HANSON CEMENT

An assessment of environmental noise levels beyond the boundary of Padeswood Works, Flintshire

MAY 2013

File reference number: 18686

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1.0 INTRODUCTION

This survey of boundary noise levels to assess environmental noise compliance was undertaken by NWSS during May 2013, at 10 no. receptor locations identified by the relevant IPPC permit and planning conditions for the site, and shown on the location plan in Appendix A.

2.0 INSTRUMENTATION AND METHODOLOGY

Sound Level Meter:	Bruel & Kjaer Hand Held Analyzer Type 2250
Conforms to:	IEC 60651 (1979) Type 1 IEC 60804 (2000) Type 1 IEC 61260 (1995) Octave & ⅓ Octave Bands
Serial no.	2590535
UKAS Calibration Date:	June 2012
UKAS Calibration Due:	June 2014
Calibrator:	Bruel & Kjaer 4231
Conforms to:	IEC 942 (1988) Class 1
Serial No.:	2518040
UKAS Calibration Date:	June 2012
UKAS Calibration Due:	June 2013

Parameters Recorded

Frequency Weighting:	Third Octave Band (A-weighted)	
Parameters reported:	L_{Aeq}, L_{AMax}, L_{A90}, L_{A10}	
Time Weighting:	Fast	
Measurement Period:	Daytime	20 minutes
	Night time	5 minutes

3.0 METHODOLOGY

NWSS Personnel: Mr Jeff Hod
Dates of measurement: 15th and 16th May 2013

Free field measurements were taken at pre-determined locations around the site during the daytime and night time periods. All measurements were taken with the microphone approx. 1.2 m above ground level, with the sound level meter approx. 20º from vertical.

20 min of data with 2 s resolution were taken at each location during representative daytime conditions, and 5 minutes of representative data with 2 s resolution were taken during the night time period where possible.

Far field measurements were taken at the following locations:

1) Spon Green, Buckley – Grassed area
2) Ty Gwyn – Roadside location, just prior to house (Padeswood side) or in access to water works
3C) Dyke Farm – Rear of barns*
4) Toll Bar Cottage – On grass verge adj. footpath marker
5) Play area at Ffordd Derwyn
6) Hawarden Road, Pen-y-ffordd – Lay-by
7A) Padeswood – Sports field near changing rooms
B) Oak Tree Farm West – Rear garden of farm house
D) Oak Tree Farm East – Grass verge on farm track
E) Rhyd Cottage – Pen-y-ffordd Station car park

**Long-term, continuous noise monitoring ongoing at this location.*

These locations are indicated on the map provided in Appendix A.

The works was in production during the monitoring period.

Weather Conditions

Day

During the Day measurements winds were 0-1 ms^{-1} and predominantly from a Westerly direction. The General conditions during the day were, cool and overcast, with temperatures at 16ºC.Measurements reduced to 30 minutes due to wind forecast

Night

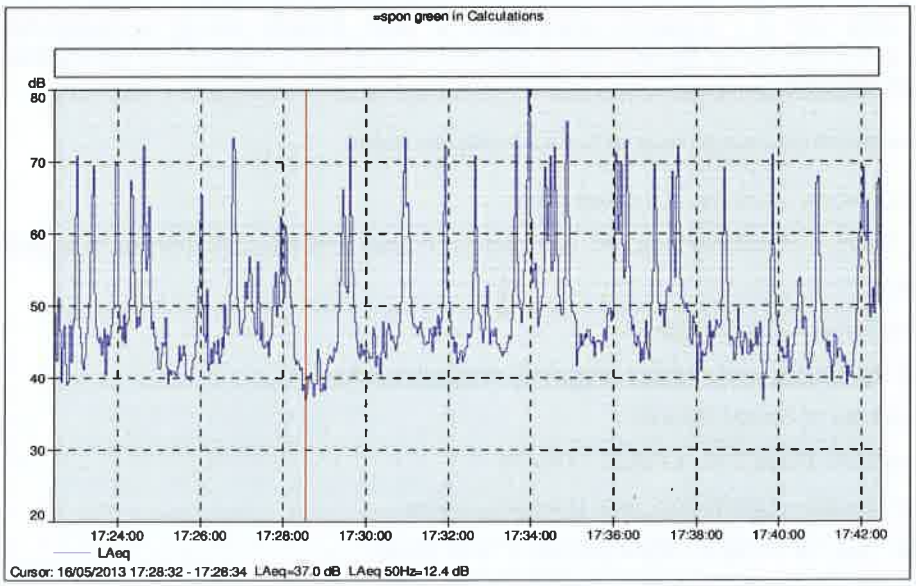
During the night measurements the, conditions were dry with, still conditions and temperatures of approximately 10ºC. Measurements reduced to 5 minutes due to imminent rain.

4.0 Measurements

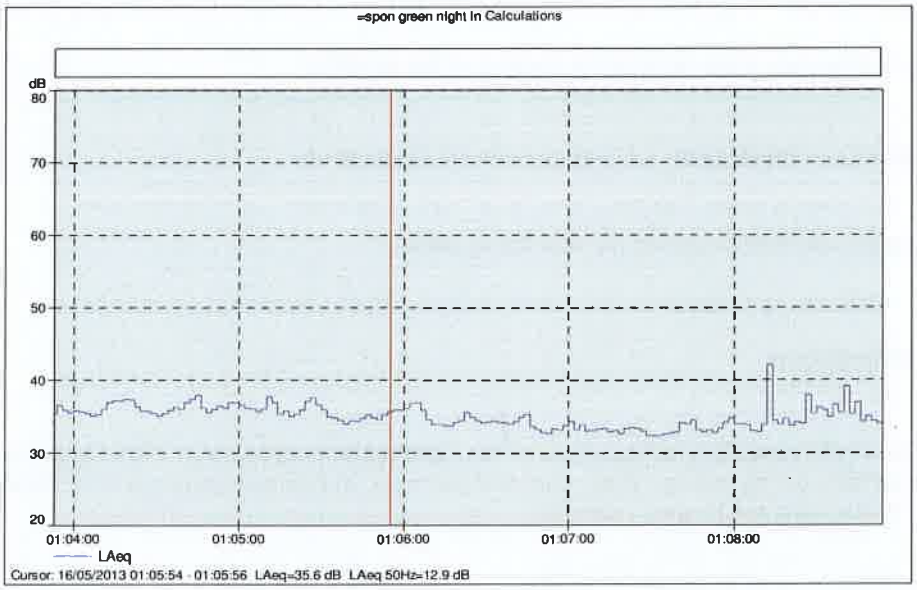
1) Spon Green

The monitoring location is approximately 830 m north-northwest of the cement works, accessed via Meg's Lane.

