Quarryplan

Keegan Quarries Ltd.

Tromman Quarry, Rathmolyon

Environmental Impact Assessment Report

to accompany a S.37L Planning Application for further development of the 21.64Ha quarry site to include extraction of limestone from 14.3Ha and mobile processing to a depth of 13mAOD. The continued use of structures referenced under application SU17.319397 and the restoration of the whole quarry site.

February 2024

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1.0 PREAMBLE

This Environmental Impact Assessment Report (EIAR) has been prepared to accompany a planning application made under s.37L of the Planning and Development Act 2000 (as amended) ('the Act'), submitted to An Bord Pleanála (the Board) for consideration.

s.37L(8) of the Act (as amended by the Planning, Development and Maritime Valuation Act 2022) provides that upon receipt of an application it shall consider the same in conjunction with the submitted substitute consent ('SC') application:

"Where the Board receives an application for permission under subsection (1), it shall consider that application in conjunction with the application for substitute consent referred to in Subsection (1) and it shall be the duty of the Board to take all such steps as are open to it to ensure that the decision under section 37N is made as soon as possible after the decision on the application for substitute consent."

The Application being submitted to the Board is for the continuation of quarrying activities over an area of 14.3ha within the existing quarry site, which sits within the wider 21.64ha wider Tromman Quarry Site.

The proposed development has been so designed to maximise the resources at depths previously assessed and permitted, whilst providing for environmental improvements and assimilation into the surrounding landscape, in particular. Outside of the quarry void, the remainder of the site is given over to screening bunding and quarry infrastructure, with the northern end of the quarry site dedicated to ancillary activities and structures that utilise the mineral produced from the adjacent quarry void.

Although the application is concerned with further quarrying, that is the winning and working of mineral and the plant to assist in achieving this, the collective operation of the larger site will be considered cumulatively, as it is the effects of the activities that combine to form the "project" in this instance. Therefore, all on-site activities and emissions from the totality of the site that flow from the extraction of the limestone deposit will be assessed as part of this EIAR.

Inevitably given the contemporary nature of the SC process and the associated supporting documents there is significant crossover in the assessments.

The site is located in the Townland of Tromman some 2.2 kilometres northwest of Rathmolyon Village and some 6.4km south of the town of Trim. The site is bounded to the west by Kilsaran's Tromman Quarry, to the south by the regional road R156 and to the north and east by agricultural fields. The precise location of the site's application area can be seen from Figure 1.1 overleaf.

Given that the Board can only grant SC in terms of the extant operations on-site and applied for at the time of submission[1], this precludes the opportunity to grant future development. S.37L of the Act remedies this legislative anomaly and provides for the potential for further quarrying into the future.

[1] The Board's interpretation of S/C provided by Assistant Director Philip Jones on 25 October 2012

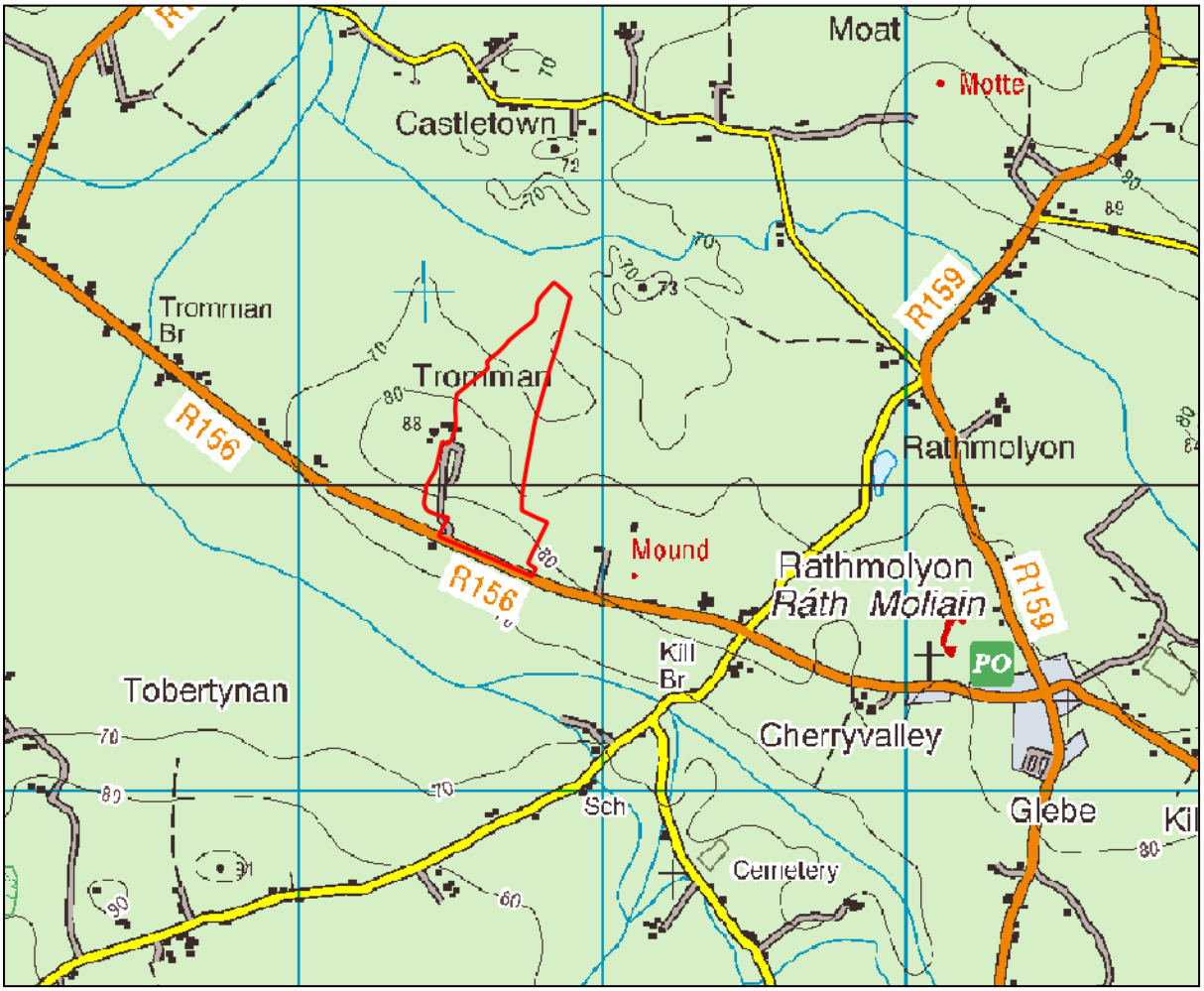


Figure 1.1 Site Location

1.1 Planning History

The totality of the operational site has a well-established planning history dating back to the original consent for a quarry and associated works in 1998 (97/1868), followed by ancillary consents for the northern concrete products yard in 2001 (00/2075) and 2003 (TA/20408) which provided consent for the mobile block making plant and for the structure for manufacturing concrete floors and associated works in each instance. The extraction consent was accompanied by an Environmental Impact Statement (EIS).

In 2004 under Permission Reference PL17.206702 (PA ref. TA/30334) approval was provided for the bulk of what is now the operational quarry, some **13.94ha**. The consent consumed and superseded the earlier permission. This application was accompanied by an EIS and provided for extraction across the quarry void to a level of **13mAOD**. This application was the first at the site considered by the Board, in which they affirmed the Planning Authority's decision. The duration of the permission was extended under PA ref. TA/1 30399 and TA/1 30400 to August 2018.

Under PL17.235960 (and PA ref. TA/900976) the extraction area of the quarry was further extended by c.2.85ha, on land towards the southern extent and to the east of the original quarry. The term of the consent was devised to determine contiguously with the larger operational consent and likewise was extended for a further 5 years under PA ref. TA/130581, again to August 2018.

Also, of relevance in this particular case, given that it is the unauthorised industrial structure that has given rise to a requirement for an application for SC, It is on record that an enforcement notice UD/1 5/284 (31st March 2017) was served on the applicant in relation to 'unauthorised newly constructed block work electrical sub-station, construction of pre-cast concrete units i.e. silos/storage bays, 2 no. concrete batching plants and associated plant and a large industrial building'.

A summary of the applications is provided for ease of reference; in reverse chronological order from the most recent to the original application for the sites, as favoured by the Board's Inspectors.

- In 2018, under PL17.249285 (PA ref: TA/161345) the Board refused the relocation of permitted blockyard and precast manufacturing plant, mixing / batching plant and associated landscaping works to the south

of the R156 for the following reasons. The proposed development is dependent on the operation of the existing quarry to the north the existing block yard and existing pre-cast concrete manufacturing facility which expired on the 5th day of August 2018.

- The following reasoning was provided: In the absence of a development strategy for these adjacent lands and a valid planning permission for the on-going operation of the quarry, it is considered that the proposed development, located on the opposite side of the R156 to existing quarry activity in the area, on low-lying land, would represent a piecemeal and disorderly approach to the development of the site and to the expansion of overall activities. Having regard to the location of this site the proposed development would seriously injure the amenities of the area and of property in the vicinity by the encroachment of an industrial type activity into an open rural area.
- In 2017, under PL17.248115 (PA ref. TA/161419), the Board granted permission for the temporary, three-year, retention of a concrete silo structure, with a footprint of 99m2 and measuring 28.6m in height, associated with and ancillary to the existing permitted precast concrete facility permitted under PA ref. TA/20408.
- In 2017 the planning authority considered three declarations sought under Section 5 as to whether or not development that had been carried out at the site (lime drying, batching plant and ESB sub-station) constituted development and was or was not exempted development. For each, the planning authority considered that the works carried out constituted development requiring planning permission (PA refs. TA/S5/1655;TA/S5/1 656 and TA/S5/1 623).
- In 2013, under PA ref. TA/130581, the planning authority granted permission for the extension of the duration of the permission granted under PA ref. PL1 7.235960 (TA/900976), with permission to expire on the 5th August 2018.

- In 2013, under PA ref. TA/1 30401, the planning authority refused permission for the extension of the duration of PA ref. TA/900976.
- In 2013, under PA ref. TA/1 30400, the planning authority granted permission for the extension of the duration of planning permission granted under PL17.206702 (PA ref. TA/30334), with permission to expire on the 5th August 2018.
- In 2013, under PA ref. TA/1 30399, the planning authority granted permission for the extension of the duration of the permission granted under PA ref. 97/1 868, with permission to expire on the 5th August 2018.
- In 2010, under PL17.235960 (PA ref. TA/900976), the Board decided to grant permission for the extension of the quarry extraction area (2.85ha).
- In 2004, under PL17.206703 and PA ref. TA/30334, the Board decided to grant permission for retention, continuance and extension of quarrying (including modification to layout permitted under PA ref. 97/1868). The application was accompanied by an EIS. Condition no. 7 required the extension and entire quarrying operation to be completed within 15 years as per the conditions granted under PA ref. 97/1 868.
- In 2003, under PA ref. TA/20408, the planning authority granted permission for the erection of a building to manufacture concrete floors, pipes, blocks, bricks and associated products.
- In 2001, under PA ref. 00/2075, the planning authority granted planning permission for a mobile block making plant, concrete yard and water settlement tank, including temporary offices and storage shed.
- In 1998, under PA ref. 97/1 868, the planning authority granted permission (15 years) for a quarry on 8.5ha together with a workshop, a mobile pressing plant, wheel wash, weighbridge and fuel storage unit and truck parking.

1.2 Previous Attempts at Regularisation

An application for leave to apply for SC (reference LS. 303334) was submitted to An Bord Pleanála (the Board) in December 2018 on behalf of the owner / occupier of the land in question, seeking to avail of the facility to apply for SC; as provided for under s.177C(2)(b) of the Act (now deleted as a consequence of the Planning and Development, Maritime and Valuation (Amendment) Act 2022).

The Board held that the subject application was one which met the requirements of Section 177C(2)(a)(ii) and that exceptional circumstances existed in this case and by Order directed the applicant to make an application for SC, accompanied by rEIAR and rNIS.

The application for SC was subsequently made to the Board in July 2019 and registered under the reference ABP-305049-19. During the period in which the SC application was being determined by the Board, the decision of the Board on the leave to apply case was challenged through the judicial process and the Board's decision was quashed. The Board confirmed to the Applicant in a letter dated 13th December 2022 that consequent to the quashing of the grant of leave to apply, that it could not continue processing the SC application. The application was deemed invalid and returned.

At the same time as the submission of the above application for SC, an application was made to the board under s.37L for permission to further develop the quarry. The application was accompanied by an EIAR and submitted to the Board and assigned the reference number ABP-305384-19. Unfortunately, the Board confirmed via a letter dated 18th October 2018 that there is no provision under s.37L of the Act for an application to further develop

the quarry when regularistion is being sought pursuant to Section 177E of the Act and as such, the application was deemed invalid an returned.

Planning Applications were also subsequently made to Meath Co. Co. in December 2020 under Section 34 of the Act for the retention of development at the Site and continuation and future extraction at the quarry under Meath Co. Co. Planning References TA201910 and TA201918 respectively. Under the terms of Section 34 (12) of the Act, the Planning Authority refused to consider the applications and both applications were returned in February 2021.

1.3 Legislative Context for EIA

The legislative context for the planning application accompanied by an EIAR is derived from the European Communities Directive 85/337/EEC as amended by Directive 92/11/EU on the assessment of the effects of certain public and private projects on the environment.

The reporting system has developed because the European Union has adopted a new Directive (2014/52/EU) (The Directive) in relation to Environmental Impact Assessment (EIA). The Directive was published in the Official Journal of the EU on 25th April 2014.

The Directive sets out a wide range of changes to the previous EIA Directive (2011/92/EU). The changes have been transposed into Irish law via Statutory Instrument No. 296 of 2018- European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 that provides for amendments to the planning and Development Act 2000 (as amended) and the Planning and Development Regulations 2001 (as amended) ('the Regulations'). This EIAR has been prepared in accordance with the amended Act and Regulations.

Schedule 5 Part 2 of the Regulations implements Annexes I and II of the EIA Directive into Irish law and provides the following "thresholds" in respect of the extractive industry and infrastructure projects, so that an EIA is required in respect of, or against which an EIA determination is required:

2. Extractive Industry

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

The site exceeds the 5ha threshold for mineral extraction and the overall project for further mineral working in combination with the ancillary 'downstream' manufacturing activities undertaken at the Site has not been the subject of EIA, and therefore having regard to the scale and nature of the project it is necessary for the planning application to be accompanied by an EIAR.

It is considered appropriate to reference when preparing an EIAR the requirements of the 2000 Act, as amended and the Regulations along with the general requirements of the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment August 2018 ('the Guidelines') and the Guidelines on the Information to be contained in Environmental Impact Assessment Reports – May 2022 (EPA Guidelines).

In preparing this application and accompanying EIAR it is considered sensible to give consideration to the environmental information; that has been considered previously by the Planning Authority and the Board and has been considered to be representative and acceptable information to provide an accurate environmental baseline for the site. This is an appropriate approach

to avoid unnecessary duplication of information and is recommended by regulation 222A of the Regulations. Table 1.1 below outlines the Environmental Impact Assessments and determinations considered when preparing this Report.

Planning Reference	Applicant	Project Description	Decision
TA30334 / RPL17.206702	Keegan Quarries Ltd.	Continuation and extension of quarrying to 13mAOD.	Approved 2004
TA/70175 / PL17.227088	Cemex (ROI) Ltd.	Extension by deepening of a 16.1Ha site to 24mAOD.	Approved 2009
TA60629 / PL17.226884	Keegan Quarries Ltd.	Extension of an existing quarry with tunnel connecting to the proposed establishment of a precast concrete plant etc to the south of the R156.	Refused 2009
TA900976 / PL17.235960	Keegan Quarries Ltd.	2.85Ha southern extension of Tromman quarry to 50mAOD	Approved 2010
QY76 / QV17.QV0182	Readymix Ltd / Cemex (ROI) ltd. & Irish Asphalt	Review under s.261A(6)(a)	Council decision set aside.
QY75 / QY17.0217	Keegan Quarries Ltd.	Review under s.261A(6)(a)	Council decision set aside.
TA161345 / PL17.249285	Keegan Quarries Ltd.	Relocation of blockyard, precast concrete and block manufacturing plants to the south of the R156.	Refused 2018
ABP-305049-19	Keegan Quarries Ltd.	Application for Substitute Consent for quarrying and manufacturing facilities	Application returned 2022

Table 1.1 Environmental Impact Assessments and determinations considered in the preparation of this EIAR

It is important to note that this s.37L application is made consequent to an application for SC for the regularisation of quarrying operations and associated downstream manufacturing and processing which has taken

place at the site. This EIAR makes reference throughout to the rEIAR prepared for the separate SC application.

1.4 EIAR Format and Structure

It is considered that the most appropriate method /structure, for ease of reporting and also reading, is one that provides analysis of the potential for significant environmental effects under each individual heading, as prescribed by the Regulations.

Although certain headings within this EIAR may be altered from the standard headings outlined in the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, the overall structuring and scope of the report has regard to the informational requirements of the EC Directives and Irish Statutory Regulations.

The "matters for inclusion" in an EIAR are outlined in Section 4.2 of the Guidance and Article 5(1)(A) to (f) of the Directive, the overall structuring and scope of the Report has regard to the informational requirements of the Directives and Irish Statutory Regulations.

This EIAR is produced in the Grouped Format Structure and is compiled and presented in as transparent and as open a manner as possible. The various authors involved in its compilation have attempted to present their findings and recommendations in a clear and unambiguous fashion. The EIAR comprises three separate parts, The Non-Technical Summary, the Main Report and the Appendices.

Non-Technical Summary

The Main Report

Section 1 The preamble outlines the background and terms of reference for the EIAR following on from the recent SC Application and outlines the format and the assumptions that underpin the report.

Section 2 Review of the reasonable alternatives considered by the applicant and the scope of the assessment with respect to the site's particular characteristics.

Section 3 describes the features of the progression of the proposed further quarry development and the intrinsic links with the ancillary buildings and structures that collectively present as 'the development project' and provides a review of the alternative designs considered and disregarded.

Section 4 defines the planning and development context in which the planning application is to be assessed.

Sections 5-18 incorporates the main body of the EIAR and outlines the aspects of the environment likely to be significantly affected by the proposed development and the interrelationship of each discipline, as identified in the Regulations.

population and human health, biodiversity, land, soil, water, air, climate, material assets, cultural heritage and the landscape.

As the EIAR is produced in the Grouped Format Structure, this approach can lead to certain topics, such as human health, being covered to varying degrees in most of the individual Sections, whereas other specific areas required under legislation fall almost exclusively into one Section. For those aspects of the environment likely to be significantly affected by the proposed development, that fall neatly into one or two sections the sections within which they are covered are shown overleaf.

Section	Heading	Aspects Required to be covered under the Regulations
5	Geological Assessment	Soil – Material Assets
6	Water Environment	Land-Water-Population and Human Health- Climate Change, Accidents and Disasters
7	Noise, Vibration and Blasting	Population and Human health – Material Assets
8	Biodiversity	Biodiversity
9	Landscape	Landscape
10	Air Quality and Dust	Air – Biodiversity- Population and Human Health-Climate
11	Traffic Impacts	Noise-Air
12	Cultural Heritage	Cultural Heritage
13	Waste Management	Landscape – Material Assets Population and Human Health Climate Change, Accidents and Disasters
14	Soil and Natural Resources	Soil
15	Socio-Economic Impacts	Population and Human Health
16	Climate Change, Accidents and Disasters	Climate, Major Accidents and Disasters
17	Human Health	Human Health
18	Intra and Inter Cumulative Impacts	Inter-relationship of above factors

Table 1.2 Sections within EIAR that cover the Aspects Required to be covered under the Regulations

1.5 EIAR Baseline

Annex IV (3) of the Directive requires

"A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge."

The grouped format structure provides that the baseline is considered in each individual assessment with specific reference to each individual discipline, however, what is clear from the directive is that it is to include the relevant aspects of the current state of the environment, regardless of the development control status.

Therefore, consideration will be given within the EIAR to all extant activities within the site and beyond that give rise to the cumulative activities that form the existing baseline. Assessments will be made upon all activities, not just those that occur due to the winning and working of the target mineral but also those on the wider site that may give rise to the potential for significant effects upon the environment as part of the wider project.

The assessments will consider the full life cycle of the proposed development to include the remediation / restoration of the complete site and the implications of residual impacts where they could arise.

1.5.1 Likely Evolution of the Baseline

Given the extant planning status of the quarry, it is considered that the baseline may evolve such that 2 scenarios are likely to occur in the future. The first is that mineral extraction will cease, all associated buildings and structures will be removed, and the quarry will be restored. The second scenario is quarrying operations and associated manufacturing will continue at the site, as proposed via this s.37L planning application.

1.5.2 Restoration and Remediation of Site

An eventuality exists that mineral extraction could cease at the quarry. In this instance, all quarrying and associated manufacturing operations at the Site would cease. The existing manufacturing buildings and structures would be removed, all plant and equipment associated with the same would be removed and the site remediated and restored. Existing water management practices would cease and de-watering pumps would be turned off and removed. The remediation and restoration efforts would likely involve the movement and placement of limited volumes of overburden material and the natural formation of a waterbody within the quarry void.

In the eventuality of such a scenario, the effects on the environment resultant from quarrying operations in terms of geology, hydrology and hydrogeology, noise, dust, air quality, and traffic would no longer occur. The cessation of operations at the quarry would result in a landscape and visual benefit associated with the disturbed footprint created by workings to date but would also result in the overburden store in the centre of the centre remaining in-situ which would continue to result in visual effects upon the environment.

This scenario would see the loss of employment of the 40 direct staff at the Quarry, with a significant impact on the 140 indirect staff supported by the extraction of the mineral at the quarry.

1.5.3 Continuation of quarrying operations

An alternative potential evolution in the baseline scenario would see a continuation and extension of quarrying operations and associated manufacturing and ancillary operations at the Site.

Mineral resources remain unworked at the Site, however the rate of extraction is impossible to predict as this is based upon prevailing market conditions at the time. This also directly correlates with traffic impacts associated with the quarry, with traffic movements directly linked to output at the quarry, which in turn is dictated by market conditions. The Applicant has not been appointed to any significant projects which would significantly intensify operations at the Site and it is impossible to predict whether any such eventuality would occur.

Given the nature and properties of the limestone mineral at the Site, it is unlikely that the approved method of extraction (drill and blasting) will alter. Similarly, it is also considered unlikely that the processing of the mineral will evolve from that currently experienced at the site, with crushing and screening, plant and equipment continuing to be utilised to produce single sized aggregates.

Whilst plant, machinery and vehicles used in connection with the quarrying processes may become more efficient in the future, it is impossible to predict the extent to which this would affect noise, dust and air quality at the quarry. It is however reasonable to conclude that with the continued improvement in quarry machinery and environmental and workplace health standards, that impacts associated with the same are considered likely to reduce in the future.

Furthermore, the quarry would continue to deepen in accordance with the development as proposed within this planning application, therefore resulting in an increased attenuating effect in terms of noise and dust emissions from the site.

Water management practices at the Site are considered likely to continue in a similar fashion to those currently employed at the Site and in line with common practice for quarries throughout the world, whereby water is collected in a quarry sump, before being discharged off-site via appropriate pollution prevention and settlement facilities.

In terms of biodiversity impacts, given the developed nature of the land use, the Site is of limited ecological value. Due to the continued disturbance resultant from the winning and working of minerals it is considered that this scenario would be unlikely to significantly evolve whilst quarry operations are continued.

In terms of landscape and visual effects, the quarry has reached its full lateral extents. The disturbed footprint is therefore established and a continuation of the landscape and visual impacts as currently experienced at the Site are considered likely to remain largely similar to those currently experienced.

As shown in the proposed development drawings a significant overburden store, located centrally within the site is proposed to be relocated to the quarry floor. In such an eventuality, the landscape and visual impacts of the same would be beneficial.

1.5.4 Evolution of the Baseline Summary

A description of the current state of the environment (baseline scenario) with respect to each discipline is provided in each of the technical sections of this EIAR. For the reasons set out above, the continuation of quarrying activities and associated manufacturing activities is unlikely to significantly evolve from the current baseline scenario at the site.

Given the similarity in the likely impacts of continued quarrying and manufacturing operations with those currently being experienced, each of the assessments contained within this EIAR which assesses the project against the existing baseline scenario are considered sufficient in complying with the requirements of the Regulations. Each technical assessment will also allow for an assessment of the evolution of the baseline to a position whereby the quarrying and manufacturing operations are ceased and the site is restored and remediated.

This approach allows for the assessment of the likely evolution of the baseline scenario without implementation of the development to be undertaken with reasonable effort, on the basis of the availability of environmental information and with scientific knowledge and is considered to accord with case law and EPA guidance on the matter.

1.6 Difficulties Encountered whilst preparing the EIAR

Given the frequency within which the site has been environmentally assessed over the past decade the vast proportion of environmental data is readily available. However, difficulties were encountered gaining access to some neighbouring properties for access to water wells, to obtain water level and

quality data, to include properties under the neighbouring quarry operator's control.

Whilst the majority of 2023 ecological surveys adhered to the recommended timeframe for target species and habitats, programme constraints hindered the surveying of breeding birds until mid-July and August, falling outside the optimal survey period (April to June). However, it is important to note that the primary aim of these surveys was to provide a contemporary update to data obtained in 2018.

The difficulties are not considered to have affected the overall conclusions of the EIAR, which are considered reliable and accurate.

1.7 Competent Experts

The coordination of the competent experts and the production of this EIAR has been managed by Chris Tinsley BA (Hons), DipTP, MRTPI of Quarryplan Limited, who has a proven track record of delivering planning and environmental projects, development plan representations and planning appeals. Chris has a proven record of managing EIA development projects, project managing, producing EIAR's and providing supporting environmental information to accompany planning applications, with specialist expertise in the area of minerals and renewable energy projects.

All external consultants have been appointed and project managed by Quarryplan. The specialist reports, which either form the relevant section of this EIAR or are held within Appendices in Volume II of this EIAR, have been reviewed and summarised by the authors in Volume I for ease of reading.

Provided below is the contributor to each Section of the EIAR in accordance with one of the main features of the EIA Regulations, that an EIA must be carried out by persons with appropriate expertise. In this regard it is confirmed that the EIAR has been prepared by competent specialist experts, whom all have in excess of 20 years' experience in their chosen area of expertise.

Section	Heading	Specialist Contributor
1	Introduction	Chris Tinsley, Quarryplan BA (Hons), DipTP, MRTPI
2	Scope of the Environmental Impact Assessment	Chris Tinsley, Quarryplan BA (Hons), DipTP, MRTPI
3	Project Description	Chris Tinsley, Quarryplan BA (Hons), DipTP, MRTPI
4	Planning Policy Framework	Chris Tinsley, Quarryplan BA (Hons), DipTP, MRTPI
5	Geological Assessment	Mike Williams, Quarry Design MGeol(Hons), MSc, MCSM, CGeol, Eur.Geol, FGS, MIQ Chris Tinsley, Quarryplan BA (Hons), DipTP, MRTPI
6	Water Environment	Henry Lister, BCL Hydrogeologists Limited B.Sc. (Hons.) M.Sc.
7	Noise, Vibration and Blasting	Mervyn Keegan, AONA B.Sc., M.Sc.
8	Biodiversity	James O'Connor, Woodrow APEM Group, BSc MSc PhD
9	Landscape	Pete Mullin, Mullin Design Associates BA (Hons) CMLI
10	Air Quality and Dust	Mervyn Keegan, AONA B.Sc., M.Sc.
11	Traffic Impacts	Chris Tinsley, Quarryplan BA (Hons), DipTP, MRTPI
12	Cultural Heritage	Chris Tinsley, Quarryplan BA (Hons), DipTP, MRTPI
13	Waste Management	Chris Tinsley, Quarryplan BA (Hons), DipTP, MRTPI Mike Williams, Quarry Design MGeol(Hons), MSc, MCSM, CGeol, Eur.Geol, FGS, MIQ
14	Soil and Natural Resources	Chris Tinsley, Quarryplan BA (Hons), DipTP, MRTPI
15	Socio-Economic Impacts	Chris Tinsley, Quarryplan BA (Hons), DipTP, MRTPI

16	Climate Change, Accidents and Disasters	Chris Tinsley, Quarryplan BA (Hons), DipTP, MRTPI
17	Human Health	Chris Tinsley, Quarryplan BA (Hons), DipTP, MRTPI
18	Intra and Inter Cumulative Impacts	Chris Tinsley, Quarryplan BA (Hons), DipTP, MRTPI

Table 1.3 Specialist Contributors to EIAR

1.8 Trans-boundary Issues

The Project Site is located over 60km away from the national boundary between Northern Ireland and the Republic of Ireland. Given the separation distance and lack of any other pathway between the site and receptors in Northern Ireland (e.g. hydrological) it has been concluded that it is unlikely that there will be areas where there is a potential for trans-boundary effects.

If any such areas should arise within the individual assessments they have been dealt with, where they occur, in the relevant sections of the EIAR.

2.0 REASONABLE ALTERNATIVES AND PROJECT SCOPING

It is recognised within both the Act, the Guidelines and EPA Guidelines that:

*'A description of the **reasonable alternatives** studied by the person or persons who prepared the EIAR, **which are relevant** to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed development on the environment.'* [2]

Indeed, the Guidelines recognise at paragraph 4.13 that:

"For example, some projects may be site specific so the consideration of alternative sites may not be relevant."[3]

Furthermore, given that the s.37L process is intrinsically linked to the preceding SC application process, it arguably removes the potential for alternative site consideration as a s.37L application is only available for a site that is undergoing consideration for SC, therefore essential rendering the alternative site element of an EIAR redundant.

It is considered that the Board's previous directions under s.177D of the now superseded Planning and Development Act, determined that the SC project satisfied the parameters of exceptional circumstances. The uniqueness of the SC and s.37L application process provides no leeway for alternative developments sites to be considered. However, this is not to say that alternative design and development considerations, for example, on how best

[2] Planning and Development Regulations 2001 as amended - Schedule 6 – Emphasis added.

[3] Page 27 Guidelines for Planning Authorities and An Bord Pleanála on carrying out EIA, August 2018.

to deliver further quarrying at the Quarry site, to maximise the high-quality resource and mitigate significant impacts are not applicable.

Notwithstanding the above, it is considered that the information provided herein, demonstrates compliance with the requirements of the EIA Directive, regarding alternatives, as transposed into Irish Planning law, insofar as possible given the nature of the SC and s.37L application process.

2.1 Alternative Design Elements Considered

It is recognised that through the design and consultation process the development will evolve in order to take account of and mitigate potential environmental impacts.

Quarrying differs from many forms of development as it is an operational use and therefore does not always, as in this instance, include a requirement for built structures and therefore the usual scope available to the Applicant, for variations in design and construction, is limited.

Furthermore, given that the proposed development is for further quarrying of a site that has already been assessed under the EIA Directive, it is not surprising that the previous designs that have been adhered to historically have mitigated out potential significant impacts.

Although limited in scope, the alternative aspects of the development considered by the developer, that have led to an alteration of the proposed extraction area, are provided below.

The consolidating consent issued in 2004 provided for the overburden storage facility that is situated between the operational void and the manufacturing

area in the northern part of the site. The storage of the materials in this area over a quarter of a century has resulted in an artificial landform, which is also sterilising a significant area of high quality mineral resource.

Although the material handling costs are substantial to relocate the overburden, it is considered to be of both commercial and environmental benefit if the material is relocated for permanent storage into the extracted void. This will maximise the release of the underlying high purity Walsourtian limestone and remove the landform from the local external views.

In order to facilitate the relocation of the overburden and to allow for an improved vehicle management system, for vehicle movements into the void of the quarry, a review of the existing system was undertaken, to see if an improved method could be devised.

This has led to the redesign of the ramping system into the deepest sinking of the quarry to follow the eastern boundary, rather than previous access via the western face. The quarry design provides a two-way system at gradients that have been evaluated by competent experts, that will minimise the haulage distances to and from both the manufacturing area and the overburden storage landform. Over the projected life of the resource, some 35 years, this will deliver significant fuel savings and deliver associated reductions in exhaust emissions.

2.2 Scope of the Environmental Impact Assessment

Legislation and guidelines outline that the scope of an EIAR needs to be determined by evaluating the aspects of the environment likely to be significantly affected by the development with reference to the following categories and their inter relationship.

- **Human Health**
- **Biodiversity**
- **Population**
- **Soil**
- **Water**
- **Air**
- **Climate**
- **Material Assets**
- **Cultural Heritage**
- **Landscape**

This EIAR considers the potential significant effects and consequences on the environment of the development both in the past, currently and in the future and assesses whether such effects are:

- Direct or indirect;
- short, medium or long-term;
- reversible or irreversible;
- beneficial or adverse.

Where significant adverse effects are identified a description of the measures necessary to avoid, reduce or remedy these effects is provided (mitigation measures).

To determine the environmental aspects that should be addressed within this EIAR, each of the main proposed activities within the development were examined and potential impacts arising from those activities were identified, together with receptors of any such impacts. The main site activities, impacts and receptors are all identified within Table 2.1 below.

Proposed Activity	Potential Source of Impact (alphabetical order)	Potential Receptors (Alphabetical Order)
Preparation of the structures in the concrete manufacturing area of the site.	Air Landscape Noise Traffic	Human Health Landscape Population
Placement of overburden and processing waste into storage.	Land Use Noise	Human health Landscape
Maintenance of site waters	Discharge of ground water and surface water quality.	Human Health Water
Drill and Blast Crush and Haul	Air Noise	Air Quality Ecology Human Health Landscape Water Environment
Transport to and from site	Traffic	Human health / Population
Restoration and after use	Land use Visual	Landscape Ecology Population Water Environment

Table 2.1. Site Activities, Impacts and Receptors

From the identification of potential impacts and receptors, a scoping matrix has been compiled which gives a clear indication of the main impacts to be assessed within this EIA. The scoping matrix is set out below in Table 2.2 and has been prepared in response to the various elements given detailed consideration in the Inspector's reports associated with the Environmental Impact Assessments undertaken by the Board in Table 1.1 above.

Potential Source of Impact	Potential Receptor						
	Agriculture	Archae-ology	Humans	Landscape	Water Environment	Ecology	Air Quality
Overburden	✓	✓	✓	✓	✓	✓	✓
Stockpiling							
Drill & Blast	✓	✓	✓	✓	✓	✓	✓
Visual			✓	✓			
Noise			✓			✓	
Dust	✓		✓	✓	✓	✓	✓
Traffic			✓				✓
After-use	✓		✓	✓	✓	✓	

Table 2.2. Scoping Matrix

The EPA Guidelines state that:

"Clear, concise, unambiguous information is essential throughout an EIAR. A systematic approach, standard descriptive methods and the use of replicable assessment techniques and standardised impact descriptions contribute to ensuring that all likely significant effects are adequately considered and clearly communicated".

Paragraph 4.5 of the guidelines describe how:

"Excessive length [of an EIAR] *can be a considerable barrier to effective public participation"*

This approach can be achieved by avoidance of duplication of optimised assessments and by focusing upon the "likely and significant" effects of a proposed development. These elements need to be discussed in detail whereas other issues, with little or no significance, may require only brief investigation. This will indicate that an area has been given due consideration but has been rejected from requiring a full investigation, in the interests of

achieving a clear, concise and unambiguous EIAR which also allows for more effective public participation.

The environmental elements chosen for commissioning of renewed specialist reports and updating with detailed scrutiny are as follows:

Biodiversity
Landscape and Visual
Water Environment
Air Quality
Noise and Vibration

Assessment of the above topics has been undertaken by the appropriate competent expert which the assessment either forming a section of this EIAR or where appropriate due to its length, being including as an appendix and summarised with the main body of the EIAR.

Each assessment considers the following:

- baseline study;
- identifying potential impacts past and future
- predicting and evaluating the magnitude and significance of those impacts;
- proposing mitigation measures, where necessary.

The remit of an EIAR is to consider all environmental aspects, which could experience impact from the proposed development, from which the identification of mitigation measures can be undertaken.

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

The remaining sections of the EIAR are not considered necessary to require specialist input, either due to their nature and the potential for them to be impacted as a result of the proposed development. Each of these topics are considered at the relevant sections of the EIAR with reference to previous assessment and data collection and interpretation, as necessary.

3.0 PROJECT DESCRIPTION

This EIAR is prepared to accompany the s.37L planning application, seeks permission for the continuation of development at lands at Tromman Quarry. The EIAR is to be read in conjunction with the recently submitted SC application and the associated rEIAR which seeks to regularise the unauthorised structures erected in the manufacturing (Northern) part of the site since 2013 and the unauthorised quarrying operations undertaken at the quarry post the 5 August 2018. In short, the application that this report accompanies, seeks consent for further quarrying activity and an assessment of the continued use of the site's ancillary structures for the life of the quarrying activities, prior to the restoration of the entire site.

The Site is located in the Townland of Tromman some 2.2 kilometres northwest of Rathmolyon Village and some 6.4km south of the town of Trim. The site is bounded to the west by Kilsaran's Tromman Quarry, to the south by the regional road R156 and to the north and east by agricultural fields.

3.1 Previous Site Activity in the Context of a Substitute Consent Application- the Receiving Environment

The unauthorised development which the accompanying SC application seeks to regularise includes a number of structures erected in the northern part of the Site since 2018 and the collective activities (including quarrying) and use of structures across the entire site post the 5th August 2018. This s.37L application therefore seeks consent for further quarrying at the site and the continued associated use of the structures that it is proposed are authorised under the SC process. The extent of the totality of the quarrying site and layout can be seen overleaf.

Figure 3.1 – Orthophotograph of Site- 17 August 2023

It is considered that the image illustrates the organised nature of the operational site, which reflects the good management practices employed by the Applicant. The image illustrates the existing sub-divisions within the site and can be described in a north-south progression as follows:

1. concrete product manufacturing activities in the northern extent of the site,
2. historical overburden storage immediately to the south of this area,
3. before the extraction area (quarry void) in the lands between the overburden storage and the 'buffer zone' between extraction activities and the public highway which;
4. contains the head office carparking and tree planted landscaping.

The operation is a mature, well-defined site, with a concealed extraction operation and a sophisticated and distinct manufacturing area.

3.2 The location and extent of the Site

The overall planning application site extends to some 21.64ha in extent and is located completely within the Townland of Tromman, near Rathmolyon. The application boundary incorporates the totality of the Applicant's operations.

3.3 Physical and Development Characteristics

3.3.1 Natural Resource Consumption

High purity calcium carbonate mineral has been sourced from Tromman quarry, at a rate of up to a maximum of 250,000 tonnes per annum as prescribed in previous EIS's, and it is proposed that this upper limit capping of extractive activities is to be retained throughout the lifetime of the proposed

development. The phasing of the proposed quarry development plans allows for this continued consumption rate. With the relocation of the overburden landform and the development of the quarry in accordance with the submitted quarry development plans, the proposed development will provide a reserve life in the order of 35 years.

A proportion of the aggregates produced at the quarry are sold directly into the marketplace, however a significant volume of material quarried at the Site is consumed by the added-value manufacturing processes, primarily located in the northern part of the Site. These include a number of cementitious activities and most recently the production of high purity limestone powders. The introduction of this additional product line differentiates the Applicant's operations from other limestone and pre-cast concrete producers and has provided a new market for the company to supply whilst maximising the end use of the high purity resource.

The Applicant continues to strive to maximise the end use of the high-quality limestone resource with the material used in powders, pre-cast concrete, ready mixed concrete and concrete blocks, in addition to using the high chemical purity of the limestone in pyrite remediation.

3.3.2 Operational Emissions

The self-contained nature of the limestone powder and precast factory units ensure that emissions, either air or noise are reduced to a minimum. In addition, the manufacturing processes, whether that be the ready mixed concrete, the powdered lime, or the block making facilities are all controlled by the Company's Environmental Management System ('EMS'), a copy of which is appended at Appendix 3.1.

3.3.3 Employment

The production process at the quarry provides direct employment for 8 staff. All parts of the Keegan Quarries business are reliant upon the continuation of the high quality resource therefore it is reasonable to state that the entirety of the Company workforce, numbering 140 direct employees and the 40 indirect sub-contractors are reliant upon the material quarried at the Site. The direct employees also include the administrative, support staff and professional staff based within the Head Office and some 10 full time skilled operatives who compliment the predominantly automated manufacturing processes.

3.3.4 Hours of operation

The quarry and its ancillary processes operate to industry standard hours of 07.00 to 19.00 Monday to Friday and from 07.00-14.00 on Saturdays. The quarry does not operate on Sundays or Bank Holidays.

3.3.5 Waste Management

Reflecting the high purity nature of the limestone resource and the broad range of products which can be manufactured from the same, the waste produced in the quarry is restricted to the overburden removed from the surface of the limestone deposit and small percentage of clay from the natural weathering process of the deposit.

