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STONECO TIMOR QUARRY

NOISE COMPLIANCE SURVEY – FEBRUARY 2018

REPORT J0241-01-R1
15 FEBRUARY 2018

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1 INTRODUCTION

This report presents results from a noise compliance survey at the nearest sensitive receptor to Stoneco's Timor Quarry located on Lot 11 DP 1161503 Timor Crawney Road, Timor. The quarry includes a limestone extraction area and a processing plant, both on the northern side of a ridgeline that runs approximately east-west. The quarry is operated according to Development Consent 308/2008 granted by Upper Hunter Shire Council in June 2009 and confirmed by the Land & Environment Court in June 2010, and according to Environment Protection Licence (EPL) 13397 issued by the EPA.

The noise survey described in this report was commissioned by Stoneco for submission to the EPA and/or Council to confirm compliance with EPL Condition L6.1 and relevant development consent conditions. The survey included noise compliance measurements over 15 minute periods taken on Monday 5 February 2018.

2 PROCEDURE AND CRITERIA

2.1 Noise Criteria

EPL 13397 Condition L6.1 specifies a noise limit of 35 LAeq,15min at Residence R2 'Caves Ridge' during the day, from 7 am to 6 pm. The LAeq,15min is the acoustic average noise level from quarry sources, excluding noise from other non-quarry sources. EPL Condition L6.2 requires noise from the quarry to be measured at the most affected point within 30 m of the residence, however the EPA will accept noise measurement results from an alternative acoustically equivalent location.

2.2 Noise Monitoring Location

Two residences are located within audible range of the quarry:

- The McIntyre residence on Lot 1 DP 590486 opposite the quarry access road. This residence is understood to be subject to acquisition by Stoneco upon request from the owner, and was therefore excluded from the noise survey; and
- The Vaughan residence known as 'Caves Ridge' on Lot 214 DP 44391 on the south eastern side of the Isis River approximately 720 m east of the quarry's limestone extraction area. This residence is specifically required to be included in the noise survey by EPL Condition L6.1.

An attempt was made by Stoneco management to advise the Vaughan family of the noise survey and request access to the property, however telephone contact could not be made at that time. In the absence of confirmed permission to enter the property, a noise monitoring location adjacent to Timor Crawney Road and the property's driveway was selected. This location is a similar distance from the quarry, therefore represents an acceptable alternative location for noise monitoring. The area plan in Appendix B indicates the location of the quarry, residences and the noise monitoring location.

2.3 Data Collection and Interpretation

Noise measurements were taken with a Svan 957 sound level meter complying with Type 1 accuracy requirements of AS1259. The instrument was mounted on a tripod with the microphone approximately 1.5 m above the ground and fitted with a windshield. The sound level meter was programmed to measure and store one second 1/3 octave LAeq noise levels in the audible frequency range of 20 Hz to 20 kHz for each 15 minute measurement period. Detailed notes taken by the operator enable subsequent processing of the results, including:

- Assigning measured noise levels to either Timor Quarry or other non-quarry sources including road traffic, birds, dogs and wind. Noise levels were primarily separated by frequency, with 1/3 octave frequency bands above 1 kHz assigned to non-quarry sources such as birds and insects. Further separation by time, based on detailed notes regarding audible sources during the noise measurement period, allows the separate noise contribution from the quarry to be determined;
- Testing the separate quarry noise contribution for tonality, based on the definition of tonality in the *NSW Noise Policy for Industry* (NPI) which replaced the *NSW Industrial Noise Policy* in October 2017; and
- Testing the separate quarry noise contribution for low frequency content by comparing the measured noise levels in 1/3 octave bands to the recommended thresholds in Fact Sheet C attached to the NPI.

If the separate quarry noise contribution satisfies the definitions of tonal or low frequency noise at a monitoring location, a correction factor of +2 or +5 dBA is added to the dBA level before comparison with the criterion at that location, as recommended in the NPI. If the tonal noise occurs in the low frequency range then only one +5 dBA correction factor is applied, also as recommended in the NPI.

