

ANNUAL REVIEW
1 January 2021 – 31 December 2021

Jandra Quarry

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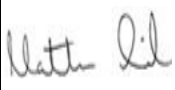
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SITE DETAILS

Name of operation	Jandra Quarry
Name of operator	Holcim (Australia) Pty Ltd
Development consent / project approval #	DA 213-10-99 (Modification 5)
Name of holder of development consent / project approval	Holcim (Australia) Pty Ltd
Annual Review start date	January 1, 2021
Annual Review end date	December 31, 2021
<p>I, Matt Neil, certify that this audit report is a true and accurate record of the compliance status of Jandra Quarry for the period of January 1, 2021 - December 31, 2021 and that I am authorised to make this statement on behalf of Holcim (Australia) Pty Ltd.</p> <p><i>Note.</i></p> <p>a) _ <i>The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.</i></p> <p>b) _ <i>The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or \$22,000, or both).</i></p>	
Name of authorised reporting officer	Matt Neil
Title of authorised reporting officer	Quarry Manager
Signature of authorised reporting officer	
Date	30/03/2022

1 STATEMENT OF COMPLIANCE

See **Table 1** for statement of commitments for the 2021 reporting period for Jandra Quarry. **Table 3** details the non-compliances identified within the reporting period.

Table 1: Statement of Commitments

Were all conditions of the relevant approval(s) complied with?	
DA 213-10-99 (Mod 5)	No
EPL No. 2796	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: <ul style="list-style-type: none"> • potential for serious environmental consequences, but is unlikely to occur; or • potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> • potential for moderate environmental consequences, but is unlikely to occur; or • potential for low environmental consequences, but is likely to occur
Admin NC	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

Table 3: Non-Compliances for 2021

Relevant Approval	Condition #	Condition description (summary)	Compliance status	Section addressed in Annual Review/Comment
DA 213-10-99 (Mod 5)	Schedule 3 Condition 15	<p>Meteorological Monitoring</p> <p>For the life of the development, the Applicant shall ensure that there is a suitable meteorological station operating in the vicinity of the site that complies with the requirements in the Approved Methods for Sampling of Air Pollutants in New South Wales guideline.</p>	<p>Low Risk Non-Compliant</p>	<p>Section 6.1 – Meteorological Monitoring</p> <p>Site meteorological station was not functioning correctly for July, August and September 2021. Therefore, complete monitoring results could not be collected for this period. The site referred to BOM data during this period.</p>
DA 213-10-99 (Mod 5)	Schedule 3 Condition 10	<p>Air Quality Impact Assessment Criteria</p> <p>The Applicant shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedances of the criteria listed in Tables 5, 6 and 7 at any residence on privately-owned land.</p>	<p>Low Risk Non-Compliant</p>	<p>Section 6.3 Air Quality</p> <p>Depositional dust results were not available for December 2021 due to the sample bottle being damaged. Therefore, the annual averages are calculated from 11 months of data, rather than 12. In addition, there was no result for November recorded for DDG2.</p> <p>It should be noted results recorded were consistently below the criteria levels during recorded months.</p>
DA 213-10-99 (Mod 5)	Schedule 3 Condition 1	<p>Noise - Noise Criteria</p> <p>The Applicant shall ensure that the noise generated by the development does not exceed the criteria in Table 2 or Table 3 at any residence on privately-owned land.</p>	<p>Low Risk Non-Compliant</p>	<p>Exceedance at R2 Morning Shoulder result in the Quarter 1. This result was impacted by uncommon overburden</p>

