

**ASSESSMENT OF THE POTENTIAL NOISE IMPACT
FROM
PROPOSED SAND AND GRAVEL EXTRACTION, PROCESSING
AND ASSOCIATED OPERATIONS
BY
HARLEYFORD AGGREGATES LIMITED
AT
LOWER HALL FARM
SAMLESBURY
PRESTON
LANCASHIRE**

Assessment of the Potential Noise Impact
from
Proposed Sand and Gravel Extraction, Processing
And Associated Operations
at
Lower Hall Farm
Samlesbury
Preston
Lancashire
by
Harleyford Aggregates Limited

Report submitted to:-

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1. INTRODUCTION

- 1.1 Harleyford Aggregates Limited (HA) proposes to extract, process, load and transport material from land to the west of Lower Hall Farm, Samlesbury, east of Preston in Lancashire. The site is north east of junction 31 of the M6 motorway, north of the A59 Preston New Road and within a loop of the River Ribble. Harleyford Aggregates Limited have an Option from the landowners, the Trustees of the Booth Charities, to pursue a planning application for mineral extraction over the relevant land. The proposed operating times are 07.00 to 17.00 Monday to Saturday.
- 1.2 The nearest dwellings to the site are situated to the east and south of the proposed extraction area and to the west of the access road from the processing plant site to the A59 Preston New Road. Lower Hall Farm and Seed House Farm are operational farms owned by the estate and tenanted. The nearest non-tenanted properties are two semi-detached houses ('The Brambles' and 'Bezza Villa') at the junction of Potters Lane and Dean Lane. The proposed development will be, at its closest, some 275 metres from these properties in relation to mineral operational activities; some 280 metres from these properties in relation to the proposed route of the access road; and some 225 metres from these properties in relation to temporary operations for the construction of a screening bund.
- 1.3 Noise from mineral workings can impact on people living and working in the vicinity of such sites. The operations are usually limited to daytime activities and do not interfere with sleep processes but can be intrusive or annoying if unmitigated during the day. Mineral site noise does not appear to have any significant impact on fauna in the vicinity of working sites. Mineral sites are well recognised as breeding sites for species such as badgers and even shy species of birds. The daytime disturbance is localised and the sites tend to be vacated by people in the night hours.

- 1.4 Vibration arising from machinery on mineral sites is not normally perceptible outside the boundary of the site. Indeed it is rarely perceptible beyond a few metres of working plant. Ground borne vibration from site HGVs on highways is sometimes cited as a potential environmental impact but in practice it is only perceptible within a few metres of a very bad pothole and imperceptible on roads complying with the design and construction standards.
- 1.5 Noise can also arise as a result of the vehicle movements both within a site, on a site access road and on the road network affected by the site HGVs. Vehicle movements within a site are conventionally combined with other noises arising within the site such that the overall site noise is assessed against established criteria. Site vehicle impacts off the site on the public highway are conventionally assessed separately by reference to the changes in noise level caused by the passage of the extra vehicles.
- 1.6 Airborne noise from HGV exhausts can sometimes be perceived as vibration by causing loose windows to rattle and in rare cases for suspended floors to vibrate. These effects are perceptible up to about 25 m from the road. Research by the Transport Research Laboratory has found that people's reaction to vibration arising from HGV movements is very similar to their reaction to HGV noise but is less marked. In other words, people would complain more about the effect of vehicle noise than about any associated vibration. As such, it is usual to disregard vehicle induced vibration and concentrate on vehicle noise. Provided any noise increase is acceptable, the corresponding change in vibration would also be acceptable. Guidance from the Government on highway design advises that changes in noise level of less than 1 dB(A) are not significant.
- 1.7 The overall potential impacts from the proposed development that have been considered relate to the extraction of mineral, the processing and loading operations within the site, the site preparation and restoration activities, and the movement of HGVs on the site access road, as they might impact on the nearest noise sensitive locations to the site.

- 1.8 Advance Environmental (AE) have undertaken an assessment of the environmental noise implications of the proposals by way of calculating site noise levels at selected receiver locations nearest to the proposed development.
- 1.9 Current specific guidelines on noise from mineral operations are contained in Planning Practice Guidance (NPPG) dated March 2014 '*Assessing environmental impacts from minerals extraction Noise emissions*', which reflects policy for sustainable development as set out in the National Planning Policy Framework (NPPF), and general noise policy as set out in the Noise Policy Statement for England (NPSE).
- 1.10 Noise limits at dwellings for quarry site noise are suggested in this report, based on the nominal daytime noise limit of 55 dB $L_{Aeq, 1 \text{ hour, free field}}$ as set out in the Planning Practice Guidance for the nearest noise sensitive locations to the site.
- 1.11 Site noise calculations have been undertaken for selected receiver locations for two combinations of activity in the proposed quarry:-
- for routine operations associated with extraction; and
 - for temporary operations associated with site preparation and restoration.
- 1.12 The calculated site noise levels are presented for inspection and comparison with the suggested site noise limits for the noise sensitive locations.
- 1.13 Mitigation measures are identified in order to reduce the potential noise impact of the proposed operations in the quarry on the nearest dwellings to the site.
- 1.14 Draft conditions on noise are proposed for consideration by HAL and the Mineral Planning Authority.
- 1.15 A glossary of acoustic terms is included as Appendix A.

2. GUIDANCE DOCUMENTS FROM THE GOVERNMENT

- 2.1 The various relevant noise guidance documents used in this assessment are detailed below.
- 2.2 The National Planning Policy Framework (NPPF) was published in March 2012 and sets out the Government's planning policies for England. At the heart of the National Planning Policy Framework is a presumption in favour of sustainable development.
- 2.3 The NPPF revoked and replaced a number of Planning Policy Statements (PPS), Planning Policy Guidance (PPG) and other guidance documents, including Planning Policy Guidance 24: Planning and Noise and Minerals Policy Statement 2 '*Controlling and Mitigating the Environmental Effects of Minerals Extraction in England Annex 2: Noise*'.
- 2.4 With regard to noise there are various aims, including that noise from a new development should avoid giving rise to significant adverse impacts on health and quality of life, and that other adverse impacts should be mitigated and reduced to a minimum including through the use of conditions.
- 2.5 Section 11 of the NPPF (Conserving and enhancing the natural environment) refers specifically to noise in the following paragraphs:

'109 The planning system should contribute to and enhance the natural and local environment by...preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability...'

