

CALGA SAND QUARRY
ATTENDED COMPLIANCE NOISE MONITORING
10 MARCH 2016

REPORT NO. 01127-E
VERSION A

MARCH 2016

PREPARED FOR

HANSON CONSTRUCTION MATERIALS PTY LTD
LOT 151 PEATS RIDGE ROAD
CALGA NSW 2250

DOCUMENT CONTROL

Version	Status	Date	Prepared By	Reviewed By
A	Draft	16 March 2016	Roman Haverkamp	John Wassermann

Note

All materials specified by Wilkinson Murray Pty Limited have been selected solely on the basis of acoustic performance. Any other properties of these materials, such as fire rating, chemical properties etc. should be checked with the suppliers or other specialised bodies for fitness for a given purpose. The information contained in this document produced by Wilkinson Murray is solely for the use of the client identified on the front page of this report. Our client becomes the owner of this document upon full payment of our **Tax Invoice** for its provision. This document must not be used for any purposes other than those of the document's owner. Wilkinson Murray undertakes no duty to or accepts any responsibility to any third party who may rely upon this document.

Quality Assurance

We are committed to and have implemented AS/NZS ISO 9001:2008 "Quality Management Systems – Requirements". This management system has been externally certified and Licence No. QEC 13457 has been issued.



Quality
ISO 9001

SAI GLOBAL

AAAC

This firm is a member firm of the Association of Australian Acoustical Consultants and the work here reported has been carried out in accordance with the terms of that membership.



Celebrating 50 Years in 2012

Wilkinson Murray is an independent firm established in 1962, originally as Carr & Wilkinson. In 1976 Barry Murray joined founding partner Roger Wilkinson and the firm adopted the name which remains today. From a successful operation in Australia, Wilkinson Murray expanded its reach into Asia by opening a Hong Kong office early in 2006. 2010 saw the introduction of our Queensland office and 2011 the introduction of our Orange office to service a growing client base in these regions. From these offices, Wilkinson Murray services the entire Asia-Pacific region.



Wilkinson Murray Pty Limited · ABN 39 139 833 060

Level 4, 272 Pacific Highway, Crows Nest NSW 2065, Australia • **Offices in Orange, Qld & Hong Kong**

† +61 2 9437 4611 • ‡ +61 2 9437 4393 • e acoustics@wilkinsonmurray.com.au • w www.wilkinsonmurray.com.au

TABLE OF CONTENTS

	Page
GLOSSARY OF ACOUSTIC TERMS	
1 INTRODUCTION	1
2 SITE DESCRIPTION	1
3 OPERATIONAL NOISE CRITERIA	3
4 METEOROLOGICAL DATA	4
5 DESCRIPTION OF SITE OPERATIONS	5
6 ASSESSMENT OF NOISE LEVELS	6
7 CONCLUSION	6

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.

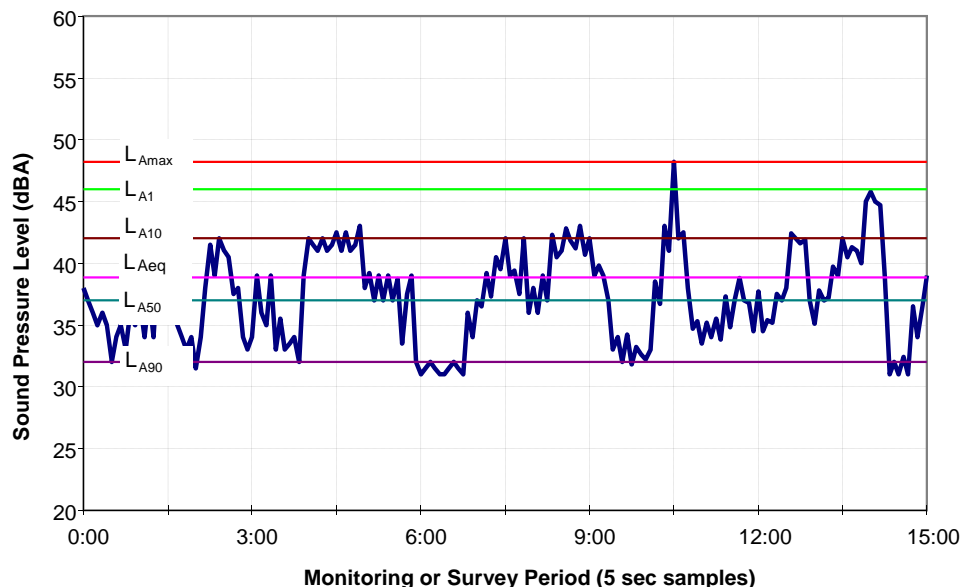
L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

