



A C O U S T I C A L C O N S U L T A N T S

23 January 2006

WM Project Number: 01127-E  
Our Ref: ROC230106 DB  
Email: craig.millikan@rocla.com.au

Mr Craig Millikan  
Rocla Pty Limited  
72 Orchardleigh Street  
GUILDFORD NSW 2161

Dear Craig

Re: Calga Sand Quarry - Bund Construction Noise Monitoring

### Introduction

Following the granting of consent by the NSW Department of Environment and Conservation (DEC) for the works, Rocla Pty Ltd has recently commenced construction of an acoustic barrier to the northern, eastern and western boundaries of its Calga Sand Quarry, which once completed, will shield nearby residences from operational quarrying noise from the site.

This report details the results of noise monitoring undertaken at residences around the site on the first day of construction of the barrier (Monday, 16 January 2006) pursuant to the requirements of the consent conditions.

### Description of the Work Site & Current Works

The construction of the quarry's perimeter acoustic barrier was commenced on Monday, 16 January 2006 and is expected to take approximately four weeks to complete. The acoustic barrier will comprise a 2m high fence mounted atop a 5m high earth bund. The earth berm required as the lower half of the barrier will be installed in lengths of typically 30-80m at a time by means of two scrapers and a dozer working in tandem.

It was observed on the day of monitoring, that the first section of the noise bund to be constructed was that section parallel to Peats Ridge Road at the easternmost corner of the site, south of the driveway into the quarry.

The bunding at this area was being constructed by means of two CAT 627G scrapers working in tandem transporting overburden from a centrally-located stockpile, which itself was managed by a small CAT D7H dozer.

On this first day of construction, no other activity at the site was observed, except for sporadic land clearing undertaken by a front end loader.

### Noise Criteria

The DEC's conditions of consent nominate noise criteria specific to the four week acoustic barrier construction program. In recognition of its relatively short duration in relation to the longer term extraction operations at the quarry, the DEC has nominated less-stringent noise objectives for barrier construction program. These noise criteria are specified in terms of the  $L_{Aeq,15min}$  noise descriptor and are detailed in Table 4.1 of the Noise Monitoring Program (NMP). For convenience, these criteria are repeated in Table 1 below which also includes the Location ID codes used to identify the residences in the NMP.

Table 1  *$L_{eq,15min}$  Noise Criteria for Works Relating to the Construction of Acoustic Barrier*

Receiver	NMP Location ID	Criterion ( $L_{eq,15min}$ dBA)
Gazzana Residence	CN-1	56
King Residence	CN-2	55
Kashouli Residence	CN-3	56
Townsend Residence	CN-4	50
Rozmanec Residence	CN-5	55

Notes: Noise Criteria are as nominated in Table 4.1 of Noise Management Program

### Noise Monitoring

Monitoring of the total noise from the construction of the acoustic barrier was undertaken from the five residential receivers identified in the NMP as being most affected, between the hours of 11.00am and 5.00pm on Monday, 16 January 2006.

Noise monitoring was undertaken using a Bruel and Kjaer Type 2230 Sound Level Meter. This 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 01dB Cal02 acoustic calibrator. No significant system drift was noted over the measurement period.

During the monitoring period, aside from the very intermittent deployment of a front end loader for minor land clearing, activity, noise from the site was contained to the operation of the two scrapers and the D7 dozer. The scrapers transported overburden spoil from a centrally-located stockpile to the eastern corner of the quarry (south-east of the entrance driveway). The activity of the D7H Dozer was contained to the stockpile, the top of which sat approximately 5-7m above local ground level.

Noise monitoring was undertaken from that facade most exposed to quarry construction activities at each of the five residences identified in the NMP (refer to Figure 1), namely:

- the Gazzana residence (CN-1);
- the King residence (CN-2);
- the Kashouli residence (CN-3);
- the Townsend residence (CN-4), and
- the Rozmanec residence (CN-5).

A summary of the results of the noise monitoring surveys are presented in Table 2.

*Table 2 Results of Noise Monitoring of Noise from Barrier Construction Works*

Receiver	NMP Location ID	Criterion (Leq,15min dBA)	Measured Noise Level (Leq,15min dBA)	Comments
Gazzana Residence	CN-1	56	56	Construction clearly audible. Estimate background noise as <50dBA
King Residence	CN-2	55	48	Construction clearly audible. Background noise: 42dBA from crickets.
Kashouli Residence	CN-3	56	45	Construction audible. Estimate background noise as 41dBA from crickets
Townsend Residence	CN-4	50	57 *	Construction noise audible. Estimate background noise as 52dBA from crickets
Rozmanec Residence	CN-5	55	48	Construction noise audible. Estimate background noise as 44dBA

\* Wind prevailing at the time of noise monitoring at the Townsend residence may have affected the measured level of noise.