'123 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 (subject to the provisions of the Environmental Protection Act 1990 and other relevant law); 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.'*

2.6 Technical guidance on noise was provided in more detail in the accompanying document '*Technical Guidance to the National Planning Policy Framework*', dated March 2012, which was superseded in March 2014 by the web based Planning Practice Guidance.

2.7 Paragraphs 19 to 22 inclusive of the '*Minerals*' chapter of the Planning Practice Guidance are under the heading '*Noise emissions*' within the section '*Assessing environmental impacts from mineral extraction*'.

2.8 Paragraph 019 Reference ID: 27-019-20140306 states:

'How should minerals operators seek to control noise emissions?

Those making mineral development proposals, including those for related similar processes such as aggregates recycling and disposal of construction waste, should carry out a noise impact assessment, which should identify all sources of noise and, for each source, take account of the noise emission, its characteristics, the proposed operating locations, procedures, schedules and duration of work for the life of the operation, and its likely impact on the surrounding neighbourhood.

Proposals for the control or mitigation of noise emissions should:

- *consider the main characteristics of the production process and its environs, including the location of noise-sensitive properties and sensitive environmental sites;*
- *assess the existing acoustic environment around the site of the proposed operations, including background noise levels at nearby noise-sensitive properties;*
- *estimate the likely future noise from the development and its impact on the neighbourhood of the proposed operations;*
- *identify proposals to minimise, mitigate or remove noise emissions at source;*
- *monitor the resulting noise to check compliance with any proposed or imposed conditions.'*

2.9 Paragraph 020 Reference ID: 27-020-20140306 states:

'How should mineral planning authorities determine the impact of noise?

Mineral planning authorities should take account of the prevailing acoustic environment and in doing so consider whether or not noise from the proposed operations would:

- *give rise to a significant adverse effect;*
- *give rise to an adverse effect; and*
- *enable a good standard of amenity to be achieved.*

In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure would be above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation. As noise is a complex technical issue, it may be appropriate to seek experienced specialist assistance when applying this policy.'

2.10 Paragraph 021 Reference ID: 27-021-20140306 states:

'What are the appropriate noise standards for mineral operators 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 (LA90,1h) by more than 10dB(A) during normal working hours (0700-1900). 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) LAeq, 1h (free field). For operations during the evening (1900-2200) the noise limits should not exceed the background noise level (LA90,1h) by more than 10dB(A) and should not exceed 55dB(A) LAeq, 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) LAeq,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 beepers, 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.'

2.11 Paragraph 022 Reference ID: 27-022-20140306 states:

'What type of operations may give rise to particularly noisy short-term activities and what noise limits may be appropriate?'

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) LAeq 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) LAeq 1h (free field) limit referred to above should be regarded as the normal maximum.

An explanation of the technical terms used in this section can be found at the end of this guidance'.

3. SITE DESCRIPTION AND GENERAL NOISE CLIMATE

- 3.1 The proposed extraction site is on land to the west of Lower Hall Farm, Samlesbury, east of Preston in Lancashire. The site is north east of junction 31 of the M6 motorway, north of the A59 Preston New Road and within a loop of the River Ribble. The site, access and dwellings are all located within 2 km of the M6 motorway.

- 3.2 The topography of the land is such that the extraction site is at about 15 m AOD, with the access road gaining height up to about 50 m AOD where it meets the A59 Preston New Road. Ground to the north west of the extraction site and west of the River Ribble rises steeply up to about 50 m AOD. A plan of the area surrounding Lower Hall Farm is included in Appendix B.
- 3.3 Advance Environmental (AE) have undertaken an assessment of the environmental noise implications of the proposals, with a visit to the site on Friday 11 September 2015 (see Appendix C, Environmental Noise Survey Tables) for the measurement of background daytime noise levels near to noise sensitive property. This survey produced a daytime background noise level of 41 dB LA90, T. In general the noise climate in the area of the proposed development is dominated or significantly affected (subject to local meteorological conditions) by road traffic noise from the M6 motorway and A59 Preston New Road. This can be demonstrated by the results of an ambient noise survey undertaken in January 2016 in connection with a planning application for late night activities at the adjacent Brockholes Centre, where noise from the M6 (some 800 metres distant) produced a background figure of 54 dB LA90, T. between 23.00 to 24.00 hours at Samlesbury churchyard.
- 3.4 The dwellings that have been selected for the purpose of this noise assessment are: Elston New Hall Farm, Lower Hall Farm, Bezza House, The Hawthorns, The Brambles & Bezza Villa (two semi-detached properties), Seed House Farm and Riverside Cottage. Also considered are Catholic Church by Preston New Road and Longridge Road Crematorium to the north west of the site.
- 3.5 A plan of the area surrounding Lower Hall Farm showing the approximate positions of the site noise calculation locations is included in Appendix D.
- 3.6 These dwellings are approximately 275 m to 600 m from the nearest edge of any operational land.

3.7 Noise may disturb wild animals. The Lancashire Wildlife Trust operates the Brockholes Centre to the south west of Lower Hall Farm which was previously the Higher Brockholes sand and gravel quarry. This area is partly a wildlife reserve (mainly for birds) and partly a recreation and tourism centre which holds various corporate, public and private functions, including those in the evening and at night. The M6 runs immediately to the west of the reserve. As an active quarry the area was colonised by wading birds and waterfowl regardless of the noise from the immediate operations. The extraction operations at Lower Hall Farm are unlikely to increase disturbance to birds or other wild animals at Brockholes and will immediately offer a 'quiet' area with minimal human disturbance which will support the conservation objectives of the Trust at Brockholes. Similar considerations apply to the Red Scar woodland SSSI. Noise from the proposed operations will not impact on wildlife conservation objectives.

