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Cooma Road Quarry Quarterly Noise Monitoring Assessment

Quarter 2 2024



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Cooma Road Quarry Quarterly Noise Monitoring Assessment

Quarter 2 2024

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Abbreviations and Definitions

Ambient Noise	The all-encompassing noise within a given environment. It is the composite of sounds from many sources, both near and far.
Background noise	The underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed. This is described using the LA90 descriptor (see below).
dB	Abbreviation for decibel, a measure of sound equivalent to 20 times the logarithm (to base 10) of the ratio of a given sound pressure to a reference pressure, and 10 times the logarithm of a given sound power to a reference power.
dB(A)	A measure of A-weighted sound levels. A Weighting is an adjustment made to the sound level measurement to approximate the response of the human ear.
Extraneous noise	Noise resulting from activities that are not typical of the area. Atypical activities may include construction, and traffic generated by holiday periods. Normal daily traffic is not extraneous noise.
LA1	The noise level, measured in dB(A), which is exceeded for 1 per cent of the measurement period.
LA1(1min)	The noise level, measured in dB(A), which is exceeded for 1 per cent of the time over a 1-minute measurement period, i.e., is exceeded for 0.6 seconds. This measure can approximate to the maximum noise level but may be less if there is more than 1 noise event during this 0.6 second period.
LA10	The noise level, measured in dB(A), which is exceeded for 10 per cent of the time.
LA90	The noise level, measured in dB(A), which is exceeded for 90 per cent of the time, referred to as the background noise level. This is considered to represent the background noise (see above).
LAeq	The level of noise equivalent to the energy average of noise levels occurring over a defined measurement period.
LAeq (period)	The average equivalent noise level, measured in dB(A), during a measurement period (e.g., 15-minute, day, evening, or night).
LAm_{ax}	The A-weighted sound pressure level that represents the maximum noise level measured over the time that a given sound is measured.
NMA	Noise Monitoring Assessment
NMP	Noise Management Plan
SPL	The Sound Pressure Level. Sound pressure is the fluctuation in air pressure, from the steady atmospheric pressure, created by sound. The sound pressure level is the sound pressure expressed on a decibel scale.

Source: Noise Guide for Local Government (NSW EPA, 2023)

1. Overview

1.1 Project Driver

Ramboll Australia Pty Ltd (Ramboll) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for Cooma Road Quarry (“the quarry”) at Googong, NSW.

This NMA was done in accordance with the following documents:

- Noise Policy for Industry (NPfI) (NSW EPA, 2017).
- Cooma Road Quarry Noise Management Plan (NMP) (Holcim Australia, 2019).
- Development Consent Application Number SSD_5109 (Minister for Planning and Infrastructure, 2013).
- Environment Protection Licence (EPL) number 1453 (NSW EPA, 2020).
- Australian Standard AS 1055:2018 Acoustics—Description and measurement of environmental noise (Standards Australia, 2018).
- Australian Standard AS/NZS IEC 61672.1:2019 Electroacoustics – Sound level meters, Part 1: Specifications (Standards Australia and Standards New Zealand, 2019)
- IEC 60942:2017 Electroacoustics - Electroacoustics – Sound calibrators (International Standard, 2017).

This NMA has been undertaken for the quarterly period April to June 2024, and forms part of the monitoring program to determine compliance with conditions of the Development Consent.

1.2 Site Location and Sensitive Receivers

The quarry is in Googong, approximately 6 kilometres south of Queanbeyan, NSW.

Sensitive receivers surrounding the quarry are primarily rural and residential properties in all directions. Old Cooma Road is located to the east of the quarry and passing road traffic is a dominate noise source for those receivers to the east of the quarry. Five monitoring locations have been selected as part of the NMA and in accordance with the Development Consent and are shown in **Table 1-1**.

Table 1-1: Monitoring locations locality and sensitive receivers

Monitoring Locations	Locality and Sensitive Receivers
N3	West of the quarry situated on a rural property off Copperfield Place. This location represents residential and rural receivers to the west of the quarry.
N8	Northeast of the quarry along Tempe Crescent and is representative of residential receivers in that area.
N38	On Heights Road and is representative of the elevated residential receivers to the east of the quarry.
N60	At 501 Old Cooma Road and represents the residence adjacent to the quarry access road.
N67	Situated on a rural property at 732 Old Cooma Road to the south of the quarry. This is representative of rural and residential receivers to the south, with direct line of site into the quarry pit

The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan shown in **Figure 1**. The NMP states attended monitoring is to be undertaken within

30 metres of a private residence, where possible. During this NMA, monitoring at most locations (N3, N8, N60, and N67) was undertaken where safely accessible at each property boundary which was approximately 100 to 200 metres from each property dwelling.



