

# Spink Quarry, Knockbaun, Abbeyleix, Co. Laois

## Spink Quarry

### Environmental Impact Assessment Report

#### Section 10

#### Noise & Vibration

2021



Part of the Breedon Group

Prepared by:

J Sheils Planning & Environmental Ltd

31 Athlumney Castle, Navan, Co. Meath

**TABLE OF CONTENTS**

<b>10</b>	<b>NOISE &amp; VIBRATION</b> .....	<b>1</b>
10.1	INTRODUCTION .....	1
10.2	REGULATORY BACKGROUND .....	1
10.2.1	Policy & Legislation.....	1
10.2.2	Laois County Development Plan 2017-2023.....	2
10.2.3	Emission Limit Values.....	3
10.2.4	Extractive Industry Guidelines .....	5
10.3	METHODOLOGY .....	6
10.3.1	Study.....	6
10.3.2	Sources of information.....	6
10.4	BASELINE DESCRIPTION OF RECEIVING ENVIRONMENT.....	9
10.4.1	Sensitive Receptors.....	9
10.4.2	Environmental Monitoring.....	9
10.5	ASSESSMENT OF IMPACTS.....	11
10.5.1	‘Do Nothing’ Impacts.....	11
10.5.2	Direct Impacts.....	12
10.5.3	Indirect Impacts .....	20
10.5.4	Cumulative Impacts.....	20
10.5.5	Transboundary Impacts.....	20
10.5.6	Residual Impacts .....	20
10.5.7	‘Worst Case’ Impact .....	21
10.6	MITIGATION & MONITORING .....	22
10.6.1	Mitigation .....	22
10.7	REFERENCES .....	27

Laois County Council Planning Authority, Viewing Purposes Only

**LIST OF TABLES AND FIGURES**

Table 10.1 Recommended General Noise Limit Criteria..... 3

Table 10.2 Recommended Tonal/Impulsive Noise Ratings ..... 3

Table 10.3 Results of Noise Monitoring Survey 01/06/21 ..... 10

Table 10.4 Noise - Impact Matrix..... 11

Table 10.5 Summary of results of attended survey for proposed Noise Sources ..... 17

Table 10.6 Summary of Traffic Flow..... 17

Table 10.7 Noise Modelling Results ..... 18

Table 10.8 BS4142 Impact relating to Level Difference ..... 19

Figure 10.1 Operational Activities..... 14

Figure 10.2 Flow Chart for Source of Noise Emissions..... 15

Figure 10.3 Proposed Site Layout showing Location of Noise Source for Worst Case Scenario  
 ..... 16

Figure 10.4 Noise Sensitive Locations ..... 18

Laois County Council Planning Authority, Viewing Purposes Only

## 10 NOISE & VIBRATION

### 10.1 INTRODUCTION

This section of the EIAR deals with the issue of noise and blast vibration associated with the proposed development at Spink Quarry, Knockbaun, Spink, Co. Laois.

The section will determine the existing environment with respect to noise and blast vibration by assessing the level of noise in the vicinity of the site, the potential impacts on the environment, and propose appropriate mitigation measures, if required, by the applicant to avoid, reduce or remedy any significant adverse impacts on the environment.

### 10.2 REGULATORY BACKGROUND

#### 10.2.1 POLICY & LEGISLATION

The strategic control of environmental noise is directed by the Environmental Noise Regulations, which transposed EU Directive 2002/49/EC. This Directive was developed to provide a common framework to avoid, prevent, or reduce the harmful effects of environmental noise. The regulations focus on the process for addressing environmental noise from major infrastructure such as airports, major roads, and large agglomerations.

Sections 106 to 108 of the *Environmental Protection Agency Act* deal with noise on a smaller (i.e., more local) scale:

- Section 106 deals with control of environmental noise by the Minister and the Agency;
- Section 107 sets out the powers prescribed by the Act to a local authority or the Agency to prevent or limit noise. It typically relates to noise from sites regulated by the Agency or a local authority. This allows local authorities or the Agency to serve notices on premises/sites where prevention or limitation of noise is required. The Environmental Protection Agency Act 1992 (Noise) Regulations 1994 provide for a prosecution where there is a failure to comply with the requirements of the issued notice; and
- Section 108 describes the provisions for complaints regarding noise nuisance to be taken to the District Court by any person or agency. It allows for any person, local authority or the Agency to make a complaint to the District Court where noise levels are considered to be generating a reasonable cause for annoyance. Where the court finds in favour of a noise nuisance complaint, the person or body responsible for the noise must reduce it to a specific level, to limit it or cease it altogether.

### 10.2.2 LAOIS COUNTY DEVELOPMENT PLAN 2017-2023

Noise control is governed by the Environmental Protection Agency Act 1992 and the Environmental Protection Agency Act (Noise) Regulations 1994 (S.I. No. 179 of 1994). The definition of environmental noise includes “noise which causes a nuisance, or would endanger human health or damage property or harm the environment”. Noise that is continuous, repeated or loud can have significant impacts on the quality of life of individuals, communities and the environment, in particular, wildlife. The protection of noise sensitive land usage, such as residential uses, is important in order to foster a good quality of life. The Council will seek to minimise noise through the planning process by ensuring that the design of future developments incorporate measures to prevent or mitigate the transmission of noise and vibration, where appropriate.

Laois County Council adopted the 2014-2018 Noise Action Plan, which is in accordance with Environmental Noise Regulations (S.I. No. 140 of 2006). The aim of the plan is to avoid, prevent and reduce, on a prioritised basis the harmful effects, including annoyance due to the long term exposure to environmental noise.

It is the policy of the Council to:

- ES12** Require an assessment of impact of the developments on noise levels, having regard to the provisions of the Environmental Protection Agency (EPA) Acts 1992 and 2003 and the EPA Noise Regulations 1994 when assessing planning applications.
- ES13** Ensure that relevant planning applications comply with the provisions of any Noise Action Plan or noise maps relating to the area.
- ES14** Restrict development proposals causing noise pollution in excess of best practice standards.
- ES15** Regulate and control activities likely to give rise to excessive noise, other than those activities which are regulated by the EPA.
- ES16** Ensure new development does not cause an unacceptable increase in noise levels affecting noise sensitive properties. Proposals for new development with the potential to create excessive noise will be required to submit a construction and/or operation management plan to control such emissions.
- ES17** Require activities likely to give rise to excessive noise to install noise mitigation measures and monitors. The provision of a noise audit may be required where appropriate.

A detailed assessment of potential noise impacts of the proposed development is provided within this report. Traffic on the adjacent R430 Regional Road is the dominant noise source at this location. The Proposed Development will not give rise to significant adverse noise related effects on nearby noise sensitive locations provided the limits and conditions are complied with and mitigation measures are in place.

### 10.2.3 EMISSION LIMIT VALUES

#### 10.2.3.1 Noise Emission Limit Values

The following are Environmental noise limits based on Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4, January 2016) as produced by the Environmental Protection Agency (EPA 2016). It should be noted *“that the guidance within this document relates to the assessment and measurement of noise in relation to Agency scheduled activities only”*.

**Table 10.1 Recommended General Noise Limit Criteria (For EPA Scheduled Activities (NG4, 2016))**

Daytime Noise Criterion, dB L <sub>Ar,T</sub> (07:00 to 19:00hrs)	Evening Noise Criterion, dB L <sub>Ar,T</sub> (19:00 to 23:00hrs)	Night-time Noise Criterion, dB L <sub>Ar,T</sub> (23:00 to 07:00hrs)
55dB	50dB	45dB

Where tonal and/or Impulsive noise is identified a rating level based on the penalty as outlined in Table 10.2 is to be applied to the measured L<sub>Aeq</sub>.

