

Joe Bonner BA MRUP Dip Env Eng Dip Proj Mgt MIPI

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NON TECHNICAL SUMMARY

1.1 This Environmental Impact Assessment report (EIAR) has been prepared on behalf of Hanly Quarries Limited, the owner and operator of Hanly Quarries, Laragan, Elphin, Co Roscommon, to describe the significant impacts upon the environment arising from the proposed development of two no extensions to the existing operating quarry, which will assist and inform the Competent Authority (CA), Roscommon County Council in undertaking an environmental impact assessment of the proposed development.

1.2 The quarry is located in the townlands of Cuilreevagh and Largan, Elphin, Castlerea, Co Roscommon and located c4km north of Strokestown and c5.7km southeast of the village of Elphin.

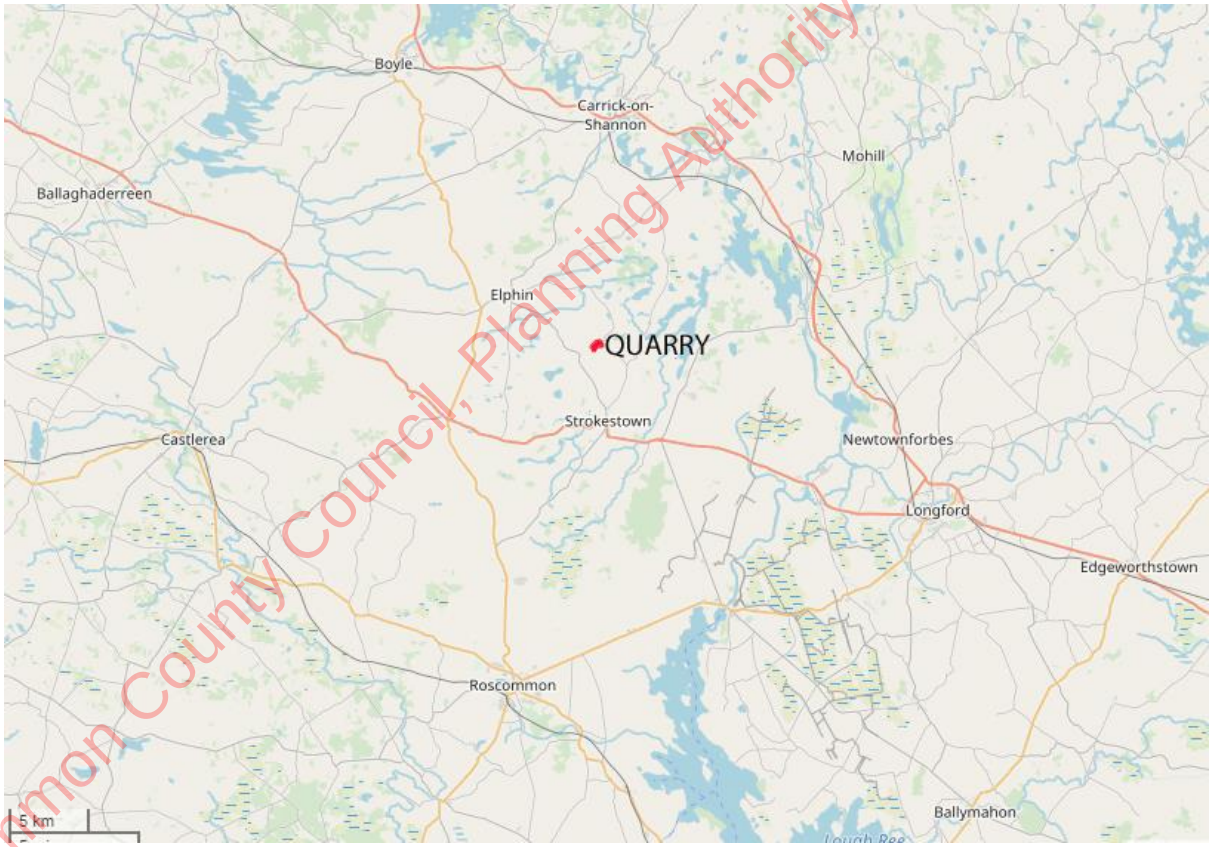

Figure 1.1 Site Location Map www.openstreetmap.org

LEGISLATIVE BACKGROUND TO APPLICATION

1.3 The principle legislation governing the preparation of this EIAR is the: -

- European Union Directive 2014/52/EU, which amended Directive 2011/92/EU
- Planning and Development Act 2000 (as amended)
- Planning and Development Regulations 2001 (as amended)

INFORMATION TO BE INCLUDED IN EIAR

1.4 The term of Environmental Impact Statement (EIS) has also been replaced in Directive 2014/52/EU with a definition of Environmental Impact Assessment Report (EIAR) and Paragraph 1 of Article 5 has been replaced with the following description of information that is required to be included in an EIAR. It states: -

> "Where an environmental impact assessment is required, the developer shall prepare and submit an environmental impact assessment report. The information to be provided by the developer shall include at least:
>
> (a) a description of the project comprising information on the site, design, size and other relevant features of the project;
>
> (b) a description of the likely significant effects of the project on the environment;
>
> (c) a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;
>
> (d) a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;
>
> (e) a non-technical summary of the information referred to in points (a) to (d); and
>
> (f) any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected."

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

- Planning and Development Acts, 2000 (S.I. 30 of 2000 – as amended);
- Planning and Development Regulations, 2001 (S.I. 600 of 2001- as amended).

1.6 This EIAR was also prepared having regard to the Environmental Protection Agency (EPA) and Government publications:-

- Guidelines on the information to be contained in Environmental Impact Statements; (EPA 2002);
- Advice Notes on Current Practice in the preparation of Environmental Impact Statements; (EPA 2003);
- Guidance for Planning Authorities and An Bord Pleanala on carrying out Environmental Impact Assessment (DCELG, 2013)
- Draft Advice Notes for Preparing Environmental Impact Statements Draft (EPA September 2015);
- Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA August 2017);
- Quarries and Ancillary Activities - Guidelines for Planning Authorities; (DoEHLG) 2004;
- Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals): (EPA) 2006.

FACTORS TO BE CONSIDERED IN EIAR

1.7 Article 3 of Directive 2014/52/EU has amended the issues that must be considered in the EIAR from that which was required formerly under Directive 2011/92/EU. It states: -

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

1.8 All of the above factors are assessed in this EIAR.

STRUCTURE OF ENVIRONMENTAL IMPACT ASSESSMENT REPORT

1.9 The impacts of the proposed development were examined under the following headings: -

1.0 Introduction

2.0 Description of Development and Consideration of Alternative

3.0 Planning Policy Context

4.0 Biodiversity

5.0 Population and Human Health

6.0 Water

7.0 Land and Soils

8.0 Air and Climate

9.0 Material Assets

10.0 Noise and Vibration

11.0 Cultural Heritage

12.0 The Landscape, Visual Impact and Restoration

13.0 Interactions between the above factors

1.10 The level of detail of the individual topics has been determined in each case, based on the likelihood of impacts occurring in the context of the nature of the proposed development.

LIST OF CONTRIBUTORS

1.11 Details of the study team are given below: -

Table 1.1 EIAR Team	Contributors
Chapter	
Non-Technical Summary	Joe Bonner Town Planning Consultants Ltd Joe Bonner BA MRUP Dip Env Eng Dip Proj Mgt MIPI
1.0 Introduction	
2.0 Description of Development and Consideration of Alternative	
3.0 Planning Policy Context	
4.0 Biodiversity	NEO Environmental Ltd Micheal McGhee Engineer Paul Neary BA H.Dip MA MSc MIEnvSc MIAI ACIFA CEnv Chartered Environmentalist and a Licensed

		Archaeologist Dawn Thompson BSc (Hons) MCIEEM MEECW Daniel Flenley Ecologist Dara Dunlop Ecologist Niall O'Reilly MSc MEd Gala Podgornik MSc
5.0	Population and Human Health	Joe Bonner Planning
6.0	Water	NEO Environmental
7.0	Land and Soils	Global Green Sustainability Niall Kiernan, BSC, Environmental Science. Member of the Environmental Association of Ireland and Engineers Ireland Alma Kurtis – Ecologist. BSc Ecology. Glenn Redmond - Master of Arts (M.A.), Archaeology
8.0	Air and Climate	Global Green Sustainability
9.0	Material Assets	NEO Environmental
10.0	Noise and Vibration	Global Green Sustainability
11.0	Cultural Heritage	Global Green Sustainability
12.0	The Landscape	Global Green Sustainability
13.0	Interactions between the above factors	Joe Bonner Planning

1.12 These specialist contributors have either prepared individually or co-authored chapters in accordance with the methodology described in the EPA's 'Guidelines on the Information to be contained in Environmental Impact Statements', and 'advice notes on current practice (in the preparation of Environmental Impact Statements)' as well as from past experience of preparing Environmental Impact Statements and Environmental Impact Assessment Reports to accompany similar planning applications.

PLANNING POLICY CONTEXT

2.1 This chapter sets out the key documents that provide the planning policy context for the proposed development. It addresses the National, Regional and Local level documents which are set out below:

2.2 National Policy

- Project 2040 - National Planning Framework
- National Development Plan 2018-2027

- Quarries and Ancillary Activities - Guidelines for Planning Authorities
- EPA Environmental Management Guidelines – Environmental Management in the Extractive Industry

2.3 Regional Policy

- Northern & Western Regional Spatial and Economic Strategy

2.4 Local Policy

- Roscommon County Development Plan 2014-2020
- Roscommon County Development Plan 2021-2027

2.5 The design of the proposed development which consists of two no extensions to the existing quarry is consistent with National, Regional and County level policies and objectives.

2.6 The National Planning Framework recognises that *extractive industries are important for the supply of aggregates and construction materials* and that *the planning process will play a key role in realising the potential of the extractive industries sector by identifying and protecting important reserves of aggregates and minerals from development that might prejudice their utilisation.*

2.7 The Regional Spatial and Economic Strategy seeks to *'ensure efficient and sustainable use of all our natural resources, in a manner which ensures a healthy society a clean environment and there is no net contribution to biodiversity loss arising from development supported in this strategy. Conserve and protect designated areas and natural heritage area. Conserve and protect European sites and their integrity.*

2.8 The Roscommon County Development Plan contains a series of policies, objectives and key environmental challenges that need to be considered in assessing applications for quarry developments and the proposed development has been designed to be consistent with each of the stated standards and requirements.

DESCRIPTION OF PROPOSED DEVELOPMENT AND CONSIDERATON OF ALTERNATIVES

3.1 The proposed development will consist of the following: -

> Permission for development for a period of 24 years at a site in the townlands of Cuilreevagh and Largan, Elphin, Castlerea, Co Roscommon. The development will consist of two no extensions to the south and west of the existing quarry with a total extraction area of 8.60ha, a berm along the southwestern side of the southern extension, all associated site development and landscaping works. An environmental impact assessment report has been prepared in respect of the proposed development and will be submitted to the planning authority with the application.

3.2 The overall landholding covers an area of 278.41Hectares (c687.42ha acres) while the existing area of extraction is 34.63ha (c85.25ha). The site area is 43.28ha (c106.4ha) while the proposed areas of extraction have a combined area of 8.6ha. The proposed development consists of two separate extensions to the quarry at the western and southern sides of the existing quarry. The western extension will extend to c3.46ha (8.56 acres) while the southern extension will extend to c5.14ha (12.70ha).

3.3 The two separate areas as showing in Figures 3.1 and 3.2 below.

3.4 The surrounding land usage consists of agricultural fields while a pig farm is located c490m to the north of the quarry and 10 one off private residences are located within 1km of the quarry.

3.5 Due to the nature of the local topography the quarry is not visible on the approach from the north or from the west as the rises towards the quarry which is excavated into a hillside. Similarly the quarry is not visible from the southern side. The quarry is visible from the east close to the entrance for a short distance and this is addressed in Chapter 12 - The Landscape, Visual Impact and Restoration.

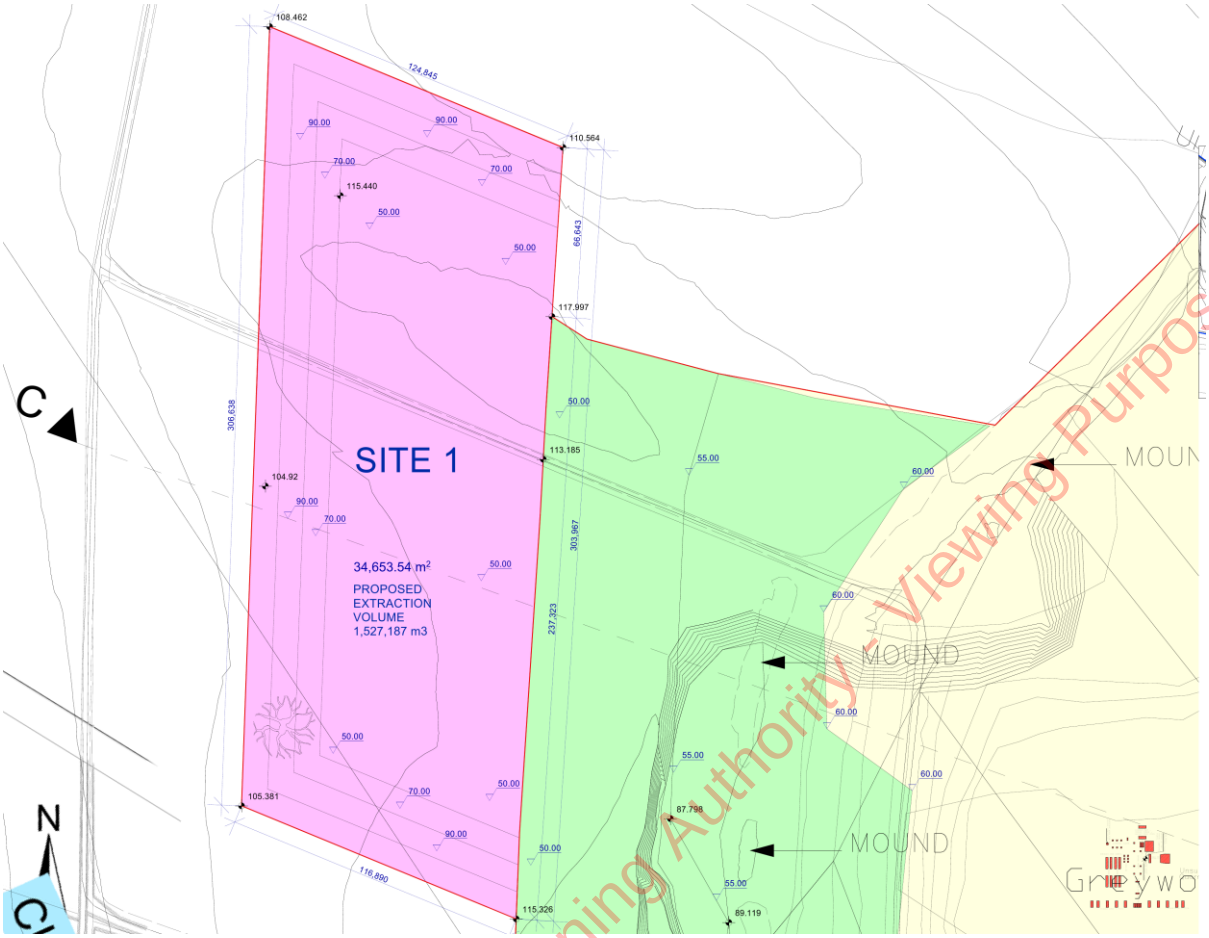

Figure 3.1 Proposed western extension to quarry of c3.46ha

3.6 Hanly Quarries was in operation prior to the coming into effect of the Local Government (Planning and Development) Act 1963, and was registered under Section 261 of the Planning and Development Act 2000 (as amended). Roscommon County Council attached conditions to the future operation of the quarry.

3.7 This application has been made on the basis that Roscommon County Council determined that the footprint of the existing quarry has reached the extent of what could have reasonably been expected to be the extent of the quarry on the appointed day of 1st October 1964 and that any further extensions to the quarry would require a grant of permission.

3.8 Hanly Quarries supply crushed rock aggregate to the local construction and road building companies. The present working area of the quarry is almost worked out. The proposed quarry extensions of 8.60 hectares will allow site operations to continue at this quarry site.

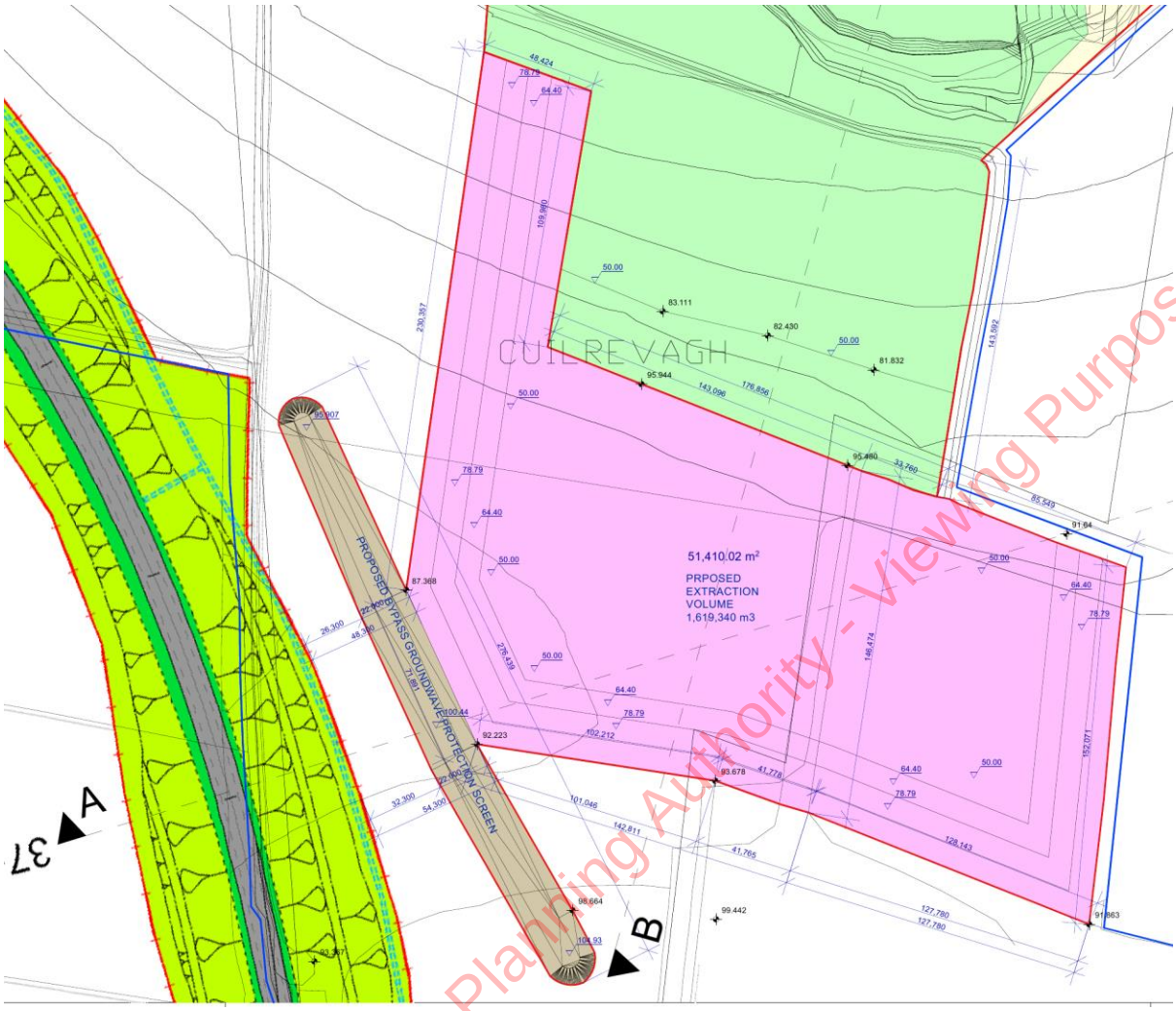

Figure 3.2 Proposed southern extension to quarry of c5.14ha

3.9 Quarry operations will remain at the same level with no intensification of site operations or production levels. The quarry employs 68 members of staff.

3.10 Operations of manufacture, delivery and product dispatch are proposed to be:

- From 07:00 hrs to 19:00 hrs Monday to Saturday

3.11 The primary resource of the proposed extended quarry is crushed rock aggregate. No new plant will be required as part of the proposed extension.

Consideration of Alternatives

3.12 A quarry has operated at this location prior to the introduction of the first Planning Act in October 1964. The quarry is strategically located within close proximity to a number of large

urban areas including Roscommon, Longford and Carrick-on Shannon as well as a number of smaller settlements. Existing supplies of aggregates of all classes and particularly those of the quality and type which exist at Hanly Quarries are limited in number and extent.

3.13 The development of new sources of supply on greenfield sites (Option A) is considered problematic from environmental and community perspectives and would prove particularly so in close proximity to populated settlements and in a rural area with a scattered rural population. This is evident by the general level of opposition to quarry development throughout the country and the number of possible alternative locations in the area for the opening of a quarry is limited. The current quarry site is not located in or near to a Natura 2000 designated site, or in an area of High Landscape importance as designated in the Roscommon County Development Plan 2014-2020 and these factors have been taken into consideration in the preparation of this EIAR.

3.14 Option B 'Do Nothing' consists of working out the existing extractable area and then ceasing activity upon the exhaustion of the existing resource. This option would not involve the loss of any additional lands and would mean that the quarry operation would cease earlier than if the proposed extension are permitted.

3.15 (Option C) which involves the continued operation of the existing quarry by way of extension is considered to be a more suitable alternative than opening a new quarry at another location in the area. With respect to alternative forms of extension, in particular possible lateral extensions, the ability to extend the quarry laterally has been determined by the topography and the proposed location of the new N5 road that will pass close to the southern boundary of the proposed southern extension.

3.16 The quarry could potentially be extended downwards and may be so in the future but the proposed lateral extensions are considered more acceptable at this time and will permit the extraction of the resource over a number of benches with the minimum amount of impact on the landscape.

3.17 The site has well established logistical routes for aggregate delivery, and the local market is well established over period that the quarry has operated. As the site is in essence part of a brownfield development, then no additional site services (electric, water supply etc.) will be required as these have already been installed at the site.

3.18 The skilled labour market within the local community has been well established for aggregate production, and the supply and sales chains have been well tested and refined over the years. The overall quarry site has 68 staff at present.

3.19 To adopt a new site selection would mean the relocation of existing facilities, supply chains, labour workforce etc. The negative effects of relocation would be similar to that outlined within the 'do nothing' scenario, which has been considered as a non-viable option for this application. Therefore, the alternative site selection is also considered to be a nonviable option given the well-established nature of the existing facilities and the lack of permitted land available for bedrock extraction.

Alternative Method of Extraction

3.20 It is proposed to continue extracting the stone from the quarry using a drilling and blasting technique. The quarry operators have being extracting stone by this method since the quarry started operating and have being using the same blasting contractor for almost 50 years. The noise and vibration results attained from the historic blasts have proven that the established method is both a safe and an acceptable form of extraction.

3.21 An alternative method of extraction is drilling and hydraulic fracturing, however, this method would be extremely time consuming and would require much more frequent drilling as the quantities of stone removed would be much smaller than using the existing blasting method. The drilling and hydraulic fracturing method would likely result in prolonged periods of noise due to the significantly additional drilling requirement, thereby making drilling and blasting a more suitable and preferred method of extraction.

3.22 Due to the nature of the rock to be extracted rock-breaking is not considered is viable method of extraction.

BIODIVERSITY

4.1 The operational phase of the proposed development is considered to have the potential to impact on ecology receptors, prior to mitigation measures being implemented. The activities within each stage of the proposed development have been considered and their potential effects assessed.

4.2 The main potential effects of the proposed development will be on bats and breeding birds (where works are undertaken during the breeding bird season March to August inclusive).

4.3 Pre-construction badger surveys have been recommended to assess the potential impacts for these species immediately prior to the commencement of the construction phase. This survey has been recommended as badgers are highly mobile, and known to be present within the local area. From the current survey findings, it is anticipated that the Development will not have a significant negative effect for badger.

4.3 Pre-construction bird surveys have been recommended where works (including vegetation clearance) are to commence during the breeding bird season (March to August inclusive). Many species of birds are sensitive to disturbance, particularly during the breeding season. Suitable mitigation including protection buffers should be outlined by the ecologist undertaking the pre-construction bird surveys to minimise potential disturbance to the breeding birds on site. From the current survey findings, it is anticipated that the Development will not have a significant negative effect for bird species.

4.4 It has also been recommended that a bat roost assessment should be undertaken for hedgerows and trees if they are to be removed. Where possible hedgerows should be removed outside of the winter months to prevent potential impacts for hibernating herptiles. If removal of hedgerows are to be undertaken during the winter months it is recommended that the work is supervised by a suitably qualified ecologist, with any hibernating herptiles found translocated to a designated safe area.

4.5 Overall the effects of the Development on the sites ecology, with the implementation of the proposed mitigation, are not significant.

POPULATION AND HUMAN HEALTH

5.1 This chapter principally addresses potential impacts on human beings and addresses population, employment, settlement patterns and land use. While it briefly addresses human health and health and safety, human health is addressed in the other chapters of this EIAR including impacts relating to air quality and dust, water, noise, visual amenity and material assets (traffic).

5.2 The study area addressed is the two Electoral Districts which the existing quarry is located within, which also correspond to two small areas set out in the Census SAPS maps. Details from census 2016 are available for those areas and provide an insight into employment and unemployment levels as well as occupation type in the area.

5.3 The overall population of the area is low as is the household occupancy rate of 1.86 persons per household while between the 2011 and 2016 census periods the local population fell more than 9% which was largely made up of the loss of young people between the ages of 20 and 34, which is reflective of the trends of young people moving to larger towns or cities in Ireland or emigrating during the recession years. The consequent loss of this young cohort of the population who in normal circumstances would be having families also resulted in a reduction in the population under the age of 18.

5.4 As the quarry currently employs 68 full time staff with many more ancillary jobs in the area depending on the quarry and income derived, the consequences for the local, economy and the future of the local national school which has only 15 students in 2019-2020 academic year could be severe if the proposed development was not to proceed.

5.5 There is a limited number of houses with 1km of the quarry with only new house sought or granted since 2000 while the propose N5 which is to run close to the southwestern corner of the proposed southern extension will sever the quarry site from the nearest houses which are located to the west and south.

5.6 In terms of impact, it is considered that the impact of the proposed quarry extensions will be positive and neutral for the local population.

WATER

Geology, Hydrology & Hydrogeology

6.1 The hydrology, geology and hydrogeology assessment has been undertaken in compliance with guidance produced by the EPA and the NRA. It is considered that due to the nature of the proposed quarry extension and the geology, hydrology and hydrogeology assets located within the Application Site and within close proximity, potential effects will be insignificant.

Flood Risk

6.2 The requirements of a FRA are set out by the Department of Environment, Heritage and Local Government in 'The Planning System and Flood Risk Management Guidelines for Planning Authorities'. The Guidance aims to avoid inappropriate development in flood zones and instead direct it to areas of low risk by adopting a *sequential approach.*

6.3 The PFRA interactive flood maps show that there are no areas within the Application Site boundary which are considered to be at risk of flooding from Fluvial or Pluvial sources. There may be some surface water risk as it flows towards the quarry detention ponds; however this risk is Short Term and would have a Low Adverse impact. Therefore, prior to the implementation of mitigation measures the potential impact is considered to be Imperceptible. Potential effects are therefore insignificant.

6.4 The existing surface water management scheme for Hanly Quarries will be retained and the discharge licence and existing testing scheme will be applied. The cumulative impact has been deemed as negligible.

6.5 The FRA has therefore demonstrated that the Development proposal can be developed in this location without increasing flood risk away from the Application Site. Specific measures will

be implemented to control and monitor surface water flow at the site discharge point and therefore the Proposed Development is considered to be acceptable in planning policy terms.

6.6 As part of the Flood Risk Assessment process, the conclusion of this 'Stage 1 Flood Risk Identification' is that the Application Site is not at risk of flooding (fluvial, pluvial or groundwater) and the Proposed Development will not result in any significant change in risk or flooding regime. As such, no further stages of flood risk assessment are therefore required.

LAND AND SOILS

7.1 This section of the Environmental Impact Assessment Report (EIAR) assesses and evaluates the potential impacts on the soils and land of the subject quarry site and the proposed extensions. In assessing likely potential impacts, account is taken of both the importance of the attributes and the predicted scale and duration of the likely impacts.

7.2 Hanly Quarries is surrounded by agricultural lands, in a rural area c.4km north of Strokestown and 6.75km southeast of Elphin in north Co Roscommon. The proposed extensions to the east and south of the quarry site extend to approximately 8.60 hectares in area and form part of an existing working quarry. Rock is extracted from the existing quarry by means of blasting and is processed into various grades depending on market requirements. The same method of extraction and production will be used in respect for the two extension areas.

7.3 In assessing likely potential impacts, account is taken of both the importance of the attributes and the predicted scale and duration of the likely impacts.

7.4 The application site is situated in an area which is characterised as being Limestone till (Carboniferous). Carboniferous Limestone is a collective term for the succession of limestones occurring widely throughout Great Britain and Ireland that were deposited during the Dinantian Epoch of the Carboniferous Period. An inspection of the Geological Survey of Ireland (GSI) records shows that the bedrock geology of the application site and the surrounding area is dominated by the rocks of the Carboniferous Age. According to the GSI Bedrock Geology sheet No. 12 (Longford - Roscommon) the bedrock geology below the site comprises of the Bricklieve Limestone Formation (Bioclastic Cherty limestone).

7.5 No significant negative impacts are predicted as a result of the proposed quarry extensions.

AIR AND CLIMATE

8.1 This section of the Environment Impact Assessment Report (EIAR) deals with the issue of air and climate quality. It assesses the levels of dust deposition at the site associated with the quarry.

8.2 Rock and gravel will be extracted from the application site by blasting and processed into various grades depending on market requirements in the same manner as the existing quarry operations. Due to the nature of the operations at the site, dust is determined to be the principal air emission associated with the subject site; however other minor air emissions are also discussed in brief.

8.3 The existing development comprises of the stripping of overburden down to the surface of the underlying limestone. Blasting is carried out 6 times per year depending on demand levels. The gravel/stone material is then passed through a crusher and a screener to separate the aggregate into various grades depending on market requirements. Processing is undertaken on the centre of the existing quarry. The material is then stockpiled on site before being transported off site.

8.4 During the site visits to the existing quarry, there were no significant visible dust emissions from operations and processing activities such as rock excavation, crushing and screening. There were small but visible emissions from the mobile machinery and lorries in the quarry.

8.5 Ground conditions were damp during the site visits, which suppressed dust generation. During prolonged periods of dry weather there would be a potential for local generation of dust from quarrying processes and on haul routes within the site.

8.6 There was no visible dust deposition at the roadside properties H1 to H3. Dust deposition surveys carried out by BHP were also examined.

8.7 There will be no change anticipated from the continuation of the associated quarry operations on the site, i.e. existing dust emissions will remain the same in this area to the north of the quarry void as this is where the screening and crushing will be taking place.

MATERIAL ASSETS

9.1 The proposed development has been assessed with reference to guidelines published by IEMA (Institute of Environmental Management and Assessment) and with consideration of the Roscommon County Development Plan.

9.2 The likely traffic generated by the proposed development during its construction, operation and decommissioning phases has been identified and the site access proposals have been discussed. The construction impacts have not been considered as this is an application for an extension to an existing quarry.

9.3 Given the very low levels of predicted traffic during the operational phase, the effects have been assessed as insignificant.

9.4 Furthermore, traffic generated as a result of the decommissioning is anticipated to be less than during the construction phase. As such, it is the environmental impacts as a result of

traffic generated during the operational phase of the development that have formed the focus of this assessment.

9.5 The potential impacts relating to traffic, severance, accidents and road safety, driver delay and pedestrian amenity, fear and intimidation have been assessed and where the impact has been identified as low or negligible, mitigation measures have been considered and identified. The resulting effects are deemed not to be significant.

9.6 The residual impacts relating to the proposed development generated traffic have been reviewed and summarised. This assessment shows that the development effects are mainly insignificant with the exception of Accidents and Road Safety where effects have been classified as low to negligible when related to both the staff and HGV movements.

NOISE AND VIBRATION

10.1 This section of the Environment Impact Assessment Report (EIAR) deals with the issue of noise and vibration.

10.2 It includes an assessment of the likely noise and vibration impact in the context of current relevant standards and guidance, and identifies requirements for remedial measures.

10.3 Noise is an inevitable result of quarrying activities and noise and vibration is often of concern to local residents. Vibration is caused by quarry blasting. There are two principal types of vibration, ground vibration and air vibration, known commonly as air over pressure.

10.4 The Noise & Vibration Impact Assessment has addressed the further development of the quarry site including the extraction of stone from two separate areas extending to 8.6Ha using conventional drilling and blasting techniques and mineral reduction using mobile crushing and screening machinery.

10.5 Quarry activities include extraction and loading, processing and transportation. Amongst other factors, noise reduction at the site is achieved by the fact that extraction and processing takes place largely below normal ground level. This fact provides a significant natural barrier to the transmission of noise. In addition noise barriers in the form of soil berms are constructed around the periphery of the site. Noise monitoring which has been carried out at the site demonstrates that the noise levels which result from the present operations are within the various guideline limits for noise.

10.6 Quarrying activities included the following noise generating activities;

- Removal of overburden material and construction of screening berms around the perimeter of the site as required.

- Drilling blast holes down into limestone rock in accordance with extraction plan and blast design.
- Loading of the blast holes with industrial explosives and detonation in accordance with blasting procedure.
- Loading of blasted rock into a crusher to reduce fragment sizes. Crushed stone is then transferred into a screening unit for grading and stockpiling.

10.7 Noise emissions at the nearest noise sensitive location associated with onsite activities benefit from a significant degree of screening along with attenuation due to distance. Blasting is normally carried out 6 times per year depending on demand levels.

10.8 The available data indicates that vibration monitoring was conducted at the closest receptor offsite on a regular basis. The information received from the blasting company indicates that the vibration levels were 0mm/s which are fully compliant with the PPV levels which are 12mm/s as stated in the criteria recommended by the Quarries and Ancillary Activities, Guidelines for Planning Authorities, April 2004, Department of the Environment, Heritage and Local Government. (DoEHLG Guidance). Levels of vibration of these magnitudes would not be expected to cause any structural damage at the assessment locations.

10.9 It is envisaged that the proposal will not increase the intensity of production but will extend the life of the quarry over a longer period.

10.10 The assessment of the noise and vibration impacts has been undertaken as follows:

- Reference to historical noise and vibration surveys at the nearest noise sensitive locations, to establish the current ambient noise levels in the area.
- Noise levels have been recorded in close proximity to the existing concrete manufacturing and quarrying activities on-going in the existing Hanly Quarry site.
- A prediction of the specific noise levels at the proposed N5 National Road to the south of the quarry extension from the existing and proposed quarrying activities at the Hanly Quarries site.

CULTURAL HERITAGE

11.1 This chapter assesses the impact of the proposed development on the archaeological and architectural heritage of the site and surrounding area. The chapter also provides details of

any appropriate remedial measures undertaken in the past or proposed to be undertaken by the applicant to remedy any significant adverse effects on the landscape.

11.2 For the purposes of this report the definition of "cultural heritage" is taken broadly from the UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage, 1972, which considers the following to be "cultural heritage":

- Monuments: architectural works, works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features, which are of outstanding universal value from the point of view of history, art or science;
- Groups of Buildings: groups of separate or connected buildings which, because of their architecture, their homogeneity or their place in the landscape, are of outstanding universal value from the point of view of history, art or science;
- Sites: works of man or the combined works of nature and man, and areas including archaeological sites which are of outstanding universal value from the historical, aesthetic, ethnological or anthropological point of view.

11.3 Two recorded monuments within the landholding are visible on www.archaeology.ie. The monuments have been removed by way of the excavations to date. The first monument to the southern side of the quarry - RO023-065 is classified as a Ringfort – rath. It has been removed by quarrying since 1996 (Bing c. 2013). The second monument - RO023-066 is classified as a Ringfort – unclassified. It has also been removed by way of the excavations to date. No existing areas or monuments of archaeological and historical potential were identified within the confines of the quarry or the proposed quarry extension areas.

11.4 The proposed development will not have any direct impact on any of the known cultural heritage sites in the study area. There may be an archaeological impact in the southern extension area of the proposal due to the possibility of unrecorded sub-surface features or finds and archaeological monitoriing of topsoil excavation is recommended.

THE LANDSCAPE, VISUAL IMPACT AND RESTORATION

12.1 The landscape section of this EIAR addresses the landscape and visual impacts of the existing quarry and proposed extensions thereto. It includes a description of Roscommon County

Council landscape policy and examines the quarry site's landscape values and sensitivity. In addition, the study area is assessed using the principles and practices recommended by Landscape and Landscape Assessment Guidelines, DoEHLG, 2000 as a guide.

12.2 The objective of the assessment is to appraise the existing landscape of the subject site and the surrounding locality, to assess the likely landscape and visual impacts arising from the proposed development, describe any potential mitigation measures if necessary and predict any residual impacts. The landscape of the area is described in terms of its character, which includes a description of the physical, visual and image units. The visual impact assessment of the existing quarry encompasses the use of photography and visibility mapping.

12.3 There are neither landscape designations, such as protected views/prospects, scenic routes or areas of outstanding natural beauty in the immediate vicinity of the site, nor are there any scenic cycling or walking routes.

12.4 The quarry is mostly screened in the vast majority of views from locations throughout the study area, due to intervening topography and previously developed berms surrounding the quarry.

12.5 The visual receptors are road users along the access road serving the quarry, as well as a number of residential properties along/nearby this road. None of the available views were found to experience significant visual impact, as all views are partial views, all are medium to long distance and the visible parts of the quarry site (i.e. upper parts of pit faces) occupy minor proportions of the overall views.

12.6 Site visits were undertaken in August and October 2019. The purpose of the site visits was to become familiar with the site, establish the general landscape character of the area and identify principle representative viewpoints including residences, prospects, public pathways and roads with views of the site. The actual extent of visibility was also checked in the field due to the localised screening effects of buildings, fences, trees, hedgerows and banks. Potential seasonal screening effects were also identified where necessary and recorded.

12.7 The landscape and visual baseline study comprised a desktop study with follow up field surveys. Analysis of the visual baseline information was used to identify the extent and nature of the existing views of the site from the principle representative viewpoints, and the nature and characteristics of the visual amenity of the potentially sensitive visual receptors.

12.8 Landscape effects consist of the changes in the landscape, its character and quality that might result from the development. The effect that these changes might have on the landscape reflects the sensitivity of that landscape to change and the magnitude of that change.

12.9 As part of the assessment an examination of the Roscommon County Development Plan (CDP) 2014-2020 and supporting documentation including the Landscape and Landscape

Character Assessment for County Roscommon was undertaken. Ordnance Survey mapping and aerial photography for the area was also examined.

12.10 The visual survey also includes and is supported by a comprehensive photographic record from the principle and other relevant viewpoints.

12.11 The surrounding landscape of the quarry is comprised of good agricultural grazing and meadow land. There are open fields with hedgerows and sparse tree lines. The profile of the land visible has not been altered significantly as a result of the quarrying to date. The view of the quarry is not a significantly detracting feature when in view from the neighboring properties.

12.11 All landscaping works undertaken in the past on this site impact significantly in a positive manner to screen most of the existing quarry faces. The long-term visual impact of the site on the surrounding environment is expected to have a positive impact as there will be sufficient screening of the quarry pit and the auxiliary machinery being used as part of the quarry operations.

12.12 The visual impacts are predicted to be minor to negligible from the 8 selected viewpoints.

INTERACTIONS

13.1 Chapter 13 addresses interactions between the different environmental topics. Interactions are noted between the following: -

POPULATION AND HUMAN HEALTH

Landscape

5.1. Perception of landscape is the major defining factor of how human beings view their local environment. Any development will cause a degree of concern when situated within a locality. The landscape impact of the proposed development and interaction with the local community already exists due to fact that a quarry already exists within the overall landholding however, views of the quarry are limited due to the drumlin nature of the local topography. Mitigation measures have been discussed in Chapter 12 to further reduce visual impact by the construction of soil berms around the site perimeter and to restore the landscape at decommissioning.

Air & Climate and Noise

5.2. An adverse impact due to air quality in the operational phase of the quarry extensions has the potential to cause health and dust nuisance issues. However, the interaction between humans and air/climate during site operations is slight as the dust monitoring that has been carried out to date has found impacts to be negligible.

5.3. Dust impact into the surrounding area will be minimal as buildings and residential dwellings are location at a distance of > 400m from the quarry operational area, therefore no adverse dust impact exists.

5.4. Noise from operational machinery is carried on air waves. The topography reduces the impact of noise into the areas beyond the quarry operational area. Quarry operational noise is not considered to have occurred during site operation based upon noise assessment results to date. Ambient noise during operation will be no more intense than general farm machinery working in the background.

5.5. No adverse Impact is known in respect of climate.

Material Assets

5.6. Traffic arising quarry operational impacts will give rise to noise and dust. The level of traffic is not projected to increase as a result of the proposed extensions as the level of output will remain at its previous level. This will ensure that perceived nuisance impacts arising from quarry working are limited and confined to the immediate quarry operational area and existing haul routes.

Soil and Water

5.7. The sites hydrology is considered in chapter 6 and land and soils in chapter 7. Surface runoff water is directed towards existing siltation lagoons. Suspended solids are allowed to settle within the phased settlement pond system before discharge in the local stream. A wheel wash unit is installed to limit the carrying of nuisance silt and sludge to the main road. This combined with regular dampening down of aggregates and the working quarry area ensures there is no adverse effect locally due to nuisance dust plumes. No site produced contaminants leave the site to filter into the local environment.

LAND AND SOILS

Biodiversity

5.8. Prior to future quarry operations to extract stone, any remaining soils and overburden will be removed and stored in bunds (mounds) at the site perimeter until site decommissioning or spread on adjacent agricultural lands.

5.9. The impact of the soil removal will be permanent and profound and will result in the loss of some habitat and may disturb some species during excavation. However, mitigation for the proposed quarry extension has proposed to store soil in perimeter berms and to spread it on adjacent farmlands, to enable the developer reduce possible impact to biodiversity and to preserve seed stock of local provenance to ensure the quality of ecological landscape restoration at site decommissioning.

Landscape, Noise and Air

5.10. A series of mitigation measures have been proposed to minimise the potential impact that quarry extensions may have on the receiving landscape.

5.11. The soil stripped from the quarry surface will be stored in bunds and used to form perimeter landscaped berms that will act as both landscape features to reduce visual impact but also to reduce noise and air impacts at third party properties in close proximity to the site.

Water

5.12. During site clearance, depending on weather conditions, there may be elevated levels of silt and sediment in the surface water runoff. Soil stripping will not be carried out in unfavourable weather conditions while all surface water will be treated in the existing surface water treatment system including settlement lagoons, thereby eliminating potential threats to surface water in the area.

Cultural Heritage

5.13. During the removal of soil there is potential for a loss of previously unknown archaeological or cultural heritage material by the clearance of the surface in preparation for quarrying. Mitigation measures included in the Cultural Heritage chapter recommend that the soil stripping is supervised by an archaeologist to identify any potential undiscovered sites of artefacts

WATER

Population and Human Health

5.14. The threat to pollution of groundwater exists from potential surface water runoff or spillage events leaking into the surface or groundwater regimes. All vehicle refuelling will happen in a secured bunded area within the main quarry area while all surface water will be directed to the existing settlement lagoon system where potential pollutants will be removed.

NOISE AND VIBRATION

Population & Human Health and Landscape & Visual Impact

5.15. As part of the proposed development it is proposed to use the soils excavated from the surface of the site to create perimeter berms that will act as both an element of the sites landscape plan but will also act as a means of reducing the impact of noise and vibration on the receiving human environment.

LANDSCAPE

Cultural Heritage

5.16. There is potential for a visual impact of development to and from known Recorded Monuments in the vicinity although no known recorded monuments are located in the either of the 2 proposed extension areas. The recorded monuments are not significant in that they are not visited by members of the public and would not be directly affected by the proposed extensions.

DIFFICULTES IN COMPILING TOPIC INFORMATION

5.17. No particular difficulties were encountered, such as technical difficulties or lack of knowledge in compiling information contained within this Environmental Impact Assessment Report. Impact mitigation to reduce impact has been described and discussed in each chapter of this document. Where appropriate, existing published sources of information have been used and acknowledged. Commissioned studies and surveys undertaken for the purpose of environmental assessment of the proposed development have been referred to.

5.18. It was not however possible to carry out new traffic counts on the road junctions due to the changes in normal traffic patterns as a result of Covid-19. As a result, the previous traffic counts that were carried out in 2017 (for a previous application for the same development) have been used to determine the traffic levels. It is noted that the staff levels are 68 in July

2020 whereas in 2018 when a previous application was submitted the number of people employed at the quarry was 70, which suggests that the traffic generated by the quarry has remained similar to that at the time the traffic count was carried out.

CONTENTS

1 INTRODUCTION

INTRODUCTION

1.1 This Environmental Impact Assessment report (EIAR) has been prepared on behalf of Hanly Quarries Limited, the owner and operator of Hanly Quarries, Laragan, Elphin, Co Roscommon, to describe the significant impacts upon the environment arising from the proposed development of two no extensions to the existing operating quarry with a combined area of extraction of 8.6ha (3.14ha and 5.14ha), which will assist and inform the Competent Authority (CA), Roscommon County Council in undertaking an environmental impact assessment of the proposed development.

1.2 The existing operational quarry is located in the townlands of Cuilreevagh and Largan, Elphin, Castlerea, Co Roscommon and located c4km north of Strokestown and c6.75km southeast of the village of Elphin.

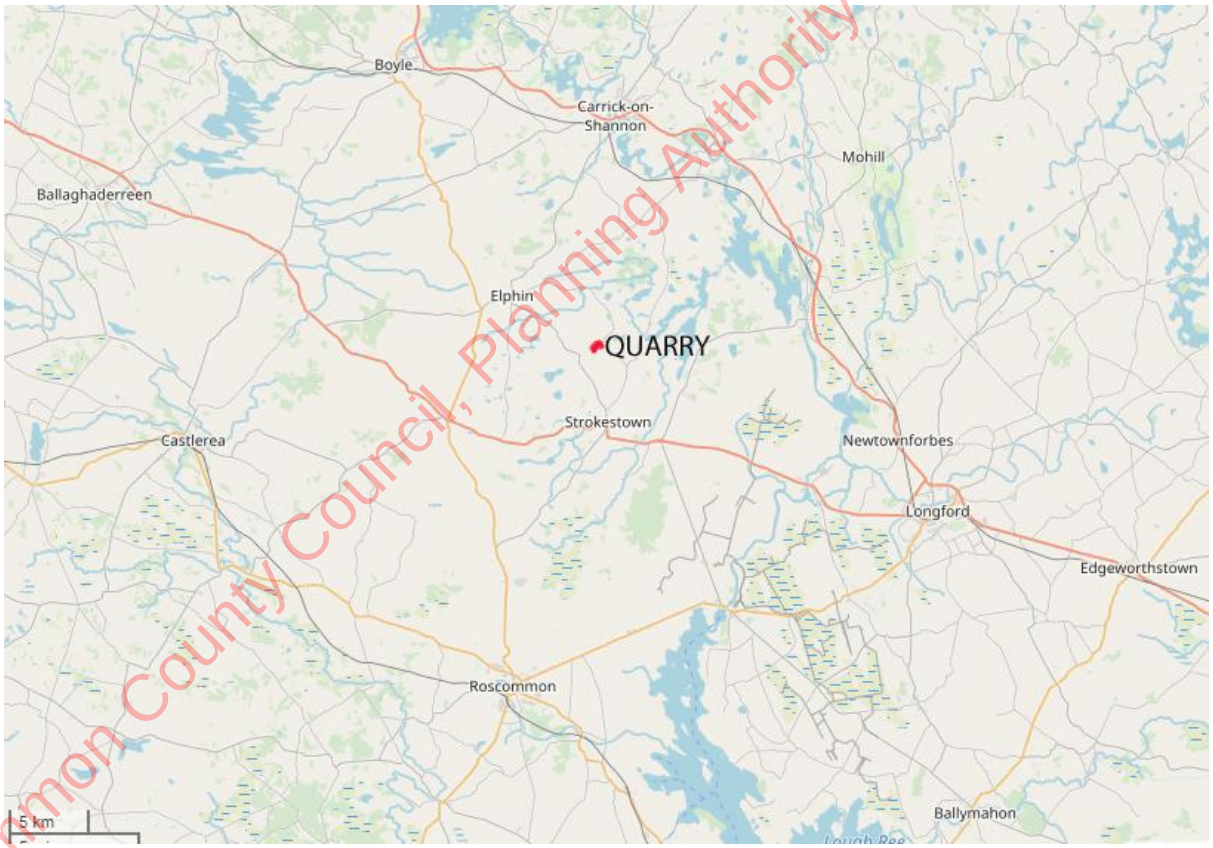

Figure 1.1 Site Location Map www.openstreetmap.org

LEGISLATIVE BACKGROUND TO APPLICATION

1.3 The principle legislation governing the preparation of this EIAR is the: -

- European Union Directive 2014/52/EU, which amended Directive 2011/92/EU
- Planning and Development Act 2000 (as amended)
- Planning and Development Regulations 2001 (as amended)

1.4 In a circular issued in May 2017 'Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive)', the Department of Housing, Planning, Community and Local Government provided guidance on procedures that that may be followed in the case of such applications received on or after 16 May 2017.

1.5 With respect to 'Applications made on or after 16 May 2017' it stated that: -

- *In respect of applications for planning permission or other development consent received on or after 16 May 2017 falling within the scope of Directive 2011/92/EU, or within the scope of Directive 2014/52/EU, competent authorities are advised to consider applying the requirements of Directive 2014/52/EU by way of administrative provisions in advance of the transposition of Directive 2014/52/EU into Irish law.*

1.6 and

- Where EIA is required the developer must prepare an EIAR (previously EIS)

DEFINITION OF EIA /EIAR

1.7 Article 1 of Directive 2011/92/EU has been amended in Directive 2014/52/EU to provides the following definition of Environmental Impact Assessment (EIA) in Paragraph 2(g): -

(g)"Environmental impact assessment" means a process consisting of:

(i) The preparation of an environmental impact assessment report by the developer, as referred to in Article 5(1) and (2);

(ii) The carrying out of consultations as referred to in Article 6 and, where relevant, Article 7;

(iii) the examination by the competent authority of t environmental impact assessment report and a

provided, where necessary, by the developer in accordance with Article 5(3), and any relevant information received through the consultations under Articles 6 and 7;

(iv) the reasoned conclusion by the competent authority on the significant effects of the project on the environment, taking into account the results of the examination referred to in point (iii) and, where appropriate, its own supplementary examination; and

(v) The integration of the competent authority's reasoned conclusion into any of the decisions referred to in Article 8a."

1.8 The EIAR Report is: -

- *'A statement of the effects, if any, which the proposed development, if carried out, would have on the environment'*

1.9 The objectives of the EIAR are to: -

- Identify and/or predict the significant impacts of the development against a baseline;
- Identify what mitigation measures should be incorporated into the development in order to reduce or eliminate the perceived impacts;
- Interpret and communicate the information regarding impacts of the proposed development in both technical and non-technical terms
- Assist the Competent Authority (Planning Authority) in the decision making process in respect of the associated planning application for extensions to Hanly Quarries

SCREENING FOR ENVIRONMENTAL ASSESSMENT

1.10 Screening is the process where a prospective development is considered in the context of thresholds set out in the Planning and Development legislation, to determine whether or not a mandatory EIA will be required or in the context of sub threshold developments, by reference to the scale and type of the proposed development and the significance of the potential impacts on the receiving baseline environment.

1.11 Schedule 5 of the Planning and Development Regulation 200[illegible] type and scale of developments requiring the carrying out of (b) of Part 2 to Schedule 5, provides that the following categ EIA.

2 Extractive Industry

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

1.12 In this case the proposed area of extraction will be 8.6ha. Therefore, a mandatory EIA is required to be carried out in respect of the proposed development.

SCOPING

1.13 An EIS was previously commissioned in 2008 by the Hanly Group and was submitted to Roscommon County Council as part of planning application reg. ref. 08/474 (Laragan Asphalt Ltd) which was for permission to commission and operate a Bitumen plant within the existing quarry area. Roscommon County Council issued a grant of permission for the development, which was described in the public notices as: -

Planning permission to commission and operate a Bitumen Plant at Largan and Cuilreevagh townlands. Planning permission is also being sought to retain and complete the structures to house and accommodate the plant. An Environmental Impact Statement will accompany the application.

1.14 The information gathered in the 2008 application and ongoing monitoring within the quarry has informed the preparation of this Environmental Impact Assessment Report.

1.15 An application was submitted to Roscommon County Council in May 2018 (Reg. Ref. 18/259) for a development of the same description as the current application but was later withdrawn prior to the issuing of a decision by the Planning Authority. The information gathered in the preparation of that application has also informed the preparation of this EIAR.

1.16 The primary resource extracted from the quarry is crushed rock aggregate rock. Hanly Quarries is one of the main crushed rock aggregate providers in the Roscommon/South Leitrim area. They provide road making crushed rock aggregate and crushed rock aggregate for construction foundations. At the time the 2008 application was submitted there was a significant demand for locally available crushed rock aggregate resources in and around the Roscommon area. While there was a fall in demand between 2008 and 2015/16 demand has grown again and for that reason, in this application, the applicants are seeking permission to expand the area of extraction to facilitate the continued operation of the quarry.

1.17 The full description of the proposed development as per the public notices is as follows: -

We, Hanly Quarries Limited, intend to apply for permission for development at a site in the townlands of Cuilreevagh and Largan, Elphin, [illegible] development will consist of two no extensions to the quarry with a combined area of 8.60ha. An environm has been prepared in respect of the proposed develo the planning authority with the application.

1.18 As this application relates to the same landholding which was subject to the previous application (08/474), certain elements of the information provided in the 2008 EIS still applies and this EIAR represents an update of that information as well as the 2018 EIAR for application reg. ref. 18/259. However, in addition, the content of this EIAR reflects the specific nature of the current proposal and complies with European and National legislative changes, Government Guidelines and best practice, which have come into effect since the previous applications were submitted

1.19 A pre planning consultation meeting was held at the offices of Roscommon County Council on Wednesday 9th August 2018, where it was confirmed that an EIAR would be required to be submitted with the proposed application and that all environmental factors set out in the EIA Directive would be required to be addressed as part of the application.

1.20 A follow up meeting was held between Alan Hanly of Hanly Quarries and Mary Grier Senior Planner on 30th September 2019 and the mates addressed included: -

- Restoration Plan
- Cumulative Effects
- Consult with NRA regarding boreholes drilled proximate to the southern boundary of the proposed extension near the new N5
- Register application on EIA Portal prior to lodgement

1.21 The subject matter experts have consulted with a number of consultees and information in respect of the consultations is contained in the relevant chapters.

INFORMATION TO BE INCLUDED IN EIAR

1.22 The term of Environmental Impact Statement (EIS) has also been replaced in Directive 2014/52/EU with a definition of Environmental Impact Assessment Report (EIAR) and Paragraph 1 of Article 5 has been replaced with the following description of information that is required to be included in an EIAR. It states: -

"Where an environmental impact assessment is required, the developer shall prepare and submit an environmental impact assessment report. The information to be provided by the developer shall include at least:

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

(b) a description of the likely significant environment;

(c) a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment; (d) a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;

(e) a non-technical summary of the information referred to in points (a) to (d); and (f) any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected."

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

- Planning and Development Acts, 2000 (S.I. 30 of 2000 – as amended);
- Planning and Development Regulations, 2001 (S.I. 600 of 2001- as amended).

1.24 This EIAR was also prepared having regard to the Environmental Protection Agency (EPA) publications: -

- Guidelines on the information to be contained in Environmental Impact Statements; 2002;
- Advice Notes on Current Practice in the preparation of Environmental Impact Statements; 2003;
- Revised Guidelines on the Information to be contained in Environmental Impact Statements September 2017;
- Advice Notes for Preparing Environmental Impact Statements Draft September 2015;

and the following guidelines;

- Quarries and Ancillary Activities - Guidelines for Planning Authorities; (DoEHLG) 2004;
- Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals): (EPA)

FACTORS TO BE CONSIDERED IN EIAR

1.25 Article 3 of Directive 2014/52/EU has amended the issues that must be considered in the EIAR from that which was required formerly under Directive 2011/92/EU. It states: -

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

1.26 All of the above factors are assessed in this EIAR.

STRUCTURE OF ENVIRONMENTAL IMPACT ASSESSMENT REPORT

1.27 The impacts of the proposed development were examined under the following headings: -

Volume 1

- Non-Technical Summary

Volume 2

- 1.0 Introduction
- 2.0 Description of Development and Consideration of Alternative
- 3.0 Planning Policy Context
- 4.0 Biodiversity
- 5.0 Population and Human Health
- 6.0 Water
- 7.0 Land and Soils
- 8.0 Air and Climate
- 9.0 Material Assets

- 10.0 Noise and Vibration
- 11.0 Cultural Heritage
- 12.0 The Landscape, Visual Impact and Restoration
- 13.0 Interactions between the above factors

1.28 The level of detail of the individual topics has been determined in each case, based on the likelihood of impacts occurring in the context of the nature of the proposed development.

1.29 This EIAR follows the "Grouped Format" structure (as detailed in the Guidelines on the Information to be contained in Environmental Impact Statements EPA) with each of the above relevant sections considering the following: -

- description of the existing environment,
- methodology;
- description of likely significant impacts from the proposed development;
- proposed mitigation measure's
- monitoring; and
- reinstatement.

LIST OF CONTRIBUTORS

1.30 Details of the study team are given below: -

Table 1.1 EIA Team		Contributors
Chapter		Contributors
Non-Technical Summary		Joe Bonner Town Planning Consultants Ltd Joe Bonner BA MRUP Dip Env Eng Dip Proj Mgt MIPI
1.0	Introduction	
2.0	Description of Development and Consideration of Alternative	
3.0	Planning Policy Context	
4.0	Biodiversity	NEO Environmental Ltd Michael McGhee BSc TechIOA Paul Neary BA H.Dip MA MSc MIEnvSc MIAI ACIFA CEnv Dawn Thompson BSc (Hons) MCIEEM MEECW Daniel Flenley Dara Dunlop Niall O'Reilly MSc MEd Gala Podgornik MSc
5.0	Population and Human Health	Joe Bonner Planning
6.0	Water	NEO Environmental
7.0	Land and Soils	Global Green Sustainability Niall Kiernan, BSC, Environmental Science. Member of the Environmental Association of Ireland and Engineers Ireland Alma Kurtis – Ecologist. Bsc Ecology. Glenn Redmond - Master of Arts (M.A.), Archaeology
8.0	Air and Climate	Global Green Sustainability
9.0	Material Assets	NEO Environmental
10.0	Noise and Vibration	Global Green Sustainability
11.0	Cultural Heritage	Global Green Sustainability
12.0	The Landscape	Global Green Sustainability
13.0	Interactions between the above factors	Joe Bonner Planning

1.31 These specialist contributors have either prepared individually or co-authored chapters in accordance with the methodology described in the EPA's 'Gui
contained in Environmental Impact Statements', and 'advice
preparation of Environmental Impact Statements)' as we
preparing Environmental Impact Statements to accompany
quarries.

BASELINE INFORMATION

1.32 The completion of the previous EIS in respect of the existing Bitumen Plant, that is located within the quarry site, in 2008, meant that baseline information relating to flora and fauna; soils and geology; noise; traffic, climate and visual impact; cultural heritage; and material assets in the area of the existing quarry had been gathered for part of the landholding in the general area of the proposed extensions.

1.33 The 2008 baseline information was supplemented by additional information gathered in respect of the application submitted in 2018.

1.34 This EIAR represents both an update of the previous EIS from 2008 and EIAR from 2018 relating to the same proposed extensions to the quarry that are the subject of this application for an extension and in some cases the gathering of entirely new information as well as analysis of the continuous environmental monitoring that is carried out in the interim.

1.35 This EIAR also reflects the nature of the current proposed development, while also addressing legislative changes and other relevant information that has become available in the interim.

1.36 Additional survey work that has been carried out on this occasion includes a new biodiversity surveys, a review of hydrology, soils and geology, noise and vibration monitoring results, a traffic assessment and junction analysis (from 2018 application due to Covid-19 restrictions). Site visits and planning history searches were carried out to determine the number of new dwellings in the area.

STATEMENT OF DIFFICULTIES ENCOUNTERED

1.37 No significant difficulties were experienced in compiling the information necessary for the preparation of this EIAR, with the exception that it was not possible to carry out new traffic counts in 2020 due to the restricted traffic movements generated by Covid-19. The Material Assets Chapter has addressed this matter and has relied on the traffic counts carried out in June 2017 and extrapolated from those numbers.

NON-TECHNICAL SUMMARY

1.38 The non-technical summary addresses in non-technical language, all of the key issues that have been addressed in the EIAR. For clarity the format of th
same as the main EIAR document.

CONTENTS

2.0 PLANNING POLICY CONTEXT

INTRODUCTION

2.1 This chapter sets out the key documents that provide the planning policy context for the proposed development. It addresses the National, Regional and Local level documents which are set out below:

National Policy

- Project 2040 - National Planning Framework
- National Development Plan 2018-2027
- Quarries and Ancillary Activities - Guidelines for Planning Authorities
- EPA Environmental Management Guidelines – Environmental Management in the Extractive Industry

Regional Policy

- Northern & Western Regional Spatial and Economic Strategy 2020-2032

Local Policy

- Roscommon County Development Plan 2014-2020

NATIONAL POLICY

Project 2040 - National Planning Framework

2.2 The National Planning Framework was published in 2018 and replaced the National Spatial Strategy 2002-2020.

2.3 The foreword to the Framework states that: -

…the National Planning Framework, is a planning fr
and investment over the coming years. It does not pr
of the country; rather it empowers each region

development of their communities, containing a set of national objectives and key principles from which more detailed and refined plans will follow.

2.4 Chapter 5.4 addresses 'Planning and Investment to Support Rural Job Creation' and under the heading of 'Aggregates and Minerals' states that: -

Extractive industries are important for the supply of aggregates and construction materials and minerals to a variety of sectors, for both domestic requirements and for export. The planning process will play a key role in realising the potential of the extractive industries sector by identifying and protecting important reserves of aggregates and minerals from development that might prejudice their utilisation.

