

CALGA SAND QUARRY
ATTENDED COMPLIANCE NOISE MONITORING
19 MARCH 2014

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GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

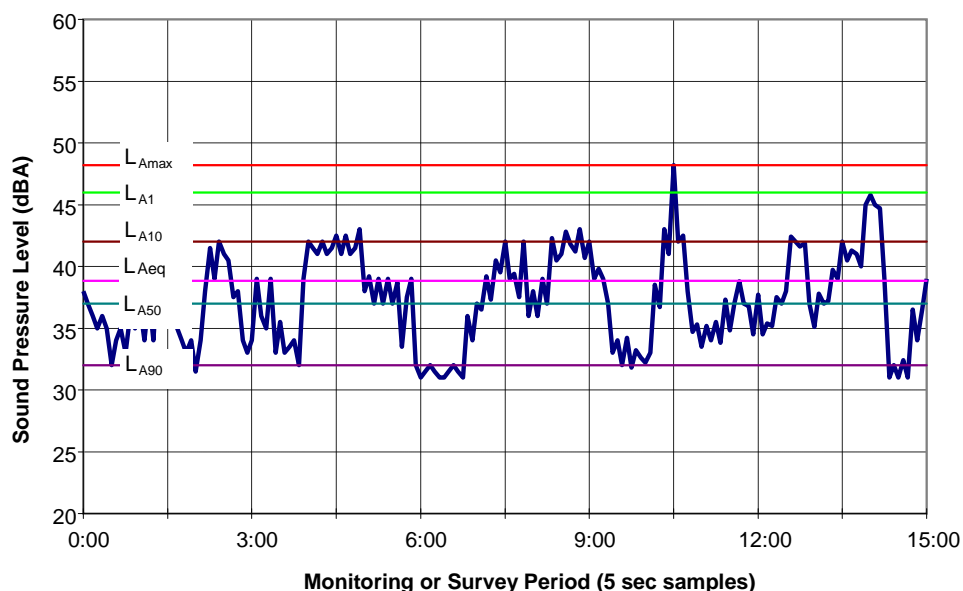
L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

Typical Graph of Sound Pressure Level vs Time



1 INTRODUCTION

This report summarises the results of the quarterly attended noise monitoring conducted on 19 March 2014 and carried out in accordance with Condition 3(7) of Development Consent DA 94-4-2004.

The Noise Monitoring Program (NMP) prepared by R.W. Corkery & Co. Pty Ltd summarises all relevant criteria, monitoring locations, and frequency / timing of monitoring.