RAMBOLL AUSTRALIA - GIS MAP file : 318000911 GIS PO06 NoiseMonitoring | F003 NoiseMonitoring_CoomaRd_V03 | 29/01/2021
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- Legend**
- Noise monitoring location
 - Property dwelling



Figure 1: Noise monitoring locations at Cooma Road Quarry

2. Noise Criteria

Table 2-1 brings the applicable noise criteria outlined in the Development Consent for the residential receivers surrounding the quarry (N1–N71), and the five monitoring locations adopted from the NMP that are deemed representative and applicable for this NMA (N3, N8, N38, N60, and N67).

Table 2-1: Monitoring locations and noise criteria

Receiver ¹	Monitoring Locations	Morning Shoulder ²	Day ³	Evening ⁴
		LAeq (15min)	LAeq (15min)	LAeq (15min)
		dB(A)		
N1, N7, N8, N56, N57, N59, N63, N64, N65	N8	40	44	39
N67	N67	36	41	35
All other receivers between N9 and N71 inclusive	N60, N38	36	38	35
All other receivers	N3	35	35	35
¹ Refer to Appendix 5 of the Consolidated Development Consent – SSD 5109 (DOC19/541449) and/or the NMP for receiver locations on the map. ² 6 am–7 am Monday to Saturday ³ 7 am–6 pm Monday to Saturday ⁴ 6 pm–10 pm Monday to Saturday Note: No operations on Sundays and public holidays				

3. Methodology

The monitoring program was developed in accordance with the procedures described in Australian Standard AS 1055:2018 and the Approval Documents referenced in Section 1.

The operator-attended measurements were carried out using a RION Sound Level Meter NL-52 on Thursday 2 May 2024, Tuesday 4 June 2024 and Wednesday 5 June 2024. The acoustic instrumentation implemented carries current NATA calibration and complies with AS/NZS IEC 61672-1:2019 Class 1. Calibration of all instrumentation was checked prior to and following the measurements using a Pulsar Acoustic Calibrator 105 which also carried a current NATA calibration and complies with IEC 60942:2017. Drift in calibration did not exceed ±0.3 dBA.

The attended noise monitoring was conducted for 15-minutes in duration during the day, evening, and night periods over three days at each monitoring location. Where possible, throughout each measurement the operator(s) quantified the contribution of each significant noise source.

Where the plant was not distinctly audible during the attended monitoring, the quarry contribution is estimated to be at least 10 dBA below the ambient noise level, as determined by the LA90.

3.1 Meteorological Conditions

Meteorology has an important influence on noise monitoring assessment. Where an onsite meteorological station with data recorded at 10m height has not been available, the nearest Bureau of Meteorology data has been adopted to inform this assessment and modelled using The Air Pollution Model (TAPM) to determine the atmospheric stability category as outline in **Table 3-1**.

Table 3-1: Classification of Atmospheric Stability (NSW EPA, 2014)

Stability Classification	Pasquill Stability Category	Ambient temperature change with height (°C/100m)
Extremely unstable	A	$\Delta T \leq -1.9$
Moderately unstable	B	$-1.9 < \Delta T \leq -1.7$
Slightly unstable	C	$-1.7 < \Delta T \leq -1.5$
Neutral	D	$-1.5 < \Delta T \leq -0.5$
Slightly stable	E	$-0.5 < \Delta T \leq 1.5$
Moderately stable	F	$1.5 < \Delta T \leq 4.0$
Extremely stable	G	$\Delta T > 4.0$

As stated in the Development Consent, the noise criteria in Table 2-1 applies under all meteorological conditions except the following:

- During periods of rain or hail
- Average wind speed at microphone height exceeds 5 m/s
- Wind speeds greater than 3 m/s measured at 10 m above ground level
- Temperature inversion conditions greater than 3°C/100m.

Appendix 9 of the Development Consent also specifies that except for wind speed at microphone height, the data to be used for determining meteorological conditions must be that recorded by the meteorological station on or in the vicinity of the site.

4. Results and Discussion

4.1 Location N3

Noise monitoring at location N3 conducted on Thursday 2 May 2024, Tuesday 4 June 2024 and Wednesday 5 June 2024 resulted in inaudible quarry noise during morning shoulder and day periods. The quarry was not operational during the evening period. Measured ambient noise sources include background road traffic, frogs, wind, birds, and aircraft. These results satisfy the established noise criteria and indicate that noise emissions from Cooma Road Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location N3 are presented in **Table 4-1**.