Aggregates and minerals extraction will continue to be enabled where this is compatible with the protection of the environment in terms of air and water quality, natural and cultural heritage, the quality of life of residents in the vicinity, and provides for appropriate site rehabilitation.

2.5 National Policy Objective 23 addresses the extractive industry and seeks to: -

Facilitate the development of the rural economy through supporting a sustainable and economically efficient agricultural and food sector, together with forestry, fishing and aquaculture, energy and extractive industries, the bio-economy and diversification into alternative on-farm and off-farm activities, while at the same time noting the importance of maintaining and protecting the natural landscape and built heritage which are vital to rural tourism.

National Development Plan 2018-2027[1]

2.6 The National Development Plan was published shortly after the National Planning Framework and on its website is described as follows: -

The National Development Plan sets out the investment priorities that will underpin the successful implementation of the new National Planning Framework (NPF). This will guide national, regional and local planning and investment decisions in Ireland over the next two decades, to cater for an expected population increase of over 1 million people.

The National Development Plan demonstrates the Government's commitment to meeting Ireland's infrastructure and investment n through a total investment estimated at €116 billion c very substantial commitment of resources and is expe top of the international league table for public investm

[1] https://www.per.gov.ie/en/national-development-plan-2018-2027/

This level of capital spending will ensure ongoing employment maintenance and creation with appropriate regional development. It will also provide clarity to the construction sector, allowing the industry to provide the capacity and capability required to deliver Government's long-term investment plans.

2.7 The N5 road project that will be carried out adjacent to the site is an example of a major infrastructure project that is funder via the NDP.

Quarries and Ancillary Activities - Guidelines for Planning Authorities

2.8 The Guidelines, which were published in 2004, are intended to offer guidance to planning authorities on planning for the quarrying industry through the development plan process and in determining applications for planning permission for quarrying and ancillary activities. They also note that aggregates are a significant natural resource and that extractive industries make an important contribution to economic development in Ireland. However, they also note that the operation of quarries can give rise to land use and environmental issues which are required to be mitigated and controlled through the planning system.

2.9 Section 3 of the guidelines addresses the following environmental implications of quarry development including: -

- Noise and vibration
- Dust deposition/air quality
- Water supplies and groundwater
- Natural heritage
- Landscape
- Traffic impact
- Cultural heritage
- Waste management

2.10 All of these topics have been considered as part of the preparation of this EIAR and will be addressed in the technical chapters.

2.11 The guidelines also note that construction aggregates ar materials for the construction industry and that over 100 mil the manufacture of concrete products, road materials, and otl construction sector slowed in the period after the guidelines v has once again grown and there continues to be a demand future.

2.12 The N5 road project will generate a significant demand for aggregates such as those produced at Hanly Quarries.

2.13 The guidelines also state that: -

> *By their nature, aggregates can only be worked where they occur. Sand and stone have a low value-to-weight ratio, and therefore it is generally neither economically nor environmentally sustainable to transport them any great distance to their market due to increased transport costs. Many pits and quarries tend to be located within 25 km of urban areas, where most construction takes place.*
>
> *There will be a continuing need for some new or expanded aggregate quarrying operations on land to meet regional and local requirements. There is thus a need to identify and protect aggregate resource areas through the planning system, to ensure an adequate supply of aggregates to meet the likely scale of future demand, while at the same time protecting Ireland's natural and cultural heritage.*

2.14 The County Development Plan has set out specific policies and objectives in relation to quarrying in County Roscommon which are discussed below and the proposed development has taken into consideration the issues raised in both the Guidelines and the Development Plan.

EPA Environmental Management Guidelines – Environmental Management in the Extractive Industry

2.15 These guidelines are principally aimed at surface developments within the extractive industry such as the existing quarry at Cuilreevagh and Largan.

2.16 The guidelines state that: -

> *They apply to surface developments that are extracting and processing construction aggregates and dimension stone (i.e. quarries and ancillary facilities), i.e. typically those regulated by Section 261 of the Planning & Development Act 2000.*
>
> *The guidelines … provide general advice and guidance in relation to environmental issues to practitioners involved in the planning, design, development, operation and restoration of quarry developments and ancillary facilities. It should be noted that each individual quarry location will have site-specific is*
>
> *The guidelines noted that of the 20 quarries visited a guidelines those quarry operations with an EMS in pl environmental issues in a more proactive manner.*

The EPA believes that these guidelines will contribute to a more environmentally sustainable quarry & pit industrial sector, greater protection for the environment and human health, and thereby a greater public confidence in such operations.

2.17 The Environment Management Guidelines address the following topics: -

- Ecology
- Surface Water
- Groundwater
- Air Quality
- Noise & Vibration
- Waste Management
- Archaeological Heritage
- Transport and Traffic

2.18 All of the issues referred to above will be addressed in detail in this EIAR.

2.19 For sites where an Environmental Impact Statement has been carried out, this will have generated all of the necessary environmental information for an EMS. Compliance with planning conditions forms a major part of the EMS.

2.20 While the constituent elements of an EMS are already being addressed in respect of the existing quarry and other activities being carried out within the existing quarry site, the applicant has indicated that they will prepare an EMS on receipt of a grant of permission, using the information gathered in this EIAR process as the baseline for the EMS.

REGIONAL POLICY

Northern & Western Region - Regional Spatial and Economic Strat

2.21 While the eight former regions have been streamlined in 2 regions and Roscommon is now located in the 'Northern Regional Spatial and Economic Strategy which will transl objectives from the National Planning Framework into mor

policies and objectives. The RSES have replaced the previous Regional Planning Guidelines 2010-2022.

2.22 Chapter 5.5 Natural Assets includes a Policy Objective that seeks to: -

Ensure efficient and sustainable use of all our natural resources, including inland waterways, peatlands, and forests in a manner which ensures a healthy society a clean environment and there is no net contribution to biodiversity loss arising from development supported in this strategy. Conserve and protect designated areas and natural heritage area. Conserve and protect European sites and their integrity.

2.23 RP 6.6 states that: -

- In accordance with National Development Plan investment commitments to bring the following schemes through planning/design/ construction, the following projects shall be delivered to an appropriate level of service in the short term and in any case by 2027 having regard to the standard in the NPF of an average inter-urban speed of 90KPH:
  - A5 Road Development
  - N4 Collooney to Castlebaldwin
  - N5 Ballaghaderreen to Scramogue and Turlough to Westport
  - N6 Galway City Ring Road
  - N56 Dungloe to Glenties and Mountcharles to Inver
  - N59 Moycullen Bypass.

LOCAL POLICY

Roscommon County Development Plan 2014-2020

2.24 The Roscommon County Development Plan 2014-2020 contains a number of policies and objectives which are considered relevant to the proposed development. Each of the policies and objectives set out below will be addressed in the context of the relevant Chapters of this EIAR.

2.25 Section 3.4.4 'Mineral Extraction & Quarries' of Chapter 3 of t Development' is reproduced in full below. It states: -

Mineral Extraction & Quarries

County Roscommon has extensive deposits of stone and mineral material, which is a fundamental resource for the building industry. Quarry developments by their nature are resource based and result in the removal of soil and rock. 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 that quarrying and 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. An aggregate potential map will be prepared by GSI for County Roscommon within the lifetime of the Plan.

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 significa

2.26 The Plan also contains a series of Policies and Objectives in re
Quarries which are set out in full in Tables 2.1 and 2.2 below:

Table 2.1 Development Plan Policies in relation to Mineral Extraction and Quarries

Policy No	Text
Policy 3.53	Protect all known unworked deposits from development that might limit their scope for extraction.
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.

2.27 The above policies have all been taken into consideration in the preparation of the technical chapters of this EIAR and reference to the factors is made in relevant chapters.

Table 2.2 Development Plan Objectives in relation to Mineral Extraction and Quarries

Objective	Text
Objective 3.13	Co-operate with the Geological Survey of Ireland (GSI) in the identification of major mineral deposits in County Roscommon through Aggregate Potential Mapping (APM) and safeguard these resources for future extraction by safeguarding un-worked deposits from new and permanent development that would prevent or hinder their future extraction.
Objective 3.14	Have regard to the Landscape Character Assessment Report 2014 and its recommendations including the provision of special recognition to the esker area in LCAs 34, 35 and 8 in South Roscommon and LCA's 24 and 25 in north Roscommon including all inter-related geo-morphological landscapes of archaeological significance.

2.28 The GSI Aggregate Potential Mapping[2] (APM) under the heading of 'Crushed Rock Aggregate Potential' indicates that the area where the two proposed extensions are to be located have 'Very High Potential' for Crushed Rock Aggregate.

2.29 The Landscape Character Assessment for County Roscommon is addressed in Chapter 12.0 'The Landscape, Visual Impact and Restoration'.

Transport and Movement

2.30 Section 4.1 Transport and Movement states that Transportation policies and objectives within the RCDP 2014-2020 will be informed by national and regional strategies and guidelines.

and in respect of the N5 that: -

> *…planned major road schemes on the N5 include the upgrade of the 35 Km route between the eastward terminus of the Ballaghaderreen bypass at Rathkeery and Bumlin (western terminus of the Scramogue Scheme). This scheme has been suspended until further notice and may not be completed during the timeframe of this plan.*

2.31 The proposed route is to run close to the existing quarry and proposed extensions thereto and planning for the route is advancing, with a recent announcement that funding of €200 million has been set aside to advance the project.

[2] https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=ee8c4c2

Table 2.3: Planned Motorway and National Primary Road Projects

Proposal	Approximate Location	Timeframe 2014-2020
N5 Strategic Corridor (Ballaghaderreen to Scramoge)	Rathkeery to Scramoge 35kms single carriageway	Advance works on the project are progressing, including archaeological works, ground investigation, topographical surveys, fencing and hedgerow removal and service diversion works, while Roscommon County Council is progressing with the CPO of land and it is expected as of July 2020 that the main construction design and build documents will be issued to the candidates meeting the minimum pre-qualification in August / September 2020.

Key Challenges

2.32 Section 2.5.1 of the CDP identifies the Key Environmental Challenges for the environment as: -

- **Biodiversity (Flora and Fauna):** Natural/Semi-natural habitats (including the Natura 2000 and NHA/pNHA network) and plant and animal species under threat due to development pressures and demand for development land.
- **Population and Human Health:** Increases in population can impact on biodiversity, water quality, landscape and cultural heritage, all of which impact on human health.
- **Geology and Soils:** Demand for development land and natural resources has the potential for impacts on important geological sites and features such as karst landscape, eskers and other glacial features.
- **Water:** The County is heavily reliant on groundwater and some forms of development have potentially negative impacts on groundwater and surface water quality. Pressure for development land prone to flooding may also have implications for human health.
- **Air:** Ireland does not have serious outdoor air quality problems. The biggest threat in terms of air quality is emissions from road traffic. A s transportation is one possible long-term solution.

- **Climatic Factors:** It is likely that humans are contributing to climate change through the emission of greenhouse gasses such as C02. Ireland must meet stringent emissions targets and a move towards clean and renewable energy sources is necessary.
- **Material Assets:** This is the critical infrastructure necessary for a functioning society such as transportation, water supply, energy production and distribution and waste management systems. The development of these assets must be sustainable and in line with national targets and objectives.
- **Cultural Assets:** County Roscommon has a diversity of cultural assets such as architectural heritage, architectural heritage, etc. which can come under threat due to development pressures and demand for development land.
- **Landscape:** The landscape is seen as a key asset and both the urban and rural landscape are potentially under threat due to development pressure, development form and layout and demand for development land.

2.33 All of the above matters are considered in the context of the other chapters of the EIAR.

2.34 Chapter 9 of the Development Plan sets out the Development Management Guidelines and Standards for a range of different forms of developments including the extractive industry which are dealt with in Section 9.34. It states: -

> *The Council recognises that the location of such industries is dictated by the availability of the resource in the first instance. By their method of extraction, processing and transportation of materials, extractive industries can impose some if not all of the following impacts on the following amenities:*
>
> - landscape of scenic, historic and geological interest
> - natural Habitats, some of which have a protected designation – e.g. NHAs
> - groundwater sources and source protection zones
> - roads infrastructure
> - archaeological and Architectural features
> - residential amenities

The Council will seek to facilitate the extractive industry and value added products associated with it whilst endeavouring to safeguard the amenities referred to above. Development of this nature will be required to adhere to the relevant planning conditions. Specific planning conditions will be imposed and will include the following:

- Ongoing monitoring in relation to noise, dust and groundwater protection.
- Implementation of a post development rehabilitation of the works site to a pre agreed schedule. A financial bond will be imposed to ensure satisfactory completion of such works.
- A financial bond will be imposed to ensure satisfactory safeguarding and maintenance of the public road network.

ROSCOMMON COUNTY DEVELOPMENT PLAN 2021-2027

2.35 The strategic issues paper for the preparation of the Draft Roscommon County Development Plan 2021-2027, the consultation period of which ends on 31st July 2020 states that: -

- There is however a need to balance the development of rural areas alongside the need to protect the countryside in order to ensure the sustainable management of the natural resources of the county.

CONCLUSION

2.36 The design of the proposed development which consists of two no extensions to the existing quarry is consistent with National, Regional and County level policies and objectives.

2.37 The National Planning Framework recognises that *extractive industries are important for the supply of aggregates and construction materials* and that *the planning process will play a key role in realising the potential of the extractive industries sector by identifying and protecting important reserves of aggregates and minerals from development that might prejudice their utilisation.*

2.38 Likewise, the Regional Spatial and Economic Strategy seeks to *'ensure efficient and sustainable use of all our natural resources'.*

2.39 The Roscommon County Development Plan contains a series [illegible] environmental challenges that need to be considered in as[illegible] developments and the proposed development has been desi[illegible] of these standards and requirements .

CONTENTS

3. DESCRIPTION OF PROPOSED DEVELOPMENT AND CONSIDERATION OF ALTERNATIVES

SITE LOCATION AND DESCRIPTION

3.1 The site of the proposed development is located in the rural townlands of Cuilreevagh and Largan, Elphin, Castlerea, Co Roscommon c4km north of Strokestown and c5.7km southeast of the village of Elphin.

3.2 The eastern boundary of the existing quarry site fronts onto a L1410 Local Road located to the east of the R368 Elphin to Strokestown Regional Road and the R368 is accessed both to the north and south from the quarry site. The existing quarry site is irregular in shape and extends over an area of 34.63ha in a south-westwards direction from the public road. Visibility of the quarry is limited as the excavation occurs into the drumlin hillside that the quarry sits within. Within the existing site, in addition to the extractive operations and ancillary operations associated with quarrying, there is a bitumen plant, block making facility and the manufacture of other concrete products, while offices and other structures are located in close proximity to the public road, which reduce visibility into the quarry.

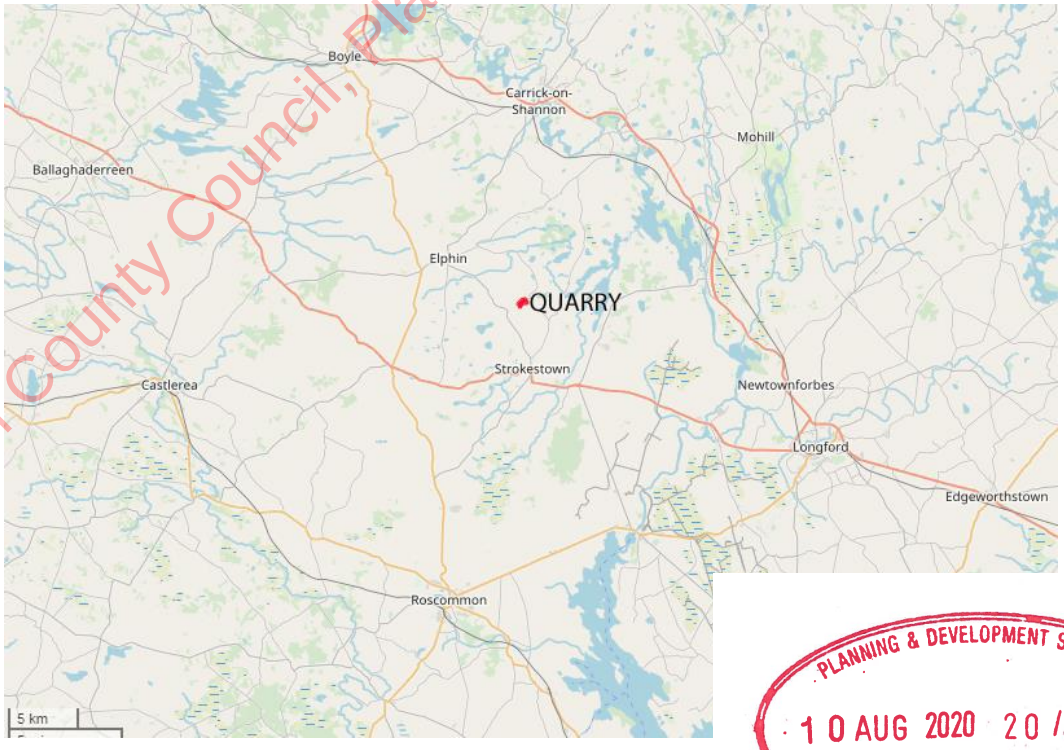

Figure 3.1 Site Location Map www.openstreetma

3.3 The overall landholding covers an area of 278.41Hectares (c687.42ha acres) while the existing area of extraction at 34.63ha (c85.25ha), is shaded in light in blue in Figure 3.2 and is the area determined by Roscommon County Council to be the extent of the pre 1963 area of extraction.

3.4. The overall area of extraction would be 43.28ha (c106.4ha), while the proposed areas of extraction are a combined 8.6ha. The proposed development consists of two separate extensions to the quarry at the western and southern sides of the quarry. The western extension will extend to c3.46ha (8.56 acres) while the southern extension will extend to c5.14ha (12.70ha). The areas are highlighted in pink in Figure 3.2 and separately in Figures 3.3 and 3.4. It is also proposed to construct a berm along the southwestern boundary of the site between the area of excavation and the new N5 road and both the berm and the new road are evident in Figure 3.2. The berm will serve as a barrier for flyrock as well as a visual and acoustic barrier.

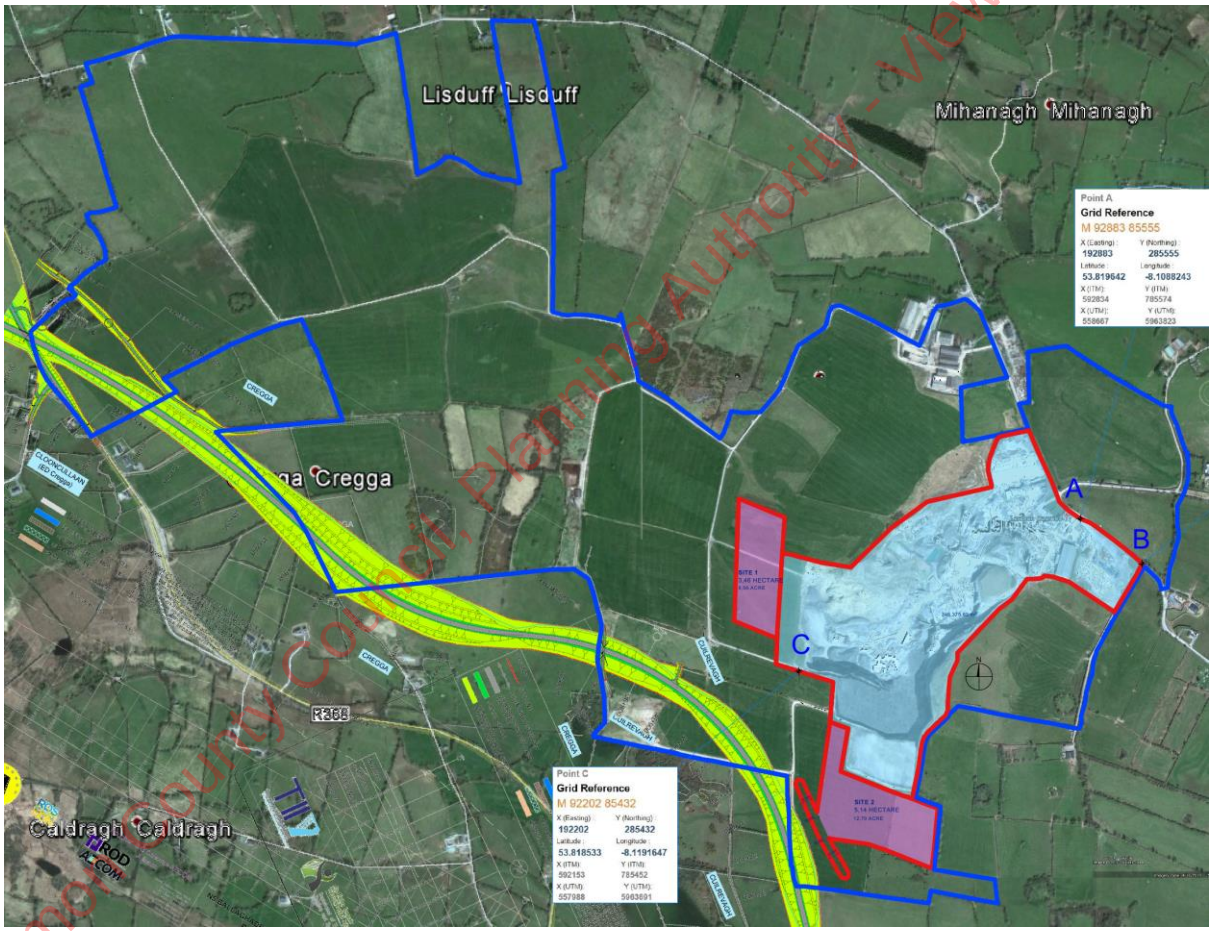

Figure 3.2 Land Ownership, existing quarry and proposed southern and western extensions

3.5 The surrounding land usage consists principally of agricult[illegible] located c490m to the north of the quarry and 10 one off priva[illegible] 1km of the quarry. No new houses have been applied for [illegible] 2008.

3.6 Due to the nature of the local topography the quarry is not visible on the approach from the north or from the west as the ground rises towards the quarry which is excavated into a drumlin hillside. Similarly, the quarry is not visible from the southern side. The quarry is visible from the east close to the entrance for a short distance and this is addressed in Chapter 12 - The Landscape, Visual Impact and Restoration.

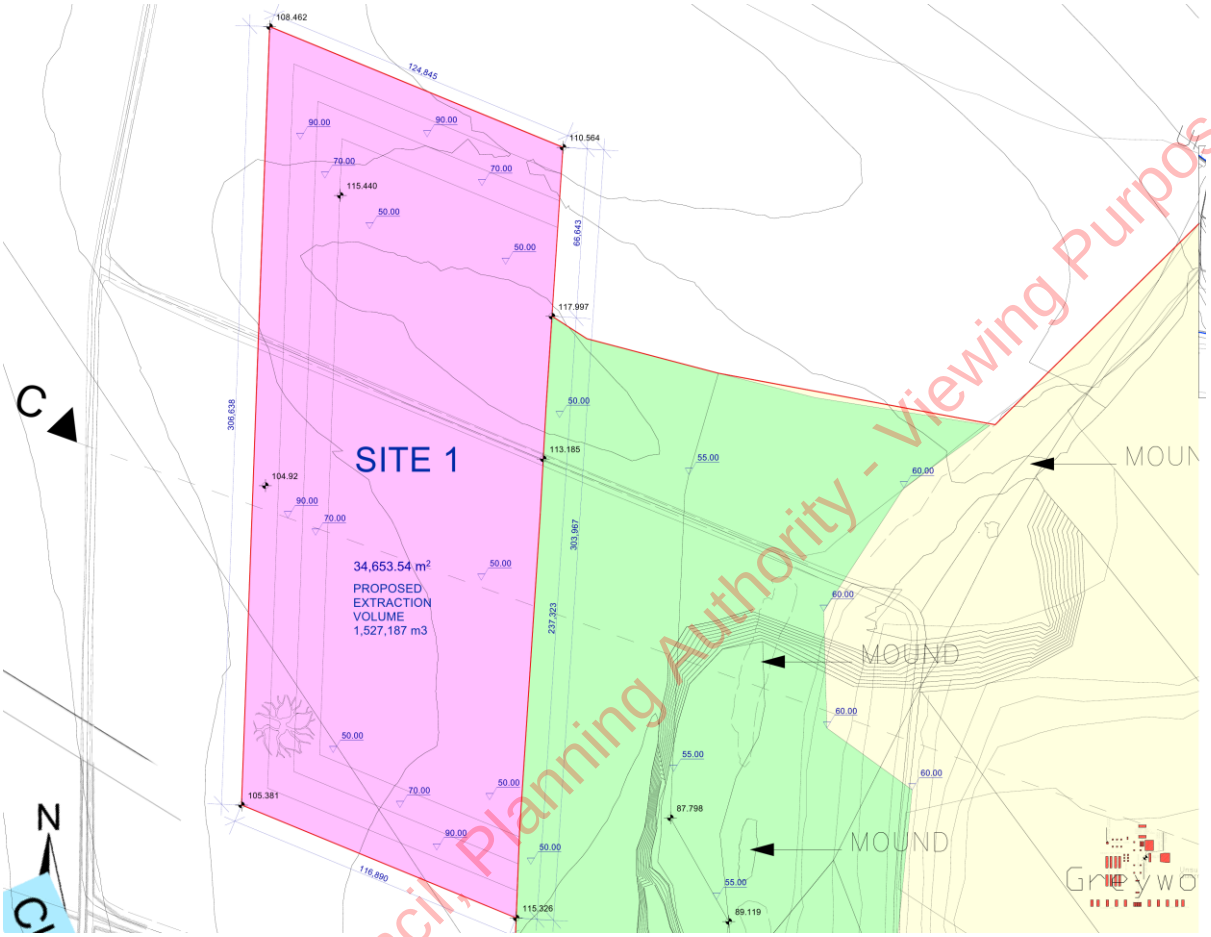

Figure 3.3 Proposed western extension to quarry of 3.46ha

3.7 Figure 3.4 shows a cut through the proposed western extension (lilac) with the existing operational quarry showing in green and beige. As per Figure 3.3, the highest point of the ground level at present is 115.326m at the south eastern corner, while the area is to have three separate benches and a floor level of 50m, giving a maximum depth of 65.326m. The bench heights will be set at 90m, 70m and 50m. The bench ledges will range from 5.0 to 10.0m in width and will have slopes of 85 degrees (Figures 3.4). The same slope and bench widths will be applied to the proposed southern extension (Figure 3.6). More detailed plans and sections of the proposed extension can be found in the planning application that this EIAR has been prepared in respect of.

3.8 It is proposed to extract 1,527,187m^3 of stone from the sout metre equating to approximately 2 tonnes in weight. The ex the Material Assets chapter in the context of traffic.

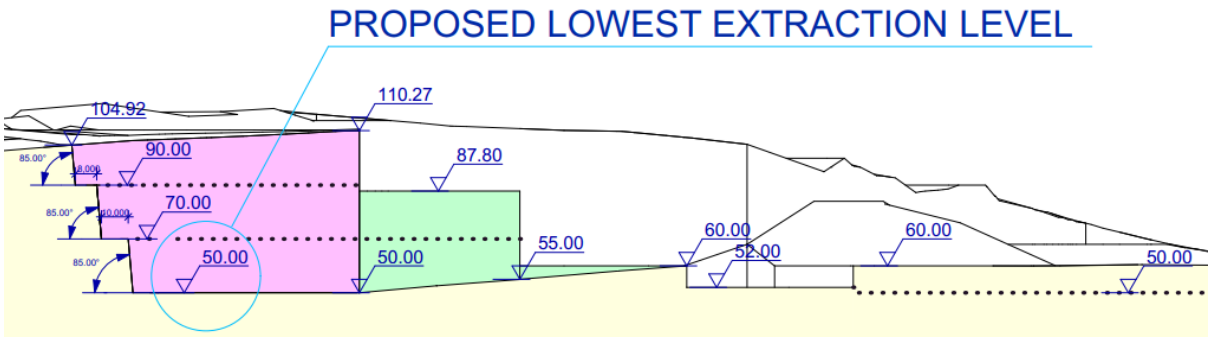

Figure 3.4 Section through proposed western quarry extension

3.9 Both proposed extensions will be extracted from the current ground levels to a floor level of 50m, which is the same floor level as the lowest level of the existing quarry at present and is also the proposed level of unworked parts of the existing quarry, once those areas have been extracted.

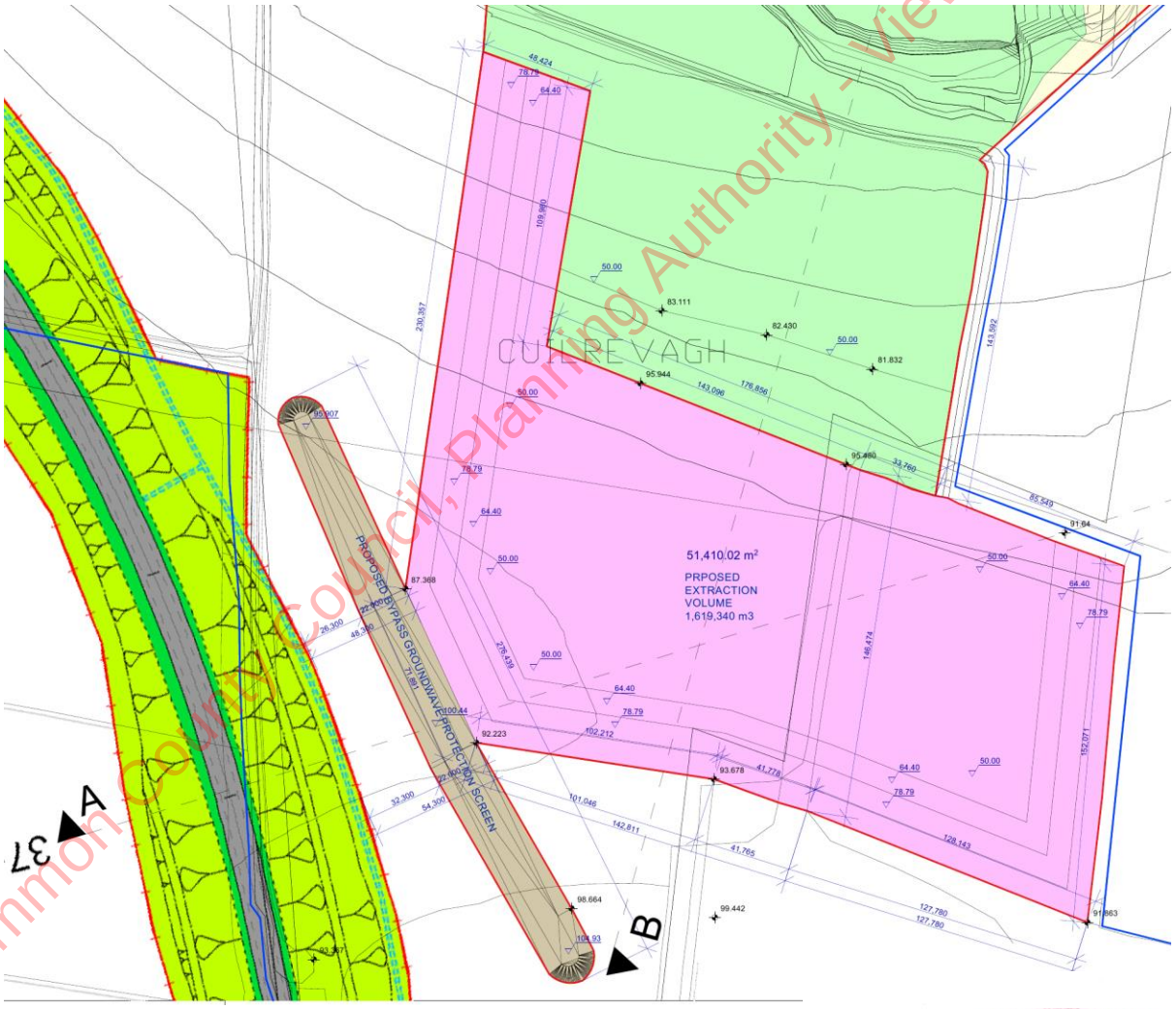

Figure 3.5 Proposed southern ex

3.10 The southern extension of 5.14ha is at a lower elevation thar a maximum existing ground level of 93.678m as per Figure 3 from the site sections prepare for the application. The ma

extension will therefore be 43.678m as the floor level is also proposed to be at 50m. The faces of the southern extension will have three benches which are evident in Figure 3.5 in plan form as well as in section profile in image 3.6. The first bench will be 13.08m in depth from the highest point, the second bench will be 14.39m and the bottom bench will be 14.40m. The sloping faces of the benches will eventually be restored as part of the restoration plan which is addressed in Chapter 12 of this EIAR.

3.11 It is proposed to extract 1,619,340m^3 of stone from the southern extension. Figure 3.6 also shows the angles of the restored facade upon completion of the restoration.

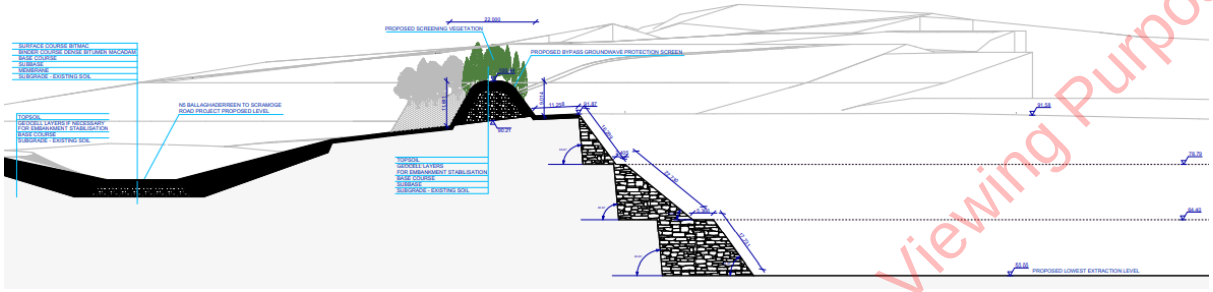

Figure 3.6 Section through Proposed N5 and southern quarry extension

3.12 The fly-rock barrier/earth berm to be constructed between the site and the new N5 will be 22m wide at its base and be more than 10m in height above the current ground level. It will be constructed of earth excavated from the site surface and will be more than 276m in length. It is evident in both Figures 3.5 and 3.6.

BACKGROUND TO PROPOSED DEVELOPMENT

3.13 The existing quarry has been operating since prior to 1st October 1964. The following are a number of planning applications that have been submitted in recent years at the quarry. A detailed planning history of applications submitted since 2000, within a 2km radius of the quarry, is addressed in Chapter 5 – Population and Human Health.

Planning History

3.14 The following planning history relates to development within the existing quarry site.

Reg Ref 05/872

3.15 Permission granted to Laragan Precast Limited on 23rd August 2006 for the following development: -

> To construct a production facility for the manufactur
> for the construction industry. The building will ha
> comprising of office space, storage facility, boiler hou
> overall height of the structure is 11.5m. Planning per
> external elements namely concrete batching plant w

bins, external gantry crane, septic tank with percolation area, new entrance onto public road and all ancillary site works.

Reg Ref 06/2399

3.16 Permission granted to Hanly Brothers Ltd for the following development on 26th March 2007:-

Retention of existing three storey office building (circa 371.42 sqm) car park, entrance and ancillary facilities; Planning Permission for the construction of a four storey extension to existing office (circa 887.0 sqm) and installation of a proprietary treatment unit and all ancillary site works and associated site and landscaping works.

Reg Ref 08/9

3.17 Permission granted to Hanly Brothers Limited on 29th May 2008 for permission and retention of the following development: -

To commission and operate a concrete batching plant. RETENTION of structures to house and accommodate the batching plant. This new concrete batching plant is an upgrade of an older existing permitted plant (Ref. No. PD/6586 (A) granted 18/10/76) which will also be maintained in use as a back up batching plant.

Reg Ref 08/474

3.18 Permission granted on 11th June 2008 to Laragan Asphalt Limited for the following development: -

Permission to complete the structures to house and accommodate the plant and permission to commission and operate a Bitumen plant. An environmental impact Statement will accompany the Application.

Reg Ref 08/1217

3.19 Permission granted to 25th November 2008 to Hanly Brothers Limited to: -

Erect 2 no. Wind Turbines and ancillary site works to cater for internal energy needs within the Quarry.

Reg Ref 18/259

3.20 An application was submitted on 30th May 2018 for the fc effectively for the same areas of extraction that are subject t forms part of: -

The development will consist of two no. extensions to the south and west of the existing quarry with a combined area of 8.60ha. An environmental impact assessment report has been prepared in respect of the proposed development and will be submitted to the planning authority with the application.

The application was withdrawn on 12th July 2018 prior to the making of a decision by Roscommon County Council.

Registration of Quarry under Section 261 – Planning and Development Act

3.21 Hanly Quarries was in operation prior to the coming into effect of the Local Government (Planning and Development) Act 1963, and was registered under Section 261 of the Planning and Development Act 2000 (as amended). Roscommon County Council attached conditions to the future operation of the quarry.

Section 261A – Planning and Development Act 2000 (as mended)

3.22 Section 261A of the Planning and Development Act 2000 (as amended) came into effect on 15th November 2011. Section 261A required that a Planning Authority examines every quarry within its administrative areas in order to determine, in relation to that quarry, whether having regard to the Environmental Impact Assessment Directive and the Habitats Directive, one or more than one of the following was required but was not carried out—

(i) an environmental impact assessment;

(ii) a determination as to whether an environmental impact assessment is required;

(iii) an appropriate assessment.

3.23 On 23rd August 2012, Roscommon County Council issued a letter to Hanly Brothers Ltd by registered post, enclosing a Section 4A Notice which stated that: -

In accordance with Section 261A subsection (2)(a) Roscommon County Council has **HEREBY DETERMINED** that:

(i) Development was carried out after 1 February 1990, which development would have required, having regard to the Environmental Impact Assessment Directive, an environmental impact assessment or a determination as to whether an environmental impact assessmen

assessment or determination was not carried

***Reason**:*

(i) Part of the quarry has expanded beyond the limits set by Condition 21 in the Section 261 order. The current working faces of the quarry to the south and the west are outside the area of the quarry on which conditions were imposed under Section 261.

3.24 The Section 4A notice went on to state: -

In accordance with Section 261A subsection (4)(a) Roscommon County Council has ***HEREBY DETERMINED***[1] *that:*

(i) The quarry commenced operation on or after 1 October 1964 and no permission was granted in respect of the quarry under Part III of the Planning and Development Acts 2000-2011 or Part IV of the Local Government (Planning and Development) Act 1963.

Reason*:*

(i) The current working faces of the quarry to the south and the west are outside the area of the quarry on which conditions were imposed under Section 261.

You are therefore notified that Roscommon County Council intends to issue an enforcement notice in relation to the quarry referred to above under section 154 of the Planning and Development Acts 2000-2011 requiring the cessation of the unauthorised quarry and the taking of such steps as Roscommon County Council considers appropriate.

Post S261A Legal Proceedings

3.25 Following from the S261A proceedings in 'Hanly Quarries Limited -v- Roscommon County Council Judicial Review High Court Record No. 2017/247 JR', Justice Noonan made the following order on 6th April 2017.

1 An order of certiorari setting aside part of Notification dated 23 August 2012 (Reference SCQY24) by which the Respondent decided in accordance with section 261A(4)(a) of the Planning and Development Act 2000 (as amended)("the PDA") that the quarry the subject of these proceedings at Larag ("the Quarry") commenced operation on or after 1 Oct

[1] DETERMINED should have stated DECIDED

2 *An Order pursuant to section 50(8) of the PDA extending the time for bringing the within application for judicial review.*

3 *An Order remitting the examination of the Quarry pursuant to section 261A of the Planning and Development Act 2000 (as amended) to the Respondent for its further consideration in accordance with law.*

3.26 Following from the above referenced proceedings, this application has been made on the basis that Roscommon County Council determined that the footprint of the existing quarry has reached the extent of what could have reasonably been expected to be the extent of the quarry on the appointed day of 1st October 1964 and that any further extensions to the quarry would require a grant of permission.

DESCRIPTION OF THE PROPOSED DEVELOPMENT - OPERATION

3.27 The proposed development subject to the proposed planning application will consist of the following: -

> Permission for development for a period of 24 years at a site in the townlands of Cuilreevagh and Largan, Elphin, Castlerea, Co Roscommon. The development will consist of two no extensions to the south and west of the existing quarry with a total extraction area of 8.60ha, a berm along the southwestern side of the southern extension, all associated site development and landscaping works. An environmental impact assessment report has been prepared in respect of the proposed development and will be submitted to the planning authority with the application.

Quarry Business

3.28 Hanly Quarries supply crushed rock aggregate to the local construction industry and road building companies. The present working area of the quarry is almost worked out. The new quarry extensions of 8.60 Hectare will allow site operations to continue at this quarry site. Quarry operations will remain at the same level with no intensification of site operations or production levels. The quarry currently employs 68 members of staff.

Working Hours

3.29 Operations of manufacture, delivery and product dispatch are present: -

- From 07:00 hrs to 19:00 hrs Monday to Saturday

Site Operations

3.30 The primary resource of the proposed extended quarry is crushed rock aggregate. No new plant will be required as part of the proposed extensions.

Liquid emissions

3.31 The main liquid emissions from the operations will be surface water and silt. Surface runoff water will be collected and filtered through the existing settlement ponds.

Water collection and disposal

Surface Water

3.32 Surface water from the quarry floor will be drained into the existing settlement ponds. The settlement ponds will filter levels of siltation through the graded settlement ponds before entering the local drainage system.

3.33 The present set up has a surface water treatment system that treats run-off water from the site. It consists of a primary settlement pond system with a total length of approximately 110 meters, several concrete sills allow water to slow and pass allowing for dis-entrainment of suspended solids. Two steel berms also exist to siphon off any surface oils, finally several oil absorbent socks or booms are ran across the channel to removed surface oils. The socks are replaced on a monthly basis by Atlas Oil Co and/or others.

3.34 All rainwater captured at the bunded area will be discharged following treatment in the oil interceptor to the onsite surface water drainage regime and silt ponds.

Wastewater

3.35 There will be no new toilets or canteen facilities associated with the proposed development. All wastewater from the present on-site canteen and toilets is treated with an on-site treatment system; planning reference number PD 06/2399.

Water Requirements

3.36 There will be no water requirement from the proposed quarry extensions.

Silt

3.37 Silt consists of small sand particles <75 microns. Silt material is suitable as a growing medium and when removed from the settlement ponds should be retained within site for the restoration of grassland habitat at decommissioning.

Hydrocarbon interceptors and mud traps

3.38 Maintenance of site machinery is unavoidable on site due to the need for servicing or because of breakdown and on such occasions the use of hydrocarbon interceptors to trap leaks etc. is advisable. Care should be taken to intercept possible oil spills or oil contamination of the quarry floor. If accidental spills or leaks should occur, an immediate clean-up of the contaminated material and safe disposal of contaminated material should be carried out. These practices are carried out at present in respect of the existing quarry and will continue in the proposed extension areas.

Waste Generation/ Waste Management

3.39 All material extracted from the quarry will be broken down into different sizes of product and sold on demand. No waste will be generated from the development. The on-site silt pond will be de-silted annually as at present or more frequently if necessary. The overburden removed from the clearance of the site and the silt extracted from the ponds will be reused at the existing quarry and on adjacent agricultural lands.

Stockpiles

3.40 There will be no stockpiles held within the two extension areas and all material will be removed from the sites after it is blasted and will be processed using the existing equipment within the existing quarry.

Processing of Crushed Rock Aggregate

3.41 The "winning " of crushed rock employs on site processes from the blasting and exaction of the rock face to the crushing and screening of the final product. The end user requires crushed aggregates of different sizes depending on project type.

Blasting and Drilling

3.42 Blasting events is carried out by professional company of exp
Limited (IIE) since IIE was founded in the 1970's. Prior to bl
local residents and An Garda Siochana are informed. A Blastir
has been prepared in respect of blasting in proximity to t
Appendix 3-1.

Drilling Rig

3.43 A drilling rig will be used to drill boreholes for the placement of explosives as part of the blasting exercises. The exact length of time will be determined by the area to be covered by the blast and the height of the working bench at the time of the blast. Before each blasting operation, boreholes are used for the placing of explosives in the blast area. The size of each blast area will be determined by a number of ever-changing factors such as short-term demand, bench height, hardness of the rock, proximity to the N5 and therefore no definitive information can be provided on the exact blasting procedure.

3.44 The drilling and blasting contractor will use a face profiling technique to plan borehole patterns and establish the exact burden that lies in front of the borehole. This will ensure the blasting process is carried out with maximum efficiency, while reducing vibration and air overpressure. The rock will be broken away from the quarry face using industry standard blasting procedures. Modern blast design technology systems aim to minimise the amount of explosives used, minimise vibrations and air overpressure, eliminate the risk of fly rock, allowing the most efficient extraction of rock from the quarry face.

3.45 Every blasting exercise will be monitored to record the vibration arising from the blast. The monitoring equipment will also record air overpressure from blasts. It will be possible to maintain a close control on vibration and rock fragmentation through analysis of previous blast data. Blast events during the existing quarry operations occur generally once every two months and dependant on demand monthly.

3.46 The extraction of the solid rock involves blasting and shattering of the rock. The rock is then crushed down to coarse aggregates sizes. There is fixed and mobile plant on site for rock crushing and production of various sized aggregates. The won aggregates are stockpiled within the site to await sale and delivery.

3.47 The crushed and screened processed aggregate is passed through the screening plant and graded into standard chip sizes according to market demand ranging from 20mm-30mm, 40mm – 50mm and 60-100mm chips and 10mm dust. The crushed rock aggregates are stockpiled according to chip grade size to await collection; according to demand graded processed chips are directly loaded to HGV for delivery to the customer's site.

Commencement of restoration

3.48 Restoration will only be carried out in areas of the site, exhausted and in which no further operations will take place will not be possible to extract all materials in one stage. In the take place after the first phase of extraction, and will only b

have been extracted. A restoration plan is included in Chapter 12 – The Landscape, Visual Impact and Restoration.

Transport (Internal and External)

Access

3.49 Trucks, lorries (outgoing/incoming material deliveries) and cars (contractor personnel, developer personnel, visitors) will use the existing main entrance located at the east of the site which is adjacent to the local road, this entrance is currently in use for the existing quarry operations, from the entrance the site will be accessed using the existing road.

External Traffic

3.50 Materials will be delivered depending on demand. All HGV's entering/leaving the site will pass through an existing wheel wash facility located at the quarry entrance to ensure that vehicle wheels are cleaned. The type of vehicles using the access road includes 6 - 8 wheel 19-23 tonne capacity rigid trucks and a number of articulated 26 tonne capacity trucks.

Internal Traffic

3.51 The haul route for vehicles accessing the site will be via the adjacent local road which connects to the R368 to both the north and south. Material leaving the site will be transported towards Strokestown or Elphin using the same route and then transported from there to differing locations, depending on the location of contracts.

3.52 No refuelling activities will take place within either of the proposed extension areas. Truck refuelling will continue as permitted at the quarry refuelling location.

RATIONALE FOR THE NEW DEVELOPMENT

3.53 Currently the existing quarry has extracted bedrock up to or close to the permitted boundary; however, a significant volume of resource material (underlying bedrock) remains extractable. This application will facilitate the extraction of this material. In the event of this application not being granted permission then the quarry will cease to operate sooner than if the proposed extension are permitted. Therefore, the following provides an overview of the site selection rationale and alternatives considered.

CONSIDERATION OF ALTERNATIVES

Alternative Locations

3.54 A quarry has operated at this location prior to the introduction of the first Planning Act in October 1964. The quarry is strategically located within close proximity to a number of large urban areas including Roscommon, Longford and Carrick-on Shannon as well as a number of smaller settlements. Existing supplies of aggregates of all classes and particularly those of the quality and type which exist at Hanly Quarries are limited in number and extent.

3.55 The development of new sources of supply on greenfield sites (Option A) is considered problematic from environmental and community perspectives and would prove particularly so in close proximity to populated settlements and in a rural area with a scattered rural population. This is evident by the general level of opposition to quarry development throughout the country and the number of possible alternative locations in the area for the opening of a quarry is limited. The current quarry site is not located in or near to a Natura 2000 designated site, or in an area of High Landscape importance as designated in the Roscommon County Development Plan 2014-2020 and these factors have been taken into consideration in the preparation of this EIAR.

3.56 Option B 'Do Nothing' consists of working out the existing extractable area and then ceasing activity upon the exhaustion of the existing resource. This option would not involve the loss of any additional lands and would mean that the quarry operation would cease earlier than if the proposed extension are permitted.

3.57 (Option C) which involves the continued operation of the existing quarry by way of extension is considered to be a more suitable alternative than opening a new quarry at another location in the area. With respect to alternative forms of extension, in particular possible lateral extensions, the ability to extend the quarry laterally has been determined by the topography and the proposed location of the new N5 road that will pass close to the southern boundary of the proposed southern extension.

3.58 The quarry could potentially be extended downwards and may be so in the future but the proposed lateral extensions are considered more acceptable at this time and will permit the extraction of the resource over a number of benches with the minimum amount of impact on the landscape.

3.59 The site has well established logistical routes for aggregate c
well established over period that the quarry has operated. A
brownfield development, then no additional site services (ele
required as these have already been installed at the site.

3.60 The skilled labour market within the local community has been well established for aggregate production, and the supply and sales chains have been well tested and refined over the years. The overall quarry site has 68 staff at present.

3.61 To adopt a new site selection would mean the relocation of existing facilities, supply chains, labour workforce etc. The negative effects of relocation would be similar to that outlined within the 'do nothing' scenario, which has been considered as a non-viable option for this application. Therefore, the alternative site selection is also considered to be a nonviable option given the well-established nature of the existing facilities and the lack of permitted land available for bedrock extraction.

Alternative Method of Extraction

3.62 It is proposed to continue extracting the stone from the quarry using a drilling and blasting technique. The quarry operators have being extracting stone by this method since the quarry started operating and have being using the same blasting contractor for almost 50 years. The noise and vibration results attained from the historic blasts have proven that the established method is both a safe and an acceptable form of extraction.

3.63 An alternative method of extraction is drilling and hydraulic fracturing, however, this method would be extremely time consuming and would require much more frequent drilling as the quantities of stone removed would be much smaller than using the existing blasting method. The drilling and hydraulic fracturing method would likely result in prolonged periods of noise due to the significantly additional drilling requirement, thereby making drilling and blasting a more suitable and preferred method of extraction.

3.64 Due to the nature of the rock to be extracted rock-breaking is not considered is viable method of extraction.

STATEMENT OF AUTHORTIY

3.65 This chapter of the EIAR has been prepared by Joe Bonner BA. MRUP, Dip Env Eng. Dip Proj Mgt. Joe has over 20 years postgraduate experience as both a Planning Officer in Local Authorities and as a private planning consultant. Joe has written, co-ordinated and edited numerous project EIS and EIAR for major commercial, industrial, retail, residential and quarry planning applications throughout the country including chapters relating to Population and Human Health.

4.BIODIVERSITY

INTRODUCTION

4.1. This Environmental Impact Assessment Report (EIAR) chapter describes the biodiversity baseline conditions and assesses the potential effects of the construction, operational and decommissioning phases of the Proposed Development of two extensions to an existing operating quarry (**Planning reference 18259**).

4.2. The chapter prescribes the methods used to identify biodiversity significance within the Application Site as well as the surrounding area. An assessment of any potential effects (including in-combination) posed by the Proposed Development will be undertaken and a suite of mitigation measures will be provided to reduce potential impacts on biodiversity receptors. An assessment of residual effects shall also be undertaken.

4.3. This chapter of the EIAR is supported by the following Figures and Technical Appendices:

- Appendix 4A:
  - Figure 4.1: Environmental Designations Map
  - Figure 4.2: Habitat Map
  - Figure 4.3: Site Location Plan
- Appendix 4B: Site Photograph

Project Description

4.4. The Proposed Development at Largan and Cuilrevagh, Elphin, County Roscommon is for an extension to the existing quarry site. The extension consists of two separately defined areas; one to the west of the existing quarry, and one to the south. The area to the west is 3.46 hectares in size and the existing ground levels vary from 116.11m AOD to 124.59m AOD. The area to the south is 5.73 hectares (5.14 hectare for the quarry extension and 0.59 hectare for the bund) in size and the existing ground levels vary from 100.14m AOD to 114.98m AOD.

4.5. For the purposes of this EIAR Chapter, the west area will b
south will be known as 'Area 2'. The site layout of the Propc
in **Figure 4.3: Appendix 6A**. Both areas currently consist
located on the boundary of the existing quarry.

4.6. The new N5 Road is to be constructed close to the southwest boundary of Area 2. The boundary of the extended quarry will be approx. 93m from the proposed road centreline and approx. 48m from the proposed land Compulsory Purchase Order (CPO) boundary.

4.7. Photographs of the proposed extension as well as the existing operations can be found in **Appendix 4B**.

4.8. For a full description of the Proposed Development and the various elements, please see **Chapter 3: Description of the Development** of this EIAR.

Site Description & Receiving Environment

4.9. The Application Site is located in the rural townlands of Cuilrevagh and Largan in Elphin, Castlerea, Co Roscommon; c4km north of Strokestown and c.5.7km southeast of the village of Elphin. Land use within the surrounding area generally consists of agriculture, with some residences and farmsteads evident along local roads. Grange Lough is found circa 700m to the east.

4.10. The eastern boundary of the existing quarry site fronts onto the local L1410 public road from which the quarry is accessed. The R368 Elphin to Strokestown regional road is found circa 770m to the west of the quarry and is accessed off the L1410 to both the north and south from the quarry site. The existing quarry is irregular in shape and extends over an area of c.34ha in a southwestern direction from the public road. In addition to the extraction and ancillary operations associated with quarrying, there is a bitumen plant, block making and manufacture of other concrete products facility within the quarry grounds, while offices and other structures are located in close proximity to the public road, which reduce visibility into the quarry.

Statement of Authority

4.11. This EIAR Chapter has been produced by ecologists registered with the Chartered Institute of Ecology and Environmental Management (CIEEM). All associated survey work has been carried out in line with the relevant professional guidance; CIEEM's Guidelines for Preliminary Ecological Appraisal[1], Ecological Impact Assessment[2], and Report Writing[3]. The following individuals produced this EIAR Chapter:

4.12. Dawn Thompson is an experienced ecologist with over twelve years of experience in ecological surveys and assessments and holds a BSc (Hons) in Environmental Biology. Dawn is a full member of the Chartered Institute of Ecology and Environmental Management

[1] CIEEM (2017) *Guidelines for Preliminary Ecological Appraisal.*

[2] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Irelar Marine.

[3] CIEEM (2017) Guidelines for Ecological Report Writing.

(CIEEM), and the Association of Environmental & Ecological Clerks of Works (AEECoW). Dawn has experience in undertaking and managing a range of surveys including badger, otter, ornithological, and other protected/notable species. Dawn has also undertaken various assessments including EIA Chapters, Ecological Impacts Assessments, Natura Impact Assessments / Appropriate Assessments, extended phase 1 habitat, for over 300 projects. These numerous projects include a variety of developments such as renewables, residential, utility, roads and flood prevention schemes.

4.13. Daniel Flenley has over 13 years of ecology experience including undertaking surveys and writing associated reports. A graduate member of the Chartered Institute of Ecology and Environmental Management (CIEEM), he is currently applying for full membership. Daniel has experience in undertaking and managing a range of surveys and assessments including Ecological Impacts Assessments (EcIAs), extended phase 1 habitat surveys and ornithological and protected species surveys, for around 200 projects. These include a variety of development types such as energy, commercial, residential and transport infrastructure. Daniel holds a Great Crested Newt class licence and has worked as an accredited agent under bat and amphibian mitigation and reptile survey licences.

4.14. Dara Dunlop is a qualifying member of the Chartered Institute of Ecology and Environmental Management (CIEEM), and has circa 3 years' experience in the ecology sector, including working for two ecological consultancies undertaking a range of protected species surveys and extended phase 1 habitat surveys for various project types including energy, residential, commercial and aggregate. Dara has also carried out assessments and survey work in relation to land management of designated sites. Dara has authored and co-authored a number of reports for various developments including Ecological Impact Assessments and Protected Species Reports.

Consultation

4.15. Please see Table 4-1 below, which details all consultee responses received relevant to Biodiversity.

Table 4-1 : Consultation

Consultee & Date	Summary of Response	Addressed within EIAR
Mary Grier, Senior Planner, (Various emails and conversations)	Requested that a cumulative assessment with the existing quarry is undertaken.	Yes

LEGISLATION, POLICY & GUIDANCE

4.16. The Proposed Development has been assessed against existing European, national, regional and local policies and guidance. The assessment has been collated and considered based upon the following legislation, planning policy and guidance:

Legislation and Policy

4.17. This Biodiversity Chapter has been undertaken with specific regard to the following legislative requirements:

- EU Habitats Directive 92/43/EEC[4];
- EU Birds Directive EC/79/409[5];
- Environmental Liability Directive 2004/35/EC[6];
- Bern Convention[7];
- Bonn Convention[8];
- EC (Natural Habitats) Regulations 1997 (as amended)[9];
- EC (Birds and Natural Habitats) Regulations (as amended)[10];
- EC (Water Policy) Regulations, 2003[11];
- Water Framework Directive[12]
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (DRAFT -2017)[13]

[4] http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm

[5] http://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm

[6] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32004L0035

[7] https://www.eea.europa.eu/policy-documents/convention-on-the-conservation-of

[8] https://jncc.gov.uk/our-work/the-convention-on-the-conservation-of-migratory-species-of-wild-animals/

[9] Office of the Attorney General (1997), *European Communities (Natural Habitats) Regulations 1997* (amended 1998, 2005), available at www.irishstatutebook.ie

[10] Office of the Attorney General (2011), *European Communities (Birds and Natural H* www.irishstatutebook.ie

[11] Office of the Attorney General (2003) *European Communities (Water Pc* www.irishstatute book.ie

[12] http://ec.europa.eu/environment/water/water-framework/index_en.html

- The Wildlife Act 1976 (as amended)[14];
- Flora Protection Order 2015[15];
- Planning and Development Act, 2000 (as amended)[16];
- Planning Policy Statement 2015[17]; and
- Roscommon County Development Plan 2014-2020[18]

Planning and Development Act, 2000 (as amended)

4.18. Relevant sections regarding ecology within the Planning and Development Act, 2000 (as amended) are as follows:

First Schedule, Part IV Environment and Amenities

"5. (a) Preserving and protecting flora, fauna and ecological diversity.

(b) Preserving and protecting trees, shrubs, plants and flowers.

6. Protecting and preserving (either in situ or by record) places, caves, sites, features and other objects of archaeological, geological, historical, scientific or ecological interest."

Fifth Schedule

"19. Any condition relating to the protection of features of the landscape which are of major importance for wild fauna and flora.

20. Any condition relating to the preservation and protection of trees, shrubs, plants and flowers.

[13] 13 Environmental Protection Agency (2017), Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, Found at http://www.epa.ie/pubs/advice/ea/EPA%20EIAR%20Guidelines.pdf

[14] Office of the Attorney General (1976) *Wildlife Act 1976 (amended 2000),* available at www.irishstatutebook.ie

[15] Office of the Attorney General (2015) *Flora Protection Order 2015*, available at www.irishstatutebook.ie

[16] http://www.irishstatutebook.ie/eli/2000/act/30/enacted/en/html

[17] https://www.housing.gov.ie/sites/default/files/migrated-files/en/Publications/DevelopmentandHousing/Planning/FileDownLoad%2C39991%2(

[18] The Roscommon County Development Plan http://www.roscommoncoco.ie/en/Services/Planning/Roscommon-County-Council-Pl County-Council-Planning-Publications/County_Development_Plan_2014_-_2020/Cou Table-of-Contents.pdf

21. Any condition relating to the preservation (either in situ or by record) of places, caves, sites, features or other objects of archaeological, geological, historical, scientific or ecological interest.

22. Any condition relating to the conservation and preservation of—

(a) one or more specific—

(i) (I) natural habitat types in Annex I of the Habitats Directive, or

(II) species in Annex II of the Habitats Directive which the site hosts,

contained in a European site selected by the Minister for Arts, Heritage, Gaeltacht and the Islands in accordance with Annex III (Stage 1) of that Directive,

(ii) species of bird or their habitat or other habitat contained in a European site specified in Article 4 of the Birds Directive, which formed the basis of the classification of that site,

or

(b) any other area prescribed for the purpose of section 10(2)(c).”

Part XIV

“212. – (1) A planning authority may develop or secure or facilitate the development of land and, in particular and without prejudice to the generality of the foregoing, may do one or more of the following:

(f) secure the preservation of any view or prospect, any protected structure or other structure, any architectural conservation area or natural physical feature, any trees or woodlands or any site of archaeological, geological, historical, scientific or ecological interest.”

Roscommon County Development Plan 2014-2020

4.19. The Roscommon County Development Plan sets out the strategic planning and sustainable development of the county over its lifetime.

4.20. The main aim of the plan is to provide a direction and focus for development in the County while focusing on eight strategic aims which include; sustainable economic and employment growth, competitiveness of business in the area, balanced development, social inclusion, improve quality of life and maintain and enhance the natural and cultural heritage.

4.21. Chapter 7: ‘Natural Heritage and Landscape Character’ ident

- *Protect, conserve and enhance the biodiversity and nat in County Roscommon.*

- *Identify, protect and conserve sites of natural heritage importance, in co-operation with the relevant statutory authorities.*

4.22. The following policies which apply to this chapter include the following:

Policy 7.1

Protect proposed and designated Natural Heritage Areas, Special Protection Areas and Special Areas of Conservation.

Policy 7.2

Protect geological Natural Heritage Areas as they become proposed, designated and notified to Roscommon County Council during the lifetime of this plan.

Policy 7.3

Protect any additional areas that may be proposed or designated during the lifetime of the plan in accordance with Policy above.

Policy 7.4

Promote development in these areas, for recreational and educational purposes, where it would not conflict with the preservation and protection of these sites.

Guidance Documents

BS 42020:2013 Biodiversity[19]

4.23. The British Standards Institute has published BS 42020:2013 Biodiversity Code of practice for planning and development, which offers a coherent methodology for biodiversity management. This document seeks to promote transparency and consistency in the quality and appropriateness of ecological information submitted with planning applications and applications for other regulatory approvals.

4.24. BS 42020:2013 cites CIEEM EcIA Guidelines as the acknowledged reference on ecological impact assessment. These guidelines are consistent with the British Standard on Biodiversity, which provides recommendations on topics such as professional practice, proportionality, pre-application discussions, ecological surveys, adequacy of ecological information, reporting and monitoring.