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 10 March 2016 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

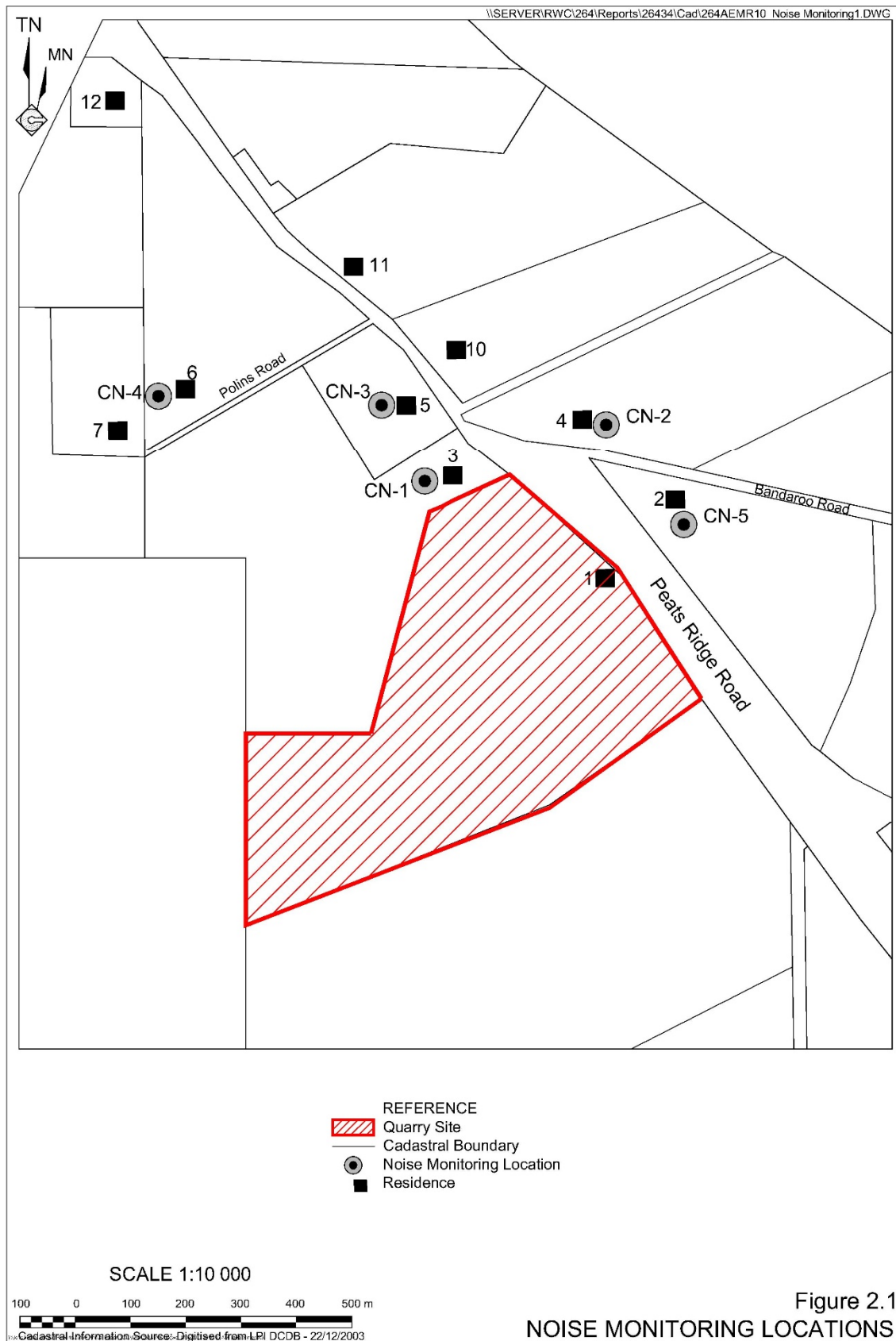
Attended noise monitoring was conducted on Thursday, 10 March 2016. Measurements were made at each of the following locations (shown in Figure 2-1):

