Assessment of the Environmental Impact of Noise from Proposed Western Extension to Mineral Extraction Operations at Mouselow Quarry, Derbyshire

WIENERBERGER LIMITED

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QUALITY MANAGEMENT

Report Title:	Assessment of the Environmental Impact of Noise from Proposed Western Extension to Mineral Extraction Operations at Mouselow Quarry, Derbyshire
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SUMMARY

1. Vibrock Limited have been commissioned by Quarryplan Limited to conduct an assessment of potential noise impact from a proposed western extension to mineral extraction operations at Mouselow Quarry, Derbyshire. It is understood that this report will form part of an Environmental Impact Assessment that will accompany a planning application that is to be submitted to the Local Authority.

2. Existing sound levels have been measured at locations chosen to represent noise-sensitive premises in the vicinity of the proposed extraction area.

3. Predicted noise levels from proposed quarry operations have been calculated at nearby noise-sensitive premises. These predictions are based on information provided by the applicant which include site layout details, required items of plant and intended methods and times of working.

4. The proposed mineral extraction operations at Mouselow Quarry have been assessed with reference to Planning Practice Guidance (PPG) to the National Planning Policy Framework (NPPF).

5. The proposed scheme is considered able to operate in accordance with the noise standards recommended within current Planning Practice Guidance for mineral sites.

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1.0 INTRODUCTION

1.1 Overview

1.1.1 Vibrock Limited were commissioned to undertake a noise assessment of the proposal to extract and process sandstone and brick making shale from an extension to the west of Mouselow Quarry, Derbyshire.

1.1.2 This study benefits from a site inspection and sound level monitoring undertaken on the 28 September 2017. Baseline monitoring was conducted at the closest noise sensitive premises to the proposed quarrying operations.

1.1.3 It is understood that identical methods of working and types of mobile plant will be used to work the western extension area as is used currently at the site. The operating hours of the site are as follows: Monday to Friday 7:00am – 7:00pm and Saturday 7:00am – 1:00 pm, although on a Saturday, only quarry plant maintenance and servicing would be taking place on site and therefore this period is not considered within this assessment.

1.1.4 The assessment addresses the following issues:

- Conduct baseline monitoring representing a number of receptor locations and record relevant observations;
- Analyse the data obtained in order to assess the suitability of the acoustic environment for the proposal;
- Where applicable, propose suitable mitigation measures in order to ensure the protection of residential amenity;
- Produce a standalone report outlining the results of the assessment.

1.1.5 It is understood that this report will accompany the application for planning permission that is to be submitted to the Local Authority.

1.2 Site Description

1.2.1 The current site is located approximately 1.5 kilometres to the north of Glossop town centre, Derbyshire.

1.2.2 The proposed extension area is 1.52 Ha, and is located to the west of the existing extraction area. The land is currently in agricultural use with approximately 850,000 tonnes of shale available. The average anticipated rate of mineral extraction is 45,000 tonnes per year

1.2.3 The quarry extension will be worked in seven phases on a campaign basis by excavator and dump truck with excavated shale being stocked on the quarry floor, where it will be removed periodically throughout the year and transported to Wienerberger's Denton brick factory for processing. The overall timescale is 19 years including restoration. Sandstone lying beneath the shale is also extracted and sold as building stone. A minor amount of sandstone rejected for building stone use is periodically crushed and screened for sale as construction aggregate.

1.2.4 The closest noise sensitive premises are detailed below and on Figure 1 and have been chosen as to be representative of the nearby settlements of Shaw and High Dinting:

Location	OS Grid Reference
1. Meadowfield Close (Shaw)	SK 016 951
2. Dinting Lane (High Dinting)	

1.2.5 The area around Meadowfield Close was subjectively quiet, with distant traffic noise from vehicles using Dinting Road, birdsong, leaf rustle and general residential actvity heard during the survey. Walkers using the footpath close to the monitoring position added to the acoustic environment. Existing quarrying activity at the site was inaudible.

1.2.6 At Dinting Lane, regular road traffic along Dinting Road was the main source of noise at this location. Birdsong, leaf rustle and occasional local vehicle movements made up the acoustic environment at Dinting Lane. Existing quarrying activity at the site was also inaudible at this location.

1.3 Existing Noise Attenuating Features

1.3.1 The area surrounding the proposed development is mostly grassland and therefore considered 'soft ground' for the purposes of the calculations presented within this report. The existing topography provides some noise attenuating features for residential dwellings in the vicinity.