[19] *BS 42020:2013 Biodiversity. Code of practice for planning and development*

CIEEM Guidelines

4.25. The Chartered Institute of Ecology and Environmental Management (CIEEM) have produced guidance on Preliminary Ecological Appraisal[20] (PEA), Ecological Impact Assessment[21] (EcIA) and Ecological Report Writing[22].

4.26. EcIA is a process of identifying, quantifying and evaluating potential effects from activities such as those related to development on habitats, species and ecosystems.

4.27. The aims of their EcIA guidelines are to:

- promote good practice;
- promote a scientifically rigorous and transparent approach to Ecological Impact Assessment (EcIA);
- provide a common framework to EcIA in order to promote better communication and closer cooperation between ecologists involved in EcIA; and
- provide decision-makers with relevant information about the likely ecological effects of a project.

METHODOLOGY

4.28. The following methods are used within the assessments and for the production of this Biodiversity Chapter.

Zone of Influence

4.29. The Zone of Influence (ZOI) is the area encompassing all predicated negative ecological effects from a proposed scheme and is informed by the habitats present within the site and the nature of the proposals. Due to the scale and nature of the proposal, it is considered that the following ZOI outlined in **Table 4-2** below, was appropriate for the gathering of information for the desk study.

[20] CIEEM (2017) Guidelines for Preliminary Ecological Appraisal.

[21] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Irelar Marine.

[22] CIEEM (2017) Guidelines for Ecological Report Writing

Table 4-2: Zone of Influence for ecological features

ECOLOGICAL FEATURE	Zone of Influence (ZOI)
International/European statutory designations	15km
National statutory designations	5km
Protected and Priority Species	2km
Extended phase one habitat survey	50m

Desk Based Assessment

4.30. A desk-based assessment was undertaken to collate available ecological information for the Application Site and the surrounding area. This included a search of Natura 2000 Sites within a 15km radius of the Proposed Development, including: Special Protection Areas (SPAs) and Special Areas of Conservation (SACs). The search also identified statutory and non-statutory designated sites within a 5km radius of the Proposed Development, including: RAMSAR Sites, Nature Reserves (NRs), Wildfowl Sanctuaries, Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs). The descriptions of each of these sites was obtained utilising the National Parks and Wildlife Service (NPWS) website[23].

4.31. A data search was conducted though the National Biodiversity Data Centre (NBDC) to obtain information regarding protected/notable species within 2km of the Application Site boundary.

4.32. Additional information on the suitability of habitat in the surrounding area for bats was also obtained from the NBDC in the form of a habitat suitability map. The map provided enhanced information on the recorded distribution of bats and broad-scale geographic patterns of occurrence and local roosting habitat requirements for Irish bat species.

Field Surveys

Extended Phase 1 Habitat Survey

4.33. An extended phase 1 habitat survey was undertaken on the 21st May 2020 by Dara Dunlop BSc (Hons). This survey covered all land within 50m the Application Site. Survey work was carried out in accordance with the Fossitt guidelines[24] in order to produce an extended phase 1 habitat survey map, which is contained within Figure

[23] https://www.npws.ie/

[24] Fossitt, J. (2000) *A Guide to Habitats in Ireland*

4.34. This habitat classification method provides a standardised system to record and map semi-natural vegetation and other wildlife habitats to assess the potential importance for nature conservation.

4.35. Prior to this, extended phase 1 habitat surveys were undertaken of the whole quarry site on 28th of June 2017 by Niall O'Reilly MSc, and on the 14th of November 2017 by Gala Podgornik MSc. The surveys were also carried out in accordance with the Fossit guidelines.

Species Scoping Survey

4.36. Incidental observations of protected and/or notable species and the potential for such species to occur on site (and in the surrounding landscape where relevant) was also noted.

4.37. **Table 4-3** below outlines the relevant habitat and field signs that indicate the presence of protected or notable species within the survey area.

Table 4-3: Indicative Habitats and Field Signs of Protected Species

Taxon	Indicative Habitat(s)	Field Signs (In Addition to Sightings)
Bats	Roosts – trees, buildings, bridges, caves, etc. Foraging areas – e.g. parkland, water bodies, streams, wetlands, woodland edges and hedgerow. Commuting routes – linear features (e.g.) hedgerows, water courses, tree lines).	In or on potential roost sites: droppings stuck to walls, urine spotting in roof spaces, oil from fur staining round roost entrances, feeding remains (e.g. moth wings under a feeding perch).
Badger	Found in most rural and many urban habitats.	Excavations and tracks: sett entrances, latrines, hairs, well-worn paths, prints, scratch marks on trees. Survey undertaken within the Application Site and adjacent 50m around the
Pine marten	Woodland.	
Red squirrel	Woodland.	
Otter	Watercourses.	

		spraints (droppings), slide marks into watercourses, feeding signs (e.g. fish bones).
Reptiles	Rough grassland, log and rubble piles.	Shedded skins.
Great crested newts	Ponds within 500 m of suitable habitat within the site boundary. Suitable (terrestrial) habitat includes rough grassland, scrub and woodland, log and rubble piles and other debris, animal burrows.	No specific field signs.
Freshwater pearl mussels	Waterways.	Suitable substrate.

Evaluation Methods

4.38. The evaluation of ecological receptors is based upon the CIEEM guidelines[25] (2017) which suggest that the value or potential value of an ecological resource or feature (for example a habitat type, species or ecosystems) should be determined within a geographical context (e.g. rare at a local level). Attributing a value to a receptor, which is also a designated site, is generally precise, as the designations themselves provide an indication of value.

Impact Assessment Methods

4.39. The impact assessment process involves:

- identifying and characterising impacts and their effects;
- incorporating measures to avoid and mitigate negative impacts and effects;
- assessing the significance of any residual effects after mitigation;
- identifying appropriate compensation measures to offset significant residual effects; and
- identifying opportunities for ecological enhancement.

4.40. The terms 'impact' and 'effect' are used commonly through defined as a change experienced by an ecological feature

[25] CIEEM (2017) Guidelines for the Ecological Impact Assessment in the UK and Irelan

outcome to an ecological feature from an impact. Impacts and effects can be positive, negative or neutral.

4.41. Assessment of potential impacts and effects needs to consider on-site, adjacent and more distant ecological features, including habitats, species and statutory and ecological designated sites.

4.42. This ecological impact assessment has been concluded by an experienced ecologist following CIEEM guidance.[26]

Significance of Effects

Assessment of Effects

4.43. This EIAR Chapter has been produced in line with best practice guidance[27] and professional judgement, in order to provide a methodology that is robust and fit for purpose for the proposed quarry extension. The following provides an outline of the methodology used to provide a structured approach to determining potential effects of the project. The assessment involved the following process:

- Evaluation of nature conservation value;
- Impact assessment of project (including construction, operational and decommissioning phase for cumulative/in-combination effect, and as an individual development);
- Provision of mitigation measures;
- Assessment of residual effects.

Evaluation of Nature Conservation Value/Sensitivity

4.44. Nature Conservation Value is defined on the basis of the geographic context given in **Table 4-4** (in accordance with CIEEM guidance[28]). Attributing a value to an ecological feature is generally straightforward in the case of designated sites, as the designations themselves are normally indicative of an importance level. In the case of species, assigning value is less straightforward as contextual information about distribution and abundance is fundamental, including trends based on historical records. This means that even though a species may be

[26] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Irelai Marine. Available at: https://cieem.net

[27] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Irelai Marine.

[28] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Irelai Marine.

protected through legislation at a national or international level, the relative value of the population on site may be quite different (e.g. the site population may consist of a single transitory animal, which within the context of a thriving local/regional/national population of a species, is therefore of local or regional value rather than national or international).

4.45. Where possible, the valuation of habitat/populations within this assessment will make use of any relevant published evaluation criteria. Where relevant, information regarding the particular feature's conservation status is also considered to fully define its importance. This enables an appreciation of current population or habitat trends to be incorporated into the assessment.

Table 4-4: Valuing Ecological Features

Importance of Feature in Geographical Context	Description
International	An internationally designated site (e.g. SAC)
	Site meeting criteria for international designations or qualifying species of a SAC where there is connectivity
	Species present in internationally important numbers (>1% of biogeographic populations)
National	A nationally designated site (Site of Special Scientific Interest (SSSI), or a National Nature Reserve (NNR)), or sites meeting the criteria for national designation or qualifying species where there is connectivity
	Species present in nationally important numbers (>1% UK population)
Regional	Species present in regionally important numbers (>1% of Natural Heritage Zone population)
	Areas of habitat falling below criteria for selection as natural anci 0.25ha)
Local	Local Nature I

	Areas of semi-natural ancient woodland smaller than 0.25ha
	Areas of habitat or species considered to appreciably enrich the ecological resource within the local context, e.g. species-rich flushes or hedgerows
Negligible	Usually widespread and common habitats and species. Features falling below local value are not normally considered in detail in the assessment process

Assessing the Magnitude of Change

4.46. Determining the magnitude of any likely effects requires an understanding of how the ecological features are likely to respond to the proposed development. This change can occur during construction or operation of the proposed development.

4.47. Effect magnitude refers to changes in the extent and integrity of an ecological receptor. A suitable definition of ecological 'integrity' is found within Scottish Executive circular 6/1995 updated in Scottish Executive 2000[29] which states that "The integrity of a site is the coherence of its ecological structure and function, across its whole area, which enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified". Although this definition is used specifically regarding European level designated sites (SACs and SPAs), it is applied to wider countryside habitats and species for the purposes of this assessment.

4.48. Effects can be adverse, neutral or beneficial. Effects are judged in terms of magnitude in space and time. There are five levels of spatial effects and five levels of temporal effects as described in Table 4-5 and Table 4-6 respectively.

Table 4-5: Spatial Effect Magnitude

Spatial Magnitude	Description
Very High	Would cause the loss of the majority of a feature (>80%) or would be sufficient to damage a feature sufficient to immediately affect its viab

[29] Natura Casework Guidance: How to consider plans and projects affecting Special A Protection Areas (SPAs) Available at: https://www.nature.scot/natura-casework-guid affecting-special-areas-conservation-sacs

High	Would have a major effect on the feature or its viability. For example, more than 20% habitat loss or damage.
Moderate	Would have a moderate effect on the feature or its viability. For example, between 10 - 20% habitat loss or damage.
Low	Would have a minor effect upon the feature or its viability. For example, less than 10% habitat loss or damage.
Negligible	Minimal change on a very small scale; effects not dissimilar to those expected within a 'do nothing' scenario.

Table 4-6: Temporal Effect Magnitude

Temporal Magnitude	Description
Permanent	Effects continuing indefinitely beyond the span of one human generation (taken her as 30+ years), except where there is likely to be substantial improvement after this period in which case the category Long Term may be more appropriate.
Long term	Between 15 years up to (and including) 30 years.
Medium term	Between 5 years up to (but not including) 20 years.
Short term	Up to (but not including) 5 years
Negligible	No effect.

Criteria for Assessing Cumulative Effects

4.49. SNH's cumulative assessment guidance[30] is used to inform th chapter. Cumulative effects are not possible to evalua development in isolation but require the assessment c

[30] SNH (2012) Assessing the Cumulative Impact of Onshore Wind Energy Developmen

combination with other developments, projects or activities. However, in the interests of focusing on the potential for significant effects, this assessment considers the potential for cumulative effects with other EIA developments. The context in which these effects are considered is heavily dependent on the ecology of the feature assessed. For example, for otters it may be appropriate to consider effects specific to individual catchments, should the distance between neighbouring catchments be sufficient to assume no movement of animals between them, whereas for blanket bog the region/Natural Heritage Zone may be the relevant spatial scale. Therefore, an assessment of cumulative impacts will be made for each scoped in feature, appropriate to its ecology.

Criteria for Assessing Significance

4.50. The potential significance of the effect was determined through a standard method of assessment based on professional judgement, considering the nature conservation value of the IEF and the magnitude of change.

4.51. Table 4-7 details the significance criteria that have been used in assessing the effects of the proposed development. 'Major' and 'Moderate' impacts are considered to be Significant in accordance with EIA Regulations. 'Minor' and 'Negligible' impacts are considered to be Not Significant in accordance with EIA Regulations.

4-7: Significance Criteria

Level of Significance of Effect	Description
Major	Significant effect, as the effect is likely to result in a long term significant adverse effect on the integrity of the feature.
Moderate	Significant effect, as the effect is likely to result in a medium term or partially significant adverse effect on the integrity of the feature.
Minor	The effect is likely to adversely affect the feature at an insignificant level by virtue of its limited duration and/or extent, but there will probably be no effect on its integrity. The level of effect would be Minor and Not Significant.
Negligible	No material effect. The effect is assessed to be Not Significant.

4.52. Using these definitions, it is decided whether there would sufficient to adversely affect the ecological feature to the ex deteriorates above and beyond that which would be expe remain (i.e. the 'do nothing' scenario).

Assessment Limitations

4.53. Results of the assessment undertaken by Neo Environmental are representative of the time that surveying was undertaken.

4.54. The absence of specific species records returned during the data search does not necessarily indicate absence of a species or habitat from an area, but rather that these have not been recorded or are perhaps under-recorded within the search area.

4.55. An extended phase 1 habitat survey does not aim to produce a full botanical or faunal species list or provide a full protected species survey but, enables competent ecologists to ascertain an understanding of the ecology of the site in order to:

- Broadly identify the nature conservation value of a site and preliminary assess the significance of any potential impacts on habitat/species recorded; and/or
- Confirm the need and extent of any additional specific ecological surveys that are required to identify the true nature conservation value of a site.

4.56. At the time of the initial survey, access was only permitted within the landownership boundary. The areas of land which formed the ESA which were not within the landownership boundary were viewed from field boundaries, with the use of binoculars, where needed. It is considered that the limited access to areas of land directly adjacent to the Proposed Development boundary has not impacted upon the findings of the habitat or species scoping surveys.

BASELINE CONDITIONS

Environmental Designated Sites Baseline

4.57. The Proposed Development at Hanly Quarries does not lie within or directly adjacent to any statutory or non-statutory designated environmental sites.

4.58. Within 15km of the Application Site boundary there are four Special Areas of Conservation (SACs) and one Special Protection Area (SPA). Each of these sites are outlined in **Table 4-8** below, and detailed within **Figure 4.1.**

4.59. There are no other statutory designated sites within 5km of the Application Site.

4.60. The site descriptions are derived from the original site citatic

31 Available at: http://www.npws.ie/protected-sites

Table 4-8: Designated Sites

Site Code	Site Name	Qualifying Features	Distance (km), Direction	Potential Connectivity with the Proposed Development Site
SAC				
001626	Annaghmore Lough (Roscommon) SAC	Alkaline fens [7230] *Vertigo geyeri* (Geyer's Whorl Snail) [1013]	1.33 SW	No
000612	Mullygollan Turlough SAC	Turloughs [3180]	13.01 SW	No
002348	Clooneen Bog SAC	Degraded Raised Bog [7120] *Rhynchosporion* Vegetation [7150] Bog Woodland[91D0]	13.64 E	No
001818	Lough Forbes Complex SAC	Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* - type vegetation [3150] Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the Rhynchosporion [7150] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]	14.26 SE	Yes, hydrological
SPA				
004101	Ballykenny-Fisherstown Bog SPA	Greenland White-fronted Goose (Anser albifrons flavirostris) [A395]	14.21 SE	Yes, hydrological

Habitats Baseline

4.61. An extended phase 1 habitat survey was undertaken on the 21st May 2020 by Dara Dunlop BSc (Hons) which identified seven habitat types within the ESA, each of these are outlined below. See **Figure 4.2** for the phase 1 habitat classification map.

4.62. Prior to this, extended phase 1 habitat surveys of the quarry site were carried out in June 2017 by Niall O'Reilly and November 2017 by Gala Podgornik.

4.63. Habitats present within the survey area include:

- Improved Agricultural Grassland (GA1)
- Quarry (ED4)
- Buildings and Artificial Surfaces (BL3)
- Spoil and Bare Ground (ED2)
- Hedgerow (WL1)
- Treelines (WL2)
- Scattered Trees (WL5)

4.64. (Note: Fossitt classification within brackets).

4.65. Both Area 1 and Area 2 consist of fields of improved grassland (GA1). A limited number of grass species occur with dock species and creeping buttercup (*Ranunculus repens*), and white clover (*Trifolium repens*) and dandelion (*Taraxacum officinale*).

4.66. An area of active quarry (ED4) falls within the ESA with an exposed limestone rock face.

4.67. There are limited amounts of hedgerows (WL1) in the ESA for Area 2 only, with hawthorn (*Crataegus monogyna*) and occasional gorse (*Ulex europaeus*). Most are tightly trimmed. Vegetation at the base of these hedgerows is dominated by grasses with nettle (*Urtica dioica*), bramble (*Rubus fruticosus)*, meadow vetchling (*Lathyrus pratensis*), creeping buttercup (*Ranunculus repens*) and creeping thistle (*Cirsium arvense*).

4.68. There are 10 trees along the eastern hedgerow of Area 2, and a treeline (WL2) consisting of hawthorn and ash (*Fraxinus excelsior*) separates fields in the northeast corner of this area. Height of trees varies above 5m.

4.69. A single immature ash is present in the southwest corner of

4.70. There are two quarry access roads within the ESA (BL3) pav
ground (ED2) lies between the access road in the western ex

4.71. No rare, notable or invasive floral species were identified during the extended phase 1 habitat survey.

Protected and Notable Species Baseline

Desk Based

4.72. The potential presence of protected species within the study area was assessed though a data search conducted through the NBDC. This identified records of invasive, rare, scarce and protected species within 2km of the Proposed Development location. The Application Site is located within the 1km grid square M9285 and M9284. A database search was also carried out for adjacent grid squares to ensure a full assessment of the 2km radius, which included grid squares M9086, M9186, M9286, M9386, M9486, M9085, M9185, M9385, M9485, M9084, M9184, M9284, M9384, M9484, M9083, M9183, M9283m M9383 and M9483.

4.73. Additional information on the suitability of habitats in the surrounding area for bats was also obtained from the NBDC in the form of a habitat suitability map. The map provided enhanced information on the recorded distribution of bats and broad-scale geographic patterns of occurrence and local roosting habitat requirements for Irish bat species.

4.74. In addition, the extended phase 1 habitat survey included a species scoping survey in order to assess the potential of the site to support protected species.

4.75. Table 4-9 below summarises the protected/notable species recorded within the search area, and their potential to be present within the Application Site boundary at Hanly Quarries.

Table 4-9: Summary of Biological Records

Species	Grids with Recordings of Species	Suitable Habitat or Field Signs Observed within Survey Area	Potential for species within Application Site
MAMMALS			
Soprano pipistrelle (*Pipistrellus pygmaeus*)	M9283	The single ash tree in the Area 1 may offer limited roosting potential. Foraging and habitat within area is extreme	
Brown long-eared bat	M9283	The single ash 1 extension are	

(*Plecotus auratus*)		limited roosting potential. Foraging and commuting habitat within the survey area is extremely limited.	
Eurasian badger (*Meles meles*)	All grids in search area	Grassland and hedgerow	Yes
BIRDS			
Lapwing (*Vanellus vanellus*)	All grids in search area	Grassland	Yes
Skylark (*Alauda arvensis*)	All grids in search area	Grassland	Yes
Swift (*Apus apus*)	All grids in search area	Grassland	Yes
Golden plover (*Pluvialis apricaria*)	All grids in search area	Limited	Unlikely
Snipe (*Gallinago gallinago*)	All grids in search area	Limited	Unlikely
Woodcock (*Scolopax rusticola*)	All grids in search area	Limited	Unlikely
Grey heron (*Ardea cinereal*)	All grids in search area	No	No
Kestrel (*Falco tinnunculus*)	All grids in search area	Limited	Unlikely
Yellowhammer (*Emberiza citronella*)	All grids in search area	Hedgerow, grassland	Yes
Linnet (*Linaria cannabina*)	All grids in search area	Hedgerow, grassland	Yes
Meadow pipit (*Anthus pratensi*)	All grids in search area	Grassland	Yes
HERPTILES			
Common frog (*Rana temporaria*)	All grids in search area	No	

4.76. Table 4-10 below details the results of The NBDC Bat Suitab the Development.

Table 4-10: Bat Suitability Index

Species	Index Score
Soprano pipistrelle (*pipistrellus pygmaeus*)	48
Brown long-eared bat (*plecotus auritus*)	39
Common pipistrelle (*pipistrellus pipistrellus*)	49
Lesser horseshoe bat (*rhinolophus hipposideros*)	1
Leisler's bat (*nyctalus leisleri*)	48
Whiskered bat (*myotis mystacinus*)	11
Daubenton's bat (*myotis daubentonii*)	41
Nathusius's pipistrelle (*pipistrellus nathusii*)	11
Natterer's bat *myotis nattereri*	38

Field Survey

Bats

4.77. Records of bats were identified within 2km of the Application Site during the data search.

4.78. No sightings or field signs of bats were observed within the survey area. Only one tree was observed within the Proposed Development, and it did not have suitable features to support roosting bats. Treelines and hedgerows present within the survey area (located adjacent to Area 2) provide limited connectivity with the wider landscape.

Badger

4.79. The data search returned records of badger (*Meles meles*) within 2km of the Application site.

4.80. Improved grassland within the Application Site provides suitable habitat for foraging badger while treelines and hedgerows provide suitable habitat for commuting and sett excavation.

Other Mammals

4.81. The data search produced no records for other protected or the 2km search area for the Application Site.

Birds

4.82. Trees, hedgerows and improved grassland offer potential nesting habitat for a variety of bird species.

4.83. Limited hedgerows and treelines are present outside of the boundary of Area 2.

4.84. Area 1 offered limited habitat suitability for nesting birds, with a short sward of improved agricultural grassland and a single immature Ash (*Fraxinus excelsior*) present in the southwest corner of the area, suitable for nesting birds.

4.85. Whilst no formal bird surveys were undertaken within the proposed ESA, the species scoping survey was completed to identify the presence of protected species, or the potential of the Application Site to support protected species. Any incidental observations of bird species during the walk over surveys were recorded to provide information for the assessment of potential bird activity within the Application Site.

4.86. Table 4-11 below lists the bird species observed during the site visits.

Table 4-11: Bird Species Observed During the Extended Phase 1 Habitat Survey

Scientific Name	Common Name	Species within Red or Amber List of BoCCI[32]
Apus apus	Swift	No
Passer domesticus	Sparrow	No
Alauda arvensis	Skylark	Red
Anthus pratensis	Meadow pipits	Amber
Aegithalos caudatus	Long-tailed tit	No

Herptiles

4.87. No herptile species or evidence of herptile species was observed at the time of the surveys. Hedgerows may offer potential shelter and commuting habitat for herptiles. However, this habitat is limited within the survey area.

4.88. Given the high level of disturbance around the proposed quarry site from the existing quarrying activities, and limited habitat availability for herptile species, it is considered that these species are unlikely to be present within the proposed

[32] Birds of Conservation Concern in Ireland 2014 - 2019

Invertebrates

4.89. No protected species of invertebrate were identified during the walkover surveys.

Future Baseline

4.90. Assuming a lag between the baseline studies and the commencement of construction phase of the Proposed Development, it is necessary to consider possible changes to baseline conditions during this time. No substantial habitat modifications or changes that could influence ecological interest in the ecology core study area are foreseen. The findings of the current 2020 ecological survey and those undertaken in 2017 were found to be similar.

Potential Effects In The Absence of Mitigation

4.91. The following section identifies the potential impacts of the Proposed Development upon the ecology of the Application Site and surrounding area.

Do Nothing Scenario

4.92. In the absence of the Proposed Development ('Do nothing' scenario) the land will likely retain its present ecological value.

Construction/Decommissioning Phase

4.93. The existing quarry operations are already in place, therefore there will be no construction stage whilst the decommissioning effects are expected to be dealt with in a remediation plan that has been prepared for the proposed extension areas.

4.94. With the implementation of the restoration plan the Application Site's potential to support local wildlife would increase, resulting in a **Long-term positive impact**.

Operational (Quarrying) Phase

4.95. For the purpose of this Impact Assessment the groundworks (including the construction of associated infrastructure) undertaken prior to the quarrying activity have been included within the Operational Phase of the Proposed Development.

4.96. Potential effects from the quarrying phase of the Proposed D

- Loss, destruction or fragmentation of habitat;
- Disturbance; and

- Contamination.

Environmental Designated Sites

4.97. This section discusses and evaluates the likely impacts of the Proposed Development affecting the environmental designated sites which are within the Zone of Influence (ZOI) of the Proposed Development (i.e. there is an ecological or hydrological connection between the Proposed Development and the designated site).

4.98. Of the five environmental designated sites present within the relevant study areas only the Lough Forbes Complex SAC and Ballykenny-Fisherstown Bog SPA have hydrological connectivity with the Application Site. As no pathway for impacts exist between the Application Site and the other environmental designated sites, **no impacts will occur for these**, resulting in **Negligible effects**.

4.99. During mineral extraction, crushing, and washing, groundwater quality has the potential to be adversely affected by the mobilisation of fines leading to high suspended solids loading or the accidental release of contaminants within the quarry void.

4.100. Aquatic systems and the species/habitats which are dependent on these systems are sensitive to pollution/contamination of surface waters. Pollution can result from any of the following entering a body of surface or groundwater:

- Poisonous, noxious or polluting matter;
- Waste matter (including silt, cement, concrete, oil, petroleum spirit, chemicals, solvents, sewage and other polluting matter);
- Other harmful activities detrimentally affecting the status of a waterbody.

4.101. The status of a waterbody can be affected not only by chemical pollution, but also by activities directly or indirectly affecting ecology, including changes in physio-chemical parameters such as temperature and turbidity or physical modification to the hydrology of a waterbody.

4.102. **Table 4-12** below details common water pollutants and their effect on the aquatic environment (Table extracted from Ciria guidance[33]).

Table 4-12: Common water pollutants and their effects on the aquatic environment

Common Water Pollutants	Adverse effect on aquatic environment
Silt	Reduces wat covers aquat

[33] Ciria (2015) Environmental good practice on site guide, fourth edition

	invertebrates, leads to a reduction in prey for species including otter and fish species, leads to degradation of habitat including that of juvenile freshwater pearl mussels
Bentonite (very fine silt)	Reduces water quality, clogs fish gills, covers aquatic plants, impacts aquatic invertebrates, leads to a reduction in prey for species including otter and fish species, leads to degradation of habitat including that of juvenile freshwater pearl mussels
Cement or concrete wash water (highly alkaline)	Changes the chemical balance, is toxic to fish and other wildlife. This can lead to direct impacts for aquatic species (including otter), or indirect through loss of prey resources
Detergent	Removed dissolved oxygen, can be toxic to fish and other wildlife present within the aquatic environment
Hydrocarbons (e.g. oil, diesel)	Suffocates aquatic life, damaging to the wildlife (e.g. birds), and to water supplies including industrial abstractions
Sewage	Reduces water quality, is toxic to aquatic wildlife including otter, and damages water supplies

Annaghmore Lough (Roscommon) SAC

4.103. Annaghmore Lough (Roscommon) SAC is located approximately 1.33km southwest of the proposed Application Site boundary. The site has been designated as a SAC for its alkaline fens and for the Geyer's whorl snail population supported within the site. Given that there is no hydrological connectivity between the proposed quarrying site and the SAC and therefore no risk of contamination, it is considered that in the absence of mitigation, **no direct impacts** will occur for either qualifying feature of the SAC from the Proposed Development.

Lough Forbes Complex SAC,

4.104. The Lough Forbes Complex SAC is located approximately 14.26km southeast Application Site boundary and has been designated for habitats outlined within **Table 4-3** above. It is hydrologically connected to the Application Site.

4.105. **Chapter 6: Water** outlines that suitable protection for watercourses potentially affected by the works will be installed prior to relevant works proceeding. All water within the current quarry is collected centrally within the Site, and is then subject to a number of measures, including settlement ponds. All water is strictly monitored and tested on-site prior to being discharged. If the current proposal is consented, all water within the extension areas of the quarry will be treated in the same manner. Therefore, no water discharged from the quarry site will contaminate water courses connected to the SAC. It is considered that the Proposed Development **will not significantly impact** upon the Lough Forbes Complex SAC.

Ballykenny-Fisherstown Bog SPA

4.106. Ballykenny-Fisherstown Bog SPA has been designated for the over-wintering Greenland white-fronted goose supported within the site. Greenland white-fronted goose are known to have a core foraging area of 5 – 8km, and are therefore unlikely to commute to the Proposed Development site from the SPA on a regular basis. It is also considered that the current levels of noise and visual disturbance from the existing quarry will deter this species from feeding within the Application Site. Given that all water discharged from the quarry site will be strictly monitored and treated as appropriate, it is considered that there will be **no loss of suitable habitat** through potential contamination of aquatic or other associated habitats.

4.107. As the separation distance between the Proposed Development and the SPA is approximately 14.21km and Greenland white-fronted geese are known to have a core foraging area of 5 – 8km , there will be **Negligible Direct effects** for the geese within the SPA.

Mullygollan Turlough SAC

4.108. Mullygollan Turlough SAC is located approximately 13.01km southwest of the Application Site and has been designated for Turloughs [3180]. Given that there is no connectivity between this site and the Proposed Development, **impacts will not occur**.

Clooneen Bog SAC and

4.109. Clooneen Bog SAC is located approximately 13.64km east Application Site and has been designated for notable habitats, as detailed within **Table 4-** connectivity between this site and the Proposed Developme

Habitats

4.110. There will be a permanent (long-term) loss of habitat under the Proposed Development footprint. It is therefore imperative that sensitive or important habitats are avoided where possible. The only habitat types under the development footprint are improved grassland fields, a single Ash tree and artificial surfaces (quarry access tracks), which are of low ecological value and offer limited potential for supporting local wildlife. The loss of these fields is considered to be of **Negligible importance**.

4.111. The small section of hedgerow recorded within the survey area is currently species-poor, with a limited ground flora. If removal of hedgerow is required the loss of this habitat is considered to be of **Negligible importance.**

Protected and Notable Species

Bats

4.112. Bats are of an International importance, and are protected by Irish and European legislation.

4.113. Many species of bats generally commute and forage along linear features, such as a stream/river, hedgerow or woodland edges (This is true for pipistrelle and myotis species). However, on occasion they will cross open features, particularly species with strong echolocation such as leisler's bat (Nyctalus leisleri).

4.114. Hedgerows and treelines within the survey area may provide feeding potential for bats, and connect the Application Site with the wider landscape. Trees within the hedgerow of Area 2 and treelines may offer potential bat roost habitat. However, as outlined previously, the tree within the Application Site was not noted as offering bat roost potential. Therefore, the Proposed Development will **not lead to a loss of roosting habitat**.

4.115. Improved grassland offers sub-optimal foraging habitat for bat species due to the limited prey abundance. The loss of this habitat under the Proposed Development footprint will not lead to a significant reduction in foraging habitat for local bats.

4.116. An effect magnitude of **Negligible Spatial and Negligible Temporal** is appropriate for this species. Therefore, **Not Significant** in terms of the EIA Regulations.

Badger

4.117. At the time of the walkover survey, suitable foraging habitat was observed throughout the Application Site, and badger are known to be present within

4.118. No evidence of badger was observed during the walkove badger observed on previous visits to the quarry site ur November 2017.

4.119. In the absence of mitigation, the construction phase has the potential to impact upon badger. Given that badger are a highly mobile species and can readily excavate setts in a short period of time, potential impacts at the time of construction may vary, where there is a change in badger activity within/adjacent to the Application Site.

4.120. It is considered (in a worst-case scenario) that the Proposed Development will have an effect magnitude of **High Spatial and Short-Term** Temporal for badger. Therefore, significant in terms of the EIA Regulations.

4.121. However, from the current survey findings, if there was to be no change in badger activity within the Application Site, the Proposed Development will have an effect magnitude of **Low Spatial and Short-term Temporal** for badger. Therefore, **Not significant** in terms of the EIA Regulations.

Otter

4.122. No suitable habitat for otter is present within or directly adjacent to the Proposed Development. The nearest water body to the Development is the Grange Lough, which is located approximately 1.4km from the Application Site.

4.123. Records of otter were not returned by the data search and no evidence of otter was observed during the walkover survey of the proposed extension areas, nor was evidence observed on previous visits to the quarry site undertaken by Neo in June and November 2017.

4.124. It is therefore considered unlikely that otter are present within the local area. Based on the current findings, an effect magnitude of **Negligible Spatial and Negligible Temporal** is appropriate for this species. Therefore, **Not Significant** in terms of the EIA Regulations.

Birds

4.125. The main impacts on bird species from developments include:

- Direct loss or deterioration of habitats.
- Indirect habitat loss as a result of displacement by disturbance.

4.126. The Proposed Development will occur primarily on improved agricultural grassland. As this habitat is of low value to local bird species and is abundant within the local area, the loss of this area would be **Negligible** for bird species present in the surrounding landscape. Hedgerows and trees within and adjacent to the Applicatic [illegible] breeding birds, if removal of hedgerow is required, loss [illegible] present in the surrounding landscape.

4.127. Breeding birds are highly susceptible to noise disturbance and as such, where works are to commence during the breeding season (March to August inclusive), in the absence of mitigation, it is likely that works will impact breeding birds (potential for significant impacts).

4.128. Although the fields may be utilised by foraging birds over winter, it is considered that given the short construction phase and the abundance of similar habitat within the local area, **no significant impacts** will occur for these species.

4.129. An effect magnitude of **Low Spatial and Short-term Temporal** is appropriate for this species. Therefore, **Not Significant** in terms of the EIA Regulations.

Herptiles

4.130. Habitat for herptile species within the survey area is limited to the several sections of hedgerow. In the absence of mitigation, the removal of this habitat may impact upon herptile species during the removal process.

4.131. If removal of hedgerow is required, the loss of this habitat will not have a long-term effect for these species, as hedgerow and other suitable habitat are abundant within the local area, and the loss of this hedgerow will not lead to habitat fragmentation.

An effect magnitude of **Low Spatial and Short-term Temporal** is appropriate for this species. Therefore, **Not Significant** in terms of the EIA Regulations.

MITIGATION MEASURES

Environmental Designated Sites

4.132. **No significant effects** will occur to the designated sites linked hydrologically with the Proposed Development, as outlined in **Chapter 6: Water** suitable protection for watercourses is in place for the existing quarry site and there will be no new drainage infrastructure.

Habitats

4.133. The loss of habitat under the Proposed Development footprint is permanent (Long term). It is therefore imperative that sensitive or important habitats are avoided where possible. The main habitat type under the development footprint is improved grassland, which is of a low ecological value and offers limited potential for supporting fields is **not significant** in terms of nature conservation.

4.134. The small section of hedgerow recorded within the survey with a limited ground flora. Hedgerows can provide suitable including farmland birds. However, hedgerows are outside c

if removal of hedgerows is required, the loss of this small section **will not be significant** given the availability of similar habitats in the surrounding landscape.

Protected and Notable Species

Bat

4.135. It is recommended that the tree within the Application Site be subject to a ground level roost potential survey.

4.136. **No significant effects** are predicted for bat species where the recommended mitigation measures have been implemented.

Badger

4.137. Pre-construction badger surveys have been recommended to assess the potential impacts for these species immediately prior to the commencement of the construction phase. This survey has been recommended as badger are highly mobile, and known to be present within the local area. From the current survey findings, it is anticipated that the Development will not have a significant negative effect for badger.

4.138. With the implementation of the outlined mitigation measures, **no significant effects** will occur for badger.

Birds

4.139. If construction of the Proposed Development occurs within the bird breeding season (March to August inclusive) it is recommended that a pre-commencement breeding bird survey be carried out by a suitably qualified ecologist prior to the commencement of any works or clearance of vegetation on site. This is to identify any nesting birds within the Application Site which may be affected by the construction phase. If any nesting birds are identified, a suitable buffer is to be set in place where no works or removal of vegetation is to occur until after the bird breeding season, to ensure **no significant effects**.

Herptiles

4.140. If the removal of any hedgerows within the ESA is required, removal is to be undertaken outside of winter months, when herptile species are likely to be in hibernation. Where works are to occur during winter months, hedgerow removal should be supervised by a suitably qualified ecologist, with any herptiles found transloc

4.141. With the implementation of this mitigation measure, it **significant effects** for local herptile species.

RESIDUAL EFFECTS

Environmental Designated Sites

4.142. **No significant impacts** for designated sites during the operational or decommissioning phases are predicted in the absence of mitigation, therefore residual impacts will also be **not significant**.

4.143. The residual effect magnitude of **Negligible Spatial and Negligible Temporal** is still appropriate for these features. Therefore, **Not Significant** in terms of the EIA Regulations.

Habitats

4.144. With the implementation of the mitigation measures outlined above impacts from the Proposed Development will have a **Long-term positive effect** for local habitats.

Protected and Notable Species

4.145. With the implementation of the recommended mitigation measures outlined above **no residual impacts** will occur for any of the protected and notable species outlined above. Therefore, resulting in **Negligible Spatial and Negligible Temporal effects** for the construction and decommissioning stages.

4.146. **Negligible Long-Term effects** are predicted for these species during the operational phase.

4.147. Where pre-commencement surveys are recommended, these will be undertaken by a suitably qualified ecologist who will conduct a further impact assessment at the time of construction/decommissioning with the updated baseline results, and where deemed necessary, will outline further mitigation measures to ensure no significant impacts occur from the Proposed Development.

4.148. The residual effect magnitude of **Negligible Spatial and Negligible Temporal** is appropriate for these species. Therefore, **Not Significant** in terms of the EIA Regulations.

CUMULATIVE EFFECTS

4.149. As the Proposed Development is an extension of the existing quarry operations, there is the potential for a cumulative effect on local ecology, in combi
Measures are in place at the existing quarry site to m
Mitigation measures suggested for the proposed extension
are anticipated.

4.150. No other quarry developments were identified in the study area and therefore no cumulative effects are anticipated.

SUMMARY & CONCLUSION

4.151. To minimise potential impacts on local wildlife, ecological measures have been incorporated into the Proposed Development as part of the iterative design process. These include buffers from potentially sensitive ecological receptors (see **Table 5-15** below).

4.152. A total of seven habitat types were noted during the extended phase 1 habitat survey undertaken in May 2020. The main effects for habitats include the direct loss of habitat due to disturbance. The **loss of the improved agricultural grassland is considered to be negligible** to nature conservation within the local area.

4.153. Of the five environmental designated sites present within the relevant study areas only Lough Forbes Complex SAC and Ballykenny-Fisherstown Bog SPA are hydrologically connected to the Application Site. Potential impacts have been considered for the ecological features associated with the designated sites. It was concluded that the effects are **Not Significant** in terms of the EIA Regulations.

4.154. Potential impacts for badger, otter and breeding birds have been highlighted in the above assessment, with appropriate mitigation measure outlined to ensure **no significant effects** will occur.

4.155. It is concluded that the residual effects of the Proposed Development are **Not Significant** in terms of EIA Regulations.

Table 4-15: Integral design measures and standard best practice

Site/ Species	Potential Development Impacts	Phase of Development	Measures implemented
MITIGATION MEASURES			
Badger	Disturbance, killing or injuring, and damage or destruction of sett	Operational Phase	Pre-commencement survey (Measures dependant on survey findings).
Breeding birds	Disturbance / destruction of nest (Only if works are undertaken between March and August)	Operational Phase	Pre-construction breeding bird survey if hedgerow to be removed (O be (M fin

Bats	Disturbance / destruction of roosts	Operational Phase	Bat Roost Feature Assessment of any tree if they are to be removed.
Herptiles	Disturbance / destruction	Operational Phase	Where possible, if removal of hedgerow is required, this should not be undertaken during winter months. Where this work must occur during winter months, a suitably qualified ecologist should be present to supervise works, with any hibernating herptiles translocated to a designated safe location.

CONTENTS

5. POPULATION AND HUMAN HEALTH

INTRODUCTION

5.1 Human Beings are a very significant element of the "environment" and any potential impact from a development proposal on the status of human health or on the socio-economic status of the population must be comprehensively addressed. The principal concern in this respect is that human beings experience no significant diminution in any aspect or aspects of "quality of life" as a consequence of the proposed extensions to the existing quarry.

5.2 Potential impacts on people that may arise from the proposed development may include, air and noise, traffic and visual impact and these matters are addressed separately in the later chapters of this EIAR.

5.3 The impact of the proposed development on Population and Human health will be assessed under the following heading in accordance with the requirements the 2014 EIA Directive. They include: -

- Population
- Economic Activity / Employment
- Settlement Patterns
- Land Use
- Social Patterns
- Human Health

5.4 Although referred to in this section Human Health is largely dealt with under the other headings of this EIAR including Air, Noise, Water, Material Assets etc.

METHODOLOGY

5.5 This assessment has been carried out by way of a desk base information sources were consulted: -

- Population and employment reports published
- OSI aerial photographs and Maps

- Previously published reports including a previous EIS for a bitumen plant within the existing quarry site and a previous application in 2018 for the same development.
- www.epa.ie
- www.tii.ie
- Planning application records available on www.roscommoncoco.ie

5.6 Following from the desk based study it was possible to consider the spatial location of population in the area and the potential sensitivity of the population and the likely significant impacts of the proposed development on those receptors.

RECEIVING ENVIRONMENT

Study Area

5.7 The proposed development is located in the townlands of Cuilreevagh and Largan, Elphin, Castlerea, Co Roscommon, c5km north of Strokestown and c6.5km southeast of the village of Elphin. The area is a relatively sparsely populated rural area located in the north of county Roscommon.

5.8 Sensitive receptors identified by the EPA Guidelines (2002) and EPA Advice Notes (2003) and also in the updated versions of those documents from 2017[1] include

- neighbouring landowners,
- homes,
- schools and rehabilitation workshops,
- hospitals,
- hotels and
- holiday accommodation etc.

[1] Guidance on the Preparation of the Environmental Impact Assessment Report (2014/52/EU)

Guidelines on the Information to be Contained in Environmental Impact Assessment F

Population

5.9 The Central Statistics Office (CSO) is the Government agency responsible for the collection and publication of most Irish official statistics. The CSO disseminates the results of its statistical inquiries in a variety of ways. In this assessment the following CSO based releases and publications were consulted to get both a historic and an up to date picture of the population of the Electoral Districts (ED's) in which the quarry is situated and the two small areas identified in Figure 5.1. The following data has been assessed: -

– Small Area Population Statistics 2002, 2006. 2011 and 2016 (SAPS).

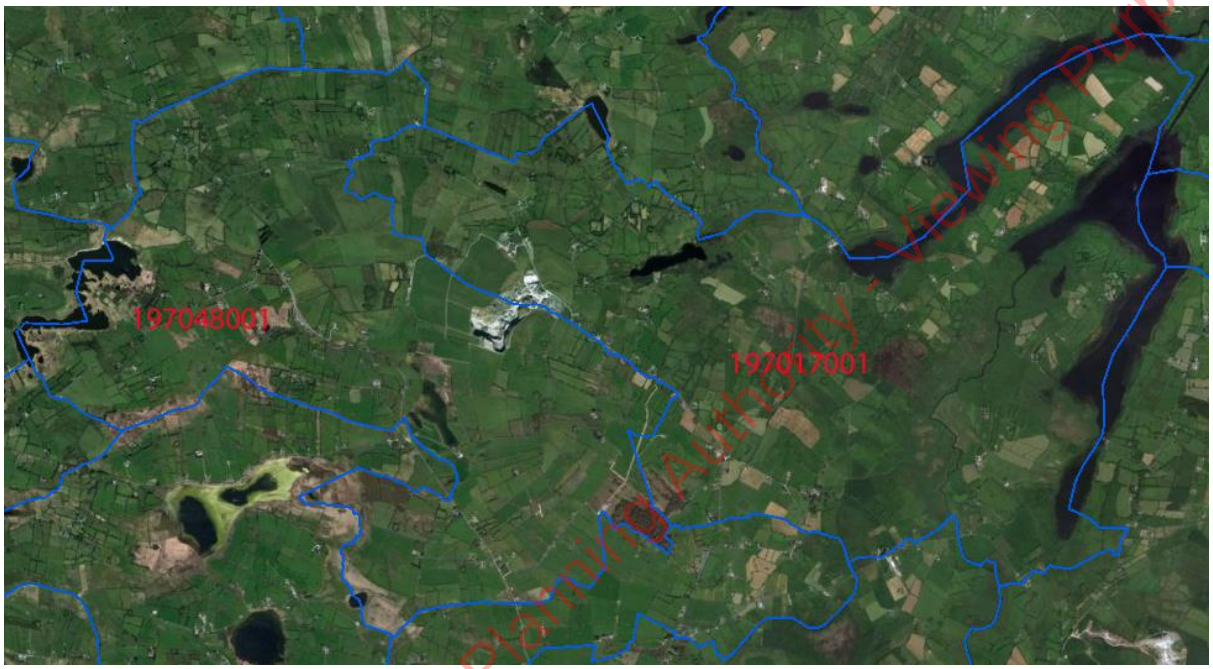

Figure 5.1 Small Areas within which the quarry sits www.cso.ie

5.10 It is noted that the Small Areas shown in Figure 5.1 correspond to the Electoral Divisions of the same area and Table 5.1 gives the total population for the two Small Areas/Electoral Divisions that the quarry is located within for the 4 census dates.

Table 5.1 Population in SAPS areas where quarry is located

Small Area / Electoral Division	Population 2002	Population 2006	Population 2011	Population 2016
197017001 / Cregga	161	172	164	155
197048001 Ballygarden	180	207	220	194
TOTAL	341	379	384	

5.11 Over the 14 year period the population has only increased b 2002-2006 it increased by 11.14%, while the growth was

where it increase by 5 people or 1.32%. Reflecting the outward flow of people from rural Ireland during the recession years the combined population of the two small areas fell by 9.12% between 2011 and 2016, while at the same time, the population of County Roscommon grew by a modest 0.75% from 64,065 to 64,544.

5.12 A review of the 2011 and 2016 SAPS indicates that there were 16 fewer people under the age of 18 living in the area in 2016 than in 2011 while there were 12 fewer people in the age groups from 20-34. This reflected the outward migration of younger adults during the recession and the consequent slower birth rate and together accounted for 80% of the decrease in population from 2011-2016.

Economic Activity / Employment

5.13 The existing quarry currently has 68 full time workers as of July 2020, reduction of 2 from the 70 that were employed in July 2018 and this number is expected to remain constant if the proposed development is permitted. Indirect employment is also generated in terms of maintenance fitters, fuel delivery personnel and general suppliers of goods and services to the quarry. In time, depending on the nature of work contacts received, there may be scope for the direct employment of additional personnel.

5.14 The principal economic activity in the surrounding area of the site is agriculture apart from the quarry. This comprises mixed grazing and cattle. A piggery is located c 490m to the north of the quarry. In addition, there are a range of small scale industrial and commercial and tourist developments in the environs of the nearby settlements of Strokestown and Elphin.

5.15 Section 3.0 Economic Development of the County Development Plan which was published in 2014 notes that: -

> *The Irish economy faces severe economic and financial conditions which have prevailed since a sudden and unprecedented downturn in economic activity in 2008, ultimately caused by a global financial and banking crisis. This global crisis stemmed the availability of credit for development and this, in conjunction with a saturation of the housing market and a longstanding trend of house price inflation up to 2008, sparked a severe correction in Ireland's property market and a sharp decline in the construction sector.*
>
> *In County Roscommon the impact of these economic conditions has been severe. The trend of economic growth and employment creation of the county from 20,514 in 1996 to 25,829 in . Roscommon Leader Partnership (RLP) have reported county trebled in the 3 years from 1,271 in . 2010.Unemployment rates have continued to rise the*

than observed in this period. The labour force of the county was 24,390 in 2011 with an unemployment rate of 19.4% and CSO publications on the 2011 census now identify the county as an unemployment blackspot.

Of the 24,390 labour force, CSO statistics show a significant decline in those employed in the construction sector in the period between 2006 when over 14% were employed in construction, and 2011 when 5.5% were employed in this sector.

Given the diverse spatial, demographic and socio-economic circumstances which prevail throughout Roscommon the Councils approach to economic development must be tailored to reflect prevailing trends in different areas of the county. …the north of the county (is) often characterised by high reliance on low-output agriculture, fewer employment opportunities combined with social isolation and lower service provision.

5.16 By census 2016[2] the unemployment rate had fallen to 13.0% from 19.4% in the 2011 census which was 3,019 persons in April 2016 and 4,048 in April 2011[3]. By April 2018, the number of people unemployed in Co Roscommon had fallen to 2,403 which was a drop of more than 40% since Census 2011 and more than 20% since Census 2016. By February 2020 the unemployment rate had fallen further to 2,028 which was a decline of 33% since 2016 and a 50% drop since 2011. The number had risen slightly to 2,182 in June 2020 post Covid-19.

5.17 The 2011 and 2016 Census of Population provide a detailed breakdown of the industries in which persons from the Cregga and Ballygarden ED's (Small Areas) work. Table 5.2 provides details of the results.

Table 5.2 Persons at work by industry in Cregga and Ballygarden ED's in Census 2011 and 2016

Persons at work by industry	Cregga and Ballygarden ED's Census 2011	Cregga and Ballygarden ED's Census 2016
Industry	Number	Number
Agriculture, forestry and fishing	18	16
Building and construction	9	4
Manufacturing industries	18	25
Commerce and trade	24	19
Transport and communications	5	5
Public administration	17	12
Professional services	36	[illegible]
Other	15	
Total	142	

[2] http://www.cso.ie/px/pxeirestat/Statire/SelectVarVal/saveselections.asp
[3] http://www.cso.ie/px/pxeirestat/Statire/SelectVarVal/saveselections.asp

5.18 The percentage of the total population of the two ED's/small areas who were working in April 2011 stood at 36.99% while that increased to 40.68% in 2016 as a result of the reduction in the local population between 2011 and 2016. The number of persons working in 'Building and Construction' fell from 9 to 4 in that period which would reflect the continued weakness in the building industry in the west of Ireland in 2016. This number may have increased since 2016 in tandem with the drop in the unemployment rate in the county by over 837 people in the 2 years and 2 months to June 2020.

Settlement Patterns

5.19 The previous sections have addressed the population and employment statistics for the area. This section will address the local settlement pattern, which consists entirely of one off-housing. The Census Small Area Population Statistics indicated that all 139 occupied houses on Census night 2011 in the two ED's/Small Areas that the quarry lies within, were one off bungalows/houses. There are no housing estates in the area.

5.20 In census 2016 the number of households in the two ED's decreased by 4 to 135 with all but one being bungalows/houses. There is no formal pattern of development in the area and houses are located along the local roadsides as is typical of rural housing. The applicant owns a significant area of land to the north and northwest of the quarry as denoted by the blue line in Figure 5.2. This area is devoid of housing and will continue to be so in the future. (This drawing forms part of the planning package and is available at A1). Figure 5.2 also shows other houses in the area that are outside of the ownership of the applicant.

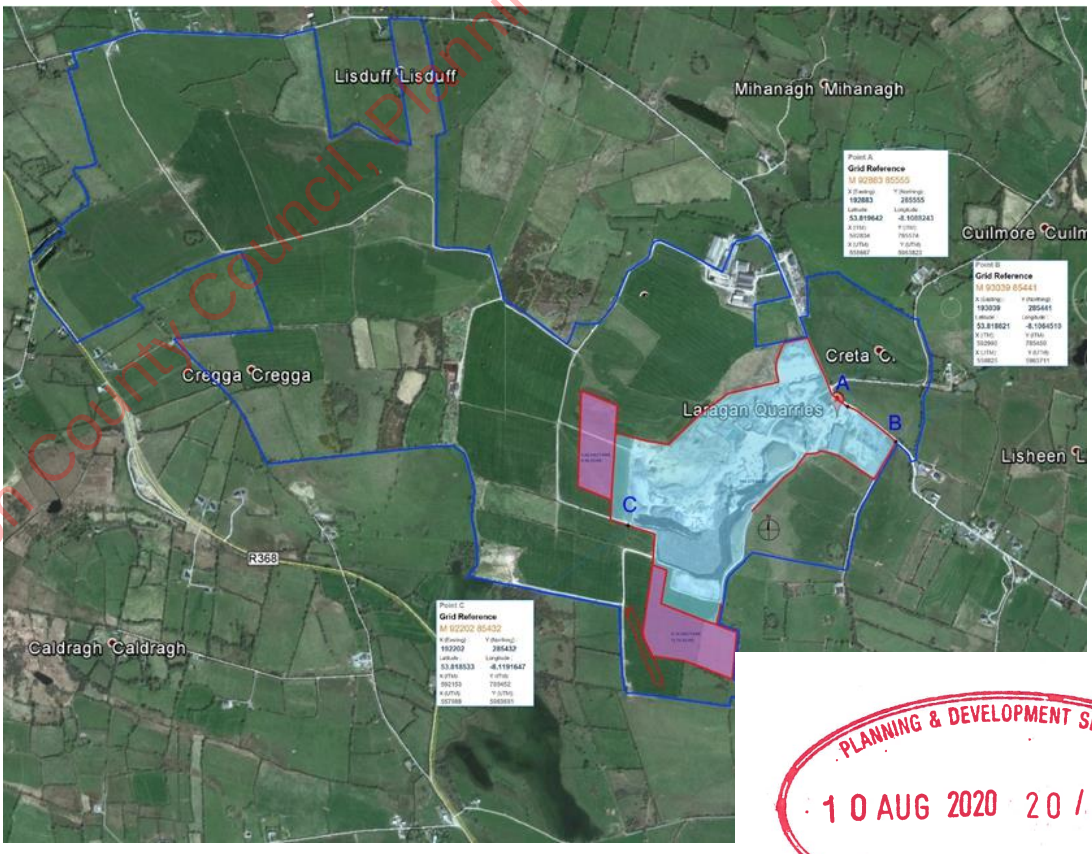

Figure 5.2 Quarry landholding and houses close to quarry si

Table 5.3: Dwellings Occupancy/Vacancy rate on Census Night - April 2016

Area	Total Housing stock	Occupied	Vacant
Roscommon	31,285	24,737 (79.07%)	6,548 (20.93%)
Cregga and Ballygarden ED's / Small Areas	188	136 (72.34%)	52 (27.66%)

5.21 The housing stock of Roscommon fell from 31,585 in 2011 to 31,285 in 2016, a reduction of 300 houses. The housing stock of the two ED's represents just 0.60% of the total housing stock of the county, while the Electoral Districts/Small Areas contains 0.54% of the population of the County, indicating an occupancy level of 1.86 persons per occupied unit which is low and indicates a high percentage of people living alone in the area.

5.22 The vacancy rate in the two ED's / Small Areas in 2016 was 59 out of 188 units or 31.38% vacancy whereas the vacancy rate in the county is 20.97%.

Land Use

5.23 With the exception of lands used for private residential use, all land in the immediate area (within 550m of the quarry) is classified as 'Agricultural Areas – Pastures', as per the Corine[4] land survey carried out by the EPA on behalf of the European Environmental Agency in 2012. The majority of the land cover in the area is also 'Agricultural Areas – Pastures' (Code 231) and extends to 682852ha (yellow on Figure 5.3), with smaller pockets of different types of land-cover located throughout the area.

5.24 c550m to the southwest of the quarry there is an area classified as 'Forest and semi-natural areas, with sub-descriptions of 'Scrub and/or herbaceous vegetation associations' and 'Natural grassland'. The area is coloured green on Figure 5.3 below and covers an area of 36.29ha. An area described as 'Agricultural Area (Code 241 – light brown) is located c500m to the east of the entrance to the quarry and has sub-descriptions of 'Heterogeneous agricultural areas' and 'Land principally occupied by agriculture with significant areas of natural vegetation'.

[4] http://www.epa.ie/downloads/data/corinedata/CLC2006%20Final%20Repo

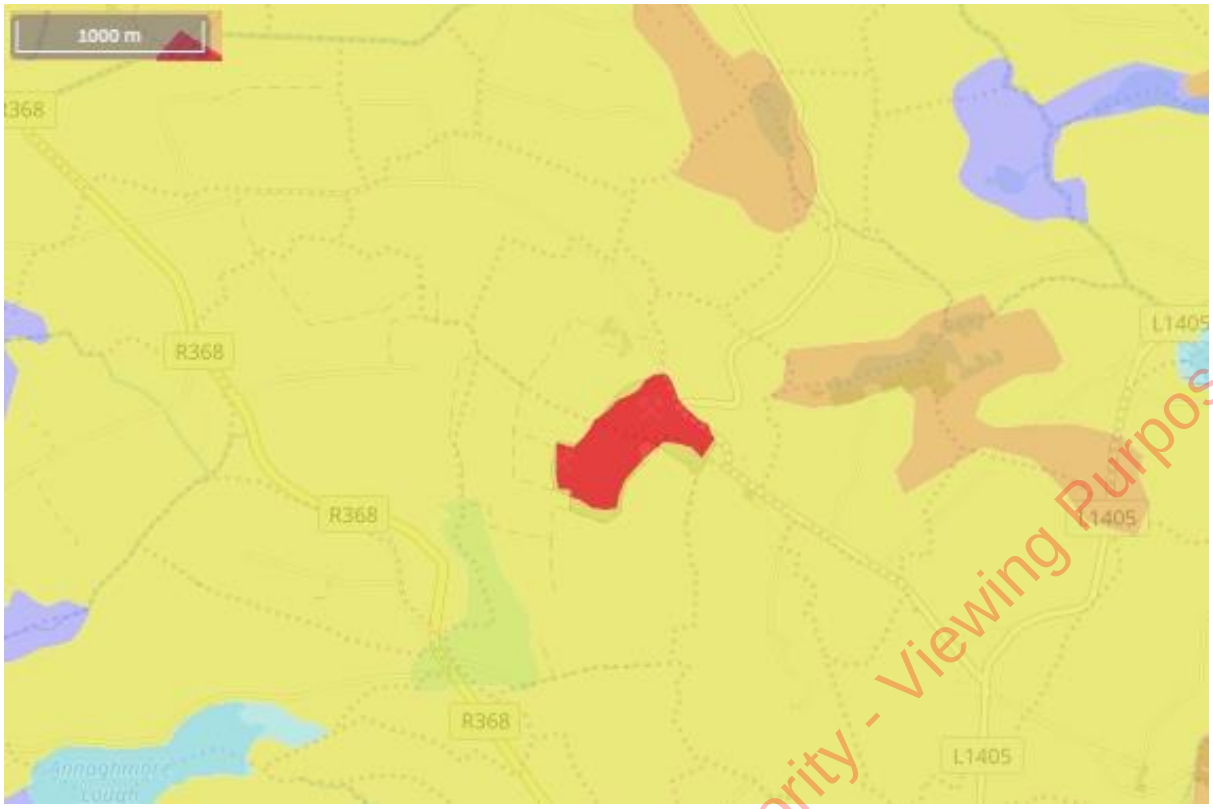

Figure 5.3 Extract from Corine Land Use Map 2012 www.epa.ie

5.25 The quarry area is describes as Artificial Surfaces (Code 131) 'Mineral extraction sites' (red).

5.26 The nature of land cover and vegetation are discussed in more detail in Chapter 4 – Biodiversity, and Chapter 6 – Water and Chapter 7 – Land and Soils.

N5 Ballaghaderreen Bypass to Longford

5.27 Transport Infrastructure Ireland propose to construct a new road which is described as: -

> *35km of Type 1 single carriageway from the eastern end of the existing Ballaghaderreen Bypass to the western end of the Scramoge Road Improvement Scheme in Co. Roscommon. The fully off-line scheme will bypass the towns/villages of Frenchpark, Bellanagare, Tulsk and Strokestown.*

5.28 An EIAR was published in December 2017 in respect of the preferred route and an application was submitted to An Bord Pleanala on 20th December 2017. The Board approved the project I January 2019 and preliminary works have commenced on the project including archaeological works, ground investigation, topographical surveys, fencin service diversion works, while Roscommon County Council is p and it is expected as of July 2020 that the main construction be issued to the candidates meeting the minimum pre-qual 2020.

5.29 The alignment indicates that the route will run c48m to the southwest of the proposed southern extension which is hatched in red in Figure 5.4.

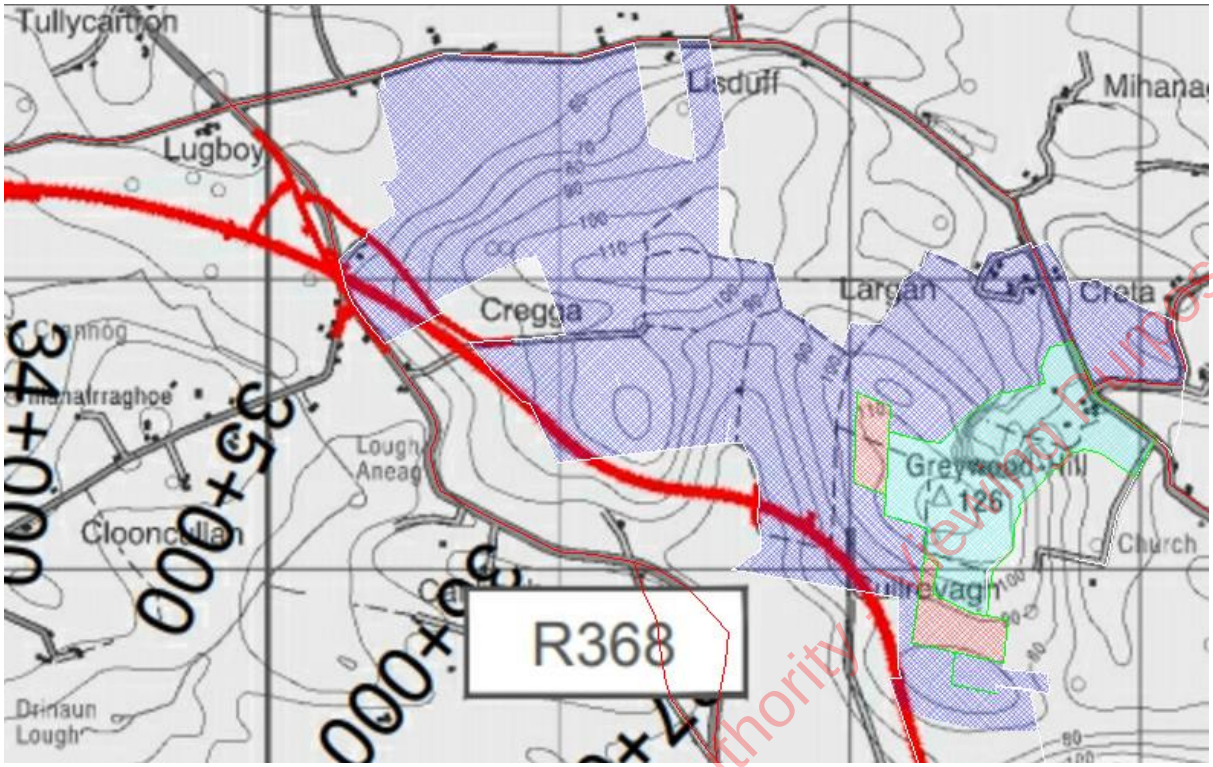

Figure 5.4[5] Proposed N5 Route alignment passing close to the propose quarry extensions

Planning Permissions

5.30 In the 2008 EIS for the Bitumen Plant with the quarry 10 occupied houses were recorded with in 1km of the quarry while Table 5.4 below indicates that permission has been granted for one house within this area since 2000 so there have been no new houses built since 2008. The nearest house remains c450 to the south east of the quarry and this separation distance will be increased due to the location of the proposed quarry extensions.

