Strength. Performance. Passion

Holcim

ANNUAL REVIEW
1 January 2023 – 31 December 2023

Teven Quarry

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SITE DETAILS

Name of operation	Teven Quarry
Name of operator	Holcim (Australia) Pty Ltd
Development consent / project approval #	SSD 6422
Name of holder of development consent / project approval	Holcim (Australia) Pty Ltd
Annual review start date	1 January 2023
Annual review end date	31 December 2023

I, **Matt Kelly**, certify that this audit report is a true and accurate record of the compliance status of the **TEVEN QUARRY** for the period of **1 JANUARY 2023 - 31 DECEMBER 2023** and that I am authorised to make this statement on behalf of **HOLCIM (AUSTRALIA) PTY LTD**.

Note.

a) *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.*

b) *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).*

Name of authorised reporting officer	Matt Kelly
Title of authorised reporting officer	Quarry Manager
Signature of authorised reporting officer	
Date	22/03/2024

1 STATEMENT OF COMPLIANCE

The statement of commitments for the 2023 reporting period for Teven Quarry is provided in **Table 1**. **Table 3** details the non-compliances of SSD 6422 identified within the 2023 reporting period, with the compliance status key provided in **Table 2**

Table 1 Statement of Commitments

Were all conditions of the relevant approval(s) complied with?	
SSD 6422	No
EPL 3293	No

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: ● 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: ● potential for moderate environmental consequences, but is unlikely to occur; or ● potential for low environmental consequences but is likely to occur.
Admin NC	**Administrative 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 2023 Summary of Non-Compliances

Relevant Approval	Condition	Condition Summary	Status	Relevant Section of the Annual Review/ Issue
SSD 6422 EPL 3293	Schedule 3 Condition 5 Condition L4.2	Approved Daytime noise criteria must not exceed 37 dBA (LAeq) at all other residences. Teven recorded a Quarry noise contribution of 44dBA (LAeq) at receiver R10 during the Q3 reporting period.	**Non-compliant**	**Section 6.2**
SSD 6422	Schedule 3 Condition 6	The Applicant shall prepare and implement a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must: (e) include a monitoring program to be implemented to measure noise from the development against the noise criteria in Table 2, and which evaluates and reports on the effectiveness of the noise management system on site. Exceedance in Q3 at location NM4 was above criteria and not reported during the reporting period.	**Administrative non-compliant**	**Section 6.2**
SSD 6422 EPL 3293	Schedule 3, Condition 7 Condition L5.2	Teven to not exceed 115 dB (Lin Peak) for more than 5% of the total number of blasts during each reporting period. Teven recorded a total of 10 blasts during the reporting period, with one blast recording 116.5dBL, this equates to 10% of the total blasts above 115 dB (Lin Peak).	**Non-compliant**	**Section 6.4**
SSD 6422	Schedule 3 Condition 11	Teven shall ensure that all Air Quality monitoring in undertaken, and that emissions generated do not exceed criteria. On 27/02/2023 a sample was missed due to equipment failure. On 12/12/2023 a 24-hour PM_{10} sample of 57.7 µg/m3 was recorded. This exceeds the criteria of 50 µg/m3	**Non-complaint**	**Section 6.3**
SSD 6422	Schedule 3 Condition 14	Air Quality Management Plan – reporting of air quality monitoring that are outside of criteria or missed.	**Administrative non-compliant**	**Section 6.3**
SSD 6422	Schedule 5 Condition 7	Incident Reporting - The Applicant shall immediately notify the Secretary and any other relevant agencies of any incident. Teven Quarry failed to notify the Secretary of Noise and Air exceedances during the 2023 reporting period.	**Administrative non-compliant**	**Section 13**

2 INTRODUCTION

Holcim (Australia) Pty Ltd (Holcim) operates Teven Quarry, a hard rock quarry located on Stokers Lane in the Ballina Shire Local Government Area in northern New South Wales (NSW) (refer to **Figure 1** and **Figure 2**). The site operates under Development Consent (SSD 6422 as modified) approved by the New South Wales Department of Planning, Housing, and Infrastructure (DPHI) (then Department of Planning and Environment (DPE))on 15 July 2015.

The site also operates in accordance with Environment Protection Licence (EPL) No. 3293 issued by the NSW Environmental Protection Authority (EPA).

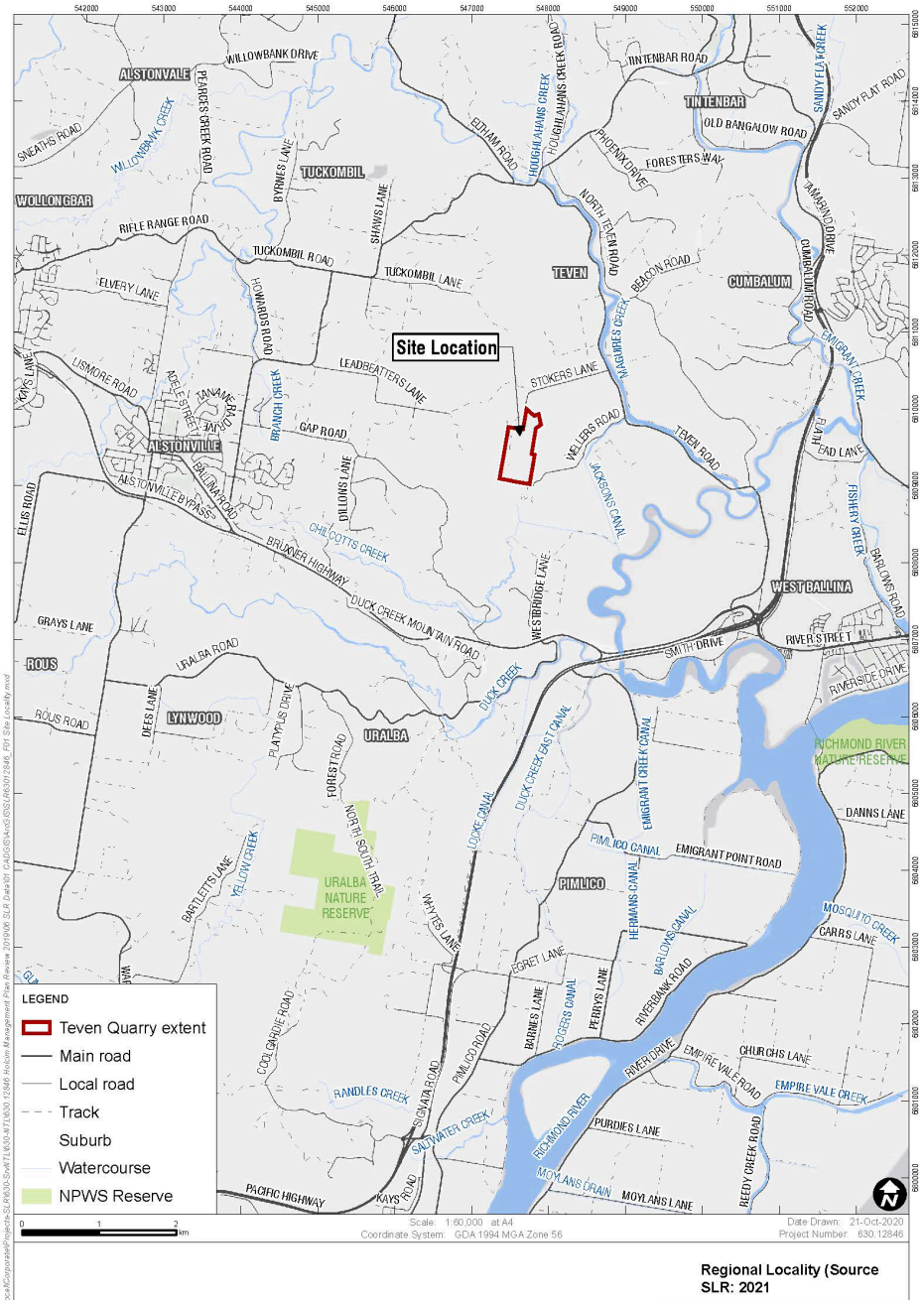

Figure 1: Regional Locality

Figure 2: Aerial view of the Teven Quarry, located on Stokers Lane, Teven (source nearmaps 2023)

In accordance with Schedule 5, Condition 4 of the modified Development Consent the site is required to undertake an Annual Review of the site in 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: - relevant statutory requirements, limits, or performance measures/criteria; - requirements of any plan or program required under this consent; - the monitoring results of previous years; and - the relevant predictions in the EIS.	Section 6, 7 and 10.3
c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;	Section 1 and 11
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 13

This Annual Review has also been prepared in accordance with the *Annual Review Guideline: Post-approval Requirements for State Significance Mining Developments* (October 2015). This report documents the environmental performance of the site from 1 January 2023 to 31 December 2023.

2.1 Contact Details

The key contact details for the site are outlined below:

Quarry Manager

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Environment Manager – NSW

Dozie Egeonu
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3 APPROVALS

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

Table 5: Approvals for Teven Quarry Operations

Approval	Regulatory Authority
SSD 6422	NSW DPHI
EPL No. 3293	NSW EPA

4 OPERATIONS SUMMARY

4.1 Exploration

There was no exploration undertaken within the Annual Review period.

4.2 Land Preparation

There was no clearing undertaken during the Annual Review period.

4.3 Construction Activities

There were no construction activities during the Annual Review period.

4.4 Quarry Operations

Operational activities undertaken at Teven Quarry in 2023 included:

- Stripping of topsoil and overburden within the existing approved extraction limit boundary;
- Drill, blast, load, and haul activities; and
- Crushing, screening, and stockpiling of product.

A list of the permissible operating hours under Schedule 3 Condition 1 is outlined below in **Table 6**.

Table 6: Operating Hours

Activity	Permissible Hours
Extraction operations Processing operations Overburden management	7 am to 6 pm Monday to Friday; 7 am to 4 pm Saturday; and At no time on Sundays or public holidays.
Blasting	10 am to 3 pm Monday to Friday; and At no time on Sundays or public holidays.
Loading and dispatch Stockpile management Maintenance of plant and equipment	7 am to 10 pm Monday to Friday; 7 am to 4 pm Saturdays; and At no time on Sundays or public holidays.

All activities took place within the approved operating hours in 2023.

Table 7 includes a summary of the product operations undertaken during the reporting period against the Development Consent conditions regarding product transported from Teven Quarry.

Table 7: Total Annual Product Distributed (Holcim Teven Quarry)

Material	Approval Limit (Tonnes)	2018	2019	2020	2021	2022	2023	2024 (Forecast)
Product Distributed - Total	500,000	372,640	458,679	292,701	299,713	295,018	292,110	300,479

Schedule 2, Condition 18 states that the applicant shall provide quarry production data to DPHI (and include a copy of this information in the annual review. **Table 8** details the 2022-2023 annual return extractive data provided to the DPHI. Note that this data will not align with this annual review due to different report periods.

Table 8: 2022-2023 Extractive Annual Return data

Product	Description	Quantity[1] (tonnes)
Over 30mm-70mm (Railway Ballast)	Virgin materials - Crushed coarse aggregates	1.4
Over 5mm-30mm Concrete Aggregates	Virgin materials - Crushed coarse aggregates	84.8
Over 75mm (Rock broken)	Virgin materials - Crushed coarse aggregates	4.4
Prepared Road Base & Sub-base & Drainage Filter	Virgin materials - Crushed coarse aggregates	83.8
Fill & Crusher Fines (under 5mm)	Construction sand	45.7
Manufact Sand	Construction sand	35.2
	Total	294.8

Note 1 – Quantity has been rounded

4.5 Next Reporting Period

Development activities proposed to be carried out at Teven Quarry in 2024, include:

- Stripping of topsoil and overburden within the existing approved extraction limit boundary;
- Drill, blast, load, and haul activities; and
- Continuation of crushing, screening, and stockpiling of product.

5 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

5.1 Actions from 2022 Annual Review – DPHI Actions

Holcim submitted the 2022 Annual Review to the Major Projects Portal by 31st March 2023. Holcim received feedback from the DPHI on 18/07/2023 and is shown in **Table 9.**

Table 9: 2022 Annual Review Feedback

Feedback	Holcim Comment	Where Addressed
Schedule 5, Condition 4(b) *requires that the review include a comprehensive review of the monitoring results and complaints records of the Project over the previous calendar year, which includes a comparison of these results against the requirements of any plan or program required under the Consent.*	Holcim have included a comparison against the requirements of any plan or program required under this consent.	**Section 6**
Schedule 2, Condition 18a states: *1. "The Applicant shall:* *(a) provide annual quarry production data to DRE using the standard form for that purpose; and* *(b) include a copy of this data in the Annual Review (see condition 4 of Schedule 5)."*	Holcim will aim to provide quarry production data to the requirements that DRE/DPHI specify.	**Section 4**
"Schedule 3, Condition 33a states: *"The Applicant shall: (a) manage on-site sewage treatment and disposal in accordance with the requirements of its EPL, and to the satisfaction of the EPA and Council"*	Holcim have advised the Department that multiple requests have been sent to the Council for approval, however, no response has been received. Holcim will formally advise the Department when approval has been obtained.	**Section 10.2**

5.2 Actions from 2022 Annual Review - Holcim Proposed Actions for 2023

Table 10 provides an update on Holcim Proposed Actions for 2023 provides an update on the proposed actions from Holcim staff.

Table 10: Update on Holcim Proposed Actions for 2023

Improvement Measure	Activities	2023 Actions
PM_{10}	Maintain a HVAS monitoring program which meets Development Consent requirements.	HVAS monitoring program was implemented during the 2023 reporting period. Only one instance of equipment failure.
Biodiversity	Weed spraying will continue at site during the next Annual Review period.	Continuation of spot spraying.
Water sampling	Complete water sampling for at least the parameters pH, Total Suspended Solids, and Oil and grease.	Surface water quality monitoring was undertaken in line with the Water Management Plan.
Groundwater Assessment	Condition 3, Schedule 19 *In the event that groundwater in excess of negligible quantities is intersected during extraction activities, the Applicant shall undertake a hydrogeological investigation, in consultation with NOW, to the satisfaction of the Secretary.* *The investigation must report on groundwater sources, levels, yield, and quality; identify any risks to groundwater users or groundwater dependent ecosystems and propose recommended management measures. The Applicant must implement reasonable and feasible management measures to the satisfaction of the Secretary.* Holcim will continue to monitor the quarry void for groundwater seepage to ensure that groundwater quantities remain negligible.	Groundwater seepage was negligible in the quarry void in the report period.

6 ENVIRONMENTAL PERFORMANCE

6.1 Meteorological Monitoring

This report uses 2023 rainfall and temperature data from the Bureau of Meteorology's Ballina Airport station, approximately 5km southeast of the site to provide a summary for the period. These meteorological results are presented in **Table 11.**

Table 11 Meteorological Monitoring Results 2023 (Ballina Airport AWS, station 058198)

Month	Total Rainfall (mm)	Minimum Temperature (°C)	Maximum Temperature (°C)
January	72.6	14.6	31.3
February	245.6	15.8	31.9
March	124.6	12.4	33.3
April	152.0	11.1	28.7
May	136.8	4.5	25.2
June	6.8	2.8	24.8
July	50.4	3.3	25.2
August	40.6	4.5	28.8
September	34.4	6.4	34.9
October	156.4	10.7	30.5
November	188.8	12.5	32.9
December	37.6	15.7	35.4
Annual TOTAL	1246.6		

Annual rainfall experienced at Teven Quarry during the 2023 reporting period was 1246.6mm.

This was a decrease from the previous 2022 reporting period of 2896.4mm and 2021 reporting period of 2026mm. During 2021 and 2022, the east coast of Australia was experiencing an active La Nina system, with above average rainfall data recorded.

6.2 Noise

6.2.1 EIS Predictions

The 2014 EIS found that the Project was not predicted to exceed the project specific noise levels at any privately owned residences surrounding the Project Area, with the exception of Receiver 9. Receiver 9 has since been purchased by Holcim.

Road traffic noise levels were predicted to increase at some receivers whilst decreasing at others, with the criteria proposed in the EIS predicted to be met.

6.2.2 Approved Criteria

In accordance with Schedule 3, Condition 5(c) of SSD 6422, *'the Applicant shall: carry out noise monitoring (at least every 3 months) to determine whether the development is complying with the relevant conditions of this consent.'*

Approved noise criteria from the Development Consent are outlined in **Table 12.**

Table 12: Noise Criteria for Teven Quarry (SSD 6422)

Table 2: Noise criteria dB(A)

Receiver	Day dB(A) ($L_{Aeq(15\ min)}$)	Evening dB(A) ($L_{Aeq(15\ min)}$)
R3, R4, R13, R15, R16, R17, R18, R20	38	35
All other residences	37	35

Note: Receiver locations are shown on the figure in Appendix 4.

6.2.3 Key Environmental Performance

Quarterly noise monitoring was undertaken 2023 in accordance with the requirements of the Schedule 3, Condition 4. Monitoring was completed by Ramboll Australia Pty Ltd (Ramboll_ on the following dates:

- Q1 monitoring – 10 and 11 January 2023;
- Q2 monitoring – 10 May and 13 June 2023;
- Q3 monitoring – 8 and 9 August 2023; and
- Q4 monitoring –11 and 12 October 2023.

Noise results at all locations were generally in the approved performance criteria. Receiver R10 exceeded the approved performance criteria of 37 LAeq(15min) in the third quarter with a result of 44 LAeq(15min), with this being recorded as a non-compliance for Schedule 3, Condition 5. The Quarterly noise monitoring results are shown in **Table 13.**

Copies of the quarterly noise monitoring reports for 2023 are attached as **Appendix 1.**

Table 13: Noise Compliance Assessment for Teven Quarry

Note: Monday to Saturday; 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.