2.0 NOISE POLICY AND GUIDANCE

2.1 Noise Policy Statement for England (NPSE, 2010)

2.1.1 The NPSE sets out the Government's policy on noise and includes the long term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

2.1.2 This long term vision is supported by the following aims:

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

2.1.3 There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

- NOEL (No Observed Effect Level) – this is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise;
- LOAEL (Lowest Observed Adverse Effect Level) – this is the level above which adverse effects on health and quality of life can be detected.

2.1.4 Extending these concepts further, the NPSE leads to the concept of a significant observed adverse effect level:

- SOAEL (Significant Observed Adverse Effect Level) – this is the level above which significant adverse effects on health and quality of life occur.

2.1.5 NPSE acknowledges that it is not possible to have a single objective noise-based measure that defines NOEL, LOAEL and SOAEL that is applicable to all sources of noise in all situations. It is therefore suggested that more specific advice from other applicable noise standards and guidance could be employed to determine suitable noise level criteria within the overall principles of the NPSE.

2.2 National Planning Policy Framework (NPPF, 2012)

2.2.1 The NPPF sets out the Government's planning policies for England and how these are expected to be applied.

2.2.2 Where issues of noise impact are concerned the NPPF provides brief guidance in paragraph 123 where it states that planning policies and decisions should aim to:

- Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;

- Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;

- Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established;

  and

- Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

2.2.3 Specifically in relation to mineral sites, the NPPF provides guidance in paragraph 143 and 144 as follows:

In preparing Local Plans, local authorities should:

- set out environmental criteria, in line with the policies in this Framework, against which planning applications will be assessed so as to ensure that permitted operations do not have unacceptable adverse impacts on the natural and historic environment or human health, including from noise;

- when developing noise limits, recognise that some noisy short-term activities, which may otherwise be regarded as unacceptable, are unavoidable to facilitate minerals extraction;

In determining planning applications, local planning authorities should:

- give great weight to the benefits of the mineral extraction, including to the economy;
- ensure, in granting planning permission for mineral development, that there are no unacceptable adverse impacts on the natural and historic environment, human health or aviation safety, and take into account the cumulative effect of multiple impacts from individual sites and/or from a number of sites in a locality;
- ensure that any unavoidable noise, dust and particle emissions and any blasting vibrations are controlled, mitigated or removed at source, and establish appropriate noise limits for extraction in proximity to noise sensitive properties.

2.3 National Planning Practice Guidance (PPG, 2014)

2.3.1 The PPG is written in support of the NPPF and provides an increased level of specific planning guidance.

2.3.2 PPG-Noise states that noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. It also highlights that neither the NPSE nor the NPPF (which reflects the Noise Policy Statement) expects noise to be considered in isolation, separately from the economic, social and other environmental dimensions of proposed development.

2.3.3 Local planning authorities' plan-making and decision taking should take account of the acoustic environment and in doing so consider:

- whether or not a significant adverse effect is occurring or likely to occur;
- whether or not an adverse effect is occurring or likely to occur;

  and
- whether or not a good standard of amenity can be achieved.

2.3.4 In line with the NPSE, PPG-Noise also includes qualitative guidance on how to recognise when noise could be a concern in planning decisions advising that the planning process should be used to 'minimise' adverse effects, 'avoid' significant adverse effects and 'prevent' unacceptable adverse effects.

2.3.5 The supporting PPG-Minerals is the current Government advice applicable to the control of noise from surface mineral workings in England and includes the following appropriate noise standards for 'normal operations';

"Mineral planning authorities should aim to establish a noise limit, through a planning condition, at the noise-sensitive property that does not exceed the background noise level ($L_{A90,1h}$) by more than 10dB(A) during normal working hours (07:00-19:00). Where it will be difficult not to exceed the background level by more than 10dB(A) without imposing unreasonable burdens on the mineral operator, the limit set should be as near that level as practicable. In any event, the total noise from the operations should not exceed 55dB(A) $L_{Aeq,1h}$ (free field). For operations during the evening (19:00-22:00) the noise limits should not exceed the background noise level ($L_{A90,1h}$) by more than 10dB(A) and should not exceed 55dB(A) $L_{Aeq,1h}$ (free field). For any operations during the period 22:00 – 07:00 noise limits should be set to reduce to a minimum any adverse impacts, without imposing unreasonable burdens on the mineral operator. In any event the noise limit should not exceed 42dB(A) $L_{Aeq,1h}$ (free field) at a noise sensitive property.

Where the site noise has a significant tonal element, it may be appropriate to set specific limits to control this aspect. Peak or impulsive noise, which may include some reversing bleepers, may also require separate limits that are independent of background noise (e.g. Lmax in specific octave or third-octave frequency bands – and that should not be allowed to occur regularly at night.)

Care should be taken, however, to avoid any of these suggested values being implemented as fixed thresholds as specific circumstances may justify some small variation being allowed."