**Table 10.2 Recommended Tonal/Impulsive Noise Ratings**

Period	Sound Characteristic	Correction to L <sub>Aeq</sub> to Arrive at Rating Level L <sub>Ar,T</sub> (dB)
Daytime & Evening	Tonal/Impulsive	5
Night-time	Tonal/Impulsive noise from the facility should not be audible at any NSL	

If more than one adjustment is potentially applicable for the type or character of a given single sound source (i.e., a source that is both tonal and impulsive), only a single adjustment shall be applied.

The proposed quarry working hours are:

Monday to Friday:	07:00 to 18:00 hours.
Saturdays:	07:00 to 14:00 hours.
Sundays/Public Holidays	No working except in the case of maintenance or emergency.

It is requested that the transportation of aggregates and concrete can commence from site at 07:00 (Monday to Saturday). This is also in line with the planning and development Guidelines for Quarrying and Ancillary Activities issued by the DoEHLG

in 2004. An early start-up is required particularly when servicing large construction projects where the concrete pour must be completed in one operation.

It is considered that the proposed development can operate for the proposed working hours and comply with the EPA Recommended General Noise Limit Criteria (For EPA Scheduled Activities (NG4, 2016) Daytime Noise Criterion, 55 dB LAr,T (07:00 to 19:00 hrs).

Adoption of the above ELV's will ensure that there is no significant impact on noise sensitive receptors in the vicinity of the site.

---

#### 10.2.3.2 Blast Vibration Criteria

Blasting in quarries gives rise to ground transmitted vibrations as well as air overpressure, which also maybe perceptible at nearby residences.

It is proposed that blasting will be carried out in accordance with Condition No. 7 of Planning Permission P.A. Ref. 10/383.

#### 7. *Blasting & Vibration*

- (a) *The developer shall only carry out blasting during 09.00 18.00 hrs, Monday to Friday, except in emergencies or for health & safety reason beyond the control of the developer. The developer shall put in place a procedure for notifying local residents o the date(s) and times of blasting. This documented procedure shall be agreed with the Planning Authority, and be available on-site for inspection by the Planning Authority.*
- (b) *No blast or combination of simultaneous blasts shall give rise to a ground-borne vibration level at the nearest noise sensitive receptor which exceeds a peak particle velocity of 12 mm/ second, as measured in any of the three mutually orthogonal direction about a fixed point.*
- (c) *No blast shall give rise to an air overpressure level at the nearest noise sensitive receptor that exceeds 125 dB (Lin) maximum peak. 95% of all air overpressure levels measured at the nearest noise receptor location shall conform to the specified limit value. No individual air overpressure value shall exceed the limit value by more than 5 dB(Lin).*
- (d) *The developer shall carry out blast monitoring (ground-borne vibration and air overpressure) for each blast. The monitoring locations shall be agreed in advance with the Planning Authority and shall be established prior to commencement of development. Blast monitoring shall be carried out for each blast, unless otherwise agreed in writing with the Planning Authority. The following information shall be recorded for each blast: date; time; location in the quarry; amount of explosive used; maximum instantaneous charge; vibration and air overpressure monitoring results. The results of the monitoring shall be submitted to the Planning Authority four weeks after the end of the quarter being reported on.*

#### 10.2.4 EXTRACTIVE INDUSTRY GUIDELINES

The EPA's Draft Advice Notes for Preparing an Environmental Impact Statement (EPA 2015) provides guidance on Air Quality in respect of preparation of EIARs. Some of the guidance available that have a bearing on Air Quality is given below.

DoEHLG (2004). *National Guidelines on Quarries and Ancillary Activities for Planning Authorities*. Department of Environment, Heritage and Local Government (DoEHLG), Dublin, Ireland.

EPA (2006). *Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)*. Environmental Protection Agency (EPA), Johnstown Castle, Wexford, Ireland.

EPA (2015). *Advice Notes on Current Practice for preparing Environmental Impact Statements*, Draft. Environmental Protection Agency (EPA), Johnstown Castle, Co. Wexford, Ireland.

ICF (2005). *Environmental Code*, 2nd Edition. Irish Concrete Federation (ICF), Dublin, Ireland.

Laois County Council Planning Authority, Viewing Purposes Only



## 10.3 METHODOLOGY

### 10.3.1 STUDY

The purpose of the baseline study was to assess existing levels of noise associated with the site, i.e., determine the baseline noise environment. The baseline study included a desktop review of relevant policy, legislation, planning guidelines and technical guidance with respect to noise emissions. The review of the guidance enabled identification of appropriate noise criteria for the proposed development, and prediction of the levels of noise & vibration emissions at the noise sensitive locations in the vicinity of the site.

Noise measurements surveys were undertaken at a number of noise sensitive locations and the results analysed to determine noise conditions. From these results, an assessment can be made of the impact of the development on the existing noise levels of the area.

Enfonic has been commissioned by J. Sheils Planning & Environmental Ltd (JSPE) to develop a noise model for the purposes of assessing the noise impact from the operation of Spink Quarry, Knockbaun, Spink, Co. Laois. JSPE previously undertook a baseline noise survey of the site, data from which are used to assess the impact.

### 10.3.2 SOURCES OF INFORMATION

Refer to Section 10.7 below for details on sources of information.

The following has been taken into consideration with respect to noise monitoring surveys and noise modelling:

- Measurement of noise levels was undertaken using a Type 1 Sound Level Meter;
- Cognisance was taken of the EPA's 'Guidance Note for Noise: Licence Applications, Surveys and Assessments in relation to Scheduled Activities (NG4);
- The surveys were carried out in accordance with '*ISO 1996 Acoustics - Description and Measurement of Environmental Noise: Parts 1/2/3*'.
  - This standard defines the basic quantities to be used for the description of noise in community environments and describes basic assessment procedures. It also specifies methods to assess environmental noise and gives guidance on predicting the potential annoyance response of a community to long-term exposure from various types of environmental noises;
  - For example, it stipulates that noise measurements taken when it's raining are invalid. It also advises on microphone positioning and other relevant procedures such as recording weather conditions.
- *BS 4142:2014 Methods for rating and assessing industrial and commercial sound*;
  - Suitable guidance on environmental noise for planning purposes can be found in the standard BS 4142:2014 Methods for rating and assessing industrial and commercial sound;

- This standard describes a method for assessing the impact of a proposed or existing industrial or commercial sound source. Its principal uses are to assess noise from new or changed industrial or commercial premises, to accompany a planning application, or to assess noise which may be giving rise to complaints;
- The standard is basic in principle, but the details can be complex. In the simplest terms, the procedure rates the noise levels from an operation (the 'Specific' noise) and compares it with the 'Background' noise levels in the absence of the noise source(s) under investigation. The level difference is an indication of the impact that the operation might have;
- If for example, if the 'Rated' noise level (the Specific noise + any penalties for particular noise characteristics) exceeds the Background noise by 10dB or more, it is likely to be an indication of a significant adverse impact. A difference of around 5dB indicates an adverse impact. If the level does not exceed the background, it is likely to have a low impact;
- This however is dependent on the 'context' of the site and its environs e.g. time of day, nature of the neighbourhood, local attitudes to the development etc. There is also a degree of uncertainty applicable to the results e.g. for weather, instrumentation, measurement duration, calculation errors etc which ought to be considered;
- ISO9613;
  - *Acoustics -- Attenuation of sound during propagation outdoors* is used to predict the propagation of the noise level from sources within the development to receptor points;
  - The resultant noise levels are calculated considering a range of factors affecting the propagation of the sound, including:
    - The magnitude of the noise source in terms of A-weighted sound power levels (L<sub>WA</sub>);
    - The distance between the source and the receiver;
    - The presence of obstacles such as screens or barriers in the propagation path;
    - The presence of reflecting surfaces;
    - The hardness of the ground between the source and receiver;
    - Attenuation due to atmospheric absorption; and
    - Meteorological effects such as wind gradient, temperature gradient and humidity (these have significant impact at distances greater than approximately 400m).