Assessment Period	Receiver No.	Monitoring Location	Quarrying Noise Criteria	Q1 2023		Q2 2023		Q3 2023		Q4 2023	
			$LAeq_{(15min)}$	Quarry Noise Contribution (LAeq(15min))	Compliance	Quarry Noise Contribution (LAeq(15min))	Compliance	Quarry Noise Contribution (LAeq(15min))	Compliance	Quarry Noise Contribution (LAeq(15min))	Compliance
Day	R2	N3/NM3	37	<37	✓	<37	✓	<30	✓	<29	✓
	R3/R4	N2/NM2	38	<38	✓	<38	✓	<33	✓	<35	✓
	R7	N1/NM1	37	<37	✓	<37	✓	<28	✓	<18	✓
	R10	N4/NM4	37	<37	✓	<37	✓	**44**	×	37	✓
	R15	NM5	37	<37	✓	<37	✓	<28	✓	<15	✓
Evening	R2	N3/NM3	35	Not operational	✓	Not operational	✓	Not operational	✓	Not operational	✓
	R3/R4	N2/NM2	35	Not operational	✓	Not operational	✓	Not operational	✓	Not operational	✓
	R7	N1/NM1	35	Not operational	✓	Not operational	✓	Not operational	✓	Not operational	✓
	R10	N4/NM4	35	Not operational	✓	Not operational	✓	Not operational	✓	Not operational	✓
	R15	NM5	35	Not operational	✓	Not operational	✓	Not operational	✓	Not operational	✓

During the 2023 monitoring period, the Quarry was generally inaudible at most locations, with other noise sources being birds, aircraft, insects, and vehicles

Long-term Trends:

The site has generally been compliant since 2017 when monitoring commenced. In the Q3 monitoring period (August), receiver location N4 recorded a quarry contribution of 44 LAeq (15min) dBA which is greater than the criteria of 37 LAeq (15min) dBA. During this period, noise sources from site where recorded as originating from the crusher, truck movements, and reverse squawkers. The noise exceedance at N4 was the only exceedance above criteria during the reporting period.

In previous years exceedances have occurred at receiver N4. These exceedances had been caused by changes in loading quantities, quarry plant operations and a significant decrease in size of quarry stockpiles functioning as a noise barrier between the site and receiver N4.

As Holcim did not notify the Department or EPA of the noise exceedance criteria, this is an additional non-compliance for the Noise Management Plan (Schedule 3, Condition 6) and Incident Reporting (Schedule 5, Condition 7) which states:

"The Applicant shall immediately notify the Secretary and any other relevant agencies of any incident. Within 7 days of the date of the incident, the Applicant shall provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested."

An incident is defined as a set of circumstances that:

- causes or threatens to cause material harm to the environment; and/or
- breaches or exceeds the limits or performance measures/criteria in this consent

Comparison to EIS Predictions:

At the time of reporting, noise monitoring is within the predicted limits of the EIS.

6.2.4 Management Measures

Noise impacts are managed in accordance with the specific management strategies, procedures, controls, and monitoring programs within the Teven Quarry Noise Management Plan (NMP). The site will ensure that stockpiles are kept at a level to reduce noise from operations.

Proposed Improvements

As per Condition 4 (b)of Schedule 5, Holcim have reviewed the results against the approved NMP, and have found that the failure to notify the department of the noise exceedance is an administrative non-compliance. Monitoring was undertaken as per the NMP; however, an exceedance was recorded as mentioned in **Section 6.2.3**.

Except for reporting, there are no proposed improvements relating to onsite noise management.

6.3 Air Quality

6.3.1 EIS Predictions

The 2014 EIS predicted that the change in air quality impacts due to the Project when compared to existing approved operations was predicted to be negligible, with the results for all scenarios predicted to be very similar.

The Project is predicted to comply with the relevant air quality criteria at all nearby sensitive receiver locations under worst case operating conditions, with the exception of 24-hour average PM_{10} concentrations at two nearby sensitive receiver locations - Receiver 9 and Receiver 6. This exceedance is due to the combined effect of Teven Quarry activities and maximum background levels. Receiver 9 has since been purchased by Holcim. If, on any day, the background levels were average rather than at maximum levels, then no property would be predicted to experience 24-hour average PM_{10} concentrations above the criteria.

6.3.2 Approved Criteria

Air Quality monitoring conducted at Teven Quarry is compared with the monitoring criteria stipulated in Schedule 3, Condition 11 of SSD 6422 and reproduced in **Table 14.**

Table 14: Air Quality Monitoring Criteria (SSD 6422)

Table 4: Air quality criteria

Pollutant	*Averaging Period*	*Criterion*	
Particulate matter < 10 µm (PM_{10})	Annual	[a,d] 30 µg/m^3	
Particulate matter < 10 µm (PM_{10})	24 hour	[b] 50 µg/m^3	
Total suspended particulates (TSP)	Annual	[a,d] 90 µg/m^3	
[c] Deposited dust	Annual	[b] 2 g/m^2/month	[a,d] 4 g/m^2/month

Notes tor Table 4:

a. *Cumulative impact (ie 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, with zero allowable exceedances of the criteria over the life of the development).*
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, or any other activity agreed to by the Secretary.*
e. *"Reasonable and feasible avoidance and mitigation measures" includes, but is not limited to, the operational requirements in conditions 12 and 13 to develop and implement a air quality management system that ensures operational responses to the risks of exceedance of the criteria.*

6.3.3 Key Environmental Performance

6.3.3.1 PM_{10} Monitoring

Condition 11, Schedule 3 (PM_{10})

In 2023 dust monitoring was undertaken using a High Volume Air Sampler (HVAS) to monitor particulate matter (PM_{10}). PM_{10} monitoring results for 2023 are provided in

Table 15. A conversion factor outlined in the Air Quality Management Plan was used to calculate from the actual monitoring result to derived TSP result.

Table 15: 2023 Dust Monitoring (PM_{10}) at Teven Quarry

Sample Date	HVAS PM10 (µg/m3)	TSP (µg/m3)	24-hour PM_{10} Criterion
	Actual Result	Calculated Result	
4/1/2023	18.1	51.7	Compliant
10/1/2023	9.2	26.3	Compliant
16/1/2023	6.9	19.7	Compliant
22/1/2023	0.2	0.6	Compliant
28/1/2023	12.5	35.7	Compliant
3/2/2023	17.1	48.9	Compliant
9/2/2023	11.4	32.6	Compliant
15/2/2023	14.5	41.4	Compliant
21/2/2023	4.9	14.0	Compliant
27/2/2023	**No Sample**	**No Sample**	Non-Compliant (Missed Sample due to equipment failure)
7/3/2023	11.9	34.0	Compliant
11/3/2023	4.2	12.0	Compliant
17/3/2023	23.2	66.3	Compliant
23/3/2023	10.9	31.1	Compliant
29/3/2023	14.4	41.4	Compliant
4/4/2023	23.2	66.3	Compliant
10/4/2023	18.9	54.0	Compliant
16/04/2023	8.1	23.1	Compliant
22/04/2023	9.4	26.9	Compliant
28/04/2023	8.2	23.4	Compliant
04/05/2023	20.8	59.4	Compliant
10/05/2023	5.4	15.4	Compliant
16/05/2023	5.2	14.9	Compliant
22/05/2023	16.3	46.6	Compliant
28/05/2023	12.6	36.0	Compliant
03/06/2023	10.8	30.9	Compliant

Sample Date	HVAS PM10 (µg/m3)	TSP (µg/m3)	24-hour PM_{10} Criterion
	Actual Result	Calculated Result	
09/06/2023	4.8	13.7	Compliant
09/06/2023	6.9	19.7	Compliant
15/06/2023	6.3	18.0	Compliant
21/06/2023	6	17.1	Compliant
27/06/2023	9.2	26.3	Compliant
03/07/2023	12	34.3	Compliant
09/07/2023	6.6	18.9	Compliant
15/07/2023	10	28.6	Compliant
21/07/2023	6.1	17.4	Compliant
27/07/2023	26.2	74.9	Compliant
02/08/2023	17.1	48.9	Compliant
08/08/2023	4	11.4	Compliant
14/08/2023	16.8	48.0	Compliant
20/08/2023	13.4	38.3	Compliant
26/08/2023	16.8	48.0	Compliant
01/09/2023	19.5	55.7	Compliant
07/09/2023	18.4	52.6	Compliant
13/09/2023	12	34.3	Compliant
19/09/2023	9.6	27.4	Compliant
25/09/2023	19.3	55.1	Compliant
01/10/2023	10.3	29.4	Compliant
07/10/2023	9	25.7	Compliant
13/10/2023	26.4	75.4	Compliant
19/10/2023	16.1	46.0	Compliant
25/10/2023	30.6	87.4	Compliant
31/10/2023	10.3	29.4	Compliant
6/11/2023	20.5	58.6	Compliant

Sample Date	HVAS PM10 (µg/m3)	TSP (µg/m3)	24-hour PM_{10} Criterion
	Actual Result	Calculated Result	
12/11/2023	11.8	33.7	Compliant
18/11/2023	19.5	55.7	Compliant
24/11/2023	35.5	101.4	Compliant
30/11/2023	20.9	59.7	Compliant
06/12/2023	6.6	18.9	Compliant
12/12/2023	**57.7**	164.9	Non-Compliant – 24 hour PM_{10} exceeded
18/12/2023	17.1	48.9	Compliant
24/12/2023	10.3	29.4	Compliant
30/12/2023	7.5	21.4	Compliant
Minimum	**0.2**	**0.6**	
Maximum	**57.7**	**164.9**	
Average	**13.9**	**39.8**	

Note – Non Compliances are highlighted in BOLD.

There were 62 sampling events for PM_{10} and TSP in 2023. During this sampling period, one sample in February was unable to be collected due to equipment failure. On December 12, HVAS 1 recorded a PM_{10} level of 57.7 µg/m³, which is above the 24-hour limit of 50 µg/m³.

Due to the missed sample in February, and the 24-hour exceedance in December, this is considered non-compliant under Schedule 3, Condition 11 of SSD 6422. As this missed sample in February, and the exceedance in criteria in December was not reported to the Department, this is also considered non-compliant for the Air Quality Management Plan (AQMP) Schedule 3, Condition 14.

The PM_{10} 2023 average was 13.9 µg/m^3 This is significantly below the annual criteria of 30 µg/m^3 and compliant with the Development Consent. This 2023 average is slightly higher than the 2022 average of 12.5 µg/m^3, but similar to the 2021 average of 13.9 µg/ m^3. The PM_{10} annual average for 2023 was significantly less than for 2019 and 2018, which were 32.4 µg/ m^3 and 28.6 µg/ m^3, respectively.

The annual average for derived TSP was 39.8 µg/ m^3 which is significantly below the annual criteria of 90 µg/ m^3 and meets conditions of the Development Consent.

While the annual averages for both PM_{10} and TSP meet the conditions of the Development Consent, Teven Quarry has recorded a low risk non-compliance in sampling frequency as a result of the missed sample, and 24-hour exceedance under Schedule 3, Condition 11 of SSD 6422. Given the compliant results obtained for the vast majority of the reporting period which were significantly below criteria, this is considered low risk. During the 2024 monitoring period, Teven will continue to monitor in accordance with the Development Consent.

6.3.3.2 Depositional Dust Monitoring

Condition 11, Schedule 3 (Dust Deposition)

Depositional dust continued to be monitored at three depositional dust gauges at Teven Quarry throughout 2023. Results for this monitoring are provided in **Table 16.**

Table 16: 2023 Dust Monitoring (Depositional Dust)

Sample Period	Insoluble Solids DDG1 (g/m^2/month)	Insoluble Solids DDG2 (g/m^2/month)	Insoluble Solids DDG3 (g/m^2/month)
January	2.2	1.3	0.2
February	0.9	1.1	0.3
March	0.8	1.1	0.3
April	0.6	1.4	0.9
May	0.5	3.0	0.3
June	0.4	0.4	0.1
July	0.3	1.2	0.1
August	0.7	0.4	0.9
September	1.4	0.8	2.8
October	0.2	1.0	0.3
November	3.6	2.7	1.5
December	2.3	1.3	0.3
Annual Average	1.15	1.3	0.67
Result	**Within Criteria**	**Within Criteria**	**Within Criteria**

The complete monitoring program was undertaken at Teven in this report period. DDG1, DDG2, and DDG 3 were within the annual average criteria of 4 g/m^2/month.

A comparison of depositional dust results from 2018 to 2023 is provided in **Table 17.** Contamination of the depositional dust gauges by insects, leaves, bird faeces, and other organic material and its impact on depositional dust monitoring has been noted from 2017 to 2022. No Contamination of samples occurred during 2023.

Table 17:Yearly Comparison of Depositional Dust Data (g/m^2/month)

Dust Depositional Gauge	Monitoring Summary for Annual Review Period	2018	2019	2020	2021	2022	2023
DDG1	Insoluble Solids Reporting Period Average	2.7	1.3	1.97	1.04	1.03	1.15
	Max. Insoluble Solids	5.0	3.9	5.2	4.8	1.0	3.6
	Min. Insoluble Solids	0.6	0.1	0.5	0.1	0.1	0.2
DDG2	Insoluble Solids Reporting Period Average	1.7	2.8	2.85	1.02	0.92	1.3
	Max. Insoluble Solids	2.1	5.5	2.9	3.7	1.4	3
	Min. Insoluble Solids	1.2	0.6	2.8	0.2	0.2	0.4
DDG3	Insoluble Solids Reporting Period Average	0.7	1.5	1.41	0.88	0.78	0.67
	Max. Insoluble Solids	1.6	3.8	0.1	2.5	1.6	2.8
	Min. Insoluble Solids	0.3	0.1	3.6	0.2	0.1	0 3

6.3.3.3 Long-term Trends:

Trends analysis for depositional dust results in 2023 has found that depositional dust levels generally remained consistent compared to previous years.

The 2023 annual average for PM_{10} remains below long-term criteria which is consistent with 2017, 2018, 2020 and 2021 results with the exception of the 2019 average which was above criteria. Deposition results from the reporting period also found no exceedances.

6.3.3.4 Comparison to EIS Predictions:

The Project is predicted to comply with the relevant air quality criteria at all nearby sensitive receiver locations under worst case operating conditions, with the exception of 24-hour average PM_{10} concentrations at two nearby sensitive receiver locations - Receiver 9 and Receiver 6. Predictions suggest that 24-hour average PM_{10} levels may exceed the criteria of 50µg/m^3 up to one day per year at these two receivers by between 1 and 7µg/m^3. PM_{10} samples were below the short-term criteria predication with no exceedances for all of 2023.

Key historical contributions to PM_{10} exceedances are bushfires and nearby agricultural activity such as cutting of cane and slashing. Previous laboratory analysis indicates outside dust sources are the major contributor to dust levels at DDG1 and DDG2.

6.3.4 Management Measures

Teven Quarry is committed to implementing reasonable and feasible avoidance and mitigation measures and to continue to investigate ways to minimise any air quality impacts from the quarry. Air quality management measures implemented at Teven Quarry are detailed in the *Air Quality Management Pla*n (AQMG) dated May 5 and approved by DPHI (then DPE) on May 25, 2022.

As per Condition 4(b) of Schedule 5, Holcim have reviewed the monitoring results and management requirements against the AQMP and have found that due to the missed sample, and 24-hour exceedance not being reported to the Department, Holcim is non-complaint for the implementation of the approved AQMP. Annual monitoring results are all within criteria.

6.3.5 Proposed Improvements

Holcim is committed to improving air quality management at Teven Quarry. There are no proposed improvement measures for 2024. Teven will continue to implement the site's AQMP.

6.4 Blasting

6.4.1 EIS Predictions

The 2014 EIS found that the Project could 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

Blasting was undertaken at Teven Quarry throughout 2023 in accordance with the conditions of the Development Consent and EPL No. 3293. The criteria for blasting at the site as per the EPL are detailed in **Table 18.**

Table 18: Blast Monitoring Criteria from EPL 3293 for Teven Quarry

Blasting	
L5.1	Blasting operations at the premises may only take place between 10:00 to 15:00 Monday to Friday. (Where a blast failure has occurred or there are compelling safety reasons, the EPA may permit a blast to occur outside the above hours. The licensee must provide prior written notice of any such blast to the EPA by contacting 131 555.)
L5.2	The airblast overpressure level from blasting operations in or on the premises must not exceed: a) 115 dB (Lin Peak) for more than 5% of the total number of blasts during each reporting period; and b) 120 dB (Lin Peak) at any time. At any point within 1 metre of any affected residential property or other sensitive noise location.
L5.3	The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed: a) 5 mm/s for more than 5% of the total number of blasts carried out on the premises during each reporting period; and b) 10 mm/s at any time. At any point within 1 metre of any affected residential property or other sensitive noise location.
L5.4	All sensitive receivers are to begiven at least 24 hours' notice when blasting is to be undertaken.
L5.5	To determine compliance with condition(s) L4.2 and L4.3: a) Airblast overpressure level and ground vibration peak particle velocity must be measured at the most affected residence or noise sensitive location that is not owned by the licensee or subject to a private agreement between the owner of the residence or noise sensitive location and the licensee as to an alternative airblast overpressure level and/or ground vibration peak particle velocity for all blasts carried out in or on the premises; and b) Instrumentation used to measure the airblast overpressure level and ground vibration peak particle velocity must meet the requirements of the current Australian Standard.
L5.6	The licensee must report any exceedance of the licence blasting limits to the EPA within 24 hours of the exceedance becoming known to the licensee or to one of the licensee's employees or agents.

In accordance with Schedule 3, Condition 1 of the Development Consent, blasting is to be undertaken between 10am and 3pm Monday to Friday, with no blasting to occur on Sundays or public holidays.

Blast monitoring results for 2023 are displayed in **Table 19.**

Table 19: 2023 Blast Monitoring Results

Location	Description	Upper Limit Criteria	Date									
			03/02/2023	07/03/2023	17/04/2023	01/06/2023	28/06/2023	01/08/2023	16/08/2023	15/09/203	16/10/2023	03/11/2023
Residence on Wellers Rd	Over Pressure - dB (Lin Peak)	120	104.3	107.5	107.1	110.5	110	111.4	107.1	104.3	105.7	104.3
	Ground Vibration - (mm/s)	10	0.79	2.2	1.68	2.08	1.32	5	0.33	0.65	0.78	1.99
Site Entrance, Stokers Lane	Over Pressure - dB (Lin Peak)	120	104.7	106	111.2	110.2	110.5	**116.5**	102.6	110.8	107.5	104.2
	Ground Vibration - (mm/s)	10	0.69	0.99	1.52	0.58	0.96	0.48	1.79	0.47	0.4	0.32

Long-term Trends:

From 2015 – 2023 the blasting levels have generally been within the Development Consent and EPL criteria. Long term blast results are provided in **Table 20.** These show long-term consistency for overpressure results. There has been a notable increase in the vibration results for 2021 and 2022 compared to previous years.