4. SUGGESTED SITE NOISE LIMITS AT NOISE SENSITIVE PROPERTY

4.1 In the Planning Practice Guidance, Paragraph 021 Reference ID: 27-021-20140306 states: *'What are the appropriate noise standards for mineral operators 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 (LA90,1h) by more than 10dB(A) during normal working hours (0700-1900). 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) LAeq, 1h (free field).'*

4.2 In general the noise climate in the area of the proposed development is dominated or significantly affected by road traffic noise from the M6 motorway and A59 Preston New Road, with noise levels dependent on wind direction and strength. In the table below, the anticipated, or measured in relation to the nearest properties, minimum existing average daytime background noise levels, dB $L_{A90, T}$ for the proposed working hours of the quarry are reproduced for each location, along with a suggested site noise limit 10 dB(A) above the anticipated average daytime background noise level. For the positions where average background noise levels are likely to be equal to or above 45 dB $L_{A90, T}$ the suggested site noise limits for routine daytime operations are set at 55 dB $L_{Aeq, 1 \text{ hour, free field}}$.

Ref. No.	Site Noise Calculation Location	Average Background Noise Level dB $L_{A90, T}$	Suggested Site Noise Limit dB $L_{Aeq, 1 \text{ hour, free field}}$
1	Elston New Hall Farm	> 40	50
2	Lower Hall Farm	> 40	50
3	Bezza House	> 40	50
4	The Hawthorns	> 40	50
5	The Brambles/Bezza Villa	> 40	50
6	Seed House Farm	> 40	50
7	Riverside Cottage	> 45	55
8	Catholic Church by Preston New Road	> 45	55
9	Longridge Road Crematorium	> 45	55

5. NOISE LEVEL CALCULATIONS (WITHOUT PROPOSED MITIGATION)

- 5.1 The potential noise impact of site noise at the nearest noise sensitive properties to the proposed operations can be assessed by the calculation of site noise levels due to the activities taking place on site and comparison with the nominal daytime noise limit. The noise levels likely to arise at dwellings depend on the sound power levels (noise output) of the plant chosen to work on site as much as on the distance to the properties and the effects of intervening ground and buildings. Proper allowance can be made for these variables, such as barrier attenuation attributable to intervening landforms, buildings and proposed barriers, to calculate site noise levels.
- 5.2 The calculations in this report are based on BS5228: 2009: Part 1 + A1: 2014. Further details of the calculation methods are set out in Appendix E to this report. A summary site noise calculation sheet for one of the nine receiver locations selected for this noise assessment is included in Appendix F, showing the noise sources and sound power levels along with separation distances and barrier attenuation values.
- 5.3 In order to calculate the noise levels for the proposed site operations, the contribution from each significant specific noise source has been evaluated separately and then combined together to give the overall noise level. The activities that will take place on the site that have been included in the site noise calculations are summarised below and set out in the summary site noise calculation sheet in Appendix F.
- 5.4 The excavation will be carried out in phases and cuts; the first cut using a loading shovel will leave the finished floor level just above the water table and the second will be a wet dig whereby an excavator will excavate to the base of the deposit from cut one's floor level. There will be no dewatering of the site.
- 5.5 The material will be transported by dump truck to the processing plant at the south eastern corner of the site, where the material will be washed.

5.6 Temporary operations such as soils stripping, bund formation and final restoration have been included in the site noise calculations, using typically an excavator, dump trucks and a dozer.

5.7 For the purposes of the calculations, the receiver height during daytime has been set as 1.5 metres for the nine receiver locations and soft ground has been assumed to be 90% between the noise sources and each receiver location.

5.8 The nearest potentially noise sensitive properties for which site noise calculations have been made are those listed below. The calculated site noise levels in the table below are for the proposed site operations, with no mitigation (bunding) considered for the processing plant site.

Ref. No.	Position 1.5 metre receiver height	Calculated Site Noise Levels for Operations dB L_{Aeq, 1 hour}, free field	Suggested Site Noise Limit for Operations dB L_{Aeq, 1 hour}, free field
1	Elston New Hall Farm	44	50
2	Lower Hall Farm	54	50
3	Bezza House	46	50
4	The Hawthorns	48	50
5	The Brambles/Bezza Villa	55	50
6	Seed House Farm	52	50
7	Riverside Cottage	48	55
8	Catholic Church by Preston New Road	46	55
9	Longridge Road Crematorium	46	55

5.9 The calculated site noise levels for extraction, processing and the access road for all of the dwellings apart from Lower Hall Farm and The Brambles/Bezza Villa comply with the suggested site noise limit of 50 or 55 dB L_{Aeq, 1 hour}, free field.

5.10 The site operator has proposed noise mitigation measures in the form of perimeter bunds for the processing plant site which have been incorporated into the site noise calculations for the proposed operations, as set out in the next section of this report.

6. NOISE LEVEL CALCULATIONS (WITH PROPOSED MITIGATION)

6.1 The calculated site noise levels in the table below are for the proposed site operations, with barrier attenuation considered for the bunding around the processing plant site.

Ref. No.	Position 1.5 metre receiver height	Calculated Site Noise Levels for Operations (with mitigation) dB L _{Aeq, 1 hour, free field}	Suggested Site Noise Limit for Operations (with Mitigation) dB L _{Aeq, 1 hour, free field}
1	Elston New Hall Farm	44	50
2	Lower Hall Farm	53	50
3	Bezza House	45	50
4	The Hawthorns	46	50
5	The Brambles/Bezza Villa	50	50
6	Seed House Farm	50	50
7	Riverside Cottage	47	55
8	Catholic Church by Preston New Road	46	55
9	Longridge Road Crematorium	46	55

Note: The calculations are for neutral wind conditions and a light wind component from the site could add say 2 dB(A).

