Our Ref: 067228

11 September 2017

Mr D Waghorn
Process Manager
Production
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Dorket Head Factory
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Nottingham
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ESG
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Report Number : 17_08_067228_HME_1

Dear Mr Waghorn

Environmental Noise Survey – Dorket Head

Please find attached the report covering the environmental noise survey carried out at Dorket Head Quarry on 11th, 22nd and 23rd August 2017.

An account for this work, which has been undertaken in accordance with our General Conditions of Contract, will be forwarded to you under separate cover.

If I can be of any further assistance in this matter, please do not hesitate to contact me.

Yours sincerely
On behalf of ESG

hmemerson

Helen Emerson
Technologist, Occupational Hygiene
Built Environment Services
ESG

Direct Line: 07825 722601
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Environmental Noise Survey –Dorket Head Quarry

Ibstock Brick Ltd

August 2017

Project No.	067228
Carried Out For:	Mr D Waghorn - Process Manager Production Ibstock Brick Limited Dorket Head Factory Arnold Nottingham NG5 8PZ
Carried Out:	11th, 22nd and 23rd August 2017
Prepared By:	Helen Emerson MSci | Occupational Hygiene Technologist
Technically Checked By:	Karl Colella MSci LFOH | Occupational Hygienist
Authorised for Issue By:	Karl Colella MSci LFOH | Occupational Hygienist
Date of Issue:	11 September 2017
Copy №:	1
Revision:	0
Report №:	17_08_067228_HME_1

ESG
Built Environment Services
Derwent House
Bretby Business Park
Ashby Road
Burton Upon Trent
DE15 0YZ
Tel: 01283 554400

CONTENTS

EXECUTIVE SUMMARY

ESG was requested by Mr. D Waghorn, Process Manager, Ibstock Brick Ltd, to undertake an environmental noise survey at the Dorket Head Quarry Site, to compare the noise levels at the nearby sensitive receptors to the limits that are in place.

Monitoring was carried out on 11th, 22nd and 23rd August 2017 between the hours of 07:30 and 17:00 by Mr K Colella and Miss H Emerson of ESG. A log of relevant noise events was maintained throughout the period monitored.

At the four locations monitored when the quarry mobile plant was operating under normal conditions the $L_{Aeq,1hr}$ recorded result were as follows:

Table 1: Summary of 1-hour results, 11th August 2017

Location	Monitoring Period	Noise Levels dB(A)				Limits
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}	L_{Aeq}
1) 220 Surgeys Lane	08:24 – 08:39	42.1	63	44.1	38.2	50
2) 15 Strathmore Road	8:51 – 10:00	39.4	58	42	36.4	49
4) Arnold Lodge	10:53 – 12:20	56.7	72.1	59.3	53.3	52
5) Dorket Head Farm	12:56 – 13:31	59.8	76.4	52.5	43.7	55
6) 48 Jenned Road	13:50 - 14:51	49.5	64.8	52.5	43.7	55

Table 2: Summary of 1-hour results, 22nd August 2017

Location	Monitoring Period	Noise Levels dB(A)				Limits
		L_{Aeq}	L_{Aeq}	L_{A10}	L_{A90}	L_{Aeq}
1) 220 Surgeys Lane	15:48 – 16:48	39.7	60.9	41.3	34.9	50
2) 15 Strathmore Road	14:30 – 15:30	39.8	62	42.4	34.8	49
4) Arnold Lodge	12:08 – 13:08	49.3	59.4	51.3	46	52
5) Dorket Head Farm	10:46 – 11:46	59.8	78.6	64.5	48.1	55
6) 48 Jenned Road	8:36 – 9:36	37.1	62.3	39	34.1	55

Table 3: Summary of 1-hour results, 23rd August 2017

Location	Monitoring Period	Noise Levels dB(A)				Limits
		L_{Aeq}	L_{Aeq}	L_{A10}	L_{A90}	L_{Aeq}
1) 220 Surgeys Lane	10:37 – 11:37	41.7	66.3	44.1	35.2	50
2) 15 Strathmore Road	07:31 – 08:31	38.8	61.5	39.7	35.2	49
3) Rugby Club	09:00 – 10:00	51.6	70.7	54.2	45.9	55
4) Arnold Farm	14:53 – 15:53	54.0	69.4	56.1	50.7	52
5) Dorket Head Farm	13:02 – 14:02	59.8	87.8	63.8	45.2	55
6) 48 Jenned Road	11:50 – 12:50	40.7	61.9	42.5	38.2	55

Although the limits were exceeded at Arnold Lodge and Dorket Head Farm, this was due to the proximity of the main road rather than site noise, as discussed below.