Day Measurement



Night Measurement



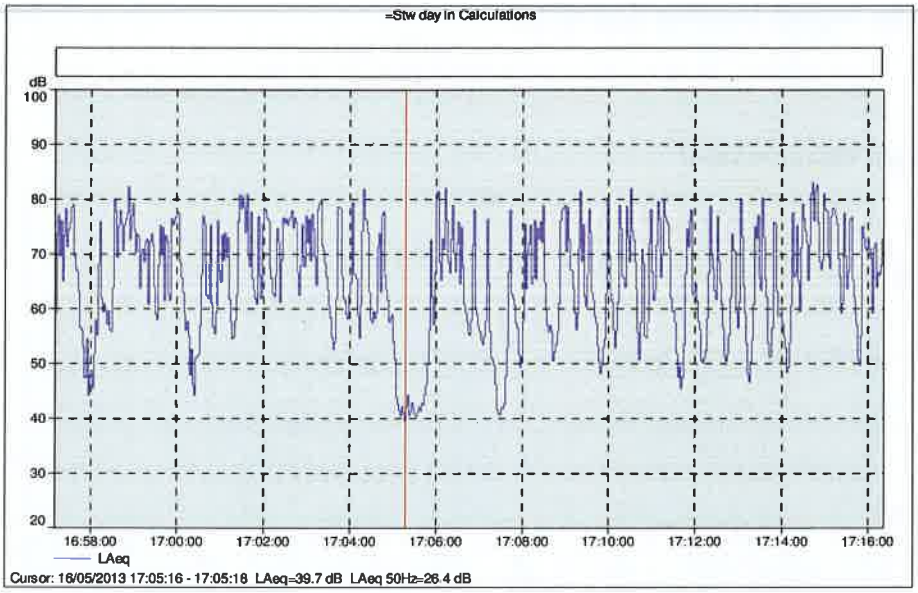
Period	Start time	LAeq [dB]	LA90 [dB]	LA10 [dB]	LAFmax [dB]
Day	17:22	60.6	41.1	60.7	84.6
Night	01:03	35.2	32.9	36.9	52.9

The works were audible in occasional quite spells.

2) Ty Gwyn

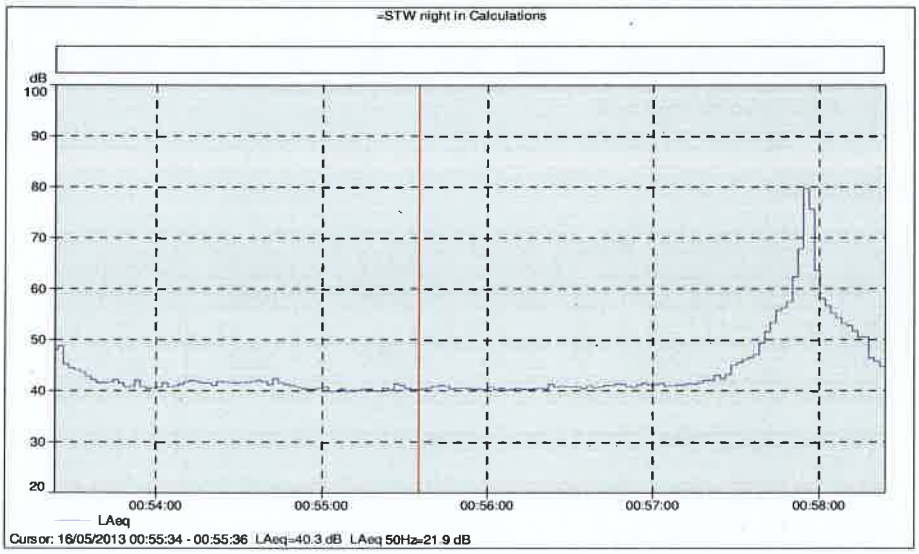
Location was down the access road to the sewage works. The dogs at the kennels seemed disturbed with barking and howling throughout measurements.

Day Measurement



The works were audible in occasional quite spells between dominant traffic noise and local noise.

Night Measurement



The works were audible.

Period	Start time	LAeq [dB]	LA90 [dB]	LA10 [dB]	LAFmax [dB]
Day	16:57	72.7	50.2	78.0	88.5
Night	00:53	59.9	40.2	52.2	81.3

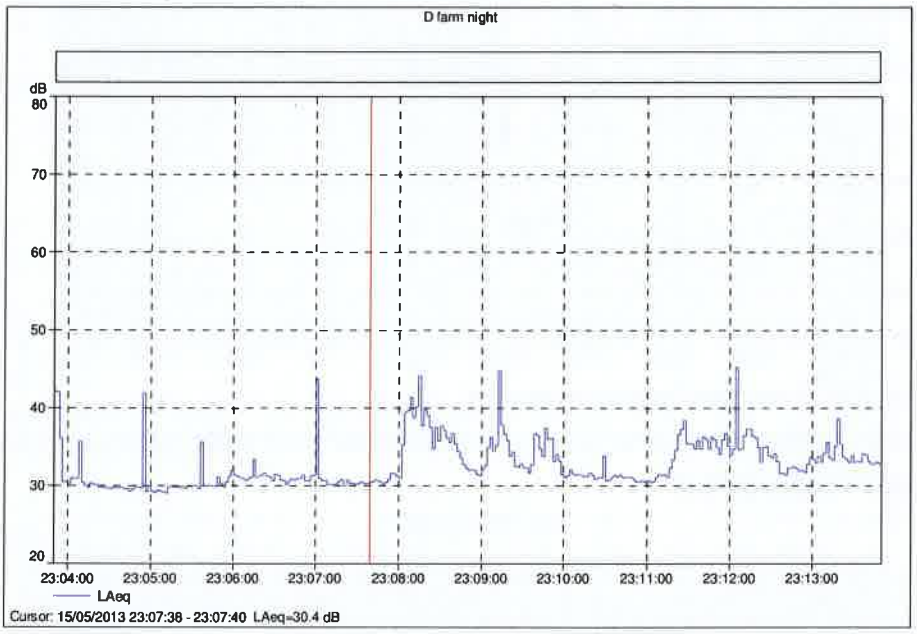
3C) Dyke Farm

The monitoring location is situated behind the barns on the north east of the farmyard, approximately 550 m from the cement works boundary. Continuous noise monitoring is currently being undertaken at this location and the results of this will be reported separately.

