

Cooma Road Quarry Annual Review 2017

Holcim (Australia) Pty Ltd



TABLE OF CONTENTS

1	STATEMENT OF COMPLIANCE	6
2	INTRODUCTION	11
2.1	Name and Contact Details.....	13
3	APPROVALS	14
4	OPERATIONS SUMMARY	15
4.1	Exploration	15
4.2	Land Preparation	15
4.3	Construction Activities	15
4.4	Quarry Operations	15
4.5	Next Reporting Period.....	15
5	ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW	17
6	ENVIRONMENTAL PERFORMANCE	18
6.1	Meteorological Monitoring	18
6.2	Noise.....	18
6.2.1	EIS Predictions	18
6.2.2	Approved Criteria.....	18
6.2.3	Key Environmental Performance.....	19
6.2.4	Management Measures.....	21
6.2.5	Proposed Improvements	21
6.3	Air Quality	21
6.3.1	EIS Predictions	21
6.3.2	Approved Criteria.....	21
6.3.3	Key Environmental Performance.....	22
6.3.4	Management Measures.....	25
6.3.5	Proposed Improvements	25
6.4	Blasting	25
6.4.1	EIS Predictions	25
6.4.2	Approved Criteria.....	25
6.4.3	Key Environmental Performance.....	26
6.4.4	Management Measures.....	27
6.4.5	Proposed Improvements	27
6.5	Traffic Management.....	28
6.5.1	EIS Predictions	28
6.5.2	Approved Criteria.....	28
6.5.3	Key Environmental Performance.....	28
6.5.4	Management Measures.....	28
6.5.5	Proposed Improvements	28

6.6	Biodiversity	28
6.6.1	EIS Predictions	28
6.6.2	Approved Criteria.....	28
6.6.3	Key Environmental Performance.....	28
6.6.4	Management Measures.....	29
6.6.5	Proposed Improvements	29
6.7	Heritage (Aboriginal Archaeology and Historic Heritage).....	29
6.7.1	EIS Predictions	29
6.7.1.1	Aboriginal Archaeology	29
6.7.1.2	Historic Heritage.....	30
6.7.2	Approved Criteria.....	30
6.7.3	Key Environmental Performance.....	30
6.7.4	Management Measures.....	30
6.7.5	Proposed Improvements	30
6.8	Summary of Environmental Performance	31
7	WATER MANAGEMENT	33
7.1	EIS Predictions	33
7.2	Approved Criteria.....	33
7.3	Water Usage and Storage	33
7.4	Surface Water Results.....	34
7.5	Groundwater	35
7.6	Water Take	35
8	REHABILITATION AND LANDSCAPE MANAGEMENT	36
8.1	Rehabilitation Performance during the Reporting Period	36
8.2	Summary of Current Rehabilitation and Performance.....	38
8.3	Actions for the Next Reporting Period	38
9	COMMUNITY	39
9.1	Community Engagement Activities.....	39
9.2	Community Contributions	39
9.3	Complaints.....	40
10	INDEPENDENT AUDIT	41
10.1	Key Audit Outcomes	41
11	INCIDENTS AND NON COMPLIANCE	42
12	ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD.....	45
13	APPENDICES	46

FIGURES

Figure 1: Locality Map (Umwelt 2014)	11
Figure 2: Aerial view of the Cooma Road Quarry, located on Old Cooma Road, Queanbeyan	12
Figure 3: Seedling planting with CVA at the Cooma Road Quarry in 2017	36

TABLES

Table 1: Statement of Commitments	6
Table 2: DPE Compliance Status Key	6
Table 3: Non-Compliances of SSD 5109 for 2017	7
Table 4: Annual Review Requirements	12
Table 5: Approvals for the Cooma Road Quarry Operations	14
Table 6: EPL Fee-Based Activity at the Cooma Road Quarry	14
Table 7: Total Product Distributed (Cooma Road Quarry)	15
Table 8: Status Update on Proposed Holcim Actions	17
Table 9: Rainfall Received at the Cooma Road Quarry 2017	18
Table 10: Cooma Road Quarry Noise Criteria	18
Table 11: Cooma Road Quarry Noise Results 2017	20
Table 12: Depositional Dust Criteria	21
Table 13: TSP and PM ₁₀ Dust Criteria	22
Table 14: 2017 Dust Monitoring (Depositional Dust)	22
Table 15: 2017 Dust Monitoring (PM ₁₀)	23
Table 16: Blast Monitoring Results	26
Table 17: Weed Control Records at the Cooma Road Quarry (2017)	29
Table 18: Environmental Performance at Cooma Road Quarry in 2017	31
Table 19: Water Quality Criteria for the Cooma Road Quarry	33
Table 20: 2017 Water Monitoring Results (Barracks Creek)	34
Table 21: 2017 Water Take	35
Table 22: Rehabilitation Performance in 2017	37
Table 23: Rehabilitation and Disturbance Status	38
Table 24: Rehabilitation and Closure Actions for the 2018 Reporting Period	38
Table 25: Summary of Statutory Compliance	41
Table 26: Incidents and Non Compliance at the Cooma Road Quarry During 2017	42
Table 27: Improvement Actions for 2018	45

APPENDICES

Appendix 1 – Cooma Road Quarry Independent Audit Action Plan	
Appendix 2 – Cooma Road Quarry Quarterly Noise Monitoring Reports 2017	
Appendix 3 – Cooma Road Quarry Transport Summary 2017	

SITE DETAILS

Name of operation	Cooma Road Quarry
Name of operator	Holcim (Australia) Pty Ltd
Development consent / project approval #	SSD 5109
Name of holder of development consent / project approval	Holcim (Australia) Pty Ltd
Annual review start date	1 January 2017
Annual review end date	31 December 2017
<p>I, ADAM BERTRAM, 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 2017- DECEMBER 2017 and that I am authorised to make this statement on behalf of HOLCIM (AUSTRALIA) PTY LTD.</p> <p>Note.</p> <p>a) <i>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.</i></p> <p>b) <i>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).</i></p>	
Name of authorised reporting officer	Adam Bertram
Title of authorised reporting officer	Quarry Manager
Signature of authorised reporting officer	
Date	29 March 2018

1 STATEMENT OF COMPLIANCE

The statement of commitments for the 2017 reporting period for the Cooma Road Quarry is provided in **Table 1**. **Table 3** details the non-compliances at the Cooma Road Quarry identified within the 2017 reporting period.

An Independent Environmental Audit (IEA) was completed in December 2017 by Pitt & Sherry (Operations) Pty Ltd, with the final report provided to Holcim in February 2018. This has formed the basis for the non – compliances identified within this section. Note, some non - compliances were recorded within the audit period, however not within the 2017 Annual Review period.

Table 1: Statement of Commitments

Were all conditions of the relevant approval(s) complied with?	
SSD 5109	NO- see Table 3 for further details.
EPL 1453	NO- see Table 3 for further details.

Table 2: DPE Compliance Status Key

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
Admin NC	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)

Table 3: Non-Compliances of SSD 5109 for 2017

Relevant approval	Condition	Condition Description	Compliance Status	Section Addressed in Annual Review/Comment
SSD 5109	Schedule 3, Condition 24	The Applicant must prepare and implement a Rehabilitation Management Plan for the development to the satisfaction of the Secretary.	Admin Non Compliance	The Rehabilitation Management Plan has been submitted to DPI, DPI Water and Council but not yet approved. Section 11. Also see Audit Action Plan.
SSD 5109	Schedule 3 Condition 30	Prior to importing onto the site any recycled concrete or any other material that may be classified as a waste under the EPA Waste Classification Guidelines 2009 (or its latest version), the Applicant must obtain a 'resource recovery exemption' under the POEO Act and provide evidence of this exemption to the Department.	Medium	Non - compliance recorded during the audit. Concrete waste (from a concrete batching plant) is processed at the site. A Resource Recovery Exemption for that material has not been obtained. Recommendation from audit: Apply for a Resource Recovery Exemption for the concrete wastes processed at the site. Section 11. Also see Audit Action Plan.
SSD 5109	Schedule 3 Condition 31	The Applicant must: a) minimise the waste generated by the development; and b) ensure that the waste generated by the development is appropriately stored, handled, and disposed of, to the satisfaction of the Secretary.	Medium	Non – compliance relating to field performance in the audit. Section 11. Also see Audit Action Plan.

Relevant approval	Condition	Condition Description	Compliance Status	Section Addressed in Annual Review/Comment
SSD 5109	Schedule 5 Condition 4	<p>With 3 months of the submission of an:</p> <ul style="list-style-type: none"> a) incident report under condition 7 below; b) Annual Review under condition 9 below; c) audit report under condition 10 below; and d) any modifications to this consent, <p>The applicant must review, and if necessary revise, the strategies, plans and programs required under this consent, to the satisfaction of the Secretary.</p>	Low	<p>Section 11.</p> <p>Updates will be completed in management plans in 2018.</p> <p>Also see Audit Action Plan.</p>
EPL	O1.1	<p>Licensed activities must be carried out in a competent manner. This includes:</p> <ul style="list-style-type: none"> a) (the processing, handling, movement and storage of materials and substances used to carry out the activity; and b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity. 	Medium	<p>Non – compliance relating to field performance in the audit.</p> <p>Section 11.</p> <p>Also see Audit Action Plan.</p>
EPL	R1.1	<p>The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:</p> <ul style="list-style-type: none"> a) Statement of Compliance; and b) Monitoring and Complaints Summary. <p>At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.</p>	Medium	<p>Non – compliance relating to error in May 2016 – 30 April 2017 Annual Return.</p> <p>Section 11.</p> <p>Also see Audit Action Plan.</p>
EPL	R1.7	<p>Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:</p> <ul style="list-style-type: none"> a) the licence holder; or b) by a person approved in writing by the EPA to sign on behalf of the licence holder. 	Admin Non - Compliance	<p>Error in signing 2017 Annual Return.</p> <p>Section 11.</p> <p>Also see Audit Action Plan.</p>

Relevant approval	Condition	Condition Description	Compliance Status	Section Addressed in Annual Review/Comment
Water Access Licence	1	<p>A logbook must be kept and maintained at the authorised work site or on the property for each water supply work authorised by this approval, unless the work is metered and fitted with a data logger.</p> <p>A logbook is a document, electronic or hard copy, that records specific required information.</p> <p>A metered water supply work is a water supply work fitted with a data logger and a meter that complies with Australian standard AS 4747: meters for non-urban water supply.</p>	Low	<p>Updates required to logbook. Section 11.</p> <p>Also see Audit Action Plan.</p>
Water Access Licence	2	<p>The purpose or purposes for which water is taken, as well as details of the type of crop, area cropped, and dates of planting and harvesting, must be recorded in the logbook each time water is taken.</p>	Low	<p>Updates required to logbook. Section 11.</p> <p>Also see Audit Action Plan.</p>
Water Access Licence	3	<p>Where a water meter is installed on a water supply work authorised by this approval, the meter reading must be recorded in the logbook before taking water. This reading must be recorded every time water is to be taken.</p> <p>A water meter is a device that measures the volume of water that is extracted over a known period of time. Examples of a water meter may include a mechanical meter, electromagnetic meter, channel meter with mobile phone, or an authorised meter equivalent.</p>	Low	<p>Updates required to logbook. Section 11.</p> <p>Also see Audit Action Plan.</p>
Water Access Licence	4	<p>Before water is taken through the water supply work authorised by this approval, confirmation must be recorded in the logbook that cease to take conditions do not apply and water may be taken.</p> <p>The method of confirming that water may be taken, such as visual inspection or internet search, must also be recorded in the logbook.</p>	Low	<p>Updates required to logbook. Section 11.</p> <p>Also see Audit Action Plan.</p>

Relevant approval	Condition	Condition Description	Compliance Status	Section Addressed in Annual Review/Comment
Water Access Licence	8	<p>The following information must be recorded in the logbook for each period of time that water is taken:</p> <ul style="list-style-type: none"> a) date, volume of water, start and end time when water was taken as well as the pump capacity per unit of time, and b) the access licence number under which the water is taken, and c) the approval number under which the water is taken, and d) the volume of water taken for domestic consumption and/or stock watering. <p>A logbook is a document, electronic or hard copy, that records specific required information.</p>	Low	<p>Updates required to logbook. Section 11. Also see Audit Action Plan.</p>

2 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 [DPE]) on September 27, 2013.

The site also operates in accordance with the Environmental Protection Licence (EPL) No. 1453 issued by the NSW Environmental Protection Authority (EPA). A regional locality figure and aerial view of the site are outlined in **Figure 1** and **Figure 2** below.

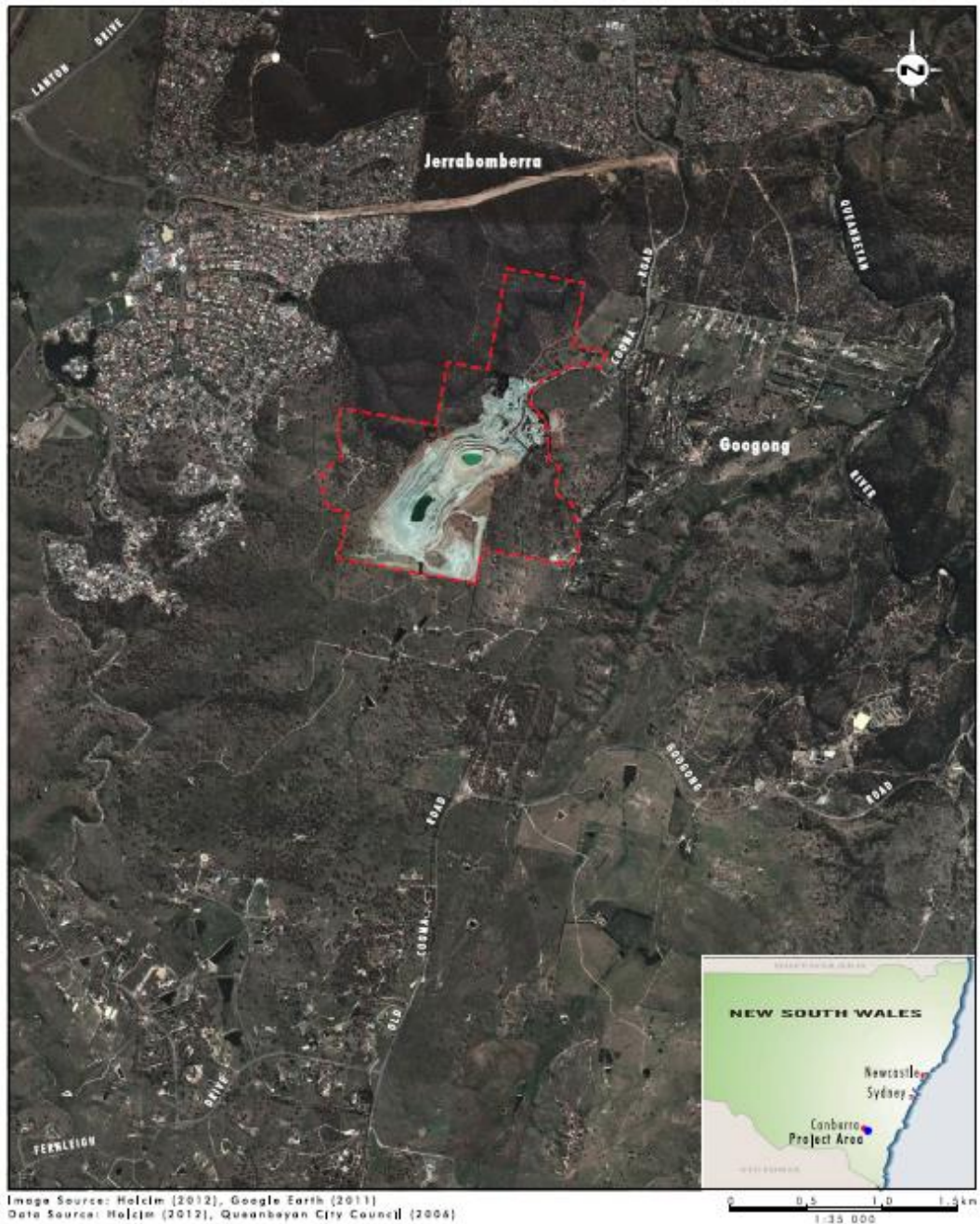


Figure 1: Locality Map (Umwelt 2014)



Figure 2: Aerial view of the Cooma Road Quarry, located on Old Cooma Road, Queanbeyan

In accordance with Schedule 5, Condition 9 of the modified Development Consent the site is required to undertake an Annual Review of the site in accordance with the conditions provided in **Table 4**.

Table 4: Annual Review Requirements

Condition	Section addressed in Annual Review
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;	Section 4 and 6
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: <ul style="list-style-type: none"> - relevant statutory requirements, limits or performance measures/criteria; - the monitoring results of previous years; and - the relevant predictions in the EIS. 	Section 6 and 7
c) identify any noncompliance over the last year, and describe what actions were (or are being) taken to ensure compliance;	Section 1
d) identify any trends in the monitoring data over the life of the development	Section 6 and 7
e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and	Section 6
f) describe what measures will be implemented over the current calendar year to improve the environmental performance of the development.	Section 12

This Annual Review has also been prepared in accordance with the *Annual Review Guideline: post approvals requirements for state significance mining developments* (October 2015). This report documents the environmental performance of the site from 1 January to 31 December 2017.

2.1 Name and Contact Details

The key contact details for the site are outlined below:

Quarry Manager

Adam Bertram

Work: +61 2 6297 2211

Mob: +61 429 790 222

Email: adam.bertram@lafargeholcim.com

ACT Aggregates Manager

Peter Hewson

Work: +61 2 4820 7007

Mob: +61 429 001 476

Email: peter.hewson@lafargeholcim.com

Planning & Environment Coordinator NSW/ACT

Amy Nelson

Holcim (Australia) Pty Ltd

Work +61 2 9412 6572

Mob +61 429 790 923

Email: amy.nelson@lafargeholcim.com

3 APPROVALS

The site operates under the following approvals listed in **Table 5**.

Table 5: Approvals for the Cooma Road Quarry Operations

Approval	Regulatory Authority
Development Consent SSD 5109	Department of Planning & Environment
EPL No. 1453	Environmental Protection Authority
Water Approval No. 40WA413082	NSW Office of Water

Holcim holds EPL 1453 which covers its activities at the Cooma Road Quarry. **Table 6** outlines these licensing limits.

Table 6: EPL Fee-Based Activity at the Cooma Road Quarry

Scheduled Activity	Fee Based Activity	Scale
Extractive Activities	Land-based extractive activity	>100,000 – 500,000 T extracted, processed or stored

4 OPERATIONS SUMMARY

4.1 Exploration

No exploration occurred at the Cooma Road Quarry in the 2017 reporting period.

4.2 Land Preparation

No land preparation activities occurred at the Cooma Road Quarry in the 2017 reporting period.

4.3 Construction Activities

No construction activities occurred at the Cooma Road Quarry in the 2017 reporting period.

4.4 Quarry Operations

Development activities undertaken at the Cooma Road Quarry in 2017 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; and
- Maintenance of rehabilitation undertaken on the overburden dump in the south-western disturbance area.

All activities took place with the approved operating hours being 6am to 6pm, Monday to Saturday. These 6am-6pm timeframes applied to all operational activities where no crushing, screening or vehicle movements occurred after 6pm and before 10pm.

Table 7 includes a summary of the operations undertaken during the reporting period against the development consent conditions regarding product transported from the Cooma Road Quarry, with the site well below the consent criteria.

Table 7: Total Product Distributed (Cooma Road Quarry)

Material	Approval Limit (Tonnes)	2016 Reporting Period (Tonnes)	2017 Reporting Period (Tonnes)
Product Distributed- Total	1,500,000	647,251	879,985

4.5 Next Reporting Period

Development activities proposed to be carried out at the Cooma Road Quarry in the 2018 reporting period 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 south-west overburden dump; and
- Progressive maintenance of rehabilitation in the completed overburden dump in the south-western disturbance area involving replacement of topsoil, revegetation activities such as planting of native species and weed control as well as nest box monitoring.

No exploration is proposed to be undertaken in the 2018 reporting period. Clearing will be limited to sporadically occurring saplings that have regenerated on currently active benches. Given the young age of these saplings, ecological pre-clearance surveys will not be required.

5 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

There was no feedback from the DPE regarding the previous Annual Review. **Table 8** outlines an update on the proposed Holcim actions from the previous Annual Review.

Table 8: Status Update on Proposed Holcim Actions

Commitment	Compliance Status
Staff will commission and undertake an Independent Environmental Audit in accordance with the Development Consent.	An Independent Environmental Audit (IEA) was undertaken in December 2017. Further detail on this audit is provided in Section 10 .
The site will continue to progressively rehabilitate available areas on the overburden dump.	The 2017 IEA observed that progressive rehabilitation appears to have been maximised at the Cooma Road Quarry with topsoil application and revegetation occurring on non-operational areas. All areas that are finalised have been stabilised, however some not to the final land-use state, and others requiring some re-vegetation. Holcim will continue to work towards achieving all rehabilitation objectives at the quarry in 2018.

6 ENVIRONMENTAL PERFORMANCE

6.1 Meteorological Monitoring

A meteorological monitoring station has been installed to obtain data in accordance with the requirements of Condition 17 of Schedule 3 of the Development Consent.

Monthly rainfall data has been provided in **Table 9**.