2.3.6 The same document includes instances where particularly noisy short-term activities may occur and the appropriate criteria for such circumstances;

"Activities such as soil-stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms and aspects of site road construction and maintenance.

Increased temporary daytime noise limits of up to 70dB(A) $L_{Aeq,1h}$ (free field) for periods of up to eight weeks in a year at specified noise-sensitive properties should be considered to facilitate essential site preparation and restoration work and construction of baffle mounds where it is clear that this will bring longer-term environmental benefits to the site or its environs.

Where work is likely to take longer than eight weeks, a lower limit over a longer period should be considered. In some wholly exceptional cases, where there is no viable alternative, a higher limit for a very limited period may be appropriate in order to attain the environmental benefits. Within this framework, the 70 dB(A) $L_{Aeq,1h}$ (free field) limit referred to above should be regarded as the normal maximum".

3.0 SOUND LEVEL PREDICTIONS

3.1 Introduction

3.1.1 The level of sound in the local environs that arises from a site will depend on a number of factors. The more significant of which are:

(a) the sound power outputs of processes and plant;

(b) the periods of operation of processes and plant;

(c) the distances from sources to receiver;

(d) the presence of screening by barriers;

(e) the reflection of sound;

(f) sound ground attenuation

3.1.2 The parameter that is in general use and is recommended internationally for the description of environmental noise at a receptor position is the equivalent continuous sound pressure level, L_{eq} (expressed in dB).

3.1.3 The L_{eq} describes the total amount of acoustic energy measured but does not take any account of the ear's ability to hear certain frequencies more readily than others. Instead an A-weighting is applied to form the L_{Aeq} (expressed in dB(A)) as this is found to relate better to the loudness of the sound heard.

3.1.4 Potential sound levels from the proposed scheme have been predicted at nearby noise-sensitive locations based on the following methodology and assumptions.

3.2 Prediction Methodology

3.2.1 The prediction methods used are those outlined within Annex F of British Standard BS 5228-1:2009+A1:2014 '*Code of practice for noise and vibration control on construction and open sites. Part 1: Noise*'. This guidance details methods to estimate noise from open sites which can include quarries, waste disposal sites and long-term construction projects.

3.2.2 The most important elements of this standard used to estimate site noise within this assessment include the sound level of plant and activities, the attenuation of sound with distance, site activity on-time, screening effects, ground absorption and angle of view corrections.

3.2.3 For all noise prediction calculations, the ground absorption coefficient has been set to '1.0', representing hard ground. 'Soft' ground is taken to refer to surfaces which are absorbent to sound, e.g grassland, cultivated land or plantations as opposed to 'hard' ground surfaces which reflect sound such as paved areas and rolled asphalt.

3.2.4 In accordance with BS 5228 methodology, the attenuation from screening and soft ground attenuation have not been combined (where applicable). Instead, either the attenuation from screening and hard ground propagation, or the attenuation provided by soft ground alone has been include in the calculation, whichever is the greeter of the two.

3.2.5 BS 5228-1:2009+A1:2014 indicates that a barrier attenuation of 10 dB(A) can be used when the noise screen completely hides the source from the receiver, and an attenuation of 5 dB(A) when the screen partially hides the source from the receiver. The standard then states that "high topographical features and specifically designed and positioned noise barrier could provide greater attenuation". Examples of which are overburden mounds or excavation high walls. For the purpose of this assessment 'complete screening' has been calculated for Meadowfield Close during short-term and normal operations, with 'partial screening' barrier attenuation applied for Dinting Lane. Partial screening has also been applied for HGV movements along the access road for both receptors (Meadowfield Close and Dinting Lane).

3.3 Plant Complement

3.3.1 The plant complement is based on information provided by Mouselow Quarry. The sound power levels used are from information contained within Annex C of BS 5228-1:2009+A1:2014 which presents current sound level data on specific items of site equipment and site activities.