6.2 With the exception of the dwelling at Lower Hall Farm which is in the control of the applicant, the calculated site noise levels for extraction, processing and the access road for all of the dwellings are at or below the suggested site noise limit of 50 or 55 dB L_{Aeq, 1 hour, free field}.

6.3 Since the dwelling at Lower Hall Farm is in the control of the applicant, it is considered that the Suggested Site Noise Limit be set at 55 dB $L_{Aeq, 1 \text{ hour, free field}}$, even though this is more than 10 dB above the anticipated average daytime background noise level.

7. TEMPORARY OPERATIONS (BUND FORMATION & RESTORATION)

7.1 The operations of topsoil and overburden stripping, bund formation and the final restoration processes are often noisier than extraction, as they tend to be closer and are usually unscreened. They are relatively short duration operations that are usually capable of completion in a total period of no more than eight weeks in any twelve month period in an area close to individual dwellings.

7.2 The construction of a bund is a brief operation taking typically a matter of two or three weeks to complete. For each dwelling the highest noise level that is calculated for storage bund formation would be reached only on a few days. The highest $L_{Aeq,T}$ noise levels expected from the closest temporary operations for the application area, including the formation of the access road, with one set of equipment as set out in the calculation sheet, are shown in the table below.

Ref. No.	Position 1.5 metre receiver height	Calculated Site Noise Levels for Temporary Operations dB $L_{Aeq, 1 \text{ hour, free field}}$	Suggested Site Noise Limit for Temporary Operations dB $L_{Aeq, 1 \text{ hour, free field}}$
1	Elston New Hall Farm	44	70
2	Lower Hall Farm	55	70
3	Bezza House	46	70
4	The Hawthorns	48	70
5	The Brambles/Bezza Villa	56	70
6	Seed House Farm	52	70
7	Riverside Cottage	48	70
8	Catholic Church by Preston New Road	46	70
9	Longridge Road Crematorium	49	70

7.3 The proposals comply with a 70 dB $L_{Aeq, 1 \text{ hour, free field}}$ noise limit for temporary works in line with current Government guidance. The proposals should also comply with the total of eight weeks duration for temporary works near to any individual property where the suggested noise limit for routine operations is likely to be exceeded.

8. SUGGESTED SITE NOISE CONDITIONS

8.1 In preparing a noise report covering a planning application or carrying out work for an environmental assessment on noise, it is usual to suggest conditions which would ensure that the operations comply with the suggested site noise limits at all times.

8.2 The extraction, loading and transportation of minerals shall be carried out between 07:00 hours to 17:00 hours on Monday to Saturdays and no working on Sundays or public holidays.

8.3 The following noise conditions for these core daytime periods are proposed as a basis for discussion with the mineral planning authority having regard to the anticipated noise climate and the provisions of the Planning Practice Guidance:

Except for temporary operations, the free-field Equivalent Continuous Noise Level, dB $L_{Aeq, 1 \text{ hour, free field}}$, due to daytime operations on the site, shall not exceed the site noise limit specified below at each dwelling for routine operations. Measurements taken to verify compliance shall have regard to the effects of extraneous noise and shall be corrected for any such effects.

For temporary operations such as site preparation, soil and overburden stripping, bund formation and final restoration, the free-field noise level due to work at the nearest point to each dwelling shall not exceed 70 dB $L_{Aeq, 1 \text{ hour, free field}}$. Temporary operations shall not exceed a total of eight weeks in any calendar year for work close to any individual noise sensitive property where the suggested noise limit for routine operations is likely to be exceeded.

Table to be referred to for noise conditions:

<i>Position 1.5 metre receiver height</i>	<i>Suggested Site Noise Limit for Extraction Operations dB L_{Aeq}, 1 hour, free field</i>	<i>Suggested Site Noise Limit for Temporary Operations dB L_{Aeq}, 1 hour, free field</i>
<i>Elston New Hall Farm</i>	55	70
<i>Lower Hall Farm</i>	50	70
<i>Bezza House</i>	50	70
<i>The Hawthorns</i>	50	70
<i>The Brambles/Bezza Villa</i>	50	70
<i>Seed House Farm</i>	50	70
<i>Riverside Cottage</i>	55	70

9. OFF-SITE ROAD TRAFFIC NOISE

- 9.1 HGV movements are included in the site noise calculations on the quarry access road between the processing area and the new access onto the A59 Preston New Road. This is a two-way flow of 50 HGV movements per day (5 per hour) over the period of 07:00 hours to 17:00 hours. There is an estimated additional up to 10 movements per day related to staff journeys and the occasional service vehicle or cars, vans etc.
- 9.2 The potential increase in traffic noise from the movement of site HGVs on relevant stretches of road can be examined by way of calculation, where suitable traffic flow information and an appropriate calculation method is available.
- 9.3 Traffic flow information has been provided for the A59 Preston New Road. The 2-way existing traffic flow on the A59 Preston New Road has been provided as more than 35000 vehicles per 18-hour day.
- 9.4 Calculation of a change in road traffic noise level has been made, at a nominal separation distance of 10 metres, using the Calculation of Road Traffic Noise (1988) document for existing traffic flow on the HGV routes and future traffic flow with site HGV movements added.
- 9.5 The prediction method in CRTN 1988 is primarily for vehicle flows of greater than 1000 vehicles per 18-hour day. The prediction method (additional procedures) provides a correction to the predicted noise levels for low traffic flows, in the range 1000 to 4000 vehicles per 18-hour day. Calculations of noise level for traffic flows below 1000 vehicles per 18-hour day are unreliable and measurements should be taken when evaluating such cases (as the development is not yet in place, measurements are not possible).
- 9.6 The calculated increases in road traffic noise level due to the addition of 50 HGVs per day is less than 0.1 dB $L_{A10, 18 \text{ hour}}$ adjacent to the A59 Preston New Road.