The manufacturing processes undertaken in the northern part of the Site ensure that wastage is kept to an absolute minimum with only the exact amounts of materials being utilised in the production of the end product. Where any small amounts of waste are generated, this is separated and stored within the Site

or placed into skips for either recycling or disposal by a licenced carrier. This topic is detailed further in the Waste Management Section of this EIAR.

3.4 Processes occurring on site

3.4.1 Processes - Quarrying

Quarrying has occurred on the site in accordance with environmentally assessed development control protocols since the first grant of planning permission in December 1998. The general approach to operations has not varied substantially since this first approval with activities having been confined to the main quarry sinking and storage of overburden in the central part of the Site and along the southern boundary to create a landform for tree planting. Therefore, activities have been confined to the disturbed footprint of the Site and the activities have continued to be operated in accordance with previous environmentally impact assessed parameters.

The proposed development has been prepared to maximise the resource within the confines of the existing site footprint and in doing so remove the existing overburden landform in the central part of the Site and upon cessation of the proposed development, remove completely the external visual impacts of the operation. The plans illustrating this phased development are provided as part of the s.37L Application Package.

3.4.2 Phase 1

During Phase 1, extraction in the quarry will be focussed primarily in the southern part of the Site. The development of quarry faces in this part of the quarry void will require the removal of the head office building located on the eastern side of the access route into the quarry.

Tromman Quarry – Phase 1

Initially, development of the upper benches will be undertaken to progress the quarry faces to their final face position. The current benches will be split to a more manageable height, introducing a 64mAOD bench and ensuring that the 43mAOD and 28mAOD benches are progressed to their final face positions. Appropriate bench widths will apply to ensure that rock fall can be captured on each bench.

In the northern margin of the quarry, a new access route, able to accommodate haulage vehicles passing, will be constructed into the sinking along the eastern boundary, from the north-eastern margin of the site at 67mAOD level to the 42mAOD level. Due to a limitation on space, this has been designed at a gradient of 1v:7h. A second ramp will also be introduced by way of a continuation along the eastern margin of the quarry from the 43mAOD level down to the 28mAOD. This has been designed at a gradient of 1v:8h.

3.4.3 Phase 2

Phase 2 will see the continued working of the southern part of the quarry void, increasing the depth of the quarry to 13mAOD. An access ramp is proposed to be installed covering a corner on the eastern margin of the quarry excavation. Of note, an access road is also retained on the 28mAOD level to ensure that load and haul vehicles and drill rigs can access the crest of the quarry faces to progress the quarry in a northerly direction in the future.

3.4.4 Phase 3

Over the course of the development of Phase 3, the northern overburden landform will be systematically removed and placed into the recently excavated void in the southern part of the Site. It is estimated that around 338,000m³ of material will have to be lifted from the existing overburden store and moved to its new location in the quarry void. It is proposed that the majority of the 13mAOD bench will be filled up with the repositioned overburden up to the 28mAOD level.

Tromman Quarry – Phase 3

In the northern margin of the overburden store formed during Phase 2 a slope will be constructed to the base of the 13mAOD level at a minimum gradient of 1v:3h, for geotechnical safety purposes. On this slope, an access ramp is to be constructed to allow access into the northern margin of the 13mAOD sinking. This ramp has been designed at a gradient of 1v:8h.

During the removal and placement of the overburden, the 67mAOD, 52mAOD and 40mAOD levels will be progressed in a northerly direction, to achieve their maximum lateral extents and therefore the maximum designed footprint of the quarry.

Tromman Quarry – Phase 3

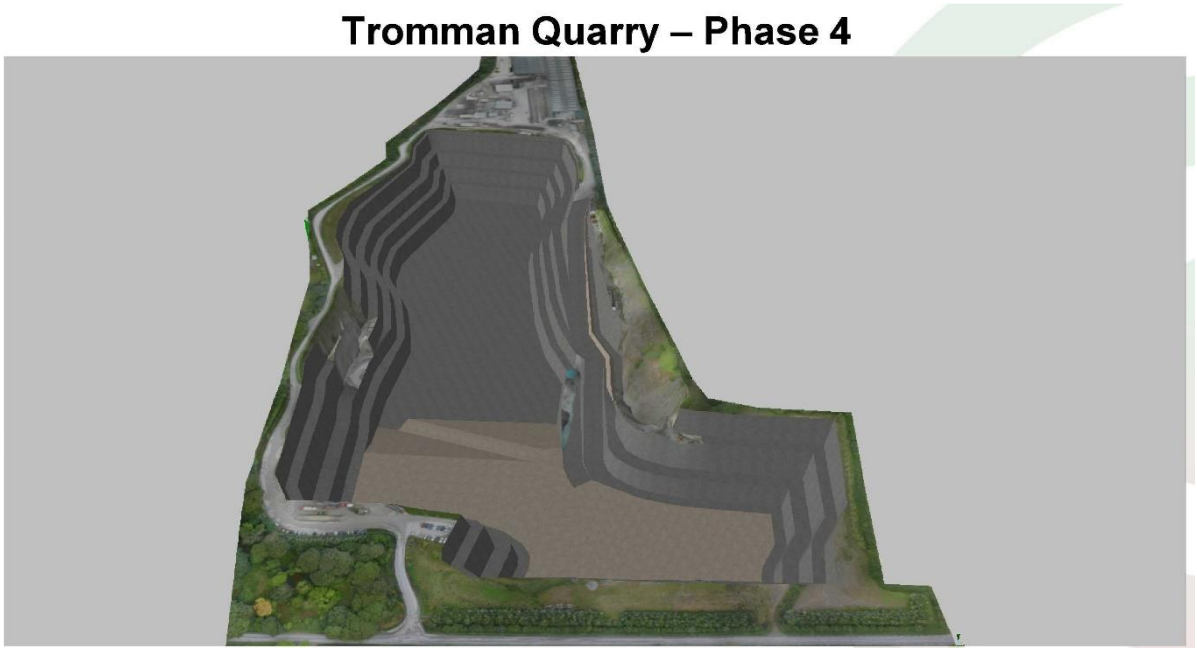
During Phase 3, it is indicated that the following volume and tonnage is extracted from Tromman Quarry:

Bench	Volume (m³)	Tonnage (T)*
67mAOD	202,000	535,000
52mAOD	522,000	1,383,000
40mAOD	532,000	1,410,000

*2.65 t/m³ conversion factor applied

3.4.5 Phase 4

Phase 4 continues to progress the lower benches of the quarry in a northerly direction.



3.4.6 Drilling and Blasting

The process adopted to produce blast rock for the purposes of processing will continue in the same manner as currently undertaken at the quarry, utilising a fully mobile air drill rig, with drilling being undertaken on average two days every month. The impacts of this drill rig and mitigation measures adopted are outlined in the Air Quality and Noise and Vibration Sections of this EIAR respectively.

The blast process involves the controlled filling of the drilled holes with explosive material and the inclusion of detonators and charges. The holes are then detonated in a tight time sequence to ensure that the potential impact is limited to the equivalent nature of one component hole of the blast.

The measured impacts of historical blasting, which provides an accurate basis for future predictions are considered in detail in the Noise and Vibration Sections of this EIAR.

3.4.7 Processing of Quarry Material

The processing of material within the site will continue to be undertaken, in the same manner as that undertaken at the quarry over the last 10+ years; within the quarry void, with the blast pile being fed into the existing mobile primary jaw crusher, using a loading shovel. This enables the blast material to be reduced to the optimum size for introduction into associated secondary and tertiary mobile screening facilities.

The crushing and screening units are fully mobile and are able to operate on any standard bench removing the requirement for the blast rock to be hauled. The primary reduced material is delivered into a semi fixed secondary and tertiary crushing and screening unit. Modern mobile primary track crushing and screening units are fitted with dust suppression units and enclosures of all potential emission points.

The benefits of the continued use of mobile plant are numerous. All the loose plant and machinery is track or wheel mounted and follows the active face they therefore have no permanent footprint or location. The materials will be stockpiled or transferred by front-end loading shovel, resulting in a minimisation of internal haulage from blast pile. This has benefits in terms of potential emission points with respect to dust and noise, with these sources being adjacent to the working face of the quarry and therefore at levels significantly below the level of the surrounding lands, which affords significant natural attenuation.

3.5 The Manufacturing Part of the Site

The added-value manufacturing area, located within the northern part of the site is fully paved with the northern extent of the site's appearance reflecting the manufacturing nature of the activities.

3.5.1 Processes Concrete Batching Plants

Concrete will continue to be manufactured in the same manner as is currently practiced at the Site. This involves mixing Portland cement and other cement graded materials with aggregates, sand and water in controlled proportions.

Sand will continue to be imported to site and combined with indigenous limestone dust and single-sized aggregates drawn from the adjacent quarry area by loading shovel or dump truck and fed into the reception hopper. Selected aggregates and sand materials are fed into the feed hoppers which are proportioned by a weighing system to achieve the desired aggregate content in the mix recipe. The weighed proportioned aggregate batch is fed by inclined conveyer into the mixer in sequence, as required by the mixing program, for eventual direct loading as a completed wet batch into a truck mix vehicle.

Alternatively, the batch may be diverted into the dry batch bypass directly into a concrete truck mixer vehicle to eventually complete final mixing after introduction of cement powders and additives.

Bulk cement and other powders stored within sealed and vented silos, are separately conveyed to dedicated weigh hoppers by sealed screw conveyors for sequenced addition into the mixer or directly into the loading area of a truck mixer to complete the final product. Water and liquid admixture materials

may also be separately pumped from adjacent tanks into additional dedicated weighing hoppers for controlled addition into product mix.

3.5.2 Limestone Powder Plant

The process undertaken at the Limestone Powder Plant (Calcium Carbonate) will continue in the same manner as is currently practiced at the Site. The process is made up of 3 main elements:

- Reduction (Crushing);
- Sizing (Screening) and;
- Drying.

All 3 activities are undertaken simultaneously, providing for continual blending to provide a tightly specified end product. The raw limestone feed is introduced from the adjacent quarry void directly into two feed hoppers and comprises:

- An 8m down product (limestone grit to dust) and;
- a 30mm single sized aggregate.

The two materials are introduced simultaneously from their individual feed hoppers to their individual processes. The 30mm aggregate is passed along an incline conveyor to a Lanway (Hammer) Mill which reduces the incoming product to a minus 3mm output. Simultaneously the 8mm down material is fed by conveyor onto a multi deck screen which divides the material into 4 different sizes:

1. Minus 8mm & plus 6mm;
2. Minus 6mm & plus 3mm;

3. Minus 3mm & plus 1.5mm and;
4. Minus 1.5mm.

All the minus 1.5mm material is forwarded directly to the gas fired, fluid bed dryer which super heats the material and dries it to less than 0.1% moisture. The material is then elevated to 3 tumbler screens on top of the silos.

The material is divided into 4 separate powder products at this stage;

1. Greater than 0.25mm,
2. Minus 0.25 & plus 0.50mm,
3. Minus 0.5 & plus 1.50mm and;
4. Less than 1.50mm.

During the drying process, the minus 100µm particles are removed by an air hood extraction system which is then elevated to a storage silo prior to delivery via tanker to the end user. The materials which are located in the silos are conveyed from the storage silos, to weigh hoppers prior to loading.

The plant produces 7 different individually sized products, these products can then either be blended to specific requirements for both internal consumption in the high specification precast products or to external customer requirements.

3.5.3 Processed Pre-cast Concrete

The process to produce the twin wall insulated product which is paint ready, for use in construction projects will continue in the same manner as is currently practised at the Site. A video of the process from start to finish can be found at the following link, however, the process is summarised below.

https://www.youtube.com/watch?v=X1JxNReZt3A

The pre-cast product designs originate in the Company's Head Office, also based on site, with the design department producing structural designs for final construction purposes.

This design is then forwarded to the host computer at the manufacturing site, which then plots the design on to a steel pallet, to include the detail for any electrical boxes and conduits.

The next station introduces the reinforcement spacers, in preparation for the next stage which is the introduction of the steel rebar from a fully automated robotic station for precision placement, in accordance with the structural requirements of the CAD design.

Following the placement of all reinforcement, spacers and conduits the concrete is ordered from the associated concrete batching plant, all of the aggregates are produced either on site in the case of aggregates or supplemented from the Company's sand and gravel sites in the case of the sand products.

The precision concrete mix process is fully automated and is then batched into a hopper that provides for accurate spreading of the 40N concrete within the waiting panel, which spreads the material on the now oscillating panel that ensures the removal of any air bubbles and ensures a high level of finish, negating the requirement for plastering either inside or out.

The panel then proceeds to the curing chamber, still under the control of the host computer and the second wall is created in exactly the same way before

the two walls are joined by a fully automated process and once cured are stored on bespoke delivery trailers for storage, prior to delivery to site.

3.5.4 Vehicle Movements

It is proposed that the site will continue to operate with vehicle movements at a level below the 55 two-way trips per day rate evaluated during successive applications at the Site. This equates to a maximum annual mineral extraction in the region of 250,000 tonnes. Vehicles associated with the Site will continue to be made up of a combination of articulated vehicles, both flat bed lorries, tippers, standard eight-wheel rigid lorries and concrete mixer trucks.

3.5.5 Water Discharge and Fuel Storage

It is proposed that the site will continue to operate in the same fashion to that which has achieved compliance with the prescribed water quality standards. The site is subject to a Discharge Consent Licence and the discharge water will continue to pass through the exsiting infrastructure in the north east corner of the Site, which includes improvements made in 2023. The efficacy of this facility is discussed in greater detail in Section 6 and Appendix 6.1.

With respect to fuel storage, the site operates a two-tier system with road going vehicles being fuelled from the fully bunded and enclosed double skin tanks within the quarry workshop adjacent to the quarry offices.

The mobile plant within the void will continue to be fuelled from a mobile fuel tanker. All the remaining machinery in the quarry void is of a mobile nature and it is intended that fuel should only be within the perimeter of the site during the process of refuelling.

The fuel for the face excavators and primary crusher will be held and delivered via this double skinned tanker system. The operatives have been trained in best practice for refuelling of machinery and also in emergency procedures.

The Site is proposed to continue to be operated in accordance with these systems and procedures.

3.6 Decommissioning – Remediation – Restoration

Following the completion of mineral extraction at the Site, the site will be restored to provide a range of biodiverse habitats, primarily in the form of a water body. At the previously assessed and acceptable levels of 250,000tpa the proposed development would result in a reserve life of 35 years, following which the quarry would be restored in accordance with the details provided on the restoration concept drawing included within the s.37L Application Package.

In terms of the restoration of the Site, firstly dealing with the concrete product manufacturing area, the structures can be decommissioned, with the buildings and structures being of a steel frame specification with cladding being fixed to or in to a concrete base.

The structures and plant and machinery can be dismantled, and the remediation completed by the removal of the concrete yard, this would involve rock breaking the yard and removal from site. It is maintained that this remediation would be sufficient to comply with the requirements of the consents to "all plant etc. shall be removed off site and the area shall be made good."

In terms of the restoration of the quarry void, it is understood that the quarry consents provide for bench and margin treatment and planting, with placement of some overburden resources around the quarry and then for the quarry void to be allowed to flood with anticipated water rebound levels of the order of 62mAOD (+/-2m). However, the work undertaken for this EIA suggests that the rebound level is more likely to be in the region of 65mAOD (see Section 6), which is still comfortably within the quarry void.

4.0 PLANNING POLICY FRAMEWORK

4.1 Introduction

This section considers the development in the context of the following contemporary planning policy sources:

- Meath County Development Plan (2021-2027).
- Sustainable Development- A Strategy for Ireland (1997);
- National Planning Framework (2018); and
- Regional Spatial and Economic Strategy (2019).

The level of compliance with the policies and objectives outlined in these documents indicates the suitability of the development from a planning and sustainable development perspective.

4.2 Meath County Development Plan (2021-2027)

The subject site is within the County Meath Administrative Area. The Meath County Development Plan (MCDP) was adopted in took effect from 3rd November 2021. The plan sets out a vision and an overall strategy for the proper planning and sustainable development of the County for a six-year period. It also sets out guiding policies and objectives for the development of the County in terms of physical growth and renewal, economic, social and cultural activity, and environmental protection and enhancement.

4.2.1 Extractive Industry Policies

Section 9.11 of the MCDP relates to the extractive industry and building materials production and states that:

"Meath County Council acknowledges the need for extractive industries in terms of supply of aggregate materials for the construction sector, delivering transport infrastructure projects, and for the export market. However, the potential for conflict in the operation of these industries with wider environmental issues needs careful consideration".

The plan goes on to state that:

"Meath contains a variety of natural resources such as building raw materials in the form of sand, gravel, stone reserves including high purity limestones and shale used in cement and magnesia manufacture and base metal deposits. The potential of these resources to underpin construction output and provide employment and economic growth in the local and regional economy is recognised as is the need to exploit such resources in an environmentally sound and sustainable manner".

The plan states how the goal in the County in relation to the extractive industry is:

"To facilitate adequate supplies of aggregate resources to meet the future growth needs of the County and the wider region while addressing key environmental, traffic and social impacts and details of rehabilitation".

The proposed development is considered to accord with this goal in that it will assist in delivering a supply of aggregate and construction products which contributes towards growth in both the County and the wider region. As demonstrated through this EIAR, no significant effects are predicted as a result of the proposed development in terms of environmental, traffic and social

impacts. As a result, the proposed development is considered to accord with the County Council's goal in relation to the extractive industry.

The MCDP lists 7 policies (Policies RD POL 21- 27) which are to be considered when assessing proposals related to the extractive industry. Each of the policies are considered in turn below.

Policy RD POL 21 states:

"To ensure that projects associated with the extractive industry carry out screening for Appropriate Assessment in accordance with Article 6(3) of the E.C. Habitats Directive, where required".

The s.37L application includes a Natura Impact Statement (NIS). The NIS concludes that:

"Taking into account the best available scientific knowledge, applying the precautionary principle, and considering the conservation objectives of the relevant European Sites, it is concluded that the continuation of operations at Tromman Quarry, whether on its own or in conjunction with other plans or projects, does not pose an adverse impact on the integrity of any European Site".

The proposed development is therefore considered to accord with Policy RD POL 21 of the MCDP.

Policy RD POL 22 states:

"To facilitate the exploitation of the county's natural resources and to exercise appropriate control over the types of development taking place in areas

containing proven deposits, whilst also ensuring that such developments are carried out in a manner which would not unduly impinge on the visual amenity or environmental quality in the area".

The proposed development site consists of an existing quarry, used for the winning and working of the Waulsortian and Lucan limestone formations with associated related industrial development linked with the working of the mineral won at the site, including a pre-cast concrete products factory, block yard and batching plant. As detailed at Section 9 of this EIAR, it is predicted that the proposed development would not result in any significant effects in terms of visual impacts. As detailed at various other sections of this report (See Water Environment; Noise; Dust; Ecology; Traffic Sections), the proposed development is not predicted to result in any significant effects. The proposed development is therefore considered to accord with **Policy RD POL 22** of the MCDP.

Policy RD POL 23 states:

"To support the extractive industry where it would not unduly compromise the environmental quality of the county and where detailed rehabilitation proposals are provided".

As detailed throughout this EIAR, it is predicted that the proposed development would not result in any significant effects upon the environment. It can therefore be demonstrated and concluded that the proposed development would not unduly compromise the environmental quality of the county.

In terms of rehabilitation proposals, the application package includes details for the proposed restoration of the quarry, following the completion of mineral

extraction. The restoration proposal will be focussed on delivering a biodiverse habitat, primarily in the form of a lake. The proposed development is therefore considered to accord with **Policy RD POL 23** of the MCDP.

Policy RD POL 24 states:

"To seek to ensure that the extraction of minerals and aggregates minimise the detraction from the visual quality of the landscape and do not adversely affect the environment or adjoining existing land uses".

As detailed at Section 9 of this EIAR, it has been demonstrated that the proposed development would not result in any significant effects upon the environment in terms of impacts upon the local landscape. It has also been demonstrated that the proposed development would not result in any significant effects by virtue of noise, dust or blasting. As a result, the proposed development is not considered likely to result in any significant effects upon the local environment and adjoining, existing land uses. The proposed development is therefore considered to accord with **Policy RD POL 24** of the MCDP.

Policy RD POL 25 states:

"To ensure that the extractive industry and associated development minimises adverse impacts on the road network in the area and that the full cost of road improvements, including during operations and at time of closure, which are necessary to facilitate those industries are borne by the industry itself".

As detailed in the Traffic Section of this EIAR, the proposed development is not predicted to result in any significant effects upon the highway network. The

proposed development is therefore considered to accord with **Policy RD POL 25** of the MCDP.

Policy RD POL 26 states:

"To ensure that all existing workings shall be rehabilitated to suitable land uses and that all future extraction activities will allow for the rehabilitation of pits and proper land use management. The biodiversity value of the site should be considered in the first instance when preparing restoration plans. Where land filling is proposed, inert material is the preferred method. Each planning application shall be considered on a case by case basis and where relevant will be dealt with under the relevant regional Waste Management Plan".

As detailed in Section 9 of this EIAR, the application site will be restored in accordance with the proposed restoration scheme for the site whereby the quarry void will be allowed to fill with water to form a waterbody. Given that this approach has been previously assessed as part of previous EIA's and approved, this approach is considered acceptable and the proposed development is therefore considered to accord with **Policy RD POL 26** of the MCDP.

Policy RD POL 27 states:

"To ensure that development for aggregates / mineral extraction, processing and associated processes does not significantly impact in the following areas: Existing & Proposed Special Areas of Conservation (SACs);

i. *Special Protection Areas (SPAs);*
ii. *Natural Heritage Areas and Proposed Natural Heritage Areas;*

iii. Other areas of importance for the conservation of flora and fauna;
iv. Areas of significant archaeological potential;
v. In the vicinity of a recorded monument, and;
vi. Sensitive landscapes
vii. World Heritage Sites".

As demonstrated in the Biodiversity, Cultural Heritage and Landscape and Visual Sections of this EIAR and the accompanying NIS, the proposed development is not considered to have given rise to any unacceptable impacts upon any of the designations identified above. As a result, the proposed development is considered to accord with **Policy RD POL 27** of the MCDP.

4.2.2 Economic Development Policies

The MCDP includes a range of other policies which are considered relevant to the proposed development. A summary of the policies and a brief analysis of each is provided below.

The "ED POL" policies of the MCDP relate to economic development in the County. The policies set out the economic vision for the County for the plan period and seek to support economic development and job creation. The policies and objectives have been developed cognisant of the forthcoming economic challenges that the County is expected to face during the Plan period.

The existing operations (stone, powders and fill; Precast and concrete block manufacture) at Tromman provide direct employment for some 140 staff and a further 40 full-time sub-contractors. Keegan Quarries, therefore makes a

significant contribution to the rural Meath economy and provides a highly skilled workforce.

A significant amount of the Company's total revenue stream is now derived from export sales to the UK, bringing external revenue into the Meath Economy. Such is the importance of the export market that the recent growth and expansion in the business, has seen internal investment focussed on satisfying the demands of this area.

The proposed development will sustain existing employment within the business and provide the opportunity for continued growth by allowing for the continued supply of mineral and manufacturing of products associated with the extraction of the mineral won at the site.

Given the significant economic benefits associated with the site, the proposed development is considered to accord with the economic development policies of the MCDP, insofar as applicable to the development project.

4.2.3 Community Building Strategy

Section 7 of the MCDP states that the creation of healthy, socially inclusive communities is a cross cutting theme of the Development Plan. The plan seeks to promote social inclusion with the development of sustainable communities with good quality public realm, access to housing, community facilities and public transport.

The policies are not considered to be of any direct relevance to the proposed development, other than to note that the delivery of all the above-named infrastructure is dependent upon an adequate supply of aggregate, to be used either directly in construction or indirectly via the products (e.g. precast

concrete and blocks) manufactured from the mineral. The Applicant's quarry has been a key supplier of aggregate and value-added products, which has indirectly supported the delivery of the social infrastructure described above.

4.2.4 Movement Strategy

Section 5 of the MCDP relates to transportation. The plan states that the maintenance and delivery of an efficient, integrated and coherent transport network in line with national and regional policy is fundamental to the future economic, social and physical development of the County.

The policies seek to promote sustainable development through walking, cycling and public transport and allow for the efficient movement of goods and people. The policies also seek to promote road and traffic safety; carry out improvements when required and address traffic problems where they arise.

As detailed in the Traffic Section of this EIAR, HGV movements from the site have been previously assessed and subsequently permitted. The proposed development has been demonstrated to not result in any significant effects in terms of highway traffic or safety. The site will continue to utilise the approved access and adequate car parking is available for staff and visitors within the site.

The proposed development is therefore considered to accord with the movement strategy contained within the MCDP insofar as applicable to the development.

4.2.5 Infrastructure Strategy

Section 6 of the MCDP describes how the sustainable future socio- economic growth of the County is dependent on the provision of the required water and wastewater infrastructure and ensuring high-quality reliable service provision. Policies contained within Section relate to the protection of water resources, management of flood risk and consideration of climate change.

As demonstrated at the Water Environment section of this EIAR, the proposed development is not predicted to result in any significant effects upon the ground or surface water environments, with management systems in place to control drainage and flood risk at the site. Impacts upon climate change have been considered at Section 16 of this EIAR, with it concluded that the proposed development would not significantly contribute to impacts associated with climate change.

The proposed development is therefore considered to accord with the movement strategy contained within the MCDP insofar as applicable to the development.

4.2.6 Cultural and Natural Heritage Strategy

The MCDP seeks to identify, protect, conserve and manage the cultural and natural heritage of the County and to encourage its sensitive integration into the sustainable development of the County for the benefit of present and future generations.

As detailed in the Landscape and Visual Section of this EIAR, the proposed development has been assessed from sensitive receptors within the local vicinity. The section describes how the proposed development would not result

in any significant effects upon the environment in terms of the landscape setting and views from surrounding sensitive receptors.

The Cultural Heritage section of this EIAR also demonstrates that the proposed development would not given rise to any unacceptable impacts upon any designated heritage assets. The section details how the archaeological potential of the site has been assessed previously as part of various EIA's and that there is not potential for impacting undiscovered archaeological remains.

Given the above, the proposed development is considered to accord with the cultural and natural heritage strategy of the MCDP insofar as applicable to the development.

4.2.7 Rural Development Strategy

Section 9 of the MCDP seeks to encourage the continued sustainable development of rural communities without compromising the physical, environmental, natural and heritage resources of the County. Many of the policies in this section of the MCDP relate to rural housing and agriculture and are therefore of no relevance to the proposed development. Section 9 of the MCDP also includes the extractive industry policies as discussed earlier in this section, and therefore are not repeated here.

Given the above, the proposed development is considered to accord with the rural development strategy of the MCDP insofar as applicable to the proposed development.

4.2.8 Climate Change Strategy

Section 10 of the MCDP sets out the climate change strategy for the county and seeks to reduce emissions and improve climate change resilience. As detailed at Section 16, the proposed development is not considered to result in any significant effects upon the environment in terms of climate change.

Given the above, the proposed development is considered to accord with the climate change strategy of the MCDP insofar as applicable to the development.

4.2.9 Development Management Guidelines and Standards

The MCDP at Section 11.6.9 states that:

"The Council recognises the contribution of the extractive industry in supporting jobs in the construction and aggregates section of the County".

MD OBJ 64 of the MDCP lists a number of criteria which it states all applications for extractive industry development should comprehensively address.

As demonstrated throughout this report and the s.37L application as a whole, all of the criteria listed have been sufficiently assessed. The overall conclusion of the EIAR is that the proposed development would not result in any significant effects upon the environment.

As summarised throughout this section, the development has been demonstrated to accord with the provisions of the MCDP 2021-2027.

4.3 Sustainable Development- A Strategy for Ireland (1997)

The principle of sustainable development is now a fundamental tenet of land use planning policy in Ireland. The document 'Sustainable Development – A Strategy for Ireland', published by the Department of the Environment in 1997 contains a framework for applying the principles of sustainable development to different sectors of the economy.

The general principle of sustainable development has also been enshrined in the Planning and Development Act 2000 (as amended) and in County Development Plans prepared in recent years, including the MCDP.

In this context, the development has been influenced by these policies and has sought to provide an appropriate methodology to maximise the exploitation of local resources.

There are several sections and policy recommendations outlined in the Sustainable Development Plan which are reviewed in the context of the proposal, as set out below.

The 'Strategic Framework' section outlined in the plan attempts to put in context perceived incongruities whereby on the one hand, there is a fundamental requirement to meet the present day needs in a sustainable way while on the other hand equally ensuring equity in access to, and use of resources, as well as equitable opportunities to participate in decision-making processes all with an overriding goal to achieve economic and social progress.

Within the *priorities for action* identified within the Strategic Framework are:

- a balance between the conservation and utilisation of resources;

- concrete action on the basis of practical programmes and clear targets and;
- an ability to measure and monitor sustainable development performance.

Accordingly, the Government's priorities within the framework of the Strategy are to:

- undertake a high level of environmental protection so that renewable resources are conserved and not depleted beyond their renewable rates;
- ensure that non-renewable resources are used prudently and efficiently with a strong emphasis on the use of substitute resources, where practicable
- and the concentration of critical natural capital on the needs of the future;

The Environment and Economic Development Chapter of the strategy quotes:

"*Ireland should replace the traditional adversarial approach that presents industrial development and environmental protection as opposites. The new approach should simultaneously maintain high environmental quality and promote a competitive enterprise sector*" - Forfas, Shaping our Future.

The Extractive Industries section accepts that quarrying for stone, gravel, sand, crushed rock, etc is based on an ultimately finite resource, stating that products are used mainly in the construction industry, both as crushed rock and for the production of cement. The strategy also notes that ground limestone is also used in agriculture.

The strategy goes on to state that whist in principle raw materials for the quarrying industry are not in short supply, the environmental impacts, require greater consideration. In certain cases, demand for aggregates for use by the construction industry could be met in some degree by recycling and reuse of construction/demolition waste.

It should be noted that due to irregular supply patterns and inconsistencies in material quality, recycled aggregate materials are often not suitable for a range of uses. As detailed earlier in this report, the mineral extracted at the quarry at Tromman is a high purity limestone, therefore replacing the mineral with recycled aggregate would not achieve the same high grade product which is required to produce the products manufactured at the site.

Given the above, the proposed development is considered to accord with the provisions of the Sustainable Development Strategy for Ireland.

4.4 National Planning Framework, 2018

The National Planning Framework (NPF) is the Government's high-level strategic plan for shaping the future growth and development of the country to the year 2040.

The NPF describes how 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.

The NPF goes on to state that 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.

National Policy Objective 23 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".

In terms of rural development, the NPF describes how the spatial, social and economic disparities between rural areas are a reflection of the fact that stronger rural areas tend to be located in a geographically advantageous place, and also have the human and social capital to address their needs and respond effectively to emerging opportunities and strategies.

The application site is considered to be strategically well placed in order to serve a variety of markets across Ireland, including the local market and that of the Greater Dublin Area. The site also benefits from a good human and social capital, as demonstrated by the current operations at the quarry.

National Policy Objective 15 is to:

"Support the sustainable development of rural areas by encouraging growth and arresting decline in areas that have experienced low population growth or decline in recent decades and by managing the growth of areas that are

under strong urban influence to avoid over-development, while sustaining vibrant rural communities".

The proposed development would contribute towards achieving sustainable growth in a rural location and sustaining vibrant local communities within Meath.

Given the above, the development is considered to accord with the provisions of the National Planning Framework.

4.5 Regional Spatial and Economic Strategy 2019-2031

A Regional Spatial and Economic Strategy (RSES) is a strategic plan and investment framework to shape future growth and to better manage regional planning and economic development throughout the Eastern & Midland Region.

The aim of the RSES is:

"To create a sustainable and competitive Region that supports the health and wellbeing of our people and places, from urban to rural, with access to quality housing, travel and employment opportunities for all".

The RSES describes how the Eastern and Midland Region is the primary economic engine of the state providing more than 1 million jobs. The main settlement is the capital city of Dublin, which is home to 1.2 million people and is supported by a network of regional and county towns and an extensive rural hinterland.

The RSES also describes how the region contains some of the fastest growing communities in the Country which increases demand for housing, infrastructure and services in those areas.

The existing site at Tromman is located some 20km from the towns of Navan and Maynooth. Significant economic importance is placed upon both of the identified towns in the RSES. These towns are identified as large economically active service and/or county towns that provide employment for their surrounding areas and with high-quality transport links and the capacity to act as growth drivers to complement the Regional Growth Centres.

Direct access to both towns is available via regional roads. Given the quarry's geographical location and resource quality, the site can be viewed as significant regional influence both in terms of sustaining the role of Dublin as the main metropolitan area within the region, but also sustaining the role and function of the identified towns, supporting the growth patterns for each as envisaged with the RSES.

The proposed development at the site would be complementary to the designations of Navan and Maynooth as 'Key Towns' and Dublin and the surrounding core region, through its role as an important generator of affordable and sustainable building materials. The site has experienced significant employment growth over the previous years. The proposed development would sustain employment in the local area, with knock-on impacts in terms of local expenditure in the towns and wider region.

Given the above, the proposed development is considered to assist in achieving the aims of the RSES through the supply of building materials throughout the region and employment in the local area. The proposed

development is therefore considered compliant with the RSES insofar as applicable to the development.

4.6 Planning Policy Summary and Conclusions

The subject site is within the Meath County administrative area. The Meath County Development Plan (2021-2027) is the current statutory Development Plan for the area. As demonstrated at Section 4.2, the proposed development is considered to accord with the policies of the County Development Plan, insofar as applicable.

The proposed development has allowed for the continuation of the significant economic and social benefits currently generated by the site in terms of employment, investment and prosperity to be sustained without resulting in significant effects upon the environment, as detailed within this EIAR. The proposed development would complement the role of nearby key towns, and the role of Dublin as the main international gateway to Ireland.

The products manufactured at the site and aggregates produced will continue to support economic growth across the Dublin and mid-east region.

The proposed development has been demonstrated to accord with the relevant local, regional and national planning policy provisions. The proposed development will maximise the potential of the finite natural resource found at the site without posing an unacceptable impact upon the environment and as such, the proposed development is considered to accord with the three dimensions of sustainable development and therefore is in accordance with the proper planning and sustainable development of the area.

5.0 GEOLOGICAL ASSESSMENT

A number of geological and geotechnical assessments have been previously undertaken at the Site including for the rEIAR for the application for SC in 2019 (ABP Ref 305049-19), the EIAR for the s.37L application which was returned in 2018; and the applications made to Meath Co. Co. under Section 34 of the Act in 2020, se referenced at Section 1 of the EIAR.

Those assessments were previously undertaken by Mike Williams of Quarrydesign Ltd (see further information below). Geology does not alter in the intervening timeframe since the previous assessments as referenced above. Accordingly, it is considered unnecessary to revisit and update the previously accepted report. As such, the assessment is repeated in the following section. The assessment has been reviewed by Quarryplan to ensure continued compliance with legislation and best practice guidance.

5.1 Author of the Report

This geological review section and the production of the quarry designs has been prepared by Mike Williams MGeol (Hons), MSc, MCSM, FGS, C.Geol, EurGeol, MIQ. As described above, it has been reviewed by Chris Tinsley MRTPI.

As a Senior Engineering Geologist with QuarryDesign Mike has an Integrated Masters in Geology from the University of Leicester and a Master of Science in Mining Engineering from Camborne School of Mines (University of Exeter). He is a Chartered Geologist and Fellow of The Geological Society of London. He was previously employed by Aggregate Industries where he was responsible for quarrying processes from drilling and blasting through to crushing and screening. He has also spent three years as an Exploration Geologist working in the Afar Desert in Ethiopia.

5.2 Geological Setting Baseline

The area around Keegan's Tromman Quarry has been mapped by the Geological Survey of Ireland at a scale of 1:100,000 (see Figure 5.1 overleaf). The mapping indicates that the site is split across two formations: the Lucan and Waulsortian Limestone formations, with the quarry activities having operated almost exclusively within the more recent Lucan Formation, which was deposited during the Carboniferous period.

Previous work undertaken by Minerex Environmental Limited in support of application TA900976 and the associated EIS stated that although the "bedrock mapping compiled by the GSI (Ref. 7.5), the active quarry area is underlain by Waulsortian Limestones in the northwest and the Lucan Formation in the southeast.

The Waulsortian Limestones are generally pale grey, poorly bedded pure limestone with distinctive cavity structures. The Lucan Formation comprises dark grey, well bedded, cherty limestones and calcareous shales.

Based on field observations, the active quarry, including the proposed extension area, is considered to be underlain by the Waulsortian Limestones and not the Lucan Formation as published. The Waulsortian Limestones in the active quarry area were observed to contain cavities and weathering features synonymous with karstification, particularly in the current lower bench.

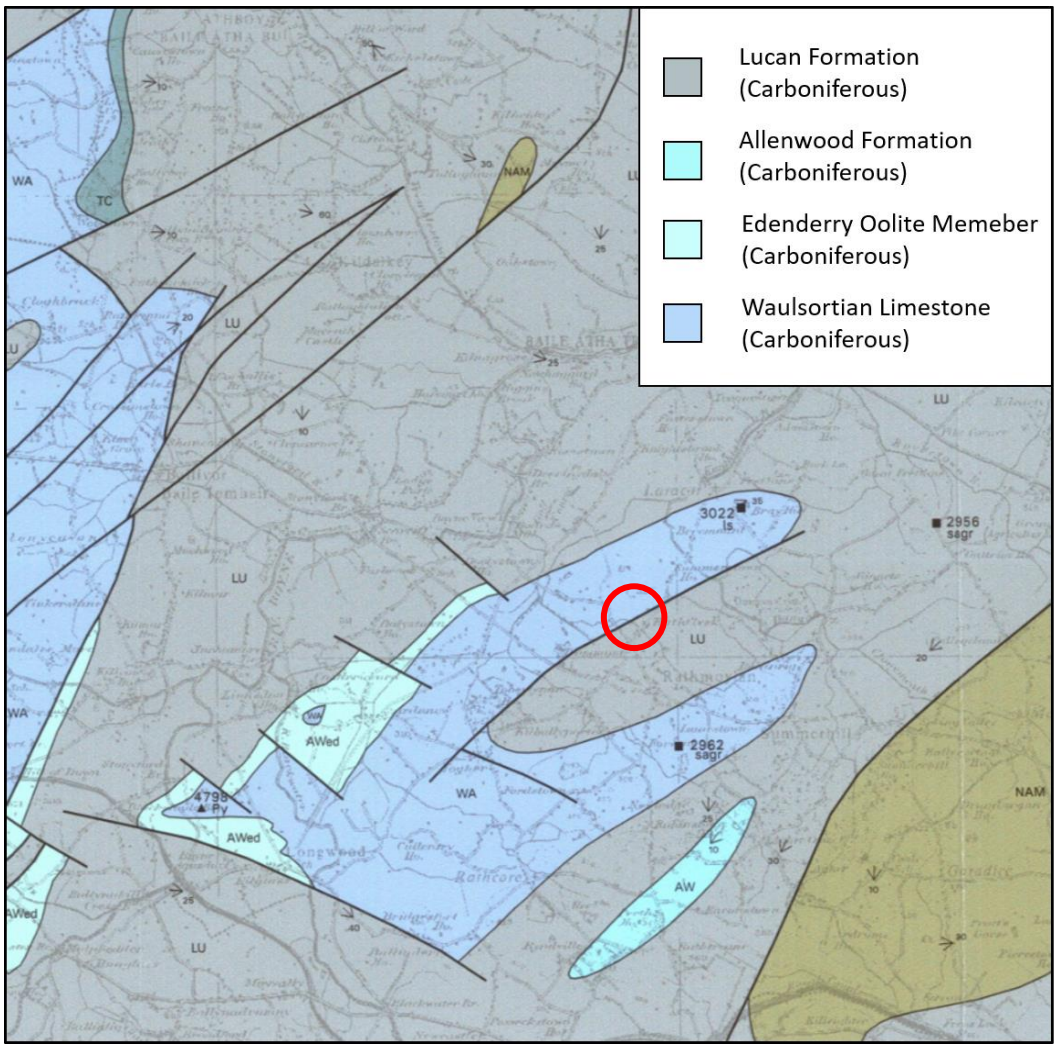


Figure 5.1: Geology of Meath (Sheet 13) 1:100,000 scale (not to scale). Solid Geology of area around Tromman Quarry, published by the Geological Survey of Ireland.

This assessment reflected the author's assessment of the resources on-site and it is considered that the site operates within the Waulsortian Limestone formation. Waulsortian limestone typically comprises pale-grey and very fine-grained carbonates, which display mudstone to wackestone depositional textures. The pale colouration reflects the relative purity of the carbonate matrix, which contains very little to no argillite and is essentially composed of lime mud. The strata at site generally dips at a low angle to the west, although can be locally steep.

