Appendix 3

Noise Monitoring Report

ENVIRONMENTAL REPORT

Noise Monitoring

At

Kilmartin Land Recovery Project

June 2008

Reference: Noise Survey				
Issue		**Prepared by**	**Checked by**	**Verified by**
V1	June 2008			
V2	-			
V3	-			
V4	-	Kevin Lynchehaun	Mervyn Keegan	Mervyn Keegan
V5	-	**Environmental Scientist**	**Associate**	**Associate**
File Reference: CE04561 Noise Reports				

White Young Green Ireland Limited,Apex Business Centre, Blackthorn Road, Sandyford, Dublin 18
Telephone: +353 12931200 Facsimile: +353 12931250 E-Mail: enviro.dublin@wyg.com

Table of Contents

1.0 INTRODUCTION

A daytime noise monitoring survey was undertaken by White Young Green (WYG) Ireland Environmental at the Kilmartin Land Recovery site on 19th June 2008. The Kilmartin Land Recovery site is currently in operation and the results of this noise survey have been compared with a previous survey of the baseline noise levels at the site, as carried out as part of the EIS in March 2006.

2.0 SCOPE

The survey was undertaken to measure the existing noise levels at the site boundaries and the existing noise level at the nearest noise sensitive receptor (NSR) in relation to the Waste Permit activities which have commenced since January 2007.

3.0 NOISE ASSESSMENT METHODOLOGY

3.1 Monitoring Locations

The noise monitoring survey was undertaken at four boundary locations and one noise sensitive receptor (NSR). This is described in Table 3.1 and illustrated on Figure 1.

Table 3.1: Noise Monitoring Locations

Sampling Locations	Description of Location	Justification for Sampling Location
N1	Southern Boundary	Boundary Location
N2	Eastern Boundary	Boundary Location
N3	Northern Boundary	Boundary Location
N4	Western Boundary	Boundary Location
N5 (NSR1)	Nearest NSR (c 200m North west of site)	Noise Sensitive Location

3.2 Instrumentation and Methodology

The measurements were made according to the requirements of BS7445 – Description and Measurement of Environmental Noise, Part 1, and the EPA "Environmental Noise Guidance Document".

The measurements were made using a Norsonic Nor140 integrating sound level meter fitted with 1:1 and 1:3 Octave Band Filters. The instrument was calibrated in situ at 94dB prior to and after use using an acoustic calibrator. Factory calibration certificates for the noise level meter and acoustic calibrator, detailing equipment serial numbers, calibration traceability and re-calibration dates are presented in Appendix 1 of this report. The sound level meter was orientated towards the noise source during all measurement surveys. This instrument is a Type 1 instrument in accordance with IEC 651 regulations. The Time Weighting used was Fast and the Frequency Weighting was A-weighted as per IEC 651. A glossary of noise related terms is presented in Appendix 2.

3.3 Survey Implementation

The noise monitoring survey was conducted by White Young Green personnel on the 6th June 2008. The measurement parameters included meteorological observations of prevailing conditions at the time of the survey. The primary measurement parameter was the equivalent continuous A-Weighted Sound Pressure level, $L_{Aeq, T}$, over 1-hour measurement intervals for the duration of the daytime monitoring survey. A statistical analysis of the measurement results was also completed so that the percentile levels, $L_{AN, T}$, for N = 90% and 10% over 30-minute measurement intervals were also recorded. The percentile levels represent the noise level in dB(A) exceeded for N% of the measurement time. L_{A10} values are used to describe intermittent, high-energy noise events whereas L_{A90} values are representative of background noise levels.

In addition, frequency was measured in the 1/3-octave band at each of the five noise monitoring locations to assess the potential tonal components of ambient noise generated in the vicinity of the proposed development. All sources of noise were noted, recorded and where possible, identified during the course of this survey.

3.4 Assessment Criteria

The World Health Organisation (WHO) recommends guideline values for noise levels in specific environments. Regarding the proposed development, the most applicable levels are presented in Table 2.

Table 2: WHO Recommended Guideline Noise Levels

Specific Environment	Critical Health Effect(s)	L_{Aeq}, dB(A)
Outdoor Living Area	Serious annoyance, daytime & evening	55
Outside Bedrooms	Sleep disturbance window open (outdoor values)	45

The noise criteria presented above is applicable at noise sensitive locations only; however, the recorded levels at boundary locations are compared to the above guideline values for comparison purposes only.

3.5 Meteorological Conditions

Weather conditions noted during the survey were sunny and dry. There was a light south-westerly breeze of 1-2 meters per second.

4.0 RESULTS

The noise measurement results for the day-time monitoring survey are reported in Table 4.1. A graphical representation of noise measurement spectra, including octave band frequency analysis is presented in Appendix 3.

Table 4.1: Day-time environmental noise survey results

Monitoring Location	Survey Date & Time	L_{Aeq} dB	L_{A10} dB	L_{A90} dB	Description of Sources
Day-time Noise Monitoring Results					
N1	19/06/08, 15.14-15.44	51.5	55.4	32	Traffic on N11, bulldozer in operation, tractor in operation
N2	19/06/08, 17.48-18.18	52.3	56.2	37.1	Traffic on N11, bulldozer in operation, birdsong,
N3	06/06/08, 15.44-16.14	73.5	81.1	45.7	Traffic on N11, noise meter was beside bulldozer in operation, tractor in operation
N4	06/06/08, 16.48-17.18	52.5	54.9	37.2	Traffic on N11, bulldozer in operation, tractor in operation
N5 (NSR1)	06/06/08, 12.17-12.47	54	53.6	47.1	Traffic on N11

Note 1: Observed meteorological conditions during daytime monitoring were as follows: 19/06/08, light breeze of 1-2m/s

4.1 Discussion of Results

The predominant noise source at the boundary locations and noise sensitive location was passing traffic on the N11. Other noise sources included the bulldozer and tractor in operation throughout the survey and some intermittent birdsong. The sound pressure level graphs are characterised by large number of peaks due to the non site related passing traffic. The L_{Aeq} was below the WHO daily recommended guidance level of 55dB at all boundary locations except N3 due to the close proximity of the bulldozer and tractor in operation. The L_{Aeq} was below the WHO daily recommended guidance level of 55dB at the nearest noise sensitive location.

The L_{Aeq} at N1 to N4 was measured at 51.5 dB, 52.3 dB, 73.5 dB and 52.5 dB respectively. The dominant noise source at N1, N2 and N4 was traffic on the N11. The noise level at N3 (73.5dB) is elevated due to the close proximity of the bulldozer in operation throughout the measurement. The other locations were more exposed and traffic noise was clearly audible.

At N5 (NSR1 - approximately 200 meters north west of the site) an L_{Aeq} of 54dB was measured. The L_{A90} was measured as 47.1dB and the L_{A10} was measured at 53.6dB. As with the boundary locations the N11 was the main influence on noise levels in the area. However, more localised traffic on the existing N11 which runs adjacent to N5 was a significant contributor to the noise level at this location. The sound pressure level graph illustrates a noise pattern with clear peaks. Each of these peaks represents a passing vehicle. No tones were detected at this location.

5.0 EVALUATION OF RESULTS

The main noise source on the Kilmartin Land Recovery Project site is the bulldozer and tractor in operation.

In order to assess the likely subjective response to the Kilmartin Land Recovery Project, a comparison between the change in noise levels compared to the baseline noise levels (submitted with the EIS in March 2006) was determined. Table 5.1 relates the general perception to a change in noise level in terms of the subjective response.

Table 5.1: Summary of typical subjective response to a change in noise level

Change in noise level	Subjective Response
1-2 dB	Not noticeable
3-5 dB	Small change
5-10 dB	Moderate change
> 10 dB	Significant change

Table 5.2 presents the increase in noise levels due to the Kilmartin Land Recovery Project.

Table 5.2: Noise Levels due to the Kilmartin Land Recovery Project.

Location	L_{Aeq} Baseline Noise Level (dB) (March 2006 EIS)	L_{Aeq} Operational Noise Level(dB)	Difference in Noise Levels (dB)	Subjective Response(dB)
N5 (NSR1)	56	54	-2	Not noticeable

The noise levels at the noise sensitive receptor as a result of the operation of the Kilmartin Land Recovery Project has resulted in no noticeable change in noise level at the nearest noise sensitive property. The WHO Guideline value was not exceeded at this location. In summary, the Kilmartin Land Recovery Project has not resulted in an adverse noise impact at the nearest sensitive receptor during daytime operation.

6.0 MITIGATION MEASURES

It is recommended that the following "Best Practice Means" should continue to be employed to minimise any operational impacts for example.