9.7 DMRB Volume II Environmental Assessment Section 3 Environmental Assessment Techniques Part 7 HD 213/11 Noise and Vibration dated November 2011, contains Chapter 3 ‘Procedure for Assessing Impacts’.

9.8 It is stated at paragraph 3.37 that ‘A change in road traffic noise of 1 dB LA10, 18h in the short term (e.g. when a project is opened) is the smallest that is considered perceptible’. The contents of Table 3.1 ‘Classification of Magnitude of Noise Impacts in the Short Term’ are reproduced below.

Noise change dB LA10, 18h	Magnitude of Impact
0	No change
0.1 – 0.9	Negligible
1 – 2.9	Minor
3 – 4.9	Moderate
5+	Major

9.9 The calculated change in road traffic noise level of 0.1 dB LA10, 18 hour on the A59 Preston New Road would be regarded as no more than ‘Negligible’ for ‘Magnitude of Impact’.

10. SUMMARY AND CONCLUSIONS

- 10.1 Harleyford Aggregates Limited (HA) proposes to extract, process, load and transport material from land to the west of Lower Hall Farm, Samlesbury, east of Preston in Lancashire. The site is north east of junction 31 of the M6 motorway, north of the A59 Preston New Road and within a loop of the River Ribble.
- 10.2 The nearest dwellings to the site are situated to the east and south of the proposed extraction area and to the west of the access road from the processing plant site to the A59 Preston New Road. These dwellings are in excess of 275 m from the nearest mineral operations. The dwellings at Lower Hall Farm and Seed House Farm are owned by the applicant and tenanted.
- 10.3 Advance Environmental (AE) have undertaken an assessment of the environmental noise implications of the proposals by way of calculating site noise levels at selected receiver locations nearest to the proposed development.
- 10.4 Current guidelines on noise are contained in Planning Practice Guidance dated March 2014 '*Assessing environmental impacts from minerals extraction Noise emissions*'.
- 10.5 Noise limits at dwellings for quarry site noise are suggested in this report, based on the nominal daytime noise limit of 55 dB $L_{Aeq, 1 \text{ hour, free field}}$ as set out in the Planning Practice Guidance for the nearest noise sensitive locations to the site.
- 10.6 Site noise calculations have been undertaken for selected receiver locations for two combinations of activity in the quarry, for routine operations associated with extraction and for temporary operations associated with site preparation and restoration. The calculated site noise levels are presented for inspection and comparison with the suggested site noise limits for the noise sensitive locations.
- 10.7 Mitigation measures are identified in order to reduce the potential noise impact from the proposed operations at the development site on the nearest dwellings.

- 10.8 The calculated site noise levels for extraction operations at all of the dwellings comply with the suggested site noise limits of ~~50~~ 55 dB $L_{Aeq, 1 \text{ hour, free field}}$.
- 10.9 Draft conditions on noise are proposed for the consideration of the Mineral Planning Authority.
- 10.10 The development related movements have been input as 50 HGV per day. Using this figure the calculated change in road traffic noise level is less than 0.1 dB $L_{A10, 18 \text{ hour}}$ on the A59 Preston New Road which would be regarded as no more than 'Negligible' for 'Magnitude of Impact'

APPENDICES

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Appendix A

Glossary of Acoustic Terms

Decibels dB

Noise levels are measured in decibels. The decibel is the logarithmic ratio of the sound pressure to a reference pressure (2×10^{-5} Pascals). The decibel scale gives a reasonable approximation to the human perception of relative loudness. In terms of human hearing, audible sounds range from the threshold of hearing (0 dB) to the threshold of pain (140 dB).

A-weighted Decibels dB(A)

The 'A'-weighting filter emulates human hearing response for low levels of sound. The filter network is incorporated electronically into sound level meters. Sound pressure levels measured using an 'A'-weighting filter have units of dB(A) which is a single figure value to represent the overall noise level for the entire frequency range.

A change of 3 dB(A) is the smallest change in noise level that is perceptible under normal listening conditions. A change of 10 dB(A) corresponds to a doubling or halving of loudness of the sound. The background noise level in a quiet bedroom may be around 20 –30 dB(A); normal speech conversation around 60 dB(A) at 1 m; noise from a very busy road around 70-80 dB(A) at 10m; the level near a pneumatic drill around 100 dB(A).

Façade Noise Level

Façade noise measurements are those undertaken near to reflective surfaces such as walls, usually at a distance of 1m from the surface. Façade noise levels at 1m from a reflective surface are normally around 3 dB greater than those obtained under freefield conditions.

Freefield Noise Level

Freefield noise measurements are those undertaken away from any reflective surfaces other than the ground.

Frequency Hz

The frequency of a noise is the number of pressure variations per second, and relates to the 'pitch' of the sound. Hertz (Hz) is the unit of frequency and is the same as cycles per second. Normal, healthy human hearing can detect sounds from around 20 Hz to 20 kHz.

Octave and Third-Octave Bands

Two frequencies are said to be an octave apart if the frequency of one is twice the frequency of the other. The octave bandwidth increases as the centre frequency increases. Two frequencies are said to be a third-octave apart if the frequency of one is 1.26 times the other.

There are recognised octave band and third octave band centre frequencies. The octave or third-octave band sound pressure level is determined from the energy of the sound which falls within that particular octave or third octave band.

Equivalent Continuous Sound Pressure Level $L_{Aeq,T}$

The 'A'-weighted equivalent continuous sound pressure level $L_{Aeq,T}$, is a notional steady level which has the same acoustic energy as the actual fluctuating noise over the same time period T. The $L_{Aeq,T}$ unit is dominated by higher noise levels, for example, the $L_{Aeq,T}$ average of two equal time periods at , for example, 70 dB(A) and 50 dB(A) is not 60 dB(A) but 67 dB(A).