Table 20: Teven Quarry Long-term Blasting Trends

Year	Number of Blasts	No. of blasts below vibration or overpressure trigger level	Max. Overpressure (dBL)	Average Overpressure (dBL)	Max Vibration (mm/s)	Average Vibration (mm/s)
2015	14	10	113.1	109.3	0.66	0.44
2016	12	7	112.1	109.6	0.45	0.37
2017	15	8	114.0	106.9	0.5	0.33
2018	12	11	114.1	112.4	0.05	0.05
2019	11	11	NT	NT	NT	NT
2020	12	7	109.3	106.2	1.9	0.9
2021	10	0	**117.50**	108.28	4.99	2.07
2022	10	10	114.7	107.76	3.07	1.58
2023	10	9	**116.5**	107.82	2.08	1.30

NT –Not Triggered

6.4.3 Comparison to EIS Predictions:

During the 2023 reporting period, Teven Quarry recorded one (1) blast above the 115 dBL limit, recording 116.5 dBL on 1 August 2023. An investigation was conducted by Grande, who concluded that the cause was due to shot design.

Condition 7 of Schedule 3, and Condition L5.2 (a) states

"115 dB (Lin Peak) for more than 5% of the total number of blasts during each reporting period"

As there was a total of 10 blasts recorded, and 1 blast exceeding the 115dBL limit, this equals 10% of the total number of blasts above 115dBL, resulting in a non-compliance for this condition.

6.4.3 Management Measures

Blast emission related impacts (vibration and air blast) are managed in accordance with the specific measures within the Teven Quarry Blast Management Plan (2021).

As per Condition 4(b) of Schedule 5, Holcim have reviewed the monitoring results and management requirements against the approved BMP and have found that the blast exceedance is above the allowed 5% 115dBL. This is a low-level non-compliance.

6.4.4 Proposed Improvements

Given the generally long term performance within criteria, no further improvements to blast management are proposed for 2024.

6.5 Traffic Management

6.5.1 EIS Predictions

The 2014 EIS assessment of traffic impacts associated with the Project found that impacts on the road network and principle intersections would be satisfactory and there was no requirement to upgrade the roads or intersections surrounding the site once minor improvements to Route 1 were undertaken.

A review of road safety conducted as part of the EIS recommended prioritising the use of Route 1 for product transport and recommended a number of minor improvements to Route 1 to improve the safety for night time haulage, including centre line marking, reflectors, and maintenance of existing guard rails at locations along Route 1. Holcim has implemented these recommendations.

6.5.2 Approved Criteria

According to Development Consent SSD 6422 the site is required to monitor transport in accordance with the following requirements:

Schedule 2, Condition 9: *The Applicant will not dispatch more than 73 laden trucks from the site per day, averaged over the total number of dispatch days in any calendar month.*

Schedule 3, Condition 23: *The Applicant shall keep accurate records of all laden truck movements to and from the site (hourly, daily, weekly, monthly, and annually) and publish a summary of records on its website every 6 months.*

6.5.3 Key Environmental Performance

Teven Quarry undertook monitoring of truck movements on a daily basis throughout 2023 to ensure compliance with movements and volume requirements discussed above. A copy of these monitoring results has been included in **Table 21.**

Table 21: Average Truck Movements for 2023

Month	Total Truck Movements	Active days	Average Truck Movement per active day
January	700	16	44
February	1370	20	68
March	1223	23	53
April	846	17	50
May	1641	24	68
June	1318	21	62
July	1129	22	51
August	1101	23	48
September	1334	21	63
October	1143	21	54
November	1061	22	48
December	833	15	29
Total	**13966**	**259**	**53**

Long term Trends:

Review of truck transport data for Teven Quarry since 2015 indicates average daily truck movements have not exceeded the maximum of 73 laden trucks from the site per day, averaged over the total number of dispatch days in any calendar month.

The annual average for laden truck movements per active day in 2023 was 53, which has been consistent to previous reporting periods. Since the 2021 reporting period the annual average has been between 53-56 laden trucks.

This is consistent with the EIS predictions.

6.5.4 Management Measures

Traffic and transport impacts are managed in accordance with the specific management strategies, procedures, controls, and monitoring programs within the *Teven Quarry Transport Management Plan* (TMP), which was approved by DPE on 20/05/2021. As per Condition 4(b) of Schedule 5, Holcim have reviewed the transport data against the TMP, and have found it meets the approved requirements.

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

The 2014 EIS found the Project is unlikely to result in a significant change to the existing noise, dust and water runoff impacts of Teven Quarry, therefore it is considered that any indirect impacts to ecology that occur will be minor and will be consistent with the existing approved impacts. The results of the impact assessments under the Environmental Planning and Assessment Act (EP&A Act) and the Environment Protection and Biodiversity Conservation Act (EPBC Act) conclude that the indirect impacts of the Project are unlikely to have a significant impact on any threatened flora or fauna species, migratory fauna species, endangered population or threatened ecological communities listed under the Threatened Species Conservation Act (TSC Act) and/or the EPBC Act.

6.6.2 Approved Criteria

There are no specific criteria associated with biodiversity management for the site.

6.6.3 Key Environmental Performance

Teven Quarry conducted targeted primary and secondary weed control and hand spraying of areas where cut and paints works have been undertaken in 2023. No additional clearing occurred in the report period. This has had a limited impact on biodiversity.

In December 2023, Holcim engaged Arbor Ecological to undertake the annual rehabilitation monitoring across site. The findings of this report are:

- Weed control remains the priority to promote natural regeneration of plant communities.
- Rehabilitation zones are separated from the approved extraction area and remain unaffected by direct or indirect environmental impacts associated with extraction activities.
- Rainforest and Brushbox communities where rehabilitation works continue to be conducted are mostly in moderate condition and on-track to achieve rehabilitation provided rehabilitation works continue.
- Small (<6cm) and medium (6cm to 12cm) sized hollow openings observed in mature Brushbox and Camphor Laurel. No substantial hollows observed in the rainforest community.
- Dense exotic grassland adjoining forest vegetation offers good habitat for a range of birdlife, frogs, and Swamp Wallaby
- Qualified and experienced bush regenerators continued to undertake weed control throughout the year using industry best practice methods for weed control and chemical handling

No feral animal management occurred in the report period.

6.6.4 Management Measures

Teven Quarry implemented biodiversity management measures from its updated Biodiversity and Rehabilitation Management Plan (2021). The main procedures include:

- Weed management;
- Habitat reinstatement;
- Pre-clearance permit process; and
- Bushfire management.

6.6.5 Proposed Improvements

Weed spraying will continue at site during the next Annual Review period.

There are no additional proposed improvements for the next reporting period.

6.7 Heritage (Aboriginal Archaeology and Historic Heritage)

6.7.1 EIS Predictions

6.7.1.1 Aboriginal Archaeology

No known Aboriginal cultural heritage sites occur within or in close proximity to the Teven Quarry Project Area. Given the terrain and history of extensive clearing, grazing, and quarrying, the area is considered to have low archaeological potential.

No known items or places of Aboriginal heritage significance are located in or within 50 metres of the Project Area. As such, the potential for impacts on items of Aboriginal cultural heritage is limited to indirect impacts such as from blasting or runoff.

6.7.1.2 Historic Heritage

No known items of historic heritage significance occur within the Teven Quarry Project Area.

No historic heritage sites were found to be located within or in close proximity to the Project Area. The closest heritage item was located approximately three kilometres to the south east in Alstonville, a sufficient distance to not experience or be impacted by indirect impacts associated with the Project.

6.7.2 Approved Criteria

There are no specific criteria associated with heritage relating to the quarry.

6.7.3 Key Environmental Performance

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

6.7.4 Management Measures

As stated in Schedule 3, Condition 26, If during the course of operations, Holcim becomes aware of any previously unknown Aboriginal archaeological material, all works likely to affect the material or site will cease immediately and Office of Environment and Heritage (OEH), relevant Aboriginal stakeholders and a suitably qualified archaeologist will be consulted to determine an appropriate course of action prior to the recommencement of work at the site.

6.7.5 Proposed Improvements

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

7 WATER MANAGEMENT

7.1 EIS Predictions

7.1.1 Surface Water

The 2014 EIS stated the Project will not result in any changes to the quarry water management system or associated water management measures. The only potential changes that could result in surface water impacts as a result of the Project are associated with the change in water demands e.g. requirement to use more water for dust suppression or processing.

7.1.2 Groundwater

The results of the hydrogeological assessment conducted during preparation of the 2014 EIS indicate that the local and regional groundwater table is located below the current and proposed elevation of the Teven Quarry pit floor. The quarry has been extracted to its maximum depth of 4mAHD without any evidence of groundwater inflows. For this reason, the assessment concludes that the Project will have a negligible impact on groundwater levels, groundwater quality, groundwater receptors, groundwater dependent ecosystems and groundwater users in the local area.

7.2 Approved Criteria

Holcim are required to monitor water quality from discharge events at the Teven Quarry licenced discharge points, in accordance with the requirements of EPL 3293 (provided in **Table 22** and **Table 23).**

Table 22: Water Monitoring Criteria (Teven Quarry EPL 3293) – LDP001

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

Table 23: Discharge Sampling Measurement Requirements (Teven Quarry EPL 3293)

POINT 1

Pollutant	Units of measure	Frequency	Sampling Method
Oil and Grease	milligrams per litre	Special Frequency 1	Visual Inspection
pH	pH	Special Frequency 1	No method specified
Total suspended solids	milligrams per litre	Special Frequency 1	Grab sample

Special Frequency 1 means sampling any discharge, whether controlled or otherwise, which has not occurred from rainfall exceeding 82.5mm over any consecutive 5 day period.

In addition to these surface water requirements, the site has been requested by the NSW DPHI to undertake an assessment of groundwater (should the requirement be triggered) based on the condition below:

Schedule 3 Condition 19

In the event that groundwater in excess of negligible quantities is intersected during extraction activities, the Applicant shall undertake a hydrogeological investigation, in consultation with NOW, to the satisfaction of the Secretary.

The investigation must report on groundwater sources, levels, yield, and quality; identify any risks to groundwater users or groundwater dependent ecosystems and propose recommended management measures. The Applicant must implement reasonable and feasible management measures to the satisfaction of the Secretary.

Teven Quarry is currently operating above the groundwater table. No groundwater seepage into the quarry void has been recorded. The quarry will continue to visually monitor the void for groundwater seepage and a detailed assessment will be undertaken in accordance with Schedule 19 Condition 3 of the Development Consent should groundwater in excess of negligible quantities be intercepted. During the reporting period this was not required.

7.3 Water Usage and Storage

Clean upstream catchment runoff is diverted away from the quarry and conveyed to the cane field drains which flow to Maguire's Creek and Emigrant Creek. Runoff from disturbed areas within the quarry operations are managed within the water management system, with this outlined in the Water Management Plan.

The Teven Quarry water management system has two dams/storages, the Main Dam, and the Pit Dam. Runoff within the quarry pit is managed in the primary siltation storage (Pit Dam), from which surplus water is pumped to the main silt retention storage (Main Dam) at the northern end of the quarry. The quarry water management system is designed to maximise sedimentation of pit runoff on site, prior to reuse on site or discharge via the licensed discharge point.

7.4 Surface Water Results

Table 24 summarises the water quality results during discharge events at LDP001. During the reporting period, LDP001 discharged seven times, twice in February, and five times in April. A copy of the full data is included in **Appendix 2.**

Table 24: Summary of Water Quality Data at Teven Quarry – 2023

Location/ Frequency	Lower Limit	Upper Limit	Unit	Description	2023 Minimum	2023 Maximum	2023 Average	2022 Average	2021 Average
LDP001 Wet Weather Discharge - Special Frequency 1	6.5	8.5	pH	pH	6.57	7.91	7.62	7.5	7.6
	N/A	50	mg/L	Suspended Solids	<1	49	32	3.4	1.4
	N/A	10	mg/L	Total Oil & Grease	0.0	0.0	0.0	0.0	0

There were no exceedances in pH and suspended solids criteria. Monitoring data at LDP001 in 2023 met the EPL criteria. This is consistent with EIS predictions.

No other discharges were recorded on site during the 2023 reporting period.

7.5 Groundwater Results

Groundwater monitoring was not undertaken during the 2023 reporting period, as there is no consent requirement. As per Schedule 3 Condition 19 of the Development Consent, in the event that groundwater in excess of negligible quantities is intersected during extraction activities, Holcim will undertake a hydrogeological investigation, in consultation with Department of Industry Water, to the satisfaction of the Secretary.

There are no groundwater trends or comparison to EIS predictions.

7.6 Water Take

There has been no groundwater take during the Annual Review period.

7.7 Water Management – Pollution Reduction Program

A Pollution Reduction Program (PRP) was prepared by EMM Consulting, dated 31 January 2019, in order to improve sediment basin management and stormwater management at Teven Quarry.

7.7.1 Basis for PRP

On 7 June 2018, the EPA undertook an inspection of Teven Quarry and observed turbid water in the drainage line between the Main Dam and the current licensed discharge point (LDP 1). The EPA noted concern that water was being discharged from the Site when less than the five-day rainfall event has occurred and that, based on the presence of turbid water, there may be disturbed areas of the Site not draining to a sediment basin.

The EPA also noted concern that:

- Site personnel present at the time of inspection were not aware of the requirement to monitor discharges in accordance with EPL conditions; and
- The Teven Quarry *Water Management Plan* did not adequately reflect EPL conditions in relation to the correct monitoring location of the LDP, and that sampling was being undertaken in the cane drain adjacent to and downstream of the Site which does not accurately reflect the quality of water leaving the Site.

Subsequently the EPA varied EPL 3293 through addition of a PRP as Clause U1, which is reproduced below:

U1 Report – Review the current sediment basin management and stormwater management.

U1.1 The licensee is to review the current sediment basin management and stormwater management of the premise to ensure that:

1. *All disturbed areas on the quarry including run-off from access roads flows to a settlement basin.*

2. *The quarry has capacity to capture the five-day rain event.*

3. *Monitoring occurs for all discharge less than the five-day rain event of 82.5mm.*

A report is to be submitted to the EPA by the 3 September 2018 detailing the review the current sediment basin management and stormwater management.

7.7.2 Improvements Completed

The following recommendations outlined in the PRP were completed in recent years:

- All Management Plans were updated in accordance with collaboration with DPE and EPA by the 2020 report period.
- Review/audit of all existing bunding of various forms/construction around Catchment C5 should be undertaken to confirm that containment measures are continuous and effective at preventing offsite discharge. If necessary, improvement or enhancement of existing controls should then be undertaken.
- It is noted that bunding is considered to form an effective sediment control for this area, and with no prior evidence or history of uncontrolled discharge from the Site, a formal sediment basin is not considered necessary to manage the risk of discharge in this location.
- Several improvements to water monitoring procedures and record keeping are recommended for capture in an updated version of the WMP (refer Section 7), including:

On 14 April 2021 Holcim received a Notice of Variation of EPL3293 from EPA. This letter acknowledged the EPA's receival of the EMM 2019 report titled, Holcim Teven Quarry – Review of Current Sediment Basin Management and Stormwater Management" which was submitted in response to the PRP.

The April 2021 Notice of Variation removed PRP U1.1 from EPL 3293.

In this Annual Review period, Holcim continued its revision of the Water Management Plan to improve water management measures at Teven Quarry. The Water Management Plan was revised and approved in 2022.

7.7.3 Proposed Improvements

Holcim will continue to implement the Water Management Plan.

8 REHABILITATION AND LANDSCAPE MANAGEMENT

8.1 Rehabilitation Performance during the Reporting Period

The site is required to undertake biodiversity and rehabilitation in accordance with the requirements in **Table 25.**

Table 25: Biodiversity and Rehabilitation Requirements for Teven Quarry (SSD 6422)

27. The Applicant shall rehabilitate the site to the satisfaction of the Secretary. This rehabilitation must be generally consistent with the rehabilitation strategy in the EIS and the conceptual final landform in Appendix 2, and must comply with the objectives in Table 5.

Table 5: Biodiversity and Rehabilitation objectives

Feature	***Objective***
Site (as a whole)	• Safe, stable and non-polluting • Final landform integrated with surrounding natural landforms as far as is reasonable and feasible, and designed to minimise the visual impacts of the development when viewed from surrounding land • Restored with native, endemic vegetation
Surface Infrastructure	• Decommissioned and removed, unless the Secretary agrees otherwise
Quarry Benches	• Landscaped and vegetated using native tree and understorey species
Quarry Pit Floor	• Landscaped and revegetated using native tree and understorey species, above the final anticipated void water level

Progressive Rehabilitation

28. The Applicant shall rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable and feasible measures must be taken to minimise the total area exposed for dust generation at any time. Interim stabilisation measures must be implemented where reasonable and feasible to control dust emissions in disturbed areas that are not active and which are not ready for final rehabilitation.

Note: It is accepted that parts of the site that are progressively rehabilitated may be subject to further disturbance in future.

8.2 Summary of Current Rehabilitation and Performance

No rehabilitation was completed in 2023 at the site as there was no opportunity for progressive rehabilitation due to ongoing operations.

A summary of the rehabilitation and disturbance status of Teven Quarry is outlined in **Table 26.**

Table 26: Rehabilitation and Disturbance Status

Quarry Area Type	2019 Annual Review Period (ha)	2020 Annual Review Period (ha)	2021 Annual Review Period (ha)	2022 Annual Review Period (ha)	2023 Annual Review Period (ha)	Next 2024 Annual Review Period (ha)
	Actual					Forecast
A. Total Quarry Footprint[1]	17.1	17.1	17.1	17.1	17.1	17.1
B. Total Active Disturbance[2]	17.1	17.1	17.1	17.1	17.1	17.1
C. Land Being Prepared for Rehabilitation[3]	0	0	0	0	0	0
D. Land Under Active Rehabilitation[4]	0	0	0	0	0	0
E. Completed Rehabilitation[5]	0	0	0	0	0	0

1 Total disturbance and rehabilitation.
2 Total disturbance within the Project Approval boundary
3 Rehabilitation that is being shaped in a phase of decommissioning, landform establishment and growth medium development.
4 Rehabilitation under a phase of ecosystem and land use establishment or ecosystem and land use sustainability
5 This refers to rehabilitation that has been signed off from the DRG.