- Working hours during site development and construction are restricted to daytime hours
- An on-site speed limit will be enforced for all traffic. Drivers of vehicles will be advised of the speed limits through the erection of signs
- Where practicable the use of quiet working methods will be selected and the most suitable plant will be selected for each activity, having due regard to the need for noise control.
- All contractors will employ the best practicable means to minimise noise emissions and will be obliged to comply with the general recommendations of BS 5228, 1997. To this end all contractors will use "*noise reduced*" plant and/or will modify their construction methods so that noisy plant is unnecessary.
- By positioning potentially noisy plant or operations as far as possible from a noise sensitive receptor (NSR) the transmission of sound can be minimised. For example earth mounds and/or stacks of material or buildings on site can be used in such a way that they act as a physical barrier between the source and the receiver. Similarly, where practicable, all machines and/or noisy equipment will be positioned so that the quietest side faces the NSR

- If required, mechanical plant used on site will be fitted with effective exhaust silencers and will be maintained in good working order. Where practicable, machines will be operated at low speeds and will be shut down when not in use.
- If required, compressors will be of the *"noise reduced"* variety and fitted with properly lined and sealed acoustic covers. In all cases engine and/or machinery covers will be closed whenever the machines or engines are in use.
- All pneumatic percussive tools will be fitted with mufflers or silencers as recommended by the equipment manufactures. Where practicable all mechanical static plant will be enclosed by acoustic sheds or screens unless they are likely to have negligible impact upon NSRs.
- Where practicable the number of machines in simultaneous operation will be minimised.
- Plant and machinery used on-site will comply with the EC (Construction Plant and Equipment) Permissible, Noise Levels Regulations, 1988 (S.I. No. 320 of 1988)
- Employees working on the construction site will be informed about the requirement to minimise noise and will undergo training on the following aspects:

  The proper use and maintenance of tools and equipment

  The positioning of machinery on-site to reduce the emission of noise to the noise sensitive receptors

  Avoidance of unnecessary noise when carrying out manual operations and when operating plant and equipment

  The use and maintenance of sound reduction equipment fitted to power pressure tools and machines

  Reporting defective noise control equipment
- Cognisance will also be taken from the 'Environmental good practice *site guide*' 2005 compiled by CIRIA and the UK Environment Agency. This guide provides useful and practical information regarding the control of noise at construction sites.

7.0 CONCLUSION

In summary, the Kilmartin Land Recovery Project will not result in a perceptible increase in noise levels at the noise sensitive location during daytime hours. Noise level measurements taken while the site was in operation were relatively low, with the WHO Guideline value exceeded at one location. Overall, it can be concluded that, during daytime hours, the activities have not resulted in a significant noise impact at the nearest residential property.

Certificate of Calibration

Cirrus Research plc
dedicated to noise measurement

Equipment Details

Instrument Manufacturer	Cirrus Research plc
Instrument Type	Sound Level Meter
Model Number	CR:831A
Serial Number	B16438FF

Calibration Procedure

The instrument detailed above has been calibrated to the published test and calibration data as detailed in the instrument handbook, 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 and ANSI S1.43-1997 where applicable.

Sound Level Meters: All Calibration procedures were carried out by substituting 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. Which are traceable to the appropriate International Standards.

The Cirrus Research plc calibration laboratory standards are:

Microphone Type	B&K4192	Serial Number	1920791	Calibration Ref.	S 5534
Pistonphone Type	B&K4220	Serial Number	613843	Calibration Ref.	S 5423

Calibrated by T. A. Goodrich

Calibration Date 05 April 2007

Calibration Certificate Number 150628

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

Certificate of Calibration

Cirrus Research plc
dedicated to noise measurement

Equipment Details

Instrument Manufacturer	Cirrus Research plc
Instrument Type	Acoustic Calibrator
Model Number	CR:513A
Serial Number	028205

Calibration Procedure

The acoustic calibrator detailed above has been calibrated to the published data as described in the operating manual. The procedures and techniques used to follow the recommendations of the IEC standard Electroacoustics – Sound Calibrators IEC 60942:2003, IEC 60942:1997, BS EN 60942:1998 and BS EN 60942:2003 where applicable.. The calibrator's main output is 94.00 dB (1 Pa) and this was set within the 0.01 dB resolution of the test system, i.e. one hundredth of a decibel. Numbers in {parenthesis} refer to the paragraph in IEC 60942.

Calibration Traceability

The calibrator 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&K4192	Serial Number	1920791	Calibration Ref.	S 5534
Pistonphone Type	B&K4220	Serial Number	613843	Calibration Ref.	S 5423

Calibration Climate Conditions

The climatic test conditions were all maintained within the permitted limits of IEC 60942:1997.

Temperature	{B.3.2}	Permitted band 15°C to 25°C
Humidity	{B.3.2}	Permitted band 30% to 90% RH
Static Pressure	{B.3.2}	Permitted band 85 kPa to 105 kPa
Ambient Noise Level	{B.3.3.6}	Max permitted level 64 dB(Z)

Measurement Results

The figures below are the Calibration Laboratory test limits for this model calibrator and have a smaller tolerance than those permitted in IEC 60942.

94 dB Output	93.96	dB	Permitted band	93.95 to 94.05 dB
104 dB Output	103.91	dB	Permitted band	103.80 to 104.30 dB
Frequency	1006.0	Hz	Permitted band	990 to 1010 Hz

Uncertainty

With an uncertainty coefficient of k=2, i.e. a 95% confidence level, the uncertainty of each measure is

94 dB Output	± 0.13 dB	104 dB Output	± 0.14 dB
Frequency	± 0.1 Hz	Level Stability	± 0.04 dB

Calibrated by T. A. Goodall

Calibration Date 05 April 2007

Calibration Certificate Number 150629

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

GLOSSARY

Air Over pressure
Intensity of pressure wave caused by blasting, expressed as dB(Lin).

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

Background noise level
The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90% of a given time interval,T measured using time weighting F, and quoted to the nearest whole number of decibels.

Day:
0800 hrs to 2200 hrs

Night:
2200 hrs to 0800 hrs

Decibel (dB)
The unit of sound pressure level, calculated as a logarithm of the intensity of sound. 0 dB is the threshold of hearing, 140 dB is the threshold of pain. A change of 1 dB is detectable only under laboratory conditions. A change of 10 dB corresponds approximately to halving or doubling the loudness of sound.

dB(A)
Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sound of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with peoples assessment of loudness.

dB(Lin) $_{\text{max peak}}$
Instantaneous Maximum Peak Sound pressure level measured in decibels on a sound level meter, without the use of a frequency weighting system.

Hertz (Hz)
Unit of frequency (pitch) of a sound.

Impulsive Noise
A noise which is of short duration (typically less than one second), the sound pressure level of which is significantly higher than the background.

1/3 Octave band analysis
Frequency analysis of sound such that the frequency spectrum is sub divided into bands of one third of an octave each. An octave is taken to be the frequency interval, the upper limit of which is twice the lower limit (in Hertz).

$L(A)_{eq}$

Equivalent Continuous A-weighted Sound Level. The continuous steady noise level, which would have the same total A-weighted acoustic energy as the real fluctuating noise measured over the same period of time.

$L(A)_{10}$

The noise level that is equaled or exceeded for 10% of the measurement period.

$L(A)_{90}$

The noise level that is equaled or exceeded for 90% of the measurement period.

Noise

Unwanted sound. Any sound which has the potential to cause disturbance, discomfort or psychological stress to a subject exposed to it, or any sound which has the potential to cause actual physiological harm to a subject exposed to it or physical damage to any structure exposed to it, is known as noise.

Noise Sensitive Receptor

A noise sensitive receptor is regarded as any dwelling house, hotel or hostel, health building, educational establishment, places of worship or entertainment, or any other facility or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.

Peak Particle Velocity

The rate of change of displacement of the particles in a solid medium. It is the term usually used to describe vibration in relation to activities involving blasting. Velocity will vary from zero to a maximum value - the peak particle velocity, and the units used are millimetres per second.

Rating level L_{ArTr}

The specific noise level plus any adjustment for the characteristic features of the noise.

Residual Noise

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

Sound Power

The energy output from a source. It is measured in Watts (W).

Specific Noise source

The noise source under investigation for assessing the likelihood of complaints.

Tone

A noise with a narrow frequency composition.

Vibration

Regularly repeated movement about a fixed point.

