

Annual Environmental Management Review (AEMR)

Cooma Road Quarry

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Table 1 - Site Details

<u>Name of operation</u>	Cooma Road Quarry
<u>Name of operator</u>	Holcim (Australia) Pty Ltd
<u>Development consent / project approval #</u>	SSD 5109
<u>Name of holder of development consent / project approval</u>	Holcim (Australia) Pty Ltd
<u>Annual Review start date</u>	January 1, 2016
<u>Annual Review end date</u>	December 31, 2016
<p><u>I, Daniel Lidbetter, certify that this audit report is a true and accurate record of the compliance status of the Cooma Road Quarry for the period of January 2016- December 2016 and that I am authorised to make this statement on behalf of Holcim (Australia) Pty Ltd.</u></p> <p><u>Note.</u></p> <p>a) <u>The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.</u></p> <p>b) <u>The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or \$22,000, or both).</u></p>	
<u>Name of authorised reporting officer</u>	Daniel Lidbetter
<u>Title of authorised reporting officer</u>	NSW Planning & Environment Coordinator
<u>Signature of authorised reporting officer</u>	
<u>Date</u>	March 31, 2016.

1.0 Statement of compliance

See Table 2 for statement of commitments for the 2015-16 reporting period for the Cooma Road Quarry. Table 3 details the non-compliances identified within the reporting period.

Table 2 - Statement of Commitments

Were all conditions of the relevant approval(s) complied with?
NO- see table below for further details.

Table 3 - Non Compliances

Relevant approval	Condition	Condition description (summary)	Compliance Status	Where addressed in Annual Review
SSD 5109	Schedule 2, Condition 23	Condition 23 (a) requires the Applicant to submit a survey plan of the boundaries of the approved limits of extraction, with applicable GPS coordinates, to the Director-General. The survey plan and GPS coordinates have not been submitted.	Non-compliant	Completed in the last Annual Review.
SSD 5109	Schedule 3, Condition 6	Condition 6 (d) requires the Applicant to regularly assess the results of noise monitoring to ensure compliance with the relevant conditions of the consent. No noise monitoring was not conducted from date of determination on 27 September 2013 until 28 June 2016.	Non-compliant	Section 6.1 (Noise)
SSD 5109	Schedule 3, Condition 7	Condition 7 requires the Applicant to prepare and implement a Noise Management Plan. The Plan was approved by the Department on 8 October 2014. Condition 7 (c) requires the Applicant to incorporate quarterly attended noise monitoring to evaluate the performance of the development against the noise criteria in Table 1. The quarterly attended noise monitoring was not implemented until June 2016.	Non-compliant	Section 6.1 (Noise)
SSD 5109	Schedule 3, Condition 12	Condition 12 (c) requires that the Applicant to operate a suitable system to enable the public to get up to date	Non-compliant	Section 6.5 (Blasting)

		information on the proposed blasting schedule on site. No system was in place.		
SSD 5109	Schedule 3, Condition 14	Condition 14 requires the Applicant to ensure all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions do not exceed the criteria in Tables 5 – 6. Depositional dust monitoring has occurred, but particulate matter monitoring had not been, and still was not being, carried at the date of the audit inspection. A HVAS was due to be installed shortly after the audit.	Non-compliant	Section 6.2 (Air Quality)
SSD 5109	Schedule 3, Condition 15	Condition 15 (b) requires the Applicant to regularly assess air quality monitoring data to ensure compliance with the relevant conditions of the consent. As particulate matter monitoring was not conducted, it was not possible to know if the Applicant was compliant with PM10 criteria required under the air quality criteria in Condition 14.	Non-compliant	Section 6.2 (Air Quality)

Table 4 - Compliance status key for Table 3

Risk level	Colour code	Description
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> potential for serious environmental consequences, but is unlikely to occur; or potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> potential for moderate environmental consequences, but is unlikely to occur; or potential for low environmental consequences, but is likely to occur

Administrative non-compliance	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)
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2.0 Introduction

Holcim (Australia) Pty Ltd (Holcim) operates the Cooma Road Quarry, a hard rock quarry located on Old Cooma Road in the Queanbeyan Local Government Area. The site operates under Development Consent (SSD 5109) approved by the New South Wales (NSW) Department of Planning & Infrastructure (now Department of Planning & Environment) on September 27, 2013.

The site also operates in accordance with the Environmental Protection Licence (EPL) No. 1453 issued by the Environmental Protection Authority.



Figure 1: Aerial view of the Cooma Road Quarry, located on Old Cooma Road, Queanbeyan.

In accordance with Schedule 5, Condition 4 of the modified Development Consent the site is required to undertake an Annual Review of the site in the following manner:

Annual Review

4. *By the end of March each year, the Applicant shall review the environmental performance of the development to the satisfaction of the Secretary. This review must:*

(a) *describe the development (including rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year;*

(b) *include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, which includes a comparison of these results against the: relevant statutory requirements, limits or performance measures/criteria; the monitoring results of previous years; and the relevant predictions in the EIS.*

(c) *identify any noncompliance over the last year, and describe what actions were (or are being) taken to ensure compliance;*

(d) *identify any trends in the monitoring data over the life of the development;*

(e) *identify any discrepancies between the predicted and actual impacts of the development,*

and analyse the potential cause of any significant discrepancies; and

(f) describe what measures will be implemented over the current calendar year to improve the environmental performance of the development.

This report documents the environmental performance of the site from January to December 2016.

3.0 Approvals

The site operates under the following approvals listed in the table below:

Table 5 - Approvals for Cooma Road Quarry Operations

Approval	Regulatory Authority
SSD 5109	Department of Planning & Environment
EPL No. 1453	Environmental Protection Authority

This Annual Review has been prepared in accordance with Condition 6.3 (Annual Performance Monitoring) of the Development Consent and in accordance with the *Annual Review Guideline: post approvals requirements for state significance mining developments* (October 2015).

4.0 Operations Summary

Development activities undertaken at the Cooma Road Quarry in 2016 included:

- Stripping of topsoil and overburden within the existing extraction limit boundary.
- Drill, Blast, Load and Haul Activities. Crushing, screening and stockpiling of product.
- Overburden removal and replacement in the southwest overburden dump.
- Maintenance of rehabilitation undertaken on the overburden dump in the southwestern disturbance area.

Operating hours in 2016 were undertaken between 6am to 6pm, Monday to Saturday. These 6am-6pm timeframes were applied for all operations on-site with no crushing, screening or vehicles movements after 6pm and before 10pm.

All activities took place within the approved operating hours in 2016.

Tables 6 includes a summary of the operations undertaken during the reporting period against the development consent conditions regarding product transported from Cooma Road Quarry.

Table 6 - Total Product Distributed (Holcim Cooma Road Quarry)

Material	Approved limit (specify source)	Previous reporting period	This reporting period (actual Tonnes)
Product Distributed- Total	1.5 Million Tonnes	587 377.68	647 251.55

Other operations

The site has not undertaken any development into the approved northern extension area and has operated within the existing footprint of the quarry throughout 2016. No new activities such as construction of the dam, workshop facilities or extraction in the extension area (approved under SSD 5109 Development Consent) have been undertaken.

Conditions relating to these activities include:

- Schedule 2, Condition 18 (Construction of new buildings or structures requiring structural adequacy).
- Schedule 2, Condition 19 (Demolition of existing structures or buildings).

Next reporting period

Development activities proposed to be carried out at Cooma Road Quarry in 2017, include:

- Stripping of topsoil and overburden within the existing extraction limit boundary (In both the Granite and Dacite Pits).
- Drill, Blast, Load and Haul Activities.
- Crushing, screening and stockpiling of product.
- Overburden removal and placement in the southwest overburden dump.
- Progressive maintenance of rehabilitation in the completed overburden dump in the southwestern disturbance area. Involving: replacement of topsoil, revegetation activities with native species and weed control.

5.0 Actions required from previous Annual Review

Actions required by the previous Annual Review are listed in the table below:

Table 7 - Actions required from previous Annual Review

<u>Condition</u>	<u>Non-compliance</u>	<u>Status</u>
Schedule 2, Condition 1:	Monitoring of Product Transport The Holcim Transport team are currently developing a report to capture all truck movements from the site over the 2015 period. This data was previously not available in the system to be published on the website and will be completed by May 1, 2016.	<u>Complete</u>
Schedule 3, Condition 4:	Quarterly Noise Monitoring Noise monitoring previously undertaken at the site does not meet the criteria of Development Consent for 15 minute continuous attended monitoring. This issue will be rectified in May 2016 with Quarterly noise monitoring to be undertaken by a qualified consultant and continued on a quarterly basis.	<u>Complete</u>

Condition	Non-compliance	Status
Schedule 3, Condition 14:	HVAS Monitoring Holcim have committed to the installation High Vol Air Sampler (HVAS) at the Cooma Road Quarry to satisfy this condition. This action will be completed following the transfer of an available HVAS monitoring station from another Holcim site by June 30, 2016.	<u>Complete</u>
Schedule 3, Condition 17:	Meteorological Monitoring Holcim have committed to the installation of a weather station at the Cooma Road Quarry to satisfy this condition. This action will be completed by June 30, 2016.	<u>Complete</u>

6.0 Environmental Performance

6.1 Noise

The site has undertaken quarterly noise monitoring throughout 2016 in accordance with the requirements of the Schedule 3, Condition 4 listed below:

4. The Applicant **must** ensure that the noise generated by the development does not exceed the criteria in Table 1 at any residence on privately-owned land

Table 1: Noise criteria dB(A)

Receiver	Day Shoulder 6 – 7 am	Day 7 am – 6 pm	Evening 6 – 10 pm
	L_{Aeq}(15 min)	L_{Aeq}(15 min)	L_{Aeq}(15 min)
N1, N7, N8, N56, N57, N59, N63, N64, N65	40	44	39
N67	36	41	35
All other receivers between N9 and N71 inclusive	36	38	35
All other receivers	35	35	35

Notes:

- To locate the receivers referred to in Table 1 refer to Appendix 5.
- After the first review on any EPL granted for this development under Section 78 of the POEO Act, nothing in this approval prevents the EPA from imposing stricter noise limits on the quarrying operations on site under the EPL.

Appendix 9 sets out the metrological conditions under which these criteria apply and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has a written agreement with the relevant landowner/s to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

All monitoring results for quarterly noise assessments have been undertaken in accordance with the conditions of consent. All results met the criteria of the Development Consent and have been attached as Appendix 1 to this report.

6.2 Air Quality

Dust Deposition monitoring was undertaken in accordance with the monitoring criteria detailed below:

Table 4: Long-Term Impact Assessment Criteria for Particulate Matter

Pollutant	Averaging period	^d Criterion
Total suspended particulates (TSP)	Annual	^a 90 µg/m ³
Particulate matter < 10 µm (PM ₁₀)	Annual	^a 30 µg/m ³

Table 5: Short Term Impact Assessment Criteria for Particulate Matter

Pollutant	Averaging period	^d Criterion
Particulate matter < 10 µm (PM ₁₀)	24 hour	^a 50 µg/m ³

The site installed a High Volume Sampling Unit (HVOL) to monitor PM10 in accordance with the criteria listed above. The site has commenced monitoring using ALS consultants and will provide all data in the 2017 reporting period.

Table 6: Long-Term Impact Assessment Criteria for Deposited Dust

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
^c Deposited dust	Annual	^b 2 g/m ² /month	^a 4 g/m ² /month

Notes to Tables 4-6:

- ^a Total impact (ie incremental increase in concentrations due to the development plus background concentrations due to all other sources);
- ^b Incremental impact (ie incremental increase in concentrations due to the development on its own);
- ^c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.
- ^d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the **Secretary** in consultation with EPA.

The site has undertaken dust deposition monitoring in accordance with the criteria listed in the Development Consent. All Annual Average results at the 5 locations are compliant with the consent criteria.

It was identified that 7 samples obtained at DDG 4 have been compromised from inundation from insects, bird droppings and organic matter (leaf litter and grass). A review of the current location for DDG 4 will be undertaken during the next reporting period to determine if this gauge should be relocated to a more suitable position.

Table 8 - Dust Monitoring (Dust Deposition)

Start Date	End Date	DDG 1	DDG 2	DDG 3	DDG 4	DDG 5
2/12/2015	12/1/2016	2.3	1.4	1.9	3.1	1
13/01/2016	16/02/2016	3.2	1.3	2.6	17.1	5.6
17/02/2016	3/3/2016	1.7	1.2	0.6	8.5	6.4
4/03/2016	4/4/2016	3.6	1.2	1.2	2.5	2.8
5/04/2016	5/5/2016	3.3	1.7	0.8	3.4	1.2

Start Date	End Date	DDG 1	DDG 2	DDG 3	DDG 4	DDG 5
6/05/2016	3/6/2016	2.4	1.1	0.4	3.8	0.4
4/06/2016	4/7/2016	1.7	0.8	0.5	7.7	7.9
5/07/2016	2/8/2016	2.6	1.2	0.5	20.3	5.1
3/08/2016	1/9/2016	3.1	1.1	0.4	19.2	0.7
2/09/2016	5/10/2016	3	1.5	0.7	51.9	1.2
6/10/2016	2/11/2016	3.6	1	0.9	26.7	0.2
3/11/2016	1/12/2016	4.5	1.2	0.7	6	0.7
Annual Average (4g/m ² /year)		2.92	1.23	0.93	3.76	2.77
Result		PASS	PASS	PASS	PASS	PASS

6.3 Traffic Management

The site undertook truck monitoring in 2016 in accordance with the criteria listed in the Development Consent conditions below:

Schedule 2, Condition 13

For the life of the development, the Applicant must ensure that:

(a) no more than an average of 48 truck movements per hour occur collectively to and from the site on any day; and

(b) no more than 30 laden trucks per hour are dispatched from the site.

The site maintained compliance with the conditions for truck movements throughout 2016. A copy of the truck movements recorded throughout 2016 are attached as Appendix 2 to this report.

6.4 Water Management

The site undertook water monitoring in 2016 in accordance with the criteria listed in the table below:

POINT 1

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
Oil and Grease	milligrams per litre				10
pH	pH				6.5-8.5
Total suspended solids	milligrams per litre				50

It is noted that the site did not discharge directly in Barracks Creek and all water monitoring listed in the table below is recorded from monitoring undertaken within the creek line, not from discharge.

Table 9 - Water monitoring results (Barracks Creek).

Criteria	Min	Max	Date	Result	PASS/FAIL
pH	6.5	8.5	12/01/2016	7.5	PASS
Total O&G	0	10	12/01/2016	1	PASS
Susp. Solids	0	50	12/01/2016	3	PASS
pH	6.5	8.5	1/02/2016	7.4	PASS
Total O&G	0	10	1/02/2016	1	PASS
Susp. Solids	0	50	1/02/2016	7	PASS
pH	6.5	8.5	4/03/2016	7.1	PASS
Total O&G	0	10	4/03/2016	1	PASS
Susp. Solids	0	50	4/03/2016	2	PASS
pH	6.5	8.5	12/04/2016	8.04	PASS
Total O&G	0	10	12/04/2016	< 1	PASS
Susp. Solids	0	50	12/04/2016	< 1	PASS
pH	6.5	8.5	9/05/2016	7.6	PASS
Total O&G	0	10	9/05/2016	<1	PASS
Susp. Solids	0	50	9/05/2016	2	PASS
pH	6.5	8.5	3/06/2016	7.6	PASS
Total O&G	0	10	3/06/2016	<1	PASS
Susp. Solids	0	50	3/06/2016	2	PASS
pH	6.5	8.5	2/08/2016	7.6	PASS
Total O&G	0	10	2/08/2016	<1	PASS
Susp. Solids	0	50	2/08/2016	<2	PASS
pH	6.5	8.5	1/09/2016	6.3	FAIL
Total O&G	0	10	1/09/2016	<1	PASS
Susp. Solids	0	50	1/09/2016	<2	PASS

pH	6.5	8.5	5/10/2016	7.4	PASS
Total O&G	0	10	5/10/2016	<1	PASS
Susp. Solids	0	50	5/10/2016	2	PASS
pH	6.5	8.5	1/11/2016	7.3	PASS
Total O&G	0	10	1/11/2016	<1	PASS
Susp. Solids	0	50	1/11/2016	3	PASS
pH	6.5	8.5	1/12/2016	7.2	PASS
Total O&G	0	10	1/12/2016	<1	PASS
Susp. Solids	0	50	1/12/2016	2	PASS

6.5 Blasting

The site undertook blasts in 2016 in accordance with the criteria listed in the table below:

Blasting Criteria			
9. The Applicant must ensure that the blasting on the site does not cause exceedances of the criteria in Table 3.			
<i>Table 3: Blasting Criteria</i>			
Location	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedance
Any residence on privately-owned land	120	10	0%
	115	5	5% of the total number of blasts over a period of 12 months
However, these criteria do not apply if the Applicant has a written agreement with the relevant owner or infrastructure provider/owner, and the Applicant has advised the Department in writing of the terms of this agreement.			

