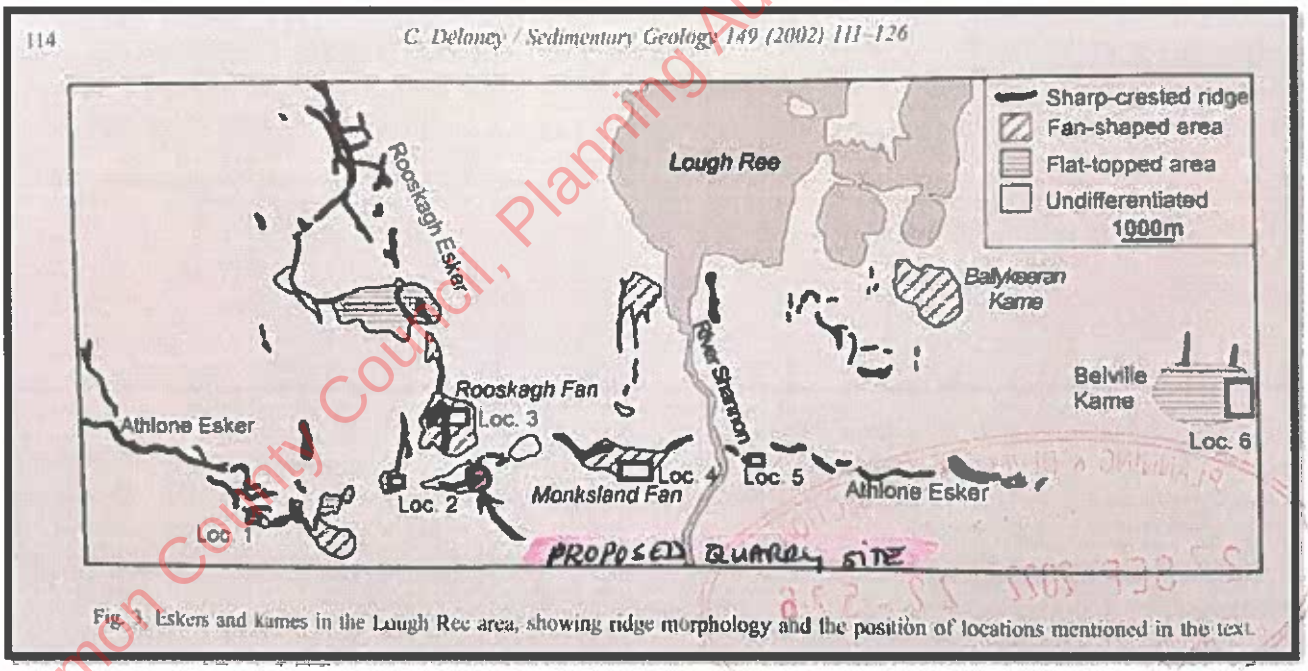

Image 09: Eskers and Kames in the Lough Ree area. Note that proposed site is part of Athlone Esker System. (from C. Delaney – Sedimentary Geology 149 (2002)) (Approximate site location indicated by pink circle).

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Rooskagh Quarry – EIAR Chapter 6 Land/Soils (Geology)

Appendix 6.4 – Geological Survey of Ireland Mapping

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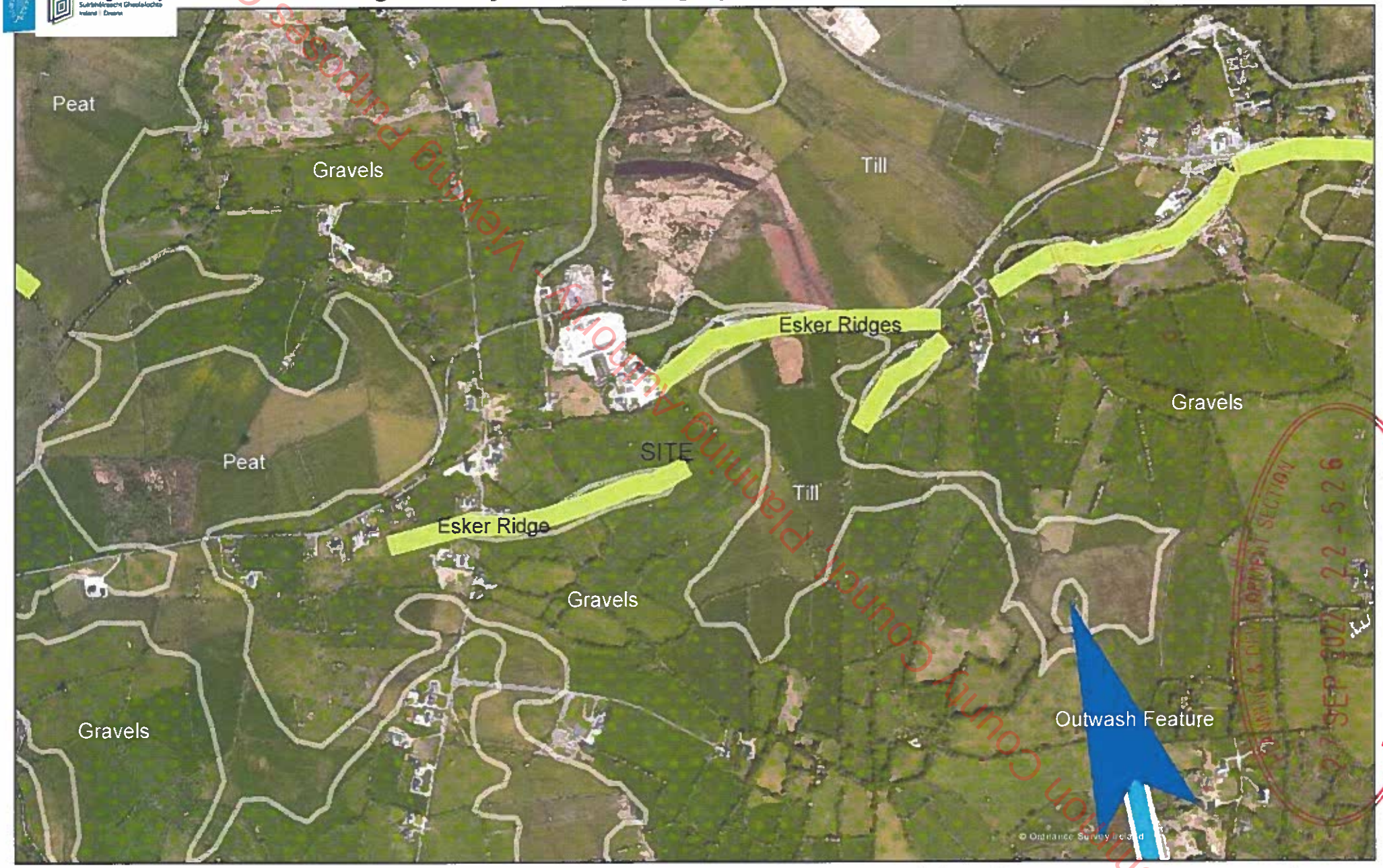
Rooskagh Quarry - GSI Physiographic Units



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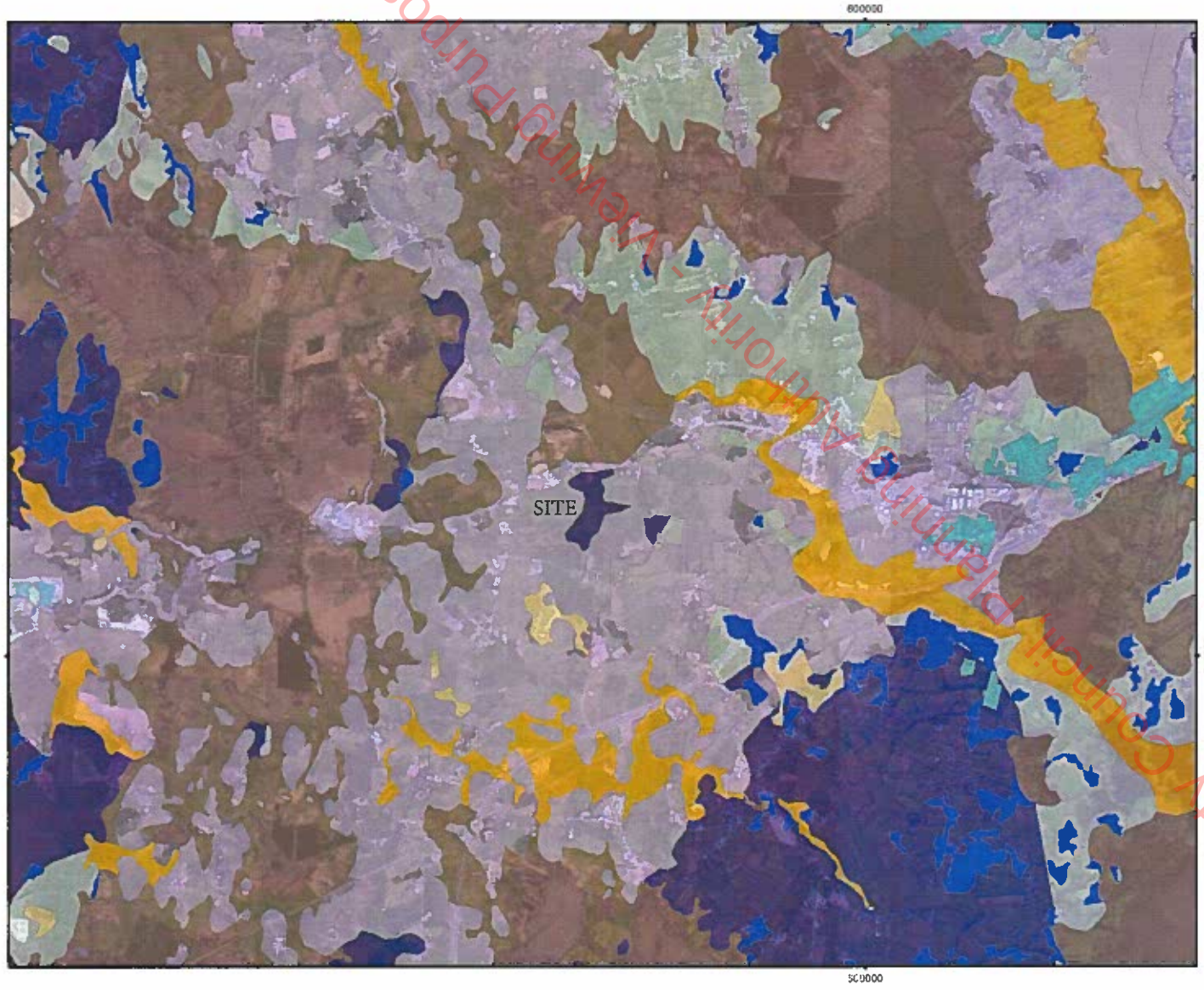
Rooskagh Quarry - GSI Teagasc Soil Mapping



Legend

Teagasc Soils

- BminDW - Deep well drained mineral (Mainly basic)
- BminPD - Mineral poorly drained (Mainly basic)
- BminPDPT - Peaty poorly drained mineral (Mainly basic)
- BminSW - Shallow well drained mineral (Mainly basic)
- BminSP - Shallow poorly drained mineral (Mainly basic)
- BminSPPT - Shallow peaty poorly drained mineral (Mainly basic)
- BminSRPT - Shallow, rocky, peaty/non-peatymineral complexes (Mainly basic)
- Cut - Cutover/cutaway peat
- AlluvMIN - Alluvial (mineral)
- Lac - Lacustrine type soils
- Made - Made ground
- Water - Water

Scale: 1:50,000

Geological Survey Ireland

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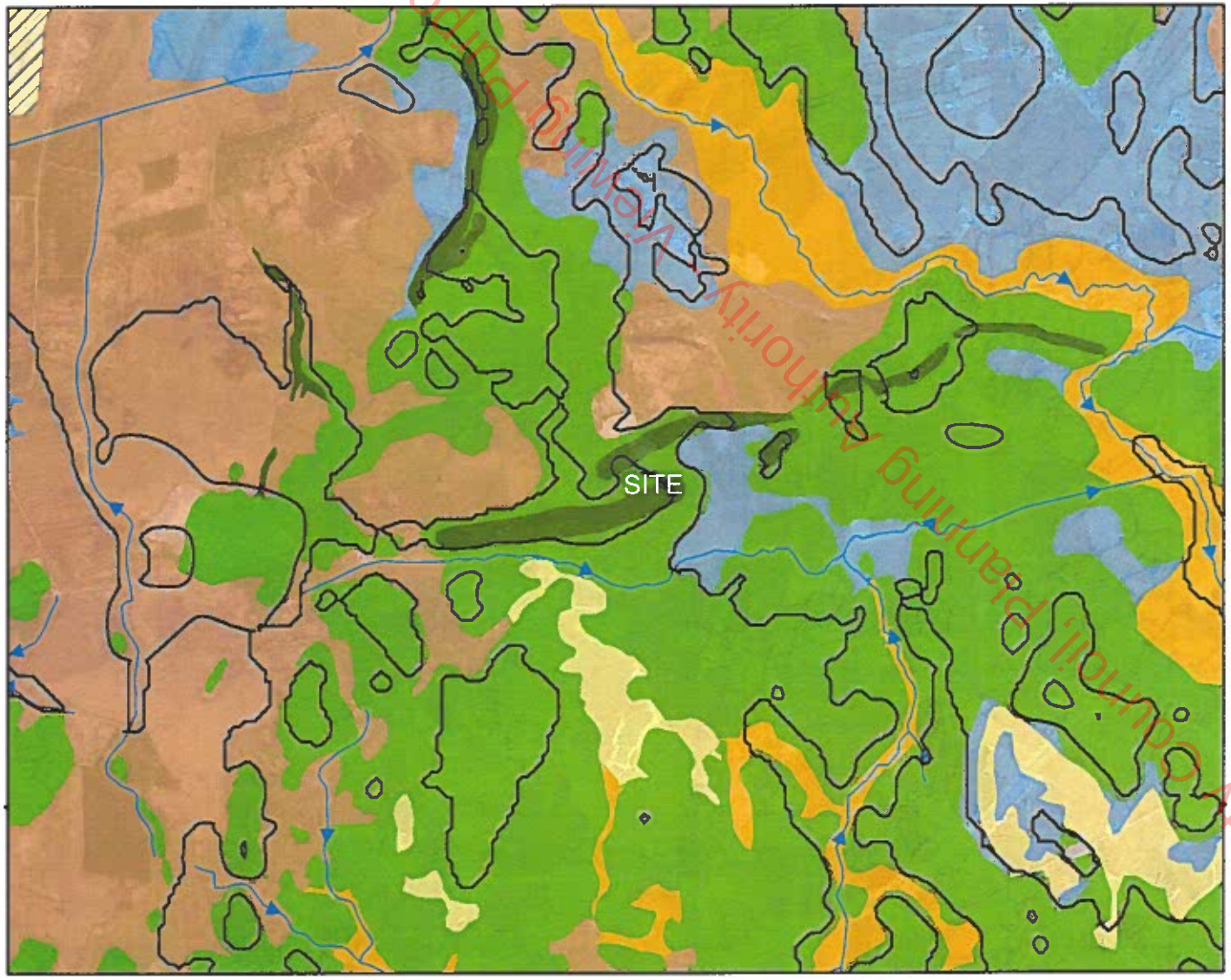
Rooskagh Quarry - GSI Quaturnary Mapping



Legend

- EPA Contours
- River Network and River Flow Direction Arrows

Quaternary Sediments 1:50,000 Ireland ITM

- A, Alluvium
- BasEsk, Eskers comprised of gravels of basic reaction
- Cut, Cut over raised peat
- GLs, Gravels derived from Limestones
- KaRck, Kartsified bedrock outcrop or subcrop
- L, Lacustrine sediments
- Mrl, Lake marl
- Rck, Bedrock outcrop or subcrop
- TLs, Till derived from limestones

Scale: 1:25,000

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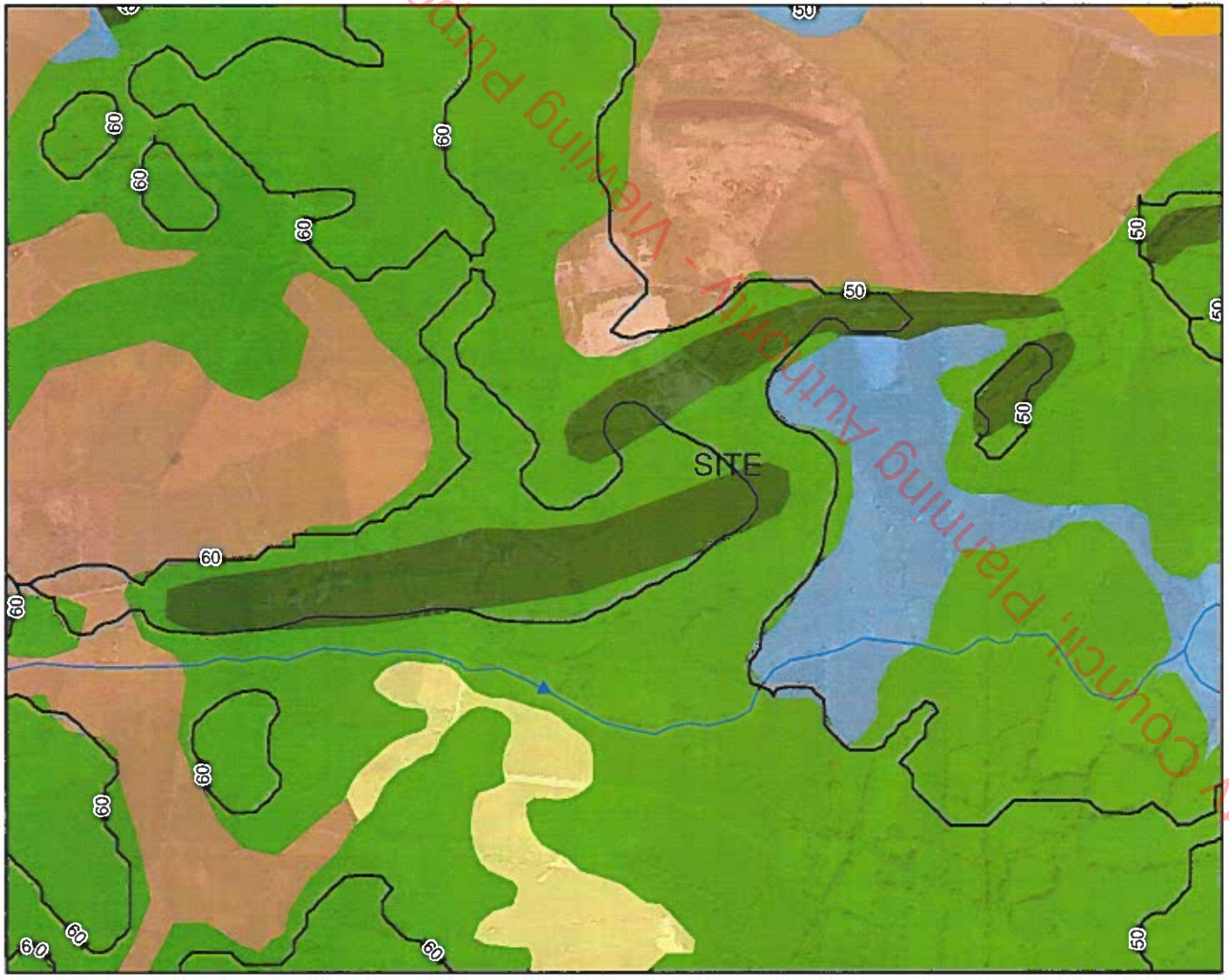
Rooskagh Quarry - GSI Quaturnary Mapping



Legend

- EPA Contours
- River Network and River Flow Direction Arrows

Quaternary Sediments 1:50,000 Ireland ITM

- A, Alluvium
- BasEsk, Eskers comprised of gravels of basic reaction
- Cut, Cut over raised peat
- GLs, Gravels derived from Limestones
- L, Lacustrine sediments
- TLs, Till derived from limestones

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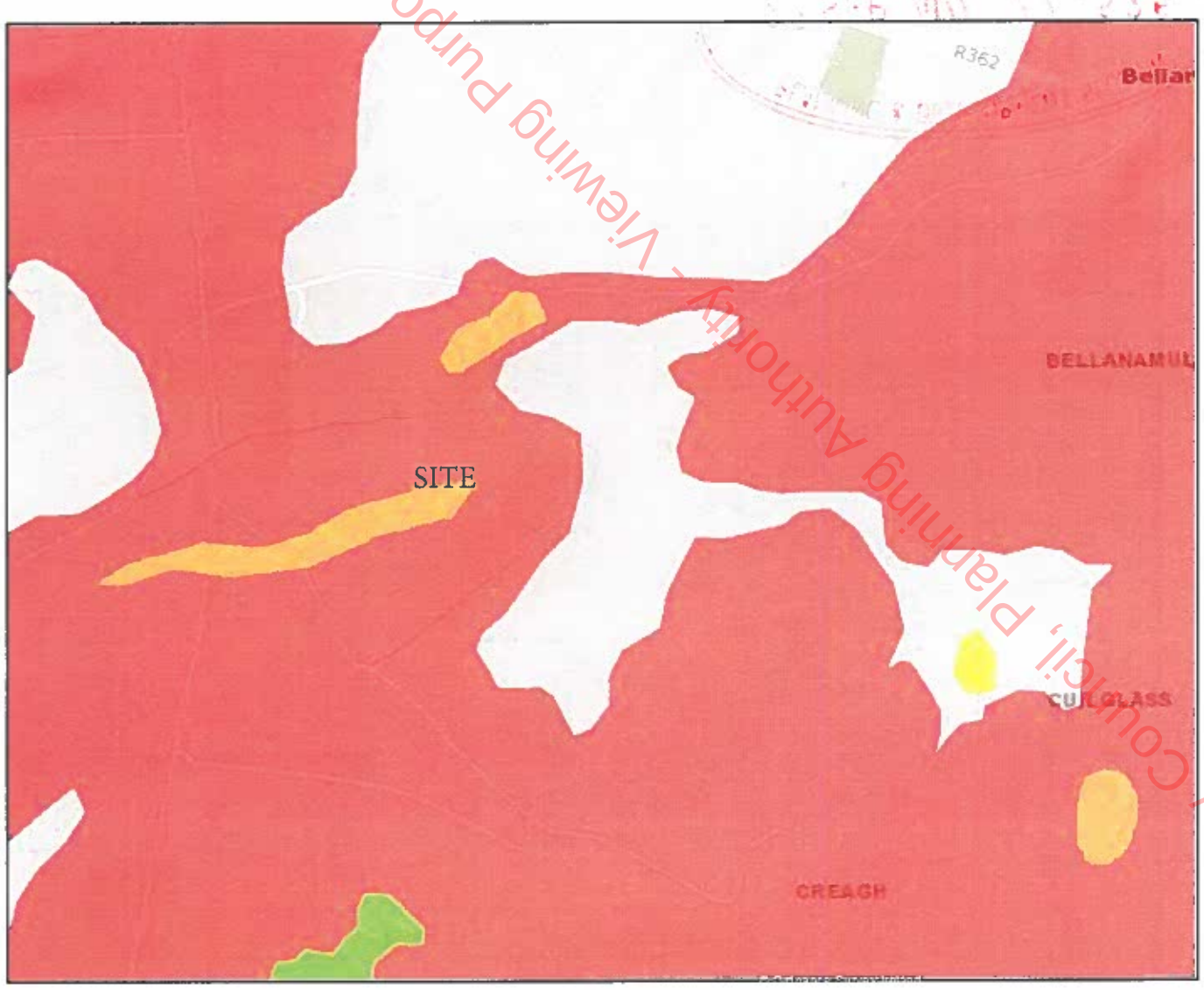
Rooskagh Quarry - GSI Aggregate Potential



Legend

Granular Aggregate Final Scores

- Very High potential
- High potential
- Moderate potential
- Low potential
- Very Low potential

Scale: 1:10,000

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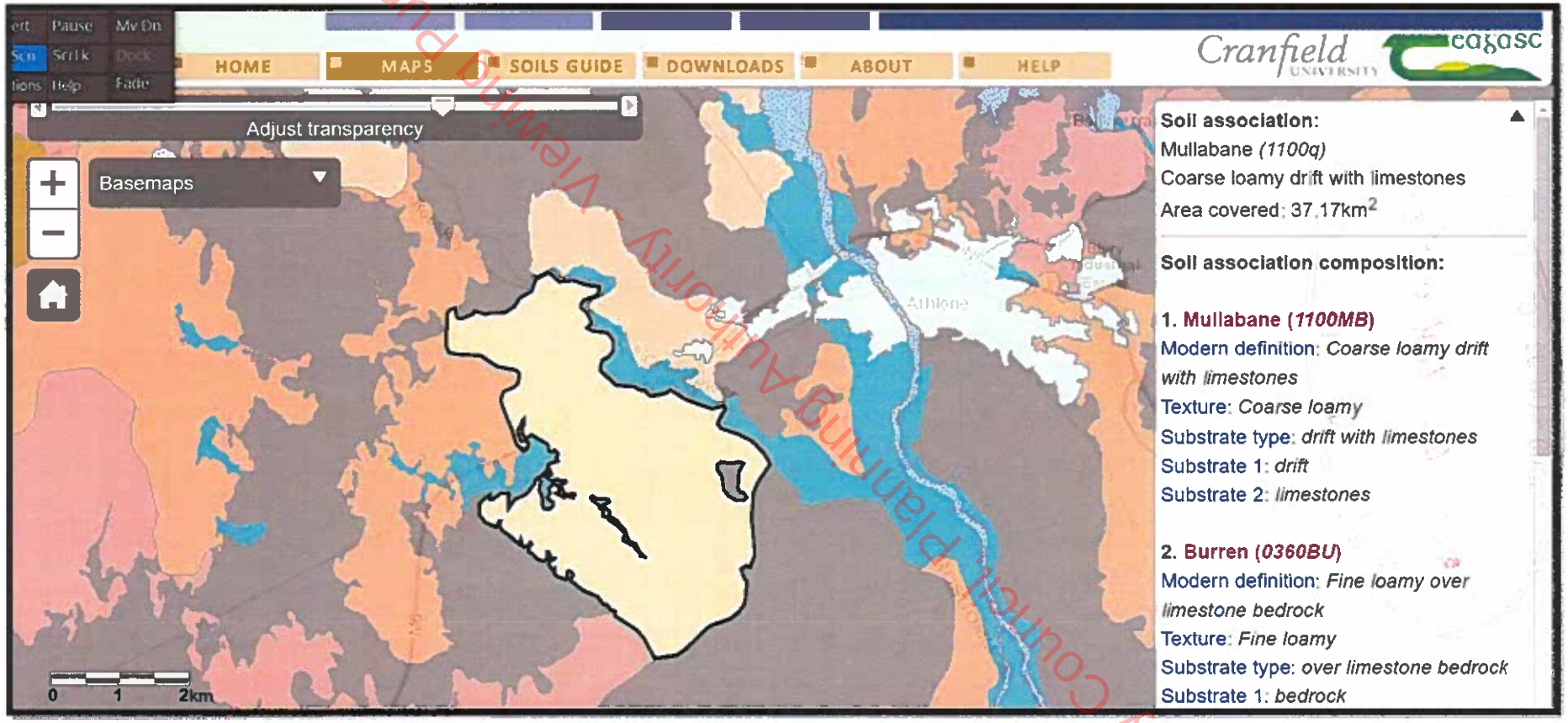

Appendix 6.4 - Teagasc Soil Mapping.

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Rooskagh Quarry – EIAR Chapter 6 Land/Soils (Geology)

Appendix 6.5 – Resistivity & Trial Pits, BRG Ltd., 2005

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Resistivity Survey on potential sand & gravel site

Magazine Road, Athlone, Co. Roscommon

Prepared for Eamonn Harney

Project Number:	**R12/05**
Author(s)	Graham Reid P.Geo
BRG Ltd	Naas County Kildare Ireland
Date of Report	1st July 2005

R12/05

brg

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1. Introduction 2
2. Site description 2
3. Survey Design & Equipment 3
4. Results 4
5. Conclusions 6

Figures

1. Location Map
2. Detailed Location Map
3. Resistivity Lines and Pit Location Map
4-9. Resistivity Sections.

Table 1 Trial Pit results

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1. Introduction

BRG Ltd. was contracted by Eamonn Harney through Dermot Nally to use the resistivity imaging technique to clarify the nature of the subsoil profile on a site at Magazine Road, Athlone, Co. Roscommon. The fieldwork was carried out on the 28th and 29th of June 2005.