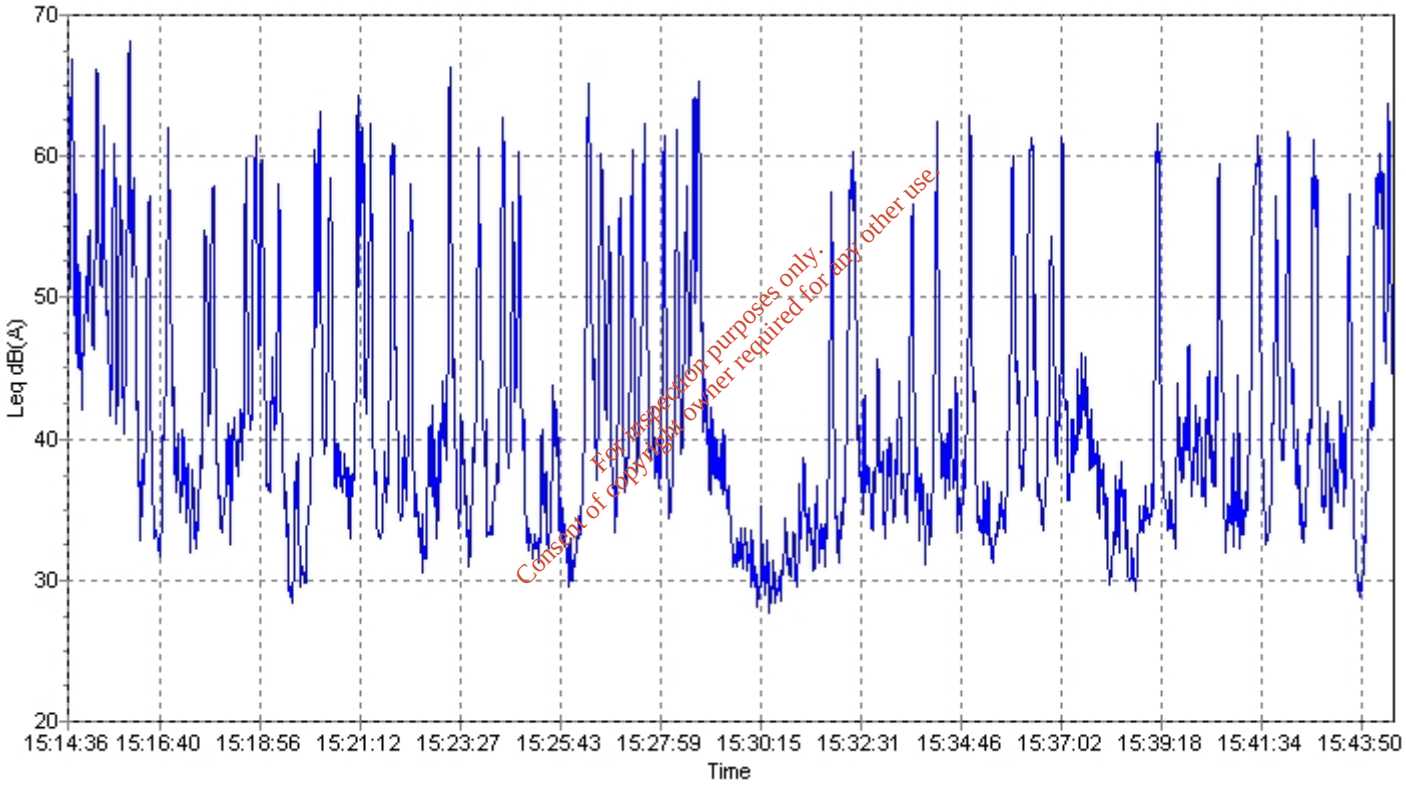
Measurement Report□

Measurement Details□

Date and Time:□	19/06/2008 15:14□
Sound Level Meter:□	Cirrus Research plc □
Recalibration Due:□	30/04/2008□
Run Duration:□	00:29:59□hh:mm:ss□
Range:□	10-80 □dB□
Overload:□	no□
Location:□	N1□

Data□

Leq□	51.5□dBA□	L1.0□	62.9□dBA□
Lepd□	39.4□dBA□	L10.0□	55.4□dBA□
LAE□	83.8□dBA□	L50.0□	38.4□dBA□
LAFmax□	70.5□dBA□	L90.0□	32.0□dBA□
Peak□	88.2□dBC□	L95.0□	30.6□dBA□
		L99.0□	28.9□dBA□



Measurement Report□

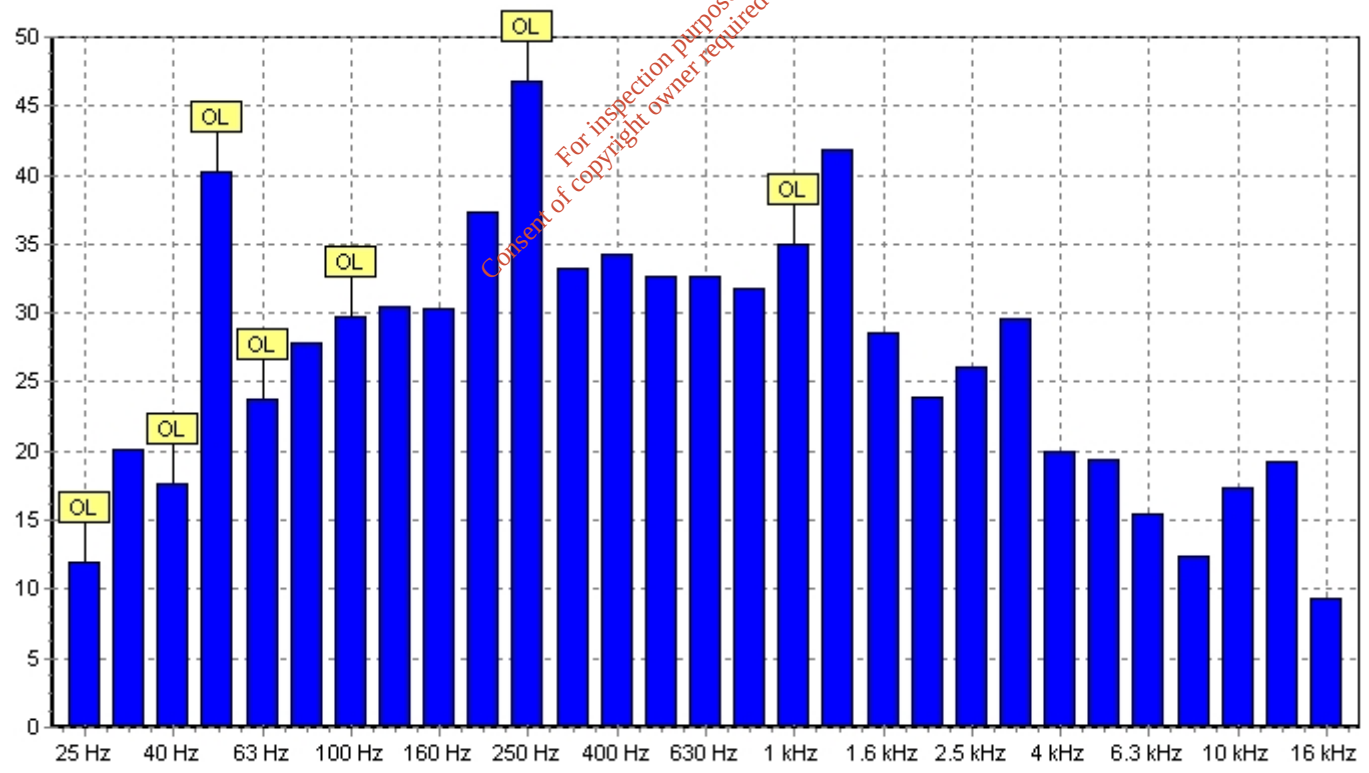
Measurement Details□

Date and Time:□	19/06/2008 13:07□
Sound Level Meter:□	Cirrus Research plc □
Recalibration Due:□	30/04/2008□
Run Duration:□	00:04:48□hh:mm:ss□
Range:□	10-80 □dB□
Location:□	N1□

Data□

Band□	LZeq,t□	Time s□	Overload□	Band□	LZeq,t□	Time s□	Overload□	Band□	LZeq,t□	Time s□	Overload□
25 Hz□	11.9 dBA□	9□	yes□	250 Hz□	46.8 dBA□	9□	yes□	2.5 kHz□	26.1 dBA□	9□	
31 Hz□	20.1 dBA□	9□		315 Hz□	33.3 dBA□	9□		3.15 kHz□	29.7 dBA□	9□	
40 Hz□	17.7 dBA□	9□	yes□	400 Hz□	34.2 dBA□	9□		4 kHz□	20.0 dBA□	9□	
50 Hz□	40.3 dBA□	9□	yes□	500 Hz□	32.6 dBA□	9□		5 kHz□	19.4 dBA□	9□	
63 Hz□	23.8 dBA□	9□	yes□	630 Hz□	32.7 dBA□	9□		6.3 kHz□	15.4 dBA□	9□	
80 Hz□	27.8 dBA□	9□		800 Hz□	31.8 dBA□	9□		8 kHz□	12.4 dBA□	9□	
100 Hz□	29.7 dBA□	9□	yes□	1 kHz□	35.1 dBA□	9□	yes□	10 kHz□	17.4 dBA□	9□	
125 Hz□	30.5 dBA□	9□		1.25 kHz□	41.9 dBA□	9□		12.5 kHz□	19.3 dBA□	9□	
160 Hz□	30.4 dBA□	9□		1.6 kHz□	28.6 dBA□	9□		16 kHz□	9.4 dBA□	9□	
200 Hz□	37.3 dBA□	9□		2 kHz□	24.0 dBA□	9□					