Results of blasting undertaken in 2016 are shown in the table below:

Table 10 - Blast monitoring results (Cooma Road Quarry).

Location	Test	Sample Date	Result	Comments
Heffernans House	Overpressure	16/02/2016	109.1	Compliant
	Vibration	16/02/2016	0.86	Compliant
Heffernans House	Overpressure	14/03/2016	91.9	Compliant
	Vibration	14/03/2016	0.56	Compliant
Heffernans House	Overpressure	15/04/2016	91.9	Compliant
	Vibration	15/04/2016	0.48	Compliant
Heffernans House	Overpressure	11/04/2016	101.9	Compliant

	Vibration	11/04/2016	1.01	Compliant
Heffernans House	Overpressure	23/05/2016	109.5	Compliant
	Vibration	23/05/2016	1.17	Compliant
Heffernans House	Overpressure	14/06/2016	103.7	Compliant
	Vibration	14/06/2016	1.98	Compliant
Heffernans House	Overpressure	21/07/2016	90.4	Compliant
	Vibration	21/07/2016	0.36	Compliant
Heffernans House	Overpressure	12/09/2016	105.2	Compliant
	Vibration	12/09/2016	0.4	Compliant
Heffernans House	Overpressure	13/12/2016	119.8	Non-compliant- This exceedance is allowable based on 5% of blasts over the 12 month period.
	Vibration	13/12/2016	1.11	Compliant

As noted in the table above, the site experienced an air blast overpressure exceedance when firing a blast on December 14, 2016. The blast registered 119.8 dB (criteria is 115 dB with a maximum upper limit of 120 dB for <5% blasts in a reporting period).

This issue was caused by a delayed initiation of at least 4 holes in the middle back row plus excessive rifling and stemming ejection.

No other blasts exceeded the 115 db criteria during the 2016 reporting period however, due to this result being quite high the Holcim ACT Management team initiated an investigation with blast contractors "MAXAM" to determine the cause of the event and corrective actions to ensure all future blasting activities are in compliance with EPL/Development Consent limits. This resulted in MAXAM being replaced by Orica as the primary contractor for blast operations at the site.

In accordance with the requirements of the DP&E permit compliance audit, the site has verified the nearest sensitive receivers and now alerts these locations within 24 hours of a proposed blast. This process is managed by the weighbridge staff who send a text message to the tenants the day before a planned blast is undertaken.

6.6 Summary of Environmental Performance

A summary of the performance of environmental management measures and sampling results are detailed in the table below.

Table 11 – Environmental performance

Aspect	Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented/ proposed management actions
Noise	EIS predictions are all below development consent criteria.	Quarter 1- 4 monitoring has met the Development Consent Criteria.	Consistently meets criteria.	None Required.
Air quality	EIS predictions are all below development consent criteria.	Dust deposition results are within criteria of EPL, EIS and Development Consent. PM10 monitoring has not been undertaken.	Dust deposition has been consistent with EIS and previous Annual Review reporting.	PM10 monitor installed and operational for 2017 reporting period.
Traffic Mgt	EIS predictions are all below development consent criteria.	Met the Development Consent Criteria.	Consistently meets criteria.	None Required.
Water Mgt	EIS predictions are all below development consent criteria.	Weekly pH monitoring regularly meets criteria. Groundwater has not been assessed during this reporting period.	Surface water consistently meets criteria. Groundwater has not been verified during this reporting period.	Groundwater assessment will be undertaken during the 2017 reporting period.

7.0 Rehabilitation and Landscape Management

The site has not planted any seedlings in 2016 with works focusing on maintenance and development of rehabilitation works already undertaken within the southwest overburden dump.

The works undertaken in 2014 covered approximately 1.6 hectares of disturbed area with planting consisting of native species (White Box and Yellow Box Gum) in accordance with the Cooma Road Rehabilitation Management Plan. Other works undertaken throughout 2015 for rehabilitation included: Weed and feral species control/ elimination in the rehabilitated area. Erosion control. Fertilisation of rehabilitated areas.

Re-seeding in areas as required. Works undertaken by the site in 2015 have been in accordance with the Rehabilitation Management Plan (Cooma Road Rehabilitation Strategy for the next 3 Years).

8.0 Community

Holcim has maintained community engagement measures during the reporting period by undertaking the following activities in accordance with Schedule 5, Condition 6 of the Development Consent:

- Maintenance of a website (containing publicly available documents).
- A telephone number, email and postal address (on the website) for community complaints and feedback.
- A copy of the Complaints Register is maintained on the company website.
- All documents and items displayed on the website are regularly updated by Holcim staff.

A review of the Holcim Safety, Health & Environment (SHE) reporting database (INX) did not identify any complaints from external stakeholders during the 2016 reporting period. A copy of the register has been included as Attachment 4 to this report.

The site implemented a Community Consultative Committee in 2014 as part of the conditions of consent. All minutes from each of the meetings undertaken in 2016 have been uploaded on the Holcim webpage in the Cooma Road profile.

9.0 Independent Audit

The site undertook an Independent Environmental Audit (IEA) in 2014 in accordance with the timeframes of the Development Consent. All actions raised in IEA have now been closed out in accordance with the recommendations made by EMM Consultants.

In accordance with Schedule 5, Condition 10 of the consent, the site is scheduled to undertake another IEA in 2017. A independent auditor will be commissioned prior to September 15, 2017 with the audit to be undertaken within 6 weeks of the Secretary's endorsement of the auditor.

10.0 Incidents and non compliance

All non-compliant items identified in the 2016 Department of Planning Audit have been closed out and rectified.

As noted in the Blasting section of this report the site experienced a non-compliance regarding the Air Blast Over-Pressure readings for a blast event undertaken on December 14, 2016. The high level result was reported to the EPA and DP&E representatives on December 15, 2016 in accordance with the requirements of the Development Consent and the *Protection of the Environment (Operations) Act 1997*.

A copy of the correspondence between Holcim, EPA and DP&E has been attached as Appendix 3 of this report.

11.0 Activities to be completed in the next reporting period

Holcim staff will undertake the following works and improvement measures and projects in 2017 to ensure compliance with the consent and to ensure that effective environmental management controls are in place and operating in accordance with the requirements of the Consent.

Table 12 - Improvement Actions (next reporting period)

Improvement Measure	Activities
Independent Environmental Audit	Staff will commission and undertake an Independent Environmental Audit in accordance with the Development Consent.
Progressive Rehabilitation	The site will continue to progressively rehabilitate available areas on the overburden dump.

12. Appendices

Quarterly Noise Monitoring Results (2016)

HOLCIM (AUSTRALIA) PTY LTD

Cooma Road Quarry

QUARTERLY ENVIRONMENTAL NOISE
MONITORING REPORT
QUARTER ENDING DECEMBER 2016

5 DECEMBER 2016

Cooma Road Quarry

QUARTERLY ENVIRONMENTAL NOISE MONITORING REPORT QUARTER ENDING DECEMBER 2016

Holcim (Australia) Pty Ltd

REV	DATE	DETAILS
-	05/12/2016	Issue

AUTHOR, REVIEWER AND APPROVER DETAILS

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GLOSSARY

A Frequency Weighting (A-weighting)	The A frequency weighting roughly approximates to the Fletcher-Munson 40 phon equal loudness contour. The human loudness perception at various frequencies and sound pressure levels is equated to the level of 40 dB at 1 kHz. The human ear is less sensitive to low frequency sound and very high frequency sound than midrange frequency sound (i.e. 500 Hz to 6 kHz). Humans are most sensitive to midrange frequency sounds, such as a child's scream. Sound level meters have inbuilt frequency weighting networks that very roughly approximates the human loudness response at low sound levels. It should be noted that the human loudness response is not the same as the human annoyance response to sound. Here low frequency sounds can be more annoying than midrange frequency sounds even at very low loudness levels. The A weighting is the most commonly used frequency weighting for occupational and environmental noise assessments.
decibel (dB)	The decibel (dB) is a logarithmic scale that allows a wide range of values to be compressed into a more comprehensible range, typically 0 dB to 120 dB. The decibel is ten times the logarithm of the ratio of any two quantities that relate to the flow of energy (i.e. power). When used in acoustics it is the ratio of square of the sound pressure level to a reference sound pressure level, the ratio of the sound power level to a reference sound power level, or the ratio of the sound intensity level to a reference sound intensity level. See also Sound Pressure Level and Sound Power Level. Noise levels in decibels cannot be added arithmetically since they are logarithmic numbers. If one machine is generating a noise level of 50 dB, and another similar machine is placed beside it, the level will increase to 53 dB (from $10 \log_{10} (10(50/10) + 10(50/10))$) and not 100 dB. In theory, ten similar machines placed side by side will increase the sound level by 10 dB, and one hundred machines increase the sound level by 20 dB. The human ear has a vast sound-sensitivity range of over a thousand billion to one so the logarithmic decibel scale is useful for acoustical assessments.
Equivalent Continuous Sound Level, L_{eq}	Many sounds, such as road traffic noise or construction noise, vary repeatedly in level over a period of time. More sophisticated sound level meters have an integrating/averaging electronic device inbuilt, which will display the energy time-average (equivalent continuous sound level - L_{Aeq}) of the A frequency weighted sound pressure level. Because the decibel scale is a logarithmic ratio, the higher noise levels have far more sound energy, and therefore the L_{Aeq} level tends to indicate an average which is strongly influenced by short term, high level noise events. Many studies show that human reaction to level-varying sounds tends to relate closer to the L_{Aeq} noise level than any other descriptor.
Fast (F) time response	Sound level meter design-goal time constant which is 0.125 seconds.
Free-field	A free field is a measurement area not subject to significant reflection of acoustical energy. A free field measurement is typically not closer than 3.5 metres to any large flat object (other than the ground) such as a fence or wall or inside an anechoic chamber.
Maximum Noise Level, L_{max}	The Root-Mean-Square (RMS) maximum sound pressure level measured with a sound level meter. When using the A frequency weighting and the Fast time weighting it is referenced as L_{AFmax} . Often used for noise assessments other than aircraft.
Statistical noise levels, L_n	Noise which varies over a specific time period, T (typical measurement times are 15 minute periods) may be quantified in terms of various statistical descriptors. The noise level, in decibels, exceeded for n % of the measurement period, when A frequency weighted and Fast time weighted, is referenced as $L_{AFn, T}$.

ABBREVIATIONS

AS	Australian Standard
EIS	Environmental Impact Statement of the development titled <i>Cooma Road Quarry Continued Operations Development, Environmental Impact Statement</i> , prepared by Umwelt (Australia) Pty Limited and dated October 2012; and <i>Response to Submissions Cooma Road Quarry Continued Operations Development</i> , prepared by Umwelt (Australia) Pty Limited and dated February 2013.
EPA	NSW Environment Protection Authority
EPL	Environment Protection Licence under the <i>POEO Act</i>
Lafarge Holcim	Holcim (Australia) Pty Ltd
INP	NSW Industrial Noise Policy
NMP	<i>Cooma Road Quarry Noise Management Plan</i> , dated March 2014
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
RTA	NSW Roads and Traffic Authority

EXECUTIVE SUMMARY

This report provides the results and findings of the quarterly noise monitoring conducted by WSP | Parsons Brinckerhoff for Cooma Road Quarry, operated by Lafarge Holcim. This report presents the results of operator-attended noise monitoring conducted on Thursday 1 December and Friday 2 December 2016

It is understood that Cooma Road Quarry operates between 6.00 am and 4.00 pm Monday to Friday, requiring noise monitoring to be conducted at each location for the Day Shoulder (6.00 to 7.00 am) and Day (7.00 am to 6.00 pm) periods, in accordance with the Noise Management Plan (dated March 2014) and Development Consent for the quarry.

Noise monitoring was conducted at five locations as specified in the Noise Management Plan. Operator-attended measurements indicate that Cooma Road Quarry operations are likely to have been within Development Consent conditions at all locations during the monitoring period.

1 PROJECT BACKGROUND

Cooma Road Quarry is a hard rock quarry operated by Holcim (Australia) Pty Ltd (Lafarge Holcim), approximately 6 km south of Queanbeyan, New South Wales. The quarry is located in the Queanbeyan-Palerang Regional Council (formerly City of Queanbeyan) Local Government Area.

The Executive Director, Development Assessment Systems and Approvals, delegate for the NSW Minister for Planning and Infrastructure, provided Development Consent for the Cooma Road Quarry Continued Operations Project (Application Number SSD_5109) on 27 September 2013.

Lafarge Holcim has commissioned WSP | Parsons Brinckerhoff to conduct quarterly noise monitoring surveys in accordance with the *Cooma Road Quarry Noise Management Plan* (NMP), dated March 2014.

The purpose of this report is to describe the attended noise monitoring performed at representative noise receivers surrounding the Cooma Road Quarry site on Thursday 1 December and Friday 2 December 2016. The objectives of the noise monitoring survey, as presented in this report, are as follows:

- Measure the ambient noise levels through 15-minute attended monitoring at five representative monitoring locations surrounding Cooma Road Quarry, as described in the NMP.
- Describe and estimate sources of noise observed during the attended surveys.
- Assess the noise emissions from Cooma Road Quarry with respect to the limits contained in the Development Consent.

Figure 1.1 is reproduced from the Noise Management Plan (Figure 6.1, page 10), indicating the Noise Receivers and Monitoring Locations surrounding Cooma Road Quarry.



Source: Cooma Road Quarry Noise Management Plan (Umwelt Australia, 2014)

Figure 1.1 Noise Receiver and Monitoring Locations surrounding Cooma Road Quarry

2 CRITERIA – DEVELOPMENT CONSENT CONDITIONS

This section presents the noise limits applicable to the operation of the Cooma Road Quarry, in accordance with the current development consent for the project.

Noise limits, hours of operation and operating conditions specific to Cooma Road Quarry are defined in the Development Consent, conditions 4 to 6 of *Schedule 3 – Environmental Performance Conditions*. These conditions are reproduced below. The Development Consent also refers to noise in *Appendix 8 – Statement of Commitments* and *Appendix 9 – Noise Compliance Assessment*.

Noise Criteria

4. The Applicant shall ensure that the noise generated by the development does not exceed the criteria in Table 1 at any residence on privately-owned land.

Table 1: Noise criteria dB(A)

Receiver	Day shoulder 6 – 7 am	Day 7 am – 6 pm	Evening 6 – 10 pm
	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{Aeq} (15 min)
N1, N7, N8, N56, N57, N59, N63, N64, N65	40	44	39
N67	36	41	35
All other receivers between N9 and N71 inclusive	36	38	35
All other receivers	35	35	35

Notes:

- To locate the receivers referred to in Table 1 refer to Appendix 5.
- After the first review on any EPL granted for this development under Section 78 of the POEO Act, nothing in this approval prevents the EPA from imposing stricter noise limits on the quarrying operations on site under the EPL.