Table 4-1: Noise survey results and observations for Location N3

Date	Time (hrs)	Descriptor (dBA)			Meteorology (Handheld at microphone height)	Onsite Met Station (2m height)	Apparent Noise Source, Description and SPL (dBA)	Cooma Road Quarry LAeq(15min) (dBA) Contribution	LAeq(15min) Criteria (dBA)
		L _{Amax}	L _{Aeq}	L _{A90}					
2-05-24	6:24am to 6:39am (Morning Shoulder)	54.7	34.5	27.2	WD: n/a WS: 0 m/s Rain: Nil	WD: N WS: 1.8 m/s Rain: nil Stability Category: E ¹	Background wind/motorway 24-32 Dog barking 34-54 Quarry inaudible	<17	35
5-06-24	8:36am to 8:51am (Day)	63.2	39.5	34.8	WD: n/a WS: 0 m/s Rain: Nil	WD: N WS: 0.9 m/s Rain: nil Stability Category: D ¹	Background motorway 32-63 Quarry inaudible	<25	35
4-06-24	6:00pm to 6:15pm (Evening)	61.1	43.3	40.0	WD: n/a WS: 0 m/s Rain: Nil	WD: n/a WS: 0 m/s Rain: Nil Stability Category: G ¹	Background motorway 38-42 Aircraft 55 Frogs 43 Quarry not operational	n/a ²	35

¹ Modelled using TAPM to determine Stability Category.

² Quarry not operational.

4.2 Location N8

Noise monitoring at location N8 on Tuesday 4 June 2024 and Wednesday 5 June 2024 resulted in inaudible quarry noise during morning shoulder and day periods. The quarry was not operational during the evening period. Measured ambient noise sources included road traffic and passing cars on Tempe Crescent. These results satisfy the established noise criteria and indicate that noise emissions from Cooma Road Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location N8 are presented in **Table 4-2**.

Table 4-2: Noise survey results and observations for Location N8

Date	Time (hrs)	Descriptor (dBA)			Meteorology (handheld at microphone height)	Onsite Met Station (2m height)	Apparent Noise Source, Description and SPL (dBA)	Cooma Road Quarry LAeq(15min) (dBA) Contribution	LAeq(15min) Criteria (dBA)
		LAmx	LAeq	LA90					
5-06-24	6:00am to 6:15am (Morning Shoulder)	76.9	58.4	43.8	WD: n/a WS: 0 m/s Rain: Nil	WD: N WS: 0.4 m/s Rain: nil Stability Category: E ¹	Background motorway 34-76 Car passing on Tempe Crescent 60-62 Quarry inaudible	<34	40
5-06-24	7:29am to 7:44am (Day)	72.3	61.3	56.6	WD: n/a WS: 0 m/s Rain: Nil	WD: N WS: 0.7 m/s Rain: nil Stability Category: E ¹	Background motorway 47-72 Car passing on Tempe Crescent 71 Quarry inaudible	<47 ²	44
4-06-24	6:26pm to 6:41pm (Evening)	73.2	59.6	52.5	WD: n/a WS: 0 m/s Rain: Nil	WD: n/a WS: 0 m/s Rain: Nil Stability Category: G ¹	Background motorway 46-73 Quarry not operational	n/a ³	39

¹ Modelled using TAPM to determine Stability Category.

² Measured LA90 value of 57 was dominated by road traffic noise so unable to estimate contribution for quarry at assessment location.

³ Quarry not operational.

4.3 Location N38

Noise monitoring at location N38 conducted on Tuesday 4 June 2024 and Wednesday 5 June 2024 resulted in inaudible quarry noise during morning shoulder and day periods. The quarry was not operational during the evening period. Measured ambient noise sources included road traffic and passing cars on Heights Road. These results satisfy the established noise criteria and indicate that noise emissions from Cooma Road Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location N38 are presented in **Table 4-3**.

Table 4-3: Noise survey results and observations for Location N38

Date	Time	Descriptor (dBA)			Meteorology (handheld at microphone height)	Onsite Met Station (2m height)	Apparent Noise Source, Description and SPL (dBA)	Cooma Road Quarry LAeq(15min) (dBA) Contribution	Laeq(15min) Criteria (dBA)
		LAmax	Laeq	LA90					
5-06-24	6:15am to 6:30am (Morning Shoulder)	75.6	56.5	43.9	WD: n/a WS: 0 m/s Rain: Nil	WD: N WS: 0.4 m/s Rain: nil Stability Category: E ¹	Background motorway 38-75 Quarry inaudible	<34	36
5-06-24	7:48am to 8:03am (Day)	72.4	58.3	49.6	WD: n/a WS: 0 m/s Rain: Nil	WD: N WS: 1.1 m/s Rain: nil Stability Category: E ¹	Background motorway 43-72 Car passing on Tempe Crescent 61 Quarry inaudible	<40 ^{3,4}	38
4-06-24	6:45pm to 7:00pm (Evening)	72.2	55.1	47.2	WD: n/a WS: 0 m/s Rain: Nil	WD: n/a WS: 0 m/s Rain: Nil Stability Category: G ¹	Background motorway 42-72 Quarry not operational	n/a ²	35

¹ Modelled using TAPM to determine Stability Category.