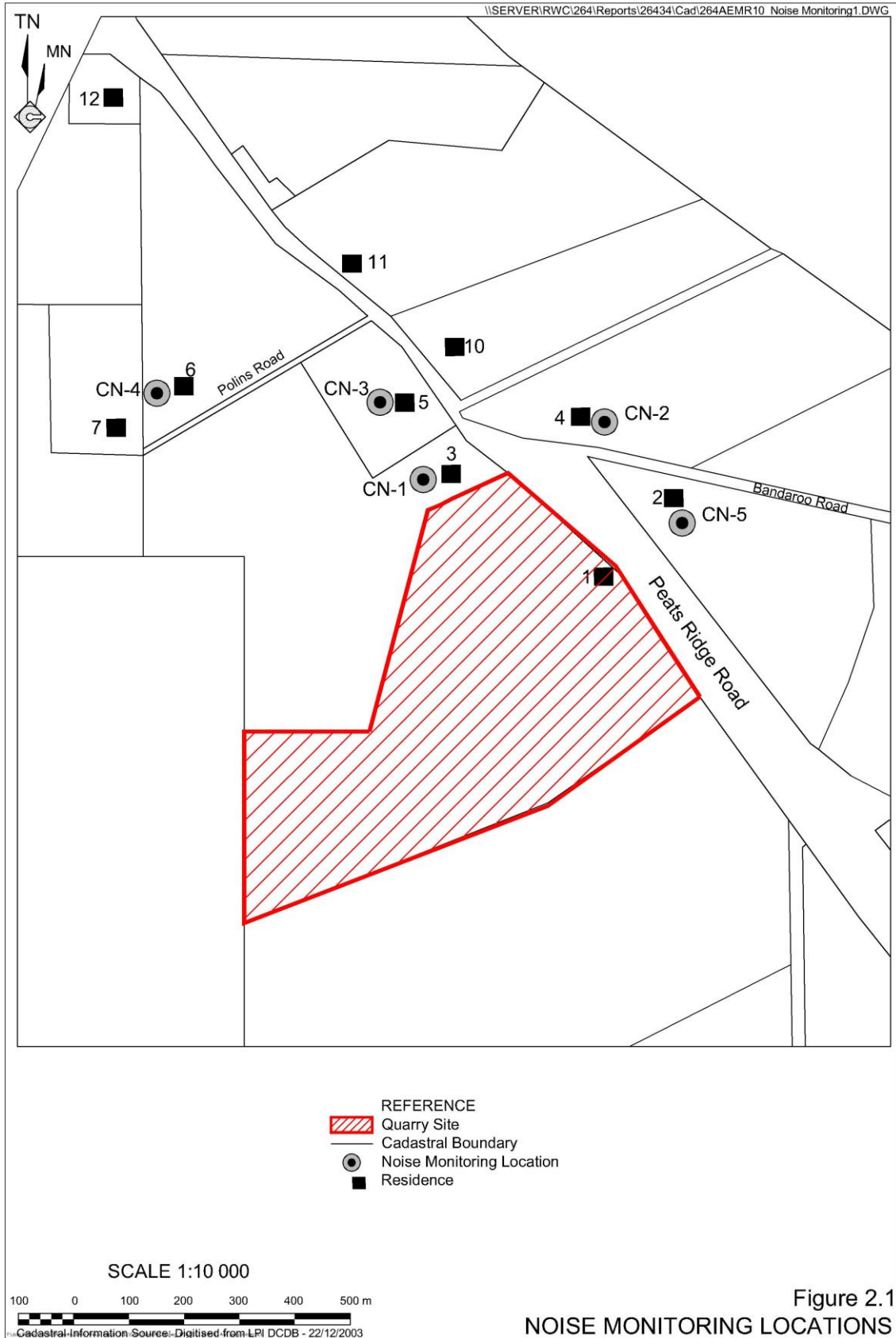
2 SITE DESCRIPTION

Attended noise monitoring was conducted on Wednesday, 19 March 2014. Measurements were made at each of the following locations (shown in Figure 2-1):

- CN-1 Gazzana Residence;
- CN-2 King Residence;
- CN-3 Kashouli Residence; and
- CN-4 Townsend Residence.

Noise levels were measured with a Bruel & Kjaer Type 2236 sound level meter. This sound level meter conforms to Australian Standard 1259 "Acoustics – Sound Level Meters" as Type 1 precision sound level meter which has an accuracy suitable for laboratory use. The A-Weighting filter of the meter was selected and the time weighting was set to 'fast'. The meter was field calibrated both before and after the measurements with a Bruel & Kjaer Sound Level Calibrator Type 4230. No significant drift in the sound level meter calibration level was recorded.

The B&K 2236 sound level meter and the B&K 4230 calibrator have been laboratory calibrated within the previous two years in accordance with Wilkinson Murray Quality Assurance procedures.



3 OPERATIONAL NOISE CRITERIA

The Noise Monitoring Program presents noise criteria for the operation of plant or equipment on the premises as required by the Environment Protection Authority (EPA) licence (EPL 11295). It states that noise levels emanating from the premises must not exceed the relevant criteria when measured within 30m of the residences or noise sensitive areas.

Daytime operational noise is assessed as an $L_{Aeq,15min}$ noise level. The L_{Aeq} level is the Equivalent Continuous Sound Level and represents the level of a continuous sound with the same average sound energy over the sampling period as the actual noise environment with its fluctuating sound levels.

Table 3-1 summarises the daytime noise criteria.

Table 3-1 Operational Daytime Noise Criteria *

Location	Daytime Criteria $L_{Aeq,15min}$ (dBA)
CN-1	41
CN-2	40
CN-3	39
CN-4	35

* Source: EPL 11295

4 METEOROLOGICAL DATA

Based on site observations, weather conditions were appropriate for conducting environmental noise measurements during the day of survey. This was confirmed by meteorological data obtained from the site's weather station.

Table 4-1 summarises meteorological conditions during the noise survey obtained from the site's weather station.