2. Site Description (Figs. 1 & 2)

The site is located to the west of Athlone, at Magazine Road in Co. Roscommon (Fig. 1). The site is dominated by a hill at the south central end, and consists of rough pasture land. Ground elevations vary considerably across the site, however these levels were not available. Nine trial pits have been dug to ascertain the thickness and of the sand and gravel assets. An existing sand/gravel operation is currently working across the lane to the north of the site.

Fig. 1: Site Location Map

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Fig. 2: Detailed Site Location Map

2. Survey Design and Equipment (Fig. 3)

All lines were orientated roughly NE-SW, at most 50m apart, with a 5m spacing between electrodes. The ends of lines, the trial pits and the field boundary were surveyed using a handheld Garmin 12 GPS receiver, with accuracy of +/- 5m.

Resistivity was measured using a Campus Geopulse modular Resistivity meter, with an Imager 50 cable set-up. Control of the transmitter/receiver was transferred through a portable laptop computer so that the survey settings could be altered through menu-driven software. The spreads were measured across the long axis of the site, with coverage density as detailed as the two day time frame would allow (spread locations – Fig3). One short line was completed with 1 length of cable (Imager 25 set-up). Resulting pseudo-sections were modelled using a two-dimensional finite element program, RESIX 2DINV to give true depth sections.

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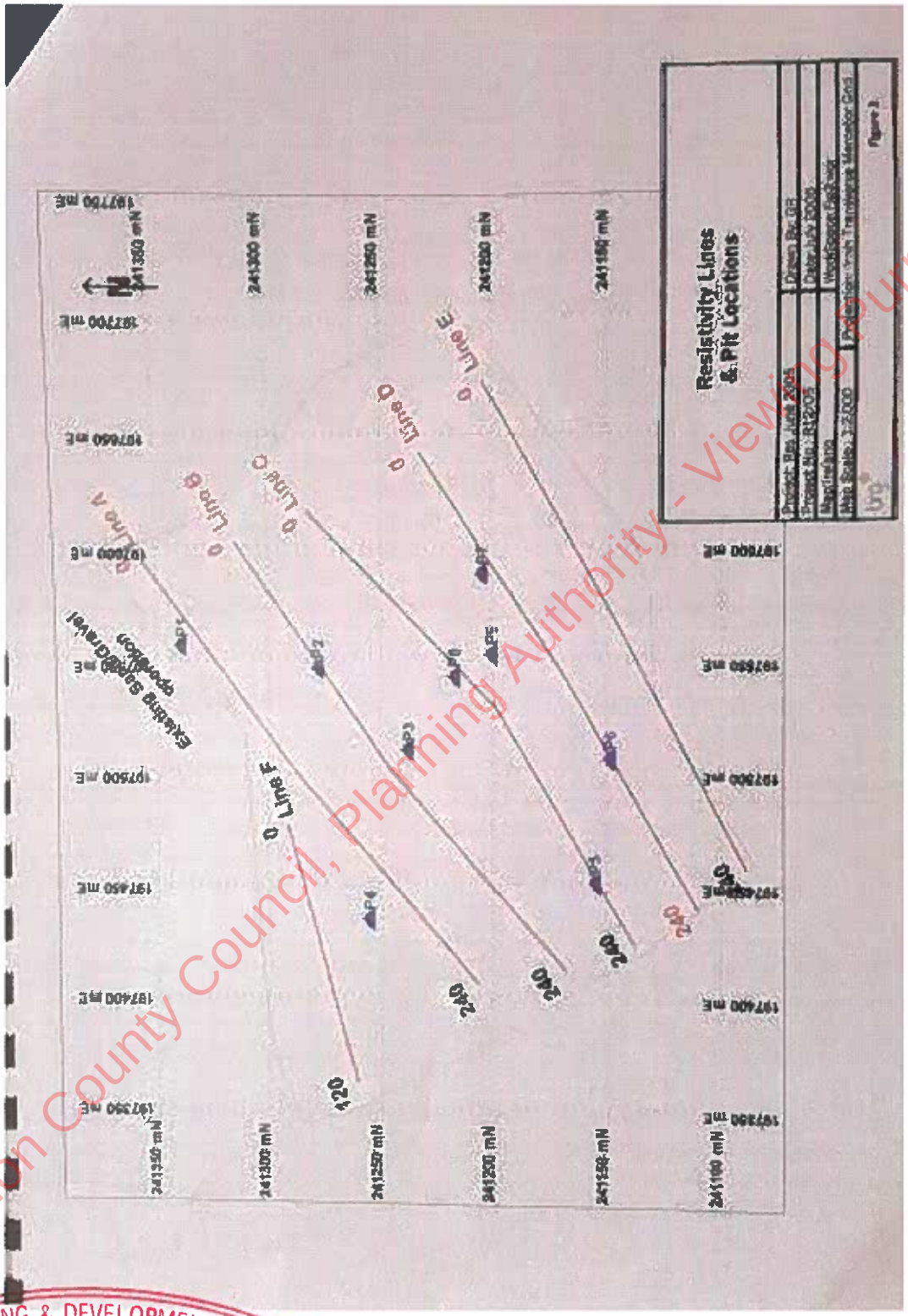

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3. Results

Pits (Fig 3 and Table 1)

Trial pitting had been carried out at the locations presented in Figure 3. The results tabulated are as briefly described by Dermott Nally (Table 1). The locations were positioned with a handheld Garmin 12 GPS. This data has been used to assist with the interpretation of the resistivity results.

PITS	EASTING	NORTHING	Description (Dermott Nally)
P1	197559.8	241336.9	0-0.5m Overburden 0.5--4m Gravel (dirty, bouldery)
P2	197548.5	241278.0	0-0.6m Overburden 0.6--4m Gravel (good clean)
P3	197509.7	241237.9	0-3 to 4m Boulder Clay. Good strong gravel below
P4	197433.4	241255.3	0--5m Boulder Clay
P5	197450.1	241154.9	0-0.05m Overburden 0.05-1 to 2m Good clean Sand 2-5m dobby sandy material
P6	197606.4	241148.3	0-1m Overburden 1-4m Good clean Sand
P7	197560.6	241204.5	0-0.7m Overburden 0.7-6 to 8m Good clean gravelly material
P8	197542.6	241217.0	Boulder Clay to base (not specified) - no gravel
P9	197552.5	241200.3	Good clean gravelly material

Table 1: Trial pitting results

Resistivity (Figs. 3 to 9)

The resistivity survey spatial data is presented on a map showing the line, spread and station location (Figure 3). The processed and interpreted data for each spread is presented as three sections, created using the RESIX 2DINV software. An upper section of measured apparent resistivity, a middle section of calculated apparent resistivities and a lower section of the true depth inverted modelled resistivity (Figures 4-9). Pits have been marked on the sections where they are on or close to the line.

The geology map for this area indicates that the bedrock is Calp Limestone. This is a graded calcarenite with argillaceous bands sometimes with finely disseminated diagenetic pyrite. The argillaceous nature of these limestones would give a relatively low resistivity response (as low as 200ohm-m, G. Reynolds 1995), compared to more resistive dry sandy gravels, as seen on this site in the various trial pits.

Line A (Fig. 4) – A relatively resistive upper zone from the start of the line at stations 0 to 140 correlates with gravels seen in Pit 1. Overburden depths appear to vary somewhat as seen in the conductive surface zones at stations 40 and 75-115. Modelled thickness of the resistive "gravels" are up to ~10m. A conductive zone from surface to depth centred at station 170

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correlates to the Boulder Clays seen in Pit 4. To the southwest of station180 the surface zone is somewhat more resistive again, however not as strong as to the NE. This may correlate to sandy gravels with a clay fraction. The low resistivity zone across most of the base of the Modelled section could be interpreted as a bedrock response of argillaceous limestones or a clay rich horizon.

Line B (Fig. 5) – Good clean gravels in Pit 3 are reflected in 10-20m thick modelled high resistivity zone from the start of the line at stations 0 to ~125m. A conductive surface zone thickest at station 135 corresponds to the boulder clay seen in the upper part of Pit 3. This overlaid good strong gravels (well sorted highly resistive), which are reflected in the resistivity section. To the southwest of station 150 the resistive zone appears to thicken up again (up to 15m below conductive surface zone). The base of the modelled section is low resistivity, which again may reflect argillaceous bedrock or a clay rich horizon.

Line C (Fig. 6) - This spread crosses to the north of the edge of the hilltop. Pit 8 encountered all boulder clay, which may be reflected in the narrow surface zone of less resistive data centred at station 100. Most of the line has a relatively thick (up to 12m) upper zone resistive response, which correlates with the sands and gravels intersected in Pit 5 at station 200. This pit intersected an upper zone of good clean gravels with "dobey" (clayey) sandy material below. These dobey sands appear to outcrop at station 210 based on lower resistivities detected at this point.

Line D (Fig. 7) – Most of this modelled section shows a good upper resistive layer corresponding to thick gravels and sands, as seen in Pits 6 &7(up to 15m in the NE thinning to 10-12m in the SW). Varying thickness (0.5-5m) in overburden clays or boulder clays from station 130 to station 175 may be encountered. The upper resistive layer is again overlying a less resistive lower layer, possible bedrock argillites or clays.

Line E (Fig. 8) – Profile E was surveyed along the southern boundary of the site. This is at a lower elevation, with the thickness of the upper resistive zone thinner than seen in the lines to the north (8-10m). Poor ground contact resistivities around station 160 (due to very dry rocky surface zone with minimal soil/electrode contacts – all electrodes were watered to improve contacts, however in this instance the contacts remained poor) may have given rise to anomalous results here, with apparent high resistivities to depth here.

Line F (Fig. 9) – A short 120m spread was surveyed to fill a gap in the data at this part of the site. Overburden/clays at surface from stations 0-30 and 80-100 appear to be as much as 5m deep. These overlie a more resistive zone, which has not been penetrated by the shorter

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spread. However, the resistivities correlate to values seen on the other spreads, which correspond to sands/gravels seen in trial pits.

5. Conclusions

The resistivity profiles measured here concur with the complexity of the results from the trial pits completed on this site. Overburden and boulder clay horizons undulate across the site, as do the sands and gravels. It is not possible to differentiate between the sands and gravels with this resistivity technique, as their signatures are similar, however the deposits of sand/gravel do appear to be extensive based on the resistivity and trial pits completed to date.

The resistive upper zone correlated to the sands/gravels from trial pitting appears to thicken in the range of 8-20m in the modelled sections completed here. Surface resistivity zones, particularly low resistivity surface clays, which have a negative impact on penetration, affect the depth of penetration of this system.

Further testing could include:

- EM-31 conductivity surveys to map the extent of surface clays
- Drillhole to test inferred bedrock/clay horizon, with standpipe piezometer installed to monitor water level fluctuations necessary to plan site development

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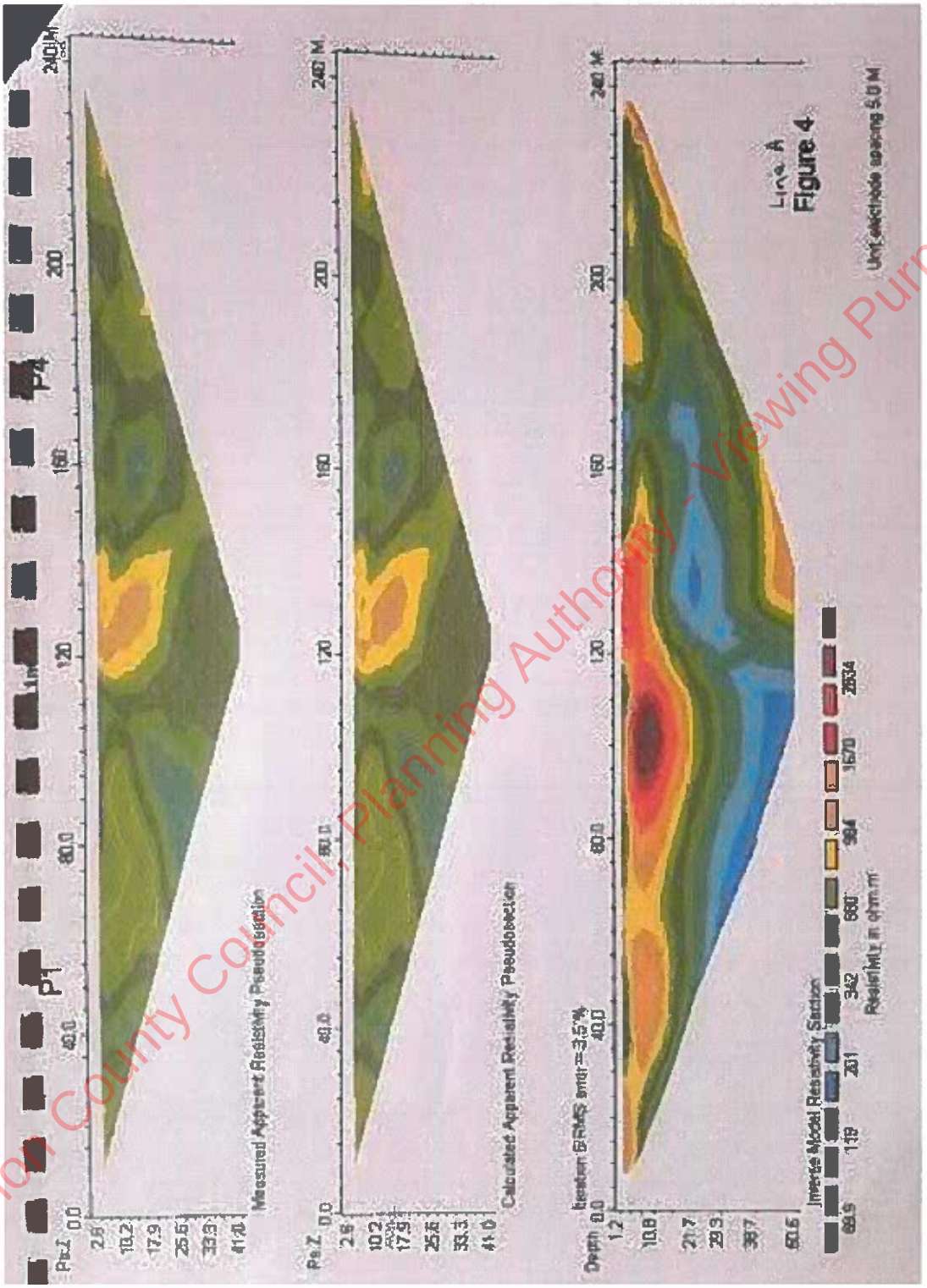

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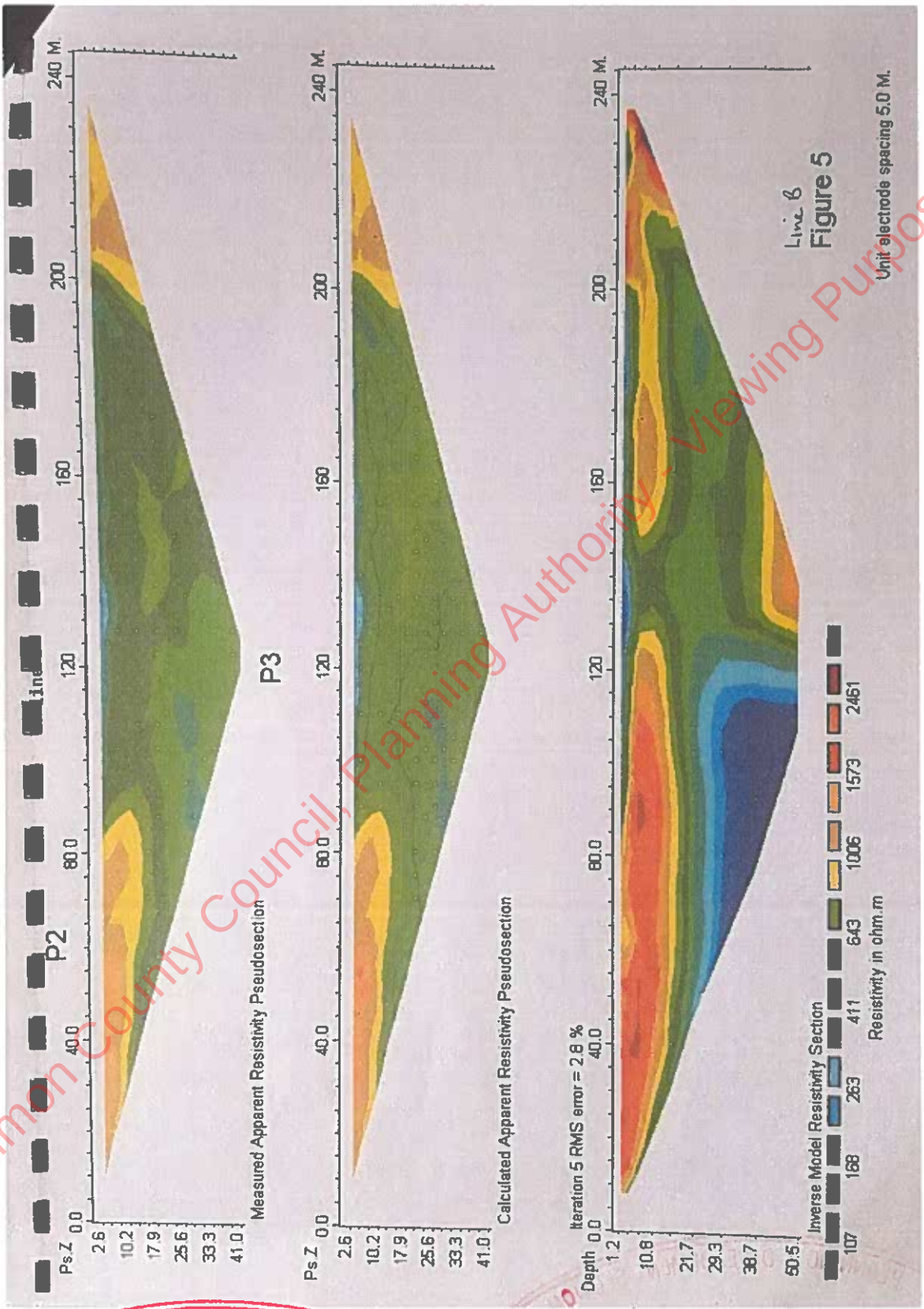

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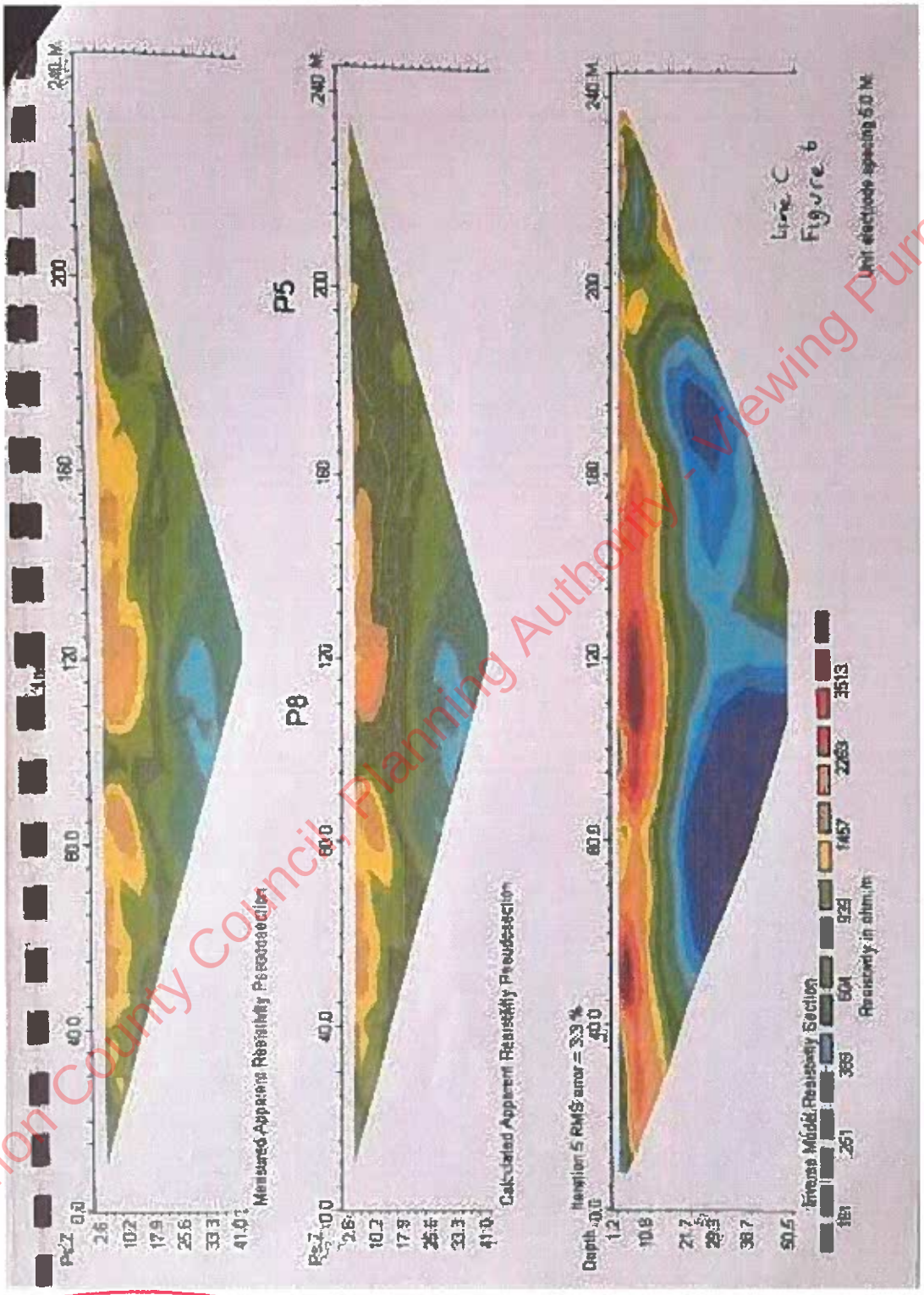

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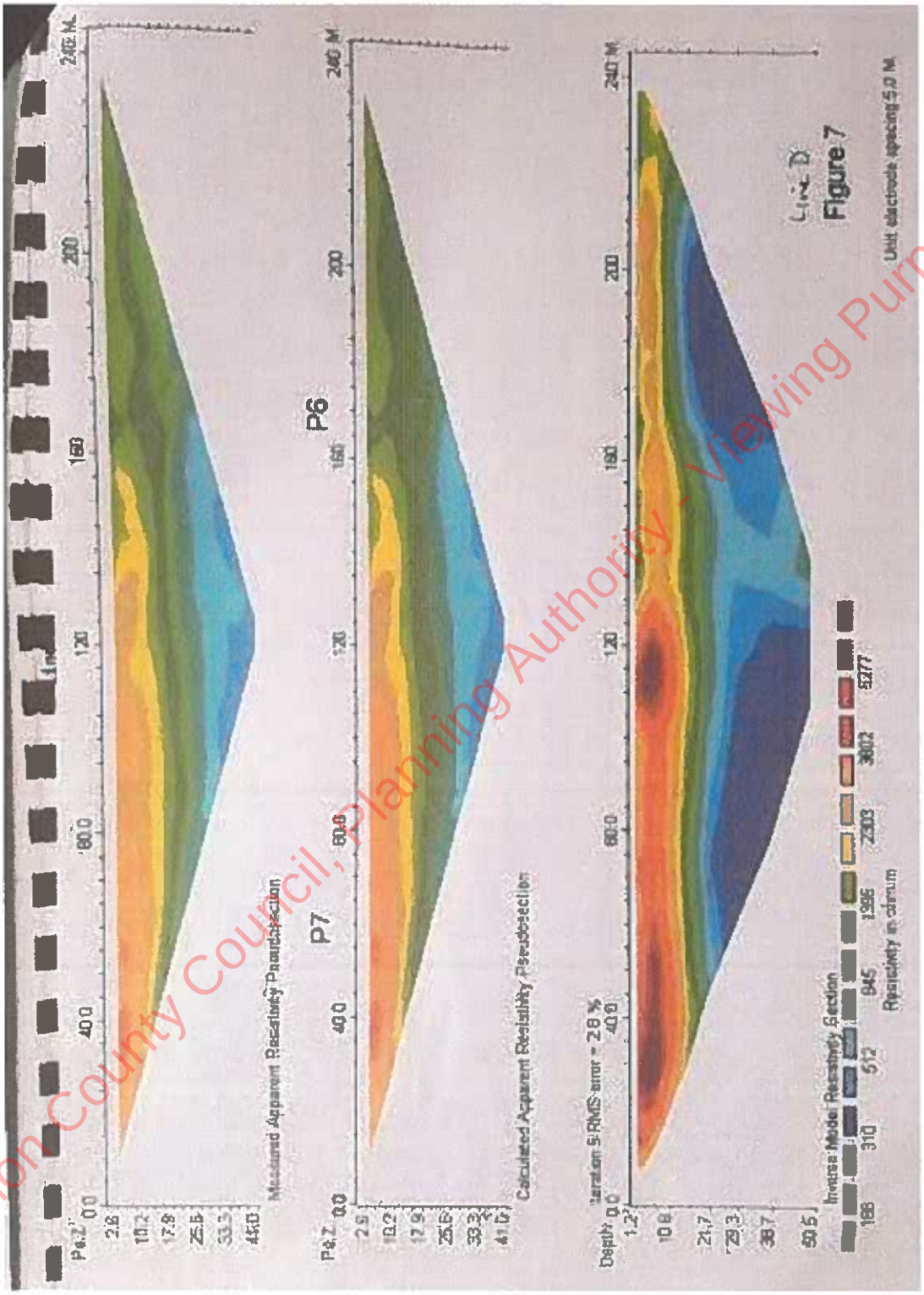

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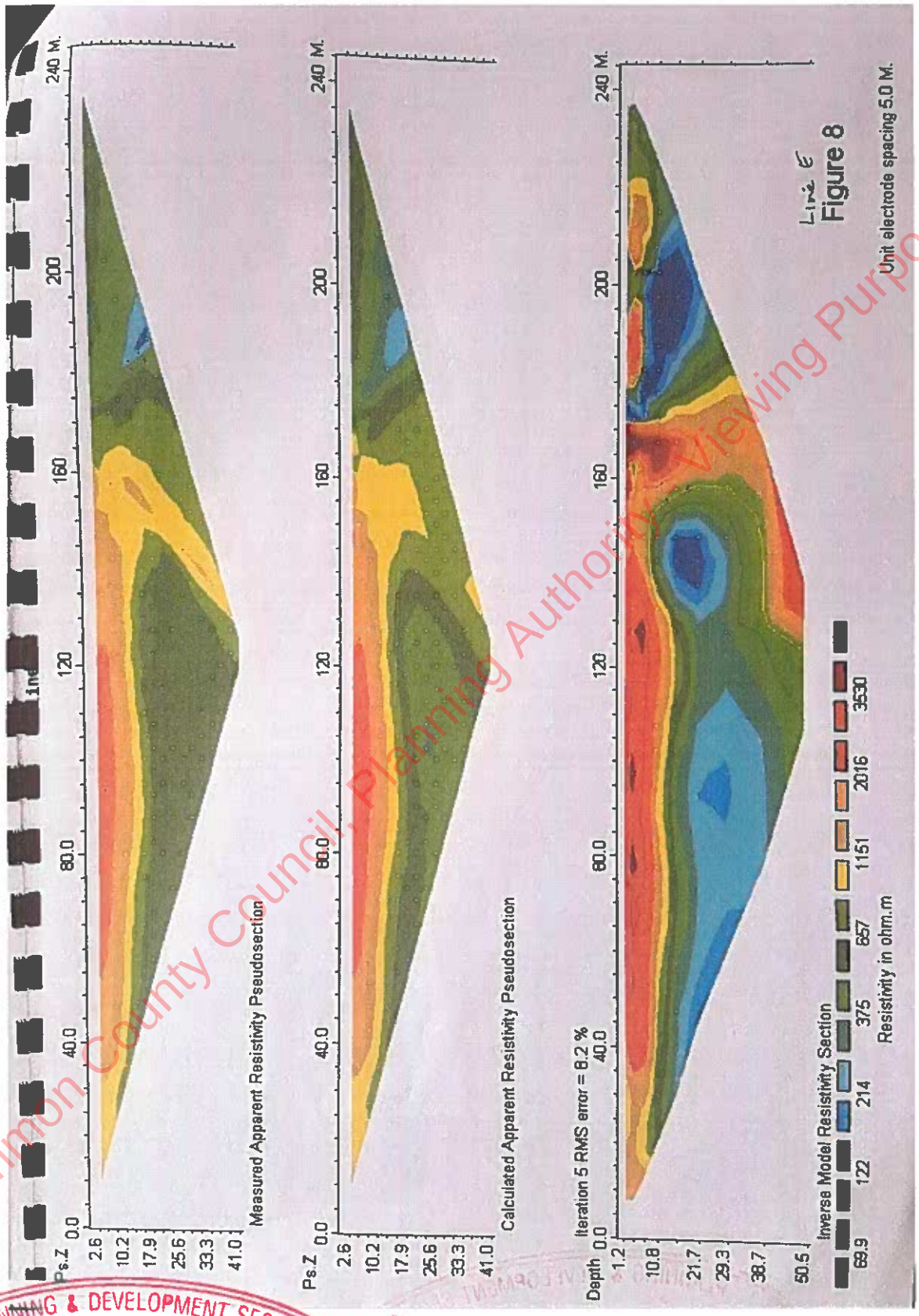