Day Measurement

No data due to poor weather conditions

Night Measurement



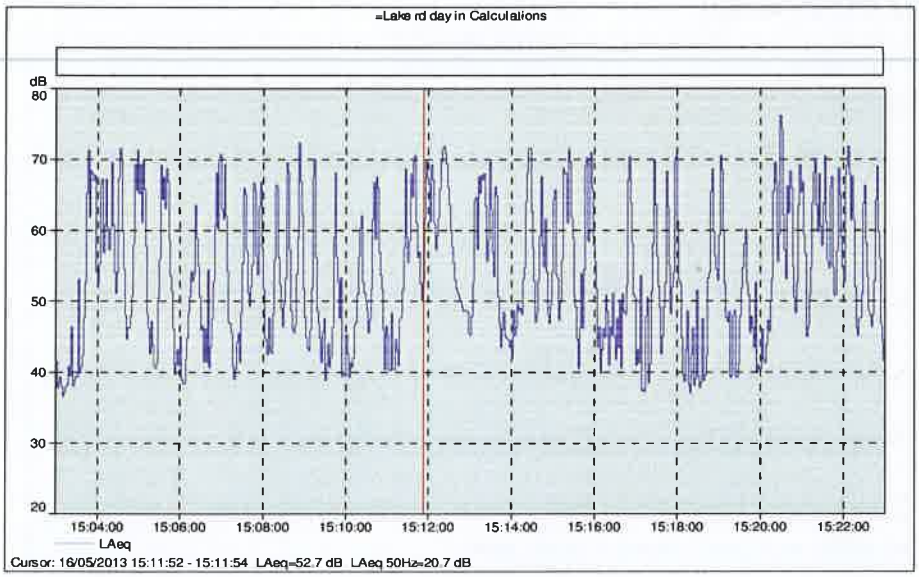
The works were audible.

Period	Start time	LAeq [dB]	LA90 [dB]	LA10 [dB]	LAFmax [dB]
Day					
Night	23:05	34.2	29.9	36.6	55.9

4) Toll Bar Cottage

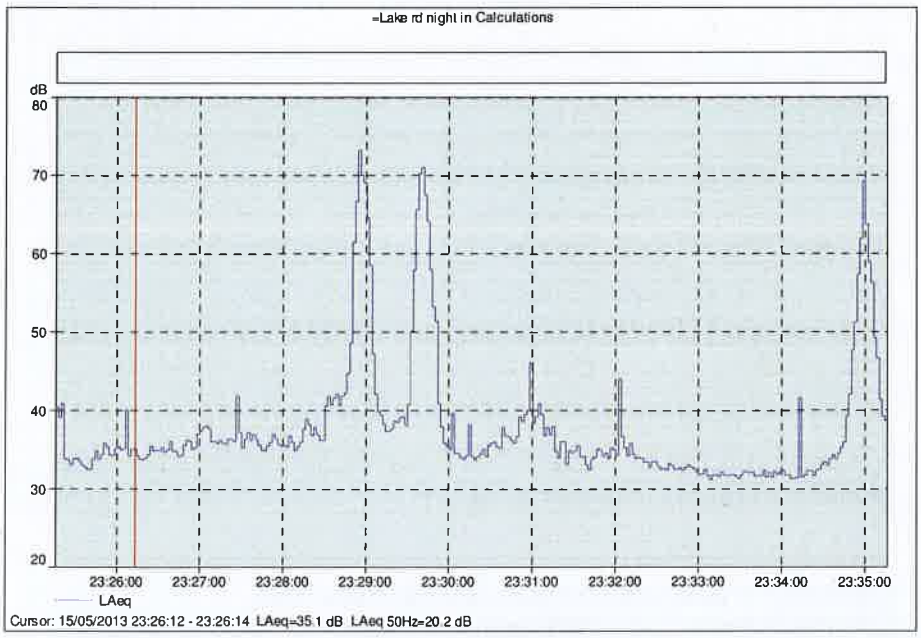
The monitoring location is situated on the highway verge opposite Toll Bar Cottage, adjacent to the footpath marker. The local noise environment is dominated by road traffic on the A5104, with occasional high level aircraft, animal and agricultural noises. .

Day Measurement



The works were audible in occasional quite spells between occasional dominant traffic noise.

Night Measurement



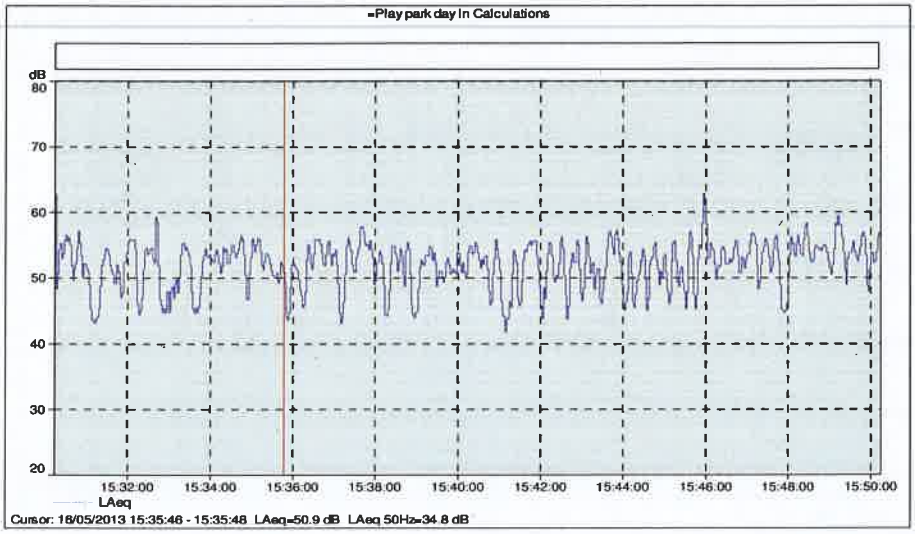
The works were audible in quite spells between occasional dominant traffic noise.