The geological mapping of the area indicates that the Waulsortian Limestone around Tromman Quarry is an outlier where the surrounding Lucan Formation was deposited more recently.

5.3 Geotechnical Setting Baseline

Quarrydesign visited the quarry on the 29th October 2018 to inspect the site to gain an appreciation of the geological and geotechnical aspects of the quarry. In terms of geotechnics, there was little of concern at Tromman and it is felt that the current practice of developing quarry faces at 75° is appropriate.

5.4 Geological Impacts

Quarrying, by definition, requires the excavation and removal of the mineral deposit, thereby producing a permanent impact on the local bedrock environment within the footprint of the proposed quarry development.

During extraction, material will be extracted through drilling and blasting methods and will then be processed into a series of single and mixed sized aggregates for sale or use on the on-site manufacturing/ processing facilities.

Whilst the material removed from the site cannot be replaced, when taking into account the wider geological landscape, the scale of the proposed extraction means that the impact upon the geological formation will be minimal.

5.5 Geotechnical Impacts

Given the very nature of the development, the method and manner of quarrying could pose an impact in terms of health and safety upon staff working within the quarry void. The proposed development also has the potential to affect those beyond the quarry boundary by virtue of the potential for land instability.

In the preparation of the proposed development plans, an investigation of the existing quarry has been undertaken to determine the failure mechanisms that could occur during extraction. An analysis of face orientations has been undertaken to ensure that the configuration of the design proposed will remain stable. Subject to the development being undertaken in accordance with the proposed development plans and with the implementation of mitigation measures listed in the following section, the geotechnical impact of the proposed development will be minimised.

5.6 Mitigation Measures

The designs for the site have been based upon the site visit on the 29th October 2018 where there were no obvious geotechnical problems observed at the site and therefore the current face angle of 75° has been adopted, however the face heights have been reduced to a maximum of 15m with appropriate bench widths to allow Rock Traps with a width equal to ¼ the quarry face height and a height equal to 1/8 the face height to be installed.

5.7 Residual Impacts

The development proposes to develop the existing quarry void in the southern part of the site to its maximum southern and eastern planning boundaries.
In the northern part of the quarry, a tip which has been previously been developed will need to be re-located to allow ongoing extraction in the northern margin of the quarry.

Quarry development plans have been prepared in accordance with relevant legislation. The designs have been prepared following a geotechnical investigation of the site and are supported by specific site investigation data. A number of measures have been incorporated within the designs in order to ensure that the development can be undertaken safely and that the proposed development would not result in any adverse impacts in the surrounding area.

5.8 Conclusions

Quarrying, by definition, requires the excavation and removal of the mineral deposit, thereby producing a permanent impact on the local bedrock environment. It is considered that the scale of the proposed development will result in the site continuing to have a limited impact at a local level on the geological environment.

Furthermore, by the nature of quarrying activities, geotechnical impacts will always be possible. Any likely impacts have been minimised by the preparation of quarry development plans which are compliant with the relevant legislation. Additional mitigation measures in the form of reduced face heights will further reduce any potential impacts arising.

The quarry will be subject to the requirements of the Safety, Health and Welfare at Work (Quarries) Regulations 2008 to ensure compliance with the regulations and continued best practice.

Given the above, the proposed development is not considered likely to result in any significant geological Waulsortian Limestone or geotechnical effects upon the environment as a whole.

6.0 WATER ENVIRONMENT

A Hydrological and Hydrogeological Impact Assessment (H&HIA) for the development has been prepared by BCL Hydro and is held at Appendix 6.1.

6.1 Author of the Report

The H&HIA was prepared by BCL Consultant Hydrogeologists Limited, a specialist consultancy with extensive experience within the aggregates, cement, building products and landfill sectors. BCL has provided specialist services and advice to the extractive industry since 2000. During this time, experience has been gained from involvement in the study of hydrogeological and hydrological systems in connection with planning matters at over 100 quarries throughout Ireland and the United Kingdom.

Henry Lister, the author of this report, is a Director of the Company and has over 25 years' experience in completing Hydrogeological and Hydrological Assessments. This has included the assessment of numerous mineral extraction planning applications, the review of mineral permissions (ROMPs) and substitute consents and associated remedial assessments.

6.2 Introduction

The application seeks consent for further quarrying activity and an assessment of the continued use of the Site's ancillary structures for the life of the quarrying activities, prior to the restoration of the entire Site.

This report presents the findings of the Baseline Study and Impact Assessment that is intended to inform consultations both prior to submission of the s.37L Planning Application and during its determination. The collection and

interpretation of baseline data has facilitated a detailed understanding of the nature of, and interactions between, the groundwater and surface water systems operating in and around the Site.

The understanding of hydrological and hydrogeological conditions has been applied to assess the likely primary impacts of the Proposed Development upon the water environment.

Significant potential impacts identified during the course of investigations have been addressed by the incorporation, at the planning stage, of mitigation measures into the design of the Proposed Development. Where appropriate, outline monitoring protocols have been advanced to facilitate validation / modification of the effectiveness of mitigation measures.

6.3 Baseline Conditions

All ingress waters (groundwater and rainfall runoff) collecting in the quarry sump are pumped out of the void and are directed through settlement tanks and discharged into a ditch upon the northern margin of the concrete products yard, as covered by Trade Effluent Discharge Licence Ref. 04/2. This ditch gently descends to the northwest to its confluence with the Rathmolyon Stream, which is 200 m downstream from the quarry discharge point.

The discharge channel incorporates a V-Notch weir, fitted with data logger that has been in operation since 8th April 2019, taking head measurements every 15 minutes. Averaged across the monitoring period, the daily discharge rate equates to 1,335 m^3/day, with a standard deviation of 640 m^3/day.

This is a worst-case estimation of flow rate because the V-notch comprises a broad concrete weir, which would have a higher roughness coefficient than a

thin-plate weir; and therefore the head measurements would be more elevated. With this in mind, the bulk of the data is expected to be broadly consistent with the licensed rate (1,400 m^3/day), which was set in 2004.

Water samples have been collected from the discharge point on a regular basis and submitted for laboratory analysis in order to demonstrate compliance with the water quality limits specified in the consent. It is noteworthy that the current limit for suspended solids is 1 mg/l, whereas Licence 14/04 (issued June 2014) allows for 20 mg/l at the neighbouring Kilsaran Quarry.

"Environmental Management Guidelines: Environmental Management in the Extractive Industry (Non-Scheduled Minerals)", published by the EPA in 2006, is promoted by Government, Planners and the EPA as the lead guidance for good environmental practice in the quarrying industry; and it includes recommendations for emission limit values (ELVs), where appropriate. The ELV recommended for Total Suspended Solids in the Guidelines is 35 mg/l.

When varying the Applicant's licence, the limit for suspended solids should be brought into line with the guidance *i.e.* a practical limit that can be achieved in a limestone quarry setting using industry-standard methodology, without incurring excessive costs; and which is appropriate for the location and hydrological setting, as per the limits stated in the discharge licence for the adjacent Kilsaran Quarry.

The Rathmolyon Stream flows from east to northwest, passing 150m standoff to the north of the Site and then running alongside the northern boundary of the neighbouring (Kilsaran's) quarry. Some 550 m downstream from the northwest limit of Kilsaran's quarry, the stream turns to the north and follows this direction

to its confluence with the Knightsbrook River (5-6 km downstream from the Site) and onwards to the River Boyne.

At the opposite/southern end of the Site, the land drops away gently towards a second watercourse, Tromman Stream. Tromman Stream passes 400 m to the south of the Application Area, at closest approach. The watercourse makes a very gentle descent westwards then northwards, maintaining 400-450 m standoff from the quarries. As it passes to the northwest of Kilsaran's quarry, it enters the uppermost section of the River Boyne & Blackwater SAC-SPA.

The protected section of the Tromman Stream is some 950m standoff to the northwest of the Applicant's quarry. At this point, the two streams (Tromman and Rathmolyon) run parallel to each other, separated by a strip of farmland (less than 100 m in width). This stretch of the Rathmolyon Stream was inspected during the water features survey completed by BCL; there is no evidence of any connection between the two watercourses.

Likewise, SLR Consulting Ireland inspected the same two streams in 2017 and reported that "there is no surface water connection between the two".

Furthermore, please refer to An Bord Pleanála (ABP) report, reference number 17.QV.0182:

(j) the apparent error made by the planning authority's advisors with respect to the existence of a proximate hydrological link between the receiving waters of the surface and ground waters discharged from the site and the nearby River Boyne and River Blackwater Special Area of Conservation, site code 002299, (no such link exists),

(k) the actual hydrological distance to the River Boyne and River Blackwater Special Area of Conservation, site code 002299, which is in excess of nine kilometres from the site,

17.QV.0182 **An Bord Pleanála** **Page 3 of 5**

On this basis, the evidence presented above is in conflict with Point 7.3.2 in the Inspector's Report ABP-303334-19, dated 14th March 2019. It is argued that Point 7.3.2 should be withdrawn from the ABP report.

The quarry is developed within a sequence of limestone beds of Lower Carboniferous age. The Project Geologist has indicated that the Site operates within the Waulsortian Limestone formation, having found no evidence in the quarry void of the faulted contact with the Lucan Formation (as shown on GSI mapping).

GSI literature classifies the Waulsortian Limestone as a "Locally important aquifer, moderately productive only in local zones" *i.e.* lower status than the Lucan Formation ("Locally important aquifer, generally moderately productive").

The groundwater level assessment (focussing on historic, present day and predicted drawdown) has been conducted on the basis that there is no hydraulic barrier between the two formations, irrespective of the precise location of the faulted contact.

Groundwater level data (collected at Site piezometers and local water supply boreholes) has been utilised to provide an indicative illustration of the cone of depression / amount of drawdown (m) that has occurred between 2003 and 2019 as a cumulative consequence of the widening and deepening of the two quarries (and the associated dewatering operations).

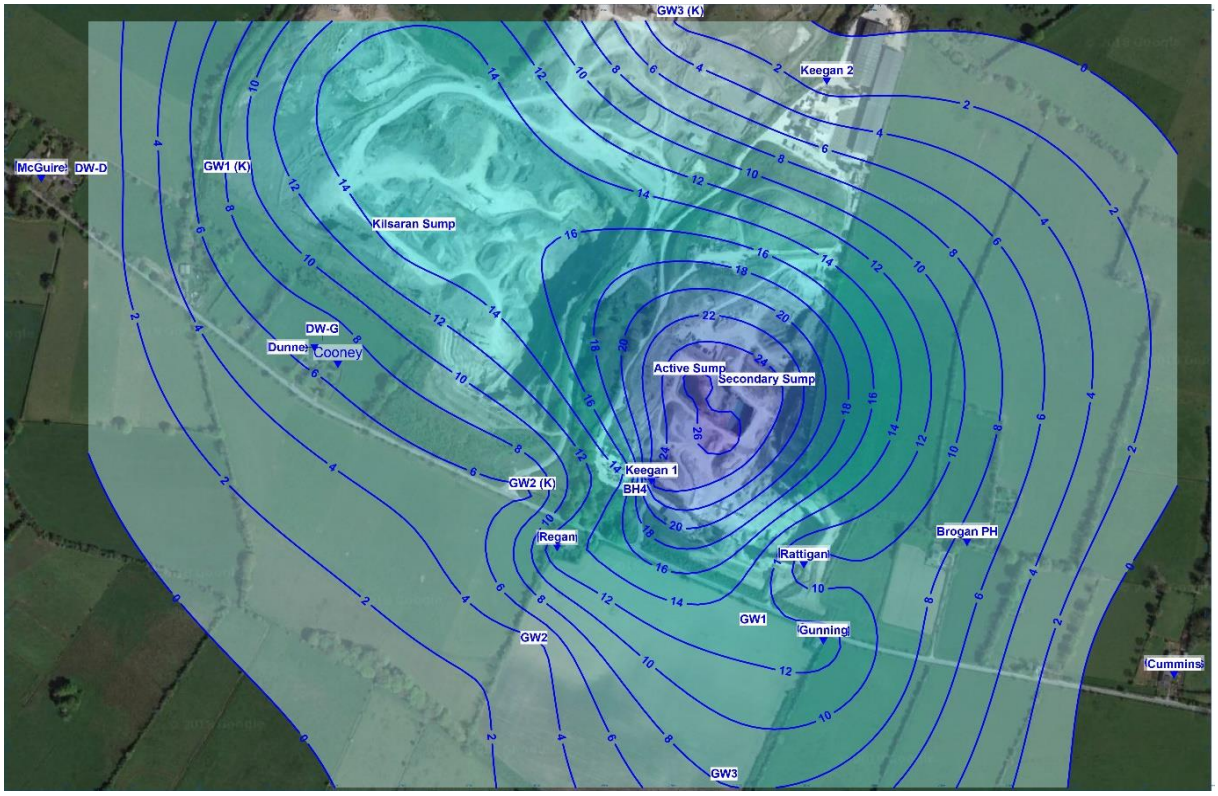


Figure 6.1 Illustration of the Cone of Depression from dewatering 2003-19.

From the data available, it is considered that the bulk of the drawdown had occurred between 2003 and 2009. This is consistent with the conceptual understanding of the limestone formations at this location, where "the majority of groundwater flow will occur in the upper 10m, comprising a weathered zone of a few metres and a connected fractured zone below this. Where the limestone is less karstified, the flow systems will be shallower and more diffuse". Thus, the more extensive drawdown would be expected to have occurred when working the upper benches.

Between March 2019 and November 2023, the quarry sump has been lowered from 27 maOD down to 15-16 maOD. The quarry sump has been deepened and water level is being suppressed at 16-17 maOD. Correcting for outliers, the peak discharge rates are currently in the region of 2,000-2,100 m^3/day.

Groundwater quality samples were collected on 10th April 2019 at the following locations: Regan, Cummins, Brogan Shallow Chamber, Keegan 1, Keegan 2, GW1 and GW3. There is no evidence of any quarry-related impact upon groundwater quality.

6.4 Potential and Predicted Environmental Impacts / Effects

In proposing to advance westwards by 20-25 m, this will be working into the narrow spine of land separating the two quarries (the Applicant's quarry and Kilsaran's quarry), where the limestone strata will have already been dewatered as a result of being sandwiched between the deepest sinking in each quarry.

The Waulsortian Limestone is a Locally important aquifer, moderately productive only in local zones" (Ll). The quarry does not overlap with any Source Protection Areas. Using the IGI guidance, the aquifer is shown to be of 'Medium' importance.

Looking at the cumulative cone of depression that has developed at the existing quarry complex (*i.e.* the Applicant's quarry and Kilsaran Quarry, taken together), the bulk of the drawdown is considered to have been established between 2003 and 2009 *i.e.* during previous phases of quarrying, when working the upper benches ("the majority of groundwater flow will occur in the upper 10 m, comprising a weathered zone of a few metres and a connected fractured zone below this"). The current radius of influence (based upon actual observed distance-drawdown readings) is shown to equate to *circa* 510 m. This is the cumulative impact of the two existing quarries. At the final development, the cumulative radius of influence is expected to increase to 550 m.

The Waulsortian Limestone belongs to the Longwood Groundwater Body (GWB), which covers an area of 50 km^2. Thus, the future development only involves the removal of a small proportion of aquifer, with minor change to the extant configuration of the aquifer (bearing in mind that the unsaturated zone has already been removed by the preexisting development).

Given the above factors, the magnitude of impact on the Hydrogeology Attribute is 'Small Adverse', therefore the significance of impact is within acceptable range, being rated as 'Slight'.

In terms of potential hydrological receptors, there is no hydraulic continuity between the groundwater in the bedrock as encountered at the quarry, and the Tromman Stream. Therefore, the Tromman Stream and associated SAC will not be impacted by the drawdown of the groundwater table in the limestone bedrock at depth.

Any drawdown-related impact upon Rathmolyon Stream would be counterbalanced by the consented discharge process, whereby (in a continuation of existing practice) water from the quarry sump will be directed into the at-risk section of stream in accordance with the Discharge Licence.

The closest 3rd party water supplies are the Regan borehole (with 18 m drawdown in worst-case conditions since 2003); and the Gunning borehole (19 m drawdown in worstcase conditions since 2003).

At the final development, these boreholes are at risk of an additional 3.0-3.5 m cumulative drawdown. Given the hydrogeological characteristics of the Limestone Formations, the collection of further monitoring data (groundwater levels in the Site piezometers and local boreholes; and flow readings at the V-

notch weir) will mean that these findings can be reviewed and refined as the development progresses.

6.5 Mitigation of Impacts

Throughout the operational life of the development, the Applicant will continue to check groundwater level in Site piezometers and third-party boreholes on a quaterly basis, subject to agreeing access arrangements.

In the eventuality that a shortfall in required yield is confirmed post monitoring, the first step towards tackling a shortfall in yield will be to pump at a lower rate but for longer hours; and provide a larger storage tank. The fall-back position would be the provision of a replacement supply *e.g.* mains water.

Precautionary procedures have been implemented for the protection of groundwater quality; by minimising the likelihood of occurrence in the first instance, and specification of reactive measures for the management of accidental spillage and / or long-term leakage of fuel, lubricating or hydraulic oils should this occur.

Quarry ingress waters (having been attenuated in the sump) will be directed into the pre-existing water management system in a continuation of current practice.

The current licensed rate is 1,400 m3/day. This will need to be varied to accommodate the total discharge requirement at the final development, which is estimated at 2,750 m3/day.

The current limit for suspendedsolids is 1 mg/l, whereas Licence 14/04 (issued June 2014) allows for 20 mg/l at Kilsaran Quarry (and national guidance for quarries is 35 mg/l). This will need to be addressed when the licence is varied.

When assessing the proposed development against this scenario, by its very nature, the proposed development would result in hydrogeological and hydrological impacts which otherwise would not be experienced if operations at the Site were to cease. Notwithstanding, given the efficacy of the water management system at the Site to date and the fact that any future development at the Site will be required to be undertaken in accordance with the same, the proposed development is not considered to result in any significant effects upon the environment when assessed against the current baseline scenario or the potential evolution thereof to a scenario whereby the quarry is restored, and the Site remediated.

6.6 Assessment of Impacts against Likely Evolution of the Baseline

The 'no development option' would involve the cessation of quarry dewatering operations, and the quarry void would fill with water to form a lake. It is considered that a lake level of some 65 maOD +/-2m (subject to seasonal variation) would be established within the abandoned workings.

When assessing the proposed development against this scenario, by its very nature, the proposed development would result in hydrogeological and hydrological impacts which otherwise would not be experienced if operations at the Site were to cease. Notwithstanding, given the efficacy of the water management system at the Site to date and the fact that any future development at the Site will be required to be undertaken in accordance with the same, the proposed development is not considered to result in any significant effects upon the environment when assessed against the current

baseline scenario or the potential evolution thereof to a scenario whereby the quarry is restored, and the Site remediated.

6.7 Residual Impacts

The pre-quarrying groundwater level is taken to be *circa* 65 maOD +/-2m.

At the time of restoration, quarry dewatering operations would be terminated and the quarry void would fill with water to form a lake. It is considered that a lake level of some 65 maOD +/-2m (subject to seasonal variation) would be established within the abandoned workings.

If a borehole supply is failing to meet demand as a result of quarry dewatering, it is envisaged that the supply will be restored when the quarry is allowed to flood with water at the cessation of extraction. At this time, the quarry operators would no longer be responsible for the costs of supplying water to these properties.

However, the quarry operators would continue to be responsible for providing an alternative supply in the unlikely event that the well/borehole failed to recover when the quarry working is finished.

6.8 Conclusions

On the basis of baseline study and subsequent impact assessment, there are considered to be no over-riding hydrological or hydrogeological related reasons why the Proposed Development should not proceed in the manner described by the Application.

This conclusion assumes that any permission, if granted, should be conditioned by implementation and adherence to any relevant recommendations advanced within the full assessment and other such conditions that may be reasonably imposed by the Planning and Regulatory Authorities.

Examining the Inspector's Reports (ABP) relating to previous planning submissions at the Application Site and Kilsaran's Quarry, it is evident that the findings of the risk assessment need to be verified by committing to a comprehensive programme of hydrometric monitoring, which will be conducted throughout the operational life of the quarry.

Any shortfalls, highlighted by the previous ABP reports, have been addressed by expanding the hydrometric monitoring scheme that is now in operation.

7.0 NOISE AND VIBRATION

7.1 Introduction

This Noise & Vibration Impact Assessment has been prepared to accompany the planning application for the proposed further development of the 21.64Ha quarry site including the extraction of limestone from an area of 14.3Ha using conventional drilling and blasting techniques and mineral reduction using mobile crushing and screening and the continuation of use of the ancillary works and structures for the life of the quarry, and the restoration and rehabilitation of the whole quarry site.

This Noise Impact Assessment report has been prepared by Mervyn Keegan. Mervyn Keegan is a Director of the environmental consultancy, AONA Environmental Consulting Ltd. Mervyn Keegan's areas of professional expertise are in Noise Control & Acoustics and Air Quality & Odour consultancy, including impact assessment and mitigation design. Mervyn Keegan has over 25 years of environmental consultancy experience. Mervyn is a full member of the Institute of Acoustics, the Institute of Environmental Sciences and the Institute of Air Quality Management. Mervyn has a Bachelor of Science Degree (Applied Sciences), a Master of Science Degree (Environmental Science) and a Diploma in Acoustics in Noise Control. AONA Environmental Consulting Ltd. is an independent consultancy specialising in Environmental Impact Assessment and Licensing. Mervyn Keegan has prepared in excess of ten Noise & Vibration and Air Quality & Climate impact assessments per annum for quarry developments in the Republic of Ireland, Northern Ireland and the UK in the last 20 years and is an expert in the awareness and understanding of the relevant legislation and guidance that pertains to best practise in such assessments. Mervyn Keegan has appeared as an Expert Witness at oral hearings, public inquiries and legal hearings. Mervyn Keegan has produced

Noise, Air Quality & Odour Impact Assessment reports to assess the impacts of a range of development types including roads, residential developments, industrial developments, quarries and mines and wind energy developments among others.

The Noise & Vibration Impact Assessment has addressed the further development of the 21.64Ha quarry site including the extraction of limestone from an area of 14.3Ha using conventional drilling and blasting techniques and mineral reduction using mobile crushing and screening to a depth of 13mAOD as well as emissions from the associated structures and the impacts of the adjacent Kilsaran operation. The Section of the EIAR should be read in conjunction with the figures held at Appendix 7.1.

7.2 Methodology

7.2.1 Impact Assessment Methodology

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 Tromman Quarry site. Subsequently, an accurate sound power level for these sources has been determined to allow for accurate noise prediction modelling.
- A prediction of the specific noise levels at the surrounding residential properties from the existing and proposed concrete manufacturing and

quarrying activities at the Tromman Quarry site using CadnaA noise prediction software.

- A comparison of the measured existing noise levels and the predicted noise levels at the surrounding residential properties (Noise Sensitive Receptors [NSR's], Ref's: N1 and N2) against relevant guidelines.

7.2.2 Relevant Guidelines & Standards

The noise and vibration impact assessment has been undertaken with regard to the following established standards and guidelines to determine the impact of the proposed Tromman Quarry site activities on the surrounding noise environment and assess for the potential for noise disturbance at existing noise sensitive receivers in the locality:

- Quarries and Ancillary Activities, Guidelines for Planning Authorities, April 2004, Department of the Environment, Heritage and Local Government. (DoEHLG Guidance)
- Environmental Management Guidelines Environmental Management in the Extractive Industry (Non-Scheduled Minerals), Environmental Protection Agency (2006)

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

'Control of noise: Noise-sensitive uses in the vicinity of a quarry, such as dwellings, schools, hospitals, places of worship or areas of high amenity, require that the amount of noise be minimised. The sensitivity to noise is usually greater at night-time (20.00 to 08.00) than during the day, by about 10 dB(A). Many quarries are situated in areas of low background noise and it is appropriate to consider this when setting noise limits. In general, it can be expected that

complaints will result where the noise from quarrying and associated activities are between 5 to 10 dB above the background noise levels. In areas of higher background noise levels, the EPA recommends that ideally, if the total noise level from all sources is taken into account, the noise level at sensitive locations should not exceed a L_{Aeq} (1 hour) of 55 dB(A) by daytime and a L_{Aeq} (15 minutes) of 45 dB(A) by night-time. Audible tonal or impulsive components in noise emissions (e.g. the reversing siren on a lorry, required for safety reasons) can be particularly intrusive, and such components should be minimised at any noise-sensitive location.

- *It may be necessary to raise the noise limits to allow temporary but exceptionally noisy phases in the extraction process, or for short-term construction activity which cannot meet the limits set for routine operations, e.g. the construction of baffle mounds, which bring long-term environmental benefits.*

- *The developer may be required to carry out noise surveys to measure noise levels at the site boundary near sensitive locations, as agreed in advance with the planning authority. Surveys should be carried out in accordance with the EPA's "Environmental Noise Survey – Guidance Document" (2003). Noise monitoring should be carried out on a quarterly basis (or as otherwise agreed), and commenced prior to the commencement of development. The results should be reported to the planning authority within 3 weeks (or as agreed). 95% of all noise measured shall comply with the specified limit values. No individual noise measurement should exceed the limit values by more than 2 dB(A).*

Control of blasting: Nearby residents (e.g. within 500 meters) need to be given advance notice when blasting operations are due to take place, which should only be carried out between 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)'.

As outlined in the Environmental Management Guidelines Environmental Management in the Extractive Industry (Non-Scheduled Minerals), Environmental Protection Agency (2006), the Environmental Protection Agency (EPA) has produced a Guidance Note for Noise in Relation to Scheduled Activities (EPA, 1996). It deals in general terms with the approach to be taken in the measurement and control of noise, and provides advice in relation to the setting of noise Emission Limit Values (ELV) and compliance monitoring. In relation to quarry developments and ancillary activities, it is recommended that noise from the activities on site shall not exceed the following noise ELVs at the nearest noise-sensitive receptor:

- Daytime: 08:00–20:00 h $L_{Aeq\ (1\ h)}$ = 55 dB(A)
- Night-time: 20:00–08:00 h $L_{Aeq\ (1\ h)}$ = 45 dB(A)

Note:

- 95% of all noise levels shall comply with the specified limit value(s). No noise level shall exceed the limit value by more than 2 dB(A).
- On-site activities should be permitted during night-time hours where they comply with the noise ELVs (e.g. heating up of asphalt plants, loading of materials).
- Where existing background noise levels are very low, lower noise ELVs may be appropriate.
- Audible tones or impulsive noise should be avoided at night.
- It is also appropriate to permit higher noise ELVs for short-term temporary activities such as construction of screening bunds, etc., where these activities will result in a considerable environmental benefit.
- In relation to blasting activities within quarry development, it is recommended that the following vibration and air overpressure ELVs are

adopted and applied at the nearest vibration and air overpressure sensitive location (e.g. a residential property):

Ground-borne vibration: Peak particle velocity = 12 mm/s, measured in any of the three mutually orthogonal directions at the receiving location (for vibration with a frequency of less than 40 Hz)
Air overpressure: 125 dB (linear maximum peak value), with a 95% confidence limit.

- Normal hours of blasting should be defined (e.g. 09:00–18:00 h Monday to Friday), and provision should be included to permit blasting outside these hours for emergency or safety reasons beyond the control of the quarry operator.
- It is recommended that quarry operators provide advance notification of blasting to nearby residents through use of written notes, signage at site entrance, telephone, or warning sirens (or a combination of these methods).

On the basis of the above, the following noise limits are suggested for the continued operation of the quarry including the extraction of limestone from an area of 14.3Ha using conventional drilling and blasting techniques and mineral reduction using mobile crushing and screening to a depth of 13mAOD as well as noise from the associated existing permitted structures and structures that Meath County Council consider to be unauthorised structures erected in the manufacturing (Northern) part of the site since 2013 and the impacts of the adjacent Kilsaran operation.

The equivalent sound levels attributable to all on-site operations associated with the development shall not exceed 55 dB(A) L_{eq} over a continuous one hour period between 0700 hours and 1900 hours on Monday to Friday inclusive, and

0700 hours and 1400 hours on Saturday, when measured at any noise sensitive receptor. Sound levels shall not exceed 45 dB(A) at any other time.

7.2.3 CadnaA Noise Prediction Modelling Methodology

CadnaA has been developed to allow detailed noise predictions to be undertaken in accordance with:

- ISO 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2 General methods of calculation.
- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Noise

The CadnaA noise prediction model allows for noise from all sources entered into the model to be undertaken simultaneously. The noise model can take topographical effects, ground absorption, screening effects, reflections and focusing effects, among others, into consideration. The modelling software calculates noise levels based on the emission parameters and spatial settings that are entered. The model calculates the propagation of the sound from each noise source and produces a noise level contour map and graphics in proximity to a facility with colour coded noise level contours. Model parameters, sources, and settings have been incorporated into the model as detailed in Table 8.1. The noise model has been produced to verify the noise readings taken on the existing Tromman Quarry site and confirms that the model is representative of the current on site operations and provides an accurate verifiable prediction at all noise sensitive receptors in the vicinity of the existing Tromman Quarry site. Thus, the noise prediction model provides an appropriate level of confidence when assessing specific noise impact from the proposed development of the Tromman Quarry site.

AONA Environmental has undertaken a site noise survey with source specific noise level readings taken in close proximity to the main noise sources on the existing Tromman Quarry site, which will continue to operate during the proposed development. This allowed for the generation of accurate sound power levels for all main noise sources on the site. For the purposes of noise impact assessment, the Sound Power level (L_W) was determined by measuring the Sound Pressure Level (L_P) at a specific distance from the noise source and assuming a Directivity Index (Q) of 2, i.e. hemispherical propagation, using the following equation;

$$L_W = L_p + |10 \cdot \log\left(\frac{Q}{4\pi \cdot r^2}\right)|$$

Parameter	Source	Details
Horizontal distances – Quarry and surrounding area	Quarryplan	Scaled drawings in AutoCAD format.
Quarry Dimensions	Quarryplan	Scaled drawings in AutoCAD format.
Receiver Locations	AONA Environmental	In outdoor amenity areas adjacent to nearest residential properties @ 1.5m height.
Plant types, location & Sound Power Level	Quarryplan / site operator.	Source noise measurements were undertaken in close proximity to plant and equipment and within buildings on site. This allowed for an accurate Sound Power Level L_w to be assigned to active plant.
Ground Absorbtion	AONA Environmental	A Ground Absorbtion Rate – G = 0.5 has been used in the model, which is appropriate for the surrounding land type.

Table 7.1: Modelling Parameters, Sources and Assumptions

7.3 Assessment of Baseline Noise & Vibration Conditions

7.3.1 On-going Noise Compliance Monitoring

Table 7.2 summarises the noise monitoring surveys that have been undertaken from 2013 until 2023 by Byrne Environmental at Tromman Quarry. The noise monitoring surveys were carried out to record and assess the noise impacts that the quarry site activities have on the local receiving noise environment and to assess compliance with site relevant Planning Conditions *(Planning Permission Ref. TA/900976 Condition 12)*. The noise monitoring surveys have been conducted in accordance with *ISO 1996-2, 2017 Acoustics – Description, Measurement and Assessment of Environmental Noise* and with reference to the 2016 EPA publication, "*Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)*.

The Tromman Quarry site is located in the townland of Tromman approximately 2.2 km west of Rathmolyon village set back from the R156 Regional Road. The surrounding lands can be characterised as rural in nature with land uses in the area identified as agricultural, extractive and single dwelling houses (residential). The extractive industry is an established land use in the surrounding area dominated by the subject site and the adjoining Kilsaran Quarry which borders the Tromman Quarry site to the West.

Condition 12 of Planning Permission Ref. TA/900976 states that "*site noise shall not exceed 55dB(A) $L_{Aeq,T}$ during 08:00hrs – 18:00 hrs Monday to Saturday and 45 dB(A) $L_{Aeq,T}$ at any other time when measured at any noise sensitive premises in the locality*".

This is an absolute limit that is applied to all extractive sites and is taken from the DoEHLG Guidance referenced earlier in this Section of the EIAR.

The recorded $L_{Aeq,T}$ values at N1 and N2 at the boundary of the Tromman Quarry site from 2013 until 2023 consistently comply with the specified limit value and are consistent with previous noise survey results. Typically at N1 and N2, the subjective commentary states either '*Quarry noise faintly audible*' or '*Quarry noise not audible*' at N1 and N2. Therefore, it is confirmed that the existing quarrying and concrete manufacturing operations at the Tromman Quarry, to include the operations of the ancillary works and structures referenced under the accompanying SC Application for the life of the quarry are not having a significant noise impact at the nearest residential properties to the site. The noise monitoring at this location is inclusive of the cumulative noise impacts from the Tromman Quarry site and Kilsaran Quarry directly adjacent to the Tromman Quarry site and conversely the data that Kilsaran have provided reflects the Keegan operations, as presented below.

Period	Location	Date	Time	$L_{Aeq, 60min}$	$L_{A10, 60min}$	$L_{A90, 60min}$	Notes
Qtr 1 2013	N1	07/02/2013	14:30	48	52	44	Quarry noise faintly audible
	N2	07/02/2013	15:45	57	59	50	Quarry noise not audible
Qtr 2 2013	N1	27/06/2013	10:35	49	55	44	Quarry noise faintly audible
	N2	27/06/2013	11:45	55	63	52	Quarry noise not audible
Qtr 3 2013	N1	03/09/2013	15:15	49	51	40	Quarry noise faintly audible
	N2	03/09/2013	14:00	56	60	48	Quarry noise not audible, Road traffic dominant
Qtr 4 2013	N1	02/12/2013	14:35	47	51	39	Quarry noise faintly audible
	N2	02/12/2013	16:00	54	62	48	Quarry noise not audible, Road traffic dominant
Qtr 1 2014	N1	03/02/2014	12:00	53	59	43	Quarry noise faintly audible
	N2	03/02/2014	10:10	50	57	45	Quarry noise not audible
Qtr 2 2014	N1	10/06/2014	15:30	55	64	47	Quarry noise faintly audible
	N2	10/06/2014	13:45	53	61	48	Quarry noise audible
Qtr 3 2014	N1	02/09/2014	10:10	53	63	43	Quarry noise faintly audible
	N2	02/09/2014	11:25	55	68	49	Quarry noise audible
Qtr 4 2014	N1	24/11/2014	14:15	54	62	50	Quarry noise faintly audible
	N2	24/11/2014	15:30	56	65	51	Quarry noise audible
Qtr 1 2015	N1	17/02/2015	09:10	50	60	41	Quarry noise faintly audible
	N2	17/02/2015	10:35	53	63	46	Quarry noise audible
Qtr 2 2015	N1	18/06/2015	14:00	59	62	38	Quarry noise not audible
	N2	18/06/2015	14:10	53	60	39	Quarry noise faintly audible
Qtr 3 2015	N1	30/09/2015	16:45	60	65	45	Quarry noise not audible
	N2	30/09/2015	15:10	54	61	44	Quarry noise faintly audible
Qtr 4 2015	N1	30/10/2015	11:05	58	63	48	Quarry noise not audible
	N2	30/10/2015	09:50	52	60	46	Quarry noise faintly audible
Qtr 1 2016	N1	01/03/2016	08:30	58	63	49	Quarry noise not audible
	N2	01/03/2016	11:05	52	55	46	Quarry noise faintly audible
Qtr 2 2016	N1	03/06/2016	09:45	60	66	52	Quarry noise not audible
	N2	03/06/2016	11:15	55	62	50	Quarry noise faintly audible
Qtr 3 2016	N1	05/09/2016	08:15	58	71	50	Quarry noise not audible
	N2	05/09/2016	11:00	53	65	48	Quarry noise faintly audible
Qtr 4 2016	N1	03/11/2016	11:05	50	53	46	Quarry noise faintly audible
	N2	03/11/2016	10:00	60	68	52	Quarry noise not audible
Qtr 1 2017	N1	30/03/2017	08:35	53	60	49	Quarry noise faintly audible

	N2	30/03/2017	09:55	57	63	50	Quarry noise not audible
Qtr 2 2017	N1	02/05/2017	11:05	51	55	46	Quarry noise faintly audible
	N2	02/05/2017	09:00	56	58	49	Quarry noise not audible
Qtr 3 2017	N1	15/08/2017	08:10	53	59	42	Quarry noise faintly audible
	N2	15/08/2017	09:20	57	62	49	Quarry noise not audible
Qtr 4 2017	N1	10/11/2017	08:25	55	66	50	Quarry noise faintly audible
	N2	10/11/2017	10:30	58	68	50	Quarry noise not audible
Qtr 1 2018	N1	04/02/2018	11:45	53	55	48	Quarry noise faintly audible
	N2	04/02/2018	13:50	60	65	53	Quarry noise not audible
Qtr 2 2018	N1	05/05/2018	14:15	52	59	46	Quarry noise faintly audible
	N2	05/05/2018	15:35	57	72	52	Quarry noise not audible
Qtr 3 2018	N1	02/08/2018	10:30	51	48	55	Quarry noise faintly audible
	N2	02/08/2018	08:45	53	50	55	Quarry noise not audible
Qtr 1 2019	N1	04/02/2019	10:35	51	58	45	Quarry noise faintly audible
	N2	04/02/2019	11:45	52	68	47	Quarry noise not audible
Qtr 2 2019	N1	01/06/2019	08:30	53	60	46	Quarry noise faintly audible
	N2	01/06/2019	09:55	54	70	48	Quarry noise not audible
Qtr 3 2019	N1	28/08/2019	10:25	54	62	45	Quarry noise faintly audible
	N2	28/08/2019	11:40	53	68	48	Quarry noise not audible
Qtr 4 2019	N1	08/10/2019	14:15	55	68	47	Quarry noise faintly audible
	N2	08/10/2019	15:55	54	57	46	Quarry noise not audible
Qtr 1 2020	N1	01/03/2020	10:10	52	56	46	Quarry noise faintly audible
	N2	01/03/2020	10:35	58	63	49	Quarry noise not audible
Qtr 2 2020	N1	03/06/2020	14:10	48	52	44	Quarry noise faintly audible
	N2	03/06/2020	15:30	59	67	50	Quarry noise not audible
Qtr 3 2020	N1	10/09/2020	14:40	50	54	47	Quarry noise faintly audible
	N2	10/09/2020	15:58	57	68	51	Quarry noise not audible
Qtr 4 2020	N1	30/10/2020	10:45	47	50	45	Quarry noise faintly audible
	N2	30/10/2020	12:40	57	66	49	Quarry noise not audible
Qtr 1 2021	N1	01/02/2021	08:05	48	55	45	Quarry noise faintly audible
	N2	01/02/2021	09:43	60	62	50	Quarry noise not audible
Qtr 2 2021	N1	17/06/2021	11:05	51	54	47	Quarry noise faintly audible
	N2	17/06/2021	13:35	62 (52 no traffic)	66	55	Quarry noise not audible
Qtr 3 2021	N1	09/08/2021	08:55	54	58	49	Quarry noise faintly audible
	N2	09/09/2021	11:15	65 (53 no traffic)	68	50	Quarry noise not audible

Qtr 4 2021	N1	02/12/2021	14:20	51	52	47	Quarry noise faintly audible
	N2	02/12/2021	15:45	63(52 no traffic)	66	55	Quarry noise not audible
Qtr 1 2022	N1	08/02/2022	14:25	50	53	46	Quarry noise faintly audible
	N2	08/02/2022	15:45	59	64	53	Quarry noise not audible
Qtr 2 2022	N1	31/05/2022	08:15	23	57	45	Quarry noise faintly audible
	N2	31/05/2022	09:35	60	63	55	Quarry noise not audible
Qtr 3 2022	N1	05/09/2022	14:10	54	57	45	Quarry noise faintly audible
	N2	05/09/2022	15:35	65 (55 no traffic)	66	56	Quarry noise not audible
Qtr 4 2022	N1	04/11/2022	11:00	55	60	45	Quarry noise faintly audible
	N2	04/11/2022	12:11	62	66	54	Quarry noise not audible
Qtr 1 2023	N1	31/03/2023	14:25	55	59	50	Quarry noise faintly audible
	N2	31/03/2023	15:50	59	64	54	Quarry noise not audible
Qtr 2 2023	N1	02/06/2023	10:15	54	57	50	Quarry noise faintly audible
	N2	05/06/2023	12:05	60	66	55	Quarry noise not audible
Qtr 3 2023	N1	03/07/2023	15:55	53	56	50	Quarry noise faintly audible
	N2	03/07/2023	15:10	54	58	52	Quarry noise not audible

Table 7.2: Noise monitoring survey results from 2013 until 2023 at Keegan Quarries Ltd., Tromman, Rathmolyon, Co. Meath.