Location 1 – Surgeys Lane, noises were deemed to be from the main road, local wildlife and garden maintenance down the road from the monitoring location.

Location 2 – Strathmore Road, noises were deemed to be from the main road, local wildlife and residential noise.

Location 3 – Rugby Club, noises were deemed to be from the main road, a local farm track and thunder.

Location 4 – Arnold Lodge, noises were deemed to be from the main road, local wildlife and the scrap yard nearby. On the final day of monitoring the site could be heard but only if there were no other noise influences.

Location 5 – Dorket Head Farm, noises were deemed to be from the main road, vehicles moving around the yard and local wildlife.

Location 6 – Jenned Road, noises were deemed to be from the main road and from local wildlife.

For more information see Field Logs in Appendix B.

1 INTRODUCTION

1.1 ESG was requested by Mr D Waghorn, Process Manager, production, Ibstock Brick Ltd, Dorket Head to undertake an environmental noise survey in the quarry area of the Dorket Head site at the nearby sensitive receptors during winning operations at the site.

1.2 Monitoring was carried out on 11th, 22nd and 23rd August 2017 between the hours of 07:30 and 17:00 by Mr K Colella and Miss H Emerson of ESG. A log of relevant noise events was maintained throughout the period monitored.

2 SCOPE AND EXCLUSIONS

2.1 The survey was required to monitor the levels of environmental noise at six locations at nearby sensitive receptors as identified by Nottinghamshire County Council in planning documents 7/2003/0335 (condition 23) and 7/97/0697 conditions 18 to 21 (these documents have not been seen by ESG).

2.2 The specified noise limits currently in force at the site are shown in the table below:

No.	Location	Grid Reference	Limits $L_{AEQ,T}$
1	220 Surgeys Lane	SK 595 467	50 dB(A)
2	15 Strathmore Lane	SK 599 464	49 dB(A)
3	Melish Rugby Club	SK 603 463	55 dB(A)
4	Arnold Lodge	SK 604 470	52 dB(A)
5	Dorket Head Farm	SK 595 476	55 dB(A)
6	48 Jenned Road	SK 593 468	55 dB(A)

3 BACKGROUND INFORMATION

3.1 The nature of the response to noise can vary widely between individuals from no response at all to disturbance that can develop into annoyance or anger. Some individuals may experience physical effects arising as a result of emotional stress, such as sleep disturbance or loss of appetite.

3.2 The effects of noise are made up of two components - its energy (an objective component) and its tendency to annoy (a subjective component which differs according to the noise source). Thus noise has a plethora of measurement units, supported to varying degrees by social survey data establishing they're subjective, annoyance factors. All this reflects the fact that, in general, noise affects people rather than the environment itself.

3.3 The Public Health Outcomes Framework (PHOF) published in January 2012 quoted that from noise mapping carried out in 2011 (and based on the 2011 census), the total

number of people in England exposed to 65 dB, $L_{Aeq\ 16h}$ or more was 2.74 million (5.2% population) in daytime.

3.4 From noise mapping carried out in 2011 (and based on the 2011 census), the total number of people in England exposed to 55 dB, L_{night} or more was 4.25 million (8.0 % population) at night-time.

3.5 Environmental noise sources are regulated by numerous legal measures, with an even larger variety of technical controls available. We aim to outline these, examining noise problems from the point of view of those causing noise and experiencing it.

4 MONITORING METHODS

4.1 See Appendix A – Methods for the test method and equipment used.

4.2 The sound level meter microphone was equipped with a windshield at all times and the following parameters were set on the sound level meter during the noise measurements:

Time weighting	Fast
Frequency weighting	A
Logging Intervals	1 Second
Parameters	LAeq; LAmax; LA10; LA90 (dB)

4.3 All readings taken were “free field”, i.e. at least 3.5m away from any facade or reflecting surface other than the ground. The microphone was located 1.2 to 1.5m above ground level.

4.4 British Standard BS4142:2014 defines weather conditions for environmental noise surveys as mean wind speed less than 5 ms^{-1} and no significant rainfall. All noise monitoring was carried out when the weather conditions satisfied the meteorological constraints as defined by British Standard BS4142:2014.

4.5 ESG personnel were present throughout the monitoring period, thereby ensuring that an accurate representation of the prevailing noise climate was recorded.