Table 9: Rainfall Received at the Cooma Road Quarry 2017

Monthly Rainfall (mm)												Total 2017
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
36	18	103	38	38.5	0	9	53	15.5	36.5	64	82	493.5

6.2 Noise

6.2.1 EIS Predictions

The 2012 EIS stated that 'Modelling results indicate that under worst case operational and meteorological conditions, with the implementation of the noise management measures outlined above, the Project is predicted to result in an exceedance of the PSNLs at one privately owned residence located to the south east of the Project area (N67) of up to 4dB during the day time period. If the secondary crushing plant were to be operated during the evening under worst case meteorological conditions, this same residence could be expected to experience exceedances of up to 3dB during the evening period. Holcim is however committed not to operate the secondary crushing plant under such conditions, namely gradient winds from the north east, thereby avoiding this potential impact.'

6.2.2 Approved Criteria

The site has undertaken quarterly noise monitoring throughout 2017 in accordance with the requirements of the Schedule 3, Condition 4 provided in **Table 10**.

Table 10: Cooma Road Quarry Noise Criteria

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																							
	<p><i>Table 1: Noise criteria dB(A)</i></p> <table border="1"> <thead> <tr> <th rowspan="2">Receiver</th> <th>Day Shoulder 6 – 7 am</th> <th>Day 7 am – 6 pm</th> <th>Evening 6 – 10 pm</th> </tr> <tr> <th>L_{Aeq}(15 min)</th> <th>L_{Aeq}(15 min)</th> <th>L_{Aeq}(15 min)</th> </tr> </thead> <tbody> <tr> <td>N1, N7, N8, N56, N57, N59, N63, N64, N65</td> <td>40</td> <td>44</td> <td>39</td> </tr> <tr> <td>N67</td> <td>36</td> <td>41</td> <td>35</td> </tr> <tr> <td>All other receivers between N9 and N71 inclusive</td> <td>36</td> <td>38</td> <td>35</td> </tr> <tr> <td>All other receivers</td> <td>35</td> <td>35</td> <td>35</td> </tr> </tbody> </table> <p>Notes:</p> <ul style="list-style-type: none"> 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. <p>Appendix 9 sets out the metrological conditions under which these criteria apply and the requirements for evaluating compliance with these criteria.</p> <p>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.</p>	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
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																					

6.2.3 Key Environmental Performance

Attended noise monitoring was undertaken quarterly at the Cooma Road Quarry during the 2017 reporting period by Muller Acoustic Consulting on the following dates:

- 6-7 April 2017;
- 15-16 June 2017;
- 26-27 September 2017; and.
- 14-15 December 2017

The compliance assessments for each monitoring location (N3, N8, N38, N60 and N67) are presented in **Appendix 2** and summarised in **Table 11**.

It is noted that the Cooma Road Quarry was not operational during the evening period, therefore satisfying the evening noise limit of 35dBA. Local traffic was the dominant source of noise at this receiver with other non-quarrying sources such as aircraft having been identified throughout the three attended measurement intervals.

Table 11: Cooma Road Quarry Noise Results 2017

Assessment Period	Receiver No.	Quarrying Noise Criteria	Q1 April 2017		Q2 June 2017		Q3 September 2017		Q4 December 2017	
		LAeq(15min)	Quarry Noise Contribution	Compliance	Quarry Noise Contribution	Compliance	Quarry Noise Contribution	Compliance	Quarry Noise Contribution	Compliance
Morning Shoulder	N3	35	Nil	✓	Nil	✓	Nil	✓	Nil	✓
	N8	40	Nil	✓	Nil	✓	Nil	✓	Nil	✓
	N38	36	Nil	✓	Nil	✓	Nil	✓	Nil	✓
	N60	36	Nil	✓	Nil	✓	Nil	✓	Nil	✓
	N67	36	30	✓	35	✓	Nil	✓	28	✓
Daytime	N3	35	Nil	✓	Nil	✓	Nil	✓	Nil	✓
	N8	44	Nil	✓	Nil	✓	Nil	✓	Nil	✓
	N38	38	Nil	✓	Nil	✓	Nil	✓	Nil	✓
	N60	38	Nil	✓	31	✓	Nil	✓	Nil	✓
	N67	38	30	✓	32	✓	35	✓	32	✓
Evening	N3	35	Nil	✓	Nil	✓	Nil	✓	Nil	✓
	N8	39	Nil	✓	Nil	✓	Nil	✓	Nil	✓
	N38	35	Nil	✓	Nil	✓	Nil	✓	Nil	✓
	N60	35	Nil	✓	34	✓	Nil	✓	Nil	✓
	N67	35	Nil	✓	37 ¹	✓	Nil	✓	Nil	✓

Note: Monday to Saturday: Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm. On Sunday's and Public Holidays: Day 8am to 6pm; Evening 6pm to 10pm.

Note 1: Deemed in compliance with criteria taking into account 2dB field tolerance as per Section 11.1.3 of the INP.

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 2** to this report.

Longterm Trends:

During 2017 noise was within the Development Consent criteria. Based on the noise results from previous years, the site has been effectively managing noise.

6.2.4 Management Measures

Management measures relating to noise are outlined within the Cooma Road Quarry *Noise Management Plan*. These include:

- Defined operating hours;
- Work restrictions during the early morning shoulder period;
- Monitoring for noise and meteorological conditions;
- Broadband reversing beepers;
- Training of staff and contractors; and
- Controlled blasting activities.

6.2.5 Proposed Improvements

There are no proposed improvements to noise management.

6.3 Air Quality

6.3.1 EIS Predictions

A comprehensive Air Quality assessment was undertaken for the Project by Sinclair Knight Merz (SKM) for the 2012 EIS. The results of the predictive air quality modelling have identified that the Project will comply with the relevant air quality criteria at all nearby sensitive receiver locations under worst case operating conditions.

6.3.2 Approved Criteria

Dust Deposition monitoring was undertaken in accordance with the monitoring criteria detailed in **Table 12**.

Table 12: Depositional Dust Criteria

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 installed a High Volume Sampling Unit (HVAS) to monitor PM₁₀ in accordance with the criteria listed in **Table 13**. Monitoring at the site has been undertaken throughout 2017 using an environmental consultant (ALS).

Table 13: TSP and PM₁₀ Dust Criteria

<i>Table 4: Long-Term Impact Assessment Criteria for Particulate Matter</i>		
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

<i>Table 5: Short Term Impact Assessment Criteria for Particulate Matter</i>		
Pollutant	Averaging period	^d Criterion
Particulate matter < 10 µm (PM ₁₀)	24 hour	^a 50 µg/m ³

6.3.3 Key Environmental Performance

The principle source of air pollution at the quarry is in the form of airborne dust, which arises from activities such as quarrying, vehicle movements and crushing. To minimise dust emissions associated with vehicle movements, in the 2017 reporting period Holcim continued to use a water cart to dampen the haul roads during operating hours and the wheel wash facility was upgraded to reduce carry over of dust onto the access road.

The site also undertakes dust deposition monitoring in accordance with the criteria listed in the Development Consent. For the 2017 reporting period, all Annual Average results at the 5 locations were compliant with the consent criteria.

Table 14: 2017 Dust Monitoring (Depositional Dust)

Start Date	End Date	DDG1	DDG2	DDG3	DGG4	DGG5
		(g/m ² /month)				
05-Jan-17	01-Feb-17	3.5	1.1	0.6	4.0*	3.8
01-Feb-17	03-Mar-17	2.1	1.6	0.8	2.4	0.9
03-Mar-17	03-Apr-17	2.6	1.2	0.6	19.6*	0.7
03-Apr-17	01-May-17	4.7*	2.1	1.4	5.3*	2.8
01-May-17	02-Jun-17	5.0*	0.9	0.4	6.7*	0.7
02-Jun-17	07-Jul-17	6.6*	2.3	0.5	0.6	2.5
07-Jul-17	01-Aug-17	3.7	2.6	0.5	1.7	1.6
01-Aug-17	01-Sep-17	3.6	1.3	0.4	0.8	3.1
01-Sep-17	03-Oct-17	3.7	2.0	0.8	4.8*	1.2
03-Oct-17	01-Nov-17	2.8	2.4	0.7	3.7	2.2
01-Nov-17	01-Dec-17	4.2*	1.9	1.6	1.2	1.5
01-Dec-17	04-Jan-18	3.0	1.9	1.2	4.3	3.1
Annual Average (4g/m²/year)		3.79	1.78	0.79	4.59	2.01
Annual Average (4g/m²/year) – with contaminated samples removed		3.1	1.78	0.79	2.1	2.01
Result		Within Criteria	Within Criteria	Within Criteria	Within Criteria	Within Criteria

Note: * indicates contaminated sample

It should be noted that 4 samples obtained at DDG1 in 2017 were identified to have been compromised from inundation from contamination sources including insects, bird droppings and organic matter (leaf litter and grass). As such, the 2017 monitoring results for DDG1 are based on eight samples.

This was also the case with DDG4, where five samples were identified as contaminated. Therefore the average for this gauge is based on seven samples.

A review of the current location for DDG 4, and possibly DDG 1, will be undertaken during the next reporting period to determine if these gauges should be relocated to a more suitable position.

Monitoring of PM₁₀ was undertaken at the quarry for the first full year in 2017 after the HVAS was installed in 2016.

Table 15: 2017 Dust Monitoring (PM₁₀)

Date Sampled	Sampling Period (hours)	PM ₁₀ (µg/m ³)	Compliance with Criteria (50 µg/m ³ in 24hr)
11-Jan-2017	24	35.9	Within criteria
18-Jan-2017	24	28.8	Within criteria
25-Jan-2017	24	27.0	Within criteria
01-Feb-2017	24	17.1	Within criteria
16-Feb-2017	48	9.1	Non-compliant due to extended sampling period
02-Mar-2017	48	15.0	Non-compliant due to extended sampling period
16-Mar-2017	48	10.8	Non-compliant due to extended sampling period
30-Mar-2017	48	8.8	Non-compliant due to extended sampling period
06-Apr-2017	24	5.3	Within criteria
13-Apr-2017	24	11.5	Within criteria
20-Apr-2017	24	3.5	Within criteria
27-Apr-2017	24	7.7	Within criteria
04-May-2017	24	7.4	Within criteria
11-May-2017	24	6.1	Within criteria
18-May-2017	24	6.2	Within criteria
25-May-2017	24	10.2	Within criteria
01-Jun-2017	24	9.0	Within criteria
08-Jun-2017	24	6.9	Within criteria
15-Jun-2017	48	13.4	Non-compliant due to extended sampling period
22-Jun-2017	48	13.4	Non-compliant due to extended sampling period
29-Jun-2017	24	2.2	Within criteria
06-Jul-2017	24	11.2	Within criteria
13-Jul-2017	24	2.5	Within criteria
20-Jul-2017	24	7.4	Within criteria
27-Jul-2017	24	12.6	Within criteria
03-Aug-2017	24	1.2	Within criteria

Date Sampled	Sampling Period (hours)	PM ₁₀ (µg/m ³)	Compliance with Criteria (50 µg/m ³ in 24hr)
10-Aug-2017	24	4.2	Within criteria
17-Aug-2017	24	18.4	Within criteria
24-Aug-2017	24	15.1	Within criteria
31-Aug-2017	48	16.6	Non-compliant due to extended sampling period
07-Sep-2017	48	16.6	Non-compliant due to extended sampling period
14-Sep-2017	48	11.4	Non-compliant due to extended sampling period
21-Sep-2017	48	11.4	Non-compliant due to extended sampling period
28-Sep-2017	24	9.0	Within criteria
05-Oct-2017	24	9.2	Within criteria
12-Oct-2017	24	19.9	Within criteria
19-Oct-2017	24	10.8	Within criteria
26-Oct-2017	48	6.7	Non-compliant due to extended sampling period
02-Nov-2017	48	6.7	Non-compliant due to extended sampling period
09-Nov-2017	48	6.4	Non-compliant due to extended sampling period
16-Nov-2017	48	6.4	Non-compliant due to extended sampling period
23-Nov-2017	48	8.0	Non-compliant due to extended sampling period
30-Nov-2017	48	8.0	Non-compliant due to extended sampling period
08-Dec-2017	24	3.2	Within criteria
11-Dec-2017	24	15.8	Within criteria
18-Dec-2017	24	19.6	Within criteria
25-Dec-2017	24	5.2	Within criteria
Annual Average (30µg/m³/year)		10.97	Within Criteria

Longterm Trends:

Holcim has monitored dust deposition on a monthly basis at five locations within the Cooma Road Quarry project area since 2001. Dust deposition data from the site shows that annual average dust deposition levels have remained below the Development Consent criteria of 4 g/m²/month, with the maximum annual average deposition being 2.1 g/m²/month. The site was also below the depositional dust results in 2016.

As 2017 was the first year of PM₁₀ monitoring there are no trends available.

Comparison to EIS Predictions:

The results for depositional dust and PM₁₀ were within the predicted limits of the EIS predictions. However it was noted that there were several missed sampling events in 2017.

6.3.4 Management Measures

Management measures relating to dust management are outlined within the Cooma Road Quarry *Air Quality Management Plan*. The plan outlines the control measures implemented as part of the continued operations of the Cooma Road Quarry to minimize the potential air quality impacts on the local community, including:

- Inspections;
- Defined operating hours;
- Monitoring for air quality and meteorological conditions; and
- Training of staff and contractors.

6.3.5 Proposed Improvements

There is a commitment to improving data capture relating to the PM₁₀ in 2018.

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 to reduce contamination of results.

6.4 Blasting

6.4.1 EIS Predictions

The 2012 EIS found that air blast and ground vibration levels would comply with relevant vibration and air blast criteria at all sensitive residential receivers through ongoing management of blast design and size.

6.4.2 Approved Criteria

According to both EPL 1453 and SSD 5109, the overpressure level from blasting operations must not exceed 115 dB(L) for more than 5% of the total number of blasts, at any residences or nearby receiver, and must not exceed 120dB(L) at any time.

Ground vibration must not exceed 5mm/s for 5% of the total number of blasts over a period of 12 months, and must not exceed 10mm/s at the nearby receiver.

6.4.3 Key Environmental Performance

Table 16 outlines the blast monitoring results at the Cooma Road Quarry during the Annual Review period.

Table 16: Blast Monitoring Results

Date	Monitoring Location	Overpressure (dBL)	Vibration (mm/s)	Compliance with Approved Criteria
		(Criteria Limit 115 dBL)	(Criteria Limit 5 mm/s)	
10-Jan-17	Heffernans House from CCC	104.4	0.98	Compliant
10-Jan-17	Jerrabomerra	88.3	0.74	Compliant
18-Jan-17	Heffernans House from CCC	105.4	0.94	Compliant
18-Jan-17	632 Old Cooma Road	104.4	0.94	Compliant
06-Feb-17	Heffernans House from CCC	107.8	0.34	Compliant
23-Feb-17	632 Old Cooma Road	109.5	1.00	Compliant
23-Feb-17	Jerrabomerra	102.4	0.7	Compliant
07-Mar-17	632 Old Cooma Road	104.5	0.69	Compliant
07-Mar-17	Jerrabomerra	88.5	0.63	Compliant
13-Mar-17	632 Old Cooma Road	103.1	1.10	Compliant
20-Mar-17	Heffernans House from CCC and 632 Old Cooma Road	102.0	0.52	Compliant
07-Apr-17	Heffernans House from CCC and 632 Old Cooma Road	99.1	0.65	Compliant
07-Apr-17	Jerrabomerra	113.5	0.66	Compliant
08-May-17	Heffernans House from CCC	95.5	0.68	Compliant
08-May-17	70 Tempe Crest	95.5	0.68	Compliant
16-May-17	Heffernans House from CCC and 632 Old Cooma Road	100.3	0.94	Compliant
15-Jun-17	Heffernans House from CCC and 632 Old Cooma Road	105.1	0.71	Compliant
15-Jun-17	70 Tempe Crest	94.4	0.63	Compliant
16-Jun-17	Heffernans House from CCC and 632 Old Cooma Road	107.9	4.34	Compliant
13-Jul-17	Heffernans House from CCC	109	0.27	Compliant

Date	Monitoring Location	Overpressure (dBL)	Vibration (mm/s)	Compliance with Approved Criteria
		(Criteria Limit 115 dBL)	(Criteria Limit 5 mm/s)	
26-Jul-17	Heffernans House from CCC	110	0.27	Compliant
26-Jul-17	Jerrabomerra	86.2	0.39	Compliant
10-Aug-17	Heffernans House from CCC	110	0.27	Compliant
10-Aug-17	Jerrabomerra	95.4	0.55	Compliant
01-Sep-17	Heffernans House from CCC	110	0.27	Compliant
01-Sep-17	70 Tempe Crest	99.2	0.50	Compliant
22-Sep-17	632 Old Cooma Road	103.6	0.53	Compliant
22-Sep-17	Jerrabomerra	89.8	0.55	Compliant
31-Oct-17	Heffernans House from CCC and 632 Old Cooma Road	105.7	0.56	Compliant
31-Oct-17	Jerrabomerra	90.3	0.58	Compliant
18-Dec-17	632 Old Cooma Road	98.6	0.83	Compliant
18-Dec-17	70 Tempe Crest	104.8	0.67	Compliant

In summary:

- There were 19 blasts during 2017; and
- All blasts were within the overpressure and vibration criteria.

Holcim alerts the nearest sensitive receivers 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.

Longterm Trends:

Blasting levels were compared against 2016 results at the Cooma Road Quarry. In 2016 there was a non - compliance relating to a blast result at Heffernans House (result of 119.8 dB). There were no non – compliances in 2017 regarding blasting. This illustrates improvement in the blasting process.

Comparison to EIS Predictions:

The results for blasting in 2017 were within the predicted limits of the EIS.

6.4.4 Management Measures

Management measures relating to blasting are outlined within the Cooma Road Quarry *Blast Management Plan*. The *Blast Management Plan* also provides a mechanism for assessing blast monitoring results against the relevant blast impact assessment criteria and outlines the control measures implemented as part of the continued operations of the quarry to minimize the potential for blast related impacts in the local community.

6.4.5 Proposed Improvements

Blast monitoring will continue in 2018 and all blasts will be reported in the Annual Review.

6.5 Traffic Management

6.5.1 EIS Predictions

The 2012 EIS predicted the increased traffic associated with the Project on the local road network to be satisfactory. On the wider network, the increase in traffic as a result of the Project was predicted to comprise a very small proportion of total traffic and be dispersed over a number of routes, resulting in relatively small increase in the overall traffic levels on these roads and intersections.

The Project was not predicted to have a negative impact on road safety.

The road upgrades were predicted to will assist in managing/addressing future road safety issues associated with the overall future traffic growth on the road network, including the relatively small increase in traffic volumes due to the Project.

6.5.2 Approved Criteria

According to Schedule 2, Condition 13 of SSD 5109, for the life of the development, the Applicant must ensure that:

- No more than an average of 48 truck movements per hour occur collectively to and from the site on any day; and
- No more than 30 laden trucks per hour are dispatched from the site.

6.5.3 Key Environmental Performance

Holcim recorded daily truck movements and volumes transported throughout 2017. The site maintained compliance with the conditions for truck movements throughout 2017. A copy of the truck movements recorded throughout 2017 are attached as **Appendix 3**.

6.5.4 Management Measures

Traffic impacts are managed in accordance with the specific management measures within the *Cooma Road Quarry Transport Management Plan*.

6.5.5 Proposed Improvements

Truck movements will continue to be monitored and recorded in the oncoming reporting period to ensure that they remain within the approved criteria.

6.6 Biodiversity

6.6.1 EIS Predictions

Consideration of the proposal under Section 5A of the *Environment Planning and Assessment Act 1979* determined there was unlikely to be any significant impacts to species or communities listed in NSW.

The Project is also considered unlikely to result in a significant impact on EPBC Act listed species and communities, or on migratory species.

6.6.2 Approved Criteria

There are no specific criteria associated with biodiversity management for the site. The approved quarrying plan has been designed to include a number of biodiversity impact mitigation factors and rehabilitation design factors.

6.6.3 Key Environmental Performance

There was no additional clearing in the 2017 reporting period, therefore there have been no additional impacts to biodiversity.

Records indicate that weed spraying was undertaken at the Cooma Road Quarry in January and August of 2017. Green Angle Investments was engaged to undertake the weed spraying.

Table 17: Weed Control Records at the Cooma Road Quarry (2017)

Date	Weed Species Targeted		Product Used	Amount Used
	Common Name	Scientific Name		
03-Jan-17	African Lovegrass	<i>Eragrostis curvula</i>	Taskforce	2L
	Serrated tussock	<i>Nassella trichotoma</i>	Glyphosate Dye	6L 500ml
04-Jan-17	Blackberry	<i>Rubus fruticosus</i>	Brush Off	40g
	Sweet Briar	<i>Rosa rubiginosa</i>	Wetter1000 Dye	500ml 500ml
09-Aug-17	Serrated tussock	<i>Nassella trichotoma</i>	Taskforce Glyphosate Dye	2L 2L 500ml

During 2017, Holcim hosted tree planting days with CVA. Planting of native trees was conducted as part of rehabilitation of the quarry and surrounding areas. CVA, with the support of Holcim, have removed noxious weeds and revegetated with native species (*Eucalyptus* sp. and *Acacia* sp.) on and around the Cooma Road Quarry site.