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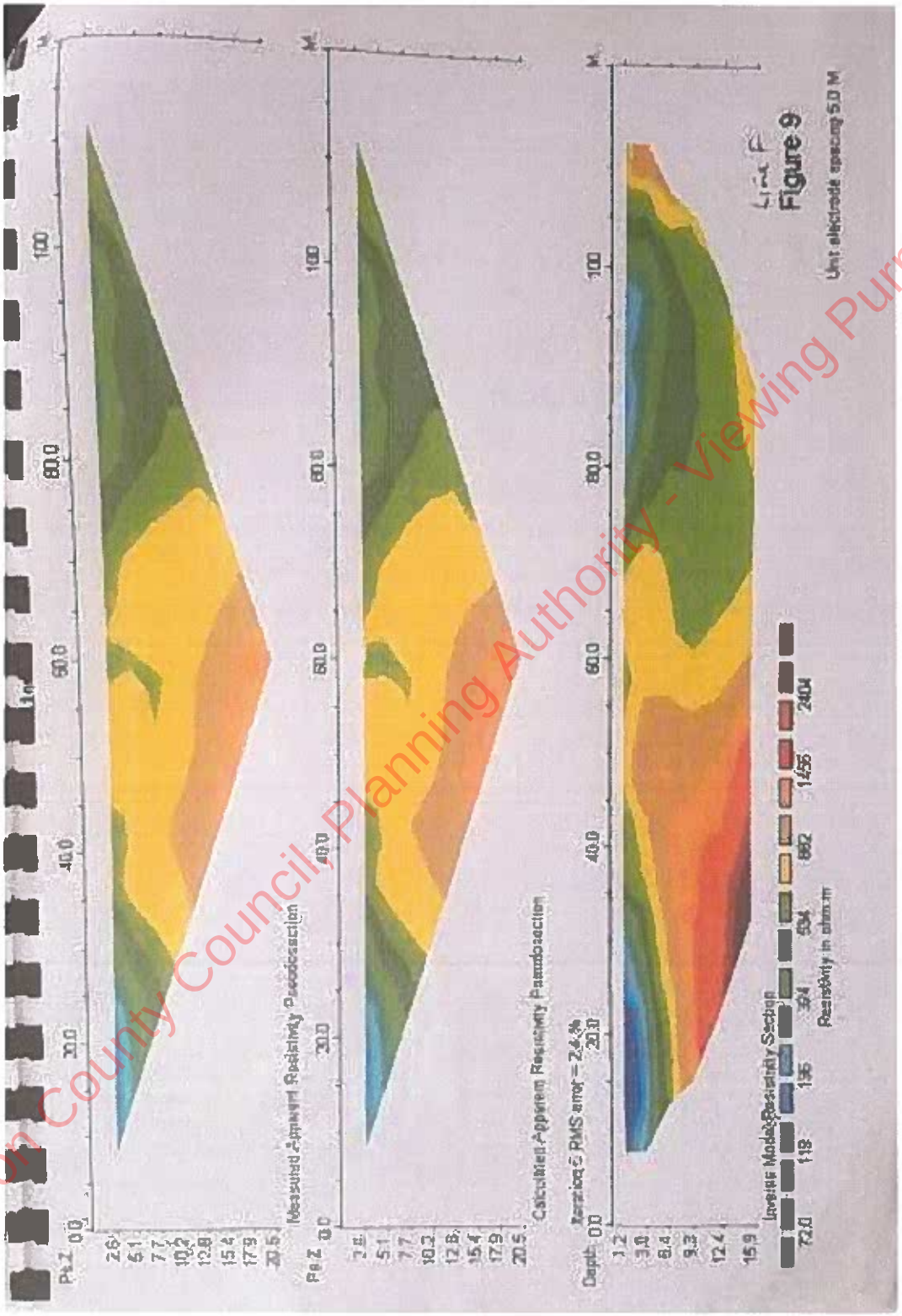

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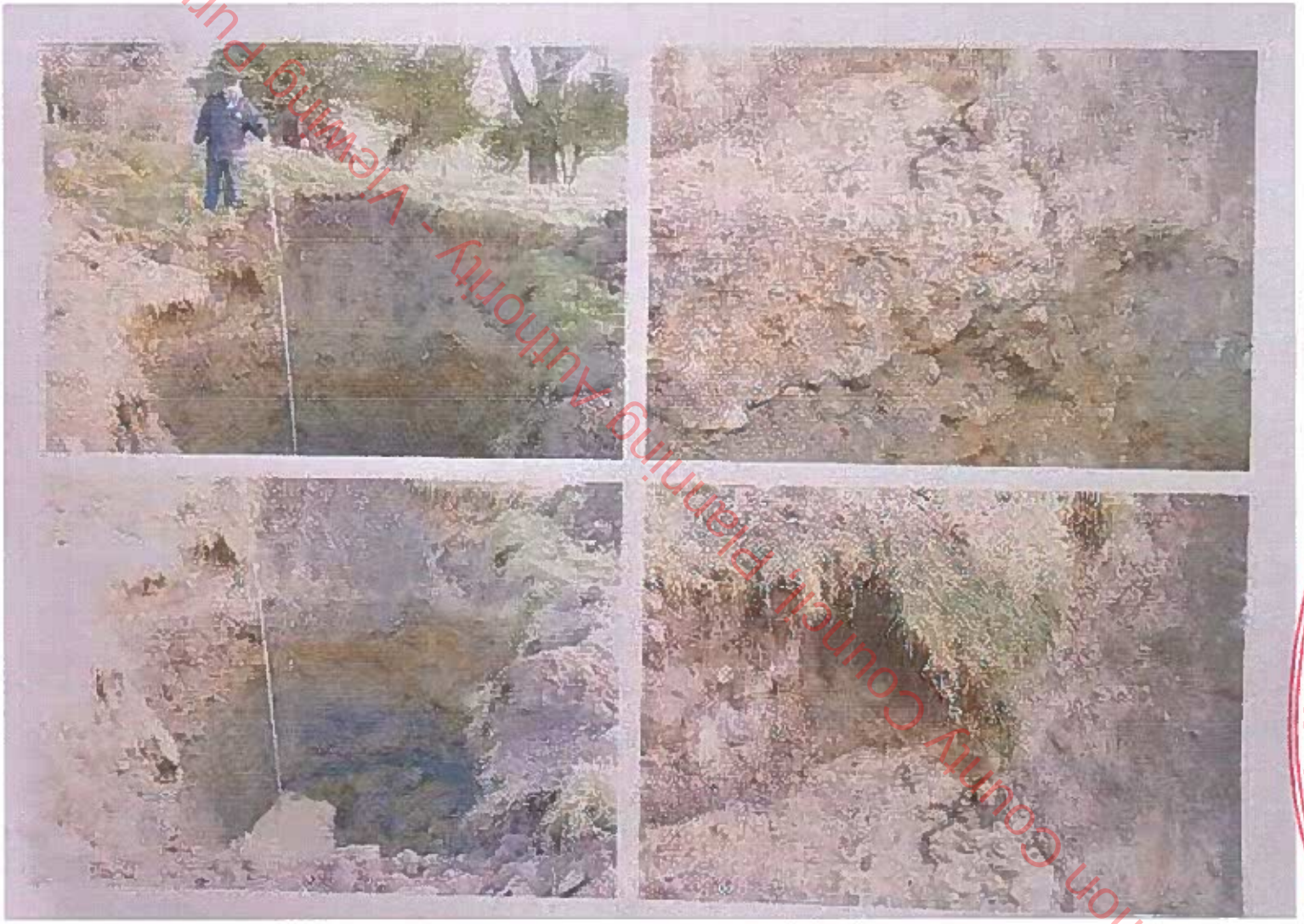

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Rooskagh Quarry – EIAR Chapter 6 Land/Soils (Geology)

Appendix 6.6 – VCL Site Walkover Photographs

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Photo 01: View of NE corner of site area – adjacent to access road beside the Kildea Concrete Works.

Photo 02: View East of old road, now over grown, which forms the northern boundary of the site. (This old road is to be retained and the quarry edge is outside (south) of this feature.)

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Photo 03: View along the eastern boundary and lowest part of the site.
(This area will accommodate the carpark, office, weighbridge, wheel wash and surface water pond.)

Photo 04: View SW from site access of eastern end of esker feature and high point of site.

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Photo 05: View East from top of ridge – eastern boundary by first hedge line.
(Tilled field in back ground is underlain by Glacial Till rather than fluvio-glacial sand & gravel sediments.)

Photo 06: View West along the top of the esker ridge – note how it continues for some distance.
(Site boundary is at the first stone wall and hedge line in the picture.)

Photo 07: View East back along the esker ridge towards the slight cone shaped high point of the site.

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Photo 08: View north from ridge of site area and adjacent Kildea Concrete Plant. (Site access is shown by blue arrow).

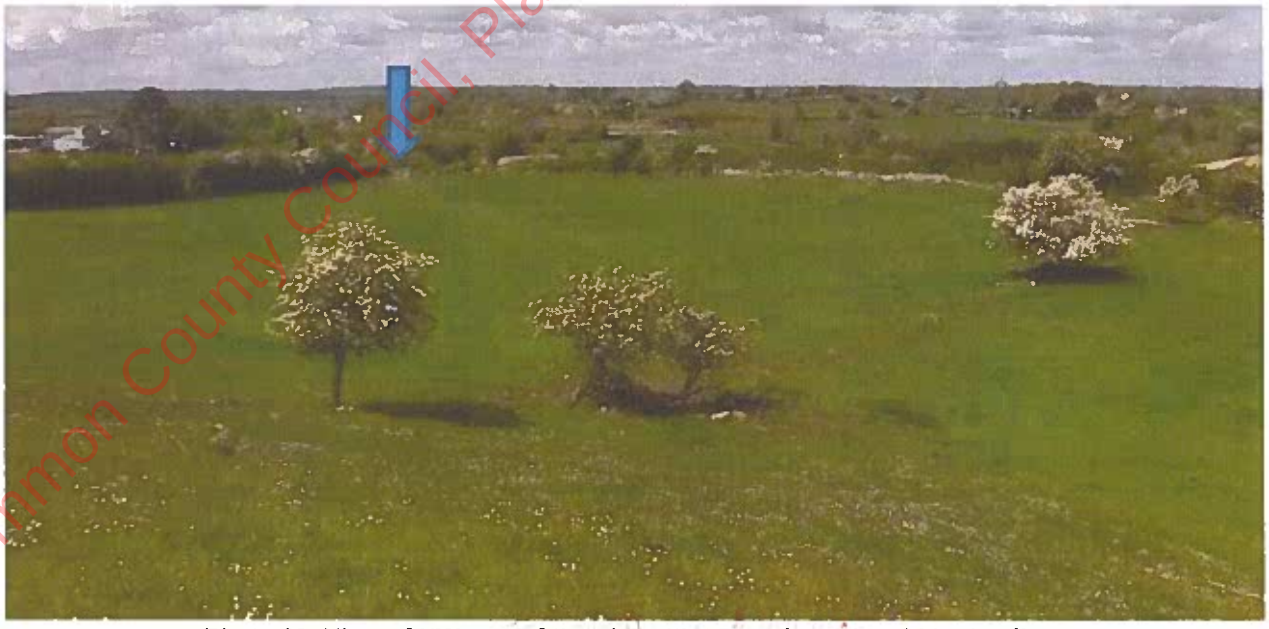

Photo 09: View of NW part of the site with trees along the old hedge line. (Note access gate shown by blue arrow.)

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Photo 10: View of NW corner of site along old wall and gate pillar beside old roadway/track.

Photo 11: View East along the southern boundary of the site wit top of esker ridge visible.

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Photo 12: View of exposure of fluvio-glacial deposits in the recently excavated ground on the Kildea site.

Photo 13: View of new excavation of northern side of esker feature on the adjacent Kildea Concrete site.

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Photo 14: View south of steep excavated face of fluvio-glacial deposits in Kildea Concrete Plant. (Note benching in upper part of slope to increase the stability).

Photo 15: View north of steep exposure of sands and gravels on the Kildea Concrete Plant.

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Rooskagh Quarry – EIAR Chapter 6 Land/Soils (Geology)

Appendix 6.7 – GSI Bedrock Mapping

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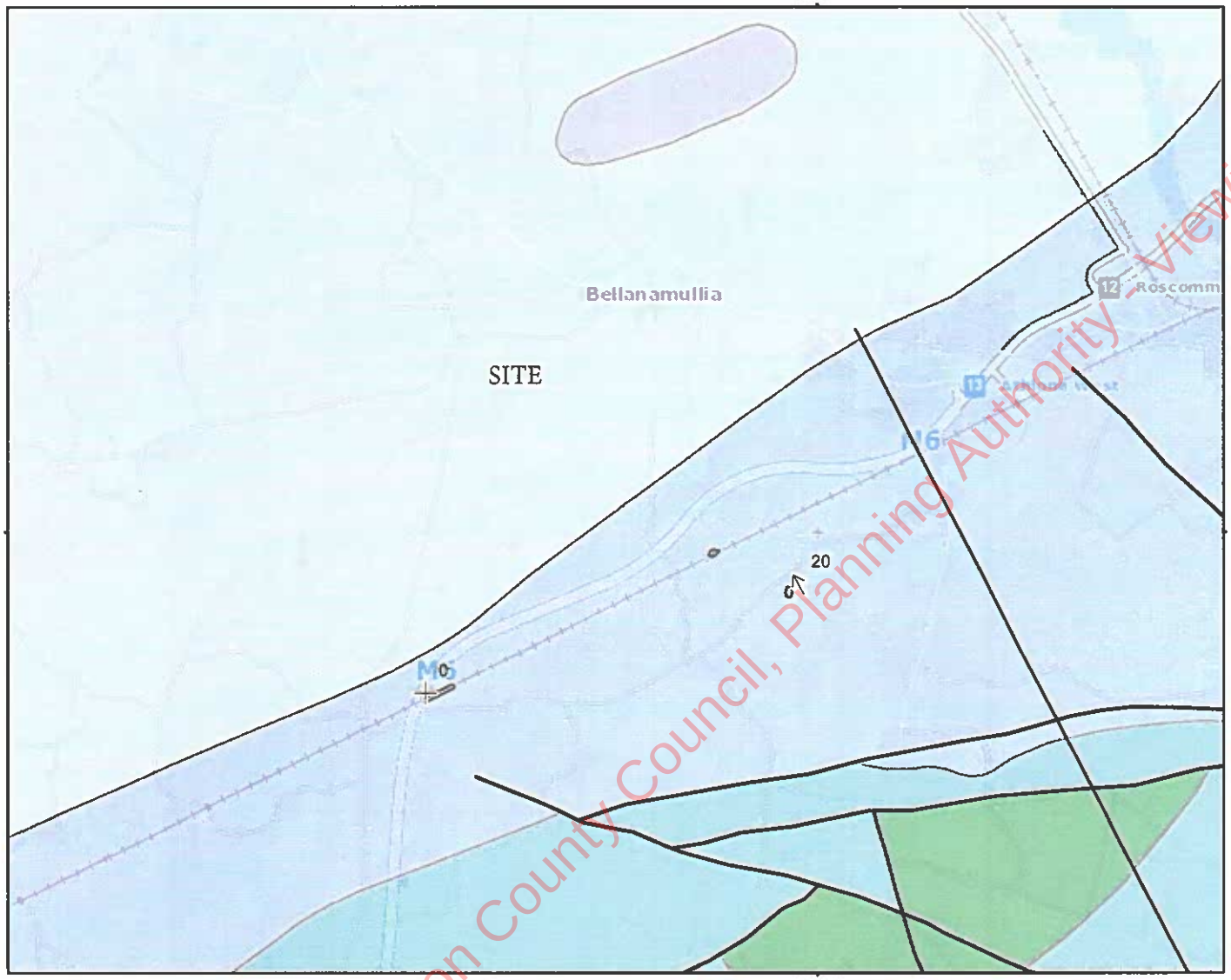
Rooskagh Quarry - GSI Bedrock Geology Mapping



Legend

Structural Symbols 100K ITM 2018

- Dip of bedding or main foliation, old GSI data
- Horizontal Bedding
- Bedrock Outcrops 100 ITM 2018

Bedrock Linework 100k ITM 2018

- Fault
- X-Section

Bedrock Polygons 100k ITM 2018

- Ballysteen Formation
- Navan Beds
- Visean Limestones (undifferentiated
- Waulsortian Limestones
- Mudbank limestone

Scale: 1:50,000

Geological Survey Ireland

0 0.35 0.7 1.4 mi
0 0.5 1 2 km

Map Centre Coordinates (ITM) 598,401 740,338
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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
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Rooskagh Quarry - GSI Bedrock Mapping

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01/07/2021, 15:24:06

0 0.175 0.35 0.7 mi
0 0.275 0.55 1.1 km

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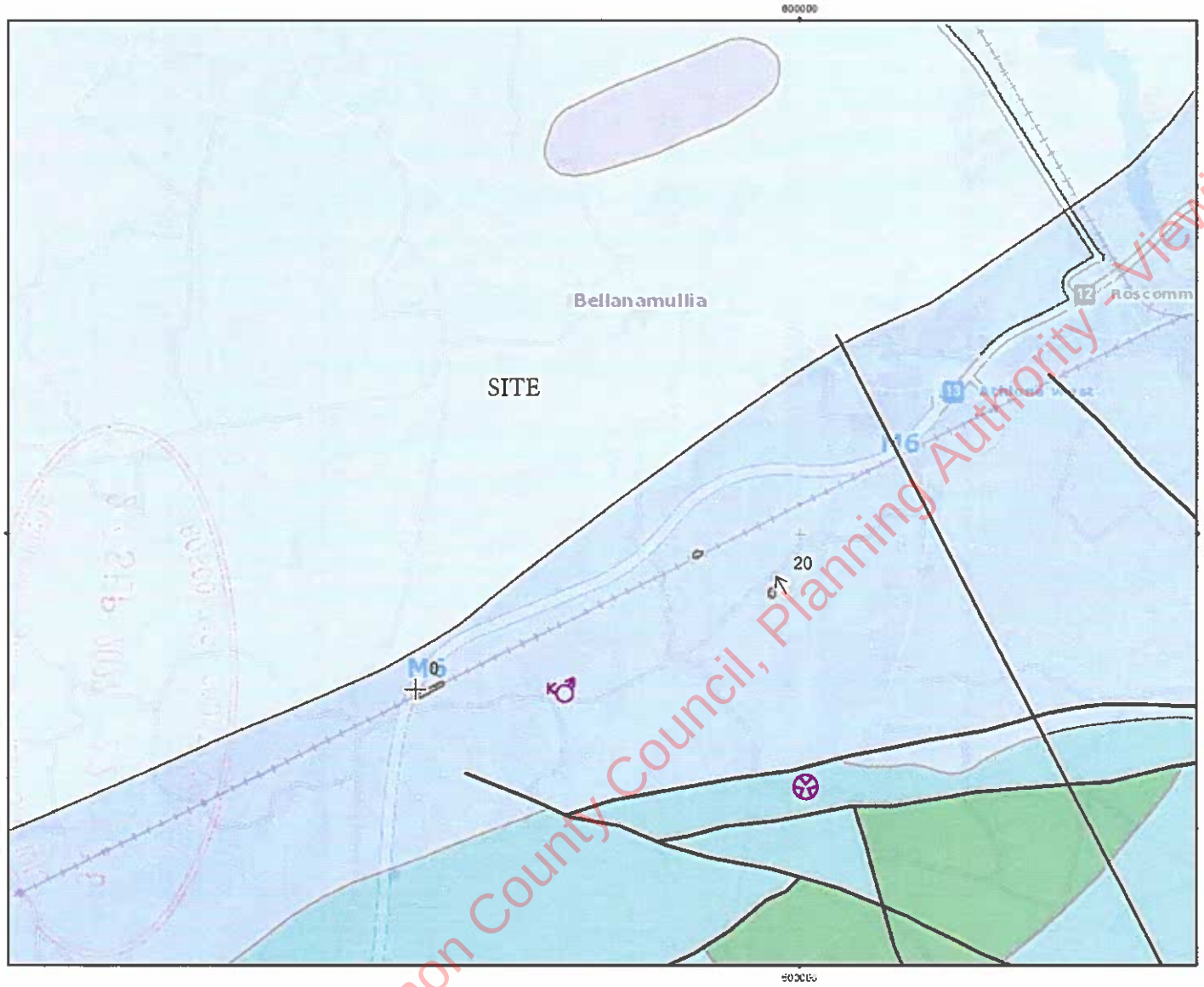
Rooskagh Quarry - GSI Karst Features Mapping



Legend

Karst Landforms

- Enclosed Depression
- Spring

Structural Symbols 100K ITM 2018

- Dip of bedding or main foliation, old GSI data
- Horizontal Bedding
- Bedrock Outcrops 100 ITM 2018

Bedrock Linework 100k ITM 2018

- Fault
- X-Section

Bedrock Polygons 100k ITM 2018

- Ballysteen Formation
- Navan Beds
- Visean Limestones (undifferentiated
- Waulsortian Limestones
- Mudbank limestone

Scale: 1:50,000

Geological Survey Ireland

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0 0.5 1 2 km

Map Centre Coordinates (ITM) 598,401 740,338
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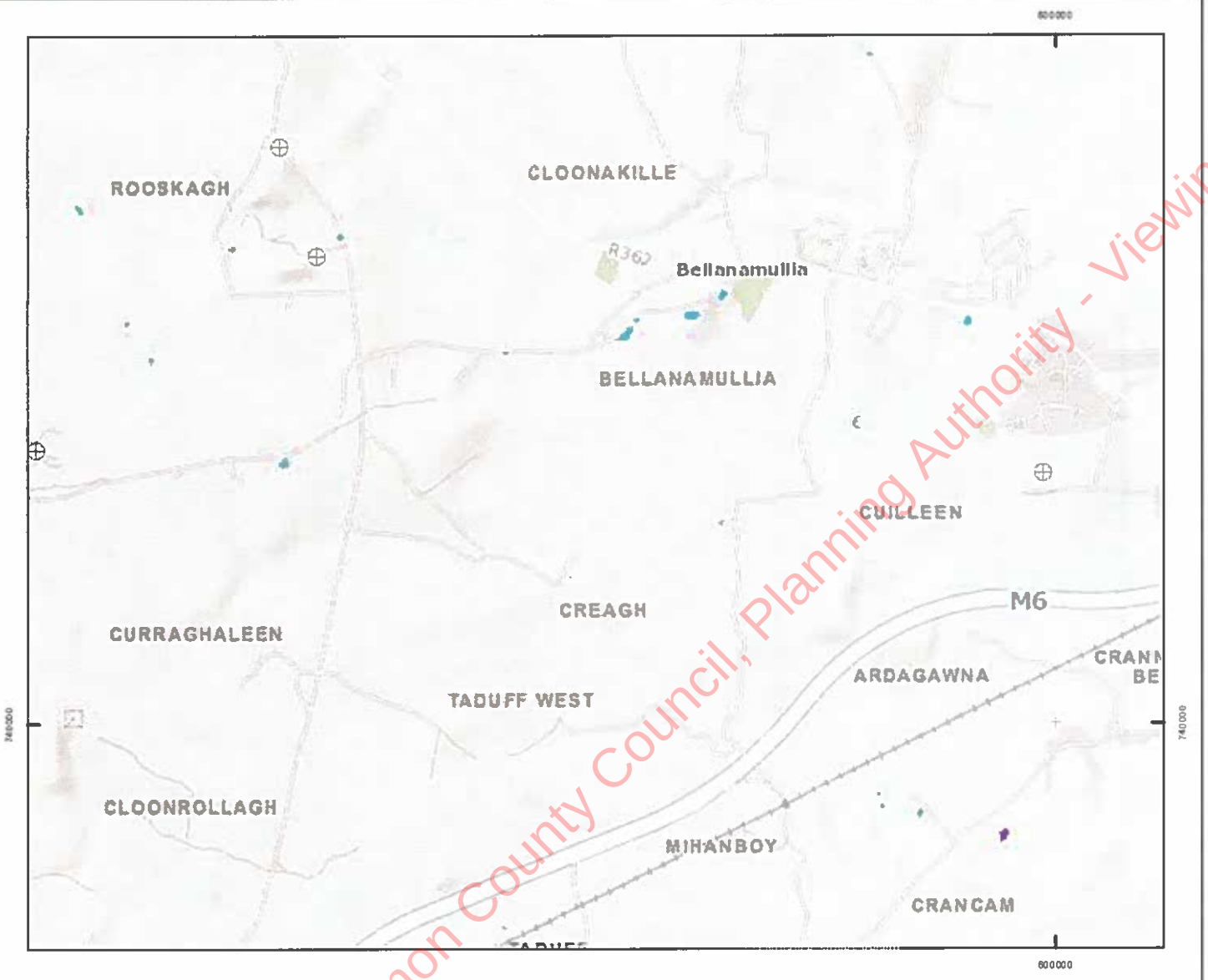
Rooskagh Quarry - GSI Quarry Records



Legend

Historic Pits and Quarry Locations

- Pit
- Quarry
- Brickfields
- No Info

Pits and Quarries Areas

- Planning Applications 2004-13: Pits
- Documented 2003: Pits (Cos. Meath, Wicklow)
- Late 20thC: Pits (Cos. Wicklow, Wexford)
- Documented c. 1970: Pits (Cos. Kildare, Wicklow)
- Mid-Late 20thC: Pits
- Mid-20thC: Pits
- Early to Mid-20thC: Pits
- Early 20thC: Pits (Cos. Dublin, Kilkenny)
- Late 19th to Mid-20thC: Pits
- Mid-Late 19thC: Pits
- Mid-19thC: Pits
- Planning Applications 2004-13: Quarries
- Documented 2003: Quarries (Cos. Meath, Wicklow)
- Early 20th to Early 21stC: Quarry (Co. Kerry)
- Late 20thC: Quarries
- Documented c. 1970: Quarries (Co. Wicklow)
- Mid-Late 20thC: Quarries
- Mid-20thC: Quarries
- Early to Mid-20thC: Quarries
- Late 19th to Mid-20thC: Quarries
- Mid-19th to Mid-20thC: Quarry (Co. Kerry)
- Mid-19th to Early 20thC: Quarry (Co. Cork)
- Mid-Late 19thC: Quarries
- Mid-19thC: Quarries