Appendix 9 sets out the meteorological conditions under which these criteria apply and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has a written agreement with the relevant landowner/s to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

Operating Hours

5. The Applicant shall comply with the operating hours set out in Table 2:

Table 2: Operating Hours

Activity	Operating Hours		
	Monday – Friday	Saturday	Sundays and Public Holidays
Primary Crushing, Truck Departures	6 am – 6 pm	6 am – 6 pm	None
Construction Operations	7 am – 6 pm	8 am – 1 pm	
Return Truck Movements	6 am – 8 pm	6 am – 8 pm	
Other Operations	6 am – 10 pm	6 am – 10 pm	

Notes: Maintenance activities may occur at any time provided they are inaudible at privately-owned residences.

Operating Conditions

6. The Applicant shall:

- a) implement best management practice to minimise the construction, operational and traffic noise of the development;
- b) minimise the noise impacts of the development during meteorological conditions when the noise limits in this consent do not apply; and
- c) maintain the effectiveness of any noise attenuation on equipment to ensure consistency with the benchmark sound power levels presented in the EIS; and
- d) regularly assess the results of noise monitoring to ensure compliance with the relevant conditions of this consent,

to the satisfaction of the Director-General.

3 PROCEDURES AND METHODOLOGY

3.1 General Requirements

The operational noise monitoring was conducted with reference to the Development Consent for application number SSD_5109 (Cooma Road Quarry Continued Operations Project), and in accordance with the NMP.

3.2 Monitoring Locations

The five representative noise monitoring locations at receivers surrounding the quarry are listed in Table 3.1. These are shown in Figure 1.1.

Table 3.1 Noise monitoring locations

Monitoring location	Property address and lot number	Description
N08	35 Tempe Crescent, Googong NSW 2620 1//DP226218	Measurements taken on public land between property and Old Cooma Road, approximately 80 m from residence
N38	51 Heights Road, Googong NSW 2620 7//DP285358	Measurements taken on public land NW of property boundary, approximately 15 m from residence
N60	632 Old Cooma Road, Googong, NSW 2620 21//DP1180981	Measurements taken near the residence on farmland to the east of the project site
N67	732 Old Cooma Road, Googong, NSW 2620 1//DP513432	Measurements taken at the project site boundary, approximately 360 m from the residence to the southern boundary of the project site ¹
N3	15 Copperfield Place, Googong, NSW 2620 1//DP1087429	Measurements taken near the residence on farmland to the west of the project site

(1) Measurements undertaken as close as possible to the nominated N67 residence while remaining inside the Lafarge Holcim site boundary. See below.

The NMP nominates the five locations listed in Table 3.1, which were deemed to be representative of all noise receivers listed in the Development Consent (refer to Section 2 of this report). Measured compliance with the operational noise limits at the monitoring locations is expected to result in compliance at all assessment locations.

Lafarge Holcim is responsible for organising access to the noise monitoring locations, and proposed the alternative location for N67 at the boundary of the project site, in lieu of a measurement position on private property. The alternative location is approximately 360 m closer to the quarry than the actual residence, which is likely to result in higher quarry noise than would be expected at the residence. As such, results at this location are acoustically appropriate, but represent a conservative assessment.

3.3 Monitoring Equipment

Details of all noise monitoring equipment used during the noise survey are presented in Table 3.2.

Table 3.2 Noise monitoring equipment details

Noise monitoring equipment	Location used	Serial number
Norsonic Nor140 sound level meter	All	1406503
Rion NC-74 field calibrator	All	34315156

The calibration of all sound level meters was checked before and after the measurements with a field calibrator and were confirmed to be within an acceptable margin of ± 1 dBA of the reference signal.

All noise monitoring equipment carry current NATA-certified calibration certificates and are designed to comply with Australian Standard (AS) IEC 61672.1 2004 *Electroacoustics – Sound level meters* and AS IEC 60942 2004 *Electroacoustics – Sound calibrators*. All measurements were performed in broad accordance with AS 1055.1-3 *Acoustics – Description and measurement of environmental noise*.

3.4 Operator-Attended Monitoring

In accordance with the NMP, operator-attended noise surveys were conducted at all five monitoring locations to provide observations of the noise sources audible at the monitoring locations.

Lafarge Holcim has advised that Cooma Road Quarry currently operates between the hours of 6:00 am and 4:00 pm Monday to Friday, in accordance with the Development Consent. Operator attended monitoring was performed for both Day Shoulder (6 am to 7 am) and Day (7 am to 6 pm) periods.

3.5 Monitoring Period Weather Conditions

Weather data has been obtained from the Canberra Airport Bureau of Meteorology weather station, approximately 10 km NNW of Cooma Road Quarry. Weather observations based on sample readings were also made at each location during noise monitoring.

During the noise monitoring undertaken on Thursday 1 December and Friday 2 December 2016, there was no rainfall and wind speeds were below 5 m/s at microphone height during all measurements. This demonstrated that all noise monitoring results are valid and appropriate for use for the assessment in accordance to the NSW Industrial Noise Policy.

3.6 Monitoring Period Works Summary

Table 3.3 summarises the activities underway at the quarry during the monitoring period, as advised by Lafarge Holcim staff at Cooma Road Quarry.

Table 3.3 Summary of quarry works during monitoring period

Date	Plant operating
Thursday 1 December 2016	All plant operating to normal conditions
Friday 2 December 2016	All plant operating to normal conditions

4 NOISE MONITORING RESULTS AND DISCUSSION

4.1 Operator-Attended Monitoring

Operator-attended 15-minute noise measurements and observations are given in Table 4.1. Sources identified by the operator as contributing to the noise levels have been described, and a typical maximum noise level (based on subjective review of the instantaneous sound level meter reading) listed. Contributions from activities associated with Cooma Road Quarry are stated only when the noise could be clearly perceived by the operator. The weather observations given in Table 4.1 are approximate based on sample measurements of the wind speed and temperature during measurements, and subjective observations of cloud cover made by the operator.

Operator-attended monitoring was conducted on Thursday 1 December and Friday 2 December 2016 by Jacalyn Macfarlane of WSP | Parsons Brinckerhoff. Weather observations from the Bureau of Meteorology Canberra Airport weather station indicate that relative humidity was between 48% and 79% during the monitoring period. Fog was not present at any of the monitoring locations during the measurements. All weather conditions were in accordance with the limits specified in the Development Consent and as such no measurements have been excluded due to unacceptable weather conditions.

It is understood that Cooma Road Quarry is currently operating between the hours of 6:00 am and 4:00 pm Monday to Friday. This is within the limits defined in the Development Consent for Day Shoulder (6:00 to 7:00 am) and Day (7:00 am to 6:00 pm) periods. As operations are not carried out during the Evening (6:00 to 10:00 pm), noise measurements were not undertaken during that time period.

One 15-minute measurement has been conducted at each location for each operational period (Day Shoulder and Day), as per the NMP.

Table 4.1 Summary of operator-attended monitoring conducted between 1/12/2016 and 2/12/2016

Location	Period Date Start time Noise limit	Weather: Temperature Wind speed Cloud cover	Sound pressure level (dB re 20 µPa), 15 minute measurement period					Description of noise source and typical observed maximum noise level, L _{Amax} (dB)		
			L _{Amax}	L _{A1}	L _{A10}	L _{A90}	L _{Aeq}			
N60	Day Shoulder 1/12/2016 6:02 am Noise limit: 36 dB L _{Aeq} (15 min)	14°C Calm 2/8 oktas	71	59	54	42	51	Regular road traffic on Old Cooma Road	55	
									Loud truck on Old Cooma Rd	61
									Birds	59
									<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <32 dB L_{Aeq}(15-min)¹</i>	
N60	Day 1/12/2016 07:59 am Noise limit: 38 dB L _{Aeq} (15 min)	19°C ~1 m/s 1/8 oktas	60	56	53	46	51	Regular road traffic on Old Cooma Rd	55	
									Birds (& road traffic)	55
									Aircraft approaching airport	50
									Aircraft landing at airport	54
							Quarry noise – rocks falling (with background noise)	54		

Location	Period Date Start time Noise limit	Weather: Temperature Wind speed Cloud cover	Sound pressure level (dB re 20 µPa), 15 minute measurement period					Description of noise source and typical observed maximum noise level, L _{Amax} (dB)
			L _{Amax}	L _{A1}	L _{A10}	L _{A90}	L _{Aeq}	
								Quarry noise – engine revving (with background noise) 53
								Quarry noise – squawker and siren (with background noise) 52, 53
								<i>Estimated quarry noise contribution, L_{Aeq(15-min)}</i> 38
N38	Day Shoulder 1/12/2016 6:24 am Noise limit: 36 dB L _{Aeq} (15 min)	13°C Calm 1/8 oktas	72	65	57	49	55	Regular road traffic on Old Cooma Rd 56
								Loud vehicle on Old Cooma Road 61
								Aircraft – with background noise 56
								Birds 71
								Resident and dogs 59
								Residential noise (running water) – with background noise 54
								Dog bark 49
								<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <39 dB L_{Aeq(15-min)}¹</i>
N38	Day 1/12/2016 7:30 am Noise limit: 38 dB L _{Aeq} (15 min)	18°C Calm 0/8 oktas	66	59	54	46	52	Regular road traffic on Old Cooma Rd 54
								Car on Heights Rd 59
								Truck on Heights Rd 66
								Birds 42, 53
								Dog bark 42
								Aircraft – with background noise 52
								Hammering at building site nearby 52
								<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <36 dB L_{Aeq(15-min)}¹</i>
N08	Day Shoulder 1/12/16 6:44 am Noise limit: 40 dB L _{Aeq} (15 min)	13°C Calm 0/8 oktas	79	67	61	53	59	Regular road traffic on Old Cooma Rd 60
								Loud vehicles on Old Cooma Rd 66
								Trucks going up Quarry Rd 64
								Trucks coming down Quarry Rd 61
								Dog bark – with background noise 60
								Birds 64

Location	Period Date Start time Noise limit	Weather: Temperature Wind speed Cloud cover	Sound pressure level (dB re 20 µPa), 15 minute measurement period					Description of noise source and typical observed maximum noise level, L _{Amax} (dB)
			L _{Amax}	L _{A1}	L _{A10}	L _{A90}	L _{Aeq}	
								<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <43 dB L_{Aeq(15-min)}¹</i>
N08	Day 1/12/2016 7:04 am Noise limit: 44 dB L _{Aeq} (15 min)	17°C Calm 1/8 oktas	70	64	61	49	58	Regular road traffic on Old Cooma Rd 62
								Loud vehicle on Old Cooma Rd 69
								Truck going down Quarry Rd 57
								Traffic on Old Cooma Rd and Quarry Rd 65
								<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <39 dB L_{Aeq(15-min)}¹</i>
N3	Day Shoulder 2/12/2016 6:11 am Noise limit: 35 dB L _{Aeq} (15 min)	10°C Calm 7/8 oktas	79	61	44	38	52	Constant road traffic noise from distant main roads 38
								Loud vehicle in distance 43
								Loud vehicle on surrounding road 52
								Birds 79
								Resident's dog 50
								Resident activity 50
<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <28 dB L_{Aeq(15-min)}¹</i>								
N3	Day 2/12/16 3:28 pm Noise limit: 35 dB L _{Aeq} (15 min)	29°C ~5 m/s 3/8 oktas	63	59	55	46	52	Constant road traffic noise from distant main roads 49
								Wind gust & foliage noise 56
								Plane 62
								Distant construction noise 46
								Insects 48
								Resident 50
								Dog bark 51
								<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <36 dB L_{Aeq(15-min)}¹</i>
N67	Day Shoulder 2/12/2016 6:52 am	10°C Calm 7/8 oktas	66	53	45	41	44	Regular traffic on Old Cooma Rd 43
								Birds 55
								Quarry noise – beeper 45

Location	Period Date Start time Noise limit	Weather: Temperature Wind speed Cloud cover	Sound pressure level (dB re 20 µPa), 15 minute measurement period					Description of noise source and typical observed maximum noise level, L _{Amax} (dB)
			L _{Amax}	L _{A1}	L _{A10}	L _{A90}	L _{Aeq}	
	Noise limit: 36 dB L _{Aeq} (15 min)							Quarry noise – squawker 41
								Quarry noise – loader 46
								Quarry noise – rocks falling 55
								<i>Estimated quarry noise contribution, L_{Aeq}(15-min)</i> 34
N67	Day 2/12/2016 7:15 am Noise limit: 41 dB L _{Aeq} (15 min)	12°C Calm 7/8 oktas	63	51	45	41	43	Regular traffic on Old Cooma Rd 43
								Loud vehicle on Old Cooma Rd 44
								Distant loud vehicle 46
								Plane 43
								Sheep 44
								Quarry noise – beeper 41
								Quarry noise – jaw 43
								Quarry noise – rocks falling 45
								<i>Estimated quarry noise contribution, L_{Aeq}(15-min)</i> 35

(1) Estimated based on L_{A90} (15-min) result.

The following is a summary of the results of the attended monitoring:

- Location N60 – Acoustic environment was dominated by road traffic noise from Old Cooma Road. Quarry noise was audible for brief periods during the day period when road traffic noise was low, estimated to be ~38 dB $L_{Aeq(15-min)}$. Noise from Cooma Road Quarry was observed to be within Development Consent limits.
- Location N38 – Acoustic environment was dominated by road traffic noise from Old Cooma Road; quarry noise was not audible. The potential noise contribution from the quarry was therefore estimated using the $L_{A90(15-min)}$ result and was estimated to be <39 dB $L_{Aeq(15-min)}$ for the day-shoulder period, which may potentially exceed the noise limit by 3 dB or less. However, considering that quarry noise was generally not audible above the typical background and that actual quarry noise might be lower, the operation of the quarry is not likely to cause disturbance at this location.
- Location N08 – Acoustic environment was dominated by road traffic noise from Old Cooma Road; quarry noise was not audible. The potential noise contribution from the quarry was therefore estimated using the $L_{A90(15-min)}$ result and was estimated to be <43 dB $L_{Aeq(15-min)}$ for the day-shoulder period, which may potentially exceed the noise limit by 3 dB or less. However, considering that quarry noise was generally not audible above the typical background and that actual quarry noise might be lower, the operation of the quarry is not likely to cause disturbance at this location.
- Location N3 – Acoustic environment was dominated by general environmental and distant road traffic noise; quarry noise was not audible. The potential noise contribution from the quarry was therefore estimated using the $L_{A90(15-min)}$ result and was estimated to be <36 dB $L_{Aeq(15-min)}$ for the day period, which may potentially exceed the noise limit by 1 dB or less. However, considering that quarry noise was generally not audible above the typical background and that actual quarry noise might be lower, the operation of the quarry is not likely to cause disturbance at this location.
- Location N67 – Acoustic environment was dominated by road traffic from Old Cooma Road and general environmental noise. Quarry was audible for brief periods when background noise was low, estimated to be ~34 – 35 dB $L_{Aeq(15-min)}$. Noise from Cooma Road Quarry was observed to be within Development Consent limits.

Operator-attended measurements indicate that Cooma Road Quarry operations are likely to have been within Development Consent conditions at all locations during the monitoring period.

5 SUMMARY OF RESULTS AND FINDINGS

WSP | Parsons Brinckerhoff has been engaged by Lafarge Holcim to conduct quarterly noise monitoring for Cooma Road Quarry, Queanbeyan, New South Wales. The results and findings in this report represent operator attended noise monitoring conducted on Thursday 1 December and Friday 2 December 2016.