- British Standard 5228-1:2009+A:2014 Noise and vibration control on construction and open sites:
  - Part 1: Noise (BS5228) sets out a methodology for predicting noise levels arising from a wide variety of construction and related activities. It can be used to predict noise levels arising from the operations of proposed minerals extraction sites. BS5228 also sets out tables of sound power levels generated by a wide variety of mobile equipment. Recognised as good practice standards for scope, content and methodology of noise impact assessment, these guidelines address the key principles of noise impact assessment and are applicable to all development proposals where noise effects are likely to occur; and
  - The guidance adopted in this standard designates noise sensitive locations into a specific category, based on the existing ambient noise levels i.e., in the absence of construction noise. This then sets threshold noise values for construction related noise that if exceeded, indicates a significant noise impact is associated with the construction activities.

Laois County Council Planning Authority, Viewing Purposes Only

## 10.4 BASELINE DESCRIPTION OF RECEIVING ENVIRONMENT

### 10.4.1 SENSITIVE RECEPTORS

The principal concern in respect of emissions from the facility is the effect on residential amenity.

The surrounding lands are largely agricultural and held in pasture, although a forestry plantation abuts the site to the southwest. The R430 Regional Road bounds landholding to the north with c. 700 m of frontage.

Residential property in the area typically comprises one-off single residences and farmsteads along public roads and to a minor extent, along and at the end of lanes off the public roads.

There are 36 residences within a 1 km radius of the quarry site (See EIAR Figure 4.1). The closest residence is located c. 175 m west of the site and is one of a cluster of three houses at Larkin's Cross. There are only four residences within 250 m of the site, but all but one of these residences (i.e., No. 4; Refer Figure 4.1) are sheltered, in terms of visual, noise and dust impacts, behind the hill into which the quarry is developed. Indeed, another 12 residences between 500 m and 1 km of the site (i.e., Nos. 11 to 22) are similarly sheltered behind the hill. Of the 13 residences within 1 km of the site that are not sheltered behind the hill, one lies within 250 m (No. 4), four more lie between 250 m and 500 m (i.e., Nos. 7-10), and seven more lie between 500 m and 1 km (i.e., 23-30). There has been a long historical association with quarrying at this location and consideration has been given to screening of the development, phasing and direction of working with respect to receptors so as to reduce visual impact, while impacts due to noise and dust are substantially attenuated.

The Knock National School is located c. 1.75 km to the west, while Headen's Bar in Spink is located c. 850 m to the west along the R430, both of which community facilities are sheltered behind the hill. There are no other industrial and commercial developments within 1 km.

### 10.4.2 ENVIRONMENTAL MONITORING

JSPE conducted an attended noise survey of the site on 1<sup>st</sup> June 2021. The locations are presented in EIAR Figure 1.3.

The results of the noise survey are given in Table 10.3. Noise from road traffic on the Regional R430 impacted on noise measured at N2 with noise levels of c. 50 to 51 dBA  $L_{Aeq}$ .

Table 10.3 Results of Noise Monitoring Survey 01/06/21

Location	Date	Start Time	Elapsed Time	LAeq	Traffic Count			Weather Conditions	Notes
					Cars	HGV	Pedestrian/ Cyclist		
N2	01/06/2021	09:40	00:30:00	50.3	33	5		Bright hazy sunshine, no wind	Local Park, Bird song, passing traffic on adjoining Regional R430
N3	01/06/2021	10:44	00:30:00	44.2	40	2		Bright hazy sunshine, no wind	Bird song, traffic on Regional R430
N4	01/06/2021	11:36	00:30:00	44.4				Bright hazy sunshine, some Cirrostratus, no wind	Bird song, distant traffic on Regional R430
N1	01/06/2021	12:59	00:30:00	37.6	4	3		Bright hazy sunshine, some stratocumulus, Light easterly Breeze	Bird song, quiet rural road, distant traffic on R430
N2	01/06/2021	13:30	00:30:00	50.9	51	2	2	As above	Bird song, traffic on Regional R430, Lawnmower opposite side of R430 (Property No.10).
N3	01/06/2021	14:07	00:30:00	41.3	23			As above	Bird song, traffic on Regional R430
N4	01/06/2021	14:45	00:30:00	45.8				As above	Bird song, distant traffic on Regional R430
N1	01/06/2021	15:26	00:30:00	41.2	11		2	As above	Bird song, quiet rural road, distant traffic on R430
N2	01/06/2021	16:18	00:30:00	49.5	51	2		As above	Local Park, Bird song, passing traffic on adjoining Regional R430
N3	01/06/2021	16:50	00:30:00	50.3	64	3		As above	Bird song, traffic on Regional R430
N4	01/06/2021	17:32	00:30:00	47.8				As above	Bird song, distant traffic on Regional R430
N1	01/06/2021	18:16	00:30:00	38.2	7	1		As above	Bird song, quiet rural road, distant traffic on R430, milking parlour

## 10.5 ASSESSMENT OF IMPACTS

The principal concern in respect potential noise emissions from the proposed development is the effect on residential amenity.

The following Impact Assessment matrix (Refer to Table 10.4) provides an indication of the significance of potential effects arising during the life cycle of the development not accounting for any mitigation measures.

Table 10.4 Noise - Impact Matrix			
'Do Nothing' Impacts	X		
Factors	Construction	Operation	Decommissioning
Direct Impacts	●	●	X
Indirect Impacts	X	X	X
Cumulative Impacts	X	X	X
Residual Impacts	X	X	X
'Worst Case' Impacts	●	●	X
<p>None/imperceptible: X; Slight: ●; Moderate: ●; Significant/Very significant: ●.</p> <p>Refer to Appendix 3 for definition of Significance</p>			

### 10.5.1 'DO NOTHING' IMPACTS

It is evident from analysis of the above results (Refer to Section 10.4.2 above) that the noise environment in the immediate vicinity of the existing quarry site is determined primarily by noise from the Regional R430 road.

Residences along this road are typically experiencing noise levels of 50 dBL<sub>Aeq</sub> during daytime hours due to passing traffic on the Regional R430 road. Locally, rural sounds such as birds, dogs and farmyard animals, as well as farm machinery are intermittently audible. It is expected that the volume of road traffic in the area will increase over time, and thus may lead to an increase in noise levels.

Under the 'Do Nothing' scenario, the proposed development would not occur and the site would be restored as per the requirements of the existing planning permission (P.A. Ref. 10/383).

### 10.5.2 DIRECT IMPACTS

The proposal is for the continued use of a quarry for the production of aggregates and operation of a concrete batching plant in the townland of Knockbaun, Spink, County Laois. The scale of the operation under planning permission P.A. Ref. 10/383 was up to a maximum output of 350,000 tonnes per annum. The proposed development will not exceed this level and the average output will be closer to c. 200,000 tonnes per annum.

The proposed development will require the stripping, transport and placement of soils and overburden, as part of the quarry extraction and restoration scheme. An excavator and dump trucks will be mobilised to site as and when required to carry out these operations. These activities will be short term and will only occur a few times over the course of the quarry development.