Plant Description	Sound Power Level (dB(A))	Reference	Assumptions
Short-Term Operations (Soil stripping & Restoration)			
25 Tonne Excavator	104	BS 5228 (Table C.10, Ref 2)	90% on-time
2 X 25 Tonne Dumper Trucks	115	BS 5228 (Table C.10, Ref 19)	8 movements per hour 16 kmph
Normal Operations (Upper Shale Extraction & Stockpile Build)			
50 Tonne Excavator	108	BS 5228 (Table C.10, Ref 1)	90% on-time
2 x 25 Tonne Dumper Trucks	111	BS 5228 (Table C.10, Ref 18)	4 movements per hour 16 kmph
40 Tonne Bulldozer	108	BS 5228 (Table C.2, Ref 10)	30% on-time
Fuel Bowser	117	BS 5228 (Table C.6, Ref 36)	10% on-time
Normal Operations (Sandstone Extraction)			
50 Tonne Excavator	105	BS 5228 (Table C.10, Ref 1)	90% on-time
Mobile Crusher/Screen Plant	110	BS 5228 (Table C.1, Ref 14)	70% on-time
HGV(access road)	107	BS 5228 (Table C11, ref 14)	2 movements per hour 16 kmph
Fuel Bowser	117	BS 5228 (Table C.6, Ref 36)	10% on-time
Normal Operations (Shale Stockpile Extraction)			
25 Tonne Excavator	104	BS 5228 (Table C.10, Ref 2)	90% on-time
HGV(access road)	107	BS 5228 (Table C11, ref 14)	3 movements per hour 16 kmph

3.4 Noise Prediction Assumptions

3.4.1 The noise prediction exercises are based on site plans supplied by Quarryplan Limited and a number of assumptions concerning the working of the site. These assumptions are as follows:-

1. The predicted levels during short-term earth moving and restoration operations are shown in Section 5.2. These predictions have assumed that a 25 tonne excavator and two 25 tonne dump trucks would be in operation during these activities which include soil-stripping and restoration.

2. The predicted noise levels during normal shale and sandstone extraction and stockpile build and extraction operations are shown in Section 5.3. During shale extraction and stockpile build operations one 50 tonne, two 25 tonne dumpers, a 40 tonne bulldozer and a fuel bowser would be in operation. The upper shale will be extracted and built up into stockpiles which are left to weather on the quarry floor. During periodic stockpile extraction operations a 25 tonne excavator would be picking off stockpiled material for transportation by HGV off site. During sandstone extraction, a 50 tonne extractor will dig out the larger blocks to be loaded on to HGVs for transportation off site, with the smaller or damaged sandstone pieces being put to one side for loading into a mobile crusher and screening plant at a later date before being loaded into HGVs for transportation off site.

3. For the purposes of this prediction exercise, a number of on-time assumptions and plant movements have been made. It has been assumed that the excavator during short-term operations will have an on-time of 90%. During shale extraction operations, a 90% on time is assumed for the 50 tonne excavator, 30% on time for the 40 tonne bulldozer and a 10% on time assumed for the fuel bowser. During sandstone extraction operations, a 90% on time is assumed for the 50 tonne excavator, 70% on time for the mobile crusher / screen plant and a 10% on time assumed for the fuel bowser. During shale stockpile extraction operations, a 90% on time is assumed for the 25 tonne excavator. A total of 8 truck movements per hour have been assumed to travel along the haul route during short term operations and up to six truck movements per hour during the shale/sandstone main operations and a total of 3 HGV movements per hour along the site access road during shale stockpile extraction operations.

3.4.2 All predictions have been calculated with the combinations of plant working simultaneously at the closest point to the assessment location. They are therefore worst case scenarios which may be of relatively short duration. However, they indicate the maximum L_{Aeq} noise level to which a particular property or group of properties may be exposed during the working of the site. By definition, the worst case situation may occur intermittently over the lifetime of the site, but longer term noise levels perceived outside of the site boundary would normally be significantly less.

3.4.3 For the purposes of this prediction exercise, the above described worst case situation has been considered at all times, thus operations are assumed to be undertaken at their realistic minimum distances and maximum heights. In this exercise only the major operations have been considered as they are likely to have the most impact on the local environs.

3.4.4 Given that all prediction methods are estimates and that in practice measured levels are invariably lower due to the effects of interactions between such things as meteorological conditions and air absorption, these predicted levels are a reasonable representation of the worst case predictions assuming ideal meteorological conditions for sound propagation.

4.0 BASELINE CONDITIONS

4.1 Introduction

4.1.1 Sound levels were measured over an 8 hour period from 06:00 – 14:00 on the 28 September 2017 in order to characterise the existing daytime sound levels experienced at noise sensitive dwellings in the vicinity of the quarry. The surveys were conducted by Mr S Edwards of Vibrock Limited.

4.1.2 The methodology described below was employed during the noise survey. Wherever possible all measurements were undertaken to comply with the requirements of BS 7445:2003.