The $L_{Aeq,T}$ unit was commended by the Noise Advisory Council and is the chosen unit of BS5228 for Construction and Open site noise, BS 7445 for the Description and Measurement of Environmental noise.

Maximum Sound Pressure Level L_{AMax}

The L_{AMax} value describes the overall maximum 'A'-weighted sound pressure level over the measurement interval.

Sound Exposure Level L_{AE} or SEL

The sound exposure level is a notional level which contains the same acoustic energy in 1 second as a varying 'A'-weighted noise level over a given period of time. It is normally used to quantify short duration noise events such as aircraft flyover or train bypasses.

Statistical Parameters L_N

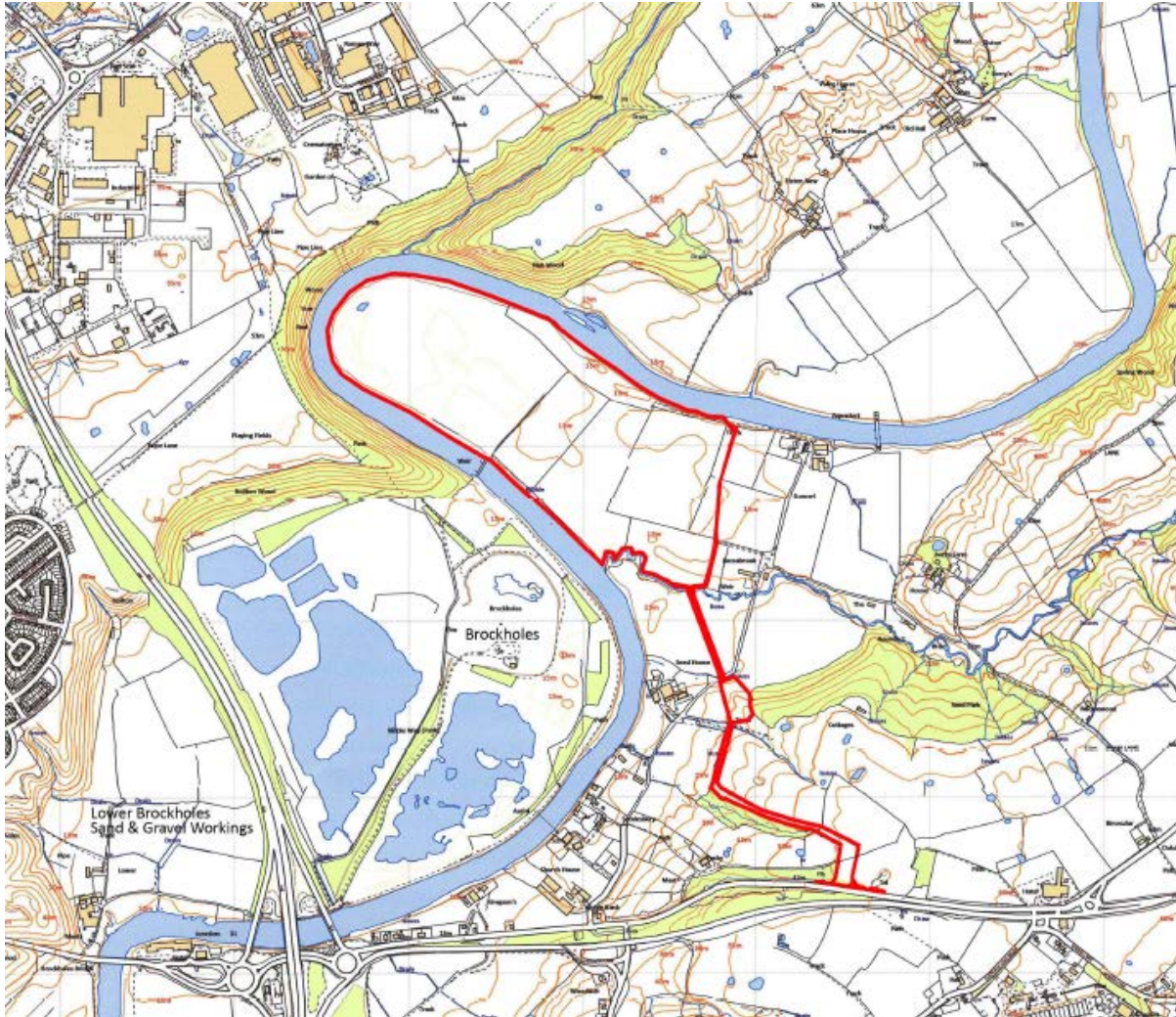
In order to cover the time variability aspects, noise can be analysed into various statistical parameters, i.e. the sound level which is exceeded for N% of the time. The most commonly used are the $L_{A01,T}$, $L_{A10,T}$ and the $L_{A90,T}$.

$L_{A01,T}$ is the 'A'-weighted level exceeded for 1% of the time interval T and is often used to give an indication of the upper maximum level of a fluctuating noise signal.

$L_{A10,T}$ is the 'A'-weighted level exceeded for 10% of the time interval T and is often used to describe road traffic noise. It gives an indication of the upper level of a fluctuating noise signal. For high volumes of continuous traffic, the $L_{A10,T}$ unit is typically 2–3 dB(A) above the $L_{Aeq,T}$ value over the same period.

$L_{A90,T}$ is the 'A'-weighted level exceeded for 90% of the time interval T, and is often used to describe the underlying background noise level.

Appendix B
Plan of Area around Lower Hall Farm



Appendix C

Environmental Noise Survey Tables

Table 1

Noise levels measured adjacent to The Brambles on 11 September 2015

Measurement period		Sound Pressure Level dB re 20 µPa		
Start Time	Finish Time	L _{A10}	L _{A90}	L _{Aeq}
12.15	12.30	47	41	44

Comments

Weather conditions were dry and sunny

Wind speed 1 ms⁻¹. Direction – Southerly

15 minute measurement periods.