Band□	Leq,t□	Time s□	Overload□
LAeq□	40.6 dBA□	9□	
LCeq□	52.0 dBC□	9□	



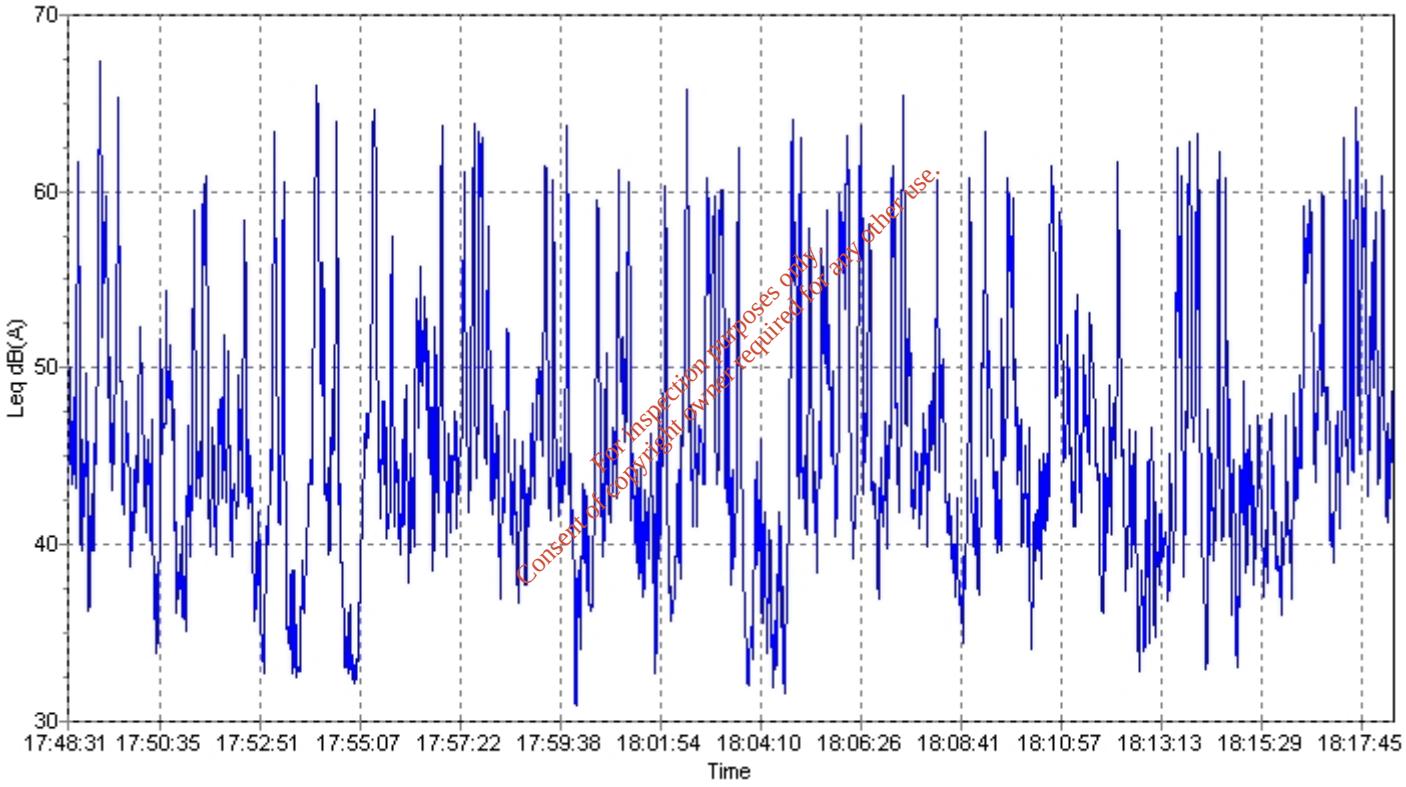
Measurement Report□

Measurement Details□

Date and Time:□	19/06/2008 17:48□
Sound Level Meter:□	Cirrus Research plc □
Recalibration Due:□	30/04/2008□
Run Duration:□	00:29:59□hh:mm:ss□
Range:□	10-80 □dB□
Overload:□	no□
Location:□	N2 bb□

Data□

Leq□	52.3□dBA□	L1.0□	63.7□dBA□
Lepd□	40.2□dBA□	L10.0□	56.2□dBA□
LAE□	84.6□dBA□	L50.0□	44.3□dBA□
LAFmax□	69.7□dBA□	L90.0□	37.1□dBA□
Peak□	88.5□dBC□	L95.0□	35.1□dBA□
		L99.0□	32.3□dBA□



Measurement Report□

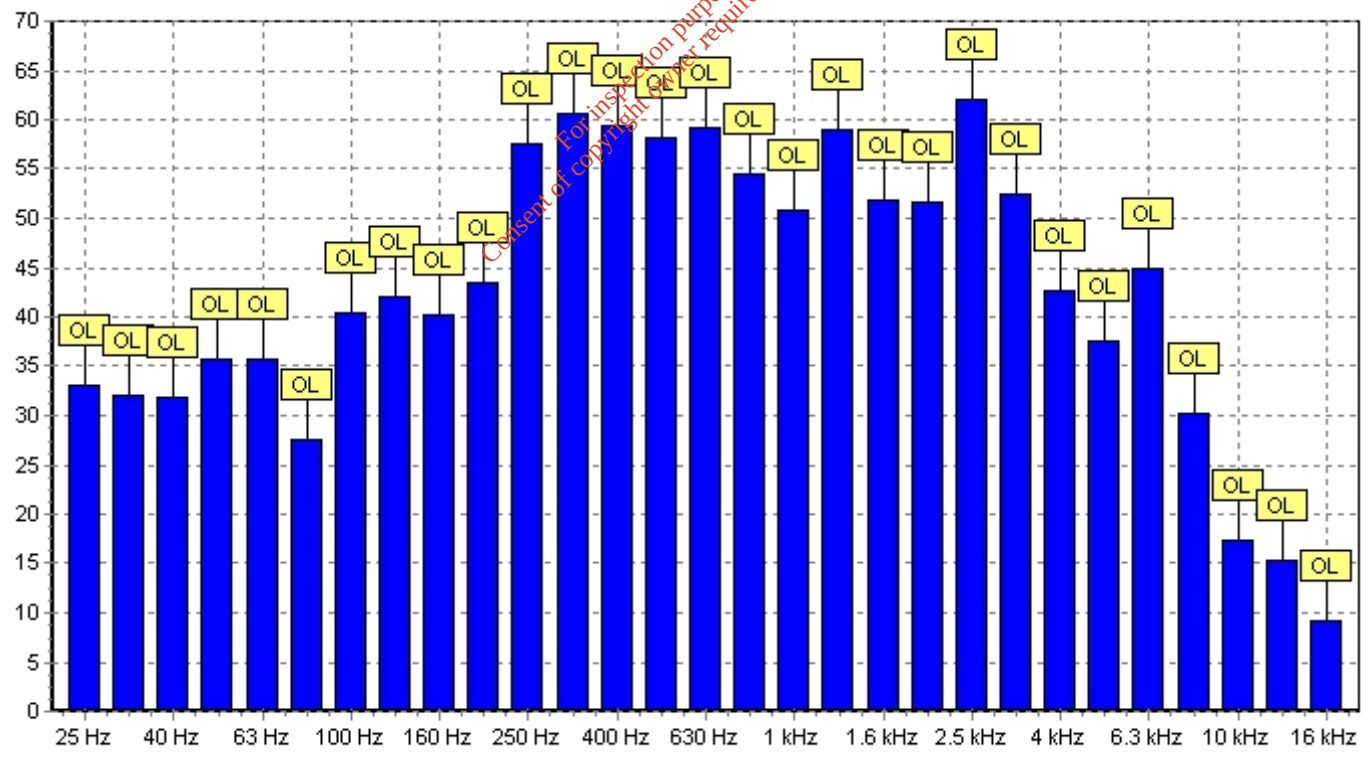
Measurement Details□

Date and Time:□	19/06/2008 13:13□
Sound Level Meter:□	Cirrus Research plc □
Recalibration Due:□	30/04/2008□
Run Duration:□	00:04:48□hh:mm:ss□
Range:□	10-80 □dB□
Location:□	N2□