All noise monitoring was conducted in accordance with the NSW Industrial Noise Policy, the Cooma Road Quarry Noise Management Plan (dated March 2014) and the Development Consent for the quarry. It is understood that Cooma Road Quarry is currently operating between 6.00 am and 4.00 pm, Monday to Friday.

The noise monitoring was conducted at five locations specified in the Noise Management Plan. Operator attended noise monitoring was conducted according to the weather conditions specified in the Development Consent and no data was excluded due to unacceptable weather.

Operator-attended measurements indicate that Cooma Road Quarry operations are likely to have been within Development Consent conditions at all locations during the monitoring period.



HOLCIM (AUSTRALIA) PTY LTD

Cooma Road Quarry

QUARTERLY ENVIRONMENTAL NOISE
MONITORING REPORT
QUARTER ENDING OCTOBER 2016

17 OCTOBER 2016

Cooma Road Quarry

QUARTERLY ENVIRONMENTAL NOISE MONITORING REPORT QUARTER ENDING OCTOBER 2016

Holcim (Australia) Pty Ltd

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decibel (dB)	The decibel (dB) is a logarithmic scale that allows a wide range of values to be compressed into a more comprehensible range, typically 0 dB to 120 dB. The decibel is ten times the logarithm of the ratio of any two quantities that relate to the flow of energy (i.e. power). When used in acoustics it is the ratio of square of the sound pressure level to a reference sound pressure level, the ratio of the sound power level to a reference sound power level, or the ratio of the sound intensity level to a reference sound intensity level. See also Sound Pressure Level and Sound Power Level. Noise levels in decibels cannot be added arithmetically since they are logarithmic numbers. If one machine is generating a noise level of 50 dB, and another similar machine is placed beside it, the level will increase to 53 dB (from $10 \log_{10} (10(50/10) + 10(50/10))$) and not 100 dB. In theory, ten similar machines placed side by side will increase the sound level by 10 dB, and one hundred machines increase the sound level by 20 dB. The human ear has a vast sound-sensitivity range of over a thousand billion to one so the logarithmic decibel scale is useful for acoustical assessments.
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Maximum Noise Level, L_{max}	The Root-Mean-Square (RMS) maximum sound pressure level measured with a sound level meter. When using the A frequency weighting and the Fast time weighting it is referenced as L_{AFmax} . Often used for noise assessments other than aircraft.
Statistical noise levels, L_n	Noise which varies over a specific time period, T (typical measurement times are 15 minute periods) may be quantified in terms of various statistical descriptors. The noise level, in decibels, exceeded for n % of the measurement period, when A frequency weighted and Fast time weighted, is referenced as $L_{AFn, T}$.

ABBREVIATIONS

AS	Australian Standard
EIS	Environmental Impact Statement of the development titled <i>Cooma Road Quarry Continued Operations Development, Environmental Impact Statement</i> , prepared by Umwelt (Australia) Pty Limited and dated October 2012; and <i>Response to Submissions Cooma Road Quarry Continued Operations Development</i> , prepared by Umwelt (Australia) Pty Limited and dated February 2013.
EPA	NSW Environment Protection Authority
EPL	Environment Protection Licence under the <i>POEO Act</i>
Lafarge Holcim	Holcim (Australia) Pty Ltd
INP	NSW Industrial Noise Policy
NMP	<i>Cooma Road Quarry Noise Management Plan</i> , dated March 2014
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
RTA	NSW Roads and Traffic Authority

EXECUTIVE SUMMARY

This report provides the results and findings of the quarterly noise monitoring conducted by WSP | Parsons Brinckerhoff for Cooma Road Quarry, operated by Lafarge Holcim. This report presents the results of operator-attended noise monitoring conducted between Friday 23 September and Tuesday 11 October 2016

It is understood that Cooma Road Quarry operates between 6.00 am and 4.00 pm Monday to Friday, requiring noise monitoring to be conducted at each location for the Day Shoulder (6.00 to 7.00 am) and Day (7.00 am to 6.00 pm) periods, in accordance with the Noise Management Plan (dated March 2014) and Development Consent for the quarry.

Noise monitoring was conducted at five locations as specified in the Noise Management Plan. Operator-attended measurements indicate that Cooma Road Quarry operations were in compliance with Development Consent noise limits at all monitoring locations during the survey period, apart from possibly at Location N38.

At Location N38, quarry noise may exceed the applicable noise limit during the day shoulder period by up to 2 dB, which is generally acoustically insignificant. This was estimated based on the recorded L_{A90} (15-min) result and is likely to be lower. As the quarry was generally not audible above the background, actual disturbance is therefore not likely at this location.

1 PROJECT BACKGROUND

Cooma Road Quarry is a hard rock quarry operated by Holcim (Australia) Pty Ltd (Lafarge Holcim), approximately 6 km south of Queanbeyan, New South Wales. The quarry is located in the Queanbeyan-Palerang Regional Council (formerly City of Queanbeyan) Local Government Area.

The Executive Director, Development Assessment Systems and Approvals, delegate for the NSW Minister for Planning and Infrastructure, provided Development Consent for the Cooma Road Quarry Continued Operations Project (Application Number SSD_5109) on 27 September 2013.

Lafarge Holcim has commissioned WSP | Parsons Brinckerhoff to conduct quarterly noise monitoring surveys in accordance with the *Cooma Road Quarry Noise Management Plan* (NMP), dated March 2014.

The purpose of this report is to describe the attended noise monitoring performed at representative noise receivers surrounding the Cooma Road Quarry site between Friday 23 September and Tuesday 11 October 2016. The objectives of the noise monitoring survey, as presented in this report, are as follows:

- Measure the ambient noise levels through 15-minute attended monitoring at five representative monitoring locations surrounding Cooma Road Quarry, as described in the NMP.
- Describe and estimate sources of noise observed during the attended surveys.
- Assess the noise emissions from Cooma Road Quarry with respect to the limits contained in the Development Consent.

Figure 1.1 is reproduced from the Noise Management Plan (Figure 6.1, page 10), indicating the Noise Receivers and Monitoring Locations surrounding Cooma Road Quarry.



Source: Cooma Road Quarry Noise Management Plan (Umwelt Australia, 2014)

Figure 1.1 Noise Receiver and Monitoring Locations surrounding Cooma Road Quarry

2 CRITERIA – DEVELOPMENT CONSENT CONDITIONS

This section presents the noise limits applicable to the operation of the Cooma Road Quarry, in accordance with the current development consent for the project.

Noise limits, hours of operation and operating conditions specific to Cooma Road Quarry are defined in the Development Consent, conditions 4 to 6 of *Schedule 3 – Environmental Performance Conditions*. These conditions are reproduced below. The Development Consent also refers to noise in *Appendix 8 – Statement of Commitments and Appendix 9 – Noise Compliance Assessment*.

Noise Criteria

4. The Applicant shall ensure that the noise generated by the development does not exceed the criteria in Table 1 at any residence on privately-owned land.

Table 1: Noise criteria dB(A)

Receiver	Day shoulder 6 – 7 am	Day 7 am – 6 pm	Evening 6 – 10 pm
	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{Aeq} (15 min)
N1, N7, N8, N56, N57, N59, N63, N64, N65	40	44	39
N67	36	41	35
All other receivers between N9 and N71 inclusive	36	38	35
All other receivers	35	35	35

Notes:

- To locate the receivers referred to in Table 1 refer to Appendix 5.
- After the first review on any EPL granted for this development under Section 78 of the POEO Act, nothing in this approval prevents the EPA from imposing stricter noise limits on the quarrying operations on site under the EPL.

Appendix 9 sets out the meteorological conditions under which these criteria apply and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has a written agreement with the relevant landowner/s to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

Operating Hours

5. The Applicant shall comply with the operating hours set out in Table 2:

Table 2: Operating Hours

Activity	Operating Hours		
	Monday – Friday	Saturday	Sundays and Public Holidays
Primary Crushing, Truck Departures	6 am – 6 pm	6 am – 6 pm	None
Construction Operations	7 am – 6 pm	8 am – 1 pm	
Return Truck Movements	6 am – 8 pm	6 am – 8 pm	
Other Operations	6 am – 10 pm	6 am – 10 pm	

Notes: Maintenance activities may occur at any time provided they are inaudible at privately-owned residences.

Operating Conditions

6. The Applicant shall:

- a) implement best management practice to minimise the construction, operational and traffic noise of the development;
- b) minimise the noise impacts of the development during meteorological conditions when the noise limits in this consent do not apply; and
- c) maintain the effectiveness of any noise attenuation on equipment to ensure consistency with the benchmark sound power levels presented in the EIS; and
- d) regularly assess the results of noise monitoring to ensure compliance with the relevant conditions of this consent,

to the satisfaction of the Director-General.

3 PROCEDURES AND METHODOLOGY

3.1 General Requirements

The operational noise monitoring was conducted with reference to the Development Consent for application number SSD_5109 (Cooma Road Quarry Continued Operations Project), and in accordance with the NMP.

3.2 Monitoring Locations

The five representative noise monitoring locations at receivers surrounding the quarry are listed in Table 3.1. These are shown in Figure 1.1.

Table 3.1 Noise monitoring locations

Monitoring location	Property address and lot number	Description
N08	35 Tempe Crescent, Googong NSW 2620 1//DP226218	Measurements taken on public land between property and Old Cooma Road, approximately 80 m from residence
N38	51 Heights Road, Googong NSW 2620 7//DP285358	Measurements taken on public land NW of property boundary, approximately 15 m from residence
N60	632 Old Cooma Road, Googong, NSW 2620 21//DP1180981	Measurements taken near the residence on farmland to the east of the project site
N67	732 Old Cooma Road, Googong, NSW 2620 1//DP513432	Measurements taken at the project site boundary, approximately 360 m from the residence to the southern boundary of the project site ¹
N3	15 Copperfield Place, Googong, NSW 2620 1//DP1087429	Measurements taken near the residence on farmland to the west of the project site

(1) Measurements undertaken as close as possible to the nominated N67 residence while remaining inside the Lafarge Holcim site boundary. See below.

The NMP nominates the five locations listed in Table 3.1, which were deemed to be representative of all noise receivers listed in the Development Consent (refer to Section 2 of this report). Measured compliance with the operational noise limits at the monitoring locations is expected to result in compliance at all assessment locations.

Lafarge Holcim is responsible for organising access to the noise monitoring locations, and proposed the alternative location for N67 at the boundary of the project site, in lieu of a measurement position on private property. The alternative location is approximately 360 m closer to the quarry than the actual residence, which is likely to result in higher quarry noise than would be expected at the residence. As such, results at this location are acoustically appropriate, but represent a conservative assessment.

3.3 Monitoring Equipment

Details of all noise monitoring equipment used during the noise survey are presented in Table 3.2.

Table 3.2 Noise monitoring equipment details

Noise monitoring equipment	Location used	Serial number
NTi Audio XL2 sound level meter	All	Meter: A2A-05718-E0 Microphone: 1519

The calibration of all sound level meters was checked before and after the measurements with a field calibrator and were confirmed to be within an acceptable margin of ± 1 dBA of the reference signal.

All noise monitoring equipment carry current NATA-certified calibration certificates and are designed to comply with Australian Standard (AS) IEC 61672.1 2004 *Electroacoustics – Sound level meters* and AS IEC 60942 2004 *Electroacoustics – Sound calibrators*. All measurements were performed in broad accordance with AS 1055.1-3 *Acoustics – Description and measurement of environmental noise*.

3.4 Operator-Attended Monitoring

In accordance with the NMP, operator-attended noise surveys were conducted at all five monitoring locations to provide observations of the noise sources audible at the monitoring locations.

Lafarge Holcim has advised that Cooma Road Quarry currently operates between the hours of 6:00 am and 4:00 pm Monday to Friday, in accordance with the Development Consent. Operator attended monitoring was performed for both Day Shoulder (6 am to 7 am) and Day (7 am to 6 pm) periods.

3.5 Monitoring Period Weather Conditions

Weather data has been obtained from the Canberra Airport Bureau of Meteorology weather station, approximately 10 km NNW of Cooma Road Quarry. Weather observations based on sample readings were also made at each location during noise monitoring.

During the noise monitoring undertaken between Friday 23 September and Tuesday 11 October 2016, there was no rainfall and wind speeds were below 5 m/s at microphone height during all measurements. This demonstrated that all noise monitoring results are valid and appropriate for use for the assessment in accordance to the NSW Industrial Noise Policy.

3.6 Monitoring Period Quarry Works Summary

Table 3.3 summaries the activities underway at the quarry during the monitoring period, as advised by Lafarge Holcim staff at Cooma Road Quarry.

Table 3.3 Summary of quarry works during monitoring period

Date	Plant operating
Friday 23 September 2016	Operations running normally
Wednesday 28 September 2016	Operations running normally
Tuesday 11 October 2016	Operations running normally

4 NOISE MONITORING RESULTS AND DISCUSSION

4.1 Operator-Attended Monitoring

Operator-attended 15-minute noise measurements and observations are given in Table 4.1. Sources identified by the operator as contributing to the noise levels have been described, and a typical maximum noise level (based on subjective review of the instantaneous sound level meter reading) listed. Contributions from activities associated with Cooma Road Quarry are stated only when the noise could be clearly perceived by the operator. The weather observations given in Table 4.1 are approximate based on sample measurements of the wind speed and temperature during measurements, and subjective observations of cloud cover made by the operator.

Operator-attended monitoring was conducted on Friday 23 September, Wednesday 28 September and Tuesday 11 October 2016 by Jacalyn Macfarlane of WSP | Parsons Brinckerhoff. Weather observations from the Bureau of Meteorology Canberra Airport weather station indicate that relative humidity was between 65% and 96% during the monitoring period. Fog was not present at any of the monitoring locations during the measurements. All weather conditions were in accordance with the limits specified in the Development Consent and as such no measurements have been excluded due to unacceptable weather conditions.

It is understood that Cooma Road Quarry is currently operating between the hours of 6:00 am and 4:00 pm Monday to Friday. This is within the limits defined in the Development Consent for Day Shoulder (6:00 to 7:00 am) and Day (7:00 am to 6:00 pm) periods. As operations are not carried out during the Evening (6:00 to 10:00 pm), noise measurements were not undertaken during that time period.

One 15-minute measurement has been conducted at each location for each operational period (Day Shoulder and Day), as per the NMP.