At the end of 2023 there was approximately 17.1 Ha of active disturbance. This area remains consistent upon previous years given that the open pit is active and does not yet present an opportunity for progressive rehabilitation to occur. There was no active rehabilitation at Teven Quarry during the 2023 reporting period.

In September 2023, DPHI (then DPE) approved the Teven Quarry Rehabilitation Bond Review. Holcim undertakes annual rehabilitation monitoring of the Quarry, as detailed in **Section 6.6.**

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 27.**

Table 27: Rehabilitation and Closure Actions for the 2024 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.	Progressive rehabilitation will be performed once areas become available for rehabilitation. No areas are anticipated to become available during 2024.
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.	Holcim will assess opportunities to perform progressive rehabilitation.

9 Summary of Environmental Performance

A summary of the performance of environmental management measures and sampling results for 2023 are detailed in **Table 26**

Table 28: Environmental Performance at Teven Quarry in 2023

Aspect	Approval Criteria / EIS Prediction	Performance during 2023 reporting period	Trend / key management implications	Implemented / proposed management actions
Meteorological	Development Consent.	Within criteria. Continuous meteorological data collected from BOM station.	Meteorological data collected at the site. Inspections done on the site station for maintenance.	None required.
Noise	EIS predictions are all below Development Consent criteria.	Exceedance recorded at receiver R10(N4). Remainder within criteria.	Noise monitoring results consistently met criteria.	None required.
Blasting	EIS predictions are all below Development Consent criteria.	Teven recorded a total of 10 blasts during the reporting period, with one blast recording 116.5dBL. As this is greater than the allowed 5% above 115 dBL, this is non-complaint.	2023 averages were mostly consistent with long-term trends. 1 Blast recorded at 116.5dBL	None-required.
Air Quality	EIS predictions are all below Development Consent criteria.	Due to one missed sample, and one sample recorded above the 24-hour criteria of 50µg/L, Teven Quarry has called themselves non - compliant relating Schedule 3, Condition 11 of SSD 6422. All other air quality results were compliant.	PM_{10} is consistent with long term data. Depositional dust monitoring continued in 2023.	Teven will continue to undertake management measures in line with the Air Quality Management
Traffic Management	EIS predictions are all below Development Consent criteria.	Within criteria.	Consistently meets criteria.	None required.
Biodiversity	No proposed impacts. No Development Consent criteria.	As per criteria. No biodiversity issues identified. Holcim to continue to carry out weed and feral animal management as necessary.	No long-term negative trends.	None required. Teven will continue to implement the Biodiversity and Rehabilitation Management Plan.
Heritage	No proposed impacts. No Development Consent criteria.	As per criteria. No Heritage impacts were identified during the reporting period.	No issues have been identified in recent years.	None required.
Water Management	EIS predictions are all below Development consent criteria.	No discharges in 2023 triggered surface water monitoring.	Consistently meets criteria.	None required.

Aspect	Approval Criteria / EIS Prediction	Performance during 2023 reporting period	Trend / key management implications	Implemented / proposed management actions
Rehabilitation and Landscape Management	No proposed impacts. No Development Consent criteria.	As per criteria. Site is still operational, with progressive rehabilitation to occur once practicable. No issues identified.	No long-term negative trends.	None required.

10 WASTE MANAGEMENT

10.1 Waste Streams

Waste streams produced at Teven Quarry are categorised as:

- Waste oil, filters, grease cartridges;
- Scrap metal;
- Tyres;
- Office paper and general rubbish;
- Silt (from aggregate washing); and
- Waste water from amenities and office.

10.2 Waste Management

All waste generated by Teven Quarry is managed by way of Council collection services, via licensed waste contractors or onsite treatment. No on-site disposal of general waste occurs. Teven Quarry is committed to reducing, reusing, and recycling wastes prior to disposal.

Key components of waste management are:

- All waste oil is collected and stored in containers within a covered and bunded area and is removed from the site by an appropriately licensed contractor as required;
- All oil filters are separately stored and returned to the manufacturer for reuse by appropriately licensed contractor;
- Scrap metal is deposited into a dedicated skip bin for periodic collection and recycling (approximately every three months) by an appropriately licenced contractor;
- Diesel fuel is stored within a self-bunded, above-ground tank and all refuelling is undertaken on a hardstand area which drains to an oil/water separator (refer waste oil disposal);
- Silt is captured in on-site silt control structures and is periodically removed and placed/stored in the product stockpile area or overburden materials for use;
- All waste tyres are removed by the supplier of replacement tyres;
- All paper/cardboard (1 x $3m^3$ bin) and general waste (2 x $3m^3$ bin) originating from the office and amenities buildings, as well as packaging from routine equipment is placed in the appropriate skips for collection by Council or a licensed contractor for disposal/ recycling at an appropriate waste management facility every month; and
- Wastewater from amenities is treated and disposed of via an on-site septic tank with absorption trenches/pump out

Holcim will advise the Department once approval to operate the on-site waste water amenities is received from Council.

11 COMMUNITY

11.1 Community Engagement Activities

Holcim has maintained community engagement measures during the reporting period by undertaking the following activities:

- Maintenance of a website containing publicly available documents as required by approvals;
- 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.

11.2 Complaints

A copy of the complaints register, as well as all publicly listed information including contacts for locals in the community is publicly available on the Teven Quarry webpage in accordance with the Development Consent requirements (https://www.holcim.com.au/about-us/community-link/teven-quarry-teven-ballina-nsw).

There was no community complaints received during the 2023 reporting period.

One community complaint was received in August 2022 in regard to blasting, however following investigation this was closed out as the blast was within criteria, with a result of 112.6 dBL

There were no complaints in 2017, three complaints in 2018, one complaint in 2019, three complaints in 2020 and three complaints in 2021.

12 INDEPENDENT AUDIT

The site undertook an Independent Environmental Audit (IEA) in August 2022 in accordance with the requirements of Schedule 5, Condition 9 of the Development Consent. Action Plan is presented in **Appendix 3**. Teven continues to work the actions outlined in this plan. The next IEA is due in August 2025.

13 INCIDENTS AND NON-COMPLIANCES

Table 29: Summary of Incidents and Non-Compliances

Condition	Incident or Non-Compliance	Action
Schedule 3 Condition 5 Condition L4.2	Teven recorded a Quarry noise contribution of 44dBA (LAeq) at receiver R10 during the Q3 reporting period. This is above the approval criteria of 37 dBA(LAeq).	Teven will continue to implement noise mitigation methods outside in the *Noise Management Plan.*
Schedule 3 Condition 6	Teven did not notify the Secretary of EPA of noise monitoring results outside of approved criteria as per the approved Noise Management Plan.	Should future exceedances be recorded above criteria levels, Teven will notify the Secretary and EPA once aware.
Schedule 3 Condition 7 Condition L5.2	Teven to not exceed 115 dB (Lin Peak) for more than 5% of the total number of blasts during each reporting period. Teven recorded a total of 10 blasts during the reporting period, with one blast recording 116.5dBL.	Teven will continue to implement the approved *Blast Management Plan*
Schedule 3 Condition 11	On 27/02/2023 a sample was missed due to equipment failure On 12/12/2023 a 24-hour PM_{10} sample of 57.7 was recorded. This exceeds the criteria of 50µg/m3.	Teven Quarry is committed to implementing reasonable mitigation measures and to continue to investigate ways to minimise any air quality impacts from the quarry.
Schedule 3 Condition 14	Air Quality Management Plan – reporting of air quality monitoring that are outside of criteria or missed.	Should future exceedances be recorded above criteria levels, Teven will notify the Secretary and EPA once aware.
Schedule 5 Condition 7	Teven Quarry failed to notify the Secretary of Noise and Air exceedances during the 2023 reporting period.	Once aware of any exceedance above criteria limits, Teven will notify the Secretary.

14 ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

Holcim staff will undertake the following works and improvement measures and projects at Teven Quarry in 2024 to ensure compliance with the Development Consent and EPL 3293, and to ensure that effective environmental management controls are in place and operating in accordance with the requirements of the Development Consent. **Table 30** outlines proposed actions for 2024.

Table 30: Improvement Actions for 2024

Improvement Measure	Activities
PM_{10}	Maintain a HVAS monitoring program which meets Development Consent requirements.
Biodiversity	Weed spraying will continue at site during the next Annual Review period.
Rehabilitation	Tubestock planting in the Brushbox forest directly to the east of the quarry is to continue in 2024.
Water sampling	Complete water sampling for the parameters pH, Total Suspended Solids, and Oil and grease.
Groundwater Assessment	Condition 3, Schedule 19 *In the event that groundwater in excess of negligible quantities is intersected during extraction activities, the Applicant shall undertake a hydrogeological investigation, in consultation with NOW, to the satisfaction of the Secretary.* *The investigation must report on groundwater sources, levels, yield, and quality; identify any risks to groundwater users or groundwater dependent ecosystems and propose recommended management measures. The Applicant must implement reasonable and feasible management measures to the satisfaction of the Secretary.* Holcim will continue to monitor the quarry void for groundwater seepage to ensure that groundwater quantities remain negligible.

APPENDIX 1:QUARTERLY NOISE RESULTS

Intended for
Holcim (Australia) Pty Ltd

Document type
Report

Date
April 2023

Project number
318000911

QUARTERLY NOISE MONITORING ASSESSMENT – QUARTER 1 2023

TEVEN QUARRY, TEVEN, NSW

RAMBOLL Bright ideas. Sustainable change.

QUARTERLY NOISE MONITORING ASSESSMENT – QUARTER 1 2023
TEVEN QUARRY, TEVEN, NSW

Project name	**Quarterly Noise Monitoring Assessment for Teven Quarry – Quarter 1 2023**
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Checked by	**Greer Laing**
Approved by	**Greer Laing**
Description	**Data collected on 10 and 11 January 2023 for Teven Quarry during Quarter 1 2023 in Teven, NSW, as part of the noise monitoring program**

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CONTENTS

Tables

ABBREVIATIONS AND DEFINITIONS

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

Source: Noise Guide for Local Government (NSW EPA, 2013)

1. OVERVIEW

1.1 Project Driver

Ramboll Australia Pty Ltd (Ramboll) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for Teven Quarry ("the quarry") at Teven, NSW.

This NMA was done in accordance with the following documents:

- Noise Policy for Industry (NPI) (NSW EPA, 2017).
- Teven Quarry Noise Management Plan (NMP) (Holcim Australia, 2021).
- Environment Protection Licence (EPL) number 3293 (NSW EPA, 2021).
- Development Consent Application Number SSD_6422 (Minister for Planning and Environment, 2015).
- Australian Standard AS 1055:2018 Acoustics—Description and measurement of environmental noise (Standards Australia, 2018).
- IEC 60942 Ed. 3.0 b:2003 Electroacoustics - Sound calibrators (Standards Australia, 2003).

This NMA has been undertaken in accordance with the NMP for the quarterly period January to March 2023 and forms part of the monitoring program to determine compliance with conditions of the Development Consent.

1.2 Site Location and Sensitive Receptors

The quarry is in Teven, NSW, approximately 7 km west of Ballina, NSW. Sensitive receptors surrounding the quarry are primarily rural and residential properties in coastal bushland with elevated and undulating topography. Five monitoring locations have been selected as part of the NMA and in accordance with the EPL and Development Consent and are shown in **Table 1-1**.

Table 1-1: Monitoring locations locality and sensitive receptors

Monitoring Locations	Nearest Receiver	Locality and Sensitive Receptors
NM1	R7	West of the quarry situated at a rural residential property at the end of Leadbeatters Lane
NM2	R3/R4	East of the quarry situated at a rural residential property on Teven Road
NM3	R2	South of the quarry situated at a rural residential property at the end of Wellers Road
NM4	R10	North of the quarry situated at a rural residential property adjacent the site off Stokers Lane
NM5	R14	Northeast of the quarry situated at a rural residential property of Teven Road

The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan shown in **Figure 1**.

Legend

- Noise monitoring location

Figure 1 : Noise monitoring locations at Teven Quarry

2. NOISE CRITERIA

Table 2-1 summaries the applicable noise criteria outlined in the NMP and Development Consent for residential receivers (NM1, NM2, NM3, NM4, NM5) surrounding the quarry.

Table 2-1: Monitoring locations and noise criteria

Receivers	Monitoring Locations	Day[1]	Evening[2]
		LAeq (15min)	LAeq (15min)
		Db(A)	
R3, R4, R13, R15, R16, R17, R18, R20	NM2	38	35
All other receivers	NM1, NM3, NM4, NM5	37	35

[1] 7 am–6 pm Monday to Saturday and 8 am–6 pm Sunday and public holidays

[2] 6 pm–10 pm Monday to Sunday

3. METHODOLOGY

The monitoring program was created in accordance with the procedures described in *Australian Standard AS 1055:2018* and the Approval Documents referenced in Section 1. The measurements were completed using a RION Sound Level Meter NL-52 on Tuesday 10 January 2023 and Wednesday 11 January 2023. The acoustic instrumentation used carries current NATA calibration and complies with *AS/NZS IEC 61672-1:2013/2002 class 1*. Calibration of all instrumentation was checked prior to and following measurements using a Pulsar Acoustic Calibrator 105 which also carried a current NATA calibration and complies with IEC 60942:2003. Drift in calibration did not exceed ±0.3 dBA.

Attended noise monitoring was conducted for 15-minute periods at each location over two days. As per the NMP, two sets of measurements were completed during the day, and two sets of measurements were completed during the evening, at each monitoring location. It is noted that the quarry was not operational during the evening periods, however, monitoring was conducted as per requirements of the EPL.

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

4. RESULTS AND DISCUSSION

4.1 Location NM1

Noise monitoring at location NM1 was completed on Tuesday 10 January 2023 and Wednesday 11 January 2023. The quarry was not audible during any monitored period during the day and evening. These results indicate that noise emissions from Teven Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring event at Location NM1 are presented in Table 4-1. Noise sources included wind, cars, birds and insects.

Table 4-1: Noise survey results and observations for Location NM1

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Teven Quarry Contribution (LA1sec) (dBA)	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90				
11-01-23	9:56 (Day)	70.2	51.3	42.2	WD: 315° WS: 1.2 m/s Rain: Nil	Wind 43-49 Insects 41-55 Birds 48-60 Car 54 Quarry inaudible	Inaudible	37
11-01-23	10:12 (Day)	71.5	54.0	49.5	WD: 315° WS: 2.1 m/s Rain: Nil	Wind 41-54 Insects 47-59 Birds 52-66 Quarry inaudible	Inaudible	37
10-01-23	19:00 (Evening)	61.7	51.4	43.5	WD: 270° WS: 1.4 m/s Rain: Nil	Wind 44-61 Birds 46-51 Insects 46-49 Quarry inaudible	Inaudible	35
10-01-23	19:16 (Evening)	70.1	48.2	42.1	WD: 270° WS: 1.7 m/s Rain: Nil	Wind 43-52 Insects 44-47 Car 45-51 Quarry inaudible	Inaudible	35

4.2 Location NM2

Noise monitoring at location NM2 was completed on Tuesday 10 January 2023 and Wednesday 11 January 2023. The quarry was not audible during any monitored period during the day and evening periods. These results indicate that noise emissions from Teven Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location NM2 are presented in Table 4-2. Noise sources measured included birds, machinery, insects, fish jumping and cars and trucks passing on Teven Road.

Table 4-2: Noise survey results and observations for Location NM2

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Teven Quarry Contribution (LA1sec) (dBA)	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90				
11-01-23	12:07 (Day)	83.6	61.4	44.7	WD: 315° WS: 1.1 m/s Rain: Nil	Cars passing 57-78 Birds 53 Wind 48-54 Machinery 50-52 Holcim truck 82 Quarry inaudible	Inaudible	38
11-01-23	12:24 (Day)	83.4	60.8	41.1	WD: 315° WS: 1.1 m/s Rain: Nil	Cars/trucks 61-84 Wind 40-46 Birds 43-58 Quarry inaudible	Inaudible	38
10-01-23	20:53 (Evening)	81.4	51.8	42.1	WD: 270° WS: 1.8 m/s Rain: Nil	Vehicle 47-77 Wind 40-46 Fish in creek 42-44 Insects 42-46 Quarry inaudible	Inaudible	35
10-01-23	21:09 (Evening)	81.5	53	41.8	WD: 0° WS: 1.7 m/s Rain: Nil	Wind 43-48 Insects 42-44 Car 52-80 Quarry inaudible	Inaudible	35

4.3 Location NM3

Noise monitoring at location NM3 was completed on Tuesday 10 January 2023 and Wednesday 11 January 2023. The quarry was not audible during any monitored period during the day and evening periods. These results indicate that noise emissions from Teven Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location NM3 are presented in Table 4-3. Noise sources measured included aircrafts, distant road traffic and chirping insects (mostly cicada). Insects were the dominant noise source.

Table 4-3: Noise survey results and observations for Location NM3

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Teven Quarry Contribution (LA1sec) (dBA)	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90				
11-01-23	12:46 (Day)	79.8	56.8	41.3	WD: 315° WS: 1.6 m/s Rain: Nil	Insects 46-62 Wind 47-54 Aircraft 80 Quarry inaudible	Inaudible	37
11-01-23	1:05 (Day)	63.9	50.6	44.7	WD: 315° WS: 3.7 m/s Rain: Nil	Insects 47-54 Wind 44-57 Quarry inaudible	Inaudible	37
10-01-23	21:28 (Evening)	64.4	43.3	41.6	WD: 0° WS: 0.8 m/s Rain: Nil	Insects 39-43 Wind 41-45 Motorway from afar 39-42 Quarry inaudible	Inaudible	35
10-01-23	21:44 (Evening)	87.6	52.7	41.6	WD: 0° WS: 1.7 m/s Rain: Nil	Insects 41-44 Wind 40-44 Motorway traffic from afar 38-43 Sneeze 88 Quarry inaudible	Inaudible	35

4.4 Location NM4

Noise monitoring at location NM4 was completed on Tuesday 10 January 2023 and Wednesday 11 January 2023. The quarry was inaudible during the evening period. During noise monitoring at location NM4 during the day period, the quarry was audible from the production area above the established noise criteria. It should be noted that the monitoring was completed close to Stokers Lane at the entrance to the residence as to not disturb the resident. The results and observations taken during the monitoring events at Location NM4 are presented in Table 4-4. Noise sources measured included birds, wind, aircraft, passing trucks, passing cars and insects.