4.2 Monitoring Locations

4.2.1 The two monitoring locations selected to represent noise-sensitive premises closest to the proposed operations are listed in the table below and shown on Figure 1:

Location No.	Description
1	Meadowfield Close (Shaw)
2	Dinting Lane (High Dinting)

4.3 Instrumentation

4.3.1 The following instrumentation was used:

Manufacturer	Description	Type	Serial No.	Cal. Date
Cirrus	Integrating Sound Level Meter	CR 811C	D20572FD	05-Sep-16
Cirrus	Integrating Sound Level Meter	CR 811C	D20222FD	14-Sep-16
Cirrus	Electronic Calibrator	CR 511E	039467	29-Jun-17

4.3.2 During all measurements the microphones were protected with outdoor windshields.

4.3.3 Measurements at all monitoring locations were ‘free field’ (no vertical reflective surfaces with 3.5 metres of the microphone) and at a height of between 1.2 – 1.5 metres above ground level.

4.3.4 The following set-up parameters were used on the sound level meters:

Main Descriptors:	Broadband L_{Aeq} and L_{A90}
Time Weighting:	Fast
Frequency Weighting:	A
Average-Integrating Period:	15 mins
Data Logging:	Repeat (Contiguous)

4.4 Calibration Checks

4.4.1 The sound level meters were checked with the electronic calibrator prior to commencement and on completion of the surveys. No significant drift (ie greater than ± 0.2 dB) in the calibration level was observed between initial and final checks.

4.5 Meteorological Conditions

4.5.1 During the monitoring period on the 28 September 2017 the weather was dry with an average temperature of 13°C, 71% relative humidity, 30% cloud cover and a light south westerly breeze of 1 – 2 ms^{-1}.

4.7 Observations

4.7.1 Observations of the local acoustic environment were undertaken at each measurement location as follows:

No.	Location	Daytime Sound Sources
1	Meadowfield Close (Shaw)	Distant road traffic movements. Birdsong and leaf rustle. Occasional train, aircraft and local traffic movements. Walkers along footpath.
2	Dinting Lane (High Dinting)	Regular traffic along Dinting Road. Birdsong and leaf rustle. Occasional local traffic movements.

4.8 Survey Results

4.8.1 The raw measurement data at each location is detailed in Tables 1 - 2.

4.8.2 The following table summarises the results of the baseline survey.

Location	Monitoring Period (T)	Date of Survey	Average $L_{Aeq,1h}$ dB(A)	Average $L_{A90,1h}$ dB(A)
1. Meadowfield Close (Shaw)	06:00 – 14:00	28 September 2017	52	44
2. Dinting Lane (High Dinting)	06:00 – 14:00	28 September 2017	58	43

4.9 Discussion

4.9.1 The average weekday daytime noise level at Meadowfield Close was 52 dB $L_{Aeq,1hr}$. The corresponding background sound level during the same measurement period was 44 dB $L_{A90,1hr}$.

4.9.2 The average weekday daytime noise level at Dinting Lane was 58 dB $L_{Aeq,1hr}$. The corresponding background sound level during the same measurement period was 43 dB $L_{A90,1hr}$.

5.0 NOISE ASSESSMENT

5.1 Introduction

5.1.1 Summaries of the worst case noise level predictions from the proposed scheme during short-term operations and normal mineral extraction are given in the tables below, together with an indication as to the difference between the predicted and measured existing levels and the criteria recommended in PPG Minerals.

5.2 Short-term Operations

5.2.1 PPG permits a temporary daytime noise limit of 70 dB(A) $L_{Aeq,1h}$ (free field) for periods of up to 8 weeks in a year for short term activities which include site preparation, restoration, soil-stripping and the construction and removal of baffle mounds, soil storage mounds and spoil heaps.

5.2.2 The table below presents an assessment of noise from these types of activities associated with the proposed scheme:

Location	Date of Survey	Existing Noise Levels (dB(A))		Predicted Worst Case Site Noise Level (dB $L_{Aeq,1h}$)	Difference (dB(A))	
		$L_{Aeq,T}$	$L_{A90,T}$		Existing L_{Aeq}	PPG Max 70 L_{Aeq}
Soil Stripping & Restoration						
1.Meadowfield Close (Shaw)	28 September 2017	52	44	40	-12	-30
2. Dinting Lane (High Dinting)	28 September 2017	58	43	47	-11	-23

5.2.3 The assessment shown in the table above demonstrates that, without exception, potential short-term operations are expected to produce worst case noise levels that are well within the 70 dB noise limit criteria of PPG.

5.3 Normal Mineral Extraction Operations

5.3.1 Subject to a maximum daytime (07:00 – 19:00) limit of 55 dB $L_{Aeq,1h}$ (free field) for normal operations, PPG permits a noise limit at noise sensitive property that does not exceed the background level by more than 10 dB(A). Where this poses an unreasonable burden on the operator the limit should be as near the L_{A90} + 10 dB(A) criteria as practicable during normal working hours (07:00 – 19:00) and should not exceed 55 dB(A) $L_{Aeq,1h}$ (free field).