Period	Start time	LAeq [dB]	LA90 [dB]	LA10 [dB]	LAFmax [dB]
Day	15:03	62.5	40.3	68.2	79.6
Night	23:25	55.3	32.0	45.4	74.8

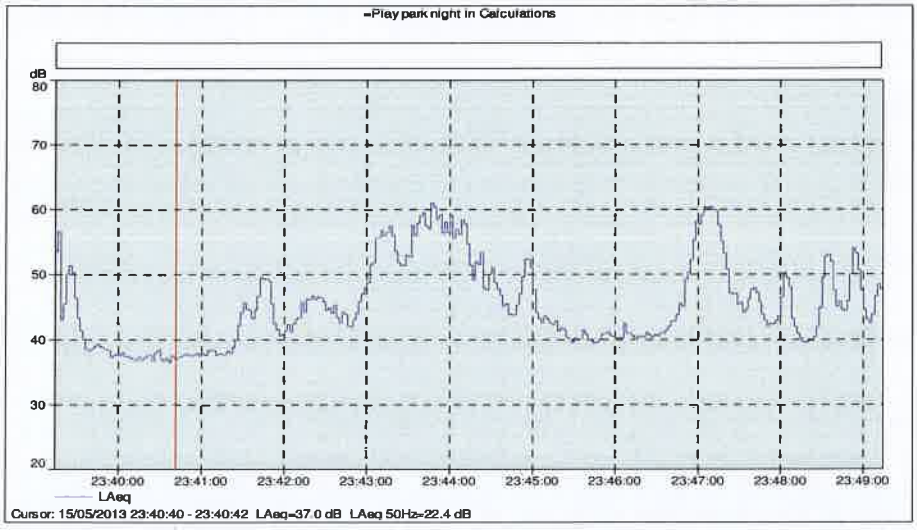
5) Pen-y-ffordd Play Area

The monitoring location is situated approximately 640 m from the cement works boundary in the children's play area found at the bottom of Ffordd Derwyn. The noise meter was positioned approx 2 m from the boundary fence of the play area. The local noise climate is dominated by frequent road traffic noise on the nearby A5104.

Day Measurement



Night Measurement



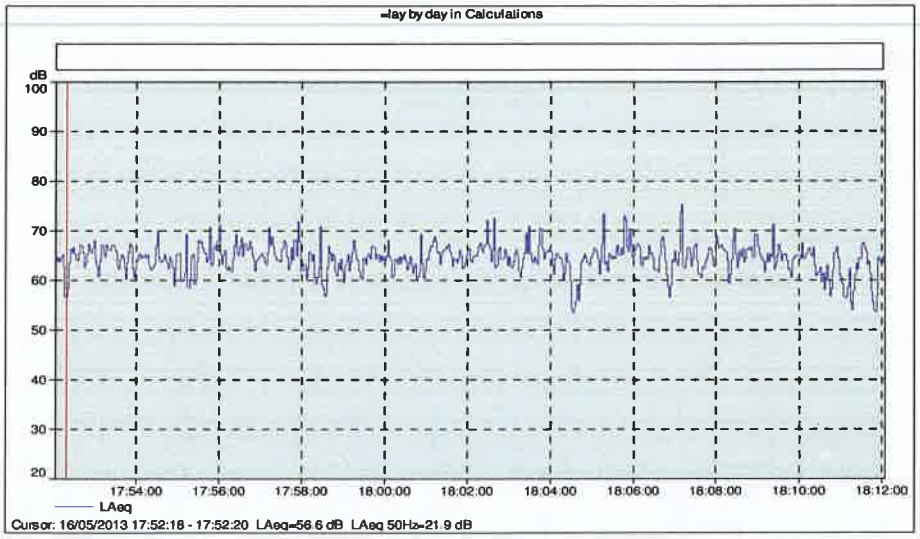
The works were audible in quite spells between dominant traffic noise

Period	Start time	LAeq [dB]	LA90 [dB]	LA10 [dB]	LAFmax [dB]
Day	15:30	53.2	46.1	55.8	73.1
Night	23:39	50.8	37.7	56.1	67.8

6) Hawarden Road

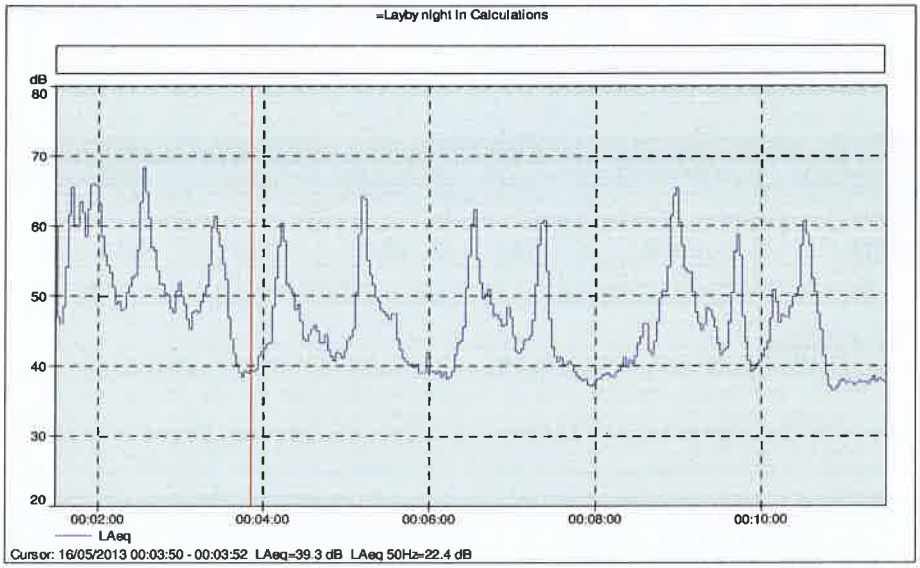
The monitoring location is situated on the grass highway verge near the lay-by on Hawarden Road. The site lies approximately 1 km east of the works. The local noise climate is dominated by road traffic using the nearby A5104.