Period	Location	Date	$L_{Aeq, 60min}$	$L_{A10, 60min}$	$L_{A90, 60min}$
Qtr 4 2014	N1	20/11/2014	47.6	48.9	45.4
	N2	20/11/2014	51.1	52.8	42.8
Qtr 2 2015	N1	16/07/2015	50.8	52.5	47.1
	N2	16/07/2015	53.6	54.1	44.9
Qtr 4 2015	N1	04/12/2015	52.8	44	41.1
	N2	04/12/2015	55	45.5	40.2
Qtr 1 2016	N1	19/02/2016	59.7	61.9	54.2
	N2	19/02/2016	56	56.7	50.5
Qtr 4 2016	N1	04/11/2016	49.9	52.9	44.1
	N2	04/11/2016	47.7	50	41.5
Qtr 1 2017	N1	04/11/2017	49.2	51.9	42.8
	N2	04/11/2017	45.9	46.8	43.3
Qtr 3 2020	N1	08/09/2020	59.0	60.0	51.0
	N2	08/09/2020	52.0	54.0	49.0
Q3 2022	N1	13/07/2022	59.0	61.0	56.0
	N2	13/07/2022	50.0	52.0	47.0

Table 7.3: Periodic Noise monitoring survey results since November 2014 until November 2022 at Kilsaran Quarries directly adjacent to Keegan Quarries

The Council-approved noise monitoring survey locations are located adjacent to the operational boundaries of the two quarries (Kilsaran and Keegan) and in proximity to the nearest residential properties to each, as presented in Figure 7.1.

The technical reports prepared by Byrne Environmental report the noise parameters $L_{Aeq, 60min}$ dB(A), $L_{A90, 60min}$ dB(A) and $L_{A10, 60min}$ dB(A). The measurement parameters recorded and reported during the noise surveys are defined as follows:

- L_{Aeq} is the A-weighted equivalent continuous steady sound level during the sample period.
- L_{A10} is the A-weighted sound level that is exceeded for 10% of the sample period and is generally used to quantify traffic noise.
- L_{A90} is the A-weighted sound level that is exceeded for 90% of the sample period and is generally used to quantify background noise.

- A-weighted Decibel (dBA): Decibels measured on a sound level meter incorporating a frequency weighting (A Weighting) which differentiates between sound of different frequency (pitch) in a similar way to the human ear. This takes account of the fact that the human ear has different sensitivities to sound at different frequencies.

It is noted that occasional exceedances of the noise limit of 55 dB(A) have been recorded at the monitoring locations since 2013. The important parameter to analyse when the measured $L_{Aeq, 60min}$ dB(A) value exceeds 55 dB(A) is the $L_{A90, 60min}$ dB(A) noise parameter. On each of the occasions when there is an exceedance of the 55 dB(A) limit value, the $L_{A90, 60min}$ dB(A) value was well below the 55 dB(A) level. These values suggest that the background noise level in the area is well below 55 dB(A) and the impact on the measured $L_{Aeq, 60min}$ dB(A) value is not due to the continuous operations at the Keegan Quarry site and may be due to other extraneous noise sources in closer proximity to the survey location. If the $L_{A90, 60min}$ dB(A) value was noted to exceed the 55 dB(A) level then this may be an indication that the specific continuous operations at the Keegan Quarry site are causing a level in excess of 55 dB(A) however this is not the case at this quarry.

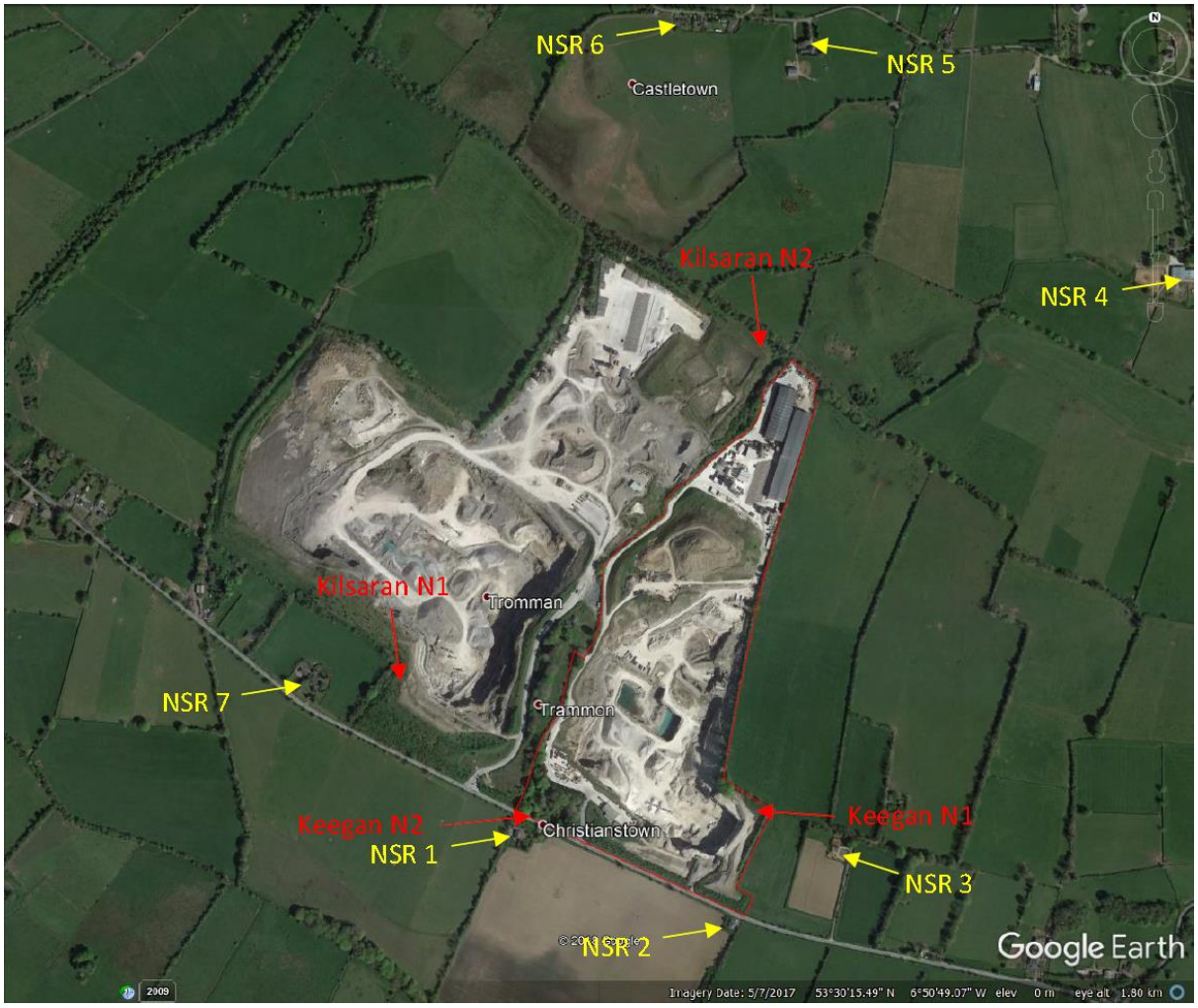


Figure 7.1: Noise monitoring locations and Noise Sensitive Receiver (NSR) locations in proximity to the nearest residential properties

7.3.2 Vibration Compliance Monitoring

In accordance with best practice, vibration monitoring with the use of a vibrograph has been undertaken for every blast since 2013 at the nearest residential properties to the Tromman Quarry site. The vibration monitoring locations and results are provided in Table 7.4. The blast monitoring locations relate to the most proximate residential properties to the extraction operations.

The DoEHLG Guidance provides a limit for ground-borne vibration: Peak particle velocity = 12 mm/s, measured in any of the three mutually orthogonal

directions at the receiving location (for vibration with a frequency of less than 40 Hz). The DoEHLG Guidance provides a limit for Air overpressure: 125 dB (linear maximum peak value), with a 95% confidence limit. These limits are not exceeded by current blast practices.

Table 7.4: Vibration monitoring results for every blast since 2013 at the nearest residential properties to the Tromman Quarry site.

Date	No of Holes	Total Charge (kgs)	No of Delays	MIC (kgs)	Peak Particle Velocity (mm/sec)			Plan distance to blast (m)	Air-Overpressure (dBL)	Bearing of Ins to Blast	Location
					H (mm/sec)	T (mm/sec)	V (mm/sec)				
29/01/2013	60	7390	60	125	2.00	2.50	2.10	310	125	43°	Regan
21/03/2013	34	8102	59	160	8.90	9.50	3.60	200	113	340	Damian Montague
05/06/2013	43	10750	43	285	7.49	8.34	5.21	220	123.9	E	Keegans House
28/08/2013	75	4830	75	95	5.08	4.95	2.92	226	116.7	E	Keegans House
30/09/2013	32	7434	64	135	2.54	1.52	1.21	240	125.5	83^0	Regans Gateway
09/12/2013	59	9485	59	170	2.16	1.97	1.40	310	119.9	33^0	Gateway to Regans
28/02/2014	49	6061	49	125	2.70	2.10	2.20	290	115	39^0	Regan
09/04/2014	66	6115	66	140	2.26	1.52	2.28	300	113.1	55^0	Regan
16/05/2014	15	4767	30	200	6.22	3.49	3.49	250	123.9	178°	Regan
26/06/2014	125	5068	125	45	2.29	1.14	1.78	270	114.2	100°	Gateway to Regans
16/07/2014	19	5776	36	195	7.62	4.57	2.47	250	121.2	68	Regan
17/09/2014	23	7835	46	180	6.70	3.90	3.60	230	125	98°	Mr. Regan
28/10/2014	20	6113	40	150	7.37	3.30	3.94	240	122.9	100°	Gateway to Regans
08/12/2014	72	7335	72	150	4.06	3.23	3.30	405	113	170	Regan Residence
26/01/2015	50	6155	49	145	4.06	2.98	3.74	300	118.9	56^0	Regans
18/03/2015	31	8400	54	180	3.60	2.30	2.10	290	132	275°	Mr. Collins
08/06/2015	78	7930	82	200	2.10	1.70	1.70	290	130	275°	Keegan Residence
24/07/2015	44 (43)	7037	43	175	4.51	3.49	3.49	290°	115.2	219°	Keegans Residence
23/09/2015	47	9492	68	170	1.77	2.03	1.58	270	124.3	110°	Regan
13/11/2015	29	8855	55	180	4.63	2.79	2.34	270	120	99°	Regan
14/01/2016	39	5749	39	160	3.11	1.56	2.85	260	119	56°	Regan Residence
27/01/2016	27	6319	54	180	2.54	1.71	2.73	395	124.3	95°	Regan
22/02/2016	31	9282	62	180	3.30	2.03	2.28	310	117.9	99°	Regans Residence
15/04/2016	20	6546	39	175	1.77	1.52	1.77	330	125.9	89°	Regan Residence
18/05/2016	26	7392	2	165	2.22	1.01	1.46	330	123.7	98°	Regan
23/06/2016	36	9010	72	150	5.20	5.20	4.00	230	123.4	39°	Regan Residence
15/07/2016	29	8374	53	170	9.33	7.23	5.71	260	115.2	103°	Regan
25/08/2016	43	6015	43	165				290		679°	Did not trigger
23/09/2016	27	8985	29	345	3.30	2.00	2.20	300	23.7	99°	Regan Residence
25/10/2016	52	8500	52	170	2.79	3.55	2.85	310	123.8	062°	Regan Residence
22/11/2016	40	6950	40	187.5	2.30	1.20	1.30	300	115.7	65°	Regans
06/12/2016	52	8844	52	175	3.30	2.90	2.50	290	114.6	66°	Regan Residence
18/01/2017	26	8007	52	165	3.10	1.50	1.80	300	117.9	99°	Regan Residence

16/02/2017	31	8227	62	150	2.09	1.84	1.52	310	95.9	102°	Regan Residence
29/03/2017	31	8230	61	155	2.28	1.65	1.65	280	112.8	91°	Regan Residence
10/05/2017	32	9860	64	180	2.80	1.60	2.30	270	106.5	142°	Regan Residence
16/06/2017	52	6752	52	140	1.95	2.60	2.92	350	94	184°	Regans Residence
10/07/2017	45	13277	90	145	10.47	6.79	6.03	260	104.9	87°	Regan Residence
04/09/2017	40	7019	40	185	5.65	4.76	3.55	300	95.9	65°	Regan Residence
02/10/2017	19	5910	38	170	8.95	5.77	6.28	200	103.5	102°	Regan Residence
03/11/2017	47+42	7910	99	175	2.64	3.36	3.93	320	94.3	119°	Regan Residence
08/11/2017	29	6355	29	275	9.84	5.58	9.90	180	91	84°	Regan Residence
04/01/2018	59+11	7,749	62	180	4.88	2.28	1.77	270	117.9	119°	Regan Residence
29/01/2018	23+61	9,765	84	170	3.45	3.17	3.61	270	124	57°	Regan Residence
26/02/2018	62+31	11,025	93	180	2.22	1.65	2.22	350	115.9	091°	Regan Residence
05/04/2018	65	7,966	65	165	3.42	3.93	4.12	220	91.5	84°	Regan
03/05/2018	44	7,420	44	180	4.00	2.70	2.50	327	119.2	50°	Regans
28/05/2018	78	9,805	76	165	2.28	2.34	2.09	200	97.5	35°	Regan Residence
27/06/2018	51	7,690	51	155	2.79	3.42	2.73	280	120	47°	Regan Residence
23/07/2018	62	9,236	62	180	1.95	1.39	2.03	290	126.1	84°	Regan Residence
27/07/2018	44	6,425	44	177.5	0.82	1.20	0.63	340	97.5	91°	Regans Residence
23/08/2018	61+2	10,242	63	175	4.31	4.00	5.77	260	116.9	50°	Regan Residence
13/09/2018	64	11,500	64	210	3.17	2.60	2.41	300	117.2	84°	Regans Residence
15/10/2018	53	9,105	53	175	3.55	2.79	3.49	280	119.7	71°	Regan Residence
07/11/2018	24+50	6,348	74	210	1.39	1.58	1.58	260	115.8	81°	Regan Residence
19/11/2018	38	7,475	30	265	1.77	1.39	1.71	300	120.9	44°	Regan Residence
14/12/2018	56	8,459	56	170	4.57	2.54	2.34	260	120.1	75°	Regan Residence
23/01/2019	10,330	73	290	2.00	1.84	1.84	4085	290	122.3	43°	Regan
12/02/2019	8,170	49	183	3.66	2.98	5.58	4088	270	116.6	67°	Regan Residence
13/03/2019	10,088	41	300	2.20	1.71	1.71	4084	290	118.5	84°	Regans
23/01/2019	39+34	10,330	73	290	2.00	1.84	1.84	290	122.3	43°	Regan Residence
12/02/2019	49	8,170	49	183	3.66	2.98	5.58	270	116.6	67°	Regan Residence
13/03/2019	41	10,088	41	300	2.20	1.71	1.71	290	118.5	84°	Regan Residence
04/04/2019	60	10,000	60	170	9.52	5.70	5.96	219	117	55°	Regan Residence
30/04/2019	30	9,242	60	170	5.71	7.42	8.12	280	115	92°	Regan Residence
04/06/2019	46	11,305	41	305	2.70	1.90	2.70	290	125	30°	Regan Residence
28/06/2019	40	7,650	48	180	1.84	1.46	1.65	410	108.4	84°	Regan Residence
19/07/2019	39+8	12424	47	300	1.58	3.81	2.73	300	116.4	84°	Regan Residence
30/08/2019	5	8,643	52	170	1.48	1.52	1.52	350	107.5	41°	Regan Residence
26/09/2019	20	6,336	40	200	2.22	1.84	1.39	350	109.5	84°	Regan Residence
18/10/2019	41+8	12,692	49	300	3.11	3.17	2.22	300	120.8	47°	Regan Residence
15/11/2019	27	7,334	54	150	1.71	1.71	1.85	360	116.1	91°	Regan Residence
17/12/2019	49	12,913	49	291	2.60	2.66	2.15	305	104.9	49°	Regan Residence
30/01/2020	32	8,890	64	150	1.58	1.27	0.88	420	88.0	101°	Regan Residence

06/03/2020	54	8,790	54	170	2.25	2.43	2.85	280	121.0	242°	Regan Residence
22/04/2020	26	7,250	52	150	1.78	1.78	1.46	285	123.0	175°	Regan Residence
27/05/2020	33	5,677	33	180	2.92	2.66	4.38	220	116.0	044°	Regan Residence
23/06/2020	30	7,611	58	140	3.17	1.77	1.39	242	121.9	119°	Regan Residence
17/07/2020	56+7	10,065	63	185	2.98	2.28	3.23	260	123.0	84°	Regan Residence
18/08/2020	52	8,695	52	180	1.96	1.14	1.46	300	119.0	84°	Regan Residence
18/09/2020	61	9,655	61	170	2.71	4.12	2.85	220	118.0	84°	Regan Residence
23/10/2020	61	9,145	60	170	3.55	2.60	2.09	290	103.0	111°	Regan Residence
27/11/2020	32	9,223	33	305	1.71	2.22	1.46	370	102.8	43°	Regan Residence
18/12/2020	26	10,550	26	465	2.03	1.71	1.96	310	94.0	119°	Regan Residence
08/01/2021	45	12,309	51	3.23	5.77	1.48	84°	5.77	1.48	95.9	Regan Residence
21/02/2021	35	10,388	35	1.90	2.03	1.01	29°	2.03	1.01	112.0	Regan Residence
23/04/2021	29	6,935	29	1.27	0.95	1.01	53°	0.95	1.01	118.0	Regan Residence
14/05/2021	60	9,778	63	3.49	4.76	6.16	41°	4.76	6.16	114.0	Regan Residence
24/06/2021	48	7,275	48	2.66	3.23	3.17	119°	3.23	3.17	106.0	Regan Residence
23/07/2021	66	10,862	66	4.63	2.66	4.12	119°	2.66	4.12	113.0	Regan Residence
30/07/2021	26	9,233	26	1.96	2.54	2.03	37°	2.54	2.03	107.0	Regan Residence
20/09/2021	62+11	10,430	73	3.81	3.55	3.93	11°	3.55	3.93	109.0	Regan Residence
12/10/2021	47	7,178	47	1.27	1.58	0.82	85°	1.58	0.82	122.0	Regan Residence
05/11/2021	57	8,800	57	3.55	4.12	3.55	95°	4.12	3.55	115.0	Regan Residence
03/12/2021	74	6,674	74	0.95	1.65	1.08	84°	1.65	1.08	102.0	Regan Residence
10/01/2022	67	7,087	67	117	1.65	2.03	1.71	270	111.0	28°	Regan Residence
02/01/2022	64	9,900	64	182	3.30	3.23	5.71	210	111.0	119°	Regan Residence
15/02/2022	34	3,327	34	105	1.52	1.65	1.71	350	103.0	42°	Regan Residence
04/03/2022	34	4,888	34	168	4.31	1.84	3.93	190	119.0	41°	Regan Residence
11/03/2022	41	5,624	41	160	2.22	2.28	1.20	348	106.0	30°	Regan Residence
08/04/2022	110	7,608	48	168	0.95	1.01	1.01	550	106.5	33°	Regan Residence
22/04/2022	32	10,220	32	375	4.63	2.54	2.85	238	104.2	28°	Regan Residence
03/06/2022	48	7,855	48	172	5.65	10.92	8.57	160	121.9	65°	Regan Residence
21/06/2022	21	6,707	21	385	5.96	2.79	4.12	220	123.5	51°	Regan Residence
11/07/2022	52	5,198	52	110	1.46	1.71	1.77	273	110.0	27°	Regan Residence
29/07/2022	72	11,035	72	184	3.11	5.90	3.87	210	115.9	84°	Regan Residence
05/09/2022	33	8,855	32	400	11.78	11.04	9.77	210	118.5	38°	Regan Residence
20/09/2022	61	8,498	61	152	2.03	2.09	2.60	319	113.1	42°	Regan Residence
07/10/2022	68	8,883	68	155	1.39	1.14	1.01	410	113.1	54°	Regan Residence
10/11/2022	46+92	12,421	148	165	4.38	6.98	8.38	205	112.3	95°	Regan Residence
16/12/2022	50	7,006	50	170	2.92	2.79	1.71	260	113.5	47°	Regan Residence
17/01/2023	67	10,123	62	178	5.33	4.57	4.25	230	124.4	119°	Regan Residence
14/02/2023	51	7,467	51	170	3.17	2.47	2.66	270	115.7	42°	Regan Residence
24/02/2023	83	5,970	83	95	<0.5	<0.5	<0.5	570	<120	95°	Regan Residence
16/03/2023	38	6,832	38	200	3.42	5.14	5.77	220	116.1	95°	Regan Residence

30/03/2023	64	8,405	64	185	1.33	1.46	1.14	295	121.5	91°	Regan Residence
21/04/2023	54	9,415	54	195	2.79	3.36	2.85	240	119.6	67°	Regan Residence
17/05/2023	38	6,486	38	180	2.28	1.52	3.23	320	112.8	42°	Regan Residence
09/06/2023	46	7,341	46	184	1.84	2.98	2.15	312	88.0	51°	Regan Residence
05/07/2023	63+12	10,921	75	220	4.25	2.41	3.62	241	88.0	95°	Regan Residence
04/08/2023	57	8,511	57	190	1.96	1.27	2.79	280	123.0	42°	Regan Residence
29/08/2023	62	10,195	62	200	2.92	1.96	2.79	280	119.3	95°	Regan Residence

There have been just three exceedances of the air overpressure limits at the vibration monitoring location at the Reagan Residence since 2013. The DoEHLG Guidance provides a limit for ground-borne vibration: Peak particle velocity = 12 mm/s, measured in any of the three mutually orthogonal directions at the receiving location (for vibration with a frequency of less than 40 Hz). No exceedances of the limit for ground-borne vibration have occurred. The DoEHLG Guidance provides a limit for Air overpressure: 125 dB (linear maximum peak value), with a 95% confidence limit. The three occurrences of the air overpressure exceedances are shown below. These values indicate an insignificant exceedance of <1 dB(L) of the air overpressure limit of 125 dB(L). Note: 1 dB(A) is indiscernible to the human ear.

Date	No of Holes	Total Charge (kgs)	No of Delays	MIC (kgs)	Peak Particle Velocity (mm/sec)			Plan distance to blast (m)	Air-Overpressure (dBL)	Bearing of Ins to Blast	Location
30/09/2013	32	7434	64	135	2.54	1.52	1.21	240	125.5	83^0	Regans Gateway
15/04/2016	20	6546	39	175	1.77	1.52	1.77	330	125.9	89°	Regan Residence
23/07/2018	62	9236	62	180	1.95	1.39	2.03	290	126.1	84°	Regan Residence

7.4 Existing Noise & Vibration Impacts

The existing noise and vibration impacts outlined below are the same as presented in the Noise & Vibration Impact Assessment that has been prepared to accompany the rEIAR for an application for SC at Tromman Quarry.

7.4.1 Existing Manufacturing Noise Impacts

A noise prediction model has been prepared which addresses the associated industrial structures that Meath County Council consider to be

unauthorised including the electrical substation, 2 no. batching plants and hopper, storage bays and the industrial unit are outlined in Table 7.5. This noise prediction model primarily assesses the source specific noise impact from the northern area of the Tromman Quarry site, which allows for the assessment of the present site layout with the erection of the pre-cast manufacturing unit on the eastern side of the concrete yard and the internal arrangement of the concrete block making yard and storage, reverting to its existing central location.

The sound power level (L_W) of the noise sources included in this noise prediction model are as follows:

Point Sources:

Name	L_W dB(A)
7 Unloading Site #1	104.0
19 Concrete Plant	110.0
6 Drying Plant	95.0

Line Sources:

Name	L_W dB(A)
Conveyor - Screening Plant	105.2
Conveyor - Batching Plant	104.8

Area Sources:

Name	L_W dB(A)
PP TA 20408 - Precast Plant #1	86.3
17 Precast Plant #2	87.6

Vertical Area Sources:

Name	L_W dB(A)
Shed 5	99.0
9 Screening Plant	105.7
10 Crushing Plant	102.1
11 Hopper Feed	98.4
17 Precast Plant #2	86.8
PP TA 20408	109.2
PP TA 20408	85.2

Name	**Predicted Noise Level**	**Receiver Height (m)**	**Coordinates**		
			X (m)	**Y (m)**	**Z (m)**
NSR 1	29.0 dB(A)	1.50	277437	249809	74.43
NSR 2	30.1 dB(A)	1.50	277800	249667	77.64
NSR 3	39.6 dB(A)	1.50	277971	249789	83.53
NSR 4	40.5 dB(A)	1.50	278562	250851	74.41
NSR 5	40.5 dB(A)	1.50	278168	251207	71.50
NSR 6	41.1 dB(A)	1.50	277922	251182	71.50
NSR 7	33.7 dB(A)	1.50	277086	250061	74.99
Limit	**55 dB(A)**				

Table 7.5: Predicted noise levels from the associated industrial structures that Meath County Council consider to be unauthorised including the electrical substation, 2 no. batching plants and hopper, storage bays and the industrial unit in the northern area of the Tromman Quarry site (See Figure 7.2)

NSR 1 corresponds to Noise Monitoring Location N2 (i.e. the house southwest of site. adjacent to the site entrance gate). The predicted noise level of 29 dB(A) at NSR 1 indicates that the associated industrial structures

in the northern area of the site are not having a significant noise impact at properties to the south of the Tromman Quarry site. Relative to the measured noise level at this location these activities are having no impact. The predicted noise level of 41 dB(A) at NSR 6 to the north of the site is not a significant daytime noise level relative to the quarry noise limits during daytime.

7.4.2 Existing Quarrying Noise Impacts

A noise prediction model has been prepared to address the existing extraction operations that post-date the extended appropriate period for the quarrying operations that Meath County Council consider to be unauthorised are presented in Table 7.6. The sound power level (L_W) of the noise sources included in this noise prediction model are as follows:

Point Sources:

Name	L_W dB(A)
Screening Plant	120.0
Drill Rig	115.0

Moving Line Sources:

Name	L_W dB(A)		Moving Pt. Src	
	Type	Value	Number per hour	Speed (km/h)
Komatsu Loaders	PWL-Pt	105	60.0	10.0
HGV Deliveries	PWL-Pt	105	12.0	10.0

Name	Predicted Noise Level	Receiver Height (m)	Coordinates		
			X (m)	Y (m)	Z (m)
NSR 1	43.5 dB(A)	1.50	277437	249809	74.43
NSR 2	44.2 dB(A)	1.50	277800	249667	77.64
NSR 3	40.7 dB(A)	1.50	277971	249789	83.53
NSR 4	34.7 dB(A)	1.50	278562	250851	74.41
NSR 5	32.9 dB(A)	1.50	278168	251207	71.50
NSR 6	31.6 dB(A)	1.50	277922	251182	71.50
NSR 7	35.1 dB(A)	1.50	277086	250061	74.99
Limit	**55 dB(A)**				

Table 7.6: Predicted noise levels from the existing extraction operations that post-date the extended appropriate period for the quarrying operations that Meath County Council consider to be unauthorised in the Tromman Quarry site. (See Figure 7.3)

NSR 1 corresponds to Noise Monitoring Location N2 (i.e. the house southwest of site, adjacent to the site entrance gate). The predicted daytime noise level of 43.5 dB(A) at NSR 1 indicates that the quarrying noise sources are not having a significant noise impact at properties to the south of the Tromman Quarry site relative to the quarry noise limits during daytime.

7.4.3 Existing Cumulative Noise Impacts

The cumulative existing noise impacts that are occurring have been calculated in accordance with the approach outlined above and the results of the cumulative noise prediction model to assess the in combination effects of the manufacturing structures in the northern area of the Tromman Quarry site and the quarrying operations that post-date

the extended appropriate period for the quarrying operations are presented in Table 8.7. The sound power level (L_W) of the noise sources included in this noise prediction model are as outlined above.

Name	**Predicted Noise Level**	**Receiver Height (m)**	**Coordinates**		
			X (m)	**Y (m)**	**Z (m)**
NSR 1	43.7 dB(A)	1.50	277437	249809	74.43
NSR 2	44.3 dB(A)	1.50	277800	249667	77.64
NSR 3	43.2 dB(A)	1.50	277971	249789	83.53
NSR 4	41.5 dB(A)	1.50	278562	250851	74.41
NSR 5	41.2 dB(A)	1.50	278168	251207	71.50
NSR 6	41.6 dB(A)	1.50	277922	251182	71.50
NSR 7	37.5 dB(A)	1.50	277086	250061	74.99
Limit	**55 dB(A)**				

Table 7.7: Predicted noise levels from the manufacturing structures in the northern area of the Tromman Quarry site and the existing extraction operations that post-date the extended appropriate period for the quarrying operations that Meath County Council consider to be unauthorised in the Tromman Quarry site. (See Figure 7.4)

The predicted cumulative daytime noise level of 43.7 dB(A) at NSR 1 indicates that the cumulative noise from quarrying and the associated industrial structures in the northern area of the site are not having a significant noise impact at properties to the south of the Tromman Quarry site relative to the quarry noise limits during daytime.

The cumulative noise from the associated structures in the northern area of the Tromman Quarry site and the existing extraction operations that post-date the extended appropriate period for the quarrying operations have been assessed. The sound level from these noise sources do not result

in an exceedance of the planning condition noise limits at the nearest residential receiver locations, as set out in Condition 12 of TA/900976 and is in accordance with the relevant Guidelines outlined in Section 8.2.1 above. This analysis is confirmed by the monitoring results provided to the Meath County Council by Keegan Quarries Limited and Kilsaran independently, under their ongoing periodic monitoring.

7.4.4 Existing Vibration Impacts

The drill rig operations and blasting for the quarrying process take place a maximum of twice per month. The drilling using an air drill and compressor operates for approximately two days every month. During the site noise survey, the drill rig was in operation on the quarry floor, with a noise level of approximately 97 dB(A) at 1m from source.

All neighbours are notified in advance of upcoming blasting dates and times. Blasting of the rock results in an instantaneous noise impact. However, this is a very short – term noise impact and results in an instantaneous increase in noise levels during daytime hours with immediate reversion back to preceding noise levels. A typical sound level from blasting, measured at 15 m from the source is 94 dB(A) (Hoover 1996). Table 7.8 outlines the predicted noise levels in the vicinity of an active blasting site. The accepted reduction in noise levels with distance from a blast is based on the assumption that the sound level drop off rate equates to 6 dB per doubling of distance.

Blasting parameters including PPV and Air Overpressure limits have been set by the EPA for all quarrying proposed operations in Ireland.

Distance to receiver (m)	Sound Level At Receiver Location dB(A)
15	~ 94
30	~ 88
60	~ 82
120	~ 76
240	~ 70
480	~ 64
960	~ 58

Table 7.8: Estimated Blasting Noise in the vicinity of the quarry.

As indicated in Table 7.8, sensitive receivers within approximately 500m of the blasting site could be exposed to instantaneous noise levels of approximately 65 - 70 dB(A). However, these blasts result in very short – term instantaneous noise impact at all residential receivers in the vicinity of the quarry and do not constitute a significant noise impact.

It is considered that as the continued activities will replicate those that have already taken place the levels of vibration likely to be experienced at the receptor properties will not to be significant in environmental terms. Blast monitoring information has been provided for a 5 year period, to include the appropriate baseline date upon which extraction activities became unauthorised of 5th August 2018. Accordingly it is considered reasonable to assume that as the levels are within acceptable parameters throughout this period, then it is likely that this will continue to be achieved.

The blast monitoring results indicate levels that fall below the limits prescribed by the DoEHLG in their relevant guidance. The results indicate that during the last 5 years presented, compliance has been absolute with the measured peak particle velocities and air-overpressure less than the

limits prescribed. Therefore, it is considered that any potential vibration impact in relation to the on-going blasting is negligible.

The operational site as outlined in previously considered EIS's employs the following general blast design control measures to ensure compliance with recommended standards.

- The optimum blast ratio is maintained and the maximum instantaneous charge is optimised.
- Explosive charges are properly and adequately confined by a sufficient amount and quality, of stemming.
- Accurate face surveys (profiling) are undertaken to assist with blast design and specification..
- No blasting is carried out outside 10:00 – 18.00 hours on working days (Monday to Friday). There is no blasting carried out on Saturdays, Sundays or public holidays.
- All nearby dwellings are given advance notice of blasting.

7.5 Predicted Noise & Vibration Impacts from Proposed Development

7.5.1 Predicted Noise Impacts

The noise prediction assessment to consider the impacts that can be expected to occur in the future as a result of the further development of the 21.64Ha quarry site including the extraction of limestone from an area of 14.3Ha using conventional drilling and blasting techniques and mineral reduction using mobile crushing and screening to a depth of 13mAOD is outlined below. Noise prediction modelling has been undertaken for the s.37L application for extraction at the quarry site to assess specific future quarrying noise impacts.

The future proposed extraction is likely to be in accordance with noise level predictions assessed 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.

It is reasonable to suggest that there will be no change anticipated from the continuation of the associated manufacturing operations on the site, i.e. existing noise emissions will remain the same in this area to the north of the quarry void on the site.

Noise levels have been predicted during periods of extraction when the excavation, crushing and screening and the drill rig operations are on-going in Phases 1 – 4 of the quarry development. The predicted noise levels are indicative of worst-case continuous on site activity over a 1 hour period with an indicative location for the excavation, crushing and screening and the drill rig operations during each phase represented in the noise prediction models.

Outlined in Table 7.9 are the predicted noise levels that will occur at the noise sensitive receivers from the worst case assumption that over a 1 hour period the Extraction Area, which includes the excavation, crushing and screening, the loading of a lorry and 6 lorry movements / hour on the proposed site access road as well as the drill rig operations are all on-going concurrently. The CadnaA noise model outputs are shown in Figures 7.5 – 7.12.

Name	Predicted Noise Level dB(A) from quarrying activities only			
	Phase 1	**Phase 2**	**Phase 3**	**Phase 4**
NSR 1	41.6	41.6	43.6	42.6
NSR 2	48.7	45.5	45.7	45.1
NSR 3	38.3	39.9	39.7	39.1
NSR 4	33.1	28.2	27.9	27.8
NSR 5	25.4	24.6	28.3	27
NSR 6	26.9	25.5	29.1	28.2
NSR 7	33.2	33.2	34.2	34
Limit	**55 dB(A)**			

Table 7.9: Predicted noise levels from the proposed quarrying activities only in the Tromman Quarry site (See Figures 7.5 – 7.8)

Name	Predicted Cumulative Noise Level dB(A) including the associated manufacturing operations in the Tromman Quarry site			
	Phase 1	**Phase 2**	**Phase 3**	**Phase 4**
NSR 1	41.8	41.8	44.8	44.1
NSR 2	49	46.2	46.4	45.9
NSR 3	42.2	43	43	42.7
NSR 4	38.6	37.7	37.7	37.5
NSR 5	38	37.9	38.2	38.1
NSR 6	39.1	39	39.2	39.1
NSR 7	36.2	36.2	38.6	38.5
Limit	**55 dB(A)**			

Table 7.10: Predicted noise levels from the cumulative operation of the proposed quarrying activities and the associated manufacturing operations in the Tromman Quarry site (See Figures 7.9 – 7.12)

As shown in Table 7.9, the predicted noise levels at the noise sensitive receiver locations due to the proposed quarrying activities are in

accordance with suggested noise limit of 55 dB(A) during the worst-case 1 hour period with an indicative location for the excavation, crushing and screening and the drill rig operations during each phase represented in the noise prediction models. The predicted noise levels are in line with noise levels which are presently experienced when similar quarrying operations are in operation.

As shown in Table 7.10, the predicted noise levels at the noise sensitive receiver locations due to the proposed quarrying activities including the associated manufacturing operations in the Tromman Quarry site are in accordance with suggested noise limit of 55 dB(A) during the worst-case 1 hour period with an indicative location for the excavation, crushing and screening and the drill rig operations during each phase represented in the noise prediction models. The predicted noise levels are in line with noise levels which are presently experienced when similar quarrying and manufacturing operations are in operation.

7.5.2 Assessment of Impacts against likely evolution of baseline Scenario

In terms of the likely evolution of the baseline, two scenarios have been identified: one is that the quarry continues to operate, the impacts of this have been sufficiently considered in the above sections. The alternative baseline scenario is that the Site is restored and remediated. In this instance, there would be short term impacts associated with the restoration of the quarry, following which, all activity at the site would cease and noise generation (and associated impacts) would be negligible.

When assessing the proposed development against the alternative baseline scenario, the proposed development would result in noise impacts which otherwise would not be experienced, however, given the compliance with noise restrictions at the site to date and the fact that any future development at the site will be required to be undertaken in accordance with the same, the proposed development is not considered to result in any significant effects upon the environment when assessed against the alternative baseline scenario.

7.5.3 Decommissioning Impacts

Should existing quarrying and associated manufacturing operations on the site cease, noise levels from de-commissioning of the industrial structures in the northern area of the Tromman Quarry site and / or the regrading of the benches in the existing extraction area and subsequent infill with groundwater will be short-term noise impacts. Such activities will be subject to a higher noise limit of 70 dB(A) as these are distinct from normal site operations. Such activities may include overburden removal, bund de-construction, restoration works, de-commissioning of plant and equipment, etc. Typically, such works will be carried out during an 8 week window per annum.

7.6 Monitoring

Quarterly noise monitoring surveys such as those which have been undertaken since 2013 by Byrne Environmental at the Tromman Quarry site will continue. The noise monitoring surveys will continue to be carried out to evaluate and assess the noise impacts that the quarry site activities have on the local receiving noise environment and to assess compliance with standards contained within the former Planning Conditions *(Planning*

Permission Ref. TA/900976 Condition 12). The noise monitoring survey will continue to be conducted according to *ISO 1996-2, 2017 Acoustics – Description, Measurement and Assessment of Environmental Noise* and with reference to the 2016 EPA publication, *"Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)*.

7.7 Conclusions

The quarterly noise monitoring surveys that have been undertaken since 2013 by Byrne Environmental at the Tromman Quarry site typically report *'Quarry noise faintly audible'* or *'Quarry noise not audible*'.

The noise monitoring which has been undertaken at Tromman Quarry in-combination with the periodic noise monitoring surveys that have been undertaken since November 2014 at Kilsaran Quarry directly adjacent to the Tromman Quarry site indicate the cumulative noise from the operation of the two adjacent quarries is not having a significant noise impact at the nearest residential properties to the sites.

Therefore, the existing operations at the Tromman Quarry site, as predicted in Noise Impact Assessments accompanying previously submitted EIS's, is not having a significant noise impact at the nearest residential properties to the site.

The addition of the unauthorised structures in the period post 2013 have not noticeably altered the monitored noise levels at the surrounding noise monitoring locations and predicted noise levels due to the cumulative noise from the operation of the quarry void and the associated manufacturing operations in the northern area of the Tromman Quarry site

indicate that the current operations have not and are not having a significant noise impact at the nearest residential properties.
The ongoing noise and vibration monitoring has confirmed operations consistently have cumulatively operated below the guideline figure provided for in the DOEHLG 2004 recommended levels.

The existing noise and vibration impacts that are occurring and are proposed to continue to occur from the quarrying activities including the associated manufacturing operations in the Tromman Quarry site have been assessed using noise prediction modelling.

The assessment indicates that the specific noise levels from the existing and proposed quarrying activities including the associated manufacturing operations do not give rise to any significant environmental impact and cumulatively do not exceed the guideline figure provided for in the DOEHLG 2004 recommended levels.

With reference to the existing vibration target levels as provided for in the DoEHLG Guidance, the site has operated in full compliance for the past 5 years, and in all likelihood will continue to do so. If the site is required to be restored and the structures removed there is no opportunity for significant impact as a result of blasting. This outcome has been previously assessed and remains valid within the extant restoration concept.

8.0 BIODIVERSITY

8.1 Overview

Woodrow APEM Group (Woodrow) was appointed to compile the Ecological Impact Assessment (rEcIA) report on behalf of Quarryplan and their client Keegan Quarries Ltd. The report provides the detailed assessment to inform the production of the EIAR, which accompanies the s.37L application by Keegan Quarries Ltd for SC for the continuation of quarrying at Tromman Quarry, Tromman, Rathmolyon, Co. Meath.

The full-length version of the EcIA for this proposal is included as Appendix 8.1 and the NIS is held as a standalone document submitted as part of the application package. The EcIA report has been compiled by James O'Connor, BSc MSc PhD and has been checked and approved by Mike Trewby B.Sc, PGDip MCIEEM.

8.1.1 Purpose of ecological impact assessment

The EcIA can be considered as having following aims:

- Establish the ecological baseline for the development or activity and determine the ecological value of the features identified;
- Provide an objective and transparent assessment of the ecological impacts of the development or activity in terms of national, regional and local policies relevant to nature conservation;
- Recommend mitigation measures to avoid, reduce and remedy any ecological impacts identified;
- Identify any residual impacts of the development or activity post-mitigation;

- Demonstrate that a development or activity will meet the legal requirements relating to habitats and species.