Table 4-4: Noise survey results and observations for Location NM4

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Teven Quarry Contribution (LA1sec) (dBA)	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90				
11-01-23	11:25 (Day)	86.6	58.8	47.6	WD: 315° WS: 1.4 m/s Rain: Nil	Insects (mostly cicadas) 56-67 Wind 46-58 Aircraft 48-50 Truck 59 Quarry audible (production area) 46	46	37
11-01-23	11:41 (Day)	65.9	55.1	47.8	WD: 315° WS: 3.1 m/s Rain: Nil	Insects 56-66 Wind 47-59 Birds 48 Quarry audible (production area) 46	46	37
10-01-23	20:01 (Evening)	73.3	54.3	45.1	WD: 270° WS: 2.4 m/s Rain: Nil	Insects (mostly cicadas) 46-58 Car 52-74 Wind 43-47 Quarry inaudible	Inaudible	35
10-01-23	20:36 (Evening)	64	46.5	44	WD: 270° WS: 3.5 m/s Rain: Nil	Insects (mostly cicadas) 44-57 Wind 46-48 Quarry inaudible	Inaudible	35

4.5 Location NM5

Noise monitoring at location NM5 was completed on Tuesday 10 January 2023 and Wednesday 11 January 2023. The quarry was inaudible during the evening period. These results indicate that noise emissions from Teven Quarry did not contribute to noise nuisance during this time. During noise monitoring at location NM5 during the day period audible quarry noise was observed from the production area. It should be noted that NM5 is a farm shed and not a living residence, so it is unlikely these noise emissions from Teven Quarry contributed to a noise nuisance at this time. The results and observations taken during the monitoring events at Location NM5 are presented in Table 4-5. Noise sources measured included birds, wind, insects, aircraft, passing trucks, and aircraft.

Table 4-5: Noise survey results and observations for Location NM5

Date	Time (hrs)	Descriptor (dBA)			Meteorology	Description and SPL, dBA	Teven Quarry Contribution (LA1sec) (dBA)	LAeq(15min) Criteria
		LAmax	LAeq	LA90				
11-01-23	10:40 (Day)	68.4	47.5	42.5	WD: 315° WS: 3.6 m/s Rain: Nil	Wind 44-52 Insects 44-49 Birds 45 Aircraft 52-60 Quarry audible (production area) 46	46	37
11-01-23	10:56 (Day)	78.7	47.2	40.4	WD: 315° WS: 2.6 m/s Rain: Nil	Wind 43-49 Insects 39-41 Birds 40-42 Aircraft 45-52 Quarry audible (production area) 46	46	37
10-01-23	19:43 (Evening)	69.8	47.4	36.8	WD: 270° WS: 1.2 m/s Rain: Nil	Wind 44-51 Insects 39-60 Birds 35-38 Quarry inaudible	Inaudible	35
10-01-23	20:18 (Evening)	81.6	52	40.2	WD: 270° WS: 0.7 m/s Rain: Nil	Wind 39-51 Insects 40-56 Birds 40-43 Quarry inaudible	Inaudible	35

5. CONCLUSION

This NMA completed by Ramboll at the Holcim Teven Quarry, Teven, NSW as a quarterly requirement of the NMP. Noise monitoring was completed out on Tuesday 10 January 2023 and Wednesday 11 January 2023 at five locations selected as representative to the sensitive receptors at the surroundings to Teven Quarry.

Noise was audible during the day periods at NM4 and NM5. Monitoring at NM4 was completed at the gate of the residence, in direct line-of-site of the quarry. This location will be moved within closer proximity of the resident for subsequent monitoring periods. The quarry was audible at NM5 during the day monitoring period, but it is noted that this receptor is a farm shed rather than a residence. The quarry was not audible at any other location or period during the monitoring campaign.

6. REFERENCES

Holcim Australia (2021) *Teven Quarry, Noise Management Plan*.

Minister for Planning and Environment (2015) 'Development Consent SSD_6422, Teven Quarry Project'.

NSW EPA (2021) Environment Protection Licence number 3293.

NSW EPA (2013) *Noise Guide for Local Government*. Sydney NSW: NSW Environment Protection Authority. Available at: https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/20130127nglg.pdf (Accessed: 25 October 2022).

NSW EPA (2017) *Noise Policy for Industry (NPfI)*. Sydney NSW: NSW Environment Protection Authority. Available at: https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/17p0524-noise-policy-for-industry.pdf (Accessed: 25 October 2022).

Standards Australia (2018) *AS 1055:2018 Acoustics—Description and measurement of environmental noise*. Australian Standard. Available at: https://infostore.saiglobal.com/preview/825367946534.pdf?sku=1131503_SAIG_AS_AS_2626154 (Accessed: 19 January 2023).

Standards Australia (2003) *AS 60942:2003 Electroacoustics - Sound calibrators.* Australian Standard.

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QUARTERLY NOISE MONITORING ASSESSMENT – QUARTER 2 2023

TEVEN QUARRY, TEVEN, NSW

RAMBOLL Bright ideas. Sustainable change.

QUARTERLY NOISE MONITORING ASSESSMENT – QUARTER 2 2023
TEVEN QUARRY, TEVEN, NSW

Project name	**Quarterly Noise Monitoring Assessment for Teven Quarry – Quarter 2 2023**
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Prepared by	**Jake Bourke, Matilda Englert**
Checked by	**Patrick Murray, Andrew Bell, Rachel Condon**
Approved by	**Belinda Sinclair**
Description	**Data collected on 10 May and 13 June 2023 for Teven Quarry during Quarter 2 2023 in Teven, NSW, as part of the noise monitoring program**

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CONTENTS

TABLE OF TABLES

APPENDICES

ABBREVIATIONS AND DEFINITIONS

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

Source: Noise Guide for Local Government (NSW EPA, 2013)

1. OVERVIEW

1.1 Project Driver

Ramboll Australia Pty Ltd (Ramboll) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for Teven Quarry ("the quarry") at Teven, NSW.

This NMA was done in accordance with the following documents:

- Noise Policy for Industry (NPI) (NSW EPA, 2017).
- Teven Quarry Noise Management Plan (NMP) (Holcim Australia, 2021).
- Environment Protection Licence (EPL) number 3293 (NSW EPA, 2021).
- Development Consent Application Number SSD_6422 (Minister for Planning and Environment, 2015).
- Australian Standard AS 1055:2018 Acoustics—Description and measurement of environmental noise (Standards Australia, 2018).
- IEC 60942 Ed. 3.0 b:2003 Electroacoustics - Sound calibrators (Standards Australia, 2003).

This NMA has been undertaken in accordance with the NMP for the quarterly period April to June 2023 and forms part of the monitoring program to determine compliance with conditions of the Development Consent.

1.2 Site Location and Sensitive Receptors

The quarry is in Teven, NSW, approximately 7 km west of Ballina. Sensitive receptors surrounding the quarry are primarily rural and residential properties in coastal bushland with elevated and undulating topography. Five monitoring locations have been selected as part of the NMA and in accordance with the EPL and Development Consent and are shown in **Table 1-1**.

Table 1-1: Monitoring locations locality and sensitive receptors

Monitoring Locations	Nearest Receiver	Locality and Sensitive Receptors
NM1	R7	West of the quarry situated at a rural residential property at the end of Leadbeatters Lane
NM2	R3/R4	East of the quarry situated at a rural residential property on Teven Road
NM3	R2	South of the quarry situated at a rural residential property at the end of Wellers Road
NM4	R10	North of the quarry situated at a rural residential property adjacent the site off Stokers Lane
NM5	R14	Northeast of the quarry situated at a rural residential property of Teven Road

The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan shown in **Figure 1**.

Legend

- Noise monitoring location

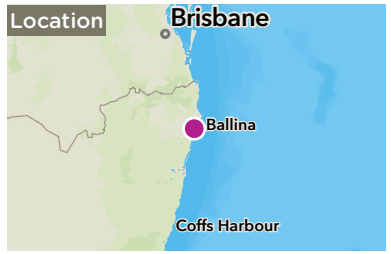

Figure 1 : Noise monitoring locations at Teven Quarry

2. NOISE CRITERIA

Table 2-1 summaries the applicable onsite noise criteria outlined in the NMP and Development Consent for residential receivers (NM1, NM2, NM3, NM4, NM5) surrounding the quarry.

Table 2-1: Monitoring locations and noise criteria

Receivers	Monitoring Locations	Day[1]	Evening[2]
		LAeq (15min)	LAeq (15min)
		dB(A)	
R3, R4, R13, R15, R16, R17, R18, R20	NM2	38	35
All other receivers	NM1, NM3, NM4, NM5	37	35
[1] 7 am–6 pm Monday to Saturday and 8 am–6 pm Sunday and public holidays [2] 6 pm–10 pm Monday to Sunday			

Table 2-2 summaries the applicable offsite noise criteria for vehicles traveling to and from site, as presented in the State Significant Development Assessment (SSD 6422) and as established by the NSW Road Noise Policy (RNP).

Table 2-2: Monitoring locations and noise criteria

Road Catergory	Type of Project/Land Use	Assessment Criteria dB(A)	
		Day (7.00am – 10.00pm)	Night (10.00pm – 7.00am)
Freeway/arterial/sub-arterial roads	Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	$L_{Aeq,\ 15\ hour}$ 60 (external)	$L_{Aeq,\ 9\ hour}$ 55 (external)
Local Roads	Existing residences affected by noise by additional traffic on existing local roads generated by land use development	$L_{Aeq,\ 15\ hour}$ 55 (external)	$L_{Aeq,\ 9\ hour}$ 50 (external)

Per the RNP, Teven Road is considered to be sub-arterial, and Stokers Lane is considered to be a local road. Accordingly, offsite noise from vehicles traveling to and from site should not exceed day/night noise levels of 60/55 dBA at NM2 and 55/50 dBA at NM4.

3. METHODOLOGY

The monitoring program was created in accordance with the procedures described in *Australian Standard AS 1055:2018* and the Approval Documents referenced in Section 1. The measurements were completed using a RION Sound Level Meter NL-52 on Wednesday 10 May and Tuesday 13 June 2023. The acoustic instrumentation used carries current NATA calibration and complies with *AS/NZS IEC 61672-1:2013/2002 class 1*. Calibration of all instrumentation was checked prior to and following measurements using a Pulsar Acoustic Calibrator 105 which also carried a current NATA calibration and complies with IEC 60942:2003. Drift in calibration did not exceed ±0.3 dBA.

Attended noise monitoring was conducted for 15-minute periods at each location over two days. As per the NMP, two sets of measurements were completed during the day, and two sets of measurements were completed during the evening, at each monitoring location. It is noted that the quarry was not operational during the evening periods, however, monitoring was conducted as per requirements of the EPL.

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

4. RESULTS AND DISCUSSION

4.1 Location NM1

Noise monitoring at location NM1 was completed on Wednesday 10 May 2023. The quarry was not audible during any monitored period during the day and evening, with the ambient noise environment dominated by insects, aircraft, and distant traffic. These results indicate that noise emissions from Teven Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring event at Location NM1 are presented in **Table 4-1**.

Table 4-1: Noise survey results and observations for Location NM1

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Teven Quarry LAeq(15min) Contribution	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90				
10-05-23	5:32pm to 5:47pm (Day)	60.4	53.9	37.6	WD: n/a WS: 0 m/s Rain: Nil	Insects 55 Quarry inaudible	<28	37
10-05-23	5:44pm to 5:59pm (Day)	68.6	53.6	39.8	WD: n/a WS: 0 m/s Rain: Nil	Insects 55 Quarry inaudible	<30	37
10-05-23	6:10pm to 6:25pm (Evening)	59.2	41.4	40.1	WD: n/a WS: 0 m/s Rain: Nil	Aircraft 59 Cars in distance 40-45 Quarry inaudible	<30	35
10-05-23	6:33pm to 6:48pm (Evening)	71.8	42.2	40.1	WD: n/a WS: 0 m/s Rain: Nil	Quarry inaudible	<30	35

4.2 Location NM2

Noise monitoring at location NM2 was completed on Wednesday 10 May 2023 and Tuesday 13 June 2023. The quarry was not audible during the evening monitored period however offsite quarry vehicles entering and existing the site as well as onsite reverse squawkers were audible during the day. A single truck entering and existing the site was observed and measured during each day monitored period. We note that noise emission from trucks is considered to be below the $L_{Aeq,\ 15\ hour}$ day criteria of 60 dBA using sound level exposure calculations included in **Appendix 1**. Additionally, a reverse squawker was observed and measured during both day monitoring periods for no more than 5 second durations. Noise emission from onsite squawkers has been determined to be well below the 15min L_{Aeq} criteria using sound level exposure calculations also included in **Appendix 1**. The ambient noise environment was dominated by passing cars on Teven Road, fish in adjacent river, and an aircraft. These results indicate that noise emissions from Teven Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location NM2 are presented in **Table 4-2**.

Table 4-2: Noise survey results and observations for Location NM2

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Teven Quarry LAeq(15min) Contribution	LAeq(15min) Criteria (dBA)	Roadway Noise LAeq (15min) Contribution	LAeq (15hr) (external) Criteria (dBA)
		LAmax	LAeq	LA90						
10-05-23	2:33pm to 2:48pm (Day)	86.0	66.1	43.7	WD: 205° WS: 1.9 m/s Rain: Nil	Cars passing 61-81 Trucks entering/exiting site 56-83 Holcim reverse squawkers 50-51 Quarry vehicles audible	<34	38	<60	60
10-05-23	2:53pm to 3:08pm (Day)	90.2	67.5	44.8	WD: 205° WS: 1.9 m/s Rain: Nil	Cars passing 61-84 Trucks entering/exiting site 56-81 Holcim reverse squawkers 50-51 Quarry vehicles audible	<35	38	<58	60
13-06-23	6:41pm to 6:56pm (Evening)	50.0	37.1	34.5	WD: - WS: 1.4 m/s Rain: Nil	Aircraft 37-40 Distant traffic hum 34-37 Quarry inaudible	<25	35	n/a	n/a
13-06-23	7:00pm to 7:15pm (Evening)	56.7	37.8	34.8	WD: - WS: 1.4 m/s Rain: Nil	Fish 36-40 Quarry inaudible	<25	35	n/a	n/a

'-' indicates not recorded

4.3 Location NM3

Noise monitoring at location NM3 was completed on Wednesday 10 May 2023 and Tuesday 13 June 2023. The quarry was not audible during any monitored period during the day and evening periods, with the ambient noise environment dominated by wind, trees, birds, aircraft, and traffic noise. These results indicate that noise emissions from Teven Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location NM3 are presented in **Table 4-3**.

Table 4-3: Noise survey results and observations for Location NM3

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Teven Quarry LAeq(15min) Contribution	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90				
10-05-23	12:20pm to 12:35pm (Day)	61.0	44.3	38.3	WD: 202° WS: 3.5 m/s Rain: Nil	Work on nearby residence 40-49 Wind/trees 43-56 Birds 45-46 Quarry inaudible	<28	37
10-05-23	12:36pm to 12:51pm (Day)	65.0	44.6	38.4	WD: 202° WS: 3.5 m/s Rain: Nil	Work on nearby residence 40-49 Wind/trees 43-56 Birds 45-46 Aircraft 64 Quarry inaudible	<28	37
13-06-23	6:01pm to 6:16pm (Evening)	51.1	36.1	33.6	WD: - WS: 0.9 m/s Rain: Nil	Insects 33-34 Distant traffic hum 32-35 Quarry inaudible	<24	35
13-06-23	6:18pm to 6:33pm (Evening)	52.3	35.2	32.9	WD: - WS: 0.9 m/s Rain: Nil	Insects 33-34 Distant traffic hum 32-38 Aircraft 48-50 Loud car 37-38 Quarry inaudible	<23	35

'-' indicates not recorded

4.4 Location NM4

Noise monitoring at location NM4 was completed on Wednesday 10 May 2023 and Tuesday 13 June 2023. The quarry was inaudible during the evening period. However offsite quarry vehicles entering and existing the site and onsite reverse squawkers were audible during the day. Up to two trucks entering and existing the site was observed and measured during each day monitoring period. Noise emission from trucks is considered to be well below the $L_{Aeq,\ 15\ hour}$ day criteria of 55 dBA as calculated using sound level exposure calculations included in **Appendix 1**. Additionally, a reverse squawker was observed and measured during both day monitoring periods for no more than 7 second durations. Noise emission from onsite squawkers is considered well below the 15min L_{Aeq} criteria using sound level exposure calculations also included in **Appendix 1**. It should be noted that the monitoring was completed close to Stokers Lane at the entrance to the residence as to not disturb the resident, however, this places the attended noise monitoring location in direct line-of-sight of the quarry rather than near the sensitive receptor, i.e., the resident. The results and observations taken during the monitoring events at Location NM4 are presented in **Table 4-4**.

Table 4-4: Noise survey results and observations for Location NM4

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Teven Quarry LAeq (15min) Criteria Contribution	LAeq (15min) Criteria (dBA)	Roadway Noise LAeq (15min) Contribution	LAeq (15 hr) (external) Criteria (dBA)
		LAmax	LAeq	LA90						
10-05-23	1:53pm to 2:08pm (Day)	71.1	56.0	43.5	WD: 205° WS: 3.0 m/s Rain: Nil	Trucks entering/exiting site 55-56 Holcim reverse squawkers 47-50 Quarry vehicles audible	<34	37	<41	55
10-05-23	2:08pm to 2:23pm (Day)	74.2	54.0	44.0	WD: 205° WS: 3.0 m/s Rain: Nil	Trucks entering/exiting site 55-56 Holcim reverse squawkers 47-50 Quarry vehicles audible	<34	37	<38	55
13-06-23	7:22pm to 7:37pm (Evening)	55.6	39.2	35.6	WD: n/a WS: 0 m/s Rain: Nil	Aircraft 38-49 Quarry inaudible	<26	35	n/a	n/a
13-06-23	7:41pm to 7:56pm (Evening)	57.5	36.9	35.5	WD: n/a WS: 0 m/s Rain: Nil	Quarry inaudible	<26	35	n/a	n/a

4.5 Location NM5

Noise monitoring at location NM5 was completed on Wednesday 10 May 2023 and Tuesday 13 June 2023. The quarry was inaudible during any monitored period during the day and evening. These results indicate that noise emissions from Teven Quarry did not contribute to noise nuisance during this time. The results and observations taken during the monitoring events at Location NM5 are presented in **Table 4-5**.