5.31 Table 5.4 provides a review of all planning applications within 1km of the centre of the quarry while Table 5.5 contains all planning applications within 2km of the centre of the quarry. These applications are available on the online planning register at www.roscommoncoco.ie and the earliest application is from 2000, 20 years ago.

5.32 Each application has a reference which can be reference to the same number on Figure 5.5 below while it also contains the planning reference r development, the applicants name and the decision issued l None of the applications were appealed to An Bord Pleanala.

[5] http://www.roscommoncoco.ie/en/Services/Roads/Publications-and-I Scramoge-Road-Project/Environmental-Impact-Assessment-Report/Volume-1 Technical-Summary.pdf

Table 5.4 Planning History within 1km of centre of existing Quarry

	Planning Ref	Application Type	Description of Development	Applicant	Decision
1	07/1937	Permission	To construct a loose shed with calving pens onto an existing slatted unit	Colm Dowd	Granted (2007)
	16/16	Permission	To construct New Agricultural Building to contain roofed manure pit and loose animal housing together with all associated site works	Colm Dowd	Granted (2016)
2	14/31 (2004)	Permission	To construct extensions to our dwellinghouse, all as per drawing documentation submitted together all ancillary site works and services	David & Sinead Hickey	Refusal (2014)
	14/305	Permission	To construct extensions to our dwellinghouse and install proprietary effluent treatment system and soil polishing filter, all as per drawing documentation submitted together with all ancillary site works and services	David & Sinead Hickey	Granted (2014)
3	07/1115	Permission	To erect a single storey livestock shed incorporating slatted tank and associated external concrete aprons and storm water drainage, site services and development works	Dominic Fallon	Granted (2007)
4	03/1141	Retention	To retain car park and complete car park entrance	Kiltrusnan National School	Granted (2003)
	06/1202	Permission	Alter and extend existing school building	Kiltrusnan National School	Granted (2006)
5	02/1247	Permission	Construct a two storey house with garage, septic tank, percolation area and associated works, also new access on to the public road	Garry Fallon & Yvonne Traynor	Granted (2003)

Table 5.5 Planning History between 1km and 2km of centre of quarry

	Planning Ref	Application Type	Description of Development	Applicant	Decision
6	00/368	Outline	Dwellinghouse and Septic tank	Kevin Brennan	Granted (2000)
	01/1709	Approval	Dwellinghouse and Septic tank	Teresa Doyle	Granted
7	06/1809	Permission	4 bedroom dormer dwelling house, a including installation of sewera treatment plant with percolation area		
	08/807	Permission	Demolish existing dwelling house and		

			construct a 4 bedroom dormer dwelling house, and including installation of sewerage treatment plant with percolation area		(2008)
8	04/1818	Retention	Septic Tank and Percolation Area	Rosaleen Daly	Granted (2001)
9	01/214	Permission	Dwelling, septic tank and percolation area	Patrick J Murray	Granted (2001)
10	15/248	Permission	For development at this site: North East Roscommon Water Treatment Plant. The development will consist of: (1) Installation of 3 No. temporary shipping containers, two of which will contain pressure filtration systems and one of which will contain an ultraviolet (UV) disinfection system. (2) Installation of 3 No. temporary 36m3 above ground precast concrete tanks to accommodate backwash water and sludge from the filtration process. (3) All temporary systems to be installed on the north eastern gable of the existing control building, obscured from view from the access road, and screened by mature trees on the eastern and western boundaries, as well as by the natural topography of the land to the north	Irish Water	Granted (2015)
11	00/53	Permission	2 storey dwelling, septic tank and new entrance	Kieran and Marian Clarke	Granted (2000)
12	07/300	Permission	New loose cattle shed and farmyard manure pit, including concrete apron	Gerard McGauran	Granted (2007)
13	06/1910	Permission	Construct a four bay single sided slatted house with creep together	Des McHugh	Granted (2007)
14	07/1406	Permission	Extension to the front of dwelling	Des McHugh	Granted (2007)
15	04/736	Outline	Construct two dwelling houses each with septic tank and percolation area	Peter Beatty	Granted (2004)
16	03/1674	Permission	septic tank and percolation area		
17	00/802	Permission	Demolish existing dwelling house a erect a new two storey dwelli complete with Demolish existi dwelling house and erect a new t		

			storey dwelling, complete		
	10/80	Permission	Extension to existing dwelling house incorporating a garage	Richard and Fiona Cahill	Granted (2010)
18	02/72	Outline	Dwelling, septic tank and percolation area	John and Rita Cahill	Granted (2002)
	03/257	Permission	Dwelling, septic tank and percolation area	John and Rita Cahill	Granted (2003)
19	02/995	Permission	Dwelling, septic tank and percolation area	John and Rita Cahill	Granted (2002)
20	05/762	Permission	Erect a dwellinghouse, detached double garage, provide effluent treatment system, connection to existing services, access onto the public road	Padraig Mc Dermott	Granted (2005)
21	04/1582	Outline	Dormer bungalow, septic tank, percolation area	Alexis and Angela Casey	Granted (2005)
22	08/133	Retention	(i) Existing single storey extensions; (ii) Existing garage & fuel storage shed, and Planning Permission for construction of new single storey extension to side of existing dwelling	Valerie Byrne	Granted (2008)
23	00/918	Permission	Septic Tank	Joseph Neary	Refused (2010)
24	07/1278	Permission	construct a new 4 bay single sided slatted cattle shed, as an extension to an existing slatted shed	Peter Joseph Diffley	Granted (2007)
25	06/626	Permission	two storey type dwellinghouse together with septic tank, percolation area	Thomas Beirne	Withdraw (2006)
26	06/309	Permission	demolishing of existing building and for the construction of a dormer type dwelling house together with septic tank, percolation area	Thomas Beirne	Granted (2007)
27	00/919	Permission	Septic Tank	Joseph Neary	Refused (2010)
28	00/1560	Outline	Erect a dwelling house and construct a septic tank	Paula McCormack	Grant (2001)
	05/839	Approval	Outline planning permission PD/00/1560 for demolition of existing derelict buildings, construction of tv storey dormer style dwellinghouse, ne road entrance, domestic efflue treatment system and polishing filter	Pat & Paul Quinn	Grant (2006)
29	19/10	Permission	To construct a 6 bay open slatt		

	cubicle shed with underground slurry storage tank along with all associated site works	01/03/19

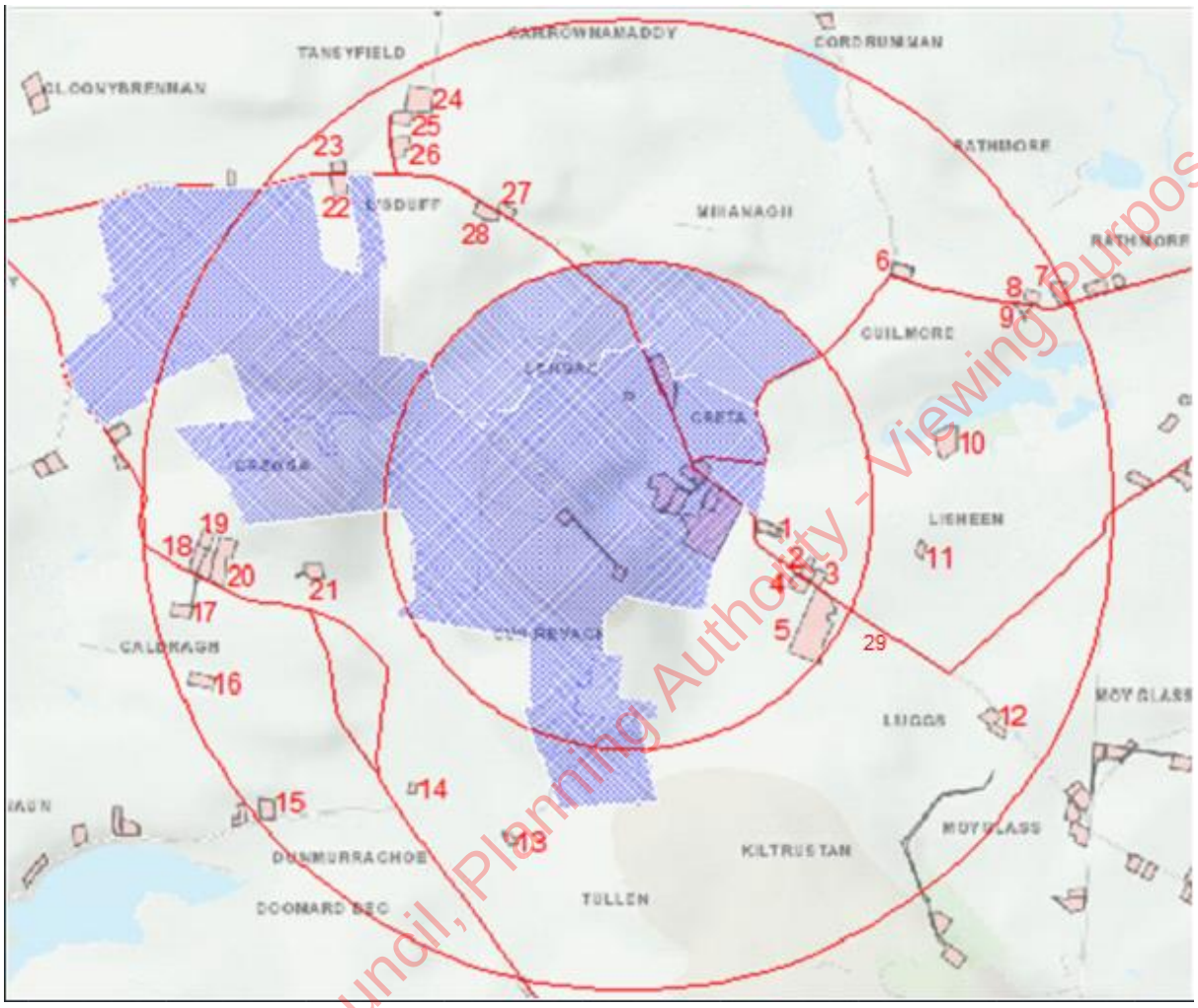

Figure 5.5 Planning sites within 1 and 2km of the quarry from www.roscommoncoco.ie

Social Patterns

5.33 Kiltrustan National School (Scoil Naisiunta Cill Trostain) is located c575m east of the existing quarry while Kiltrustan Graveyard is located immediately to the north of the school grounds. The school has a roll of 5 boys and 10 girls (15 in total) for the 2019-2020 academic year[6], which is a drop from 19 students in the 2017/18 academic year. The Kiltrustan Catholic Church is located c1km south of the Graveyard in the direction of Strokestown.

5.34 Strokestown, which is the largest settlement in the area is lc quarry and includes shops, banking facilities, cafes, pubs

[6] https://www.schooldays.ie/school/s-n-cill-trostain-rollnumber-17353E

restaurants, petrol station and other services that serve the needs of the rural hinterland including the area around the quarry. The Irish National Famine Museum is also located in the town.

5.35 The Local Link bus service connects Elphin and Strokestown to Roscommon town via Tulsk seven days per week and a key feature of this integrated service is a link to various visitor attractions namely King House, Lough Key Forest Park, Cruachan Ai at Tulsk, Strokestown Park House and the Tourist Information Office and Museum at Roscommon. It also permits person taking the train from Dublin or Westport to access the bus service at Roscommon while the service also connects to the Primary Care centre and hospital in Roscommon town.

5.36 Bus Eireann operates an Expressway service (np 22) from Ballina to Dublin Airport via Strokestown. The service operates five times a day with an extra service on Sundays. The Boyle to Roscommon route also passes through both Elphin and Strokestown, which facilitates connections to other towns throughout the region and the country

Human Health/ Health and Safety

5.37 Human health and its impact are largely dealt with in the other section of this EIAR and reference should be made to the relevant chapters.

5.38 The Roscommon County Hospital is located 26km south of the quarry in Roscommon Town. It provides a range of services but does not contain an Accident and Emergency Department and patients would be required to travel to Galway University Hospital to avail of that service. The Strokestown Medical Practice is located in the town c5km to the south of the quarry

5.39 The Strokestown Golf club is located c1km south of the town while the Strokestown GAA club is also located in the town.

5.40 An earth berm has been constructed along a number of the site boundaries and acts as both a visual and acoustic barrier for the quarry from passing traffic while also providing a barrier to easy access to the quarry site.

5.41 It is proposed to construct an earth berm between the proposed southern extension and the new N5 alignment to protect the road from flyrock, while the berm will also act as an acoustic and visual barrier between the road and the quarry.

PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

5.42 This section provides a description of the likely significant extensions on the following: -

Population

5.42 The proposed development, which involves the winning of aggregates, does not contain any element of housing or services development.

5.43 The population of the two ED's / Small Areas fell by 9.12% between 2011 and 2016 while at the same time the countywide population grew by 0.75% from 64,065 to 64,544. This pattern of falling rural population is reflective of a trend in rural Ireland due to a lack of adequate population as younger people move to larger towns and cities within Ireland and abroad and as a result the birth rates also fell.

5.44 If demand for aggregates increases to where it was in the mid 2000's it is likely that the extensions to the existing quarry will help sustain the existing employment level at 68 people as of July 2020 and would have a long term positive impact on population levels in the vicinity of the quarry.

Economic Activity/Employment

5.45 The quarry currently employs 68 staff while indirect employment is also generated in terms of maintenance fitters, fuel delivery personnel and general suppliers of goods services and professional services such as accountants, and specialists in dust, noise and water monitoring. Through the proposed extension to the quarry these jobs will continue to exist allowing people to continue living and working in the area and may enable the number of local resident working in the building and construction sectors in 2016 to return to and surpass the numbers thus employed as per census 2011.

5.46 In time, depending on the nature of work contracts won such as the proposed N5 (Ballaghderreen to Scramoge), there may be scope for the direct employment of additional personnel within the quarry. The income derived from the 68 direct jobs which will be maintained as a result of the proposed extensions will be circulated in the Strokestown and Elphin communities and will continue to be an important part of the local economy. The impact of the proposed development will be neutral to moderately beneficial if additional employment is generated.

Settlement Patterns

5.47 From a review of the existing dispersed settlement pattern and the planning history of the area since 2000, the existing quarry operations have had no discernible impact on the desire of people to build new home or to extend and improve ex (within 2km of the quarry).

5.48 The applicant owns a significant area of land to the north developed in the future while the proposed N5 is to be built

extension to the quarry and the nearest houses to the south and west of the proposed extensions and will limit the potential for future development in proximity to the existing and extended quarry.

5.49 The demand for additional housing in the area is low and the last house applied for and granted within 2km of the site was in 2008. It is considered that the proposed development will have a neutral impact on the local settlement pattern.

Land Use

5.50 If permission is granted for the proposed extensions to the existing quarry, that part of the site will be changed from 'Agricultural Areas – Pastures', to a working quarry. The total area of Agricultural Areas – Pastures' within which the proposed extension lie and is calculated to cover an area of 682852ha while the proposed extension is to be 8.60ha or 0.00126% or approximately one eight hundredth of the total area of this land type in the area. The impact on the existing land use will be permanent and severe but the overall impact on Agricultural Areas – Pastures' will be slight.

5.51 Provided that appropriate mitigation measures are carried out as set out in other chapters of this EIAR, the operation of the quarry within the applicants land ownership will not have a negative impact on land uses outside of the site.

Social Patterns

5.52 The nearest part of the existing quarry operation is c525m from Kiltrustan National School (Scoil Naisiunta Cill Trostain), while the nearest face of the quarry to the school is c650m. The nearest part of the proposed southern extension will be c670m from the school. If the proposed extension is permitted it with will potentially provide local employment and as a result the local school going population may increase, enabling the school to remain open and would thus have a positive impact on the school. The numbers of students have fallen from 19 in 2017-18 to 15 in 2019/20 academic year.

Human Health

5.53 Impacts on Human Health are addressed in other chapters of this EIAR under the headings of Noise and Vibration, Air and Climate, Water, Material Assets and The landscape, Visual Impact and Restoration.

5.54 In summary, the potential impacts on human health can be de

- During the initial operation stage of soil excavatic generation of dust, particularly during periods of dry vehicles to and from the working face;

- noise generated by the operation of machinery and the movement between the working quarry faces and the processing plant;
- leakage or spillage oil and other fuels directly to soil or to surface water and ultimately to groundwater.

MITIGATION MEASURES

5.55 This section will address mitigation measures in relation to Population, Employment, Health and Safety. Other mitigation measures will be addressed in later chapters in respect of other issues that may affect Human Health.

Population

5.56 A small number of residential homes are located within 1km of the existing quarry site, most of which are also located in close proximity to the proposed N5 National Primary Road that is to be constructed to the southwest of the quarry or the piggery to the north. It is not considered that any mitigation measures are necessary in respect of population over and above those set out in the other chapters relating to landscape, air, noise, material assets etc.

5.57 Site operation will be during normal day working hours. The existing landscaped berms will be enhanced by new berms thereby reducing visual, air, noise and vibration impacts from the quarry.

Employment

5.58 As an employment source in the area, the continued operation of the quarry will help sustain jobs in an area where the unemployment level is above the national average. Therefore, no mitigation measures are considered necessary.

Health and Safety

5.59 The site boundaries of the proposed extensions are not fenced at present. In the event that planning permission is granted for the continuation and extension of the quarry, fencing should be erected along the new site boundaries, to prevent unauthorised access to the quarry. It is also proposed that excavated soil will be used to create temporary berms around the perimeter of the quarry to reduce noise and visual impact. This soil will later be used as part of the restoration plan (see Chapter 12).

5.60 Additional warning signs should also be erected on the perim
nature of the work carried out in the quarry and the associat
as a result of access by unauthorised personnel.

5.61 If permission is granted, it is recommended that an Environmental Management System (EMS) be put in place that will address all of the following areas, many of which are addressed in more detail in the remainder of this EIAR: -

- Public Safety and Security
- Visual Amenity
- Ecological Management
- Noise Emissions
- Emissions to Air
- Fuel
- Water Discharge
- Management of Waste
- Transport
- Restoration and After use

CUMULATIVE IMPACTS

5.62 As the quarry is just an extension of the existing quarry operations and while the proposed development will result in an increase in the footprint of the quarry; there will not be an increase in the extraction levels as it is proposed to keep the same level of output as current and historic levels. Therefore, the cumulative impacts will be negligible.

5.63 There is potential for cumulative impacts to occur as a result of the construction of the proposed N5 upgrade however, the quarry may be used to provide stone for the road building which would have a positive impact locally as it would reduce the distance that stone would have to be hauled for the construction of the road while the impact would also be limited to a short period of time during construction of the road.

RESIDUAL IMPACTS

5.64 Details of specific residual impacts are outlined in the appropriate sections of the other chapters of this EIAR. In terms of population the impact of quarry are considered to be positive.

UNPLANNED EVENTS

5.65 The EPA guidelines describe unplanned events, such as accidents, to include "spill from traffic accident's, floods or land-slides affecting the site, fire, collapse or equipment failure on the site". The 2014 EIA directive refers to "major accidents, and/or natural disasters (such as flooding, sea level rise, or earthquakes".

5.66 In the case of Hanly Quarries, the vulnerability of the proposed development to accidents, unplanned events or natural disasters is considered to be limited owing to the long established record of the existing quarry, the nature the rock, the techniques and procedures followed in extracting the rock, and the rural location of the proposed works.

5.67 Unplanned events in relation to the proposed development could potentially relate to:

- instability following the extraction of materials from the working face;
- spill from vehicles moving within the site;
- flooding.

5.68 Instability of the quarry faces following the extraction of materials is unlikely based on the historic development of the existing quarry and any incidents would not have any significant impacts on employment or population, particularly beyond the site. The restoration of the faces will be carried out to provide stability and regrowth on the slopes

5.69 Chapter 9 Material Assets indicates that the local road network would not be significantly impacted by traffic generated by the development due to the capacity of the road network and the risk of an accident resulting in a spillage being considered to be no greater in relation to this development than for any other form of development that relies on the transportation of goods and materials by HGVs. The potential for significant impacts on employment, human health in the wider population as a result of a road spillage is likely to be low and any such effects would be temporary.

5.70 The risk of flooding has been assessed to be low in Chapter 6 - Water.

MONITORING

5.71 No proposed monitoring relating to the population aspects of the study area are deemed necessary. All other monitoring to be carried out from oth
potential concerns that may arise for population and human h

DO NOTHING SCENARIO

5.72 The existing quarry will continue to operate within its existing footprint, until that section is exhausted or until a grant of permission is issued for further extraction.

REINSTATEMENT

5.73 No reinstatement measures relating to the population or human health aspects of the study area are deemed necessary.

STATEMENT OF AUTHORTIY

5.74 This chapter of the EIAR has been prepared by Joe Bonner BA. MRUP, Dip Env Eng. Dip Proj Mgt. Joe has over 20 years postgraduate experience as both a Planning Officer in Local Authorities and as a private planning consultant. Joe has written, co-ordinated and edited numerous project EIS and EIAR for major commercial, industrial, retail, residential and quarry planning applications throughout the country including chapters relating to Population and Human Health.

6. WATER

6.1. The aim of this Chapter is to identify the hydrogeological and hydrological conditions of land containing a proposed quarry extension comprising two areas (the "Application Site") and the surrounding area, in order to assess the potential impacts of this quarry extension (the "Proposed Development") and to recommend mitigation measures where appropriate.

6.2. This Chapter has been prepared in accordance with 'Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Statements (Draft)'[1] document.

6.3. This chapter of the Environmental impact Assessment Report (EIAR) is supported by the following:

- Appendix 6A Figures:
  - Figure 6-1: Surface Water Management Plan
  - Figure 6-2: Site Location Plan;
  - Figure 6-3: Topographical Survey;
  - Figure 6-4: Geology;
  - Figure 6-5: Subsoils;
  - Figure 6-6: River Network;
  - Figure 6-7: Preliminary Flood Risk Assessment Map;
  - Figure 6-8: Office of Public Works (OPW) National Flood Hazard Map;
  - Figure 6-9: Aquifer Classification;
  - Figure 6-10: Groundwater Vulnerability; and
  - Figure 6-11: Groundwater Wells.
  - Figure 6-12: Site Section
- Appendix 6B: Photo Appendix;
- Appendix 6C: Existing Discharge Licence

[1] Environmental Protection Agency (2017), Guidelines on the Information to be Assessment Reports, Found at http://www.epa.ie/pubs/advice/ea/EPA%20EIAR%20G

- Appendix 6D: Borehole Logs

Project Description

6.4. The Proposed Development at Largan and Cuilrevagh, Elphin, County Roscommon is for an extension to the existing quarry site. The extension consists of two separately defined areas; one to the west of the existing quarry, and one to the south. The area to the west is 3.46 hectares in size and the existing ground levels vary from 116.11m AOD to 124.59m AOD. The area to the south is 5.73 hectares (5.14 hectare for the quarry extension and 0.59 hectare for the bund) in size and the existing ground levels vary from 100.14m AOD to 114.98m AOD.

6.5. For the purposes of this EIAR Chapter, the west area will be known as 'Area 1' whilst the south will be known as 'Area 2'. The site layout of the Proposed Development can be found in **Figure 6-2: Appendix 6-A**. Both areas currently consist of agricultural fields which are located on the boundary of the existing quarry.

6.6. For a full description of the Proposed Development and the various elements, please see **Chapter 3: Description of the Development** of this EIAR.

Site Description and Receiving environment

6.7. The Application Site is located in the rural townlands of Cuilrevagh and Largan in Elphin, Castlerea, Co Roscommon; c4km north of Strokestown and c.5.7km southeast of the village of Elphin. Land use within the surrounding area generally consists of agriculture, with some residences and farmsteads evident along local roads. Grange Lough is found circa 700m to the east.

6.8. The eastern boundary of the existing quarry site fronts onto the local L1410 public road from which the quarry is accessed. The R368 Elphin to Strokestown regional road is found circa 770m to the west of the quarry and is accessed off the L1410 to both the north and south from the quarry site. The existing quarry is irregular in shape and extends over an area of c.34ha in a southwestern direction from the public road. In addition to the extraction and ancillary operations associated with quarrying, there is a bitumen plant, block making and manufacture of other concrete products facility within the quarry grounds, while offices and other structures are located in close proximity to the public road, which reduce visibility into the quarry.

6.9. The new N5 Road is to be constructed close to the southwest boundary of Area 2. The boundary of the extended quarry will be approx. 93m fror
and approx. 48m from the proposed land Compulsory Purch

6.10. Photographs of the proposed extension as well as the exis
Appendix 6-B.

Statement of Authority

6.11. This EIAR Chapter has been produced by Michael McGhee and Paul Neary of Neo Environmental. Having completed a civil engineering degree in 2012, Michael has worked on over numerous development types across the UK and Ireland whilst working towards becoming a Charted Engineer. Michael has over six years of environmental consultancy experience, mainly producing flood risk and drainage impact assessments for renewable energy projects as well as EIAR chapters for a range of large projects.

6.12. Paul Neary BA H.Dip MA MSc MIEnvSc MIAI ACIFA CEnv is dual qualified as a Chartered Environmentalist and a Licensed Archaeologist. He is a full member of the Institute of Environmental Science and has over 15 years of professional consultancy experience throughout the UK and Ireland. He has managed and produced environmental reports and chapters for large road, residential, mixed use, aggregate and energy projects in that time.

Consultation

6.13. Please refer to **Table 6-1** for all consultee responses received in relation to the land, soils and water effects of the Proposed Development.

Table 6-1: Consultees

Consultee & Date	Summary of Response	Addressed within EIAR
James Kilcoyle, Senior Executive engineer (Email 28th February 2018)	Requested geotechnical data including boreholes and the depth of the quarry cutting. He also requested details on arrangements for collecting and diverting surface water at the perimeter of the quarry.	Yes
Mary Grier, Senior Planner, (Various emails and conversations)	Requested that a cumulative assessment with the existing quarry is undertaken.	Yes

LEGISLATION, POLICY & GUIDANCE

6.14. The development has been assessed against existing European, national, regional and local policies and guidance. The assessment has been collated and considered based upon the following legislation, planning policy and guidance:

European and National Policies & Guidance

Regional & Local Policies & Guidance

6.15. A review of relevant legislation has been conducted to ensure the Proposed Development complies with the following:

- Environmental Protection Agency: Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2017)[2].
- EU Directive on the Assessment and Management of Flood Risks [2007/60/EC];
- The Water Framework Directive [2000/60/EC];
- The Groundwater Directive [2006/118/EC];
- Planning and Development Act 2000 (as amended);
- The Water Policy Regulations (S.I. No. 722 of 2003);
- Surface Waters Regulations (S.I. No. 272 of 2009);
- Groundwater Regulations (S.I. No. 9 of 2010); and
- Environmental Protection Agency Acts, 1992 to 2011.

6.16. The Environmental Protection Agency (EPA) has produced Pollution Prevention Guidelines (PPGs). The guidelines which are most relevant to the Proposed Development include:

- IPC Guidance Note – Guidance Note on Storage and Transfer of Materials for Scheduled Activities (EPA 2004) (amended 2012, 2013)[3]. This guidance note covers tanks, bunds and pipelines which store or transmit potentially polluting substances.

[2] Environmental Protection Agency (2017) *Guidelines on the Information to be Assessment Reports*. EPA: available at https://www.epa.ie/pubs/advice/ea/EPA%20EIA

3 Environmental Protection Agency, Ireland (EPA) (2004) IPC Guidance Note – Guic Materials for Scheduled Activities. Available at www.epa.ie

- National Hazardous and Waste Management Plan 2014-2014 (EPA 2014)[4]. The plan details guidance on how to prevent, reduce and collect hazardous waste.

6.17. Key guidance from other bodies that are relevant to the Development include:

- Best Practice Guide BPGCS005 – Oil Storage Guidelines[5]
- Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects[6]
- Construction and Demolition Waste Management – a handbook for Contractors and Site Managers[7]
- IEMA Environmental Impact Assessment Guide to: Delivering Quality Development[8].

6.18. UK Pollution Prevention Guidelines have also been considered in the production of this Chapter. The suite of Pollution Prevention Guidelines (or Guidance for Pollution Prevention (GPP)), published by the Scottish Environmental Protection Agency (SEPA), the Environment Agency (EA) and the Northern Ireland Environment Agency (NIEA) were withdrawn on the 17th of December 2015. However, these documents provide sound advice and can be accessed online[9]. The PPGs which are most relevant to the Proposed Development include:

- PPG1 'General Guide to the Prevention of Pollution'
- GPP2 'Above Ground Oil Storage'
- GPP 5 'Works and Maintenance in or Near Water'
- PPG6 'Working at Construction and Demolition sites'
- PPG 7 'Safe Storage – The Safe Operation of Refuelling Facilities'

6.19. These PPGs/GPPs provide guidance as to the various environmental considerations and potential mitigation and prevention measures considered within this Chapter.

4 Environmental Protection Agency, Ireland (EPA) (2014) National Hazardous Waste Management Plan 2014-2020. Available at www.epa.ie

5 Best Practice Guide BPGCS005 – Oil Storage Guidelines. Available at www.envirocentre.ie

6 Department of the Environment, Heritage and Local Government (2006) Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects. Available at www

7 FÁS and Construction Industry Federation (2002) Construction and Demolition W Contractors and Site Managers. Available at www.ncdwc.ie

8 IEMA (2016) EIA Guide to: Delivering Quality http://www.iema.net/assets/newbuild/documents/Delivering%20Quality%20Develop

9 SEPA, Guidance. Available online: https://www.sepa.org.uk/regulations/water/guida

6.20. The aim of this EIAR Chapter was to identify any significant geological, hydrogeology or hydrological features and environmental constraints within the proposed Application Site, and to identify the potential impact on the Development during the construction, operation and decommissioning phases. The assessment has been undertaken in accordance with the methodology specified in the following documents:

- Guidance on the Preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU)[10]
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (DRAFT)[11]
- Environmental Management in the Extractive Industry[12]
- EPA Advice Notes on Current Practice in the Preparation of EIA[13]; and
- National Roads Authority Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes[14].

6.21. Flood planning policy for Ireland was set out by the Department of Environment, Heritage and Local Government in 'The Planning System and Flood Risk Management Guidelines for Planning Authorities[15]' ("the FRM Guidelines") document. This EIAR Chapter has been undertaken in accordance with these documents.

[10] European Commission (2017) Guidance on the Preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU)

11 Environmental Protection Agency (2017), Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, Found at http://www.epa.ie/pubs/advice/ea/EPA%20EIAR%20Guidelines.pdf

[12] Environmental Protection Agency (2004), Environmental Management in the Extractive Industry, Found at https://www.epa.ie/pubs/advice/general/EPA_management_extractive_industry.pdf

13 EPA (2003) Advice Notes on Current Practice in the preparation of Environmental Impact Statements. Available at: http://www.epa.ie/pubs/advice/ea/guidelines/EPA_advice_on_EIS_2003.pdf

14 NRA (2009) Guidelines on procedures for assessment and treatment of geology, hy
Road Schemes. Available at: http://www.tii.ie/technical-services/environment/p
Assessment-and-Treatment-of-Geology-Hydrology-and-Hydrogeology-for-National-Rc

15 Department of Environment, Heritage and Local Government (2009) The Plannin
Available at: http://www.opw.ie/media/Planning%20System%20and%20Flood%20Risl

Assessment of Relevant Policies, Guidance & Legislation

Roscommon County Development Plan (CDP)

6.22. The Roscommon County Development Plan 2014 – 2020[16] ("the CDP") came into effect on the 12th of May 2014 and sets out the strategic planning and sustainable development of the county for the next 6 years. The Application Site lies in a rural part of the county.

6.23. Policies which are of relevance to this Hydrology, Geology and Flood Risk Assessment are detailed within **Table 1-1** below.

Table 6-2: Roscommon CDP Flood Management Policies/Objectives

Planning Policy/Objective	Assess	Comment
Policy on Surface Water		
Policy 4.38 *"Require compliance with best practice guidance for the collection, reuse, treatment and disposal of surface waters for all development. Development proposals must demonstrate adequate water conservation, water quality protection, and surface water run-off rate regulation measures to prevent the increase of flooding issues in the catchment"*	Yes	Surface water runoff addressed within report and existing quarry surface water management plan.
Policy 4.39 *"Ensure that potentially polluting and otherwise inappropriate developments are kept at an appropriate distance from watercourses, to protect them from contamination, allow for natural drainage and facilitate channel maintenance."*	No	No watercourses near to the Proposed Development
Policy 4.40 *"In all cases, require the provision of separate foul and surface water drainage systems."*	Yes	Surface water and foul plans for the existing quarry will remain unaltered.

[16] Roscommon County Council. *County Development Plan 2014 – 2020.* Available at: http://www.roscommoncoco.ie/en/Services/Planning/Plans/County_Development_Pl

Policy on Flood Risk		
Policy 4.43 *"Have regard to and implement the provisions of the DEHLG's Planning System and Flood Risk Management Guidelines for Planning Authorities, 2009."*	Yes	This report provides details of flood risk in the flooding section.
Policy 4.44 *"Implement the following standards for development:* • *Avoid inappropriate development in areas at risk of flooding unless it is demonstrated that such development is necessary on wider sustainability grounds and the flood risk can be managed to an acceptable level without increasing flood risk elsewhere.* • *Avoid new developments increasing flood risk elsewhere, including that which may arise from surface run-off.* • *Ensure effective management of residual risks for development permitted in floodplains.* • *Avoid unnecessary restriction of national, regional or local economic and social growth.* • *Improve the understanding of flood risk amongst relevant stakeholders.* • *Ensure that the requirements of EU and national law in relation to the natural environment and nature conservation are complied with at all stages of flood risk management.* • *Ensure that developments considered necessary in order to meet the objectives*	No	No area of the site within the flood zone

of this Plan, or required on wider sustainability grounds, will be subject to the development management justification test outlined in chapter 5 of the Planning System and Flood Risk Management Guidelines."		
Policy 4.46 *"Require all significant development impacting on flood risk areas to provide a detailed Flood Risk Assessment, to identify potential loss of flood plain storage and how it would be offset in order to minimise impact on the river flood regime. Such development shall also be designed to address flood risk management in accordance with Appendix B of the DEHLG's Planning System and Flood Risk Management Guidelines for Planning Authorities."*	Yes	This report provides details of flood risk in the flooding section.
Policy 4.47 *"Require all new large scale developments to provide 'Sustainable Urban Drainage Systems (SUDS) as part of their development proposals in order to minimise the extent of hard surfacing and paving."*	Yes	Surface water runoff addressed within report and existing quarry surface water management plan.

METHODOLOGY

Study Area

6.24. Due to the nature of this chapter, the study area generally consists of the Application Site of the Proposed Development, as this is the area where construction works will take place and therefore effects will occur. Where a feature is outside the Application Site boundary but may affect or be effected by the Proposed Development, an assessment of this is also included. This will be outlined, where relevant.

Desk Based Assessment

6.25. A desk-based assessment will be undertaken to identify the geological, hydrological and hydrogeological baseline environment utilising publicly available information. The following sources have been consulted:

- Geological Survey of Ireland Spatial Resources Viewer[17];
- Environmental Protection Agency Maps[18]; and
- Teagasc soil and subsoil database[19].

6.26. The desk study included:

- Identification of underlying soils, geology and hydrogeology;
- Identification of groundwater vulnerability;
- Assessment of topography and slope characteristics;
- Identification of catchments, watercourses, springs and water features;
- Collation of data provided through consultations; and
- Collation of flood plain information and water quality data.

Field Surveys

6.27. An initial walkover survey was conducted at the Application Site in 2017 and a further survey was undertaken on the 21st May 2020. These surveys covered all land within the Application Site and existing quarry. Weather conditions during the site walkovers were changeable with minor precipitation events and extended periods of dry weather.

6.28. The aim of the survey was to assess geological, hydrogeological and hydrological features within the Application Site which had been identified from the desk-based assessment, whilst also identifying any additional previously unrecorded features. Watercourses within the Application Site were documented photographically and descriptions recorded.

17GSI Spatial Resources. Available at: http://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0a

18EPA Maps. Available at: http://gis.epa.ie/Envision

19Teagasc Soil Map. Available at: http://gis.teagasc.ie/soils/map.php

Evaluation Methods

6.29. The sensitivity of the hydrology, geology and hydrogeology features of the Application Site have been identified utilising the criteria outlined within the National Roads Authority (NRA) document. These criteria are outlined within **Tables 6.3 - 6.5** below.

Table 6-3: Criteria for Rating Site Attributes - Estimation of Importance of Soil and Geology Attributes

Importance	Criteria	Typical Examples
Very High	Attribute has a high quality, significance or value on a regional or national scale Degree or extent of soil contamination is significant on a national or regional scale. Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale*	Geological feature rare on a regional or national scale (NHA) Large existing quarry or pit Proven economically extractable mineral resource
High	Attribute has a high quality, significance or value on a local scale Degree or extent of soil contamination is significant on a local scale Volume of peat and/or soft organic soil underlying route is significant on a local scale*	Contaminated soil on site with previous heavy industrial usage. Large recent landfill site for mixed wastes Geological feature of high value on a local scale (County Geological Site) Well drained and/or highly fertility soils Moderately sized existing quarry or pit Marginally economic extractable mineral resource
Medium	Attribute has a medium quality, significance or value on a local scale Degree or extent of soil contamination is moderate on a local scale Volume of peat and/or soft organic soil underlying route is moderate on a local scale	Contaminated soil on site with previous light industrial usage Small recent landfill site for mixed wastes Moderately drained and/or moderate fertility so Small exist Sub-econc resource

Low	Attribute has a low quality, significance or value on a local scale Degree or extent of soil contamination is minor on a local scale Volume of peat and/or soft organic soil underlying route is small on a local scale	Large historical and/or recent site for construction and demolition wastes Small historical and/or recent landfill site for construction and demolition wastes Poorly drained and/or low fertility soils. Uneconomically extractable mineral resource

Table 6-4: Criteria for Rating Site Attributes - Estimation of Importance of Hydrological Attributes

Importance	Criteria	Typical Examples
Extremely High	Attribute has a high quality or value on an international scale.	River, wetland or surface water body ecosystem protected by EU legislation e.g. 'European sites' designated under the Habitats Regulations or 'Salmonid waters' designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988
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 – NHA status Regionally important potable water source supplying >2500 homes Quality Class A (Biotic Index Q4, Q5) Flood plain protecting more than 50 residential or commercial properties from flooding Nationally important amenity site for wide range of leisure activities
High	Attribute has a high quality or value on a local scale	Salmon fishery / Locally important potable water source supplying >1000 homes Quality C Flood plai 50 residen from flooc Locally im

		range of leisure activities
Medium	Attribute has a medium quality or value on a local scale	Coarse fishery / Local potable water source supplying >50 homes Quality Class C (Biotic Index Q3, Q2- 3). Flood plain protecting between 1 and 5 residential or commercial properties from flooding
Low	Attribute has a low quality or value on a local scale	Locally important amenity site for small range of leisure activities Local potable water source supplying <50 homes Quality Class D (Biotic Index Q2, Q1). Flood Plain protecting 1 residential or commercial property from flooding. Amenity site used by small numbers of local people

Table 6-5: Criteria for Rating Site Attributes - Estimation of Importance of Hydrogeology Attributes

Importance	Criteria	Typical Examples
Extremely High	Attribute has a high quality or value on an international scale	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation e.g. SAC or SPA status
Very High	Attribute has a high quality or value on a regional or national scale	Regionally Important Aquifer with multiple wellfields Groundwater supports river, wetland or surface water body ecosystem protected by national legislation – NHA status Regionally important potable water source supplying >2500 homes Inner source protection area for regionally
High	Attribute has a high quality or value on a local scale	Regionally Groundwa of baseflo

		Locally important potable water source supplying >1000 homes Outer source protection area for regionally important water source Inner source protection area for locally important water source
Medium	Attribute has a medium quality or value on a local scale	Locally Important Aquifer Potable water source supplying >50 homes Outer source protection area for locally important water source
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer Potable water source supply

Impact Assessment Methods

6.30. Following on from the identification of the baseline environment, the available data was utilised to identify and categorise potential impacts likely to affect the geological, hydrological and hydrogeological environment as a result of the Proposed Development. Impacts have been categorised as follows:

- Direct: where the existing geological, hydrological or hydrogeological environment alongside or in close proximity to the Proposed Development is altered, in whole or in part.
- Indirect: where the geological, hydrological or hydrogeological environment beyond the Proposed Development is altered by activities related to the construction or operation of the Proposed Development.
- No Impact: where the Proposed Development has neither a negative nor a positive impact upon the geological, hydrological or hydrogeological environment.

6.31. The magnitude of potential impacts has been defined in accordance with the criteria provided in the NRA Guidance, as outlined within Tables 6.6 – 6.10.

Table 6-6: Impact Assessment Criteria

Magnitude of Impact	Description
Imperceptible	An impact capable of measurement but without noticeable consequences
Slight	An impact that alters the character of the environment without affecting its sensitivities
Moderate	An impact that alters the character of the environment in a manner that is consistent with existing or emerging trends
Significant	An impact, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
Profound	An impact which obliterates all previous sensitive characteristics

Table 6-7: Criteria for Rating Impact Significance - Estimation of Magnitude of Impact on Soil/ Geology Attribute

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute	Loss of a high proportion of future quarry or pit reserves Irreversible loss of a high proportion of local high fertility soils Removal of entirety of geological heritage feature Requirement to excavate / remediate entire waste site Requirement to excavate and replace high proportion of peat, organic soils and/or soft mineral soils beneath alignment
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Loss of moderate proportion of future quarry or pit reserves Removal c feature Irreversibl proportior Requireme

		significant proportion of waste site Requirement to excavate and replace moderate proportion of peat, organic soils and/or soft mineral soils beneath alignment
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Loss of small proportion of future quarry or pit reserves Removal of small part of geological heritage feature Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils Requirement to excavate / remediate small proportion of waste site Requirement to excavate and replace small proportion of peat, organic soils and/or soft mineral soils beneath alignment
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	No measurable changes in attributes
Minor Beneficial	Results in minor improvement of attribute quality	Minor enhancement of geological heritage feature
Moderate Beneficial	Results in moderate improvement of attribute quality	Moderate enhancement of geological heritage feature
Major Beneficial	Results in major improvement of attribute quality	Major enhancement of geological heritage feature

Table 6-8: Criteria for Rating Impact Significance - Estimation of Magnitude of Impact on Hydrology Attribute

Magnitude of Impact	Criteria	Typical Exa
Large Adverse	Results in loss of attribute and /or quality and	Loss or waterbody

	integrity of attribute	Increase in predicted peak flood level >100mm. Extensive loss of fishery Calculated risk of serious pollution incident >2% annually Extensive reduction in amenity value
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Increase in predicted peak flood level >50mm Partial loss of fishery Calculated risk of serious pollution incident >1% annually Partial reduction in amenity value
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Increase in predicted peak flood level >10mm Minor loss of fishery Calculated risk of serious pollution incident >0.5% annually Slight reduction in amenity value
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Negligible change in predicted peak flood level Calculated risk of serious pollution incident <0.2% annually
Minor Beneficial	Results in minor improvement of attribute quality	Reduction in predicted peak flood level >10mm Calculated reduction in pollution risk of 50% or more where existing risk is <1% annually
Moderate Beneficial	Results in moderate improvement of attribute quality	Reduction in predicted peak flood level >50mm Calculated reduction in pollution risk of 50% or more where existing risk is >1% annually
Major Beneficial	Results in major improvement of attribute quality	Reduction in predicted peak flood level >100mm

Table 6-9: Criteria for Rating Impact Significance - Estimation of Magnitude of Impact on Hydrogeological Attribute

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and / or quality and integrity of attribute	Removal of large proportion of aquifer Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply, springs and wells, river baseflow or ecosystems Potential high risk of pollution to groundwater from routine runoff Calculated risk of serious pollution incident >2% annually
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Removal of moderate proportion of aquifer Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems Potential medium risk of pollution to groundwater from routine runoff Calculated risk of serious pollution incident >1% annually
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Removal of small proportion of aquifer Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems Potential low risk of pollution to groundwater from routine runoff Calculated risk of serious pollution incident > 0.5% annually
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Calculated risk of serious pollution incident <

Significance of Effects

6.32. The significance of effects has been defined in accordance with the criteria provided in the NRA Guidance as outlined within **Table 6-10** below. The importance of the attribute and the magnitude of the potential impact have been combined to identify the significance of the effect.

Table 6-10: Rating of Significant Environmental Impacts

Magnitude of Impact	Level of Significance Relative to Sensitivity of Receptor				
	Extremely High	Very High	High	Medium	Low
Large	Profound	Profound	Severe /Significant	Significant	Slight/ Moderate
Moderate	Profound	Profound/ Significant	Significant/ Moderate	Moderate	Slight
Small	Significant	Significant/ Moderate	Moderate/ Slight	Slight	Imperceptible
Negligible	Imperceptible	Imperceptible	Imperceptible	Imperceptible	Imperceptible

Assessment Limitations

6.33. All data considered necessary to identify and assess the potential significant effects resulting from the Proposed Development was taken from a variety of online sources as well as site visits.

6.34. The consulted sources contain records of all known geological, hydrogeological and hydrological features. However, it should be noted that some of the records retrieved are not exhaustive and various maps used are high level rather than site specific.

BASELINE CONDITIONS

6.35. This section presents the information gathered on the ex hydrological and hydrogeological conditions of the prop immediate surroundings.

Topography and Landuse

6.36. A topographical survey was undertaken at the proposed Application Site (**Figure 6-3: Appendix 6-A**). According to the topographical survey, Area 1 of the proposed extension is 3.46 hectares in size and the existing ground levels vary from 124.59m AOD to 116.11m AOD. Area 2 is 5.73 hectares (5.14 hectare for the quarry extension and 0.59 hectare for the bund) in size and the existing ground levels vary from 114.98m AOD to 100.14m AOD.

6.37. The new N5 road will be constructed close to the southwest boundary of Area 2. The boundary of the extended quarry would be c. 93m from the proposed road centreline and approx. 48m from the proposed Compulsory Purchase Order (CPO) boundary. All surface water from the quarry will be directed to the existing surface water scheme and discharge point and therefore no surface water from the new quarry development will reach the road. A new bund is proposed between Area 2 of the Proposed Development and the new road and a section drawing of this can be viewed on **Figure 6-12: Appendix 6-A**.

Existing Surface Water Management Plan

6.38. The existing surface water management plan for the existing quarry will be retained and any new sections of quarry floor should direct surface water to the existing treatment location.

6.39. The existing surface water management plan includes the following:

- Concrete settlement lagoons with concrete over flow sills to manage suspended solid distrainment. Cells are desilted once per year during the summer low flow. There are five cells in total measuring 110m long.
- Baffles at cell 4 (see **Photo 9: Appendix 6-B**) to catch any floating debris and surface oils. All surface oils to be removed by Atlas Co who specialise in the disposal of waste such as this.
- 600mm diameter pipe which connects the lagoons to the discharge point. This includes a culvert under the road.
- Permanent monitoring station (see **Photo 4: Appendix 6-B**).
- Discharges to linear drainage ditch which eventually flows to Grange Lough (see **Appendix 6-C** for existing discharge licence)
- Detention points at the wheel wash and aggregate
  pipe water back into the system for re-use. Surface w
  also and any overflow is directed to the surface w
  Photos 1-3: Appendix 6-B).

6.40. A map of the surface water management system can be found in **Figure 6-1: Appendix 6-A**.

Geology & Soil

6.41. The geological conditions of the site were identified utilising the Geological Survey of Ireland (GSI) Spatial Resources online Bedrock Lithology 100k mapping[20] system. The proposed Application Site is underlain by one type of bedrock geology (**Figure 6-4: Appendix 6-A** refers):

- **Visean Limestone:** which comprises of undifferentiated Limestone;

6.42. GSI does not identify any karst features within the Application Site or the surrounding area, whilst the area of the quarry is defined as a bedrock outcrop.

6.43. During the extraction operations into the limestone at Hanly Quarries no deep karstic formations or cavities have been encountered. i.e. there has been no evidence of either dissolution widened discontinuities, shafts, underground tubes, underground streams, caverns or cave systems.

6.44. Refer to **Paragraphs 1.6 and 1.7** of the Land and Soils Chapter for a more detailed description.

Geo-Hazards

6.45. According to the GSI on-line mapping, the classification for landslide susceptibility for this site is low (D). There are presently no records of geo-hazards such as landslides within or in close proximity to the Application Site.

Geological Heritage

6.46. The GSI on-line mapping was reviewed to identify sites of geological heritage within the Application Site and surrounding area. The whole Application Site is within the 'Mid Roscommon Ribbed Moraines' geological site.

6.47. This field of ribbed moraine forms part of a small, discrete field of these features, west and northwest of Slieve Bawn. It covers an area of 10 by 20 kilometres, and includes approx. 100 ribbed moraine features. The ribbed moraines are formed on bedrock which is Lower Carboniferous limestone. The features themselves are Quaternary in age, having been deposited at the base of the ice sheet moving northwest to southeast during the maximum period of the last Ice Age.

[20] *GSI Spatial Resources Online Map*, Available at http://dcenr.maps.arcgis.com/apps/MapSeries/?appid=a30af518e87a4c0ab2fbde2aa

Soil

6.48. Different soil types have different capabilities for soaking up water, the efficiency of which is dependent upon the structure and infiltration capacity. The GSI interactive map has been utilised to obtain Teagasc soil data. There are two different types of subsoil distributed across the proposed Application Site (see **Figure 6-5: Appendix 6-A**), including:

- RckCa – Bedrock at Surface; and
- TLs – Till derived chiefly from limestone.

6.49. The majority of the Application Site is underlain by bedrock. Both surface and ditch examination of the soil during the site walkover suggests the soil type as identified within the GSI database is correct.

Overall Evaluation

6.50. Based upon the NRA methodology (**Table 6.3** above refers), the criteria for rating site importance of geological features at this site are considered to be of **Very High** importance due to the existing quarry adjacent to Proposed Development

Hydrology

6.51. According to the Environmental Protection Agency Map[21] the proposed Application Site and the surrounding area lies within the Hydrometric Area No. 26, Shannon Upper Water Framework Directive Catchment Area and within the Owenur River sub-catchment Owenur_SC_010.

6.52. The Proposed Development is situated approximately 1km to the west of a small Lough considered to be part of the Grange Lough network. The closest watercourse to the Application Site is the Unnamed Stream which lies around 0.5km to the northeast (see **Figure 6-6: Appendix 6-A**). This stream flows in a north-eastern direction before meeting with the small Grange Lough. The Waterbody WFD Status (2010 – 2015) of the small Lough is classified as 'Moderate'.

6.53. The site walkover survey identified than the surface water run-off generated within the existing quarry, which abuts the Application Site, is collected by gravity in a centrally located open channel. Water is then diverted toward a suspended solids treatment lagoon where it is slowed and skimmed for surface water oils (see **Photos 7-10: Appendix 6-B**).

[21] Environmental Protection Agency. *EPA Map Viewer.* Available at: http://gis.epa.ie/E

6.54. Further investigation of the EPA and Myplan[22] map viewer as well as the catchment areas from the OPW online maps confirmed that the surface water within the quarry all lead to the Unnamed Stream to the northeast of the Application Site.

Flooding

6.55. The Preliminary Flood Risk Assessment Map[23] (**Figure 6-7**) provides a broad overview of the source and significance of all types of flood risk. According to this map there are no areas of any type of flood risk within the Application Site of the quarry extension.

6.56. Due to the limited catchment area which could flow towards the Application Site, the risk of flooding from surface water runoff is considered to be **low**. Groundwater flooding was also considered to be **low** due to the borehole logs, discussed later, not encountering any groundwater to a depth of 45m, which is below the proposed level of the quarry floor.

Overall Evaluation

6.57. Based upon the NRA methodology (**Table 6.4** above refers), the criteria for rating site importance of hydrological features, the importance of the hydrological features at this site are considered to be of **Medium** due to the waterbody WFD Status being classified as moderate.

Hydrogeology

6.58. According to the GSI map, the Application Site lies within the Carrick on Shannon[24] Groundwater Body ("GWB"). This body occupies a large area in north County Roscommon, south of the Curlew Mountains. It is bounded to the north by the contact with the Dinantian Lower Impure Limestones of the Curlew Mountains GWB. It is bounded to the west and south by topographic highs and groundwater divides that coincide with surface water catchment boundaries. It is bounded to the east, in part by the contact with the Dinantian Sandstones of the Scramoge North GWB and in part by the contact with various low permeability rocks of the Kilglass Dromod and Mohill GWBs. According to the GSI the recharge mechanisms of this GWB are as follows:

"Both point and diffuse recharge occur in this GWB. Swallow holes and collapse features provide the means for point recharge. Diffuse recharge will occur over the entire GWB via rainfall percolating through the subsoil. Where the GWB is covered by 'low' permeability subsoil this can restrict percolation of recharge and increase runoff. Despite the presence of peat and low permeability till, point recharge to the underlying aquifer still occurs by means of swallow holes and collapse features/dolines. Dolines hav

[22] *Myplan Map Viewer*. Available at http://www.myplan.ie/viewer/

[23] OPW PFRA Interactive Mapping. Available at: http://www.cfram.ie/pfra/interactive

[24] http://www.gsi.ie/NR/rdonlyres/05A63357-2956-42EF-8FA5-D3F25E909D85/0/Car

thick peat deposits. (Hickey et al, 2002). In areas where point recharge is common and/or subsoils are relatively thin, groundwater generally shows a rapid response to recharge. Where gravels overlie the karstic aquifer, they provide a permeable pathway for recharge to the underlying karstic aquifer. They can also act to augment storage in the karstic aquifer."

6.59. The underlying bedrock aquifer at the proposed Application Site is considered by GSI to be Regionally Important (important karstified aquifer dominated by conduit flow), covering an area of 928km^2 (see **Figure 6-9: Appendix 6-A**).

Groundwater Vulnerability

6.60. Groundwater Vulnerability refers to the intrinsic geological and hydrogeological characteristics that determine the ease at which groundwater may be contaminated by human activities. The more vulnerable the groundwater is, the more easily it can be contaminated by surface water. The GSI Groundwater Vulnerability maps are based upon the type and thickness of subsoils, and the presence of karst features.

6.61. According to the GSI map the groundwater vulnerability across the proposed Application Site is considered to be 'Extreme' or consist of 'Rock at or near the surface' (see **Figure 6-10: Appendix 6-A**). The majority of the Application Site is classified as having 'Extreme' vulnerability. The highly permeable soils onsite suggest an overburden thickness of 0 – 3m for these areas as illustrated in **Table 6-11** below.

Table 6-11: GSI Vulnerability Rating (Groundwater Protection Schemes, DELG/GSI/EPA, 1999[25])

Vulnerability Rating	Hydrogeological Conditions				
	Subsoil Permeability (Type and Thickness)			Unsaturated Zone	Karst Features
	High Permeability (sand/gravel)	Medium Permeability (sandy subsoil)	Low Permeability (Clayey subsoil, slay, 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		

25 DELG. EPA/GSI (1999) Protection Schemes https://www.gsi.ie/Programmes/Groundwater/Projects/Protection+Schemes+Guideli

Groundwater Wells and Boreholes

6.62. The GSI Well Card Index is a record of wells drilled in Ireland. It is noted that this record is not comprehensive as licensing of wells is not currently a legal requirement in the Republic of Ireland.

6.63. A review of the GSI wells database revealed that there is a borehole located within close proximity to the Application Site. The buffer area extends within the area of the existing quarry but not the Application Site for the extension. During the site walkover, there were no signs of any boreholes within the Application Site. There are two additional boreholes where the buffer is located 800m to the south of the Application Site. **Figure 6-11: Appendix 6-A** shows groundwater wells recorded on the GSI database.

6.64. In addition, two boreholes were drilled to check for the groundwater level at the Proposed Development. These were location at the south western edge of Area 2, see **Figure 6-11: Appendix 6-A**. The boreholes were drilled to a depth of just over 45m Below Ground Level (BGL) and the logs can be found in **Appendix 6-D**. The ground level of Borehole 1 was 88.37m ASL, whilst the ground level at Borehole 2 is 92.22m ASL. No groundwater was encountered on either of the boreholes which suggests that the groundwater level is below 43.37m ASL.

Overall Evaluation

6.65. Based upon the NRA methodology (**Table 6-3**), the criteria for rating site importance of hydrogeological features at this site are considered to be of **High** importance. This is due to the Application Site being underlain by a regionally important aquifer.

POTENTIAL EFFECTS

6.66. The following section identifies the potential impacts of the Proposed Development upon the geology, hydrology and hydrogeology environment of the Application Site and surrounding area.

Do Nothing Scenario

6.67. In the absence of the Proposed Development it is likely that the future baseline hydrochemistry conditions for all watercourses within the study area will remain relatively constant, and that agricultural practices will continue to contribute to nitrates and phosphates entering the hydrological environment. As well [illegible] cover will continue to grow in its current manner

Construction/Decommissioning Phase

6.68. The existing quarry operations are already in place, therefore there will be no construction stage whilst the decommissioning effects are expected to be dealt with in a remediation plan. Hanly Quarries have produced a restoration plan to be implemented post the quarry extraction process.

Operational Stage

Geology, Soils & Hydrogeology

6.69. Potential impacts during the construction phase in relation to soil, geology and hydrogeology include:

- Removal and stockpiling of soils and subsoils;
- Blasting of rock face;
- Excavation;
- Crushing;
- Washing stone; and
- Contamination from spillages and leaks; and
- Modification to surface water runoff/water table.

6.70. Soil depths within the Application Site are expected to be between 0 and 3m deep. The whole area will need to be stripped prior to the blasting stage of operations. Any excavated soil which will need to be stockpiled within the Application Site could be at risk from erosion. The potential for impacts associated with the excavation of the soil is considered to be **Short Term** with a **Low Adverse** magnitude of impact. Therefore, the potential effect is considered to be **Moderate / Slight**. Mitigation measures will be adopted throughout the construction phase to reduce the overall impact and these are outlined in the mitigation section of this Chapter. All soil which is stockpiled on site will be managed in order to reduce the risk of erosion.

6.71. As the Proposed Development is on a greenfield site consisting only of agricultural land, the potential for contamination impacts are assessed as **Small.** Therefore, significance is considered to be an **Imperceptible effect** prior to the measures.

6.72. Blasting of the rock face risks the occurrence of nitrate/am potential to contaminate groundwater. Appropriate disposa selection of the appropriate type of explosives (particularly i

where significant karst features such as open cavities have been observed/encountered). Should groundwater be contaminated by the blasting material, due to the small amounts used in the blasting of the rock face it is considered to have a **Low Adverse** impact. The potential impact significance is therefore considered to be **Moderate/Slight.**

6.73. Borehole data suggests that the groundwater level is below the height of the existing quarry floor level and therefore there will be no need to lower the water table or to modify the groundwater flow regime in the immediate vicinity of the quarry void. However, as groundwater levels vary throughout the year, it cannot be ruled out that groundwater will be encountered. Due to the absence of groundwater abstractions or groundwater-supported sites of ecological interest within the immediate vicinity of quarry extension, the impact on the groundwater levels is considered a **Low Adverse** impact. The potential impact significance is therefore considered to be **Moderate/Slight.**

6.74. During mineral extraction, crushing, and washing, groundwater quality has the potential to be adversely affected by the mobilisation of fines leading to high suspended solids loading or the accidental release of contaminants within the quarry void.

6.75. The proposed method of water management is such that the flux of groundwater flow is consistently towards the quarry void. It is therefore considered to be extremely unlikely that any form of contamination (physical or chemical) could enter the groundwater system external to the site and therefore this would have a **Negligible** impact. The potential effects are therefore considered to be **Imperceptible.**

Hydrology

6.76. Potential impacts during the construction phase in relation to hydrology include the following:

- Flood Risk;
- Contamination of surface water from chemicals stored and used onsite (including concrete);
- Modification to surface water runoff;
- Impediments to flow;
- Erosion and sedimentation; and
- Wastewater generation.

6.77. The PFRA interactive flood maps (reproduced at **Figure 6-7** are no areas within the Application Site boundary which flooding from Fluvial or Pluvial sources. There may be some towards the quarry detention ponds, however this risk is **Sh**

Adverse impact. Therefore, prior to the implementation of mitigation measures the potential effects are considered to be **Imperceptible.**

6.78. A number of chemicals will be stored and used onsite throughout the operational phase of the Proposed Development, including fuel and oil. Should these contaminants enter the water environment they have the potential to adversely impact upon water quality.

6.79. Contamination of surface water may occur as a result of spillages from routine plant maintenance, improper storage or accidental spillages as outlined above. Should a contamination event occur, there is potential for surface water runoff with pollutant loads to enter the drainage ditches identified within the vicinity of the Application Site.

6.80. In relation to the contamination of local watercourses, the potential impact is considered to be **Short Term** with a **Moderate Adverse** magnitude of change**.** Therefore, prior to the implementation of mitigation measures the potential effect is considered to be **Moderate.**

6.81. During the operational phase of the Proposed Development there is potential for a slight increase in runoff due to the increase in impermeable rock surfaces. This will reduce the infiltration capacity of the Application Site and will lead to a slight increase in surface water runoff. This could lead to sediment loading which could potentially impact upon the surrounding drainage ditches, if not adequately mitigated.

6.82. In relation to the surface water runoff and sedimentation of local watercourses, the duration of the impact is considered to be **Short Term** and the magnitude of the impact is considered to be **Moderate Adverse** as per **Table 6-6**, prior to the implementation of mitigation measures. The potential effects are therefore considered to be **Moderate**.

6.83. There will be no new wastewater requirements for the Proposed Development. All wastewater from the present on-site canteen and toilets is treated with an on-site treatment system (**planning ref: PD06/2399 and PD06/939**).

MITIGATION MEASURES

Geology, Hydrology & Hydrogeology

6.84. A number of the potential geological, hydrological and hydrogeological impacts identified as a result of the Proposed Development are considered to be significant, and therefore the following measures will be required.