M1 Breeze in trees. Bird song and distant road traffic from M6

Table 2

Noise levels measured adjacent to Seed House Farm on 11 September 2015

Measurement period		Sound Pressure Level dB re 20 µPa		
Start Time	Finish Time	L _{A10}	L _{A90}	L _{Aeq}
12.35	12.50	45	41	43

Comments

Weather conditions were dry and sunny

Wind speed 1 ms⁻¹. Direction – Southerly

15 minute measurement periods.

M1 Breeze in trees. Bird song and distant road traffic from A59/M6

Appendix C

Environmental Noise Survey Tables

Table 3

Noise levels measured adjacent to Riverside Cottage on 11 September 2015

Measurement period		Sound Pressure Level dB re 20 μ Pa		
Start Time	Finish Time	L _{A10}	L _{A90}	L _{Aeq}
12.50	13.05	53	48	51

Comments

Weather conditions were dry and sunny

Wind speed 1 ms⁻¹. Direction – Southerly

15 minute measurement periods.

M1 A59 road traffic more audible and becoming dominant

Table 4

Noise levels measured adjacent to St Leonards House on 11 September 2015

Measurement period		Sound Pressure Level dB re 20 μ Pa		
Start Time	Finish Time	L _{A10}	L _{A90}	L _{Aeq}
13.10	13.25	53	50	55

Comments

Weather conditions were dry and sunny

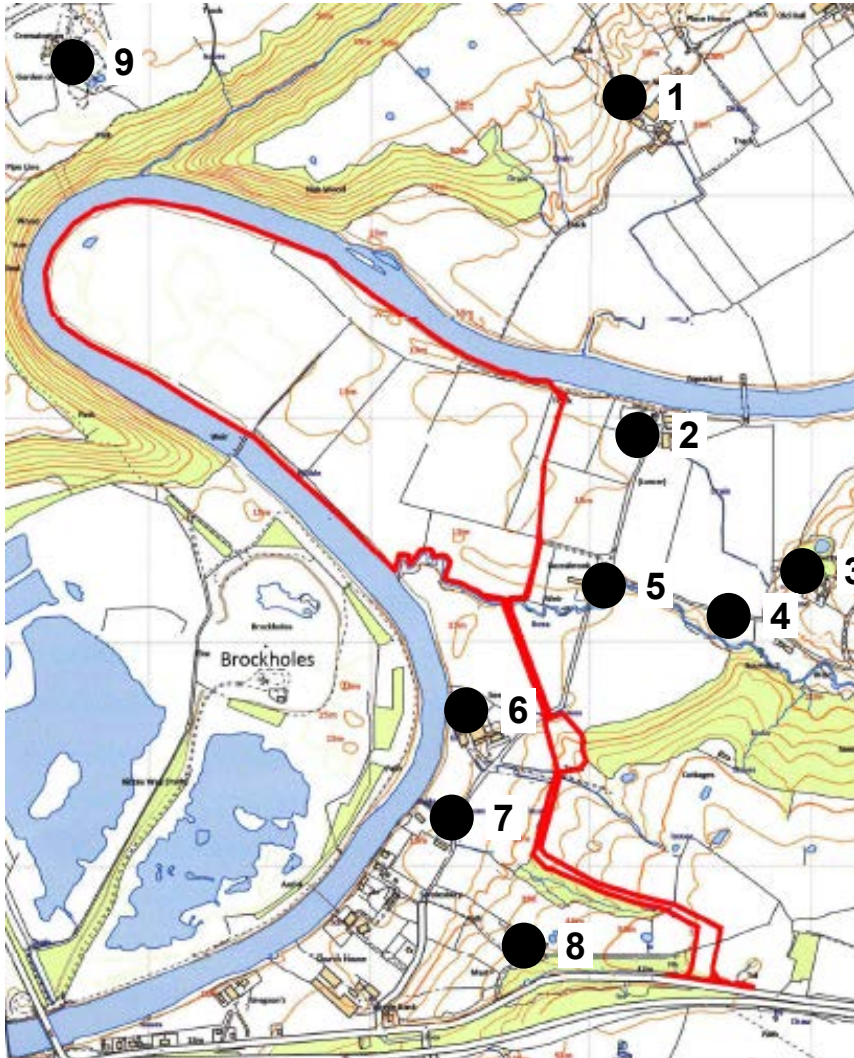
Wind speed 1 ms⁻¹. Direction – Southerly

15 minute measurement periods.

M1 A59 road traffic very audible

Appendix D

Site Noise Calculation Locations



Site Noise Calculation Locations (approximate positions shown)

- 1 Elston New Hall Farm
- 2 Lower Hall Farm
- 3 Bezza House
- 4 The Hawthorns
- 5 The Brambles/Bezza Villa
- 6 Seed House Farm
- 7 Riverside Cottage
- 8 Catholic Church by Preston New Road
- 9 Longridge Road Crematorium

Appendix E

Noise Calculation Methods

Specific noise levels are predicted or measured in terms of the Equivalent Continuous Noise Level, $L_{Aeq,T}$ over a given reference time interval, $T = 1$ hour, as detailed in Department for Communities and Local Government 2014 document '*Planning Practice Guidance – Assessing environmental impacts from minerals extraction*'.

The calculation method for any plant which is relatively fixed in location is that set out in BS 5228: 2009 + A1: 2014 Part 1, Annex F, and is the 'Method for activity L_{Aeq} ' described in section F.2.2 or the 'Method for plant sound power level' described in section F.2.3.

The calculation method for site mobile plant such as lorries is that set out in BS5228: 2009 + A1: 2014 Part 1, Annex F, and is the 'Method for mobile plant using a regular well defined route (e.g. haul roads)' described in section F.2.5.

Ground Absorption has been calculated using the technique set out in BS 5228: 2009 + A1: 2014 Part 1, Annex F, assuming 90% soft ground between the site and the nearest receiver locations.