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

All measurements were conducted using a Bruel and Kjaer Type 2236 Sound Level Meter. This sound level meter conforms to Australian Standard 1259 *Acoustics – Sound Level Meters* as a Type 1 Precision Sound Level Meter which has an accuracy suitable for field and laboratory use. The A-Weighting filter of the meter was selected and the time weighting was set to “Fast”. The calibration of the meter was checked before and after the measurements with a Bruel and Kjaer Type 4230 sound level calibrator and no significant drift was noted.

The Bruel and Kjaer Type 2236 and Type 4230 have been laboratory calibrated within the previous two years in accordance with our in-house Quality Assurance Procedures.

Figure 2-1 Noise Monitoring Locations



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.

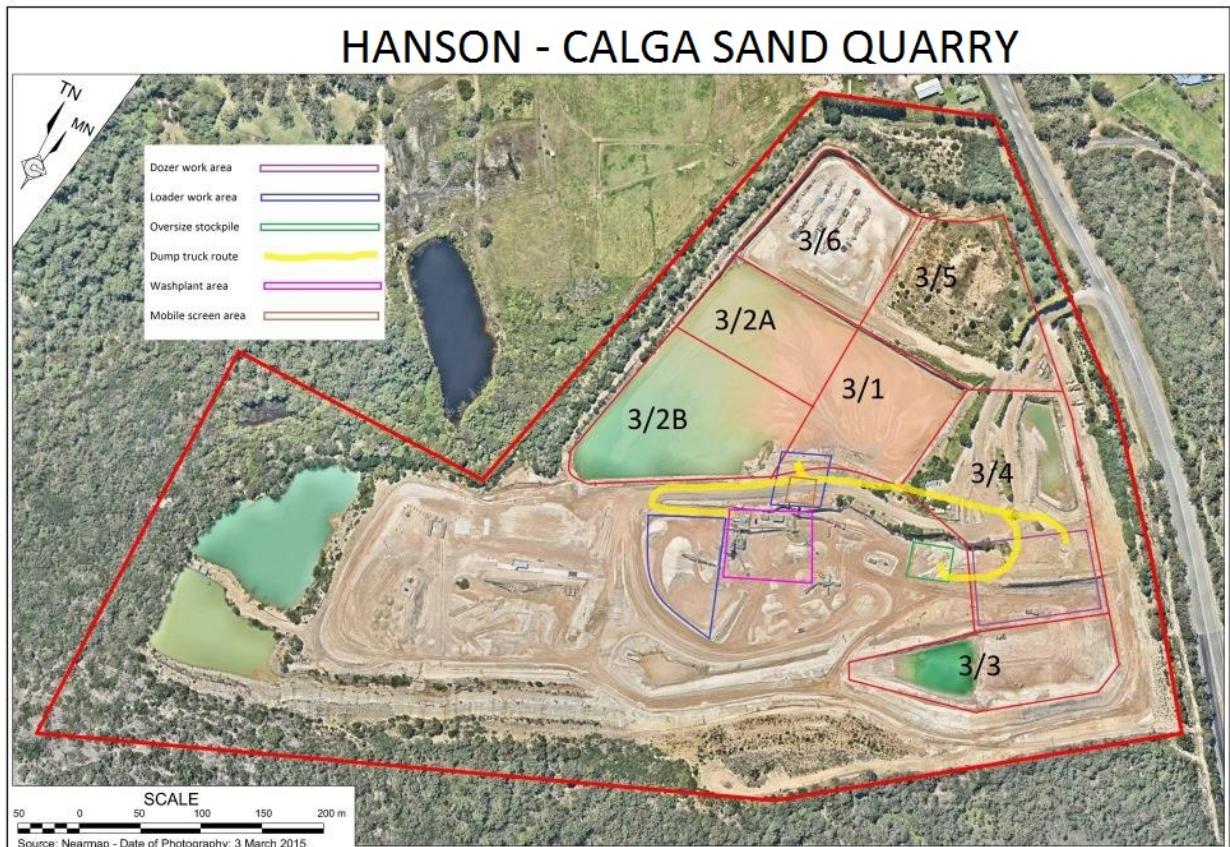
**Table 4-1 Meteorological Conditions during Noise Survey
(Thursday, 10 March 2016)**