6.6.4 Management Measures

The ongoing management of the ecological values of the Project area are conducted in accordance with the Cooma Road Quarry *Rehabilitation Management Plan*. The plan outlines the control measures to be implemented as part of the continued operations at the Cooma Road Quarry. This includes minimising the potential impacts on biodiversity as a result of quarrying activities as well as risks associated with unsuccessful post-quarrying rehabilitation.

6.6.5 Proposed Improvements

During the 2018 reporting period Holcim will continue to manage weed species on the site and progress the rehabilitation areas through supplementary plantings with support from CVA.

Holcim will assess the need to carry out feral animal control and implement a program if required, however there have been no feral animal sightings to date.

Holcim will initiate a round of monitoring to assess the effectiveness of the 55 nest boxes that have previously been installed around the quarry. Holcim will continue to salvage fallen timber and boulders to promote increased habitat complexity in the rehabilitation areas.

6.7 Heritage (Aboriginal Archaeology and Historic Heritage)

6.7.1 EIS Predictions

6.7.1.1 Aboriginal Archaeology

The 2012 EIS and associated due diligence assessment found that due to the highly disturbed nature of the Project Area, the potential for subsurface Aboriginal artefacts in modified areas would be zero. No previously recorded sites were identified within the proposed disturbance area.

One isolated artefact, a silcrete broken flake (identified as Cooma Quarry 2), was located on the spur crest adjacent to the proposed infrastructure area. Holcim has committed that the Project will not impact on this site.

6.7.1.2 Historic Heritage

The known locally listed Moses Morley Kiln is the only heritage item/site to be identified within the Project Area.

The Historic Heritage Assessment conducted as part of the 2012 EIS determined the Project would not physically impact on the kiln and it would be very unlikely to impact on the identified heritage significance of the site.

The EIS did identify the potential for indirect impacts as the result of vibration associated with blasting and construction. Holcim implemented additional management measures for construction and blasting operations.

No other potential heritage items/sites were identified within the Project Area.

6.7.2 Approved Criteria

There are no specific criteria associated with heritage relating to the project. The process for managing any unexpected heritage items is outlined in the Heritage Management Plan.

6.7.3 Key Environmental Performance

There were no issues relating to Aboriginal and historic heritage during the reporting period.

Monitoring of Heritage infrastructure was undertaken in 2017 by surveyors Craven Elliston & Hayes (Dapto) Pty Ltd. No significant observations were observed from base surveys conducted in 2014.

6.7.4 Management Measures

Heritage impacts will continue to be monitored in accordance with the *Heritage Management Plan*.

6.7.5 Proposed Improvements

As there have been no Aboriginal heritage items located to date, no improvements to management measures are proposed.

Holcim are committed to undertaking ongoing consultation with the local Aboriginal community throughout the life of the project.

6.8 Summary of Environmental Performance

A summary of the performance of environmental management measures and sampling results for 2017 are detailed in **Table 18**.

Table 18: Environmental Performance at Cooma Road Quarry in 2017

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. PM ₁₀ monitoring undertaken.	Dust deposition has been consistent with EIS and previous Annual Review reporting.	There is a commitment to improving data capture relating to the PM ₁₀ in 2018. A review of the current location for DDG 4 will be undertaken during 2018 to determine if this gauge should be relocated to a more suitable position to reduce contamination of results.
Traffic Management	EIS predictions are all below development consent criteria.	Met the Development Consent Criteria	Consistently meets criteria	None required.
Water Management	EIS predictions are all below development consent criteria.	No discharge. Groundwater has not been assessed during this reporting period.	Surface water generally meets criteria. Note, no discharges during 2017. Groundwater has not been verified during this reporting period.	None required.

Aspect	Approval Criteria / EIS Prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
Biodiversity	It unlikely there will be any significant impacts to species or communities listed in NSW.	No additional impacts - no clearing.	Operating as per the <i>Rehabilitation Management Plan</i> .	None Required.
Heritage	No predictions	No impacts to Aboriginal Cultural Heritage or European Heritage.	Continued to be no impacts	None Required.

7 WATER MANAGEMENT

Water management at the Cooma Road Quarry is undertaken in accordance with the *Water Management Plan*.

7.1 EIS Predictions

Section 5.3 of the EIS (2012) assessed impacts to water. The Project is expected to have a negligible impact on annual flow volumes in Barracks Creek compared to the currently approved impacts. The Project will not impact on annual flow volumes within Jerrabomberra Creek. The Project is primarily located within the boundary of the existing water management system. The construction and operation of the Project will be consistent with the existing *Water Management Plan* and associated erosion and sediment controls, therefore it is considered that there will be negligible impact on water quality in downstream surface water systems. As such it is considered that the Project will result in no changes to the currently approved impacts.

Given both rock types (granite and dacite) quarried at the Cooma Road Quarry are relatively stable with respect to groundwater quality, there is no concern regarding the potential for the quarried material to affect groundwater quality.

7.2 Approved Criteria

The site undertook water monitoring in 2017 in accordance with the criteria listed in **Table 19**.

Table 19: Water Quality Criteria for the Cooma Road Quarry

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	

7.3 Water Usage and Storage

Water storages utilised at the Cooma Road Quarry include:

- Extractive Area Sump;
- Granite Hole;
- Pump Dam;
- Sediment Interception Pond (SIP); and
- Discharge Pond

During this reporting period water has been used for use in crushing and screening and watering of haul roads.

Water usage has continued to be recorded during this reporting period.

7.4 Surface Water Results

Holcim monitors surface water quality in Barracks Creek on a monthly basis.

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 20: 2017 Water Monitoring Results (Barracks Creek)

Water Parameter	Criteria		Date of Sample	Result	Compliance
	Min	Max			
pH	6.5	8.5	05-Jan-17	7.2	Within Criteria
			01-Feb-17	7.5	Within Criteria
			03-Mar-17	7.2	Within Criteria
			03-Apr-17	7.3	Within Criteria
			01-May-17	7.6	Within Criteria
			02-Jun-17	7.3	Within Criteria
			07-Jul-17	7.3	Within Criteria
			01-Aug-17	7.9	Within Criteria
			01-Sep-17	7.6	Within Criteria
			03-Oct-17	7.4	Within Criteria
			01-Nov-17	8.8	Outside Criteria
			01-Dec-17	7.4	Within Criteria
			04-Jan-18	7.4	Within Criteria
Total O&G (mg/L)	0	10	05-Jan-17	<1	Within Criteria
			01-Feb-17	<1	Within Criteria
			03-Mar-17	<1	Within Criteria
			03-Apr-17	<1	Within Criteria
			01-May-17	<1	Within Criteria
			02-Jun-17	<1	Within Criteria
			07-Jul-17	<1	Within Criteria
			01-Aug-17	<1	Within Criteria
			01-Sep-17	<1	Within Criteria
			03-Oct-17	<1	Within Criteria
			01-Nov-17	<1	Within Criteria
			01-Dec-17	<1	Within Criteria
			04-Jan-18	<1	Within Criteria
Suspended Solids (mg/L)	0	50	05-Jan-17	3	Within Criteria
			01-Feb-17	2	Within Criteria
			03-Mar-17	<2	Within Criteria
			03-Apr-17	<2	Within Criteria
			01-May-17	<2	Within Criteria

Water Parameter	Criteria		Date of Sample	Result	Compliance
	Min	Max			
			02-Jun-17	<2	Within Criteria
			07-Jul-17	<2	Within Criteria
			01-Aug-17	<2	Within Criteria
			01-Sep-17	2	Within Criteria
			03-Oct-17	4	Within Criteria
			01-Nov-17	<2	Within Criteria
			01-Dec-17	6	Within Criteria
			04-Jan-18	<2	Within Criteria

Longterm Trends:

A comparison of data between 2016 and 2017 indicated that results for pH, total oil and grease and suspended solids are generally within the development consent criteria. The only exceptions being one result in 2016 and one result in 2017 for pH. The pH results are generally neutral to slightly alkaline, with oil and grease and suspended solids both recording low readings across 2016 and 2017.

There was no discharge events in 2016 and 2017.

Comparison to EIS Predictions:

There was no evidence of any detrimental impact from the Quarry on surface water. This is consistent with the EIS predictions.

7.5 Groundwater

Summary of Monitoring

There was no groundwater monitoring completed at the Cooma Road Quarry in 2017.

7.6 Water Take

Table 21 outlines the water take at the Cooma Road Quarry in 2017. The water take was within the limits of the water access licence requirement.

Table 21: 2017 Water Take

Water Licence Number	Entitlement	Active Pumping During 2017
40SL27690	98 ML	48ML

8 REHABILITATION AND LANDSCAPE MANAGEMENT

Rehabilitation and biodiversity management strategies, procedures, controls and monitoring programs at the Cooma Road Quarry are undertaken in accordance with the *Rehabilitation Management Plan*. The *Rehabilitation Management Plan* is available on the Holcim Community Link website.

8.1 Rehabilitation Performance during the Reporting Period

During 2017 Holcim partnered with CVA with the planting of native seedlings at the Cooma Road Quarry. This re-vegetation project is ongoing with CVA volunteers planting native trees on and around the Quarry site in 2017. Further planting is proposed in 2018. This area equated to a planting area of 200m² (0.02Ha)



Figure 3: Seedling planting with CVA at the Cooma Road Quarry in 2017

The 2017 IEA observed that progressive rehabilitation appears to have been maximised at the Cooma Road Quarry with topsoil application and revegetation occurring for the majority of non-operational areas. All areas that are finalised have been stabilised, however some not to the final land-use state, and others requiring some re-vegetation. Holcim will continue to work towards achieving all rehabilitation objectives at the quarry in 2018 through rehabilitation maintenance.

The Cooma Road Quarry's rehabilitation performance during the 2017 reporting period has been summarised in **Table 22**.

Table 22: Rehabilitation Performance in 2017

Guideline Requirement	Site Comment
Extent of the operations and rehabilitation at completion of the reporting period	Planting of 300 native seedlings at the Cooma Road Quarry in collaboration with the CVA. This covered an area of 200 m ² (<0.1 hectares).
Agreed post- rehabilitation land use	The final rehabilitation at the Cooma Road Quarry will consist of a woodland/grassland revegetation mix.
Key rehabilitation performance indicators	See Section 4 of the <i>Rehabilitation Management Plan</i>
Renovation or removal of buildings	No buildings removed in 2017, and none proposed in 2018.
Any other Rehabilitation Taken including: <ul style="list-style-type: none"> • Exploration activities; • Infrastructure; • Dams; and • The installation or maintenance of fences, bunds and any other works. 	No rehabilitation completed in 2017 relating to exploration, infrastructure or dams.
Any rehabilitation areas which have received formal sign off from DRG	No rehabilitation has received signoff.
Variations to activities undertaken to those proposed (including why there were variations and whether DRG was notified)	Rehabilitation as per the <i>Rehabilitation Management Plan</i>
Outcomes of trials, research projects and other initiatives	No specific trials.
Key issues that may affect successful rehabilitation	There are several potential issues that can affect rehabilitation including availability of material, seed stock, climatic events and rehabilitation methodology.

8.2 Summary of Current Rehabilitation and Performance

A summary of the rehabilitation and disturbance status is outlined in **Table 23**.

Table 23: Rehabilitation and Disturbance Status

Quarry Area Type	This Reporting Period (Actual)	Next Reporting Period (Forecast)
	Current AEMR Period (ha)	Next AEMR Period (ha)
A. Total Quarry Footprint	0	0
B. Total Active Disturbance	71.5	71.5
C. Land Being Prepared for Rehabilitation	0	0
D. Land Under Active Rehabilitation	7.6	7.6
E. Completed Rehabilitation	0	0

At the end of 2017 there was approximately 71.5 Ha of active disturbance and 7.6 Ha of active rehabilitation. There is no proposed additional disturbance or rehabilitation in 2018. Rehabilitation maintenance will continue.

8.3 Actions for the Next Reporting Period

The DPE 2015 Annual Review Guidelines require the Annual Review to outline the rehabilitation actions proposed during the next reporting period. These actions are detailed in **Table 24**.

Table 24: Rehabilitation and Closure Actions for the 2018 Reporting Period

Requirement	Site Comment
Describe the steps to be undertaken to progress agreement during next reporting period, where final rehabilitation outcomes have not yet been agreed between stakeholders	Rehabilitation to continue as per the <i>Rehabilitation Management Plan</i> .
Outline proposed rehabilitation trials, research projects and other initiatives to be undertaken during next reporting period	No proposed rehabilitation trials.
Summary of rehabilitation activities proposed for next report period	Rehabilitation maintenance will continue in 2018.

9 COMMUNITY

9.1 Community Engagement Activities

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; and
- All documents and items displayed on the website are regularly updated by Holcim staff.

Schedule 5, Condition 6 also requires the establishment and operation of a Community Consultative Committee (CCC) for Cooma Road Quarry. The Cooma Road Quarry CCC was established in May 2014. During the 2017 reporting period, CCC meetings were held on 8 May 2017 and 12 December 2017. The CCC 2017 Annual Report has been uploaded on the Holcim webpage in the Cooma Road Quarry profile. The Annual Report contains details of committee members, meetings and communication with the community throughout the year.

Councillor Brian Brown was nominated as the new Holcim Quarry Consultative Committee Representative by Council on 11 October 2017. On 12 December 2017 Councillor Brown was also nominated as the Independent Chair.

Past community engagement activities have included open days, attendance at resident's association meetings and provision of materials for local projects. Whilst there were no community engagement days held in the reporting period, residents or groups are welcome to contact the Quarry to arrange tours.

In addition to the CCC, Holcim prepared a Community Engagement Plan in 2016 to establish two-way communication with the community. Holcim understands that an integral part of ensuring the continuing success of the quarry operations is the fostering of positive community relations through effective two-way communications and through the promotion of a positive public image.

The Cooma Road Quarry has an extensive program for an engagement with the local Ngambri Land Council including employment of indigenous workers for maintenance and housekeeping activities, assistance in the start-up of a local native nursery and guidance on the establishment of a construction materials haulage company utilising indigenous workers.

9.2 Community Contributions

The Cooma Road Quarry contributed to the community during the 2017 reporting period through the following initiatives:

- Developed a partnership with CVA for a revegetation project involving tree planting days on areas requiring rehabilitation around the quarry site. More planting days are scheduled to occur in 2018;
- Sponsored a Marymead charity event (a local rodeo);
- Donated material to the Royalla Community Common project;
- Provided a water cart and labour to support National Tree Day (Sunday 30 July 2017) plantings that occurred on Council owned land adjacent to the Quarry;
- Partnered with Greening Australia to provide a water cart and labour to support tree plantings occurring on Council owned land adjacent to the Quarry; and
- Supported Molonglo Catchment Group (MCG) and Queanbeyan-Pelarang Council by providing a water cart and labour to assist with a Biodiversity Connectivity Project which involved planting approximately 3000 native species along 2 km of Jerrabomberra Creek.

For more information on the above projects refer to the CCC 2017 Annual Report which has been uploaded on the Holcim webpage in the Cooma Road Quarry profile.

9.3 Complaints

A review of the Holcim Safety, Health & Environment (SHE) reporting database (INX) identified two complaints from external stakeholders during the 2017 reporting period.

Complaint 1 – a neighbour complained about blast vibration and noise. A review of blasting criteria indicated the blast was within the consent level. Holcim provided this information to the neighbour.

Complaint 2 – a person travelling on the Monaro Highway complained that a rock was flicked up by a Holcim truck causing a cracked window to a vehicle. Holcim completed an investigation based on a review of GPS tracking data. It was determined that there were no Holcim trucks on the road (Monaro Highway) at the time of the incident.

All publicly listed information including incidents and contacts for locals in the community is available at <http://www.holcim.com.au/cooma-road.html>. Holcim continue to operate a Community contact line (02 6297 2211).

10 INDEPENDENT AUDIT

The IEA was undertaken by Pitt & Sherry (Operations) Pty Ltd of behalf of Holcim in December 2017 as required in accordance with Schedule 5, Condition 10 of the Development Consent (SSD_5109) – MOD 1 for the quarry. This was the second IEA, with the previous IEA completed in 2014.

The 2017 IEA provided an assessment of the environmental performance of the project by way of compliance with the requirements and conditions of:

- Development Consent (SSD_5109);
- Statement of Commitments;
- EPL No. 1453; and
- Water Approval No. 40WA413082.

The IEA process involves a site inspection, interviews with quarry staff and document reviews to assess environmental compliance. A summary of compliance with statutory requirements is provided in **Table 25**.

Table 25: Summary of Statutory Compliance

Approval/ Licence	No. of Conditions	Compliant	Non- Compliant	Observation	Noted	Not Applicable	Not Verified
SSD_5109	76	44	7	2	6	16	1
Statement of Commitments	21	17	0	0	0	4	0
EPL 1453	44	22	4	1	9	6	2
Water Approval 40WA413082	7	9	5	1	0	2	0
TOTAL	158	92	16	4	15	28	3

A copy of the IEA Action Plan is attached as **Appendix 1**.

10.1 Key Audit Outcomes

During the site inspection, a range of observations related to environmental risk management and performance were identified. Opportunities for general environmental improvement at the Quarry include:

- Improved record keeping and document management, including final approval of management plans by relevant authorities; and
- Improved recording of water data, including the maintenance of log books for the site water extraction.

The next IEA is required to be conducted in 2020.

11 INCIDENTS AND NON COMPLIANCE

Non - compliances are outlined within the audit action plan for Cooma Road Quarry. Non – compliances within the table below.

There have been specific environmental incidents within the Annual Review period.

Table 26: Incidents and Non Compliance at the Cooma Road Quarry During 2017

Date	Incident/Non Compliance	Action/Comment
1st December 2017 Audit inspection	SSD 5109 Schedule 3, Condition 24 The Rehabilitation Management Plan not yet approved.	Holcim will engage a suitably qualified and experienced person/s to assist with the finalisation of the Rehabilitation Management Plan through consultation with relevant stakeholders. Responsibility: Planning & Environment Team Date: Quarter 2, 2018
1st December 2017	SSD 5109 Schedule 3 Condition 30 Concrete Batching Plan Operations	Holcim will engage a suitably qualified person to assist with the applying for a Resource Recovery Exemption for the concrete waste processed at Cooma Road Quarry. Responsibility: Planning & Environment Team Date: Quarter 2, 2018
1st December 2017	Schedule 3 Condition 31 Non – compliance relating to field performance in the audit. Waste oil management.	Holcim has a comprehensive Environmental Management System (EMS) that addresses environmental risks associated with operational aspects related to quarrying. Chapter 6.11 of the Holcim EMS provides guidelines on the Storage of Liquid Fuels & Chemicals. Holcim’s Quarry Manager will review Chapter 6.11 of the Holcim EMS and will hold a toolbox talk for Cooma Road Quarry employees. Environmental hazards will continue to be recorded using Holcim’s internal reporting software – INX. Responsibility: Quarry Manager Date: Quarter 1, 2018

Date	Incident/Non Compliance	Action/Comment
During audit period	Schedule 5 Condition 4 Requirement to revised management plans	Develop a Minutes template for recording meetings and/or reviews associated with strategies, plans and programs. Should a revision be required, the strategy, plan and/or program will be updated and submitted to DPE as well as other relevant stakeholders. Responsibility: The Planning and Environment team Date: Quarter 1, 2018
1st December 2017	O1.1 of the EPL Non – compliance relating to field performance in the audit. Waste oil management	Holcim has a comprehensive Environmental Management System (EMS) that addresses environmental risks associated with operational aspects related to quarrying. Chapter 6.11 of the Holcim EMS provides guidelines on the Storage of Liquid Fuels & Chemicals whilst Chapter 6.13 provides guidelines on Waste Management. Holcim’s Quarry Manager will review Chapter 6.11 and 6.13 of the Holcim EMS and will hold a toolbox talk for Cooma Road Quarry employees. Environmental hazards will continue to be recorded using Holcim’s internal reporting software – INX. Responsibility: Quarry Manager Date: Quarter 1, 2018
Annual Return Submission 2017	R1.1 of the EPL Non – compliance relating to error in May 2016 – 30 April 2017 Annual Return.	Noted. Annual Returns are coordinated by Holcim’s Executive Support team. From now on, this team will ensure that the document is reviewed and signed by the Quarry Manager. Responsibility: Executive Support team/Planning & Environment team/Quarry Manager. Date: Quarter 1, 2018
Annual Return Submission 2017	R1.7 of the EPL Error in signing 2017 Annual Return.	Noted. Annual Returns are coordinated by Holcim’s Executive Support team. From now on, this team will ensure that the document is reviewed and signed by the Quarry Manager. Responsibility: Executive Support team/Planning & Environment team/Quarry Manager Date: Quarter 1, 2018

Date	Incident/Non Compliance	Action/Comment
Throughout Annual Review period.	Water Access Licence Condition 1	Holcim will update the logbook with the required information. The Quarry Manager will continue to log details of water usage as well as additional information required as per logbook update. Responsibility: Planning & Environment Team and Quarry Manager Date: Quarter 4, 2018
Throughout Annual Review period.	Water Access Licence Condition 2	Same as previous comment.
Throughout Annual Review period.	Water Access Licence Condition 3	Same as previous comment.
Throughout Annual Review period.	Water Access Licence Condition 4	Same as previous comment.
Throughout Annual Review period.	Water Access Licence Condition 8	Same as previous comment.