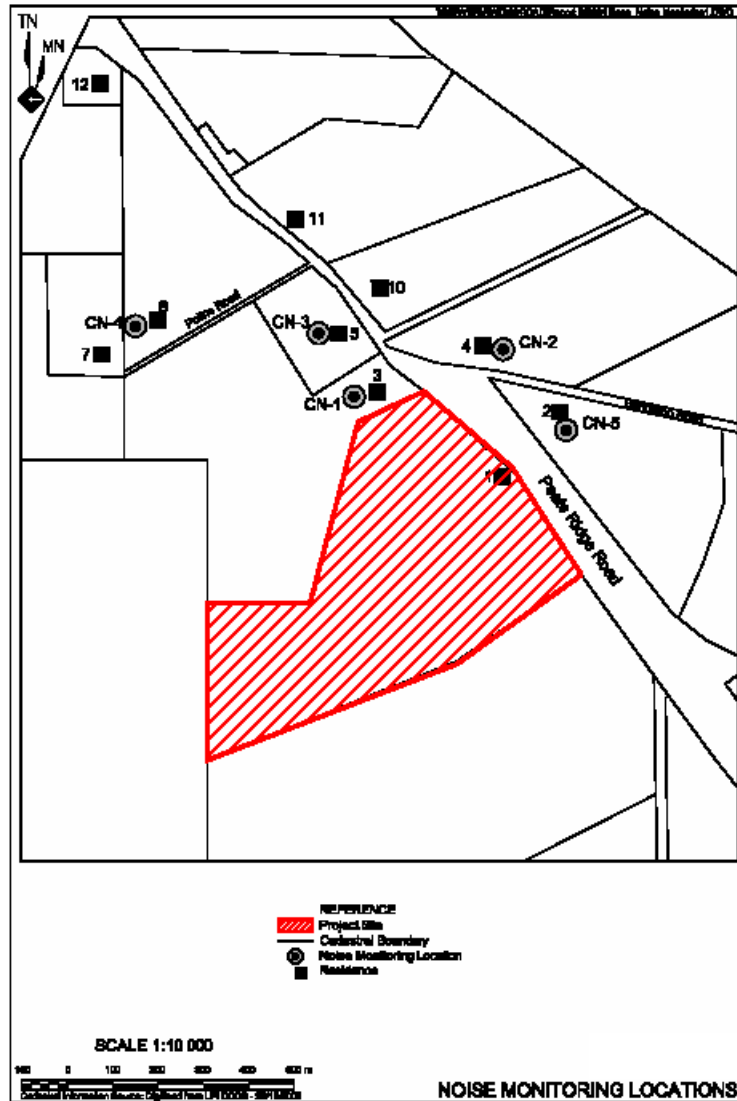


Figure 1 Noise Monitoring Locations (Identified as CN-1 to CN-5)

## Discussion

As indicated in Table 2, the  $L_{Aeq,15min}$  level of construction noise at the surrounding residences ranged from 45-57dBA. For all but one receiver, construction noise levels complied with the relevant DEC noise objectives. The level of construction noise measured from the Townsend residence was up to 7dBA higher than the respective noise objective although it is possible that construction noise levels at the time were influenced by wind gusts

– although local meteorological data indicates that at the time, regional winds were primarily from the nor-east.

Where other receivers such as the Rozmanec, King and Kashouli residences benefited from shielding provided by either the local topography or adjacent buildings, the Townsend residence was observed to have a direct line of sight to the construction works, and in particular the elevated stockpile area, upon which, the graders were at their noisiest.

It was noted on the day of monitoring that the relative level (RL) of the stockpile was approximately 5-6m above the local ground level at the commencement of works that day. The height of the stockpile was observed to be notably lowered by the end of works that day. Further, advice from Rocla indicated that the stockpile was expected to be diminished to below local ground level within the days after the commencement of works. At such time it would be anticipated that construction noise levels to most residences and particularly, the Townsend residence, will be much reduced compared to the construction noise levels presented in Table 2. The extent to which the total construction noise level would be reduced would differ depending on the receiver considered, but in the case of the Townsend residence, a reduction of 3-5dBA may be likely.

Our discussion with Mr Townsend at the time of monitoring indicated that he and his wife were not disturbed by the level of construction noise.

In addition, Rocla is considering additional noise mitigation measures inclusive of:

- Re-arranging the sequencing of construction works such that those sections of the acoustic barrier nearest the northern and western boundaries be completed first so as to sooner protect nearby residences;
- Investigating alternative non-audible warning systems for the D7 dozer which on the day of monitoring was observed to frequently sound its reversing alarm. (Notably, no reversing alarms were heard from either of the scrapers which had been programmed to operate in only a forward direction at all times). Rocla has undertaken to introduce any safe and practically-applicable alternative as soon as possible.

I trust this information is sufficient. Please don't hesitate to contact us if you require further information.

Yours faithfully  
WILKINSON MURRAY PTY LIMITED

David Borella  
Senior Acoustic Engineer