Day Measurement



The works were not audible

Night Measurement



The works were just audible in occasional quite spells between dominant traffic noise

Period	Start time	LAeq [dB]	LA90 [dB]	LA10 [dB]	LAFmax [dB]
Day	17:52	65.3	60.4	67.3	78.3
Night	00:01	54.7	38.3	59.1	69.8

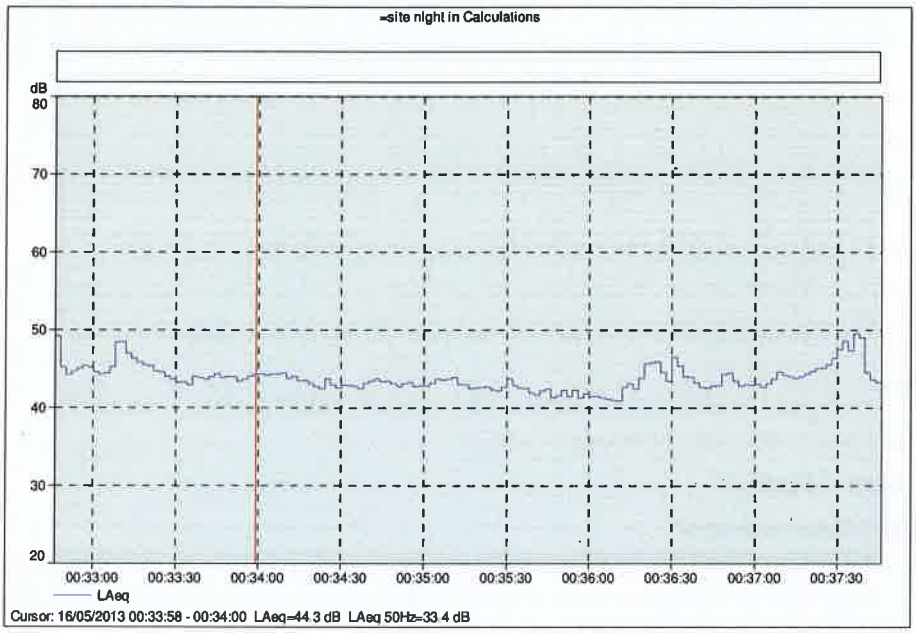
7A) Padeswood Sports Field

The monitoring location is accessed via the works site, at the sports fields situated to the rear of houses on Padeswood Drive.

Day Measurement

No data due to poor weather conditions

Night Measurement



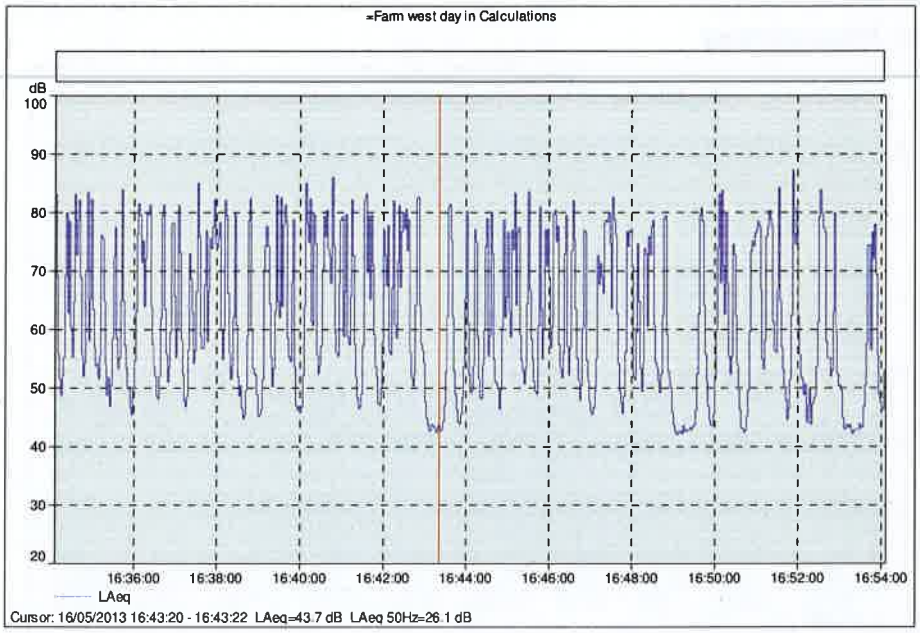
Period	Start time	LAeq [dB]	LA90 [dB]	LA10 [dB]	LAFmax [dB]
Day					
Night	00:32	44.2	42.1	45.7	57.1

The works were audible.