Waste Management

Storage of Fuels and Chemicals (Already in Place at Existing Quarry)

6.85. As per Best Practice Guidance (BPGCS005)[26], all fuels, oils and chemicals on site have a secondary containment system of 110% capacity and is located more than 20m from any watercourse (i.e. outside of the water course buffer).

6.86. Two bunded diesel tanks are located within a designated area within the original quarry and any other chemicals will be stored within a storage container with an accompanying Control of Substances Hazardous to Health ("COSHH") Datasheet in accordance with health and safety regulations. If generators are used on site, these shall be bunded (the bund shall be capable of containing 110% of the fuel tank's capacity). The bund shall be kept empty of water.

6.87. Where chemicals are required on site, they must be placed in an appropriate bund to prevent ground contamination. All chemicals must be stored in a correctly marked container clearly identifying the contents. Where labels are worn off, then they must be replaced or the contents transferred to a correctly marked container.

6.88. Spill kits will be on site and, for ease of access, located in the site office. Contingency plans will be in place for dealing with a spillage should one occur.

Refuelling

6.89. Fuel and oil deliveries shall take place at the designated areas at the bunded bowsers. The Contractor shall supervise site deliveries to ensure that the correct amount of material is delivered to the correct tank and that the level is checked prior to refilling to avoid spillage.

6.90. Where refuelling of vehicles on site is necessary the following guidelines will be strictly adhered to:

- Mobile plant will be filled in a designated area, on an impermeable surface well away from any drains or watercourses;
- A spill kit will be stored (and clearly marked) near refuelling areas;
- A bunded tank / bowser will be used with capacity of the bund to be 110% of the fuel storage capacity;
- Vehicles will never be left unattended during refuelli
  under all static plant vehicles;

[26] *Best Practice Guide BPGCS005 - Oil Storage Guidelines*. Available at: http://www.envirocentre.ie/includes/documents/OilStorageBPG.pdf;

- Hoses and valves will be checked regularly for signs of wear, and will be turned off and securely locked when not in use;
- Vehicles will not be left running unnecessarily and low emission fuels will be used where possible; and
- Diesel pumps and similar equipment will be checked regularly and any accumulated oil removed for appropriate disposal.

Excavation and Earthworks

6.91. All excavation and earthworks, will be carried out in accordance with BS6031:2009 Code of Practice for Earthworks[27]. Soil handling, extraction and management will be undertaken with regard to best practice guidelines such as Guidance on the Waste Management (Management of Waste from the Extractive Industries) Regulations 2012[28].

6.92. The following practices will be followed in relation to blasting, topsoil stripping and any other earthworks:

- During mineral extraction groundwater levels within the quarry void will be controlled by pumping to a settlement lagoon;
- Rock blasting to be undertaken by experienced contractors (the contractors of the existing quarry to be retained);
- Hydrogeological risk assessment to be undertaken prior to works;
- Where soil excavated has been contaminated this will be disposed of by a licensed waste disposal contractor;
- Soil excavation should be undertaken during dry periods whenever possible;
- The amount of exposed ground and soil stockpiles will be kept to a minimum;
- Stockpiles in place for an extended period of time will be allowed to re-vegetate naturally;
- Excess soil will be used to improve the relief of the existing Agricultural land in selected locations adjacent to the quarry and will be re-seeded;
- Silt fences will be used alongside all exposed ground v

[27] British Standards Institute (BSI), 2009. *BS 6031:2009 Code of Practice for Earthwork*

[28] Environmental Protection Agency (EPA) 2012. *Guidance on the Waste Managem Extractive Industries) Regulations 2012*. Available at www.epa.ie

Pollution Prevention

6.93. Suitable protection for watercourses potentially affected by the works will be installed prior to relevant works proceeding. These measures will be in-line with Environment Agency Pollution Prevention Guidelines. Protection measures will be developed in consultation with the Environmental Protection Agency and will include:

- Plant and equipment will be stored on dedicated hard standing within the construction compound. This will minimise the risk of pollution caused by leakages occurring out of hours. Drip trays will be used where appropriate;
- Spill kits will be readily available to all personnel. The spill kits will be of an appropriate size and type for the materials held on site;
- Diesel fuel will be stored in a bunded diesel bowser which will be located within a fenced off area in the construction compound;
- Refuelling and maintenance of vehicles and plant will take place in designated areas of hardstanding; and
- All other chemicals will be stored within a storage container with an accompanying COSHH Datasheet.

6.94. All staff on site will be made aware of the pollution prevention measures being implemented through the use of appropriate tool box talks and the site induction.

Flood Risk

6.95. The Development has been designed in order to reduce the possibility of additional flood risk impacting the surrounding area. Some of these design features include:

- Surface water management plan in place where all surface water directed to one discharge point;
- Clean out lagoon cells once every year in summer low flows;
- Detention points at the wheel wash and aggregate wash system which are used to pipe water back into the system for re-use. Surface water can flow to these locations also and any overflow is directed to the surface water
- Discharges to linear drainage ditch which eventual **Appendix 6-C** for existing discharge licence); and
- Approved contractor to remove oils from surface wat

RESIDUAL EFFECTS

6.96. The mitigation measures identified throughout this Chapter have been summarised in **Table 6-12** below.

Table 6-12: Mitigation Measures

Potential Receptor	Significance	Recommended Mitigation	Residual effects
Geology			
Soil Contamination	Moderate/slight	Stock piles to be stored in location away from contaminants. Excavation during dry periods. Spill Kits to be available onsite.	Slight
Hydrology			
Flood Risk	Imperceptible	Surface water management plan in place. Recycling of water for mineral and wheel washing.	Imperceptible
Surface Water Contamination	Moderate	Spill Kits to be available onsite. Diesel Bowers to be Bunded. Refuelling and maintenance of plant and vehicles in designated areas only. Surface water management plan in place. Discharge point to be monitored for compliance with discharge licence (see **Appendix 6-C** for existing discharge licence).	Imperceptible
Increase surface water run off	Moderate	Surface water manag plan in place. Recycling of wate	

		mineral and wheel washing.	
Hydrogeology			
Rock Blasting	Moderate/slight	Rock blasting to be undertaken by experienced contractors. Hydrogeological risk assessment to be undertaken prior to works.	Slight
Water Table	Moderate/slight	During mineral extraction groundwater levels within the quarry void will be controlled by pumping to settlement lagoon.	Slight
Mineral Extraction/ crushing/ washing	Imperceptible	Surface water management plan in place. Recycling of water for mineral and wheel washing. Discharge point to be monitored for compliance with discharge licence (see **Appendix 6C** for existing discharge licence).	Imperceptible
Flood Risk			
Surface Water Flooding	Imperceptible	Surface water management plan in place.	Imperceptible

CUMULATIVE EFFECTS

6.97. As the quarry is an extension of the existing quarry operations, all of the operations have been considered together within this Chapter. Extraction of aggregates from a quarry requires strict measures in place (conditioned as part of the Planning Consent) to discharge water that will not impact upon the quality of the local aquatic environment. For the Proposed Development, only localised excavation works of a the output of which will be retained onsite and therefo significant cumulative effects on geology. As such, **no cumula**

6.98. No other quarry developments were identified in the **cumulative effects are anticipated.**

SUMMARY & CONCLUSION

6.99. The Proposed Development at Largan and Cuilrevagh, Elphin, County Roscommon is for an extension to the existing quarry site. The extension consists of the two separately defined areas; one to the west of the existing quarry, and one to the south.

6.100. The PFRA interactive flood maps show that there are no areas within the Application Site boundary which are considered to be at risk of flooding from Fluvial or Pluvial sources. There may be some surface water risk as water flows towards the quarry detention ponds, however this risk is **Short Term** and would have a **Low Adverse** impact. Therefore, prior to the implementation of mitigation measures the potential impact is considered to be **Imperceptible.** Potential effects are therefore **not significant**.

6.101. The existing surface water management scheme for Hanly Quarries will be retained and the discharge licence and existing testing scheme will be applied. The cumulative impact has been deemed as **negligible**.

6.102. The hydrology, geology and hydrogeology assessment has been undertaken in compliance with guidance produced by the EPA and the NRA. It is considered that due to the nature of the proposed quarry extension and the geology, hydrology and hydrogeology assets located within the Application Site and within close proximity, potential effects will **not be significant**.

CONTENTS

7. LAND AND SOILS

INTRODUCTION

7.1. This section of the environmental impact assessment report (EIAR) assesses and evaluates the potential impacts on land and soils of the subject quarry site and proposed extensions. In assessing likely potential impacts, account is taken of both the importance of the attributes and the predicted scale and duration of the likely impacts.

7.2. The proposed extensions to the west and south of the quarry site extend to approximately 8.60 hectares in area and will form part of an existing working quarry. Rock is extracted from the existing quarry by means of blasting and is processed into various grades depending on market requirements. The same method of extraction and production will be used in respect for the two extension areas.

7.3. In assessing likely potential impacts, account is taken of both the importance of the attributes and the predicted scale and duration of the likely impacts.

Statement of Authority

7.4. This section of the EIA has been prepared by Mr. Niall Kiernan of Global Green Technical Consultancy Ltd. Mr. Kiernan has a Bachelor's Degree in Environmental Science incorporating Soils and Geology from Sligo Institute of Technology and has over 10 years' experience in geology including the preparation of land and soils assessments and is a member of a number of professional organisations, Engineers Ireland, IEMA, and ESAI. Global Green Technical Consultancy Ltd. have considerable experience in the assessment of land and soils impact and have compiled EIA studies ranging from quarries to commercial developments.

METHODOLOGY

7.5. The appraisal methodology for the EIAR is completed in accordance with the EPA 'Guidelines on the Information to be contained in Environmental Impact Statements' (EPA, 2002) and EPA Guidelines on the Information to Be Contained in Environmental Impact Assessment Reports Draft August 2017. The EPA document entitled 'Advice Notes on Current Practice in the Preparation of Environmental Impact Statements' (EPA, 2003) is also followed in this geological assessment and classification of environmental impacts. Due consideration is also given to the guidelines provided by the Institute of Geologists of Ireland (IGI) in the document entitled 'Geology in Environmental Impact Statements, a Guide', (IGI, 2

7.6. In the EIAR, consideration is given to both the importance of a
the potential environmental impacts of the quarry activitie

impact ratings are in accordance with impact assessment criteria provided in the aforementioned EPA 2002 and 2017 publications.

7.7. In addition, the document entitled 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the National Roads Authority (NRA, 2009) is also referenced where appropriate. Publicly available information from the GSI was also reviewed as part of this assessment.

7.8. A desk study of the site and the surrounding area was completed in advance of undertaking the walkover survey and site investigations. This involved collecting all relevant geological data for the site and surrounding area. This included consultation and review of the following information: -

- Environmental Protection Agency database.
- Geological Survey of Ireland - National Draft Bedrock Aquifer map.
- Geological Survey of Ireland - Groundwater database.
- Geological Survey of Ireland (GSI, 2004).
- Geological Survey of Ireland - 1:25,000 Field Mapping Sheets.
- The Department of Communications Marine and Natural Resources - Exploration and Mining Division website.
- General Soil Map of Ireland 2nd edition.
- Ordinance Survey of Ireland - Discovery Series and 1:50,000 maps.
- Ordinance Survey of Ireland - aerial photographs.

ASESSMENT METHODOLOGY

7.9. Using information from the desk study and walkover survey, an estimation of the importance of the soil and geological environment within the study area was assessed using the criteria set out in (NRA, 2005). The guidance criteria (EPA, 2002 and EPA, 2003) for the assessment of impacts require that impacts are described with respect to their extent, magnitude, complexity, probability, duration, frequency, reversibility and transfrontier nature (if applicable). In addition, the two impact characteristics proximity and probability are described for each impact and these are also defined in EPA, 2002 and EPA, 2003.

7.10. The rating of potential environmental impacts on the land, s
matrix presented in Table 7.1 below which takes account of

and type of impact characteristic identified. This is based on Table 3.3 presented in the EPA Guidelines on the Information to Be Contained in Environmental Impact Assessment Reports Draft August 2017.

Quality of Effects It is important to inform the non-specialist reader whether an effect is positive, negative or neutral	**Positive Effects** A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative/adverse Effects A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Describing the Significance of Effects "Significance' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (also see *Determining Significance* below.).	**Imperceptible** An effect capable of measurement but without significant consequences.
	Not significant An effect which causes noticeable[2] changes in the character of the environment but without significant consequences.
	Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Very Significant An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
	Profound Effects An effect which obliterates sensitive characteristics
Describing the Extent and Context of Effects Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.	**Extent** Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
	Context Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)

Table 7-1 Criteria used in the Assessment of Impacts on Land & Soi/

RECEIVING ENVIRONMENT

7.11. Hanly Quarries is surrounded by agricultural lands, in a rural and 6.75km southeast of Elphin in north Co Roscommon, (see

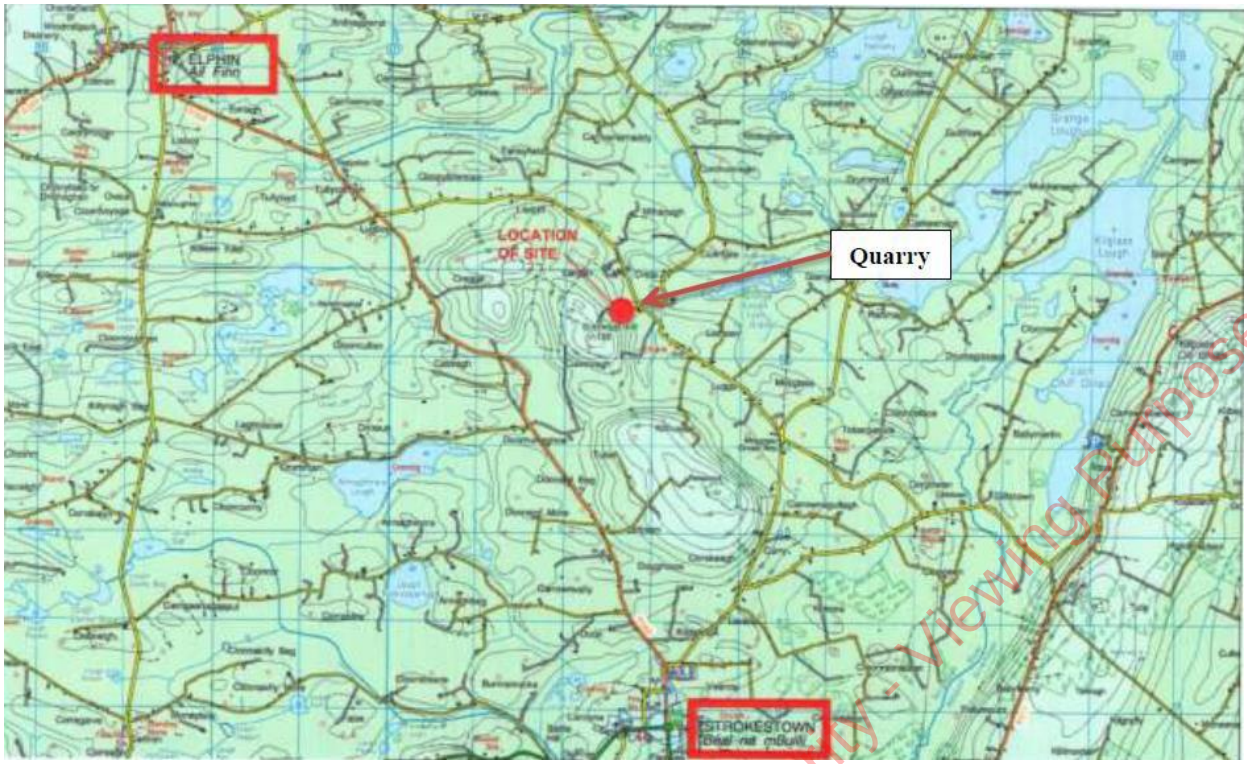

Figure 7.1 Quarry Location www.osi.ie

7.12. The baseline study consisted of an analysis of the available geological maps and surveys. The site comprises of an existing quarry with the limestone rock exposed in the working faces. The application site is situated in an area which is characterised as being Limestone till (Carboniferous). Carboniferous Limestone is a collective term for the succession of limestones occurring widely throughout Great Britain and Ireland that were deposited during the Dinantian Epoch of the Carboniferous Period. These rocks formed between 363 and 325 million years ago.

7.13. The quarry operations comprised extraction of rock using occasional blasting techniques; processing (crushing, screening and washing) of the fragmented rock to produce aggregates.

7.14. Residences within the general area consist of one-off rural houses, farmsteads with some ribbon development along the local road network.

7.15. There was no reference of any past geotechnical investigations in the study area in the GSI files, which could have complemented the desk study.

7.16. There is a small stream which was constructed along the side of settlement lagoons. This is located on the western side of the quarry. The small man-made stream was constructed to facilitate the circulation of settlement water from the lagoons. Maintenance and Desludging is carried out on an ongoing basis according to the quarry owner/operator.

Figure 7.2 Aerial photo of existing quarry area www.googlemaps.com

7.17. A number of shallow depressions located at various levels around the quarry were filled with ponded surface water at the time of the site walkover indicating that the permeability of the bedrock is poor and vertical drainage generally limited.

7.18. The surrounding soils i.e. in the adjacent farmlands including the extensive landholding in the applicant's ownership (see landownership map - Figure 7.3) are tills derived from limestone. Bedrock out-crops and sub-crop is also known to be present in the general area as the subsoil's can be sometimes very shallow

7.19. Geology can be sub-divided into solid and subsoil geology. Solid geology deals with the bedrock geology while quaternary geology deals with the subsoil deposits deposited or formed in the last 2 million years. This section will be discussed in terms of distribution of bedrock geology, quaternary geology and soils in the study area.

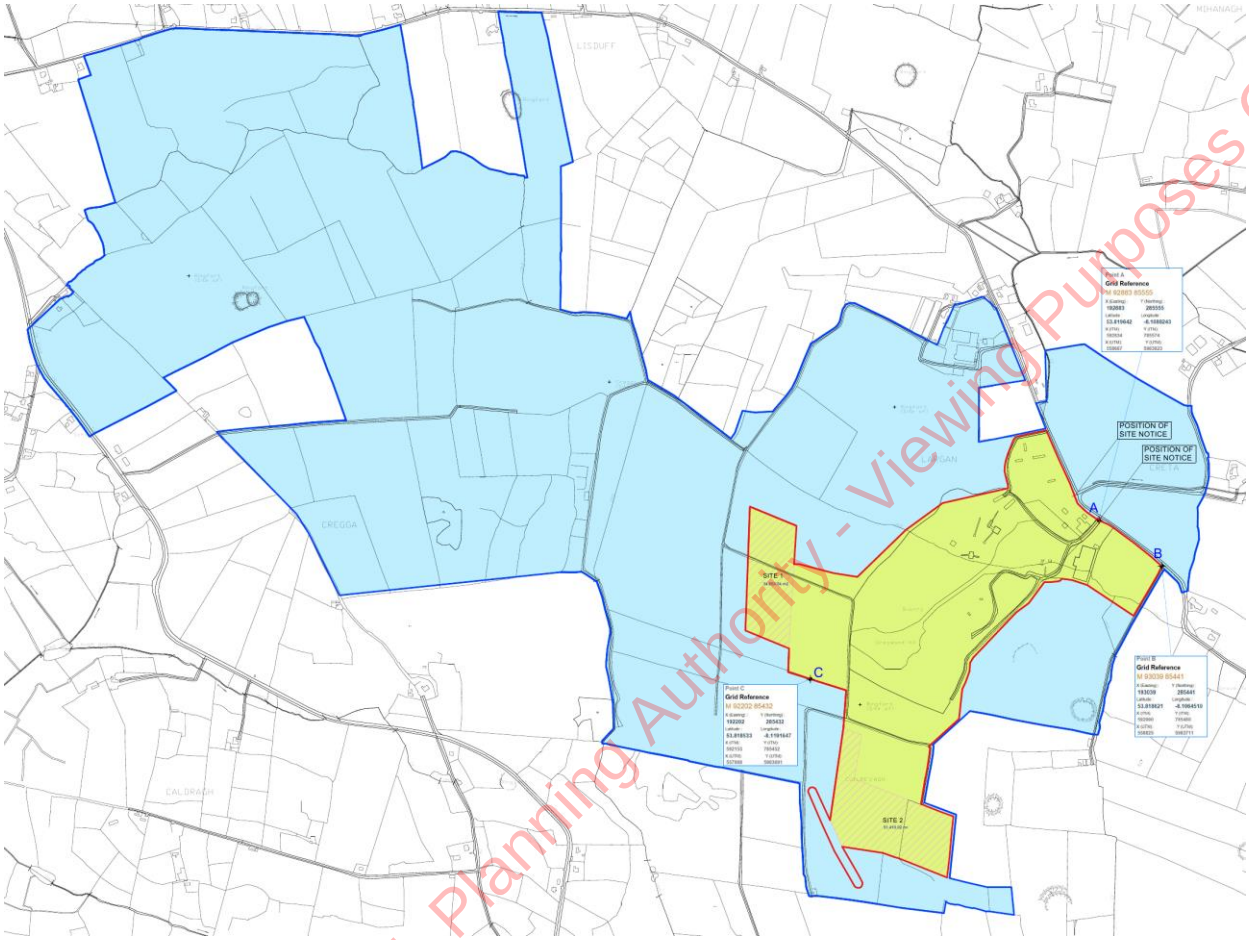

Figure 7.3 Site and Land ownership map ASE Design Consultants

Consultation

7.20. Please see **Table 7-2** below, which details all consultee responses received relevant to Land and Soil.

Table 7-2 : Consultation

Consultee	Summary of Response	Addressed within EIAR
Consultation was had with Michael Whitelaw in the GSI as in the Roscommon County Development Plan it stated that it is important that there is consultation with the GSI if development is proposed within a County Geological Site.	Our aim is not to prevent further quarrying, as the very process of extraction provides the Geological Survey with much valuable data that can be added to our national databases, but our purpose in protecting and promoting geological heritage is partly educational both for the public and the geologist. The Geoheritage Programme has numerous working quarries on its database where there are significant geological sections or features exposed within the quarry. In fact, new exposures through quarrying may reveal new features of interest to the geologist, and we have in the past requested that periodic monitoring of the new faces be permitted. IGH tries to promote a partnership between geological heritage and active quarrying, with such measures as those outlined in the 'Geological Heritage Guidelines for the Extractive Industry', which can be downloaded at: Geological Heritage Guidelines for the Extractive Industry.	Yes

CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

7.21. Refer to chapter 3.0 (Description of Development) for a detailed site and development description. The following specific details of the proposed quarry extensions are relevant to this chapter of the EIAR.

- The extensions to the quarry will see the clearance of all existing soil cover over an area of 8.60ha.
- Earth removed as part of the works will be used to construct perimeter berms around the edge of the extended quarry and may be spread on adjacent agricultural lands.
- No excavation works will take place outside of the areas subject to the planning application for the extensions to the quarry.
- The area cleared of soil will be excavated by means of blasting over a period of time.

REGIONAL GEOLOGY

7.22. Hanly Quarries is located c.4km north of Strokestown and 6.75km southeast of Elphin in north Co Roscommon and is predominantly underlain by limestone according to Teagasc soil mapping.

7.23. Soil is the top layer of the earth's crust and is formed by mineral particles, organic matter, water, air and living organisms. Soil is an extremely complex, variable and living medium and its characteristics are a function of parent subsoil or bedrock materials, climate, relief and the actions of living organisms over time.

7.24. Soil can take thousands of years to evolve and is essentially a non-renewable resource. Soil performs many vital functions, it supports food and other biomass production (forestry, biofuels etc.) by providing anchorage for vegetation and storing water and nutrients long enough for plants to absorb them. Soil also stores, filters and transforms others substances including carbon and nitrogen, and has a role supporting habitats serving as a platform for human activity.

7.25. The whole region has been subjected to at least two periods of glaciation during the ice age. The latest period of glaciation has mostly removed evidence of previous periods. In general, one type of glacial deposit is encountered in the locality: -

- Drumlins - glacial deposits comprising sandy silts and and boulders are found in landforms termed drumlins

features that generally follow a north east to south west trend. In this region, drumlins may be expected to be of the order of 0.5-1 km long (or greater), several hundred metres wide and with vertical relief varying from 5 to 25 m. The drumlins are formed when existing glacial deposits are moulded by ice movements. The drumlins are aligned on a northeast-southwest axis and this arrangement determines the pattern of lakes in the greater area. The drumlin landscape can be identified on the Ordinance Survey discovery sheet of the area. GIS mapping below showing the soils on site of proposed development.

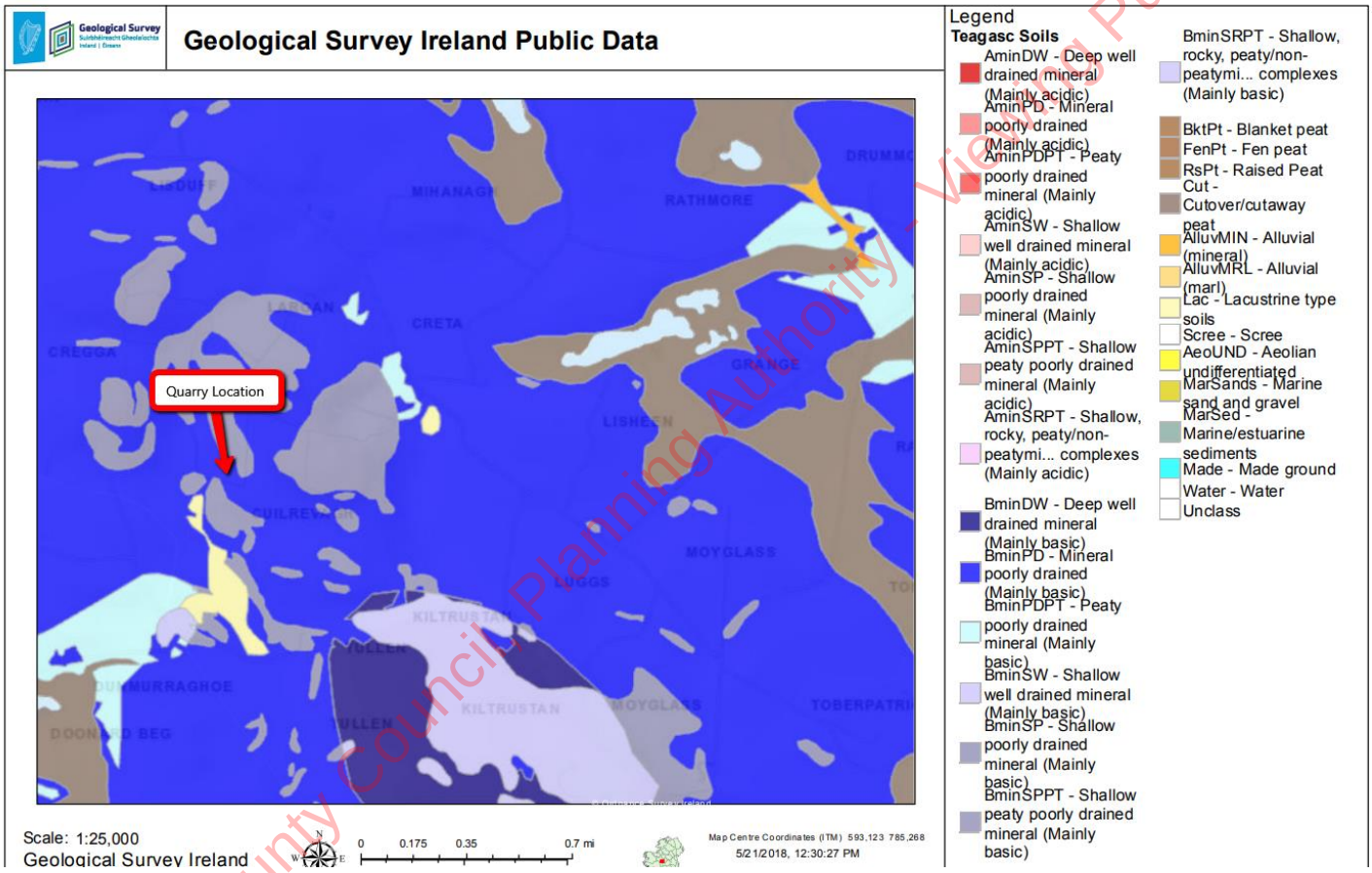

Figure 7.4 Soils Map of Hanly Quarries www.gsi.ie

QUATERNARY GEOLOGY (SUBSOILS)

7.26. The quaternary geological period extends from about 1.5 million years ago to the present day and can be sub-divided into the Pleistocene Epoch, which cov extended up to 10,000 years ago and the Holocene Epoch, wh present day. The Pleistocene Epoch in Ireland began when the

earth's climate, and was characterised by alternating extended periods of very cold conditions, during which time much of the country was covered by an ice sheet. These colder periods were interspaced with warmer periods, known as interglacials, which lasted for approximately 10,000 years at a time. It is under debate whether or not the last glacial period is over, or whether we are in the middle of another interglacial period.

7.27. The ice sheet was formed by a number of coalescing ice domes from which ice flowed radially outwards. As the ice travelled over the ground, it eroded underlying bedrock and formed within, and beneath, the ice sheet, sediment, which consisted of particles with a massive size distribution, from clay particles to boulders. This material has been labeled glacial till or boulder clay and is the most widespread sediment type in Ireland. Once the glaciers melted, the melt-water also deposited large quantities of sand and gravel. Drift deposits can mantle the bedrock in thicknesses ranging from 0.5m to 20m.

7.28. Older deposits laid down by glaciers mainly comprise glacial till. Younger deposits, such as peat, alluvium and lake deposits are post glacial in age.

BEDROCK GEOLOGY

7.29. An inspection of the Geological Survey of Ireland (GSI) records shows that the bedrock geology of the application site and the surrounding area is dominated by the rocks of the Carboniferous Age. According to the GSI Bedrock Geology sheet No. 12 (Longford -Roscommon) the bedrock geology below the site comprises of the Bricklieve Limestone Formation (Bioclastic Cherty limestone). The Bricklieve formation is a carboniferous limestone (undifferentiated) of the Visean period and is the most widespread formation on this sheet (No. 12). There are no major faults proximal to the proposed site. Some calcareous shale's are known to be present in the area. There is no aquifer source protection area' present nor is there any gravel aquifers present in the locality.

7.30. The limestone is a sedimentary rock composed predominantly of calcium carbonate ($CaCO_3$) laid down in horizontal layers termed beds. Figure 7.5 below illustrates the bedrock geology present in the study area.

Hanly Quarries Soil Mapping

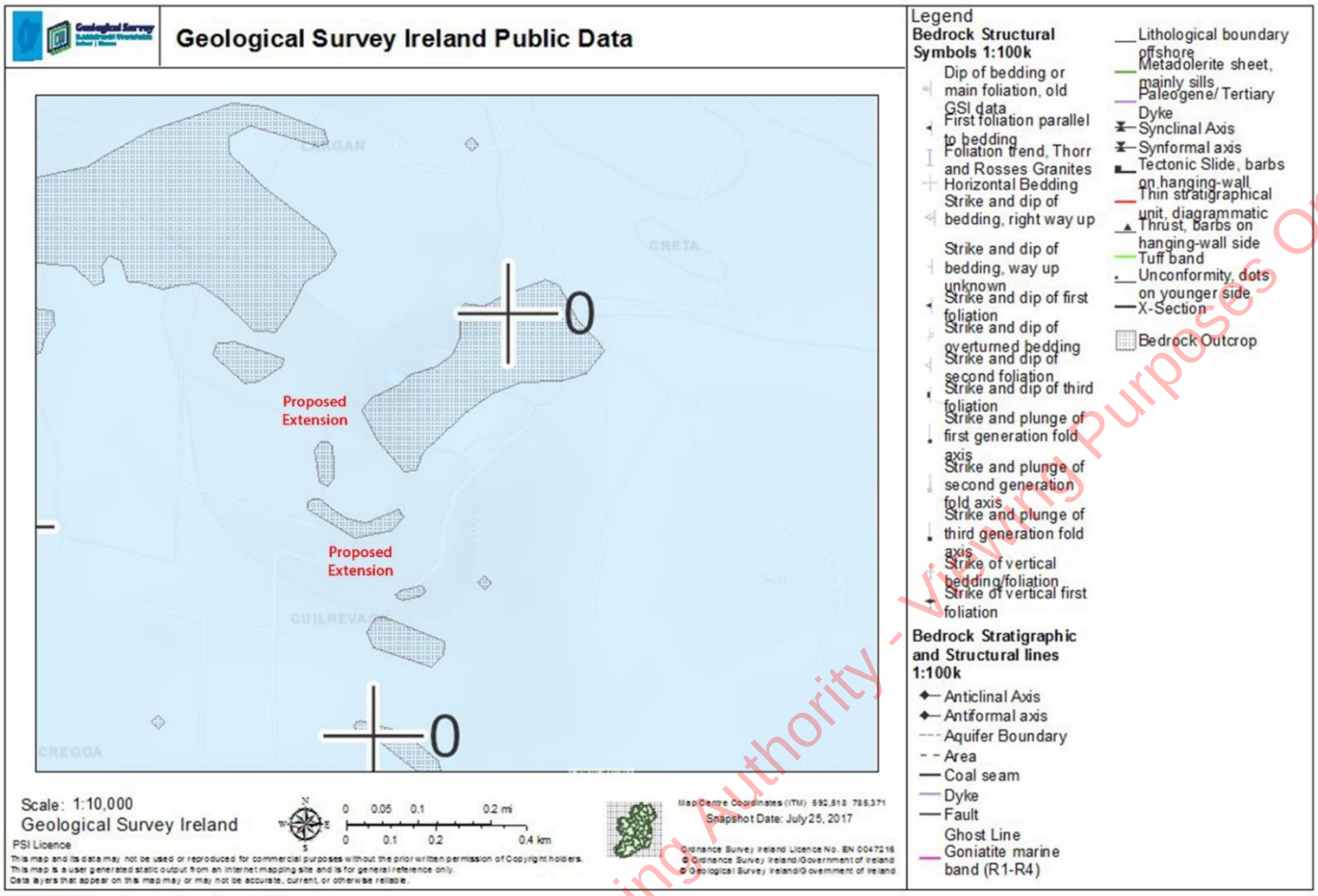

Figure 7.5 Bedrock geology present in the study area www.gsi.ie

7.31. After the rock was formed the rock was deformed resulting in gentle folding of the limestone beds. To accommodate the movement, the brittle, strong limestone rock cracked forming joints or fractures. It would appear obvious that the discontinuities in the rock mass are formed by sets of discontinuities at right angles to the bedding plane (ie. subvertical), bedding planes, joints and fractures which, can be referred to collectively as discontinuities. Such discontinuities are termed orthogonal. The structural planes of the rock do not display any pronounced syncline or anticline at the quarry face.

7.32. The structural trend would have a significant influence on the nature of discontinuities within the limestone which in turn can affect groundwater flow.

7.33. The calcium carbonate that makes up the majority of the limestone in the region is soluble. Where aggressive waters (i.e. slightly acidic} come into conta
dissolved.

7.34. Limestone that has been affected by the processes of dissolution is termed karstic limestone.

7.35. A search of GSI geotechnical holes and boreholes in the vicinity of the site found that there was none present (Figure 7.4). GSI geotechnical holes can give useful information in relation to the geology of the site such as the depth of overburden.

KARST FEATURES

7.36. Surface karst is formed where limestone is exposed at the surface and aggressive water may fall directly onto the limestone. In this setting, discontinuities in the limestone may be widened by dissolution forming classical limestone pavement. Limestone pavement gives direct and rapid access of surface waters to the underlying aquifers. No karstic limestone pavement is present within or proximal to the subject site.

7.37. Deeper karst includes dissolution widened discontinuities, shafts, underground tubes and streams along with caverns and cave systems. Deeper karst is formed by extensive underground flows of groundwater forming a subterranean drainage network. In the Roscommon region, surface runoff from lands commonly enters the limestone in karst features termed sink holes and follows a subterranean drainage network. There are no sink holes within the vicinity of the proposed development. The development of karst (karstification) takes place best in Ireland on limestone rocks that are hard and almost impermeable to water. Rain water is slightly acidic and this acid (carbonic acid) readily dissolves the rock, carrying it away as an invisible solution. Rain water which first passes through soil before reaching the limestone becomes much more acidic and is capable of dissolving a greater quantity of rock.

7.38. As the acidified rain water trickles down the cracks in the limestone, it progressively enlarges them which allow a greater quantity of water to enter and hence enlarge the cracks even more. In time, the fissures are sufficiently enlarged to capture all rainwater within moments of its falling. In some areas, rivers which rise on non-limestone rocks flow on to the limestone and sink underground in swallow holes – again formed by the corrosive action of the river water on the soluble rock.

7.39. Underground, the waters from fissures unite to form small streams and in turn these join and excavate correspondingly large conduits. Conduits accessible to humans are called caves. At some point the underground waters return to the surface as springs, except where local geological conditions may cause the waters to emerge from the sea bed some distance off-shore.

7.40. During the extraction operations into the limestone at Hanly Quarries no deep karstic formations or cavities have been encountered. i.e. there dissolution widened discontinuities, shafts, underground tube or cave systems.

Hanly Quarries Soil Mapping

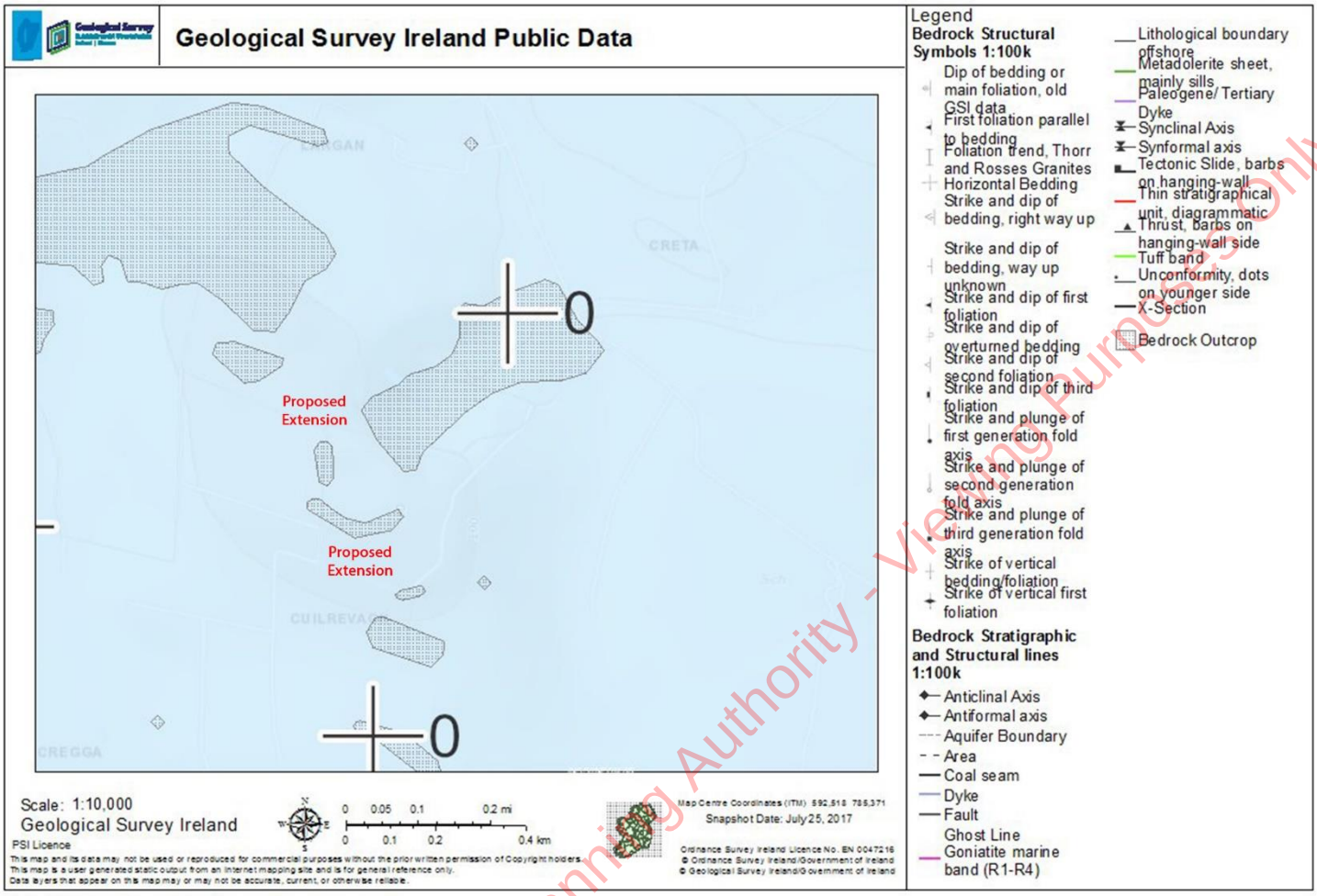

Figure 7.6 Karst features in the area of Hanly Quarries

7.41. The ground level dips at the two extensions which will result in the soil depth being shallower as the quarry extension progresses. The proposed use of the soil will be to provide screening in the form of berms at the border of the proposed quarry extensions while some will be spread on adjacent farmland. The remaining soil will be stored for later restoration works.

ASSESSMENT OF IMPACTS

Do Nothing

7.42. With respect to a 'do nothing' scenario, the proposed development will have no significant impact on local or regional geology.

Predicted

7.43. The development will involve the stripping and relocation of soils and overburden followed by the extraction and processing of rock. The impact of soils may be considered to be of a temporary nature in that they will be reused or integrated as a fundamental part of the site rehabilitation.

7.44. It is self-evident that the quarrying of rock will have a permanent impact on local geology however; this is restricted to the area of extraction. It will not have an impact on geology outside of the site and the development does not result in any loss of nor does it affect any geologically important site or important geological feature. Stability has been considered in preparing a design for the future workings.

7.45. In the region in which the quarry is located the GSI web page identifies within its Geological Heritage Viewer, one site within 14km. The site is described as Gortinee. Gortinee is 12km to the north-east of the quarry.

7.46. The site description is below: -

Site Name	Gortinee
IGH-THEME-PRIMARY	IGH 15 Economic Geology
IGH-THEME-TERTIARY	
IGH-THEME-SECONDARY	
County	Leitrim
TOWNLANS/DISTRICT	Drumsna
BUFFER METRES	1000
CRITICAL FEATURES	Iron ore in tholeiitic volcanics. Mined as early as the 16thC; smelted at Dromod and Arigna
SUMMARY DESCRIPTION	
X CENTROID ITM	202600
Y CENTROID ITM	293500
EX-ASI SITE?	
SITE DESIGNATION	CGS
LEGALFOUNDATIONDATE	2002
LEGALFOUNDATIONDOCUMENTS	National Heritage
SITEPROTECTIONCLASSIFICATION	geological

7.47. The proposed extensions will not impact on this site or any other site of geological importance.

Worst Case

7.48. Worst case scenario is that the rock is removed from its present position permanently.

Direct Impacts

7.49. There are two main considerations under this heading.

1 What is the impact on the geology of the area?

2 What is the impact on the development arising from the geology of the area?

7.50. With respect to item 1 the proposed extensions will result in the removal of geological material. This is considered to be a slight impact.

7.51. Soils that are required to be stripped before extraction of the limestone will be removed and stored in soil storage berms or spread on adjacent farmlands. Whilst the soils will not be replaced directly in their original location they will be reused or integrated as a fundamental part of the site rehabilitation.

7.52. With respect to item 2 the geology will have no significant impact on the extensions. The rock been extracted in the quarry over a number of decades and experience demonstrates that it is competent and suitable for the manufacture of aggregates. Under the terms of quarry safety legislation the faces are inspected on a frequent basis by quarry management. Procedures are in place to assess the local geology prior to any blast.

Indirect

7.53. The development has not and will not have any indirect impacts on the local or regional geology other than within the areas of extraction. The quarrying of the limestone rock has created an exposure of the local geology in the quarry face. This will also be the case with respect to the proposed extensions. Many quarry faces/exposures are listed as features of geological interest with geological authorities such as the GSI and are of significant interest to geologists and other interested parties. It is likely that the e
feature of considerable geological interest to interested partie

7.54. This is considered a beneficial impact.

Interaction with other impacts

7.55. The potential interaction with other impacts described in this statement has been considered. With respect to geology there is a direct link between geology i.e. the removal of rock and surface and groundwater. These interactions are described and set out elsewhere in the EIAR and in particular Chapter 6.0 - Water.

CUMULATIVE IMPACTS

7.56. The existing and the proposed development must also be considered in association with other developments located within or close to the application site. The proposed N5 is to be developed south of the proposed quarry extension. The proposed N5 and the proposed quarry extension will have a cumulative impact as this will involve extraction and removal of geological material. There is therefore an impact on the local and geological environment. This impact is confined to the designated extraction area. Removal of overburden and rock has been undertaken in response to a demand for aggregate. It is envisaged that this will be offset by the proposed restoration plan to be undertaken on a phased basis over the life time of the project.

7.57. The restoration drawing is included with chapter 12.0 – The Landscape.

7.58. The working quarry is where most of the activity is undertaken on a day to day basis.

7.59. An adverse cumulative impact in terms of soils and geology as a result of the application site and the existing permitted section of the quarry has not been identified.

REMEDIAL/MITIGATION MEASURES

7.60. The development to date has not had an impact on the geological aspects of the environment outside the existing quarry area. Overburden on adjoining lands has not been impacted on as part of activities.

7.61. Various plant and machinery have been used to extract and process material at the application site since quarrying activity began up to the present day. Acc
and vehicles may have entered the ground over th

remedial/mitigation measures presented in Chapter 6.0 will minimise the risk to overburden and groundwater from operations at the site.

7.62. Procedures for dealing with such events are in place to minimise the potential impacts on groundwater. Due to the nature of the development to date, a significant volume of overburden has been stripped from the site during the operation of the quarry. Overburden has been used for the construction of berms around the boundary of the site and stored for future planned re-instatement works. Stored overburden was allowed to re vegetate so as to minimise loss through erosion. The restoration drawing is included with Chapter 12.0 – The Landscape.

7.63. There is a slight potential impact on the stability of the rock environment due to the extractive operations at the application site to date. Some shear faces exist as a result of extraction to date. The rock been extracted in the quarry over a number of decades and experience demonstrates that it is competent and suitable for the manufacture of aggregates. Under the terms of quarry safety legislation, the faces are inspected on a frequent basis by quarry management. Procedures are in place to assess the local geology prior to any blast. As the rock will be removed entirely, there are no mitigation measures for the rock face and no waste will be retained on site as it all will be processed into one type of product or another.

7.64. Provided the remedial measures described below are implemented, it can be concluded that the operation of the existing development will have no significant negative impact on the soil and land environment.

7.65. The proposed restoration drawings for the quarry extension will be undertaken to blend the quarry site into its surrounding environment insofar as is practicable. By their nature infill activities impact on the geological environment, however the measures proposed should mitigate the impact on the surrounding environment. The following remedial measures are continuously practiced or will be implemented in order to limit the effects of quarrying activity on the overburden and rock environment;

- All overburden material is placed in permanent or temporary locations for re-use during restoration. Overburden is stored at an angle in order to reduce erosion from stockpiles.
- The surface of restored areas will be re-vegetated as soon as is practical after extraction activities have been completed.
- The re-handling of soil material will be minimised as much as possible in order to preserve the integrity of the topsoil material.
- Screening berms will be constructed where required.

- The addition of fuels, hydraulic oils and lubricants to plant and equipment takes place at designated areas which are monitored to ensure that no product is present on the surface once the activity has been completed.
- Benches will be developed which provide for increased safety and will act as rock traps.

RESIDUAL IMPACTS

7.66. Based on the impact assessment and existing mitigation measures described above, there will be no residual impact on land, soils or geology as a result of this proposed development.

MONITORING

7.67. No monitoring of the soils or geology is proposed.

CONTENTS

8. AIR AND CLIMATE

INTRODUCTION

8.1. This section of the Environment Impact Assessment Report (EIAR) deals with the issue of air and climate quality impact associated with two proposed extensions to an existing quarry at Largan and Cuilreevagh, Elphin, Co Roscommon. It assesses the levels of dust deposition at the site associated with the quarry. Rock and gravel are extracted from the existing quarry and will be extracted from the application site by blasting and will continue to be processed into various grades depending on market requirements. Due to the nature of the operations at the site, dust is determined to be the principal air emission associated with the subject site; however other minor air emissions are also discussed in brief.

8.2. The existing development comprises of the stripping of overburden down to the surface of the underlying stone. Blasting is generally carried out 6 times per year depending on demand levels. The stone material is then passed through a crusher and a screener to separate the aggregate into various grades depending on market requirements. Processing is undertaken in the central area of the existing quarry. The material is then stockpiled on site until it is moved off site.

8.3. Day to day activities have the potential to give rise to elevated dust levels if activities associated with overburden stripping, blasting, processing and transportation of aggregate are not managed correctly. As dust travels downwind from the source it disperses outwards and upwards and progressively falls to the ground surface, with larger particles falling first.

8.4. Air emissions will be as a result of the extraction, processing and transporting of material. The report considers the potential air quality impacts arising from the quarry extensions, including emissions of dust (as fine Particulate Matter, PM10), and dispersion of dust results from the existing quarry site operations were analysed as part of the study. The main emissions to air will be associated with plant and machinery and dust blow which may be generated during dry windy conditions. It is not anticipated that there have been or will be any significant air emissions from the existing development on its own and in combination with other development if existing and proposed mitigation measures are adhered to.

Statement of Authority

8.5. This section of the EIA has been prepared by Mr. Niall Kiernan of Global Green Technical Consultancy Ltd. Mr. Kiernan has a Bachelor's Degree in Environmental Science incorporating Air and Climate from Sligo Institute of Technology and has ov
climate including the preparation of air and climate assessme
of professional organisations, Engineers Ireland, IEMA, an
Consultancy Ltd. has considerable experience in the assessm
has compiled EIA studies ranging from quarries to commercial

SCOPE OF WORK

8.6. The main focus of the assessment is the potential impact on the local amenity from fugitive dust emissions from the existing quarry operations and the activities of the proposed extensions. The activities that are going to take place in the proposed extension areas are already being carried out in the existing quarry. They include: -

- transport – access road and internal haulage routes;
- soil and overburden handling;
- excavation, storage and transfer of materials; and
- Processing plant (screening).

8.7. The following sections of this chapter describe the potential air quality impacts associated with quarrying activities within the quarry area. The following issues are addressed separately: -

- methodology used to assess the potential impacts of the activities at the development on air quality at local properties;
- baseline conditions pertaining to the measured (or estimated) existing air quality levels around the development;
- assessment of the potential impacts;
- description of existing mitigation measures that are incorporated into the construction, design and operation of the scheme to eliminate or reduce the potential for air quality impacts;
- Remedial measures, if required.
- Legislative Framework / Planning Policy

ASSESSMENT METHODOLOGY

8.8. In reviewing the air quality, reference was made to the published EPA Air Quality Data for rural areas. A site a visit was undertaken in October 2019 and a visual inspection was carried out of the operations and the potential for dust generation within the site. Dust monitoring is carried out on-site by BHP bi-annually. BHP is an INAB 17025 accredited testing laboratory. The data was reviewed as part of the assessment and recent results are

SOURCES OF INFORMATION

8.9. A desk study was carried out to examine all relevant information relating to air quality conditions around the application site. Met Eireann, the Irish National Meteorological Service, was consulted in relation to the climate / weather information related to the study area. The NPWS website, which is part of the Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, published information which was analysed in relation to sites that are charged with the conservation of a range of habitats and species in the study area. Ordnance Survey maps and aerial photography were also examined.

Environmental Management Guidelines

8.10. In 1996 the Irish Concrete Federation developed the ICF Environmental Code (updated in 2005) for its members on matters of environmental performance of quarry activities.

8.11. In 2006 the EPA issued the Environmental Management Guidelines for Environmental Management in the Extractive Industry. These guidelines on environmental management are intended to complement existing guidance.

National Planning Policy

8.12. The Guidelines for Planning Authorities - Quarries and Ancillary Activities 2004 was reviewed as part of this chapter. Local authorities consider the land use and planning issues associated with quarries and the extractive industry in their County Development Plans. The general objective in planning for provision of these materials is to ensure that the supply is managed in a sustainable way so the best balance is obtained between environmental, economic and social considerations.

Local Planning Policy – Roscommon County Development Plan

8.13. The Roscommon County Development Plan was adopted in 2014. It provides policies and objectives for the planning and sustainable development of the County from 2014 to 2020. There are no policies adopted in the plan in relation to Air Quality. It does however stated that *'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.*

DUST DEPOSITION LIMITS

8.14. The action of wind over dry ground will carry small parti
emissions of dust occur naturally, man-made dust events ar
including agriculture, road traffic, and construction works, har

by vehicles using paved and unpaved site haul roads. For those operations involving the mechanical break up of solids the most common concern regarding dust emissions is the potential nuisance effect from the larger fractions of dust.

8.15. Potential impacts from larger fractions of dust typically relate to nuisance effects as opposed to potential human health effects. When the rate of accumulation of this coarser fraction of dust (referred to as deposited dust) is sufficiently rapid to cause fouling or discoloration then it is generally considered to introduce a nuisance.

CHARACTERISTICS OF PROPOSED DEVELOPMENT

8.16. Refer to chapter 3.0 (Description of Development) for a detailed site and development description. The following specific details of the proposed quarry extensions are relevant to this chapter of the EIAR.

- The extensions to the quarry will see the clearance of all existing soil cover over an area of 8.60ha.
- Earth removed as part of the works will be used to construct perimeter berms around the edge of the extended quarry and may be spread on adjacent agricultural lands.
- No excavation works will take place outside of the areas subject to the planning application for the extensions to the quarry.
- The area cleared of soil will be excavated by means of blasting over a period of time.

RECEIVING ENVIRONMENT

8.17. The land surrounding Hanly Quarries is currently dominated by small pasture fields which are mostly improved agricultural grassland. Small rural settlements and isolated farm sheds are scattered along local roads and lanes. Currently, the nearest sensitive receptors are the houses in the locality, and St. Joseph's National School to the south of the site, as indicated in Figure 8.1, and Table 8.1.

Table 8.1 Nearest sensitive receptors to the receiving environment

Receptor	Distance from Quarry (M)	Direction
H1	560	
H2	450	
H3	630	

H4	490	East
H5	600	North-east
School	590	South-east
H6	150	South-west
H7	150	South
H8	345	East

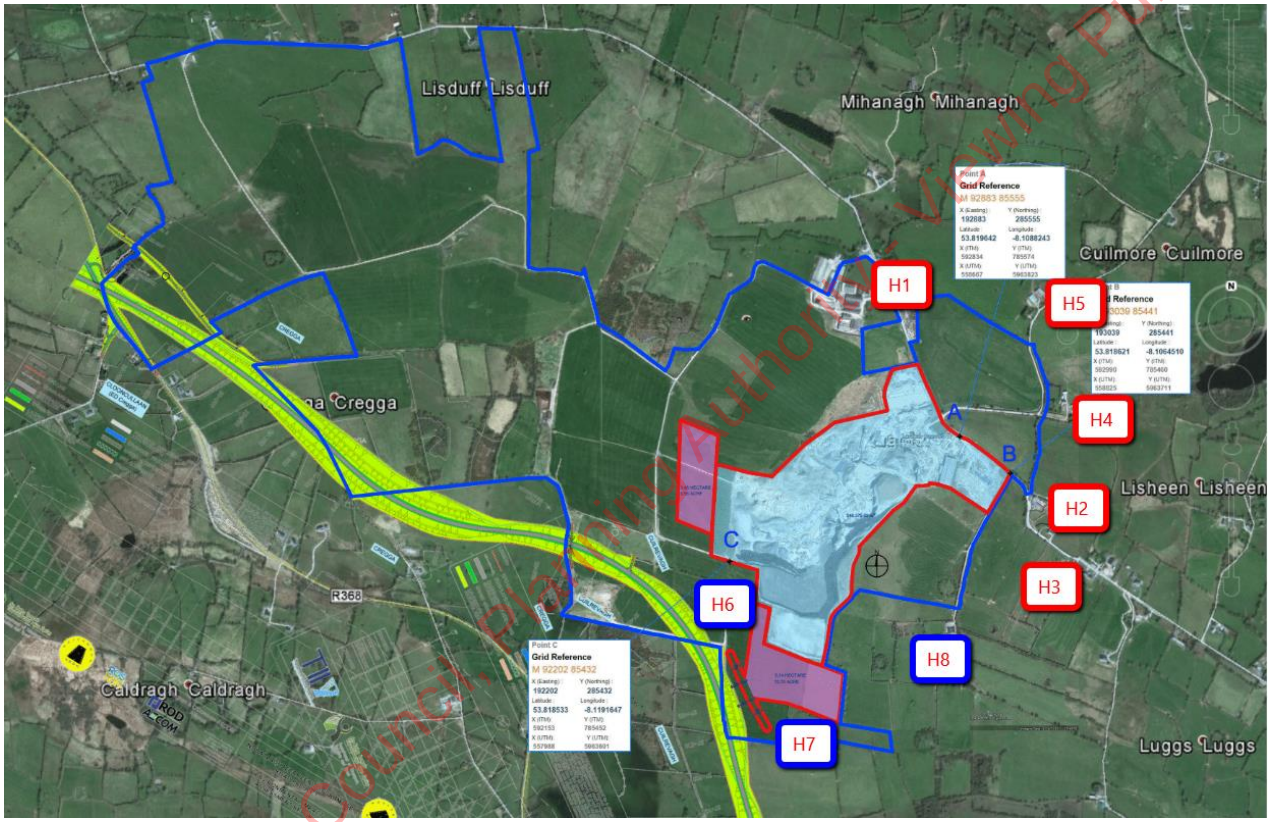

Figure 8.1 Study Area

8.18. The proposed N5 will be constructed to the south of the proposed quarry extension. Monitoring points H6 and H7 will be closest receptor to the quarry when the proposed N5 is constructed. Even with the quarry extension going to be close by a the N5 National Road the future proposed extraction is likely to be in accordance with dust level predictions assessed based on the current dust levels for existing extraction at the quarry site, and if anything future dust levels should be lower as development descends to lower depths allowing for increased attenuation by quarry walls and at a greater distance from the school than the existing quarry.

8.19. It is reasonable to suggest that there will be no change anticip associated quarry operations on the site, i.e. existing dust e this area to the north of the quarry void as this is where th taking place.

EXISTING ENVIRONMENT

8.20. Dust monitoring at Hanly Quarries in the townlands of Largan and Cuilreevagh to the north of the town of Strokestown, Co. Roscommon is continuously being conducted using the 'Bergerhoff method'. The deposition gauge used in the surveys is the 'Bergerhoff' dust gauge, which comprises a plastic collection bottle and a post with protective basket, set at 1500mm above ground level. The input of the atmospheric material is determined over a planned period measurement (usually one month) by exposing the plastic collection bottle. The total dust is expressed as deposition of insoluble particulate matter (mg/m^2/day) arising from fugitive actions in the environs of the quarry.

FIELD MONITORING / INSPECTION

8.21. Dust monitoring is completed bi-annually at three locations - D1, D2 and D3 which are the closest receptors to the existing quarry. With the proposed N5 to be constructed on the southern side of the proposed quarry extension H6 and H7 monitoring points should be introduced so as they will be between the proposed quarry extension and the proposed N5.

8.22. Dust monitoring locations for the proposed extension should be conducted at H6, H7, and H8 as illustrated in Figure 8.1.

Dust Monitoring Locations, D1, D2, and D3:

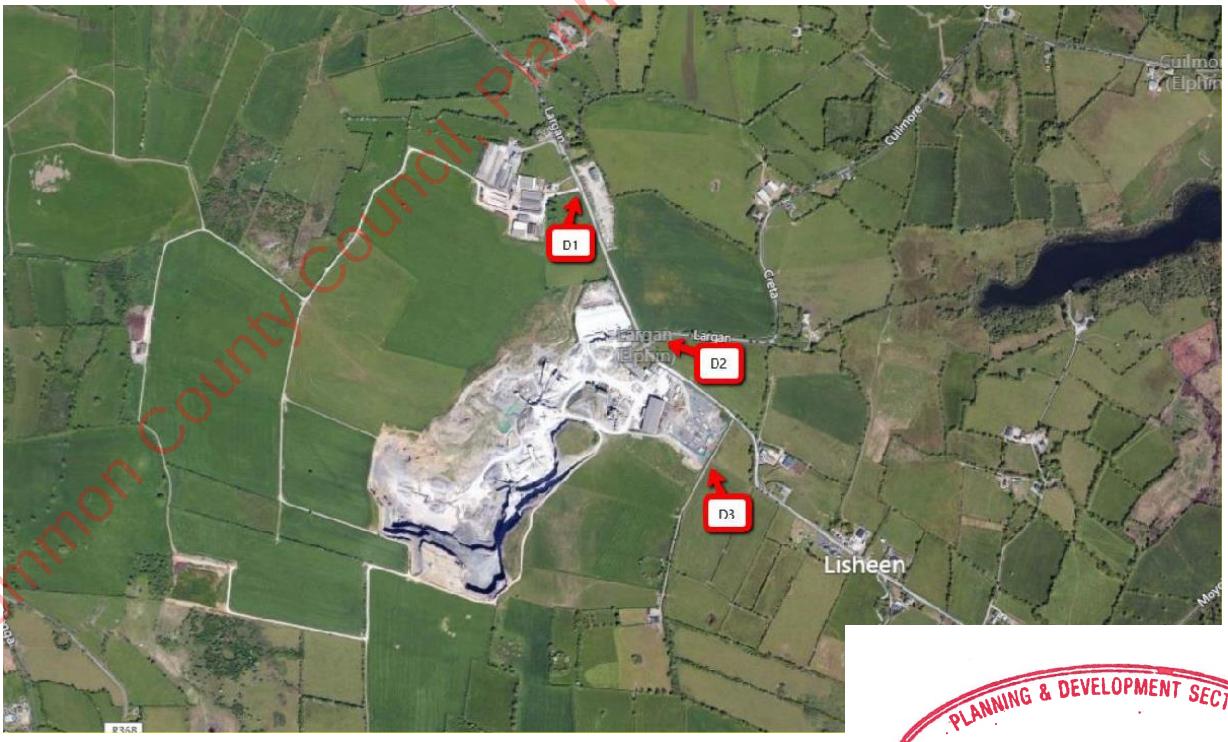

Figure 8.2 Dust Monitoring Locations

Dispersion Characteristics of Site

8.23. The nearest Met Eireann synoptic station is at Knock, County Mayo. The wind characteristics at the site at Hanly Quarries could be expected to be similar. The wind rose for Knock is illustrated in Figure 8.3, superimposed on the site. The dominant wind direction at the site is from the west and south, with consequent dispersion of airborne emissions mainly towards the east and north/northeast. As indicated by the analysis of wind speed statistics in Table 8.2, wind speeds are likely to exceed 2m/s for 93% of the time.