Scale: 1:25,000

Geological Survey Ireland

PSI Licence

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0 0.275 0.55 1.1 km

Map Centre Coordinates (ITM) 598,102 740,952

04/07/2021, 17:57:28

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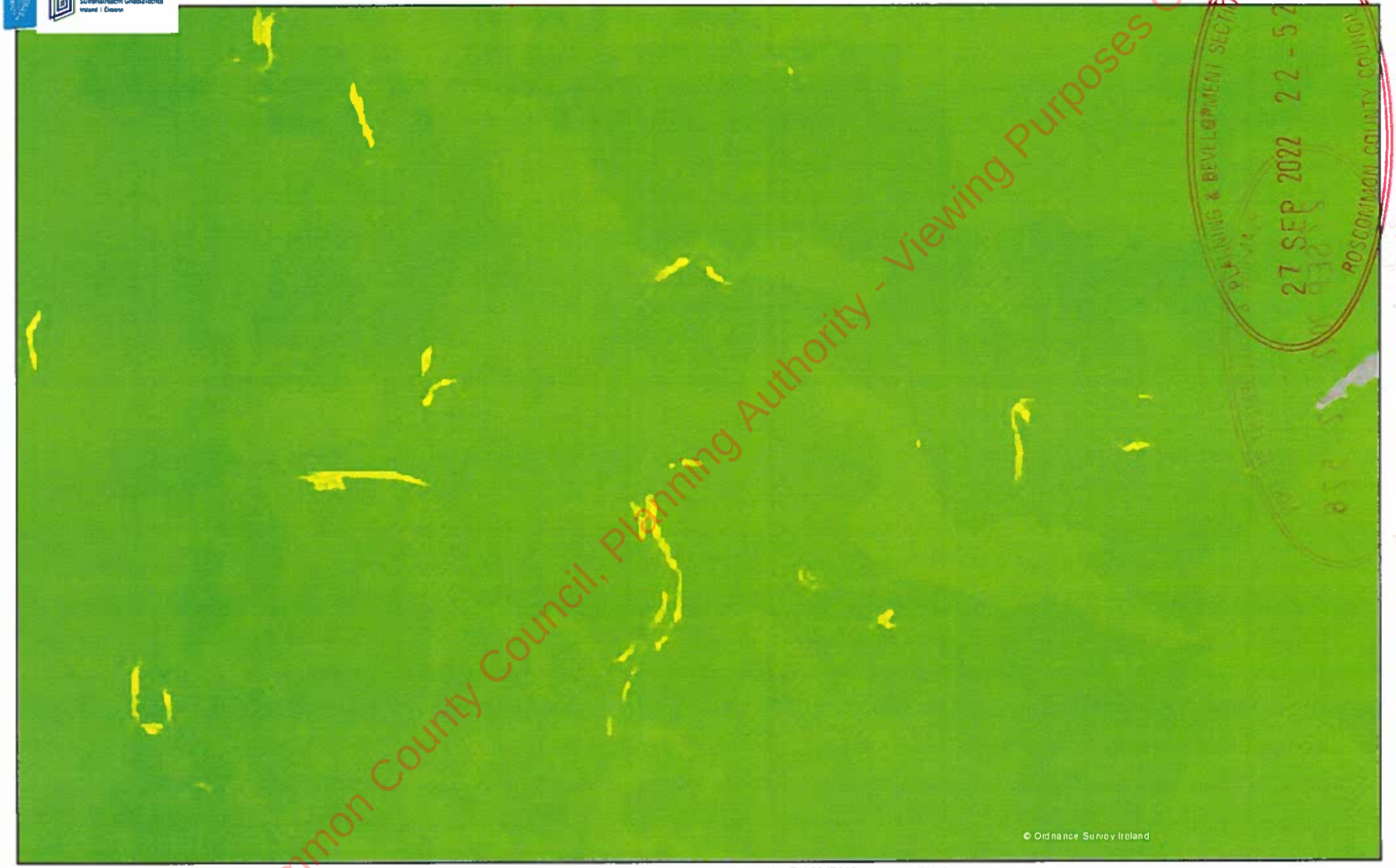
GSI Landslide Susceptibility Map



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04/07/2021, 00:59:20

0 0.175 0.35 0.7 mi
0 0.275 0.55 1.1 km

532

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Rooskagh Quarry – EIAR Chapter 6 Land/Soils (Geology)

Appendix 6.8 – GSI Heritage Mapping & IGH7 Report

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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
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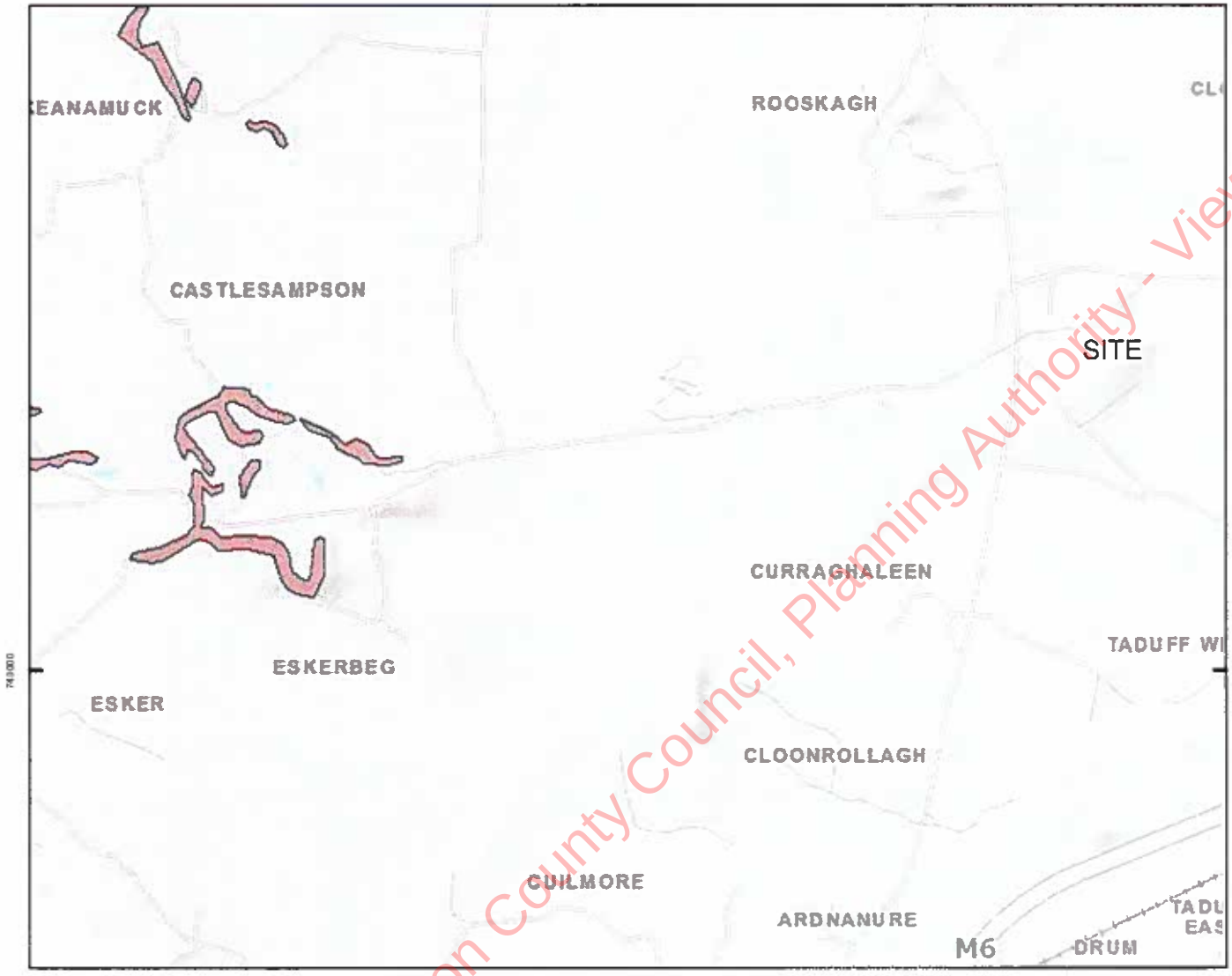
Rooskagh Quarry - GSI Geological Heritage



Legend
Geoheritage Audited Sites

Scale: 1:25,000
Geological Survey Ireland
PSI Licence

0 0.175 0.35 0.7 mi
0 0.275 0.55 1.1 km

Map Centre Coordinates (ITM) 595,619 740,713
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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
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ROSCOMMON - COUNTY GEOLOGICAL SITE REPORT

NAME OF SITE	**Castlesampson Esker**
Other names used for site	Onagh Esker
IGH THEME	**IGH7 Quaternary**
TOWNLAND(S)	**Tobermacloughlin, Onagh, Kilkenny, Castlesampson, Carrowkeeran, Eskerbeg**
NEAREST TOWN	**Athlone, Ballyforan**
SIX INCH MAP NUMBER	**48, 51**
NATIONAL GRID REFERENCE	**192000 241240 (centre of features)**
1:50,000 O.S. SHEET NUMBER	**47 1/2 inch Sheet No. 15**

Outline Site Description
This esker trends west-northwest to east-southeast in south Roscommon, occurring south of the R363 road between Ballyforan and Athlone.

Geological System/Age and Primary Rock Type
The esker is formed on bedrock which is Lower Carboniferous limestone. The feature itself is Quaternary in age, having been deposited at the base of the ice sheet moving northwest to southeast during early deglaciation after the last Ice Age.

Main Geological or Geomorphological Interest
The Castlesampson esker is an excellent example of a complex, multi-crested esker which is comprised of numerous beads. The esker system comprises ten individual segments, which stretch for a distance of just over six kilometres. The most complex portion of the longest bead (3.5km) has at least four crests. The esker has a very complex, generally sinuous morphology. The feature interfingers with many flanking fans and deltas, with a pronounced kame-kettle topography in places. Many of the kettle holes host lakes.

The esker was probably deposited as a series of fans, which formed at the mouth of a subglacial tunnel as the ice progressively retreated towards the northwest in this area of Roscommon. Several fans, deltas and kames flank the feature.

Site Importance – County Geological Site
The esker is one of Ireland's best examples of the 'long beaded' esker type.

Management/promotion issues
This report gives proper recognition to the geomorphological component of a site that is already conserved for its grassland natural heritage as SAC and proposed NHA (Site Number 001625).

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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
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Scrub vegetation on a bead of the Castlesampson esker system.

Reclaimed gravel pit within the Castlesampson esker system.

Bare gravels outcropping on the summit of the Castlesampson esker. See the sinuous nature of the feature as it winds away into the distance.

Two distinct beads of the Castlesampson esker system.

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27 SEP 2022 22-526
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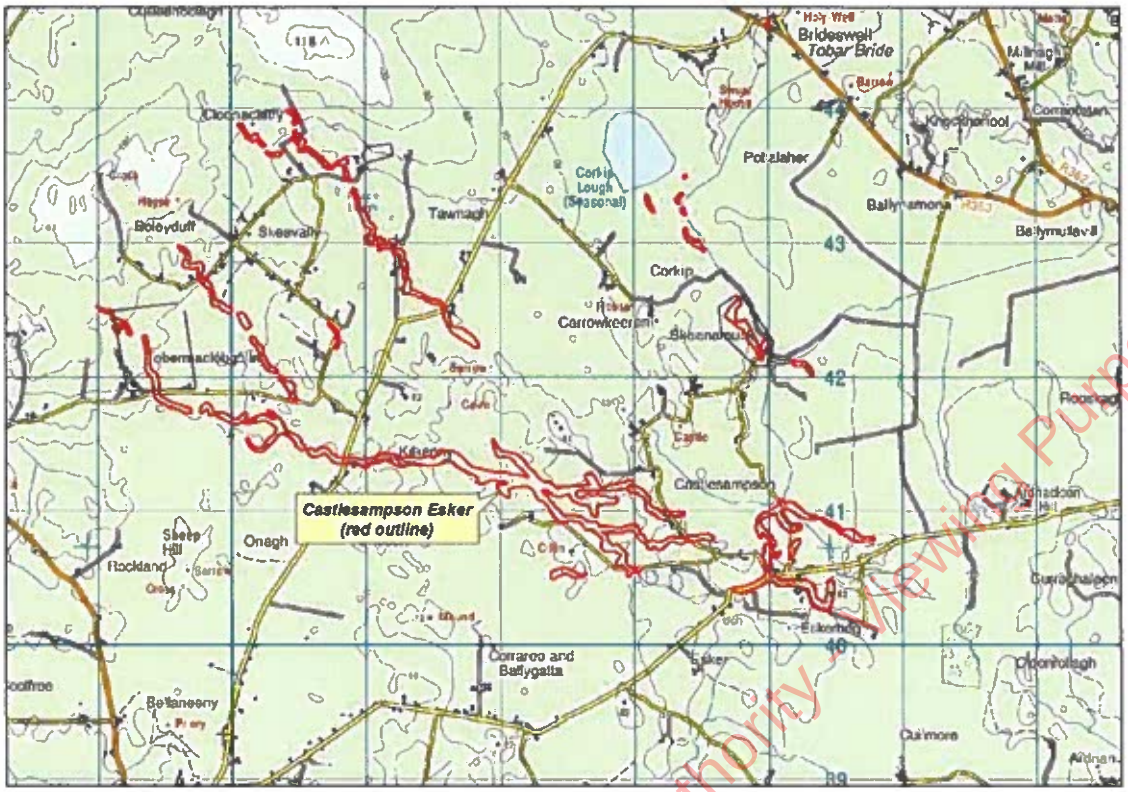

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Rooskagh Quarry – EIAR Chapter 6 Land/Soils (Geology)

Appendix 6.9 – Collins Boyd Site Layout & Cross Sections

Roscommon County Council, Planning Authority - Viewing Purposes Only!

PLANNING & DEVELOPMENT SECTION
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ORDNANCE SURVEY OF IRELAND LICENCE NUMBER CYAL50211192 © Ordnance Ireland/Government of Ireland

==========

For extents of site refer to proposed site masterplan 22.137-010A

For Planning Purposes Only

LANDOWNERSHIP IN BLUE
SITE OUTLINED IN RED
RIGHT OF WAY

Area of Site:
69,381 Sq/m
17.2 Acres
6.938 Hectares

ITM: 597452, 741243

SCALE BAR 1:500

0 10m 20m 30m 40m 50m 60m 70m 80m 90m 100m

GATEWAY
DECIDUOUS TREE DRAWN TO SIZE
SEWER MANHOLE & DETAILS
GULLY AND DETAILS
FENCE
ESB COVER
EIRCOM COVER
SPOTHEIGHT & ELEVATION
FIRE HYDRANT
STOP VALVES
BUILDING
ESB/EIRCOM POLE & CABLE
TREES/TREELINE
DITCHLINE
HEDGELINE
WALL
EMBANKMENT
EXTRACTION AREA
PROPOSED TOPSOIL STOCKPILE
PROPOSED TARMACADAM
PROPOSED CONCRETE
PROPOSED HARDSTANDING AREA
PROPOSED SETTLEMENT POND
STOCKPROOF POST & WIRE FENCE
2.4m HIGH WELDED MESH FENCE
OUTLINE OF EXTRACTION AREA
SIGHTLINES

60m Buffer zone from adjacent property denoted thus.

Proposed new stock proof fence. Refer to boundary treatment layout for details of boundaries.

For extents of lands under the control of the applicant refer to the site location maps.

Proposed new weld mesh fence. Refer to boundary treatment layout for details of boundaries.

Existing hedge to be removed/cut back as required to achieve required sight-lines within the landownership of the applicant.

Wayleave marked in yellow. Refer to letter from solicitor for further details.

Location of site notice Nr. 2.

For details of proposed entrance walls refer to Site Entrance drawing 21.137-017.

60m SIGHTLINE

Proposed entrance gate. Refer to site entrance drawing for details.

Roadside boundary to be set back 3m from metalled edge of existing road. Road to be extended to meet new boundary.

Staff and visitor car park

Small vehicles queuing area.

Proposed topsoil stockpile for re-use during reinstatement phase.

For details of lighting and lighting layout refer to specification attached to application.

Top of slope denoted thus.

Bottom of slope denoted thus.

For details of proposed weighbridge, refer to drawing 21.137-019.

For details of proposed office building, refer to drawing 22.137-030.

For details of proposed toilet building, refer to drawing 22.137-031.

For details of proposed soakaway, refer to drawing 21.137-020.

For details of proposed wastewater storage tank, refer to drawing 21.137-022.

For details of portable wheelwash, refer to drawing 21.137-018.

Petrol Interceptor

Hardstanding graveled area.

Inspection Manhole on overflow outfall to soakaway

For details of proposed silt trap manhole, refer to drawing 22.137-020.

For details of proposed re-fuelling/petrol interceptor, refer to drawing 21.137-020.

Stockpiling area.

15m x 10m x 2m Dp. Soakaway to take water from settlement tank overflow

Outline of Extraction area

Soil embankment surrounding the settlement pond.

2m High weld mesh fencing surround settlement pond. New 6m wide gates to facilitate access on western end of pond.

Proposed well with manhole cover surrounded in concrete slab refer to drawing 22.137-033

Overflow pipe from settlement pond taken from clean water side

2m High weld mesh fencing surrounding settlement pond.

Site outlined in red.

Section-05

Section-0

01 02 03 04 05

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3. All works to be carried out in accordance with the current building control act and building regulations.
4. Clients are obliged to forward a commencement notice to the local authority at least 14 days prior to the commencement of any works on site.
5. Consultants to be informed immediately of any discrepancies before work proceeds.

NOT FOR CONSTRUCTION

Revisions

Rev	By	Date	Description
PL0	MD	16.09.22	Issued for Planning

Client:
Eamon Harney

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

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ENGINEERS & ARCHITECTS
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Co.Roscommon
F42 V344
Phone: 090 6634421
Fax: 090 6634423
Email: info@collinsboydeng.com

Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Proposed Site Layout Sheet 1

Status	Planning
Date:	July 2022
Scale:	1:500 @ A1
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	010B	PL0

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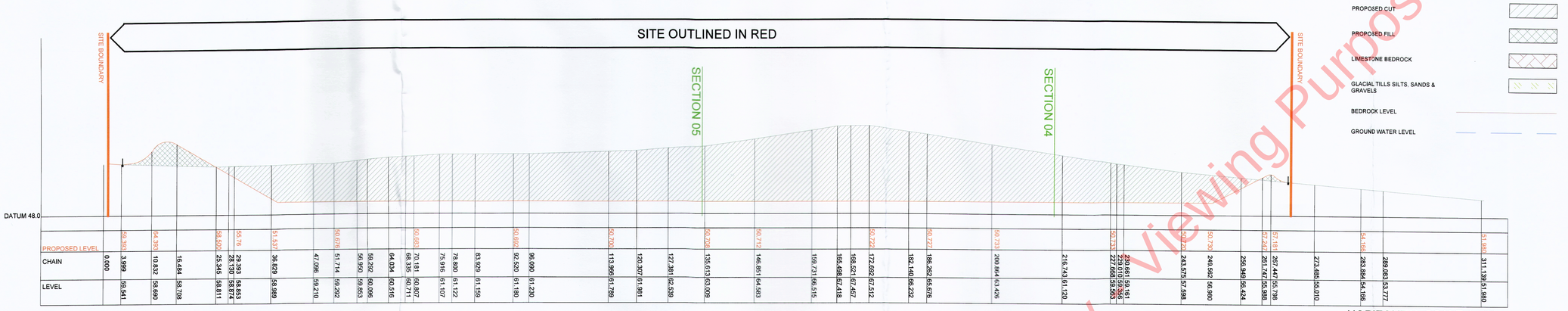
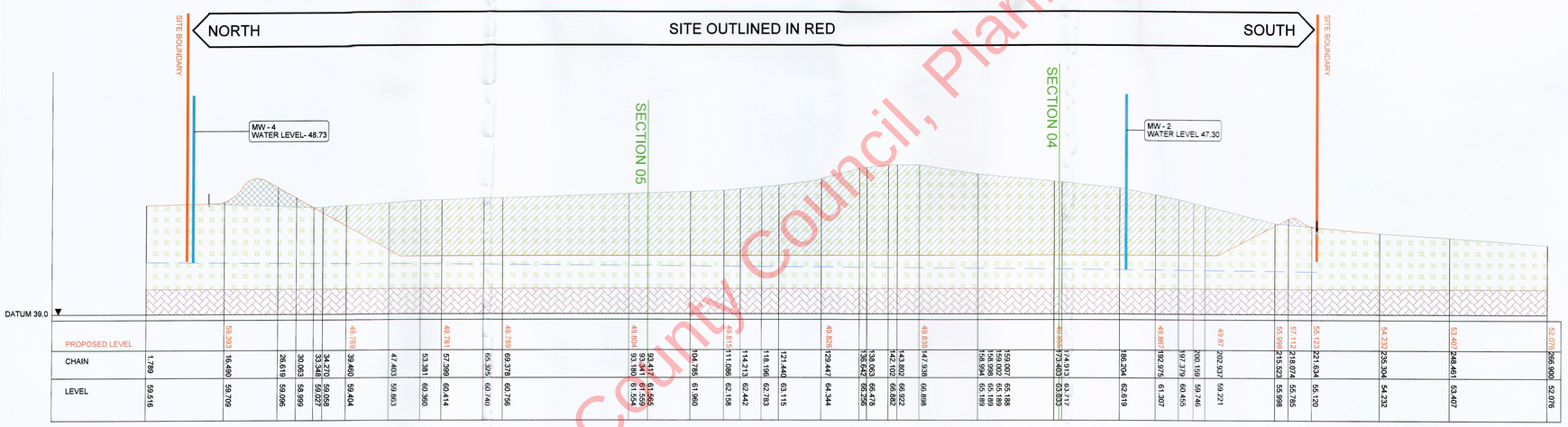


Section-01

HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:500



Section-02

HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:500

LEGEND

- PROPOSED FINISHED LEVEL
- EXISTING LEVEL
- PROPOSED CUT
- PROPOSED FILL
- LIMESTONE BEDROCK
- GLACIAL TILLS SILTS, SANDS & GRAVELS
- BEDROCK LEVEL
- GROUND WATER LEVEL

Notes:

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Revisions

Rev	By	Date	Description
PL0	MD	16.09.22	Issued for Planning

Client:
Eamon Harney

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27 SEP 2022 22-526
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Fax: 090 6634423
Email: info@collinsboydeng.com

Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Proposed Site Sections - Sheet 1

Status	For Planning
Date:	27/07/2022
Scale:	1:500 @ A1
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	014	PL0

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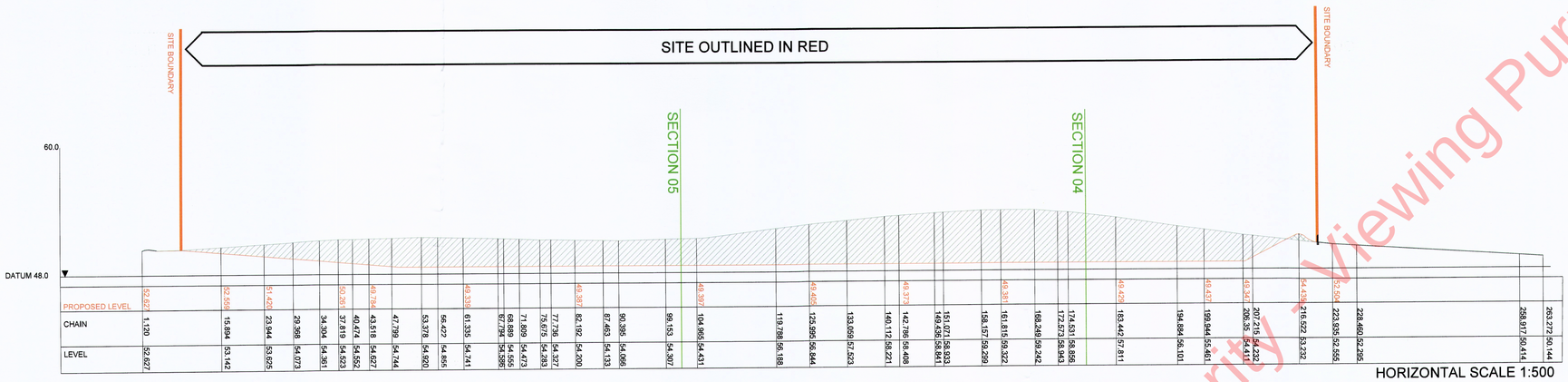
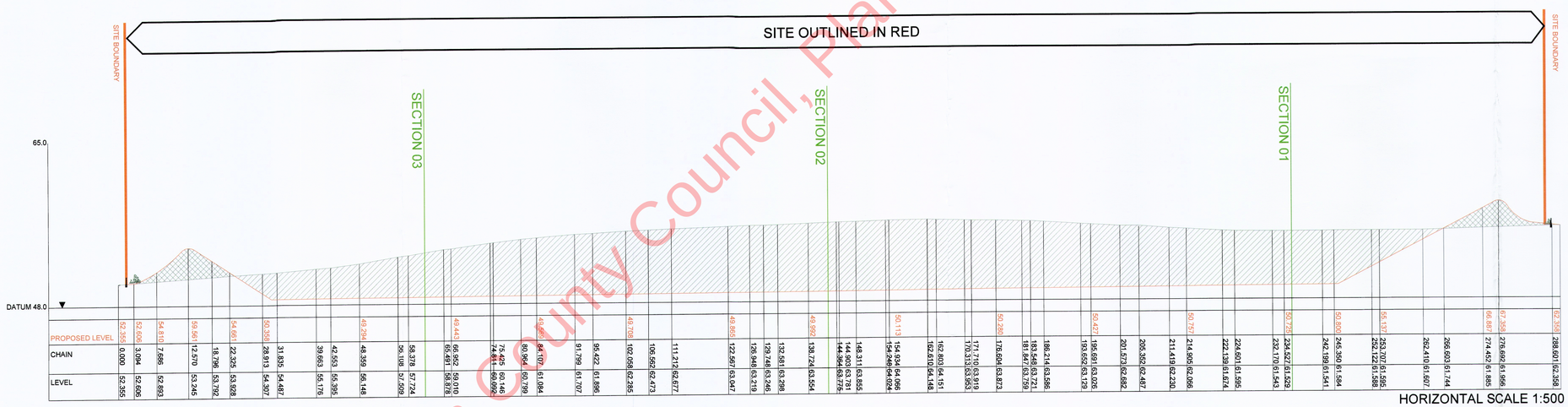


HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:500

Section-03



HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:500

Section-04

LEGEND

- PROPOSED FINISHED LEVEL
- EXISTING LEVEL
- PROPOSED CUT
- PROPOSED FILL
- LIMESTONE BEDROCK
- GLACIAL TILLS SILTS, SANDS & GRAVELS
- BEDROCK LEVEL
- GROUND WATER LEVEL

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Revisions

Rev	By	Date	Description
PL0	MD	16.09.22	Issued for Planning

Client:
Eamon Harney

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Email: info@collinsboydeng.com

Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Proposed Site Sections - Sheet 2

Status	For Planning
Date:	27/07/2022
Scale:	1:500 @ A1
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	015	PL0

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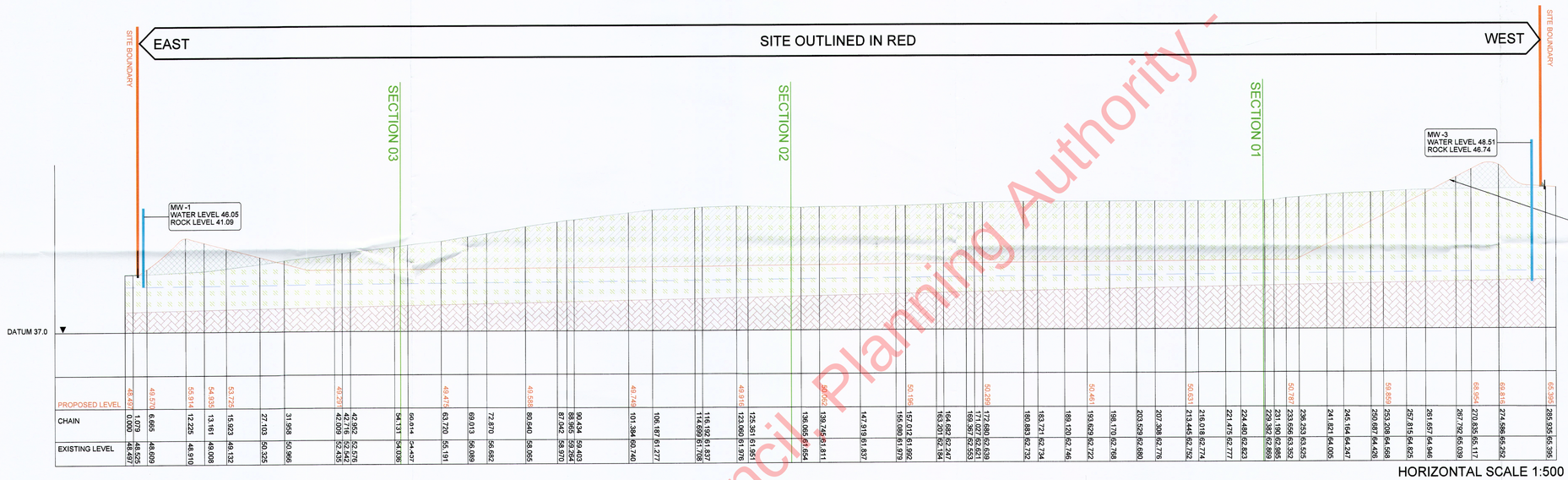

HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:500

Section-05

LEGEND

- PROPOSED FINISHED LEVEL
- EXISTING LEVEL
- PROPOSED CUT
- PROPOSED FILL
- LIMESTONE BEDROCK
- GLACIAL TILLS SILTS, SANDS & GRAVELS
- BEDROCK LEVEL
- GROUND WATER LEVEL

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Revisions

Rev	By	Date	Description
PL0	MD	16.09.22	Issued for Planning

Client:

Eamon Harney

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27 SEP 2022 22-516
ROSCOMMON COUNTY COUNCIL

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Phone: 090 6634421
Fax: 090 6634423
Email: info@collinsboydeng.com

Job Title:

Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:

Proposed Site Section - Sheet 3

Status	For Planning
Date:	27/07/2022
Scale:	1:500 @ A1
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	016	PL0

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NOTES:

- SITE OUTLINED IN RED
- LANDS IN CONTROL OF APPLICANT OUTLINED IN BLUE
- GRASSED AREA TO BE COVERED WITH MIN. 300mm OF TOPSOIL & SOWN WITH AGRICULTURAL SEED MIX
- SLOPED ENBANKMENTS & SITE PERIMETRE PLANTED AS PER LANDSCAPE ARCHITECTS PLAN
- 2.4m HIGH WELDED MESH FENCE
- TIMBER POST & SHEEP WIRE FENCE

Area of Site:
69,381 Sq/m
17.2 Acres
6.938 Hectares

ITM: 597452, 741243

For Planning Purposes Only

- LANDOWNERSHIP IN BLUE
- SITE OUTLINED IN RED
- RIGHT OF WAY

01

02

03

04

05

60m Buffer zone to protect the residential amenity of the adjacent property.