Data□

Band□	LZeq,t□	Time s□	Overload□	Band□	LZeq,t□	Time s□	Overload□	Band□	LZeq,t□	Time s□	Overload□
25 Hz□	33.0 dBA□	9□	yes□	250 Hz□	57.5 dBA□	9□	yes□	2.5 kHz□	62.1 dBA□	9□	yes□
31 Hz□	32.1 dBA□	9□	yes□	315 Hz□	60.7 dBA□	9□	yes□	3.15 kHz□	52.5 dBA□	9□	yes□
40 Hz□	31.8 dBA□	9□	yes□	400 Hz□	59.3 dBA□	9□	yes□	4 kHz□	42.7 dBA□	9□	yes□
50 Hz□	35.6 dBA□	9□	yes□	500 Hz□	58.2 dBA□	9□	yes□	5 kHz□	37.6 dBA□	9□	yes□
63 Hz□	35.7 dBA□	9□	yes□	630 Hz□	59.3 dBA□	9□	yes□	6.3 kHz□	44.8 dBA□	9□	yes□
80 Hz□	27.6 dBA□	9□	yes□	800 Hz□	54.5 dBA□	9□	yes□	8 kHz□	30.3 dBA□	9□	yes□
100 Hz□	40.5 dBA□	9□	yes□	1 kHz□	50.8 dBA□	9□	yes□	10 kHz□	17.4 dBA□	9□	yes□
125 Hz□	42.0 dBA□	9□	yes□	1.25 kHz□	59.0 dBA□	9□	yes□	12.5 kHz□	15.4 dBA□	9□	yes□
160 Hz□	40.2 dBA□	9□	yes□	1.6 kHz□	51.8 dBA□	9□	yes□	16 kHz□	9.2 dBA□	9□	yes□
200 Hz□	43.4 dBA□	9□	yes□	2 kHz□	51.7 dBA□	9□	yes□				

Band□	Leq,t□	Time s□	Overload□
LAeq□	71.4 dBA□	9□	yes□
LCeq□	73.2 dBC□	9□	yes□



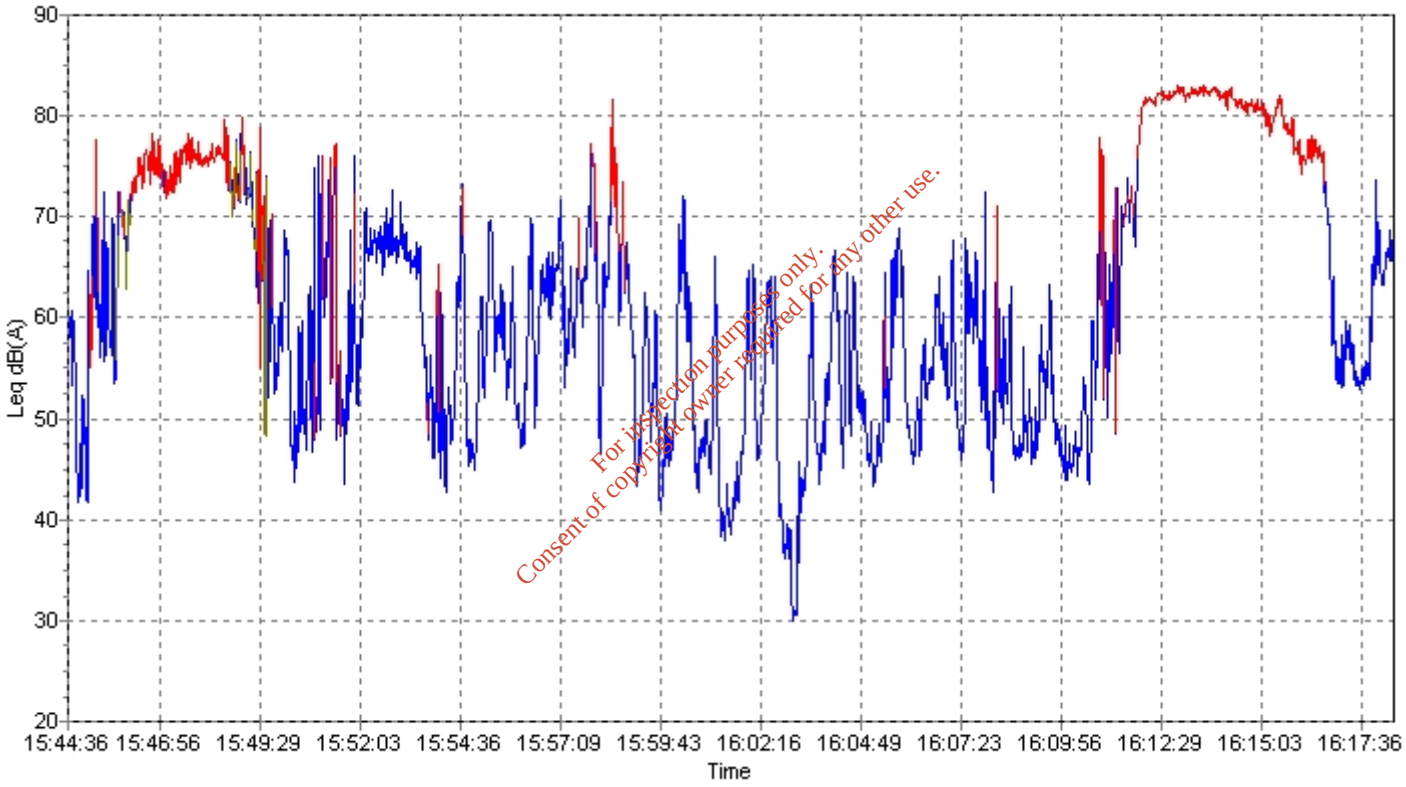
Measurement Report□

Measurement Details□

Date and Time:□	19/06/2008 15:44□
Sound Level Meter:□	Cirrus Research plc □
Recalibration Due:□	30/04/2008□
Run Duration:□	00:29:59□hh:mm:ss□
Range:□	10-80 □dB□
Overload:□	yes□
Location:□	N3□

Data□

Leq□	73.5□dBA□	L1.0□	83.2□dBA□
Lepd□	61.5□dBA□	L10.0□	81.1□dBA□
LAE□	105.9□dBA□	L50.0□	58.0□dBA□
LAFmax□	83.8□dBA□	L90.0□	45.7□dBA□
Peak□	95.5□dBC□	L95.0□	43.3□dBA□
		L99.0□	37.3□dBA□



Measurement Report□

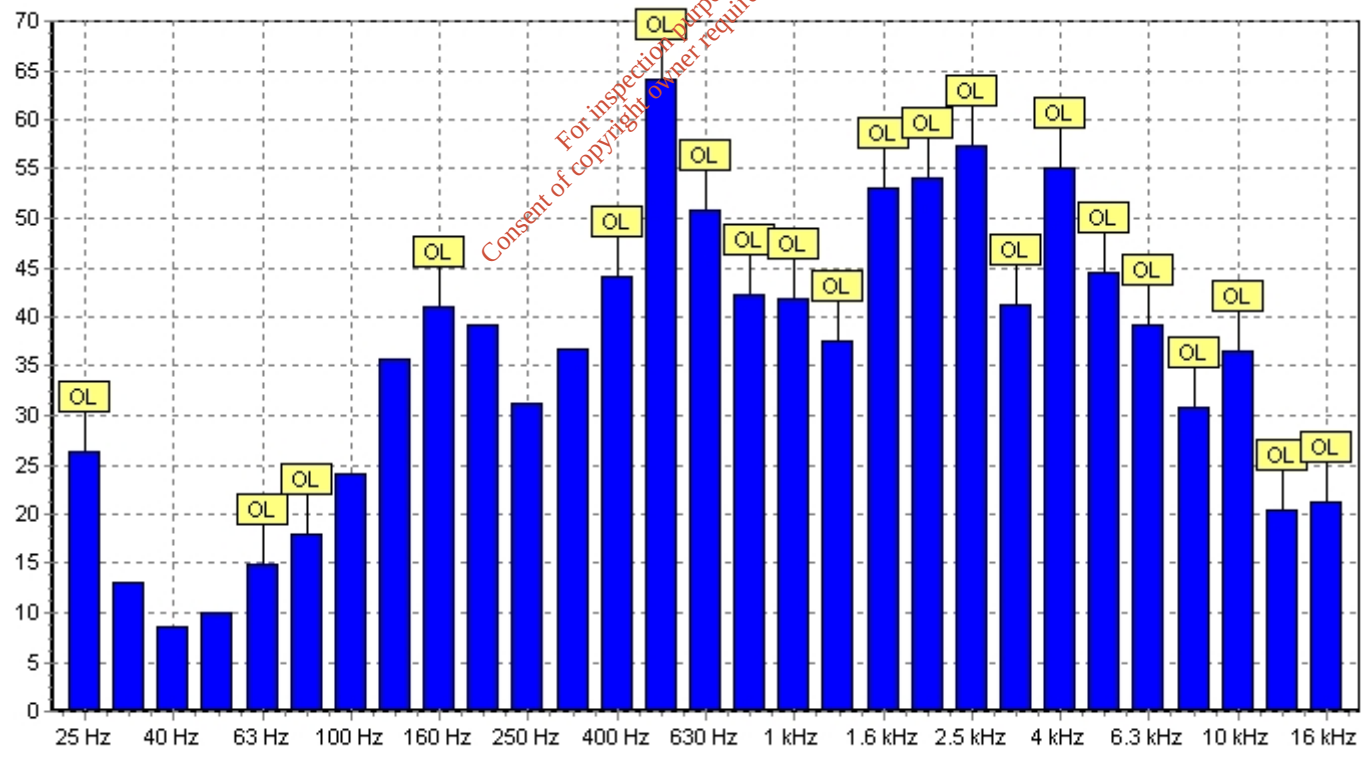
Measurement Details□

Date and Time:□	19/06/2008 13:24□
Sound Level Meter:□	Cirrus Research plc □
Recalibration Due:□	30/04/2008□
Run Duration:□	00:04:48□hh:mm:ss□
Range:□	10-80 □dB□
Location:□	N3□