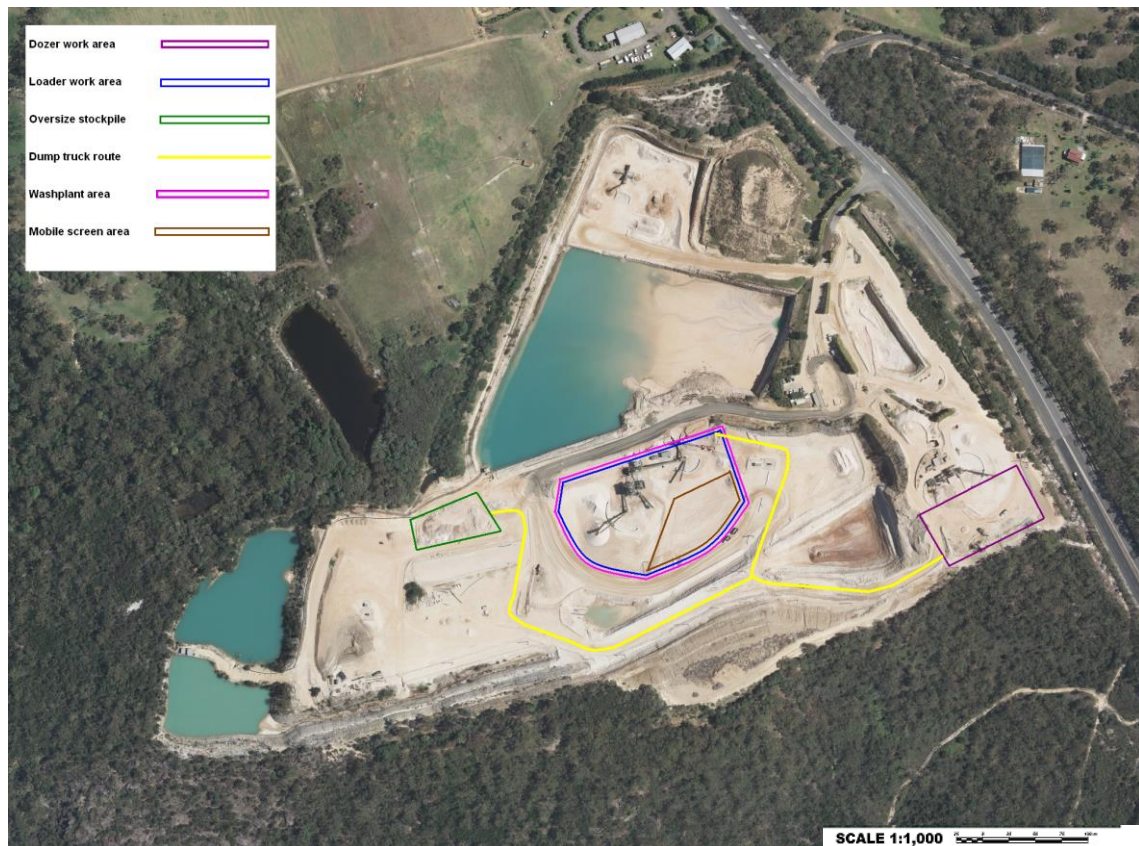
**Table 4-1 Meteorological Conditions during Noise Survey
(Wednesday, 19 March 2014)**

Time Period	Wind Speed (m/s)	Wind Direction	Rain (mm)
11.15am – 11.30am	1.3	S	0
11.30am – 11.45am	2.2	S	0
11.45am – 12.00pm	1.8	SSE	0
12.00pm – 12.15pm	1.3	SSE	0
12.15pm – 12.30pm	1.8	SSW	0

5 DESCRIPTION OF SITE OPERATIONS

Figure 5-1 presents an aerial of the quarry site.

Figure 5-1 Quarry Site Layout and Operational Areas



The following mobile plant and equipment were in operation during the time of the survey:

- Dozer ripping and pushing sandstone in Stage 3/4.
- Excavator loading dump truck with raw feed from Stage 3/4.
- Dump trucks taking raw feed from Stage 3/4 to Site B washplant on Stage 2 and brickies raw feed stockpile at Mobile screen area.
- Front end loader loading sales trucks from Site B washplant and Mobile screen area.
- Front end loader feeding Jaw crusher at Site B washplant area.
- Jaw crusher feeding crushed material onto transfer conveyor.
- Diesel operated transfer conveyor transferring crushed material into Site B washplant.
- Site B Washplant in full production.

6 ASSESSMENT OF NOISE LEVELS

Table 6-1 summarises the measurement results and compares them against the relevant daytime noise criteria.

Table 6-1 Attended Noise Measurement Results (Wednesday, 19 March 2014)

Location	Time	$L_{Aeq,15min}$ due to Quarry Operations (dBA)	Daytime Criteria $L_{Aeq,15min}$ (dBA)	Comments
CN-1	11.15am – 11.30am	30	41	Distant quarry noise audible most of the time 29-30dBA. Mobile plant engine noise audible very briefly L_{Amax} 38dBA. Typical and heavy traffic on Peats Ridge Road measured with L_{Amax} 52-55dBA and L_{Amax} 62-65dBA, respectively.
CN-3	11.35am – 11.50am	30	39	Distant quarry noise audible most of the time 28-32dBA. Typical and heavy traffic on Peats Ridge Road measured with L_{Amax} 38-45dBA and L_{Amax} 49-53dBA, respectively.
CN-2	11.55am – 12.10pm	27	40	Distant quarry noise audible most of the time 26-28dBA. Typical and heavy traffic on Peats Ridge Road measured with L_{Amax} 50-52dBA and L_{Amax} 54-57dBA, respectively. Birds nearby L_{Amax} 54-58dBA.
CN-4	12.16pm – 12.31pm	34	35	Distant quarry noise audible most of the time 33-34dBA. Typical and heavy traffic on Peats Ridge Road measured with L_{Amax} 52-53dBA and L_{Amax} 56-58dBA, respectively.

Table 6-1 shows that measured $L_{Aeq,15min}$ noise levels due to quarry operations comply with the relevant daytime noise criteria at all four receivers.

7 CONCLUSION

Attended compliance noise monitoring was conducted on Wednesday, 19 March 2014. The results of the survey indicated that noise emissions from the Calga Sand Quarry plant complied with the daytime limits set in the Noise Monitoring Program at all four identified receivers.