8.1.2 Legislative and policy context

This report has been undertaken with full account of legislation, policy and guidance relating to species and habitat protection, importance and survey protocol.

8.2 Impact assessment methodology

The impact assessment methodology applied, follows the Chartered Institute of Ecology and Environmental Management 'CIEEM' guidance (CIEEM 2018, updated 2022) The following list provides a useful summary of the process for undertaking an EcIA, as detailed in this CIEEM guidance document.

8.2.1 Identifying ecological features within the zone of influence

Information acquired during the desk-study and field surveys determines the ecological features potentially affected by the unauthorised development, and as such occur within its 'zone of influence'. The zone of influence depends on the type of development that has taken and is taking place, the presence of ecological connections and pathways, and ecological receptors that may be sensitive to such impacts.

8.2.2 Evaluating ecological features within the zone of influence

Those ecological features within the zone of influence such as nature conservation sites, habitat or species are evaluated in geographic

hierarchy of importance. The following categories are used (adapted from NRA 2009).

Importance	Criteria
International Importance	'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation. Proposed Special Protection Area (pSPA). Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). Features essential to maintaining the coherence of the Natura 2000 Network Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. Resident or regularly occurring populations (assessed to be important at the national level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or Species of animal and plants listed in Annex II and/or IV of the Habitats Directive. Ramsar Site (Convention on Wetlands of International Importance, especially Waterfowl Habitat 1971). World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972). Biosphere Reserve (UNESCO Man & The Biosphere Programme) Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979). Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). Biogenetic Reserve under the Council of Europe. European Diploma Site under the Council of Europe. Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).
National Importance	Site designated or proposed as a Natural Heritage Area (NHA). Statutory Nature Reserve. Refuge for Fauna and Flora protected under the Wildlife Acts. National Park. Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park. Resident or regularly occurring populations (assessed to be important at the national level) of the following: Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list. Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive.
County Importance	Area of Special Amenity. Area subject to a Tree Preservation Order. Area of High Amenity, or equivalent, designated under the County Development Plan. Resident or regularly occurring populations (assessed to be important at the County level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;

Importance	Criteria
	Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list. Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance. County important populations of species; or viable areas of semi-natural habitats; or natural heritage features identified in the National or Local BAP; if this has been prepared. Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county. Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
Local Importance (Higher Value)	Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared; Resident or regularly occurring populations (assessed to be important at the Local level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list. Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality; Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.
Local Importance (Lower Value)	Sites containing small areas of semi-natural habitat that are of some local importance for wildlife; Sites or features containing non-native species that is of some importance in maintaining habitat links.

Only Important Ecological Features (i.e. those features evaluated as being of Local Importance (Higher Value) or greater) within the zone of influence are assessed with respect to potential impact.

8.2.3 Significant effects on important ecological features

For the purpose of EcIA, 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for those ecological features which have been identified as being an important feature of the site ("Important Ecological Features"). Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature

conservation policy). As such effects can be considered significant in a wide range of geographic scales from international to local. Consequently, 'significant' effects are qualified with reference to the appropriate geographic scale (CIEEM 2018, updated 2022).

8.2.4 Assessment of residual impacts and effects

After characterising the potential impacts of the development and assessing the potential effects of these impacts on the 'Important Ecological Features', mitigation measures are proposed to avoid and / or mitigate the identified ecological effects. Once measures to avoid and mitigate ecological effects have been finalised, assessment of the residual impacts and effects is undertaken to determine the significance of their effects on the 'Important Ecological Features'.

8.2.5 Assessment of cumulative impacts and effects

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location (CIEEM 2018, updated 2022). Different types of actions can cause cumulative impacts and effects. As such, these types of impacts may be characterised as:

- Additive/incremental – in which multiple activities/projects (each with potentially insignificant effects) add together to contribute to a significant effect due to their proximity in time and space (CIEEM 2018, updated 2022).
- Associated/connected – a development activity 'enables' another development activity e.g. phased development as part of separate planning applications. Associated developments may include

different aspects of the project which may be authorised under different consent processes. It is important to assess impacts of the 'project' as a whole and not ignore impacts that fall under a separate consent process (CIEEM 2018, updated 2022).

8.3 Ecological survey methodology

Surveys of the terrestrial ecology at the site were undertaken following specific guidelines for the relevant target species outlined below. The importance of the habitats and species present is evaluated using the Chartered Institute of Ecology and Environmental Management Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal (CIEEM 2018, updated 2022). This guidance document outlines an accepted approach for the evaluation of impacts from such developments.

8.3.1 Desk based review of biological records

A desktop study was undertaken during August 2023 to gather information on the likely distribution of species in the general area prior to the field survey visits, so that a targeted approach to surveying could be undertaken.

8.3.2 Surveys undertaken

Several surveys were undertaken in 2018 and 2019 as part of the SC application, the details of which are provided in the rEcIA. Site visits were conducted during the summer of 2023 in order to provide a contemporary update to the ecological baseline at the site.

8.3.3 Limitations

While the majority of 2023 surveys adhered to the recommended timeframe for target species and habitats, programme constraints hindered the surveying of breeding birds until mid-July and August, falling outside the optimal survey period (April to June). However, it is important to note that the primary aim of these surveys was to provide a contemporary update to data obtained in 2018.

8.4 Designated sites with potential ecological / hydrological connections to the development

8.4.1 European Sites

The EPA Guidelines for Environmental Impact Assessment Reports (EPA, 2022) states in section 3.3.5 that:

"*A biodiversity section of an EIAR, for example, should not repeat the detailed assessment of potential effects on European sites contained in a Natura Impact Statement, but it should refer to the findings of that separate assessment*".

This approach has been adopted and the conclusions of the NIS are referenced. No part of the application site lies within a designated Special Area of Conservation (SAC) or Special Protection Area (SPA). As a result of hydrological connections two European Sites were brought through to Stage 2 Appropriate Assessment:

- River Boyne and River Blackwater SAC; and
- River Boyne and River Blackwater SPA.

The concluding statement of the NIS is as follows:

"The two European Sites, and associated QIs/SCI listed above, were assessed as part of the AA process. This process found that whilst a number of potential impacts pertaining to water quality were identified, including in-combination impacts, the mitigation measures presented in Section 6 eliminate the potential for any adverse effects.

Taking into account the best available scientific knowledge, applying the precautionary principle, and considering the conservation objectives of the relevant European Sites, it is concluded that the continuation of operations at Tromman Quarry, whether on its own or in conjunction with other plans or projects, does not pose an adverse impact on the integrity of any European Site".

8.4.2 Nationally Designated Sites

No part of the application site lies within an NHA or pNHA. There was only one NHA within 15 km of Tromman Quarry and six pNHAs. These sites are located between 2 km and 14 km from the quarry and there is considered to be no ecological or hydrological connection between these sites and the quarry.

8.5 Baseline conditions

8.5.1 Ecological baseline

Additional site visits were undertaken in 2023, in order to provide a contemporary update to the ecological baseline already established in

2018/2019. As before, these visits assessed the quarry and pre-cast concrete manufacturing facility as a whole.

Terrestrial Mammals

Several mammal trails were identified as part of the mammal survey. However, apart from one trail located in the east of the site, most were associated with the woodland located outside the southern boundary. Similar to the previous surveys conducted in 2018/2019, there was some evidence of badger activity observed within the site. This evidence primarily manifested as signs of digging, which were located in the western section of the site. The hardstand surrounding the manufacturing facility in the north of the site means that it is difficult to track mammals there. In any case, this area is considered to be largely unsuitable for most mammal species, with the possible exception of rodents.

Bats

Bat surveys were undertaken on 01 August 2023 by means of five deployed static bat detectors. Five species of bat were detected as part of the 2023 surveys, which is the same number of species and the same assemblage of bats recorded in 2019.

Potential roosts within the site were notably scarce, with one moderately sized dead tree covered in ivy being the only main option. Additionally, the abandoned gate lodge situated in the small southern woodland offered some limited suitability as a roost. A few other trees with ivy cover and occasional older specimens providing deadwood and knots were also present. However, akin to the findings in 2019, the majority of these sites were considered to have low suitability due to their limited sheltering capabilities.

The red-brick garage positioned in the southeast corner of the site, which underwent examination during the 2019 baseline assessment, has been subsequently demolished, along with c. 60 m of non-native beech hedgerow. An emergence survey conducted at this location in 2019 found no bats emerging from the building.

Birds

Two bird surveys were undertaken at the site during the 2023 site visits, occurring on 12 July and 03 August, respectively. A full list of the birds recorded in and around the site as part of the 2023 surveys, including their current conservation status is provided with the EcIA. As before, birds recorded during the 2023 site visits were mostly common, widespread species, and typical for the habitat available within the site.

Reptiles and Amphibians

Given that the previous baseline assessment of 2018/2019 found the site to be largely unsuitable for reptiles and amphibians (with the exception of common frog), there were no targeted surveys performed as part of the 2023 site visits.

Flora and Habitats

A site walkover performed on 10 August 2023 sought to provide an update to the habitats on-site. The findings from this survey found that the majority of habitats comprised those already described as part of the 2018 walkover. No rare plants listed under the Flora (Protection) Order, 2022 (S.I. No. 235 of 2022) were located within Tromman Quarry during the 2023 habitat survey, nor were there any such records found on the NBDC database.

Invasive Species

Similar to the 2018/2019 findings, there were no plant species recorded that are included on the Third Schedule of Regulations 49 and 50 (not yet in effect) of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011).

8.6 Evaluation of important ecological features within the zone of influence

Table 8.1 below summarises the Important Ecological Features of interest within the zone of influence of the development. Habitats and species which have been assessed to be of Local Importance (Higher Value) or above within the application site, have been listed as Important Ecological Features as shown in Table 8.2 below. This evaluation covers the development as whole.

Invasive Alien Species (IAS) are considered within the impact and mitigation sections below.

Important Ecological Feature	Evaluation
Designated Areas	
River Boyne and River Blackwater SAC River Boyne and River Blackwater SPA	International Importance
Habitat	
GS2 Dry meadows and grassy verges	Local Importance (Higher Value)
WS1 Scrub	Local Importance (Higher Value)
WS2 Immature woodland	Local Importance (Higher Value)
WL1 Hedgerows	Local Importance (Higher Value)
WL2 Treelines	Local Importance (Higher Value)
BL2 Earth banks	Local Importance (Higher Value)
Species	
Birds	Local Importance (Higher Value)

Badger	Local Importance (Higher Value)
Bats	Local Importance (Higher Value)

Table 8.1. Important Ecological Features and their Evaluation

8.7 Impact assessment of important ecological features within the zone of influence

8.7.1 Contamination of surface water / ground water

Quarrying activities occurring near water can result in pollution from fuel spillages, oil leakages, and accidents, causing the contamination of surface water runoff and degradation of water quality in the vicinity of the site. Moreover, extraction activities, dewatering and the discharge of water has the potential to alter localised groundwater levels and surface water base flows.

The stripping of vegetation, ground disturbance and the storing of stripped soils, can lead to sediment and pollutants derived from quarrying activities being washed into watercourses during periods of prolonged rainfall or flood events. Associated impacts of this include sedimentation and contamination of watercourses, resulting in ecological implications for freshwater biota downstream of the quarry site. This includes QIs/SCI of the River Boyne and River Blackwater SAC and SPA, which occur downstream of the site via hydrological connection.

Translocation of the stockpile of overburden during Phase 3, which involves removing and transporting the spoil near the northern end of the site and placing it in the void in the southern margin of the quarry, may lead to the potential loss of sediment that could be carried into existing watercourses. However, due to the site's topography, characterised by a southward

gradient, the likelihood of direct surface runoff is low. Any runoff that does occur will be directed to the quarry sump and the existing drainage infrastructure before discharge into the watercourses located to the north of the site.

Due to the anticipated increase in dewatering driven by an increase in ingress water (estimated at 2,750 m³/day) arising from continued mineral extraction (BCL Consultant Hydrogeologists Ltd., 2023), it is paramount that the mitigation measures outlined in the Applicant's EMS (Byrne Environmental Consulting Ltd., 2009, updated 2023) continue to be implemented. Without these measures, there is a heightened risk of contaminants and sediment entering the drainage ditch along the northern site boundary, which is hydrologically connected, albeit distantly (c. 10 km), to the River Boyne and River Blackwater SAC and SPA.

8.7.2 Potential impacts on Designated Sites

The NIS accompanying this application (Woodrow, 2023b) concluded that the distance of the hydrological link to European Sites downstream of the development (c. 10 km) in combination with the control measures within the site, mean that there is no potential for adverse impacts on the integrity of the River Boyne and Blackwater SAC or the River Boyne and Blackwater SPA.

8.7.3 Potential impacts on flora and habitats

Habitat loss and fragmentation

The development of quarry faces will result in the loss of small patches of WS1 scrub and ED3 recolonising bare ground that occur on the upper levels of the quarry faces. There will be no further loss of WS1 scrub on the

south-eastern quarry face, as vegetation has not yet properly established on these recently quarried faces. An area of built land comprising the head office building will be lost during Phase 1, in order to facilitate the development of quarry faces in the southern part of the site.

Dust deposition on flora

Quarrying activities generate dust and in the absence of mitigation, dust emissions have the potential to exceed permitted levels. Fugitive dust is typically deposited within 10 to 200 m of the source; the greatest proportion of which, comprising larger particles (> 30 µm) is deposited within 100 m. Large amounts of dust deposited on vegetation over a prolonged period results in adverse effects on plant productivity, which can lead to the degradation of sensitive habitats. Prevailing weather conditions have a bearing on how much dust is generated and deposited, with factors such as rainfall supressing the agitation of dust and potentially having a cleansing effect, washing deposits off foliage.

A review by Farmer (1993) found that dust deposition starts to affect the more sensitive species at levels above 1000 mg/m2/day, which is significantly higher than the upper limit permitted under the planning conditions for the site – set at 350 mg/m2/day. Based on these limits the impact on flora in the vicinity of the quarry will be minimal and in addition there are no dust sensitive terrestrial habitats adjacent to the development.

Non-native and invasive plant species

No high impact invasive plant species (as listed by NBDC) were recorded during the site visits at Tromman Quarry, nor were there any plant species

listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011.

8.7.4 Potential impacts on Fauna

Disturbance to fauna

Much of the preparatory work for quarry expansion (vegetation removal and stripping of overburden) has already been undertaken; and as such, there will be minimal direct disturbance to fauna resulting from habitat loss – see sections under birds and protected mammals below.

Quarrying activities, along with the resultant potential ecological disturbance factors including noise, vibration and movement (machinery and human operatives) have been well-established at Tromman Quarry over the last c. 25 years. As such, any fauna occurring in the area will have become habituated to disturbance factors emanating from the site and species particularly sensitive to disturbance are likely to have been displaced previously.

Given the minimal levels of lateral expansion and that all quarrying activity will be restricted to the existing quarry void and the northern spoil heap, no additional significant impacts are predicted to occur during the operational lifespan of the quarry.

Badger

Given the current context of the site, with ample foraging and sett building opportunities in the environs, the impact to badger is also assessed as low.

Bats

Overall, in the context of substantial areas of suitable habitats existing on the periphery of the site and in the surrounding area, the potential loss of any foraging / commuting features is deemed to be insignificant at a local level.

Birds

It is not considered that development of quarry faces poses any significant impacts upon the local bird population.

8.8 Cumulative Impacts

Provided the mitigation measures outlined in the Keegan Quarries Ltd. EMS continue to be adhered to, and monitoring of the discharge point continues into the future, then there is not considered to be any potential for quarry operations to contribute to cumulative water quality impacts within the locality. There are no other issues that are considered to be relevant with respect to potential in-combination impacts for this site.

8.9 Consideration Against Alternative Baseline Scenario

When assessing the proposed development against the alternative baseline scenario, the proposed development would result in impacts which would otherwise not be experienced. However, given that any future development at the site will be subject to best practices and mitigation measures already employed, it is considered that the proposed development will not result in any additional impacts beyond those currently experienced.

8.10 Proposed Mitigation and Enhancement Measures

This section of the report aims to outline mitigation and/or enhancement measures, which aim to avoid, reduce and compensate for effects on Important Ecological Features within the zone of influence of the proposed development.

8.10.1 Mitigation for potential impacts in water quality

Without existing mitigation in place, future quarrying activities have the potential to have significant effects on ecological receptors within the zone of influence of the development, through impacting water quality. The EMS for the site provides the list of mitigation measures to control against contamination of surface water and ground water, whereby protecting watercourses in the local area.

With these requirements in place as mitigation, the risk of local watercourses and groundwaters becoming contaminated as a result of continuation of extraction is considered to be low. During restoration of the quarry, dewatering activities would cease, meaning that discharge and flow into the northern drain would also cease. This would further diminish any hydrological link between the site and the downstream SAC/SPA.

8.10.2 Mitigation for potential impacts on habitats

Continuation of quarrying activities will not significantly impact on any habitats on the periphery of the site, such as hedgerows, treeline and drains, as these areas will be avoided when quarrying resumes.

There is potential for dust deposition to supress plant productivity and lead to degeneration of sensitive habitats. As detailed in the EMS, existing control measures are in place and are employed throughout the site to suppress the generation of dust and ensure that threshold levels are not exceeded. Ongoing monitoring of dust deposition for activities will adequately control the impact on flora in the vicinity of the quarry..

No significant impact on habitats are anticipated to result from the proposed resumption of quarrying activities at Tromman; and therefore, mitigation by compensation is not required.

8.10.3 Mitigation for potential impacts on breeding birds

The development of quarry faces is likely to lead to the loss of small patches of WS1 scrub found on the upper levels of the faces themselves. As such, clearance of these areas will be curtailed to periods outside of the breeding bird season (breeding bird season: 01 March – 31 August, inclusive).

Peregrines are known to become habituated to a range of human activity, including quarrying; however nesting birds can be sensitive to disturbance in the early stages of the breeding season (late March to early May). If nesting in the Tromman Quarry, implementation of minimal blasting schedule over this early period will limit disturbance to breeding peregrines. The following measures will be employed to protect nesting peregrines:

There will be no blasting within 150m of any peregrine nest while active. Blasting within the quarry will be limited to twice per month during the breeding season (March to June inclusive).

8.10.4 Mitigation for Potential Impacts on Bats

None of the potential bat roosts identified on the periphery of the site will be removed during the operational phase of the quarry. As such, no bat roosts will be impacted by the proposed continuation of quarrying activities.

8.10.5 Enhancement Measures

A restoration plan has been produced for the proposal. This outlines that the site restoration will result in the following (approximate) areas:

- Floating islands 0.507 Ha
- Dry woodland 2.08 Ha
- Calcareous Grassland 2.25 Ha
- Ponds x 8No

In terms of the restoration of the quarry void, it is understood that the quarry consents provide for bench and margin treatment and planting, with placement of some overburden resources around the quarry and then for the quarry void to be allowed to flood with anticipated water rebound levels of the order of 62 m AOD (± 2 m), though this is more likely to be in the region of 65 m AOD. This will result in cliffs of 13-23 m surrounding the quarry following restoration, meaning that parts of the site will remain suitable for nesting peregrine.

The overall impact of site restoration will be positive. The site would be restored for nature conservation through planting and natural regeneration, the range and extent of habitats occurring on the site will be increased including grasslands, transitional scrub, woodland and a lake

surrounded by rocky cliffs, which will provide opportunities for a range of species.

8.11 Residual impacts and effects on important ecological features

Negative residual impacts are limited from negligible to minor long-term impacts. These are not considered to be ecologically significant. Residual impacts will not result in any significant effects on Important Ecological Features within the Zone of Influence.

8.12 Conclusions

Based on the collation of the above information, it is considered that the continuation of quarrying activities at Tromman will have a low adverse ecological impact via permanent habitat removal, which will then be negated by the proposed landscaping and planting as part of site restoration works.

While the site holds habitats that are likely to be locally important for foraging and commuting species in the wider area, such as birds and mammals (including bats), none are particularly rare or of significant ecological importance.

Given the existing habitats, and the permitted post-operational remedial landscaping and planting works, it is considered that the development shall result in a short to medium term ecological impact during operation, which shall be managed by implementing best practice mitigation measures across the site. As a result, the proposed development will not give rise to any significant impact beyond local level.

9.0 LANDSCAPE AND VISUAL

9.1 Introduction

This Section has been prepared by Mullin Design Associates, Chartered Landscape Architects, as a standalone Landscape and Visual Impact Assessment Report to establish potential landscape and visual impacts/effects arising from proposed extractive and ancillary operations associated with an existing hard rock quarry at Tromman, Co. Meath.

The report has been drafted and overseen by Pete Mullin, BA (Hons) CMLI, Chartered Landscape Architect and principal of Mullin Design Associates. Pete has produced over 100 Landscape and Visual Impact Assessments during 25 years in the sector.

This study has been structured in the following subsections:

- Methodology – explanation of how the assessment has been undertaken, with reference to methodology, terminology, assessment criteria, and planning policy.
- Receiving Environment - or Landscape and Visual Context – baseline description, classification and evaluation of the existing landscape character containing the application site and an assessment of visual amenity, with identification of visual receptors.
- Project Description – description of aspects of the proposed development which have the potential to cause a landscape and/or visual effect and measures which will be incorporated to mitigate or avoid greater potential effects.

- Assessment of Impacts – an outline of potential landscape and visual impacts with proposed mitigation measures and cumulative impacts.
- Residual Impacts and impact summary.

The Figures referenced throughout this section constitute an important element of the assessment and as such are held in Appendix 9.1 separate to the section to allow for ease of access to the reader, that the text and the visual analysis can be viewed side by side, much in the same way as having two screens on a PC.

9.2 Methodology

9.2.1 Method of Assessment & Guidelines

The landscape and visual assessment was carried out in accordance with the following best practice guidance documents:

- Guidelines for Landscape and Visual Impact Assessment (GLVIA), Third Edition, edited by The Landscape Institute and Institute of Environmental Management and Assessment (2013);
- Landscape Character Assessment Guidance (2002) Countryside Agency in conjunction with Scottish Natural Heritage;
- Landscape Character Topic papers 1 to 9 (Various Dates). Published by The Countryside Agency and Scottish Natural Heritage;
- Environmental Protection Agency (EPA) "Guidelines on the Information to be contained in Environmental Impact Assessments" May 2002
- In addition, the EPA are currently revising the Guidelines and Advice Notes, therefore the assessment also follows the Guidelines on

Information to be contained in Environmental Impact Assessment Reports (EIAR) May 2022.

- Meath County Development Plan 2021-2027;
- Ordnance Survey mapping; and
- Digital sources of mapping and aerial photography.

Finally, as recommended within the Guidelines for Landscape and Visual Impact Assessment (GLVIA), Third Edition, the landscape and visual assessment incorporates both desk and field-based studies, and has been compiled and interpreted by an experienced landscape professional.

9.2.2 Assessment Sequence

The Landscape & Visual Assessment was undertaken in the following stages:

• Desk Study (Stage 1)	1	Analysis of Baseline data, Map/Plans
	2	Consultation of Policy Documentation
	3	Zone of Visual Influence (Theoretical)
	4	Identification of Potential Visual Receptors
• Field Study	5	Confirmation of Visual Receptors
	6	Photo Survey from Visual Receptors
	7	Zone of Visual Influence (Actual/Field)
	8	Confirmation of Landscape Character
	9	Establish Landscape Sensitivity
• Desk Study (Stage2)	10	Analysis of Field Survey data
	11	Viewpoint Analysis
	12	Consider Mitigation &Restoration
• Desk Study (Stage3)	13	Report Preparation

9.2.3 Assessment Criteria

The aim of the landscape and visual impact assessment is to identify, evaluate key effects arising from the unauthorised aspects of the development. The assessment combines **sensitivity** with predicted **magnitude of change** to establish the **significance of residual landscape & visual effects.** These are based on pre-defined criteria as set out in Tables 9.1 – 9.5 below.

Table 9.1 Landscape Sensitivity Criteria	
Class	**Criteria**
High	Landscape characteristics or features with little or no capacity to absorb change without fundamentally altering their present character Landscape designated for its international or national landscape value Outstanding example in the area of well cared for landscape or set of features
High-Medium	Landscape characteristics or features with a low capacity to absorb change without fundamentally altering their present character Landscape designated for regional or county-wide landscape value where the characteristics or qualities that provided the basis for their designation are apparent. Good example in the area of reasonably well cared for landscape or set of features
Medium	Landscape characteristics or features with moderate capacity to absorb change without fundamentally altering their present character Landscape designated for its local landscape value or a regional designated landscape where the characteristics and qualities that led to the designation of the area are less apparent or are partially eroded or an undesignated landscape which may be valued locally – for example an important open space An example of a landscape or a set of features which is neutral or mixed character
Medium-Low	Landscape characteristics or features which are reasonably tolerant of change without detriment to their present character No designation present or of little local value .An example of an un-stimulating landscape or set of features
Low	Landscape characteristics or features which are tolerant of change without detriment to their present character No designation present or of low local value. An example of monotonous unattractive visually conflicting or degraded landscape or set of features
Table 9.2 Visual Sensitivity Criteria	
Class	**Criteria**

High	Users of outdoor recreational facilities, on recognised national cycling or walking routes or in national designated landscapes Dwellings with views orientated towards the proposed development
High-Medium	Users of outdoor recreational facilities, in locally designated landscapes or on local recreational routes that are well publicised in guide books Road and rail users in nationally designated landscapes or on recognised scenic routes, likely to be travelling to enjoy the view
Medium	Users of primary transport road network, orientated towards the Development, likely to be travelling for other purposes than just the view. Dwellings with oblique views of the proposed development.
Medium-Low	People engaged in active outdoor sports or recreation and less likely to focus on the view. Primary transport road network and rail users likely to be travelling to work with oblique views of the Development or users of minor road network.
Low	People engaged in work activities indoors, with limited opportunity for views of the Development. Road users on minor access roads travelling for other purposes than just the view.

Table 9.3 Landscape Magnitude Criteria

Class	**Criteria**
Very High	Very extensive, highly noticeable change, affecting most key characteristics and dominating the experience of the landscape; and Introduction of highly incongruous development
High	Extensive, noticeable change, affecting many key characteristics and the experience of the landscape; and Introduction of many incongruous elements.
Medium	Noticeable change to a significant proportion of the landscape, affecting some key characteristics and the experience of the landscape; and Introduction of some uncharacteristic elements.
Low	Minor change, affecting some characteristics and the experience of the landscape to an extent; and Introduction of elements that are not uncharacteristic.
Very Low	Little perceptible change.

Table 9.4 Visual Magnitude Criteria

Class	**Criteria**
Very High	The development would dominate the existing view
High	The development would cause a considerable change to the existing view over a wide area or an intensive change over a limited area.
Medium	The development would cause moderate changes to the existing view over a wide area or noticeable change over a limited area.

Low	The development would cause minor changes to the existing view over a wide area or moderate changes over a limited area.
Very Low	No real change to perception of the view. Weak, not legible, hardly discernible

Table 9.5 Categories of Landscape and Visual Significance of Effect

Degree of significance	Description of Landscape Effect	Description of Visual Effect
Major	Substantial alteration to elements/features of the baseline (pre-development) conditions. Notably affect an area of recognised national landscape quality. Substantial alteration to the character, scale or pattern of the landscape.	Major/substantial alteration to elements/features of the baseline (pre-development) conditions. Where the proposed development would cause a very noticeable alteration in the existing view. This would typically occur where the proposed development closes an existing view of a landscape of regional or national importance and the proposed development would dominate the future view.
Major-Moderate	This category is a combination of descriptions of Major listed above and Moderate below. These combinations are discussed within the assessment of each landscape or visual receptor when they occur.	
Moderate	Alteration to elements/features of the baseline conditions. Affects an area of recognised regional landscape quality. Alteration to the character, scale or pattern of the local landscape.	Alteration to one or more elements/features of the baseline conditions such that post development character/attributes of the baseline will be materially changed. This would typically occur where the proposed development closes an existing view of a local landscape and the proposed development would be prominent in the future view.
Moderate-Minor	This category is a combination of descriptions of Moderate listed above and Minor below. These combinations are discussed within the assessment of each landscape or visual receptor when they occur.	
Minor	A minor shift away from baseline conditions. The Development partially changes the character of the site without compromising the overall existing landscape character area.	A minor shift away from baseline conditions. Occur where change arising from the alteration would be discernible but the underlying character / composition / attributes of the baseline condition will be similar to the pre-development. It would also occur where the proposed development newly appears in the view but not as a point of principal focus or where the proposed development is closely located to the viewpoint but seen at an acute angle and at the extremity of the overall view.
Negligible	No or very little change from baseline conditions. Change not material, barely distinguishable or indistinguishable.	Where there is no discernible improvement or deterioration in the existing view.
No Effect	The Development would not affect the landscape receptor	The Development would not affect the view

The significance of identified landscape and visual effects is established through a simple matrix, which measures the magnitude of change against landscape or visual sensitivity. The resulting impacts are classed

Major, Moderate-Major, Moderate, Minor, Negligible/None. Therefore as the sensitivity of a landscape increases from Low to High, and the Magnitude of Change increases from Very Low to Very High the predicted impacts also increase.

Example Matrix (Professional judgement applied at every stage of assessment and matrix only used to check consistency.)		**Sensitivity**				
		High	**High - Medium**	**Medium**	**Medium - Low**	**Low**
Magnitude	**Very High**	Major	←→	Major	←→	Mod-major
	High	Major	←→	Mod-major	←→	Moderate
	Medium	Mod-major	←→	Moderate	←→	Minor
	Low	Moderate	←→	Minor	←→	Negligible
	Very Low	Minor	←→	Negligible	←→	Negligible

Intermediate sensitivity ratings (as per the criteria) would lead to a series of effects that lie between those stated above if a matrix was applied to the assessment. Professional judgement should be used to determine the degree of effect. e.g high-medium sensitivity combined with medium magnitude would equate to a Moderate+ effect and a decision needs to be made to determine if this effect is Moderate or Mod-Major. Intermediate magnitude ratings could also be arrived at during the assessment and a similar method should be applied here too.

Effects of above Moderate are considered Significant (Dark Grey)

Where intermediate effects are arrived at, particular care should be taken at the edges of the significance threshold i.e. between Mod and Mod-Maj (lighter grey) and these effects may require additional explanation as to why the decision was made to judge the effect as either significant or not significant.

The example matrix table above is used to summarise the findings from the criteria tables. By combining sensitively (along the top) with predicted magnitude of change (along the side) a predicted impact/ effect is reached. This format is applicable to both landscape impacts and visual impacts.

9.2.4 Type of Visual Impacts

- **Beneficial**: A positive impact which will improve or enhance the landscape character or viewpoint.
- **Neutral**: A neutral impact which will neither enhance nor detract from the landscape character or viewpoint.
- **Adverse**: A negative impact which will have an adverse effect on the existing landscape character or viewpoint.

9.2.5 Duration of Impacts

- **Temporary**: Impacts lasting one year or less.
- **Short–term**: Impacts lasting one to seven years.
- **Medium-term**: Impacts lasting seven to twenty years.
- **Long-term**: Impacts lasting twenty to fifty years.
- **Permanent**: Impacts lasting over fifty years.

9.3 Receiving Environment

The Landscape is about the relationship between people and place. Understanding the character of a landscape allows us to identify its 'sense of place', and what distinguishes it from other places. All landscape has economic, social and environmental value; landscape characterisation provides a mechanism and baseline from which landscapes can be

valued and their sensitivity and capacity to accommodate various development typologies gauged. Collectively this information assists with positive decision making when considering future appearance and function. This section establishes the landscape and visual context (or baseline) of the proposed development.

9.3.1 Desk Study

Desk studies generally involve analysis and interpretation of available print material relating to a site's context and the proposed development within that context. It is a way of focussing the study prior to detailed field work and landscape investigation. In this instance, variable scale Ordnance Survey maps and satellite imagery were studied along with 3D Data Terrain Models. In addition, the Meath County Council Landscape Character Assessment was also consulted.

Although general in nature the desk study stage of the project assists in the clarification of the following considerations;

- **The general topography, vegetative cover, visible ground water, and sites of potential historic or cultural interest.**
  Study of the available map information indicated that the site is located on a localised elevation in a gently undulating area.
  OSi 1:50000 mapping indicates that within 5km radius of the site there is a significant cover of coniferous forestry (approx. 2.5km to the West of the site) and several other blocks of deciduous woodland interspersed throughout the area.
  Several historic/archaeological sites of note including Churches and Mounds have been highlighted within 5km around the application area. Specific impacts on these elements should be separately

assessed. However their presence is noted within the landscape and visual section due to potential for them to be visitor attractions and therefore become key visual receptors.

- **Identification of primary investigation area or Zone of Theoretical Visual Influence (ZTVI).**

  Given the site's topography, it was expected that there would be open views to the site from positions to the North and South.

  Although the ZTVI is calculated and generated using topographical data, it is generally accepted that such models do not necessarily reflect the actual visual catchment on the ground, it is therefore crucial that the topographically generated ZTVI is refined through detailed site survey and analysis.

- **The potential relationship between the development and any residential settlements, dwellings and the surrounding transportation network.**

  Although not all dwellings are individually identifiable on the OSi 1:50000 map, it is sufficiently detailed for the desk study to reveal that the site is located in an area which has a relatively low population concentration. Population is concentrated in the village of Rathmolyon and elsewhere as sporadic ribbon settlements primarily located along the surrounding minor roads.

- **Landscape & Visual Designations, Protected areas and significant viewpoints.**

  The site does not lie within a landscape designation. Meath County Council undertook a landscape character assessment survey which is included within the County Development Plan 2021 – 2027 (Appendix 5), which divides the county into 'Landscape Character

Areas' (LCA); the site is located on the boundary of the 'Central Lowlands' running to the South West and on the Western boundary of Rathmolyon Lowlands'. The site is located approximately 3km to the South West of the Boyne River Valley (LCA).

9.3.2 Field Study

Desk studies are important to establish the basic approach to landscape and visual assessment and setting out principle issues/ areas to be investigated. However, it is only through field work that an accurate understanding of potential influence of a proposed development can be fully determined.

Most importantly field study helps to clarify the eye level visual envelope of the development. This exercise refines the computer generated ZTVI models to more accurately reflect the actual visual envelope of the development.

The area has been visited on numerous occasions and specifically for the purpose of this report in September 2023 with foliage cover reasonably full. It should be noted that foliage cover decreases through Autumn and Winter resulting in increased visibility. The influence of foliage cover has been factored into the findings, with a worst-case scenario considered – i.e vegetation cover at its lightest.

In addition to the information revealed during the desktop analysis, the field study work investigated and considered a number of critical issues, which have been factored into the assessment conclusions:

- Confirmation of the landscape character and sense of place, quality and value of the surrounding area;
- Localised topography variation and woodland / hedgerow cover.
- Effects of localised planting, stone wall, earthworks and boundaries associated with residential properties;
- Relationship of other operations in the area
- Consideration of operations in low light conditions
- Potential eye level perceptions (Local residents – Frequent, Passive Tourism – Occasional); and
- General landscape dynamic (assessing the potential pressures and evolution of surrounding landscape).

9.3.3 Baseline Study – Site description

The subject site is almost entirely occupied by an existing quarry operation with a variety of ancillary operations.

9.3.4 Baseline Study - Landscape Character

As outlined above a broad landscape characterisation study of County Meath has been prepared and is contained within the County Meath Development Plan. The site sits on the border of two landscape characterisation areas within that study; the Central Lowlands, and the Rathmolyon Lowlands. The relevant information has been studied and extracted from this document and is included below.

Central Lowlands

LCA 6 Central Lowlands

Large lowland landscape with rolling drumlins interspersed with numerous large estates and associated parkland. Thick wooded hedgerows and some conifer plantations. Deep roadside ditches and banked hedgerows are a common feature. In more remote areas farmland is less well-managed with rough pasture, overgrown hedgerows and less woodland. Farmland is in a variety of scales and squares divided by hedgerows which are usually clipped to eye-level, but less well-managed away from roads. The North East of the area deep and shallow well-drained soils have been developed for agriculture with estate landscapes more prevalent.

Land Uses

- Mix of small-medium rough pasture fields
- Beech stands
- Sand and gravel quarries

Boundary Determinants

- Deep roadside ditches
- Banked hedgerows
- Eye-level clipped hedges

Landscape Value: Exceptional Very High **High** Moderate Low
Landscape Sensitivity: High **Medium** Low
Landscape Importance: Regional

9.3.5 Baseline Study - Visual

When establishing the extent of a development proposals visibility there are a number of recognised stages:

- The first is conducted through desk study via utilisation of digital terrain models or printed mapping to generate a ZTVI. This provides the assessor with a worst-case scenario of potential visibility, recognising that the exercise does not account for potential screening influence of vegetation, manmade structures or indeed low level localised topographical variation.
- With the ZTVI prepared, the next stage is to consider potential visual receptors. Again, this can initially be carried out as a desk study to identify potential properties, road intersections, historic sites or OSi marked viewpoints etc which may be important to the assessment.
- The next stage is to test and refine desk study analysis in the field. Consideration of the surrounding landscape from a high point within the proposed development site is often a logical starting point for field work. From an elevated location, the assessor (comparing with ZTVI mapping) can identify points in the wider landscape from which the site is most likely to be visible. This exercise is known as intervisibility

and forms the basis of defining the actual visual envelope. The ZTVI models for the proposed development are shown on Figure 9.2 held at Appendix 9.1.

- The final stage is to consider visibility of the subject site from the surrounding landscape. This generally involves assessment and photography from fixed key locations as identified, along with sequential views experienced along pedestrian and vehicle routes.

Whilst field work involves consideration from all surrounding roads and pathways, it would be impossible (indeed unnecessary) to formally assess potential visibility from every possible angle or potential viewpoint. Therefore, the recognised practice is to identify and analyse a selection of viewpoints considered representative of a range of views and viewer types, including residences, transport routes, recreational routes, visitor attractions (including historic monuments), main landscape character types and a variety of distances, aspects, elevations, extents, and sequential routes.

These are known as 'key visual receptors' and provide a reliable sample of potential impressions across the study area. Based on field survey and analysis, Figure 9.2 illustrates the identified ZTVI created by the development with Table 9.6 below listing, and Figure 9.3 illustrating, the location of key visual receptors identified for the study.

Viewpoint	Grid Reference	X	Y	Latitude	Longitude	Type
VP1	N 76003 50730	276003	250730	53.501289	-6.8552381	Regional Road - Sequential
VP2	N 76368 51482	276368	251482	53.507988	-6.8495505	Regional Road - Sequential
VP3	N 78216 51194	278216	251194	53.505137	-6.8217775	Local Road - Sequential
VP4	N 78344 51188	278344	251188	53.505061	-6.8198571	Local Road - Sequential
VP5	N 78923 50236	278923	250236	53.496423	-6.8113598	Local Road - Sequential
VP6	N 77417 48767	277417	248767	53.483443	-6.8344215	Local Road - Sequential
VP7	N 77289 48716	277289	248716	53.483012	-6.8363634	Local Road - Sequential

Table 9.6 – Key Visual Receptors

It should be noted as a basic visual principle that any type of development in the landscape will become less perceptible with distance. This simply equates to a reduction of the significance of potential visual impacts as one moves further away from the subject site.

Whilst there is no standard measure in relation to mineral workings in particular, the following descriptions provide a good guide of what may be experienced from distance categories.

Viewpoint Distance 0-2km

It is generally accepted that a development located approximately 2km or less from a viewer would be close enough to allow identification of significant detail. Any positions within this range with open uninterrupted views of a development would generally receive the greatest visual impacts.

Viewpoint Distance 2-5km

At this distance, visibility of a development site becomes more general, with viewers in open uninterrupted positions able to identify general form, colour/tone and textural contrast, but losing the more focused detail achievable from closer positions. Effects at this distance are generally less than those found between 0-2km.

Viewpoint Distance 5-15km+

Beyond 5km visual prominence quickly diminishes. Certain circumstances/light conditions etc. have potential to allow certain types of development and material finishes to be perceived. The development increasingly becomes part of the general background/distance views. Upwards of 15km distance and developments quickly become minor features within the landscape and considered imperceptible to the average human eye. The development in effect becomes part of the general background/distance views.

Figure 9.2 illustrates the identified ZTVI (Zone of Theoretical Visual Influence) created by the existing elements of the operation and the proposed development. Figures 9.4 to 9.10 illustrate the key visual receptors identified for the study.

The visibility assessment in this case has concentrated on publicly accessible areas primarily within the first distance category (0-2km).

The undulating topography, frequency and density of hedgerows combined with clusters of woodland vegetation greatly reduce the potential extent of visibility, however, there remain several stretches of minor public road from which portions of the unauthorised elements can be witnessed. These existing elements within the Site are not the focus of this Application, with their impacts assessed in detail in the rEIAR submitted as part of the accompanying SC Application.