5.3.2 The table below presents an assessment of noise from a range of normal working scenarios associated with proposed scheme:

Location	Existing Noise Levels (dB(A))		Predicted Worst Case Site Noise Level (dB $L_{Aeq,1h}$)	Difference (dB(A))		
	$L_{Aeq, T}$	$L_{A90, T}$		Existing L_{Aeq}	PPG *L_{A90} + 10 dB	PPG Max 55 L_{Aeq}
Upper Shale Extraction & Stockpile Build						
1.Meadowfield Close (Shaw)	52	44	41	-11	-13	-14
2. Dinting Lane (High Dinting)	58	43	46	-12	-7	-9
Sandstone Extraction						
1.Meadowfield Close (Shaw)	52	44	46	-6	-8	-9
2. Dinting Lane (High Dinting)	58	43	52	-6	-1	-3
Upper Shale Stockpile Extraction						
1.Meadowfield Close (Shaw)	52	44	41	-11	-13	-14
2. Dinting Lane (High Dinting)	58	43	47	-11	-6	-8

5.3.3 The assessment presented in the table above demonstrates that, without exception, all normal operations within the proposed site produce worst case noise levels that are below the L_{A90} + 10 dB criteria of PPG.

6.0 RECOMMENDATIONS

6.1 Noise Limits

6.1.1 PPG Minerals suggests that the noise level ($L_{Aeq,1h}$ free field) due to mineral extraction, processing of material, excluding topsoil and subsoil stripping and other works in connection with landscaping, shall not exceed the existing background level by more than 10 dB(A) where possible. Where this imposes an unreasonable burden on the site operator a limit as close as possible to that level shall apply, but in any case no greater than 55 dB $L_{Aeq,1h}$ free field as recorded at any inhabited property.

6.1.2 Specifically we recommend the following limits, which are derived from the measured background sound level plus 10 dB (up to a maximum of 55 dB(A) $L_{Aeq,1h}$):-

No.	Location	Site Noise Limits during Normal Operations (dB $L_{Aeq,1h}$)
1	Meadowfield Close (Shaw)	54
2	Dinting Lane (High Dinting)	53

6.1.3 Particularly noisy, short term operations, such as site preparation, shall not exceed 70 dB $L_{Aeq,1h}$ free field at any inhabited property and be limited to a period not exceeding 8 weeks per year at any one property.

6.2 Additional Mitigation and Control Measures

6.2.1 With regards to general site activities, it is proposed that the site operator follows best practice to minimise the potential off site noise impact as follows:

(a) All construction plant and equipment should comply with EU noise emission limits;

(b) Ensure machinery is regularly well maintained and where appropriate fitted with exhaust silencers;

(c) Adhere strictly to the stated operating hours of the site and ensure that site working hour restrictions are effectively communicated to all site staff and subcontractors;

(d) Start up plant and vehicles sequentially rather than all together;

(e) Avoid unnecessary horn usage and revving of engines;

(f) Switch off or throttle-down equipment when not required;

(g) Minimise drop height of materials;

(h) Operatives should be trained to employ appropriate techniques to keep site noise to a minimum, and should be effectively supervised to ensure that best working practice in respect of noise reduction is followed;

(i) Keep internal haul routes clear and well maintained. Avoid steep gradients where possible.

6.2.2 Audible reversing warning systems on mobile plant and vehicles should be of a type which, whilst ensuring that they give proper warning, has a minimum noise impact on persons outside sites.

7.0 CONCLUSIONS

7.1 Existing ambient sound levels have been measured at two locations around the proposed mineral extraction area. Measurements were made in terms of the L_{Aeq} and L_{A90} thus enabling the existing acoustic environment to be characterised.

7.2 A series of noise predictions based upon BS 5228 methodologies, and including assumptions regarding the working of the site have been made for the two noise sensitive locations in the vicinity of the proposed extraction area.

7.3 It should be noted that all the predicted noise levels in this report refer to worst case scenarios, when operations are undertaken at their closest distances to sensitive properties and therefore have the greatest influence on the noise levels at these locations. These worst case noise scenarios may only last for a few weeks or even days throughout the envisaged working life of the proposed development.

7.4 The potential noise impact of the scheme has been assessed against the noise standards outlined in PPG Minerals. The results demonstrate that potential noise levels from mineral extraction:

(a) In all cases do not exceed the 55 dB $L_{Aeq,1h}$ criterion, considered, when necessary, as an upper limit in PPG;

(b) Without exception do not exceed the existing background noise level by more than 10 dB(A);

(c) Without exception do not exceed the temporary 70 dB $L_{Aeq,1h}$ criterion considered a normally justifiable limit for short-term operations in PPG;

7.5 With the noise control recommendations implemented and the exercise of reasonable engineering control over general site operations, it is considered that the proposed mineral extraction and processing operations at Mouselow Quarry can be implemented in line with current planning practice guidance for mineral sites, therefore, there are unlikely to be any significant or unacceptable adverse impacts at noise-sensitive premises in the vicinity of the proposed site.