Relevant Approval	Condition #	Condition description (summary)	Compliance status	Section addressed in Annual Review/Comment																																				
EPL2796	L4.2 Noise limits	<p>Table 2: Noise criteria – quarrying operations only dB(A)</p> <table border="1" data-bbox="611 316 1420 467"> <thead> <tr> <th>Location</th> <th>6 am – 10 pm (L_{Aeq}(15 min))</th> </tr> </thead> <tbody> <tr> <td>R1</td> <td>46</td> </tr> <tr> <td>R5</td> <td>40</td> </tr> <tr> <td>R2, R4, R6</td> <td>36</td> </tr> <tr> <td>R7</td> <td>35</td> </tr> </tbody> </table> <p>Table 3: Noise criteria – quarrying operations & asphalt plant production combined dB(A)</p> <table border="1" data-bbox="611 507 1420 711"> <thead> <tr> <th rowspan="2">Location</th> <th rowspan="2">6 am – 10 pm (L_{Aeq}(15 min))</th> <th colspan="2">10 pm – 6 am</th> </tr> <tr> <th>(L_{Aeq}(15 min))</th> <th>(L_{A1}(1 min))</th> </tr> </thead> <tbody> <tr> <td>R1</td> <td>48</td> <td>46</td> <td>51</td> </tr> <tr> <td>R5</td> <td>41</td> <td>39</td> <td>51</td> </tr> <tr> <td>R4</td> <td>40</td> <td>39</td> <td>51</td> </tr> <tr> <td>R2, R6</td> <td>40</td> <td>35</td> <td>48</td> </tr> <tr> <td>R7</td> <td>36</td> <td>35</td> <td>48</td> </tr> </tbody> </table> <p>Notes:</p> <ul style="list-style-type: none"> Receiver locations are shown on the figure in Appendix 2. Condition 10 of Schedule 2 prohibits quarrying operations during the hours 10 pm – 6 am. 	Location	6 am – 10 pm (L _{Aeq} (15 min))	R1	46	R5	40	R2, R4, R6	36	R7	35	Location	6 am – 10 pm (L _{Aeq} (15 min))	10 pm – 6 am		(L _{Aeq} (15 min))	(L _{A1} (1 min))	R1	48	46	51	R5	41	39	51	R4	40	39	51	R2, R6	40	35	48	R7	36	35	48		<p>maintenance being done at the site at the time of monitoring. Immediate and long-term corrective actions were taken to address this. This exceedance was not consistent with the results of previous years.</p>
Location	6 am – 10 pm (L _{Aeq} (15 min))																																							
R1	46																																							
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R7	36	35	48																																					

2 INTRODUCTION

Holcim (Australia) Pty Ltd (Holcim) operates Jandra Quarry, a hard rock quarry located on the Pacific Highway, Possum Brush in the Greater Taree Local Government Area. The site operates under Development Consent (DA -213-10-99 Modification 5) approved by the then New South Wales (NSW) Department of Planning and Environment (DPE) (now Department of Planning, Industry and Environment (DPE)) on 13 March 2015.

The site also operates in accordance with Environment Protection Licence (EPL) No. 2796 issued by the Environmental Protection Authority (EPA). A regional locality figure and aerial view of the site are outlined in **Figure 1** and **Figure 2** below.