Overburden stripped to access the underlying bedrock will be used to construct peripheral screening berms or embankments, temporary berms to aid noise attenuation and visual impact of the upper quarry face and/or for restoration of the completed sections of the excavation. The presence of the existing quarry means that there is little development works required.

The current vegetated site boundaries will be retained in-situ and the existing vegetation and intervening natural topography, coupled with the distance to neighbouring residences will ensure that the development does not impinge on the locality.

Elevated noise levels may be experienced along site boundaries during construction of screening embankments. However, these works will be of a short-term nature and intermittent as the quarry is progressively advanced to its limits.

As an existing quarry with much of its infrastructure in-situ, only a brief construction phase is envisaged. The proposed development will continue to use/upgrade the established quarry infrastructure located in the site, including site entrance, internal roads, wheel wash, weighbridge, aggregate storage bays, refueling hard stand, water pond system, and other ancillaries (Refer to Figure 1.3). The development will include provision of new site infrastructure, including portacabin site office/canteen, toilets, concrete batching plant and truck washdown facility, hydrocarbon interceptors, mobile crushing and screening plant, upgrading of the water management system, provision of holding tank for wastewater, and other ancillaries.

Peripheral screening mounds along the northern roadside and western boundary are in place.

It is considered that any direct impact with respect to noise emissions will be slight, short term, negative due to construction works.

This is an established well developed quarry and as such the working face has already been developed/exposed within the central portion of the site. The mobile crushing and screening plant will be located centrally within the existing excavation, relocating periodically as the working face is developed to the southeast.

The attached Site Layout Figure 3.1 shows the proposed site layout including mobile crushing, and screening plant, wheel wash, weighbridge, site office, concrete batching plant, truck washdown facility, water management ponds, quarry sump, refuelling hard stand and other ancillaries. Cross sections illustrating the quarry development are shown in Figure 3.3.

There will be no changes to the method of extraction and processing as a result of this planning application. Drilling and blasting will continue to be utilised with processing of extracted rock using mobile crushing and screening plant located within the quarry void. This will reduce handling of material and will also have the benefit of screening these activities from outside views, and being at depth, will also mitigate impacts associated with noise and dust. The broken rock will be excavated by a combination of either a wheeled loading shovel and / or excavator. Once loaded, the excavated rock will be taken directly to the crushing plant.

The proximity to residences and the requirement to protect their amenity value has been given due consideration through scale, siting and layout of plant and machinery, phasing and direction of working and site restoration. A working scheme has been designed for the quarry that provides for the sequence and direction of working. The objective of this scheme is to reduce as far as possible the overall visual impact of the workings (Refer to Figures 3.1 to 3.3). Furthermore, mitigation measures to alleviate any adverse impacts from the development on the environment have been incorporated into the design to ensure that the development can be operated above / within accepted thresholds / standards for this type of development.

The main site activity including mobile processing plant will be sited on the quarry floor and as such benefit from screening afforded by the existing quarry faces and perimeter berms and hedgerows.

The southeasternmost section of the land holding (c. 4.7 ha), remains as undisturbed scrub and poor grazing land and will remain in place to form a natural screening barrier from views to the east and northeast.

The quarry will be worked top-down and phased with initial development in a westerly direction and then in an easterly direction. As such the plant and machinery will be screened from outside views by the intervening quarry face and topography which will also act as a noise attenuation barrier.

The following figure is a generalised flow chart (Refer Figure 10.1) showing the main site activities likely to give rise to noise emissions.

The processing area and loading area will be removed from residential property in the area and screened by the existing topography, quarry face and the proposed screening berm along the outer limits of the excavation. The concrete batching plant will also be located at the base of the screening mound at the western site boundary. This screening mound is to be landscaped to a more natural profile.

The following flow diagram shows the main sources of noise emissions arising on site and the methods of treatment/abatement to be employed.



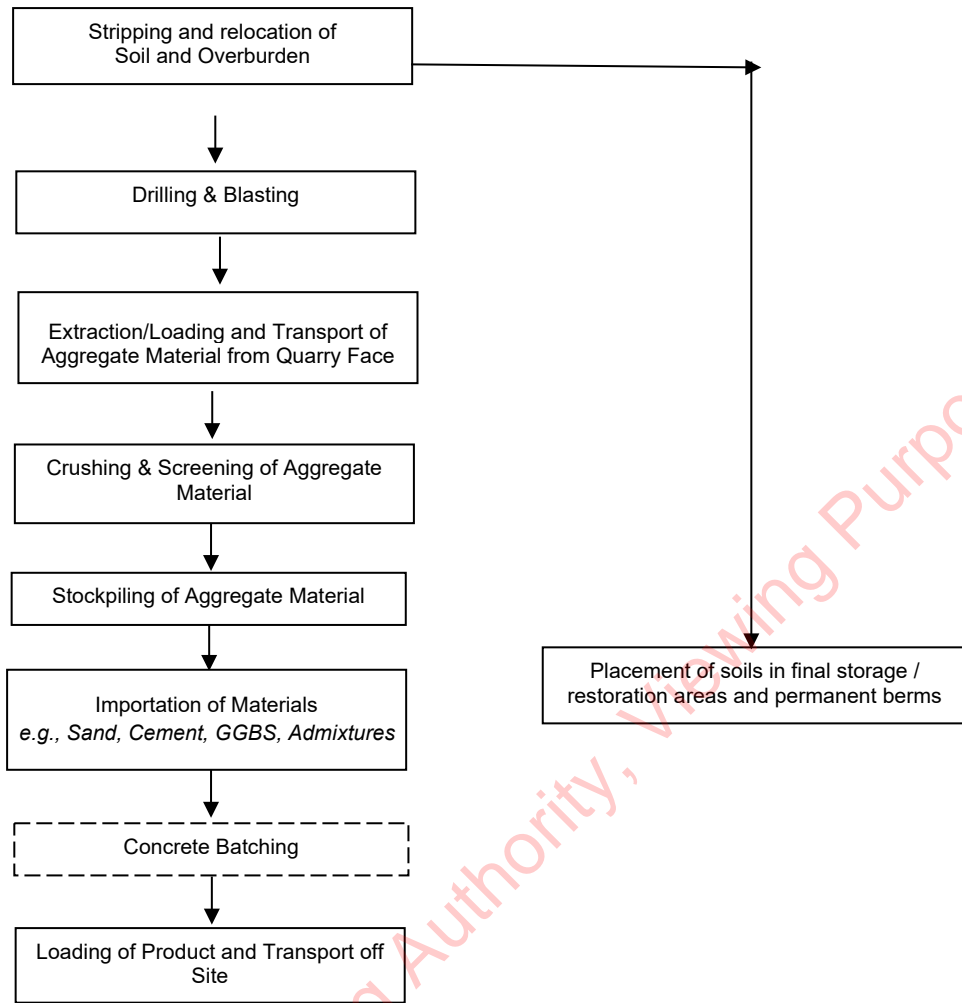
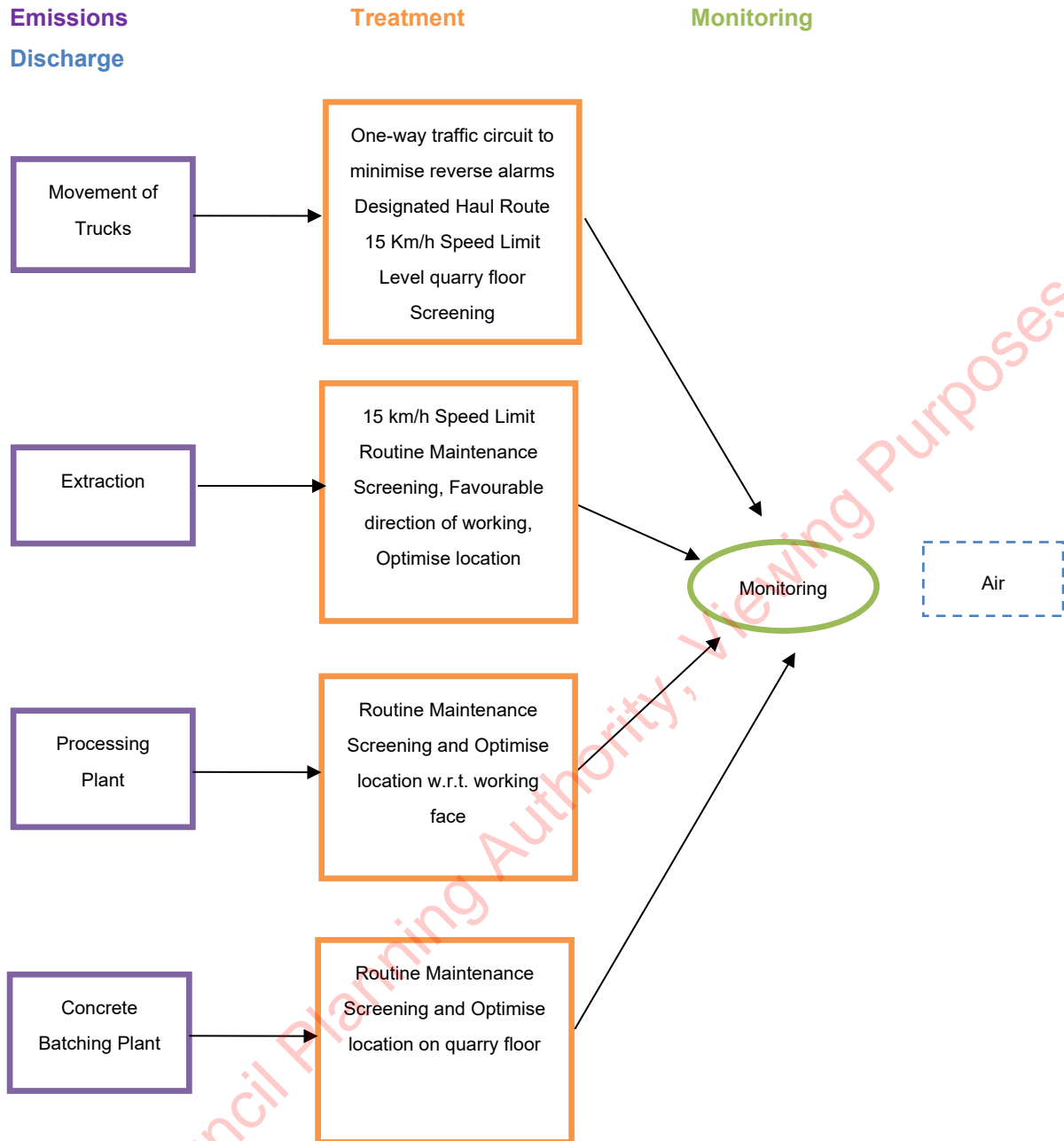