Table 4.1 Summary of operator-attended monitoring conducted between 23/9/2016 and 11/10/2016

Location	Period Date Start time Noise limit	Weather: Temperature Wind speed Cloud cover	Sound pressure level (dB re 20 µPa), 15 minute measurement period					Description of noise source and typical observed maximum noise level, L _{Amax} (dB)	
			L _{Amax}	L _{A1}	L _{A10}	L _{A90}	L _{Aeq}		
N67	Day Shoulder 23/09/2016 6:45 am Noise limit: 36 dB L _{Aeq} (15min)	10°C ~3 m/s 4/8 oktas	80	60	48	42	52	Regular traffic on Old Cooma Rd	43
								Loud traffic on Old Cooma Rd	49, 51
								Wind gusts, foliage noise, road traffic	48, 51
								Plane flyover	46
								Birds	68
<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <32 dB L_{Aeq}(15min)¹</i>									
N67	Day 23/09/2016 7:20 am Noise limit 41 dB L _{Aeq} (15min)	10°C ~3 m/s 3/8 oktas	65	60	52	45	50	Wind gusts, foliage noise, road traffic	55
								Regular traffic on Old Cooma Rd (wind affected)	45, (48)
								Loud traffic on Old Cooma Rd	53
								Birds	64
								Plane flyover	65
<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <35 dB L_{Aeq}(15min)¹</i>									
N60	Day Shoulder 28/09/2016 6:04 am Noise limit 36 dB L _{Aeq} (15min)	0°C Calm - ~1 m/s 0/8 oktas	60	56	52	42	49	Regular traffic on Old Cooma Rd	48-55
								Airport	50
								Birds	60
								<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <32 dB L_{Aeq}(15min)¹</i>	
N60	Day 28/09/2016 8:35 am Noise limit: 38 dB L _{Aeq} (15min)	7°C Calm - ~1 m/s 0/8 oktas	63	55	52	42	49	Regular traffic on Old Cooma Rd	53
								Birds	60
								Operator interference	63
								Truck noise when road traffic on Old Cooma Rd low	39
								<i>Cooma Road Quarry possibly audible for <10 s of measurement; estimated quarry noise contribution <32 dB L_{Aeq}(15min)¹</i>	
N38	Day Shoulder 28/09/2016 6:32 am	0°C Calm - ~1 m/s 0/8 oktas	66	61	57	48	54	Regular traffic on Old Cooma Rd	52
								Loud traffic on Old Cooma Rd	63
								Dog barking	57

Location	Period Date Start time Noise limit	Weather: Temperature Wind speed Cloud cover	Sound pressure level (dB re 20 µPa), 15 minute measurement period					Description of noise source and typical observed maximum noise level, L _{Amax} (dB)
			L _{Amax}	L _{A1}	L _{A10}	L _{A90}	L _{Aeq}	
	Noise limit 36 dB L _{Aeq} (15min)							Resident 63
								Birds 66
								Traffic on Heights Rd 60
								<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <38 dB L_{Aeq}(15min)¹</i>
N38	Day 28/09/2016 7:56 am Noise limit 38 dB L _{Aeq} (15min)	6°C Calm 0/8 oktas	62	59	54	46	51	Regular traffic on Old Cooma Rd 52
								Traffic on Old Cooma Rd & Heights Rd 62
								Plane overhead (and road traffic & birds) 53
								Distant residential construction 52
								Operator interference 62
								<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <36 dB L_{Aeq}(15min)¹</i>
N08	Day Shoulder 28/09/2016 6:53 am Noise limit 40 dB L _{Aeq} (15min)	3°C Calm 0/8 oktas	68	66	61	50	58	Regular traffic on Old Cooma Rd 61
								Loud traffic on Old Cooma Rd and Quarry Rd 68
								Birds 52
								Trucks on Quarry Rd 51
								<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <40 dB L_{Aeq}(15min)¹</i>
N08	Day 28/09/2016 7:14 am Noise limit 44 dB L _{Aeq} (15min)	3°C Calm - ~1 m/s 0/8 oktas	74	66	61	50	58	Regular traffic on Old Cooma Rd 62
								Loud traffic on Old Cooma Rd 70
								Trucks on Quarry Rd 60
								Birds 74
								<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <40 dB L_{Aeq}(15min)¹</i>
N3	Day Shoulder 11/10/2016 6:25 am Noise limit 35 dB L _{Aeq} (15min)	5°C 1 – 3 m/s 1/8 oktas	70	52	45	38	43	Loud vehicle on surrounding road 56
								Birds 58
								Operator interference 70
								<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <28 dB L_{Aeq}(15min)¹</i>

Location	Period Date Start time Noise limit	Weather: Temperature Wind speed Cloud cover	Sound pressure level (dB re 20 μ Pa), 15 minute measurement period					Description of noise source and typical observed maximum noise level, L_{Amax} (dB)	
			L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}		
N3	Day	9°C	73	57	48	32	45	Birds	49
	28/09/2016	Calm						Dog barking	44
	9:17 am	0/8 oktas						Plane landing	62
	Noise limit 35 dB $L_{Aeq(15min)}$							Operator interference	73
								<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <32 dB $L_{Aeq(15min)}$¹</i>	

(1) Estimated based on $L_{A90(15min)}$ result.

The following is a summary of the results of the attended monitoring:

- Location N67 – Acoustic environment was dominated by road traffic noise from Old Cooma Road; quarry noise was not audible. Quarry activities were likely to be within Development Consent limits.
- Location N60 – Acoustic environment was dominated by road traffic noise from Old Cooma Road; quarry noise was not generally audible. When road traffic noise immediate to the location was low, distant truck noise was observed. It was however not possible to distinguish on whether the observed noise was associated with the quarry or part of general road traffic. Assuming that the observed truck noise was associated with the quarry, the noise contribution was estimated to be below the noise limit for the location. Quarry activities were likely to be within Development Consent limits.
- Location N38 – Acoustic environment was dominated by road traffic noise from Old Cooma Road; quarry noise was not audible. The potential noise contribution from the quarry was therefore estimated using the $L_{A90(15\text{-min})}$ result and was estimated to be <38 dB $L_{Aeq(15\text{-min})}$, which may potentially exceed the noise limit by up to 2 dB. However, considering that quarry noise was generally not audible above the background and that actual quarry noise contribution might be lower, the operation of the quarry is not likely to cause disturbance at this location.
- Location N08 – Acoustic environment was dominated by road traffic noise from Old Cooma Road; quarry noise was not audible. Quarry activities were likely to be within Development Consent limits.
- Location N3 – Acoustic environment was dominated by road traffic noise from surrounding roads; quarry noise was not audible. Quarry activities were likely to be within Development Consent limits.

Operator-attended measurements indicate that Cooma Road Quarry operations were in compliance with Development Consent noise limits at all monitoring locations.

5 SUMMARY OF RESULTS AND FINDINGS

WSP | Parsons Brinckerhoff has been engaged by Lafarge Holcim to conduct quarterly noise monitoring for Cooma Road Quarry, Queanbeyan, New South Wales. The results and findings in this report represent operator attended noise monitoring conducted between Friday 23 September and Tuesday 11 October 2016.

All noise monitoring was conducted in accordance with the NSW Industrial Noise Policy, the Cooma Road Quarry Noise Management Plan (dated March 2014) and the Development Consent for the quarry. It is understood that Cooma Road Quarry is currently operating between 6.00 am and 4.00 pm, Monday to Friday.

The noise monitoring was conducted at five locations specified in the Noise Management Plan. Operator attended noise monitoring was conducted according to the weather conditions specified in the Development Consent and no data was excluded due to unacceptable weather.

Operator-attended measurements indicate that Cooma Road Quarry operations were in compliance with Development Consent noise limits at all monitoring locations during the survey period, apart from possibly at Location N38.

At Location N38, quarry noise may exceed the applicable noise limit during the day shoulder period by up to 2 dB, which is generally acoustically insignificant. This was estimated based on the recorded $L_{A90(15\text{-min})}$ result and is likely to be lower. As the quarry was generally not audible above the background, actual disturbance is therefore not likely at this location.



HOLCIM (AUSTRALIA) PTY LTD

Cooma Road Quarry

QUARTERLY ENVIRONMENTAL NOISE
MONITORING REPORT
QUARTER ENDING SEPTEMBER 2016

13 SEPTEMBER 2016

Cooma Road Quarry

QUARTERLY ENVIRONMENTAL NOISE MONITORING REPORT QUARTER ENDING SEPTEMBER 2016

Holcim (Australia) Pty Ltd

REV	DATE	DETAILS
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GLOSSARY

A Frequency Weighting (A-weighting)	The A frequency weighting roughly approximates to the Fletcher-Munson 40 phon equal loudness contour. The human loudness perception at various frequencies and sound pressure levels is equated to the level of 40 dB at 1 kHz. The human ear is less sensitive to low frequency sound and very high frequency sound than midrange frequency sound (i.e. 500 Hz to 6 kHz). Humans are most sensitive to midrange frequency sounds, such as a child's scream. Sound level meters have inbuilt frequency weighting networks that very roughly approximates the human loudness response at low sound levels. It should be noted that the human loudness response is not the same as the human annoyance response to sound. Here low frequency sounds can be more annoying than midrange frequency sounds even at very low loudness levels. The A weighting is the most commonly used frequency weighting for occupational and environmental noise assessments.
decibel (dB)	The decibel (dB) is a logarithmic scale that allows a wide range of values to be compressed into a more comprehensible range, typically 0 dB to 120 dB. The decibel is ten times the logarithm of the ratio of any two quantities that relate to the flow of energy (i.e. power). When used in acoustics it is the ratio of square of the sound pressure level to a reference sound pressure level, the ratio of the sound power level to a reference sound power level, or the ratio of the sound intensity level to a reference sound intensity level. See also Sound Pressure Level and Sound Power Level. Noise levels in decibels cannot be added arithmetically since they are logarithmic numbers. If one machine is generating a noise level of 50 dB, and another similar machine is placed beside it, the level will increase to 53 dB (from $10 \log_{10} (10(50/10) + 10(50/10))$) and not 100 dB. In theory, ten similar machines placed side by side will increase the sound level by 10 dB, and one hundred machines increase the sound level by 20 dB. The human ear has a vast sound-sensitivity range of over a thousand billion to one so the logarithmic decibel scale is useful for acoustical assessments.
Equivalent Continuous Sound Level, L_{eq}	Many sounds, such as road traffic noise or construction noise, vary repeatedly in level over a period of time. More sophisticated sound level meters have an integrating/averaging electronic device inbuilt, which will display the energy time-average (equivalent continuous sound level - L_{Aeq}) of the A frequency weighted sound pressure level. Because the decibel scale is a logarithmic ratio, the higher noise levels have far more sound energy, and therefore the L_{Aeq} level tends to indicate an average which is strongly influenced by short term, high level noise events. Many studies show that human reaction to level-varying sounds tends to relate closer to the L_{Aeq} noise level than any other descriptor.
Fast (F) time response	Sound level meter design-goal time constant which is 0.125 seconds.
Free-field	A free field is a measurement area not subject to significant reflection of acoustical energy. A free field measurement is typically not closer than 3.5 metres to any large flat object (other than the ground) such as a fence or wall or inside an anechoic chamber.
Maximum Noise Level, L_{max}	The Root-Mean-Square (RMS) maximum sound pressure level measured with a sound level meter. When using the A frequency weighting and the Fast time weighting it is referenced as L_{AFmax} . Often used for noise assessments other than aircraft.
Statistical noise levels, L_n	Noise which varies over a specific time period, T (typical measurement times are 15 minute periods) may be quantified in terms of various statistical descriptors. The noise level, in decibels, exceeded for n % of the measurement period, when A frequency weighted and Fast time weighted, is referenced as $L_{AFn, T}$.

ABBREVIATIONS AND DEFINITIONS

AS	Australian Standard
EIS	Environmental Impact Statement of the development titled <i>Cooma Road Quarry Continued Operations Development, Environmental Impact Statement</i> , prepared by Umwelt (Australia) Pty Limited and dated October 2012; and <i>Response to Submissions Cooma Road Quarry Continued Operations Development</i> , prepared by Umwelt (Australia) Pty Limited and dated February 2013.
EPA	NSW Environment Protection Authority
EPL	Environment Protection Licence under the <i>POEO Act</i>
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NSW	New South Wales
OEH	NSW Office of Environment and Heritage
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
RTA	NSW Roads and Traffic Authority

EXECUTIVE SUMMARY

This report provides the results and findings of the quarterly noise monitoring conducted by WSP | Parsons Brinckerhoff for Cooma Road Quarry, operated by Lafarge Holcim. This report presents the results of operator-attended noise monitoring conducted between Wednesday 7 September 2016 and Friday 9 September 2016.

It is understood that Cooma Road Quarry operates between 6.00 am and 4.00 pm Monday to Friday, requiring noise monitoring to be conducted at each location for the Day Shoulder (6.00 to 7.00 am) and Day (7.00 am to 6.00 pm) periods, in accordance with the Noise Management Plan (dated March 2014) and Development Consent for the quarry.

Noise monitoring was conducted at five locations as specified in the Noise Management Plan. Operator-attended measurements indicate that Cooma Road Quarry operations were in compliance with Development Consent noise limits at all monitoring locations during the survey period, apart from at Location N60.

At Location N60, quarry noise may exceed the applicable noise limit during the day shoulder period by up to 1 dB, which is acoustically insignificant. This was based on the recorded $L_{A90(15\text{-min})}$ result and is likely to be lower. As the quarry was generally not audible above the background, actual disturbance is therefore not likely at this location.

1 PROJECT BACKGROUND

Cooma Road Quarry is a hard rock quarry operated by Holcim (Australia) Pty Ltd (Lafarge Holcim), approximately 6 km south of Queanbeyan, New South Wales. The quarry is located in the Queanbeyan-Palerang Regional Council (formerly City of Queanbeyan) Local Government Area.

The Executive Director, Development Assessment Systems and Approvals, delegate for the NSW Minister for Planning and Infrastructure, provided Development Consent for the Cooma Road Quarry Continued Operations Project (Application Number SSD_5109) on 27 September 2013.

Lafarge Holcim has commissioned WSP | Parsons Brinckerhoff to conduct quarterly noise monitoring surveys in accordance with the *Cooma Road Quarry Noise Management Plan* (NMP), dated March 2014.

The purpose of this report is to describe the attended noise monitoring performed at representative noise receivers surrounding the Cooma Road Quarry site between Wednesday 7 September and Friday 9 September 2016. The objectives of the noise monitoring survey, as presented in this report, are as follows:

- Measure the ambient noise levels through 15-minute attended monitoring at five representative monitoring locations surrounding Cooma Road Quarry, as described in the NMP.
- Describe and estimate sources of noise observed during the attended surveys.
- Assess the noise emissions from Cooma Road Quarry with respect to the limits contained in the Development Consent.

Figure 1.1 is reproduced from the Noise Management Plan (Figure 6.1, page 10), indicating the Noise Receivers and Monitoring Locations surrounding Cooma Road Quarry.



Source: Cooma Road Quarry Noise Management Plan (Umwelt Australia, 2014)

Figure 1.1 Noise Receiver and Monitoring Locations surrounding Cooma Road Quarry

2 CRITERIA – DEVELOPMENT CONSENT CONDITIONS

This section presents the noise limits applicable to the operation of the Cooma Road Quarry, in accordance with the current development consent for the project.

Noise limits, hours of operation and operating conditions specific to Cooma Road Quarry are defined in the Development Consent, conditions 4 to 6 of *Schedule 3 – Environmental Performance Conditions*. These conditions are reproduced below. The Development Consent also refers to noise in *Appendix 8 – Statement of Commitments and Appendix 9 – Noise Compliance Assessment*.

Noise Criteria

4. The Applicant shall ensure that the noise generated by the development does not exceed the criteria in Table 1 at any residence on privately-owned land.

Table 1: Noise criteria dB(A)

Receiver	Day shoulder 6 – 7 am	Day 7 am – 6 pm	Evening 6 – 10 pm
	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{Aeq} (15 min)
N1, N7, N8, N56, N57, N59, N63, N64, N65	40	44	39
N67	36	41	35
All other receivers between N9 and N71 inclusive	36	38	35
All other receivers	35	35	35

Notes:

- To locate the receivers referred to in Table 1 refer to Appendix 5.
- After the first review on any EPL granted for this development under Section 78 of the POEO Act, nothing in this approval prevents the EPA from imposing stricter noise limits on the quarrying operations on site under the EPL.

Appendix 9 sets out the meteorological conditions under which these criteria apply and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has a written agreement with the relevant landowner/s to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

Operating Hours

5. The Applicant shall comply with the operating hours set out in Table 2:

Table 2: Operating Hours

Activity	Operating Hours		
	Monday – Friday	Saturday	Sundays and Public Holidays
Primary Crushing, Truck Departures	6 am – 6 pm	6 am – 6 pm	None
Construction Operations	7 am – 6 pm	8 am – 1 pm	
Return Truck Movements	6 am – 8 pm	6 am – 8 pm	
Other Operations	6 am – 10 pm	6 am – 10 pm	

Notes: Maintenance activities may occur at any time provided they are inaudible at privately-owned residences.