2.4m welded mesh fence

Entrance to be retained for agricultural use.

Site Notice Nr. 2

2.4m high welded mesh fence.

Wayleave marked in yellow. Refer to letter from solicitor for further details.

Top of bank denoted thus.

Bottom of bank denoted thus.

For extents of lands under the control of the applicant refer to the site location maps.

Proposed land to grade into meet existing levels.

Site outlined in red.

Section-0

Section

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Notes:

1. This drawing is the copyright of Collins Boyd Engineering Ltd. It is a confidential document and must not be copied, used or its contents divulged without prior written permission.
2. DO NOT SCALE, use figured dimensions only, if in doubt ask. All dimensions to be checked by contractor on site, any errors or discrepancies to be reported to the Architects.
3. All works to be carried out in accordance with the current building control act and building regulations.
4. Clients are obliged to forward a commencement notice to the local authority at least 14 days prior to the commencement of any works on site.
5. Consultants to be informed immediately of any discrepancies before work proceeds.

NOT FOR CONSTRUCTION

N

Revisions

Rev	By	Date	Description
PL0	MD	16.09.22	Issued for Planning

Client:
Eamon Harney

PLANNING & DEVELOPMENT SECTION
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Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Proposed Restoration Plan

Status	Planning
Date:	August 2022
Scale:	1:500 @ A1
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	013	PL0

Rooskagh Quarry – EIAR Chapter 6 Land/Soils (Geology)

Appendix 6.10 – IGI EIA Guideline Tables

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Figure 1 Flow Chart

*Matrix: See Figure 2 in Guidelines for the Preparation of the Soils, Geology and Hydrogeological Chapters of Environmental Impact Statements - Issued by the Institute of Geologists of Ireland (2013)

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Figure 2 Activities /Environments Matrix

Environments	Activities: Earthworks	Storage / transmission of leachate and/or hazardous materials	Lowering of groundwater levels by pumping or drainage	Discharges to ground	Excavation of material above the water table	Excavation of material below the water table	Landspreading	Waste to the ground
Type A	Invasive site works to characterise nature and thickness of soil and subsoil e.g. trial pits or augering.	Establish nature and quantity of leachable materials.	Establish details of borehole /spring construction or drainage system structure details (as appropriate).	Complete a Risk Assessment as per EPA (2011) Guidance on the Authorisation of Discharges to Groundwater[2]; Apply Tier 1, 2 or 3 Assessment as appropriate	Site works to characterise nature[1], thickness, permeability and stratification of soils and subsoils e.g. trial pits, augering.	Site works to characterise nature[1], thickness, permeability and stratification of soils and subsoils e.g. trial pits, augering.	Establish the type of waste to be landspread.	Provide details of type of system (open/closed, shallow/deep). The site works required and described below will reflect the design parameters of the system being installed.
		Site works to characterise nature[1], thickness, permeability and stratification of soils, subsoils and bedrock geology e.g. trial pits, boreholes.	Establish sustainable yield and proposed daily abstraction rate or drainage system invert levels (as appropriate).		Site works to fully characterise the bedrock geology and in order to to define the resource volume/weight according to The PERC Reporting Standard[3] e.g. trenching, drilling, geophysics.	Site works to fully characterise the bedrock geology and in order to to define the resource volume/weight according to The PERC Reporting Standard[3] e.g. trenching, drilling, geophysics.	Undertake a walkover survey of the site.	Site works to characterise nature[1], thickness, permeability and stratification of soils, subsoils and bedrock geology.
		Works to determine groundwater level, e.g.mapping, monitoring in stand pipes, piezometers, or boreholes.	Works to determine seasonal level of the water table, annual actual recharge and proposed maximum drawdown. Measurement of effects of change in water level on nearby abstractions.		Works to determine groundwater level, flow direction and gradient; e.g.monitoring in stand pipes, piezometers, or boreholes.	Works to determine groundwater level, flow direction and gradient; e.g.monitoring in stand pipes, piezometers, or boreholes. Characterisation of groundwater chemistry and quality. If lowering of groundwater levels is required, then proceed also as for activity Lowering of water levels by pumping of drainage.	Review Groundwater Protection Responses for Landspreading[4], and apply Departmental[5] and Regulatory[6] guidelines and best practice. Assign a response category.	Design parameters for the system will be required to be collected, however these are out of the remit of this document - although any information gathered for design purposes should be used in the EIS.
Type B	In addition to all the above:	In addition to all the above:	In addition to all the above:	As above:	As above:	As above:	In addition to all the above:	In addition to all the above:
	Works to determine groundwater level, flow direction and gradient; e.g. monitoring in stand pipes, piezometers, or boreholes.	Works to determine groundwater flow direction and gradient; e.g. monitoring in stand pipes, piezometers, or boreholes.	Works to determine aquifer properties, seasonal variations in water levels, extent of cone of depression or drawdown of surrounding water levels (as appropriate) and alterations in groundwater flow pattern.				Site works to characterise subsoil/soil characteristics e.g. trial pits or augering.	Characterise baseline temperature of soil / groundwater and groundwater hydrochemistry and quality.
	Works to determine groundwater - surface water interactions.	Works to determine groundwater - surface water interactions.	Works to determine groundwater - surface water interactions and measure effects of drawdown in water levels on hydraulically connected surface waters and springs.					Works to determine groundwater level e.g.monitoring in stand pipes, piezometers, or boreholes. If it is proposed to discharge to surface water, then characterisation surface water quality, baseline temperature and flow rates.
Type C	In addition to all the above:	In addition to all the above:	In addition to all the above:	As above:	As above:	As above:	In addition to all the above:	In addition to all the above:
	Identify location and abstraction rate of nearby groundwater abstractions	Measure or determine rate of groundwater flow/travel time.	Installation of sufficient monitoring wells to provide groundwater flow direction, gradient, flow pattern and rate of flow/travel time. Identify nearby geothermal systems, and discharges to groundwater				Confirm subsoil permeability in laboratory. Delineate inner and outer source protection areas and source protection zones. Establish water quality of groundwater abstraction. Undertake risk assessment if appropriate.	Works to determine thermal and hydraulic conductivity of soil, subsoil and bedrock. Identify location and abstraction rate of nearby groundwater abstractions.
Type D	In addition to all the above:	In addition to all the above:	In addition to all the above:	In addition to all the above:	In addition to all the above:	In addition to all the above:	As for Type C above:	In addition to all the above:
	Regional study of karst in an area, including identified karst features (both mapped and identified during site walkovers). Karst bedrock topography. Geotechnical assessment of risk of landslide or subsidence.	Full detailed hydrogeological assessment required in this situation. Geotechnical assessment of risk of landslide or subsidence.	Geotechnical assessment of risk of landslide or subsidence.	Geotechnical assessment of risk of landslide or subsidence.	Full detailed hydrogeological assessment required in this situation. Geotechnical assessment of risk of landslide or subsidence.	Geotechnical assessment of risk of landslide or subsidence.		Geotechnical assessment of risk of landslide or subsidence.
Type E	Full detailed hydrogeological assessment required in this situation.	Full detailed hydrogeological assessment required in this situation	Full detailed hydrogeological assessment required in this situation.	Complete a Risk Assessment as per EPA (2011); Apply Tier 1, 2 or 3 Assessment as appropriate.	Full detailed hydrogeological assessment required in this situation.	Full detailed hydrogeological assessment required in this situation.	As for Type C above	Full thermogeological and/or hydrogeological assessment required in this situation.

Type A	Passive geological / hydrogeological environments
Type B	Natural dynamic hydrogeological environments
Type C	Man-made dynamic hydrogeological environments
Type D	Sensitive geological / hydrogeological environments
Type E	Groundwater dependent eco systems

Where works are required to characterise, establish, measure, determine or otherwise provide information, the level of activity and detail required will be informed by a combination of a) the potential impact of the proposed development , b) the scale of the proposed development and c) the professional judgement of the project geoscientist. In addition, the works are likely to be iterative, with new works required in response to information acquired during any phase of works.

1 Characterisation of soil and sub-soils to be carried out in accordance with a recognised standard or nomenclature system e.g. BS5930:1990 for subsoils or EPA Code of practice for Environmental Risk Assessment for Unregulated Waste Disposal sites where relevant.
2 EPA, 2011. Guidance on the Authorisation of Discharges to Groundwater - Version 1 December 2011. www.epa.ie
3 The PERC Reporting Standard
4 Groundwater Protection Schemes (DoELG/EPA/GSI. 1999)
5 Control of Farm Pollution (DAFF, 1992) and the Code of Good Agricultural Practice to Protect Waters from Pollution by Nitrates (DoE and DAFF, 1996)
6 Landspreading of Organic Waste - Guidance on Groundwater Vulnerability Assessment of Land (EPA 2004)

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APPENDIX 7

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Rooskagh Quarry – EIAR Chapter 7 Water

Appendix 7.1 – OSI Contour & Drainage Mapping

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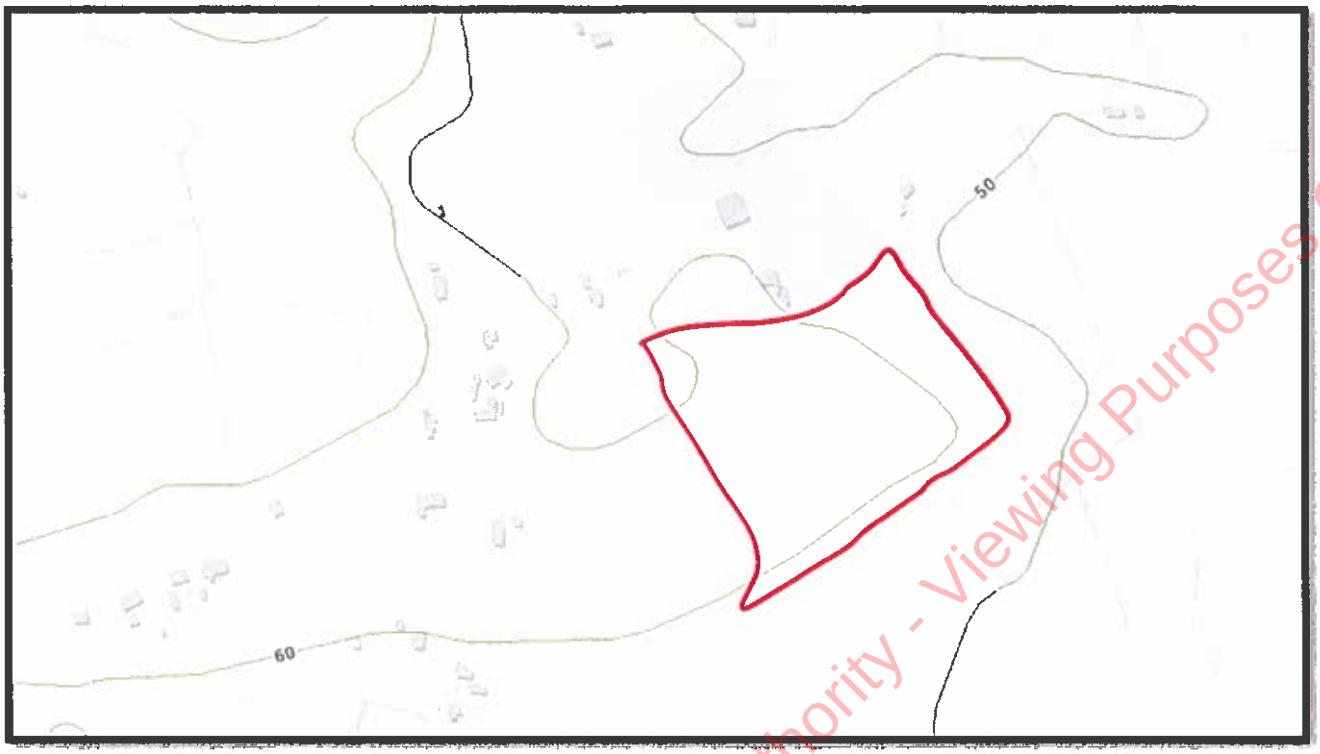

Image 01: OSI Contour Mapping of Rooskagh Quarry Area. (Study area is approximately in the red boundary.) (Note there are no water features on site. Nearest drainage channels are >70m to the east & south-east)

Image 02: OSI Aerial Photo with approximate site area shown by red boundary. Proposed BH locations in blue.

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Rooskagh Quarry – EIAR Chapter 7 Water

Appendix 7.2 – WFD Shannon Catchment Mapping

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Upper Shannon (Mid Shannon) Catchment Assessment 2010-2015 (HA 26G)

Catchment Science & Management Unit

Environmental Protection Agency

December 2018
Version no. 3

epaCatchments
Healthy • Resilient • Productive
Valued water resources supporting vibrant communities

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1 Introduction

This small catchment covers an area of 383km² and is comprised of the catchment area from Athlone to Shannonbridge. The catchment is characterised by flat topography and expanses of bogs and flood prone areas. The area of the catchment located northwest of Athlone is underlain by highly karstified rock with surface and groundwater drainage closely connected in this region.

The Shannon flows into the catchment through Athlone, heading south before being joined from the west by the Cross River. This river drains the karstified part of the catchment from Lough Funshinagh to Athlone. Lough Funshinagh is located north of Curraghboy and does not have a surface outflow channel. Underground flow has been identified from this lake to the Cross River near Brideswell.

Continuing south, the Shannon is then joined from the east by the westerly flowing Cloonbonny and Boor Rivers, which drain the eastern part of the catchment. The Shannon then veers southwest and is joined from the west by a series of small tributaries, the largest of which is the Ballydangan River, before flowing out of the catchment at Shannonbridge.

The Upper Shannon (Mid Shannon) catchment comprises three subcatchments with 13 river water bodies and eight groundwater bodies (Table 1, Figure 1). There are no transitional and coastal water bodies in the catchment.

Table 1. List of subcatchments in the Upper Shannon (Mid Shannon) catchment

Subcatchment ID	Subcatchment Name
26G_1	Shannon[Lower]_SC_020
26G_2	Shannon[Upper]_SC_100
26G_3	Shannon[Lower]_SC_010

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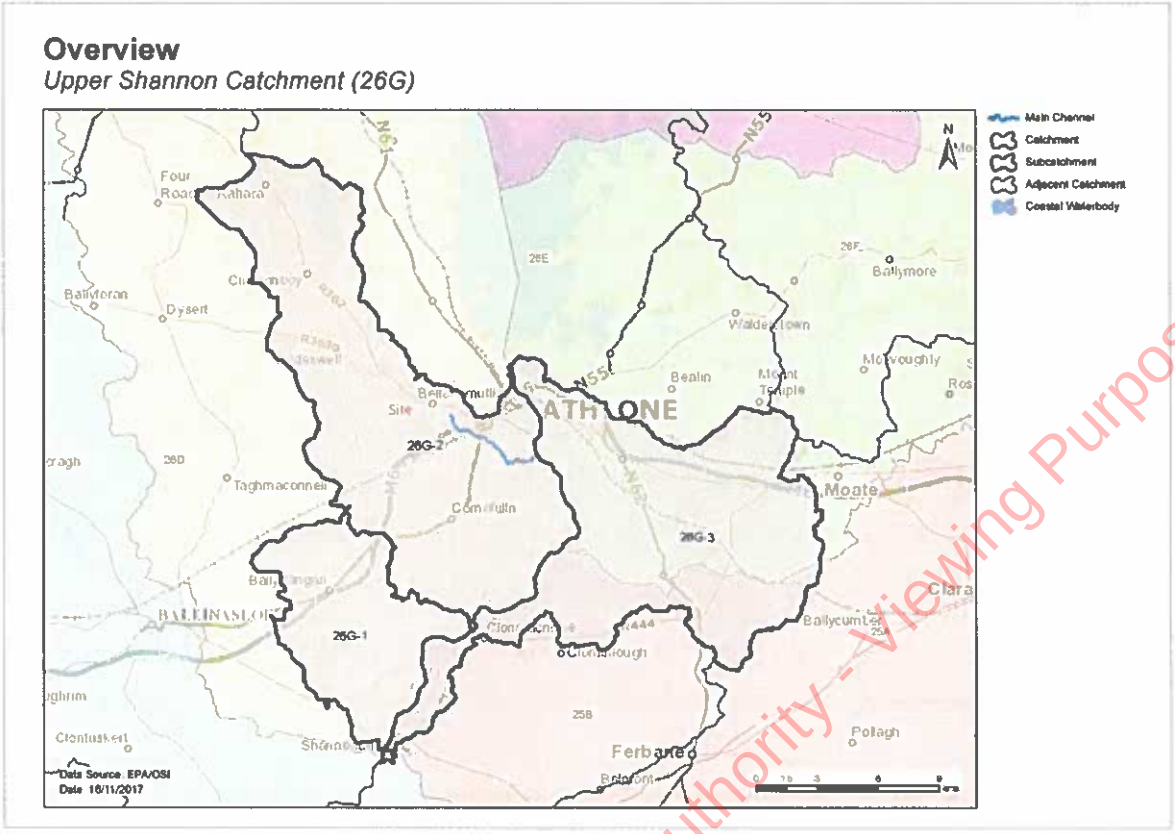

Figure 1. Subcatchments in the Upper Shannon (Mid Shannon) catchment

2 Water body status and risk of not meeting environmental objectives

2.1 Surface water ecological status

2.1.1 Rivers

- There were four (31%) river water bodies at Good or High status, and six (46%) at less than Good status in 2015 (Table 2, Figure 2). Three (23%) river water bodies are unassigned.
- There are no water bodies and sites that have a high ecological status objective.
- The number of water bodies at each status class in 2007-09 and 2010-15 are shown in Figure 3.
- Three water bodies have an improved status and one has deteriorated since 2007-09 (Figure 4).
- The variation in nutrient concentrations and loads in the Cross River main channel is illustrated in Appendix 1.

Table 2. Summary of surface water body status and risk categories

	Number of water bodies	2010-15 Status						Risk Categories		
		High	Good	Mod	Poor	Bad	Unassigned	Not at Risk	Review	At Risk
Rivers	13	0	4	3	3	0	3	5	2	6

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Rooskagh Quarry – EIAR Chapter 7 Water

Appendix 7.3 – EPA Drainage Mapping

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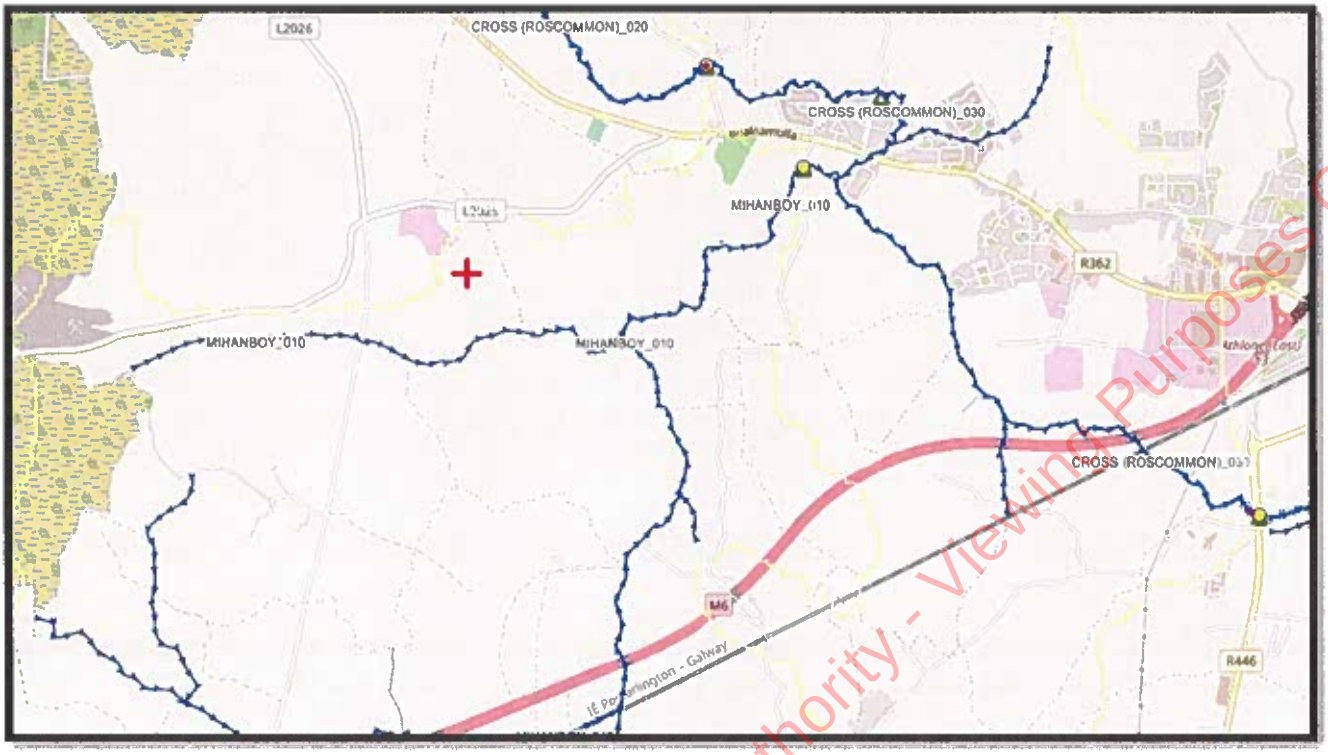

EPA Map 01: Local River Bodies with drainage direction and EPA monitoring points (yellow dots).
(Note there are no water features on site. Nearest watercourse is the Mihanboy_010 > 200m to the south)

EPA Map 02: Distances to the local drainage ditches and Mihanboy Watercourse located >200m to the south.

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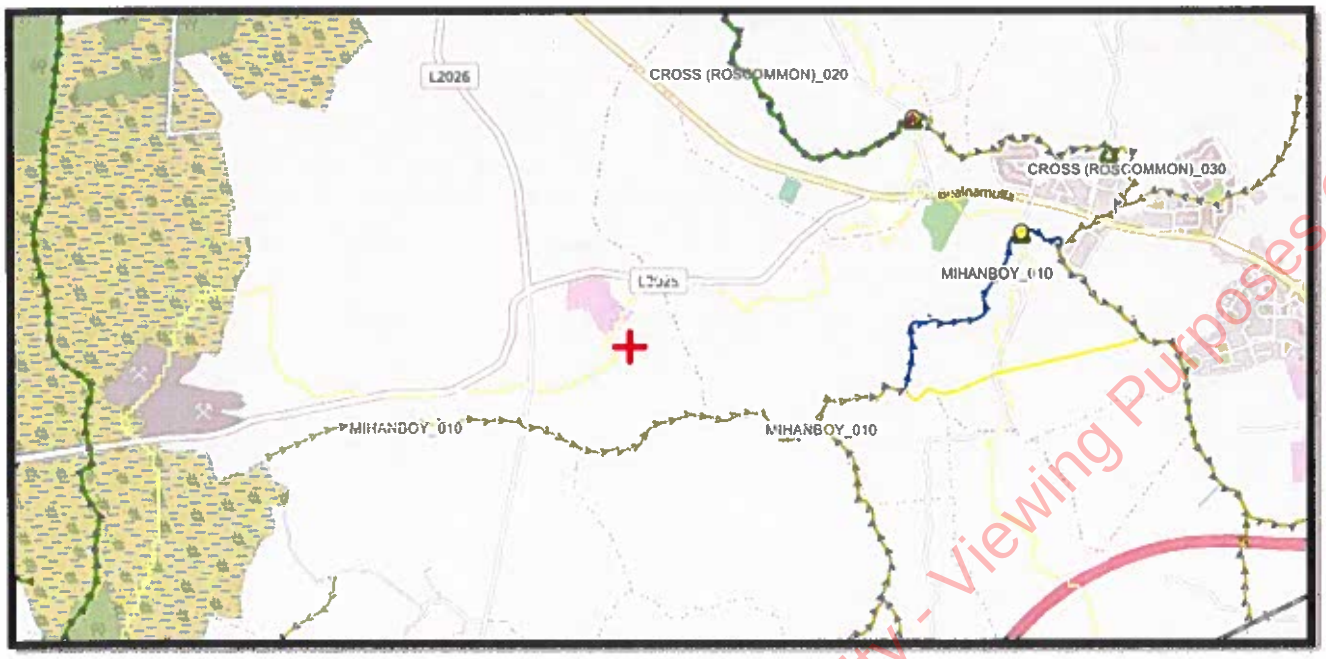
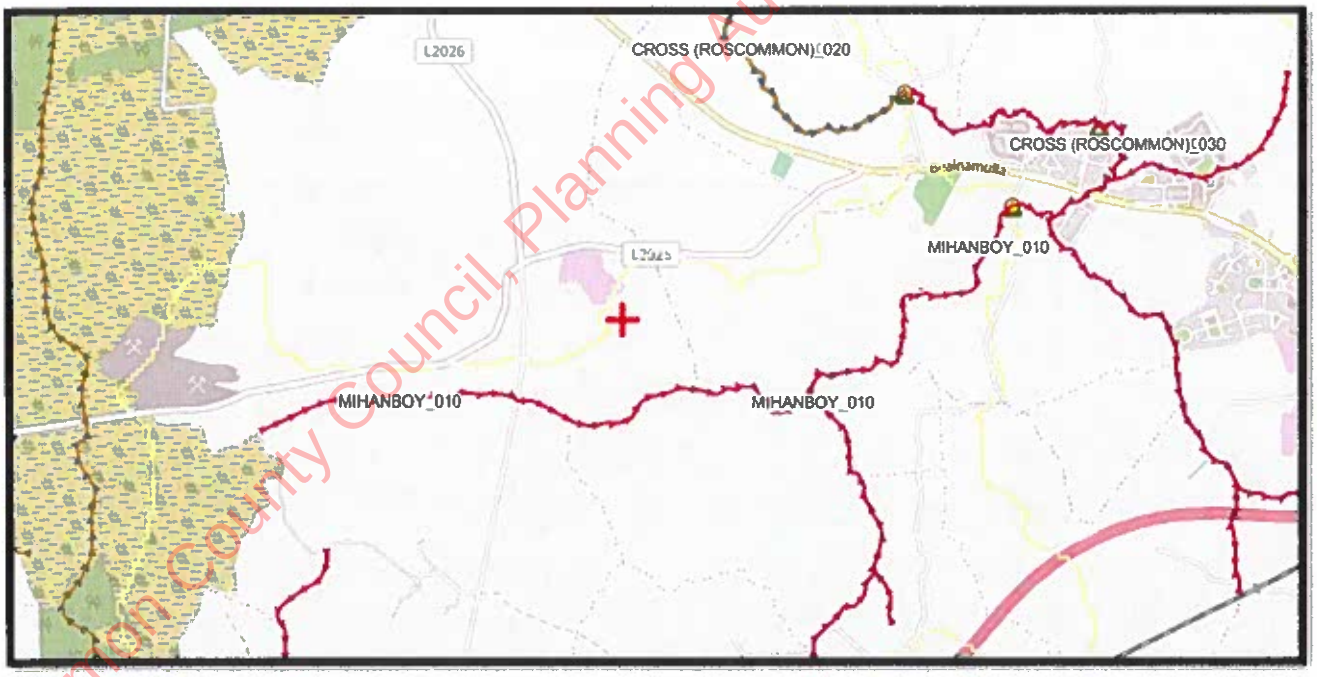


EPA Map 03: EPA Water Quality Status Map showing Mihanboy_010 with Moderate Quality (yellow).