5 RESULTS

5.1 A summary of the noise measurements are given in Tables 1, 2 and 3.

Table 1: Summary of 1-hour results, 11th August 2017

Location	Monitoring Period	Noise Levels dB(A)			
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
1) 220 Surgeys Lane	08:24 – 08:39	42.1	63	44.1	38.2
2)15 Strathmore Road	8:51 – 10:00	39.4	58	42	36.4
4) Arnold Farm	10:53 – 12:20	56.7	72.1	59.3	53.3
5) Dorket Head Farm	12:56 – 13:31	59.8	76.4	52.5	43.7
6) 48 Jenned Road	13:50 - 14:51	49.5	64.8	52.5	43.7

Table 2: Summary of 1-hour results, 22nd August 2017

Location	Monitoring Period	Noise Levels dB(A)			
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
1) 220 Surgeys Lane	15:48 – 16:48	39.7	60.9	41.3	34.9
2)15 Strathmore Road	14:30 – 15:30	39.8	62	42.4	34.8
4) Arnold Farm	12:08 – 13:08	49.3	59.4	51.3	46
5) Dorket Head Farm	10:46 – 11:46	59.8	78.6	64.5	48.1
6) 48 Jenned Road	8:36 – 9:36	37.1	62.3	39	34.1

Table 3: Summary of 1-hour results, 23rd August 2017

Location	Monitoring Period	Noise Levels dB(A)			
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
1) 220 Surgeys Lane	10:37 – 11:37	41.7	66.3	44.1	35.2
2)15 Strathmore Road	07:31 – 08:31	38.8	61.5	39.7	35.2
3) Rugby Club	09:00 – 10:00	51.6	70.7	54.2	45.9
4) Arnold Farm	14:53 – 15:53	54.0	69.4	56.1	50.7
5) Dorket Head Farm	13:02 – 14:02	59.8	87.8	63.8	45.2
6) 48 Jenned Road	11:50 – 12:50	40.7	61.9	42.5	38.2

5.2 The following weather conditions were recorded during the survey:

11th August 2017	Light cloud and sunny at the beginning of the monitoring period going to overcast but dry at the end of the day. Maximum wind speed >1 mph to 3.5 mph. Temperature 10 – 18 °C.
22nd August 2017	Overcast but dry during the monitoring period. Maximum wind speed >0.5 mph to 1.1 mph. Temperature 17 – 22 °C.
23rd August 2017	Overcast but dry during the monitoring with a short, light shower at ~09:30. Maximum wind speed 0.5 mph to 2 mph. Temperature 15 - 20 °C.

6 DISCUSSION

6.1 Dorket Head Quarry operates between the hours of 07:00 – 18:00 Monday to Friday. The site undertakes clay winning on a campaign basis to supply the brick factory. The mobile plant on site that is used regularly comprises of three dumpers, three dozers, two 360 excavators, one small excavator and a tractor with bowser for dust suppression. On occasion a grader is used.

6.2 On all three days Locations 1, 2 and 6 were found to be below their respective limits. On the one day access was available to Location 3, the level monitored was below the permitted levels.

6.3 On the second day of monitoring Location 4 (Arnold Lodge) was below its respective limit. However, on the first and final days the level monitored was above the permitted limit, but this was due to other influences such as road traffic noise and local wildlife.

6.4 On all three days of monitoring location 5 (Dorket Head Farm) was found to be above the permitted level, however, this was due to other influences such as road traffic noise, cars coming in and out of the yard and local wildlife. Site noise was not audible in this location.

6.5 Where road noise dominates at a sensitive receptor, alternative method of measuring the potential effect at the location are to measure at an equivalent location or to measure closer to the source and to calculate the predicted levels. However, due to the proximity of the roads along most of the site boundary, along with the large area within the quarry where operations were taking place, suitable substitutes with public access were not found for Arnold lodge or Dorket Head Farm.

6.6 The dominant noises varied from location to location:

Location 1 – Surgeys Lane, noises were deemed to be from the main road, local wildlife and garden maintenance down the road from the monitoring location.

Location 2 – Strathmore Road, noises were deemed to be from the main road, local wildlife and residential noise.

Location 3 – Rugby Club, noises were deemed to be from the main road, a local farm track and thunder.

Location 4 – Arnold Lodge, noises were deemed to be from the main road, local wildlife and the scrap yard nearby. On the final day of monitoring the site could be heard but only if there was no other noise influences.

Location 5 – Dorket Head Farm, noises were deemed to be from the main road, vehicles moving around the yard and local wildlife.

Location 6 – Jenned Road, noises were deemed to be from the main road and from local wildlife.

7 CONCLUSIONS & RECOMMENDATIONS

7.1 The results of the survey indicate that the noise produced by the site does not exceed the limits that have been put in place. Although locations 4 and 5 do exceed the limits the noise is not produced from the quarry. Instead it is mostly produced by traffic on the main road.