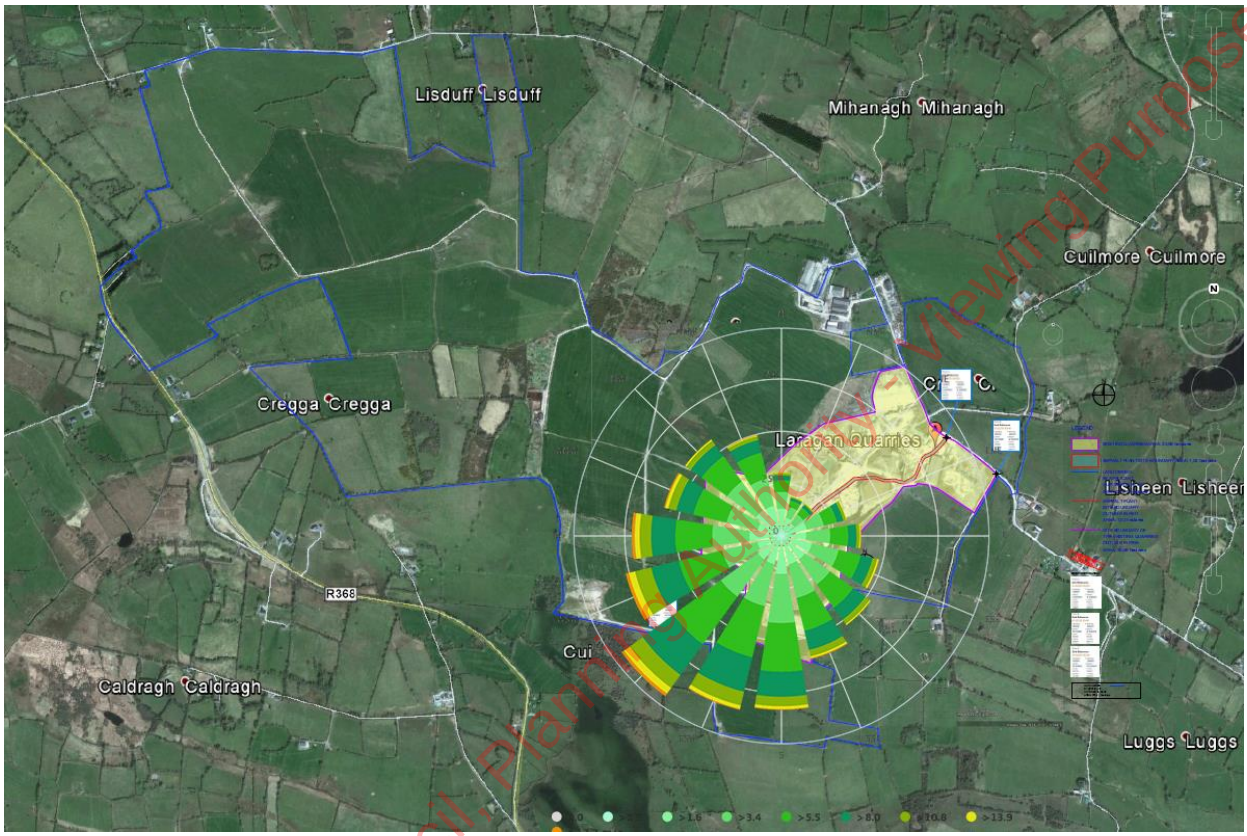

Figure 8.3 Wind rose superimposed on the site

Table 8.2 Analysis of wind speeds statistics for Knock 2019

Date	WDSP
Jan-2019	8.9
Feb-2019	11.4
Mar-2019	11.1
Apr-2019	10.3
May-2019	
Jun-2019	

Jul-2019	8.1
Aug-2019	9.1
Sep-2019	8.7
Oct-2019	8.9
Nov-2019	8.2
Dec-2019	10.6

8.24. During the site visits to the existing quarry and the areas of the proposed extensions in October 2019, there were no significant visible dust emissions from operations and processing activities such as rock excavation, crushing and screening.

8.25. Ground conditions were dry during the site visit. During prolonged periods of dry weather there would be a potential for local generation of dust from quarrying processes and on haul routes within the site. There is a wheel wash in operation at the entrance/exit of the quarry. Water is regularly spread on the site and haul routes to keep dust down.

8.26. There was no visible dust deposition at the roadside properties H1 to H3.

8.27. Dust deposition surveys carried out by BHP were also examined. The average measured dustfall rates were in general comfortably within the EPA guideline limit of 350mg/m2/day, applicable for extractives industry sites, apart from a small number of samples, where there was most likely contamination of the sample.

8.28. Table 8.3 below shows the previous dust monitoring locations and the results, including emissions from the Bitumen Plant within the overall site.

Table 8.3 Analysis of dust emissions at locations D1, D2 and D3

Test Name	Location	Units	Results	EPA limit	Date Analysed	Method		Comments
Dust Deposition	D1	mg/m^2/day	264	355	14/11/2017	BHP 017	AC	
Dust Deposition	D2	mg/m^2/day	183	355	14/11/2017	BHP 017	AC	
Dust Deposition	D3	mg/m^2/day	4313	355	14/11/2017	BHP 017	AC	Organic deposition was determined
Dust Deposition	D1	mg/m^2/day	156	355	19/12/2017	BHP	AC	
Dust Deposition	D2	mg/m^2/day	292	355	19/			
Dust Deposition	D3	mg/m^2/day	207	355	19/			
Dust Deposition	D1	mg/m^2/day	21	355	19/			

Dust Deposition	D2	mg/m^2/day	13	355	19/04/2018	BHP 017	AC	
Dust Deposition	D3	mg/m^2/day	156	355	19/04/2018	BHP 017	AC	
Dust Deposition	D1	mg/m^2/day	202	355	25/05/2018	BHP 017	AC	
Dust Deposition	D2	mg/m^2/day	363	355	25/05/2018	BHP 017	AC	
Dust Deposition	D3	mg/m^2/day	559	355	25/05/2018	BHP 017	AC	
Dust Deposition	D1	mg/m^2/day	187	355	20/07/2018	BHP 017	AC	
Dust Deposition	D2	mg/m^2/day	325	355	20/07/2018	BHP AC 017		
Dust Deposition	D3	mg/m^2/day	402	355	20/07/2018	BHP AC 017		
Dust Deposition	D1	mg/m^2/day	187	355	16/10/2018	BHP AC 017		
Dust Deposition	D2	mg/m^2/day	325	355	16/10/2018	BHP AC 017		
Dust Deposition	D3	mg/m^2/day	402	355	16/10/2018	BHP AC 017		
Dust Deposition	D1	mg/m^2/day	233	355	19/04/2019	BHP AC 017		
Dust Deposition	D2	mg/m^2/day	442	355	19/04/2019	BHP AC 017		
Dust Deposition	D3	mg/m^2/day	2314	355	19/04/2019	BHP AC 017	Organic deposition was determined	
Dust Deposition	D1	mg/m^2/day	312	355	25/06/2019	BHP AC 017		
Dust Deposition	D2	mg/m^2/day	267	355	25/06/2019	BHP AC 017		
Dust Deposition	D3	mg/m^2/day	1131	355	25/06/2019	BHP AC 017	Organic deposition was determined	
Dust Deposition	D1	mg/m^2/day	155	355	23/07/2019	BHP AC 017		
Dust Deposition	D2	mg/m^2/day	269	355	23/07/2019	BHP AC 017		
Dust Deposition	D3	mg/m^2/day	149	355	23/07/2019	BHP AC 017		
Dust Deposition	D1	mg/m^2/day	317	355	24/05/20	BHP AC 017		
Dust Deposition	D2	mg/m^2/day	62	355	24/			
Dust Deposition	D3	mg/m^2/day	156	355	24/			

8.29. Dust deposition gauges are prone to contamination by local dust sources in the vicinity of the gauge. This can happen especially when gauges are located near roads, as in the case of Hanly Quarries, where the splash or spray from passing vehicles can deposit mud into the gauges

DUST DEPOSITION

8.30. The action of wind over dry ground can lead to particles being carried in the air. This can occur in most environments where particles are present, however, due to the nature of activities being undertaken at quarry sites dust blow can be a common problem if not dealt with efficiently. Road traffic, aggregate and mineral extraction, agricultural activity as well as industrial activity all contributes to ambient dust levels. The extent to which dust particles can become a nuisance or a hazard will depend on the amount of the particles which become airborne and the extent to which they spread.

8.31. Dust is characterised as encompassing particulate matter with a particle size of between 1 and 75 microns (1-75µm). Deposition typically occurs in close proximity to each site and potential impacts generally occur within 500 metres of the dust generating activity as dust particles fall out of suspension in the air. Larger particles deposit closer to the generating source and deposition rates will decrease with distance from the source. Particles which are deposited to ground may give rise to problems such as soiling of buildings and other materials and general nuisance. The amount of dust capable of being dispersed to a particular location during windy conditions is related to several factors: -

- Distance
- Weather
- Topography & Vegetation

8.32. The likely impacts on air quality as a result of the proposed development arise from the following sources or activities, which are already being carried out within the overall quarry area:

- Stripping of overburden
- Extraction of aggregate
- Processing of aggregate
- Aggregate stockpiles
- Loading aggregate onto vehicles and transporting

8.33. All the above activities could give rise to dust particularly durir ideal conditions for dust blow. Dust arising from the app background levels of dust already present in the environmen implemented and practiced.

8.34. The existing quarry faces provide shelter from prevailing winds thereby maximising screening and minimising dust blow off-site. Elevated levels of dust may have been experienced in the past. However, mitigation measures are going to be put in place in the near future as detailed in the mitigation section.

8.35. Activities undertaken at the application site to date do not have an adverse impact on the environment and it is anticipated that this will be the case going forward provided that mitigation/remedial measures are adhered to.

VEHICLE & PLANT EMISSIONS

8.36. Exhaust emissions resulting from plant and vehicles operating directly at the application site or indirectly by transporting material to and from the application site may have the potential to contribute to local pollution levels, both within and surrounding the application site.

8.37. The impact on air quality was assessed by comparison with the requirements of the Air Quality Standards Regulations of 2011 (SI 180). These regulations assign limit values for the common pollutants associated with combustion.

8.38. Changes in concentration of less than 10% of the annual limit value can in general be considered to be of negligible impact, (unless air quality is already close to a limit value). Limit values are set out in Table 8.4 below.

Table 8.4 Limit Values from Air Quality Standards Regulations of 2011 (SI 180)

1. Sulphur dioxide

	Health protection	Vegetation protection
Upper assessment threshold	60% of 24-hour limit value (75 µg/m³, not to be exceeded more than 3 times in any calendar year)	60% of winter critical level (12 µg/m³)
Lower assessment threshold	40% of 24-hour limit value (50 µg/m³, not to be exceeded more than three times in any calendar year)	40% of winter critical level (8 µg/m³)

2. Nitrogen dioxide and oxides of nitrogen

	Hourly limit value for the protection of human health (NO_2)	Annual limit value for the protection of human health (NO_2)	Annual critical level for the protection of vegetation & natural ecosystems (NOx)
Upper assessment threshold	70% of limit value (140 µg/m³, not to be exceeded more than 18 times in any calendar year)	80% of limit value (32 µg/m³)	80% of critical level (24 µg/m³)
Lower assessment threshold	50% of limit value (100 µg/m³, not to be exceeded more than 18 times in any calendar year)	65% of limit value (26 µg/m³)	65% of critical level (19,5 µg/m³)

3. Particulate matter — PM_{10} and $PM_{2.5}$

	24-hour average PM_{10}	Annual average PM_{10}	Annual average $PM_{2.5}$[8]
Upper assessment threshold	70% of limit value (35 µg/m³, not to be exceeded more than 35 times in any calendar year)	70% of limit value (28 µg/m³)	70% of limit value (17 µg/m³)
Lower assessment threshold	50% of limit value (25 µg/m³, not to be exceeded more than 35 times in any calendar year)	50% of limit value (20 µg/m³)	50% of limit value (12 µg/m³)

4. Lead

	Annual average
Upper assessment threshold	70% of limit value (0,35 µg/m³)
Lower assessment threshold	50% of limit value (0,25 µg/m³)

5. Benzene

	Annual average
Upper assessment threshold	70% of limit value (3,5 µg/m³)
Lower assessment threshold	40% of limit value (2 µg/m³)

6. Carbon monoxide

	Eigh
Upper assessment threshold	70% of li
Lower assessment threshold	50% of li

REVIEW OF PUBLISHED EPA DATA

8.39. Hanly Quarries is located in a rural area. Other than the existing quarry and associated operations, a Bitumen plant and a small steelworks to the north of the site, there is no industrial activity in the locality.

8.40. The only EPA licensed activity in the Elphin/Strokestown area is Laragan Farms Limited. This farm is licensed for intensive pig-rearing under EPA Reg No. PO51 5-01.

8.41. Other than emissions from agriculture, and local traffic, there are no identified significant emissions to atmosphere in the area.

8.42. EU legislation on air quality requires that member states divide their territory into zones for the assessment and management of air quality. The zones in place in Ireland in 2015 are shown in Figure 8.4. Zone A is the Dublin conurbation, Zone B is the Cork conurbation with zone C comprising 23 large towns in Ireland with a population >15,000. Zone D is the remaining area of Ireland. The region of Roscommon in which the quarry is located falls into zone D.

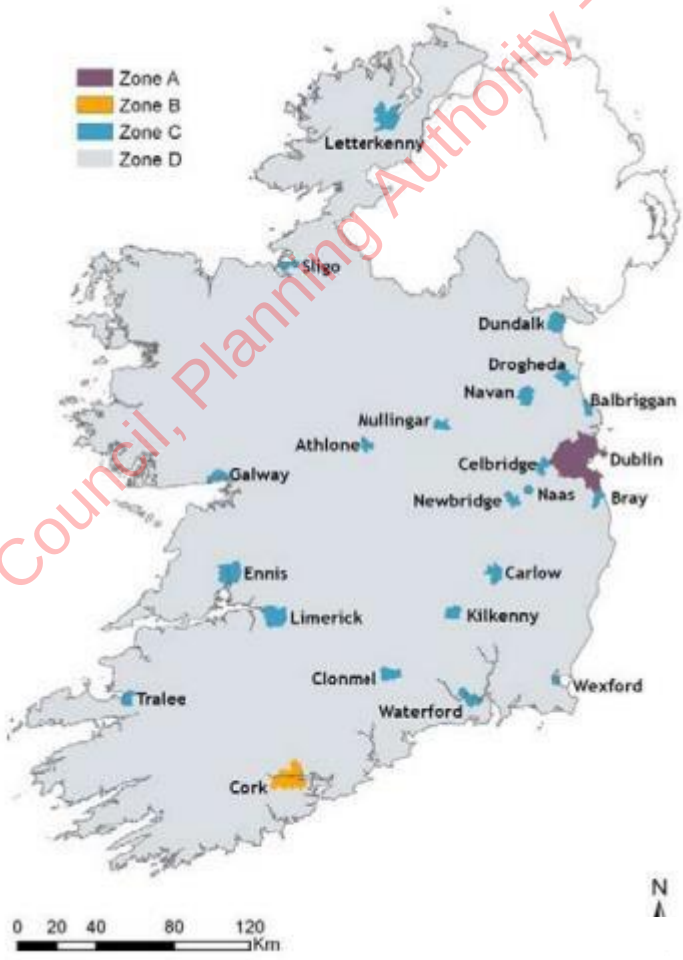

Figure 8.4 Air quality zones in Irela

8.43. The most recent published national air quality data is contained in the EPA publication "Air Quality in Ireland 2015". The zone D stations in 2015 were located at Kilkitt, Castlebar, Claremorris, Longford, Enniscorthy, Emo Court, Shannon Estuary, Mace Head and Valentia. The air quality was found to be within the applicable standards at all locations, with the exception of Ozone Concentrations. The mean concentrations >120 µg/m^3, when compared to the WHO guideline value, seven monitoring stations were above this guideline value. The AOT40 is an indicator of exposure of vegetation to ozone during the growing season, when vegetation is more susceptible to damage from pollutants.

8.44. Rural background stations are classified as remote, regional or near city depending on their proximity to urban areas. Ozone levels are higher in remote regions and tend to be highest along the western seaboard (indicated by the Galway and Kerry sites) and lower in the east of the country (indicated by the Monaghan site).

8.45. Because ozone levels in Ireland are highly influenced by transboundary sources, attainment of the Long Term Objective (LTO) and compliance with the WHO guideline value will only occur should hemispheric ozone levels reduce. This will require a European, and possibly global, effort to reduce emissions of ozone precursors.

8.46. The rural location of Hanly Quarries could be expected to have air quality characteristics similar to that of the rural monitoring station at Kilkitt, Co. Monaghan. In 2006, the annual mean concentrations measured at Kilkitt were: -

- Sulphur dioxide (SO2): 2 µg/m^3
- Nitrogen dioxide (NO2): 3 µg/m^3
- Particle Matter (PM10): 10 µg/m^3

8.47. These were comfortable within the limit values, and represent good air quality.

Ambient Air Quality

8.48. In order to protect human health, vegetation and ecosystems, EU Directives set down air quality standards in Ireland and in other Member States for a wide variety of pollutants. These pollutants are generated through fuel combustion, in space heating, traffic, electricity generation and industry and, in sufficient amounts, could affect the well-being of the areas inhabitants. The EU Directives include details regarding how ambient air quality should be monitored, assessed and managed.

8.49. In order to comply with the directives mentioned above, tl
number of atmospheric pollutants. For the purposes of mon
defined in the Air Quality Standards Regulations 2002 (SI No. 2

8.50. Roscommon is located within Zone D where air quality is currently identified as being good 5. Key issues/challenges identified in the EPA's (2016) Air Quality in Ireland 2015 report include:-

- The WHO has intimated that there is no safe limit for air pollution.
- In general, air quality in Ireland is good and compares favourably with other EU member states, largely as a result of the relative absence of large cities, weather and access to predominantly clean air masses from the southwest. However, this status is both weather dependent and a comparison, relative to European neighbours many of whom are in exceedance of EU limit values for pollutants such as particulate matter, ozone and nitrogen dioxide.
- As the improvement in the Irish economy continues, Ireland will face challenges to comply with EU legislation for pollutants emitted from car exhausts.
- Economic activity will likely be mirrored by increases in NOX emissions, particularly in urban areas.
- City centre and urban monitoring sites in Ireland are approaching EU limit values for NO2, and it is probable that Ireland will see limit value exceedances in the near future unless mitigation steps are taken.

ASSESSMENT OF POTENTIAL IMPACTS

Direct impacts

8.51. The dust that is likely to be generated by a limestone quarry operation would include fine particles of soil and rock resulting from the activities as outlined above. The dust can be described as inert and harmless in the chemical context. In particular, they would not include any of the harmful compounds as described and listed in Atmospheric Emissions by the German standard, Technical Guideline for Clean Air (Technical Instructions on Air Quality Control - TA Luft 2002).

8.52. Potential impacts will be related primarily to dust deposition arising mainly from soil handling, from mineral processing and from the movement of traffic.

8.53. The proposed operations include drilling, blasting, extractior movement, disturbance and storage of soils. These operatior dust.

8.54. With the proposed N5 constructed to the south of the p constructed the N5 will be the closest receptor to the qu

extension going to be close by a the N5 National Road the future proposed extraction is likely to be in accordance with dust level predictions assessed based on the current dust levels for existing extraction at the quarry site, and if anything future dust levels should be lower as development descends to lower depths allowing for increased attenuation by quarry walls.

8.55. It is reasonable to suggest that there will be no change anticipated from the continuation of the associated quarry operations on the site, i.e. existing dust emissions will remain the same in this area to the north of the quarry void as this is where the screening and crushing will be taking place.

8.56. Similar operations at similar distances to the site boundaries have taken place throughout the life of the quarry.

Indirect Impacts

8.57. Apart from the direct impact of the deposition of particulate material there may be an associated visual impact should fugitive dust be allowed to be generated without the implementation of dust suppression measures.

Interaction with other impacts

8.58. Interactions with other impacts associated with air quality issues have been considered. Adjacent developments could contribute to air quality issues in an accumulative manner. These include all of the operations in the limestone quarry together with adjacent agricultural activities. Adjacent agricultural activities are mainly pastoral and the creation of dust as a result these activities is expected to be insignificant. The monitoring to date has provided for monitoring from all sources including all of the existing operations in the limestone quarry.

Residual impacts

8.59. Residual impacts are those that may occur after the proposed mitigation measures have been put in place. There are no significant residual impacts predicted with respect to air quality as a result of the proposed development. The natural regeneration of ecological habitats upon cessation of operations may be considered to be a beneficial residual impact.

Human Health

8.60. Human health has the potential to be impacted upon by environmental vectors (i.e. environmental components such as air, water or soil through v[illegible] which have the potential to cause harm, can be transported with human beings). Hazards or nuisances to human health ca these vectors arising from incompatible adjacent land uses been considered with regard to the description of: the

component; and the identification and evaluation of the likely significant environmental effects of implementing the proposed development.

Cumulative Impacts

8.61. The existing development must also be considered in association with other developments located within or close to the application site. The application site consists of an extension to the existing quarry site which is subject to rock extraction and processing. The current reserve of rock at the existing site is near exhaustion point therefore the proposed extension is required in order to serve the demand for aggregates and secure the viability of the quarry going forward. Rock will be extracted from the application site in a series of levels in tandem with the existing reserves. The proposed development will result in an increase in the footprint of the quarry; however, there will not be an increase in the extraction levels as it is proposed to keep the same level of output as current and historic levels. Therefore there will not be a combined impact on air quality as a result of the proposed development.

REMEDIAL/MITIGATION MEASURES

8.62. The following remedial/mitigation measures are continuously practiced when quarrying activities are being undertaken or will be imposed during future activities to reduce or minimise dust generated as a result of the activities listed above: -

- Site roads will be regularly cleaned and maintained as appropriate.
- Any road that has the potential to give rise to fugitive dust will be regularly watered; this system is currently in place and has been used previously during long dry spells of weather.
- On-site speed restrictions (<20 kph) will continue to be implemented in order to prevent the unnecessary generation of fugitive dust emissions. This speed restriction is currently in place.
- Vehicles transporting material with dust emission potential will be enclosed or covered with tarpaulin at all times to restrict the escape of dust.
- Public roads outside the site will be regularly inspected for cleanliness, and cleaned as necessary.
- Material handling systems and site stock piling of mate to minimize exposure to wind.

– Water sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.

8.63. The assessment determined that the impact on air quality in the locality will be negligible.

DO NOTHING SCENARIO

8.64. If the proposed development did not proceed there would be no additional impacts on Air and Climate and the land would remain in its current agricultural state.

9.MATERIAL ASSETS

INTRODUCTION

9.1. Material assets are generally considered to be the physical resources in the environment, which may be of human or natural origin. This chapter assesses the potential impact of the quarry extension (the "Proposed Development") on these resources within the Application Site, namely built services and infrastructure (roads and traffic) as defined in the Draft EPA EIA Guidelines (2017)[1]. The Draft EPA Advice Notes[2] adds soils, ownership and access and tourism to this list.

9.2. Material Assets can also be considered resources and amenities that are valued and intrinsic to places, including Heritage and Archaeology. However, these are individually assessed in **Chapter 11: Cultural Heritage.**

9.3. The principal material asset being assessed as part of this Environmental Impact Assessment Report (EIAR) is the existing road network. As this Proposed Development is for an extension to an existing quarry, built services and waste management will remain the same as present, the current waste management plan can be found in **Appendix 9-C.** There are no existing services that need considered within the Application Site.

9.4. In light of this, the focus of this chapter is to provide an assessment of the potential effects resulting from the generated traffic, site access proposals and the movement of loads associated with the Proposed Development. As the proposal is for an extension of the existing quarry, only the operational phase of the Development will be considered. The Proposed Development will not require any additional energy, water or other material assets. They are therefore scoped out of this assessment.

9.5. This chapter of the EIAR is supported by the following Figures and Technical Appendices:

- Appendix 9-A: Figures
  - Figure 9-1: Transport Overview Map
  - Figure 9-2: Swept Path Analysis

[1] Environmental Protection Agency (EPA) Draft Guidelines on Information to be Assessment Reports (2017) Available at: https://www.epa.ie/pubs/advice/ea/EPA%20

[2] EPA Draft Advice Notes for Preparing Environmental Impact S https://www.epa.ie/pubs/consultation/reviewofdrafteisguidelinesadvicenotes/Draft%ng%20an%20EIS.pdf

- Appendix 9-B: Junction Capacity Testing Report
- Appendix 9-C: Current Waste Management Plan

Project Description

9.6. The Proposed Development at Largan and Cuilrevagh, Elphin, County Roscommon is for an extension to the existing quarry site. The extension consists of two separately defined areas; one to the west of the existing quarry, and one to the south. The area to the west is 3.46 hectares in size and the existing ground levels vary from 116.11m AOD to 124.59m AOD. The area to the south is 5.73 hectares (5.14 hectare for the quarry extension and 0.59 hectare for the bund) in size and the existing ground levels vary from 100.14m AOD to 114.98m AOD.

9.7. For a full description of the Proposed Development and the various elements, please see **Chapter 3: Description of the Development** of this EIAR.

Site Description and Receiving Environment

9.8. The Application SIte is located in the rural townlands of Cuilreevagh and Largan in Elphin, Castlerea, Co Roscommon; c4km north of Strokestown and c.5.7km southeast of the village of Elphin. Land use within the surrounding area generally consists of agriculture, with some residences and farmsteads evident along local roads. Grange Lough is found circa 700m to the east.

9.9. The eastern boundary of the existing quarry site fronts onto a local L1410 public road from which the quarry is accessed. The R368 Elphin to Strokestown regional road is found circa 770m to the west of the quarry and is accessed off the L1410 to both the north and south from the quarry site. The existing quarry is irregular in shape and extends over an area of c.34ha in a southwestern direction from the public road. In addition to the extraction and ancillary operations associated with quarrying, there is a bitumen plant, block making and manufacture of other concrete products facility within the quarry grounds, while offices and other structures are located in close proximity to the public road, which reduce visibility into the quarry.

9.10. The new N5 road is to be constructed close to the boundary of Area 2 (see **Figure 9-1: Appendix 9A**). The boundary of the extended quarry would be approx. 93m from the proposed road centreline and approx. 48m from the proposed land acquisition boundary (CPO).

Statement of Authority

9.11. This EIAR Chapter has been produced by the following individ

9.12. Paul Neary BA H.Dip MA MSc MIEnvSc MIAI ACIFA CEnv is dual qualified as a Chartered Environmentalist and a Licensed Archaeologist. He is a full member of the Institute of Environmental Science and has over 15 years of professional consultancy experience throughout the UK and Ireland. He has managed and produced environmental reports and chapters for large road, residential, mixed use, aggregate and energy projects in that time.

9.13. Michael McGhee BSc TechIOA of Neo Environmental. Having completed a civil engineering degree in 2012, Michael has worked on over 1GW of solar farm planning applications, wind farms, quarry developments, large residential and mixed-use projects and commercial developments across the UK and Ireland.

Consultation

9.14. Please include the following table to detail all consultee responses received relevant to your topic and details of any further consultations undertaken.

Table 9-1: List of Consultations with Relevant Bodies

Consultee & Date	Summary of Response	Addressed within EIAR
Mary Grier, Senior Planner, (Various emails and conversations)	Requested that a cumulative assessment with the existing quarry is undertaken. Detail in how traffic generation numbers relate to the volume of extraction proposed.	Yes

LEGISLATION, POLICY & GUIDANCE

9.15. The Proposed Development has been assessed against existing national, regional and local policies and guidance. The assessment has been collated and considered based upon the following legislation, planning policy and guidance:

National Policies & Guidance

Traffic and Transport

9.16. This Environmental Impact Assessment Report (EIAR) Cl
considered based on the following legislative and guidance c

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2017 - DRAFT)[3]
- Guidelines for the Environmental Assessment of Road Traffic[4]
- Spatial Planning and National Roads Guidelines for Planning Authorities[5]
- National Roads Authority (NRA), Traffic and Transport Assessment Guidelines[6];
- Design Manual for Roads and Bridges[7]; and
- Transport Infrastructure Ireland (TII) Publications, online suite of Standards and Technical publications related to national road and light rail networks in Ireland[8].

Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2017 - DRAFT)

9.17. In accordance with the guidelines, categories addressed include the following:

- Construction Phase
- Operational Phase
- Unplanned events (i.e. Accidents)

9.18. The guidelines state:

"Effects on traffic due to an individual industrial project may be acceptable however it may be necessary to assess the cumulative impacts taking account of traffic generated by other permitted or planned projects."

[3] Environmental Protection Agency (2017), Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, Found at http://www.epa.ie/pubs/advice/ea/EPA%20EIAR%20Guidelines.pdf

[4] Various Authors. 1992. Guidelines for the Environmental Assessment of Road Traffic. Institute of Environmental Management and Assessment

[5] Department of Environment, Community and Local Government (2012) Spatial Planning and National Roads Guidelines for Planning Authorities. Available at: http://www.environ.ie/sites/default/files/migrated-files/en/Publications/DevelopmentandHousing/Planning/FileDownLoad%2C29322%2(

6 National Roads Authority (2014) Traffic and Transport Assessment Guidelin library/land-use-planning/Transport-Assessment-GuidelinesMay2014.pdf

[7] National Roads Authority, The Design Manual for Roads and Bridges

[8] Transport Infrastructure Ireland, TII Publications, online suite of Standards and Te road and light rail networks in Ireland, Found here http://www.tiipublications.ie/

Spatial Planning & National Roads Guidelines for Planning Authorities

9.19. The Spatial Planning and National Roads Guidelines for Planning Authorities document ("the Spatial Planning and Roads Guidelines") sets out planning policy considerations in relation to development affecting national primary and secondary roads.

9.20. Section 3.4 of the Spatial Planning and Roads Guidelines 'Traffic and Transport Assessments (TTA)' describes a TTA as *"a methodology used to assess the transport impacts of a proposed development, incorporating any subsequent measures necessary to ensure roads and junctions and other transport infrastructure in the vicinity of the development remain fit for purpose…"*

9.21. The Spatial Planning and Roads Guidelines indicate the following:

- *"The TTA should be written as an impartial assessment of the traffic impacts of the proposed development and it should not be seen to be a "best case" promotion of the development. All impacts, whether positive or negative, should be recorded.*
- *The level of detail included within the TTA should be sufficient to enable the planning authority and those making observations on the proposed development to follow all stages of the assessment process, to know what assumptions have been made and to arrive at a similar set of results and conclusions.*
- *The TTA should assist the developer and local planning authority in deciding if any adverse traffic impact identified is significant enough to require revision of the development proposal or whether the proposed response measures are sufficient to mitigate the impact of the development on the road network to acceptable levels. This is the fundamental test and is often regarded as the main purpose of a Traffic and Transport Assessment as related to road infrastructural considerations."*

Traffic & Transport Assessment Guidelines

9.22. The Traffic and Transport Assessment Guidelines produced by the National Roads Authority ("the NRA Guidance") aims to provide a framework to promote an integrated approach to development, which ensures that proposals promote efficient use of investment in transportation infrastructure, reduce travel demand and promote road safety.

9.23. The ("the NRA Guidance") states:

"A Traffic and Transport Assessment is a comprehensive revi
impacts of a proposed development or re-development, with
adverse consequences.

It is essential that the developer or promoter should provide a full and detailed assessment of how the trips to and from the development might affect the transport network. The assessment should be an impartial description of the impacts of the proposed development and should outline both its positive and negative aspects."

9.24. This EIAR chapter will take into account parts of the NRA Guidance which are suitable for this project, namely to include details of the existing conditions and issues relating to the Proposed Development.

Review of County Development Plan Policy

Roscommon County Development Plan (CDP)

9.25. The Roscommon Development Plan 2014 – 2020[9] ("the CDP") sets out the vision, aims, goals and strategy for the county over the plan period. Chapter 4 'Infrastructure' and Chapter 9 'Development Management Guidelines and Standards' contain policies in relation to transport and access across the County. Much of the emphasis of these policies is to promote sustainable transport measures for new developments.

9.26. Paragraph 9.5.1 of Chapter 9 specifically relates to access to sites which is particularly relevant to this development. It states:

"New access arrangements serving rural developments (of all types) and the associated necessity to provide adequate sight lines in the interests of traffic safety requires careful consideration. The Council will require substantiated proof that safe unimpeded sight lines, appropriate to the road classification concerned can be permanently achieved in relation to all new developments as well as further development of existing operations. A legally binding agreement shall be signed by both parties where there is a transfer of land or the physical movement of a boundary is required to achieve the required sightlines. In all other instances a signed letter from the accommodating landowner to the planning permission applicant shall suffice. The creation of new entrance and sight line provision has the potential to disturb existing roadside arrangements. This can result in undue visual imposition on existing roadside boundaries and can result in a jarring punctuation of the rural roadscape."

9.27. The Proposed Quarry extension proposes to use the existing quarry access point and no changes to this will be made.

9 Roscommon County Council. Roscommon County Development Plan 2014 – 2020. A
http://www.roscommoncoco.ie/en/Services/Planning/Plans/County_Development_Pl

METHODOLOGY

Desk Based Assessment

9.28. Traffic count data on the surrounding roads was retrieved from TII traffic data site[10] for roads local to the development. No Automatic Transport Count (ATC) surveys were conducted on the surrounding roads as it was clear that the quarry traffic would take up a significant percentage of the road usage of the local access road where the quarry access is located. Therefore, it was decided to look at the two closest junctions where traffic would be generated and assess the impact on them.

9.29. The expected Heavy Good Vehicle (HGV) volumes are based on best estimates on existing quarry data and are based on the peak period of the year.

Field Surveys

9.30. Manual traffic counts were taken at two identified junctions in June 2017, the purpose of this was to enable a baseline for which additional quarry traffic could be added. The traffic counts were taken between 0800 and 0900 on a Friday morning. The counts give a robust representational view of the traffic flows experienced on the network at peak times for a typical weekday scenario.

Study Area

9.31. The study area for this project includes the local roads and out to where they connect to the R368. It is thought that the main impact on the local transport network would take place within these roads.

Assessment Limitations

9.32. The traffic counts taken during 2017 include existing traffic movements already associated with the quarry. Predicted traffic movements following expansion also include existing traffic associated with the quarry. In order to provide a robust, conservative assessment of junction capacities, all predicted traffic movements have been added to each junction, without subtraction of existing traffic movements.

9.33. The new N5 has not been built yet and this will have an impact on traffic on the local roads due to how traffic interacts with it.

[10] Transport Infrastructure Ireland, Traffic Data Site, Found at https://www maintenance/traffic-count-data/

Evaluation Methods

9.34. The Guidelines for the Environmental Assessment of Road Traffic identify groups and special interests which should be considered:

- Private and commercial vehicle users;
- Users and operators of public transport;
- People walking; and
- People cycling.

9.35. Categories of receptor sensitivity have been defined from the principles set out in the Guidelines for the Environmental Assessment of Road Traffic, and include the following:

- The need to identify particular groups or locations which may be sensitive to changes in traffic conditions;
- The list of affected groups and special interests set out in the guidance;
- The identification of links or locations where it is felt that specific environmental problems may occur; and
- Such locations *"… would include accident black spots, conservation areas, hospitals, links with high pedestrian flows etc."*

9.36. These categories have been used to outline in broad terms the sensitivity of receptors to traffic for the categories of impact assessed in this chapter. Although assessed in detail, each receptor assessed will have a different sensitivity to each specific impact, in relation to severance, pedestrian amenity, fear and intimidation, pedestrian and driver delay, accidents and safety, hazardous loads.

Impact Assessment Methods

9.37. The potential effects of the traffic generated by the Proposed Development have been assessed with reference to the 'Guidelines for the Environmental Assessment of Road Traffic' (EART, 1992) published by the Institute of Environmental Management and Assessment (IEMA).

9.38. The expected traffic generation for the operation and d
Proposed Development have been considered. However, co
considered as the original quarry infrastructure will be used

9.39. The IEMA Guidance lists the following transport-related environmental impacts (in addition to those such as noise and vibration, and air quality covered in separate sections of this report):

- Severance;
- Driver Delay;
- Pedestrian Delay;
- Pedestrian Amenity;
- Fear and Intimidation;
- Accidents and Safety; and
- Hazardous Loads.

9.40. The IEMA Guidelines for the Environmental Assessment of Road Traffic (EART) sets out the broad principles of how to assess the magnitude of effect for each category. This is summarised in the following paragraphs.

9.41. Severance – The guidance states that *"severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery."* Furthermore, *"Changes in traffic flow of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' changes in severance respectively"*. However, the guidance acknowledges that the measurement and prediction of severance is difficult. The assessment of severance pays full regard to specific local conditions, in particular the location of pedestrian routes to key local facilities and whether crossing facilities are provided.

9.42. Volume 11, Section 3, Part 8, Chapter 6 of the Design Manual for Roads and Bridges entitled 'Pedestrians and Others and Community Effects' provides further guidance on this aspect of New Severance. It states that new severance should be described in terms of "Slight", *"Moderate"* or *"Severe"* and that these categories *"… should be coupled with an estimate of the numbers of people affected, their location and the community facilities from which they are severed."* In addition (with specific reference to relief from existing severance), it acknowledges that there is a traffic flow threshold below which changes in Severance are not considered significant (existing AADT (Annual Average Daily Traffic) flow below 8,000 vehicles).

9.43. Driver delay – such delays *"… are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the cc*

9.44. Pedestrian delay – *"Changes in the volume, composition or ability of people to cross roads."* The guidance sugges *judgement to determine whether pedestrian delay is a signifi*

9.45. Pedestrian amenity – broadly defined as the relative pleasantness of a journey, it is affected by traffic flow, traffic composition and pavement width / separation from traffic. The guidance suggests a tentative threshold for judging the significance of changes in pedestrian amenity of where traffic flow (or its lorry component) is halved or doubled.

9.46. Fear and intimidation – the impact of this is dependent upon the volume of traffic, its HGV composition and its proximity to people or the lack of protection caused by such factors as narrow footway widths. The guidance states that there are no commonly agreed thresholds for estimating this from known traffic and physical conditions, but thresholds are suggested which could be used. These are based on previous research and are shown in Table 9-2.

Table 9-2: Fear and Intimidation Thresholds

DEGREE OF HAZARD	AVERAGE TRAFFIC FLOW OVER 18 HR DAY – VEHICLES/HOUR 2-WAY	TOTAL 18 HOUR HGV FLOW	AVERAGE VEHICLE SPEED OVER 18 HOUR DAY – MPH
High	+1,800	+ 3,000	+ 20
Medium	1,200 – 1,800	2,000 – 3,000	15 – 20
Minor	600 – 1,200	1,000 – 2,000	10 – 15
Negligible	<600	<1,000	<10

- Note 1: Although no category is given in the guidance for flows less than the "Medium" threshold, this has been estimated and added to the table by Neo.
- Note 2: These categories of degree / magnitude of hazard have also been expressed consistently with the terms used in this assessment

9.47. Accidents and safety – the guidance suggests that *"Professional judgement will be needed to assess the implications of local circumstances, or factors, which may elevate or lessen risks of accidents, e.g. junction conflicts".*

9.48. Hazardous loads – the guidance states that the Environmental Assessment needs to clearly outline the estimated number and composition of such loads, but the analysis should reflect the nature of the load in question. The IEMA guidelines acknowledge that most developments will not result in increases in the number of movements or hazardous / dangerous loads.

9.49. The guidance makes it clear that a *"... critical feature c determining whether a given impact is significant."* Furthern *no simple rules or formulae which define thresholds of signif need for interpretation and judgement on the part of the quantified information whenever possible. Such judgement the numbers of people experiencing a change in environment*

EIA Significance of Effects

9.50. The significance of effects has been defined in accordance with the criteria provided in the EPA publication "Guidelines on the Information to be Contained in Environmental Impact Statements" as outlined within **Table 9-3** below. The importance of the attribute and the magnitude of the potential impact have been combined to identify the significance of the effect.

Table 9-3: Rating of Significant Environmental Impacts

Magnitude of Impact	Level of Significance Relative to Sensitivity of Receptor			
	High	Medium	Low	Negligible
Very High	Profound	Very Significant	Significant	Imperceptible
High	Very Significant	Significant	Moderate	Imperceptible
Medium	Significant	Moderate	Slight	Imperceptible
Low	Slight	Slight	Slight	Imperceptible
Negligible	Not Significant	Not Significant	Imperceptible	Imperceptible

BASELINE CONDITIONS

9.51. **Figure 9-1** shows the quarry and the manual traffic count locations. It is thought that most of the impact from the quarry will be on these two junctions on the L1410 and most of the assessment will focus on these.

Strategic Highway Network

9.52. A new section of the N5 is being constructed close to the quarry (see **Figure 9-1 Appendix 9A**). There is a new junction proposed onto the R368 to the west and the L1405 to the southeast. The new junctions would have been designed with the existing quarry traffic generation in place and the new quarry isn't proposin
movements from their present state.

Local Highway Network

9.53. The local road network includes the L1410, where the quarry is accessed from. Surrounding roads also include the R368 to the west, the L1405 to the east, as well as a number of other small local roads. Traffic on the L1410 is dominated by activities from the existing quarry, with very little commercial or HGV traffic other than this.

Traffic Flows

9.54. Traffic data was obtained from the Transport Infrastructure Ireland (TII) online Mapping Application, in addition to an Automatic Traffic Count (ATC) at two junctions on the L1410 that were undertaken in June 2017. The data from the ATC is included within **Appendix 9-B** whilst the traffic flows on the wider network are summarised in **Table 9-4**.

Table 9 -4 Background Peak Hour Traffic Flow Data (two-way)

SITE	ANNUAL AVERAGE DAILY TRAFFIC (AADT, 2019)	PEAK FLOW AM	PEAK FLOW PM
N61 Between Roscommon Town and Tulsk	5955	159	289
N5 between Strokestown and Longford	5295	165	427

* AADT flows for the N61 and N5 are based on data from Transport Infrastructure Ireland. Peak volume times vary; however, the worst case has been identified.

9.55. As per **Table 9.4**, it is illustrated that the background traffic flows experienced on all of the above roads are very low when compared to the theoretical flow rate of a single carriageway rural road of approximately 13,000 vehicles (AADT – average) per day as identified in DMRB TA46/97.

Accident Data

9.56. It is noted from the collision database maintained by the Road Safety Authority, between the years 2012 and 2016 (the database hasn't been updated past 2016), that there have been no collisions along the L1410. This indicates that th route has operated relatively safely during this period.

Sensitive Receptors

9.57. Whilst the site is located in a predominantly rural area, a number of receptors likely to be sensitive to traffic have been identified in the vicinity of the site. The main road which will be affected by increased traffic is the L1410 and this stretch of road and receptors on it will be the focus in this section.

9.58. Largan Farm and Milling company is likely the largest employer outside the quarry along this stretch of road. This is located around 0.3km to the north to the existing quarry. There are other various local agriculture and farm enterprises, however there are no major employers or traffic generators other than the existing quarry and Largan Farm.

9.59. Kiltrustan National School is located off the L1410 and is approximately 0.7m to the east of the Application Site, whilst the next closest schools are located in Strockestown to the south and Elphin to the north. Vehicles travelling to and from these public facilities are likely to have a high sensitivity.

9.60. There are no pedestrian facilities along this stretch of road and therefore the number of pedestrians using the route is likely to be low, however their sensitivity is likely to be High. This is the same with cyclists using the route.

POTENTIAL EFFECTS

Do Nothing Scenario

9.61. In the absence of the Proposed Development it is likely that the existing traffic levels in the surrounding road network will remain unchanged. The Application Site will continue as an existing quarry but will close years earlier if no extension is permitted.

Construction and Decommissioning Phase

9.62. The existing quarry operations are already in place, therefore there will be no construction stage whilst the decommissioning effects are expected to be dealt with in a remediation plan. The restoration plan, submitted separately, shows only minor proposal in which traffic generation is likely to be limited and not significant.

Operational Stage

9.63. The extent of extractable rock from the Proposed Devel
tonnes, whilst the lifespan of the development is expecte
tonne loads leaving the site, this amounts to approximat
project's lifespan. This assumes the same number of loads
which in reality is unlikely. The quarry also uses some of th

where load sizes differ. The construction industry is seasonal and fluctuates over the year and therefore it was thought that the best approach would be to identify a peak day for the purposes of the traffic impact assessment, based on previous experience of the quarry traffic generation.

9.64. Operational and maintenance traffic generated by the quarry in a peak day has been estimated as:

- Stone deliveries (250 Loads);
- Concrete deliveries (50 Loads);
- Block deliveries (20 Loads);
- Cement deliveries (3 Loads per day);
- Addition Articulated lorries accessing the site (27 Loads per day); and
- Staff (20 per day)

9.65. This has been broken down over a typical day and the hourly traffic generation movements can be seen in Table 9-5.

Table 9 - 5: Hourly Traffic Generation

Time	Hourly Totals	Cycles	Motor Cycles	Car Van	Car Van Towing	2 Axle Van / Lorry	Articulated Vehicle
0000 - 0100	0	0	0	0	0	0	0
0100 - 0200	0	0	0	0	0	0	0
0200 - 0300	0	0	0	0	0	0	0
0300 - 0400	0	0	0	0	0	0	0
0400 - 0500	0	0	0	0	0	0	0
0500 - 0600	0	0	0	0	0	0	0
0600 - 0700	70	0	0	10	0	0	60
0700 - 0800	68	4	0	6	0		
0800 - 0900	76	6	0	4	0		
0900 -	26	0	0	0	0		

1000							
1000 - 1100	31	0	0	0	0	0	31
1100 - 1200	39	0	0	0	0	0	39
1200 - 1300	31	0	0	0	0	0	31
1300 - 1400	42	0	0	0	0	0	42
1400 - 1500	40	0	0	0	0	0	40
1500 - 1600	63	0	0	0	0	0	63
1600 - 1700	78	0	0	10	0	0	68
1700 - 1800	72	2	0	6	0	0	64
1800 - 1900	55	6	0	4	0	0	45
1900 - 2000	35	2	0	0	0	0	33
2000 - 2100	33	0	0	0	0	0	33
2100 - 2200	0	0	0	0	0	0	0
2200 - 2300	0	0	0	0	0	0	0
2300 - 0000	0	0	0	0	0	0	0
0700 - 1900	**622**	**18**	**0**	**30**	**0**	**0**	**574**
0600 - 2200	**760**	**20**	**0**	**40**	**0**	**0**	**700**
0600 - 0000	**760**	**20**	**0**	**40**	**0**	**0**	**700**
0000 - 0000	**760**	**20**	**0**	**40**	**0**	**0**	**700**

Traffic Effects

9.66. The EART Guidelines suggests that, to help with assessment, part of a screening process. These rules state that a road s assessment if the total increase in traffic flows or HGV flows roads should be considered where traffic has increased by 1(

9.67. No Automatic Transport Count (ATC) surveys were conducted on the surrounding roads as it was clear that the quarry traffic would take up a significant percentage of the road usage of the local access road where the quarry access is located. Therefore, it was decided to look at the two closest junctions where traffic would be generated and assess the impact on them (see Figure 9-1: Appendix 9A).

9.68. Due to COVID-19 restrictions, it was not possible to obtain a representative traffic count along Junctions A and B in 2020. Therefore, in order to gain an insight into the background traffic flows on the local road network, manual traffic counts taken in 2017 were used. The traffic counts were taken at the reported peak time along the local road network, between 0800 and 0900 on a Friday morning. The counts give a representational view of the traffic flows experienced on the network at peak time for a typical weekday scenario.

9.69. Current likely traffic flows were obtained by factoring up the 2017 data using central growth factors for Co. Roscommon, as specified in TII Guideline document PE-PAG-02017 of May 2019. Similarly, the future design year scenarios (5 years after opening and 15 years after opening) for 2025 and 2035 were obtained using TII central growth factors.

9.70. The traffic counts taken during 2017 include existing traffic movements already associated with the quarry. Predicted traffic movements following expansion also include existing traffic associated with the quarry. In order to provide a robust, conservative assessment of junction capacities, all predicted traffic movements have been added to each junction, without subtraction of existing traffic movements.

9.71. Predicted traffic was split into arrivals and departures in proportion to existing traffic flow proportions at each junction. It should also be noted that 50% of predicted traffic was assumed to travel through each junction.

9.72. A series of *JUNCTIONS 9* capacity assessments were carried out for each scenario to provide a basis to assess the impact the expanded quarry may have in 2020 or in future design years. A total of three capacity assessments were carried out at each junction. These were carried out for the 2020 baseline year and for future design years 2025 and 2035.

9.73. From the analysis carried out on the junctions, the following minimum capacities were observed:

- Junction A will have a minimum available capacity of 62% in the 2035 design year with the quarry in operation.
- Junction B will have a minimum available capacity of 72% in the 2035 design year with the quarry in operation.

9.74. From the results of the analysis it is evident that the proj accommodated on the local road network without excessi arm at peak times.

9.75. Due to the low usage of the existing capacity at the local junctions the impacts on these due to the quarry will be low to negligible. Given that the L1410 is rural and likely to have a low AADT rate, the significance of any change is likely to be **High**, which results in effects which are considered to be **slight to not significant**. It should also be noted that the quarry extension will not result in a significant increase traffic flow to what is presently agreed for the existing quarry.

Severance

9.76. Severance refers to the level of crossing difficulty for pedestrians, which may be caused by the introduction of additional traffic. The threshold for assessing severance given in EART is a 30% increase in traffic results in a 'slight' severance impact.

9.77. As can be seen in **Appendix 9-B**, the HGV traffic impact remains just below the 30% threshold, despite the very low background flows. The staff vehicle traffic increases by more than 30% along the L1410 during the peak periods. However, the L1410 has no pedestrian facilities or infrastructure in the vicinity of the site and consequently pedestrians are not expected along the L1410 and are therefore not a receptor in this location.

9.78. Pedestrian activity in the vicinity of the site is extremely low, primarily due to the remote nature of the site and a lack of dedicated pedestrian infrastructure on the surrounding road network. Therefore, the impact from staff travel and from HGV traffic on severance is considered to be **low** which will result in a **Slight Adverse effect**.

Accidents and Road Safety

Staff Traffic

9.79. Staff will generally travel within the normal network peak hours and at times when background traffic flows are likely to be relatively high. Any increase in traffic can result in the potential for accidents to rise, most notably at the site access junction. There have been no accidents along the L1410 in the five years assessed previously (up to 2016), which indicates that the road network along the haul route has operated relatively safely during this period. Therefore, the impact from staff travel on road safety is considered to be **low to negligible, resulting in a slight to not significant effect.**

HGV Traffic

9.80. There is no proposal for a significant increase in traffic from the existing quarry development out with normal company growth. The N5 [illegible] increase the amount of traffic short term, however its likely [illegible] normal peak period for the quarry, however there is still [illegible] number of movements. Therefore, the result of the impac[illegible] **negligible, resulting in a slight to not significant effect.**

Driver Delay

Staff Traffic

9.81. EART Guidelines note that driver delay can occur at several points on the network, although the effects are only likely to be significant when the traffic on the highway network is predicted to be at or close to the capacity of the system. Traffic delays to non-development traffic can occur at several points along the network surrounding the site:

- At the site entrance, where additional turning movements occur;
- On the highways passing the site, where there is likely to be additional traffic and the flow might be affected by additional parked cars;
- At other key intersections along the highway, which might be affected by increased traffic; and
- At side roads where the ability to find gaps in traffic may be reduced, thereby lengthening delays.

9.82. EART states that driver delay can increase at the site entrance where there is an increase in on-street parking. Parking for staff will be provided entirely within the existing quarry and therefore background traffic on the L1410 waiting at the site access would not be affected. However, there may be a slight delay as vehicles enter the site, particularly during peak times.

9.83. In addition, driver delay can also increase due to increased traffic flows through junctions. The amount of staff traffic is low and therefore will have a low impact and a **not significant** effect.

HGV Traffic

9.84. The Junction analysis in **Appendix 9-B** assesses the reserve capacity at the 2 closest junctions to the Development where all HGV traffic will be routed through whilst connecting to the wider road network.

9.85. The remaining capacity in the 2035 design year with the quarry extension in operation is 62% at Junction A and 72% at Junction B. This was a very conservative assessment and it still shows a high capacity at the local junctions.

9.86. The potential effect of the resultant increases in driver dela
not significant due to the high capacity left at each of the jun

Pedestrian Amenity, Fear and Intimidation

9.87. An identified area of potential environmental impact, as outlined within EART, is pedestrian amenity, fear and intimidation which are affected by the perceived traffic flow, traffic composition, footway width and its separation away from the carriageway.

9.88. Due to the Proposed Development's remote nature, there are no dedicated pedestrian facilities on the surrounding road network; as a result, pedestrian activity is very low. Therefore, the effect from staff travel and from HGV traffic on pedestrian amenity, fear and intimidation is considered to be **negligible** and therefore an **Imperceptible effect.**

MITIGATION MEASURES

9.89. Having reviewed the surrounding road environment and the impact the quarry has on the traffic conditions; the following mitigation measures were deemed necessary. Hanly Quarries has confirmed that they have implemented these policies already:

- Staggered approach to HGV traffic leaving the quarry during peak times. Queuing at local junctions to be avoided.
- Regular maintenance and servicing of vehicles.
- To control, prevent and minimise dirt on the access route and emissions of dust and other airborne contaminants during the construction works, the following mitigation measures will also be implemented (some have already been implemented within the existing quarry):
  - Damping down site roads to minimise dust emissions;
- Wheels should be cleaned on all vehicles leaving the quarry site. There is a dedicated wheel cleaning operation near to the site entrance. The water used for the wheel washing is directed to a detention pond where it is recycled and pumped back into the wheel washing equipment.
- In order to limit the potential impact on local residential dwellings and neighbouring villages, Hanly Quarries operate within designated times. It is company policy for hauling of materials to only operate between the h
  (Monday to Friday) and 8.00am to 14.00pm on Saturda

MITIGATION & RESIDUAL EFFECTS

9.90. Table 9-6 summarises the predicted residual impacts related to the generated traffic impacts from the Proposed Development. It should be noted that all traffic and transport impacts relate to the construction stage of the Proposed Development. The methodology section clarifies the reasons why these stages are considered.

Table 9-6: Summary of Residual Impacts

POTENTIAL IMPACT		MITIGATION	SIGNIFICANCE OF RESIDUAL EFFECTS
Traffic and Roads			
Operational Stage			
Traffic Impacts	Staff	Staff to be encouraged to vehicle share. Where possible staff will access the site outside peak times.	Slight Adverse to Not Significant
	HGVs	Deliveries to be staggered at peak times.	Slight Adverse to Not Significant
Severance	Staff	None.	Slight Adverse
	HGVs	None.	Slight Adverse
Accidents & Road Safety	Staff	Staff to be encouraged to vehicle share. Where possible staff will access the site outside peak times.	Slight Adverse to Not Significant
	HGVs	Deliveries to be staggered at peak times.	Slight Adverse to Not
Driver Delay	Staff	Staff to encouraged vehicle share.	

		Where possible staff will access the site outside peak times. Staff parking completely contained within Applaition Site.	
	HGVs	Deliveries to be staggered at peak times.	Not significant
Pedestrian Amenity, Fear & Intimidation	Staff	None.	Imperceptible
	HGVs	None.	Imperceptible

CUMULATIVE EFFECTS

9.91. As the quarry is an extension of the existing quarry operations, all of the operations have been considered together within this Chapter. There is no proposal for a significant increase in traffic from the existing quarry development out with normal company growth.

9.92. No other quarry developments were identified in the study area and therefore **no cumulative effects are anticipated.**

SUMMARY & CONCLUSION

9.93. This chapter has assessed the likely significance of effects of the Proposed Development on road traffic. As this Proposed Development is for an extension to an existing quarry, built services and waste management will remain the same as present and there are no existing services within the area of the Proposed Development. They have therefore been scoped out of this assessment.

9.94. The likely traffic generated by the Proposed Development during its operational phase has been identified and the site access proposals have b
construction stage impacts as this is an application for an
and therefore works will only involve extraction activities. Ir
effects are expected to be dealt with in a remediation pla
quarry life time. The restoration plan, submitted separately
which traffic generation is likely to be limited and not signific

9.95. The potential impacts relating to traffic, severance, accidents and road safety, driver delay and pedestrian amenity, fear and intimidation have been assessed and where the impact has been identified as **low** or **negligible**. Mitigation measures have also been considered and identified. The resulting effects are deemed to be **slight adverse** to not **significant**.

9.MATERIAL ASSETS

INTRODUCTION

9.1. Material assets are generally considered to be the physical resources in the environment, which may be of human or natural origin. This chapter assesses the potential impact of the quarry extension (the "Proposed Development") on these resources within the Application Site, namely built services and infrastructure (roads and traffic) as defined in the Draft EPA EIA Guidelines (2017)[1]. The Draft EPA Advice Notes[2] adds soils, ownership and access and tourism to this list.

9.2. Material Assets can also be considered resources and amenities that are valued and intrinsic to places, including Heritage and Archaeology. However, these are individually assessed in **Chapter 11: Cultural Heritage.**

9.3. The principal material asset being assessed as part of this Environmental Impact Assessment Report (EIAR) is the existing road network. As this Proposed Development is for an extension to an existing quarry, built services and waste management will remain the same as present, the current waste management plan can be found in **Appendix 9-C.** There are no existing services that need considered within the Application Site.

9.4. In light of this, the focus of this chapter is to provide an assessment of the potential effects resulting from the generated traffic, site access proposals and the movement of loads associated with the Proposed Development. As the proposal is for an extension of the existing quarry, only the operational phase of the Development will be considered. The Proposed Development will not require any additional energy, water or other material assets. They are therefore scoped out of this assessment.

9.5. This chapter of the EIAR is supported by the following Figures and Technical Appendices:

- Appendix 9-A: Figures
  - Figure 9-1: Transport Overview Map
  - Figure 9-2: Swept Path Analysis

[1] Environmental Protection Agency (EPA) Draft Guidelines on Information to b Assessment Reports (2017) Available at: https://www.epa.ie/pubs/advice/ea/EPA%20

[2] EPA Draft Advice Notes for Preparing Environmental Impact S https://www.epa.ie/pubs/consultation/reviewofdrafteisguidelinesadvicenotes/Draft% ng%20an%20EIS.pdf

- Appendix 9-B: Junction Capacity Testing Report
- Appendix 9-C: Current Waste Management Plan

Project Description

9.6. The Proposed Development at Largan and Cuilrevagh, Elphin, County Roscommon is for an extension to the existing quarry site. The extension consists of two separately defined areas; one to the west of the existing quarry, and one to the south. The area to the west is 3.46 hectares in size and the existing ground levels vary from 116.11m AOD to 124.59m AOD. The area to the south is 5.73 hectares (5.14 hectare for the quarry extension and 0.59 hectare for the bund) in size and the existing ground levels vary from 100.14m AOD to 114.98m AOD.

9.7. For a full description of the Proposed Development and the various elements, please see **Chapter 3: Description of the Development** of this EIAR.

Site Description and Receiving Environment

9.8. The Application SIte is located in the rural townlands of Cuilreevagh and Largan in Elphin, Castlerea, Co Roscommon; c4km north of Strokestown and c.5.7km southeast of the village of Elphin. Land use within the surrounding area generally consists of agriculture, with some residences and farmsteads evident along local roads. Grange Lough is found circa 700m to the east.

9.9. The eastern boundary of the existing quarry site fronts onto a local L1410 public road from which the quarry is accessed. The R368 Elphin to Strokestown regional road is found circa 770m to the west of the quarry and is accessed off the L1410 to both the north and south from the quarry site. The existing quarry is irregular in shape and extends over an area of c.34ha in a southwestern direction from the public road. In addition to the extraction and ancillary operations associated with quarrying, there is a bitumen plant, block making and manufacture of other concrete products facility within the quarry grounds, while offices and other structures are located in close proximity to the public road, which reduce visibility into the quarry.

9.10. The new N5 road is to be constructed close to the boundary of Area 2 (see **Figure 9-1: Appendix 9A**). The boundary of the extended quarry would be approx. 93m from the proposed road centreline and approx. 48m from the proposed land acquisition boundary (CPO).

Statement of Authority

9.11. This EIAR Chapter has been produced by the following individ

9.12. Paul Neary BA H.Dip MA MSc MIEnvSc MIAI ACIFA CEnv is dual qualified as a Chartered Environmentalist and a Licensed Archaeologist. He is a full member of the Institute of Environmental Science and has over 15 years of professional consultancy experience throughout the UK and Ireland. He has managed and produced environmental reports and chapters for large road, residential, mixed use, aggregate and energy projects in that time.

9.13. Michael McGhee BSc TechIOA of Neo Environmental. Having completed a civil engineering degree in 2012, Michael has worked on over 1GW of solar farm planning applications, wind farms, quarry developments, large residential and mixed-use projects and commercial developments across the UK and Ireland.

Consultation

9.14. Please include the following table to detail all consultee responses received relevant to your topic and details of any further consultations undertaken.

Table 9-1: List of Consultations with Relevant Bodies

Consultee & Date	Summary of Response	Addressed within EIAR
Mary Grier, Senior Planner, (Various emails and conversations)	Requested that a cumulative assessment with the existing quarry is undertaken. Detail in how traffic generation numbers relate to the volume of extraction proposed.	Yes

LEGISLATION, POLICY & GUIDANCE

9.15. The Proposed Development has been assessed against existing national, regional and local policies and guidance. The assessment has been collated and considered based upon the following legislation, planning policy and guidance:

National Policies & Guidance

Traffic and Transport

9.16. This Environmental Impact Assessment Report (EIAR) Cl
considered based on the following legislative and guidance c

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2017 - DRAFT)[3]
- Guidelines for the Environmental Assessment of Road Traffic[4]
- Spatial Planning and National Roads Guidelines for Planning Authorities[5]
- National Roads Authority (NRA), Traffic and Transport Assessment Guidelines[6];
- Design Manual for Roads and Bridges[7]; and
- Transport Infrastructure Ireland (TII) Publications, online suite of Standards and Technical publications related to national road and light rail networks in Ireland[8].

Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2017 - DRAFT)

9.17. In accordance with the guidelines, categories addressed include the following:

- Construction Phase
- Operational Phase
- Unplanned events (i.e. Accidents)

9.18. The guidelines state:

"Effects on traffic due to an individual industrial project may be acceptable however it may be necessary to assess the cumulative impacts taking account of traffic generated by other permitted or planned projects."