EPA Map 04:EPA Surface Water Risk Status Map with Mihanboy_010 'At Risk' (red) of not achieving high status.

The reasons identified by the EPA for this 'At Risk' status are primarily - hydromorphology pressures. These are subcategorised into channelization, embankment, dams, barriers, weirs, locks, culverts, land drainage, overgrazing, bank erosion and alteration to the physical environment of the watercourse. Impacts from extractive industry activities include potential sediment/siltation pollution and alteration to the physical environment. The main extractive industry identified is peat harvesting.

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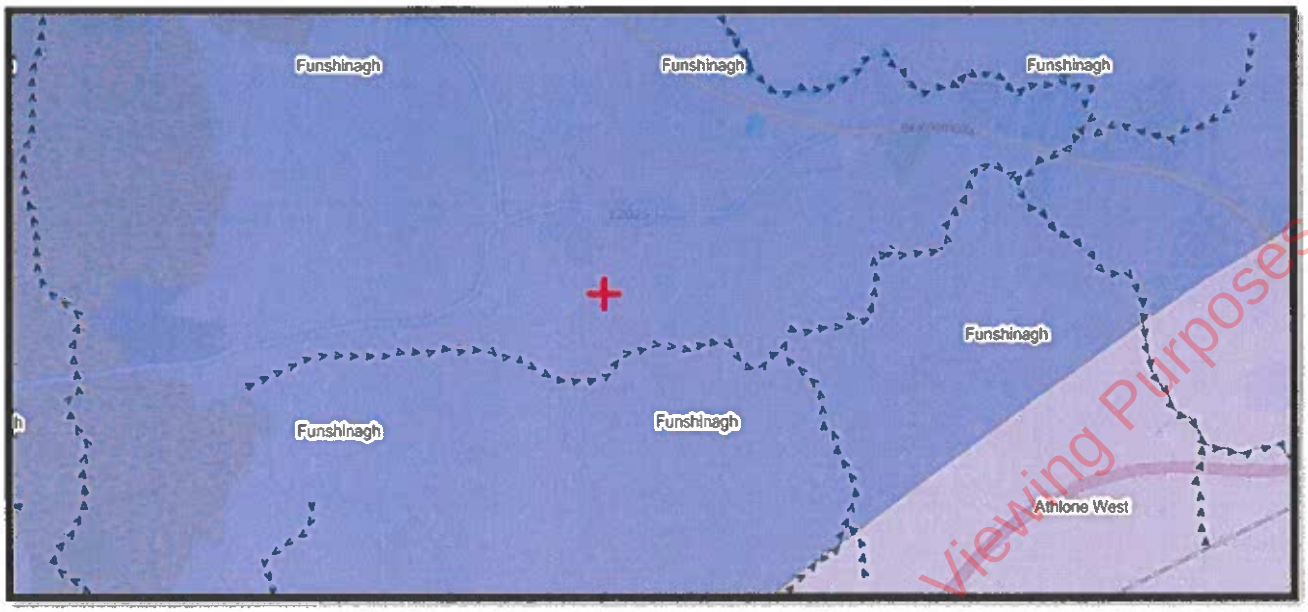

EPA Map 05:EPA Groundwater Mapping showing the site is in the Funsginagh Groundwater Body Catchment.

EPA Map 06:EPA Groundwater Mapping showing the Funsginagh Groundwater Body 'At Risk of not achieving the required High groundwater quality status.

The Funshinagh groundwater body is considered by the EPA to be 'At Risk' of not achieving the required High Quality Status because it are hydrologically linked to surface waters that are not meeting water quality objectives.

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Appendix 7.4 – VCL Site Walkover Pictures

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Photo 01: View South along eastern boundary. MW01 drilled along old hedge line, (blue arrow).

Photo 02: View of location of MW01 on Eastern boundary. Low point of site area.

Photo 03: View across adjacent field towards eastern boundary. (MW01 is in top left of picture.)

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Photo 04: View South along ditch drain on field boundary over 100m east of eastern site boundary.

Photo 05: View South along field drain located about 100m from the SE corner of the site area.

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Photo 06: View South of drainage ditches, which drain south, located >70m south of the site boundary.

Photo 07: View SW of drainage ditches >70m to the south of the site.
(Little water, very vegetated and not protected to prevent animals accessing or crossing them.)
(The local watercourse (Mihanboy Stream) is located along the distant hedge line >200m from the site.)

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Photo 08: View West of MW02 located on the southern site boundary.

Photo 09: View East of MW02 located on the southern site boundary.
(Borehole location shown by blue arrow.)

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Photo 10: View West of MW03 located on Western boundary on top of esker ridge.

Photo 11: View West along the northern boundary with MW04 in foreground.

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Photo 12: View of the Kildea site borehole location and water storage tank. (Well is at blue arrow).

Photo 13: View surface water sump for recycling wash water at the Kildea Concrete site.

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Appendix 7.5 – Borehole Location Plan & Drilling Logs

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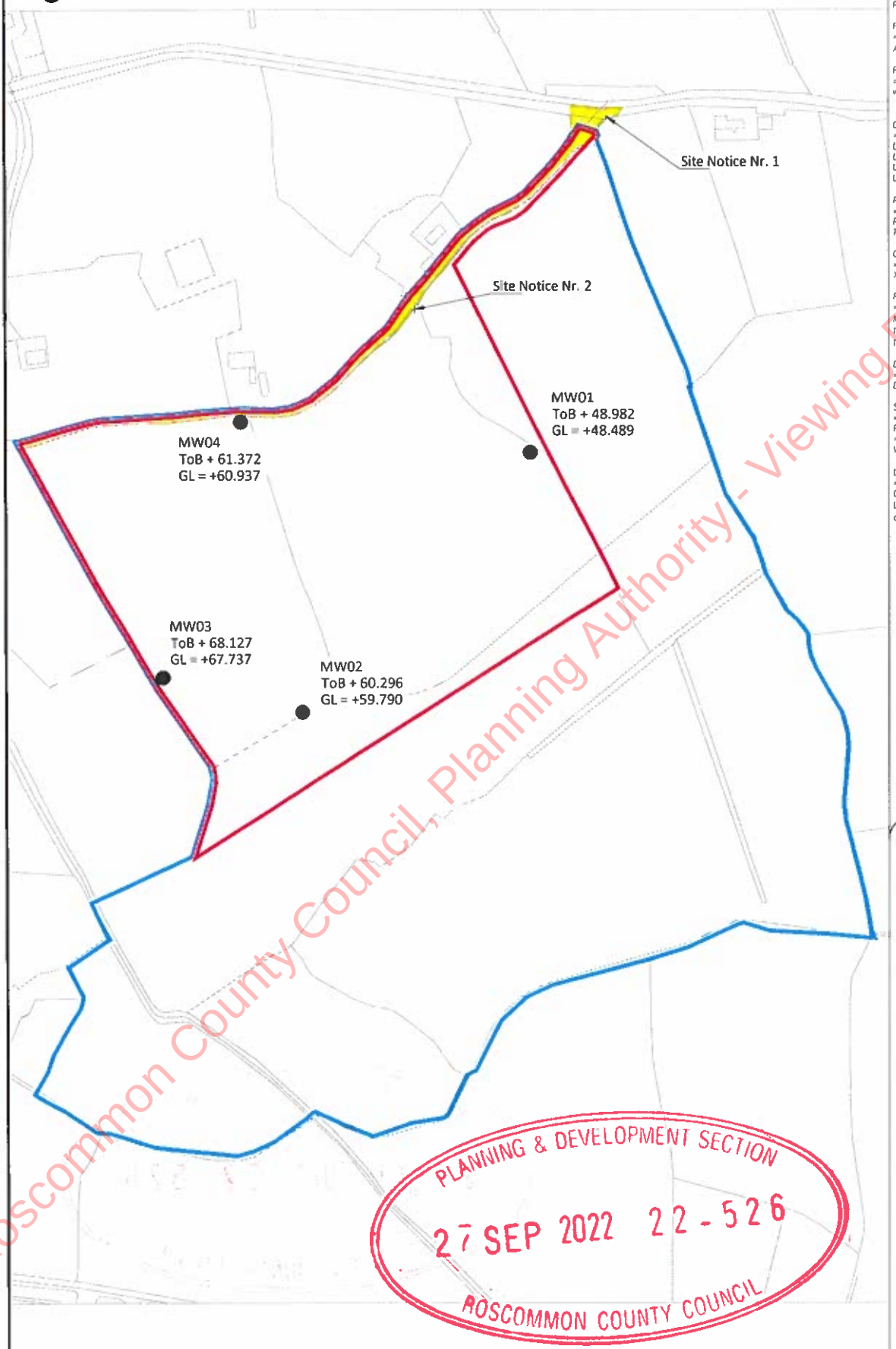
LANDOWNERSHIP IN BLUE
SITE OUTLINED IN RED

BOREHOLE LOCATION



Description:
Digital Cartographic Model (DCM)

Publisher / Source:
Ordnance Survey Ireland (OSi)

Data Source / Reference:
PRIME2

File Format:
Autodesk AutoCAD (DWG_R2013)

File Name:
v_50166743_1.dwg

Clip Extent / Area of Interest (AOI):
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LRX,LRY= 597851.6164,740764.5325
ULX,ULY= 597236.6164,741594.5325
URX,URY= 597851.6164,741594.5325

Projection / Spatial Reference:
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Centre Point Coordinates:
X,Y= 597544.1164,741179.5325

Reference Index:
Map Series | Map Sheets
1:5,000 | 3034
1:5,000 | 3102

Data Extraction Date:
Date= 20-Jan-2021

Source Data Release:
Product Version:
Version= 1.3

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Revisions

Rev	By	Date	Description
P1.0	MD	16.09.22	Issued for Planning

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Job Title:
Proposed Extraction of Sand, Stone and Gravel at Roepkagh Td., Bellanamulla (Beallnamulla), Athlone, Co. Roscommon

Drawing Title:
Borehole Location Map

Status	Planning
Date:	03.08.2022
Scale:	1:2,500 @ A3
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	003	P1.0

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Appendix 7.6 – VCL GW Sampling Logs & Lab Results

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Groundwater Borehole Sampling Log

Borehole I.D.: RQ MW01

Project Details

Client:	Collins Boyd Engs	***Project No.:***	CONS0151
Location:	Rooskagh Quarry	***Scientist:***	Darragh Musgrave
		Date:	19th May 2020

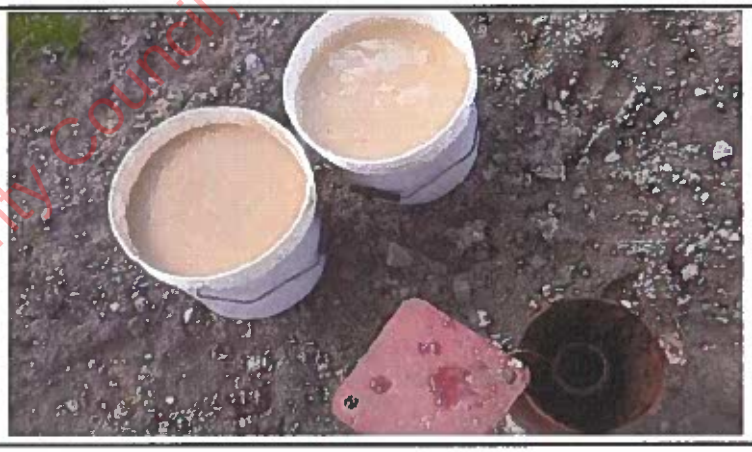
Monitoring Borehole Details

Water Level (m):	2.93 (mbtc)	***Well Depth (m):***	7.70
Head (m):	4.77	***Well Diameter (mm):***	50mm
Volume in Well (L):	9.54	***Volume Purged (L):***	30L
Decon. Procedure:	New gloves & lab bottles.	***Bailer Type:***	New disposalble bailer
Measurement Point:	Top of casing.	***Casing height (m):***	0.48

Field Measurements

Observed Colour:	Slightly silty brown	***Odour:***	None
Temperature (° C):	10.9	***Conductivity (µS/cm):***	677
pH:	6.8	***ORP***	30

Sample Water Photo



Comments

Monitoring borehle located on eastern boundary near low point of the site.
Water still silty after recent drilling and standpippe instillation.
Recharged very quickly. Little or no drawing down of water table by balling.
MW02 on southern boundary Note sampled - GW at 13m btc with casing at 0.5m & depth at 20.12m.

Email <darragh.musgrave@viridus.ie> Viridus Consulting Ltd.

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Groundwater Borehole Sampling Log

Borehole I.D.: RQ MW03

Project Details

Client:	Collins Boyd Engs	*Project No.:*	CONS0151
Location:	Rooskagh Quarry	*Scientist:*	Darragh Musgrave
		Date:	19th May 2020

Monitoring Borehole Details

Water Level (m):	19.62 (mbtc)	*Well Depth (m):*	27.55
Head (m):	7.93	*Well Diameter (mm):*	50mm
Volume in Well (L):	15.86	*Volume Purged (L):*	~50L
Decon. Procedure:	New gloves & lab bottles.	*Bailer Type:*	New disposalble bailer
Measurement Point:	Top of casing	*Casing height (m):*	0.33

Field Measurements

Observed Colour:	Light brown - silty	*Odour:*	None
Temperature (° C):	12.3	*Conductivity (µS/cm):*	695
pH:	6.8	*ORP*	54

Sample Location Photo

Comments

Monitoring borehle located on western boundary near high point of the site.
Water still silty after recent drilling and standpippe instillation.
Recharge reasonably good

Email <darragh.musgrave@viridus.ie> Viridus Consulting Ltd.

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Groundwater Borehole Sampling Log

Borehole I.D.: RQ MW04

Project Details

Client:	Collins Boyd Engs	***Project No.:***	CONS0151
Location:	Rooskagh Quarry	***Scientist:***	Darragh Musgrave
		Date:	19th May 2020

Monitoring Borehole Details

Water Level (m):	12.64 (mbtc)	***Well Depth (m):***	15.67
Head (m):	3.03	***Well Diameter (mm):***	50mm
Volume in Well (L):	6.06	***Volume Purged (L):***	~20L
Decon. Procedure:	New gloves & lab bottles.	***Bailer Type:***	New disposalble bailer
Measurement Point:	Top of casing.	***Casing height (m):***	0.43

Field Measurements

Observed Colour:	Very brown - silty	***Odour:***	None
Temperature (° C):	11.5	***Conductivity (µS/cm):***	711
pH:	6.5	***ORP***	57

Sample Location Photo

Comments

Monitoring borehle located on northern boundary near boundary with Kildea Concrete Plant.
Water still silty after recent drilling and standpippe instillation.
Recharge was poor. Had to leave water recover beofore last 10L abstracted for sampling.
Active GW well on the Kildea Concrete Plant was examined. Water level was 8m below ground level.

Email <darragh.musgrave@viridus.ie>

Viridus Consulting Ltd.

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Appendix 7.6: Rooskagh Quarry EIAR - Groundwater Analysis May 2021: Field, Chemical, and Hydrocarbon Parameters.

GROUNDWATER									
PARAMETER	**LIMIT OF DETECTION**	**UNITS**	**MW01**	**MW03**	**MW04**		**Drinking Water Regs S.I. No. 122 of 2014**	**Groundwater Regs S.I. No. 9 of 2010**	**EPA IGV's 2003**
Date of sampling			19/05/2021	19/05/2021	19/05/2021				
Sample point			East Bouundary Monitoring BH	West Boundary Monitoring BH	North Boundary Monitoring BH				
FIELD MEASUREMENTS									
Conductivity	**10**	µS/cm	677	695	711		2,500	800 - 1875	1,000
pH	**-**	pH units	6.8	6.8	6.5		6.5 - 9.5	-	6.5 - 9.5
Temperature	**-**	°C	10.9	12.3	11.5		-	-	25°C
CHEMICAL PARAMETERS									
Conductivity	**10**	µS/cm	604	631	646		2,500	800 - 1875	1,000
pH	**-**	pH units	7.6	7.4	7.40		6.5 - 9.5	-	6.5 - 9.5
Ammonium as NH4	**0.006**	mg/l NH4	0.007	0.074	0.099		0.30	0.175	0.15
Ammonia as N	**0.005**	mg/l N	0.005	0.057	0.077		-	0.065 - 0.175	-
Nitrate as NO3	**0.66**	mg/l NO3	7.8	21.0	6.6		50	37.5	25
Nitrite as NO2	**0.016**	mg/l NO2	0.018	0.055	<0.016		0.50	0.375	0.1
Phosphate-Ortho	**0.005**	mg/l P	0.006	0.007	0.01		-	35	30
Chloride	**1.0**	mg/l Cl	11	23	25		250	24 - 187.5	30
Sulphate	**1.0**	mg/l SO_4	15	12.0	6.2		250	187.5	200
Sulphide	**0.03**	mg/l	1.32	0.22	<0.03		-	-	-
Hardness	**3.0**	mg/l	320	630	380		200	-	200
Calcium	**1.0**	mg/l	110	220	130		200	-	200
Magnesium	**0.3**	mg/l	11.2	17.4	10.6		-	-	50
Potassium	**0.2**	mg/l	5.4	4.2	2.70		-	-	5
Sodium	**0.5**	mg/l	44.3	11.7	15.5		200	150	150
Manganese	**0.001**	mg/l	0.047	0.094	0.042		0.05	-	0.05
Total Alkalinity	**10**	mg/L CaCO3	1122	53	537		-	-	-
Total Dissolved Solids	**15**	mg/l	497	399	449		-	-	1000
Microbiological									
Biological O2 Demand	**1**	mg/l	<1	1.2	<1		-	-	-
Chemical O2 Demand	**8**	mg/l	88	427	8		-	-	-
Hydrocarbons									
TPH >C6 - C10 (PRO)	**<10.0**	ug/l	<10.0	<10.0	<10.0		-	-	0.01
TPH >C10 - C20 (DRO)	**<0.1**	ug/l	<0.10	<0.10	<0.10		-	-	0.01
TPH >C20 - C40 (MO)	**<0.1**	ug/l	<0.10	<0.10	<0.10		-	-	0.01
TPH >C6 - C40 (TPH)	**<0.10**	ug/l	<0.10	<0.10	<0.10		-	-	0.01

Notes:
VCL Sampled GW for EIAR in on May 19th 2021.
Drinking Water Standards SI No.122 of 2014.
Groundwater Regulations SI No. 9 of 2010 - 'Overall Threshold Value Range' values.
IGV = EPA Groundwater Interim Guideline Values 2003.
"-" = no value or not analysed.
TPH = Total Petroleum Hydrocarbons
Results are in bold where they exceed the relevant EPA IGV
Results are shaded where they exceed the relevant Drinking Water Standard
Results are underlined where they exceed the Groundwater Regulations

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ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 1111

Contact Name	Darragh Musgrave	**Report Number**	**199003 - 1**
Address	Viridus Consulting Ltd. Gaia House, Cloughphilip,	**Sample Number**	199003/001
		Date of Receipt	20/05/2021
		Date Started	20/05/2021
Tel No	021 438 4733	**Received or Collected**	Hand
Customer PO	PO210	**Date of Report**	30/06/2021
Project No.	QN010206	**Sample Type**	Ground Waters
Customer Ref	RQ MW01	**Condition on receipt**	Satisfactory

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.
BOD								
	BOD		EW001	1.0		<1.0	mg/L	INAB
COD-Chemical Oxygen Demand								
	COD		EW184	8		88	mg/L	INAB
Gallery Plus-Suite A								
	Ammonia as N		EW175	0.005		0.005	mg/l N	INAB
	Ammonium as NH4 (calc)		EW175	0.006		0.007	mg/l NH4	INAB
	Nitrate as N		EW175	0.15		1.8	mg/l N	INAB
	Nitrate as NO3 (Calc)		EW175	0.66		7.8	mg/l NO3	INAB
	Nitrite as N		EW175	0.005		0.005	mg/l N	INAB
	Nitrite as NO2 (Calc)		EW175	0.016		0.018	mg/l NO2	INAB
	Phosphate (Ortho/MRP) as P		EW175	0.005		0.006	mg/l P	INAB
	Chloride mg/L		EW175	1.0		11	mg/L	INAB
	Sulphate mg/L		EW175	1.0		17	mg/L	INAB
Metals-Dissolved								
	Hardness-Dissolved		EW188	3.0		320	mg/L CaCO3	YES
	Manganese-Dissolved		EW188	1.0		47	ug/L	YES
	Calcium-Dissolved		EW188	1.0		110	mg/L	
	Magnesium-Dissolved *Subcontracted*		EW188	0.3		11.2	mg/L	YES
	Potassium-Dissolved		EW188	0.2		5.4	mg/L	YES
	Sodium-Dissolved		EW188	0.5		44.3	mg/L	YES
Sulfide								
	Sulfide		EW024	0.03		1.32	mg/L	
Suspended Solids								
	Suspended Solids		EW013	5		2210	mg/L	
Titralab								
	pH		EW153	0.0		7.6	pH Units	INAB
	Conductivity @20 DegC		EW153	25		604	uscm-1@20	INAB
	Alkalinity Total (R2 pH4.5)		EW153	10		1122	mg/L CaCO3	
Total Dissolved Solids (TDS)								
	Total Dissolved Solids (TDS)		EW046	15		497	mg/L	INAB
TPH (TPH3B1_W) (Sub)								

Signed : Máire Bradley 30/06/2021

Máire Bradley-Deputy Technical Manager

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Contact Name	Darragh Musgrave	**Report Number**	**199003 - 1**
Address	Viridus Consulting Ltd. Gaia House, Cloughphilip,	**Sample Number**	199003/001
		Date of Receipt	20/05/2021
		Date Started	20/05/2021
Tel No	021 438 4733	**Received or Collected**	Hand
Customer PO	PO210	**Date of Report**	30/06/2021
Project No.	QN010206	**Sample Type**	Ground Waters
Customer Ref	RQ MW01	**Condition on receipt**	Satisfactory

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.
TPH (TPH3B1_W) (Sub)								
	Total TPH >C6-C40 (sub)	*	Default	10		<10	ug/L	YES
	TPH >C21-C40	*	Default	0.1		<0.1	ug/L	
	TPH >C10-C21	*	Default	0.1		<0.1	ug/L	
	TPH>C6-C10	*	Default	0.1		<0.1	ug/L	

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Máire Bradley-Deputy Technical Manager

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Contact Name	Darragh Musgrave	**Report Number**	**199003 - 1**
Address	Viridus Consulting Ltd. Gaia House, Cloughphilip,	**Sample Number**	199003/002
		Date of Receipt	20/05/2021
		Date Started	20/05/2021
Tel No	021 438 4733	**Received or Collected**	Hand
Customer PO	PO210	**Date of Report**	30/06/2021
Project No.	QN010206	**Sample Type**	Ground Waters
Customer Ref	RQ MW03	**Condition on receipt**	Satisfactory

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.
BOD								
	BOD		EW001	1.0		12	mg/L	INAB
COD-Chemical Oxygen Demand								
	COD		EW184	8		427	mg/L	INAB
Gallery Plus-Suite A								
	Ammonia as N		EW175	0.005		0.057	mg/l N	INAB
	Ammonium as NH4 (calc)		EW175	0.006		0.074	mg/l NH4	INAB
	Nitrate as N		EW175	0.15		4 8	mg/l N	INAB
	Nitrate as NO3 (Calc)		EW175	0.66		21	mg/l NO3	INAB
	Nitrite as N		EW175	0.005		0.017	mg/l N	INAB
	Nitrite as NO2 (Calc)		EW175	0.016		0.055	mg/l NO2	INAB
	Phosphate (Ortho/MRP) as P		EW175	0.005		0.007	mg/l P	INAB
	Chloride mg/L		EW175	1.0		23	mg/L	INAB
	Sulphate mg/L		EW175	1.0		12	mg/L	INAB
Metals-Dissolved								
	Hardness-Dissolved		EW188	3.0		630	mg/L CaCO3	
	Manganese-Dissolved		EW188	1.0		94	ug/L	YES
	Subcontracted							
	Calcium-Dissolved		EW188	1.0		220	mg/L	
	Magnesium-Dissolved		EW188	0.3		17.4	mg/L	YES
	Potassium-Dissolved		EW188	0.2		4.2	mg/L	YES
	Sodium-Dissolved		EW188	0.5		11.7	mg/L	YES
Sulfide								
	Sulfide		EW024	0.03		0.22	mg/L	
Suspended Solids								
	Suspended Solids		EW013	5		3745	mg/L	
Titralab								
	pH		EW153	0.0		7.4	pH Units	INAB
	Conductivity @20 DegC		EW153	25		631	uscm-1@20	INAB
	Alkalinity Total (R2 pH4.5)		EW153	10		53	mg/L CaCO3	INAB
Total Dissolved Solids (TDS)								
	Total Dissolved Solids (TDS)		EW046	15		399	mg/L	INAB
TPH (TPH3B1_W) (Sub)								
	Total TPH >C6-C40 (sub)	*	Default	10		<10	ug/L	YES

Signed : Máire Bradley 30/06/2021

Máire Bradley-Deputy Technical Manager

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Contact Name	Darragh Musgrave	**Report Number**	**199003 - 1**
Address	Viridus Consulting Ltd. Gaia House, Cloughphilip.	**Sample Number**	199003/002
		Date of Receipt	20/05/2021
		Date Started	20/05/2021
Tel No	021 438 4733	**Received or Collected**	Hand
Customer PO	PO210	**Date of Report**	30/06/2021
Project No.	QN010206	**Sample Type**	Ground Waters
Customer Ref	RQ MW03	**Condition on receipt**	Satisfactory

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.
TPH (TPH3B1_W) (Sub)								
	TPH >C21-C40	*	Default	0.1		<0.1	ug/L	
	TPH >C10-C21	*	Default	0.1		<0.1	ug/L	
	TPH>C6-C10	*	Default	0.1		<0.1	ug/L	

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Contact Name	Darragh Musgrave	**Report Number**	**199003 - 1**
Address	Viridus Consulting Ltd. Gaia House, Cloughphilip,	**Sample Number**	199003/003
		Date of Receipt	20/05/2021
		Date Started	20/05/2021
Tel No	021 438 4733	**Received or Collected**	Hand
Customer PO	PO210	**Date of Report**	30/06/2021
Project No.	QN010206	**Sample Type**	Ground Waters
Customer Ref	RQ MW04	**Condition on receipt**	Satisfactory