3 ASSESSMENT

3.1 Quarrying Operations

Immediately prior to the noise survey the quarry was visited to determine operating conditions, although only the processing plant was visited in the absence of contact with operations staff working in the extraction area. The processing plant was observed to be operating, however the extraction area is elevated and not visible from the processing area therefore operating conditions in the extraction area could not be determined.

3.2 Measured Noise Levels

The first noise measurement over a 15 minute period occurred from 11:44 am to 11:59 am and did not include any audible noise from the quarry. Measured noise levels were primarily due to birds, insects, wind action in nearby trees and a car passby and ranged from below 30 dBA to over 65 dBA as the car passed the microphone. Weather conditions were suitable for noise monitoring with light winds in the range 0.5 to 1.5 m/s from the south.

Shortly after the end of the first noise measurement, some quarry noise became audible. This first noise measurement was then considered a background noise measurement and a second measurement was taken at the same location.

The second noise measurement occurred from 12:01 pm to 12:16 pm. Audible quarry noise included impact sounds that were most likely due to an excavator bucket and to material being deposited into an empty truck body. Excavator track noise and truck engine noise was also audible at times. Other sources included birds, insects and wind. A short period of dominant wind noise at approximately 9 minutes into the measurement period was removed from the quarry noise contribution, with remaining noise up to and including the 1 kHz frequency band attributed to the quarry.

Quarry noise levels were generally around 25 dBA, with peaks due to impacts generally up to 35 dBA and one peak up to 39 dBA due to an excavator bucket impact. An average quarry noise contribution of 27 LAeq,15min, averaged over 14 minutes 44 seconds excluding the period of dominant wind noise, has been determined from the measurement results.

Quarry noise remained well below the low frequency thresholds recommended in the NPI and the average quarry noise level was not considered tonal as defined in the NPI. A total of 11 seconds of noise were considered tonal in the 160 Hz frequency band, approximately 20 seconds before the end of the measurement period which coincided with audible truck noise. Applying a +5 dBA tonal correction to

quarry noise levels in this 11 second period increased the average noise level by 0.2 dBA (from 26.9 to 27.1 dBA) which did not significantly affect the result.

Figure 1: Measurement 1, 5 February 2018 11:44 to 11:59.