[3] Environmental Protection Agency (2017), Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, Found at http://www.epa.ie/pubs/advice/ea/EPA%20EIAR%20Guidelines.pdf

[4] Various Authors. 1992. Guidelines for the Environmental Assessment of Road Traffic. Institute of Environmental Management and Assessment

[5] Department of Environment, Community and Local Government (2012) Spatial Planning and National Roads Guidelines for Planning Authorities. Available at: http://www.environ.ie/sites/default/files/migrated-files/en/Publications/DevelopmentandHousing/Planning/FileDownLoad%2C29322%2(

6 National Roads Authority (2014) Traffic and Transport Assessment Guidelin library/land-use-planning/Transport-Assessment-GuidelinesMay2014.pdf

[7] National Roads Authority, The Design Manual for Roads and Bridges

[8] Transport Infrastructure Ireland, TII Publications, online suite of Standards and Te road and light rail networks in Ireland, Found here http://www.tiipublications.ie/

Spatial Planning & National Roads Guidelines for Planning Authorities

9.19. The Spatial Planning and National Roads Guidelines for Planning Authorities document ("the Spatial Planning and Roads Guidelines") sets out planning policy considerations in relation to development affecting national primary and secondary roads.

9.20. Section 3.4 of the Spatial Planning and Roads Guidelines 'Traffic and Transport Assessments (TTA)' describes a TTA as *"a methodology used to assess the transport impacts of a proposed development, incorporating any subsequent measures necessary to ensure roads and junctions and other transport infrastructure in the vicinity of the development remain fit for purpose…"*

9.21. The Spatial Planning and Roads Guidelines indicate the following:

- *"The TTA should be written as an impartial assessment of the traffic impacts of the proposed development and it should not be seen to be a "best case" promotion of the development. All impacts, whether positive or negative, should be recorded.*
- *The level of detail included within the TTA should be sufficient to enable the planning authority and those making observations on the proposed development to follow all stages of the assessment process, to know what assumptions have been made and to arrive at a similar set of results and conclusions.*
- *The TTA should assist the developer and local planning authority in deciding if any adverse traffic impact identified is significant enough to require revision of the development proposal or whether the proposed response measures are sufficient to mitigate the impact of the development on the road network to acceptable levels. This is the fundamental test and is often regarded as the main purpose of a Traffic and Transport Assessment as related to road infrastructural considerations."*

Traffic & Transport Assessment Guidelines

9.22. The Traffic and Transport Assessment Guidelines produced by the National Roads Authority ("the NRA Guidance") aims to provide a framework to promote an integrated approach to development, which ensures that proposals promote efficient use of investment in transportation infrastructure, reduce travel demand and promote road safety.

9.23. The ("the NRA Guidance") states:

"A Traffic and Transport Assessment is a comprehensive revi
impacts of a proposed development or re-development, with
adverse consequences.

It is essential that the developer or promoter should provide a full and detailed assessment of how the trips to and from the development might affect the transport network. The assessment should be an impartial description of the impacts of the proposed development and should outline both its positive and negative aspects."

9.24. This EIAR chapter will take into account parts of the NRA Guidance which are suitable for this project, namely to include details of the existing conditions and issues relating to the Proposed Development.

Review of County Development Plan Policy

Roscommon County Development Plan (CDP)

9.25. The Roscommon Development Plan 2014 – 2020[9] ("the CDP") sets out the vision, aims, goals and strategy for the county over the plan period. Chapter 4 'Infrastructure' and Chapter 9 'Development Management Guidelines and Standards' contain policies in relation to transport and access across the County. Much of the emphasis of these policies is to promote sustainable transport measures for new developments.

9.26. Paragraph 9.5.1 of Chapter 9 specifically relates to access to sites which is particularly relevant to this development. It states:

"New access arrangements serving rural developments (of all types) and the associated necessity to provide adequate sight lines in the interests of traffic safety requires careful consideration. The Council will require substantiated proof that safe unimpeded sight lines, appropriate to the road classification concerned can be permanently achieved in relation to all new developments as well as further development of existing operations. A legally binding agreement shall be signed by both parties where there is a transfer of land or the physical movement of a boundary is required to achieve the required sightlines. In all other instances a signed letter from the accommodating landowner to the planning permission applicant shall suffice. The creation of new entrance and sight line provision has the potential to disturb existing roadside arrangements. This can result in undue visual imposition on existing roadside boundaries and can result in a jarring punctuation of the rural roadscape."

9.27. The Proposed Quarry extension proposes to use the existing quarry access point and no changes to this will be made.

9 Roscommon County Council. Roscommon County Development Plan 2014 – 2020. A
http://www.roscommoncoco.ie/en/Services/Planning/Plans/County_Development_Pl

METHODOLOGY

Desk Based Assessment

9.28. Traffic count data on the surrounding roads was retrieved from TII traffic data site[10] for roads local to the development. No Automatic Transport Count (ATC) surveys were conducted on the surrounding roads as it was clear that the quarry traffic would take up a significant percentage of the road usage of the local access road where the quarry access is located. Therefore, it was decided to look at the two closest junctions where traffic would be generated and assess the impact on them.

9.29. The expected Heavy Good Vehicle (HGV) volumes are based on best estimates on existing quarry data and are based on the peak period of the year.

Field Surveys

9.30. Manual traffic counts were taken at two identified junctions in June 2017, the purpose of this was to enable a baseline for which additional quarry traffic could be added. The traffic counts were taken between 0800 and 0900 on a Friday morning. The counts give a robust representational view of the traffic flows experienced on the network at peak times for a typical weekday scenario.

Study Area

9.31. The study area for this project includes the local roads and out to where they connect to the R368. It is thought that the main impact on the local transport network would take place within these roads.

Assessment Limitations

9.32. The traffic counts taken during 2017 include existing traffic movements already associated with the quarry. Predicted traffic movements following expansion also include existing traffic associated with the quarry. In order to provide a robust, conservative assessment of junction capacities, all predicted traffic movements have been added to each junction, without subtraction of existing traffic movements.

9.33. The new N5 has not been built yet and this will have an impact on traffic on the local roads due to how traffic interacts with it.

[10] Transport Infrastructure Ireland, Traffic Data Site, Found at https://www maintenance/traffic-count-data/

Evaluation Methods

9.34. The Guidelines for the Environmental Assessment of Road Traffic identify groups and special interests which should be considered:

- Private and commercial vehicle users;
- Users and operators of public transport;
- People walking; and
- People cycling.

9.35. Categories of receptor sensitivity have been defined from the principles set out in the Guidelines for the Environmental Assessment of Road Traffic, and include the following:

- The need to identify particular groups or locations which may be sensitive to changes in traffic conditions;
- The list of affected groups and special interests set out in the guidance;
- The identification of links or locations where it is felt that specific environmental problems may occur; and
- Such locations *"… would include accident black spots, conservation areas, hospitals, links with high pedestrian flows etc."*

9.36. These categories have been used to outline in broad terms the sensitivity of receptors to traffic for the categories of impact assessed in this chapter. Although assessed in detail, each receptor assessed will have a different sensitivity to each specific impact, in relation to severance, pedestrian amenity, fear and intimidation, pedestrian and driver delay, accidents and safety, hazardous loads.

Impact Assessment Methods

9.37. The potential effects of the traffic generated by the Proposed Development have been assessed with reference to the 'Guidelines for the Environmental Assessment of Road Traffic' (EART, 1992) published by the Institute of Environmental Management and Assessment (IEMA).

9.38. The expected traffic generation for the operation and d
Proposed Development have been considered. However, co
considered as the original quarry infrastructure will be used

9.39. The IEMA Guidance lists the following transport-related environmental impacts (in addition to those such as noise and vibration, and air quality covered in separate sections of this report):

- Severance;
- Driver Delay;
- Pedestrian Delay;
- Pedestrian Amenity;
- Fear and Intimidation;
- Accidents and Safety; and
- Hazardous Loads.

9.40. The IEMA Guidelines for the Environmental Assessment of Road Traffic (EART) sets out the broad principles of how to assess the magnitude of effect for each category. This is summarised in the following paragraphs.

9.41. Severance – The guidance states that *"severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery."* Furthermore, *"Changes in traffic flow of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' changes in severance respectively"*. However, the guidance acknowledges that the measurement and prediction of severance is difficult. The assessment of severance pays full regard to specific local conditions, in particular the location of pedestrian routes to key local facilities and whether crossing facilities are provided.

9.42. Volume 11, Section 3, Part 8, Chapter 6 of the Design Manual for Roads and Bridges entitled 'Pedestrians and Others and Community Effects' provides further guidance on this aspect of New Severance. It states that new severance should be described in terms of "Slight", *"Moderate"* or *"Severe"* and that these categories *"… should be coupled with an estimate of the numbers of people affected, their location and the community facilities from which they are severed."* In addition (with specific reference to relief from existing severance), it acknowledges that there is a traffic flow threshold below which changes in Severance are not considered significant (existing AADT (Annual Average Daily Traffic) flow below 8,000 vehicles).

9.43. Driver delay – such delays *"… are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the cc*

9.44. Pedestrian delay – *"Changes in the volume, composition or ability of people to cross roads."* The guidance sugges *judgement to determine whether pedestrian delay is a signifi*

9.45. Pedestrian amenity – broadly defined as the relative pleasantness of a journey, it is affected by traffic flow, traffic composition and pavement width / separation from traffic. The guidance suggests a tentative threshold for judging the significance of changes in pedestrian amenity of where traffic flow (or its lorry component) is halved or doubled.

9.46. Fear and intimidation – the impact of this is dependent upon the volume of traffic, its HGV composition and its proximity to people or the lack of protection caused by such factors as narrow footway widths. The guidance states that there are no commonly agreed thresholds for estimating this from known traffic and physical conditions, but thresholds are suggested which could be used. These are based on previous research and are shown in Table 9-2.

Table 9-2: Fear and Intimidation Thresholds

Degree of Hazard	Average Traffic Flow over 18 hr day – vehicles/hour 2-way	Total 18 hour HGV flow	Average Vehicle Speed over 18 hour day – mph
High	+1,800	+ 3,000	+ 20
Medium	1,200 – 1,800	2,000 – 3,000	15 – 20
Minor	600 – 1,200	1,000 – 2,000	10 – 15
Negligible	<600	<1,000	<10

- Note 1: Although no category is given in the guidance for flows less than the "Medium" threshold, this has been estimated and added to the table by Neo.
- Note 2: These categories of degree / magnitude of hazard have also been expressed consistently with the terms used in this assessment

9.47. Accidents and safety – the guidance suggests that *"Professional judgement will be needed to assess the implications of local circumstances, or factors, which may elevate or lessen risks of accidents, e.g. junction conflicts".*

9.48. Hazardous loads – the guidance states that the Environmental Assessment needs to clearly outline the estimated number and composition of such loads, but the analysis should reflect the nature of the load in question. The IEMA guidelines acknowledge that most developments will not result in increases in the number of movements or hazardous / dangerous loads.

9.49. The guidance makes it clear that a *"… critical feature c determining whether a given impact is significant."* Furthern *no simple rules or formulae which define thresholds of signif need for interpretation and judgement on the part of the quantified information whenever possible. Such judgement the numbers of people experiencing a change in environment*

EIA Significance of Effects

9.50. The significance of effects has been defined in accordance with the criteria provided in the EPA publication "Guidelines on the Information to be Contained in Environmental Impact Statements" as outlined within **Table 9-3** below. The importance of the attribute and the magnitude of the potential impact have been combined to identify the significance of the effect.

Table 9-3: Rating of Significant Environmental Impacts

Magnitude of Impact	Level of Significance Relative to Sensitivity of Receptor			
	High	Medium	Low	Negligible
Very High	Profound	Very Significant	Significant	Imperceptible
High	Very Significant	Significant	Moderate	Imperceptible
Medium	Significant	Moderate	Slight	Imperceptible
Low	Slight	Slight	Slight	Imperceptible
Negligible	Not Significant	Not Significant	Imperceptible	Imperceptible

BASELINE CONDITIONS

9.51. **Figure 9-1** shows the quarry and the manual traffic count locations. It is thought that most of the impact from the quarry will be on these two junctions on the L1410 and most of the assessment will focus on these.

Strategic Highway Network

9.52. A new section of the N5 is being constructed close to the quarry (see **Figure 9-1 Appendix 9A**). There is a new junction proposed onto the R368 to the west and the L1405 to the southeast. The new junctions would have been designed with the existing quarry traffic generation in place and the new quarry isn't proposin movements from their present state.

Local Highway Network

9.53. The local road network includes the L1410, where the quarry is accessed from. Surrounding roads also include the R368 to the west, the L1405 to the east, as well as a number of other small local roads. Traffic on the L1410 is dominated by activities from the existing quarry, with very little commercial or HGV traffic other than this.

Traffic Flows

9.54. Traffic data was obtained from the Transport Infrastructure Ireland (TII) online Mapping Application, in addition to an Automatic Traffic Count (ATC) at two junctions on the L1410 that were undertaken in June 2017. The data from the ATC is included within **Appendix 9-B** whilst the traffic flows on the wider network are summarised in **Table 9-4**.

Table 9 -4 Background Peak Hour Traffic Flow Data (two-way)

SITE	ANNUAL AVERAGE DAILY TRAFFIC (AADT, 2019)	PEAK FLOW AM	PEAK FLOW PM
N61 Between Roscommon Town and Tulsk	5955	159	289
N5 between Strokestown and Longford	5295	165	427

* AADT flows for the N61 and N5 are based on data from Transport Infrastructure Ireland. Peak volume times vary; however, the worst case has been identified.

9.55. As per **Table 9.4**, it is illustrated that the background traffic flows experienced on all of the above roads are very low when compared to the theoretical flow rate of a single carriageway rural road of approximately 13,000 vehicles (AADT – average) per day as identified in DMRB TA46/97.

Accident Data

9.56. It is noted from the collision database maintained by the Road Safety Authority, between the years 2012 and 2016 (the database hasn't been updated past 2016), that there have been no collisions along the L1410. This indicates that th route has operated relatively safely during this period.

Sensitive Receptors

9.57. Whilst the site is located in a predominantly rural area, a number of receptors likely to be sensitive to traffic have been identified in the vicinity of the site. The main road which will be affected by increased traffic is the L1410 and this stretch of road and receptors on it will be the focus in this section.

9.58. Largan Farm and Milling company is likely the largest employer outside the quarry along this stretch of road. This is located around 0.3km to the north to the existing quarry. There are other various local agriculture and farm enterprises, however there are no major employers or traffic generators other than the existing quarry and Largan Farm.

9.59. Kiltrustan National School is located off the L1410 and is approximately 0.7m to the east of the Application Site, whilst the next closest schools are located in Strockestown to the south and Elphin to the north. Vehicles travelling to and from these public facilities are likely to have a high sensitivity.

9.60. There are no pedestrian facilities along this stretch of road and therefore the number of pedestrians using the route is likely to be low, however their sensitivity is likely to be High. This is the same with cyclists using the route.

POTENTIAL EFFECTS

Do Nothing Scenario

9.61. In the absence of the Proposed Development it is likely that the existing traffic levels in the surrounding road network will remain unchanged. The Application Site will continue as an existing quarry but will close years earlier if no extension is permitted.

Construction and Decommissioning Phase

9.62. The existing quarry operations are already in place, therefore there will be no construction stage whilst the decommissioning effects are expected to be dealt with in a remediation plan. The restoration plan, submitted separately, shows only minor proposal in which traffic generation is likely to be limited and not significant.

Operational Stage

9.63. The extent of extractable rock from the Proposed Devel
tonnes, whilst the lifespan of the development is expected
for restoration. Assuming 20 tonne loads leaving the site, th
loads per day over the project's lifespan. This assumes the
365 days of the year which in reality is unlikely. The quarry

for other purposes where load sizes differ. The construction industry is seasonal and fluctuates over the year, in addition, some quarry products such as lime are weather dependent. It is therefore considered that the best approach would be to identify a peak day for the purposes of the traffic impact assessment, based on previous experience of the quarry traffic generation.

9.64. Operational and maintenance traffic generated by the quarry in a peak day has been estimated as:

- Stone deliveries (250 Loads);
- Concrete deliveries (50 Loads);
- Block deliveries (20 Loads);
- Cement deliveries (3 Loads per day);
- Addition Articulated lorries accessing the site (27 Loads per day); and
- Staff (20 per day)

9.65. This has been broken down over a typical day and the hourly traffic generation movements can be seen in Table 9-5.

Table 9 - 5: Hourly Traffic Generation

Time	Hourly Totals	Cycles	Motor Cycles	Car Van	Car Van Towing	2 Axle Van / Lorry	Articulated Vehicle
0000 - 0100	0	0	0	0	0	0	0
0100 - 0200	0	0	0	0	0	0	0
0200 - 0300	0	0	0	0	0	0	0
0300 - 0400	0	0	0	0	0	0	0
0400 - 0500	0	0	0	0	0	0	0
0500 - 0600	0	0	0	0	0	0	0
0600 - 0700	70	0	0	10	0	0	60
0700 - 0800	68	4	0	6	0		
0800 - 0900	76	6	0	4	0		

0900 - 1000	26	0	0	0	0	0	26
1000 - 1100	31	0	0	0	0	0	31
1100 - 1200	39	0	0	0	0	0	39
1200 - 1300	31	0	0	0	0	0	31
1300 - 1400	42	0	0	0	0	0	42
1400 - 1500	40	0	0	0	0	0	40
1500 - 1600	63	0	0	0	0	0	63
1600 - 1700	78	0	0	10	0	0	68
1700 - 1800	72	2	0	6	0	0	64
1800 - 1900	55	6	0	4	0	0	45
1900 - 2000	35	2	0	0	0	0	33
2000 - 2100	33	0	0	0	0	0	33
2100 - 2200	0	0	0	0	0	0	0
2200 - 2300	0	0	0	0	0	0	0
2300 - 0000	0	0	0	0	0	0	0
0700 - 1900	**622**	**18**	**0**	**30**	**0**	**0**	**574**
0600 - 2200	**760**	**20**	**0**	**40**	**0**	**0**	**700**
0600 - 0000	**760**	**20**	**0**	**40**	**0**	**0**	**700**
0000 - 0000	**760**	**20**	**0**	**40**	**0**	**0**	**700**

Traffic Effects

9.66. The EART Guidelines suggests that, to help with assessment, part of a screening process. These rules state that a road s

assessment if the total increase in traffic flows or HGV flows exceeds 30%. In sensitive areas, roads should be considered where traffic has increased by 10% or more.

9.67. No Automatic Transport Count (ATC) surveys were conducted on the surrounding roads as it was clear that the quarry traffic would take up a significant percentage of the road usage of the local access road where the quarry access is located. Therefore, it was decided to look at the two closest junctions where traffic would be generated and assess the impact on them (see **Figure 9-1: Appendix 9A**).

9.68. Due to COVID-19 restrictions, it was not possible to obtain a representative traffic count along Junctions A and B in 2020. Therefore, in order to gain an insight into the background traffic flows on the local road network, manual traffic counts taken in 2017 were used. The traffic counts were taken at the reported peak time along the local road network, between 0800 and 0900 on a Friday morning. The counts give a representational view of the traffic flows experienced on the network at peak time for a typical weekday scenario.

9.69. Current likely traffic flows were obtained by factoring up the 2017 data using central growth factors for Co. Roscommon, as specified in TII Guideline document PE-PAG-02017 of May 2019. Similarly, the future design year scenarios (5 years after opening and 15 years after opening) for 2025 and 2035 were obtained using TII central growth factors.

9.70. The traffic counts taken during 2017 include existing traffic movements already associated with the quarry. Predicted traffic movements following expansion also include existing traffic associated with the quarry. In order to provide a robust, conservative assessment of junction capacities, all predicted traffic movements have been added to each junction, without subtraction of existing traffic movements.

9.71. Predicted traffic was split into arrivals and departures in proportion to existing traffic flow proportions at each junction. It should also be noted that 50% of predicted traffic was assumed to travel through each junction.

9.72. A series of *JUNCTIONS 9* capacity assessments were carried out for each scenario to provide a basis to assess the impact the expanded quarry may have in 2020 or in future design years. A total of three capacity assessments were carried out at each junction. These were carried out for the 2020 baseline year and for future design years 2025 and 2035.

9.73. From the analysis carried out on the junctions, the following minimum capacities were observed:

- Junction A will have a minimum available capacity of 62% in the 2035 design year with the quarry in operation.
- Junction B will have a minimum available capacity of 7
  the quarry in operation.

9.74. From the results of the analysis it is evident that the proposed quarry expansion can be accommodated on the local road network without excessive delays or queuing along any arm at peak times.

9.75. Due to the low usage of the existing capacity at the local junctions the impacts on these due to the quarry will be low to negligible. Given that the L1410 is rural and likely to have a low AADT rate, the significance of any change is likely to be **High**, which results in effects which are considered to be **slight to not significant**. It should also be noted that the quarry extension will not result in a significant increase traffic flow to what is presently agreed for the existing quarry.

Severance

9.76. Severance refers to the level of crossing difficulty for pedestrians, which may be caused by the introduction of additional traffic. The threshold for assessing severance given in EART is a 30% increase in traffic results in a 'slight' severance impact.

9.77. As can be seen in **Appendix 9-B**, the HGV traffic impact remains just below the 30% threshold, despite the very low background flows. The staff vehicle traffic increases by more than 30% along the L1410 during the peak periods. However, the L1410 has no pedestrian facilities or infrastructure in the vicinity of the site and consequently pedestrians are not expected along the L1410 and are therefore not a receptor in this location.

9.78. Pedestrian activity in the vicinity of the site is extremely low, primarily due to the remote nature of the site and a lack of dedicated pedestrian infrastructure on the surrounding road network. Therefore, the impact from staff travel and from HGV traffic on severance is considered to be **low** which will result in a **Slight Adverse effect**.

Accidents and Road Safety

Staff Traffic

9.79. Staff will generally travel within the normal network peak hours and at times when background traffic flows are likely to be relatively high. Any increase in traffic can result in the potential for accidents to rise, most notably at the site access junction. There have been no accidents along the L1410 in the five years assessed previously (up to 2016), which indicates that the road network along the haul route has operated relatively safely during this period. Therefore, the impact from staff travel on road safety is considered to be **low to negligible, resulting in a slight to not significant effect.**

HGV Traffic

9.80. There is no proposal for a significant increase in tra
development out with normal company growth. The N5 p
increase the amount of traffic short term, however its likel

normal peak period for the quarry, however there is still a risk to road safety from this number of movements. Therefore, the result of the impact on road safety will be **low to negligible, resulting in a slight to not significant effect.**

Driver Delay

Staff Traffic

9.81. EART Guidelines note that driver delay can occur at several points on the network, although the effects are only likely to be significant when the traffic on the highway network is predicted to be at or close to the capacity of the system. Traffic delays to non-development traffic can occur at several points along the network surrounding the site:

- At the site entrance, where additional turning movements occur;
- On the highways passing the site, where there is likely to be additional traffic and the flow might be affected by additional parked cars;
- At other key intersections along the highway, which might be affected by increased traffic; and
- At side roads where the ability to find gaps in traffic may be reduced, thereby lengthening delays.

9.82. EART states that driver delay can increase at the site entrance where there is an increase in on-street parking. Parking for staff will be provided entirely within the existing quarry and therefore background traffic on the L1410 waiting at the site access would not be affected. However, there may be a slight delay as vehicles enter the site, particularly during peak times.

9.83. In addition, driver delay can also increase due to increased traffic flows through junctions. The amount of staff traffic is low and therefore will have a low impact and a **not significant** effect.

HGV Traffic

9.84. The Junction analysis in **Appendix 9-B** assesses the reserve capacity at the 2 closest junctions to the Development where all HGV traffic will be routed through whilst connecting to the wider road network.

9.85. The remaining capacity in the 2035 design year with the c
62% at Junction A and 72% at Junction B. This was a very
still shows a high capacity at the local junctions.

9.86. The potential effect of the resultant increases in driver delay is therefore considered to be **not significant** due to the high capacity left at each of the junctions assessed.

Pedestrian Amenity, Fear and Intimidation

9.87. An identified area of potential environmental impact, as outlined within EART, is pedestrian amenity, fear and intimidation which are affected by the perceived traffic flow, traffic composition, footway width and its separation away from the carriageway.

9.88. Due to the Proposed Development's remote nature, there are no dedicated pedestrian facilities on the surrounding road network; as a result, pedestrian activity is very low. Therefore, the effect from staff travel and from HGV traffic on pedestrian amenity, fear and intimidation is considered to be **negligible** and therefore an **Imperceptible effect.**

MITIGATION MEASURES

9.89. Having reviewed the surrounding road environment and the impact the quarry has on the traffic conditions; the following mitigation measures were deemed necessary. Hanly Quarries has confirmed that they have implemented these policies already:

- Staggered approach to HGV traffic leaving the quarry during peak times. Queuing at local junctions to be avoided.
- Regular maintenance and servicing of vehicles.
- To control, prevent and minimise dirt on the access route and emissions of dust and other airborne contaminants during the construction works, the following mitigation measures will also be implemented (some have already been implemented within the existing quarry):
  - Damping down site roads to minimise dust emissions;
- Wheels should be cleaned on all vehicles leaving the quarry site. There is a dedicated wheel cleaning operation near to the site entrance. The water used for the wheel washing is directed to a detention pond where it is recycled and pumped back into the wheel washing equipment.
- In order to limit the potential impact on local residen villages, Hanly Quarries operate within designated t

hauling of materials to only operate between the hours of 7.30am and 18.00pm (Monday to Friday) and 8.00am to 14.00pm on Saturday.

MITIGATION & RESIDUAL EFFECTS

9.90. **Table 9-6** summarises the predicted residual impacts related to the generated traffic impacts from the Proposed Development. It should be noted that all traffic and transport impacts relate to the construction stage of the Proposed Development. The methodology section clarifies the reasons why these stages are considered.

Table 9-6: Summary of Residual Impacts

POTENTIAL IMPACT		MITIGATION	SIGNIFICANCE OF RESIDUAL EFFECTS
Traffic and Roads			
Operational Stage			
Traffic Impacts	Staff	Staff to be encouraged to vehicle share. Where possible staff will access the site outside peak times.	Slight Adverse to Not Significant
	HGVs	Deliveries to be staggered at peak times.	Slight Adverse to Not Significant
Severance	Staff	None.	Slight Adverse
	HGVs	None.	Slight Adverse
Accidents & Road Safety	Staff	Staff to be encouraged to vehicle share. Where possible staff will access the outside peak tim	Slight Adverse to Not Significant
	HGVs	Deliveries to staggered at times.	

Driver Delay	Staff	Staff to be encouraged to vehicle share. Where possible staff will access the site outside peak times. Staff parking completely contained within Applaition Site.	Not significant
	HGVs	Deliveries to be staggered at peak times.	Not significant
Pedestrian Amenity, Fear & Intimidation	Staff	None.	Imperceptible
	HGVs	None.	Imperceptible

CUMULATIVE EFFECTS

9.91. As the quarry is an extension of the existing quarry operations, all of the operations have been considered together within this Chapter. There is no proposal for a significant increase in traffic from the existing quarry development out with normal company growth.

9.92. No other quarry developments were identified in the study area and therefore **no cumulative effects are anticipated.**

SUMMARY & CONCLUSION

9.93. This chapter has assessed the likely significance of effects of the Proposed Development on road traffic. As this Proposed Development is for an extension to an existing quarry, built services and waste management will remain the same as present and there are no existing services within the area of the Proposed Development. They have therefore been scoped out of this assessment.

9.94. The likely traffic generated by the Proposed Development c been identified and the site access proposals have b construction stage impacts as this is an application for an

and therefore works will only involve extraction activities. In addition, the decommissioning effects are expected to be dealt with in a remediation plan to be developed later in the quarry life time. The restoration plan, submitted separately, shows only minor proposals in which traffic generation is likely to be limited and not significant.

9.95. The potential impacts relating to traffic, severance, accidents and road safety, driver delay and pedestrian amenity, fear and intimidation have been assessed and where the impact has been identified as **low** or **negligible**. Mitigation measures have also been considered and identified. The resulting effects are deemed to be **slight adverse** to not **significant**.

CONTENTS

10. NOISE AND VIBRATION

INTRODUCTION

10.1. This section of the Environment Impact Assessment Report (EIAR) assesses the Noise & Vibration levels associated with the existing development and the potential impacts if any resulting from the generated noise and vibration levels on the environs surrounding the application site and the working quarry.

10.2. It also assesses the likely noise and vibration impact of the proposed development in the context of current relevant standards and guidance, and identifies requirements for remedial measures.

10.3. The existing development comprises of the stripping of overburden down to the surface of the underlying stone. Blasting is carried out 6 times per year depending on demand levels. The stone material is then passed through a crusher and a screener to separate the aggregate into various grades depending on market requirements. Processing is undertaken on the southern side of the existing quarry. The material is then stockpiled on site. It is envisaged that the proposal will not increase the intensity of production but will extend the life of the quarry over a longer period.

10.4. Noise monitoring is completed bi-annually. Noise monitoring is carried out at 3 locations, N1, N2 and N3 which are the closest receptors to the quarry. There have been no complaints in relation to noise at the quarry.

Statement of Authority

10.5. This section of the EIA has been prepared by Mr. Niall Kiernan of Global Green Technical Consultancy Ltd., Mr. Kiernan has a Bachelor's Degree in Environmental Science incorporating Noise and Vibration from Sligo Institute of Technology and has over 10 years' experience in noise and vibration control including the preparation of noise impact assessments and is a member of a number of professional organisations, Engineers Ireland, IEMA, and ESAI. Global Green Technical Consultancy Ltd. has considerable experience in the assessment of noise in studies ranging from quarries to commercial developmen

METHODOLOGY

10.6. Noise monitoring is completed bi-annually. Noise monitoring is carried out at N1, N2 and N3 which are the closest receptors to the quarry. The locations of the noise monitoring points are indicated on Figure 10.2. The monitoring is carried out by BHP.

10.7. The assessment of the noise and vibration impacts has been undertaken as follows:

- Reference to historical noise and vibration surveys at the nearest noise sensitive locations, to establish the current ambient noise levels in the area.
- Noise levels have been recorded in close proximity to the existing concrete manufacturing and quarrying activities on-going in the existing Hanly Quarries site.

10.8. A prediction of the specific noise levels at the proposed N5 National Road to the south of the quarry extension from the existing and proposed quarrying activities at the Hanly Quarries site.

NOISE AND VIBRATION STANDARDS

10.9. 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 Hanly Quarries site activities on the surrounding noise environment and assess for the potential for noise disturbance at existing noise sensitive receptors 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 - Draft August 2017.
- The Quarries and Ancillary Activities, Guidelines f that following with regard to the control of noise a

- *'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.*
- *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 LAeq (1 hour) of 55 dB(A) by daytime and a LAeq (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 the limit values by more than 2 dB(A). Control (e.g. within 500 meters) need to be given a operations are due to take place, which shoul*

09.00 and 18.00 hours, Monday to Friday (except in emergencies or for health and safety reasons beyond the control of the developer). Similarly, such residents should be given the "all clear" signal by means of sirens or other agreed measures when blasting has been completed.

- *The EPA recommends that to avoid any risk of damage to properties in the vicinity of a quarry, the vibration levels from blasting should not exceed a peak particle velocity of 12 millimeters per second as measured at a receiving location when blasting occurs at a frequency of once per week or less. In the rare event of more frequent blasting, the peak particle velocity should not exceed 8 millimeters per second. The nature of the underlying rock can influence the way blast vibrations are transmitted through the ground to locations outside the site, so it is important that such information (including predicted vibration levels in adjacent noise-sensitive receptors) be submitted with the planning application where relevant.*
- *Blast noise is characterised by containing a large proportion of its energy within a frequency that is below the normal hearing range and is therefore termed "air overpressure". The EPA recommends that blasting should not give rise to air overpressure values at the nearest occupied dwelling in excess of 125 dB(Lin)max. peak with a 95% confidence limit.*
- *The developer should carry out blast monitoring (groundborne vibration and air overpressure) for each blast. The monitoring locations should be as agreed within the planning authority and shall be established prior to the commencement of blasting. The results should be reported to the planning authority on a regular agreed basis. Groundborne vibration levels measured at the nearest occupied dwelling should not exceed the specified limit values. 95% of all air overpressure levels measured at the nearest occupied dwelling shall conform to the specified limit value. No individual air overpressure value should exceed the limit value by more than 5 dB(Lin)'.*

10.10. As outlined in the Environmental Management Guidelines in the Extractive Industry (Non-Scheduled Minerals), Envi (2006), the Environmental Protection Agency (EPA) has p Noise in Relation to Scheduled Activities (EPA, 1996). It de

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.

NOISE & VIBRATION STANDARD CONDITIONS

10.11. On the basis of the above, the following noise limits are suggested to be retained for the further operation of the quarry and the proposed extension;

Noise Criterion

10.12. The following sets out a standard for similar facilities in relation to noise:

- Noise from the installation shall not give rise to sound pressure levels (LAeq,T) measured at the nearest noise sensitive location1 (NSL), which exceed the limit value(s).
  - Daytime (08:00hrs to 22:00hrs): 55dB LAeq,T
  - Night-time (22:00hrs to 08:00hrs): 45dB LAeq,T

10.13. There shall be no clearly audible tonal component or impulsive component in the noise emission from the activity at any noise sensitive boundary.

10.14. It is understood that the quarry does not operate at night-time.

Vibration Criterion

10.15. BS 7385, 1993 states that there should typically be no cosmetic damage if transient vibration does not exceed 15mm/s at low frequencies rising to 20mm/s at 15Hz and 50mm/s at 40Hz and above. These guidelines relate to relatively modern buildings and should be reduced to 50% or less for more critical buildings.

10.16. BS 5228-2, 2009 recommends that, for soundly constructed residential property and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15mm/s at 4Hz increasing to 20mm/s at 15Hz and 50mm/s at 40Hz and above. Below these values minor damage is unlikely. Where continuous vibration is such as to give rise to dynamic magnification due to resonance, the guide values may need to be reduced by also comments that important buildings which are diff special consideration on a case by case basis.

10.17. Table 10.1 indicates the maximum PPV values, below which transient vibration should not cause cosmetic damage to buildings.

Table 10.1 Peak particle velocities (PPV in mm/s) below which transient vibration should not cause cosmetic building damage (BS 7385, 19993 & BS 5228-2, 2009)

Type of structure	Frequency of vibration	
	4 Hz to 15 Hz	15 Hz and above
Residential or light commercial buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

ACOUSTIC TERMINOLOGY

10.18. Noise is regarded as a form of manmade pollution and under the Environmental Protection Agency Act of 1992, the definition of 'environmental pollution' includes noise which is a nuisance or would endanger human health or damage property or harm the environment.

10.19. Conscious reactions, such as annoyance, most often occur when the noise could be considered unwanted, due to the level, the location, the time of day, or interference with other activities. An indication of the level of some common sounds on the dB(A) scale is presented in Figure 10.1.

Source: URS Corporation, 2008

Figure 10.1 Noise comparison table

RECEIVING ENVIRONMENT

10.20. For the purpose of this EIAR, an assessment of potential noise sensitive receptors and review of the existing noise reports completed by BHP near the subject site was conducted. The Environmental Protection Agency (EPA) describes a noise sensitive location (NSL) as: -

- "Any dwelling, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or area of high amenity, which for its proper enjoyment requires the absence of noise at nuisance levels"

10.21. The nearest noise sensitive location is approximately 450m to the south east of the site. The noise monitoring points which are used by BHP are 3 locations to assess the existing noise levels in the vicinity of the site. There are few residences in the immediate vicinity of the development. Most residences comprise isolated farm dwellings and ribbon development. There are no large residential settlements close to the site.

10.22. The proposed N5 will soon be built in close proximity to the south-western boundary of the quarry site. Even with the quarry extension going to be close by the N5 National Road, the future proposed extraction is likely to be in accordance with noise level predictions assessed based on the current noise levels for existing extraction at the quarry site, and if anything future noise levels should be lower as development descends to lower depths allowing for increased attenuation by quarry walls.

10.23. It is reasonable to suggest that there will be no change anticipated from the continuation of the associated quarry operations on the site, i.e. existing noise emissions will remain the same in this area to the north of the quarry void and for the southern side of the quarry extension where the proposed N5 is to be constructed a berm is to be constructed along the southern side which will also increase noise attenuation.

Dates & Times of Survey

10.24. Noise monitoring is completed bi-annually. Noise monitoring is carried out at N1, N2 and N3 which are the closest receptors to the quarry. 30-minute daytime levels were measured at each of the 3 locations. The locations of the noise monitoring points are indicated on Figure 10.2. BHP carries out the bi-annual noise monitoring surveys. The purpose of these surveys is to provide Hanly Quarries wit
required as part of the ongoing quarry operations to ensu

Instrumentation

10.25. Two sound level meters (SLM's) were used for the surveys, a Cirrus 171C type 1 (serial number G068852) and a Cirrus 831C type 1 (serial number D20874FF). The SLM's do be calibrated with a CRL 515 calibrator (serial number 74767). The same calibrator is used to check the SLM at the end of the survey, to inspect the microphone drift.

Measurement Locations

10.26. Noise monitoring is carried out at N1, N2 and N3 which are the closest receptors to the quarry. The locations of the noise monitoring points are indicated on Figure 10.2. The Noise monitoring location photos attached herein were sourced from the noise monitoring contractors, BHP.

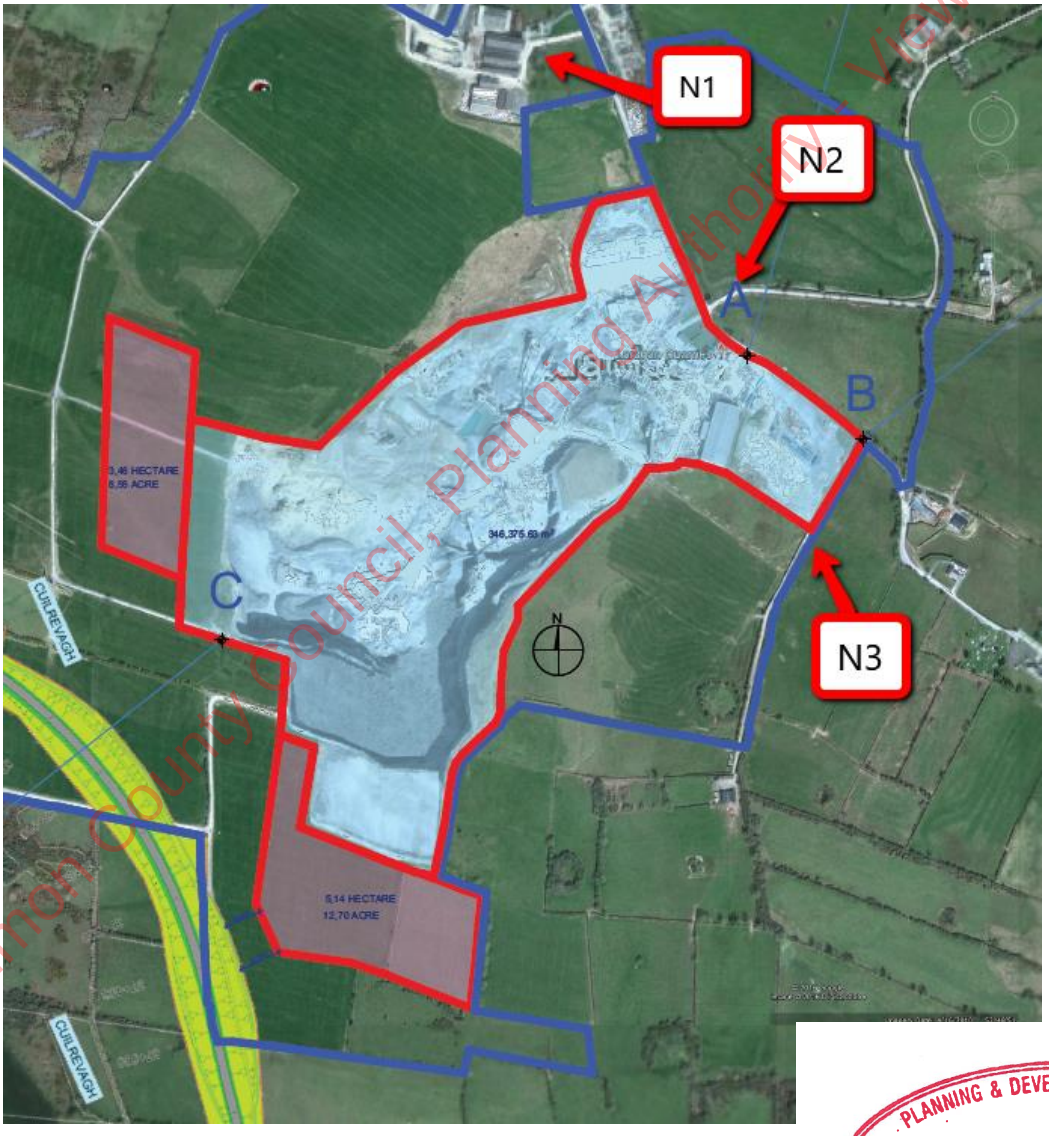

Figure 10.2 Noise mon

Figure 10.3 Location 1 is in the vicinity along the west side of the northern part of the quarry

Figure 10.4 Location 2 is at the entrance which is at the nort

Figure 10.5 Location 3 is in the vicinity along the east side of the quarry

SURVEY METHODOLOGY

10.27. Sample periods for the noise measurements were 30 minutes daytime levels measured at each location.

MEASUREMENT PARAMETERS

10.28. The noise survey results are presented in terms of the following four parameters:

10.29. LAeq is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period. It is typically used as a descriptor for ambient noise.

10.30. The "A" suffix denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear nature of human hearing. , are expressed in terms of decibels (dB) relative to $2x10^{-5}$ F

SURVEY RESULTS & DISCUSSION

2018 Sampling Results (9th March 2018)

Location	Sampling Interval	Duration	LAeqT	LA10	LA90	Impulsive Tonal	Note
NSL1	10:08-10:38	30mins	50	50	43	No	Passing traffic at up to 65dBA. Activity from cement plant and block yard audible at 45-50dBA. Frequent birdsong at up to 52dBA.
NSL2	10:22-10:52	30mins	41	44	36	No	Some passing traffic on local roads at up to 60dBA. Activity audible from quarry at 40-45dBA, mobile plant, block maker, cement plant etc. Birdsong at up to 50dBA
NSL3	09:36-10:06	30mins	49	53	32	No	Trucks entering and leaving quarry at up to 50dBA. Passing traffic on local road at up to 65dBA. Birdsong at 45-55dBA.

10.31. The noise contribution made by the operation does not exceed the daytime limit of 55dBA at the noise monitoring locations. There was no evidence of tonal or impulsive qualities to the recorded noise from the quarry at the nominated locations.

Monitoring Date: 24th October 2018

Location	Sampling Interval	Duration	LAeqT	LA10	LA90	Impulsive Tonal	Note
N1	10:42-11.12	30mins	54	48	41	No	Activity from the quarry audible at 40-45 dBA (crusher, batching plant, mobile plant and reversing sirens) Location close to roadside with passing traffic at 70-80 dBA (paused out where possible)
N2	10:50-11.20	30mins	46	48	43	No	Activity audible from various sources in the quarry at 43-48 dBA (crusher, mobile plant, reversing sirens etc.) with occasional sounds of machine bucket scraping yard reaching 55 dBA. Occasional passing traffic at up to 55 dBA.
N3	10.05-10:35	30mins	49	53	32	No	Quarry crusher audible at 40-45 dBA, Trucks entering and leaving quarry at 50-55 dBA. Passing traffic on local road at 50-60 dBA.

10.32. The noise contribution made by the operation does not exceed the daytime limit of 55dBA at the noise monitoring locations. There was no evidence of tonal or impulsive qualities to the recorded noise from the quarry at the nominated locations.

Monitoring Date: 13th May 2019

Location	Sampling Interval	Duration	LAeqT	LA10	LA90	Impulsive Tonal	Note
N1	12:22-12:52	30mins	51	53	47	No	The quarry crusher is audible at 45-50 dBA in a gusty southerly wind which is bringing levels to 52 dBA at times Location close to roadside with passing traffic at 60-70 dBA (paused out where possible), Crows in nearby trees at up to 55 dBA at times.
N2	11:45-12:15	30mins	50	52	46	No	The crushing plant and occasional reversing sirens are audible at 45-50 dBA with rockfall into the crusher at up to 53 dBA at times. Occasional passing traffic at up to 55 dBA, gusty wind bringing levels to 50 dBA occasionally.
N3	11:38-12:08	30mins	50	54	38	No	Wind noise keeping levels at 40-45 dBA, the crusher and faint reversing sirens are audible at <40 dBA at times, truck nearby picking up trailer at 45-50 dBA. Passing traffic on local road at 50-60 dBA with some trucks at up to 65 dBA. Birdsong at 40-50 dBA.

10.33. The noise contribution made by the operation does not exc
at the noise monitoring locations. There was no evidence c
the recorded noise from the quarry at the nominated locatic

ASSESSMENT OF NOISE IMPACTS

10.34. The main noise sources were from the processing machinery, screening, crushing and washing in the working quarry which produces a range of aggregates. The N5 National Road is to be developed south of the quarry extension. The proposed N5 will be the closest receptor to the quarry.

10.35. Activities which can give rise to noise levels can be associated with the following activities:

- Stripping of overburden,
- Blasting,
- Extraction of aggregate,
- Processing of aggregate,
- Aggregate stockpiles,
- Loading aggregate onto vehicles and transporting, and,
- Movement of HGV's along unpaved site roads.

10.36. All monitoring results were below the recommended guideline value of 55 dB(A) for day time hours. Therefore, it is submitted that the application site and the working quarry will not have a cumulative impact on the surrounding area. However, the bi-annual noise monitoring should still continue for the proposed extension. Consideration should be given to adding a monitoring point to take into consideration the proposed N5. As discussed previously the building of the berm on the southern side of the quarry extension will increase noise attenuation and act as a buffer to the N5.

10.37. Traffic using local and regional roads and farm machinery operating in adjacent fields are identified as the only other sources of noise in the vicinity of the application site.

ASSESSMENT OF VIBRATION IMPACTS

10.38. Rock is generally removed from quarries by rock breaking, which consists of a pneumatic hammer attached to an excavator or by blasting, which is a one-off event occurring a number of times per year depending on the market requirements. Blasting is the method undertaken at Hanly Quarries with rock breaking and crus material too big to pass through the crusher.

10.39. Ground vibration is caused by the imperfect utilisation of from the fragmentation of rock during blasting operations. fragmentation of rock propagates as an elastic disturbanc

seismic waves. These waves, which radiate in a complex manner, diminish in strength with distance from the source. The theory relative to this motion is based on an idealised (sinusoidal) vibratory motion. When these waves come into contact with a free face, physical motion results as the energy induces oscillation in the ground surface. Blasting vibration is a surface wave type, which incorporates components of both body and surface motion.

10.40. Ground vibration itself is in-audible, however air vibrations (air overpressure) both audible and sub-audible usually accompany it. The resulting impacts of blasting vibration are often characterised as being impulsive and of short duration, usually less than 2 seconds. It is difficult for the average lay person to differentiate between the various types of vibrations (ground vibration and air overpressure), humans commonly associate the level of vibration with the 'loudness' of a blast.

10.41. Ground vibration control is based on reducing and controlling the weight of explosives detonated per delay. In any given situation large amounts of explosives can be detonated using time intervals (greater than 8millie-second) between specific charges within the overall blast. The level of ground vibration is directly related to the maximum charge weight per delay and numerous studies have shown that peak particle velocity (PPV) is directly related to the maximum charge weight per delay. In terms of predicting ground vibration each quarry location is 'site specific'. Typically a 'scaled distance' regression line can be established using monitored vibration data, microphone and distance. Continuous vibration monitoring will ensure that blast vibration limits are being complied with and it also allows the development and adjustments to the 'scale distance' regression line for the proposed site. As this is an established blasting site, vibration monitoring has been completed historically and this has been shown to ensure compliance with ground vibration levels. In practice the distance and MIC to a blast receptor will determine the MIC used for blasting. As blasting operations move in a north to north-east direction blast vibration levels can be reduced by lowering the MIC. Lowering the MIC can be obtained by a number of means including a combination of the following:

- reducing the shot hole diameter
- reducing the bench height, thereby reducing the shot hole
- decking charges-dividing the charge with the shot hole by using a minimum of 1.5m of stemming

10.42. The most up to date technology in blasting operation is used and will continue to be used in the quarry. To this end face profiling will be carried out for geometry of the free face can be established, thereby ena spacing to be applied for each blast.

10.43. Blasting is currently carried out at a rate of 6 blasting ses would have been one blasting session per month when

Blasting in quarries gives rise to ground transmitted vibration, which may be perceptible inside residences. It also gives rise to air overpressure, which may induce vibration in residential structures. Blasts are designed to minimise these effects.

Historical Blast Measurements

10.44. Vibration monitoring was conducted previously by BHP, when conducted at the nearest noise sensitive location which is approximately 450m to the south-east of the site. A 0 reading was received and BHP confirmed that the existing operation does not have any impact from the blasting in the quarry. From an assessment point of view this is determined to be the case also for the proposed extension to the existing quarry.

10.45. The proposed N5 will be the closet receptor to the quarry south of the quarry extension. This has been assessed from a vibration assessment point of view. There is a potential impact from fly-rock to enter onto the new road.

10.46. Flyrock can occur due to incorrect design and poor management of blasting rounds where there is inadequate stemming or inadequate burden (overcharging the holes with explosives). Overcharging can be avoided by following proper management procedures. Considerations for the bench height, bench face profile, face condition, local geology, rock properties, burden and spacing of the drilling pattern and in particular to the first row of boreholes when calculating charge weight per hole will ultimately define the optimum powder and energy factors for a safe and productive blast. The measures taken to control ground vibration and air-overpressure will also control and counteract the possibility of fly-rock.

10.47. There is a proposed fly-rock barrier that has been agreed with the quarry operator, the local authority and the road design office to reduce any potential for fly-rock to enter onto the new road. There is a berm to be constructed on the southern side of the extension as shown in the figure 10.6 below.

Figure 10.6 3D view of southern extension and berm between quarry and n5

10.48. The short term adverse impact of ground-borne vibration and air overpressure during blasting events, along with the risk of fly rock during blasting have been identified.

10.49. The only activity undertaken onsite which have potential to have given rise to ground borne vibration in the future is the blasting of bed rock. The number of blasts carried out at the quarry depends on market demand for construction materials. Typically, however, blasting is carried out 6 times per year depending on demand levels. The duration of a blast in terms of noise is of short duration, similar to a clap of thunder.

10.50. Blasting-induced vibration is of short duration and transient in nature. A typical blast consists of a number of drilled holes into which explosive charges are placed. The charged holes are detonated individually by use of detonators each with different delays.

10.51. The main reason for complaints from blast-induced vibration is usually attributed to the fear of damage and/or nuisance rather than actual damage or nuisance itself. The human body is very sensitive to vibration; this can result in concerns being raised at vibration levels well below the threshold of cosmetic damage to property or t
planning conditions.

10.52. The blast design and blasting methodology for the site op
planning application area have been and are optimised to e
and are within these recommended limits.

10.53. The following measures should be implemented at the planning application area to minimise disturbances to local receptors including the proposed N5 due to blasting operations.

10.54. These mitigation measures are in accordance with the 'best practice / mitigation' measures described in Section 3.2 of the DoEHLG (2004) guidelines.

- Blast notifications provided by pre and post siren warnings.
- All blasting operations should be carried out by a certified 'shotfirer' in accordance with the relevant health and safety regulations.
- The optimum blast ratio is maintained and the maximum instantaneous charge is optimised.
- To avoid any risk of damage to properties in the vicinity of the site, the ground borne vibration levels from blasting should not exceed a peak particle velocity of 12 mm/sec.

10.55. As levels are in line with recommended values currently, it is not anticipated that there will be a significant effect as a result of the proposed extensions.

10.56. Vibration monitoring should be conducted for blasting session in the proposed extensions and this should be an extra monitoring point on the southern side to monitor levels for the N5 as the closet receptor.

Ground Vibration Criteria, Guidelines/Recommendations/Standards

10.57. The measurement of peak particle velocity (PPV) is internationally recognised as the best single descriptor to use when assessing potential ground vibration damage to structures/buildings. More recently velocity-frequency control bounds are used as damage control criteria. There are no Irish standards for ground vibration control, however there are limits recommended in the EPA's Guidance Note on Noise in Relation to Scheduled Activities. These limits are also recommended in the Guidelines for Planning Authorities for Quarries and Ancillary Activities issues in April 2004 by the Department of the Environment, Heritage and Local Government. The EPA has also published a document "Environmental Management Guidelines" Environmental Management in the Extractive Industry (Non-Schedule Minerals)-2006. There are many different standards and recommendations being used internationally, some like the German DIN 41501 tha
However, most of these standards and recommendations ar
work carried out by the US Bureau of Mines (USBM). The
8507 gives practical safe criteria for blasts that generate l
(<40Hz). These are 19 mm/sec for modern houses and 12.7

1993 British Standards Institute have adopted BS 7385 Part 2: 1993, this is based predominately on a literature review of the previous studies already alluded to in this report.

10.58. The EPA "Environmental Management Guidelines Environmental Management in the Extractive Industry (Non-Scheduled Minerals)" recommends that the vibration and air pressure ELVs are adopted and applied at the nearest vibration and air overpressure sensitive location. The following levels are recommended:

- Ground vibration arising from any blast carried out on site shall not exceed a peak particle velocity of 12mm/s measured in any of the three mutually orthogonal planes at the threshold of any house in the vicinity of the site.

10.59. The air over pressure arising from any blast carried out on site shall not exceed 125 dB (linear) maximum peak value, when measured outside the nearest house to the blast.

Air Blast (Air-Overpressure) Noise

10.60. A blast causes a diverging shock-wave front that quickly reduces to the speed of sound, and an air blast is then propagated through the atmosphere as sound waves. Air blast or air overpressure is the term used to describe the low frequency, high energy air vibrations generated by blasting detonation. Air blasts are characterised by containing a larger proportion of its energy in the sub-audible spectrum, below 20Hz. Because the waves associated with air blasts are essentially outside the audible spectrum (below 20Hz) a separate unit of measure, pressure is reported.

10.61. The pressure is recorded using and air-blast transducer and the linear device must measure accurately in the structurally critical range, 2 to 20Hz. Air blast (sound waves) can be reported in two distinct units of measurements, pressure (psi) or decibels (dB).

10.62. Sound waves in the form of the sub-audible sound waves (air overpressure/air blast waves), and noise (the audible waves) are sometimes linked inextricable. It is difficult sometimes for humans to differentiate between the characteristics of air blasts and noise.

10.63. In general the sub-audible waves are of greatest concern. The sub-audible sound waves, if high enough can excite structures to produce audible rattle inside structures and may, in the extreme, break glass and crack wall coverings. However, there are no known cases of foundation cracks from air blasts at values anywhere near the glass breakage threshold of 140 dB. The cracking of glass (the weakest component probabilistic in nature. In other words not all windows will cr

10.64. A wind speed of 9 m/s produces a pressure equal to 133. wind is comparable in amplitude to a strong air-blast, it

because of the relatively slow rate of wind change and the corresponding minor or non-existent rattling, compared with the rapid rise time (impulsive) of an air blast transient.

10.65. Air blast waves are attenuated over distance in much the same way as sound waves; however there are some differences due to the lower frequency of the sub-audible air blast waves. Lower frequency waves are attenuated at a lower rate by air absorption over distance than the higher frequency audible waves. Air blasts, being very high pulses of energy in the form of low frequency waves can travel great distances. The effects of temperature inversions are negligible close to a blast, but may exceed 10 dB at 800m or greater. However, lack of focusing at short distances is important, since only at short distances are pressures large enough to produce cracking. The effects of ambient temperature and relative humidity are considered negligible, at less than 1 dB at 1Km. Prediction and control of air blasts can be more difficult than that of ground vibration due to the influences of weather conditions on the air blast propagation.

Control of Air Blasts

10.66. The principal factors governing air blasts are:

a) the type and quantity of explosives

b) the degree and type of confinement (stemming)

c) the method of initiation (not-use of exposed detonating Cord etc.)

d) local geology, topography and distance

e) atmospheric conditions

10.67. Factors (a), (b) and (c) are variables within control of the quarry operator whereas (d) and (e) are essentially uncontrollable at any particular site. However, by varying the timing of a blast (avoid early morning or late evening), by controlling the degree of confinement and by using non-electric or electronic detonators as the method of initiation (non-use of detonating Cord on surface) the quarry operator, in effect, achieves control over the influence of atmospheric conditions and hence over the blast emissions. It is important to note that atmospheric conditions (including temperature inversions) will have little effects at distances within 300m.

10.68. It is proposed to limit the air blast to an air overpressure level of 125 dB (Lin peak) with a 95% confidence limit when measured with instrumentation to 2 Hz. This proposed limit is well below the safe level o Siskind et al., 1980 and is also within the limit recommended

MITIGATION MEASURE FOR NOISE, GROUND VIBRATION, AIR-OVERPRESSURE NOISE AND FLYROCK CONTROL

10.69. The following controls will be put in place so that ground vibration, air overpressure and noise is minimised and kept within the regulatory limits. Specific mitigations measures are listed as follows:

10.70. Proper management procedures as described below: -

- Implementation of the proposed fly-rock barrier that has been agreed with the quarry operator, the local authority and the road design office to reduce any potential for fly-rock to enter onto the new road.
- Construction of berm on the southern side of the extension as shown in figure 10.6

10.71. Prior to any drilling taking place, the following will be undertaken: -

- Suitable areas for blasting are identified on the ground and face profiling is carried out.
- The face profiling data is incorporated into the blast design considerations.
- Care is taken to optimise blast design (ratio of borehole geometry, position and distance between boreholes and free face, powder factor and energy factor) so that optimum fragmentation and safe blasting and design limits with respect to peak particle velocity (PPV) are attained.
- Drilling operations commence when the locations of the boreholes are properly marked on the ground as per the blasting plan.
- These holes are drilled in rows and positioned at a distance from the face of the bench in proportion to the diameter of the hole and other blast design considerations in accordance with the agreed blasting plan. Prior to the loading of the blast, each borehole will have an individual record on the existing ground conditions presented during drilling, for example: hard or soft ground, cavity, water, clay or mud seams and any other relevant notes (borehole block, etc.).
- Considerable care will be taken to conduct the bla
18:00 hrs, Monday to Friday. No blasting operations v
on Bank Holidays.

- Prior to drilling of any blast a face profiling or a trigonometric bench height measurement will be carried out for all blasts.
- A blasting plan will be issue by the blaster in charge for agreement to the Drilling and Blasting Manager prior the drilling of any blast.
- Only personnel with appropriated Certification in drilling and blasting will be allowed to operate the blasting programs.
- A driller's log will be in place at all times.
- A site specific scale distance regression for the proposed development site will be developed (or equivalent) as blasting continues over the life of the quarry.
- Monitoring locations for ground vibration and air overpressure will be agreed prior to blasting. Monitoring data will be used to allow for future adjustments to the maximum instantaneous charge of the blast if required.
- All seismographs will have a certificate of calibration from the manufacturer and all certificates and serial numbers of each seismograph to be use for the monitoring of the blast will be kept on file.
- Advance warning notice of all blasts will be given to residents in the environs of the quarry at least 24hrs prior to blasting.
- Notification to road users of pending blasts
- Ensure that the optimum blast ratio is maintained and ensure that the maximum amount of explosive on any one delay, the maximum instantaneous charge (MIC) is optimised so that the ground vibration levels are kept below the regulatory limits.
- Explosive charges will be properly and adequately confined by a sufficient amount of quality of stemming by using angular chippings and/or a combination of angular chippings and plug.
- The adequate confinement of all charges by means of accurate face survey and the subsequent judicious placement of explosives by cert
- Overcharging will be avoided by considering dep calculating charge weight per hole
- There will be no exposed detonating cord used in surf

- The initiation sequence in the blast will be set in a way that it progresses away from the nearest sensitive locations or structure to be protected, were practical. An adequate powder factor and energy factor will be chosen for each blast by considering safety, confinement and productivity.
- Borehole deviation studies will be conducted in order to have a better control in potential borehole deviation.
- Only the necessary sub drilling to achieve good breakage will be use (Normally 1 to 1.5 m), excessive sub-drilling will be avoided at all times.
- Increase confinement on the boreholes of the explosives by using angle chippings or a combination of angled chippings and a plug.
- Use of decked charges if required in order to reduce the Maximum Instantaneous Charge (MIC).
- Pre-splitting technique will be use for the final slope stability.

DO-NOTHING SCENARIO

10.72. If the proposed development were not to proceed, the operator would continue to operate within the authorised area of the quarry until a further planning permission was granted.

UNPLANNED EVENTS

10.73. In the event of an emergency such as a fire to plant or equipment, the emergency response plan will be implemented and the relative emergency services will be contacted should they be required. In the event of an increase in noise levels associated with plant or vehicle breakdown, an assessment in relation to the cause of the emissions will be undertaken and the activity will not recommence until the problem has been rectified.

DECOMMISSIONING

10.74. Noise effects during decommissioning are likely to be of a similar nature to that during the operation of the quarry. Any legislation, guidance or best [illegible] decommissioning would be complied with.

NOISE AND VIBRATION MONITORING

10.75. Ground vibration monitoring should be carried out at the application site and where appropriate other locations can be considered.

RESIDUAL IMPACTS

10.76. It is not anticipated that there will be an adverse impact on noise or vibration quality in the vicinity of the application site provided that mitigation measures and best practice is applied.

CUMULATIVE IMPACTS

10.77. At present the noise environment within the study area is dominated by road traffic noise emanating from the local roads. Locally, natural sounds such as farmyard animals or barking dogs are also audible.

10.78. Over time, it is anticipated that the volume of road traffic will increase with the new N5 and as economic activity increases and that this in turn is likely to lead to an increase in ambient and background noise levels.

10.79. There are no cumulative noise impacts arising from the proposed development. Noise levels arising from proposed activities will not have the potential to increase the existing ambient noise levels in the vicinity of the quarry.

CONCLUSION– NOISE AND BLAST VIBRATION

10.80. The predicted noise levels from the application site will have a negligible noise impact at all receptors. The nose levels of the existing works have been assessed and are well within the existing noise limits and within the guideline as published by the EPA.