12 ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

Proposed improvement actions for 2018 are noted below:

Table 27: Improvement Actions for 2018

Improvement Measure	Activities	Timeframe
Approval of the <i>Rehabilitation Management Plan</i>	The <i>Rehabilitation Management Plan</i> was submitted to DPI, NOW and Council in 2014 but has not yet been approved. Holcim to follow up as required to get <i>Rehabilitation Management Plan</i> approved	As required.
Improving Data Capture PM ₁₀	There is a commitment to improve data capture of the PM ₁₀ in 2018.	All Year
Depositional Dust Gauge Review	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.	June 2018.

13 APPENDICES

APPENDIX 1

COOMA ROAD QUARRY INDEPENDENT AUDIT ACTION PLAN



Ms Katrina O'Reilly
Team Leader Compliance
Department of Planning & Environment
PO Box 5475
Wollongong NSW 2520

Email: Katrina.OReilly@planning.nsw.gov.au
CC: Georgia.Dragicevic@planning.nsw.gov

22 February 2018

Dear Ms O'Reilly,

Re: 2017 Independent Environmental Audit Report Submission

Holcim (Australia) Pty Ltd (Holcim) owns and operates Cooma Road Quarry, located approximately 6 kilometres south of Queanbeyan, NSW. Cooma Road Quarry has been operating since 1959 and is a significant supplier of granite and dacite hard rock aggregates in the region.

In September 2013, a new State Significant Development (SSD-5019) approval was granted to provide an additional 20 years of quarry life and an increased production limit from 1 million tonnes per annum (Mtpa) to 1.5 Mtpa.

As per Condition 10 of Schedule 5 of the Development Consent (SSD-5019), Holcim engaged Pitt&sherry to conduct an Independent Environmental Audit representing the first of three yearly audits required for the site. Pitt&sherry were endorsed by the Secretary of the Department of Planning & Environment as per letter dated 26 October 2017 (included in this submission letter as Attachment 1).

As per Condition 11 of Schedule 5 of the Development Consent (SSD-5019), please find enclosed the 2017 Independent Environmental Audit report for Cooma Road Quarry. Holcim has considered the recommendations from this report and developed a response (included in this submission letter as Attachment 2).

Please do not hesitate to contact me if you have any questions.

Yours sincerely,

A handwritten signature in cursive script that reads 'Amy Nelson'.

Amy Nelson
Planning & Environment Coordinator – NSW/ACT

Attachment 1:

Endorsement by the Department of Planning &
Environment



Contact: Georgia Dragicevic
Phone: 4224 9477
Fax: 4224 9470
Email: Georgia.Dragicevic@planning.nsw.gov.au

Ms Rachel Heath
Planning & Environment Manager
Holcim (Australia) Pty Ltd
PO Box 76
MARULAN NSW 2579

Dear Ms Heath

**Cooma Road Quarry (SSD 5109)
Independent Environmental Audit 2017**

I refer to your letter dated 10 October 2017 seeking approval of Ken Holmes of KMH Environmental as the lead auditor for the upcoming Cooma Road Quarry Independent Environmental Audit, in accordance with condition 10 of Schedule 5 of the State significant development consent SSD 5109 (the consent).

Having considered the qualifications and experience of Mr Holmes, the Secretary endorses the appointment of Mr Holmes to undertake the audit in accordance with condition 10 of Schedule 5 of the consent. This approval is conditional on Mr Holmes being independent of the development.

The audit is to be conducted in accordance with AS/NZS ISO 19011 Australian/New Zealand Standard: Guidelines for quality and/or environmental management systems auditing and in accordance with the Independent Audit Guideline dated October 2015. A copy of this guideline can be located at <http://www.planning.nsw.gov.au/Policy-and-Legislation/Mining-and-Resources/Integrated-Mining-Policy>.

The audit report is to include the following:

- a compliance table indicating the compliance status of each condition of approval and any relevant EPL;
- not use the term "partial compliance";
- recommend actions in response to non-compliances;
- review the adequacy of plans and programs required under this consent; and
- identify opportunities for improved environmental management and performance.

Within 10 weeks of commissioning the audit, or as otherwise agreed by the Secretary, Holcim is to submit a copy of the audit report to the Secretary and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report and a timetable to implement the recommendations. Prior to submitting the audit report to the Secretary, it is recommended that Holcim review the report to ensure it complies with the relevant consent condition.

Should you have any enquiries in relation to this matter, please contact Georgia Dragicevic, Senior Compliance Officer, on telephone number (02) 4224 9477 or by email to Georgia.Dragicevic@planning.nsw.gov.au

Yours sincerely

Katrina O'Reilly
Team Leader Compliance
as nominee of the Secretary

Attachment 2:

Holcim Response to 2017 Independent
Environmental Audit Recommendation

Table 1. Development Consent SSD_5109 - MOD 1

Schedule	Condition	Condition Description/Requirement	Compliance	Pittsherry Comments & Recommendations	Holcim Comments & Response to Recommendations
2	26	<p>The Applicant must pay Council road maintenance contributions of \$0.2911 per tonne for every tonne of quarry product or recycled concrete transported to and from the site in accordance with Council's Section 94 Contributions Plan – No 2 Extractive Industry. Each payment must be:</p> <p>(a) paid to Council at the end of each calendar year; and</p> <p>(b) based on weighbridge records of the quantity of quarry products and recycled concrete transported to and from the site.</p> <p>Note: If the parties are not able to agree on any aspect of the road upgrade and maintenance contributions, either party may refer the matter to the Secretary for resolution.</p>	Not Verified	Documentation confirming compliance with this Condition was not available for review.	Noted. Holcim will continue to pay Council road maintenance contributions in accordance with this Condition.
3	1	<p>The Applicant must keep accurate records of:</p> <p>(a) the amount of quarry products transported from the site (monthly and annually) and publish these records on its website on a quarterly basis; and</p> <p>(b) the quantity, destination and source of all laden truck movements to and from the site (hourly, daily, weekly, monthly and annually).</p>	Observation	<p>(a) Production data is commercially sensitive. Annual production data is provided in the Annual Review (see Schedule 2, Condition 17) to confirm that the quarry's production limits are not exceeded. The data is captured in weighbridge records and in Annual Review documents.</p> <p>(b) Weighbridge records record the quantity, destination of all laden truck movements to and from the site (hourly). This information can be used to determine daily, weekly, monthly and annually dispatches.</p> <p>Observation: AEMR 2016 for the calendar year is signed by NSW Planning and Environment Coordinator on 31 March 2016</p> <p>Recommendation: this typographical error should be corrected.</p>	Noted. Holcim will continue to provide annual production data in the Annual Review. Holcim will ensure future Annual Reviews are proof-read to avoid typographical errors.
3	6	<p>The Applicant must:</p> <p>(a) implement best management practice to minimise the construction, operational and traffic noise of the development;</p> <p>(b) minimise the noise impacts of the development during meteorological conditions when the noise limits in this consent do not apply;</p> <p>(c) maintain the effectiveness of any noise attenuation</p>	Not Compliant	(a) The Noise Management Plan (2014) describes best management practice to minimise the construction and operational traffic noise. Earth bunds have been constructed in accordance with the plan. Night/evening work are not undertaken. The 2014 and 2015 Annual Reports stated that no noise monitoring was	Noted. Holcim will continue to undertake attended noise monitoring on a quarterly basis. Holcim will also engage a suitably qualified person to conduct a sound power level testing program to review against sound power level (SWL) for equipment outlined in the Environmental Impact Statement (EIS). A comprehensive

		<p>on equipment to ensure consistency with the benchmark sound power levels presented in the EIS; and</p> <p>(d) regularly assess the results of noise monitoring to ensure compliance with the relevant conditions of this consent, to the satisfaction of the Secretary.</p>		<p>being undertaken and planned to commence quarterly noise monitoring in 2016.</p> <p>(b) As per (a).</p> <p>(c) The Noise Management Plan (2014) states that “the three-yearly sound power level testing program will commence with the first year of operations following Development Consent”. This has not occurred. Other than noting that there have been no noise-related complaints, it cannot be assessed whether this condition has been met.</p> <p>(d) Attended noise monitoring of operations are being undertaken (see Appendix 9, Condition 3). The AEMR 2016 includes detailed noise report.</p> <p>Conclusion: Noise monitoring data is not available for the entire audit period however it is to be included in the annual report as of 2016.</p>	<p>obligations register will assist with managing these commitments.</p> <p>Responsibility: Both the Planning & Environment team and Quarry Manager</p> <p>Date: Quarter 2, 2018</p>
3	7	<p>The Applicant must prepare and implement a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:</p> <p>(a) be prepared in consultation with Council and the EPA, and submitted to the Secretary for approval within 6 months of this consent;</p> <p>(b) describe the measures that would be implemented to comply with the:</p> <ul style="list-style-type: none"> • noise criteria in Table 1; • hours of operation in Table 2; and • operating conditions in Condition 7 above; <p>(c) include a monitoring program that:</p> <ul style="list-style-type: none"> • incorporates quarterly (or as otherwise agreed by the Secretary) attended noise monitoring to evaluate the performance of the development against the noise criteria in Table 1; • includes a protocol for determining exceedances of the noise criteria in Table 1; and • assesses the sound power levels of the equipment on site, compares it with the benchmark levels used in the EIS, and evaluates the effectiveness of any attenuation. <p>The Applicant must implement the approved management plan as approved from time to time by the Secretary.</p>	Not Compliant	<p>a) The Noise Management Plan has been prepared and submitted as required.</p> <p>b) and c): The plan includes details of how to address the relevant requirements including attended noise monitoring.</p> <p>Table 2.1 in the Noise Management Plan refers to section 2.1.3 of the plan on addressing condition 7 (a). there is no section 2.1.3 in the plan (2014).</p> <p>The AEMR contains the reports of quarterly noise monitoring in the appendix (December 2016 report by WSP/PB indicating the noise levels are likely to have been within Development Consent conditions).</p> <p>However, implementation of the plan is inadequate in terms of noise monitoring and reporting.</p> <p>Conclusion: Section 6.1 of the plan (2014) refers to quarterly attended noise monitoring however this was not implemented until June 2016. This is now being implemented.</p>	<p>Noted. Holcim will continue to undertake attended noise monitoring on a quarterly basis. Holcim will also engage a suitably qualified person to conduct a sound power level testing program to review against sound power level (SWL) for equipment outlined in the Environmental Impact Statement (EIS). A comprehensive obligations register will assist with managing these commitments.</p> <p>Responsibility: Both the Planning & Environment team and Quarry Manager</p> <p>Date: Quarter 2, 2018</p>

3	9	<p>The Applicant must ensure that the blasting on the site does not cause exceedances of the criteria in Table 3. Table 3: Blasting Criteria</p> <table border="1" data-bbox="369 536 1019 651"> <thead> <tr> <th>Location</th> <th>Airblast overpressure (dB(Lin Peak))</th> <th>Ground vibration (mm/s)</th> <th>Allowable exceedance</th> </tr> </thead> <tbody> <tr> <td></td> <td>120</td> <td>10</td> <td>0%</td> </tr> <tr> <td>Any residence on privately-owned land</td> <td>115</td> <td>5</td> <td>5% of the total number of blasts over a period of 12 months</td> </tr> </tbody> </table> <p>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.</p>	Location	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedance		120	10	0%	Any residence on privately-owned land	115	5	5% of the total number of blasts over a period of 12 months	Not Compliant	<p>One blast event logged in INX breach of blasting limit on 14/12/16. The Auditor understands that this exceedance is an isolated event.</p> <p>Recommendation: Continue to monitor blasts. If exceedances occur in the future, undertake a review of blasting procedures.</p>	<p>The EPA & DP&E were notified of the exceedance of the 115 dB limit on 14/12/16. The resulting exceedance did not exceed the 120 dB max criteria or the annual limit for blasting.</p> <p>Cooma Road Quarry enters blast monitoring data into a database on a fortnightly basis which is consequently published to the Holcim webpage¹ (as required by the Cooma Road Quarry EPL). Cooma Road Quarry will continue to monitor blasts and enter blast monitoring data on a fortnightly basis. The Holcim Planning & Environment team will continue to work with the Cooma Road Quarry Manager to ensure that exceedances are identified and that appropriate stakeholders are notified as soon as practical.</p> <p>If more than one exceedance occurs in a three month period, a review will be undertaken of the blasting procedure and DP&E (and any other stakeholders) will be provided with the review report.</p> <p>Responsibility: Planning & Environment Team and Quarry Manager</p> <p>Date: Quarter 1, 2018</p>
Location	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedance														
	120	10	0%														
Any residence on privately-owned land	115	5	5% of the total number of blasts over a period of 12 months														
3	20	<p>The Applicant must prepare and implement a Water Management Plan for the development to the satisfaction of the Secretary. This plan must be prepared in consultation with the EPA and DPI Water by suitably qualified and experienced person/s whose appointment has been approved by the Secretary, and be submitted to the Secretary for approval within 6 months of the date of this consent. This plan must include a:</p> <p>(a) Site Water Balance that includes details of:</p> <ul style="list-style-type: none"> • sources and security of water supply, including contingency planning; • water use on site; and 	Observation	<p>The Water Management Plan has been submitted but approval from the Secretary/Director-General has not been received as at the time of the audit (01 Dec 2017).</p> <p>Recommendation: DPI Water be contacted regarding finalisation of the Water Management Plan.</p>	<p>Holcim will engage a suitably qualified and experienced person/s to assist with the finalisation of the Water Management Plan through consultation with DPI Water.</p> <p>Responsibility: Planning & Environment Team</p> <p>Date: Quarter 2, 2018</p>												

¹ Pollution monitoring data, <http://www.holcim.com.au/en/sustainability/environment/pollution-monitoring-data.html>

		<ul style="list-style-type: none"> • measures that would be implemented to minimise use of clean water and maximise recycling of dirty water on the site; (b) Surface Water Management Plan that includes: <ul style="list-style-type: none"> • baseline data on surface water flows and quality in the watercourses that could be affected by the development; • a detailed description of the surface water management system on site, including the design objectives and performance criteria for the: <ul style="list-style-type: none"> - clean water diversions; - erosion and sediment controls; - water storages (including Maximum Harvestable Rights requirements); and - control of water pollution from areas of the site that have been rehabilitated; • performance criteria, including trigger levels for investigating any potentially adverse surface water quality impacts; • a program to monitor: <ul style="list-style-type: none"> - any surface water discharges; - the effectiveness of the water management system; - surface water flows and quality in local watercourses; and - ecosystem health of local watercourses; (c) Groundwater Monitoring Program that includes: <ul style="list-style-type: none"> • baseline data of groundwater levels surrounding the development; • groundwater assessment criteria based upon analysis of baseline data for groundwater, including trigger levels for investigating any potentially adverse groundwater impacts; and • a program to monitor and/or validate the impacts of the development on groundwater resources; (d) Surface and Ground Water Response Plan that describes the measures and/or procedures that would be implemented to: <ul style="list-style-type: none"> • respond to any exceedences of the surface water and groundwater assessment criteria; and • mitigate and/or offset any adverse impacts on surface water and groundwater resources located within and adjacent to the site. <p>The Applicant must implement the approved management plan as approved from time to time by the Secretary</p>			
3	24	<p>The Applicant must prepare and implement a Rehabilitation Management Plan for the development to the satisfaction of the Secretary. This plan must:</p>	Administrative non-compliance	The Rehabilitation Management Plan has been submitted to DPI, NOW and Council but not yet approved.	Holcim will engage a suitably qualified and experienced person/s to assist with the finalisation of the Rehabilitation Management Plan

		<p>(a) be prepared in consultation with DRE, DPI, DPI Water and Council;</p> <p>(b) be submitted to the Secretary for approval within 12 months of the date of this consent;</p> <p>(c) describe the short, medium and long term measures that would be implemented to:</p> <ul style="list-style-type: none"> • manage remnant vegetation and habitat on site; • ensure compliance with the rehabilitation objectives and progressive rehabilitation obligations in this consent; <p>(d) include detailed performance and completion criteria for evaluating the performance of the rehabilitation of the site, including triggering remedial action (if necessary);</p> <p>(e) include a detailed description of the measures that would be implemented over the next 3 years, including the procedures to be implemented for:</p> <ul style="list-style-type: none"> • ensuring compliance with the rehabilitation objectives and progressive rehabilitation obligations in this consent; • enhancing the quality of remnant vegetation and fauna habitat; • establishing vegetation screening to minimise the visual impacts of the site on surrounding receivers; • restoring native endemic vegetation and fauna habitat within the rehabilitation area; • maximising the salvage of environmental resources within the approved disturbance area – including tree hollows, vegetative and soil resources – for beneficial reuse in the enhancement of the biodiversity areas or rehabilitation area; • collecting and propagating seed; • minimising the impacts on native fauna on site; • controlling weeds and feral pests; • controlling erosion; • controlling access; and • bushfire management; <p>(f) include a program to monitor and report on the effectiveness of these measures, and progress against the performance and completion criteria;</p> <p>(g) include details of who would be responsible for monitoring, reviewing, and implementing the plan;</p> <p>(h) provide details of the conceptual final landform and associated land uses; and</p> <p>(i) provide details of water management requirements and details of the final void in relation to water storage.</p> <p>The Applicant must implement the approved management plan as approved from time to time by the</p>		<p>Observation: Follow up as required to get Rehabilitation Management Plan approved.</p>	<p>through consultation with relevant stakeholders.</p> <p>Responsibility: Planning & Environment Team</p> <p>Date: Quarter 2, 2018</p>
--	--	--	--	---	---

		Secretary			
3	30	<p>Prior to importing onto the site any recycled concrete or any other material that may be classified as a waste under the EPA Waste Classification Guidelines 2009 (or its latest version), the Applicant must obtain a 'resource recovery exemption' under the POEO Act and provide evidence of this exemption to the Department.</p> <p>Note: This condition does not apply to routine deliveries to the site.</p>	Not Compliant	<p>Concrete waste (from a concrete batching plant) is processed at the site.</p> <p>A Resource Recovery Exemption for that material has not been obtained.</p> <p>Recommendation: Apply for a Resource Recovery Exemption for the concrete wastes processed at the site.</p>	<p>Holcim will engage a suitably qualified person to assist with the applying for a Resource Recovery Exemption for the concrete waste processed at Cooma Road Quarry.</p> <p>Responsibility: Planning & Environment Team</p> <p>Date: Quarter 2, 2018</p>
3	31	<p>The Applicant must:</p> <p>(a) minimise the waste generated by the development; and</p> <p>(b) ensure that the waste generated by the development is appropriately stored, handled, and disposed of, to the satisfaction of the Secretary.</p>	Not Compliant	<p>No waste stockpile was observed during site inspection. Waste materials are sorted into 3 m³ bins.</p> <p>Waste management service by contractors – waste receipts were inspected – e.g. Remondis 30 June 2017, 31 Aug 2017; Southern Oil (waste oil) on 11 Nov 2017; Southern Oil (waste filter) on 11 Oct 2017.</p> <p>Waste oil is managed in a bunded area. One open waste oil drum for temporary storage was sighted outside the bund. The auditees mentioned that this area is served by an oil/grease separator with hardstand sloping towards a capture drain. However, the area is not protected by any bunds and stormwater or surface water contamination is possible during storm events.</p> <p>Recommendation: It is recommended that this waste oil drum be kept in a drip tray or other suitable mechanism to avoid any leaks affecting stormwater runoff.</p>	<p>Holcim has a comprehensive Environmental Management System (EMS) that addresses environmental risks associated with operational aspects related to quarrying. Chapter 6.11 of the Holcim EMS provides guidelines on the Storage of Liquid Fuels & Chemicals. Holcim's Quarry Manager will review Chapter 6.11 of the Holcim EMS and will hold a toolbox talk for Cooma Road Quarry employees. Environmental hazards will continue to be recorded using Holcim's internal reporting software – INX.</p> <p>Responsibility: Quarry Manager</p> <p>Date: Quarter 1, 2018</p>
5	4	<p>With 3 months of the submission of an:</p> <p>(a) incident report under condition 7 below;</p> <p>(b) Annual Review under condition 9 below;</p> <p>(c) audit report under condition 10 below; and</p> <p>(d) any modifications to this consent,</p> <p>The applicant must review, and if necessary revise, the strategies, plans and programs required under this consent, to the satisfaction of the Secretary.</p>	Not Compliant	<p>The Environmental Management Strategy has not been revised since March 2014, as per the Strategy available on the Holcim website². Annual Review report for 2016 mentions the Modifications to SSD_5109 (page 6).</p> <p>Evidence for review of the Strategy</p>	<p>Develop a Minutes template for recording meetings and/or reviews associated with strategies, plans and programs. Should a revision be required, the strategy, plan and/or program will be updated and submitted to DP&E as well as other relevant stakeholders.</p>

² http://www.holcim.com.au/fileadmin/templates/AU/doc/Community_Link/Cooma_Road/EnvironmentalMgtPlans/EnvironmentalMgtStrategy.pdf

		Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the development.		following modifications to the consent SSD 5109 as per the August 2016 Modification was not provided to the Auditor. Recommendation: Prepare and save minutes of meetings where documentation Management Reviews and/or procedural document reviews are undertaken.	Responsibility: The Planning & Environment team Date: Quarter 1, 2018
--	--	--	--	--	--