7.2 The following 'good housekeeping' measures should continue to be considered when crushing and screening activities are carried out on site to ensure that noise levels emanating from site are kept to a minimum:

- Consider reducing the volume of reverse sirens at site, in particular at site boundary locations in close proximity to sensitive receptors. Substituting traditional 'beeping' reverse alarms with newer broadband / white noise type alarms will also enable reversing alarms to be operated at lower volumes whilst still being effective as a safety measure.

- Ensure that inspection plates and any acoustic panels on mobile and static plant are in place and fitted correctly.

- Repair or replace any defective exhaust systems on mobile plant (i.e. missing clamps or locating pins) as soon as possible after any defects are discovered.

- Ensure that mobile plant is driven and operated correctly, and that all site speed limits are properly observed.

- Inspect the equipment used on site to ensure it is not damaged or requiring maintenance.

8 REFERENCES

1. Minerals Planning Guidance: 1993.
   MPG 11. The Control of Noise at Surface Mineral Workings.

2. Planning Policy Guidance: 1994. PPG 24. Planning and Noise.

3. BS 4142:2014 Methods for rating and assessing industrial and commercial sound

4. British Standards Institution (2009) BS EN 5228:2009 Noise and vibration on construction and open sites. London, BSI.

   Part 1. Code of Practice for Basic Information and Procedures for Noise and Vibration Control.

5. ISO 1996-2:2007 (BS7445:2003) Acoustics – Description, measurement and assessment of environmental noise, Part 2 : Determination of environmental noise levels.

6. British Standards Institution BS EN 7445:2003 Description and Measurement of Environmental Noise. London, BSI.

7. World Health Organisation: 1980. Environmental Health Criteria 12, Noise. Berglund, B., Lindvall, T., and Schwela, D, H. (1999) Guidelines for Community Noise. Geneva, World Health Organization.

8. Environment Agency; IPPC H3 Horizontal Guidance for Noise Part 2 – Noise Assessment and Control

9. British Standards Institution (2003a) BS EN 61672-1:2003 Electroacoustical performance specifications of sound level meters. London, BSI.

10. British Standards Institution (2003b) BS EN 60942:2003. Electroacoustics. Sound calibrators. London, BSI.

Appendix A – Methods

Process	Environmental Noise Measurements
Reference Documentation	British Standard BS7445 Parts 1 and 2: 1991 - Description and measurement of environmental noise, ISO 1996-2 1987. Instrumentation used for the noise monitoring conforms to the requirements of British Standard BS4142: 2014 - 'Methods for rating and assessing industrial and commercial sound, Section 4 - Measuring Equipment; it complies with the requirements of BS EN 60651:1994 (Type 1) and BS EN 60804:1994 (Type 1) which are the current National and European Standards applicable to sound level meters and integrating sound level meters. ESG in house procedure – Noise Surveys - ENV/004
Monitoring equipment / Serial Number / Calibration status	Cirrus CR 171A Precision Integrating/Logging Sound Level Meter, serial number G078355, calibrated 14/07/16 fitted with windshield and calibration checked before, during and after survey. Cirrus Type CR:513A calibrator, serial number 75444 calibrated 30/08/16. Cirrus CR 171B Precision Integrating/Logging Sound Level Meter, serial number G071621, calibrated 28/07/2017 fitted with windshield and calibration checked before, during and after survey. Cirrus Type CR:513A calibrator, serial number 75444 calibrated 30/08/16.
Analysis/Reporting Laboratory	ESG Bretby

Appendix B – Field Log

Dorket Head Quarry

Environmental Noise Measurements

Survey Date: 11th August 2017

Location No: 1) 220 Surgeys Lane

(OS Grid Ref. SK 596 467)

Time Period: 08:24 to 08:39 (measurement abandoned after 15 minutes due to construction work starting at 220 Surgeys Lane.)

Noise Sources:
a) Local wildlife
b) Main road noise
c) Local garden maintenance

Sound Pressure Levels [dB(A)]:

Location	Monitoring Period	Noise Levels dB(A)			
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
1) 220 Surgeys Lane	08:24 – 08:39	42.1	63	44.1	38.2

Dorket Head Quarry

Environmental Noise Measurements

Survey Date: 11th August 2017

Location No: 2) 15 Strathmore Road

(OS Grid Ref. SK 599 464)

Time Period: 08:51 – 10:00

Noise Sources:

a) Local wildlife
b) Main road noise
c) Residential noise
d) Occasional local traffic
e) Residential machinery

Sound Pressure Levels [dB(A)]:

Location	Monitoring Period	Noise Levels dB(A)			
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
2)15 Strathmore Road	8:51 – 10:00	39.4	58	42	36.4