8.0 REFERENCES

1. National Planning Policy Framework – Department for Communities and Local Government. March 2012.

2. Planning Practice Guidance (PPG) – Department for Communities and Local Government. March 2014.

3. Noise Policy Statement for England (NPSE). DEFRA, 2010.

4. British Standard 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites. Part 1: Noise*. British Standards Institution 2014.

5. British Standard 7445-1:2003 Description and measurement of environmental noise – Part 1: Guide to quantities and procedures. British Standards Institution, 2003.

TABLE 1

Results of Baseline Sound Level Monitoring around Mouselow Quarry

Date of Survey: 28 September 2017

Location No. 1: Meadowfield Close (Shaw)

Time Period (T)	Parameters (dB(A))			
	$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$	$L_{Amax,T}$
06:00 – 06:15	45.5	47.6	41.8	58.8
06:15 – 06:30	45.2	47.5	42.4	63.9
06:30 – 06:45	46.0	47.8	42.6	73.5
06:45 – 07:00	53.6	52.2	43.9	75.1
Resultant 1.0 hour period	**49**	**49**	**43**	**75**
07:00 – 07:15	50.1	50.9	44.3	69.1
07:15 – 07:30	50.0	52.5	45.0	64.4
07:30 – 07:45	51.0	53.9	45.7	64.6
07:45 – 08:00	54.4	54.8	44.4	73.3
Resultant 1.0 hour period	**52**	**53**	**45**	**73**
08:00 – 08:15	50.3	53.4	43.6	65.6
08:15 – 08:30	53.9	54.7	45.0	78.6
08:30 – 08:45	50.2	53.0	43.7	72.1
08:45 – 09:00	52.4	54.7	44.2	68.8
Resultant 1.0 hour period	**52**	**54**	**44**	**79**
09:00 – 09:15	51.5	55.5	43.8	62.9
09:15 – 09:30	51.5	54.8	43.2	60.7
09:30 – 09:45	49.9	52.1	43.1	61.8
09:45 – 10:00	53.0	55.7	47.4	63.5
Resultant 1.0 hour period	**52**	**55**	**44**	**64**
10:00 – 10:15	51.9	54.4	47.3	68.3
10:15 – 10:30	52.6	55.6	46.0	68.4
10:30 – 10:45	54.9	57.4	43.3	68.0
10:45 – 11:00	50.6	52.0	43.1	72.7
Resultant 1.0 hour period	**53**	**55**	**45**	**73**

TABLE 1
Continued

Results of Baseline Sound Level Monitoring around Mouselow Quarry

Date of Survey: 28 September 2017

Location No. 1: Meadowfield Close (Shaw)

Time Period (T)	Parameters (dB(A))			
	$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$	$L_{Amax,T}$
11:00 – 11:15	46.1	48.2	42.3	61.4
11:15 – 11:30	48.2	50.4	42.2	66.1
11:30 – 11:45	53.4	57.0	42.0	64.1
11:45 – 12:00	57.2	60.0	46.0	69.1
Resultant 1.0 hour period	**53**	**54**	**43**	**69**
12:00 – 12:15	58.2	60.4	55.2	67.8
12:15 – 12:30	49.2	51.9	44.3	63.7
12:30 – 12:45	46.8	48.4	43.6	63.6
12:45 – 13:00	50.1	53.5	42.5	65.5
Resultant 1.0 hour period	**54**	**54**	**46**	**68**
13:00 – 13:15	50.1	52.4	43.3	66.4
13:15 – 13:30	49.5	52.3	41.8	69.9
13:30 – 13:45	53.1	56.1	43.2	69.8
13:45 – 14:00	51.1	55.0	44.2	75.4
Resultant 1.0 hour period	**51**	**54**	**43**	**75**
Resultant 8.0 hour period	**52**	**54**	**44**	**79**

TABLE 2

Results of Baseline Sound Level Monitoring around Mouselow Quarry

Date of Survey: 28 September 2017

Location No. 2: Dinting Lane (High Dinting)