Table 2. Environment Protection License (EPL) 1453

Condition	Condition Description/Requirement	Compliance	Comments and Recommendations	Holcim Response
01.1	<p>Licensed activities must be carried out in a competent manner. This includes:</p> <p>a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.</p>	Not Compliant	<p>No waste stockpile was observed during site inspection. Waste materials are sorted into 3m3 bins.</p> <p>Waste management service by contractors – waste receipts were inspected – eg Remondis 30 June 2017, 31 Aug 2017; Southern Oil (waste oil) on 11 Nov 2017; Southern Oil (waste filter) on 11 Oct 2017.</p> <p>Waste oil is managed in a bunded area. One open waste oil drum for temporary storage was sighted outside the bund. The auditees mentioned that this area is served by a oil/grease separator with hardstand sloping towards a capture drain. However, the area is not protected by any bunds and stormwater or surface water contamination is possible during storm events.</p> <p>Recommendation: Refer to MCoA Schedule 3 Condition 31 above.</p>	<p>Holcim has a comprehensive Environmental Management System (EMS) that addresses environmental risks associated with operational aspects related to quarrying. Chapter 6.11 of the Holcim EMS provides guidelines on the Storage of Liquid Fuels & Chemicals whilst Chapter 6.13 provides guidelines on Waste Management. Holcim's Quarry Manager will review Chapter 6.11 and 6.13 of the Holcim EMS and will hold a toolbox talk for Cooma Road Quarry employees. Environmental hazards will continue to be recorded using Holcim's internal reporting software – INX.</p> <p>Responsibility: Quarry Manager</p> <p>Date: Quarter 1, 2018</p>
M2.2	<p>The record must include details of the following:</p> <p>a) the date and time of the complaint; b) the method by which the complaint was made; c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect; d) the nature of the complaint; e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and f) if no action was taken by the licensee, the reasons why no action was taken.</p>	Observation	<p>The required details of complaints, action and status are recorded in the incident report form.</p> <p>The method by which the complaint was made is not clear on the two extracts presented.</p> <p>Recommendation: all required details should be noted on the forms.</p>	<p>Noted. Holcim will continue to record community complaints using Holcim's internal reporting software – INX. Cooma Road Quarry Manager will hold a toolbox talk for Cooma Road Quarry employees explaining the details that must be entered into INX following a community complaint.</p> <p>Responsibility: Quarry Manager</p> <p>Date: Quarter 1, 2018</p>
R1.1	<p>The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:</p> <p>a) a Statement of Compliance; and b) a Monitoring and Complaints Summary.</p> <p>At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.</p>	Not Compliant	<p>The 2017 (1 May 2016 – 30 Apr 2017) Annual Return Form G Statement of Compliance is incomplete. The blasting complaint of March 2017 (as noted in the INX extract) is not noted in the 2017 Annual Return (a similar complaint in 2014 was noted in the 2014 Annual Return).</p> <p>Recommendation: Annual Reports should</p>	<p>Noted. Annual Returns are coordinated by Holcim's Executive Support team. From now on, this team will ensure that the document is reviewed and signed by the Quarry Manager.</p> <p>Responsibility: Executive Support team/Planning & Environment team/Quarry Manager</p>

			be complete and signed off by relevant senior personnel.	Date: Quarter 1, 2018
R1.7	<p>Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:</p> <p>a) the licence holder; or b) by a person approved in writing by the EPA to sign on behalf of the licence holder.</p>	Administrative Non-Compliance	<p>Annual Returns for 2014, 2015 and 2016 are signed by Director and Secretary.</p> <p>Observation: Annual Return for 2017 is not signed on form H.</p>	<p>Noted. Annual Returns are coordinated by Holcim's Executive Support team. From now on, this team will ensure that the document is reviewed and signed by the Quarry Manager.</p> <p>Responsibility: Executive Support team/Planning & Environment team/Quarry Manager</p> <p>Date: Quarter 1, 2018</p>
R2.2	<p>The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.</p> <p>Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.</p>	Not Compliant	<p>There have been no serious environmental harm incidents occurred on site. Any environmental incidents should be included in the Annual Returns; However, Annual Return 2017 (01/5/16 – 30/4/17) form C did not include the one instance of lower than limits pH (6.3 against lower limit of 6.5) as noted on 1 Sept 2016 (AEMR 2016 and Attachment 4.1H Environmental Monitoring Worksheet for 1/9/16 – 15/9/16).</p> <p>Recommendation: Make sure Annual Reports are complete and include all relevant information.</p>	<p>Quarry Manager will be up-skilled to understand notification requirements.</p> <p>Responsibility: Planning & Environment team</p> <p>Date: Quarter 1, 2018</p> <p>Annual Returns are coordinated by Holcim's Executive Support team. From now on, this team will ensure that the document is reviewed and signed by the Quarry Manager.</p> <p>Responsibility: Executive Support team/Planning & Environment team/Quarry Manager</p> <p>Date: Quarter 1, 2018</p>
G1.1	A copy of this licence must be kept at the premises to which the licence applies.	Not Verified	Auditees advised that it is kept in Permit Compliance Folder in the weighbridge office.	<p>Noted. Holcim have a permit compliance folder on-site however this should be audited to check it contains all relevant approvals, licences and/or permits.</p> <p>Responsibility: Quarry Manager</p> <p>Date: Quarter 4, 2018</p>

Table 3. Water Licence 40WA413082

Condition	Condition Description/Requirement	Compliance	Comments and Recommendations	Holcim Response
1	<p>A logbook must be kept and maintained at the authorised work site or on the property for each water supply work authorised by this approval, unless the work is metered and fitted with a data logger.</p> <p>A logbook is a document, electronic or hard copy, that records specific required information.</p> <p>A metered water supply work is a water supply work fitted with a data logger and a meter that complies with Australian standard AS 4747: meters for non-urban water supply.</p>	Not Compliant	<p>Two spreadsheets are maintained for plant water usage and water usage vs rainfall. Such information for past years could not be verified as only 2017 logbooks were available at the audit. The plant water usage spreadsheet for 2017 indicates process water usage and total water usage as per meter reading. Data is available January to November 2017 at the time of this audit.</p> <p>The Water Licence number and other specific details on the logged meter/water source are not noted in the logbooks. Recommendation: update the logbook with required specific details.</p>	<p>Holcim will update the logbook with the required information. The Quarry Manager will continue to log details of water usage as well as additional information required as per logbook update.</p> <p>Responsibility: Planning & Environment Team and Quarry Manager</p> <p>Date: Quarter 4, 2018</p>
2	<p>The purpose or purposes for which water is taken, as well as details of the type of crop, area cropped, and dates of planting and harvesting, must be recorded in the logbook each time water is taken.</p>	Not Compliant	<p>Water metering reading for general use and process water use at plant are noted in the spreadsheet. Only total water usage per month for quarry water usage is available.</p> <p>Recommendation: update the logbook with required specific details.</p>	<p>Holcim will update the logbook with the required information. The Quarry Manager will continue to log details of water usage as well as additional information required as per logbook update.</p> <p>Responsibility: Planning & Environment Team and Quarry Manager</p> <p>Date: Quarter 4, 2018</p>
3	<p>Where a water meter is installed on a water supply work authorised by this approval, the meter reading must be recorded in the logbook before taking water. This reading must be recorded every time water is to be taken.</p> <p>A water meter is a device that measures the volume of water that is extracted over a known period of time. Examples of a water meter may include a mechanical meter, electromagnetic meter, channel meter with mobile phone, or an authorised meter equivalent.</p>	Not Compliant	<p>Logbook entries are per monthly water consumption, not per water extraction. Reading is not recorded every time water is taken.</p> <p>Recommendation: update the logbook with required specific details.</p>	<p>Holcim will update the logbook with the required information. The Quarry Manager will continue to log details of water usage as well as additional information required as per logbook update.</p> <p>Responsibility: Planning & Environment Team and Quarry Manager</p> <p>Date: Quarter 4, 2018</p>
4	<p>Before water is taken through the water supply work authorised by this approval, confirmation must be recorded in the logbook that cease to take conditions do not apply and water may be taken.</p> <p>The method of confirming that water may be taken, such as visual inspection or internet search, must also be recorded in the logbook.</p> <p>If water may be taken, the:</p>	Not Compliant	<p>Date, time and licence or approval number is not recorded in the logbook.</p> <p>Recommendation: Logbooks for WAL 413082 include all required information, including date, time and licence or approval number.</p>	<p>Holcim will update the logbook with the required information. The Quarry Manager will continue to log details of water usage as well as additional information required as per logbook update.</p> <p>Responsibility: Planning & Environment Team and Quarry Manager</p> <p>Date: Quarter 4, 2018</p>

	<p>a. date, and b. time of the confirmation, and c. flow rate or water level at the reference point in the water source must be recorded in the logbook.</p> <p>Visual inspection means to physically inspect the gauge (or reference point) and confirm flow rate or water level by eye. Internet search means to confirm the flow rate or water level at the appropriate gauge by checking the correct website. Cease to take conditions means any condition on this approval, or on the access licence under which water is proposed to be taken, that prohibits the taking of water in a particular circumstance.</p>			
5	<p>Once the approval holder becomes aware of a breach of any condition on this approval, the approval holder must notify the minister as soon as practicable. The minister must be notified by:</p> <ol style="list-style-type: none"> email: information@water.nsw.gov.au, or by telephone: 1800 353 104. Any notification by telephone must also be confirmed in writing within seven (7) business days of the telephone call. 	Observation	<p>Recommendation: The water approval related Non- Compliances described in this audit should be reported as per this condition.</p>	<p>Holcim will report the non-compliances identified by this audit to DPI Water.</p> <p>Responsibility: Planning & Environment Team</p> <p>Date: Quarter 1, 2018</p>
8	<p>The following information must be recorded in the logbook for each period of time that water is taken:</p> <ol style="list-style-type: none"> date, volume of water, start and end time when water was taken as well as the pump capacity per unit of time, and the access licence number under which the water is taken, and c. the approval number under which the water is taken, and the volume of water taken for domestic consumption and/or stock watering. a logbook is a document, electronic or hard copy, that records specific required information. 	Not Compliant	<p>The logbook contains monthly total water usage only. It doesn't have date, time, volume of each water draw, access licence number etc.</p> <p>Recommendation: update the logbook with required information.</p>	<p>Holcim will update the logbook with the required information. The Quarry Manager will continue to log details of water usage as well as additional information required as per logbook update.</p> <p>Responsibility: Planning & Environment Team and Quarry Manager</p> <p>Date: Quarter 4, 2018</p>

APPENDIX 2

COOMA ROAD QUARRY QUARTERLY NOISE MONITORING REPORTS 2017

Quarterly Noise Monitoring Assessment

Cooma Road Quarry, Googong, NSW

April 2017

Prepared for : Holcim (Australia) Pty Ltd

April 2017



Document Information

Quarterly Noise Monitoring Assessment

Cooma Road Quarry, Googong, NSW

April 2017

Prepared for: Holcim (Australia) Pty Ltd

Prepared by: Muller Acoustic Consulting Pty Ltd

PO Box 262, Newcastle NSW 2300

ABN: 36 602 225 132

P: +61 2 4920 1833

www.mulleracoustic.com

Document ID	Status	Date	Prepared By	Signed	Reviewed By	Signed
MAC170437RP1	Final	3 May 2017	Robin Heaton	<i>Robin Heaton</i>	Oliver Muller	<i>OM</i>

DISCLAIMER

All documents produced by Muller Acoustic Consulting Pty Ltd (MAC) are prepared for a particular client's requirements and are based on a specific scope, circumstances and limitations derived between MAC and the client. Information and/or report(s) prepared by MAC may not be suitable for uses other than the original intended objective. No parties other than the client should use or reproduce any information and/or report(s) without obtaining permission from MAC. Any information and/or documents prepared by MAC is not to be reproduced, presented or reviewed except in full.

CONTENTS

1 INTRODUCTION..... 5

2 NOISE CRITERIA..... 7

3 METHODOLOGY..... 9

 3.1 LOCALITY..... 9

 3.2 NOISE MONITORING LOCATIONS..... 9

 3.3 ASSESSMENT METHODOLOGY..... 10

4 RESULTS 13

 4.1 ASSESSMENT RESULTS - LOCATION N3..... 13

 4.2 ASSESSMENT RESULTS - LOCATION N8..... 14

 4.3 ASSESSMENT RESULTS - LOCATION N38..... 15

 4.4 ASSESSMENT RESULTS - LOCATION N60..... 16

 4.5 ASSESSMENT RESULTS - LOCATION N67..... 17

5 NOISE COMPLIANCE ASSESSMENT 19

6 CONCLUSION..... 21

APPENDIX A - GLOSSARY OF TERMS

This page has been intentionally left blank

1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for the April 2017 quarter for Cooma Road Quarry ('the quarry'), Googong, NSW.

The monitoring has been conducted in accordance with the Cooma Road Noise Management Plan and in general accordance with Development Consent (SSD-5109); at five representative monitoring locations. This assessment has been undertaken during Quarter 1, 2017 and forms part of the annual noise monitoring program for the quarry.

The assessment has been conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Industrial Noise Policy (INP), 2000;
- Cooma Road Quarry, Noise Management Plan, 2014;
- Conditions of Consent SSD-5109; and
- Standards Australia AS 1055.1:1997 - Acoustics - Description and measurement of environmental noise - General Procedures.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

This page has been intentionally left blank

2 Noise Criteria

Schedule 3, Condition 4 of the Cooma Road Quarry Development Consent, approved on 27 September 2013, outlines the applicable noise criteria for residential receivers N1 – N71 surrounding the quarry site. Table 1 presents the criteria for each of the receivers N1 – N71 as outlined in the Development Consent for quarry operations.

Table 1 Noise Criteria			
Receivers	Morning Shoulder	Day	Evening
	6am – 7am	7am – 6pm	6pm – 10pm
	L _{Aeq} (15min)	L _{Aeq} (15min)	L _{Aeq} (15min)
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

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

This page has been intentionally left blank

3 Methodology

3.1 Locality

The quarry is located in Googong, NSW approximately 13km south east of Canberra, ACT. Receivers in the locality surrounding the quarry are primarily rural/residential. Old Cooma Road is situated to the east of the site, with passing traffic a dominant noise source at all assessed receivers. The quarry is bounded by rural properties in all cadastral directions with noise from passing road traffic dominating the acoustic environment. The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan shown in **Figure 1**.

3.2 Noise Monitoring Locations

Five monitoring locations have been selected as part of the NMA and in accordance with the Development Consent.

N3 is located to the west of the quarry on a rural property off Copperfield Road. This location represents residential and rural receivers to the west of the quarry.

N8 is located to the north east of the quarry along Tempe Crescent and is representative of residential receivers in that area.

N38 is located on Heights Road and is representative of the elevated residential receivers to the east of the quarry.

N60 is located at 501 Old Cooma Road and represents the residence adjacent to the quarry access road.

N67 is located on a rural property at 732 Old Cooma Road to the south of the quarry. This is representative of rural and residential receivers to the south, with direct line of site into the quarry pit.

3.3 Assessment Methodology

The attended noise surveys were conducted in general accordance with the procedures described in Australian Standard AS 1055-1997, "Acoustics - Description and Measurement of Environmental Noise" and the EPL. The measurements were carried out using one Svantek Type 1, 971 noise analyser and one Svantek Type 1, 977 noise analyser on Thursday 6 April 2017 and Friday 7 April 2017. The acoustic instrumentation used carries current NATA calibration and complies with AS IEC 61672.1-2004- Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ± 0.5 dBA.

Noise measurements were of 15 minutes in duration and where possible, throughout each survey the operator quantified the contribution of each significant noise source. One measurement was conducted at each of the monitoring locations during the day, evening and shoulder periods.

Extraneous noise sources were excluded from the analysis to calculate the LAeq(15min) quarry noise contribution for comparison against the relevant criteria.

FIGURE 1

LOCALITY PLAN

REF: MAC170437



KEY

NOISE MONITORING LOCATIONS



This page has been intentionally left blank

4 Results

4.1 Assessment Results - Location N3

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N3 for the monitoring assessment are presented in **Table 2**.

Table 2 Operator-Attended Noise Survey Results – Location N3

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
06/04/2017	08:47	65	44	32	Dir: Easterly Wind Speed: 1.0m/s Rain: Nil	Aircraft 44 – 54
	(Day)					Truck at home – 47 Insects & Birds 38 – 42 Traffic Hum 34 – 40
Cooma Road Quarry LAeq(15min) Contribution						Quarry Inaudible
07/04/2017	19:09	67	43	36	Dir: North Easterly Wind Speed: 0.7m/s Rain: Nil	Distant Traffic 36 – 40
	(Evening)					Aircraft 42 – 45
Cooma Road Quarry LAeq(15min) Contribution						Quarry Inaudible
06/04/2017	06:27	63	47	39	Dir: East North East Wind Speed: 0.8m/s Rain: Nil	Birds 38 – 56
	(Morning Shoulder)					Traffic Hum 38 – 42
Cooma Road Quarry LAeq(15min) Contribution						Quarry Inaudible

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

4.2 Assessment Results - Location N8

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N8 for the monitoring assessment are presented in **Table 3**.

Table 3 Operator-Attended Noise Survey Results – Location N8

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
06/04/2017	07:58 (Day)	71	58	52	Dir: North East	Traffic 53 – 69
					Wind Speed: 0.6m/s	Birds 55 – 59
					Rain: Nil	Aircraft 50 – 54
Cooma Road Quarry L _{Aeq} (15min) Contribution						Quarry Inaudible
07/04/2017	18:41 (Evening)	69	51	45	Dir: North East	Traffic 38 – 55
					Wind Speed: 0.6m/s	Insects 38 – 40
					Rain: Nil	Passing Car 65 – 70
Cooma Road Quarry L _{Aeq} (15min) Contribution						Quarry Inaudible
06/04/2017	06:00 (Morning Shoulder)	76	53	44	Dir: South East	Traffic Noise 38 – 56
					Wind Speed: 1.0m/s	Wind in trees – 42
					Rain: Nil	
Cooma Road Quarry L _{Aeq} (15min) Contribution						Quarry Inaudible

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

4.3 Assessment Results - Location N38

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N38 for the monitoring assessment are presented in **Table 4**.

Table 4 Operator-Attended Noise Survey Results – Location N38

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
06/04/2017	07:40	80	58	49	Dir: North East Wind Speed: 0.4m/s Rain: Nil	Traffic 50 – 80
	(Day)					Birds 52 – 55
Cooma Road Quarry L _{Aeq} (15min) Contribution						Quarry Inaudible
07/04/2017	18:14	63	49	44	Dir: North Wind Speed: 0.5 m/s Rain: Nil	Traffic 43 – 49
	(Evening)					Insects 39 – 40
Cooma Road Quarry L _{Aeq} (15min) Contribution						Quarry Inaudible
06/04/2017	06:23	68	54	49	Dir: South Easterly Wind Speed: 1.6m/s Rain: Nil	Traffic 51 – 58
	(Morning Shoulder)					Birds 50 – 56 Distant Siren 50 – 54 Car in Garage 54 – 56
Cooma Road Quarry L _{Aeq} (15min) Contribution						Quarry Inaudible

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

4.4 Assessment Results - Location N60

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N60 for the monitoring assessment are presented in Table 5.

Table 5 Operator-Attended Noise Survey Results – Location N60

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
06/04/2017	08:16 (Day)	85	64	48	Dir: Easterly Wind Speed: 1.0m/s Rain: Nil	Distant Traffic 46 – 69
						Birds 40 – 46
						Aircraft 47 – 49
						Passing Traffic 70 – 89
		Cooma Road Quarry L _{Aeq} (15min) Contribution				Quarry Inaudible
07/04/2017	18:55 (Evening)	71	50	42	Dir: South West Wind Speed: 1.0m/s Rain: Nil	Insects 38 – 40
						Passing Traffic 47 – 70
						Aircraft 38 – 46
						Domestic Noise - 50
		Cooma Road Quarry L _{Aeq} (15min) Contribution				Quarry Inaudible
06/04/2017	06:40 (Morning Shoulder)	84	64	51	Dir: South Easterly Wind Speed: 0.4 m/s Rain: Nil	Distant Traffic 50 – 68
						Passing Traffic 74 – 82
						Birds 46 – 65
						Aircraft 48 – 52
		Cooma Road Quarry L _{Aeq} (15min) Contribution				Quarry Inaudible

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

4.5 Assessment Results - Location N67

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N67 for the monitoring assessment are presented in Table 6.

Table 6 Operator-Attended Noise Survey Results – Location N67

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
06/04/2017	07:15 (Day)	62	46	43	Dir: South Easterly	Traffic 48 – 59
					Wind Speed: 1.7m/s	Birds 43 – 53
					Rain: Nil	Faint Reverse Alarm – 34
Cooma Road Quarry LAeq(15min) Contribution						30
07/04/2017	18:26 (Evening)	60	41	36	Dir: South West	Traffic Noise 33 – 46
					Wind Speed: 0.2m/s	Insects & Frogs 34 – 40
					Rain: Nil	Aircraft 38 – 55
Cooma Road Quarry LAeq(15min) Contribution						Quarry Inaudible
06/04/2017	06:00 (Morning Shoulder)	61	46	41	Dir: South West	Traffic 47 – 54 Birds 40 – 60
					Wind Speed: 0.4m/s	Aircraft – 41
					Rain: Nil	Faint Haul Truck 30 – 33 Horn Blasts at site 40 – 44
Cooma Road Quarry LAeq(15min) Contribution						30

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

This page has been intentionally left blank

5 Noise Compliance Assessment

The compliance assessment for each monitoring locations N03, N08, N38, N60 and N67 are presented in Table 7 to Table 9 for day, evening and morning shoulder assessment periods.