Data□

Band□	LZeq,t□	Time s□	Overload□	Band□	LZeq,t□	Time s□	Overload□	Band□	LZeq,t□	Time s□	Overload□
25 Hz□	26.3 dBA□	9□	yes□	250 Hz□	31.3 dBA□	9□		2.5 kHz□	57.3 dBA□	9□	yes□
31 Hz□	13.1 dBA□	9□		315 Hz□	36.8 dBA□	9□		3.15 kHz□	41.1 dBA□	9□	yes□
40 Hz□	8.5 dBA□	9□		400 Hz□	44.2 dBA□	9□	yes□	4 kHz□	55.1 dBA□	9□	yes□
50 Hz□	9.9 dBA□	9□		500 Hz□	64.0 dBA□	9□	yes□	5 kHz□	44.5 dBA□	9□	yes□
63 Hz□	14.9 dBA□	9□	yes□	630 Hz□	50.8 dBA□	9□	yes□	6.3 kHz□	39.2 dBA□	9□	yes□
80 Hz□	18.0 dBA□	9□	yes□	800 Hz□	42.2 dBA□	9□	yes□	8 kHz□	30.8 dBA□	9□	yes□
100 Hz□	24.0 dBA□	9□		1 kHz□	41.8 dBA□	9□	yes□	10 kHz□	36.5 dBA□	9□	yes□
125 Hz□	35.8 dBA□	9□		1.25 kHz□	37.6 dBA□	9□	yes□	12.5 kHz□	20.4 dBA□	9□	yes□
160 Hz□	41.1 dBA□	9□	yes□	1.6 kHz□	53.1 dBA□	9□	yes□	16 kHz□	21.2 dBA□	9□	yes□
200 Hz□	39.3 dBA□	9□		2 kHz□	54.2 dBA□	9□	yes□				

Band□	Leq,t□	Time s□	Overload□
LAeq□	58.0 dBA□	9□	
LCeq□	63.7 dBC□	9□	yes□



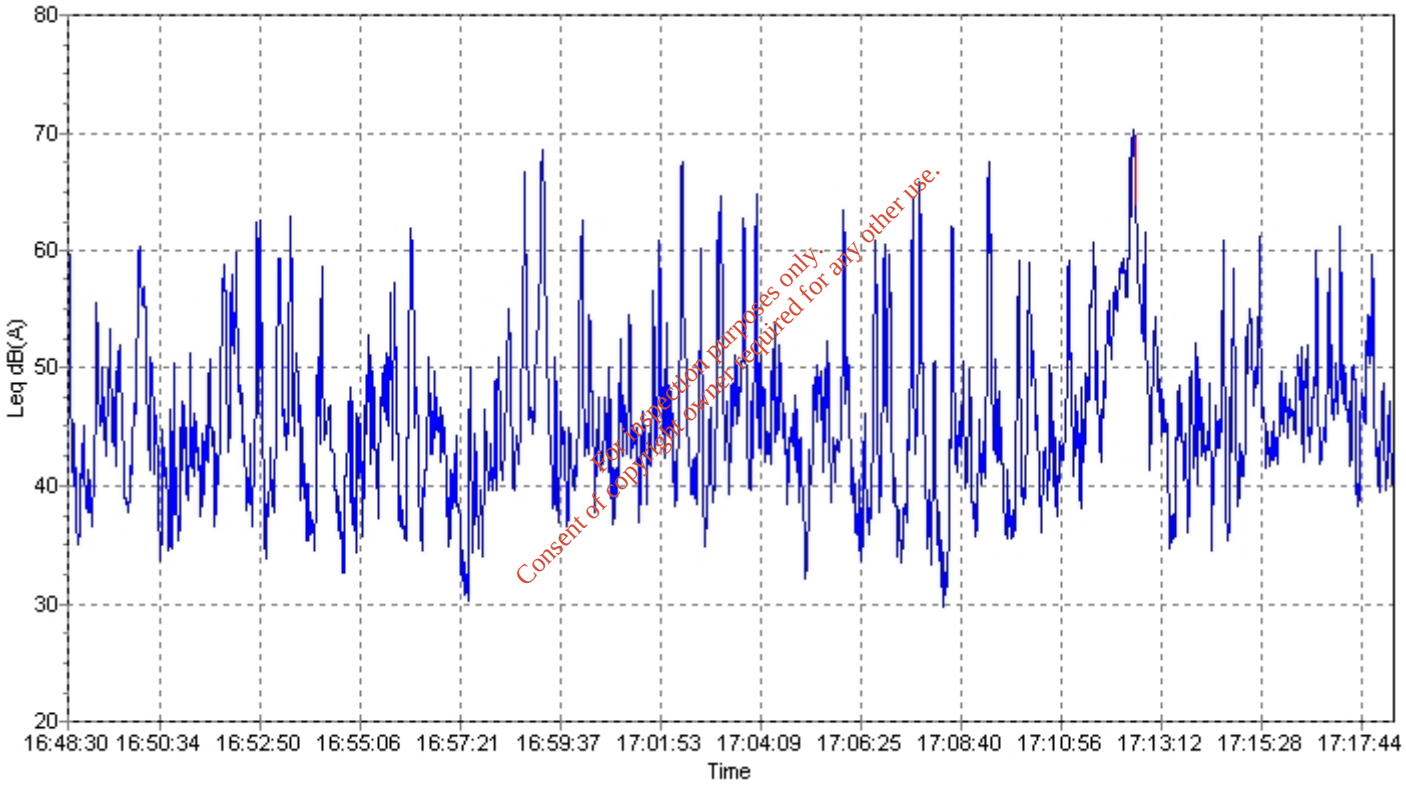
Measurement Report□

Measurement Details□

Date and Time:□	19/06/2008 16:48□
Sound Level Meter:□	Cirrus Research plc □
Recalibration Due:□	30/04/2008□
Run Duration:□	00:29:59□hh:mm:ss□
Range:□	10-80 □dB□
Overload:□	yes□
Location:□	N4□

Data□

Leq□	52.5□dBA□	L1.0□	64.3□dBA□
Lepd□	40.5□dBA□	L10.0□	54.9□dBA□
LAE□	84.8□dBA□	L50.0□	44.3□dBA□
LAFmax□	75.8□dBA□	L90.0□	37.2□dBA□
Peak□	89.1□dBC□	L95.0□	35.4□dBA□
		L99.0□	32.4□dBA□