Dorket Head Quarry

Environmental Noise Measurements

Survey Date: 11th August 2017

Location No: 4) Arnold Lodge

(OS Grid Ref. SK 603 464)

Time Period: 10:53 – 12:20

Noise Sources: a) Main road noise

Sound Pressure Levels [dB(A)]:

Location	Monitoring Period	Noise Levels dB(A)			
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
4) Arnold Farm	10:53 – 12:20	56.7	72.1	59.3	53.3

Dorket Head Quarry

Environmental Noise Measurements

Survey Date: 11th August 2017

Location No: 5) Dorket Head Farm

(OS Grid Ref. SK 595 477)

Time Period: 12:56 – 13:31

Noise Sources:
a) Main road noise
b) Vehicular movement in yard
c) Local Wildlife

Sound Pressure Levels [dB(A)]:

Location	Monitoring Period	Noise Levels dB(A)			
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
5) Dorket Head Farm	12:56 – 13:31	59.8	76.4	52.5	43.7

Dorket Head Quarry

Environmental Noise Measurements

Survey Date: 11th August 2017

Location No: 6) 48 Jenned Road

(OS Grid Ref. SK 592 469)

Time Period: 13:50 – 14:51

Noise Sources:
a) Local wildlife
b) Main road noise

Sound Pressure Levels [dB(A)]:

Location	Monitoring Period	Noise Levels dB(A)			
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
6) 48 Jenned Road	13:50 - 14:51	49.5	64.8	52.5	43.7

Dorket Head Quarry

Environmental Noise Measurements

Survey Date: 22nd August 2017

Location No: 1) 220 Surgeys Lane

(OS Grid Ref. SK 596 467)

Time Period: 15:48 – 16:48

Noise Sources:
a) Local wildlife
b) Main road noise
c) Local garden maintenance

Sound Pressure Levels [dB(A)]:

Location	Monitoring Period	Noise Levels dB(A)			
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
1) 220 Surgeys Lane	15:48 – 16:48	39.7	60.9	41.3	34.9

Dorket Head Quarry

Environmental Noise Measurements

Survey Date: 22nd August 2017

Location No: 2) 15 Strathmore Road

(OS Grid Ref. SK 599 464)

Time Period: 14:30 – 15:30

Noise Sources:
a) Local wildlife
b) Main road noise
c) Residential noise
d) Occasional local traffic
e) Machinery

Sound Pressure Levels [dB(A)]:

Location	Monitoring Period	Noise Levels dB(A)			
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
2) 15 Strathmore Road	14:30 – 15:30	39.8	62	42.4	34.8

Dorket Head Quarry

Environmental Noise Measurements

Survey Date: 22nd August 2017

Location No: 4) Arnold Lodge

(OS Grid Ref. SK 603 464)

Time Period: 12:08 – 13:08

Noise Sources:
a) Main road noise
b) Scrap yard
c) Local wildlife

Sound Pressure Levels [dB(A)]:

Location	Monitoring Period	Noise Levels dB(A)			
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
4) Arnold Farm	12:08 – 13:08	49.3	59.4	51.3	46

Dorket Head Quarry

Environmental Noise Measurements

Survey Date: 22nd August 2017

Location No: 5) Dorket Head Farm

(OS Grid Ref. SK 595 477)

Time Period: 10:46 – 11:46

Noise Sources:
a) Main road noise
b) Vehicular movement in yard
c) Local Wildlife
d) Wood yard noise

Sound Pressure Levels [dB(A)]:

Location	Monitoring Period	Noise Levels dB(A)			
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
5) Dorket Head Farm	10:46 – 11:46	59.8	78.6	64.5	48.1

Dorket Head Quarry

Environmental Noise Measurements

Survey Date: 22nd August 2017

Location No: 6) 48 Jenned Road

(OS Grid Ref. SK 592 469)

Time Period: 08:36 – 9:36

Noise Sources:
a) Local wildlife
b) Main road noise
c) Dogs Barking

Sound Pressure Levels [dB(A)]:

Location	Monitoring Period	Noise Levels dB(A)			
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
6) 48 Jenned Road	8:36 – 9:36	37.1	62.3	39	34.1

Dorket Head Quarry

Environmental Noise Measurements

Survey Date: 23rd August 2017

Location No: 1) 220 Surgeys Lane

(OS Grid Ref. SK 596 467)

Time Period: 10:37 – 11:37

Noise Sources:
a) Local wildlife
b) Main road noise
c) Local garden maintenance
d) Strimmer

Sound Pressure Levels [dB(A)]:

Location	Monitoring Period	Noise Levels dB(A)			
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
1) 220 Surgeys Lane	10:37 – 11:37	41.7	66.3	44.1	35.2