B) Oak Tree Farm (West)

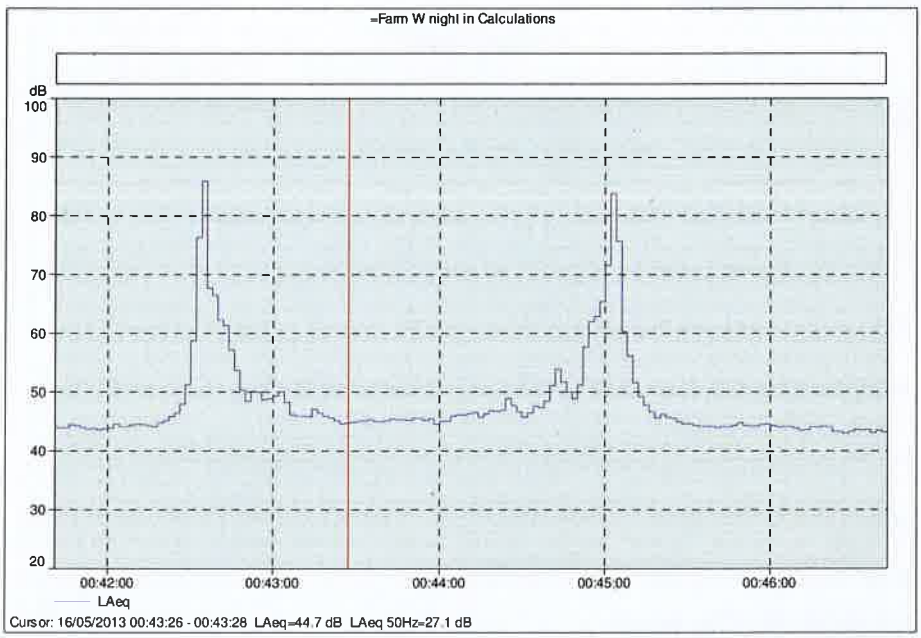
Monitoring was undertaken in the rear garden of the farm house, approximately 320 m northwest of the cement works.

Day Measurement



The works were audible in occasional quite spells between occasional dominant traffic noise.

Night Measurement



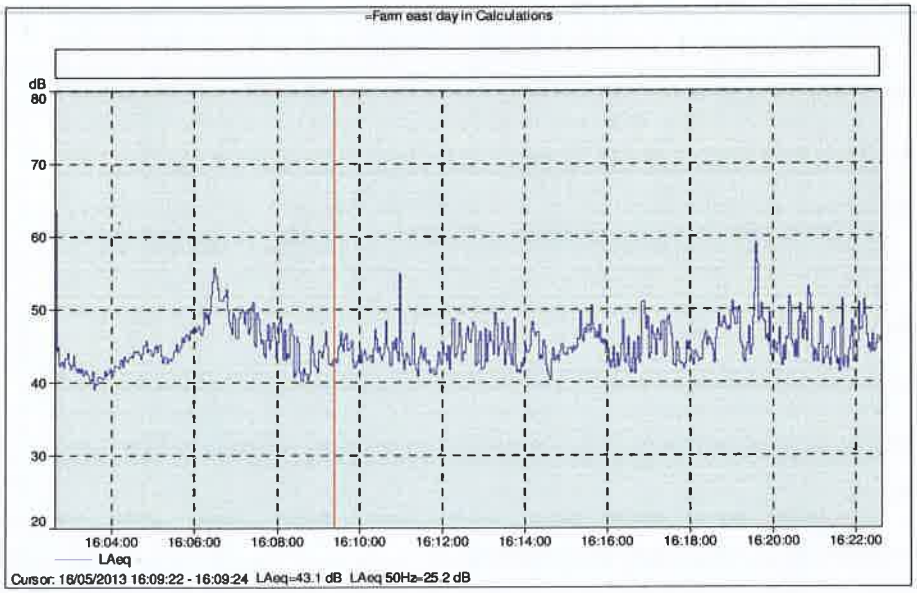
The works were audible in quite spells between occasional dominant traffic noise.

Period	Start time	LAeq [dB]	LA90 [dB]	LA10 [dB]	LAFmax [dB]
Day	16:34	74.3	45.0	79.4	94.4
Night	00:41	66.9	43.7	57.6	90.0

D) Oak Tree Farm (East)

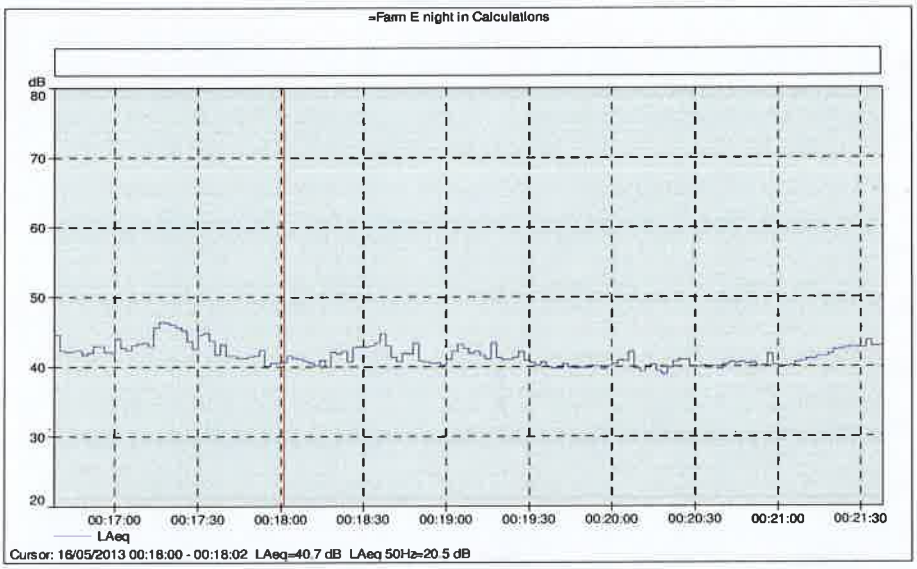
The noise monitoring location used is a grass verge situated half way along the track leading to Oak Tree Farm (East), approximately 600 m from the cement works. The local noise climate comprises road traffic noise from the A5118 and A550, aircraft and occasional vehicles using the farm track.

Day Measurement



Noise was audible from the works.

Night Measurement



Noise was audible from the works.

Period	Start time	LAeq [dB]	LA90 [dB]	LA10 [dB]	LAFmax [dB]
Day	16:02	46.6	41.7	49.0	74.0
Night	00:16	41.9	39.9	43.6	50.9

E) Station Car Park

The monitoring location is situated within Pen-y-ffordd Station car park, close to the large tree at the level crossing, approximately 930 m south of the cement works. The main noise source is from local traffic.