² Quarry not operational.

³ Measured LA90 value of 50 was dominated by road traffic noise so unable to estimate contribution for quarry at assessment location.

⁴ Negligible exceedance (NPF1 2017 – Table 4.1 and Table 4.2)

4.4 Location N60

Noise monitoring at location N60 conducted on Tuesday 4 June 2024 and Wednesday 5 June 2024 resulted in inaudible quarry noise during morning shoulder and day periods. The quarry was not operational during the evening period. Measured ambient noise sources included road traffic, and frogs. These results satisfy the established noise criteria and indicate that noise emissions from Cooma Road Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location N60 are presented in **Table 4-4**.

Table 4-4: Noise survey results and observations for Location N60

Date	Time	Descriptor (dBA)			Meteorology (handheld at microphone height)	Onsite Met Station (2m height)	Apparent Noise Source, Description and SPL (dBA)	Cooma Road Quarry LAeq(15min) (dBA) Contribution	LAeq(15min) Criteria (dBA)
		L _{Amax}	L _{Aeq}	L _{A90}					
5-06-24	6:45am to 7:00am (Morning Shoulder)	75.1	66.2	57.5	WD: n/a WS: 0 m/s Rain: Nil	WD: N WS: 0.4 m/s Rain: nil Stability Category: E ¹	Background motorway 48-75 Quarry inaudible	<48 ³	36
5-06-24	7:07am to 7:22am (Day)	79.3	67.4	55.8	WD: n/a WS: 0 m/s Rain: Nil	WD: N WS: 0.4 m/s Rain: nil Stability Category: E ¹	Background motorway 46-79 Quarry inaudible	<46 ³	38
4-06-24	7:25pm to 7:40pm (Evening)	73.7	61.3	46.1	WD: n/a WS: 0 m/s Rain: Nil	WD: n/a WS: 0 m/s Rain: Nil Stability Category: G ¹	Background motorway/frogs 34-73 Quarry not operational	n/a ²	35

¹ Modelled using TAPM to determine Stability Category.

² Quarry not operational.

³ Measured LA90 value of 56 was dominated by road traffic noise so unable to estimate contribution for quarry at assessment location.

4.5 Location N67

Noise monitoring at location N67 conducted on Tuesday 4 June 2024 and Wednesday 5 June 2024 resulted in inaudible quarry noise during morning shoulder and day periods. The quarry was not operational during the evening period. Measured ambient noise sources included road traffic. These results satisfy the established noise criteria and indicate that noise emissions from Cooma Road Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location N67 are presented in **Table 4-5**.

Table 4-5: Noise survey results and observations for Location N67

Date	Time	Descriptor (dBA)			Meteorology (handheld at microphone height)	Onsite Met Station (2m height)	Apparent Noise Source, Description and SPL (dBA)	Cooma Road Quarry LAeq(15min) (dBA) Contribution	LAeq(15min) Criteria (dBA)
		L _{Amax}	L _{Aeq}	L _{A90}					
5-06-24	6:30am to 6:45am (Morning Shoulder)	85.3	72.3	53.1	WD: n/a WS: 0 m/s Rain: Nil	WD: N WS: 0.4 m/s Rain: nil Stability Category: E ¹	Background motorway 39-85 Quarry inaudible	<43 ³	36
5-06-24	8:08am to 8:23am (Day)	85.0	74.3	60.7	WD: n/a WS: 0 m/s Rain: Nil	WD: N WS: 1.3 m/s Rain: nil Stability Category: D ¹	Background motorway 43-85 Quarry inaudible	<51 ³	41
4-06-24	7:06pm to 7:21pm (Evening)	79.9	64.9	47.7	WD: n/a WS: 0 m/s Rain: Nil	WD: n/a WS: 0 m/s Rain: Nil Stability Category: G ¹	Background motorway 33-79 Quarry not operational	n/a ²	35

¹ Modelled using TAPM to determine Stability Category.

² Quarry not operational.

³ Measured LA90 value of less than 61 was dominated by road traffic noise so unable to estimate contribution for quarry at assessment location.

5. Conclusion

This NMA was completed by Ramboll at the Holcim Cooma Road Quarry, Googong, NSW as a quarterly requirement of the NMP. Monitoring was carried out on Thursday 2 May 2024, Tuesday 4 June 2024 and Wednesday 5 June 2024 at five locations selected as representative to the sensitive receivers at the surroundings to Cooma Road Quarry.

No exceedances of the noise criteria were recorded, and quarry noise was inaudible at the selected monitoring locations during the monitoring campaign. The quarry was not operational during the evening periods.

The results presented in this NMA show compliance with the relevant noise criteria applicable to the operation of the Holcim Cooma Road Quarry, Googong, NSW.

6. References

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