Time Period	Wind Speed (m/s)	Wind Direction	Rain (mm)
11.00am – 11.15am	0.9	WSW	0
11.15am – 11.30am	1.3	SSW	0
11.30am – 11.45am	1.3	SSW	0
11.45am – 12.00pm	0.4	SSW	0
12.00pm – 12.15pm	0.9	ESE	0
12.15pm – 12.30pm	1.8	E	0

5 DESCRIPTION OF SITE OPERATIONS

Figure 5-1 presents an aerial of the quarry site with the works generally taking place during the monitoring survey.

Figure 5-1 Quarry Site Layout and Operational Areas



The following mobile plant and equipment were in operation during the time of the monitoring.

- Dozer ripping and pushing sandstone in Stage 3/4.
- Excavator loading dump truck with raw feed from Stage 3/4 to washplant.
- Dump truck taking raw feed from Stage 3/4 to washplant stockpile.
- Front end loader, loading sales trucks and loading dump truck with oversized to be taken to oversized stockpile.
- Water truck was in operation to suppress dust on designated haul road.
- Dry screening plant was in full production.
- Washplant was 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 (Thursday, 10 March 2016)

Location	Time	L _{Aeq,15min} due to Quarry Operations (dBA)	Daytime Criteria L _{Aeq,15min} (dBA)	Comments
CN-1	11.06am – 11.21am	36	41	Site noise audible during lulls in traffic, typically 33-36dBA and 38-40dBA during onsite truck passbys. Typical and heavy traffic on Peats Ridge Road measured with L _{Amax} 50-55dBA and L _{Amax} 60-68dBA, respectively. Insect noise audible most of the time, 38-45dBA.
CN-3	11.25am – 11.40am	32	39	Site noise audible during lulls in traffic, est. 30-34dBA. Typical and heavy traffic on Peats Ridge Road measured with L _{Amax} 53-54dBA and L _{Amax} 60-65dBA, respectively. Mobile plant on CN-1 property audible for approx. 6mins, 55-60dBA.
CN-4	11.45am – 12.00pm	Inaudible	35	Quarry noise inaudible at all times. Typical and heavy traffic on Peats Ridge Road measured with L _{Amax} 40-45dBA and L _{Amax} 46-50dBA, respectively.
CN-2	12.07pm – 12.22pm	37	40	Site noise audible during lulls in traffic, typically 36-38dBA and very briefly 39dBA with dozer tracks slapping. Typical and heavy traffic on Peats Ridge Road measured with L _{Amax} 54-56dBA and L _{Amax} 63-66dBA, 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 (4) receivers.

7 CONCLUSION

Attended compliance noise monitoring was conducted on Thursday, 10 March 2016. 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 (4) identified receivers.