Figure 10.1 Operational Activities

Laois County Council Planning Authority, Viewing Purposes Only



**Figure 10.2 Flow Chart for Source of Noise Emissions**

10.5.2.1 Noise Modelling

In order to assess the impact of the proposed quarry extraction operations on residences in the locality a noise prediction exercise was undertaken, whereby the levels of noise at the nearest noise sensitive receptors were calculated.

The proprietary software used, Brüel & Kjær Type 7810-C Predictor, to calculate noise levels in accordance with the ISO 9613:1996 standard.

A computer-based prediction model has been prepared to quantify the noise levels of the proposed development. This section discusses the methodology behind the noise modelling process and presents the results of the modelling exercise.

The noise model was prepared using the following data:

- Scaled map of the area around the site;
- Topographic data;
- Buildings associated with sensitive receptors;
- Sound power data of the main sources; and
- Ground types.

The details of the fixed and mobile noise sources used in the model are shown in Figure 10.3 and their values in Table 10.5.

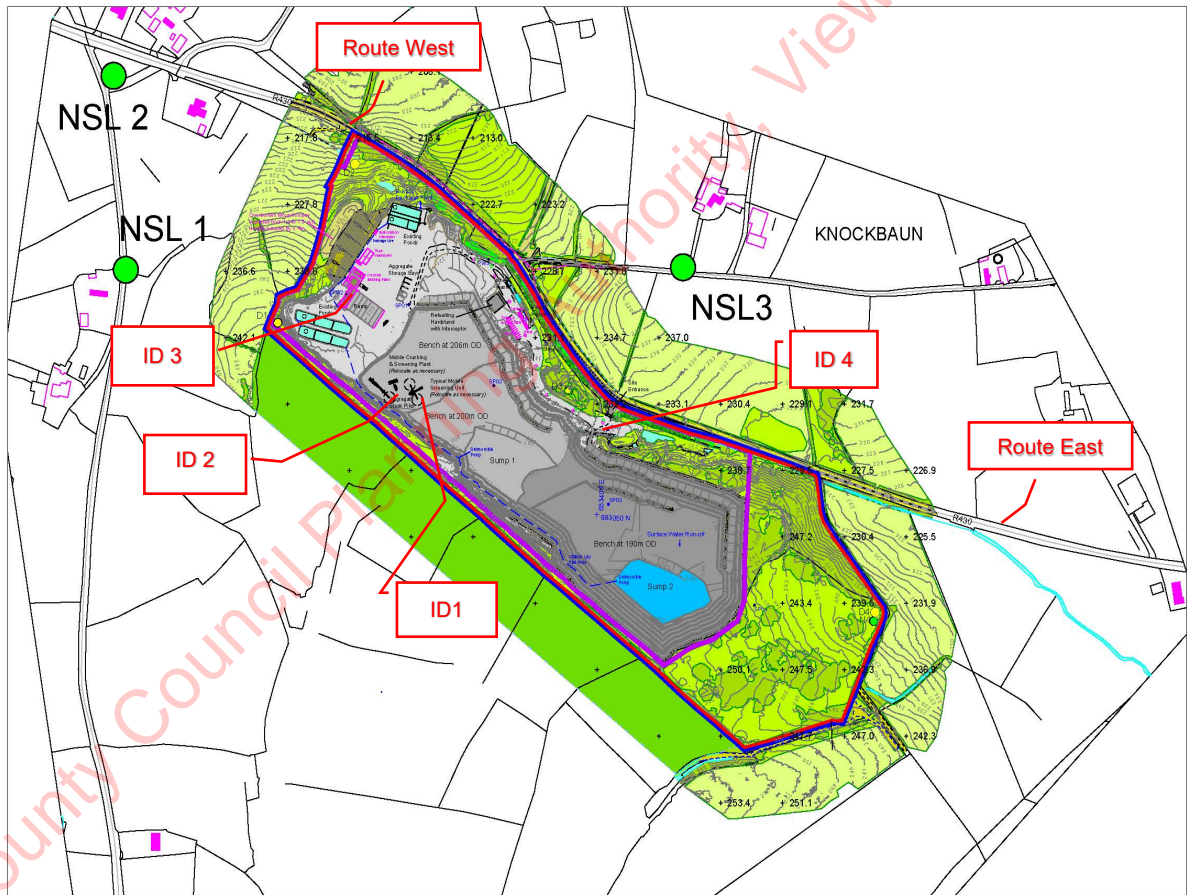


Figure 10.3 Proposed Site Layout showing Location of Noise Source for Worst Case Scenario

**Table 10.5 Summary of results of attended survey for proposed Noise Sources**

ID	Item	Octave band (Hz) sound power levels L <sub>w</sub>								Overall (dBA)
		63	125	250	500	1k	2k	4k	8k	
1	Crushing and screening plant	123	119	111	106	105	103	97	90	111
2	Loading shovel	92	95	92	88	90	88	80	73	94
3	Concrete Batching Plant	77	87	91	92	97	96	94	87	101
4	Traffic in/out	94	92	87	85	82	79	74	68	87
<i>dB re2x10<sup>-12</sup>pW</i>										

A worst case scenario is being considered i.e., the sources will be operating simultaneously and continuously from 07:00 to 18:00. Night-time noise impacts are not being considered as the site will not be operational at night-time. For the purpose of the worst case scenario the processing plant is positioned in the northwest corner closest to the concrete batching plant and nearest residence (NSL2) to the west. However, as the quarry is developed the processing plant will be relocated further east and on a lower bench.