Dorket Head Quarry

Environmental Noise Measurements

Survey Date: 23rd August 2017

Location No: 2) 15 Strathmore Road

(OS Grid Ref. SK 599 464)

Time Period: 07:31 – 08:31

Noise Sources:
a) Local wildlife
b) Main road noise
c) Residential noise
d) Occasional local traffic

Sound Pressure Levels [dB(A)]:

Location	Monitoring Period	Noise Levels dB(A)			
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
2) 15 Strathmore Road	07:31 – 08:31	38.8	61.5	39.7	35.2

Dorket Head Quarry

Environmental Noise Measurements

Survey Date: 23rd August 2017

Location No: 3) Rugby Club

(OS Grid Ref. SK 603 464)

Time Period: 09:00 – 10:00

Noise Sources:
a) Main road noise
b) Farm noise
c) Thunder

Sound Pressure Levels [dB(A)]:

Location	Monitoring Period	Noise Levels dB(A)			
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
3) Rugby Club	09:00 – 10:00	51.6	70.7	54.2	45.9

Dorket Head Quarry

Environmental Noise Measurements

Survey Date: 23rd August 2017

Location No: 4) Arnold Lodge

(OS Grid Ref. SK 603 464)

Time Period: 14:53 – 15:53

Noise Sources:
a) Main road noise
b) Local Wildlife
c) Scrap yard

Sound Pressure Levels [dB(A)]:

Location	Monitoring Period	Noise Levels dB(A)			
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
4) Arnold Farm	14:53 – 15:53	54.0	69.4	56.1	50.7

Dorket Head Quarry

Environmental Noise Measurements

Survey Date: 23rd August 2017

Location No: 5) Dorket Head Farm

(OS Grid Ref. SK 595 477)

Time Period: 13:02 – 14:02

Noise Sources:
a) Main road noise
b) Vehicular movement in yard
c) Local Wildlife

Sound Pressure Levels [dB(A)]:

Location	Monitoring Period	Noise Levels dB(A)			
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
5) Dorket Head Farm	13:02 – 14:02	59.8	87.8	63.8	45.2

Dorket Head Quarry

Environmental Noise Measurements

Survey Date: 23rd August 2017

Location No: 6) 48 Jenned Road

(OS Grid Ref. SK 592 469)

Time Period: 11:50 – 12:50

Noise Sources:
a) Local wildlife
b) Main road noise
c) Local garden maintenance
d) Dog walkers

Sound Pressure Levels [dB(A)]:

Location	Monitoring Period	Noise Levels dB(A)			
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
6) 48 Jenned Road	11:50 – 12:50	40.7	61.9	42.5	38.2

Appendix C – Calibration Certificates

3 pages

Certificate of Calibration

Cirrus Research plc
dedicated to noise measurement

Equipment Details

Instrument Manufacturer	Cirrus Research plc
Instrument Type	CR:171A
Description	Sound Level Meter
Serial Number	G078355

Calibration Procedure

The instrument detailed above has been calibrated to the publish test and calibration data as detailed in the instrument hand book, using the techniques recommended in the latest revisions of the International Standards IEC 61672-1:2002, IEC 60651:1979, IEC 60804:2001,IEC 61260:1995, IEC 60942:1997, IEC 61252:1993, ANSI S1.4-1983, ANSI S1.11-1986 and ANSI S1.43-1997 where applicable.
Sound Level Meters: All Calibration procedures were carried out by subsitituting the microphone capsule with a suitable electrical signal, apart from the final acoustic calibration.

Calibration Traceability

The equipment detailed above was calibrated against the calibration laboratory standards held by Cirrus Research plc. These are traceable to International Standards {A.0.6}. The standards are:

Microphone Type	B&K 4192	Serial Number	1920791	Calibration Ref.	S6450
Pistonphone Type	B&K 4220	Serial Number	613843	Calibration Ref.	S6388

Calibrated by	
Calibration Date	14 July 2016
Calibration Certificate Number	239821

This Calibration Certificate is valid for 12 months from the date above.

Cirrus Research plc, Acoustic House, Bridlington Road, Hunmanby, North Yorkshire, YO14 0PH
Telephone: +44 (0) 1723 891655 Fax: +44 (0) 1723 891742
Email: sales@cirrusresearch.co.uk

This is to certify that the information contained in this document has been checked and verified by Environmental Scientifics Group

Name: M.S. Harper

Signature:

Date: 24.7.2016

Certificate of Calibration

Certificate Number: **107544**

Date of Issue: **30 August 2016**

Cirrus Research plc
dedicated to noise measurement

Acoustic Calibrator

Manufacturer: **Cirrus Research plc** Serial Number: **75444**

Model Number: **CR:515**

Calibration Procedure

The sound calibrator detailed above has been calibrated to the published data as described in the operating manual and in the half-inch configuration. The procedures and techniques used are as described in IEC 60942:2003 Annex B – Periodic Tests and three determinations of the sound pressure level, frequency and total distortion were made.