As illustrated in Figure 9.2 the Zone of Theoretical Visual Influence is relatively compact, focussed largely within a 2km radius and primarily to lands and local roads to the North.

9.4 Description of Development

Whilst Section 3 provides a detailed description of the development the application in landscape terms is considered to cover three primary elements which form the focus of this assessment:-

1. Lateral & vertical extension of extraction area (all within the footprint of the existing quarry operations);
2. The removal of a large existing overburden tip (c.30m high) centrally located within the site, and;
3. Comprehensive restoration scheme.

9.5 Assessment of Impacts

9.5.1 Summary of Landscape Impacts

Landscape Assessment attempts to measure the sensitivity of specific landscape resources and describe the significance of changes to that landscape that may occur as a result of the development. They also more importantly identify opportunities during the design process that may minimise potential landscape and visual impacts through positive intervention. This can include exerting influence on the development layout and arrangement, or determining the most sympathetic operational approach to a proposal, i.e. suggested phasing, direction and sequence of extraction.

These are referred to a 'primary mitigation measures. Landscape and visual impacts are intrinsically linked; therefore, measures to reduce landscape impacts will generally assist with reduction of visual impacts and vice versa.

Consideration Factor Type Significance	**Comment**	**Significance**
Landscape designation	Not within Landscape designated area, or Area of Constraint on Mineral Development.	Whilst this is a pleasant landscape of local value, it is not considered of national or international importance
Landscape scale	Varies from large scale to relatively intimate.	Attractive rural landscape
Landscape quality	There are valuable qualities to this landscape which should be enhanced and replicated at restoration stage.	Rich and interesting but not considered rare or threatened.
Visual Receptors	The majority of views are from a small number of roads adjacent to the site.	Views from the surrounding minor roads are not classed as significant.

Table 9.7 Landscape Sensitivity Summary (within visual envelope)

The Landscape Character Assessment as outlined, broadly describes and classifies the landscape of the county, providing a valuable tool to aid decision making by planners and other interested parties.

However, it is generally accepted that large scale, characterisation of this type presents some limitations. Within each identified character area there can be localised variability of landscape conditions which cannot be identified at a large scale. For example, it would not be unusual to find pockets of very high or very low landscape value within a landscape character area generally classified as having an overall landscape value of medium.

In this instance, the landscape character and value of the lands surrounding the subject site have been directly influenced by the presence of quarry operations for several decades. Therefore, whilst the general landscape character of the region is classified as high value, it is

considered that a value of moderate to low is appropriate to describe the localised / site level character .

Weighing up the various complex factors as outlined in the Criteria Tables, and in particular the Application Site's location outwith any recognised landscape designation area, combined with natural screening, low numbers of impacted population, and potential for additional mitigation it is concluded that the landscape sensitivity of the area should be generally classed as **Medium-Low** as defined below.

Medium-Low - Landscape characteristics or features which are reasonably tolerant of change without determent to their present character
No designation present or of little local value.
An example of an un-stimulating landscape or set of features
(Extract from Table 9.1 Landscape Sensitivity Criteria)

Landscape sensitivity is combined with the magnitude of change generated by a development to establish the overall impact / effect. In addition to the Criteria Tables above, magnitude of change will be influenced by the following:

- Potential for mitigation.
- Development typology
- Duration of development
- Existing precedence of quarrying / processing operations in the area.
- Form of buildings and structures – i.e Do they appear as agricultural structures familiar to the region.
- The population numbers impacted are considered low.
- Full decommissioning and restoration proposed.

9.5.2 Landscape Impacts - Operational / Extraction Phases

The Assessment Criteria Tables 9.1 – 9.5 provided earlier in this Section provide definitions of sensitivity and magnitude of change which in turn establish a mechanism to determine potential significance of landscape and visual effects/ impact.

Landscape Sensitivity Criteria – Operational / Extraction Phases
As above the Landscape sensitivity remains the same whether considering the establishment, operational or restoration phases of the development. Table 9.1 'Landscape Sensitivity Criteria' it is considered that the definition of **Medium-Low** is most suited to the landscape associated with the subject site.

Medium-Low - Landscape characteristics or features which are reasonably tolerant of change without detriment to their present character,
No designation present or of little local value .An example of an un-stimulating landscape or set of features.

Landscape sensitivity is combined with the magnitude of change generated by a development to establish the overall impact / effect.
In addition to the definitions outlined within the criteria tables, magnitude of change can also be influenced by the following:

- Potential for mitigation including advanced screening measures
- Development typology, its phasing and duration limited.
- The population numbers impacted are considered low.
- Full decommissioning and extent and effectiveness of restoration proposals.

Landscape Magnitude Criteria – Operational / Extraction Phases

The operational phases of this development involves the sequential removal of the existing overburden store and deepening of existing quarry void. It is considered that the category of **Very Low** as defined in Table 9.3 'Landscape Magnitude Criteria' is most appropriate:-

Very Low *Little perceptible change.*

		Sensitivity				
		High	**High - Medium**	**Medium**	**Medium – Low**	**Low**
Magnitude	**Very High**	Major	←→	Major	←→	Mod-major
	High	Major	←→	Mod-major	←→	Moderate
	Medium	Mod-major	←→	Moderate	←→	Minor
	Low	Moderate	←→	Minor	←→	**Negligible**
	Very Low	Minor	←→	Negligible	←→	Negligible

Table 9.8 - Assessment of landscape impacts (Operations / Extraction Phases)

Therefore with **Medium-Low** landscape sensitivity combined with **Very Low** magnitude of change, it is considered that the proposed development would generate a **Negligible** impact on the landscape character area during the operational phase.

9.5.3 Landscape Impacts - Restoration Phase

The Assessment Criteria Tables 9.1 to 9.5 provide definitions of sensitivity and magnitude of change which in turn establish a mechanism to determine potential significance of landscape and visual effects/ impact.

Landscape Sensitivity Criteria – Restoration Phase

Landscape sensitivity remains the same whether considering the establishment, operational or restoration phases. As above with reference to Table 9.1 'Landscape Sensitivity Criteria' it is considered that the definition of **Medium-Low** is most suited to the landscape associated with the subject site.

Medium-Low- Landscape characteristics or features which are reasonably tolerant of change without detriment to their present character,
No designation present or of little local value .An example of an un-stimulating landscape or set of features.

Landscape sensitivity is combined with the magnitude of change generated by a development to establish the overall impact / effect. In addition to the definitions outlined within the criteria tables, magnitude of change can also be influenced by the following:

- Potential for mitigation including advanced screening measures
- Development typology, its phasing and duration.
- The population numbers impacted are considered low.
- Full decommissioning and extent and effectiveness of restoration proposals.

Landscape Magnitude Criteria – Restoration Phase

With extractive operations ended the final stages of restoration can be completed in accordance with Figure 9.11. Final restoration will offer a landscape typology focused on biodiversity, with significant screening woodland retained, and further woodland encouraged (Planted and Natural regeneration) along redundant benches and overburden area.. Significantly with all extractive and processing operations ceased, restoration will see the removal of all plant structures and the large temporary overburden mound in the centre of the site. The void area would then fill with groundwater and rainwater. This would be allowed to fill to c. 65mAOD.

Restoration will have a positive beneficial effect on the Landscape Character Area with a 'Landscape Magnitude of Change' considered to fall within **Medium** category as defined below:

Medium- *Noticeable change to a significant proportion of the landscape, affecting some key characteristics and the experience of the landscape; and Introduction of some uncharacteristic elements.*

Post restoration as illustrated in Table 9.9 below, the predicted magnitude of change to this landscape character area is expected to be **Medium.** The resultant landscape impact following the full cessation of operations and establishment of the proposed restored landscape is predicted to be **Moderate** and beneficial. None of the potential landscape effects are predicted to fall within the **Significant** range.

		Sensitivity				
		High	**High - Medium**	**Medium**	**Medium - Low**	**Low**
Magnitude	**Very High**	Major	←→	Major	←→	Mod-major
	High	Major	←→	Mod-major	←→	Moderate
	Medium	Mod-major	←→	**Moderate**	←→	Minor
	Low	Moderate	←→	Minor	←→	Negligible
	Very Low	Minor	←→	Negligible	←→	Negligible

Table 9.9 - Assessment of landscape impacts (Restoration Phase)

9.5.4 Visual Impacts

Assessment of potential visual impacts have been considered from several visual receptors within the ZTVI. Effects are separated into the following phases:

1. Operational Phase (Extractive Operations); and
2. Restoration Phase (Post Extractive Operations).

9.5.5 Visual Impacts - Operational / Extraction Phases

Visual impacts have been illustrated by assessment from specific viewpoints. As shown at Figures 9.4 to 9.10. The figures illustrate key identified visual receptors, with potential visual impacts assessed from each position. Further detail on the visual impacts from each position is provided in each of the figures. Table 9.12 below provides a summary of predicted visual impacts from each of the selected viewpoints during operational/ extraction phases.

These viewpoints are representative of worst-case scenario views of the proposed development, therefore, as viewers move away from these receptors, the magnitude of change and potential visual effects will generally diminish.

Viewpoint No.	Receptor Type	Visual Sensitivity	Magnitude of Change	Effect /Impact
Viewpoint 1	Public Road - Sequential	Medium-Low	Very Low	Negligible (N)
Viewpoint 2	Public Road - Sequential	Medium-Low	Very Low	Negligible (N)
Viewpoint 3	Public Road - Sequential	Low	Very Low	Negligible (N)
Viewpoint 4	Public Road - Sequential	Low	Very Low	Negligible (N)
Viewpoint 5	Public Road - Sequential	Low	Very Low	Negligible (N)
Viewpoint 6	Public Road - Sequential	Medium	Very Low	Negligible (N)
Viewpoint 7	Public Road - Sequential	Medium	Very Low	Negligible (N)

Table 9.10 - Summary of Visual impacts (Operational / Extraction Phases)

It is predicted that visual effects arising from the proposed operational / extraction phases at the selected key visual receptors would be **Negligible** and Neutral.

None of the potential visual effects during this phase are predicted to fall within the **Significant.**

9.5.6 Visual Impacts- Restoration Phase

With extractive operations complete the final stages of restoration would be finalised as illustrated in the submitted restoration concept.

Viewpoint No.	Receptor Type	Visual Sensitivity	Magnitude of Change	Effect /Impact
Viewpoint 1	Public Road - Sequential	Medium-Low	Very Low	Negligible (B)
Viewpoint 2	Public Road - Sequential	Medium-Low	Very Low	Negligible (B)
Viewpoint 3	Public Road - Sequential	Low	Medium	Minor (B)
Viewpoint 4	Public Road - Sequential	Low	Medium	Minor (B)
Viewpoint 5	Public Road - Sequential	Low	Medium	Minor (B)
Viewpoint 6	Public Road - Sequential	Medium	Low	Minor (B)
Viewpoint 7	Public Road - Sequential	Medium	Low	Minor (B)

Table 9.11 - Summary of Visual impacts (Restoration Phase)

Predicted visual effects arising from the proposals at the selected visual receptors following the operational phases and full restoration would range from **Minor** to **Negligible** and would in general be beneficial. None of the potential visual effects during this phase are predicted to fall within the **Significant** range.

9.6 Assessment of Impacts against likely evolution of baseline Scenario

In terms of the likely evolution of the baseline, two scenarios have been identified: one is that the quarry continues to operate, the impacts of this have been sufficiently considered in the above sections.

The alternative baseline scenario is that the Site is restored and remediated. In this scenario, as shown in Table 9.12 below, with a landscape sensitivity of **Medium - Low** and the magnitude of change **considered Low,** it is predicted that impact to the landscape character area would be **Minor** (Neutral).

		Sensitivity				
		High	**High - Medium**	**Medium**	**Medium - Low**	**Low**
Magnitude	**Very High**	Major	←→	Major	←→	Mod-major
	High	Major	←→	Mod-major	←→	Moderate
	Medium	Mod-major	←→	**Moderate**	←→	Minor
	Low	Moderate	←→	Minor	←→	Negligible
	Very Low	Minor	←→	Negligible	←→	Negligible

Table 9.12 Assessment of landscape impacts expected to occur with alternative baseline - continuance of operations refused.

In terms of visual effects which are reasonably expected to occur at the selected visual receptors, resultant from the alternative baseline scenario, these would be **Negligible** and Neutral. (see Table 9.13 below).

Viewpoint No.	Receptor Type	Visual Sensitivity	Magnitude of Change	Effect /Impact
Viewpoint 1	Public Road - Sequential	Medium-Low	Very Low	Negligible (N)
Viewpoint 2	Public Road - Sequential	Medium-Low	Very Low	Negligible (N)
Viewpoint 3	Public Road - Sequential	Low	Very Low	Negligible (N)
Viewpoint 4	Public Road - Sequential	Low	Very Low	Negligible (N)
Viewpoint 5	Public Road - Sequential	Low	Very Low	Negligible (N)
Viewpoint 6	Public Road - Sequential	Medium	Very Low	Negligible (N)
Viewpoint 7	Public Road - Sequential	Medium-Low	Very Low	Negligible (N)

Table 9.13 Summary of Visual Impacts expected to occur with alternative baseline - continuance of operations refused.

Therefore, when assessing the effects of the proposed development against the alternative baseline scenario, the landscape impacts would be **Minor** and Neutral, whilst the visual impacts would be **Negligible** and Neutral.

None of the potential visual effects when assessed against the baseline scenario are predicted to fall within the **Significant** range.

9.7 Mitigation Measures

The purpose of mitigation is to where possible avoid, reduce and offset any significant negative (adverse) effects on the environment arising from a proposed development. If good environmental planning and design principles are applied, together with a flexible approach to design, a high degree of mitigation can be built into a development proposal from the outset.

Mitigation measures may be considered under two categories:

1. Primary mitigation measures - These are an intrinsic part of a proposal, achieved through iterative design development (i.e. Designing out potential issues);
2. Secondary mitigation measures - Designed to specifically targeted to address remaining negative (adverse) effects of the final development proposal.

The focus of this assessment is to identify potential landscape and visual effects generated by the proposed extractive operations at this site and recommend mitigation to minimise those effects.

Primary mitigation measures include:

- Collaboration with project planners & design consultants regarding recommended operational sequence and phasing to minimise visual impacts;
- Collaboration with project ecologist to agree appropriate restoration solutions.
- Retention, protection and strengthening as required of existing boundaries; and
- Progressive restoration

Secondary mitigation measures include:

- The existing extraction works are visually well concealed, therefore no additional targeted screening has been identified. Gapping up screen planting in existing hedgerows will be ongoing .
- The primary focus in terms of mitigation measures is the potential landscape and visual benefits generated by the removal of an existing visually prominent overburden tip. The reduction and gradual removal of the tip as shown in the proposed quarry development drawings is considered to be of benefit in landscape and visual terms.

9.8 Interactions

These effects are typically interactive, i.e. arising from the combined action of a number of different environmental topic areas. For example, the removal of trees not only has potential to generate landscape and visual impact, but can also have an ecological impact. There are a

number of topic areas were interaction impacts can occur along with Landscape and Visual, with key interactive effects in this case being:

9.8.1 Noise /Air Quality

Potential noise & air quality impacts are generally most prevalent during operational phases. Whilst these would have no visual impacts, they can alter people's perception of the areas landscape character. Measures to minimise noise and air quality impacts will reduce perceived landscape character impacts. Through a combination of directional extraction and earthwork screening berms, potential impacts from Noise / Air have been reduced.

During the operations phase potential interactive impacts would be Negative, with likely significance considered Minor. Post operations noise & air quality impacts would diminish and would be limited to typical traffic and day to day usage typical of this agricultural context.

Post operations, potential interactive impacts would be Neutral, with likely significance considered Negligible.

9.8.2 Natural Heritage

The ecological impact assessment report provides detail and recommendations, notably identifying the importance and value of hedgerows, grasslands and woodland areas. The proposed landscape restoration scheme offers a positive opportunity to restore the ecological diversity of this site through habitat creation on final slopes around the periphery of the proposed site. The Restoration Scheme will provide

opportunities for the development of species rich grasses and native woodland.

9.8.3 Cumulative Impacts Arising from other Developments

Cumulative effects may arise from the combined effects of other developments in the vicinity. Whilst there are a number of quarry operations within the region, it is considered that only the adjoining quarry to the west of the application site presents potential for cumulative impacts.

Given the close proximity of these operations, from a number of locations (particularly to the north) visually, both can viewed as a single operation.

The proposed removal of the large overburden store from the subject site will have a net positive impact and reduce the overall cumulative impacts currently associated with the operations. The cumulative impact of the proposed development in combination with other mineral developments is therefore expected to be **Negligible / None**.

9.9 Residual Impacts

Topographically the subject site is largely obscured from many locations. As described above, the areas which are likely to be exposed to the greatest residual visual impact are from localised stretches of minor roads to the north.

The majority of the remaining potential views occurring along the surrounding road network are generally insignificant and where achievable, normally only visible at angles to the vehicles forward field of

vision (oblique angles). This factor combined with the speed of moving vehicles, distance, fragmentation of views caused by hedgerows, trees, buildings, and local topographical variation etc. reduces the site's overall visual impact.

9.10 Conclusion

The following conclusions have been made based on the above investigation:

- The site lies outwith any identified landscape designation area.
- It is located in the South East of landscape character 'Central Lowlands' and on the boundary of 'Rathmolyon Lowlands' Co. Meath Draft Development Plan 2021-2027.
- The site is on the northern side of a local hill in the area of Tromman.
- Some field boundaries surrounding are reasonably mature and therefore provide significant screening of the proposed development.
- The visual catchment of the site is considered relatively small and is focussed primarily to the North.
- Population is considered low in the region, with low numbers located within the proposed visual envelope.
- The most open significant views of the site are limited to areas within close proximity of the site. This will impact a very low number of properties and public roads. Distance views are restricted by the presence of mature trees in hedgerows and copses which are common to the area.
- The various ancillary buildings and structures associated with the extractive operations would be decommissioned following the

completion of mineral extraction. The lands would be restored primarily to biodiversity use.

- Within the Meath County Development plan this Character Area is described as having Medium Landscape Sensitivity and High Landscape Value.
- On a localised level the Landscape sensitivity is considered to be **Medium- Low**
- The Magnitude of change to the landscape is considered **Low**.
- Overall the landscape impact/effect is collectively considered **Negligible**.
- Visual sensitivity is considered to range from **Medium to Low**.
- Magnitude of change incorporating mitigation from specific key visual receptors are illustrated in Figures 9.4 to 9.10 and are collectively considered **Medium to Very Low**.
- Overall the visual impacts/significance are collectively considered **Negligible**.

All impacts fall below the threshold considered to be **'significant'**.

10.0 AIR QUALITY

10.1 Introduction

This Air Quality Impact Assessment has been prepared to accompany the planning application for the proposed further development of the 21.64Ha quarry site including the extraction of limestone from an area of 14.3Ha using conventional drilling and blasting techniques and mineral reduction using mobile crushing and screening and the continuation of use of the ancillary works and structures for the life of the quarry, and the restoration and rehabilitation of the whole quarry site.

10.2 Author of the Report

This Air Quality Impact Assessment report has been prepared by Mervyn Keegan to be included as a standalone section within the larger EIAR . Mervyn Keegan is a Director of the environmental consultancy, AONA Environmental Consulting Ltd. Mervyn Keegan's areas of professional expertise are in Noise Control & Acoustics and Air Quality & Odour consultancy. Mervyn Keegan has over 25 years of environmental consultancy experience. Mervyn is a full member of the Institute of Acoustics, the Institute of Environmental Sciences and the Institute of Air Quality Management. Mervyn has a Bachelor of Science Degree (Applied Sciences), a Master of Science Degree (Environmental Science) and a Diploma in Acoustics in Noise Control. AONA Environmental Consulting Ltd. is an independent consultancy specialising in Environmental Impact Assessment and Licensing. Mervyn Keegan has prepared in excess of ten Noise & Vibration and Air Quality impact assessments annually for quarry developments in the Republic of Ireland, Northern Ireland and the UK in the last 20 years and is an expert in the

awareness and understanding of the relevant legislation and guidance that pertains to best practise in such assessments. Mervyn Keegan has appeared as an Expert Witness at oral hearings, public inquiries and legal hearings. Mervyn Keegan has produced Noise, Air Quality & Odour Impact Assessment reports to assess the impacts of a range of development types including roads, residential developments, industrial developments, quarries and mines and wind energy developments among others.

The Air Quality Impact Assessment has addressed the further development of the 21.64Ha quarry site including the extraction of limestone from an area of 14.3Ha using conventional drilling and blasting techniques and mineral reduction using mobile crushing and screening to a depth of 13mAOD as well as emissions from the associated structures and the impacts of the adjacent Kilsaran operation.

The site is located in the townland of Tromman, 2.2 kilometres northwest of Rathmolyon Village and 6.4km south of the town of Trim. The site is bounded to the west by Kilsaran's Tromman Quarry, to the south by the regional road R156 and to the north and east by agricultural fields. The precise location of the site's application area can be seen from Figure 1.1.

10.3 Methodology

10.3.1 Impact Assessment Methodology

This assessment of the air quality & dust impact has been undertaken as follows:

- Reference to historical quarterly dust deposition surveys at four boundary locations, to establish the current dust deposition rates in the area.
- A comparison of the measured quarterly dust deposition rates at four boundary locations against relevant guidelines.
- An assessment of the air quality & dust impact at the surrounding residential properties from the existing and proposed concrete manufacturing and quarrying activities at the Tromman Quarry site.

10.3.2 Relevant Guidelines & Standards

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

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

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

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

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

Total dust deposition (soluble and insoluble): 350 mg/m^2/day (when averaged over a 30-day period).

Planning Condition 15 of the Planning Permission Ref. TA/900976 requires the operator to monitor and record dust deposition levels. No dust deposition limits are specified.

Guidance on the Assessment of Mineral Dust Impacts (Institute of Air Quality Management - IAQM)

The Institute of Air Quality Management (IAQM) guidance document entitled Guidance on the Assessment of Mineral Dust Impacts for Planning (2016 V1.1), outlines that "emissions of dust to air from minerals sites can occur during the preparation of the land, extraction, processing, handling and transportation of extracted minerals. Emissions can vary substantially from day to day, depending on the level of activity, the specific operations being undertaken, and the weather conditions. The scale of these impacts depends on the dust suppression and other mitigation measures applied". This guidance provides advice on robust and consistent good-practice approaches that can be used to assess the operational-phase dust impacts for use in the planning process. The IAQM guidance document outlines a methodology by which it is possible to screen out the need for a detailed assessment based on the distance from a mineral site to potentially sensitive receptors and where the potential dust impact of a mineral site cannot be 'screened out', a more detailed dust assessment will be required.

The IAQM Guidance provides a flow chart to assess whether a detailed dust assessment should be undertaken. If there are no relevant receptors within 1 km of the operations, then a detailed dust assessment can be screened out. In such a case, it is considered that irrespective of the nature, size and operation of the site, the risk of an impact is likely to be "negligible" and any resulting effects are likely to be 'not significant'. In cases whereby receptors are located between 400m, or 250m (depending on the rock type) and 1km of operations, it would normally be assumed that a detailed disamenity dust impact assessment is not required. However, the decision on whether to assess should be made and justified on a site-specific basis by a suitably experienced air quality professional. If there are relevant human and/or ecological receptors within 250 m or 400 m (depending on the rock type) then a disamenity dust impact assessment will almost always be required, which means that assessments are required for most minerals development schemes. Therefore, in the case of the proposed development, as it is not possible for potential dust impact to be 'screened out', a more detailed dust assessment is required.

Dust Standards & Guideline Values

Statutory standards exist for concentrations of suspended particulate matter (both PM10 and the PM2.5) under The Air Quality Standards Regulations 2010.

Pollutant	Air Quality Objective	
	Measured as	**Concentration**
Particles (PM_{10})	Annual mean 24 hour mean	40 µg/m^3 50 µg/m^3, not to be exceeded > 35 times a year
Particles ($PM_{2.5}$)	Annual mean	25 µg/m^3

Table 10.1: Relevant Air Quality Standards Regulations (Ireland).

New World Health Organisation (WHO) Global Air Quality Guidelines (AQGs) were released in September 2021, and these provide clear evidence of the damage air pollution inflicts on human health, at even lower concentrations than previously understood. The guidelines recommend new air quality levels to protect the health of populations, by reducing levels of key air pollutants, some of which also contribute to climate change.

Pollutant	Air Quality Objective	
	Measured as	**Concentration**
Particles (PM_{10})	Annual mean 24 hour mean	15 µg/m^3 45 µg/m^3
Particles ($PM_{2.5}$)	Annual mean 24 hour mean	5 µg/m^3 15 µg/m^3 not to be exceeded more than 3-4 times a year

Table 10.2: WHO Air quality guideline values (September 2021)

No statutory air quality criterion has been set at a European, National or World Health Organisation (WHO) level, although a range of national 'yardstick' criteria from many countries is found in literature.

For the sensitivity of people to the health effects of PM10, the IAQM recommends that the air quality practitioner assumes that there are three sensitivities based on whether or not the receptor is likely to be exposed to elevated concentrations over a 24-hour period.

High sensitivity receptor -

- locations where members of the public are exposed over a time period relevant to the air quality objective for PM10 (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day)
- indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.

Medium sensitivity receptor -

- locations where people are occupationally exposed over a full working day.
- indicative examples include offices, warehouses and industrial units.

Low sensitivity receptor -

- locations where human exposure is transient.
- Indicative examples public footpaths, playing fields, parks and shopping streets.

In terms of the protection of the sensitive ecological habitats, the Guidance on the Assessment of Mineral Dust Impacts for Planning

contained within the IAQM guidance states that professional judgement is required to identify where on the spectrum between high and low sensitivity a receptor lies, taking into account the likely effect and the value of the ecological asset. A habitat may be highly valuable but not sensitive, alternatively it may be less valuable but more sensitive to dust deposition. For the sensitivity of ecosystems to dust deposition the IAQM recommends that an ecologist is consulted to determine the potential effects on plant communities.

The IAQM guidance defines high, medium and low sensitivity ecological receptors as follows;

High sensitivity receptor –

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

Medium sensitivity receptor –

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

Low sensitivity receptor –

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

In 2005, the UK Highways Agency released an Interim Advice Note 61/05 'Guidance for Undertaking Environmental Assessment of Air Quality for Sensitive Ecosystems in Internationally Designated Nature Conservation Sites and SSSIs' as a supplement to the Design Manual for Roads and Bridges (DMRB) Guidelines. This interim guidance states that dust or particles falling onto plants can physically smother the leaves affecting photosynthesis, respiration and transpiration. The literature suggests that the most sensitive species appear to be affected by dust deposition at levels above 1,000 mg/m2/day which is higher than the level at which most dust deposition may start to cause a perceptible nuisance to humans. As such, once dust deposition rates are maintained within the guidelines for human nuisance the impact of dust deposition on sensitive ecosystems is considered negligible.
Therefore, the following dust limits should be used in the assessment of dust levels from the proposed quarry extension;

- PM_{10} 24 Hour Mean concentration limit = 50 µg/m^3 not to be exceeded more than 35 times a calendar year
- PM_{10} Annual Mean concentration limit = 40 µg/m^3
- $PM_{2.5}$ Annual Mean concentration limit = 25 µg/m^3
- Dust Deposition Rate limit affecting sensitive ecological receptors = 1,000 mg/m2/day using a Bergerhoff gauge. (Ref. The Highways Agency, Design Manual for Roads and Bridges)

10.3.3 Dust Deposition Impact Assessment

In quarries, dust typically becomes airborne due to the action of wind on material stockpiles and other dusty surfaces, or when thrown up by mechanical action, for example the movement of tyres on a dusty road or activities such as blasting, drilling, screening, etc. There are many types of particulate matter (PM) that are included in the definition of dust, including variations in terms of size and chemical composition.

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

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

Large particles (100µm diameter) are likely to settle within 5-10m of their source under a typical mean wind speed of 4-5 m/s, and particles between 30-100 µm diameter are likely to settle within 100m of the source. Smaller particles, particularly those <10 µm in diameter, have a greater potential to have their settling rate impeded by atmospheric turbulence

and to be transported further from their source. Dust emissions are exacerbated by dry weather and high wind speeds. Therefore, the dust deposition impact depends on the wind direction and the relative location of the dust source and receptor.

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

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

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

The British Research Establishment (BRE) has previously published guidelines for ambient background dust deposition rates in different types of districts as follows;

Type of District	**Dust Deposition Rate ($mg/m^2/day$)**
Major city centre, heavy industrial area	1,040
Highly developed large urban area	520
Urban area of limited size with parkland or largely rural surroundings	260
Partially developed area	180
Rural area with little development	130

Table 10.3: British Research Establishment guidelines for ambient background dust deposition rates in different types of districts.

The immediate area around the Tromman Quarry site can be categorised as a "rural area with little development"/ "partially developed area". Therefore, it is considered that it is reasonable to assume that the background dust deposition rates for such areas range up to approximately 130 $mg/m^2/day$.

The prevailing meteorological conditions are the most significant issue which will affect the rate of dust deposition outside of the boundary of a quarry and its associated activities. Therefore, it can be assumed that during the drier months of the year, there is the potential for dust deposition rates to be higher than the annual average dust deposition rate. In order to establish an accurate existing baseline dust deposition level in the area, a 12 month dust deposition survey typically needs to be carried out. Also, as the existing quarry has been in operation in the area for in excess of 20 years, the existing baseline dust deposition level may be elevated above the normal rural levels. Tromman Quarry has been undertaking continuous dust deposition monitoring in accordance with the requirements of previous planning consents.

10.3.4 Dust Deposition Monitoring Methodology

The dust deposition monitoring locations in proximity to the Tromman Quarry have been determined after consideration of the requirements of German Standard Method VDI 2119 – 'Measurement of Dustfall, Determination of Dustfall using Bergerhoff Instrument (Standard Method) German Institute)'. Gauges were installed in consideration of requirements relating to location of the gauges relative to buildings and other obstructions, height above ground and sample collection and analysis procedures. Dust deposition monitoring is continuously undertaken using Bergerhoff glass deposition gauges at four monitoring locations at the entrance. Figure 10.1 illustrates the dust deposition monitoring locations.

Figure 10.1: Dust deposition monitoring locations (DDML).

The dust deposition monitoring surveys have been undertaken by Byrne Environmental since 2013 in accordance with the procedure in Standard Method VDI 2119 – '*Measurement of Dustfall, Determination of Dustfall using Bergerhoff Instrument (Standard Method) German Institute'*. The dust deposition monitoring surveys comprise of positioning of four Bergerhoff Dust Deposit Gauges at the locations described for a period of 30 (+- 2) days. After the exposure period is complete, the gauges are removed from the site and transported to an accredited laboratory under a strict chain of custody for analysis. The samples are evaporated down and the dry residue, and the total dust content determined gravimetrically and the

result reported in mg/sample. Results are expressed as a dust deposition rate in mg/m^2/day in accordance with the relevant standard.

10.4 Assessment of Baseline Conditions

10.4.1 Baseline Air Quality Data

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

There are no other significant air pollutant sources in the area other than the Keegan Quarries Ltdand Kilsaran's quarry which lies directly adjacent to the target site. Background air quality is most likely to be typical of rural areas, being primarily influenced by existing local traffic and agricultural activities, etc.

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

Rural East	Towns with population less than 5,000, villages and rural areas in Counties Carlow, Cavan, Dublin, Kildare, Kilkenny, Laois, Longford, Louth, Meath, Monaghan, Offaly, Tipperary, Waterford, Westmeath, Wexford and Wicklow.	Corresponds to part of Zone D

Based on the Environmental Protection Agency's Air Quality in Ireland Report 2022, the following background concentrations are likely in the area;

- Nitrogen dioxide (NO_2) – Zone C / D Average = 10.4 µg/m^3 – Limit Value 40 µg/m^3
- Sulphur dioxide (SO_2) – Zone D Average = 5 µg/m^3 – Limit Value 20 µg/m^3 (for the protection of vegetation)
- Particulate Matter (PM_{10}) – Zone D Average = 12.7 µg/m^3 – Limit Value 40 µg/m^3
- Particulate Matter ($PM_{2.5}$) – Zone D Average = 8.4 µg/m^3 – Limit Value 25 µg/m^3
- Nitrogen oxides (NOx) – Zone D Average = 14 µg/m^3 – Limit Value 30 µg/m^3 (for the protection of vegetation)

10.4.2 On-going Dust Deposition Monitoring Results

The dust deposition rates outlined below are the same as presented in the Air Quality Impact Assessment that has been prepared to accompany a rEIAR for an application for SC at Tromman Quarry.

The surrounding lands can be characterised as rural in nature with land uses in the area identified as agricultural, extractive and single house residential. The extractive industry is an established land use in the

surrounding area dominated by the subject site and the adjoining Kilsaran Quarry which borders the Tromman Quarry site to the west. As outlined in Table 10.4, since 1st Quarter 2013, there has been exceedances of the 350 mg/m^3/day limit value recorded at just three monitoring locations during the dust deposition surveys. The average dust deposition rate is well below the assessment limit for ambient dust impact of 350 mg/m^2/day. This dust deposition monitoring data includes the cumulative impact of the dust from the adjoining Kilsaran Quarry.

Period	Date	D1 (South)	D2 (East)	D3 (West)	D4 (North)
Qtr 1 2013	07/01/2013-07/02/2013	89	125	98	<45
Qtr 2 2013	03/06/2013-03/07/2013	88	64	172	49
Qtr 3 2013	02/09/2013-03/10/2019	<88	98	98	98
Qtr 4 2013	05/11/2013-03/12/2013	89	110	116	179
Qtr 1 2014	03/02/2014-03/03/2014	<53	<53	<53	<53
Qtr 2 2014	21/04/2014-21/05/2014	49	74	108	54
Qtr 3 2014	02/09/2014-02/10/2014	<49	<49	<49	<49
Qtr 4 2014	05/11/2014-04/12/2014	63	95	<51	52
Qtr 1 2015	17/01/2015-17/02/2015	<53	<53	<53	<53
Qtr 2 2015	18/05/2015-18/06/2015	<49	59	<49	137
Qtr 3 2015	01/09/2015-30/09/2015	<49	93	79	54
Qtr 4 2015	30/09/2015-30/10/2015	<49	<49	<49	<49
Qtr 1 2016	01/03/2016-01/04/2016	<48	<48	<48	<48
Qtr 2 2016	01/06/2016-30/06/2016	123	79	<49	<49
Qtr 3 2016	30/06/2016-26/07/2016	<57	<57	<57	<57
Qtr 4 2016	03/10/2016-03/11/2016	<48	<48	<48	<48
Qtr 1 2017	01/03/2017-30/03/2017	<51	<51	<51	<51
Qtr 2 2017	02/05/2017-03/06/2017	<46	<46	<46	<46
Qtr 3 2017	02/08/2017-1/09/2017	<49	<49	<49	<49
Qtr 4 2017	01/10/2017/-01/11/2017	<48	<48	<48	<48
Qtr 1 2018	04/01/2018-04/02/2018	<48	<48	152	124
Qtr 2 2018	04/05/2018-05/06/2018	<46	<46	<46	<46
Qtr 3 2018	02/07/2018-02/08/2018	48	62	214	76

Qtr 4 2018	01/10/2018-01/11/2018	<48	<48	<48	119
Qtr 1 2019	04/02/2019-04/03/2019	121	53	53	<53
Qtr 2 2019	01/06/2019-01/07/2019	157	137	<49	<64
Qtr 3 2019	03/09/2019-02/10/2019	63	76	624[4]	65
Qtr 4 2019	01/11/2019-02/12/2019	101	74	37	60
Qtr 1 2020	01/03/2020-31/03/2020	260	157	118	na
Qtr 2 2020	01/05/2020-31/5/2020	45	96	282	32
Qtr 3 2020	01/07/2020-31/07/2020	66	91	165	51
Qtr 4 2020	01/10/2020-31/10/2020	260	108	74	172
Qtr 1 2021	01/01/2021-31/01/2021	16	104	93	<11
Qtr 2 2021	01/05/2021-31/05/2021	93	167	59	118
Qtr 3 2021	01/08/2021-31/08/2021	63	16	84	299
Qtr 4 2021	01/10/2021-31/10/2021	109	123	128	78
Qtr 1 2022	01/02/2022-31/02/2022	314	71	24	171
Qtr 2 2022	01/05/2022-31/05/2022	128	67	242	200
Qtr 3 2022	01/09/2022-31/09/2022	77	49	661	95
Qtr 4 2022	01/10/2022-31/10/2022	356	259	334	117
Qtr 1 2023	01/02/2023-31/02/2023	181	329	208	203
Qtr 2 2023	01/05/2023-31/05/2023	143	107	97	147
Qtr 3 2023	01/07/2023-31/07/2023	328	290	297	198
Qtr 4 2023	01/10/2023-31/10/2023	108	136	126	156
Limit Value		**350 mg/m²/day**			

Table 10.4: Quarterly Dust Deposition monitoring survey results since 1st Quarter 2013 until the 4th Quarter of 2023 at Keegan Quarries Ltd., Tromman, Rathmolyon, Co. Meath.

10.4.3 Prevailing Meteorological Conditions

Meteorological conditions such as rainfall, wind speed and wind direction have the greatest impact on potential dust deposition impacts in proximity to the Tromman Quarry site.

[4] It was observed that the D3 deposition gauge was contaminated by organic matter including insects and bird faeces and as such this result should be discarded.

The closest representative Met Eireann weather station data to Tromman Quarry is located at Dunsany. This weather station is located ~15km NE of Tromman Quarry. Dunsany meteorological station records temperature and rainfall. Table 10.5 summarises the monthly rainfall values from January 2020 to December 2023. This data exhibits a relatively high rainfall level throughout the year (Long Term Average 59.7 mm in February – 90.6 mm in October), which acts as a significant natural dust suppressant on site.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2023	54.2	110.7	1210.9	70.9	25.1	50.5	184.5	1010.2	109.9	125.8	70.9	0.6	945.2
2022	29.5	118.1	38.2	35.3	63.8	64.0	34.7	14.1	126.4	141.1	81.9	81.0	828.1
2021	104.7	100.4	46.0	11.8	106.7	12.6	96.1	53.3	310.7	101.7	30.2	114.6	815.8
2020	55.1	1510.1	410.1	19.3	14.2	76.9	130.9	99.2	69.0	86.1	73.4	89.0	9110.3
LTA	80.2	59.7	63.4	61.1	65.1	71.5	61.4	710.7	71.8	90.6	84.0	83.2	869.7

Table 10.5: Monthly rainfall values for Dunsany from 2020 to 2023.

Wind direction is primarily from a south-westerly direction, which is represented in the windrose from Dublin Airport shown in Figure 10.2 [Note: the windrose indicates the wind 'Blowing From' direction]. This weather station is located ~40km east of Tromman Quarry.

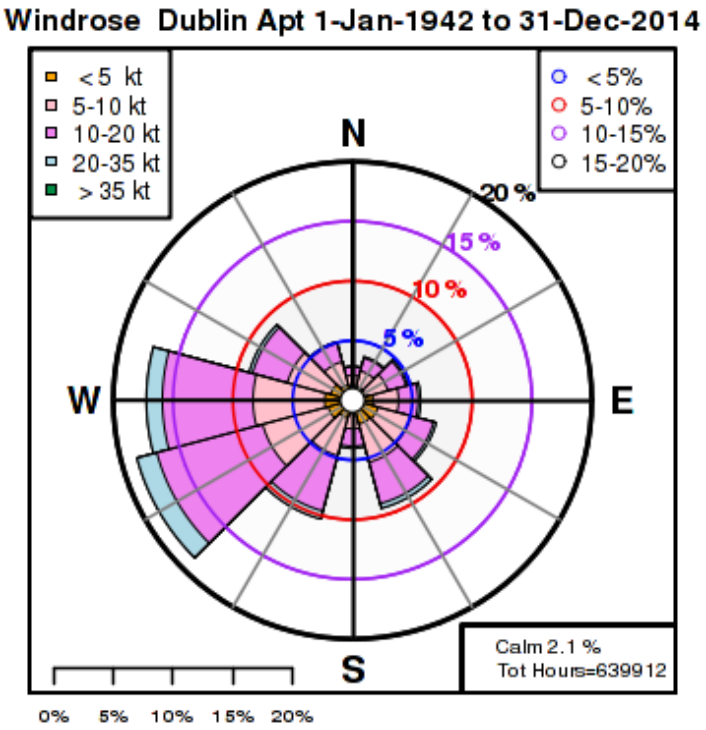


Figure 10.2: Met Eireann windrose for Dublin Airport (wind 'Blowing From' direction, i.e. prevailing south-westerly wind direction) (Source - https://www.met.ie/climate/what-we-measure/wind#).