Operating Conditions

6. The Applicant shall:

- a) implement best management practice to minimise the construction, operational and traffic noise of the development;
- b) minimise the noise impacts of the development during meteorological conditions when the noise limits in this consent do not apply; and
- c) maintain the effectiveness of any noise attenuation on equipment to ensure consistency with the benchmark sound power levels presented in the EIS; and
- d) regularly assess the results of noise monitoring to ensure compliance with the relevant conditions of this consent,

to the satisfaction of the Director-General.

3 PROCEDURES AND METHODOLOGY

3.1 General Requirements

The operational noise monitoring was conducted with reference to the Development Consent for application number SSD_5109 (Cooma Road Quarry Continued Operations Project), and in accordance with the NMP.

3.2 Monitoring Locations

The five representative noise monitoring locations at receivers surrounding the quarry are listed in Table 3.1. These are shown in Figure 1.1.

Table 3.1 Noise monitoring locations

Monitoring location	Property address and lot number	Description
N08	35 Tempe Crescent, Googong NSW 2620 1//DP226218	Measurements taken on public land between property and Old Cooma Road, approximately 80 m from residence
N38	51 Heights Road, Googong NSW 2620 7//DP285358	Measurements taken on public land NW of property boundary, approximately 15 m from residence
N60	632 Old Cooma Road, Googong, NSW 2620 21//DP1180981	Measurements taken near the residence on farmland to the east of the project site
N67	732 Old Cooma Road, Googong, NSW 2620 1//DP513432	Measurements taken at the project site boundary, approximately 360 m from the residence to the southern boundary of the project site ¹
N3	15 Copperfield Place, Googong, NSW 2620 1//DP1087429	Measurements taken near the residence on farmland to the west of the project site

(1) Measurements undertaken as close as possible to the nominated N67 residence while remaining inside the Lafarge Holcim site boundary. See below.

The NMP nominates the five locations listed in Table 3.1, which were deemed to be representative of all noise receivers listed in the Development Consent (refer to Section 2 of this report). Measured compliance with the operational noise limits at the monitoring locations is expected to result in compliance at all assessment locations.

Lafarge Holcim is responsible for organising access to the noise monitoring locations, and proposed the alternative location for N67 at the boundary of the project site, in lieu of a measurement position on private property. The alternative location is approximately 360 m closer to the quarry than the actual residence, which is likely to result in higher quarry noise than would be expected at the residence. As such, results at this location are acoustically appropriate, but represent a conservative assessment.

3.3 Monitoring Equipment

Details of all noise monitoring equipment used during the noise survey are presented in Table 3.2.

Table 3.2 Noise monitoring equipment details

NOISE MONITORING EQUIPMENT	LOCATION USED	SERIAL NUMBER
Norsonic Nor140 sound level meter	N3, N38, N08, N60	1406503
NTi Audio XL2 sound level meter	N67, N60	Meter: A2A-05718-E0 Microphone: 1519

The calibration of all sound level meters was checked before and after the measurements with a field calibrator and were confirmed to be within an acceptable margin of ± 1 dBA of the reference signal.

All noise monitoring equipment carry current NATA-certified calibration certificates and are designed to comply with Australian Standard (AS) IEC 61672.1 2004 *Electroacoustics – Sound level meters* and AS IEC 60942 2004 *Electroacoustics – Sound calibrators*. All measurements were performed in broad accordance with AS 1055.1-3 *Acoustics – Description and measurement of environmental noise*.

3.4 Operator-Attended Monitoring

In accordance with the NMP, operator-attended noise surveys were conducted at all five monitoring locations to provide observations of the noise sources audible at the monitoring locations.

Lafarge Holcim has advised that Cooma Road Quarry currently operates between the hours of 6:00 am and 4:00 pm Monday to Friday, in accordance with the Development Consent. Operator attended monitoring was performed for both Day Shoulder (6 am to 7 am) and Day (7 am to 6 pm) periods.

3.5 Monitoring Period Weather Conditions

Weather data has been obtained from the Canberra Airport Bureau of Meteorology weather station, approximately 10 km NNW of Cooma Road Quarry. Weather observations based on sample readings were also made at each location during noise monitoring.

During the noise monitoring undertaken between Wednesday 7 September and Friday 9 September 2016, there was no rainfall and wind speeds were below 5 m/s at microphone height during all measurements. This demonstrated that all noise monitoring results are valid and appropriate for use for the assessment in accordance to the NSW Industrial Noise Policy.

3.6 Monitoring Period Quarry Works Summary

Table 3.3 summarises the activities underway at the quarry during the monitoring period, as advised by Lafarge Holcim staff at Cooma Road Quarry.

Table 3.3 Summary of quarry works during monitoring period

Date	Plant operating
Wednesday 7 September 2016	→ Secondary crusher → 2 loaders → 2 dump trucks
Thursday 8 September 2016	→ Secondary crusher → 2 loaders → 2 dump trucks
Friday 9 September 2016	→ 3 loaders → 3 dump trucks

4 NOISE MONITORING RESULTS AND DISCUSSION

4.1 Operator-Attended Monitoring

Operator-attended 15-minute noise measurement results and observations are given in Table 4.1. Sources identified by the operator as contributing to the noise levels have been described, and a typical maximum noise level (based on subjective review of the instantaneous sound level meter reading) listed. Contributions from activities associated with Cooma Road Quarry are stated only when the noise could be clearly perceived by the operator. The weather observations given in Table 4.1 are approximate based on sample measurements of the wind speed and temperature during measurements, and subjective observations of cloud cover made by the operator.

Operator-attended monitoring was conducted between Wednesday 7 September and Friday 9 September 2016 by Jacalyn Macfarlane of WSP | Parsons Brinckerhoff. Weather observations from the Bureau of Meteorology Canberra Airport weather station indicate that relative humidity was between 76% and 99% during the monitoring period. Fog was not present at any of the monitoring locations during the measurements. All weather conditions were in accordance with the limits specified in the Development Consent and as such no measurements have been excluded due to unacceptable weather conditions.

It is understood that Cooma Road Quarry is currently operating between the hours of 6:00 am and 4:00 pm Monday to Friday. This is within the limits defined in the Development Consent for Day Shoulder (6:00 to 7:00 am) and Day (7:00 am to 6:00 pm) periods. As operations are not carried out during the Evening (6:00 to 10:00 pm), noise measurements were not undertaken during that time period.

One 15-minute measurement has been conducted at each location for each operational period (Day Shoulder and Day), as per the NMP.

Table 4.1 Summary of operator-attended monitoring conducted between 7/9/2016 and 9/9/2016

Location	Period Date Start time Noise limit	Weather: Temperature Wind speed Cloud cover	Sound pressure level (dB re 20 µPa), 15 minute measurement period					Description of noise source and typical observed maximum noise level, L _{Amax} (dB)
			L _{Amax}	L _{A1}	L _{A10}	L _{A90}	L _{Aeq}	
N67	Day Shoulder 7/9/2016 6:35 am Noise limit: 36 dB L _{Aeq} (15 min)	6°C Calm 3/8 oktas	62	53	47	42	45	Regular road traffic on Old Cooma Rd ~46
								Loud truck on Old Cooma Rd ~51
								Birds ~52-62
								Machinery / processing noise from quarry, with background noise ~46
								Brief spike in machinery noise on one occasion, with background noise ~47
								<i>Estimated quarry noise contribution, L_{Aeq}(15-min)</i> 36
N67	Day 7/9/2016	7°C Calm	73	63	49	40	50	Regular road traffic on Old Cooma Rd ~42
								Loud motorbike on Old Cooma Rd 54

	7:06 am Noise limit: 41 dB L _{Aeq} (15 min)	3/8 oktas						Birds	59
								Plane landing / taking off	~40-41
								Sheep in adjoining paddocks	~41-56
								Machinery / processing noise from quarry, with background noise	~44
								<i>Estimated quarry noise contribution, L_{Aeq}(15-min)</i>	<36
N60	Day Shoulder 8/9/2016 6:48 am Noise limit: 36 dB L _{Aeq} (15 min)	8°C Calm 7/8 oktas	72	63	56	47	54	Regular road traffic on Old Cooma Rd	~45
								Birds	55-57
								<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <37 dB L_{Aeq}(15-min)¹</i>	
N60	Day 7/9/2016 7:51 am Noise limit: 38 dB L _{Aeq} (15 min)	9°C Calm 2/8 oktas	66	62	56	48	54	Regular road traffic on Old Cooma Rd	~45
								Loud truck on Old Cooma Rd	60
								Siren, not associated with quarry	52 – 56
								<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <38 dB L_{Aeq}(15-min)¹</i>	
N3	Day Shoulder 9/9/2016 6:33 am Noise limit: 35 dB L _{Aeq} (15 min)	7°C Calm 4/8 oktas	66	58	47	43	47	Constant road traffic noise from distant main roads	43-45
								Birds	56-63
								Residential noise	44
								<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <33 dB L_{Aeq}(15-min)¹</i>	
N3	Day 8/9/16 7:34 am Noise limit: 35 dB L _{Aeq} (15 min)	10°C <2 m/s 7/8 oktas	62	58	50	42	48	Constant road traffic noise from distant main roads	~42
								Plane landing / taking off	49-59
								Machinery / processing noise from quarry, with background noise	~42
								<i>Estimated quarry noise contribution, L_{Aeq}(15-min)</i>	<30
N08	Day Shoulder 8/9/16 6:24 am Noise limit: 40 dB L _{Aeq} (15 min)	9°C Calm 7/8 oktas	66	62	59	48	56	Regular road traffic on Old Cooma Rd	~46
								Bus on Old Cooma Rd	60
								Trucks on Quarry Road	60
								Loud truck on Old Cooma Rd	63
								Dog barking	57-62
								Birds	46-62

								Aircraft movement	57
								<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <38 dB LAeq(15-min)¹</i>	
N08	Day	12°C	70	65	59	44	56	Regular road traffic on Old Cooma Rd	~45
	8/9/2016	<2 m/s						Loud truck on Old Cooma Rd	70
	8:52 am	7/8 oktas						Trucks on Quarry Road	60-61
	Noise limit: 44 dB LAeq (15 min)							<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <34 dB LAeq(15-min)¹</i>	
N38	Day Shoulder	8°C	83	57	51	41	53	Regular road traffic on Old Cooma Rd	~38-40
	8/9/2016	Calm						Vehicle passbys on Heights Rd	59
	6:01 am	7/8 oktas						Plane landing / taking off	47
								Residential noise (including barking dog)	>57
								Birds	~52
								<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <31 dB LAeq(15-min)¹</i>	
N38	Day	11°C	62	60	54	46	52	Regular road traffic on Old Cooma Rd	~45
	8/9/2016	Calm						Loud truck on Old Cooma Rd	59
	8:20 am	7/8 oktas						Vehicle passbys on Heights Rd	62
	Noise limit: 38 dB LAeq (15 min)							Residential noise	50
								<i>Cooma Road Quarry not audible during measurement period, estimated quarry noise contribution <36 dB LAeq(15-min)¹</i>	

(1) Estimated based on LA90 (15-min) result.

The following is a summary of the results of the attended monitoring:

- Location N67 – Acoustic environment was dominated by road traffic noise on Old Cooma Road, with quarry activities audible at levels generally below that of the typical road traffic. Noise from Cooma Road Quarry was observed to be within Development Consent limits.
- Location N60 – Acoustic environment was dominated by road traffic noise from Old Cooma Road; quarry noise was not audible. The potential noise contribution from the quarry was therefore estimated using the $L_{A90(15-min)}$ result and was estimated to be $<37\text{ dB } L_{Aeq(15-min)}$, which may potentially exceed the noise limit by 1 dB or less. However, considering that quarry noise was generally not audible above the background and that actual quarry noise contribution might be lower, the operation of the quarry is not likely to cause disturbance at this location.
- Location N3 – Acoustic environment was dominated by road traffic noise from local roads and distant main roads. Quarry activities were faintly audible for brief periods but were estimated to be within Development Consent limits.
- Location N38 – Acoustic environment was dominated by road traffic from Old Cooma Road; quarry noise was not audible. Quarry activities were likely to be to be within Development Consent limits.
- Location N08 – Acoustic environment was dominated by road traffic noise from Old Cooma Road; quarry noise was not audible. Quarry activities were likely to be to be within Development Consent limits.

Operator-attended measurements indicate that Cooma Road Quarry operations were in compliance with Development Consent noise limits at all monitoring locations during the survey period, apart from at Location N60.

At Location N60, quarry noise may exceed the applicable noise limit during the day shoulder period by up to 1 dB, which is acoustically insignificant. This was based on the recorded $L_{A90(15-min)}$ result and is likely to be lower. As the quarry was generally not audible above the background, actual disturbance is therefore not likely at this location.

5 SUMMARY OF RESULTS AND FINDINGS

WSP | Parsons Brinckerhoff has been engaged by Lafarge Holcim to conduct quarterly noise monitoring for Cooma Road Quarry, Queanbeyan, New South Wales. The results and findings in this report represent operator attended noise monitoring conducted between Wednesday 7 September and Friday 9 September 2016.

All noise monitoring was conducted in accordance with the NSW Industrial Noise Policy, the Cooma Road Quarry Noise Management Plan (dated March 2014) and the Development Consent for the quarry. It is understood that Cooma Road Quarry is currently operating between 6.00 am and 4.00 pm, Monday to Friday.

The noise monitoring was conducted at five locations specified in the Noise Management Plan. Operator attended noise monitoring was conducted according to the weather conditions specified in the Development Consent and no data was excluded due to unacceptable weather.

Operator-attended measurements indicate that Cooma Road Quarry operations were in compliance with Development Consent noise limits at all monitoring locations during the survey period, apart from at Location N60.

At Location N60, quarry noise may exceed the applicable noise limit during the day shoulder period by up to 1 dB, which is acoustically insignificant. This was estimated based on the recorded $L_{A90(15\text{-min})}$ result and is likely to be lower. As the quarry was generally not audible above the background, actual disturbance is therefore not likely at this location.