The scale of the operation under planning permission P.A. Ref. 10/383 allowed for a maximum output of 350,000 tonnes per annum. The proposed development will not exceed this level and the average output will be closer to c. 200,000 tonnes per annum of aggregates. In addition, the concrete batching plant will produce up to 15,000 m<sup>3</sup> (36,000 tonnes) of ready-mix concrete per annum.

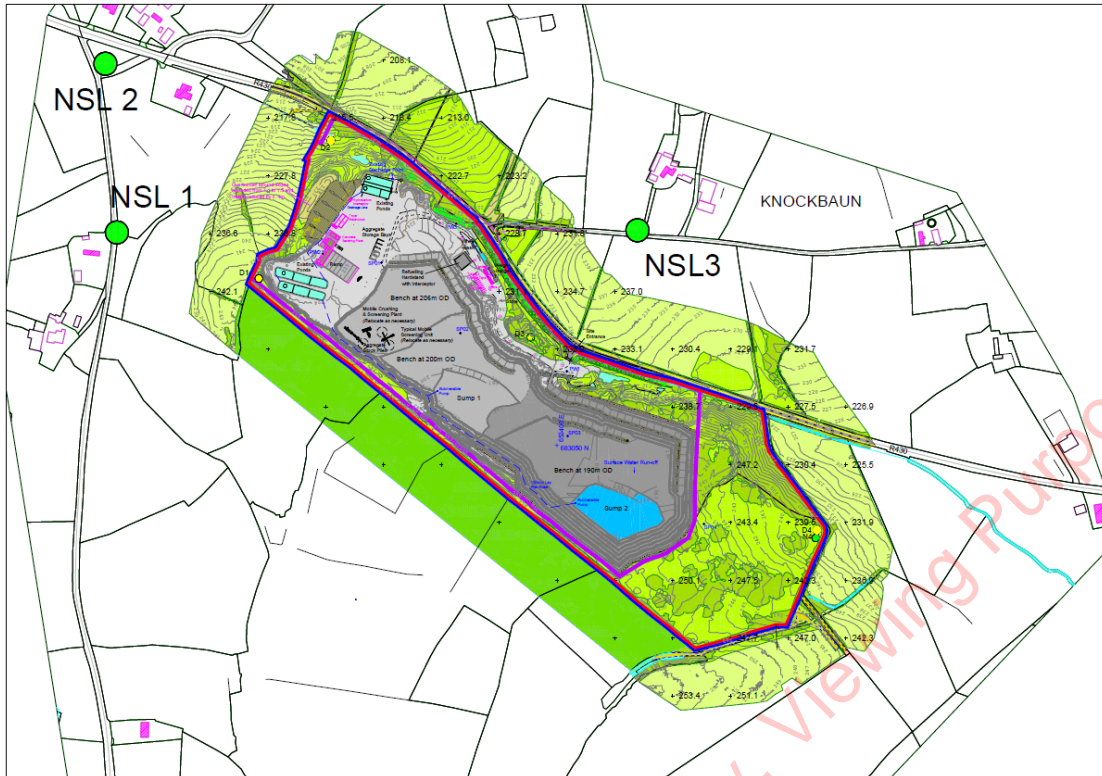
The number of truck movements per hour for a worst case scenario is set out in Table 10.6.

**Table 10.6 Summary of Traffic Flow**

Vehicle Type	Average Trips/hr	Average Trips/day
Quarry HGV	10	110

The traffic exiting the quarry has been modelled as joining the main R430 at an average speed of 50 km/hr.

The noise sensitive locations are shown in Figure 10.4.



**Figure 10.4 Noise Sensitive Locations**

Penalties/adjustments to the predicted ‘Specific’ noise levels may also be applied. These include penalties for Tonal and Impulsive characteristics of the site noise and its Intermittency to give the “Rated level” ( $L_r$ ). From measurements of operational noise at similar sites undertaken by Enfonc and others, such operations don’t typically generate tonal or impulsive characteristics provided site management plans, including correct maintenance schedules, are maintained. The noise from the development is therefore not expected to exhibit any of these characteristics and no penalties apply.

The measured noise levels, the predicted  $L_{Aeq}$  levels and their differences are given in Table 10.7.

**Table 10.7 Noise Modelling Results**

Name	Height (m)	Proxy location	Measured Background $L_{A90}$	Predicted Level $L_{Aeq}$	Level difference
NSL1	1.5	N1	30.0	30.1	0.1
NSL2	1.5	N2	28.2	35.9	7.7
NSL3	1.5	N3	38.2	38.8	0.6

*dB re:  $2 \times 10^{-5} Pa$*

Following the guidelines of BS:4142, the likely impact as a result of the level differences are summarised in the following Table 10.8.

**Table 10.8 BS4142 Impact relating to Level Difference**

Level difference	Adverse Impact
<0	None
Around 5dB	Low
>10dB	Significant

From Table 10.8 the maximum impact therefore relates to NSL2, which is not surprising as this is the closest dwelling to the quarrying activity. The level difference here is +7.7dB which falls within the 'Low' adverse impact category.

The worse-case scenario suggests 'None' or 'Low' adverse impact is likely at the residents including the closest to the development (NSL2). This location is also close to the road and the some of the existing measured ambient noise levels here already exceed the predicted levels from the development.

The impact assessment and its context are such that the development is highly unlikely to result in an adverse effect. With that in mind, we see no reason from a noise impact perspective for this development not to proceed.

Noise resulting from the quarry operations can be kept to acceptable levels by the implementation of good design, effective operation and management and by the implementation of measures which are deemed to be best practice.

---

#### 10.5.2.2 Blast Vibration

On average 20,000 to 30,000 tonnes of rock will be produced per blast. Blasting will occur on site approximately once per month.

The duration of a blast in terms of noise is over in a split second similar to a clap of thunder. The nearest proposed limit of the quarry area will be c. 300 m removed from the nearest residential property.

A blast must be carried out on site on the specified day as concerns over security does not allow for explosives to be stored on site. In exceptional circumstances, due to unforeseen circumstances (e.g. late delivery or security) a blast may be delayed or brought forward. Where possible the Company would endeavour to inform the public of the revised blasting timetable.

Blasting will be carried out using industry standard bench blasting techniques. A consequence of blasting is ground vibration measured as peak particle velocity (i.e., PPV) and air overpressure measured as the noise level of "air blast" (i.e., dB (Lin)). Blast monitoring will be carried out at agreed residences within the area. Ground vibration and air overpressure will be measured for each blast.