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.
BOD								
	BOD		EW001	1.0		<1.0	mg/L	INAB
COD-Chemical Oxygen Demand								
	COD		EW184	8		8	mg/L	INAB
Gallery Plus-Suite A								
	Ammonia as N		EW175	0.005		0.077	mg/l N	INAB
	Ammonium as NH4 (calc)		EW175	0.006		0.099	mg/l NH4	INAB
	Nitrate as N		EW175	0.15		1.5	mg/l N	INAB
	Nitrate as NO3 (Calc)		EW175	0.66		6.6	mg/l NO3	INAB
	Nitrite as N		EW175	0.005		<0.005	mg/l N	INAB
	Nitrite as NO2 (Calc)		EW175	0.016		<0.016	mg/l NO2	INAB
	Phosphate (Ortho/MRP) as P		EW175	0.005		0.007	mg/l P	INAB
	Chloride mg/L		EW175	1.0		25	mg/L	INAB
	Sulphate mg/L		EW175	1.0		6.2	mg/L	INAB
Metals-Dissolved								
	Hardness-Dissolved		EW188	3.0		380	mg/L CaCO3	
	Manganese-Dissolved		EW188	1.0		4.2	ug/L	YES
	Calcium-Dissolved		EW188	1.0		130	mg/L	
	Magnesium-Dissolved *Subcontracted*		EW188	0.3		10.6	mg/L	YES
	Potassium-Dissolved		EW188	0.2		2.7	mg/L	YES
	Sodium-Dissolved		EW188	0.5		15.5	mg/L	YES
Sulfide								
	Sulfide		EW024	0.03		<0.03	mg/L	
Suspended Solids								
	Suspended Solids		EW013	5		94	mg/L	INAB
Titralab								
	pH		EW153	0.0		7.4	pH Units	INAB
	Conductivity @20 DegC		EW153	25		646	uscm-1@20	INAB
	Alkalinity Total (R2 pH4.5)		EW153	10		537	mg/L CaCO3	INAB
Total Dissolved Solids (TDS)								
	Total Dissolved Solids (TDS)		EW046	15		449	mg/L	INAB
TPH (TPH3B1_W) (Sub)								
	Total TPH >C6-C40 (sub)	*	Default	10		<10	ug/L	YES

Signed : Máire Bradley 30/06/2021

Máire Bradley-Deputy Technical Manager

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Contact Name	Darragh Musgrave	**Report Number**	**199003 - 1**
Address	Viridus Consulting Ltd. Gaia House, Cloughphilip,	**Sample Number**	199003/003
		Date of Receipt	20/05/2021
		Date Started	20/05/2021
Tel No	021 438 4733	**Received or Collected**	Hand
Customer PO	PO210	**Date of Report**	30/06/2021
Project No.	QN010206	**Sample Type**	Ground Waters
Customer Ref	RQ MW04	**Condition on receipt**	Satisfactory

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.
TPH (TPH3B1_W) (Sub)								
	TPH >C21-C40	*	Default	0.1		<0.1	ug/L	
	TPH >C10-C21	*	Default	0.1		<0.1	ug/L	
	TPH>C6-C10	*	Default	0.1		<0.1	ug/L	

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Signed : Maire Bradley 30/06/2021

Máire Bradley-Deputy Technical Manager

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Rooskagh Quarry – EIAR Chapter 7 Water

Appendix 7.7 – GSI Mapping

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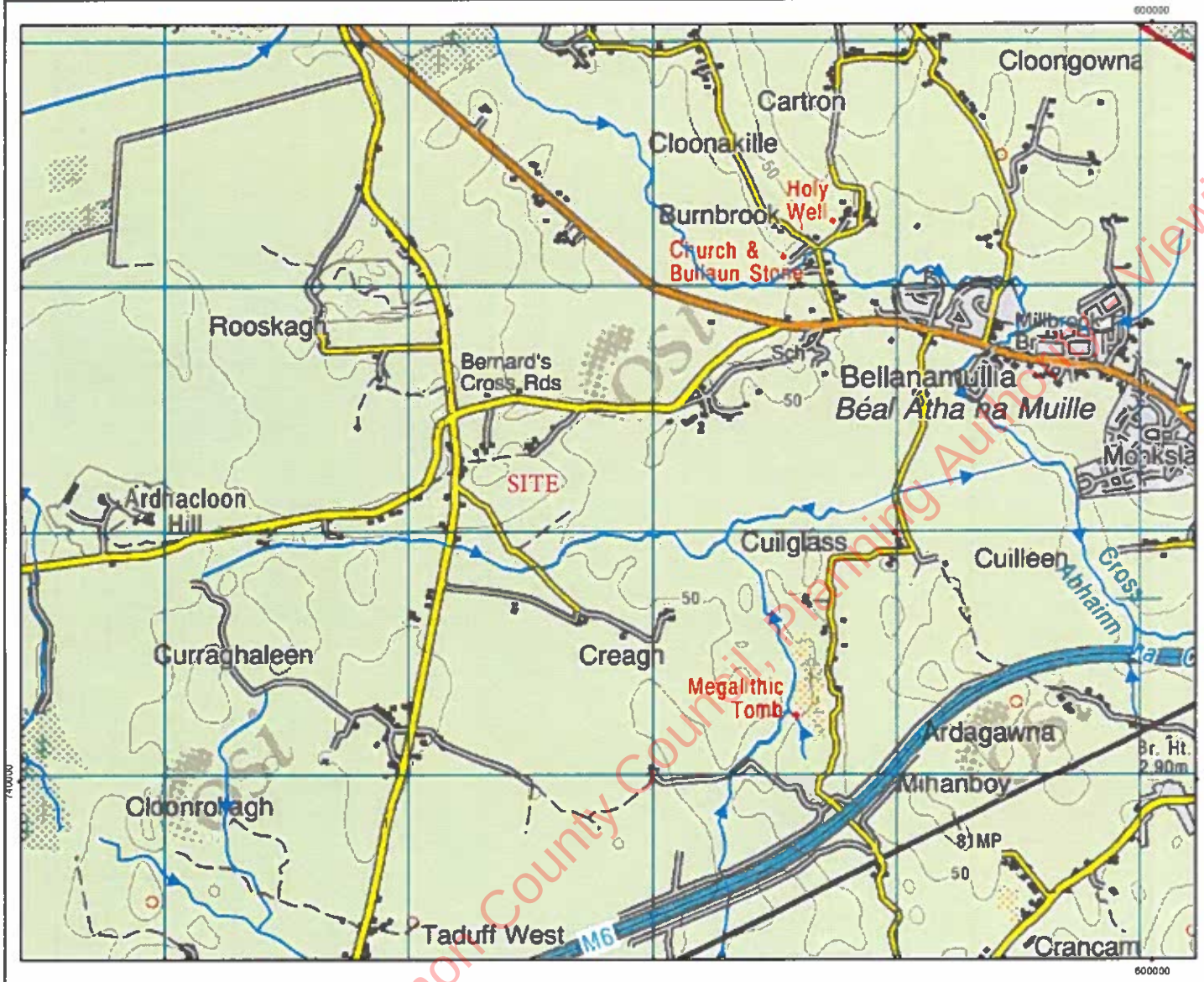
Rooskagh Quarry - GSI/OSI Discovery Mapping



Scale: 1:25,000

Geological Survey Ireland

0 0.175 0.35 0.7 mi

0 0.275 0.55 1.1 km

Map Centre Coordinates (ITM) 597,771 741,178

09/07/2021, 13:34:31

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Legend

River Network and River Flow Direction Arrows

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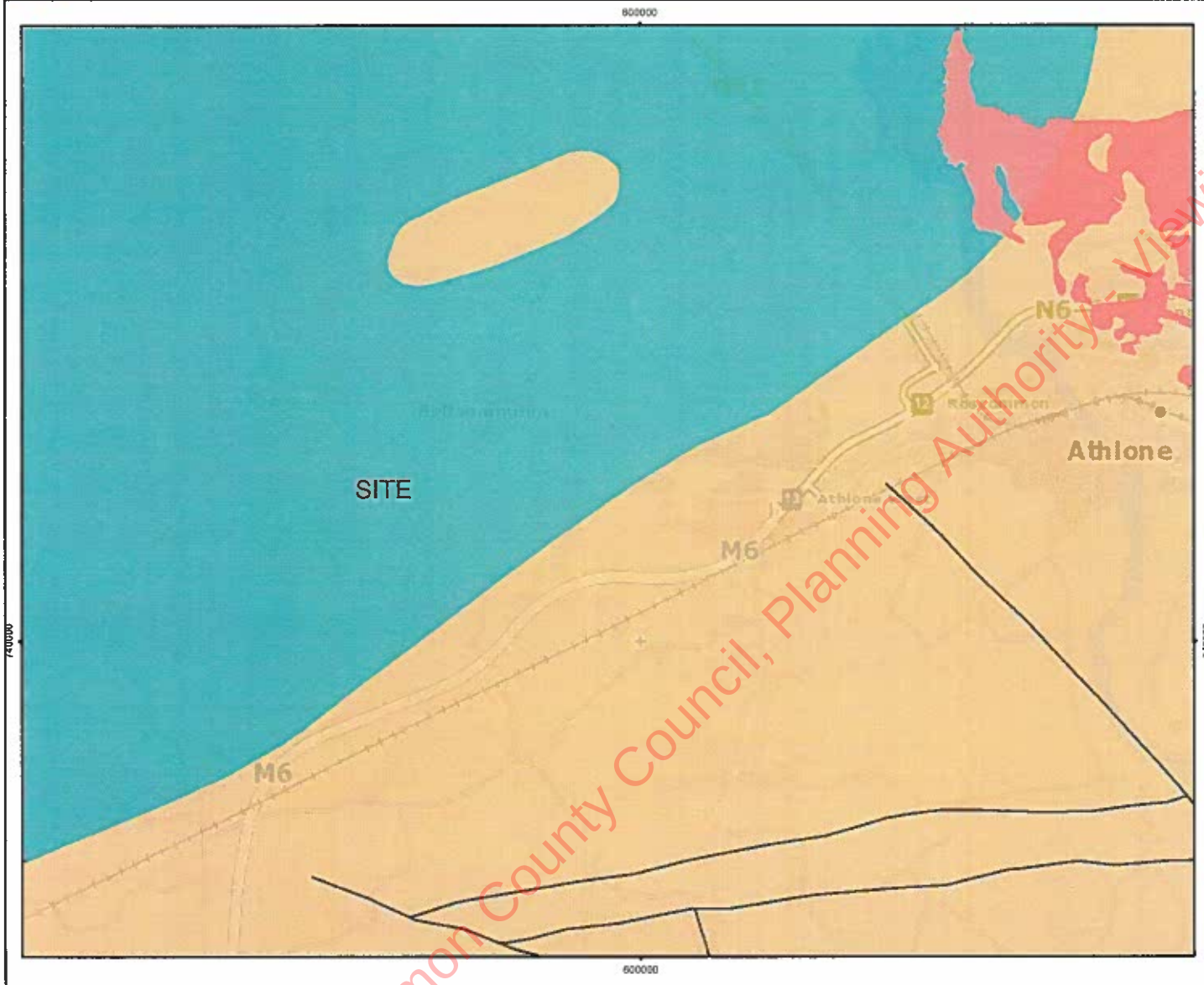
Rooskagh Quarry - GSI Aquifer Mapping



Scale: 1:50,000

Geological Survey Ireland

0 0.35 0.7 1.4 mi
0 0.5 1 2 km

Map Centre Coordinates (ITM) 599,732 741,229
07/07/2021, 01:13:43

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Legend

Gravel Aquifer

- Locally important gravel aquifer
- Bedrock Aquifer Faults

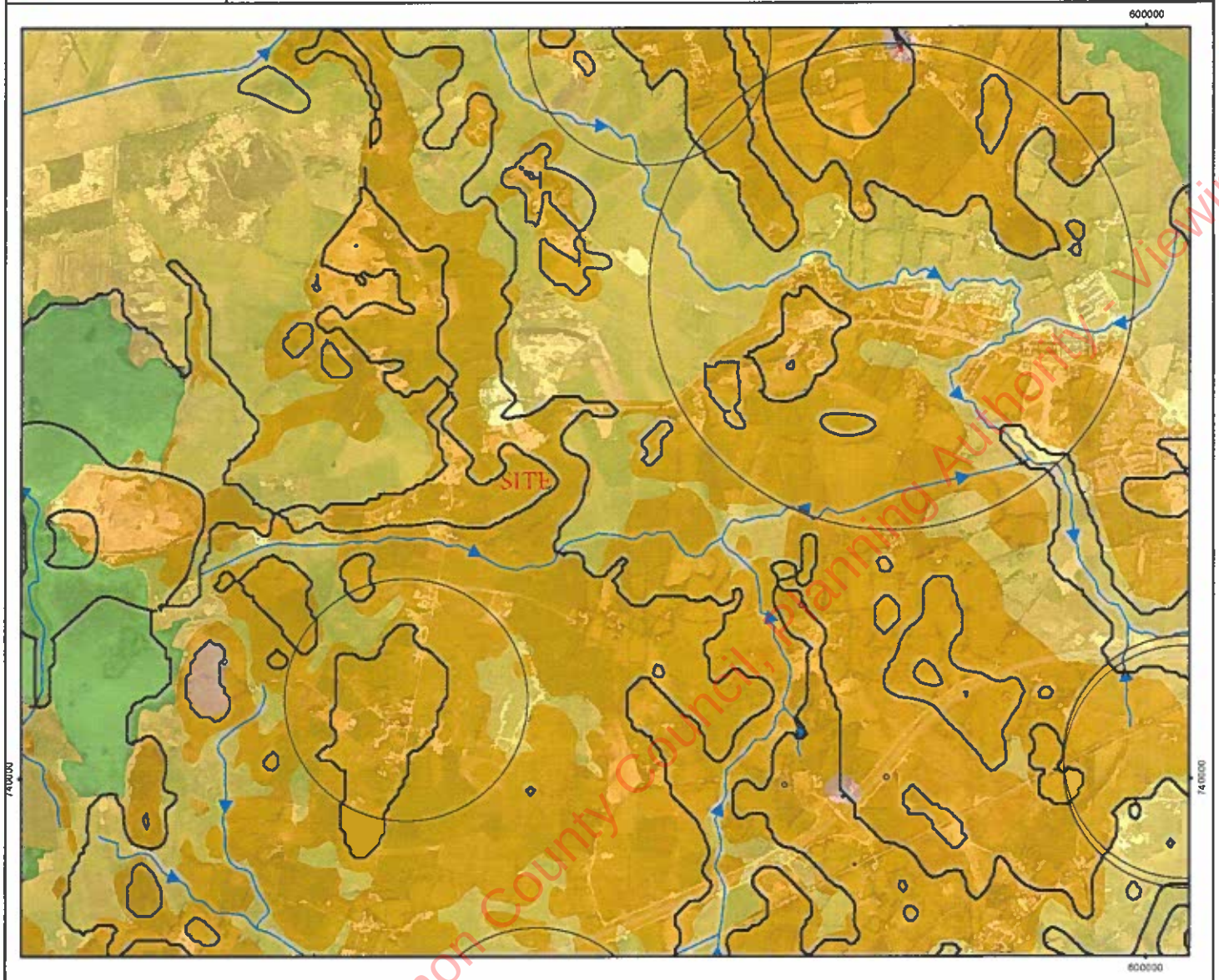
Bedrock Aquifer

- Rkc - Regionally Important Aquifer - Karstified (conduit)
- Ll - Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones

Roscommon County Council, Planning Authority - Viewing Purposes Only!

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

Rooskagh Quarry - GSI Vulnerability & Well Mapping



Legend

- Groundwater Wells and Springs
- EPA Contours
- River Network and River Flow Direction Arrows

National Groundwater Vulnerability Ireland

- Rock at or near Surface or Karst
- Extreme
- High
- Moderate
- Low

Scale: 1:25,000

Geological Survey Ireland

0 0.175 0.35 0.7 mi
0 0.275 0.55 1.1 km

Map Centre Coordinates (ITM) 597,771 741,178
09/07/2021, 13:23:31

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27 SEP 2022 22-526
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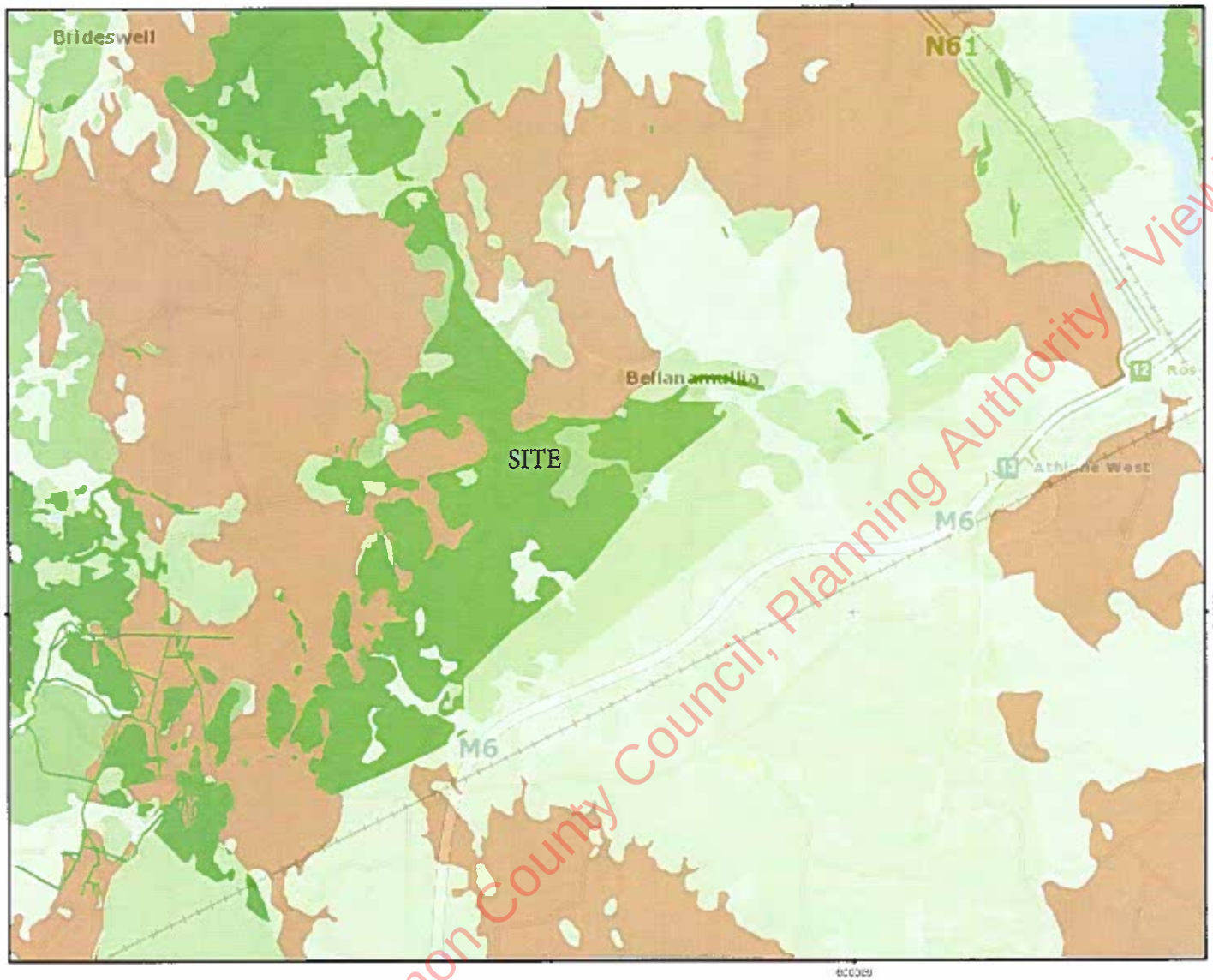
Roscommon County Council, Planning Authority - Viewing Purposes Only!

Rooskagh Quarry - GSI Recharge Data



Legend

Groundwater Recharge 1 40000 Ireland ITM

- 451-500 mm
- 401-450 mm
- 301-350 mm
- 201-250 mm
- 151-200 mm
- 101-150 mm
- 51-100 mm
- 1-50 mm

Scale: 1:50,000

Geological Survey Ireland

0 0.35 0.7 1.4 mi
0 0.5 1 2 km

Map Centre Coordinates (ITM) 598,012 741,038
08/07/2021, 12:48:36

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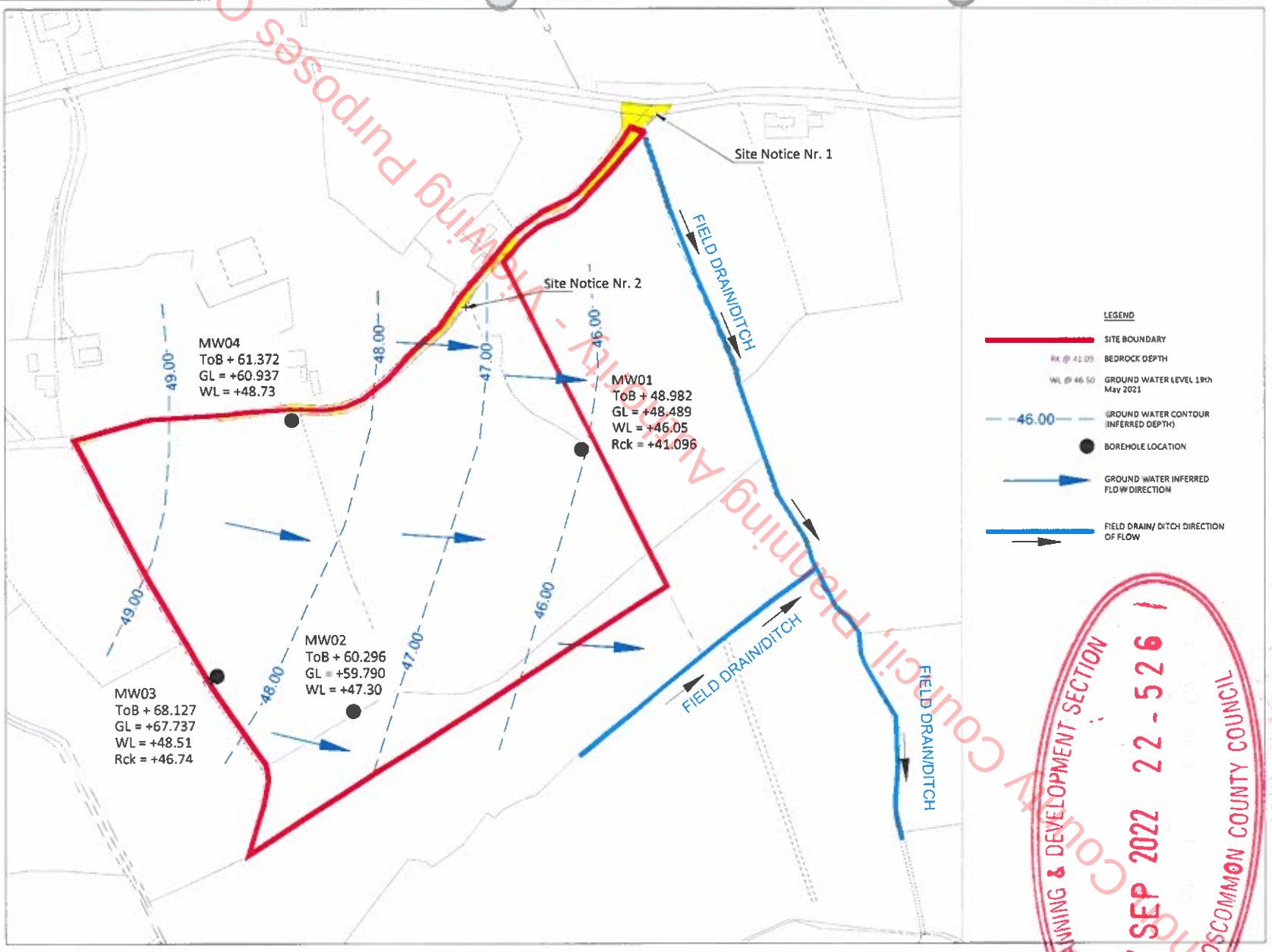
PLANNING & DEVELOPMENT SECTION
27 SEP 2022
22 - 526
ROSCOMMON COUNTY COUNCIL

Rooskagh Quarry – EIAR Chapter 7 Water

Appendix 7.8 – Groundwater Flow Direction Drawing

Roscommon County Council, Planning Authority - Viewing Purposes Only!

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL



ORDNANCE SURVEY OF IRELAND LICENCE NUMBER
CYAL50211192 © Ordnance Ireland/Government of Ireland

PLANNING & DEVELOPMENT SECTION
27 SEP 2022
22-526
ROSCOMMON COUNTY COUNCIL

Revisions			
Rev	By	Date	Description
PL0	MD	16.09.22	Issued for Planning

Client:
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Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Inferred Ground Water Flow Direction

Status	Planning
Date:	August 2022
Scale	1:2,500 @ A3
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	004	PL0

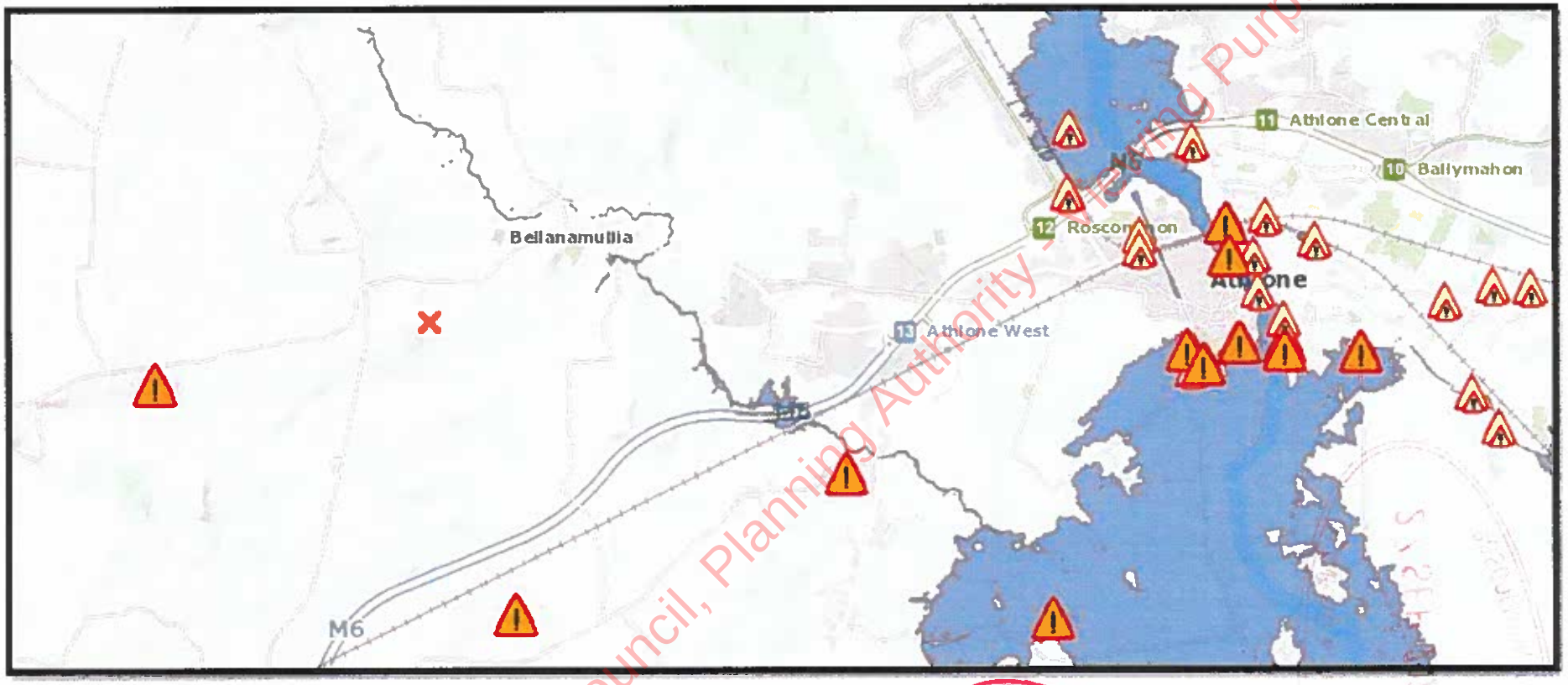
Roscommon County Council Planning Authority - Viewing Purposes Only!

Rooskagh Quarry – EIAR Chapter 7 Water

Appendix 7.9 – OPW Flood Mapping

Roscommon County Council, Planning Authority - Viewing Purposes Only!

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL



Rooskagh Quarry EIAR - OPW Historic Flood Mapping, (site location show by red X).