HOLCIM (AUSTRALIA) PTY LTD

Cooma Road Quarry

QUARTERLY ENVIRONMENTAL NOISE
MONITORING
QUARTER ENDING JUNE 2016

JUNE 2016

Cooma Road Quarry



QUARTERLY ENVIRONMENTAL NOISE MONITORING QUARTER ENDING JUNE 2016

Holcim (Australia) Pty Ltd

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GLOSSARY

A Frequency Weighting (A-weighting)	The A frequency weighting roughly approximates to the Fletcher-Munson 40 phon equal loudness contour. The human loudness perception at various frequencies and sound pressure levels is equated to the level of 40 dB at 1 kHz. The human ear is less sensitive to low frequency sound and very high frequency sound than midrange frequency sound (i.e. 500 Hz to 6 kHz). Humans are most sensitive to midrange frequency sounds, such as a child's scream. Sound level meters have inbuilt frequency weighting networks that very roughly approximates the human loudness response at low sound levels. It should be noted that the human loudness response is not the same as the human annoyance response to sound. Here low frequency sounds can be more annoying than midrange frequency sounds even at very low loudness levels. The A weighting is the most commonly used frequency weighting for occupational and environmental noise assessments.
decibel (dB)	The decibel (dB) is a logarithmic scale that allows a wide range of values to be compressed into a more comprehensible range, typically 0 dB to 120 dB. The decibel is ten times the logarithm of the ratio of any two quantities that relate to the flow of energy (i.e. power). When used in acoustics it is the ratio of square of the sound pressure level to a reference sound pressure level, the ratio of the sound power level to a reference sound power level, or the ratio of the sound intensity level to a reference sound intensity level. See also Sound Pressure Level and Sound Power Level. Noise levels in decibels cannot be added arithmetically since they are logarithmic numbers. If one machine is generating a noise level of 50 dB, and another similar machine is placed beside it, the level will increase to 53 dB (from $10 \log_{10} (10(50/10) + 10(50/10))$) and not 100 dB. In theory, ten similar machines placed side by side will increase the sound level by 10 dB, and one hundred machines increase the sound level by 20 dB. The human ear has a vast sound-sensitivity range of over a thousand billion to one so the logarithmic decibel scale is useful for acoustical assessments.
Equivalent Continuous Sound Level, L_{eq}	Many sounds, such as road traffic noise or construction noise, vary repeatedly in level over a period of time. More sophisticated sound level meters have an integrating/averaging electronic device inbuilt, which will display the energy time-average (equivalent continuous sound level - L_{Aeq}) of the A frequency weighted sound pressure level. Because the decibel scale is a logarithmic ratio, the higher noise levels have far more sound energy, and therefore the L_{Aeq} level tends to indicate an average which is strongly influenced by short term, high level noise events. Many studies show that human reaction to level-varying sounds tends to relate closer to the L_{Aeq} noise level than any other descriptor.
Fast (F) time response	Sound level meter design-goal time constant which is 0.125 seconds.
Free-field	A free field is a measurement area not subject to significant reflection of acoustical energy. A free field measurement is typically not closer than 3.5 metres to any large flat object (other than the ground) such as a fence or wall or inside an anechoic chamber.
Maximum Noise Level, L_{max}	The Root-Mean-Square (RMS) maximum sound pressure level measured with a sound level meter. When using the A frequency weighting and the Fast time weighting it is referenced as L_{AFmax} . Often used for noise assessments other than aircraft.
Statistical noise levels, L_n	Noise which varies over a specific time period, T (typical measurement times are 15 minute periods) may be quantified in terms of various statistical descriptors. The noise level, in decibels, exceeded for n % of the measurement period, when A frequency weighted and Fast time weighted, is referenced as $L_{AFn, T}$.

ABBREVIATIONS AND DEFINITIONS

AS	Australian Standard
EIS	Environmental Impact Statement of the development titled <i>Cooma Road Quarry Continued Operations Development, Environmental Impact Statement</i> , prepared by Umwelt (Australia) Pty Limited and dated October 2012; and <i>Response to Submissions Cooma Road Quarry Continued Operations Development</i> , prepared by Umwelt (Australia) Pty Limited and dated February 2013.
EPA	NSW Environment Protection Authority
EPL	Environment Protection Licence under the <i>POEO Act</i>
Lafarge Holcim	Holcim (Australia) Pty Ltd
INP	NSW Industrial Noise Policy
NMP	<i>Cooma Road Quarry Noise Management Plan</i> , dated March 2014
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
RTA	NSW Roads and Traffic Authority

EXECUTIVE SUMMARY

This report provides the results and findings of the quarterly noise monitoring conducted by WSP | Parsons Brinckerhoff for Cooma Road Quarry, operated by Lafarge Holcim. This report represents operator-attended noise monitoring conducted on Wednesday 29 June 2016.

It is understood that Cooma Road Quarry operates between 6:00 am and 4:00 pm Monday to Friday, requiring noise monitoring to be conducted at each location for the Day Shoulder (6:00 to 7:00 am) and Day (7:00 am to 6:00 pm) periods, in accordance with the Noise Management Plan (dated March 2014) and Development Consent for the quarry.

Noise monitoring was conducted at five locations as specified in the Noise Management Plan. Based on the results and observations from the noise monitoring, the following findings were made:

- Locations N3, N08, N38 and N60:
 - Activities at Cooma Road Quarry were mostly inaudible at these locations.
 - At times when quarry activities were audible, the estimated noise contribution was generally below the $L_{Aeq(15\text{-minute})}$ noise limits for the relevant locations.
- Location N67:
 - Minor exceedances of 1 dB to 3 dB of the $L_{Aeq(15\text{-minute})}$ Day Shoulder criteria were observed. These were generally associated with quarry operations start-up activities, which are not likely to be sustained over a long period of time.

Aside from the observed exceedance at Location N67, based on the results and observations from the operator-attended measurements it is expected that contributed noise levels from Cooma Road Quarry operational activities complied with the project-specific noise limits.

1 PROJECT BACKGROUND

Cooma Road Quarry is a hard rock quarry operated by Holcim (Australia) Pty Ltd (Lafarge Holcim), approximately 6 km south of Queanbeyan, New South Wales. The quarry is located in the Queanbeyan Palerang Regional Council (formerly City of Queanbeyan) Local Government Area.

The Executive Director, Development Assessment Systems and Approvals, delegate for the NSW Minister for Planning and Infrastructure, provided Development Consent for the Cooma Road Quarry Continued Operations Project (Application Number SSD_5109) on 27 September 2013.

Lafarge Holcim has commissioned WSP | Parsons Brinckerhoff to conduct quarterly noise monitoring surveys in accordance with the *Cooma Road Quarry Noise Management Plan* (NMP), dated March 2014.

The purpose of this report is to describe the attended noise monitoring performed at representative noise receivers surrounding the Cooma Road Quarry site on Wednesday 29 June 2016. The objectives of the noise monitoring survey, as presented in this report, are as follows:

- Measure the ambient noise levels through 15-minute attended monitoring at five representative monitoring locations surrounding Cooma Road Quarry, as described in the NMP.
- Describe and estimate sources of noise within each of the attended surveys.
- Assess the noise emissions from Cooma Road Quarry with respect to the limits contained in the Development Consent.

Figure 1.1 is reproduced from the Noise Management Plan (Figure 6.1, page 10), indicating the Noise Receiver and Monitoring Locations surrounding Cooma Road Quarry.



Figure 1.1 Noise Receiver and Monitoring Locations surrounding Cooma Road Quarry

2 CRITERIA – DEVELOPMENT CONSENT CONDITIONS

This section presents the noise limits applicable to the operation of the Cooma Road Quarry, in accordance with the current development consent for the project.

Noise limits, hours of operation and operating conditions specific to Cooma Road Quarry are defined in the Development Consent, conditions 4 to 6 of *Schedule 3 – Environmental Performance Conditions*. These conditions are reproduced below. The Development Consent also refers to noise in *Appendix 8 – Statement of Commitments and Appendix 9 – Noise Compliance Assessment*.

Noise Criteria

4. The Applicant shall ensure that the noise generated by the development does not exceed the criteria in Table 1 at any residence on privately-owned land.

Table 1: Noise criteria dB(A)

Receiver	Day shoulder 6 – 7 am	Day 7 am – 6 pm	Evening 6 – 10 pm
	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{Aeq} (15 min)
N1, N7, N8, N56, N57, N59, N63, N64, N65	40	44	39
N67	36	41	35
All other receivers between N9 and N71 inclusive	36	38	35
All other receivers	35	35	35

Notes:

- To locate the receivers referred to in Table 1 refer to Appendix 5.
- After the first review on any EPL granted for this development under Section 78 of the POEO Act, nothing in this approval prevents the EPA from imposing stricter noise limits on the quarrying operations on site under the EPL.

Appendix 9 sets out the meteorological conditions under which these criteria apply and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has a written agreement with the relevant landowner/s to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

Operating Hours

5. The Applicant shall comply with the operating hours set out in Table 2:

Table 2: Operating Hours

Activity	Operating Hours		
	Monday – Friday	Saturday	Sundays and Public Holidays
Primary Crushing, Truck Departures	6 am – 6 pm	6 am – 6 pm	None
Construction Operations	7 am – 6 pm	8 am – 1 pm	
Return Truck Movements	6 am – 8 pm	6 am – 8 pm	
Other Operations	6 am – 10 pm	6 am – 10 pm	

Notes: Maintenance activities may occur at any time provided they are inaudible at privately-owned residences.

Operating Conditions

6. The Applicant shall:

- a) implement best management practice to minimise the construction, operational and traffic noise of the development;
- b) minimise the noise impacts of the development during meteorological conditions when the noise limits in this consent do not apply; and
- c) maintain the effectiveness of any noise attenuation on equipment to ensure consistency with the benchmark sound power levels presented in the EIS; and
- d) regularly assess the results of noise monitoring to ensure compliance with the relevant conditions of this consent,

to the satisfaction of the Director-General.

3 PROCEDURES AND METHODOLOGY

3.1 General Requirements

The operational noise monitoring was conducted with reference to the Development Consent for application number SSD_5109 (Cooma Road Quarry Continued Operations Project), and in accordance with the NMP.

3.2 Monitoring Locations

The five representative noise monitoring locations at receivers surrounding the quarry are listed in Table 3.1. These are shown in Figure 1.1.

Table 3.1 Noise monitoring locations

MONITORING LOCATION	PROPERTY ADDRESS AND LOT NUMBER	DESCRIPTION
N08	35 Tempe Crescent, Googong NSW 2620 1//DP226218	Measurements taken on public land between property and Old Cooma Road, approximately 80 m from residence
N38	51 Heights Road, Googong NSW 2620 7//DP285358	Measurements taken on public land NW of property boundary, approximately 15 m from residence
N60	632 Old Cooma Road, Googong, NSW 2620 21//DP1180981	Measurements taken near the residence on farmland to the east of the project site
N67	511 Old Cooma Road, Googong, NSW 2620 1//DP513432	Measurements taken at the project site boundary, approximately 360 m from the residence to the southern boundary of the project site ¹
N3	15 Copperfield Place, Googong, NSW 2620 1//DP1087429	Measurements taken near the residence on farmland to the west of the project site

1. Measurements undertaken as close as possible to the nominated N67 residence while remaining inside the Lafarge Holcim site boundary. See below.

The NMP nominates the five locations listed in Table 3.1, which were deemed to be representative of all noise receivers listed in the Development Consent (refer to Section 2 of this report). Measured compliance with the operational noise limits at the monitoring locations is expected to result in compliance at all assessment locations.

Lafarge Holcim are responsible for organising access to the noise monitoring locations, and proposed the alternative location for N67 at the boundary of the project site, in lieu of a measurement position on private property. The alternative location is approximately 360 m closer to the quarry than the actual residence, which is likely to result in higher quarry noise than would be expected at the residence. As such, results at this location are acoustically appropriate, but represent a conservative assessment.

3.3 Monitoring Equipment

Details of all noise monitoring equipment used during the noise survey are presented in Table 3.2.

Table 3.2 Noise monitoring equipment details

NOISE MONITORING EQUIPMENT	LOCATION USED	SERIAL NUMBER
Norsonic Nor140 sound level meter	N67, N3	4294981
NTi Audio XL2 sound level meter	N08, N38, N60	Meter: A2A-05718-E0 Microphone: 1519

The calibration of all sound level meters were checked before and after the measurements with a field calibrator and were confirmed to be within an acceptable margin of ± 1 dBA of the reference signal.

All noise monitoring equipment carry current NATA-certified calibration certificates and are designed to comply with Australian Standard (AS) IEC 61672.1 2004 *Electroacoustics – Sound level meters* and AS IEC 60942 2004 *Electroacoustics – Sound calibrators*. All measurements were performed in broad accordance with AS 1055.1-3 *Acoustics – Description and measurement of environmental noise*.

3.4 Operator Attended Monitoring

In accordance with the NMP, operator attended noise surveys were conducted at all five monitoring locations to provide observations of the noise sources audible at the monitoring locations.

Lafarge Holcim has advised that Cooma Road Quarry currently operates between the hours of 6:00 am and 4:00 pm Monday to Friday, in accordance with the Development Consent. Operator attended monitoring was performed for both Day Shoulder (6 am to 7 am) and Day (7 am to 6 pm) periods.

3.5 Monitoring Period Weather Conditions

Weather data has been obtained from the Canberra Airport Bureau of Meteorology weather station, approximately 10 km NNW of Cooma Road Quarry. Weather observations based on sample readings were made at each location during noise monitoring.

During the noise monitoring undertaken on Wednesday 29 June 2016, there was no rainfall and wind speeds were below 5 m/s at microphone height during all measurements.

3.6 Monitoring Period Quarry Works Summary

Lafarge Holcim provided verbal confirmation that all plant was operating for the duration of the attended monitoring.

4 NOISE MONITORING RESULTS AND DISCUSSION

4.1 Operator Attended Monitoring

Operator attended 15-minute noise measurement results and observations are given in Table 4.1. Sources identified by the operator as contributing to the noise levels have been described, and a typical maximum noise level (based on subjective review of the instantaneous sound level meter reading) listed. Contributions from activities associated with Cooma Road Quarry are stated only when the noise could be clearly perceived by the operator. The weather observations given in Table 4.1 are approximate based on sample measurements of the wind speed and temperature during measurements, and subjective observations of cloud cover made by the operator.

Operator attended monitoring was conducted on Wednesday 29 June 2016 between 6:00 am and 9:45 am by Zhang Lai and Jacalyn Macfarlane of WSP | Parsons Brinckerhoff. Weather observations from the Bureau of Meteorology Canberra Airport weather station indicate that relative humidity was between 94% and 99% during the monitoring period. Fog was not present at any of the monitoring locations during the measurements. All weather conditions were in accordance with the limits specified in the Development Consent and as such no measurements have been excluded due to unacceptable weather conditions.

It is understood that Cooma Road Quarry is currently operating between the hours of 6:00 am and 4:00 pm Monday to Friday. This is within the limits defined in the Development Consent for Day Shoulder (6:00 to 7:00 am) and Day (7:00 am to 6:00 pm) periods. As operations are not carried out during the Evening (6:00 to 10:00 pm), noise measurements were not undertaken during that time period.

One 15-minute measurement has been conducted at each location for each operational period (Day Shoulder and Day), as per the NMP.