Measurement Report□

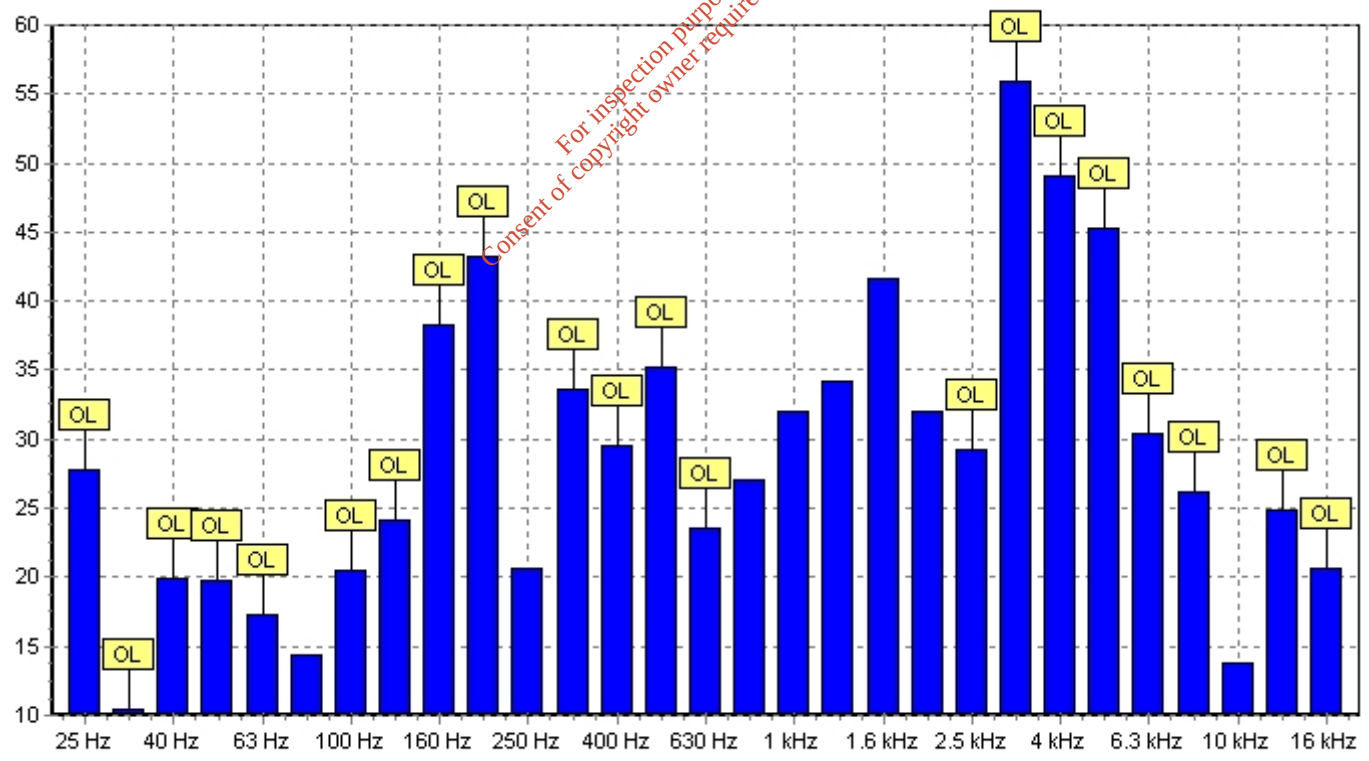
Measurement Details□

Date and Time:□	19/06/2008 13:35□
Sound Level Meter:□	Cirrus Research plc □
Recalibration Due:□	30/04/2008□
Run Duration:□	00:04:48□hh:mm:ss□
Range:□	10-80 □dB□
Location:□	N4□

Data□

Band□	LZeq,t□	Time s□	Overload□	Band□	LZeq,t□	Time s□	Overload□	Band□	LZeq,t□	Time s□	Overload□
25 Hz□	27.7 dBA□	9□	yes□	250 Hz□	20.7 dBA□	9□		2.5 kHz□	29.3 dBA□	9□	yes□
31 Hz□	10.4 dBA□	9□	yes□	315 Hz□	33.6 dBA□	9□	yes□	3.15 kHz□	55.9 dBA□	9□	yes□
40 Hz□	19.9 dBA□	9□	yes□	400 Hz□	29.5 dBA□	9□	yes□	4 kHz□	49.1 dBA□	9□	yes□
50 Hz□	19.7 dBA□	9□	yes□	500 Hz□	35.3 dBA□	9□	yes□	5 kHz□	45.3 dBA□	9□	yes□
63 Hz□	17.3 dBA□	9□	yes□	630 Hz□	23.5 dBA□	9□	yes□	6.3 kHz□	30.4 dBA□	9□	yes□
80 Hz□	14.4 dBA□	9□		800 Hz□	27.0 dBA□	9□		8 kHz□	26.2 dBA□	9□	yes□
100 Hz□	20.4 dBA□	9□	yes□	1 kHz□	32.0 dBA□	9□		10 kHz□	13.7 dBA□	9□	
125 Hz□	24.1 dBA□	9□	yes□	1.25 kHz□	34.2 dBA□	9□		12.5 kHz□	24.8 dBA□	9□	yes□
160 Hz□	38.4 dBA□	9□	yes□	1.6 kHz□	41.7 dBA□	9□		16 kHz□	20.7 dBA□	9□	yes□
200 Hz□	43.3 dBA□	9□	yes□	2 kHz□	32.0 dBA□	9□					

Band□	Leq,t□	Time s□	Overload□
LAeq□	59.3 dBA□	9□	yes□
LCeq□	48.6 dBC□	9□	



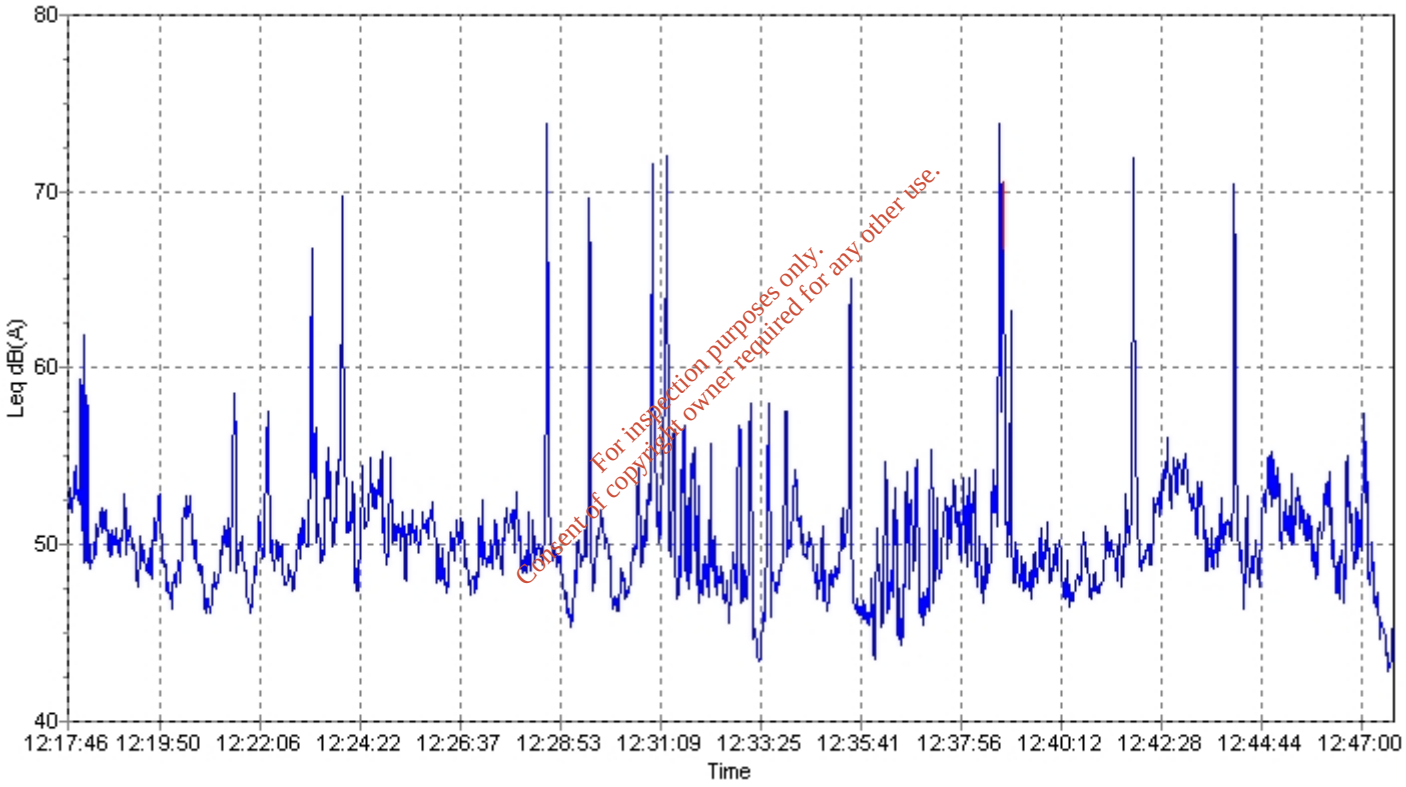
Measurement Report□

Measurement Details□

Date and Time:□	20/06/2008 12:17□
Sound Level Meter:□	Cirrus Research plc □
Recalibration Due:□	30/04/2008□
Run Duration:□	00:29:59□hh:mm:ss□
Range:□	10-80 □dB□
Overload:□	yes□
Location:□	N5 (NSR1)□

Data□

Leq□	54.0□dBA□	L1.0□	64.5□dBA□
Lepd□	41.9□dBA□	L10.0□	53.6□dBA□
LAE□	86.3□dBA□	L50.0□	49.8□dBA□
LAFmax□	77.4□dBA□	L90.0□	47.1□dBA□
Peak□	88.9□dBC□	L95.0□	46.3□dBA□
		L99.0□	44.2□dBA□