Table 7 Daytime Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	LAeq(15min)	LAeq(15min)	
N3	Nil	35	✓
N8	Nil	44	✓
N38	Nil	38	✓
N60	Nil	38	✓
N67	30	38	✓

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

Table 8 Evening Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	LAeq(15min)	LAeq(15min)	
N3	Nil	35	✓
N8	Nil	39	✓
N38	Nil	35	✓
N60	Nil	35	✓
N67	Nil	35	✓

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

Table 9 Morning Shoulder Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	LAeq(15min)	LAeq(15min)	
N3	Nil	35	✓
N8	Nil	40	✓
N38	Nil	36	✓
N60	Nil	36	✓
N67	30	36	✓

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

This page has been intentionally left blank

6 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a noise monitoring assessment Holcim (Australia) Pty Ltd at the Cooma Road Quarry, Googong, NSW. The assessment was completed to assess the quarry's compliance with the relevant criteria outlined in their Development Consent for residential receivers surrounding the quarry.

Attended noise monitoring was undertaken on Thursday 6 April 2017 and Friday 7 April 2017 at representative monitoring locations with quarry noise contributions compared against the relevant criteria. The assessment has identified that noise emissions generated by Cooma Road Quarry comply with relevant statutory noise criteria specified in the conditions of consent at all assessed residential receivers.

This page has been intentionally left blank

Appendix A - Glossary of Terms

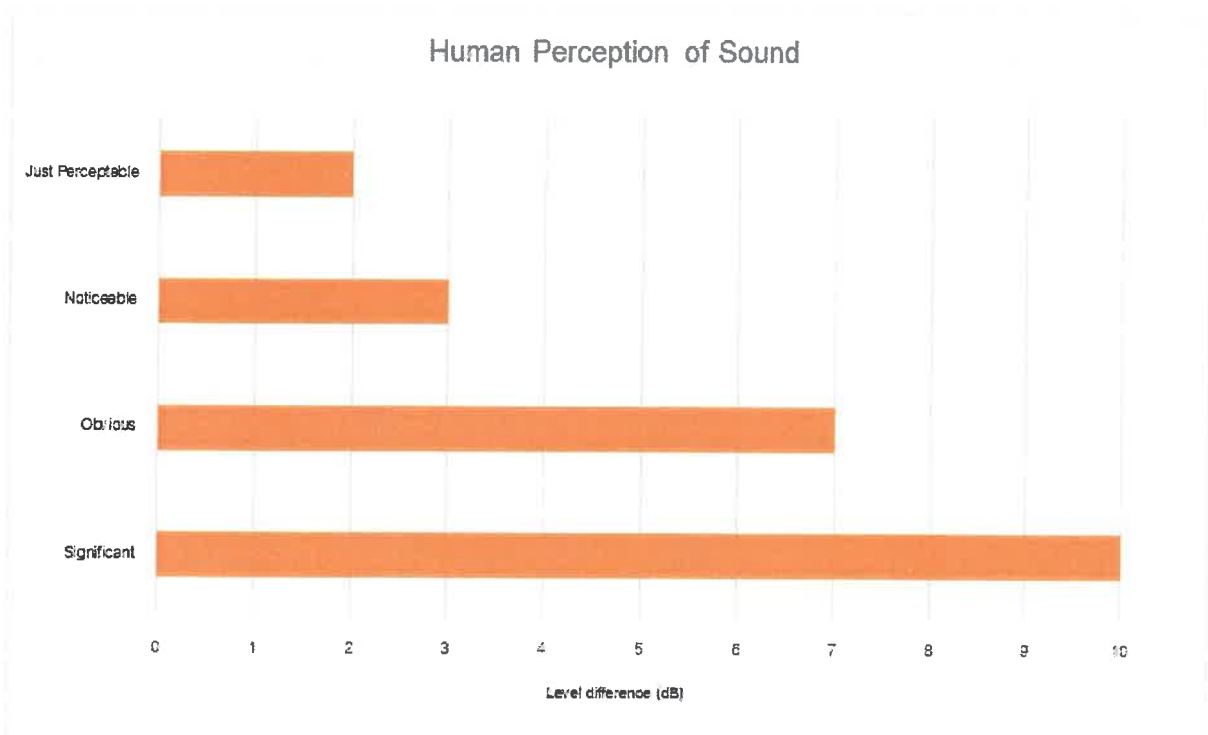
Table A1 provides a number of technical terms have been used in this report.

Table 1A Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the INP as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAmx	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by : $= 10 \cdot \log_{10} (W/W_0)$ Where : W is the sound power in watts and W_0 is the sound reference power at 10-12 watts.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA	
Source	Typical Sound Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



Muller Acoustic Consulting Pty Ltd
PO Box 262, Newcastle NSW 2300
ABN: 36 602 225 132
P: +61 2 4920 1833
www.mulleracoustic.com



Quarterly Noise Monitoring Assessment

Cooma Road Quarry, Googong, NSW.
June 2017

Prepared for : Holcim (Australia) Pty Ltd
Quarter 2, June 2017



Document Information

Quarterly Noise Monitoring Assessment

Cooma Road Quarry, Googong, NSW

June 2017

Prepared for: Holcim (Australia) Pty Ltd

Prepared by: Muller Acoustic Consulting Pty Ltd

PO Box 262, Newcastle NSW 2300

ABN: 36 602 225 132

P: +61 2 4920 1833

www.mulleracoustic.com

Document ID	Status	Date	Prepared By	Signed	Reviewed By	Signed
MAC170437RP2	Final	26 June 2017	Robin Heaton	<i>Robin Heaton</i>	Oliver Muller	<i>OM</i>

DISCLAIMER

All documents produced by Muller Acoustic Consulting Pty Ltd (MAC) are prepared for a particular client's requirements and are based on a specific scope, circumstances and limitations derived between MAC and the client. Information and/or report(s) prepared by MAC may not be suitable for uses other than the original intended objective. No parties other than the client should use or reproduce any information and/or report(s) without obtaining permission from MAC. Any information and/or documents prepared by MAC is not to be reproduced, presented or reviewed except in full.

CONTENTS

1 INTRODUCTION.....5

2 NOISE CRITERIA7

3 METHODOLOGY9

 3.1 LOCALITY9

 3.2 NOISE MONITORING LOCATIONS9

 3.3 ASSESSMENT METHODOLOGY 10

4 RESULTS 13

 4.1 ASSESSMENT RESULTS - LOCATION N3 13

 4.2 ASSESSMENT RESULTS - LOCATION N8 14

 4.3 ASSESSMENT RESULTS - LOCATION N38 15

 4.4 ASSESSMENT RESULTS - LOCATION N60 16

 4.5 ASSESSMENT RESULTS - LOCATION N67 17

5 NOISE COMPLIANCE ASSESSMENT 19

6 CONCLUSION 21

APPENDIX A - GLOSSARY OF TERMS

This page has been intentionally left blank

1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for Cooma Road Quarry ('the quarry'), Googong, NSW.

The monitoring has been conducted in accordance with the Cooma Road Noise Management Plan and in general accordance with Development Consent (SSD-5109); at five representative monitoring locations. This assessment has been undertaken during Quarter 2, 2017 and forms part of the annual noise monitoring program for the quarry.

The assessment has been conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Industrial Noise Policy (INP), 2000;
- Cooma Road Quarry, Noise Management Plan (NMP), 2014;
- Conditions of Consent SSD-5109; and
- Standards Australia AS 1055.1:1997 - Acoustics - Description and measurement of environmental noise - General Procedures.

A glossary of terms, definitions and abbreviations used in this report is provided in Appendix A.

This page has been intentionally left blank

2 Noise Criteria

Schedule 3, Condition 4 of the Cooma Road Quarry Development Consent, approved on 27 September 2013, outlines the applicable noise criteria for residential receivers N1 – N71 surrounding the quarry site. Table 1 presents the criteria for each of the receivers N1 – N71 as outlined in the Development Consent for quarry operations.

Table 1 Noise Criteria			
Receivers	Morning Shoulder	Day	Evening
	6am – 7am	7am – 6pm	6pm – 10pm
	LAeq(15min)	LAeq(15min)	LAeq(15min)
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

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

A 2dB field tolerance as per Section 11.1.3 of the INP is also applicable to reported levels for this assessment and has been applied where relevant.

This page has been intentionally left blank

3 Methodology

3.1 Locality

The quarry is located in Googong, NSW approximately 13km south east of Canberra, ACT. Receivers in the locality surrounding the quarry are primarily rural/residential. Old Cooma Road is situated to the east of the site, with passing traffic a dominant noise source at all assessed receivers. The quarry is bounded by rural properties in all cadastral directions with noise from passing road traffic dominating the acoustic environment. The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan shown in Figure 1.

3.2 Noise Monitoring Locations

Five monitoring locations have been selected as part of the NMA and in accordance with the Development Consent.

N3 is located to the west of the quarry on a rural property off Copperfield Road. This location represents residential and rural receivers to the west of the quarry.

N8 is located to the north east of the quarry along Tempe Crescent and is representative of residential receivers in that area.

N38 is located on Heights Road and is representative of the elevated residential receivers to the east of the quarry.

N60 is located at 501 Old Cooma Road and represents the residence adjacent to the quarry access road.

N67 is located on a rural property at 732 Old Cooma Road to the south of the quarry. This is representative of rural and residential receivers to the south, with direct line of site into the quarry pit.

3.3 Assessment Methodology

The attended noise surveys were conducted in general accordance with the procedures described in Australian Standard AS 1055-1997, "Acoustics - Description and Measurement of Environmental Noise" and the EPL. The measurements were carried out using one Svantek Type 1, 971 noise analyser and one Svantek Type 1, 977 noise analyser on Wednesday 14 June 2017 and Thursday 15 June 2017. The acoustic instrumentation used carries current NATA calibration and complies with AS IEC 61672.1-2004- Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed $\pm 0.5\text{dBA}$.

Noise measurements were of 15 minutes in duration and where possible, throughout each survey the operator quantified the contribution of each significant noise source. One measurement was conducted at each of the monitoring locations during the day, evening and shoulder periods.

Extraneous noise sources were excluded from the analysis to calculate the $L_{Aeq}(15\text{min})$ quarry noise contribution for comparison against the relevant criteria.

FIGURE 1

LOCALITY PLAN

REF: MAC170437



KEY

● N1 NOISE MONITORING LOCATIONS



This page has been intentionally left blank

4 Results

4.1 Assessment Results - Location N3

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N3 for the monitoring assessment are presented in Table 2.

Table 2 Operator-Attended Noise Survey Results – Location N3						
Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
15/06/2017	6:40				Dir: Southerly	Aircraft 45 – 47
	(Morning	64	43	40	Wind Speed: 0.3m/s	Traffic 40 – 45
	Shoulder)				Rain: Nil	Birds 44 – 51
Cooma Road Quarry LAeq(15min) Contribution						Quarry Inaudible
14/06/2017	14:39				Dir: North West	Traffic 37 – 40
	(Day)	56	41	36	Wind Speed: 1.4m/s	Aircraft 40 – 48
					Rain: Nil	
Cooma Road Quarry LAeq(15min) Contribution						Quarry Inaudible
14/06/2017	18:46				Dir: North	Traffic 42 – 44
	(Evening)	66	43	40	Wind Speed: 0.1m/s	Dogs 45 – 46
					Rain: Nil	Aircraft 42 – 54
Cooma Road Quarry LAeq(15min) Contribution						Quarry Inaudible

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

4.2 Assessment Results - Location N8

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N8 for the monitoring assessment are presented in Table 3.

Table 3 Operator-Attended Noise Survey Results – Location N8						
Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
15/06/2017	6:00	83	58	39	Dir: Westerly	Domestic Noise 45 – 72 Traffic 36 – 51
	(Morning				Wind Speed: 0.2m/s	
	Shoulder)				Rain: Nil	
Cooma Road Quarry L _{Aeq} (15min) Contribution						Quarry Inaudible
14/06/2017	13:22	91	64	45	Dir: Westerly	Traffic 45 – 63
	(Day)				Wind Speed: 2.0m/s	Wind in Trees <30
					Rain: Nil	Passing Car 55 – 91
Cooma Road Quarry L _{Aeq} (15min) Contribution						Quarry Inaudible
14/06/2017	18:00	69	57	50	Dir: Northerly	Traffic 50 – 75
	(Evening)				Wind Speed: 0.2m/s	Insect <30
					Rain: Nil	
Cooma Road Quarry L _{Aeq} (15min) Contribution						Quarry Inaudible

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

4.3 Assessment Results - Location N38

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N38 for the monitoring assessment are presented in Table 4.

Table 4 Operator-Attended Noise Survey Results – Location N38

Date	Time (hrs)	Descriptor (dBA re 20 μ Pa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
15/06/2017	6:19				Dir: Northerly	
	(Morning Shoulder)	74	55	47	Wind Speed: 0.1m/s Rain: Nil	Traffic 38 – 71
Cooma Road Quarry LAeq(15min) Contribution						Quarry Inaudible
14/06/2017	13:41				Dir: Westerly	Traffic 40 – 65
	(Day)	70	53	46	Wind Speed: 1.2m/s Rain: Nil	Birds <30 Wind in Trees <30
Cooma Road Quarry LAeq(15min) Contribution						Quarry Inaudible
14/06/2017	18:18				Dir: Northerly	Traffic 50 – 62
	(Evening)	72	54	47	Wind Speed: 0.2m/s Rain: Nil	Insects <30
Cooma Road Quarry LAeq(15min) Contribution						Quarry Inaudible

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

4.4 Assessment Results - Location N60

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N60 for the monitoring assessment are presented in Table 5.

Table 5 Operator-Attended Noise Survey Results – Location N60						
Date	Time (hrs)	Descriptor (dBA re 20 μ Pa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
15/06/2017	6:37				Dir: North West	Traffic 38 – 68
	(Morning	77	67	53	Wind Speed: 0.1m/s	Quarry Hum <33
	Shoulder)				Rain: Nil	Birds 35 – 42
Cooma Road Quarry LAeq(15min) Contribution						31
14/06/2017	13:31				Dir: North West	Aircraft 50 – 52
	(Day)	69	58	45	Wind Speed: 0.2m/s	Traffic 50 – 67
					Rain: Nil	Drill Hum 30 – 32
Cooma Road Quarry LAeq(15min) Contribution						34
14/06/2017	18:37				Dir: North West	
	(Evening)	73	62	48	Wind Speed: 0.2m/s	Traffic 36 – 73
					Rain: Nil	
Cooma Road Quarry LAeq(15min) Contribution						Quarry Inaudible

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

4.5 Assessment Results - Location N67

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N67 for the monitoring assessment are presented in Table 6.

Table 6 Operator-Attended Noise Survey Results – Location N67						
Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
15/06/2017	6:00				Dir: Westerly	Traffic 35 – 49
	(Morning	64	42	35	Wind Speed: 0.4m/s	Quarry Hum 31 – 34
	Shoulder)				Rain: Nil	Dogs 40 – 45
Cooma Road Quarry LAeq(15min) Contribution						32
14/06/2017	13:57				Dir: North West	Aircraft 47 – 54
	(Day)	59	42	36	Wind Speed: 1.5m/s	Wind Noise 46 – 48
					Rain: Nil	Drill Hum 34 – 40
Cooma Road Quarry LAeq(15min) Contribution						37 ¹
14/06/2017	18:06				Dir: North West	Insects 37 – 42
	(Evening)	62	39	36	Wind Speed: 0.1m/s	Truck Noise 32 – 36
					Rain: Nil	Reverse Alarm 34 – 37
Cooma Road Quarry LAeq(15min) Contribution						35
Cooma Road Quarry LAeq(15min) Contribution						35

Note: Monday to Saturday, Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

Note 1: Deemed in compliance with criteria taking into account 2dB field tolerance as per Section 11.1.3 of the INP.

This page has been intentionally left blank

5 Noise Compliance Assessment

The compliance assessment for each monitoring locations N03, N08, N38, N60 and N67 are presented in Table 7 to Table 9 for day, evening and morning shoulder assessment periods.

Table 7 Daytime Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarry Noise Criteria	Compliant
	LAeq(15min)	LAeq(15min)	
N3	Nil	35	✓
N8	Nil	44	✓
N38	Nil	38	✓
N60	31	38	✓
N67	32	41	✓

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

Table 8 Evening Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarry Noise Criteria	Compliant
	LAeq(15min)	LAeq(15min)	
N3	Nil	35	✓
N8	Nil	39	✓
N38	Nil	35	✓
N60	34	35	✓
N67	37 ¹	35	✓

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

Note 1: Deemed in compliance with criteria taking into account 2dB field tolerance as per Section 11.1.3 of the INP.

Table 9 Morning Shoulder Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarry Noise Criteria	Compliant
	LAeq(15min)	LAeq(15min)	
N3	Nil	35	✓
N8	Nil	40	✓
N38	Nil	36	✓
N60	Nil	36	✓
N67	35	36	✓

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

This page has been intentionally left blank

6 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment Holcim (Australia) Pty Ltd at the Cooma Road Quarry, Googong, NSW. The assessment was completed to assess the quarry's compliance with the relevant noise criteria outlined in their Development Consent for residential receivers surrounding the quarry.

Attended noise monitoring was undertaken on Wednesday 15 June 2017 and Thursday 16 June 2017 at representative monitoring locations. The assessment has identified that noise emissions generated by Cooma Road Quarry comply with relevant statutory noise criteria specified in the conditions of consent at all assessed residential receivers.

This page has been intentionally left blank

Appendix A - Glossary of Terms

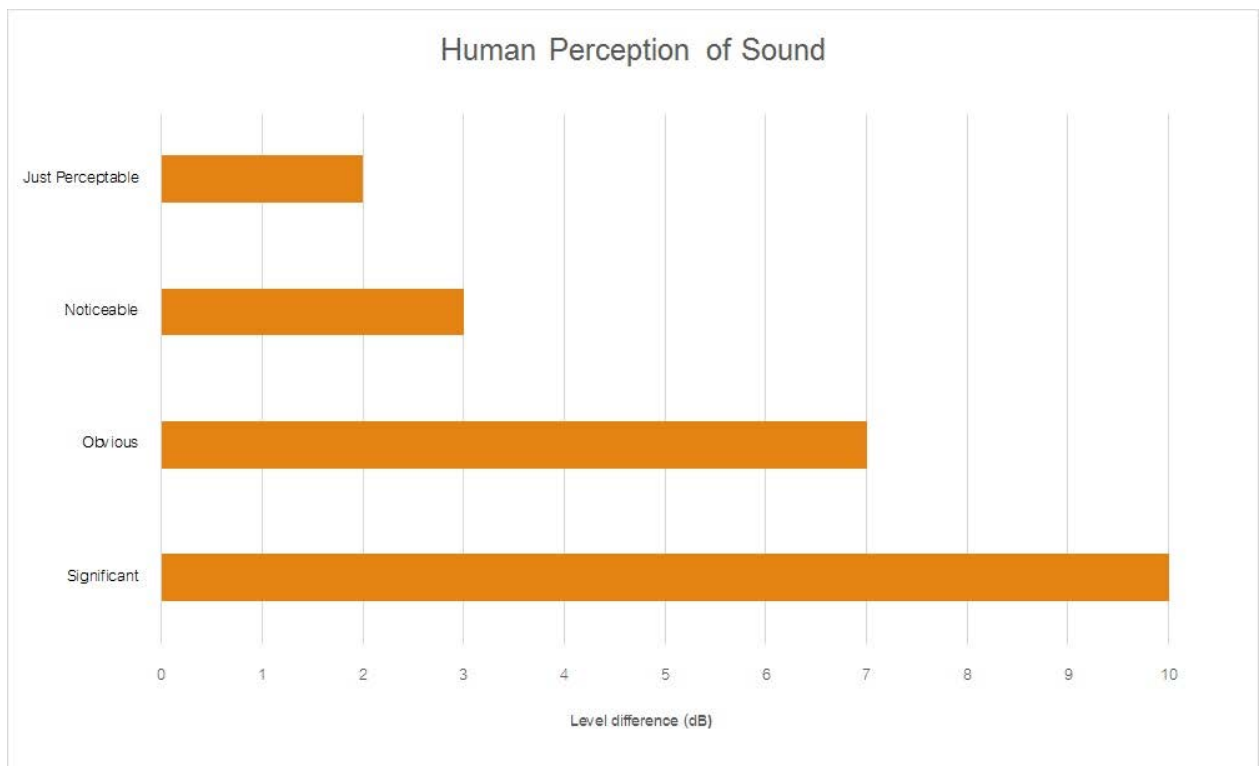
Table A1 provides a number of technical terms have been used in this report.