The Environmental Protection Agency publication "Integrated Pollution Control Licensing – Guidance Notes for Noise in Relation to Scheduled Activities" states that *"in the case of quarrying and mining operations, the vibration levels from blasting should not exceed a peak particle velocity of 12 mm/sec, measured in any three mutually orthogonal directions at a receiving location when blasting occurs at a*

*frequency of once per week, or less. For more frequent blasting the peak particle velocity should not exceed 8 mm/sec. These levels are for low frequency vibration, i.e., less than 40 Hertz. Blasting should not give rise to air overpressure values at sensitive locations which are in excess of 125 dB (Lin) <sub>max peak</sub>.*

This is consistent with Condition No. 7 of Planning Permission P.A. Ref. 10/383 (Refer to Section 10.2.3.2 above).

Ground vibration and air overpressure measurements will be undertaken taken at the nearest susceptible residences in the area.

Lagan will put in place a "Blast Notification Procedure & Blast Monitoring Programme". A copy of the proposed procedure is provided in Appendix 11. This procedure will be amended as necessary on any grant of planning permission for the quarry development.

---

### 10.5.3 INDIRECT IMPACTS

There are no indirect impacts with respect to noise.

---

### 10.5.4 CUMULATIVE IMPACTS

There are no other quarries, commercial or industrial facilities in close proximity to the site. As such it is considered there is no significant cumulative impact with respect to the operation of the quarry.

---

### 10.5.5 TRANSBOUNDARY IMPACTS

The EIA Directive 2014-52-EU invokes the Espoo Convention on Environmental Impact Assessment in a Transboundary Context, 1991, and applies its definition of transboundary impacts. Given the location (c. 135 km from the border with N. Ireland), nature, size and scale of the proposed development, it is expected that the impacts of the development would have imperceptible transboundary effects on air quality.

---

### 10.5.6 RESIDUAL IMPACTS

As a result of the proposed mitigation and enhancement measures incorporated in the design, no significant, adverse residual impacts are predicted in terms of noise and vibration levels on the local residences, their property, livestock or amenity during the operational phase.

Following full restoration and closure of the site that there will also be no adverse impacts in terms of the noise levels. The restored quarry will provide a more quiescent environment than is currently the case, but with a change in land-use from the original agricultural use to mineral extraction to ultimately a future beneficial use as a wildlife amenity.

### 10.5.7 'WORST CASE' IMPACT

The worse-case scenario suggests 'None' or 'Low' adverse impact is likely at the residents including the closest to the development (NSL2). This location is also close to the road and the some of the existing measured ambient noise levels here already exceed the predicted levels from the development. Refer to EIAR Section 10.5.2.1 above with respect to worst case scenario.

Various mitigation measures will be implemented to minimise any impacts as much as practical to ensure the operation of the quarry will not result in any significant impact on residences or local amenities (Refer to Section 10.6.1 below).

Laois County Council Planning Authority, Viewing Purposes Only



## 10.6 MITIGATION & MONITORING

### 10.6.1 MITIGATION

#### 10.6.1.1 Noise

Sources of noise from the development will originate mainly from the operation of the extraction equipment, processing plant, mobile plant, concrete batching plant and from the movement of trucks. Noise resulting from the operations can be kept to acceptable levels by the implementation of good design, effective operation and management and by the adoption of 'best practices'.

In accordance with the principles of Best Available Techniques (BAT) the applicant is committed to employing the most effective and advanced methods of operation to reduce noise emissions and their impacts on the environment.

Lagan Materials Ltd have in place a group wide Environmental Management System (EMS). They have established an integrated management system (IMS) designed to comply with the Environmental requirements of the ISO 14001:2015 standard and the Quality Management requirements of ISO 9001:2015. The IMS is a two-tier system with this top-level Environmental Manual based on ISO EN 14001:2015 being applicable to all activities. The top-level Quality manual then feeds down to the Factory Production Control (FPC) Quality Plans and the depot specific Environmental Management Plans.

The FPC Quality Plans incorporate the procedures and controls in place to reflect the quality system for asphalt and aggregate production. The Environmental Management Plans (EMP's) are depot specific and have been designed to comply with the requirements of ISO EN 14001:2015. The EMP's record the procedures and controls in place to reflect the Quality System and the specific environmental aspects and impacts and the legislative requirements applicable at each depot.

The Company has implemented a quality assurance system and an environmental management system and has certification to the ISO 9001 and ISO 14001 standards. The Company's experience and implementation of the systems has identified the advantages of a structured and systematic approach in achieving managerial objectives.

A copy of the existing EMP for Spink Quarry is included as Appendix 10.

A number of mitigation measures will be put in place with respect to the proposed quarry in order to minimise noise emissions and blast vibration and ensure that the operation is within any specified thresholds, and in line with good industry practice. These are:

#### **EMP (Refer to Appendix 10 - DP 010 Noise & Vibration Management)**

- Working hours shall be strictly confined to the hours stated in the sites planning consents;
- There shall be no works on Sundays or Bank Holidays;

- The lowest possible noise level reverse warning alarms consistent with site safety shall be utilised;
- Compressors and pumps shall be enclosed and insulated where possible when in use;
- Muffling devices shall be fitted to ensure that effective noise control is achieved;
- Unnecessary revving of engines shall be avoided;
- Equipment shall be switched off when not in use;
- Plant and vehicles shall be properly maintained and, in particular, the effectiveness of silencers and lubrication of bearings and moving parts shall be carefully monitored; cutting edges of relevant equipment shall be kept sharp;
- For directional noise sources e.g. reversing trucks, the noise source shall be pointed away from the nearest noise sensitive receptors wherever possible;
- Internal haul roads shall be effectively maintained and constructed in such a way as to minimise gradients;
- Acoustic enclosures for pumps and generators and similar plant shall be used to minimise noise levels associated with their operation where possible;
- Drop heights for materials shall be minimised;
- Plant and vehicles shall be started sequentially rather than all at once; and
- When working in close proximity to noise sensitive receptors the works programme shall be carefully controlled so that noisy activities are planned in such a way that they do not all occur simultaneously.

#### **Other Site Measures**

- The provision of temporary screen banks to screen site activities from outside views as necessary;
- The preservation of hedgerows and boundary features aids noise attenuation;
- Consideration has been given to phasing and direction of working through preparation of the working scheme;
- The quarry will be worked top-down and phased with initial development in a westerly direction and then in an easterly direction. As such the plant and machinery will be screened from outside views by the intervening quarry face and topography which will also act as a noise attenuation barrier;
- Extracted rock will be processed on the floor of the quarry using mobile crushing and screening equipment to produce saleable aggregates. As such the plant and machinery will be screened from outside views by the intervening quarry face and topography which will also act as a noise attenuation barrier;
- Noise sources will be located to take advantage from screening provided by quarry faces and stockpiles. Mobile processing plant will be located at a screened location within the quarry. Haul routes will be designed and maintained, with strict speed limits, to limit vehicle noise;

- The existing designated internal haul roads will be utilised to manage traffic entering and leaving the site to ensure that site traffic is removed from nearest noise sensitive receptors;
- Internal haul road gradients will be kept as low as possible to reduce engine / brake noise from heavy vehicles;
- All plant and machinery is switched off when not in use;
- The noise emanating units of the concrete batching plant, i.e., the mixer, will be enclosed structures; and
- A noise management programme will be defined as part of the EMS.

---

#### 10.6.1.2 Blasting & Vibration

Blasting in quarries gives rise to ground transmitted vibrations as well as air overpressure, which also maybe perceptible at nearby residences. In order to minimise these effects, the blast management practice at this quarry will include several mitigation measures, such as: (1) best professional practice in the design and execution of blasting; (2) only certified Shotfirers are used to conduct blasting; (3) millisecond time delays are used in sequential detonation of the explosives to limit the maximum instantaneous charge; and (4) explosive charges are properly confined by a sufficient quantity of quality stemming material.