No Data due to workers at train station and generator noise

5.0 Summary of Findings

5.1 Daytime Measurements

The following table summarises the noise figures obtained for the total period daytime profiles at each location

Location		L_{Aeq} dB	L_{AF90} dB	L_{AF10} dB
Spon green	1	60.6	41.1	60.7
Ty Gwyn	2	72.7	50.2	78.0
Dyke Farm	3C	-	-	-
Toll Bar	4	62.5	40.3	68.2
Play Area	5	53.2	46.1	55.8
Hawarden Rd.	6	65.3	60.4	67.3
Sports Field	7A	-	-	-
Oak Tree Farm West	B	74.3	45.0	79.4
Oak Tree Farm East	D	46.6	41.7	49.0
Pen-y-ffordd Station	E	-	-	-

Apparent exceedance of daytime noise criteria (50dB $L_{Aeq, 1hour}$)

The measured $L_{Aeq\ 1\ hour}$ value exceeds the boundary criteria of **50dB** at the monitoring locations during the daytime survey, mainly as a result of extraneous noise incidents such as road traffic, and not due to direct noise from the cement works. The high L_{Aeq} values were recorded at all Locations; and the highest L_{A90} values were recorded at Location 6.

The noise climate at Locations 1, 2, 4, 6 and E is particularly dominated by road traffic passing. Road traffic noise has a considerable influence on the daytime noise levels at nearly all monitoring locations as the majority are situated nearby busy A-roads.

The L_{AF90} figure provides the best indication of the underlying background noise at each location, and the difference between the L_{AF90} and the L_{AF10} figures is a good indication of the variability of the noise levels. In reality, of the parameters measured, the L_{A90} figure is potentially a more reliable indication of the noise impact of the cement works if it is audible during lulls in the traffic. The noise from the works is broadly constant in nature and may form the underlying noise level within the area during lulls in nearby road traffic noise or other sources local to the noise monitoring locations. However, road traffic noise forms such a significant proportion of the noise environment during the day that even during lulls in the local traffic; distant traffic noise typically forms the background noise in the area. In most cases noise from the works is significantly lower than the L_{Aeq} figure which cannot singularly be used to illustrate noise levels emanating from the site.

5.2 Night time Measurements

The following table summarises the noise levels obtained for the night time profiles at each location. The L_{AF90} figure is the best indication of the background noise at each location, and the difference between the L_{AF90} and the L_{AF10} figures is a good indication of the variability of the noise levels.

Location		L_{Aeq} dB	L_{AF90} dB	L_{AF10} dB
Spon Green	1	35.2	32.9	36.9
Ty Gwyn	2	59.9	40.2	52.2
Dyke Farm	3C	34.2	29.9	36.6
Toll Bar	4	55.3	32.0	45.4
Play Area	5	50.8	37.7	56.1
Hawarden Rd.	6	54.7	38.3	59.1
Sports Field	7A	44.2	42.1	45.7
Oak Tree Farm West	B	66.9	43.7	57.6
Oak Tree Farm East	D	41.9	39.9	43.6
Pen-y-ffordd Station	E	-	-	-

Apparent exceedance of night time noise criteria (45 dB $L_{Aeq, 15min}$)

The measured night time noise levels exceeded the night time noise level criteria at four of the locations. The highest recorded L_{Aeq} was at Location B this is due to the number of vehicles passing during the monitoring period. The highest L_{A90} values were recorded at Location B.

Of the parameters measured the L_{AF90} figure is potentially a more reliable indication of the noise impact of the cement works at most of the locations. The noise from the works is broadly constant in nature and is therefore more likely to form the underlying noise level within the area during lulls in road traffic noise or short-term noise incidents local to the noise monitoring locations. In most cases, this is significantly lower than the L_{Aeq} figure which tends to overestimate the impact of the noise from the cement works.

5.3 Trends in Noise Data

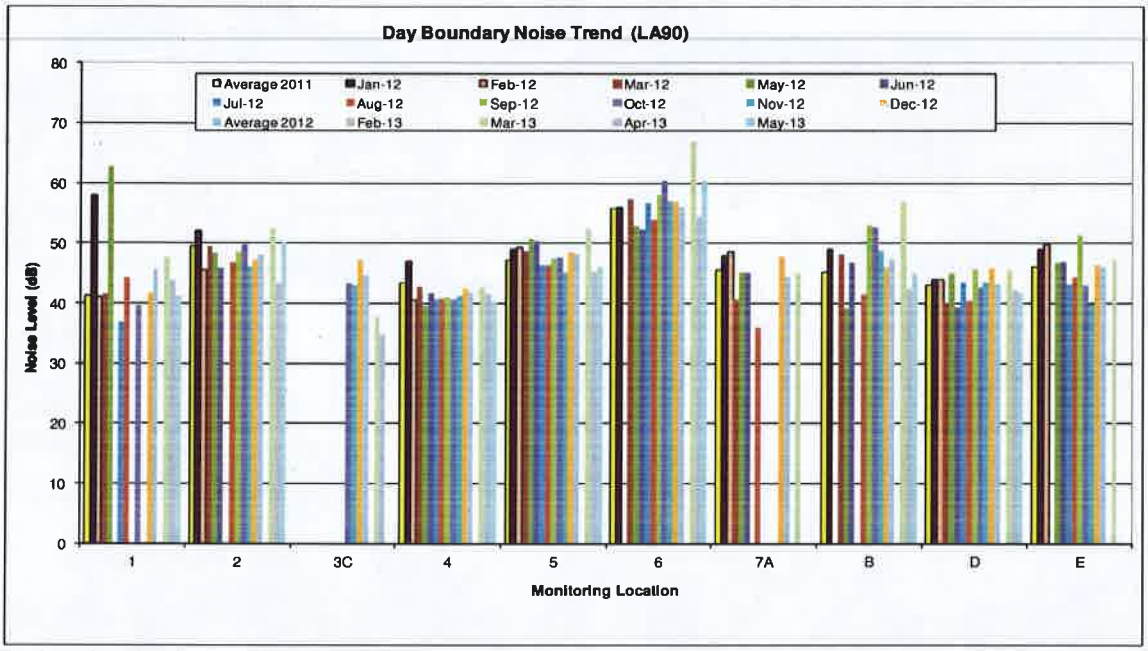
The following table compares the noise data collected during the previous 12 month period, in dB (L_{A90}). This provides better information on the underlying noise levels generated by the works than the L_{Aeq} data.