Noise sources measured included insects, wind, and cars.

Table 4-5: Noise survey results and observations for Location NM5

Date	Time (hrs)	Descriptor (dBA)			Meteorology	Description and SPL, dBA	Teven Quarry LAeq(15min) Contribution	LAeq(15min) Criteria
		LAmax	LAeq	LA90				
10-05-23	3:35pm to 3:50pm (Day)	61.3	47.7	42.2	WD: n/a WS: 0 m/s Rain: Nil	Insects 46-47 Wind 48-51 Quarry inaudible	<32	37
10-05-23	3.50pm to 4:05pm (Day)	61.8	46.5	41.2	WD: n/a WS: 0 m/s Rain: Nil	Insects 46-47 Wind 48-56 Quarry inaudible	<31	37
13-06-23	8:03pm to 8:18pm (Evening)	67.2	47.1	36.7	WD: - WS: 1.2 m/s Rain: Nil	Car 53-60 Quarry inaudible	,27	35
13-06-23	8:23pm to 8:38pm (Evening)	60.8	40.3	33.9	WD: - WS: 1.2 m/s Rain: Nil	Cars 51-56 Insects 34-36 Quarry inaudible	<24	35

'-' indicates not recorded

5. CONCLUSION

This NMA completed by Ramboll at the Holcim Teven Quarry, Teven, NSW as a quarterly requirement of the NMP. Noise monitoring was completed on Wednesday 10 May 2023 and Tuesday 13 June 2023 at five locations selected as representative to the sensitive receptors at the surroundings to Teven Quarry. No audible quarry noise was recorded at any of the selected monitoring locations.

Noise was audible during the day periods at NM2 and NM4 but was in compliance with offsite noise requirements of the Road Noise Policy and onsite noise requirements of the NMP and Development Consent for residential receivers. Monitoring at NM4 was completed at the gate of the residence, in direct line-of-sight of the quarry. Moving this location within closer proximity of the residence for subsequent monitoring periods is recommended to better capture the noise impacts at the receptor, however it is acknowledged that resident approval will be required to gain access onto the property. The quarry was not audible at any other location or period during the monitoring campaign.

The results presented in this NMA show compliance with the relevant noise criteria at the Holcim Teven Quarry, Teven, NSW.

6. REFERENCES

Holcim Australia (2021) *Teven Quarry, Noise Management Plan*.

Minister for Planning and Environment (2015) 'Development Consent SSD_6422, Teven Quarry Project'.

NSW EPA (2021) Environment Protection Licence number 3293.

NSW EPA (2013) *Noise Guide for Local Government*. Sydney NSW: NSW Environment Protection Authority. Available at: https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/20130127nglg.pdf (Accessed: 25 October 2022).

NSW EPA (2017) *Noise Policy for Industry (NPfI)*. Sydney NSW: NSW Environment Protection Authority. Available at: https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/17p0524-noise-policy-for-industry.pdf (Accessed: 25 October 2022).

Standards Australia (2018) *AS 1055:2018 Acoustics—Description and measurement of environmental noise*. Australian Standard. Available at: https://infostore.saiglobal.com/preview/825367946534.pdf?sku=1131503_SAIG_AS_AS_2626154 (Accessed: 19 January 2023).

Standards Australia (2003) *AS 60942:2003 Electroacoustics - Sound calibrators.* Australian Standard.

APPENDIX 1
SOUND EXPOSURE LEVEL CALCULATIONS

Project No: 318000911
Client Name: Holcim Australia Pty Ltd
Project Name: NSW Environmental Monitoring
Project Site: Teven Quarry
9/08/2023

Sound Level Exposure Calculations
NM2 and NM4

RAMBOLL

NM2 Holcim reverse squawkers

Monitoring period	2:33PM to 2:48 PM and 2:53PM to 3:08PM
Meas. Dist from source (m)	1230
Meas. Time (s)	5
Meas. LAeq dB	51
Calc Sel dB	58
No. Events in 15min	1
Total LAeq (15min)	**28**

NM4 Holcim reverse squawkers

Monitoring period	1:53 to 2:08 PM, and 2:08 to 2:23 PM
Meas. Dist from source (m)	260
Meas. Time (s)	7
Meas. LAeq dB	50
Calc Sel dB	58
No. Events in 15min	1
Total LAeq (15min)	**29**

NM2 Holcim trucks entering/exiting site

Monitoring period	2:33 to 2:48 PM
Meas. Dist from source (m)	10
Meas. Time (s)	5
Meas. LAeq dB	83
Calc Sel dB	90
No. Events in 15 hrs	60
No. seconds in 15hrs	54000
Total LAeq (15hrs)	**60**

NM4 Holcim trucks entering/exiting site

Monitoring period	2:33 to 2:48 PM
Meas. Dist from source (m)	30
Meas. Time (s)	15
Meas. LAeq dB	56
Calc Sel dB	68
No. Events in 15 hrs	120
No. seconds in 15hrs	54000
Total LAeq (15hrs)	**41**

NM2 Holcim trucks entering/exiting site

Monitoring period	2:53PM to 3:08PM
Meas. Dist from source (m)	10
Meas. Time (s)	5
Meas. LAeq dB	81
Calc Sel dB	88
No. Events in 15 hrs	60
No. seconds in 15hrs	54000
Total LAeq (15hrs)	**58**

NM4 Holcim trucks entering/exiting site

Monitoring period	2:53PM to 3:08PM
Meas. Dist from source (m)	30
Meas. Time (s)	15
Meas. LAeq dB	56
Calc Sel dB	68
No. Events in 15 hrs	60
No. seconds in 15hrs	54000
Total LAeq (15hrs)	**38**

Intended for
Holcim (Australia) Pty Ltd

Document type
Report

Date
October 2023

Project number
318001799

QUARTERLY NOISE MONITORING ASSESSMENT – QUARTER 3 2023

TEVEN QUARRY, TEVEN, NSW

RAMBOLL Bright ideas. Sustainable change.

QUARTERLY NOISE MONITORING ASSESSMENT – QUARTER 3 2023
TEVEN QUARRY, TEVEN, NSW

Project name	**Quarterly Noise Monitoring Assessment for Teven Quarry – Quarter 3 2023**
Project no.	**318001799**
Recipient	**Matt Kelly**
Document type	**Report**
Version	**1**
Date	**26/10/2023**
Prepared by	**Jake Bourke**
Checked by	**Arnold, Cho, Rachel Condon**
Approved by	**Belinda Sinclair**
Description	**Data collected on 8 and 9 August 2023 for Teven Quarry during Quarter 3 2023 in Teven, NSW, as part of the noise monitoring program**

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TABLE OF TABLES

APPENDICES

ABBREVIATIONS AND DEFINITIONS

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

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

1. OVERVIEW

1.1 Project Driver

Ramboll Australia Pty Ltd (Ramboll) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for Teven Quarry ("the quarry") at Teven, NSW.

This NMA was done in accordance with the following documents:

- Noise Policy for Industry (NPfI) (NSW EPA, 2017).
- Teven Quarry Noise Management Plan (NMP) (Holcim Australia, 2021).
- Environment Protection Licence (EPL) number 3293 (NSW EPA, 2021).
- Development Consent Application Number SSD_6422 (Minister for Planning and Environment, 2015).
- Australian Standard AS 1055:2018 Acoustics—Description and measurement of environmental noise (Standards Australia, 2018).
- IEC 60942 Ed. 3.0 b:2003 Electroacoustics - Sound calibrators (Standards Australia, 2003).

This NMA has been undertaken in accordance with the NMP for the quarterly period July to September 2023 and forms part of the monitoring program to determine compliance with conditions of the Development Consent.

1.2 Site Location and Sensitive Receivers

The quarry is in Teven, NSW, approximately 7 km west of Ballina. Sensitive receivers surrounding the quarry are primarily rural and residential properties in coastal bushland with elevated and undulating topography. Five monitoring locations have been selected as part of the NMA and in accordance with the EPL and Development Consent and are shown in **Table 1-1**.

Table 1-1: Monitoring locations locality and sensitive receptors

Monitoring Locations	Nearest Receiver	Locality and Sensitive Receivers
NM1	R7	West of the quarry situated at a rural residential property at the end of Leadbeatters Lane
NM2	R3/R4	East of the quarry situated at a rural residential property on Teven Road
NM3	R2	South of the quarry situated at a rural residential property at the end of Wellers Road
NM4	R10	North of the quarry situated at a rural residential property adjacent the site off Stokers Lane
NM5	R14	Northeast of the quarry situated at a rural residential property of Teven Road

The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan shown in **Figure 1**.

Legend

- Noise monitoring location

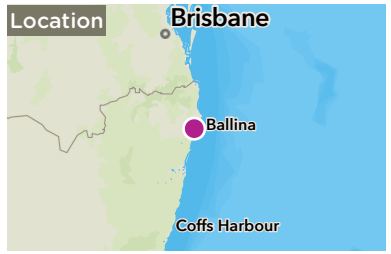

Figure 1 : Noise monitoring locations at Teven Quarry

2. NOISE CRITERIA

Table 2-1 summaries the applicable onsite noise criteria outlined in the NMP and Development Consent for residential receivers (NM1, NM2, NM3, NM4, NM5) surrounding the quarry.

Table 2-1: Monitoring locations and noise criteria

Receivers	Monitoring Locations	Day[1]	Evening[2]
		LAeq (15min)	LAeq (15min)
		dB(A)	
R3, R4, R13, R15, R16, R17, R18, R20	NM2	38	35
All other receivers	NM1, NM3, NM4, NM5	37	35

[1] 7 am–6 pm Monday to Saturday and 8 am–6 pm Sunday and public holidays

[2] 6 pm–10 pm Monday to Sunday

3. METHODOLOGY

The monitoring program was developed in accordance with the procedures described in *Australian Standard AS 1055:2018* and the Approval Documents referenced in Section 1. The measurements were completed using a RION Sound Level Meter NL-52 on Tuesday 8 August and Wednesday 9 August 2023. The acoustic instrumentation used carries current NATA calibration and complies with *AS/NZS IEC 61672-1:2013/2002 Class 1*. Calibration of all instrumentation was checked prior to and following measurements using a Pulsar Acoustic Calibrator 105 which also carried a current NATA calibration and complies with IEC 60942:2003. Drift in calibration did not exceed ±0.3 dBA.

Attended noise monitoring was conducted for 15-minute periods at each location over two days. As per the NMP, two sets of measurements were completed during the day, and two sets of measurements were completed during the evening, at each monitoring location. It is noted that the quarry was not operational during the evening periods, however, monitoring was conducted as per requirements of the EPL.

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

4. RESULTS AND DISCUSSION

4.1 Location NM1

Noise monitoring at location NM1 was completed on Tuesday 8 August and Wednesday 9 August 2023. The quarry was not audible during any monitored period during the day and evening, with the ambient noise environment dominated by aircraft, barking dogs, passing cars, and distant traffic. The quarry was not operational during the evening period. These results indicate that noise emissions from Teven Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring event at Location NM1 are presented in **Table 4-1**.

Table 4-1: Noise survey results and observations for Location NM1

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Teven Quarry LAeq(15min) Contribution	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90				
09-08-2023	12:00pm to 12:15pm (Day)	71.2	45.9	38.1	WD: 180° WS: 2.5 m/s Rain: Nil	Background road traffic/wind 38-40 Quarry inaudible	<28	37
09-08-2023	12:16pm to 12:31pm (Day)	84.9	54.5	37.1	WD: 180° WS: 2.5 m/s Rain: Nil	Background road traffic/wind 38-40 Car passing 84 Quarry inaudible	<27	37
08-08-2023	6:00pm to 6:15pm (Evening)	79.9	52.4	37.1	WD: n/a WS: 0 m/s Rain: Nil	Dogs barking 39-40 Passing car 40-79 Quarry not operational	n/a[1]	35
08-08-2023	6:16pm to 6:31pm (Evening)	81.6	51.5	33.6	WD: n/a WS: 0 m/s Rain: Nil	Aircraft 40-52 Passing car 60-81 Quarry not operational	n/a[1]	35

[1] quarry not operational

4.2 Location NM2

Noise monitoring at location NM2 was completed on Tuesday 8 August and Wednesday 9 August 2023. The quarry was not operational during the evening period. Offsite quarry vehicles entering and exiting the site were audible during the day. A single Holcim truck exiting the site was observed and measured during one monitored day period, however as this was an offsite vehicle movement it doesn't constitute as a contributor to the quarry contribution. The ambient noise environment was dominated by passing cars on Teven Road, fish in adjacent river, and birds. These results indicate that noise emissions from Teven Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location NM2 are presented in **Table 4-2**.

Table 4-2: Noise survey results and observations for Location NM2

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Teven Quarry LAeq(15min) Contribution	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90				
09-08-2023	9:55am to 10:10am (Day)	79.4	58.1	42.5	WD: 205° WS: 3.1 m/s Rain: Nil	Background noise (wind, birds, highway traffic) 47-55 Holcim truck exiting quarry (occurred once) 41-77 Birds 42-55 Passing cars on Teven Rd 42-78 Quarry inaudible	<33	38
09-08-2023	10:10am to 10:25am (Day)	74.1	55.3	40.5	WD: 205° WS: 3.1 m/s Rain: Nil	Background noise (wind, birds, highway traffic) 48-62 Passing cars on Teven Rd 60-78 Quarry inaudible	<31	38
08-08-2023	8:00pm to 8:15pm (Evening)	82.3	57.9	38.1	WD: n/a WS: 0 m/s Rain: Nil	Background road traffic 38-40 Fish jumping in river 39-40 Passing cars on Teven Rd 82 Quarry inaudible	n/a[1]	35
08-08-2023	8:18pm to 8:33pm (Evening)	77.5	50.9	36.7	WD: n/a WS: 0 m/s Rain: Nil	Background road traffic 38-40 Fish jumping in river 39-40 Passing cars on Teven Rd 82 Quarry inaudible	n/a[1]	35

[1] quarry not operational

4.3 Location NM3

Noise monitoring at location NM3 was completed on Tuesday 8 August and Wednesday 9 August 2023. The quarry was audible during one monitored day period. However, it was difficult to determine the noise nuisance from the site vehicles reverse squawkers due to the constant background noise which was dominated by road traffic. These results indicate that noise emissions from Teven Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location NM3 are presented in **Table 4-3**. The ambient noise environment consisted of background road traffic, wind, birds, frogs, and insects.

Table 4-3: Noise survey results and observations for Location NM3

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Teven Quarry LAeq(15min) Contribution	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90				
09-08-2023	9:09am to 9:24am (Day)	57.3	43.4	39.6	WD: 250° WS: 3.7 m/s Rain: Nil	Background road traffic/wind 39-43 Aircraft 41-57 Frogs 40-41 Birds 41-43 Quarry inaudible	<30	37
09-08-2023	9:25am to 9:40am (Day)	56.1	44.4	39.7	WD: 250° WS: 3.7 m/s Rain: Nil	Background road traffic/wind 39-43 Reverse squawkers 41-42 (unable to quantify due to constant background noise) Aircraft 41-42 Frogs 40-50 Birds 39-54 Quarry onsite vehicles audible	<30[2]	37
08-08-2023	8:40pm to 8:55pm (Evening)	59.3	50.3	39.9	WD: n/a WS: 0 m/s Rain: Nil	Background road traffic 40-51 Insects 52-59 Quarry inaudible	n/a[1]	35
08-08-2023	8:55pm to 9:10pm (Evening)	62.2	51.3	41.9	WD: n/a WS: 0 m/s Rain: Nil	Background road traffic 39-44 Insects 52-59 Quarry inaudible	n/a[1]	35

[1] quarry not operational

[2] sound level exposure calculation in Appendix 1 estimated holcim reverse sqwuakers at 23 dBA but higher LA90 value adopted for conservatism.

4.4 Location NM4

Noise monitoring at location NM4 was completed on Tuesday 8 August and Wednesday 9 August 2023. The quarry was not operating during the evening period. The quarry was audible during both monitored day periods. One offsite quarry vehicle entering and exiting the site was observed and measured during each day monitoring period, however as this was an offsite vehicle movement it doesn't constitute as a contributor to the quarry contribution. Additionally, an onsite reverse squawker was observed and measured during both day monitoring periods for no more than 15 second durations. Noise emission from onsite squawkers is below the 15min L_{Aeq} criteria using sound level exposure calculations also included in **Appendix 1**. It should be noted that the monitoring was completed close to Stokers Lane at the entrance to the residence as to not disturb the resident, however, this places the attended noise monitoring location in direct line-of-sight of the quarry rather than near the sensitive receptor, i.e., the resident. Subsequently the LA90 results for both monitored day periods were adopted for distance correction to receiver using noise emission level calculations in **Appendix 1**. The results and observations taken during the monitoring events at Location NM4 are presented in **Table 4-4**. These results indicate that noise emissions from Teven Quarry may contribute to noise nuisance during the evening. Noise nuisance can be considered for both monitored day periods with estimated quarry contribution at 43 and 44 LAeq (15min) dBA which are both above the criteria of 37 LAeq (15min) dBA.

Table 4-4: Noise survey results and observations for Location NM4

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Teven Quarry LAeq (15min) Contribution	LAeq (15min) Criteria (dBA)
		LAmax	LAeq	LA90				
09-08-2023	11:21am to 11:36am (Day)	73.0	54.9	48.6	WD: 180° WS: 2.1 m/s Rain: Nil	Crusher 52-54 Holcim truck exiting quarry 50-73 (occurred once) Quarry audible - reverse squawkers 53-60	43[2]	37
09-08-2023	11:37am to 11:52am (Day)	74.5	56.4	49.5	WD: 180° WS: 2.1 m/s Rain: Nil	Crusher 52-54 Holcim truck exiting quarry 56-74 (occurred once) Quarry audible - reverse squawkers 53-60	<44[2]	37
08-08-2023	7:23pm to 7:38pm (Evening)	46.4	41.7	40.5	WD: n/a WS: 0 m/s Rain: Nil	Background road traffic 40-46 Quarry inaudible	n/a[1]	35

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Teven Quarry LAeq (15min) Contribution	LAeq (15min) Criteria (dBA)
		LAmax	LAeq	LA90				
08-08-2023	7:39pm to 7:54pm (Evening)	56.2	41.8	39.8	WD: n/a WS: 0 m/s Rain: Nil	Background road traffic 40-46 Passing car on Teven Rd 46-56 Quarry inaudible	n/a[1]	35

[1] quarry not operational

[2] value estimated based on distance correction to receiver location in calculation in **Appendix 1**.