10.5 Existing Air Quality & Dust Impacts

10.5.1 Existing Manufacturing Impacts

The results of the quarterly dust deposition surveys incorporate dust deposition impacts from the associated manufacturing installations. The results of the quarterly dust deposition surveys, primarily at DDML 4 assess the dust deposition impact from the northern area of the Tromman Quarry site, including the cumulative impact from the adjoining Kilsaran Quarry. This allows for the assessment of the present site layout with the erection of the pre-cast manufacturing unit on the eastern side of the concrete yard and the internal arrangement of the concrete block making yard and storage, reverting to its existing central location. The dust deposition rate

results are well in accordance with the limit value of 350 mg/m^2/day as recorded at this location in the last 10 years.

10.5.2 Existing Quarrying Impacts

The results of the quarterly dust deposition surveys address the existing extraction operations that post-date the extended appropriate period for the quarrying operations that Meath County Council consider to be unauthorised. The results of the quarterly dust deposition surveys, primarily at DDML 1, 2 and 3, including the cumulative impact from the adjoining Kilsaran Quarry, assess the dust deposition impact from the quarry area of the Tromman Quarry site. The dust deposition rate results are well in accordance with the limit value of 350 mg/m^2/day as recorded at these locations in the last 10 years.

10.5.3 Existing Cumulative Impacts

The results of the quarterly dust deposition surveys at DDML 1, 2, 3 and 4, including the cumulative impact from the adjoining Kilsaran Quarry, address the quarry extraction operations that post-date the extended appropriate period for the quarrying operations that Meath County Council consider to be unauthorised and the associated industrial structures and operations in the northern area of the site. The dust deposition rate results are well in accordance with the limit value of 350 mg/m^2/day as recorded at these locations in the last 10 years.

10.6 Predicted Impacts from the Proposed Development

The assessment to consider the impacts that can be expected to occur in the future as a result of the further development of the 21.64Ha quarry site

including the extraction of limestone from an area of 14.3Ha using conventional drilling and blasting techniques and mineral reduction using mobile crushing and screening to a depth of 13mAOD is outlined below. This considers the significant effects, or impacts, that can reasonably be expected to occur as a result of further quarrying and the continued operation of the ancillary structures and buildings. It is envisaged that the proposed continuation of use of the site together with the proposed development, in line with the environmental parameters previously assessed, would continue to be environmentally acceptable.

It is reasonable to suggest that there would be no change anticipated from the continuation of the associated manufacturing operations on the site, i.e. existing dust deposition rates will remain the same.

The extraction of limestone from an area of 14.3ha using conventional drilling and blasting techniques and mineral reduction using mobile crushing and screening to a depth of 13mAOD with associated HGV traffic movements as per the current rates of extraction is likely to result in similar dust deposition rates in proximity to the quarry site. If anything, it is reasonable to expect that future dust deposition rates should be lower as the development descends to lower depths allowing for increased attenuation of windblown dusts by higher quarry faces.

Wind speed and direction have the greatest potential impact on dust deposition impacts in proximity to the site. The predominant wind direction is from the south-west quarter, with winds from the south to west direction occurring most frequently. The properties to the north-east of the site, i.e. downwind of the prevailing wind direction are in excess of 1 Km away from the quarry void and therefore, highly unlikely to experience a dust nuisance impact at such distances.

It is considered that the increase in risk of elevated dust impacts in the vicinity of the proposed extraction area will be negligible for all receptors. An increased risk of dust impacts is unlikely due to the deepening of the proposed quarrying operations and hence the increased mitigating effects of the existing quarry faces, screening bunds and surrounding vegetation. Therefore, the risk of nuisance dust impacts occurring is considered unlikely.

The cumulative dust deposition impacts from the associated structures in the northern area of the Tromman Quarry site, the adjacent Kilsaran Quarry dust emissions and the proposed extraction operations have been assessed. The dust deposition impacts are most unlikely to result in an exceedance of the 350 mg/m^2/day limit at the Tromman Quarry boundary locations.

Dust deposition impacts from de-commissioning of the quarry site including the regrading of the benches in the existing extraction area and subsequent infill with groundwater may result in short-term dust deposition impacts. Such activities will include movement of overburden, internal bund construction, restorative planting works, de-commissioning of plant and equipment, etc. Typically, such works will be carried out during an 8 week window per annum. These short-term works will be implemented in accordance with the proposed restoration concept for the site.

The assessment to consider the dust impact that can be expected to occur in the future as a result of the proposed development at the Tromman Quarry site including extraction of limestone using conventional drilling and blasting techniques and extraction using mobile excavator and haul truck movements is outlined below. This considers the potential significant effects, or impacts, that can reasonably be expected to occur

as a result of quarrying. It is reasonable to suggest that there will be no change anticipated from the continuation of the associated operations at the quarry, i.e. existing potential dust sources which are highly controlled will remain the same. It is envisaged that the proposed continuation of use of the processing plant together with the further deepening of the quarry development, in line with the environmental parameters previously assessed, will continue to be undertaken and will be environmentally acceptable.

10.6.1 Dust Sensitive Receptors

The magnitude of the potential impact was assessed for all receptors. This assessment was based on the following:

- Sensitive receptors are naturally screened by existing hedgerows and trees and surrounding topography;
- The previous and proposed development of the quarry, includes the establishment of significant perimeter earth berms and quarry faces which reduce the potential for wind-blown dusts off site;
- The continued development of the quarry method of working into the quarry faces will continue to create a barrier for potential dust migration to nearby receptors; and
- Existing dust management methods employed on site will be maintained.

Figure 10.3 and Table 10.6 indicates that there are no properties within 250m to the north-east of the proposed quarry extension area, i.e. downwind of the prevailing wind direction. Beyond 250m it is highly unlikely that any receptors will experience a dust nuisance.

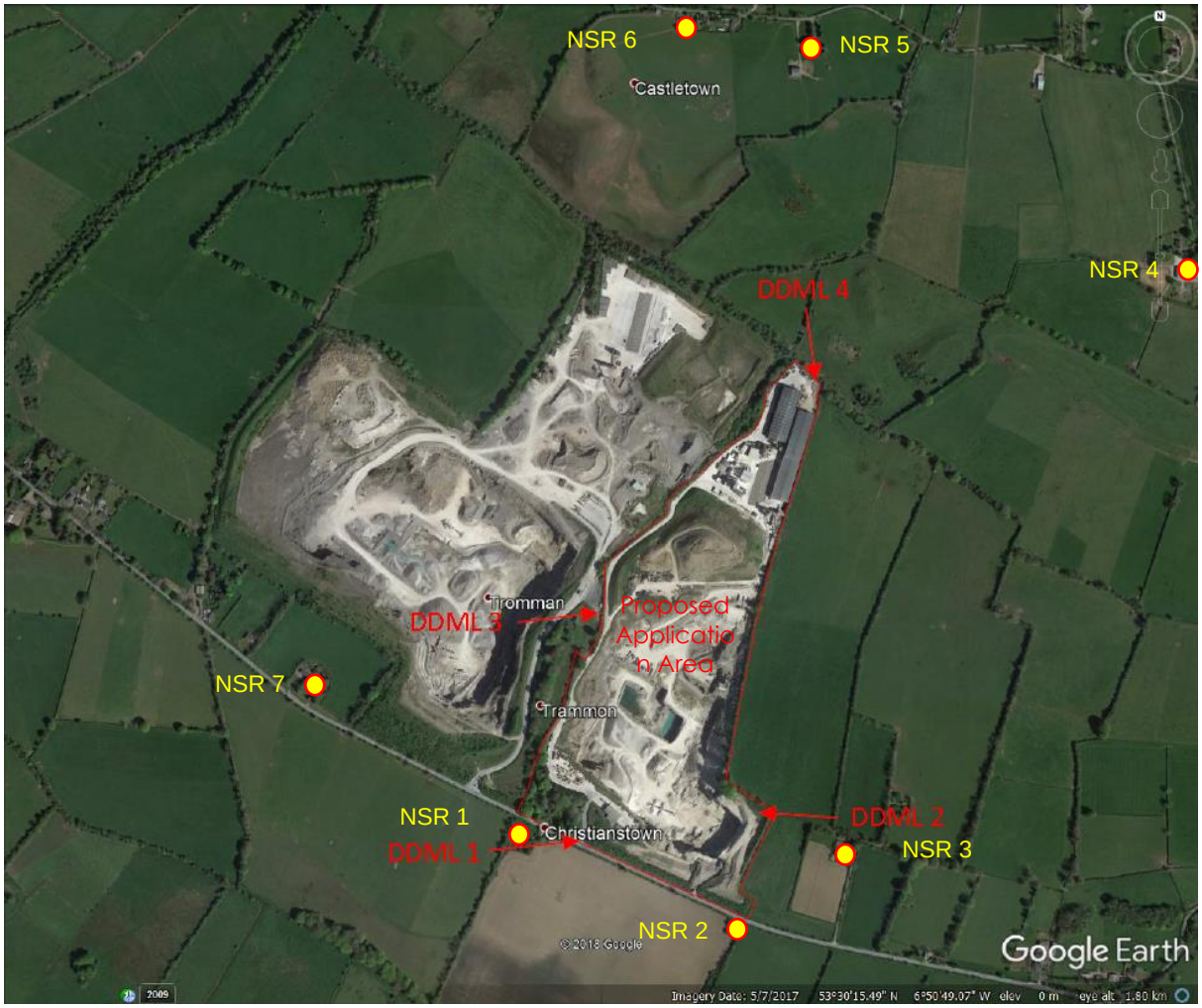


Figure 10.3: Nearest Sensitive Receptors (NSR) in proximity to Tromman Quarry

Reference	Grid Coordinates		Distance to dust source (Mineral extraction)
NSR 1	277361	250276	~160 m
NSR 2	277435	249805	~130 m
NSR 3	277801	249658	~170 m
NSR 4	277977	249793	~900 m
NSR 5	278574	250854	~855 m
NSR 6	277928	251191	~890 m
NSR 7	277733	251231	~420 m

Table 10.6: Nearest sensitive receiver locations.

Table 10.6 provides a list of the 7 nearest sensitive receptor properties surrounding the planning application area, of which 3 are located within 400m of existing and proposed quarry operations. The nearest sensitive receptor property is located within ~130m of the proposed quarry operations. The dust impact assessment is based upon nearest sensitive receptor proximity to the proposed development site. Each receptor chosen is considered to illustrate the worst-case scenario relative to the wind direction and proximity to proposed workings. Four residential receptors located in excess of 400m from the quarry (NSR 4, 5, 6 and 7) have been screened out from detailed consideration due to their distance to existing and proposed workings.

10.6.2 Potential Dust Impact from Activities

The following aspects of the proposed development have been identified that could possibly give rise to an impact on the air quality environment of the surrounding area:

- Excavation, drilling / blasting of mineral and processing;
- Loading and despatch of vehicles;
- On-site transportation of material; and,
- Overburden Stripping, material placement and Restoration.

The inherent mitigation factors have also been examined in the following sections.

Excavation, drilling / blasting of mineral and processing

The operational methodology within the proposed extension will follow previously approved methodology which is ongoing within the existing quarry. The extraction of mineral using conventional drilling and blasting techniques, as required, and extraction using mobile excavator with associated HGV traffic movements as per the current rates of extraction (will result in similar dust deposition rates in proximity to the quarry site).

As is the current, approved practice at the quarry, the blasted rock will be processed on the quarry floor using mobile crushing and screening plant to produce a range of aggregate sizes. This plant is fully mobile and able to operate on any standard bench; thus, removing the requirement for the blast rock to be hauled elsewhere within the quarry, or off-site for processing. The modern mobile plant is fitted with dust suppression units and enclosures of all potential emission points. As the quarry deepens, the

quarry faces will provide additional attenuation in terms of dust generated by the processing plant. Processed material will be stockpiled on the quarry floor prior to being loaded into HGV's for dispatch off-site or use in the manufacturing plant on site.

It is proposed that the rock will be extracted at the same rate per annum to that which presently occurs on site.

Loading and despatch of vehicles; and onsite transportation of material

There is no requirement to alter the existing mobile plant utilised at Tromman Quarry. Material will be liberated at the face via drill and blast technology. Material in the blast pile will be loaded into the mobile processing equipment via a tracked face excavator, crushed and screened before being transported from the quarry via HGV or hauled to the manufacturing plant area by dump truck. Existing mobile plant on site includes excavators, crushers and screeners, trucks and wheeled loading shovels.

There will be no change in the number of movements per hour from the area of extraction and processing to and from the site access area. The weight of vehicles, their speed and the number of wheels in contact with the ground can all affect the resuspension of dust deposits on road surfaces. Strict site speed limits will continue to be enforced (10kph) to minimise dust generation. Dust control measures will continue to be implemented on site for the control of dust during prolonged dry periods and will be reflected in the Dust Management Plan. This includes for the dampening of the haul routes using a water bowser as necessary. The implementation of such mitigation measures is in accordance with best practice as currently takes place at the existing Tromman Quarry site.

Restoration

Following the completion of mineral extraction, the site will be restored in accordance with the submitted restoration concept to create a waterbody and a range of biodiverse habitats. Details of the proposed planting ratios are detailed on the restoration scheme, with the aim of allowing the site to assimilate back into the local landscape as well as delivering biodiversity improvements.

Following the cessation of operations at the site, all vehicles, plant and equipment related to the proposed development will be removed.

Following the cessation of mineral extraction at the site and the associated management of water via de-watering, groundwater levels will rebound to see a water body (lake) formed within the quarry void following the exhaustion of permitted reserves.

10.6.3 Dust Impact on Ecological Receptors

The ecological effects resulting from the predicted dust impact must be assessed. An 'ecological receptor' refers to any sensitive habitat affected by dust deposition. This includes the direct impacts on vegetation or aquatic ecosystems, and the indirect impacts on fauna (e.g. on foraging habitats). For locations with a statutory designation, e.g. Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs), consideration should be given as to whether the particular site is sensitive to dust and this will depend on why it has been designated. Some non-statutory sites (i.e. local wildlife sites) and/or locations with very specific sensitivities may also be considered if appropriate.

If there are relevant ecological receptors within 250 m or 400 m (depending on the rock type) then an assessment of the ecological effects resulting from the predicted dust impact is required. There are no sensitive habitats in close proximity to the quarry. The nearest sensitive habitat to Tromman Quarry is River Boyne And River Blackwater SAC, which is located ~1 km to the west. Rathmolyon Esker pNHA is located ~2 km to the west. Therefore, due to the significant separation distance between the site and the nearest sensitive habitat, any further assessment of the ecological effects resulting from the predicted dust impact is not required in this instance.

10.6.4 Assessment of Potential Dust Impacts

The IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning gives an illustrative example of a dust risk assessment for a minerals site based on the underlying IAQM assessment procedure set out in Section 5.1 of the guidance in Appendix 3. The example provides a series of assessment matrices which are used to estimate the Dust Impact Risk, the Pathway Effectiveness and the Likely Magnitude of Disamenity Effects at each receptor. The latter is used to determine whether overall there is likely to be a significant effect or not on the surrounding area.

Estimation of Dust Impact Risk

Estimation of Residual Source Emissions
The Dust Impact Risk was determined for each of the main operational activities:

a. Site preparation and restoration; (Overburden Stripping & Restoration)

b. Mineral extraction;
c. Materials handling;
d. On-site transportation;
e. Mineral processing;
f. Stockpiles and other exposed surfaces;
g. Off-site transportation (track-out).

More than one of these activities may occur at any one time, and this was taken into consideration in the assessment. Owing to the long-term nature of this mineral's development, the site was divided into 'zones' for the dust risk assessment, considering the proposed phases of extraction and the mitigation measures that are applied on site. The Residual Source Emissions was based on the scale of the anticipated operations and was classified as Small, Medium, or Large for each relevant operational activity in each phase, taking into account the designed-in mitigation. The Residual Source Emissions for each activity are presented in Table 10.7.

Activity	Residual Source Emissions	Notes
Site preparation and restoration	Small	Site Preparation - Perimeter noise bunds already in place along boundary, with little or no overburden material movement required. Proposal for deepening of existing quarry.
Mineral extraction	Medium	Working area = no change to current extraction rate. Further development of the 21.64Ha quarry site including the extraction of limestone from an area of 14.3Ha using conventional drilling and blasting techniques and mineral reduction using mobile crushing and screening
Materials handling	Medium	>5 plant, within 50 m from site boundary within the quarry on hard standing haul roads
On-site transportation	Medium	<20 haul truck movements per hour - ~200 movements per day, haul roads >500m in length
Mineral processing	Medium	Mobile crusher and screener processing – no change to current extraction rate.
Stockpiles and other exposed surfaces	Medium	Stockpile duration of >1 month with a total area >1 ha
Off-site transportation	N/A	As per current rate from existing processing area.

Table 10.7. Residual Source Emissions Classification

On the basis of the fact that 'mineral extraction' and 'on-site transportation' will be the main potential continuous dust sources on site, a **medium** Residual Source Emission Classification for each of the phases has been selected.

Estimation of Pathway Effectiveness

The site-specific factors considered to determine the Effectiveness of the Pathway were the distance and direction of receptors relative to the prevailing wind directions. There are three receptors identified within 400m of the site (See Table 10.6) and therefore each receptor was considered separately. For each receptor within 400 m of the site boundary the wind direction from the proposed dust source was considered. The frequencies of wind in each direction were then calculated based on meteorological wind direction data for a representative meteorological station as shown in Figure 10.2. The resulting frequency of moderate to high wind speeds (>5 m/s) with the potential of carrying airborne dust towards receptors were then assigned to the categories in Table 10.8 based on 12 x 30° wind direction sectors.

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

Table 10.8. Categorisation of Frequency of Potentially Dusty Winds

The categorisation shown in Table 10.8 was applied to the distance from each receptor to source.

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

Table 10.9. Categorisation of Receptor Distance from Source

The pathway effectiveness was classified using the Frequency of Potentially Dusty Winds from Table 10.8 and the Receptor Distance from Source from Table 10.9, as shown in Table 10.10.

		Frequency of potentially dusty winds			
		Infrequent	**Moderately frequent**	**Frequent**	**Very frequent**
Receptor Distance Category	Close	Ineffective	Moderately Effective	Highly Effective	Highly Effective
	Intermediate	Ineffective	Moderately Effective	Moderately Effective	Highly Effective
	Distant	Ineffective	Ineffective	Moderately Effective	Moderately Effective

Table 10.10. Pathway Effectiveness

Estimation of Dust Impact Risk

The Residual Source Emissions and the Pathway Effectiveness were combined to predict the Dust Impact Risk as shown in Table 10.11.

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

Table 10.11. Descriptors for Magnitude of Dust Effects

Estimate Likely Magnitude of Disamenity Effects

The likely disamenity effect at each receptor was determined from the Dust Impact Risk (Table 10.11) and the Receptor Sensitivity, as shown in Table 10.12.

Level of Risk	**Receptor Sensitivity**		
	Low	**Medium**	**Large**
High Risk	Slight Adverse Effect	Moderate Adverse Effect	Substantial Adverse Effect
Medium Risk	Negligible Effect	Slight Adverse Effect	Moderate Adverse Effect
Low Risk	Negligible Effect	Negligible Effect	Slight Adverse Effect
Negligible Risk	Negligible Effect	Negligible Effect	Negligible Effect

Table 10.12. Dust Disamenity Effects at Specific Representative Receptors

The dust disamenity effects predicted at each receptor around the proposed minerals extraction development is summarised in Table 10.13, setting out the risks of impacts for each activity being assessed.

Ref. (See Fig. 10.3)	Location relative to nearest dust source	Residual Source Emissions	Pathway Effectiveness	Dust Impact Risk	Receptor Sensitivity	Magnitude of Dust Effect
DSR 1 Note 1	~160m "upwind" of mineral extraction	Medium	Ineffective (Infrequent & Intermediate)	Negligible Risk	Large	Negligible Effect
DSR 2 Note 2	~130m "crosswind" of mineral extraction	Medium	Ineffective (Infrequent & Intermediate)	Negligible Risk	Large	Negligible Effect
DSR 3Note 3	~170m "downwind" of mineral extraction	Medium	Moderately Effective (Moderately frequent & Intermediate)	Low Risk	Large	Slight Adverse Effect

Table 10.13. Dust Disamenity Effects at Specific Representative Receptors

Note 1 – DSR 1 represents the property to the south-west of Tromman Quarry. The windrose in Figure 10.2 indicates that the wind may blow towards this property at >5m/s for <5% of the time.

Note 2 – DSR 2 represents the property to the to the south-east of the proposed development. (The windrose in Figure 10.2 indicates that the wind may blow towards this property at >5m/s for <5% of the time.

Note 3 – DSR 3 represents the property to the east of the proposed development. The windrose in Figure 10.2 indicates that the wind may blow towards these properties at >5m/s for approximately 5-10% of the time.

Overall, the proposed development is considered to have the potential to cause a 'Slight Adverse Effect' at the nearest residential receptors in the surrounding area. Therefore, the overall effect is considered to be 'not

significant'. This is based on a consideration of the different magnitude of effects at individual receptors, and the number of receptors that would experience these different effects. The existing site dust management practices are considered to be appropriate to mitigate the potential impacts.

10.7 Mitigation Measures

The following dust mitigation measures are employed to minimise operational impacts. The aim of these mitigation measures is to minimise the release of dust to the environment. Outlined in detail below are the dust suppression measures which are currently employed, and will continue to be employed, at the Tromman Quarry site.

10.7.1 Operating and Dust Mitigation Measures:

The site manager has overall responsibility for insuring that operations within the Tromman Quarry site comply with the requirements of any planning authorisation. The site has at its disposal a suitable water bowser and associated water supply to allow for dampening down of the site when windblown dust from its surface arises. This is in very regular use on site. The occurrence of potential wind-blown dust is weather dependent but suitable facilities are available to minimise windblown dust from the site surfaces.

Dust mitigation measures are undertaken in accordance with the EMS for Keegan Quarries Ltd, held at Appendix 3.1. Tromman Quarry dated August 2019, as prepared by Byrne Environmental and reviewed in 2023 by the Applicant. Section 4.5 Air Quality of the EMS outlines dust and air quality mitigation measures that are adhered to on site.

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

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

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

10.7.3 Stockpiling Operations

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

- Stockpiling and offloading operations to the processing plant and equipment is co-ordinated in such a way as to minimise the potential for double handling of material.
- Unloading of materials within the facility is carefully planned to ensure minimum exposure to winds, thereby reducing dust emission to air.
- The aims of the stockpiling procedure is to ensure that management of the stockpile is conducted in such a way that releases of dust to atmosphere are minimised.
- Stockpile areas are clearly and physically delineated to deter vehicles from running over mineral extract at the stock edge.
- Stockpiles are managed to ensure that the profile of material will minimise wind whipping.
- During any stockpiling, stockpiles are profiled and compacted by flattening out peaks and ridges and when partially worked, are re-contoured to prevent ridges or overhanging falls.
- Whenever possible, settled stockpiles are not be broken into when the wind is likely to lift newly exposed dry dust. When this is unavoidable, effective dust control methods are implemented.
- Prior to carrying out any stock handling operations, the dust suppression equipment is checked to ensure that it is working properly.

10.7.4 Monitoring & Reporting

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

10.8 Monitoring

Dust monitoring will continue to be carried out on a quarterly basis by Byrne Environmental at the existing monitoring locations, previously agreed with the Planning Authority. If the level of dust is found to exceed the dust deposition limits as outlined above as 350 mg/m^2/day, at the perimeter of the site, immediate action will be taken, and additional mitigation measures will be incorporated to control any dust emission.

10.9 Assessment of Impacts against likely evolution of baseline Scenario

In terms of the likely evolution of the baseline, two scenarios have been identified: one is that the quarry continues to operate, the impacts of this have been sufficiently considered in the above sections. The alternative baseline scenario is that the Site is restored and remediated. In this instance, there would be short term impacts associated with the

restoration of the quarry, following which, all activity at the site would cease and dust generation (and associated impacts) would be negligible.

When assessing the proposed development against the alternative baseline scenario, the proposed development would result in dust impacts which otherwise would not be experienced. However, given the consistent compliance with dust deposition limits at the site boundary to date and the fact that any future development at the site will be required to be undertaken in accordance with the same, the proposed development is not considered to result in any effects upon the environment over and above those currently being experienced.

Should existing quarrying and associated manufacturing operations on the site cease, any potential dust from de-commissioning of the industrial structures in the northern area of the Tromman Quarry site and / or the regrading of the benches in the existing extraction area and subsequent infill with groundwater will be short-term dust impacts. Such activities may include overburden removal, bund de-construction, restoration works, de-commissioning of plant and equipment, etc.

10.10 Conclusion

The potential for any dust arising from the proposed extraction of limestone using conventional drilling and blasting techniques and mineral reduction using mobile crushing and screening to a depth of 13mAOD with associated HGV traffic movements as per the current rates of extraction at the Tromman Quarry site has been assessed.

It is considered that the potential for nuisance impact has been, and is limited to, the immediate vicinity of the existing activities, even without dust

suppression measures in operation, because of the quarried materials predominantly coarse nature. The potential for nuisance dust impacts is considered to be negligible at the nearest sensitive receptors and dust deposition monitoring results of the existing exposed quarried surfaces and associated industrial activities to the north of the site indicate very low dust deposition levels at the site entrance and along the site boundary.

The impacts that are expected to occur with the proposed extraction of limestone using conventional drilling and blasting techniques and mineral reduction using mobile crushing and screening to a depth of 13mAOD with associated HGV traffic movements as previously permitted rates of extraction at the Tromman Quarry have been assessed and do not give rise to any significant environmental impact. Given that ongoing monitoring has confirmed operations consistently have cumulatively operated below the guideline figure provided for in the DOEHLG 2006 recommended levels, it is considered reasonable to predict that the further quarry and ancillary operations within the existing site footprint, albeit at greater depths will continue to comply with the outlined limits.

It is considered that the potential for dust nuisance impact has been, and is limited to, the immediate vicinity of the existing activities because of the quarried materials predominantly coarse nature, with dust suppression measures in operation, as required. Overall, the proposed extraction area is considered to have the potential to cause a 'Slight Adverse Effect' at the residential receptors in the surrounding area and, the overall effect of the proposed development below existing extraction levels is considered to be 'not significant' and will result in a 'Negligible Effect' at the nearest residential properties.

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

The existing quarrying activities have been continuously reported to be in compliance with the dust deposition limit value of 350 mg/m^2/day at all monitoring locations and there is no significant potential for increased dust deposition impact.

11.0 TRAFFIC

11.1 Background

A full traffic impact assessment specifically assessing quarrying activities has been carried out in November 2009, by Roughan & O'Donovan Consulting Engineers (RDCE) for application TA900976 and the associated Board decision PL17.235960.

In addition to the RDCE report referenced above, RCDE were also engaged by Keegan Quarries in September 2020 to undertake a Traffic Impact Assessment for the planning application made under Section 34 of the Act for the proposed further development of Tromman Quarry (Meath Co. Co. planning register reference TA200151, RFI Item 5). Reference is drawn to this report, held at Appendix 11.1, within this Section.

The consecutive assessments covering a number of applications as cited in Section 2 have also analysed the prevailing traffic movements in the context of the existing road infrastructure, with Picady junction analysis, vehicle number counts and haul route analysis.

However, in this particular instance it is essential to consider the impact of vehicle movements that have occurred from the quarry site in the context of baseline, given the site's presence and consistent level of activity over a 30 year period, thus inexorably forming part of the local highways activity.

Therefore, any assessment of the future activity levels and its potential for impact, is required to be measured against the previous levels of activity,

in order to establish whether there is intensification and potential for significant impact.

From the commencement of operation of the original Meath County Council planning consent 97-1868 in 1998, Tromman Quarry has operated at a permitted ceiling rate of up to 250,000 tonnes per annum (tpa). Since the original assessment there have been considerable alterations to on-site production techniques and heavy goods vehicles load capacity. The purpose of this section is to evaluate the traffic activity, associated with the existing and predicted sales composition, generated from the further operation of the existing quarry within the established upper limit of 250,000tpa.

11.2 Historical Vehicle Movements – Baseline

The figures analysed by RDCE in 2009 related to the immediately preceding sales years, which are widely acknowledged to have seen the highest operating levels for Irish quarries, with Tromman being no different.

Accordingly, sales figures have been provided by Keegan Quarries Limited in consecutive EIS's from the year 2000 up until the most recent application in December 2016 and consistently the vehicular activity levels associated with an upper limit of 250,000tpa of aggregate production has been assessed as a worst-case scenario.

The most concise analysis of the worst-case scenario is provided by RDCE in section 12.3.2 of the aforementioned EIS where they outline:

"The existing site extracts up to 250,000 tonnes of crushed stone per annum. The proposed development will not increase the rate of extraction

of crushed stone per annum from the site. It is proposed that 100,000 tonnes of crushed stone be used in the block making plant and pre-cast unit factory. There will be no additional trips generated by the removal of raw material from the site and any external trips. The number of heavy vehicle trips the entire development will generate has been calculated as follows:

- *HGV trips are evenly distributed throughout the day;*
- *Inbound HGV trips equal outbound HGV trips;*
- *110 existing trips by heavy goods vehicles (HGVs) per day (two-way, i.e. 55 loads);*
- *Assuming operation between 07:00 and 19:00 a total of 9 heavy goods vehicle trips per hour (two-way);*
- *Employee trips to and from the site are evenly distributed between east and west;*
- *80% employees arrive during the peak hour;*
- *Employee outbound trips during the peak hour equals 10% employee inbound trips"*

It follows that any vehicle movement activity at levels less than those assessed with 250,000tpa, some 55 two way movements (110 trips), will cause less of an impact and no form of intensification / additional impact can be forthcoming.

The findings of traffic count data for the 2009 ROD Report confirms that heavy goods vehicles make up approximately 10% of all vehicle movements on the surrounding network over a 24 hour period and that the existing access at Tromman Quarry has been operating at levels that "well within capacity with no queuing or delay under the anticipated traffic flows".

Historic output levels from the baseline date of 2013 until present are presented and analysed in Table 11.1 and 11.2 respectively.

Sales by Product	Unit by Product	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
RMC	m3	3,282	4,330	7,421	8,903	10,554	17,656	18,253	15,320	18,810	20,784
Blocks	tonnes	4,052	15,787	20,041	22,748	25,660	26,290	25,470	24,570	28,009	29,547
Ags	tonnes	23,291	30,351	40,601	60,054	80,207	85,151	88,489	79,439	90,560	93,645
Ags Pre Cast	tonnes	14,708	20,195	34,865	31,184	24,584	31,635	34,961	31,565	33,704	36,549
Lime	tonnes	3,509	4,158	3,828	5,293	6,152	4,739	5,402	4,429	6,027	7,458
RMC	*tonnes (m3x2)*	*6,564*	*8,660*	*14,842*	*17,806*	*21,108*	*35,312*	*36,506*	*30,640*	*37,620*	*41,568*
	Total annual Aggregate tonnages	**52,124**	**79,151**	**114,177**	**137,085**	**157,711**	**183,127**	**190,828**	**170,643**	**195,920**	**208,767**

Table 11.1 Sales analysis of product by type and equivalent aggregate consumption.

2022	Av.Load Capacity (tonnes)	Annual Loads	Daily Loads
20,784	7	2970	11
29,547	19	1555	6
93,645	25	3746	14
36,549	27	1354	5
7,458	27	276	1
			37

Table 11.2 – Analysis of worst-case scenario year (maximum output) over the baseline timeframe to provide daily vehicle movement figures.

As detailed in Section 2.2 of the 2020 ROD Report, held at Appendix 11.1, an Automatic Traffic Counts (ATC) survey on the R156, R159, R160 and R161 was carried out in 2009. A growth factor was calculated using traffic growth data from a TII permanently fixed traffic counter on the M4 west of Junction 7 (Maynooth). This is the closest TII counter with traffic data extending back as far as 2009.

Analysis within the 2020 ROD Report indicates that the 2020 baseline traffic volume was 3,234 vehicles per day with 315 HGVs or 9.7% of the total traffic volume. The method of projecting the 2009 traffic survey information to subsequent years was verified using a 2016 ATC survey provided by Meath Co. Co. The survey was captured in June 2016 on the R156, west of R159.

The projected 2016 Annual Average Daily Traffic (AADT) on the R156 was compared to the 2016 ATC survey. The projected AADT figure was 3.4% greater than the actual AADT recorded in 2016. The projected HGV figure was within 1% of the HGV figure from the ATC survey. This shows that the method used to estimate the 2020 baseline traffic was acceptable in the absence of up-to-date data.

11.2.1 Haul Routes

Given that the proposal is for further quarrying, the existing haul routes used by Keegan Quarries remain valid and in line with those previously agreed with Meath County Council's Roads Department at the time of the last extraction permission and are shown in Figure 11.1, held at Appendix 11.2.

Approximately 40% of Keegan Quarries' custom is generated along the N3 corridor; 40% is generated along the N4 / M4 corridor west of Enfield and; he remaining 20% of custom is accounted for by the Dunboyne area and the N4/M4 east of Kilcock.

There will be no additional haul routes utilised. HGV traffic will continue to follow these specified and evaluated routes to their destinations.

11.2.2 Site Access

The impact of the proposed development at the existing access to Keegan Quarries has been assessed using PICADY software developed by the Transport Research Laboratory of the UK for the capacity assessment of priority junctions. Based on the previous assumptions made in regard to the traffic generated by the development a summary of the PICADY results is shown in Table 12.1 below.

	AM Peak Hour			PM Peak Hour		
	RFC	Queue Length (veh)	Average Delay (min/veh)	RFC	Queue Length (veh)	Average Delay (min/veh)
R156 East	0.01	0.0	0.05	0.02	0.0	0.03
R156 West	0.00	0.0		0.00	0.0	
Existing Access	0.05	0.0		0.03	0.1	

Table 12.1 Summary of PICADY Results

RFC – Ratio of Flow Capacity

A priority junction is considered to operate within capacity when the RFC is less than 0.85. The PICADY analysis shows that the highest RFC will be 0.05, well below the recommended maximum of 0.85. These results show that the existing entrance will operate well within capacity with no queuing or delay under the anticipated traffic flows.

The upgrading of the site's entrance through cutting back vegetation to improve sightlines and adding a sprinkler system to the avenue will have a positive impact on the safety of the R156 road. See Figure 11.2, held at Appendix 11.2.

11.3 Impacts

What is understood from the analysis undertaken for the preceding rEIAR and illustrated in Table 11.2 is that extraction output, in line with economic recovery nationally has steadily risen from a historic low in 2013 over the subsequent period, most recently in 2022 to c.84% of level previously assessed and approved under TA/30334 An Bord Pleanála Reference Number: PL 17.206702. The impacts were assessed against daily vehicle movements of 110 (20 tonne payload) vehicle movements per day.

What is apparent from the figures above is that there has been a shift in sales makeup at the Site with a move to lower volumes but higher value products, which ties in with the development in the Northern precast manufacturing area. This has also coincided with the requirement for greater delivery efficiency with a greater proportion of loads being delivered by articulated vehicle, with a 30-tonne payload.

This has resulted in the number of vehicles being utilised for delivery having dropped to a figure in the region of 67% of the number originally assessed in 2004 whilst the extraction volumes are operating at levels of c.84%. In short, the volume of aggregate being extracted has steadily grown however, due to the nature of the products manufactured at the Site and the volume of material which can be transported per load, traffic movements have not increased at the same rate of extraction and are still well below those previously assessed and considered acceptable.

The proposed continuation of the recent years' peak activity levels, will result in projected vehicle movements at levels less than those previously assessed (55 two-way vehicle movements) and constituting part of the existing baseline.

Therefore, there will be no intensification of use of the site access, or indeed along the haul routes to be associated with the further (continuation of) activities and therefore no significant impact can be attributed.

In terms of the likely evolution of the baseline, two scenarios have been identified: one is that the quarry continues to operate, the impacts of this

have been sufficiently considered in the above sections. The alternative baseline scenario is that the Site is restored and remediated. In this instance, there would be short term impacts associated with the vehicle movements associated with the restoration of the quarry, following which, all activity at the site would cease and highways impacts would be negligible.

When assessing the proposed development against the alternative baseline scenario, the proposed development would result in traffic impacts which otherwise would not be experienced, however, given that the quarry has operated at levels previously assessed, it follows that any vehicle movement activity at levels less than those assessed with 250,000tpa, some 55 two way movements (110 trips), will cause less of an impact and no form of intensification / additional impact can that previsoully deemed acceptable for the local road network. Given the same, the proposed development is not considered to result in any significant effects upon the environment when being considered against the current baseline or the likely evolution thereof.

11.4 Mitigation

The main mitigatory measure with respect to vehicular movements has been driven by the revised business practices at Tromman quarry and the steady increase in vehicle load capacity, resulting in fewer vehicle movements.

In addition, the site access will continue to implement the access improvement recommendations as provided for in Figure 11.2, held at Appendix 11.2.

11.5 Conclusions

Development of the range of products being sold from the quarry, linked directly to the manufacturing element of the site has resulted in the number of vehicles being utilised for delivery having dropped to a figure in the region of 67% of the number originally assessed in 2004 whilst the extraction volumes are operating at levels of c.84%.

It is acknowledged that the move away from standard dry aggregate sales results in incoming deliveries associated with the manufacturing element, however, this forms a very small percentage of the vehicle movements and therefore the impacts associated with the transfer of aggregate production in to value added products, rather than direct dry aggregate sales, along with a change in the HGV fleet can be said to be have a seen a significant reduction of vehicle movements on the public highway and therefore a positive impact.

Given that the quarry has operated at levels previously assessed, it follows that any vehicle movement activity at levels less than those assessed with 250,000tpa, some 55 two way movements (110 trips), will cause less of an impact and no form of intensification / additional impact than that previously deemed acceptable for the local road network. As such, it is considered that the proposed development would not result in any significant effects upon the environment in terms of highways impacts.

12.0 CULTURAL HERITAGE

Archaeological evaluations have previously been prepared to cover the totality of the application site, as part of the consolidation application and EIS in 2004 and then most recently prepared by Arch-Tech Limited for the 2009 EIS to accompany application TA900976 and the associated Board decision PL17.235960.

Archaeology, like geology in this instance does not alter in the intervening timeframe post the submission of those documents and it is considered unnecessary to revisit and update the previously accepted report.

All soils have already been removed from the operational areas of the site, resulting in there being no opportunity for impact on Cultural Heritage Assets going forward in these active zones.

12.1 Potential Impacts

What is not known with absolute certainty is whether the interface between topsoil and subsoil remains intact below the overburden storage mound, accordingly it is proposed that during phases 3 and 4 and the removal of the overburden landform that the mitigation proposed in the 2004 EIS, where appropriate, remains valid for the footprint.

12.2 Mitigation

Given that the opportunity to undertake any advanced assessment works, such as geophysical assessments or trial trenching has been lost

as a result of the consent to store overburden on the area, currently occupied by the landform (RPL17.206702). It is proposed that once the original ground levels are approached when removing overburden for placement in the quarry floor, that a qualified archaeologist should be employed to establish whether an interface between topsoil and subsoil remains intact.

In the eventuality that this is the case, it is further recommended that any further earthmoving works, at this interface, be monitored by a qualified archaeologist. This will ensure the early identification of any archaeological remains which may be revealed during such operations and ensure that such remains are appropriately recorded prior to removal. In the event of the discovery of archaeological remains during monitoring, all works must cease in the vicinity until a decision is made by the Department of Culture, Heritage and the Gaeltacht in relation to the resolution of the archaeology on the site. These recommendations could involve revision of plans in order to ensure avoidance or excavation depending on the significance of the remains uncovered and on the likely impact that the proposed development will have on them.

12.3 Conclusion

It is concluded that there is no potential for there to be any impacts upon cultural heritage during further operations until the point at which former ground levels below the existing overburden landform, during phases 3 to 4, are to be excavated.

Whilst it is unclear whether any archaeological remains have the potential to exist, it is considered appropriate to employ an appropriate

mitigation measure at the point at which the interface is reached in order to establish the same.

13.0 WASTE MANAGEMENT

This section of the EIAR is prepared by Chris Tinsley MRTPI, whose competency is set out at Section 1. This section of the EIAR addresses the potential effects of the proposed development in terms of waste management.

The evaluation of effects of the proposed development in terms of waste management comprises a qualitative assessment based on an analysis of potential effects on the environment undertaken in other sections of this EIAR. The assessment presented within this section also takes into account a review of relevant literature and professional judgement in relation to impacts upon the environment in terms of the proposed development.

Given that this EIAR is considering the totality of the project there are two distinct operational types and therefore two distinct waste streams. The first covers the waste arising from the extraction activities that principally revolve around plant and machinery wastes associated with routine maintenance and repairs and potential accidental fuel and oil spillages and the extractive waste that is an inevitable consequence of quarrying that is covered specifically by the Extractive Waste Regulations. The second is the waste that can arise from the ancillary manufacturing facilities that operate in the northern part of the site.