Table 4.1 Summary of operator attended monitoring conducted on Wednesday, 29 June 2016

LOCATION	PERIOD START TIME, NOISE LIMIT	WEATHER TEMPERATURE WIND SPEED CLOUD COVER	SOUND PRESSURE LEVEL (dB re 20 µPa), 15 MINUTE MEASUREMENT PERIOD					DESCRIPTION OF NOISE SOURCE AND TYPICAL OBSERVED MAXIMUM NOISE LEVEL, L _{Amax} (dB)
			L _{Amax}	L _{A1}	L _{A10}	L _{A90}	L _{Aeq}	
N08	Day shoulder 6:16 am Noise limit: 40 dB L _{Aeq} (15 min)	-4°C Calm 1/8 oktas	66	63	59	49	56	Road traffic dominant ~53-55 3 local vehicle pass-bys on Tempe Cres ~60-66 Empty quarry trucks turning from Old Cooma Road to Quarry Road ~58-62 Quarry siren audible briefly (<10 seconds) but not distinguishable from road traffic background noise Other quarry activities generally not audible. Estimated quarry noise contribution <39 dB L _{Aeq} (15 min)

LOCATION	PERIOD START TIME, NOISE LIMIT	WEATHER TEMPERATURE WIND SPEED CLOUD COVER	SOUND PRESSURE LEVEL (dB re 20 µPa), 15 MINUTE MEASUREMENT PERIOD					DESCRIPTION OF NOISE SOURCE AND TYPICAL OBSERVED MAXIMUM NOISE LEVEL, L _{Amax} (dB)
			L _{Amax}	L _{A1}	L _{A10}	L _{A90}	L _{Aeq}	
N08	Day 8:11 am Noise limit: 44 dB L _{Aeq} (15 min)	-3°C Calm 1/8 oktas	68	65	61	50	59	Road traffic dominant up to ~58 Intermittent dog barking, wildlife ~62-63 3 vehicle pass-bys on Tempe Cres, incl. school bus ~68 Quarry activities generally not audible. Estimated quarry noise contribution <40 dB L _{Aeq} (15 min)
	Day shoulder 6:47 am Noise limit: 36 dB L _{Aeq} (15 min)	-4°C Calm 1/8 oktas	63	61	57	49	54	Road traffic dominant ~54 Intermittent wildlife ~57-63 Vehicle pass-by on Heights Rd ~60-61 Quarry activities generally not audible. Estimated quarry noise contribution <39 dB L _{Aeq} (15 min)
N38	Day 8:42 am Noise limit: 38 dB L _{Aeq} (15 min)	-2°C Calm 1/8 oktas	59	56	54	46	51	Road traffic dominant ~51 Dog barking, wildlife ~55-59 Quarry activities generally not audible. Estimated quarry noise contribution <36 dB L _{Aeq} (15 min)
	Day shoulder 7:34 am Noise limit: 36 dB L _{Aeq} (15 min)	-3°C 0.5 m/s 1/8 oktas	61	58	55	48	53	Road traffic dominant ~50-52 Intermittent bird and wind-chime ~56-58 Jet aircraft ~58-61 Quarry activities generally not audible. Estimated quarry noise contribution <38 dB L _{Aeq} (15 min)
N60	Day 9:18 am Noise limit: 38 dB L _{Aeq} (15 min)	-2°C Calm 1/8 oktas	78	62	55	42	54	Road traffic dominant ~52 Jet aircraft ~55-60 Wildlife ~68-78 Quarry activities generally not audible. Estimated quarry noise contribution <32 dB L _{Aeq} (15 min)

LOCATION	PERIOD START TIME, NOISE LIMIT	WEATHER TEMPERATURE WIND SPEED CLOUD COVER	SOUND PRESSURE LEVEL (dB re 20 µPa), 15 MINUTE MEASUREMENT PERIOD					DESCRIPTION OF NOISE SOURCE AND TYPICAL OBSERVED MAXIMUM NOISE LEVEL, L _{Amax} (dB)
			L _{Amax}	L _{A1}	L _{A10}	L _{A90}	L _{Aeq}	
N67	Day shoulder 6:09 am Noise limit: 36 dB L _{Aeq} (15 min)	-4°C Calm 1/8 oktas	58	49	44	39	42	Regular road traffic on Old Cooma Rd ~39-41 Truck on Old Cooma Rd ~44 Birds ~50-58 Truck and alarm noise from quarry ~42 Constant machinery noise from quarry for about 4-5 minutes ~42-44 Spike in machinery noise on one occasion ~48 Estimated quarry noise contribution 37-39 dB L _{Aeq} (15 min)
	Day 7:43 am Noise limit: 41 dB L _{Aeq} (15 min)	-3°C Calm 1/8 oktas	65	54	50	44	48	Regular road traffic noise from Old Cooma Road ~44-48 Birds ~50-65 Aircraft movements ~48-55 Truck and alarm noise from quarry ~42 Machinery and/or processing noise from quarry faintly audible above background ~42 Estimated quarry noise contribution <39 dB L _{Aeq} (15 min)
N3	Day shoulder 6:45 am Noise limit: 35 dB L _{Aeq} (15 min)	-4°C Calm 1/8 oktas	65	50	46	42	45	Regular road traffic noise from distant main road corridors ~42-43 Local traffic in Jerrabomberra ~46 Birds ~46-51 Interference from resident's dog ~60-65 Distant motorcycle ~51 Quarry activities generally not audible. Estimated quarry noise contribution <32 dB L _{Aeq} (15 min)
	Day 7:00 am Noise limit: 35 dB L _{Aeq} (15 min)	-4°C Calm 1/8 oktas	70	60	50	42	49	Regular road traffic noise from distant main road corridors ~42-43 Local bus movement in Jerrabomberra ~44 Birds ~46-51 Aircraft movements ~49-58 Interference from resident's dog ~60-70 Quarry activities generally not audible. Estimated quarry noise contribution <32 dB L _{Aeq} (15 min)

The following is a summary of the noise sources that were audible during the attended monitoring:

- Location N08 – Acoustic environment was dominated by road traffic noise on Old Cooma Road, including notable contributions of empty quarry trucks turning into Quarry Road from Old Cooma Road. Sirens from quarry operations were also faintly audible.
- Location N38 – Acoustic environment was dominated by road traffic noise on Old Cooma Road; quarry noise was not audible.
- Location N60 – Acoustic environment was dominated by road traffic noise on Old Cooma Road, with jet aircraft flyovers faintly audible; quarry noise was not audible.
- Location N67 – Acoustic environment was dominated by road traffic noise on Old Cooma Road, with activities from the quarry being audible, notably during the morning shoulder and faintly on occasions during the day.
- Location N3 – Acoustic environment was dominated by traffic noise from local roads and distant main roads; quarry noise was not audible.

In general, it was observed that noise impact due to the quarry was more notable at the start of the day shoulder period. This is likely to be due to noise associated with the commencement of operation for the day (e.g. initiation of processing plant, truck movements and associated alarm).

The operator attended measurements indicate that Cooma Road Quarry operations are in compliance at locations N38, N60, N08 and N3. Quarry noise was not generally audible at locations N38, N60 and N3. Contributions to the ambient noise environment at N08 from Cooma Road Quarry were audible but not distinguishable from the other noise sources, namely road traffic noise, and are estimated to be in compliance with the Consent criteria.

At location N67, the estimated levels of noise contribution from the quarry were 37 to 39 dB $L_{Aeq(15\text{ min})}$, which exceeds the applicable limit for the day shoulder period by up to 1 to 3 dB. However, this was likely to be associated with the initial start-up activities and not likely to be sustained over a long period of time. This minor exceedance is also generally below the levels of human perception, and not likely to contribute significantly to sleep disturbance.

5 SUMMARY OF RESULTS AND FINDINGS

WSP | Parsons Brinckerhoff has been engaged by Lafarge Holcim to conduct quarterly noise monitoring for Cooma Road Quarry, Queanbeyan, New South Wales. The results and findings in this report represent operator attended noise monitoring conducted on Wednesday 29 June 2016.

All noise monitoring was conducted in accordance with the NSW Industrial Noise Policy, the Cooma Road Quarry Noise Management Plan (dated March 2014) and the Development Consent for the quarry. It is understood that Cooma Road Quarry is currently operating between 6:00 am and 4:00 pm, Monday to Friday.

The noise monitoring was conducted at five locations specified in the Noise Management Plan. Operator attended noise monitoring was conducted according to the weather conditions specified in the Development Consent and no data was excluded due to unacceptable weather.

Based on the results and observations from the attended monitoring, the following findings were made:

- Locations N3, N08, N38 and N60:
 - Activities at Cooma Road Quarry were mostly inaudible at these locations.
 - At times when quarry activities were audible, the estimated noise contribution was generally below the $L_{Aeq(15\text{-minute})}$ noise limits for the relevant locations.
- Location N67:
 - Minor exceedances of 1 dB to 3 dB of the $L_{Aeq(15\text{-minute})}$ Morning Shoulder criteria were observed. These were generally associated with quarry operations start-up activities, which are not likely to be sustained over a long period of time.

Aside from the observed exceedance at Location N67, based on the results and observations from the operator-attended measurements it is expected that contributed noise levels from Cooma Road Quarry operational activities complied with the project-specific noise limits.



Truck Movement Data (2016)



Cooma Road Quarry Transport

2016	January		February		March		April		May		June		July		August		September		October		November		December	
	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)
Day 1	0	0	26	646.86	79	2002.88	67	1680.92	0	0	144	4349.74	90	2116.89	72	1870.67	64	1425.56	0	0	90	2395.46	152	4346.17
Day 2	0	0	66	1664.99	149	4346.9	0	0	53	1214.38	108	3067.83	65	1820.42	37	844.98	61	1395.44	0	0	148	4103.23	151	4250.38
Day 3	0	0	79	2375.44	163	4618.02	0	0	70	1795.08	67	1866.6	0	0	85	1778.75	0	0	0	0	142	3926.32	89	2604.78
Day 4	0	0	77	2159.96	109	3098.95	119	3430.6	61	1722.83	17	417.1	118	2634.24	111	2855.3	0	0	50	977.42	122	3452.44	0	0
Day 5	0	0	73	1951.89	51	1515.93	67	1861.8	105	3047.33	44	927.15	54	1428.7	89	2298.33	29	494.14	75	1701.26	99	2881.6	115	3142.12
Day 6	0	0	62	1960.22	0	0	89	2462.15	129	3634.9	82	1791.96	102	2767.32	64	1567.85	71	1567.85	133	3134.35	0	0	137	3437.02
Day 7	0	0	0	0	110	3218.08	136	4164.79	36	934.66	59	1084.63	87	1954.98	0	0	82	1827.11	125	2697.08	102	2796.88	154	4259.36
Day 8	0	0	58	1672.86	78	2114.21	139	4220.06	0	0	85	1967.31	78	1998.28	119	3158.28	104	2711.97	75	1596.54	111	3051.06	191	5066.19
Day 9	0	0	72	2079.04	150	4619.75	79	2354.57	43	1143.72	0	0	0	0	105	2860.48	128	3203.9	0	0	148	4203.77	118	3218.52
Day 10	0	0	62	1873.24	106	2958.92	0	0	39	1086.38	0	0	0	0	73	1566.86	5	136.86	100	2414.97	77	1959.93	77	2295.58
Day 11	55	1255.73	72	2031.43	45	1218.17	97	2496.83	47	1141.56	0	0	26	628.12	67	1400.12	0	0	133	3007.88	141	4037.6	0	0
Day 12	105	2845.86	61	1556.32	76	1653	97	2738.21	76	1653	0	0	104	2792.31	102	2768.83	80	2106.67	139	3668.4	30	713.08	147	3957.94
Day 13	132	3747.04	0	0	103	2659.82	131	3696.76	103	2659.82	0	0	78	1874.5	72	973.46	112	2803.91	123	3481.9	0	0	158	3982.5
Day 14	70	1996.78	0	0	2	32.3	133	3710.44	1	23.7	41	1055.12	164	3828.99	0	0	121	2412.62	117	3341	115	3170.28	168	4811.26
Day 15	88	2501.42	73	1910.38	0	0	114	3091.31	0	0	76	1840.78	161	3841.03	59	1463.2	96	1618	73	1739.58	148	4355.08	154	4009.56
Day 16	0	0	105	3200.48	48	990.1	1	24.68	48	990.1	162	4480.12	82	1869.38	82	2082.7	126	2947.49	0	0	140	3797.92	82	1759.9
Day 17	0	0	89	2427.96	16	432.32	0	0	73	1898.37	102	2290.02	0	0	94	2416.11	39	972.1	87	2507.73	142	3605.9	5	144.22
Day 18	64	1681.64	52	1528.74	49	1357.78	96	2747.66	85	2128.13	127	1697.04	122	2245.44	119	3084.57	0	0	97	2033.23	134	3825.74	0	0
Day 19	59	1680.5	97	2729.63	0	0	120	3087.31	76	1852.02	0	0	79	1425.08	133	3438.89	100	1964.45	107	2901.89	65	1979.4	155	4619.54
Day 20	47	1270.6	13	329.9	0	0	89	2556.77	116	3244.26	43	839.61	124	2729.17	28	766.14	160	3601.64	138	3870.49	0	0	126	3686.48
Day 21	41	1137.4	0	0	109	3262.88	79	2117.62	30	826.81	108	2109.71	88	1923.76	0	0	75	1802	149	4162.73	172	4973	108	3098.88
Day 22	26	596.64	88	2650.08	116	3299.99	26	664.52	0	0	98	1974.11	72	1358.72	103	2625.82	36	919.93	52	1504.24	165	4815.5	13	347.8
Day 23	0	0	97	2807.33	75	1989.46	0	0	62	1409.26	121	2929.03	0	0	94	2029.99	101	2445.62	0	0	99	3820.42	8	110.8
Day 24	0	0	83	2359.49	59	1436.56	0	0	86	2298.95	150	3372.48	0	0	92	1998.56	11	12	135	3786.67	174	4690.26	0	0
Day 25	0	0	76	2129.35	0	0	0	0	60	1690.39	55	954.42	54	1305.32	40	816.74	0	0	134	3784.63	122	2973.42	0	0
Day 26	0	0	96	2665.16	0	0	66	1659.13	35	939.44	0	0	86	2047.32	66	1721.48	40	735.08	134	3857.46	48	1426.12	0	0
Day 27	27	740.33	18	570.7	0	0	59	1515.6	58	1623.18	104	2025.6	83	1914.75	89	2655.18	136	2974.39	39	1104.24	0	0	0	0
Day 28	41	1049.26	0	0	0	0	82	2257.66	11	286.34	114	2811.38	97	2300.12	0	0	134	3578.42	160	4803.3	162	4012.52	0	0
Day 29	43	1172	95	2776.92	44	955.84	90	2606.11	0	0	176	5130.81	102	2404.3	92	2619.14	40	987.9	66	1921.03	145	4379.23	0	0
Day 30	0	0	0	0	84	2381.42	15	212.35	49	1376.92	169	4868.93	32	856.17	79	2364.7	56	1549.98	0	0	175	4851.52	0	0
Day 31	0	0	0	0	134	4059.55	0	0	88	2445.64	0	0	0	0	38	1030.63	0	0	167	4785.9	0	0	0	0
TOTAL	25.74	21675.2	54.52	48058.37	63.03	54222.83	64.23	55357.85	52.90	42967.17	72.65	53751.48	69.29	49865.31	70.77	55473.03	64.42	46195.03	84.13	68783.92	103.74	89107.68	74.45	63150

Holcim and DP&E Correspondence (Blast Incident Notification)



Daniel Lidbetter <daniel.lidbetter@lafargeholcim.com>

FW: Cooma rd Quarry blast notification

1 message

Sharon Peters <Sharon.Peters@epa.nsw.gov.au>

15 December 2016 at 12:49

To: "daniel.lidbetter@lafargeholcim.com" <daniel.lidbetter@lafargeholcim.com>

Hi Daniel

Further to our phone conversation in relation to your notification, EPA advised that since the EPL sets 90th percentile limits, you are allowed one exceedence of the blast criteria in the reporting period before a non compliance is reportable. You advised Holcim are investigating the circumstances surrounding the incident and as a precautionary measure will engage an alternate contractor to undertake future blasts. As discussed could you please provide the EPA with a copy of the investigation findings for our records. If you need to discuss the matter further please call me on 62297002

Regards

Sharon

Sharon Peters**Regional Operations Officer – South East Region**

NSW Environment Protection Authority

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PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL



Daniel Lidbetter <daniel.lidbetter@lafargeholcim.com>

Blast Exceedance: Cooma Road Quarry

1 message

Daniel Lidbetter <daniel.lidbetter@lafargeholcim.com>

15 December 2016 at 15:04

To: Paul.Rutherford@planning.nsw.gov.au

Cc: Adam Bertram <adam.bertram@holcim.com>, Peter Hewson <peter.hewson@holcim.com>, "Shenton, Ian" <ian.shenton@lafargeholcim.com>, katrina.o'reilly@planning.nsw.gov.au

Hi Paul,

As discussed, Holcim's Cooma Road Quarry experienced an air blast overpressure exceedance when firing a blast yesterday, the blast registered 119.8 dB (criteria is 115 dB with a maximum upper limit of 120 dB for <5% blasts in a reporting period).

It is thought that this issue was caused by a delayed initiation of at least 4 holes in the middle back row plus excessive rifling and stemming ejection.

To date no other blasts have exceeded the 115 db criteria during the 2015/16 reporting period however, due to this result being quite high the Holcim ACT Management team have initiated an investigation with blast contractors "MAXAM" to determine the cause of the event and corrective actions to ensure all future blasting activities are in compliance with EPL/Development Consent limits.

Will keep you updated with further information once the investigation has been undertaken and if you have any questions please give me a call to discuss.

--

Regards....Dan

Daniel Lidbetter

Holcim (Australia) Pty Ltd

NSW/ACT Planning & Environment Coordinator

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A member of LafargeHolcim.