The sound pressure level was measured using a WS2F condenser microphone type MK:224 manufactured by Cirrus Research plc.

The results have been corrected to the reference pressure of 101.33 kPa using the manufacturer s data.

Date of Calibration: **30 August 2016**

Initial Calibration Results

Measurement	Level (dB)	Frequency (Hz)	Distortion (% THD + Noise)
1	93.84	1000.3	0.29
2	93.84	1000.3	0.30
3	93.82	1000.3	0.31
Average	**93.83**	**1000.3**	**0.30**
Uncertainty	± 0.13	± 0.1	± 0.10

The reported uncertainties of measurement are expanded by a coverage factor of k=2, providing a 95% confidence level.

Adjusted Calibration Results

Measurement	Level (dB)	Frequency (Hz)	Distortion (% THD + Noise)
1	94.00	1000.3	0.30
2	94.00	1000.3	0.31
3	93.98	1000.3	0.31
Average	**93.99**	**1000.3**	**0.30**
Uncertainty	± 0.13	± 0.1	± 0.10

The reported uncertainties of measurement are expanded by a coverage factor of k=2, providing a 95% confidence level.

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Web: www.cirrusresearch.co.uk
UK Registration No. 987160

bsi. ISO 9001 Quality Management FM 531001 ISO 14001 Environmental Management EMS 552104

Environmental Conditions

Pressure:	**101.52 kPa**
Temperature:	**20.6 °C**
Humidity:	**61.1 %**

Evidence of Pattern Approval

The manufacturer's product information indicates that this model of sound calibrator has been formally pattern approved to IEC 60942:2003 Annex A to Class 1. This has been confirmed with the PhysikalischTechnische Bundesanstalt (PTB).

Statement of Calibration

As public evidence was available, from a testing organisation responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the Class 1 requirements of IEC 60942:2003.

This is to certify that the information contained in this document has been checked and verified by Environmental Scientifics Group

Name: M. P. Hopper

Signature: ———

Date: 1.9.2016

Calibration Laboratory

Laboratory:	Cirrus Research plc Acoustic House, Bridlington Road, Hunmanby North Yorkshire, YO14 0PH, United Kingdom
Test Engineer:	Shane Doveton

Certificate of Calibration

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Equipment Details

Instrument Manufacturer	Cirrus Research plc
Instrument Type	CR:171B
Description	Sound Level Meter
Serial Number	G071621

Calibration Procedure

The instrument detailed above has been calibrated to the publish test and calibration data as detailed in the instrument hand book, using the techniques recommended in the latest revisions of the International Standards IEC 61672-1:2013, IEC 61672-1:2002, IEC 60651:1979, IEC 60804:2001, IEC 61260:1995, IEC 60942:2003, IEC 60942:1997, IEC 61252:1993, ANSI S1.4-1983, ANSI S1.11-1986 and ANSI S1.43-1997 where applicable.
Sound Level Meters: All Calibration procedures were carried out by subsitituting the microphone capsule with a suitable electrical signal, apart from the final acoustic calibration.

Calibration Traceability

The equipment detailed above was calibrated against the calibration laboratory standards held by Cirrus Research plc. These are traceable to International Standards {A.0.6}. The standards are:

Microphone Type	B&K 4192	Serial Number	1920791	Calibration Ref.	S6450
Pistonphone Type	B&K 4220	Serial Number	613843	Calibration Ref.	S6388

Calibrated by T. A. Goodhill

Calibration Date	28 July 2017
Calibration Certificate Number	251357

This Calibration Certificate is valid for 12 months from the date above.

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This is to certify that the information contained in this document has been checked and verified by Environmental Scientifics Group
Name: M. Orton
Signature:
Date: 11/8/17

Date:

Signature:

Name:

Certificate of Calibration

Cirrus Research plc
dedicated to noise measurement

Certificate Number: **113228**

Date of Issue: **28 July 2017**

FILE WITH SLM G071621

Microphone Capsule

Manufacturer: **Cirrus Research plc** Serial Number: **204141A**

Model Number: **MK224**

Calibration Procedure

The microphone capsule detailed above has been calibrated to the published data as described in the operating manual of the associated sound level meter (where applicable).

The frequency response was measured using an electrostatic actuator in accordance with BS EN 61094-6:2005 with the free-field response derived via standard correction data traceable to the National Physical Laboratory, Middlesex, UK.