Time Period (T)	Parameters (dB(A))			
	$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$	$L_{Amax,T}$
06:00 – 06:15	55.7	58.8	39.0	76.4
06:15 – 06:30	49.7	48.7	40.6	69.0
06:30 – 06:45	52.5	56.6	41.7	70.1
06:45 – 07:00	61.6	60.8	42.9	85.0
Resultant 1.0 hour period	**57**	**56**	**41**	**85**
07:00 – 07:15	56.9	61.3	43.8	73.1
07:15 – 07:30	56.1	60.9	44.7	72.4
07:30 – 07:45	56.6	61.2	45.8	70.6
07:45 – 08:00	64.4	64.3	45.0	87.9
Resultant 1.0 hour period	**60**	**62**	**45**	**88**
08:00 – 08:15	58.2	62.3	43.2	77.3
08:15 – 08:30	58.0	62.3	45.2	71.7
08:30 – 08:45	58.7	63.2	43.6	75.0
08:45 – 09:00	61.7	63.6	43.7	83.4
Resultant 1.0 hour period	**59**	**63**	**44**	**83**
09:00 – 09:15	59.4	63.9	43.4	76.3
09:15 – 09:30	56.3	60.5	41.5	72.6
09:30 – 09:45	56.0	60.7	39.0	71.1
09:45 – 10:00	55.8	60.2	41.1	72.0
Resultant 1.0 hour period	**57**	**61**	**41**	**76**
10:00 – 10:15	63.1	61.5	42.9	87.7
10:15 – 10:30	57.4	60.9	45.0	76.4
10:30 – 10:45	55.0	59.4	43.4	71.6
10:45 – 11:00	54.8	59.3	43.6	69.3
Resultant 1.0 hour period	**59**	**60**	**44**	**88**

TABLE 2
Continued

Results of Baseline Sound Level Monitoring around Mouselow Quarry

Date of Survey: 28 September 2017

Location No. 2: Dinting Lane (High Dinting)

Time Period (T)	Parameters (dB(A))			
	$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$	$L_{Amax,T}$
11:00 – 11:15	56.3	58.9	42.8	79.1
11:15 – 11:30	53.2	57.4	41.4	72.2
11:30 – 11:45	55.1	58.9	39.2	73.4
11:45 – 12:00	55.0	59.1	42.3	70.6
Resultant 1.0 hour period	**55**	**59**	**41**	**79**
12:00 – 12:15	56.7	58.6	41.2	78.1
12:15 – 12:30	55.9	59.9	43.5	71.8
12:30 – 12:45	53.8	58.1	43.6	69.1
12:45 – 13:00	52.8	57.1	42.9	66.2
Resultant 1.0 hour period	**55**	**58**	**43**	**78**
13:00 – 13:15	52.9	57.2	43.3	66.9
13:15 – 13:30	53.7	57.6	41.7	70.2
13:30 – 13:45	53.2	57.1	42.1	68.4
13:45 – 14:00	55.2	58.9	44.9	69.9
Resultant 1.0 hour period	**54**	**58**	**43**	**70**
Resultant 8.0 hour period	**58**	**60**	**43**	**88**

FIGURE 1

Monitoring Positions and Location Plan

APPENDIX 1

Terminology and Definitions

Acoustic Environment
Sound from all sources as modified by the environment.

Sound Power Level, L_{WA}
The total amount of sound energy per unit of time generated by a particular sound source independent of the acoustic environment that it is in.

Equivalent Continuous A-weighted Sound Pressure Level
Value of the A-weighted sound pressure level of a continuous steady sound that, within a specified time interval *T*, has the same mean square sound pressure as a sound under consideration whose level varies with time.

A-weighting
A-weighting is used to replicate this sensitivity by modifying the electrical response of a sound level meter with frequency in approximately the same way as the sensitivity of the human hearing system.

Ambient Sound Level
Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far.

Site Attributable Sound Level (also referred to as 'site noise' or 'specific sound level')
Sound in the neighbourhood of a site that originates from the site.

Residual Sound Level
Ambient sound remaining at a given position in a given situation when the specific noise source is suppressed to a degree such that it does not contribute to the ambient noise.

Background Sound Level ($L_{A90,T}$)
A-weighted sound pressure level of the residual sound at the assessment position with no operation occurring at the proposed site. Defined in terms of the $L_{A90,T}$ (which is the "A weighted" noise level exceed for 90 per cent of the specified measurement period (T).

Free-field
External sound field in which no significant sound reflections occur (apart from the ground).
NOTE Measurements made 1.2 m to 1.5 m above the ground and at least 3.5 m away from other reflecting surfaces are usually regarded as free-field.

Noise-Sensitive Premises (NSPs)
Any occupied premises outside a site used as a dwelling (including gardens), place of worship, educational establishment, hospital or similar institution, or any other property likely to be adversely affected by an increase in noise level.