Measurement Report□

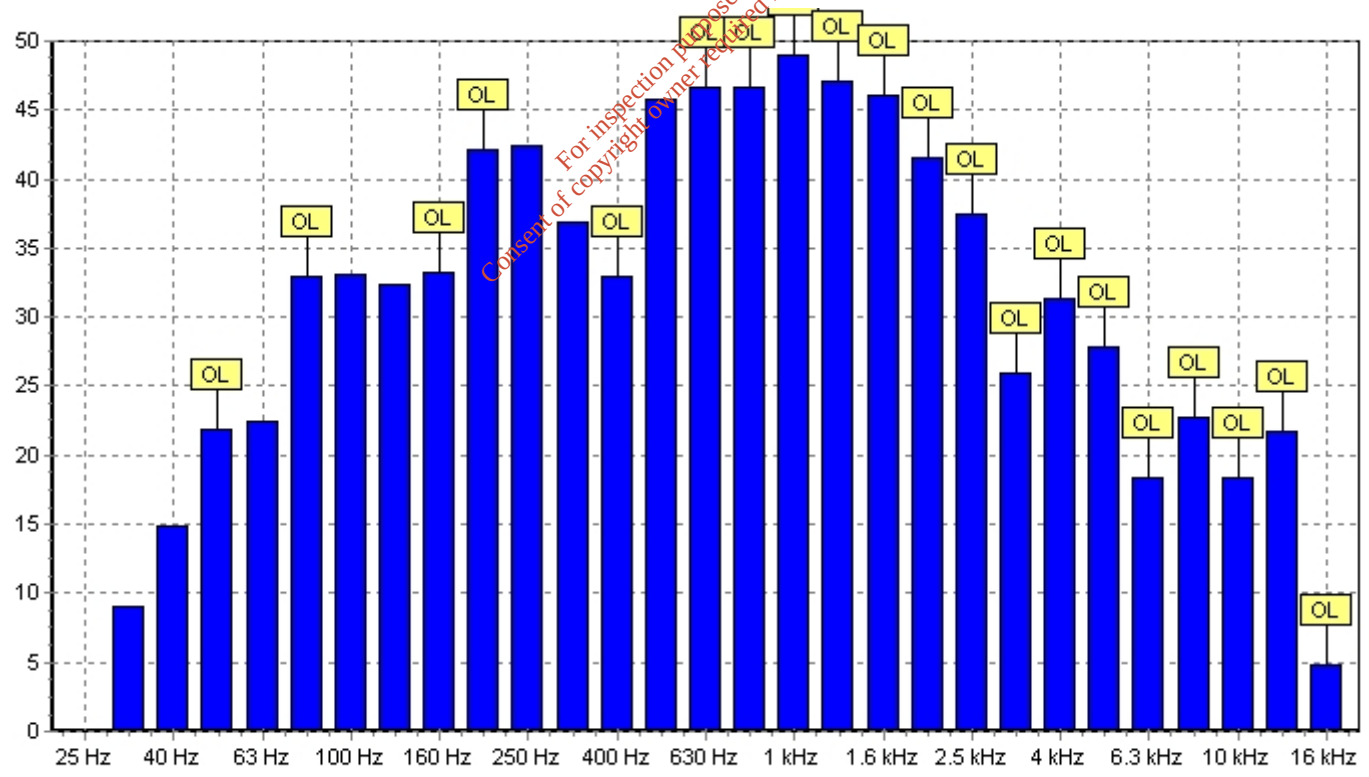
Measurement Details□

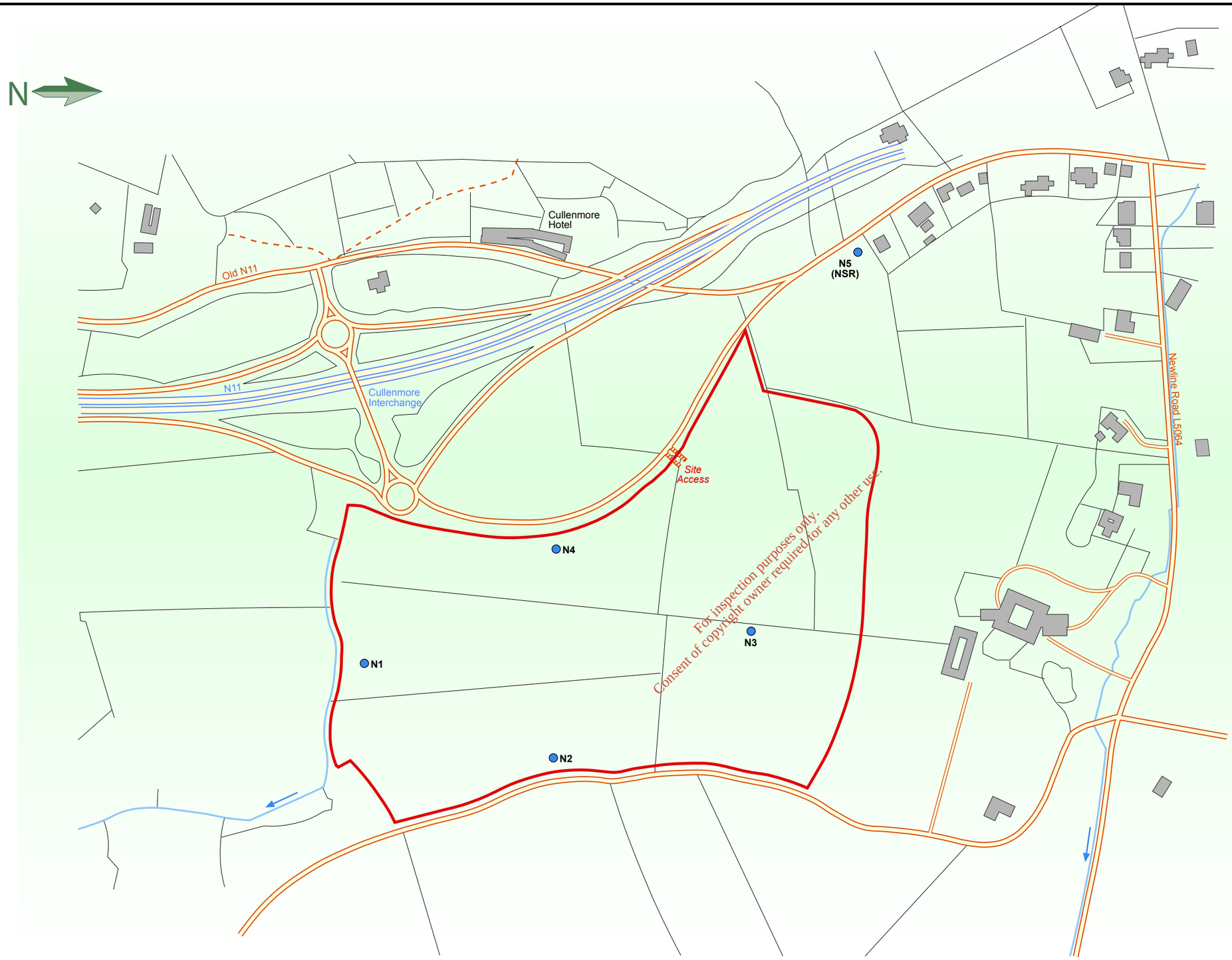
Date and Time:□	20/06/2008 12:48□
Sound Level Meter:□	Cirrus Research plc □
Recalibration Due:□	30/04/2008□
Run Duration:□	00:04:48□hh:mm:ss□
Range:□	10-80 □dB□
Location:□	N5 (NSR1)□

Data□

Band□	LZeq,t□	Time s□	Overload□	Band□	LZeq,t□	Time s□	Overload□	Band□	LZeq,t□	Time s□	Overload□
25 Hz□	0.0 dBA□	9□		250 Hz□	42.4 dBA□	9□		2.5 kHz□	37.4 dBA□	9□	yes□
31 Hz□	9.0 dBA□	9□		315 Hz□	36.8 dBA□	9□		3.15 kHz□	25.9 dBA□	9□	yes□
40 Hz□	14.9 dBA□	9□		400 Hz□	32.9 dBA□	9□	yes□	4 kHz□	31.3 dBA□	9□	yes□
50 Hz□	21.9 dBA□	9□	yes□	500 Hz□	45.8 dBA□	9□		5 kHz□	27.8 dBA□	9□	yes□
63 Hz□	22.5 dBA□	9□		630 Hz□	46.7 dBA□	9□	yes□	6.3 kHz□	18.3 dBA□	9□	yes□
80 Hz□	33.0 dBA□	9□	yes□	800 Hz□	46.6 dBA□	9□	yes□	8 kHz□	22.7 dBA□	9□	yes□
100 Hz□	33.1 dBA□	9□		1 kHz□	48.9 dBA□	9□	yes□	10 kHz□	18.3 dBA□	9□	yes□
125 Hz□	32.3 dBA□	9□		1.25 kHz□	47.2 dBA□	9□	yes□	12.5 kHz□	21.7 dBA□	9□	yes□
160 Hz□	33.3 dBA□	9□	yes□	1.6 kHz□	46.1 dBA□	9□	yes□	16 kHz□	4.8 dBA□	9□	yes□
200 Hz□	42.1 dBA□	9□	yes□	2 kHz□	41.5 dBA□	9□	yes□				

Band□	Leq,t□	Time s□	Overload□
LAeq□	73.5 dBA□	9□	yes□
LCeq□	83.8 dBC□	9□	yes□





0 100 200 300
1:7,000 Meters

LEGEND
- Site Boundary
- Water Course/Stream
- N1 Noise Monitoring Location

Kilmartin Restoration Project
Noise Monitoing Locations

Figure No. 2.3.1 | Job No. CE04561 | Date. July 2007 | Finalised By - NM

White Young Green

NOTE: Drawing is for diagrammatic purposes only. No measurements to be taken.

JF(ai)