The method of assessing screening is that attributed to Maekawa as used in BS 5228: 2009 + A1: 2014 and various other Government published documents. This method uses the calculated path difference and octave band noise data for each noise source over the frequency range stated in BS 5228: 2009 + A1: 2014. The effects of ground absorption are not used in the calculations if screening has been assessed and offers a higher attenuation.

The nearest distances to the respective dwellings, from the various items of plant, have been used in an acoustic model for the site to calculate the site noise levels in terms of dB $L_{Aeq,1}$ hour, free field for daytime periods.

A summary site noise calculation sheet has been provided for inspection, for one of the nine receiver locations, for 1.5 metre receiver height for daytime site noise calculations.

Appendix F

Site Noise Calculation Summary Sheets

Ref	Plant Item	Comments on Plant	Activity LAeq @ 10 m or LWA / m	Power LWA or LWA / m	On-time	Capacity Tonnes	Source Height	Receiver Height : Site Ground Height : Water Table Depth :	1.5 15 5	2 way flow Q per hour	Speed V kph	10	Plant Set back(m)	BS5228 method	Resultant LAeq
	ADVANCE ENVIRONMENTAL	4436	04-Mar-16	PWC											
	Harleyford Aggregates Limited - Lower Hall Farm Samesbury Preston Lancashire														
1	Volvo L120 loading shovel (in extraction area)	Manufacturers data	78	106	100		2					10	m back	1	Activity
2	Volvo L150 loading shovel (at plant site)	Manufacturers data	79	107	100		2					30	m back	1	Activity
3	Volvo A25 dump truck	WBM plant noise database	78	106	100		2					20	m back	3	Defined Area
4	Volvo EC220 excavator	Manufacturers data	75	103	100		2					30	m back	1	Activity
5	Duo Aggresand combined with lignite removal	Manufacturers data	86	114	100		3.5					0	m back	1	Activity
6	Sykes super wisaset 200 X1	Manufacturers data	62	90	100		2					0	m back	1	Activity
7	Sykes GP200 - not to be used	Sykes data 122 dB LWA	-1027	-999	100		2					0	m back	1	Activity
8	Pegson 900 maxtrack	WBM plant noise database	83	111	100		3.5					0	m back	1	Activity
9	FG Wilson super silenced 500KVA generator	Generator in acoustic enclosure	78	106	100		2					0	m back	1	Activity
10	Access road 1	WBM plant noise database	76	104	100		2			16	15	0	m back	4	Haul Road
11	Access road 2	WBM plant noise database	76	104	100		2			16	20	0	m back	4	Haul Road
12	Access road 3	WBM plant noise database	76	104	100		2			16	25	0	m back	4	Haul Road
13	Excavator for temporary campaign works	Manufacturers data	75	103	100		2					0	m back	1	Activity
14	Dump trucks for temporary campaign works	WBM plant noise database	78	106	100		2					0	m back	1	Activity
15	Dozer for temporary campaign works	WBM plant noise database	80	108	100		2					0	m back	1	Activity
	Location No.	2	Lower Hall Farm												
	Receiver Height	16.5	m AOD												
	Site Noise Level for items 1 to 12	53	dB LAeq, 1 hour, free field												
	Site Noise Level for items 5 to 9	46	dB LAeq, 1 hour, free field												
	Site Noise Level for items 13 to 15	55	dB LAeq, 1 hour, free field												
Ref	Plant Item	Plan Distance	Working Distance	Ground Height	Working Height/depth	Source Height	Angle Degrees	Range Metres	Barrier -Receiver	Barrier Height	Path Diff.	Barrier Atten.	Soft Ground %	Ground Atten.	Resultant LAeq
1	Volvo L120 loading shovel (in extraction area)	170	180	15.0	0.0	17.0	0	0	140	15.0	-0.057	0.1	90.0	3.8	49.0
2	Volvo L150 loading shovel (at plant site)	450	480	15.0	0.0	17.0	0	0	260	21.0	0.075	10.9	90.0	5.8	34.5
3	Volvo A25 dump truck	170	190	15.0	0.0	17.0	0	200	140	15.0	-0.047	0.0	90.0	4.0	46.5
4	Volvo EC220 excavator	170	200	15.0	-5.0	12.0	0	0	140	15.0	0.032	7.9	90.0	4.1	41.1
5	Duo Aggresand combined with lignite removal	450	450	15.0	0.0	18.5	0	0	260	21.0	0.051	8.6	90.0	5.2	44.3
6	Sykes super wisaset 200 X1	450	450	15.0	0.0	17.0	0	0	260	21.0	0.081	10.8	90.0	5.6	21.9
7	Sykes GP200 - not to be used	450	450	15.0	0.0	17.0	0	0	260	21.0	0.051	8.6	90.0	5.6	-1070.9
8	Pegson 900 maxtrack	450	450	15.0	0.0	17.0	0	0	260	21.0	0.081	10.8	90.0	5.2	41.3
9	FG Wilson super silenced 500KVA generator	450	450	15.0	0.0	17.0	0	0	260	21.0	0.051	8.6	90.0	5.6	34.7
10	Access road 1	400	400	20.0	0.0	22.0	40	0	0	0.0	-1.000	0.0	90.0	5.4	33.3
11	Access road 2	10	10	30.0	0.0	32.0	1	0	0	0.0	-1.000	0.0	90.0	0.0	37.5
12	Access road 3	970	970	45.0	0.0	47.0	20	0	0	0.0	-1.000	0.0	90.0	7.1	22.5
13	Excavator for temporary campaign works	170	170	15.0	0.0	17.0	0	0	0	0.0	-1.000	0.0	90.0	3.7	46.7
14	Dump trucks for temporary campaign works	170	170	15.0	0.0	17.0	0	0	0	0.0	-1.000	0.0	90.0	3.7	49.7
15	Dozer for temporary campaign works	170	170	15.0	0.0	17.0	0	0	0	0.0	-1.000	0.0	90.0	3.7	51.7