10.81. Ground vibration and air-overpressure will be kept below the guidelines recommended and below the regulatory limits and historical measurements confirm good control. The location of blasting will not be any closer to receptors than it has been in the past. Controls specified to limit ground vibration and air-overpressure will be in place as a component of good management procedures. To ensure compliance with regulatory limits, monitoring of all blast vibration will be carried out at a location to be agreed with Local Authority. Keeping within the statutory limits for blast vibration and air overpressure will ensure that the likelihood of damage (or superficial damage) to property app

10.82. The applicant has agreed to implement the following measures in the future:

- Construction of further berms around the boundary of the application site and working quarry which will screen the site from the surrounding NSLs to further reduce any dust, noise and air overpressure;
- The quarry access road, and the quarry floor, will be maintained in good condition and free of potholes in order to avoid banging of empty truck bodies;
- Compliance with EPA guideline values for daytime Emission Limit Values (ELV's) at the closest noise sensitive receptor;
- Use of vehicle horns will be prohibited onsite;
- All plant and exhaust silencers will be maintained in satisfactory condition, and worn parts will be repaired or replaced immediately;
- Minimising drop heights of material from plant and machinery;
- Regular maintenance and lubrication of plant and machinery.

CONTENTS

11. CULTURAL HERITAGE

INTRODUCTION

11.1 This Environmental Impact Assessment Report (EIAR) prepared on behalf of Hanly Quarries has been undertaken to assess the significant effects, if any, on the cultural heritage, archaeology and architecture that can reasonably be expected to occur because of the proposal to continue quarrying on land in the townlands of Largan and Cuilrevagh, c 4km to the north of the town of Strokestown in the north of Co. Roscommon. The proposed development includes two separate extensions to the south and west of an existing quarry extending respectively to 5.14ha and 3.46ha.

11.2 A wide variety of paper, cartographic, photographic and archival sources was consulted. All the lands of the application area were visually inspected.

11.3 The chapter also provides details of any appropriate remedial measures undertaken in the past or proposed to be undertaken by the applicant to remedy any significant adverse effects on the landscape.

Statement of Authority

11.4 This section of the EIA has been prepared by Mr. Niall Kiernan of Global Green Technical Consultancy Ltd. Mr. Kiernan has a Bachelor's Degree in Environmental Science incorporating Archaeology and the Built Environmental from Sligo Institute of Technology and has over 10 years' experience in the field of archaeology assessment and report writing and is a member of a number of professional organisations, Engineers Ireland, IEMA, and ESAI. Global Green Technical Consultancy Ltd. has considerable experience in the assessment of archaeology features and has compiled EIA studies ranging from quarries to commercial developments.

METHODOLOGY

11.5 This study which complies with the requirements of Directive EIA 2014/52/EU is an assessment of the known or potential cultural heritage resource within a specified area and includes the information that may reasonably be required for reaching significant effects of the project on the environment, taking int methods of assessment. It consists of a collation of existing w order to identify the likely context, character, significance

potential cultural heritage, archaeological and structural resource using an appropriate methodology (EPA 2002 and 2003).

11.6 A wide variety of paper, cartographic, photographic and archival sources was consulted. All the lands of the application area were visually inspected. The report is based on a desktop study and field walking including visual examinations of the Monuments and Places shown on the SMR mapping to be located within the landownership of the applicant.

11.7 The Irish Archaeological excavations were examined, which contains summary accounts of all excavations carried out annually in the country. The study included an examination of the following documents;

- Record of Monuments and Places (RMP) of County Roscommon;
- The Roscommon County Development Plan 2014-2020 including the Record of Protected Structures;
- Aerial photographs;
- 1st and 2nd edition Ordnance Survey (OS) maps.

11.8 In light of the legislative protection afforded to the cultural heritage resource, this chapter assesses the archaeological, architectural, cultural and historical importance of the subject area and examines both the direct and indirect effects of the proposed development on the receiving environment as well as potential impacts and recommends mitigation measures.

11.9 World Heritage Sites and Candidate World Heritage Sites were reviewed to see if any are located within the vicinity of the proposed development.

11.10 All known cultural heritage sites were consulted along with aerial photography and Ordnance Survey Ireland (OSI) First Edition Mapping (Circa 1830). Sites consulted included the following:

- National Monuments, a now out of date data set previously available from www.heritagedata.ie;
- Record of Monuments & Places (RMP) from www.archaeology.ie
- Records of Protected Structures (RPS) from Roscommo

- National Inventory of Architectural Heritage (NIAH) for County Roscommon from www.buildingsofireland.ie; and all townlands located within 2km of the quarry development site were listed and crossed referenced with:
- National Monuments, a list for County Roscommon available from www.archaeology.ie;
- Preservation Orders, a list available from the DoAHG; and
- The Roscommon County Development Plans for 2014 - 2020 was reviewed to obtain a comprehensive understanding of the cultural heritage policies and objectives of the Planning Authority.

11.11 In order to assess the potential impact of the proposal the following sources were also consulted or reviewed:

- Excavations Bulletin;
- Topographical files of the National Museum of Ireland;
- Cartographic Sources;
- Toponym analysis;
- Aerial photographs;
- Published archaeological inventories: and

11.12 A field assessment was carried out in October 2019 to identify and assess any known archaeological sites and structures and previously unrecorded features, possible finds and structures within the quarry area.

RECEIVING ENVIRONMENT

11.13 Two recorded monuments within the landholding are visible on www.archaeology.ie. The monuments have been removed by way of the excavations to date. The first monument to the southern side of the quarry - RO023-065 is classified as a Ringfort – rath. It has been removed by quarrying since 1996 (Bing c. 2013). The second monument - RO023-066 is classified as a Ringfort – unclassified. It has also been removed by way of the excavat
monuments of archaeological and historical potential were ide
quarry or the proposed quarry extension areas.

11.14 There are a number of monuments within close proximity to the existing and proposed extension areas. There are 3 monuments close to the eastern boundary of the existing quarry and 2 to the east and south of the proposed extension to the south of the quarry. There is also another monument to the north-west, RO023-026. This monument is located circa 446m metres to the north of the proposed western extension. With the direction of the proposed extension the present monuments won't be affected. The nature of the quarry development scheme indicates that further impact on the cultural heritage and archaeology of the area will be low.

11.15 This development is located within the townlands of Largan and Cuilrevagh to the north of the town of Strokestown and east of the Village of Elphin in the northern half of Co. Roscommon. The area is in the barony of Roscommon and the civil parish of Kiltrustan. The study area is on the northeast slopes of Greywood Hill, which has a high point of 126 metres. The proposed N5 is located to the southwest. An Environmental Impact Assessment has been completed for the proposed N5.

11.16 The N5 Ballaghaderreen to Scramoge Road Project, Co. Roscommon, involves the construction of approximately 33.4km of single carriageway new road and 15.4km realignment of existing roads, and ancillary works.

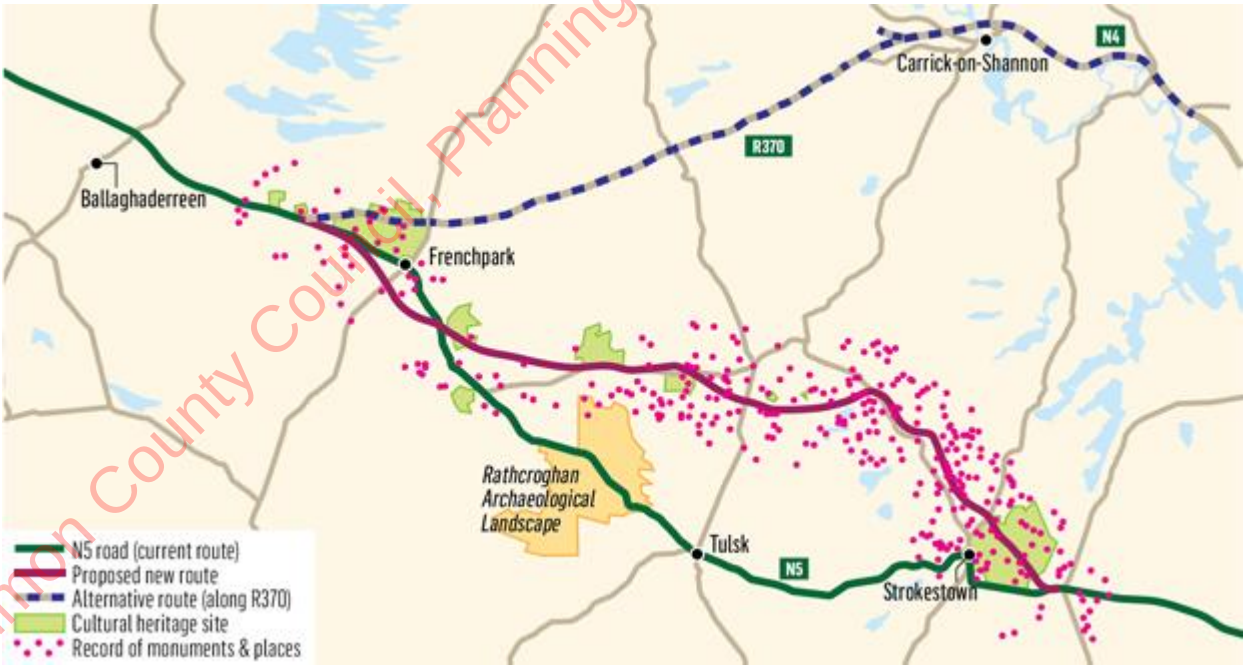

Figure 11.1 Proposed N5 Route (maroon) showing record of m

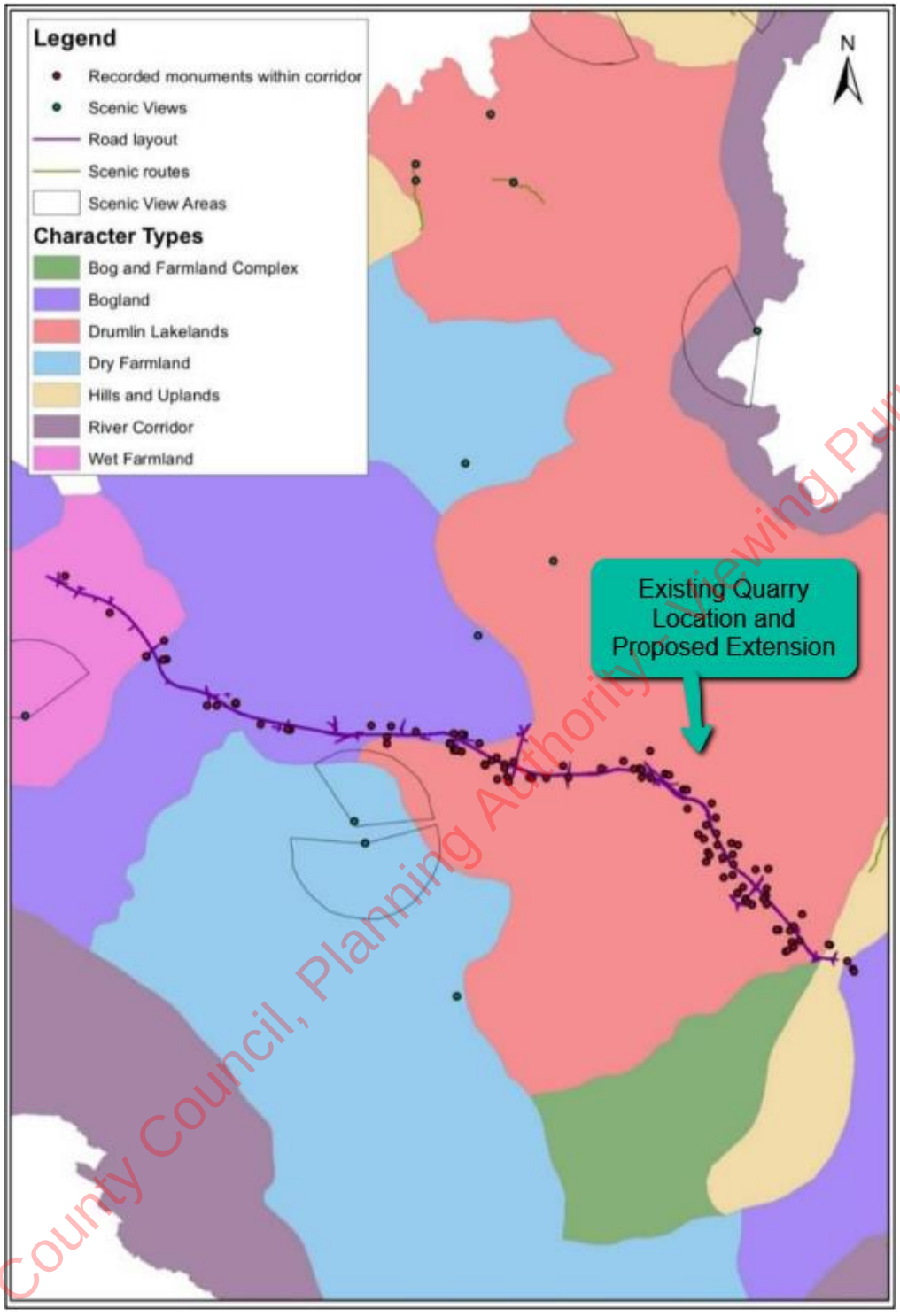

Figure 11.2 Character Type Areas and viewpoints (Mosart 2008) with the Proposed Route and Adjacent Recorded Monuments Shown

11.17 Dr Mark Clinton, chairman of the Monuments and Antiquities area was "a very serious, well preserved landscape". He was co

have cleared the archaeological landscape integral to the royal site" - (Rathcroghan Royal Site near Tulsk).

11.18 The proposed quarry extensions are an addition to an existing operating quarry. This quarry has been in use for over 60 years and includes a number of structures. The site was previously in use as agricultural land. With the exception of the quarry and ancillary operations within the applicant's landholding, agriculture is the main industry in the area.

11.19 The study area for archaeology, architectural and cultural heritage resources extended to a distance of 2km from the development, is characterised by monuments dating to the early medieval period. All recorded archaeological monuments and architectural features noted below are located outside the quarry boundary however, there is a high concentration of sites marked in the RMP in the wider area.

11.20 The most common archaeological monuments in the environs of the development are ringforts and enclosures. Over twenty have been recorded in a 2km radius.

Table 11.1 Recorded Monuments and Places of proximity to Hanly Quarries

	RMP No.	Class	Townland	Description	Distance from site
A	RO023-026	Ringfort - unclassified	Largan / Cuilrevagh	Marked as a circular embanked enclosure.	0.3km north-west
B	RO023-067	Ringfort – rath	Largan / Cuilrevagh	Marked only on the 1914 ed. of the OS 6-inch map as a D-shaped feature	0.2km east
C	RO023-068	Kiln – lime	Largan / Cuilrevagh	Marked as a lime-kiln on the 1837 ed. of the OS 6-inch map and as a small mound (diam. c. 10m) on the 1914	0.3km east
D	RO023-	House - indeterminat	Largan /	At the E broad c hills risir	

	070002	e date	Cuilrevagh	NW and S. There is no evidence of what might have been marked as a building in the interior of rath (RO012-070001-) on the 1837 ed. of the OS 6-inch map.	east
E	RO023-070001	Ringfort – rath	Largan / Cuilrevagh	On an E-facing slope at the E end of a broad coll with hills rising to the NW and S. Circular grass-covered area	0.3km south-east
F	RO023-069	Ringfort – rath	Largan / Cuilrevagh	Towards the bottom of an E-facing slope of Greywood Hill. Subcircular scrub-covered area (dims 49m N-S; 42m E-W) defined by an overgrown earthen bank	0.4km east

11.21 Ringforts are fortified settlements that are generally agreed to be from the Early Medieval period. They are also known as rath, caiseatl, cathair and dun in the early Irish sources. They were made of earth and built of stone in the west of the country. In terms of quantity, distribution and access, no historical or archaeological record of the early Medieval Period in Ireland comes close to the ringfort.

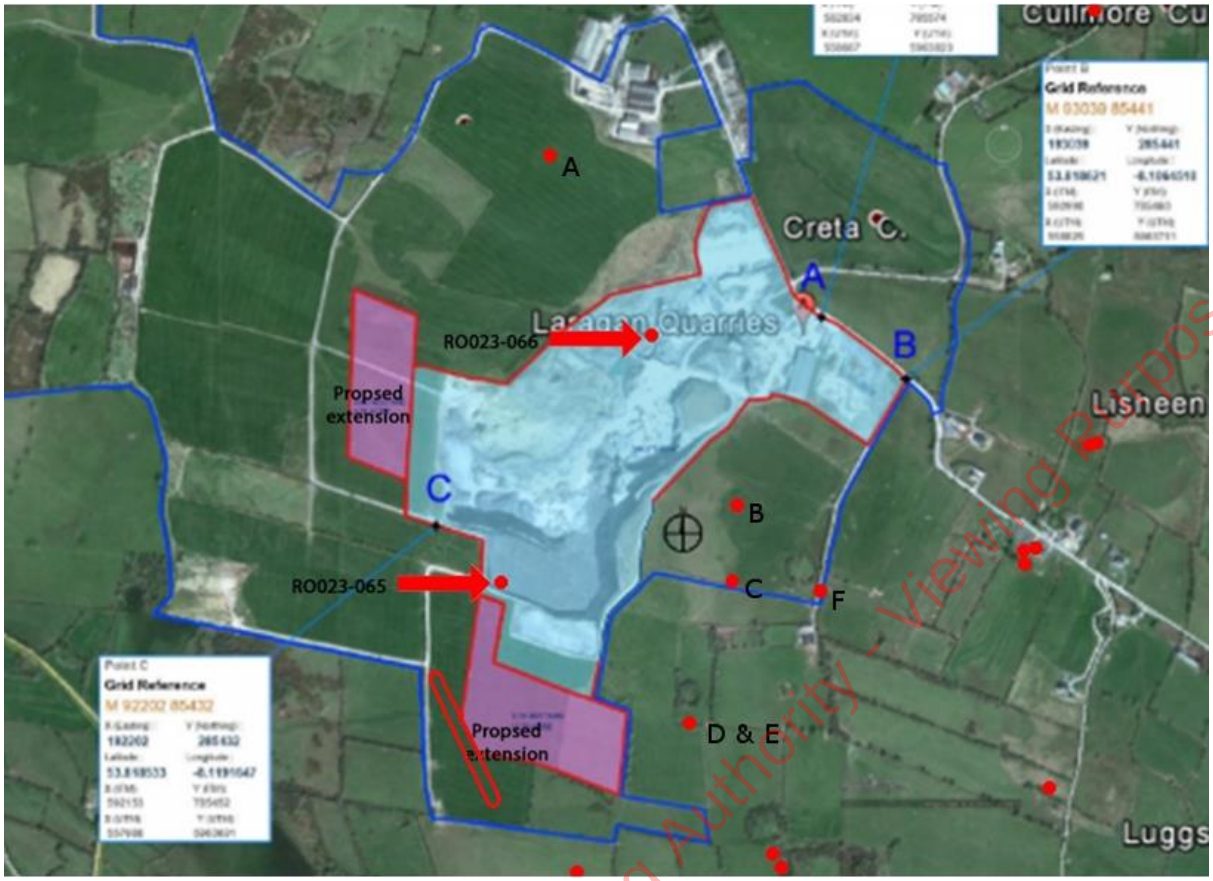

Figure 11.3 Extent of quarry and archaeology features

ASSESSMENT OF POTENTIAL IMPACTS

Direct Impacts

11.22 There will be no direct impacts on any known items of archaeology, cultural heritage or buildings of heritage interest in the application area or the vicinity.

Indirect Impacts

11.23 There will be no indirect impacts on any known items of archaeology, cultural heritage or buildings of heritage interest in the application area or the vicinity.

Interactions with Other Impacts

11.24 No interaction with other impacts has been identified.

Worst Case Impact

11.25 In the worst-case scenario, the development might disturb previously unknown deposits or artefacts without preservation by record taking place in the unextracted green field area.

PREDICTED IMPACTS

11.26 No existing areas or monuments of archaeological and historical potential were identified within the confines of the quarry or the proposed quarry extension areas. Work associated with site excavations for any project including topsoil stripping for the existing and proposed quarry extensions may result in the discovery of previously unknown archaeological artefacts or sites. The closest recorded monument is 0.3km to the south and east of the site. The 1837 OSI map shows a few buildings on the site of the proposed southern extension. It is possible that artefacts of archaeological or cultural significance would be discovered as there was a settlement pattern of houses and sheds in the Historic 6-inch Map (1837-1872).

11.27 The proposed development will not have any direct impact on any of the known cultural heritage sites in the study area. There may be an archaeological impact in the southern extension area of the proposal due to the possibility of unrecorded sub-surface features or finds.

MITIGATION MEASURES

11.28 The cultural and archaeological heritage component of the Environmental Impact Assessment Report for the proposed development at Largan and Cuilrevagh to the north of the town of Strokestown consisting of a paper and fieldwork study was carried out in October 2019. There are no direct or indirect impacts on any known items of cultural heritage, archaeology or buildings of heritage interest in the application area or the vicinity.

MONITORING

Archaeological Testing

11.29 Archaeological testing is recommended on the site of the prop

Archaeological Monitoring

11.30 Archaeological monitoring is recommended only where testing has indicated an area of archaeological potential. If any archaeological artefacts are discovered within this site all site work will be required to cease and the finds reported to Roscommon Country Council, Roscommon County Museum and the National Museum.

CUMULATIVE IMPACTS

11.31 There are no predicted cumulative impacts arising from the proposed extensions.

RESIDUAL IMPACTS

11.32 Implementation of the mitigation and monitoring measures outlined in sections 11.6 above will ensure that potential impacts of the two no extensions to the quarry on cultural heritage do not occur.

DO NOTHING SCENARIO

11.33 If the proposed development did not proceed there would be no additional impacts on cultural heritage and the land would remain in its current agricultural state.

REINSTATEMENT

11.34 No reinstatement measures are required.

CONTENTS

12. THE LANDSCAPE, VISUAL IMPACT AND RESTORATION

INTRODUCTION

12.1. This section of the EIAR assesses the landscape & visual impact associated with the development on the surrounding landscape in the vicinity of the quarry site. Methodologies used to assess the landscape and visual impacts are outlined and mitigation measures are proposed where required. A landscaping plan is proposed which will be implemented during the operational lifetime of the development with a restoration plan which will be implemented on closure of the quarry.

12.2. This chapter presents the findings of a landscape and visual impact assessment that was conducted to assess the impact of the subject quarry development on the landscape and visual amenities of the surrounding area. The chapter has been prepared by Global Green Sustainability, Environmental Consultants.

12.3. Landscape and visual effects are independent but related issues; landscape effects are changes in the landscape, its character and quality, while visual effects relate to the appearance of these changes and the resulting effect on visual amenity. Wherever possible, identified effects are quantified, however the nature of landscape and visual impact assessment requires interpretation by professional judgment. In order to provide a level of consistency to the assessment, the appraisal of sensitivity and the prediction of magnitude and assessment of significance of the residual landscape and visual effects have been based on pre-defined criteria, as described further preceding the relevant sections of this chapter.

12.4. This section also outlines the methodologies used to assess the landscape and visual impacts and provides details on proposed remedial measures.

Statement of Authority

12.5. Niall Kiernan, Senior Engineer from Global Green completed this section of the EIAR. Mr. Kiernan has a Bachelor's Degree in Environmental Science incorporating Landscape and Visual Impact from Sligo Institute of Technology and has over 10 years' experience in Landscape and Visual Impact Surveys and is a member of a number of professional organisations. Global Green Technical Consultancy Ltd. has considerable experience in the assessment of visual impact and has compiled EIA studies ranging from quarries and commercial developments.

ASSESSMENT METHODOLOGY

12.6. A detailed landscaping assessment was undertaken to assess the impact of the existing development on the surrounding landscape. This involved undertaking a visual impact assessment of the area and a desk-based study to gather information on the existing landscape, visual resource, planning context and landscape designations. The methodology used in conducting the landscape and visual impact assessment for this EIAR is based on the following:

- EPA's Guidelines on the Information to be contained in an Environmental Impact Statement, 2002
- DOE 'Landscape and Landscape Assessment Guidelines' (June 2000)
- 'Guidelines for Landscape and Visual Impact Assessment', (GLVIA) by the Landscape Institute with the Institute of Environmental Management and Assessment (Second Edition, 2002).
- The Landscape Institute with the Institute of Environmental Management and Assessment, 2013, Guidelines for Landscape and Visual Assessment, (Third Edition).
- Draft Revised Guidelines on Information to be contained in Environmental Impact Assessments August 2017.

12.7. The aforementioned documents recommend baseline studies to describe, classify and evaluate the existing landscape and visual resources, focusing on its sensitivity and ability to accommodate the change that will occur as a result of this development.

12.8. This is established through a combined process of desktop study and onsite survey work, in addition to photographic and plan surveying and analysis. The development is then applied to the baseline conditions to allow for the identification of impacts, assessment of their magnitude and significance on the landscape character and any visual amenities.

12.9. During the formulation of this EIAR, the assessment of the landscape impact was conducted on a quantitative and qualitative basis involving: -

- Desktop study to assess the development through a combination of historical ordnance survey maps, site plans and photographs, geology and soil maps
- A review of the Roscommon County Development Plan 2014-2020 and Roscommon Landscape Character Assessment
- National planning policy guidance

- Geology and soil maps
- Site visits to determine the principle viewpoints and the main visual receptors, in addition to assessing the impact of the development on the landscape/historical character and setting.

12.10. Site visits were undertaken in August and October 2019.

12.11. The purpose of the site visits was to become familiar with the site, establish the general landscape character of the area and identify principle representative viewpoints including residences, prospects, public pathways and roads with views of the locations where the proposed extensions are to be developed. The actual extent of visibility was also checked in the field due to the localised screening effects of buildings, fences, trees, hedgerows, banks and the existing established quarry.

12.12. Potential seasonal screening effects were also identified where necessary and recorded.

12.13. The proposed N5 has been taken into account from the perspective of viewpoints 6, 7, and 8 which will be separated from the quarry by the proposed N5.

12.14. Landscape is a combination of two separate but closely related aspects. 'The first is visual impacts focusing on the extent to which new developments can be seen. The second aspect is impacts on the character of the landscape, examining responses which are felt towards the combined effects of the development.

12.15. This landscape and visual impact assessment examines and evaluates the implications of the subject development in terms of landscape character and visual alterations, arising from the proposed extensions to the subject quarry.

12.16. Refer to Landscape Impact section for the eight chosen viewpoints (VP 1-8).

EXISTING / RECEIVING ENVIRONMENT

Site Context

12.17. Hanly Quarries is located in a rural area c.4km north of Strokestown and 6.75km southeast of Elphin in north, Co Roscommon.

12.18. The two separate extensions will be located immediately adjacent to the boundaries of an existing active quarry; the access to the quarry site is from the Strokestown to Elphin 3" Class County Road. The nearest primary route is the R368 Strol
extension to the quarry it is possible that some of the infr
quarry extension to the southern part of the quarry will be vis

measures to minimise the visual impact are stated as part of restoration plan (Appendix 12-1) in the mitigation measures section in this chapter. The proposed extensions have a combined site area of 8.60 hectares.

12.19. The N5 Ballaghaderreen to Scramoge Road Development will pass in close proximity to the southern most of the proposed extension and is evident in Figure 12.3 below.

LANDSCAPE CHARACTER

12.20. The existing quarry is situated in a sparsely populated rural area. The lands surrounding the quarry are thus mainly rural in nature; characterised by fields enclosed by hedgerows and scattered, one off housing, a national school and farm outbuildings.

12.21. The surrounding landscape of the quarry is comprised of agricultural grazing and meadow land. There are open fields with hedgerows and sparse treelines.

12.22. There are no areas either within, adjoining or close to the quarry which have specific landscape protection designations.

Figure 12.1 Quarry Location www.googleearth.com

LANDSCAPE PLANNING CONTEXT

12.23. The Roscommon County Development Plan 2014 – 2020 (CDP) and the National Quarrying Guidelines were consulted with regard to Landscape Character and planning policy. The Planning and Development Act 2000 (as amended) requires the inclusion of a development plan objective for: *"The preservation of the character of the landscape where, and to the extent that, in the opinion of the Planning Authority, the proper planning and sustainable development of the area requires it, including the preservation of views and prospects and the amenities of places and features of natural beauty or interest".*

12.24. According to the Roscommon County Council LCA 2014 the site sits in LCA 4 - Kilglass Drumlin Lakeland's.

Roscommon LCA 4: Kilglass Drumlin Lakeland's

12.25. The Key Characteristics of the locality in which the subject site sits is described in the Roscommon County Council Landscape Character Assessment which forms part of the - County Development Plan 2014-2020. The description of LCA 4 is set out in full below.

12.26. The N5 upgrade will be bordering the southern quarry extension as shown in Figure 12.2.

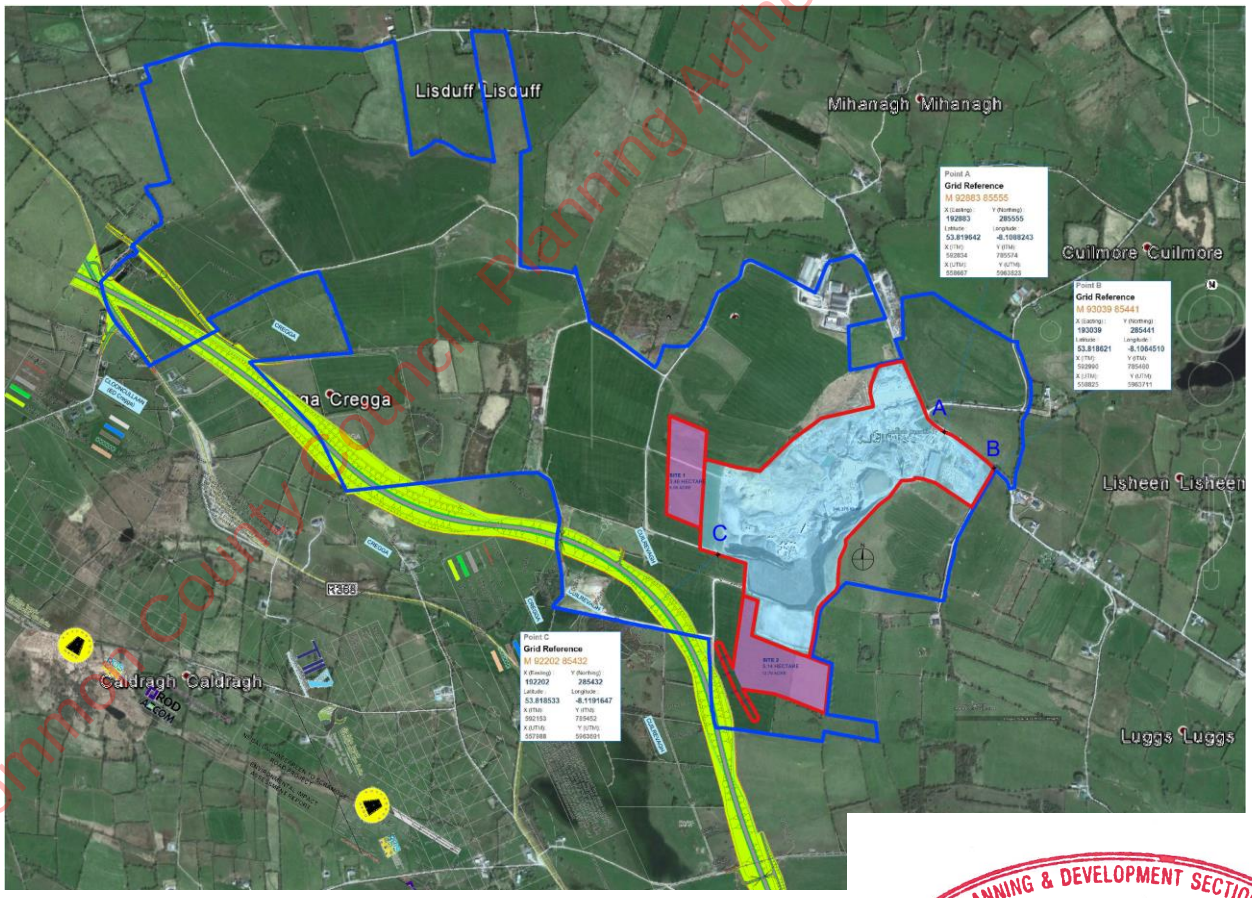

Figure 12.2 Ballaghaderreen to Scramoge Road Development to the

Key Characteristics: Kilglass Drumlin Lakelands:

12.27. *"This character area is located on the eastern boundary of County Roscommon in the northern half of the county. It is defined by a ridge of high ground in the south, the Shannon and a series of lakes, the largest of which is Lough Bo Berg, to the east and north and by a cluster of three hills to the west. The area comprises low undulating drumlins which are well drained in the north and interspersed with a number of large lakes, the largest being Kilglass Lake, in the south. The drumlins are aligned on a northeast southwest axis and this arrangement determines the pattern of lakes in the greater area. The lakes fan out from east to west similar to fingers extending into the rolling drumlin landscape. The effect of this pattern of lake and hill is unique in the context of the county. Land cover comprises mostly dry grassland and reclaimed blanket bog with patches of raised bog on lower ground, with the higher ground on the southern ridge covered mostly in wet grassland as well as some areas of conifer forest. Many of the small hills defining Kilglass Lake are covered in broadleaf woodland cover. This landscape character area is thus complex, both from a landform perspective as well as considering landcover. There are no major settlements in the area and the closest one outside the area is Strokestown to the south. There is a dense network of mostly local roads nestled into the rolling landscape. Kilglass Lake serves boating and fishing enthusiasts and includes a marina with pleasure boats" (Roscommon LCA, 2014).*

Landscape Value

12.28. The Kilglass Drumlin Lakeland area is considered to be of Very High Value due to it its tourist amenities including fishing, boating and extensive scenic views. The only regional road, the R371, is located in the south of the LCA and provides elevated and panoramic views over Kilglass Lakes as far as Slieve Anerin and the Arigna Mountains in the distance. A section of this road is proposed as a Scenic Route. Another Scenic Route is proposed further north in a low lying area along a local road and provides a closer view of Kilglass Lake, its wetland and a marina. This LCA is thus highly visually sensitive. The whole of Kilglass Lake is designated an NHA, increasing its sensitivity regarding natural heritage.

Forces of Change

12.29. The area is of very high visual amenity and thus tends to attract considerable interest in people wishing to build single rural dwellings. There are several locations where houses have been built in the recent past overlooking the lakes and this trend is likely to continue unless measures are put in place to afford greater protection to the landscape. There is also likely to be an increase in the extent of afforestation in this landscap farmland. The N5 is due to be realigned over a 32 kilon anticipated that there will be increased demand for quarrying

Quarries and Ancillary Activities Guidelines for Planning Authorities

12.30. The following recommendations from the National Quarrying Guidelines are recommended as mitigation measures for quarry extensions: -

- Where possible, existing landscape features (such as hills and trees) should be used to screen new extractive industry development. Native species of trees and shrubs can be planted to create food reserves for wildlife.

- Landscaped mounds, sometimes using topsoil and overburden from the aggregate workings, can be constructed to screen unsightly excavations, plant or storage ponds. Topsoil and subsoil should be stored separately after surface clearance to facilitate re-use and should also be seeded. Once work has started, it may be possible to move equipment and structures to well within the site and in some cases to locate plant in the deepest part, so as to lessen the visual, noise and dust nuisance impacts on adjoining properties. Suitable selection of colours and finishes for buildings and plant may help lessen the visual impact.

- Restoration is a process that will enable the worked-out quarry or sand pit to be used for its original purpose (such as agriculture) or adapted for a new use (such as amenity). Restoration includes design, initial landscaping works, soil spreading, final landform construction and aftercare. Aftercare is the work done after the replacement of the soil and includes fertilising, planting, construction of pathways, vegetation maintenance and an ongoing long-term commitment to the restored land. For successful restoration, steps must be taken at every stage, from design through operation to decommissioning of the facility, to ensure that restoration is integrated into the process.

- All proposed extractive development proposals must be accompanied by detailed restoration and after-care plans (although in the case of sites with a long working life, it may be appropriate to establish the need for such plans at the outset, while leaving the details to be agreed either on a phased basis or towards the end of the extractive process). Progressive restoration should be employed where relevant and practicable, e.g. for sand and gravel pits.

- All buildings, plant, internal roads and paved areas sho
is completed, unless otherwise agreed as part of the re
terrain, the existing character of the area, and the na

extraction, a variety of after-uses may be possible, including farming, forestry, recreation/amenity uses, nature conservation, or industry. Where the excavated area will be below the water table, a landscaped pond or lake may be possible. It is important that the acceptability of the proposed after-use be discussed with the planning authority at the pre-application stage. The aspirations of the local community should be taken into account in this regard.

12.31. As part of the Roscommon County Council Landscape Character Assessment (County Development Plan 2014-2020) a scenic route is identified along the elevated part of the R371.

12.32. The existing quarry can be vaguely distinguished at distance from this scenic route; however no structures present or structures proposed as part of the quarry extension (no structures are proposed as part of the extensions) will be visually discernable from the scenic route. There will be no degradation of the quality, character or value of the landscape as viewed from this scenic route. The proposed quarry extension will not affect this scenic route in any way.

Landscape Character Areas and Landscape Value

12.33. Landscape character areas were compiled and defined by a combination of professional judgement relating to the physical elements which make up the landscape of an area and the following procedures from the prescribed landscape assessment methodology: -

- Physical units i.e. the combination of land form and land cover comprising: -
- Visual units i.e. physical limits of a view and
- Image units i.e. physical features such as focal points

12.34. According to the Roscommon County Council LCA 2014, the Landscape Character Areas in which the proposed site lies and is proximal to are: -

- Area 29; Strokestown drumlin and turlough belt: Landscape value; Moderate Value.
- Area 4; Kilglass drumlin Lakeland. Landscape value; High Value. The proposed site lies just within the boundary of this landscape character area.

Landscape character types and landscape capacity for change

12.35. According to the Roscommon County Council LCA 2014, the landscape character type in which the proposed site lies is Drumlin Lakeland's. This particula
having the following pertinent attributes:

- Landscape sensitivity: Low

- Landscape capacity for change: High
- Special landscapes: No special landscapes in immediate proximity or visual envelope

Landscape Value of the Subject site and surrounding lands

12.36. This character area is of Moderate to high landscape value. The main features of value in the locality are associated with Kilglass Lough. Although the visual envelope of the quarry does not extend out over this lake, nor is the subject site or proposed extension visible from the Lough. The quarry faces are very well screened by existing tree lines and the quarry office buildings. The southern extension will have a slight visual impact however due to the proposed N5 upgrade the surrounding landscape has exceptional capacity to accommodate change as the N5 upgrade will dominate the landscape to the south of the proposed quarry extension. Indeed, it is our opinion that the quarry extension will not create any significant impact on the surrounding landscape character.

12.37. Following a review of the County Development Plan "Landscape and Landscape Character Assessment of Roscommon County" maps, it is determined that the subject quarry is not located within or adjacent to any designated areas. Further to the review of the National Quarrying Guidelines the subject quarry and proposed extension areas are fully compliant with the guidelines with regards to landscape and visual impact. With respect to the extension to the southern side of the quarry proposed mitigation measures are detailed in the mitigation section of this report.

CHARACTERISTICS OF PROPOSED DEVELOPMENT

12.38. Refer to chapter 3.0 (Description of Development) for a detailed site and development description. The following specific details of the proposed quarry extensions are relevant to this chapter of the EIAR.

- The extensions to the quarry will see the clearance of all existing soil cover over an area of 8.60ha.
- Earth removed as part of the works will be used to construct perimeter berms around the edge of the extended quarry as part of the landscaping works on the site and may be spread on adjacent agricultural lands.
- No excavation works will take place outside of the areas subject to the planning application for the extensions to the quarry.
- The area cleared of soil will be excavated by means of b

IMPACT OF THE DEVELOPMENT

12.39. This section examines the landscape and visual impacts of the existing development and proposed extensions, in addition to the overall significance on the surrounding landscape and visual characteristics.

12.40. All landscaping works undertaken in the past on this site impact significantly in a positive manner to screen most of the existing quarry faces. The long-term visual impact of the site on the surrounding environment is expected to have a positive impact as there will be sufficient screening of the quarry pit and the auxiliary machinery being used as part of the quarry operations.

12.41. A further reduction in landform is not very significant. However, the enclosed character of the existing landscape is largely determined by the undulating ridgelines, and any modifications to these needs to be carefully considered if the quarry development was to interrupt the ridge lines. For the proposed extension to the existing quarry it is expected that the quarry development won't interrupt the primary ridge lines.

ASSESSMENT OF IMPACTS

12.42. The landscape has been significantly altered as a result of past quarrying activities. Upon assessment of the locality, it was determined that the site is visible from a very limited number of areas as the topography of the area in addition to the existing vegetation around the site and nearby lands screens the site exceptionally well from public view. There is a potential that the southern extension will have an impact from the west and the north. Mitigation measures to minimise these impacts are listed in the mitigation section of this report.

12.43. Much of the quarrying has been undertaken on the northern part of the site. Due to the nature of extractive industry, all works occur below ground levels. The lands surrounding the site are relatively flat to gently undulating in character.

Landscape Impacts

12.44. The impact on the landscape is dependent upon the development context, the level of sensitivity and vulnerability of the affected landscape, its tolerance to change and its importance within a local, region, national or global context.

12.45. All photographs were taken as part of the field work in August and October 2019, using a Panasonic Lumix DMC- FZ50 digital camera. It should be noted that photography is a tool to assist in the visualisation process and cannot be expected to [illegible] would be attained on the ground.

12.46. Figure 12.3 provides details of the 8 no viewpoints that have been selected.

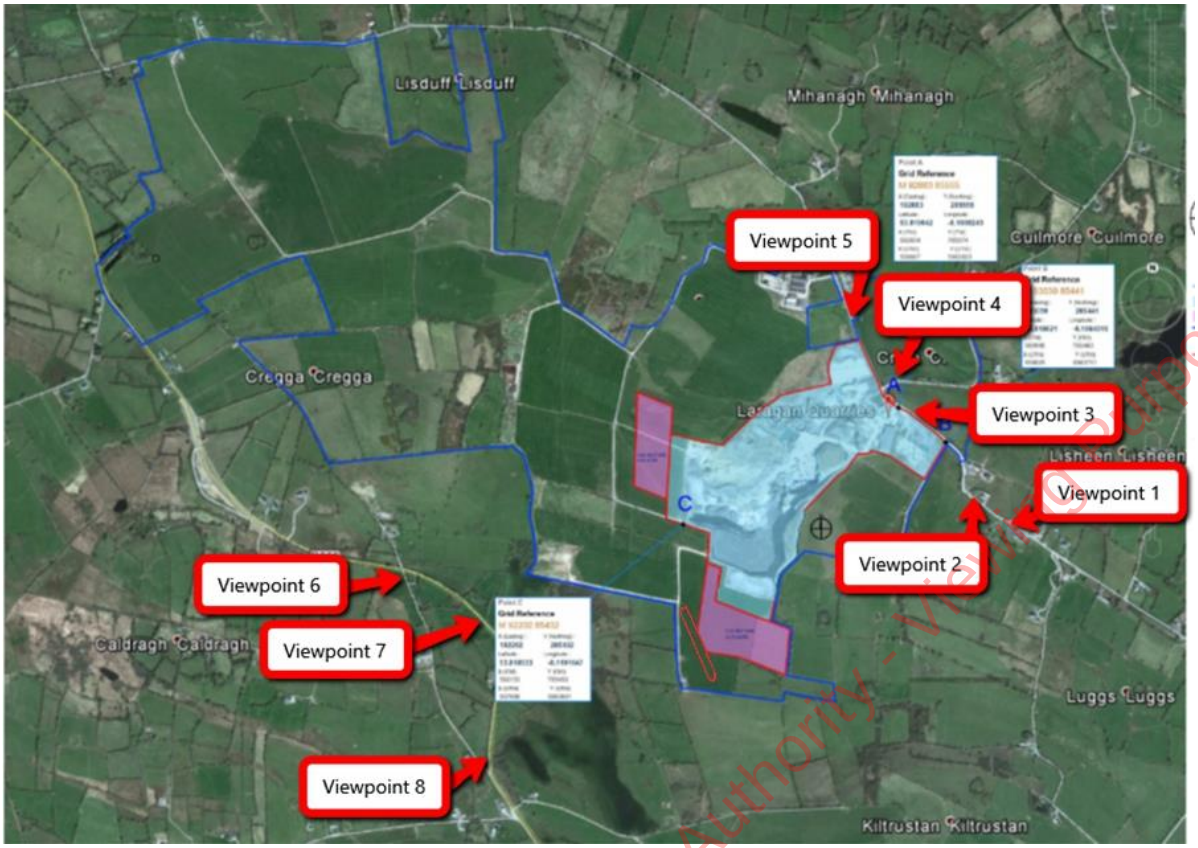

Figure 12.3 Map of viewpoints

Figure 12.4 Viewpoint 1 Kiltrustan Hill beside Kiltrustan Primary S

Figure 12.5 Viewpoint No 2 from the closest receptor to the quarry

Figure 12.6 Viewpoint No 3 / Photo from beside quarry entrance

Figure 12.7 Viewpoint No 4 from the north-east of the quarry entrance

Figure 12.8 Viewpoint No 5 from the west of the quarry entrance

Figure 12.9 Viewpoint No 6 from the south of the proposed extensions along R368

Figure 12.10 Viewpoint No 7 from the south of the proposed extensions along R368

Figure 12.11 Viewpoint No 8 from the southern side of the proposed extensions looking towards the west along R368

12.47. The visibility of the proposed extension was initially assessed by a desktop study of OS maps in order to identify potential viewpoints. This was followed up by field survey where viewpoints were generally chosen at locations from which the existing/proposed development was visible.

12.48. The viewpoints were chosen to give a representative sample of views of the proposed extension and existing development within the landscape to illustrate the impact on local residential properties and school.

12.49. The following factors were examined in determining the significance of the impact on the landscape: -

- The level of sensitivity of the affected landscape and visual resources
- The scale of change
- The altering of existing patterns of landscape elements and features as a result of the works.

Visual Impact

12.50. In order to facilitate the assessment of the visual impact of th determined.

12.51. The envelope defines the general area within which the development site may be visible, whether completely or slightly, due to topography. The visual envelope extends to 2 km from the site at its furthest point. Beyond the envelope the visual impacts of the site are considered negligible.

Figure 12.12 2km landscape radius

12.52. Potential sensitive receptors were determined firstly by desktop assessment of OSI maps, Google and Bing aerial photography and on the ground during fieldwork.

12.53. Representative photos were taken only at potential sensitive receptors with an aspect toward the quarry site. Other locations and residences considered either did not have an aspect toward the site of the view were obscured by topography.

12.54. The higher worked areas including quarry faces are apparent in the landscape from the graveyard in viewpoint 1; the site is recognisable as a qua
substrate. The proposed N5 will be constructed to the south
proposed extension will be visible from viewpoints 6, 7 and

implemented the views of the quarry will be slight to moderate and the impact minor on the surrounding landscape and the southern view from the proposed N5.

12.55. The new N5 will also be built between viewpoints 6, 7 and 8 and the proposed quarry extensions.

12.56. The impact is discussed with the mitigation measures in the mitigation section.

Viewpoint No	Receptor Type	Visual Sensitivity	Magnitude of change	Effect / Impact
Viewpoint 1	Kiltrustan Hill beside Kiltrustan Primary School Primary School	Low	Very low	Negligible
Viewpoint 2	Closest receptor to the quarry	Medium	Low	Minor
Viewpoint 3	Quarry entrance	Low	Low	Negligible
Viewpoint 4	North-east of the quarry entrance	Medium	Medium	Minor
Viewpoint 5	West of the quarry entrance	Medium	High	Minor
Viewpoint 6	South of the proposed extensions along R368	High	High	Minor
Viewpoint 7	South of the proposed extensions along R368	High	High	Minor
Viewpoint 8	Southern side of the proposed extensions looking towards the west along R368	High	High	Minor

12.57. Several banks of topsoil, now vegetated, help to effectively screen the lower, main level. Colonising vegetation on worked areas is predominantly grass species. Due to its north-western aspect, partial views of the development are possible from the north, northwest, and east. Accordingly the views within the visual envelope are limited to these aspects as shown in photographic survey.

12.58. While aggregates extraction has altered the landscape to date, the assessment of the existing visual environment and the impact of the existing development and its various component parts on visual receptors have been assessed. There are no designated focal points or views in the vicinity of the application site listed in the Roscommon County Development Plan 2014-2020. The viewer sensitivity has established that there is Medium view sensitivity.

12.59. While aggregates extraction operations to-date has altered the landform and vegetation cover, the magnitude of change as a result of the proposed extension has been assessed as Low.

CUMULATIVE IMPACTS

12.60. Due to the nature of quarrying operations, it is inevitable that there will be an impact on the surrounding landscape and the view from the proposed N5. However, the severity of the impact can be substantially reduced through the implementation of landscaping mitigation measures through screening, site layout/planning, berms along the southern side of the quarry, planting, utilisation of existing landscape features and progressive site restoration.

12.61. The minimal views of the quarry from the viewpoints have a slight impact on the character of the landscape.

12.62. The landscape character, topography and landcover have slightly changed, but only on a very localised level. The quarry site is not significantly visible from the surrounding area such as to impact on the landscape quality of the surrounding lands.

12.63. The view of the quarry is not a significantly detracting feature when in view.

MITIGATION AND RESTORATION MEASURES

12.64. Due to the nature of quarrying operations, it is inevitable that there will be an impact on the surrounding landscape. However, as part of the proposed development the severity of the impact can be substantially reduced through the implementation of landscaping mitigation measures through screening; site layout/planning; planting; utilisation of existing landscape features and progressive site restoration. The appearance of the development is a major influence on how the site is perceived by the public. Therefore, the extraction and restoration schemes include landscape development, planting, and screei
a number of restoration/mitigation measures have been c
berms, planting and utilisation of the existing landscape featur

Figure 12.13 Existing landscape mitigation measures

12.65. The proposed N5 which will be developed to the south of the proposed extension to the existing quarry, won't have a view of the proposed extension as there will be a berm, shown in figure 3 below constructed to control fly rock from the quarry which will also act as a visual and noise barrier.

Figure 1 Berm Construction

Figure 12.14 3D Image of quarry with acoustic berm between quarry and new N5

12.66. It has been identified that the present quarry is already part of the surrounding landscape character. It has also been identified within the Roscommon LCA (2014) that the landscape in which the proposed development has a good capacity to accept changes, which is evident by the granting of permission for the construction of the new N5 alignment that will pass close to the southwest boundary of the proposed southern extension to the quarry. This point is highlighted by the local investigations carried out to identify the extent to which the area associated with the proposed quarry extension can be seen from the surrounding landscape. These surveys by Niall Kiernan showed the present quarry is not significant visually throughout the surrounding area. The local landscape and visual survey therefore validated the point from the Roscommon County Council Landscape Assessment that the local landscape has the capacity to accept change without excessive visual intrusion or change to its present landscape character or value. The southern extension will have a slight visual impact however due to the proposed N5 upgrade the surrounding landscape has exceptional capacity to accommodate change as the N5 upgrade will dominate the landscape to the south of the proposed quarry extension. Indeed, it is our opinion that the quarry extensi
impact on the surrounding landscape character.

12.67. From more distant viewpoints, no additional visual impact is anticipated. Furthermore, the proposed development and surrounding quarry is not significantly visible but visible from a few views points which will be no greater than levels arising from the present quarry operations as there will be planting and berms constructed. The berm to control fly rock will be completed in the southern section of the proposed extension as this will be screening from the proposed N5 viewpoints. A landscape plan has been developed which shows the proposed planting and berms that are going to be developed to reduce the visual impact of the quarry extensions. Please see plan below. A restoration plan is also provided in Appendix 12-1

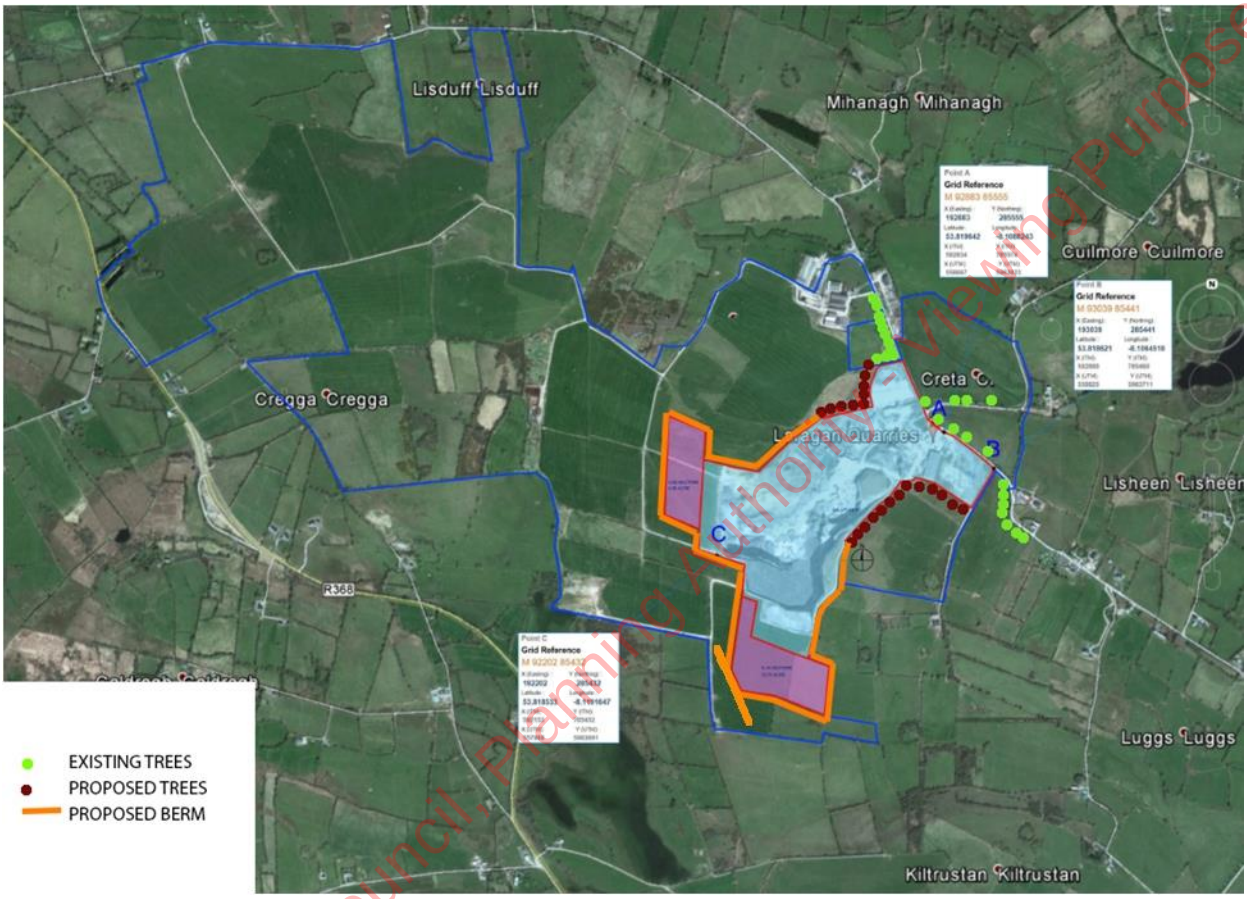

Figure 12.15 Existing and Proposed Restoration

RESIDUAL IMPACT

12.68. The visibility of the application site from the receiving environment is minimal due mainly to the application site being below ground level but some faces may be visible. Mounds of overburden stored in an around the quarry may be used during re-profiling where they have not developed a useful screen of tree cover. The requirement
be assessed at that time, however it is predicted that the re
the residual visual impact.

12.69. Since the proposed development will be an extension to an existing quarry site and as the proposed development will not be visible from any Secondary National Road or any present or proposed scenic view it is therefore unlikely to have any significant negative impact on the existing views as the present quarry is already part of the present landscape character. Consequently, no significant residual impacts on views are expected. The Roscommon County Council Landscape Character Assessment (County Development Plan 2014-2020) identifies the landscape character types as Drumlin Lakeland, Wet Farmland and Farmland Complex (i.e. the landscape around the proposed site), as landscape that can absorb the impact of new development due to their visual complexity created by variation in both landform and land cover. We believe that this is why this is the proposed location for the N5 upgrade.

12.70. The local landscape and visual surveys showed the present and proposed developments are not significant visually throughout the surrounding area. The locality is capable of visually absorbing the proposed extension as it will only have a slightly negative impact on the landscape as it will be seen merely from the R368, which will be separated from the quarry by the N5.

12.71. The impact to the surrounding views can be classified as neutral. The proposed development will not in any way degrade or change the landscape character or landscape value of the locality.

CONTENTS

13. INTERACTIONS

13.1. The interactions between the environmental issues are outlined below and briefly discuss where different aspects of the environmental factors inter-relate with each other.

13.2. While the predicted significant impacts of the proposed quarry extensions and proposed mitigation measures have been outlined in the preceeding chapters of this EIAR, all environmental factors will interact to some extent, however those interactions may not be significant. The comprehensive impact assessment carried out as part of this EIAR has revealed that the proposal will not result in any significant adverse effects or cumulative impacts on the environment.

13.3. The elements of the environmental that may experience impacts as a result of the proposed development have been identified in the individual assessments and include: -

- Effects on land use and soils
- Impacts on bedrock geology and groundwater
- Visual impact
- Impact on material assets in particular local roads
- Potential nuisance from dust and noise

POPULATION AND HUMAN HEALTH

Landscape

13.4. Perception of landscape is the major defining factor of how human beings view their local environment. Any development will cause a degree of concern when situated within a locality. The landscape impact of the proposed development and interaction with the local community already exists due to fact that a quarry already exists within the overall landholding however, views of the quarry are limited due to the drumlin nature of the local topography. Mitigation measures have been discussed in Chapter 12 to further reduce visual impact by the construction of soil berms around the site perimeter and to restore the landscape at decommissioning.

Air & Climate and Noise

13.5. An adverse impact due to air quality in the operational phase of the quarry extensions has the potential to cause health and dust nuisance issues. However, the interaction between humans and air/climate during site operations is slight as the dust monitoring that has been carried out to date has found impacts to be negligible.

13.6. Dust impact into the surrounding area will be minimal as buildings and residential dwellings are location at a distance of > 400m from the quarry operational area, therefore no adverse dust impact exists.

13.7. Noise from operational machinery is carried on air waves. The topography reduces the impact of noise into the areas beyond the quarry operational area. Quarry operational noise is not considered to have occurred during site operation based upon noise assessment results to date. Ambient noise during operation will be no more intense than general farm machinery working in the background.

13.8. No adverse Impact is known in respect of climate.

Material Assets

13.9. Traffic arising quarry operational impacts will give rise to noise and dust. The level of traffic is not projected to increase as a result of the proposed extensions as the level of output will remain at its previous level. This will ensure that perceived nuisance impacts arising from quarry working are limited and confined to the immediate quarry operational area and existing haul routes.

Soil and Water

13.10. The sites hydrology is considered in chapter 6 and land and soils in chapter 7. Surface runoff water is directed towards existing siltation lagoons. Suspended solids are allowed to settle within the phased settlement pond system before discharge in the local stream. A wheel wash unit is installed to limit the carrying of nuisance silt and sludge to the main road. This combined with regular dampening down of aggregates and the working quarry area ensures there is no adverse effect locally due to nuisance dust plumes. No site produced contaminants leave the site to filter into the local environment.

LAND AND SOILS

Biodiversity

13.11. Prior to future quarry operations to extract stone, any remaining soils and overburden will be removed and stored in bunds (mounds) at the site perimeter until site decommissioning or spread on adjacent agricultural lands.

13.12. The impact of the soil removal will be permanent and profound and will result in the loss of some habitat and may disturb some species during excavation. However, mitigation for the proposed quarry extension has proposed to store soil in perimeter berms and to spread it on adjacent farmlands, to enable the developer reduce possible impact to biodiversity and to preserve seed stock of local provenance to ensure the quality of ecological landscape restoration at site decommissioning.

Landscape, Noise and Air

13.13. A series of mitigation measures have been proposed to minimise the potential impact that quarry extensions may have on the receiving landscape.

13.14. The soil stripped from the quarry surface will be stored in bunds and used to form perimeter landscaped berms that will act as both landscape features to reduce visual impact but also to reduce noise and air impacts at third party properties in close proximity to the site.

Water

13.15. During site clearance, depending on weather conditions, there may be elevated levels of silt and sediment in the surface water runoff. Soil stripping will not be carried out in unfavourable weather conditions while all surface water will be treated in the existing surface water treatment system including settlement lagoons, thereby eliminating potential threats to surface water in the area.

Cultural Heritage

13.16. During the removal of soil there is potential for a loss of previously unknown archaeological or cultural heritage material by the clearance of the surface in preparation for quarrying. Mitigation measures included in the Cultural Heritage chapter recommend that the soil stripping is supervised by an archaeologist to identify any potential undiscovered sites of artefacts

WATER

Population and Human Health

13.17. The threat to pollution of groundwater exists from potential surface water runoff or spillage events leaking into the surface or groundwater regimes. All vehicle refuelling will happen in a secured bunded area within the main quarry area while all surface water will be directed to the existing settlement lagoon system where potential pollutants will be removed.

NOISE AND VIBRATION

Population & Human Health and Landscape & Visual Impact

13.18. As part of the proposed development it is proposed to use the soils excavated from the surface of the site to create perimeter berms that will act as both an element of the sites landscape plan but will also act as a means of reducing the impact of noise and vibration on the receiving human environment.

LANDSCAPE

Cultural Heritage

13.19. There is potential for a visual impact of development to and from known Recorded Monuments in the vicinity although no known recorded monuments are located in the either of the 2 proposed extension areas. The recorded monuments are not significant in that they are not visited by members of the public and would not be directly affected by the proposed extensions.

DIFFICULTES IN COMPILING TOPIC INFORMATION

13.20. No particular difficulties were encountered, such as technical difficulties or lack of knowledge in compiling information contained within this Environmental Impact Assessment Report. Impact mitigation to reduce impact has been described and discussed in each chapter of this document. Where appropriate, existing published sources of information have been used and acknowledged. Commissioned studies and surveys undertaken for the purpose of environmental assessment of the proposed development have been referred to.

13.21. It was not however possible to carry out new traffic counts d changes in normal traffic patterns as a result of Covid-19. counts that were carried out in 2017 (for a previous applica have been used to determine the traffic levels. It is noted th

2020 whereas in 2018 when a previous application was submitted the number of people employed at the quarry was 70, which suggests that the traffic generated by the quarry has remained similar to that at the time the traffic count was carried out.