Measured Background Noise Level (L_{AF90} dB)																								
Location	May 2012		June 2012		July 2012		Aug 2012		Sept 2012		Oct 2012		Nov 2012		Dec 2012		Feb 2013		March 2013		April 2013		May 2012	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Day	Night	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
1	62.8	36.7	-	38.2	36.9	28.2	44.2	25.6	-	28.4	39.6	62.8	36.7	26.9	41.8	31.5	-	29.2	47.7	37.3	43.9	30.0	41.1	32.9
2	48.3	37.3	45.9	38.2	-	36.0	46.7	37.5	48.6	32.3	49.8	48.3	37.3	36.5	47.3	43.9	-	32.0	52.5	36.8	43.4	37.8	50.2	40.2
3	-	-	-	-	-	-	-	-	-	-	43.3	-	-	39.4	47.2	33.3	-	39.2	37.8	32.9	34.8	28.5	-	29.9
4	39.5	35.8	41.7	37.9	40.6	30.3	40.9	37.9	41.0	32.7	40.6	39.5	35.8	33.8	42.5	39.0	-	38.2	42.7	34.2	41.5	33.3	40.3	32.0
5	50.7	41.2	50.3	38.5	46.3	34.6	46.3	39.3	47.4	33.5	47.6	50.7	41.2	36.2	48.6	37.4	-	37.1	52.5	34.3	45.3	35.9	46.1	37.7
6	52.8	36.7	52.3	37.5	56.6	32.6	53.9	29.9	58.0	34.2	60.4	52.8	36.7	31.7	56.9	41.5	-	29.0	66.8	43	54.5	28.5	60.4	38.3
7	45.1	41.4	45.1	38.1	-	38.9	35.9	35.9	-	32.1	-	45.1	41.4	42.0	47.9	39.3	-	32.5	45.1	41	-	32.9	-	42.1
B	39.2	34.0	46.8	39.9	-	36.3	41.5	36.2	53.1	-	52.6	39.2	34.0	39.2	46.1	42.8	-	29.3	56.9	40.7	42.5	36.4	45.0	43.7
D	45.0	37.9	39.4	42.2	43.5	35.9	40.4	31.3	45.7	33.4	42.6	45.0	37.9	38.6	45.9	37.4	-	34.0	45.4	38.9	42.3	32.0	41.7	39.9
E	46.7	-	46.9	38.6	53.2	36.0	44.4	39.9	51.5	34.4	43.0	46.7	-	31.8	46.3	-	-	-	47.2	46.2	-	-	-	-

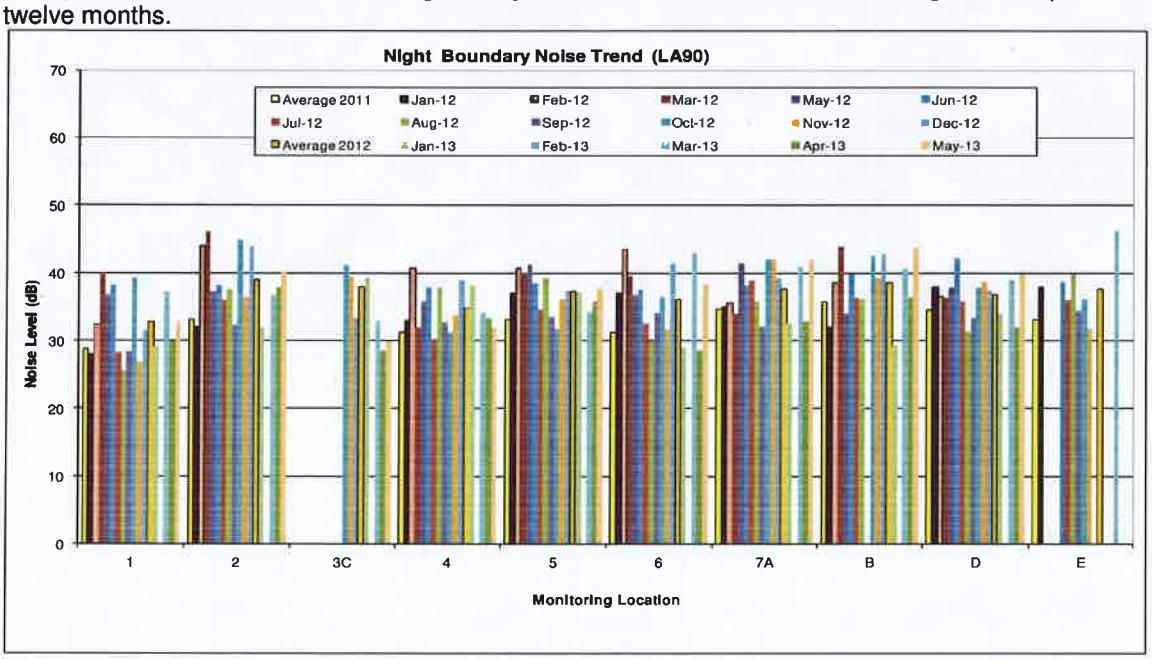
The daytime L_{A90} history shows that noise levels were reasonably consistent at all locations. The night time L_{A90} values may provide a better indication of the noise influence of the cement works at each of the receptor locations.

4.4 Overall Conclusions

As the boundary noise data build up, it is possible to see trends emerging at some of the locations; however daytime L_{Aeq} noise level data are generally too affected by ancillary noise such as road traffic noise, trains and other such short duration noise incidents to be considered representative of noise emissions from the works. The following charts present L_{A90} noise level data for the previous 12 months.



During the daytime period, the background noise levels in May 2013 are similar to those measured during the previous month. Levels generally correlate with data obtained throughout the previous twelve months.



During the more sensitive night time monitoring period, the effects of short duration events close to the noise meter, such as passing road traffic, dogs barking etc, are more noticeable. The night time background noise levels during May 2013 were similar to previous measurements.

APPENDIX A NOISE MONITORING LOCATIONS