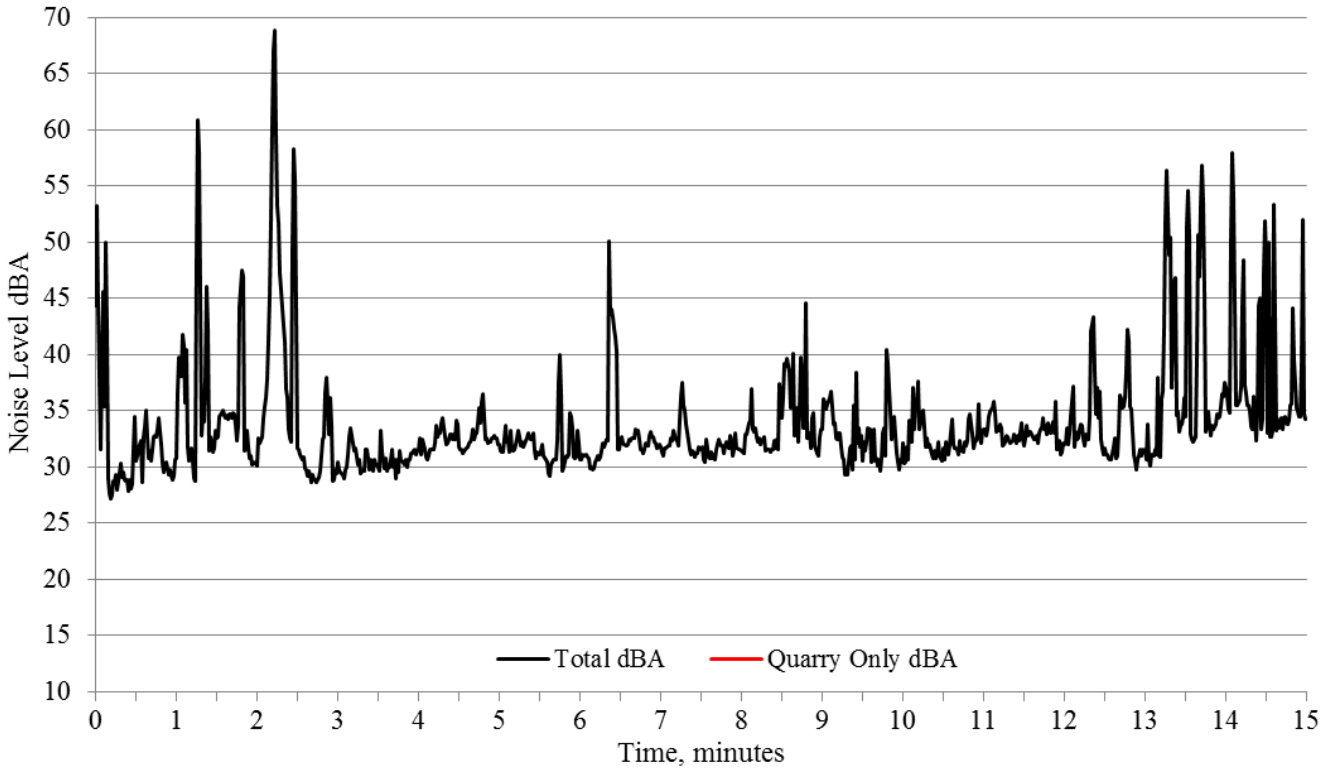
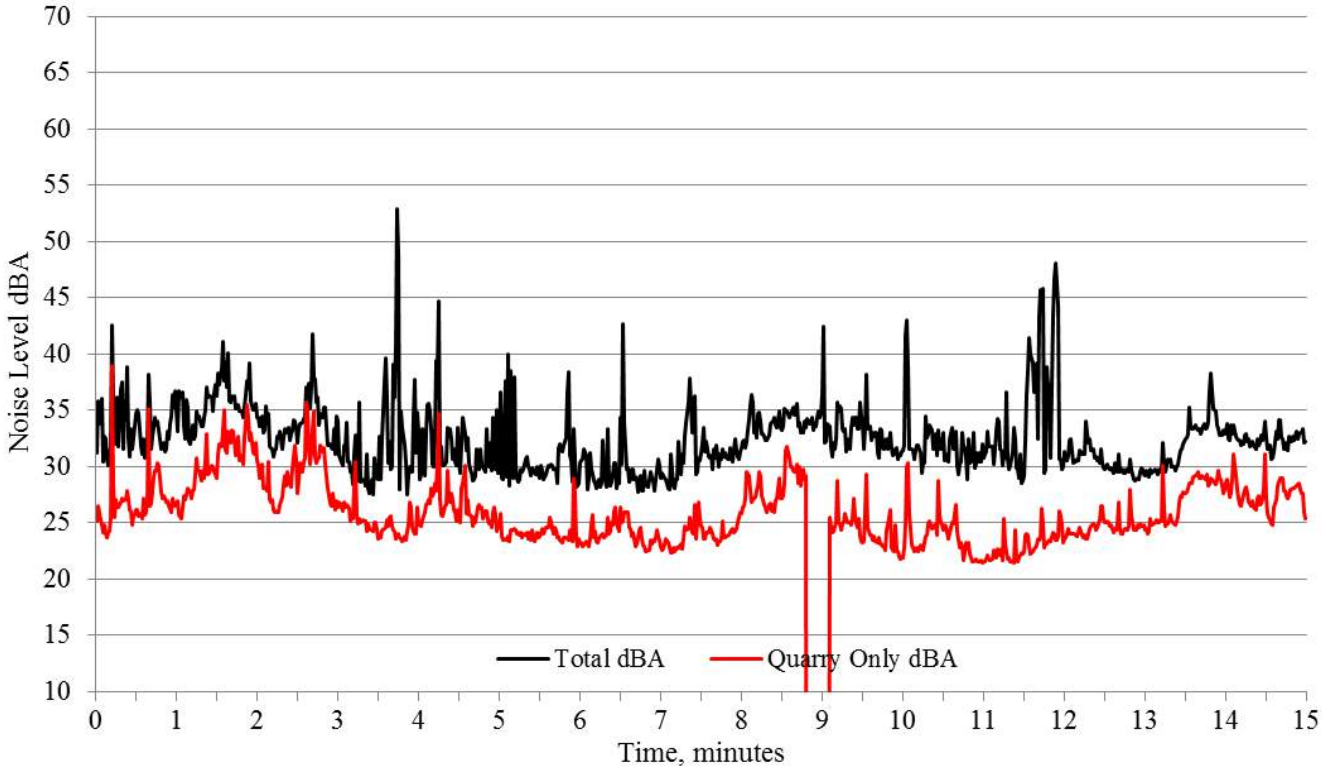