4.5 Location NM5

Noise monitoring at location NM5 was completed on Tuesday 8 August and Wednesday 9 August 2023. The quarry was inaudible during any monitored period during the day and evening. These results indicate that noise emissions from Teven Quarry did not contribute to noise nuisance during this time. The results and observations taken during the monitoring events at Location NM5 are presented in **Table 4-5**.

Noise sources measured included cars, birds, and aircraft.

Table 4-5: Noise survey results and observations for Location NM5

Date	Time (hrs)	Descriptor (dBA)			Meteorology	Description and SPL, dBA	Teven Quarry LAeq(15min) Contribution	LAeq(15min) Criteria
		LAmax	LAeq	LA90				
09-08-2023	12:43pm to 12:58pm (Day)	88.3	66.5	37.5	WD: 180° WS: 2.2 m/s Rain: Nil	Passing cars 88 Birds 45-48 Aircraft 58-69 Quarry inaudible	<28	37
09-08-2023	12:58pm to 1:13pm (Day)	86.7	64.3	38.9	WD: 180° WS: 2.2 m/s Rain: Nil	Passing cars 86 Birds 40-57 Quarry inaudible	<29	37
08-08-2023	6:47pm to 7:02pm (Evening)	79.5	56.0	40.0	WD: n/a WS: 0 m/s Rain: Nil	Background road traffic 39-41 Passing cars on Teven Rd 40-79 Quarry not operational	n/a[1]	35
08-08-2023	7:02pm to 7:17pm (Evening)	79.9	55.6	39.3	WD: n/a WS: 0 m/s Rain: Nil	Background road traffic 39-41 Passing cars on Teven Rd 40-79 Quarry not operational	n/a[1]	35

[1] quarry not operational

5. CONCLUSION

This NMA completed by Ramboll at the Holcim Teven Quarry, Teven, NSW as a quarterly requirement of the NMP. Noise monitoring was completed on Tuesday 8 August and Wednesday 9 August 2023 at five locations selected as representative to the sensitive receptors at the surroundings to Teven Quarry.

Noise was audible from the quarry and offsite site vehicles during both day periods at NM4 and one day period at NM3. Audible quarry noise at NM3 showed compliance with onsite noise requirements of the NMP and Development Consent for residential receivers. Audible quarry vehicles at NM4 were estimated to not show compliance with the NMP and Development Consent for residential receivers using noise emission level calculations. Noise nuisance can be considered for both monitored day periods at NM4 with estimated quarry contribution at 43 and 44 LAeq (15min) dBA which are both above the criteria of 37 LAeq (15min) dBA. Monitoring at NM4 was completed at the gate of the residence, in direct line-of-sight of the quarry and subsequently, noise emission level calculations were required to estimate quarry contribution and it is acknowledged that this methodology has limitations. Moving this location within closer proximity of the residence for subsequent monitoring periods is recommended to better capture the noise impacts at the receptor, however it is acknowledged that resident approval will be required to gain access onto the property. The quarry was not operational during the evening period. The quarry was not audible at any other location or period during the monitoring campaign.

The results presented in this NMA show compliance with the relevant noise criteria at the Holcim Teven Quarry, Teven, NSW, except for day monitored periods at NM4.

6. REFERENCES

Holcim Australia (2021) *Teven Quarry, Noise Management Plan*.

Minister for Planning and Environment (2015) 'Development Consent SSD_6422, Teven Quarry Project'.

NSW EPA (2021) Environment Protection Licence number 3293.

NSW EPA (2013) *Noise Guide for Local Government*. Sydney NSW: NSW Environment Protection Authority. Available at: https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/20130127nglg.pdf (Accessed: 25 October 2022).

NSW EPA (2017) *Noise Policy for Industry (NPfI)*. Sydney NSW: NSW Environment Protection Authority. Available at: https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/17p0524-noise-policy-for-industry.pdf (Accessed: 25 October 2022).

Standards Australia (2018) *AS 1055:2018 Acoustics—Description and measurement of environmental noise*. Australian Standard. Available at: https://infostore.saiglobal.com/preview/825367946534.pdf?sku=1131503_SAIG_AS_AS_2626154 (Accessed: 19 January 2023).

Standards Australia (2003) *AS 60942:2003 Electroacoustics - Sound calibrators.* Australian Standard.

APPENDIX 1
NOISE EMISSION LEVEL AND SOUND LEVEL EXPOSURE CALCULATIONS

Project No: 318001799
Client Name: Holcim Australia Pty Ltd
Project Name: NSW Environmental Monitoring
Project Site: Teven Quarry
10/26/2023

Noise Emission Levels Calculations

RAMBOLL

NM4 site contribution corrected for distance from monitoring location to receiver

Monitoring period	**11:21am to 11:36am**
Measured site contribution (LA90) at monitoring location (dBA)	49
Approx. distance from monitoring location to site (m)	315
Approx. distance from site to receiver (m)	500
istance corrected site contribution at receiver (LAeq dBA)	**45.0**
Estimated additional attenuation (vegetation)	2.0
Estimated site contribution at receiver (dBA)	**43**

NM4 site contribution corrected for distance from monitoring location to receiver

Monitoring period	**11:37am to 11:52am**
Measured site contribution (LA90) at monitoring location (dBA)	50
Approx. distance from monitoring location to site (m)	315
Approx. distance from site to receiver (m)	500
istance corrected site contribution at receiver (LAeq dBA)	**46.0**
Estimated additional attenuation (vegetation)	2.0
Estimated site contribution at receiver (dBA)	**44**

Project No: 318001799
Client Name: Holcim Australia Pty Ltd
Project Name: NSW Environmental Monitoring
Project Site: Teven Quarry
10/26/2023

Sound Level Exposure Calculations

RAMBOLL

NM3 Holcim reverse squawkers

Monitoring period	9:25AM to 9:40AM
Meas. Dist from source (m)	925
Meas. Time (s)	4
Meas. LAeq dB	42
Calc Sel dB	48
No. Events in 15min	3
Total LAeq (15min)	**23**

NM4 Holcim reverse squawkers

Monitoring period	11:21AM to 11:36AM and 11:37AM to 11:52AM
Meas. Dist from source (m)	260
Meas. Time (s)	15
Meas. LAeq dB	60
Calc Sel dB	58
No. Events in 15min	1
Total LAeq (15min)	**29**

NM4 Holcim crusher

Monitoring period	11:21AM to 11:36 AM
Meas. Dist from source (m)	260
Meas. Time (s)	5
Meas. LAeq dB	54
Calc Sel dB	58
No. Events in 15min	5
Total LAeq (15min)	**36**

Intended for
Holcim (Australia) Pty Ltd

Document type
Report

Date
February 2024

Project number
318001799

QUARTERLY NOISE MONITORING ASSESSMENT – QUARTER 4 2023

TEVEN QUARRY, TEVEN, NSW

RAMBOLL Bright ideas. Sustainable change.

QUARTERLY NOISE MONITORING ASSESSMENT – QUARTER 4 2023
TEVEN QUARRY, TEVEN, NSW

Project name	**Quarterly Noise Monitoring Assessment for Teven Quarry – Quarter 4 2023**
Project no.	**318001799**
Recipient	**Matt Kelly**
Document type	**Report**
Version	**1**
Date	**01/02/2024**
Prepared by	**Jake Bourke, Matilda Englert**
Checked by	**Arnold, Cho**
Approved by	**Belinda Sinclair**
Description	**Data collected on 11 and 12 October 2023 for Teven Quarry during Quarter 4 2023 in Teven, NSW, as part of the noise monitoring program**

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APPENDICES

ABBREVIATIONS AND DEFINITIONS

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

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

1. OVERVIEW

1.1 Project Driver

Ramboll Australia Pty Ltd (Ramboll) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for Teven Quarry ("the quarry") at Teven, NSW.

This NMA was done in accordance with the following documents:

- Noise Policy for Industry (NPfI) (NSW EPA, 2017).
- Teven Quarry Noise Management Plan (NMP) (Holcim Australia, 2021).
- Environment Protection Licence (EPL) number 3293 (NSW EPA, 2021).
- Development Consent Application Number SSD_6422 (Minister for Planning and Environment, 2015).
- Australian Standard AS 1055:2018 Acoustics—Description and measurement of environmental noise (Standards Australia, 2018).
- IEC 60942 Ed. 3.0 b:2003 Electroacoustics - Sound calibrators (Standards Australia, 2003).

This NMA has been undertaken in accordance with the NMP for the quarterly period October to December 2023 and forms part of the monitoring program to determine compliance with conditions of the Development Consent.

1.2 Site Location and Sensitive Receivers

The quarry is in Teven, NSW, approximately 7 km west of Ballina. Sensitive receivers surrounding the quarry are primarily rural and residential properties in coastal bushland with elevated and undulating topography. Five monitoring locations have been selected as part of the NMA and in accordance with the EPL and Development Consent and are shown in **Table 1-1**.

Table 1-1: Monitoring locations locality and sensitive receptors

Monitoring Locations	Nearest Receiver	Locality and Sensitive Receivers
NM1	R7	West of the quarry situated at a rural residential property at the end of Leadbeatters Lane
NM2	R3/R4	East of the quarry situated at a rural residential property on Teven Road
NM3	R2	South of the quarry situated at a rural residential property at the end of Wellers Road
NM4	R10	North of the quarry situated at a rural residential property adjacent the site off Stokers Lane
NM5	R14	Northeast of the quarry situated at a rural residential property of Teven Road

The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan shown in **Figure 1**.

Imagery@ESRI World Imagery

Legend

- Noise monitoring location
- Residential receiver location

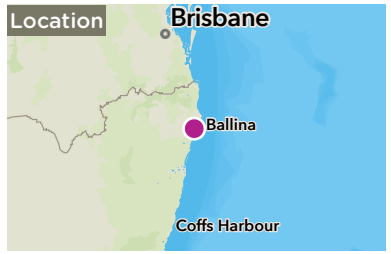

Figure 1 : Noise monitoring locations at Teven Quarry

2. NOISE CRITERIA

Table 2-1 summaries the applicable onsite noise criteria outlined in the NMP and Development Consent for residential receivers (NM1, NM2, NM3, NM4, NM5) surrounding the quarry.

Table 2-1: Monitoring locations and noise criteria

Receivers	Monitoring Locations	Day[1]	Evening[2]
		LAeq (15min)	LAeq (15min)
		dB(A)	
R3, R4, R13, R15, R16, R17, R18, R20	NM2	38	35
All other receivers	NM1, NM3, NM4, NM5	37	35

[1] 7 am–6 pm Monday to Saturday and 8 am–6 pm Sunday and public holidays

[2] 6 pm–10 pm Monday to Sunday

3. METHODOLOGY

The monitoring program was developed in accordance with the procedures described in *Australian Standard AS 1055:2018* and the Approval Documents referenced in **Section 1**. The measurements were completed using a RION Sound Level Meter NL-52 on Wednesday 11 October and Thursday 12 October 2023. The acoustic instrumentation used carries current NATA calibration and complies with *AS/NZS IEC 61672-1:2013/2002 Class 1*. Calibration of all instrumentation was checked prior to and following measurements using a Pulsar Acoustic Calibrator 105 which also carried a current NATA calibration and complies with IEC 60942:2003. Drift in calibration did not exceed ±0.3 dBA.

Attended noise monitoring was conducted for 15-minute periods at each location over two days. As per the NMP, two sets of measurements were completed during the day, and two sets of measurements were completed during the evening, at each monitoring location. It is noted that the quarry was not operational during the evening periods, however, monitoring was conducted as per requirements of the EPL.

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

4. RESULTS AND DISCUSSION

4.1 Location NM1

Noise monitoring at location NM1 was completed on Wednesday 11 October and Thursday 12 October 2023. The quarry was not audible during any monitored period during the day and evening, with the ambient noise environment dominated by wind, trees, and birds. The quarry was not operational during the evening period. These results indicate that noise emissions from Teven Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring event at Location NM1 are presented in **Table 4-1**.

Table 4-1: Noise survey results and observations for Location NM1

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Teven Quarry LAeq(15min) Contribution	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90				
12-10-2023	10:27am to 10:42am (Day)	87.8	56.3	27.8	WD: n/a WS: 0 m/s Rain: Nil	Background wind/trees 25-35 Car passing 88 Birds 30-53 Quarry inaudible	<18	37
12-10-2023	10:44am to 12:59am (Day)	57.9	36.3	27.3	WD: n/a WS: 0 m/s Rain: Nil	Background wind/trees 25-33 Birds 40-57 Quarry inaudible	<17	37
11-10-2023	6:00pm to 6:15pm (Evening)	69.7	48.4	39.5	WD: 50° WS: 3.1 m/s Rain: Nil	Background wind/trees/birds 36-69 (only exceeded 50dBA for period of 23 secs) Quarry not operational	n/a[1]	35
11-10-2023	6:17pm to 6:32pm (Evening)	70.8	53.0	42.8	WD: 50° WS: 3.1 m/s Rain: Nil	Background wind/trees/birds only exceeded 50dBA for a period of 18 secs Quarry not operational	n/a[1]	35

[1] quarry not operational.

4.2 Location NM2

Noise monitoring at location NM2 was completed on Wednesday 11 October and Thursday 12 October 2023. The quarry was not audible during any monitored period during the day and evening, with the ambient noise environment dominated by wind, trees, birds, insects, an aircraft, a lawn mower and passing cars on Teven Road. The quarry was not operational during the evening period. These results indicate that noise emissions from Teven Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location NM2 are presented in **Table 4-2**.

Table 4-2: Noise survey results and observations for Location NM2

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Teven Quarry LAeq(15min) Contribution	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90				
12-10-2023	12:38pm to 12:53pm (Day)	81.0	58.8	42.2	WD: 10° WS: 3.6 m/s Rain: Nil	Background wind/trees/birds/lawn mower 39-50 Cars passing on Teven Road 50-81 Quarry inaudible	<32	38
12-10-2023	12:53pm to 1:08pm (Day)	84.5	60.3	45.1	WD: 10° WS: 3.6 m/s Rain: Nil	Background wind/trees/birds 40-50 Cars passing on Teven Road 50-85 Quarry inaudible	<35	38
11-10-2023	8:04pm to 8:19pm (Evening)	61.6	41.1	37.4	WD: n/a WS: 0 m/s Rain: Nil	Background motorway/ insects 37-39 Cars passing on Teven Road 43-58 Quarry inaudible	n/a[1]	35
11-10-2023	8:20pm to 8:35pm (Evening)	61.1	40.2	36.9	WD: n/a WS: 0 m/s Rain: Nil	Background motorway/insects 36-38 Cars passing on Teven Road 49 Aircraft 36-48 (30 seconds) Quarry inaudible	n/a[1]	35

[1] quarry not operational.

4.3 Location NM3

Noise monitoring at location NM3 was completed on Wednesday 11 October and Thursday 12 October 2023. The quarry was not audible during any monitored period during the day and evening, with the ambient noise environment dominated by background motorway traffic, insects, wind, and a car. The quarry was not operational during the evening period. These results indicate that noise emissions from Teven Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location NM3 are presented in **Table 4-3**.

Table 4-3: Noise survey results and observations for Location NM3

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Teven Quarry LAeq(15min) Contribution	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90				
12-10-2023	1:13pm to 1:28pm (Day)	59.8	42.9	39.1	WD: 10° WS: 3.7 m/s Rain: Nil	Background motorway/insects/wind 36-60 Birds 40-42 Quarry inaudible	<29	37
12-10-2023	1:28pm to 1:43pm (Day)	58.4	43.7	38.6	WD: 10° WS: 3.7 m/s Rain: Nil	Background motorway/insects/wind 35-58 Birds 40-46 Quarry inaudible	<29	37
11-10-2023	8:42pm to 8:57pm (Evening)	69.5	44.9	44.9	WD: n/a WS: 0 m/s Rain: Nil	Background motorway/insects 43-45 Aircraft 70 Quarry inaudible	n/a[1]	35
11-10-2023	8:57pm to 9:12pm (Evening)	59.1	46.1	46.1	WD: n/a WS: 0 m/s Rain: Nil	Background motorway/insects 43-45 Car 46-59 Quarry inaudible	n/a[1]	35

[1] quarry not operational.

4.4 Location NM4

Noise monitoring at location NM4 was completed on Wednesday 11 October and Thursday 12 October 2023. The quarry was audible during both monitored day periods. During the first day period two offsite Holcim quarry trucks were observed and measured entering the site, however as this was offsite vehicle movement it doesn't constitute as a contributor to the quarry contribution. Holcim alrams were also observed and measured for up to 10 seconds on two occasions, however, are below the 15min L_{Aeq} criteria using sound level exposure calculations included in **Appendix 1**. During the second day period a Holcim tipper and Holcim alarms were observed and measured for up to four seconds on two occasions, however both are below the 15min L_{Aeq} criteria using sound level exposure calculations included in **Appendix 1**. Holcim crushing and screening equipment was observed continuously through this same period and a sound level exposure calculation was used to determine a quarry contribution of 43 dBA 15min L_{Aeq}. It should be noted that the monitoring was completed close to Stokers Lane at the entrance to the residence as to not disturb the resident, however, this puts the attended noise monitoring location in direct line-of-sight of the quarry rather than near the sensitive receptor, i.e., the resident. A calculated cumulative noise level 15min L_{Aeq} result was adopted for distance correction to receiver using noise emission level calculations in **Appendix 1**. The quarry was not operational during the evening period. These results indicate that noise emissions from Teven Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location NM4 are presented in **Table 4-4**.