13.1 Assessment of Baseline Conditions

In the first instance the totality of the activities that are taking place on site are covered by the Site's EMS, updated 2019 and 2023 – Appendix 3.1, that was originally promoted as part of the application and EIS that

covers the Southern half of the site namely TA900976 and the associated Board decision PL17.235960.

With regard to waste management and control, the company's EMS continues to provide as follows:

"The controls and mitigation measures for minimising the quantities of wastes generated and for minimising the potential impacts of storage and disposal of wastes are summarised as follows:

1. *Waste oil from maintaining vehicles and plant machinery and hazardous wastes are stored in a designated bunded storage area pending disposal by a licensed waste disposal contractor;*
2. *Wherever possible materials from site construction activities and from workforce management and administration that are able to be recycled will be separated at source;*
3. *Small containers will be strategically located close to offices, canteens and similar areas to separate useful paper, cardboard, wood, glass, plastics and metals;*
4. *Operational activities including the delivery of materials will result in the generation of wastes such as wood off-cuts, plastic and cardboard packaging, shipping pallets and metals. Waste and materials separated for recycling will be collected on a monthly basis and transferred to storage containers in a designated Waste Storage Area on the site;*
5. *Inspection of storage facilities for wastes and recyclables will be done on a daily basis.*
6. *All general waste that is unable to be separated or is otherwise not suitable for recycling will be collected for off-site disposal by licensed waste disposal contractors at regular intervals. Records*

of quantities of wastes disposed of or sent off-site for recycling and the contractor used will be kept as outlined in procedure EMS-008.

7. *In order to ensure that site staff properly segregate waste materials, it is the responsibility of the Quarry Manager to ensure all staff are trained and made responsible for ensuring site housekeeping and the proper segregation of waste;*
8. *The following classes of materials are segregated into individual storage containers;*

Waste oils / greases / paints
Wood
Plastics
Glass
Cardboard / Paper
Domestic refuse
Metal
Contaminated soil (generated by oil spills etc)
Waste aggregate materials segregated into different size categories
Waste concrete / blocks
Batteries
Rubber conveyor belts

9. *All segregated wastes will be collected and sent for reuse or recycling by a suitable licensed waste contractor.*
10. *Suitable licensed waste contractors will be employed by Keegan Quarries Ltd to ensure that waste materials which cannot be reused or recycled at the site are collected and correctly disposed of at a waste licensed facility.*

13.2 Proposed Development

The quarrying aspect of the proposed development comprises the extraction of limestone and restoration of the site to biodiversity after use (water body).

The mineral won at the site will be processed via mobile crushing and screening plant. Out of specification and lower value material resultant from this process will be stored in the landforms in the proposed quarry void, as shown on the proposed development plans.

Over the course of the development of Phase 3, the northern overburden landform will be systematically removed and placed into the recently excavated void in the southern part of the Site. It is estimated that around excavated void in the southern part of the Site. It is estimated that around 338,000m³ of material will be lifted from the existing overburden store and moved to its new location in the quarry void. It is proposed that the majority of the 13mAOD bench will be filled up with the repositioned overburden up to the 28mAOD level.

The landforms have been designed using terrain modelling software to ensure sufficiently stability.

Other than out of specification material derived from mineral processing, the main waste management concerns will principally revolve around vehicular wastes associated with routine maintenance and repairs and accidental fuel and oil spillages and the potential for entry into surface and groundwater. These issues are discussed at Section 6 and within the H&HIA held as Appendix 6.1.

13.3 Assessment of Impacts

A number of precautions, mitigation and best practice measures are detailed at the H&HIA appended at Appendix 6.1 and outlined at Section 6 of this EIAR. These measures will be implemented to ensure that any potential impact associated with the proposed development on local surface and groundwater features will be minimised. These measures will safeguard and protect from potential pollution events and contaminants entering and impacting upon surface water and groundwater resources.

By implementing the measures as outlined in Section 6, there are not considered to be any direct or indirect impacts resultant from the proposed development upon the local water environment. On completion of the proposed development, there will be a permanent reduction in direct risks to surface water features and groundwater.

13.3.1 Extractive Waste

The activities relating to quarrying are not considered to give rise to any specialist requirements and they can be managed by a series of Good Housekeeping measures as part of an overall waste management strategy outlined above from the EMS.

The effectiveness of these systems is illustrated by the general appearance of the quarry, the quarry waste products being limited to overburden storage and the quality of the monitored water, discharged from the site as outlined in Section 6.

13.3.2 Unplanned Events

According to the EPA guidelines, unplanned events, such as accidents, can include "spill from traffic accidents, floods or landslides affecting the site, fire, collapse or equipment failure on the site".

The vulnerability of the proposed development to unplanned events is considered to be limited due to:

- the proposed works being planned and designed by suitably qualified professionals;
- The level of existing monitoring undertaken at the Site and compliance with relevant standards and legislation with regards to a number of areas of environmental risk management;
- the rural location of the Application site; and
- the experience of the Applicant in operating the site to date.

Spillages and leaks from HGVs and other plant or vehicles moving within the site is considered to be sufficiently mitigated against within the proposed development, either as an integral part of the design or as part of the procedures and mitigations proposed for the operation of the site.

13.3.3 Manufacturing Waste

The precise nature of manufacturing employed in the pre-cast manufacturing unit ensures that wastage is kept to an absolute minimum with only the exact amounts of materials utilised in the production of the product. Therefore, the minimal wastage arising is separated and stored or placed into skips for either recycling or removed from Site for disposal

via a licenced haulier. The continued practice of waste minimisation and suitable disposable is not considered to result in any significant effects upon the environment.

13.4 Mitigation Measures

A number of mitigation measures are detailed at various sections of this EIAR which detail how specific actions and measures can be implemented as part of the proposed project to ensure that the proposed development does not result in any significant effects upon the environment. Measures include:

- Works undertaken in accordance with proposed plans, taking account of quarry face angles, stockpiling etc;
- Fuel Handling and Storage Measures as detailed at Section 6;
- Good site management practices;
- Contingency plans / procedures;
- Noise and dust controls;
- Measures for the regular inspection and maintenance of plant and machinery;
- Systems for recording and monitoring impacts associated with the development upon the environment e.g. water quality ; and
- Management of restored areas.

The above list is not comprehensive but provides the main mitigation measures advanced as part of the proposed development, to ensure that the proposed development would not result in any significant effects upon the environment in terms of the management of waste.

13.5 Residual Impacts

The continuation of further quarrying activities is considered unlikely to give rise to any potential waste management related impacts if the existing measures continue to be employed on site. Following the extractive period, it is proposed that promoted restoration concept for the quarry, see Figures 3.1 onwards in Section 3, would result in a water body and associated edged treatment and planting.

In addition, the proposal promotes the removal and remediation of the northern element of the site that constitutes the manufacturing area. It is considered with the continued application of the adopted standards within the Company's EMS that this would not give rise to any potential waste management related impacts.

13.6 Conclusions

The continued implementation of an EMS, updated in 2023 containing waste management measures and the compliance with the Extractive Waste Regulations 2009 will continue to ensure that the proposed development will not result in a significant effect upon the environment.

14.0 SOILS AND NATURAL RESOURCES

14.1 Aggregate Material

A requirement exists in the Regulations that due regard is had to the likely significant direct and indirect consequences that a development proposal would have on the environment which might result from the use of natural resources.

Aggregate, limestone powders and the variety precast and ready mixed concrete products are all derived from naturally occurring, finite resources as discussed in Section 5.

The type of limestone worked at Tromman quarry is a high purity calcium carbonate limestone. The chemical properties of the mineral permit a broad range of end uses, as illustrated by the wide range of manufacturing facilities at the site.

It is considered that the proposed project will not give rise to a significant reduction in the volume of resource in Meath or with the Waulsortian Formation.

The excavated material will be processed on site and used in various other building material processes. Global environmental issues like fossil fuel use and alternative energy sources are matters subject to national/international treaties and agreements.

They are considered outside the scope of this statement, as the cumulative contributions of this particular development to such matters are insignificant in a national context.

The Applicant intends on conserving the natural resources by maximising the resource potential by way of ensuring that the end use is maximised, thus achieving the most prudent and efficient use of this high-quality, non-renewable resource.

14.2 Soils

All soils have been removed within the northern manufacturing area and the extraction area, resulting in there being no opportunity for impacts on soil resources to occur as a result of the proposed development. Therefore, the impact upon soils is considered to be complete and as the land has been permanently removed from agriculture, it is a permanent loss.

14.3 Impact Assessment

Limestone is intended to be extracted at the rate of up to 250,000tpa. This is a permanent removal of the existing mineral resource, however, as outlined in Section 5, this is not considered to be a significant loss when considered against the scale of the formation as a whole.

The proposed development would also see the removal of the large overburden mound / soil making material that is currently immediately to the south of the manufacturing zone and the use of the same in lake margin treatment. The impact on the limestone resource would be negligible in the context of the formation and the impact on soils is considered neutral given that limited volumes of soil would be repositioned to affect ultimate beneficial restoration of the Site.

14.4 Conclusion

The impact on the geological resource that could occur as a result of the proposed development is permanent but not significant in the extent to which the volume affects the Waulsortian Formation as a whole.

There is no further soil stripping required for the proposed development. The impact upon soils is considered to be complete and as the land has been permanently removed from agriculture, it is a permanent loss.

There is no further impact upon soil resources anticipated as part of this development and the main body of the site is proposed to revert to a water body with treatment utilising some soils and overburdens at the margins and in the floor.

15.0 SOCIO-ECONOMIC IMPACTS

15.1 Introduction

This section considers the impact of the proposed development in the context of population/settlement, employment and other socio-economic effects.

15.2 Assessment of Baseline Conditions

15.2.1 Employment

The existing operations (stone, powders and fill; Precast and concrete block manufacture) at Tromman provide direct employment for some 140 staff and a further 40 full-time sub-contractors with a direct wage bill and associated contractors wage bill of c.€12 million. Keegan Quarries makes a significant contribution to the rural Meath economy, providing a variety of jobs across a highly skilled workforce. A significant amount of the Company's total revenue stream is derived from export sales to the UK, bringing external revenue into the Irish and Meath economy. Such is the importance of the export market that the growth and expansion in the business experienced over the assessment period has seen internal investment focussed on satisfying the demands of this area.

The Keegan Group of companies make a significant contribution to the economic prosperity of County Meath. Census 2022 data[5] shows that

[5] Available at https://www.cso.ie/en/csolatestnews/pressreleases/2023pressreleases/pressstatementcensusofpopulation2022-summaryresultsmeath/

the population of Meath grew by 13% to 220,826, which means the number of people in the county rose by 25,782 between April 2016 and April 2022. Over the same period, Ireland's population grew by 8% from 4,761,865 to 5,149,139. This follows an increase in population evident in the 2016 census which showed that the population of Meath had increased by 5.9% from the 2011 to the 2016 census.

The trend between 2011 and 2022 shows that Meath has experienced a sustained above-state increase in population over the last 10+ years. The employment generated across the group of companies is vital to the local economy, both in terms of the direct employment at the Tromman site but also in the associated downstream uses associated with the end use of the mineral products. Figure 15.1, shows the employee numbers for the years covering the timeframe being considered, indicating continued growth.

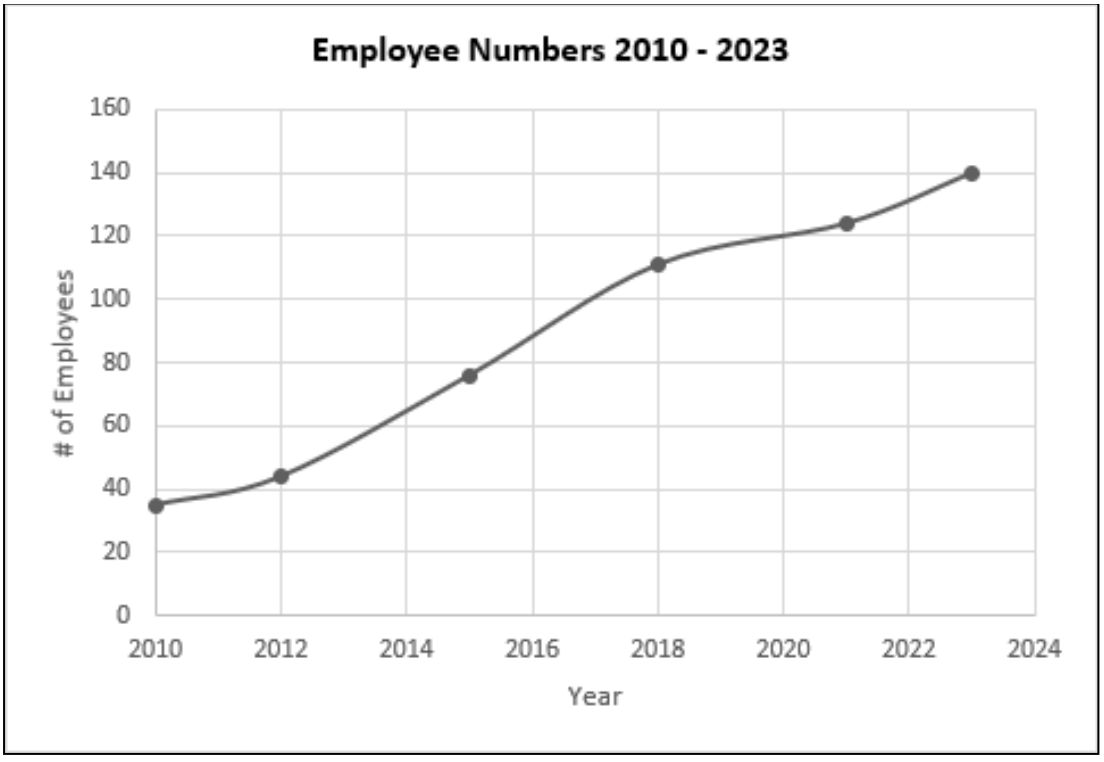


Figure 15.1 – Keegan Group - Employment Figures

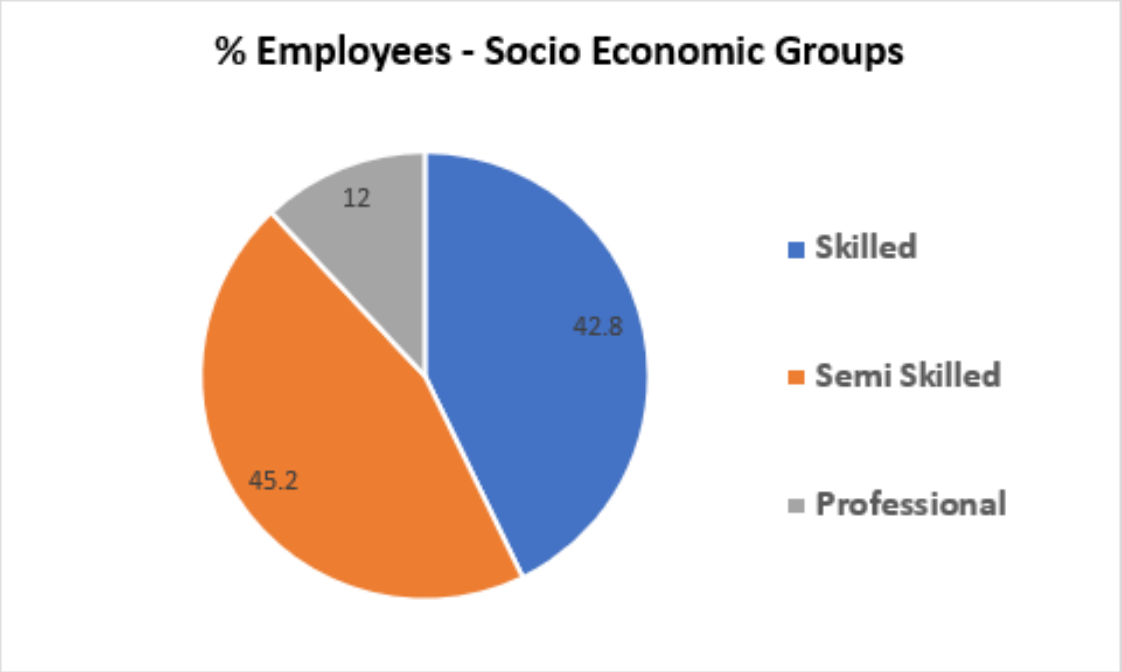


Figure 15.2 – Employment by percentage of Socio Economic Groups

Figure 15.2 illustrates total employment at the company's Tromman Site, expressed by skill sectors. The figure highlights the breadth of skills covered at the Site, extending beyond those normally expected in a traditional extraction/manufacturing site.

15.2.2 Local Employment

The 2016 census showed the average travel time of commuting workers in Ireland is 28.2 minutes. In 2022, the average commuting time was just over 29 minutes.

Meath however, due to the high numbers of people commuting to Dublin, had the highest commuting time of 34.6 minutes at the census in 2016 (the 2022 census data for the county has not yet been published).

Creating employment and generating economic activity in areas outside of Dublin, provides significant social and environmental benefits, as the active labour force do not need to spend hours commuting to Dublin for well remunerated employment. Upon analysis of the Keegan Group workforce the majority of employees work and live within a 10 km radius of travel, as shown in Figure 15.3. This results in significant induced local economic benefits with wages being spent locally on goods and services. Shorter commutes also result in obvious benefits in terms of reduced fuel consumption and emissions associated with reduced traffic movements and reduced journey times.

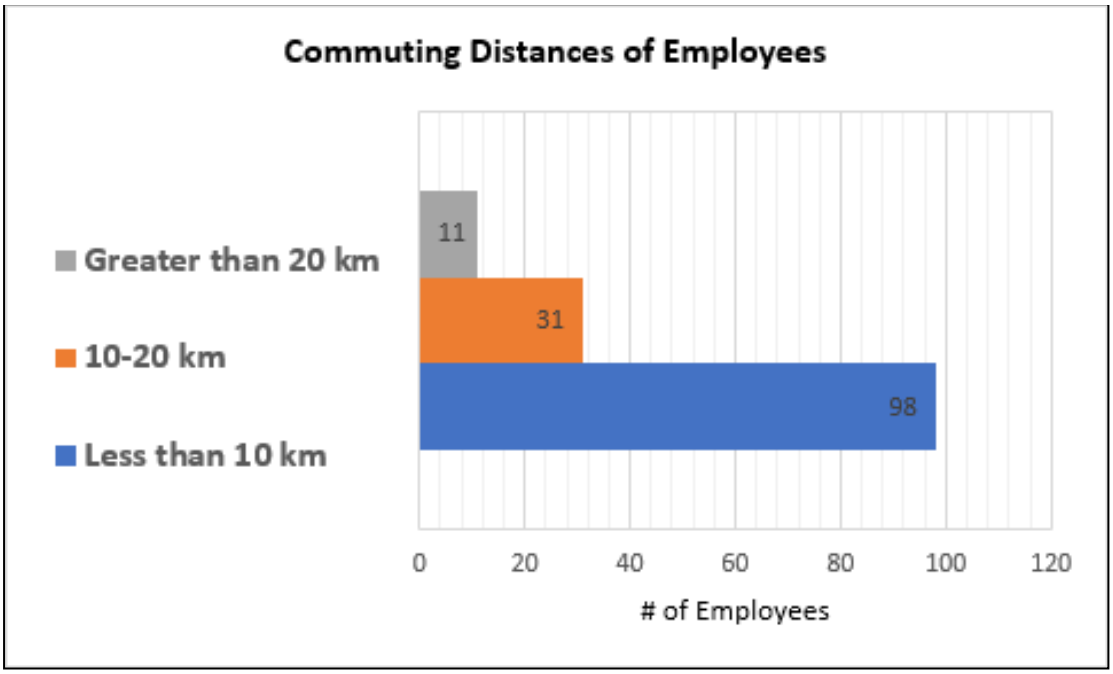


Figure 15.3 Employee average commuting distance to Tromman Quarry

15.2.3 Housing and Infrastructure Delivery

Department of Housing, Local Government and Heritage data[6] describes how there were 13,318 people homeless across Ireland in

[6] Available at https://www.gov.ie/en/collection/80ea8-homelessness-data/

December 2023. The number of people who are homeless rose by 2,186 people since December 2023, an 18% increase on the previous year. In Meath, there we some 234 adults accessing emergency accommodation in December 2023 with 88 families across the Mid-East Region.

As a result of the recognised housing crisis within Ireland, the Government has introduced the "'Housing for All - a New Housing Plan for Ireland". This is the government's housing plan to 2030. It is a multi-annual, multi-billion euro plan which seeks to improve Ireland's housing system and deliver more homes of all types for people with different housing needs. The plan estimates that Ireland will need an average of 33,000 new homes to be provided each year from 2021 to 2030.

Statistics from the Department of Housing, Local Government and Heritage[7] states that 22,443 new homes were completed in the first nine months of 2023- an increase of 14% on the same period last year. The Housing for All Q3 2023 Progress Report[8] states that:

"The coming year will see over €5 billion of capital investment in housing, a record figure. We will continue to increase the housing stock in the country while progressing major reforms in our housing system. We can look forward to a strong 2024, with almost 24,000 new homes having commenced in the first 9 months of this year. There are currently over 22,600 social homes at various stages of delivery and 2,700 additional affordable homes already approved for funding.".

[7] Available at https://www.gov.ie/en/publication/97015-housing-for-all-action-plan-update-and-q3-2023-progress-report/

[8] Ibid

The Government has stated[9] that in response to Brexit and wider challenges such as climate change, a core tenet of the Government's strategy is to bring greater economic resilience to Ireland's regions by addressing the infrastructure deficits that currently exist. Under this €116 billion plan, public capital investment will reach 4% of national income, placing Ireland well above the recent EU average of 2.9%.

When launched in 2018 Project Ireland included over 150 projects which each have a value in excess of €20 million. This pipeline of projects has continued to expand and evolve since then, with numerous major projects being completed and many more projects entering into the pipeline. There are now over 200 large projects at various stages of the project lifecycle.

15.2.4 Demand for Aggregates and Mineral Products

The Mineral Products Association (MPA; trade association for aggregates in the UK) estimates that 50 tonnes of aggregate is required for the construction of a typical house. With the widely recognised unprecedented demand in Ireland for housing and the programme of infrastructure delivery which is ongoing, naturally the demand for aggregate used in the construction of housing units and infrastructure projects reflects this demand.

It has been, and continues to be, of vital Socio Economic importance that a steady and adequate supply of aggregate in Ireland is maintained, attempting to satisfy society's long-term housing and infrastructure requirements.

[9] Project Ireland 2040, Prospects Ireland's Pipeline of Major Infrastructure Projects, Investment Projects and Programmes Office, December 2019

15.2.5 Socio Economics and the import of Export Markets

The quarry in Tromman is a high-quality mineral resource and it must be utilised to its full value, with properties that make it ideal for high quality finished and export markets.

Without the continued operation of the quarry the Company's export business, which is focussed on the products manufactured at the Tromman site would collapse.

Enterprise Ireland, the government organisation responsible for the development and growth of Irish enterprises in world markets states that: "Success in export markets is crucial to the long-term growth of Irish businesses and the Irish economy. Support for companies focused on growth through international sales is a priority for Enterprise Ireland."

Enterprise Ireland recognises the value of the products manufactured at the Tromman site and have been fully supportive of Keegan Precast operations and have been involved in developing new products and markets over recent years.

15.3 Impact Assessment

15.3.1 Population and Employment

The proposed development will sustain existing full time employment associated with the winning and working of the mineral at the quarry. The proposed development will also sustain indirect employment associated with the operation of the quarry and associated downstream

manufacturing employment through contractors, hauliers, engineers and mechanics.

Direct benefits associated with the proposed development will include the continued direct employment of 140 local people across semi-skilled, skilled and professional sectors. It is anticipated that ongoing employment opportunities will remain available to the local population for years to come, along with providing job security for those currently employed by the business.

The limestone mineral resource to be quarried at the application site will underpin the applicant's business model and directly supports the jobs outlined above. The proposed development will sustain rural employment in this part of Meath, providing an alternative to agriculture and will provide additional employment opportunities for the increasing population and workforce currently being experienced in this part of Ireland and predicted to increase over the coming years.

The proposed development is estimated to generate an expenditure of several hundred thousand euro per annum, with much of this expenditure being made locally on the likes of purchases, transport, fuel, wages and business rates. This is considered to result in a direct economic impact on the local economy.

The socio-economic impacts associated with the proposed development will be positive. The employment and expenditure generated by the proposed development will result in a tangible positive impact in this location, sustaining local direct employment and the resultant indirect and induced economic benefits as outlined above.

15.3.2 House Building and Infrastructure

Tromman Quarry supplies a range of aggregates to a number of construction projects currently ongoing in the wider Dublin region. For example, works are currently under way for a 258-home residential scheme in Belmayne, Dublin. This €100+ million scheme with Sisks as the design and build contractor is set to achieve LEED Gold standard sustainability (Leadership in Energy and Environmental Design, US Building Counsil). Fifty of the homes will be available for social housing and the remaining 208 homes for private rental. Keegan Precast and Keegan Quarries are involved in the delivery of wall, slabs and ready-mix concrete to the site.

The year 2023 also saw Keegan Precast deliver walls and floors to Oxford University for it's new 'Life and Mind Building' as part of a £200 million project. The building represents the largest building project ever undertaken on behalf of the University and will be its largest teaching facility. The building covers 25,000 sqm set over two wings.

The impacts associated with the proposed development in terms of housing and infrastructure delivery will be positive. The physical infrastructure required to drive construction will be driven by mineral quarried at the application site. The proposed development will therefore result in a tangible positive impact via the continued supply of construction materials required to deliver the housing and infrastructure projects, which have been identified for the wider region for years to come.

15.4 Conclusions

The proposed development will sustain the direct employment associated with the quarrying of the material currently experienced at the quarry, as well as significant employment associated with the downstream manufacturing processes associated with the mineral.

The quantifiable socio-economic contribution of the Tromman operation is known and the importance at a local, regional and on a national level through export business is established.

The high purity limestone resource at Tromman Quarry underpins the added value manufacturing elements of the Keegan Groups business, the loss of this resource would have serious ramifications upon the business with wholesale contraction of the business and the associated employment levels. The socio-economic impacts of such action are considered to be significant.

It is considered that the significance of the continued prosperity resultant from operations at Tromman Quarry should not be understated and the potential for continued socio-economic contributions from the delivery of continuation of supply acknowledged.

16.0 CLIMATE CHANGE, ACCIDENTS AND DISASTERS

16.1 Introduction

This section of the EIAR is prepared by Chris Tinsley MRTPI, whose competency is set out at Section 1. The EIA Regulations require applicants to include within an EIAR, a description of the likely significant effects on the environment of the proposed development resulting from, among other things—

"*the impact of the proposed development on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the proposed development to climate change*".

16.2 Baseline Setting

Climate change not only means changes in the average climate such as temperature but also changes in the frequency and intensity of extreme weather and climate events. Though climate change projections, like all projections of the future, are subject to uncertainty, the latest climate modelling projections by Met Eireann for Ireland are in broad agreement with previous research[10] on the subject.

In terms of temperature trends, the EPA describes[11] how Ireland's climate is changing in line with global trends, with a temperature increase of, on

[10] Available at: https://www.met.ie/epa-climate-projections-2020

[11] Available at: https://www.epa.ie/environment-and-you/climate-change/what-impact-will-climate-change-have-for-ireland/#:~:text=Ireland's%20climate%20is%20changing%20in,depending%20on%20the%20emissions%20trajectory.

average, 0.8°C compared with 1900. By the middle of this century (2041 – 2060) the average annual temperatures are projected to increase by between 1–1.2℃ and 1.3–1.6℃ depending on the emissions trajectory. The number of warm days is expected to increase and heat waves are expected to occur more frequently.

In terms of precipitation, the EPA also describes how Ireland has seen an increase in average annual national rainfall of approximately 60mm or 5% in the period 1981-2010, compared to the 30- year period 1961-1990. Significant reductions are expected in average levels of annual, spring and summer rainfall. Projections indicate a substantial increase in the frequency of heavy precipitation events in Winter and Autumn (approx. 20%).

16.3 Impact Assessment

The only potential for direct and indirect climate change impacts from the proposed development is considered to be through the emissions resultant from the burning of hydrocarbons as fuel both on-site and in the transportation of materials to and from the quarry.

To date, there have been limited technological advances with respect to emissions in the delivery method of aggregates to market, with improvements focussing on enhanced performance and rating of the diesel engines in the HGV's.

It is proposed that mineral extracted at the site will be processed at the quarry face using mobile crushing and screening plant, as is current practice at the quarry. The proposed development will result in the

haulage (and associated emissions) being less than those associated with the transportation of material over a greater distance.

The mineral can only be worked where it is found and the application site is one which is well placed to serve the directly adjacent manufacturing facilities and the greater Dublin market area and which has been demonstrated via this EIAR, to not result in any significant effects upon the environment.

The Applicant is committed to operating its business in a manner that reduces its contribution to global warming by seeking to mitigate its climate change impacts through industrial innovation and the application of industry best practice.

16.4 Accidents and Disasters

Given the nature of the proposed processes on-site and the experience of the applicant in extraction, transporting and handling minerals and in operating quarry and value-added plant and machinery, the potential for accidents and disasters relating to the processes are considered to be limited. In any event, operations at the site will be controlled by a multitude of legislation and adopted best practice procedures.

The proposed mineral extraction, downstream processing and manufacturing of products and restoration works will be covered by a host of health and safety legislation and the site will be subject to regular monitoring and inspection by the relevant regulatory authorities.

The proposed development plans have been prepared by chartered geotechnical engineers at Quarrydesign Ltd, using digital terrain

modelling software (LSS). The designs have been prepared in order to accord with health and safety legislation and mineral extraction best practice standards in order to minimise the potential for accidents to occur.

Extreme weather events such as 1 in 100 year storm event have been modelled within the H&HIA (held at Appendix 6.1). The assessment demonstrates that during such an event, surface waters can be wholly managed within the site, with no risk to neighbouring land.

Given the temperate climate of the island of Ireland, it is considered that even with the increasing volatility of the weather events that are predicted in the future, it is not anticipated that these events would have the potential to give rise to a natural disaster at the site.

16.5 Conclusion

The potential for likely significant impacts on climate change due to greenhouse gas emissions are considered unlikely given the scale and nature of the proposals. The only potential for direct and indirect climate change impacts from the proposed development is considered to be through the emissions resultant from vehicle movements and plant and machinery associated with the development.

Given the worldwide geographic location of the site (in the eastern part of Ireland, in the mid-latitudes), it is predicted that the development will not be adversely affected by climate change, having the capacity to deal with the most likely variations in climate and storm events.

Given the nature of the proposed processes on-site and the experience of the applicant, the potential for accidents and disasters relating to the processes are limited and, in any event, are controlled by a multitude of legislation.

17.0 HUMAN HEALTH

This section of the EIAR is prepared by Chris Tinsley MRTPI, whose competency is set out at Section 1. The EIA Regulations require the Applicant to consider the impacts of the proposed development upon human health. As detailed in Section 1 of this EIAR, this topic is covered across a number of the sections of this EIAR (see Table 1.2 for convergence).

In this regard, the consideration of human health is a prerequisite of the relevant guidance and legislation governing target levels with respect to:

- Water Quality Standards (Section 6);
- Noise Emissions (Section 7); and
- Air Quality (Section 10).

Each of the above sections of the EIAR explicitly references the appropriate guidance when establishing whether the proposed development is acceptable in human health terms and indeed in the case of noise and air quality considers wider guidance from the World Health Organisation.

17.1 Baseline Setting

The site is currently operated in accordance with best practice standards and other regulatory regimes. Best practice and operating procedures are in place at the quarry to ensure a healthy and safe working environment. As detailed in Sections 7 and 10, air quality and

noise monitoring data collected at the quarry show very limited exceedances in accepted levels.

17.2 Impact Assessment

17.2.1 Water Environment

Consideration of the potential for impacts upon the water environment and thereby on human health is explicitly undertaken by measurement against the relevant standards provided in guidance and legislation as referenced in Section 6 of this EIAR and the accompanying H&HIA held at Appendix 6.1.

The H&HIA assesses the risk of derogation at local water supplies, stating that the piezometer network provides sufficient coverage for groundwater level and quality monitoring to check that there is no risk of impact at local water supplies.

17.2.2 Noise

Consideration of the potential for impacts from noise on human health is explicitly undertaken by measurement against the standards provided in guidance and legislation, as referenced in Section 7 of this EIAR.

The following policy documents, standards and guidelines relevant to the baseline noise monitoring survey are relevant to the specific monitoring procedures adopted as part of the baseline noise survey:

- Quarries and Ancillary Activities, Guidelines for Planning Authorities, April 2004, Department of the Environment, Heritage and Local Government. (DoEHLG Guidance); and

- Environmental Management Guidelines Environmental Management in the Extractive Industry (Non-Scheduled Minerals), Environmental Protection Agency (2006).

The CadnaA noise modelling (as detailed at Section 7) has been developed to allow detailed noise predictions to be undertaken in accordance with:

- ISO 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2 General methods of calculation; and

- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites.

The recorded noise values at the boundary of the Tromman Quarry site from 2013 until 2023 consistently comply with the specified limit value and are consistent with previous noise survey results. Therefore, it is confirmed that the existing quarrying and concrete manufacturing operations at Tromman Quarry are not having a significant noise impact at the nearest residential properties to the site. The noise monitoring undertaken at the nearest properties is inclusive of the cumulative noise impacts from the Tromman Quarry site and Kilsaran Quarry.

The predicted worst-case 1-hour noise levels (dB L_{Aeq}) at Noise Sensitive Receivers during the proposed development are predicted to be in accordance with the daytime noise limit of 55 dB $L_{Aeq, 1\ hour}$ from quarry activities.

Prediction noise and vibration levels as a result of blasting have been assessed at the nearest sensitive receptors. These blasts result in very short – term instantaneous noise impact at all residential receivers in the vicinity of the quarry and will not constitute a significant impact, as the blast monitoring results will be required to be within the limits prescribed by the DoEHLG in their relevant guidance. The operator will continue to carry out blast monitoring (ground-borne vibration and air overpressure) for each blast.

Given the above, the proposed development is not considered to have the potential to result in any significant effects upon human health in terms of noise or vibration. Notwithstanding, a number of mitigation measures are proposed to minimise operational impacts.

17.3 Air Quality

Consideration of the potential for impacts upon human health from air emissions is explicitly undertaken by measurement against the standards provided in guidance and legislation, as referenced in Section 10 of this EIAR.

The assessment with regards to air quality has primarily been undertaken with cognisance to IAQM guidance. Statutory standards exist for concentrations of suspended particulate matter (both PM_{10} and the

$PM_{2.5}$) under The Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011).

World Health Organisation (WHO) Global Air Quality Guidelines (AQGs) were released in September 2021. These provide clear evidence of the damage air pollution inflicts on human health, at even lower concentrations than previously understood. The guidelines recommend new air quality levels to protect the health of populations, by reducing levels of key air pollutants, some of which also contribute to climate change.

No statutory air quality criterion has been set at a European, National or World Health Organisation (WHO) level, although a range of national 'yardstick' criteria from many countries is found in literature.

Dust monitoring data from the locations around the boundary of the quarry has been reviewed and shows no exceedance in accepted limits.

Overall, the proposed development is considered to have, at worst, the potential to cause a 'Slight Adverse Effect' at the nearest residential receptor in the surrounding area. Therefore, the overall effect is considered to be 'not significant'. This is based on a consideration of the different magnitude of effects at individual receptors, and the number of receptors that would experience these potential effects.

Any residual dust deposition impacts resulting from the future de-commissioning and restoration of the quarry will be of a short duration and all potential dust impacts from the site are considered to be

reversible i.e. the risk of impact will cease on completion of quarrying and restoration of the site.

Given the above, the proposed development is not considered to have the potential to result in any significant effects upon human health in terms of air quality. Notwithstanding, a number of mitigation measures are proposed to minimise operational impacts.

17.4 Residual Impacts

Subject to the continued practices at the quarry which are demonstrated to be effective via the monitoring results and the implementation of any additional mitigation measures detailed at Sections 6, 7 and 10 of this EIAR, the proposed development is not considered to result in any significant effect upon human health.

17.5 Conclusion

The impacts of the proposed development upon human health are considered to have been fully covered within the relevant sections of the EIAR; namely the Water Environment; Noise and Air Quality Sections (Section 6, 7 and 10).

All of these sections identify relevant guidance and legislation which has been implemented to protect human health and demonstrates how monitoring results from the quarry show that the existing practices and working methods are appropriate and adequate for protecting human health. The proposed development will see a continuation of the best practices already observed at the quarry which will accord with the relevant standards.

Notwithstanding, a number of mitigation measures are proposed in order to further minimise impacts associated with the proposed development. Given the same, the proposed development would not result in any significant effect upon the environment by virtue of human health impacts.

18.0 INTRA AND INTER CUMULATIVE IMPACTS

This section of the EIAR is prepared by Chris Tinsley MRTPI, whose competency is set out at Section 1. The EIAR has considered the environmental aspects within and around the site, which potentially could experience impact as a result of the proposed development.

Regulation 2 (e) (v) requires the applicant to provide a description of the likely significant effects on the environment of the proposed development resulting from, among other things- the cumulation of effects with other existing or approved developments, or both, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources.

The cumulative effects assessment, considered in this section, for the project follows the guidelines as set by the Institute of Environmental Management and Assessment (IEMA).

IEMA's guidelines recognise two major sources of cumulative effects:

- Intra-project effects – These occur where a single receptor is affected by more than one source of effect arising from different aspects of the project. An example of an intra-project effect would be where a local resident is affected by dust, noise and traffic disruption during the construction of a scheme, with the result being a greater nuisance than each individual effect alone; and

- Inter-project effects – These effects occur as a result of a number of past, present or reasonably foreseeable proposed developments, which individually might not be significant but when considered together could create a significant cumulative effect on a shared receptor and could include developments separate from and related to the project.

Cumulative impacts may arise from the combined effects of a number of existing or proposed developments, in combination with the proposed development being evaluated, on a single receptor/ source. Where appropriate, potential cumulative effects have been identified in the individual environmental assessments contained within this EIAR, in the reports on air quality, noise, biodiversity, water environment and landscape and visual impact, for example.

Consideration has been given to how the different environmental effects of the development will interact and how the development will interact with other developments in the area with each specialist report/section of the EIAR.

18.1 Intra Cumulative Effects

Intra cumulative impacts can occur where a single receptor is affected by more than one source of effect arising from different aspects of the project. This has been assessed at relevant sections of the EIAR. For example at Section 7, the Noise Impact Assessment considers the worst case scenario assuming that haul road movements, excavator and mobile plant would all be operating concurrently.

The potential cumulative effects have been identified in the individual environmental assessments contained within this EIAR, where applicable and, given that the predicted levels of impact accord with the limits as prescribed in the various guidance documents and that none of the potential receptors are subjected to all of the potential effects of the development at once, then the proposed development is considered to have no unacceptable intra cumulative impacts.

18.2 Inter Cumulative Effects

This EIAR has demonstrated that no significant effects upon the environment are anticipated as a result of the proposed development.

In order for there to be inter cumulative impacts, it is a practical necessity for there to be an overlap (accumulation) of impacts with other developments / projects creating similar effects.

Following consideration of the various technical sections of this EIAR and accompanying reports, the main potential for overlap with other operations/ consented development is limited to effects at Tromman Quarry in combination with effects resultant from operations at the adjacent Kilsaran Quarry.

Where appropriate, the potential for inter cumulative impacts have been considered in more detail in the individual sections. In the Noise and Dust and Air Quality Sections of this EIAR for example, the background data includes noise and dust emanating from the adjacent quarry.

These background noise levels have been used to identify the background noise environment upon which the CadnaA noise models are based. As such, the assessment therefore accounts for the cumulative impacts of existing development and operations and the proposed operations at the Application site operating concurrently.

Similarly, the LVIA takes account of the mineral processing plant and equipment and stockpiles which are visible from the surrounding area. Given the close proximity of the adjacent operations from a number of locations (particularly to the north), both quarries can viewed as a single operation.

Furthermore, in terms of the water environment, the H&HIA held at Appendix 6.1 considers the impacts of groundwater drawdown and water quality as well as surface water quality resultant from discharge from the 2 quarries. The assessment concludes that the proposed development would not individually or in combination with the adjacent quarry, result in significant effects upon the environment.

The s.37L Application package includes a NIS prepared by Woodrow APEM Group. The NIS considers the impacts of the proposed development both individually and in-combination with other developments. The NIS concludes that:

"Taking into account the best available scientific knowledge, applying the precautionary principle, and considering the conservation objectives of the relevant European Sites, it is concluded that the continuation of operations at Tromman Quarry, whether on its own or in conjunction with other plans or projects, does not pose an adverse impact on the integrity of any European Site".

Given the above, it is concluded that the proposed development would not result in any inter cumulative impacts which would result in any significant effects upon the environment.