The absolute sensitivity at 1 kHz was measured using an acoustic calibrator conforming to IEC 60942:2003 Class 1.

Date of Calibration: **26 July 2017**

Open Circuit Sensitivity at 1 kHz: **46.0 mV/Pa** **-26.7 dB rel 1 V/Pa**

Environmental Conditions

Pressure: **99.80 kPa**

Temperature: **22.0 °C**

Humidity: **57.0 %**

Calibration Laboratory

Laboratory: Cirrus Research plc
Acoustic House, Bridlington Road, Hunmanby
North Yorkshire, YO14 0PH, United Kingdom

Test Engineer: Debra Swalwell

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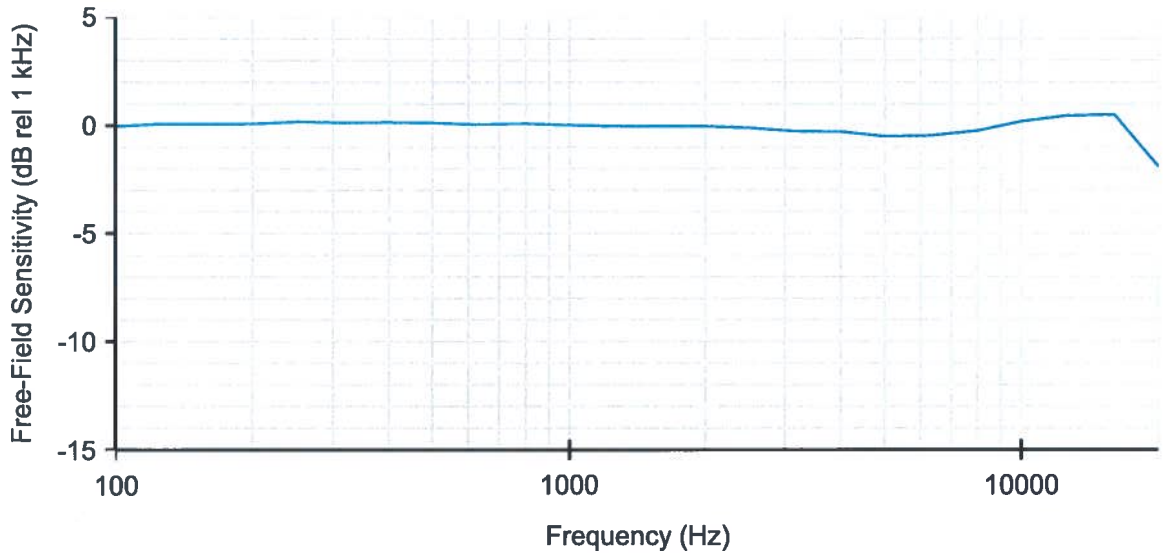
bsi. ISO 9001 Quality Management FM 531001 ISO 14001 Environmental Management EMS 552104

Free-Field Frequency Response

Frequency (Hz)	Free-Field Sensitivity (dB rel 1 kHz)	Actuator to Free-Field Correction (dB)
100	-0.04	0.07
125	0.08	0.16
160	0.06	0.15
200	0.07	0.17
250	0.16	0.25
315	0.12	0.21
400	0.14	0.21
500	0.10	0.18
630	0.03	0.08
800	0.08	0.10
1 000	0.00	0.01
1 250	-0.04	-0.07
1 600	-0.06	-0.16
2 000	-0.05	-0.24
2 500	-0.14	-0.50
3 150	-0.28	-0.92
4 000	-0.31	-1.31
5 000	-0.51	-2.02
6 300	-0.48	-2.75
8 000	-0.27	-3.59
10 000	0.16	-4.70
12 500	0.41	-5.77
16 000	0.47	-7.39
20 000	-1.91	-11.00



Appendix D – Site Plan

See tables overleaf for key.

Monitoring Locations and Limits set by Nottinghamshire County Council

No.	Location	Grid Reference	Limits $L_{AEQ,T}$
1	220 Surgeys Lane	SK 595 467	50 dB(A)
2	15 Strathmore Lane	SK 599 464	49 dB(A)
3	Melish Rugby Club	SK 603 463	55 dB(A)
4	Arnold Lodge	SK 604 470	52 dB(A)
5	Dorket Head Farm	SK 595 476	55 dB(A)
6	48 Jenned Road	SK 593 468	55 dB(A)

Site Operations Locations

Letter	Task	Vehicle
A	Quarrying/Winning	Excavators and dozers
B	Dumper Emptying near entrance to site	N/A
C	Dumper Emptying into Dozer	Dozer