Figure 2: Measurement 2, 5 February 2018 12:01 to 12:16.



4 CONCLUSION

This report describes results from a noise compliance assessment at a location representing the nearest residence to Timor Quarry, excluding a residence subject to acquisition upon request by the owner. A quarry noise level of 27 LAeq,15min has been determined from the noise measurements, taken during a light southerly wind.

Results described in this assessment, based on noise measurements taken on 5 February 2018, indicate the Timor Quarry noise contribution was well below the EPL noise limit of 35 LAeq,15min at the residence and is therefore considered acceptable.

APPENDIX A – INSTRUMENT CALIBRATION CERTIFICATES

CERTIFICATE OF CALIBRATION

CERTIFICATE NO.: **SLM 18934 & FILT 1304**

Equipment Description:	Sound & Vibration Analyzer		
Manufacturer:	Svantek		
Model No:	Svan-957	**Serial No:**	23829
Microphone Type:	7052E	**Serial No:**	55424
Filter Type:	1/3 Octave	**Serial No:**	23829
Comments:	All tests passed for class 1. (See over for details)		
Owner:	Bridges Acoustics 78 Woodglen Close Paterson, NSW 2421		
Ambient Pressure:	996 hPa ±1.5 hPa		
Temperature:	23 °C ±2° C	**Relative Humidity:**	39% ±5%
Date of Calibration:	08/06/2016	**Issue Date:**	17/06/2016

Acu-Vib Test Procedure: AVP10 (SLM) & AVP06 (Filters)

CHECKED BY: ..... AUTHORISED SIGNATURE: ..... Jack Kidd

Accredited for compliance with ISO/IEC 17025
The results of the tests, calibration and/or measurements included in this document are traceable to Australian/national standards.

NATA
WORLD RECOGNISED ACCREDITATION

Accredited Lab. No. 9262
Acoustic and Vibration Measurements

ACU-VIB
ELECTRONICS

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web site: www.acu-vib.com.au

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CERTIFICATE OF CALIBRATION

CERTIFICATE NO: 20770

EQUIPMENT TESTED: Sound Level Calibrator

Manufacturer: O1dB
Type No: CAL01 **Serial No:** 000853
Owner: Bridges Acoustics
78 Woodglen Close
Paterson, NSW 2421

Tests Performed: Measured output pressure level was found to be:

Parameter	Pre-Adj	Adj Y/N	Output: (db re 20 µPa)	Frequency: (Hz)	THD&N (%)
Level 1:	NA	N	94.14	1000.0	1.12
Level 2:	NA	N	114.08	1000.0	0.56
Uncertainty:			±0.11 dB	±0.05 Hz	±0.2 %
Uncertainty (at 95% c.l.) k=2					

CONDITION OF TEST:
Ambient Pressure: 1010 hPa ±1.5 hPa **Relative Humidity:** 47% ±5%
Temperature: 21 °C ±2° C
Date of Calibration: 05/06/2017 **Issue Date:** 05/06/2017
Acu-Vib Test Procedure: AVP02 (Calibrators)
Test Method: AS IEC 60942 - 2004
CHECKED BY: ..... **AUTHORISED SIGNATURE:** .....
Jack Kielt

Accredited for compliance with ISO/IEC 17025
The results of the tests, calibration and/or measurements included in this document are traceable to Australian/national standards.

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APPENDIX B – AREA PLAN

Base plan from SIX Maps, 2018.