Table 1A Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the INP as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAm _{ax}	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by : $= 10 \cdot \log_{10} (W/W_0)$ <p>Where : W is the sound power in watts and W₀ is the sound reference power at 10-12 watts.</p>

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA	
Source	Typical Sound Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



Muller Acoustic Consulting Pty Ltd
PO Box 262, Newcastle NSW 2300
ABN: 36 602 225 132
P: +61 2 4920 1833
www.mulleracoustic.com



Quarterly Noise Monitoring Assessment

Cooma Road Quarry, Googong, NSW
September 2017

Prepared for : Holcim (Australia) Pty Ltd
October 2017



Document Information

Quarterly Noise Monitoring Assessment

Cooma Road Quarry, Googong, NSW

September 2017

Prepared for: Holcim (Australia) Pty Ltd

Prepared by: Muller Acoustic Consulting Pty Ltd

PO Box 262, Newcastle NSW 2300

ABN: 36 602 225 132

P: +61 2 4920 1833

www.mulleracoustic.com

Document ID	Status	Date	Prepared By	Signed	Reviewed By	Signed
MAC170437RP3	Final	16 October 2017	Robin Heaton	<i>Robin Heaton</i>	Oliver Muller	<i>OM</i>

DISCLAIMER

All documents produced by Muller Acoustic Consulting Pty Ltd (MAC) are prepared for a particular client's requirements and are based on a specific scope, circumstances and limitations derived between MAC and the client. Information and/or report(s) prepared by MAC may not be suitable for uses other than the original intended objective. No parties other than the client should use or reproduce any information and/or report(s) without obtaining permission from MAC. Any information and/or documents prepared by MAC is not to be reproduced, presented or reviewed except in full.

CONTENTS

1 INTRODUCTION5

2 NOISE CRITERIA7

3 METHODOLOGY9

 3.1 LOCALITY9

 3.2 NOISE MONITORING LOCATIONS9

 3.3 ASSESSMENT METHODOLOGY 10

4 RESULTS 13

 4.1 ASSESSMENT RESULTS - LOCATION N3 13

 4.2 ASSESSMENT RESULTS - LOCATION N8 14

 4.3 ASSESSMENT RESULTS - LOCATION N38 15

 4.4 ASSESSMENT RESULTS - LOCATION N60 16

 4.5 ASSESSMENT RESULTS - LOCATION N67 17

5. NOISE COMPLIANCE ASSESSMENT 19

6 DISCUSSION 21

 6.1 DISCUSSION OF RESULTS - LOCATION N3 21

 6.2 DISCUSSION OF RESULTS - LOCATION N8 21

 6.3 DISCUSSION OF RESULTS - LOCATION N38 21

 6.4 DISCUSSION OF RESULTS - LOCATION N60 21

 6.5 DISCUSSION OF RESULTS - LOCATION N67 22

7 CONCLUSION 23

APPENDIX A - GLOSSARY OF TERMS

This page has been intentionally left blank



1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for Cooma Road Quarry ('the quarry'), Googong, NSW.

The monitoring has been conducted in accordance with the Cooma Road Noise Management Plan and in general accordance with Development Consent (SSD-5109); at five representative monitoring locations. This assessment has been undertaken during Quarter 3, 2017 and forms part of the annual noise monitoring program for the quarry.

The assessment has been conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Industrial Noise Policy (INP), 2000;
- Cooma Road Quarry, Noise Management Plan (NMP), 2014;
- Conditions of Consent SSD-5109; and
- Standards Australia AS 1055.1:1997 - Acoustics - Description and measurement of environmental noise - General Procedures.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

This page has been intentionally left blank

2 Noise Criteria

Schedule 3, Condition 4 of the Cooma Road Quarry Development Consent, approved on 27 September 2013, outlines the applicable noise criteria for residential receivers N1 – N71 surrounding the quarry site.

Table 1 presents the criteria for each of the receivers N1 – N71 as outlined in the Development Consent for quarry operations.

Table 1 Noise Criteria			
Receivers	Morning Shoulder	Day	Evening
	6am – 7am	7am – 6pm	6pm – 10pm
	LAeq(15min)	LAeq(15min)	LAeq(15min)
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

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

A 2dB field tolerance as per Section 11.1.3 of the INP is also applicable to reported levels for this assessment and has been applied where relevant.

This page has been intentionally left blank

3 Methodology

3.1 Locality

The quarry is located in Googong, NSW approximately 13km south east of Canberra, ACT. Receivers in the locality surrounding the quarry are primarily rural/residential. Old Cooma Road is situated to the east of the site, with passing traffic a dominant noise source at all assessed receivers. The quarry is bounded by rural properties in all directions with noise from passing road traffic dominating the acoustic environment. The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan shown in **Figure 1**.

3.2 Noise Monitoring Locations

Five monitoring locations have been selected as part of the NMA and in accordance with the Development Consent.

N3 is located to the west of the quarry on a rural property off Copperfield Road. This location represents residential and rural receivers to the west of the quarry.

N8 is located to the north east of the quarry along Tempe Crescent and is representative of residential receivers in that area.

N38 is located on Heights Road and is representative of the elevated residential receivers to the east of the quarry.

N60 is located at 501 Old Cooma Road and represents the residence adjacent to the quarry access road.

N67 is located on a rural property at 732 Old Cooma Road to the south of the quarry. This is representative of rural and residential receivers to the south, with direct line of site into the quarry pit.

3.3 Assessment Methodology

The attended noise surveys were conducted in general accordance with the procedures described in Australian Standard AS 1055-1997, "Acoustics - Description and Measurement of Environmental Noise" and the EPL. The measurements were carried out by two MAC staff members using Svantek Type 1, 971 noise analysers on Tuesday 26 September 2017 and Wednesday 27 September 2017. The acoustic instrumentation used carries current NATA calibration and complies with AS IEC 61672.1-2004- Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ± 0.5 dBA.

Noise measurements were of 15 minutes in duration and where possible, throughout each survey the operator quantified the contribution of each significant noise source. One measurement was conducted at each of the monitoring locations during the day, evening and morning shoulder periods.

Extraneous noise sources were excluded from the analysis to calculate the LAeq(15min) quarry noise contribution for comparison against the relevant criteria.

FIGURE 1

LOCALITY PLAN

REF: MAC170437



KEY

NOISE MONITORING LOCATIONS



This page has been intentionally left blank

4 Results

4.1 Assessment Results - Location N3

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N3 for the monitoring assessment are presented in **Table 2**.

Table 2 Operator-Attended Noise Survey Results – Location N3

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
27/09/2017	06:00				Dir: NW	Birds 38-68
	(Morning Shoulder)	70	51	39	Wind Speed: 0.4m/s Rain: Nil	Distant traffic <37 Aircraft 44-50
	Cooma Road Quarry LAeq(15min) Contribution					Quarry Inaudible
26/09/2017	17:42				Dir: NE	Birds 36-41
	(Day)	62	43	38	Wind Speed: 0.8m/s Rain: Nil	Distant traffic 37-44
	Cooma Road Quarry LAeq(15min) Contribution					Quarry Inaudible
26/09/2017	18:00				Dir: NE	Birds 35-53
	(Evening)	60	44	38	Wind Speed: 1.2m/s Rain: Nil	Distant traffic 36-41 Dog bark <35 Aircraft 38-57
	Cooma Road Quarry LAeq(15min) Contribution					Quarry Inaudible

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

4.2 Assessment Results - Location N8

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N8 for the monitoring assessment are presented in **Table 3**.

Table 3 Operator-Attended Noise Survey Results – Location N8

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
27/09/2017	06:42				Dir: NE	
	(Morning Shoulder)	74	58	52	Wind Speed: 0.5m/s Rain: Nil	Traffic 58-69 Birds <58
Cooma Road Quarry L _{Aeq} (15min) Contribution						Quarry Inaudible
26/09/2017	17:10				Dir: NE	Traffic 38-52
	(Day)	72	52	47	Wind Speed: 1.0m/s Rain: Nil	Local traffic 64-66 Local residential noise 49-52
Cooma Road Quarry L _{Aeq} (15min) Contribution						Quarry Inaudible
26/09/2017	18:56				Dir: NE	Traffic 42-71
	(Evening)	72	53	45	Wind Speed: 0.1m/s Rain: Nil	Local residential noise 48-68
Cooma Road Quarry L _{Aeq} (15min) Contribution						Quarry Inaudible

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

4.3 Assessment Results - Location N38

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N38 for the monitoring assessment are presented in **Table 4**.

Table 4 Operator-Attended Noise Survey Results – Location N38

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
27/09/2017	06:00				Dir: SW	Traffic 40-61
	(Morning	66	45	41	Wind Speed: 0.5m/s	Aircraft 44-47
	Shoulder)				Rain: Nil	Birds & roosters <44
	Cooma Road Quarry LAeq(15min) Contribution					Quarry Inaudible
26/09/2017	16:50				Dir: NE	Traffic 40-58
	(Day)	78	52	42	Wind Speed: 1.0m/s	Birds & roosters 53-63
					Rain: Nil	
	Cooma Road Quarry LAeq(15min) Contribution					Quarry Inaudible
26/09/2017	18:37				Dir: NE	Traffic 38-66
	(Evening)	78	55	44	Wind Speed: 0.4m/s	Dog bark 58-73
					Rain: Nil	
	Cooma Road Quarry LAeq(15min) Contribution					Quarry Inaudible

Note: Monday to Saturday; Morning shoulder 8am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

4.4 Assessment Results - Location N60

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N60 for the monitoring assessment are presented in **Table 5**.

Table 5 Operator-Attended Noise Survey Results – Location N60

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
27/09/2017	06:20				Dir: SE	
	(Morning Shoulder)	68	57	50	Wind Speed: 1.0m/s Rain: Nil	Traffic 52-63 Aircraft 52-58
	Cooma Road Quarry LAeq(15min) Contribution					
26/09/2017	17:32				Dir: NE	
	(Day)	70	56	46	Wind Speed: 1.0m/s Rain: Nil	Traffic 48-58
	Cooma Road Quarry LAeq(15min) Contribution					
26/09/2017	18:35				Dir: NE	
	(Evening)	64	51	40	Wind Speed: 1.0m/s Rain: Nil	Traffic 40-60
	Cooma Road Quarry LAeq(15min) Contribution					

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

4.5 Assessment Results - Location N67

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N67 for the monitoring assessment are presented in **Table 6**.

Table 6 Operator-Attended Noise Survey Results – Location N67

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
27/09/2017	06:42	62	43	40	Dir: SW	Birds 42-46
	(Morning Shoulder)				Wind Speed: 0.5m/s	Traffic 36-42
Cooma Road Quarry L _{Aeq} (15min) Contribution						Quarry Inaudible
27/09/2017	07:01	66	43	39	Dir: SW	Birds 34-42
	(Day)				Wind Speed: 0.5m/s	Traffic 34-39
Cooma Road Quarry L _{Aeq} (15min) Contribution						Quarry hum 34-35
						35
26/09/2017	18:10	66	40	35	Dir: NE	Traffic 34-38
	(Evening)				Wind Speed: 2.5m/s	Sheep 34-37
Cooma Road Quarry L _{Aeq} (15min) Contribution						Quarry Inaudible

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

This page has been intentionally left blank

5 Noise Compliance Assessment

The compliance assessment for each monitoring location N03, N08, N38, N60 and N67 are presented in **Table 7** to **Table 9** for day, evening and morning shoulder assessment periods.

Table 7 Daytime Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarry Noise Criteria	Compliant
	LAeq(15min)	LAeq(15min)	
N3	Nil	35	✓
N8	Nil	44	✓
N38	Nil	38	✓
N60	Nil	38	✓
N67	35	41	✓

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

Table 8 Evening Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarry Noise Criteria	Compliant
	LAeq(15min)	LAeq(15min)	
N3	Nil	35	✓
N8	Nil	39	✓
N38	Nil	35	✓
N60	Nil	35	✓
N67	Nil	35	✓

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

Table 9 Morning Shoulder Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarry Noise Criteria	Compliant
	LAeq(15min)	LAeq(15min)	
N3	Nil	35	✓
N8	Nil	40	✓
N38	Nil	36	✓
N60	Nil	36	✓
N67	Nil	36	✓

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

This page has been intentionally left blank

6 Discussion

6.1 Discussion of Results - Location N3

Monitoring on 26 September 2017 and 27 September 2017 identified that Cooma Quarry noise was inaudible on all three occasions, and therefore satisfied the morning shoulder and daytime noise limits of 35dBA. It is noted that Holcim Cooma was not operational during the evening period however background measurements were undertaken for completeness and as per the EPL. Extraneous sources audible during the three attended surveys included birds, distant traffic, aircraft and dog bark.

6.2 Discussion of Results - Location N8

Monitoring results for N8 during the September 2017 quarter were dominated by local traffic that was mostly constant during all three attended measurements. Quarry emissions were inaudible on all three occasions, therefore satisfying the relevant morning shoulder criteria of 40dBA and daytime noise limits of 44dBA. The quarry was not operational during the evening period therefore satisfying the evening noise limit of 39dBA. Extraneous sources measured include local traffic, birds and local residential noise.

6.3 Discussion of Results - Location N38

Quarry noise was inaudible on all three occasions during the September 2017 survey period, therefore satisfying the daytime criteria of 38dBA and morning shoulder limits of 36dBA. Cooma quarry was not operational during the evening period therefore satisfying the evening criteria of 35dBA. Non-quarrying noise sources included local traffic, aircraft, birds, roosters, and dog bark.

6.4 Discussion of Results - Location N60

Quarry noise emissions were inaudible during all three attended noise surveys at N60 for the September 2017 quarter, therefore the relevant morning shoulder limits of 36dBA and daytime noise limits of 38dBA were satisfied at this monitoring location. It is noted that Cooma Quarry was not operational during the evening period, therefore satisfying the evening noise limit of 35dBA. Local traffic was the dominant source at this receiver with other non-quarrying sources including an aircraft throughout the three attended measurements.

6.5 Discussion of Results - Location N67

Quarry noise emissions were audible during the daytime attended noise survey at N67 for the September 2017 quarter. The relevant daytime noise limits of 41dBA were satisfied as Holcim emissions were measured at 35dBA at this monitoring location. It is noted that Cooma Quarry was not operational during the evening period, therefore satisfying the evening noise limit of 35dBA. Quarry emissions were inaudible during the morning shoulder period, therefore satisfying the relevant noise limits of 36dBA. Distant traffic was the dominant source at this receiver with other non-quarrying sources including birds and livestock.

7 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment for Holcim (Australia) Pty Ltd at the Cooma Road Quarry, Googong, NSW. The assessment was completed to assess the quarry's compliance with the relevant noise criteria outlined in their Development Consent for residential receivers surrounding the quarry.

Attended noise monitoring was undertaken on Tuesday 26 September 2017 and Wednesday 27 September 2017 at representative monitoring locations. The assessment has identified that noise emissions generated by Cooma Road Quarry comply with relevant statutory noise criteria specified in the conditions of consent at all assessed residential receivers.

This page has been intentionally left blank

Appendix A - Glossary of Terms

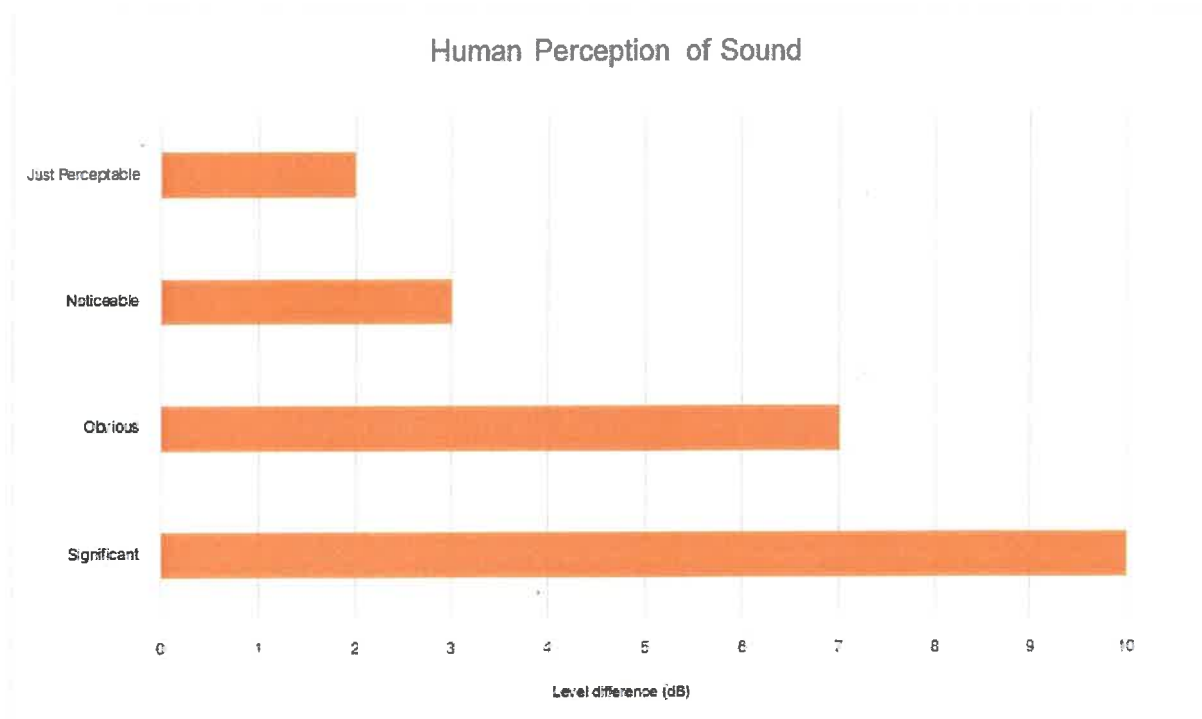
Table A1 provides a number of technical terms have been used in this report.

Table 1A Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the INP as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAmax	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by : $= 10 \cdot \log_{10} (W/W_0)$ <p>Where : W is the sound power in watts and W₀ is the sound reference power at 10-12 watts.</p>

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA	
Source	Typical Sound Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



Muller Acoustic Consulting Pty Ltd
PO Box 262, Newcastle NSW 2300
ABN: 36 602 225 132
P: +61 2 4920 1833
www.mulleracoustic.com



Noise Monitoring Assessment Quarterly

Cooma Road Quarry, Googong, NSW
December 2017

Prepared for : Holcim (Australia) Pty Ltd
December 2017



Document Information

Quarterly Noise Monitoring Assessment

Cooma Road Quarry, Googong, NSW

December 2017

Prepared for: Holcim (Australia) Pty Ltd

Prepared by: Muller Acoustic Consulting Pty Ltd

PO Box 262, Newcastle NSW 2300

ABN: 36 602 225 132

P: +61 2 4920 1833

www.mulleracoustic.com

Document ID	Status	Date	Prepared By	Signed	Reviewed By	Signed
MAC170437RP4	Final	22 December 2017	Robin Heaton	<i>Robin Heaton</i>	Oliver Muller	<i>OM</i>

DISCLAIMER

All documents produced by Muller Acoustic Consulting Pty Ltd (MAC) are prepared for a particular client's requirements and are based on a specific scope, circumstances and limitations derived between MAC and the client. Information and/or report(s) prepared by MAC may not be suitable for uses other than the original intended objective. No parties other than the client should use or reproduce any information and/or report(s) without obtaining permission from MAC. Any information and/or documents prepared by MAC is not to be reproduced, presented or reviewed except in full.

CONTENTS

1 INTRODUCTION5

2 NOISE CRITERIA7

3 METHODOLOGY9

 3.1 LOCALITY9

 3.2 NOISE MONITORING LOCATIONS9

 3.3 ASSESSMENT METHODOLOGY 10

4 RESULTS 13

 4.1 ASSESSMENT RESULTS - LOCATION N3 13

 4.2 ASSESSMENT RESULTS - LOCATION N8 14

 4.3 ASSESSMENT RESULTS - LOCATION N38 15

 4.4 ASSESSMENT RESULTS - LOCATION N60 16

 4.5 ASSESSMENT RESULTS - LOCATION N67 17

5 NOISE COMPLIANCE ASSESSMENT 19

6 DISCUSSION 21

 6.1 DISCUSSION OF RESULTS - LOCATION N3 21

 6.2 DISCUSSION OF RESULTS - LOCATION N8 21

 6.3 DISCUSSION OF RESULTS - LOCATION N38 21

 6.4 DISCUSSION OF RESULTS - LOCATION N60 21

 6.5 DISCUSSION OF RESULTS - LOCATION N67 22

7 CONCLUSION 23

APPENDIX A - GLOSSARY OF TERMS 25

This page has been intentionally left blank

1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for Cooma Road Quarry ('the quarry'), Googong, NSW.

The monitoring has been conducted in accordance with the quarry Noise Management Plan and in general accordance with Development Consent (SSD-5109); at five representative monitoring locations. This assessment has been undertaken during Quarter 4, December 2017 and forms part of the annual noise monitoring program for the quarry.

The assessment has been conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- Cooma Road Quarry, Noise Management Plan (NMP), 2014;
- Conditions of Consent SSD-5109; and
- Standards Australia AS 1055.1:1997 - Acoustics - Description and measurement of environmental noise - General Procedures.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

This page has been intentionally left blank

2 Noise Criteria

Schedule 3, Condition 4 of the Cooma Road Quarry Development Consent, approved on 27 September 2013, outlines the applicable noise criteria for residential receivers N1 – N71 surrounding the quarry site.

Table 1 presents the criteria for each of the receivers N1 – N71 as outlined in the Development Consent for quarry operations.

Table 1 Noise Criteria			
Receivers	Morning Shoulder	Day	Evening
	6am – 7am	7am – 6pm	6pm – 10pm
	LAeq(15min)	LAeq(15min)	LAeq(15min)
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

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

This page has been intentionally left blank

3 Methodology

3.1 Locality

The quarry is located in Googong, NSW approximately 13km south east of Canberra, ACT. The quarry is bounded primarily by rural/residential properties in all directions with noise from passing road traffic on Old Cooma Road dominating the acoustic environment for receivers to the east of the quarry. The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan shown in **Figure 1**.