Table 4-4: Noise survey results and observations for Location NM4

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Teven Quarry LAeq (15min) Contribution	LAeq (15min) Criteria (dBA)
		LAmax	LAeq	LA90				
12-10-2023	9:32am to 9:47am (Day)	68.8	50.0	40.8	WD: n/a WS: 0 m/s Rain: Nil	Birds 40-60 Aircraft 47-54 Holcim trucks entering site 54-68 (twice for approx. 10 secs each) Holcim alarms 43-45 (twice briefly) Quarry audible	28	37
12-10-2023	9:49am to 10:04am (Day)	64.9	47.3	40.1	WD: n/a WS: 0 m/s Rain: Nil	Birds 41-60 Aircraft 40-50 (once for 30 secs) Insects 41-56 (continuous sporadic) Holcim tipper 47-51 (once for 3 secs) Holcim alarms 41-42 (twice for 4 secs each) Holcim crusher/screening equipment 41-43 (continuous) Quarry audible	37[2]	37

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Teven Quarry LAeq (15min) Contribution	LAeq (15min) Criteria (dBA)
		LAmax	LAeq	LA90				
11-10-2023	7:28pm to 7:43pm (Evening)	58.2	45.6	42.7	WD: n/a WS: 0 m/s Rain: Nil	Background motorway/insects/frogs 41-58 Quarry inaudible	n/a[1]	35
11-10-2023	7:44pm to 7:59pm (Evening)	62.5	43.1	42.0	WD: n/a WS: 0 m/s Rain: Nil	Background motorway/insects/frogs 41-43 Aircraft 47-62 (occurred once for 26 secs) Quarry inaudible	n/a[1]	35

[1] quarry not operational.

[2] value estimated based on distance correction to receiver location in calculation in **Appendix 1**.

4.5 Location NM5

Noise monitoring at location NM5 was completed on Wednesday 11 October and Thursday 12 October 2023. The quarry was not audible during any monitored period during the day and evening, with the ambient noise environment dominated by background motorway traffic, wind, trees, insects, birds, aircraft, passing cars on Teven Rd and a lawn mower on a nearby property. The quarry was not operational during the evening period. These results indicate that noise emissions from Teven Quarry did not contribute to noise nuisance during this time. The results and observations taken during the monitoring events at Location NM5 are presented in **Table 4-5**.

Table 4-5: Noise survey results and observations for Location NM5

Date	Time (hrs)	Descriptor (dBA)			Meteorology	Description and SPL, dBA	Teven Quarry LAeq(15min) Contribution	LAeq(15min) Criteria
		LAmax	LAeq	LA90				
12-10-2023	11:07am to 11:22am (Day)	87.5	62.2	38.7	WD: 40° WS: 1.7 m/s Rain: Nil	Background wind/birds 38-40 Aircraft 40-45 occurred once for 28 secs, cars passing on Teven Rd occurred 8 times approx. 15 secs each 40-87, mower on nearby residence 40-47 Quarry inaudible	<29	37
12-10-2023	11:22am to 11:33am (Day)	89.1	65.6	41.4	WD: 40° WS: 1.4 m/s Rain: Nil	Background wind/birds/mower 44-49 Aircraft 39-46 occurred once, passing cars occurred 8 times for approx 15 seconds each 50-90 Quarry inaudible	<31	37
11-10-2023	6:49pm to 7:04pm (Evening)	62.1	43.5	37.4	WD: 52° WS: 1.3 m/s Rain: Nil	Background motorway/birds/trees/insects exceeded 40dBA for 16 seconds 34-62 Aircraft 40-48 occurred once for 50 seconds Quarry not operational	n/a[1]	35
11-10-2023	7:05pm to 7:20pm (Evening)	61.6	51.8	39.4	WD: 52° WS: 1.3 m/s Rain: Nil	Background motorway/birds/trees/insects exceeded 40dBA for 20 seconds in the first 10 minutes. At 10 minutes, 50-61 frogs (continuous) Quarry not operational	n/a[1]	35

[1] quarry not operational.

5. CONCLUSION

This NMA completed by Ramboll at the Holcim Teven Quarry, Teven, NSW as a quarterly requirement of the NMP. Noise monitoring was completed on Wednesday 11 October and Thursday 12 October 2023 at five locations selected as representative to the sensitive receptors at the surroundings to Teven Quarry.

Noise was audible from the quarry and offsite site vehicles during both day periods at NM4. Audible quarry noise at NM4 showed compliance with onsite noise requirements of the NMP and Development Consent for residential receivers. Monitoring at NM4 was completed at the gate of the residence, in direct line-of-sight of the quarry and subsequently, noise emission level calculations were required to estimate quarry contribution and it is acknowledged that this methodology has limitations. Moving this location within closer proximity of the residence for subsequent monitoring periods is recommended to better capture the noise impacts at the receptor, however it is acknowledged that resident approval will be required to gain access onto the property. The quarry was not operational during the evening period. The quarry was not audible at any other location or period during the monitoring campaign.

The results presented in this NMA show compliance with the relevant noise criteria at the Holcim Teven Quarry, Teven, NSW.

6. REFERENCES

Holcim Australia (2021) *Teven Quarry, Noise Management Plan*.

Minister for Planning and Environment (2015) 'Development Consent SSD_6422, Teven Quarry Project'.

NSW EPA (2021) Environment Protection Licence number 3293.

NSW EPA (2013) *Noise Guide for Local Government*. Sydney NSW: NSW Environment Protection Authority. Available at: https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/20130127nglg.pdf (Accessed: 25 October 2022).

NSW EPA (2017) *Noise Policy for Industry (NPfI)*. Sydney NSW: NSW Environment Protection Authority. Available at: https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/17p0524-noise-policy-for-industry.pdf (Accessed: 25 October 2022).

Standards Australia (2018) *AS 1055:2018 Acoustics—Description and measurement of environmental noise*. Australian Standard. Available at: https://infostore.saiglobal.com/preview/825367946534.pdf?sku=1131503_SAIG_AS_AS_2626154 (Accessed: 19 January 2023).

Standards Australia (2003) *AS 60942:2003 Electroacoustics - Sound calibrators.* Australian Standard.

APPENDIX 1
SOUND EXPOSURE LEVEL AND NOISE EMISSION LEVEL CALCULATIONS

Project No: 318001799
Client Name: Holcim Australia Pty Ltd
Project Name: NSW Environmental Monitoring
Project Site: Teven Quarry
1/02/2024

Sound Exposure Level Calculations

RAMBOLL

NM4 day monitoring period (9:32AM to 9:47AM)

Noise source	Holcim alarms
Meas. Dist from source (m)	260
Meas. Time (s)	10
Meas. LAeq dB	45
Calc Sel dB	**55**
No. Events in 15min	2
Total LAeq (15min)	**28**

NM4 day monitoring period (9:49AM to 10:04AM)

Noise source	Holcim tipper
Meas. Dist from source (m)	260
Meas. Time (s)	3
Meas. LAeq dB	51
Calc Sel dB	**56**
No. Events in 15min	1
Total LAeq (15min)	**26**

Noise source	Holcim alarms
Meas. Dist from source (m)	260
Meas. Time (s)	4
Meas. LAeq dB	42
Calc Sel dB	**48**
No. Events in 15min	2
Total LAeq (15min)	**21**

Noise source	Holcim crusher/ screening equipment
Meas. Dist from source (m)	260
Meas. Time (s)	900
Meas. LAeq dB	43
Calc Sel dB	**73**
No. Events in 15min	1
Total LAeq (15min)	**43**

Cumulative SEL of tipper, alarms and crusher/screening equipment	**43**

Project No: 318001799
Client Name: Holcim Australia Pty Ltd
Project Name: NSW Environmental Monitoring
Project Site: Teven Quarry
1/02/2024

Noise Emission Level Calculation

RAMBOLL

NM4 day monitoring period (9:49AM to 10:04AM)

Site contribution corrected for distance from monitoring location to receiver

Noise source	Holcim crusher/ screening equipment
Estimated site contribution (LAeq) at monitoring location (dBA)	43.1
Approx. distance from monitoring location to site (m)	315
Approx. distance from site to receiver (m)	500
Distance corrected site contribution at receiver (LAeq dBA)	**39.1**
Estimated additional attenuation (vegetation)	2
Estimated site contribution at receiver (dBA)	**37.1**

APPENDIX 2: SURFACE WATER QUALITY RESULTS

Discharge via LDP1

Date	pH	Total Suspended Solids (mg/L)	Oil and Grease
24/2/23	7.87	<1	**0**
25/2/23	6.57	1	**0**
3/4/23	7.75	<1	**0**
4/4/23	7.79	<1	**0**
20/4/23	7.66	41	**0**
21/4/23	7.82	37	**0**
24/4/23	7.91	49	**0**

APPENDIX 3:INDEPENDENT ENVIRONMENTAL AUDIT ACTION PLAN (2023)

Reference	Approval or licence requirement	Evidence collected 2022	Audit Finding	Audti Finding Compliance status
Development Consent (SSD 6422)				
16	To ensure that strategies, plans and programs required under this consent are updated on a regular basis, and that they incorporate any appropriate additional measures to improve the environmental performance of the development, the Applicant may at any time submit revised strategies, plans or programs for the approval of the Secretary. With the agreement of the Secretary, the Applicant may also submit any strategy, plan or program required by this consent on a staged basis. With the agreement of the Secretary, the Applicant may prepare a revision of or a stage of a strategy, plan or program without undertaking consultation with all parties nominated under the applicable condition in this consent. Notes: • While any strategy, plan or program may be submitted on a staged basis, the Applicant will need to ensure that the existing operations on site are covered by suitable strategies, plans or programs at all times. • If the submission of any strategy, plan or program is to be staged; then the relevant strategy, plan or program must clearly describe the specific stage/s of the development to which the strategy, plan or program applies; the relationship of this stage/s to any future stages; and the trigger for updating the strategy, plan or program.	Teven Quarry (TQ) EMS April 2021 TQ Blast Management Plan Sept. 2021 TQ Transport Management Plan April 2021 TQ Air Quality Management Plan May 22 TQ Biodiversity & Rehabilitation Management Plan Nov. 2021 TQ Noise Management Plan April 2021 TQ Water Management Plan March 2022	There is no intent to stage the development. The various management plans listed have been prepared and submitted to DPE and other departments and Council as part of the review process. DPE have highlighted a number of issues that need to be addressed in order for the plans to be approved. Plan updates and improvements were ongoing at the time of the audit.	Not-compliant
17	Until they are replaced by an equivalent strategy, plan or program approved under this consent, the Applicant shall implement the existing strategies, plans or programs for the site that have been approved under previous consents.	As above	There is no intent to stage the development. The various management plans listed have been prepared and submitted to DPE and other departments and Council as part of the review process. DPE have highlighted a number of issues that need to be addressed in order for the plans to be approved. Plan updates and improvements were on going at the time of the audit.	Not-compliant
18	The Applicant shall: (a) provide annual quarry production data to DRE using the standard form for that purpose; and	TQ Annual Review 2019, 2020 and 2021.	Report form not available	Not-compliant
	(b) include a copy of this data in the Annual Review (see condition 4 of Schedule 5).	Annual Review Teven Quarry 2019, 2020 and 2021.	Copy of report not included in AR	Not-compliant
Schedule 3 - Environmental Performance Conditions				
10	The Applicant shall prepare and implement a Blast Management Plan for the development to the satisfaction of the Secretary. This plan must: (a) be submitted to the Secretary for approval within 6 months of the date of this consent, unless otherwise agreed by the Secretary;	TQ Blast Management Plan 2021	Blast Management Plan 2021 developed and has been submitted to DPE for review and approval. Some outstanding matters to be resolved by TQ prior to approval of the plan.	Not-compliant
14	The Applicant shall prepare and implement an Air Quality Management Plan for the development to the satisfaction of the Secretary. This plan must: (a) be submitted to the Secretary for approval within 6 months of the date of this consent, unless otherwise agree by the Secretary;	Air Quality Management Plan 2021. Site observation	TQAQMP submitted to DPIE for review and DPE October 2020 required alterations to the plan which have not been addressed.	Not-compliant
29	The Applicant shall prepare and implement a Biodiversity and Rehabilitation Management Plan for the site to the satisfaction of the Secretary. This plan must: (a) be prepared in consultation with OEH, and be submitted to the Secretary for approval within 6 months of the date of this consent, unless the Secretary agrees otherwise;	Biodiversity and Rehabilitation Management Plan Nov 2021 (BRMP). Previous Audit Findings GHD 2020.	BRMP was available on the TQ website at the time of the audit. The previous version of the plan was compliant in the last audit. The August 2020 BRMP was submitted to DPE in August 2020 and DPE provided comments on 7/10/2020. Holcim submitted the updated document to BCD (Now BCS) on 4/2/2021. BCD provided feedback on the BRMP on the 9/3/2021. Holcim addressed BCS and DPE comments in appendix A of the BRMP. At the time of the audit no evidence could be found that the current version of the BRMP was approved by DPE.	Not-compliant

33	The Applicant shall: (a) manage on-site sewage treatment and disposal in accordance with the requirements of its EPL, and to the satisfaction of the EPA and Council;	Site observations	On site sewage is regulated by the Local government Act. The system was installed prior to 2017 when council updated its OSSM policy. The sytem is in low risk setting with a small number of non residential users and an adequate effluent disposal area. At the time of the audit an approval to operate the system from BSC was not available.	Not-compliant
Schedule 5 - Environmental Management, Reporting and Auditing				
1	The Applicant shall prepare and implement an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must: (a) be submitted to the Secretary for approval within 6 months of the date of this consent;	TQ Environmental Management Strategy April 2021 Update (TQEMS). Independent Environmental Audit 2020.	The 2020 IEA by GHD found that the original EMS was submitted. Section 2.2 of the EMS 2021 states that an updated EMS was submitted to DPE in August 2020 and Holcim received comments in October 2020. DPE's comments were addressed and the response to DPE comments are in Appendix A of the EMS. No evidence of DPE approval of the EMS is provided in its current form.	Not-compliant
4	By the end of March each year, or other timing as may be agreed by the Secretary, the Applicant shall review the environmental performance of the development to the satisfaction of the Secretary. This review must: (a) describe the development (including any 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;	Pers. Comm Matt Kelly. TQ Annual Reviews 2019, 2020 and 2021.	Annual reviews prepared and submitted to DPE. Annual review for 2021 not available at the time of the audit.	Not-compliant
8	The Applicant shall provide regular reporting on the environmental performance of the development on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent.	Annual Reviews uploaded to Holcim website	The annual review for 2021 has not been submitted or displayed in a timely fashion.	Not-compliant
Environment Protection Licence - EPL 3293				
O4.7	Each sedimentation basin must have a marker (the "sedimentation basin marker") that identifies the upper level of the sediment storage zone.	Site observations	No marker observed	Not-compliant
O4.8	Whenever the level of liquid and other material in any sedimentation basin exceeds the level indicated by the sedimentation basin marker, the licensee must take all practical measures as soon as possible to reduce the level of liquid and other material in the sedimentation basin.	Site observations	No marker observed	Not-compliant

O4.11	The level of sediment in any sedimentation basin on the premises must be maintained below the upper level indicated by the sedimentation marker.	Site observations	No Marker observed	Not-compliant
M1.3 **M5.2**	b) the time(s) at which the sample was collected;	Sample records	Time not recorded	Not-compliant
	b) the method by which the complaint was made;	Holcim Complaint Register - Teven	Method not recorded	Not-compliant
	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;	Holcim Complaint Register - Teven	More recent record included some personal details	Not-compliant

Audit Action Reference	Holcim Response / Action	Holcim Response / Action Timeframe	Status
.			
Plans Require finalisation and approval from DPE.	Plans to be reviewed and updated if necessary as (per conditions of consent) with regard to this IEA and the 2022 Annual Report to be submitted on 31 March.	30/06/2023	Completed
Finalise and have plans approved by DPE.	Plans to be reviewed and updated if necessary as (per conditions of consent) with regard to this IEA and the 2022 Annual Report to be submitted on 31 March.	30/06/2023	Completed
Include report form or lodgement screen shot in Annual Review, or delete condition from consent.	The online form was completed. Moving forwards a screenshot of the submisision will be kept for records.	N/A	Completed
Include report form or lodgement screen shot in Annual Review, or delete condition from consent.	The production data was included in Table 7 of each the 2019, 2020 and 2021. Annual Reviews	N/A	Completed
	Plans to be reviewed and updated if necessary as (per conditions of consent) with regard to this IEA and the 2022 Annual Report to be submitted on 31 March.	30/06/2023	Completed
	Plans to be reviewed and updated if necessary as (per conditions of consent) with regard to this IEA and the 2022 Annual Report to be submitted on 31 March.	30/06/2023	Completed
Request final approval from DPE to the BRMP	Plans to be reviewed and updated if necessary as (per conditions of consent) with regard to this IEA and the 2022 Annual Report to be submitted on 31 March.	30/06/2023	Completed

Seek approval to operate the system from BSC.	The Teven Quarry Manager emailed Ballina Council on 13 March 2023 requesting a copy of the approval to operate. Council responsed on 27 March 2023 and advised '*There is no record of an OSSM approval to operate for the Teven Quarry. Please fill out the attached form and send back to Council and an approval to operate certificate will be issued. The attached form has an inspection checklist which will need to be completed by a NSW licensed plumber and drainer. However, if the OSSM system is an AWTS which gets serviced quarterly then you will only need to submit the latest service report along with the application form attached (the inspection checklist does not need to be filled out in this case).* ' Holcim to engage plumber to completre checklist and submit form.	30/06/2023	Completed
Submit updated EMS for DPE Approval and append approval to Appendix A of the EMS when obtained.	EMS to be reviewed and updated if necessary as (per conditions of consent) with regard to this IEA and the 2022 Annual Report to be submitted on 31 March.	30/06/2023	Completed
Prepare annual review and submit.	The 2021 Annual Review was completed and submitted to DPIE. IT is available on the Holcim Teven Website at: https://www.holcim.com.au/ about-us/community-link/teven-quarry-teven- ballina-nsw	N/A	Completed
	The 2021 Annual Review was completed and submitted to DPIE. IT is available on the Holcim Teven Website at:	N/A	Completed
	In agreement with the EPA the marker is to be reinstated following the current onoing clear out of dam. The works are estimated to be completed by 28 April 2023	28/04/2023	Completed
	In agreement with the EPA the marker is to be reinstated following the current onoing clear out of dam. The works are estimated to be completed by 28 April 2023	28/04/2023	Completed

	In agreement with the EPA the marker is to be reinstated following the current onoing clear out of dam. The works are estimated to be completed by 28 April 2023	28/04/2023	Completed
	Sampling periods are monthly for Dust Deposition and 24 hourly for PM10. Time the sample was collected is therefore the date. The time the sampe was provided to the lab is on the Chain of Custody certificate.	N/A	Completed
N/A	Teven Quarry Manger to create procedure for complaints to include method of reporting.	31/03/2023	Completed
N/A	Teven Quarry Manger to create procedure for complaints to include method of reporting.	31/03/2023	Completed