Efficient blasts ensure as much of the explosive energy as possible is utilised for rock fragmentation, and by implication ground vibration and air overpressure is inefficient use of this energy. Air overpressure values arising from blasting operations fluctuate depending on the weather conditions, a factor outside the control of operators. The emission limit value should be specified with a 95% confidence limit to address this issue.

The following measures should be considered to reduce the effects of blasting:-

- Optimise blast design;
- Monitor blasts and revise blast design, as required;
- Limit ground borne vibration and minimise air over pressure by:
  - taking care in unusual situations e.g., corners;
  - including geological considerations in blast design;
  - Air overpressure is minimised through proper blast design, avoiding detonation of large unconfined charges, and by consideration of atmospheric conditions before blasting;
  - A blast must be carried out on a specified day as concerns over security does not allow for explosives to be stored on site. In exceptional circumstances or unforeseen circumstances (e.g. late delivery, security, meteorological conditions, etc.) a blast may be delayed or brought forward. Where possible

the operator should endeavour to inform the public of the revised blasting timetable;

- Adequate stemming of holes;
- Ensure the correct blasting ratio is obtained. The blasting ratio is a measure of the amount of work expected per unit volume of explosives i.e., tonnes/kg; and
- Notify nearest residences prior to the blast.

It is proposed that blasting will be carried out in accordance with Condition No. 7 of Planning Permission P.A. Ref. 10/383).

#### 7. *Blasting & Vibration*

- (e) *The developer shall only carry out blasting during 09.00 18.00 hrs, Monday to Friday, except in emergencies or for health & safety reason beyond the control of the developer. The developer shall put in place a procedure for notifying local residents of the date(s) and times of blasting. This documented procedure shall be agreed with the Planning Authority, and be available on-site for inspection by the Planning Authority.*
- (f) *No blast or combination of simultaneous blasts shall give rise to a ground-borne vibration level at the nearest noise sensitive receptor which exceeds a peak particle velocity of 12 mm/ second, as measured in any of the three mutually orthogonal direction about a fixed point.*
- (g) *No blast shall give rise to an air overpressure level at the nearest noise sensitive receptor that exceeds 125 dB (Lin) maximum peak. 95% of all air overpressure levels measured at the nearest noise receptor location shall conform to the specified limit value. No individual air overpressure value shall exceed the limit value by more than 5 dB(Lin).*
- (h) *The developer shall carry out blast monitoring (ground-borne vibration and air overpressure) for each blast. The monitoring locations shall be agreed in advance with the Planning Authority and shall be established prior to commencement of development. Blast monitoring shall be carried out for each blast, unless otherwise agreed in writing with the Planning Authority. The following information shall be recorded for each blast: date; time; location in the quarry; amount of explosive used; maximum instantaneous charge; vibration and air overpressure monitoring results. The results of the monitoring shall be submitted to the Planning Authority four weeks after the end of the quarter being reported on.*

The local community will be informed by the Company of the blasting schedule i.e.,

- Nearby residences within 200 m of the quarry face will be provided with 7 days written notice of intention to blast;
- Residences within 500 m of the quarry will be provided with a minimum of 24 hours' written notice of intention to blast;
- On the day of the blast, all of these identified residents will be contacted by phone approximately 1 hour before the blast is due to take place. A clearly audible

warning siren is sounded before each blast. When blasting operations are completed an ALL CLEAR siren is sounded.

A copy of the proposed Blast Notification Procedure & Blast Monitoring Programme to be adopted at Spink Quarry is provided (Refer to Appendix 11).

Consequently it is considered that the proposed development can be operated within the accepted noise and vibration thresholds.

Blast monitoring will be carried out at agreed residences within the area. The results obtained will be used to ensure compliance with any planning condition requirements.

---

#### 10.6.1.3 Monitoring

Noise monitoring will ensure that the operations comply with recognised thresholds for this type of development.

The noise prediction modelling data shows that the development can comply with the noise level threshold as specified and as a consequence the development will have no significant effects regards noise levels in the area.

Lagan Materials Ltd have in place a group wide Environmental Management System (EMS). A copy of the existing EMP for Spink Quarry is included as Appendix 10. The EMP for the quarry includes for regular noise monitoring to demonstrate that the development is not having an adverse impact on the surrounding environment. The locations of the proposed noise monitoring stations are shown in Figure 3.1.

The developer shall carry out blast monitoring (ground-borne vibration and air overpressure) for each blast. The monitoring locations shall be agreed in advance with the Planning Authority and shall be established prior to commencement of development. The following information shall be recorded for each blast: date; time; location in the quarry; amount of explosive used; maximum instantaneous charge; vibration and air overpressure monitoring results. The results of the monitoring shall be submitted to the Planning Authority four weeks after the end of the quarter being reported on.

This programme will allow on-going monitoring of noise and blast vibration emissions from the site, thereby assisting in ensuring compliance with any future requirements or regulations.

Through implementation of the proposed mitigation measures it is considered the development will continue to have no significant effects with regard to noise and blast vibration levels on the local residences, their property, livestock and amenity.

## 10.7 REFERENCES

- BSI (2014). *BS 5228-2:2009+A1:2014. Noise and vibration control on construction and open sites. Code of practice for basic information and procedures for noise and vibration control*. British Standards Institute (BSI), London, UK.
- DoEHLG (2004). *Quarries and Ancillary Activities - Guidelines for Planning Authorities*, Dept. of the Environment, Heritage and Local Government (DoEHLG), Dublin, Ireland, 46 p. [Available at <http://www.environ.ie/en/Publications/DevelopmentandHousing/Planning/>]
- EPA (1992). *BATNEEC: Guidance Notes for the Extraction of Minerals*. Environmental Protection Agency (EPA), Johnstown Castle, Co. Wexford, Ireland, 22 p.
- EPA (2002). *Guidelines on the Information to be contained in Environmental Impact Statements*. Environmental Protection Agency (EPA), Johnstown Castle, Co. Wexford, Ireland, 33 p. [Available at <http://www.epa.ie/pubs/>]
- EPA (2003). *Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)*. Environmental Protection Agency (EPA), Johnstown Castle, Co. Wexford, Ireland, 140 p. [Available at <http://www.epa.ie/pubs/>]
- EPA (2006a). *Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)*. Environmental Protection Agency (EPA), Johnstown Castle, Co. Wexford, Ireland, 28 p. [Available at <http://www.epa.ie/pubs/>]
- EPA (2006b). *Integrated Pollution Control Licensing – Guidance Notes for Noise in Relation to Scheduled Activities, 2nd ed*. Environmental Protection Agency (EPA), Johnstown Castle, Co. Wexford, Ireland.
- EPA (2015). *Advice Notes on Current Practice for preparing Environmental Impact Statements*, Draft. Environmental Protection Agency (EPA), Johnstown Castle, Co. Wexford, Ireland.
- ICF (2005). *Environmental Code, 2nd ed*. Irish Concrete Federation (ICF), Dublin, Ireland.

### Internet Sources

- <http://epa.ie> Environmental Protection Agency (EPA), Wexford.
- [https://europa.eu/european-union/eu-law/legal-acts\\_en](https://europa.eu/european-union/eu-law/legal-acts_en) European Union, Regulations, Directives and other Acts.
- <http://ec.europa.eu/environment/eia/eia-guidelines/g-screening-full-text.pdf> European Commission, Guidance on EIA Screening.
- <http://www.irishstatutebook.ie/home.html> Irish Statute Book, Office of the Attorney General, Dublin.