3.2 Noise Monitoring Locations

Five monitoring locations have been selected as part of the NMA and in accordance with the Development Consent.

N3 is located to the west of the quarry on a rural property off Copperfield Road. This location represents residential and rural receivers to the west of the quarry.

N8 is located to the north east of the quarry along Tempe Crescent and is representative of residential receivers in that area.

N38 is located on Heights Road and is representative of the elevated residential receivers to the east of the quarry.

N60 is located at 501 Old Cooma Road and represents the residence adjacent to the quarry access road.

N67 is located on a rural property at 732 Old Cooma Road to the south of the quarry. This is representative of rural and residential receivers to the south, with direct line of site into the quarry pit.

3.3 Assessment Methodology

Attended noise surveys were conducted in general accordance with the procedures described in Australian Standard AS 1055-1997, "Acoustics - Description and Measurement of Environmental Noise" and the EPL. Measurements were carried out by two MAC staff members using Svantek Type 1, 971 noise analysers on Thursday 14 December 2017 and Friday 15 December 2017. The acoustic instrumentation used carries current NATA calibration and complies with AS IEC 61672.1-2004- Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed $\pm 0.5\text{dBA}$.

Noise measurements were of 15 minutes in duration and where possible, throughout each survey the operator quantified the contribution of each significant noise source. One measurement was conducted at each monitoring location during the day, evening and morning shoulder periods.

Extraneous noise sources were excluded from the analysis to calculate the $L_{Aeq}(15\text{min})$ quarry noise contribution for comparison against the relevant criteria.

KEY

● N1 NOISE MONITORING LOCATIONS

FIGURE 1

LOCALITY PLAN

REF: MAC170437



This page has been intentionally left blank

4 Results

4.1 Assessment Results - Location N3

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N3 for the monitoring assessment are presented in **Table 2**.

Table 2 Operator-Attended Noise Survey Results – Location N3

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
15/12/2017	6:06				Dir: E	
	(Morning Shoulder)	61	41	37	Wind Speed: 0.4m/s Rain: Nil	Traffic 40 – 42 Birds 45 – 61
	Cooma Road Quarry L _{Aeq} (15min) Contribution					Quarry Inaudible
14/12/2017	12:13				Dir: NW	Wind Turbulence 40 – 65
	(Day)	65	45	37	Wind Speed: 3.1m/s Rain: Nil	Birds 42 – 50 Cars 40 – 53
	Cooma Road Quarry L _{Aeq} (15min) Contribution					Quarry Inaudible
14/12/2017	18:29				Dir: NW	Birds 38 – 60
	(Evening)	60	43	37	Wind Speed: 1.0m/s Rain: Nil	Aircraft 42 – 57 Traffic 36 – 38
	Cooma Road Quarry L _{Aeq} (15min) Contribution					Quarry Inaudible

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

4.2 Assessment Results - Location N8

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N8 for the monitoring assessment are presented in **Table 3**.

Table 3 Operator-Attended Noise Survey Results – Location N8						
Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
15/12/2017	06:06				Dir: E	
	(Morning Shoulder)	64	50	38	Wind Speed: 0.1m/s Rain: Nil	Birds 37 – 40 Traffic 52 – 64
	Cooma Road Quarry LAeq(15min) Contribution					Quarry Inaudible
14/12/2017	11:14				Dir: NW	
	(Day)	77	57	50	Wind Speed: 1.5m/s Rain: Nil	Traffic 54 – 74 Birds 40 – 48
	Cooma Road Quarry LAeq(15min) Contribution					Quarry Inaudible
14/12/2017	18:26				Dir: NW	
	(Evening)	77	56	49	Wind Speed: 0.2m/s Rain: Nil	Traffic 48 – 77 Dog Bark 46 – 48 Aircraft e 44 – 54
	Cooma Road Quarry LAeq(15min) Contribution					Quarry Inaudible

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

4.3 Assessment Results - Location N38

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N38 for the monitoring assessment are presented in **Table 4**.

Table 4 Operator-Attended Noise Survey Results – Location N38						
Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
15/12/2017	6:26				Dir: E	
	(Morning Shoulder)	58	45	41	Wind Speed: 0.2m/s Rain: Nil	Birds 45 – 49 Traffic 42 – 58
	Cooma Road Quarry LAeq(15min) Contribution					Quarry Inaudible
14/12/2017	11:33				Dir: NW	
	(Day)	71	50	46	Wind Speed: 3m/s Rain: Nil	Traffic 46 – 71 Birds 49 – 50
	Cooma Road Quarry LAeq(15min) Contribution					Quarry Inaudible
14/12/2017	18:45				Dir: NW	
	(Evening)	79	58	47	Wind Speed: 0.1m/s Rain: Nil	Traffic 53 – 79 Birds 53 – 74 Aircraft 50 – 52
	Cooma Road Quarry LAeq(15min) Contribution					Quarry Inaudible

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

4.4 Assessment Results - Location N60

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N60 for the monitoring assessment are presented in **Table 5**.

Table 5 Operator-Attended Noise Survey Results – Location N60

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
15/12/2017	06:31				Dir: NE	
	(Morning Shoulder)	91	69	48	Wind Speed: 0.2 m/s Rain: Nil	Traffic 46 – 91 Birds 40 – 48
	Cooma Road Quarry L _{Aeq} (15min) Contribution					Quarry Inaudible
14/12/2017	11:41				Dir: NW	
	(Day)	87	67	49	Wind Speed: 2.3m/s Rain: Nil	Traffic 50 – 87 Leaves Rustling 40 – 50
	Cooma Road Quarry L _{Aeq} (15min) Contribution					Quarry Inaudible
14/12/2017	18:56				Dir: NW	
	(Evening)	69	53	43	Wind Speed: 0.6m/s Rain: Nil	Traffic 54 – 69 Aircraft 48 – 50 Urban Hum 42 – 43
	Cooma Road Quarry L _{Aeq} (15min) Contribution					Quarry Inaudible

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

4.5 Assessment Results - Location N67

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N67 for the monitoring assessment are presented in **Table 6**.

Table 6 Operator-Attended Noise Survey Results – Location N67						
Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
15/12/2017	6:48				Dir: NE	Traffic 38 – 42
	(Morning Shoulder)	65	42	38	Wind Speed: 0.1m/s	Aircraft 42 – 50
					Rain: Nil	Quarry Hum 35 – 42
Cooma Road Quarry LAeq(15min) Contribution						28
14/12/2017	12:51				Dir: NW	Wind Turbulence 38 – 61
	(Day)	61	45	39	Wind Speed: 2.4m/s	Mobile Quarry Plant 30 – 36
					Rain: Nil	Aircraft 40 – 45
Cooma Road Quarry LAeq(15min) Contribution						32
14/12/2017	19:09				Dir: NW	Birds 47 – 65
	(Evening)	65	41	33	Wind Speed: 0.1 m/s	Aircraft 38 – 45
					Rain: Nil	Livestock 39 – 41
Cooma Road Quarry LAeq(15min) Contribution						Quarry Inaudible

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

This page has been intentionally left blank

5 Noise Compliance Assessment

The compliance assessment for each monitoring location N3, N8, N38, N60 and N67 are presented in **Table 7** to **Table 9** for day, evening and morning shoulder assessment periods.

Table 7 Daytime Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarry Noise Criteria	Compliant
	dB, LAeq(15min)	dB, LAeq(15min)	
N3	Nil	35	✓
N8	Nil	44	✓
N38	Nil	38	✓
N60	Nil	38	✓
N67	32	41	✓

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

Table 8 Evening Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarry Noise Criteria	Compliant
	dB, LAeq(15min)	dB, LAeq(15min)	
N3	Nil	35	✓
N8	Nil	39	✓
N38	Nil	35	✓
N60	Nil	35	✓
N67	Nil	35	✓

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

Table 9 Morning Shoulder Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarry Noise Criteria	Compliant
	dB, LAeq(15min)	dB, LAeq(15min)	
N3	Nil	35	✓
N8	Nil	40	✓
N38	Nil	36	✓
N60	Nil	36	✓
N67	28	36	✓

Note: Monday to Saturday; Morning shoulder 6am to 7am; Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Day 8am to 6pm; Evening 6pm to 10pm; Night 10pm to 8am.

This page has been intentionally left blank

6 Discussion

6.1 Discussion of Results - Location N3

Monitoring on 14 December 2017 and 15 December 2017 identified that Cooma Quarry noise was inaudible on all three occasions, and therefore satisfied the morning shoulder and daytime noise limits of 35dBA. It is noted that the quarry was not operational during the evening period however background measurements were undertaken for completeness and as per the EPL. Extraneous sources audible during the three attended surveys included birds, distant traffic, aircraft and dog bark.

6.2 Discussion of Results - Location N8

Monitoring results for N8 during Quarter 4, December 2017 were dominated by local traffic that was generally constant during all three attended measurements. Quarry emissions were inaudible on all three occasions, therefore satisfying the relevant morning shoulder criteria of 40dBA and daytime noise limits of 44dBA. The quarry was not operational during the evening period therefore satisfying the evening noise limit of 39dBA. Extraneous sources measured include local traffic, birds and local residential noise.

6.3 Discussion of Results - Location N38

Quarry noise was inaudible on all three occasions for the 14 December 2017 and 15 December 2017 survey periods, therefore satisfying the daytime criteria of 38dBA and morning shoulder limits of 36dBA. The quarry was not operational during the evening period therefore satisfying the evening criteria of 35dBA. Non-quarrying noise sources included local traffic, aircraft, birds, and dog barks.

6.4 Discussion of Results - Location N60

Quarry noise emissions were inaudible during all three attended noise surveys at N60 during all measurements conducted on 14 December 2017 and 15 December 2017, therefore the relevant morning shoulder limits of 36dBA and daytime noise limits of 38dBA were satisfied at this monitoring location. It is noted that Cooma Quarry was not operational during the evening period, therefore satisfying the evening noise limit of 35dBA. Local traffic was the dominant source at this receiver with other non-quarrying sources including an aircraft throughout the three attended measurements.

6.5 Discussion of Results - Location N67

Quarry noise emissions were audible during the morning shoulder and daytime attended noise surveys at N67 on 14 December 2017 and 15 December 2017. The relevant daytime noise limits of 41dBA were satisfied as quarry noise contribution was 30dBA and satisfied the daytime noise limit. Quarry emissions were also audible during the morning shoulder period with emissions measured at 28dBA which satisfies the relevant noise limits of 36dBA for the period.

It is noted that the quarry was not operational during the evening period, therefore satisfying the evening noise limit of 35dBA. Distant traffic was the dominant source at this receiver with other non-quarrying sources including birds and livestock noise.

7 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment (NMA) for Holcim (Australia) Pty Ltd at the Cooma Road Quarry, Googong, NSW. The assessment was completed to assess the quarry's compliance with the relevant noise criteria outlined in their Development Consent for residential receivers surrounding the quarry.

Attended noise monitoring was undertaken on Thursday 14 December and Friday 15 December 2017 at representative monitoring locations. The assessment has identified that noise emissions generated by Cooma Road Quarry comply with relevant statutory noise criteria specified in the Conditions of Consent at all assessed residential receivers during Quarter 4, December 2017.

This page has been intentionally left blank

Appendix A - Glossary of Terms

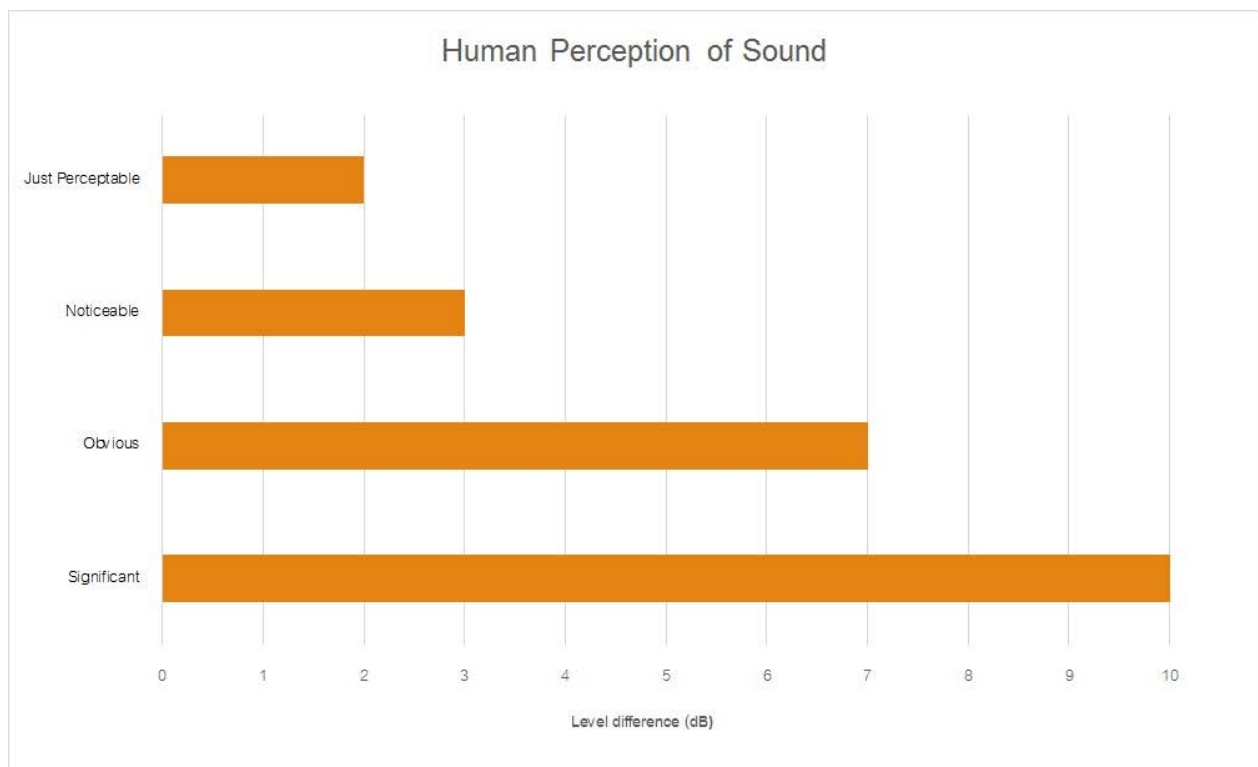
Table A1 provides a number of technical terms have been used in this report.

Table 1A Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAm _{ax}	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by : $= 10 \cdot \log_{10} (W/W_0)$ Where : W is the sound power in watts and W ₀ is the sound reference power at 10-12 watts.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA	
Source	Typical Sound Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



Muller Acoustic Consulting Pty Ltd
PO Box 262, Newcastle NSW 2300
ABN: 36 602 225 132
P: +61 2 4920 1833
www.mulleracoustic.com



APPENDIX 3

COOMA ROAD QUARRY TRANSPORT SUMMARY 2017



Cooma Road Quarry Transport 2017

2017	January		February		March		April		May		June		July		August		September		October		November		December	
	Truck	Volume (T)	Truck	Volume (T)	Truck	Volume (T)	Truck	Volume (T)	Truck	Volume (T)	Truck	Volume (T)	Truck	Volume (T)	Truck	Volume (T)	Truck	Volume (T)	Truck	Volume (T)	Truck	Volume (T)	Truck	Volume (T)
Day 1	0	0	128	3493.04	150	4031.45	0	0	129	3456.21	128	3625.18	49	1336.1	81	2162.83	147	4104.02	0	0	149	4050.53	181	5128.76
Day 2	0	0	89	2358.18	140	3390.37	0	0	121	3289.25	159	4433.72	0	0	100	2510.87	31	824.67	0	0	182	5325.41	0	0
Day 3	0	0	71	1829.36	96	2621.04	110	2872.06	139	3745.27	76	2237.57	118	3149.34	124	2940.4	0	0	98	1586.25	216	5860.01	0	0
Day 4	51	1564	48	1390.92	22	688.1	130	3417.9	126	3151.56	0	0	141	3782.59	45	1015.37	133	3457.87	146	3945.55	89	2307.55	58	1392.8
Day 5	72	2113.74	0	0	0	0	138	3607.15	148	3748.32	204	5730.85	165	4542.98	0	0	129	3397.91	117	3166.37	0	0	76	1651.06
Day 6	69	1985.14	117	3233	103	3119.96	93	2309.1	93	2577.77	211	5456.33	162	4641.44	0	0	101	2349.38	109	2693.64	16	366.2	143	3536.22
Day 7	0	0	93	2659.53	107	2951.09	95	2302.8	0	0	215	5773.29	145	4165.14	35	644.32	154	4130.73	46	1177.4	87	1885.44	149	3798.14
Day 8	0	0	97	2737.05	94	2652.3	51	1245.7	113	3019.19	165	4611.09	0	0	102	2384.82	134	3396.71	0	0	162	4541.52	170	4652.93
Day 9	82	2183.62	132	3815.72	126	3512.03	0	0	135	3682.88	111	2980.26	0	0	112	2792.48	31	880.98	119	2788.81	120	3257.99	110	2847.82
Day 10	67	1935.96	81	2478.81	136	3894.36	87	2192.42	161	4337.17	0	0	146	3837.4	93	1947.1	0	0	112	2688.13	130	3704.19	0	0
Day 11	74	1999.4	17	336.34	0	0	119	3130.52	167	4233.46	0	0	182	5109.26	100	2452.14	108	2609.98	141	3438.95	92	2237.62	196	5144.36
Day 12	80	2096.82	0	0	0	0	142	3966.04	165	4415.26	0	0	134	3850.2	47	1349.56	148	4064.86	132	3362.27	0	0	166	4598.84
Day 13	63	1788.1	65	1852.38	0	0	115	3151.94	65	1775.24	42	848.94	156	4393.08	0	0	181	5428.24	99	2245.54	131	3686.16	170	4610.73
Day 14	0	0	98	2737.31	86	2560.8	0	0	0	0	156	4584.68	151	3835.42	106	2501.12	202	5780.07	36	909.54	196	5371.87	173	4688.24
Day 15	0	0	87	2231.92	99	2617.3	0	0	142	4017.5	133	3609.78	61	1248.06	170	4377.16	161	4603.08	0	0	202	5307.02	176	4735.61
Day 16	74	2015.8	110	3119.86	103	2833.18	0	0	146	4114.07	163	4457.6	0	0	68	1290.18	27	754.92	176	4562.18	157	4492.9	155	4611
Day 17	66	1787.6	81	2215.44	120	3329.84	0	0	160	5042.16	46	1320.26	116	3184.14	129	3104.86	0	0	130	3248.31	118	2992.18	0	0
Day 18	87	2345.16	0	0	98	2991.06	42	975.46	163	4295.28	0	0	128	3244.7	99	2112.06	140	3801.46	142	3753.85	22	562.6	164	4623.3
Day 19	105	3052.76	0	0	0	0	55	1403.57	188	5356.68	125	3160.12	129	3431.56	0	0	173	4698.08	149	4079.15	0	0	163	4583.25
Day 20	52	1314.6	124	3737.46	113	2964.43	78	2091.74	15	437.74	108	2689.68	121	3397.92	0	0	107	2645.61	119	3069.28	136	3996.19	186	5511.79
Day 21	35	902.1	82	2199.03	44	1088.24	136	4050.48	0	0	122	2924.45	102	2765.98	151	4154.06	137	3740.99	35	840.66	159	4744.64	98	2766.52
Day 22	0	0	101	2654.68	79	1952.7	0	0	174	5039.7	122	3453.41	21	530.08	190	5515.52	112	3065.5	0	0	129	3828.79	0	0
Day 23	91	2501.85	80	2066.51	102	2323.59	0	0	166	4815.61	159	4249.72	0	0	134	3632.5	50	1420.5	156	3761.95	139	3122.12	0	0
Day 24	98	2420.38	100	2709.41	170	4229.3	0	0	193	5028.36	48	1313.11	115	3080.12	146	3756.21	0	0	144	3779.16	154	4031	0	0
Day 25	110	2923.2	29	755.09	16	492.62	0	0	205	5676.76	0	0	158	4235.72	133	3300.9	35	679.2	145	3896.5	67	1643.4	0	0
Day 26	0	0	0	0	0	0	62	1558.96	147	3737.32	108	3042.05	133	3694.49	65	1907.37	149	4120.72	146	3582.07	0	0	0	0
Day 27	31	689.46	99	2679.98	119	2816.34	61	1397.82	60	1737.46	96	2651.72	103	2632.44	0	0	126	3251.2	138	3019.65	41	933.71	0	0
Day 28	0	0	121	3020.2	118	3026.46	105	2666.85	0	0	128	3330.61	89	2256.07	146	3990.28	119	2822.26	77	2137.84	77	1735	0	0
Day 29	0	0	N/A	N/A	84	2124.97	77	2154.24	104	2685.45	112	2867.81	45	1385	121	3108.34	106	2866.14	0	0	169	4541.21	0	0
Day 30	87	2394.68	N/A	N/A	88	2033	0	0	125	3443.03	113	3184.97	0	0	85	1890.93	0	0	109	3056.44	170	4805.42	0	0
Day 31	113	3194.16	N/A	N/A	97	2659.18	N/A	N/A	136	3921.65	N/A	N/A	23	290.52	104	2656.12	N/A	N/A	104	2648.06	N/A	N/A	0	0
TOTAL	1507	41208	2050	56311	2510	66904	1696	44495	3706	100780	3050	82537	2893	78020	2686	67398	2941	78895	2925	73438	3310	89320	2534	68871