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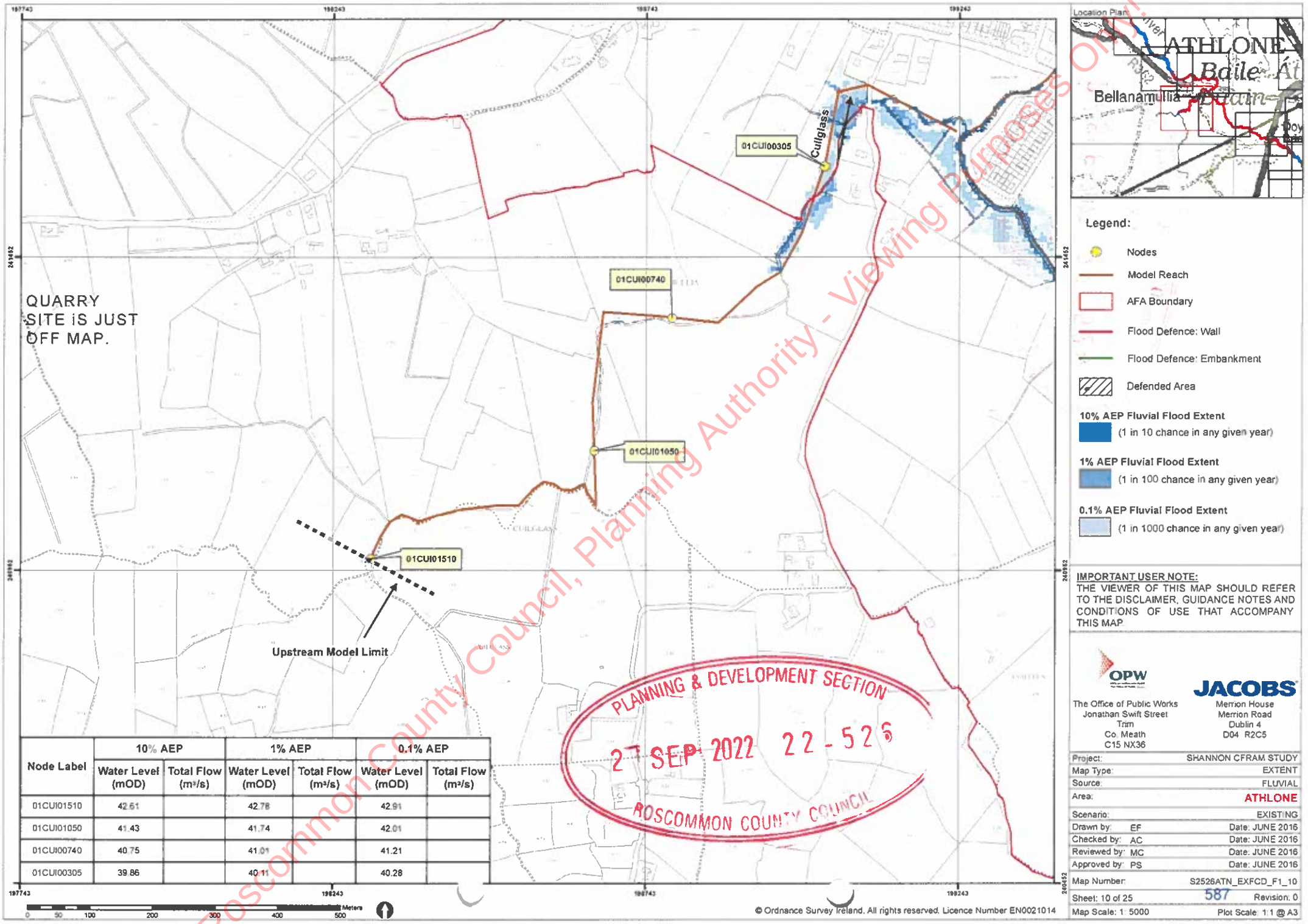

Node Label	10% AEP		1% AEP		0.1% AEP	
	Water Level (mOD)	Total Flow (m³/s)	Water Level (mOD)	Total Flow (m³/s)	Water Level (mOD)	Total Flow (m³/s)
01CUI01510	42.61		42.78		42.91	
01CUI01050	41.43		41.74		42.01	
01CUI00740	40.75		41.01		41.21	
01CUI00305	39.86		40.11		40.28	

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Rooskagh Quarry – EIAR Chapter 7 Water

Appendix 7.10 – C Boyd Layout & Infrastructure Drawings

Roscommon County Council, Planning Authority - Viewing Purposes Only!

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

SCALE BAR 1:1,000

0 10m 20m 30m 40m 50m 60m 70m 80m 90m 100m

For Planning Purposes Only

LANDOWNERSHIP IN BLUE
SITE OUTLINED IN RED
RIGHT OF WAY

Area of Site:
69,381 Sq/m
17.2 Acres
6.938 Hectares

ITM: 597452, 741243

22.137-010C

22.137-010B

60m Buffer zone from adjacent property denoted thus.

01 02 03 04 05

Proposed new stock proof fence. Refer to boundary treatment layout for details of boundaries.

Proposed new weld mesh fence. Refer to boundary treatment layout for details of boundaries.

Bottom of slope denoted thus.

Top of slope denoted thus.

For details of proposed entrance walls refer to Site Entrance drawing 21.137-017.

Existing hedge to be removed/cut back as required to achieve required sight-lines within the landownership of the applicant.

Proposed entrance gate. Refer to site entrance drawing for details.

Staff and visitor car park

Wayleave marked in yellow. Refer to letter from solicitor for further details.

Location of site notice Nr. 1.

Existing road to be widened on the applicants road side to facilitate a 6m wide road.

Road centreline.

Location of site notice Nr. 2.

Roadside boundary to be set back 3m from metalled edge of existing road. Road to be extended to meet new boundary.

Proposed topsoil stockpile for re-use during reinstatement phase.

Small vehicles queuing area.

For details of lighting and lighting layout refer to specification attached to application.

For details of proposed office building, refer to drawing 21.137-030.

For details of proposed weighbridge, refer to drawing 22.137-019.

For details of proposed wastewater storage tank, refer to drawing 23.137-022.

For details of portable wheelwash, refer to drawing 22.137-018.

For details of proposed toilet building, refer to drawing 21.137-031.

For details of proposed soakaway, refer to drawing 21.137-020.

Inspection Manhole prior to discharge to soakpit.

For details of proposed silt trap manhole, refer to drawing 21.137-020.

For details of proposed re-fueling/petrol interceptor, refer to drawing 21.137-020.

Petrol interceptor refer to dwg. 22.137-020

Hardstanding gravelled area.

15 x 10 x 2 Dp. Soakaway to take overflow from settlement pond

Inspection Manhole on overflow outfall to soakaway

Soil embankment surrounding the settlement pond.

2m High weld mesh fencing surround settlement pond. New 6m wide gates to facilitate access on western end of pond.

Proposed well with manhole cover surrounded in concrete slab

Overflow pipe from settlement pond taken from clean water side

Soil embankment surrounding the settlement pond.

Top of slope denoted thus.

Site outlined in red.

Proposed Settlement Pond- Refer to Dwg. 22.137-021

For extents of lands under the control of the applicant refer to the site location maps.

Existing road to be widened on the applicants road side to facilitate a 6m wide road.

Existing hedge to be removed/cut back as required to achieve required sight-lines within the landownership of the applicant.

Section-01

Section-02

Section-03

Section-04

Section-05

GATEWAY
DECIDUOUS TREE DRAWN TO SIZE
SEWER MANHOLE & DETAILS
GULLY AND DETAILS
FENCE
ESB COVER
EIRCOM COVER
199.997 SPOTHEIGHT & ELEVATION
FIRE HYDRANT
STOP VALVES
BUILDING
ESB/EIRCOM POLE & CABLE
TREES/TREELINE
DITCHLINE
HEDGELINE
WALL
EMBANKMENT
EXTRACTION AREA
PROPOSED TOPSOIL STOCKPILE
PROPOSED TARMACADAM
PROPOSED CONCRETE
PROPOSED HARDSTANDING AREA
PROPOSED SETTLEMENT POND
STOCKPROOF POST & WIRE FENCE
2.4m HIGH WELDED MESH FENCE
OUTLINE OF EXTRACTION AREA

Notes:

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5. Consultants to be informed immediately of any discrepancies before work proceeds.

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N

Revisions

Rev	By	Date	Description
PL0	MD	16.09.22	Issued for Planning

Client:
Eamon Harney

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

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Email: info@collinsboydeng.com

Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Proposed Site Masterplan

Status	Planning
Date:	July 2022
Scale:	1:1,000 @ A1
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	010A	PL0

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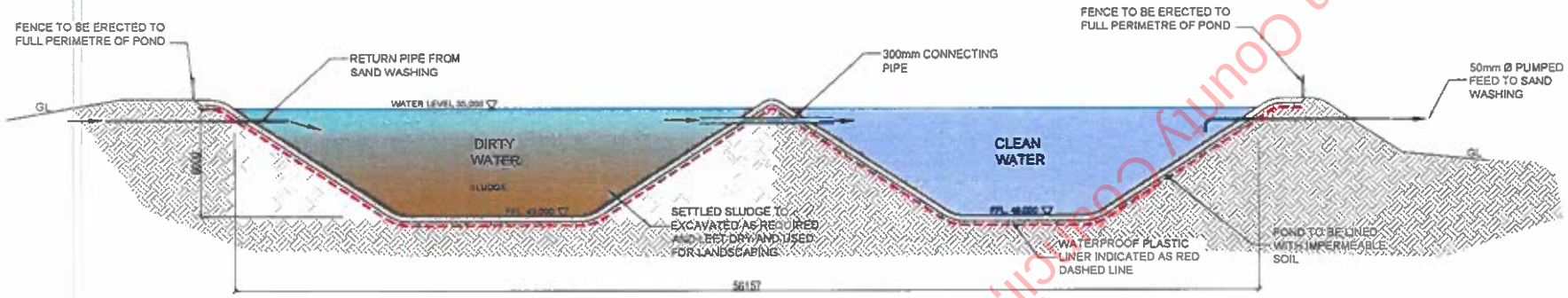
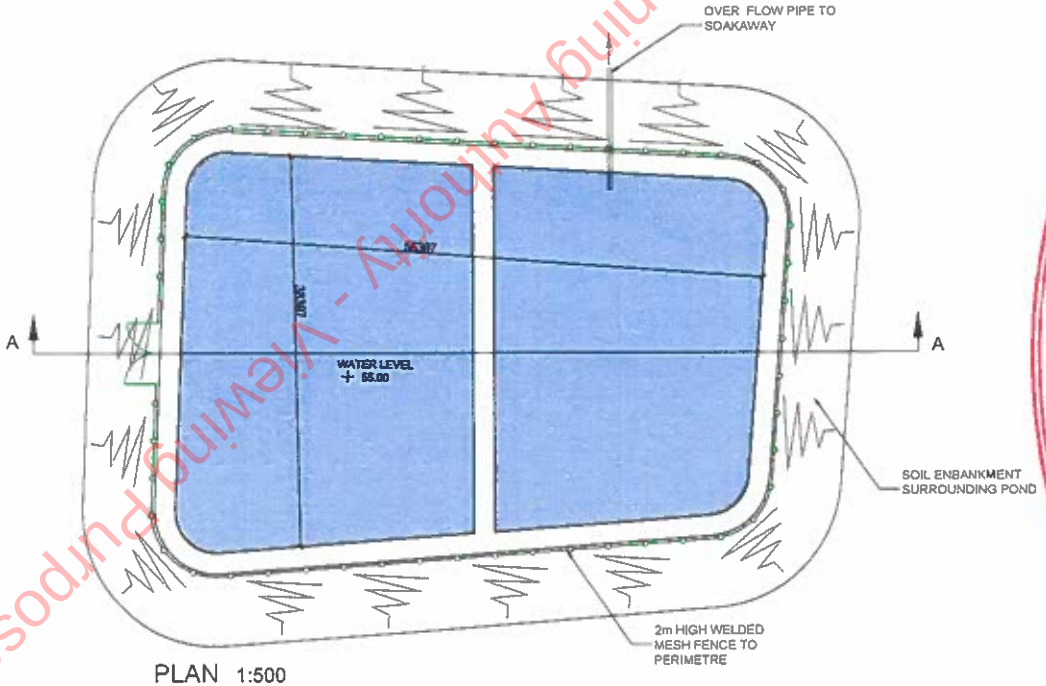


SECTION A-A 1:250



PLAN 1:500

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

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Revisions

Rev	By	Date	Description
P1.0	MD	16.08.2022	Issued For Planning

Client:
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Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamulla (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Proposed Water Settlement Pond Plan and Details

Status:	Planning
Date:	August 2022
Scale:	As Shown
Drawn by:	MD

JOB No.	DRG No.	REV.
22.137	021	P1.0

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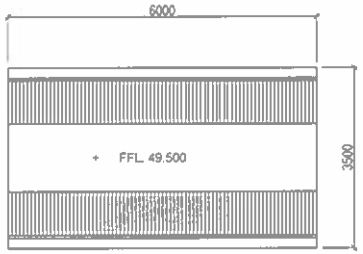

Plan

TYPICAL FRONT VIEW

West Elevation

North Elevation

East Elevation

South Elevation

TYPICAL FRONT VIEW

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PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
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Revisions

Rev	By	Date	Description
P1.0	MD	15.09.2022	Issued For Planning

Client:
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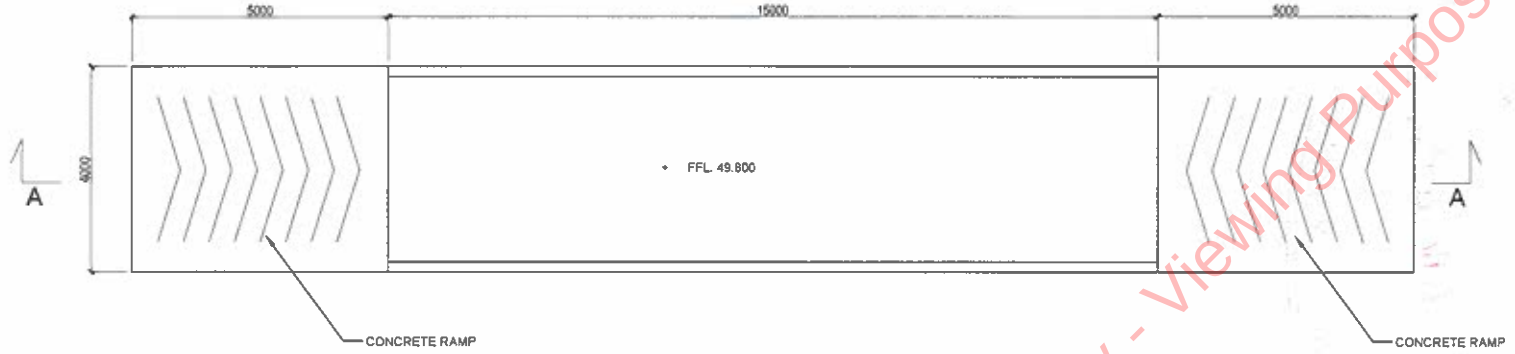
Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Proposed Portable Wheelwash System

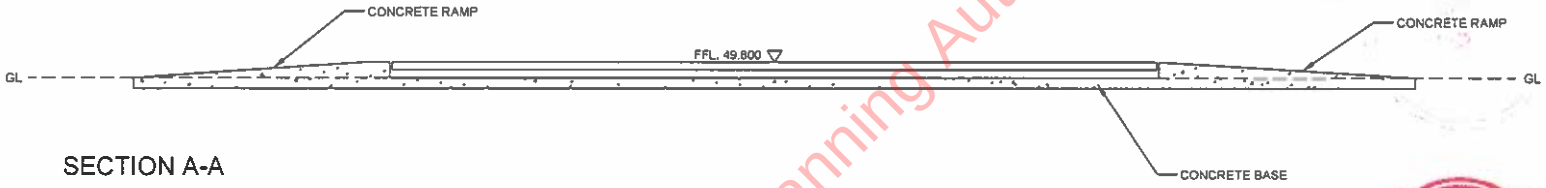
Status:	Planning
Date:	August 2022
Scale:	1:100 @ A3
Drawn by:	MD

JOB No.	DRG No.	REV.
22.137	010	P1.0

For Planning Purposes Only



Plan



SECTION A-A

TYPICAL EXAMPLE OF WEIGHBRIDGE

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Revisions

Rev	By	Date	Description
P1.0	MD	16.08.2022	Issued For Planning

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Job Title

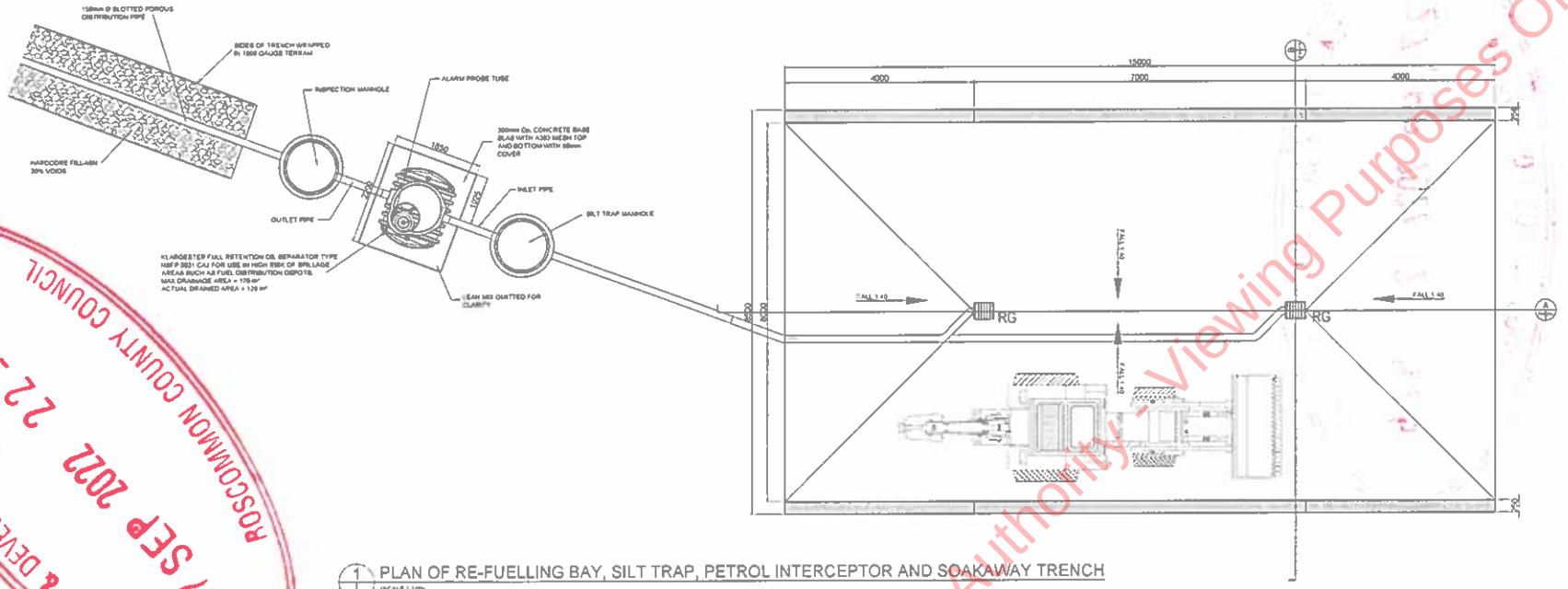
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title

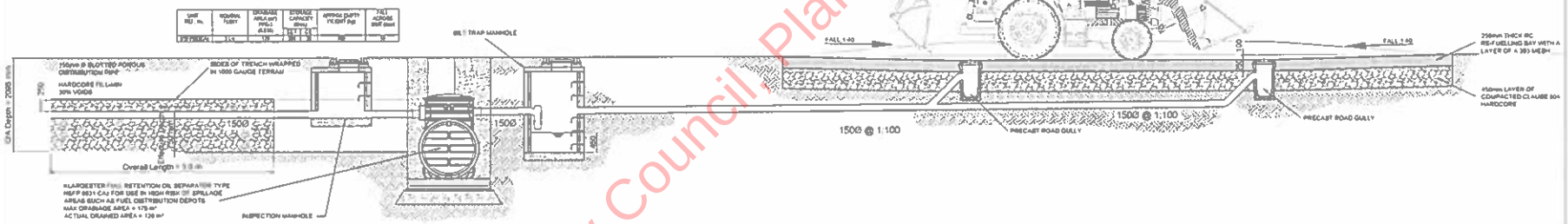
Proposed Weighbridge

Status	Planning
Date	August 2022
Scale	1:100 @ A3
Drawn by	MD

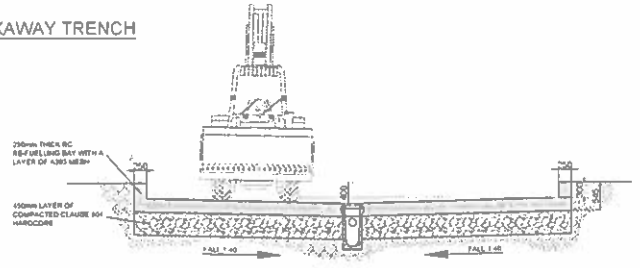
JOB No.	DRG No.	REV.
22.137	019	P1.0



1 PLAN OF RE-FUELLING BAY, SILT TRAP, PETROL INTERCEPTOR AND SOAKAWAY TRENCH
(SCALE 1:100)



A SECTION A-A THROUGH RE-FUELLING BAY, SILT TRAP, PETROL INTERCEPTOR AND SOAKAWAY TRENCH
(SCALE 1:100)



B SECTION B-B THROUGH RE-FUELLING BAY
(SCALE 1:100)

For Planning Purposes Only

PLANNING & DEVELOPMENT SECTION
27 SEP 2022
ROSCOMMON COUNTY COUNCIL
22 - 526

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NOT FOR CONSTRUCTION

Revisions

Rev	By	Date	Description
P1.0	MD	19.08.2022	Issued For Planning

Client

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Job Title

Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

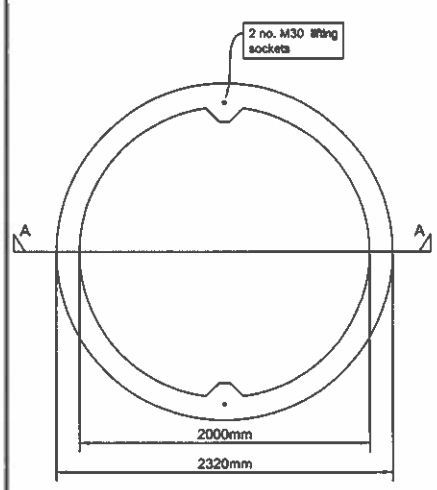
Drawing Title

Proposed Petrol Interceptor and Re-fuelling Bay

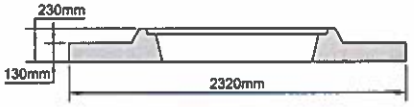
Status	For Planning
Date:	August 2022
Scale:	1:100 @ A3
Drawn by:	MD

JOB No.	DRG No.	REV.
22.137	020	P1.0

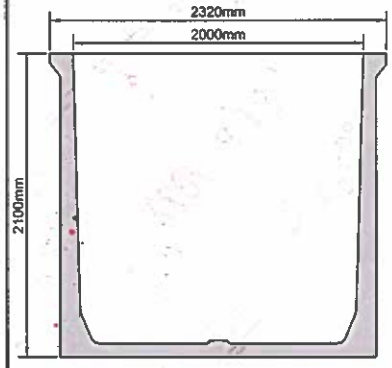
For Planning Purposes Only



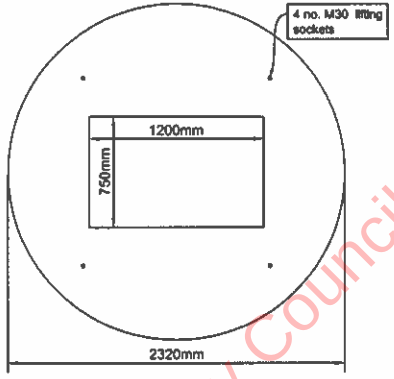
TANK/RISER PLAN



HEAVY DUTY LID SECTION through B-B

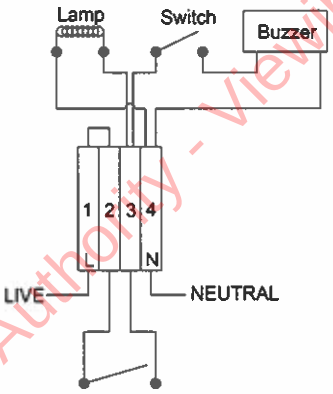


TANK SECTION through A-A



HEAVY DUTY LID PLAN option 2: 1,200 X 750mm opening

01/022 Wastewater Storage Tank Plan, Elevation and Section 1:25



Float Switch

Supply to this box must be fused.

Please ensure all connections are tight before commissioning.

All connections by qualified person only

02/022 Alarm System Wiring NTS

Roscommon County Council, Planning Authority - Viewing Purposes Only!

PLANNING & DEVELOPMENT SECTION
27 SEP 2022
22 - 526
ROSCOMMON COUNTY COUNCIL

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5. Consultants to be informed immediately of any discrepancies before work proceeds.

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Revisions

Rev	By	Date	Description
P1.0	MD	16.09.2022	Issued For Planning

Client:
Eamon Hanley

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Phone: 090 6634421
Fax: 090 6634423
Email: info@collinsboydeng.com

Job Title:
Proposed Sand & Gravel Quarry at Rooskagh Td. Bealnamulla Co. Roscommon

Drawing Title:
Proposed Wastewater Storage Tank and Alarm System/Kiosk

Status:	For Planning
Date:	August 2022
Scale:	1:25 @ A2
Drawn by:	MD

JOB No.	DRG No.	REV.
22.137	022	P1.0

NOTES:

- SITE OUTLINED IN RED
- LANDS IN CONTROL OF APPLICANT OUTLINED IN BLUE
- GRASSED AREA TO BE COVERED WITH MIN. 300mm OF TOPSOIL & SOWN WITH AGRICULTURAL SEED MIX
- SLOPED ENBANKMENTS & SITE PERIMETRE PLANTED AS PER LANDSCAPE ARCHITECTS PLAN
- 2.4m HIGH WELDED MESH FENCE
- TIMBER POST & SHEEP WIRE FENCE

Area of Site:
69,381 Sq/m
17.2 Acres
6.938 Hectares

ITM: 597452, 741243

For Planning Purposes Only

- LANDOWNERSHIP IN BLUE
- SITE OUTLINED IN RED
- RIGHT OF WAY

01

02

03

04

05

60m Buffer zone to protect the residential amenity of the adjacent property.

2.4m welded mesh fence

Entrance to be retained for agricultural use.

Site Notice Nr. 2

2.4m high welded mesh fence.

Wayleave marked in yellow. Refer to letter from solicitor for further details.

Top of bank denoted thus.

Bottom of bank denoted thus.

For extents of lands under the control of the applicant refer to the site location maps.

Proposed land to grade into meet existing levels.

Site outlined in red.

Section-0

Section

Roscommon County Council, Planning Authority - Viewing Purposes Only!

Notes:

1. This drawing is the copyright of Collins Boyd Engineering Ltd. It is a confidential document and must not be copied, used or its contents divulged without prior written permission.
2. DO NOT SCALE, use figured dimensions only, if in doubt ask. All dimensions to be checked by contractor on site, any errors or discrepancies to be reported to the Architects.
3. All works to be carried out in accordance with the current building control act and building regulations.
4. Clients are obliged to forward a commencement notice to the local authority at least 14 days prior to the commencement of any works on site.
5. Consultants to be informed immediately of any discrepancies before work proceeds.

NOT FOR CONSTRUCTION

N

Revisions

Rev	By	Date	Description
PL0	MD	16.09.22	Issued for Planning

Client:
Eamon Harney

PLANNING & DEVELOPMENT SECTION
27 SEP 2022 22-526
ROSCOMMON COUNTY COUNCIL

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Job Title:
Proposed Extraction of Sand, Stone and Gravel at Rooskagh Td., Bellanamullia (Bealnamulla), Athlone, Co. Roscommon

Drawing Title:
Proposed Restoration Plan

Status	Planning
Date:	August 2022
Scale:	1:500 @ A1
Drawn by:	CM

JOB No.	DRG No.	REV.
22.137	013	PL0