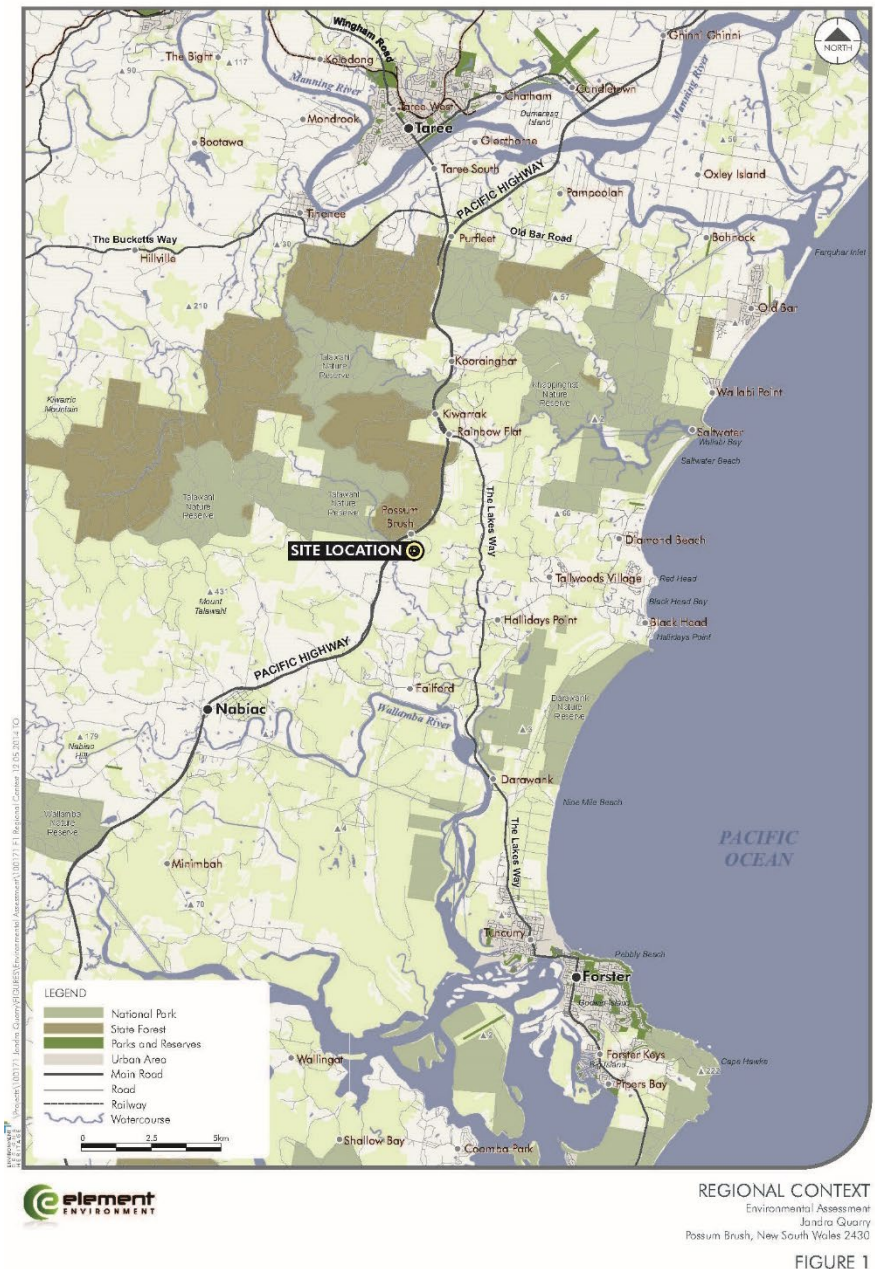


Figure 1: Regional Locality (Umwelt, 2012 as in Element Environment, 2014, Environmental Assessment)



Figure 2: Jandra Quarry Operation – Source: Umwelt August 2012

In accordance with Schedule 5, Condition 4 of the modified Development Consent the site is required to undertake an Annual Review of the site. This Annual Review has been prepared in accordance with Schedule 5 Condition 4 (Annual Performance Monitoring) of the Development Consent and in accordance with the *Annual Review Guideline: Post Approvals Requirements for State Significance Mining Developments* (October 2015). The Annual Review requirements and the section where they have been addressed in this document have been provided in **Table 4**.

Table 4: Annual Review Requirement

Condition	Section in Annual Review
<p>4. Annual Review</p> <p>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:</p> <p>(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;</p>	Section 4 and 6
<p>(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:</p> <ul style="list-style-type: none"> - the relevant statutory requirements, limits or performance measures/criteria; - the monitoring results of previous years, and - the relevant predictions in the documents listed in condition 2 of Schedule 2; 	Section 6 and 7
<p>(c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;</p>	Section 1 and 11
<p>(d) identify any trends in the monitoring data over the life of the development;</p>	Section 6 and 7
<p>(e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and</p>	Section 6
<p>(f) describe what measures will be implemented over the current calendar year to improve the environmental performance of the development</p>	Section 12

2.1 Name and Contact Details

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3 APPROVALS

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

Table 5: Approvals for Jandra Operations

Approval	Regulatory Authority
DA 213-10-99 (Modification No. 5)	NSW Department of Planning & Environment
EPL No. 2796	NSW Environmental Protection Authority

Holcim holds EPL 2796 which covers its activities at Jandra Quarry. **Table 6** outlines the EPL licensing limits.

Table 6: EPL Fee-Based Activity at Jandra Quarry

Scheduled Activity	Fee Based Activity	Scale
Crushing, grinding or separating	Crushing, grinding or separating	> 100,000 – 500,000 T processed
Extractive activities	Land-based extractive activity	>100,000 – 500,000 T extracted, processed or stored
Resource recovery	Recovery of general waste	Any waste recovered
Waste storage	Waste storage – other types of waste	Any other types of waste stored

Jandra Quarry requested a review of EPL 2796 in 2021. On 27 August 2021 the EPA issued a variation of EPL 2796. The variations to the EPL were related to noise and air quality monitoring.

Schedule 2 Condition 8 outlines the approved extraction limit is 490,000 tonnes of quarry products from the site in any calendar year. An outline of 2021 production is outlined in **Section 4.4**.

4 OPERATIONS SUMMARY

4.1 Exploration

No exploration activities were completed during the Annual Review period.

4.2 Land Preparation

No land preparation (clearing) occurred within the project boundary during the Annual Review period.

4.3 Construction Activities

There was no construction undertaken during the Annual Review period.

4.4 Quarry Operations

Development activities undertaken at Jandra Quarry in 2021 included:

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

In addition to routine activities, Jandra Quarry undertook planning and preparation activities for planned upgrades to the wash plant in 2022.

Extraction and processing operations in 2021 were undertaken between 6am and 10pm, Monday to Friday and between 6am and 6pm on Saturdays. Transportation operations in 2021 were undertaken between 6am and 10pm, Monday to Saturday. These timeframes are in accordance with the permissible hours outlined in Schedule 2, Condition 10 of the Development Consent DA 213-10-99 (Modification 5) dated 13 March 2015.

Table 7 includes a summary of the operations undertaken during the reporting period against the development consent conditions regarding product transported from Jandra Quarry.

Table 7: Total Product Distributed (Jandra Quarry)

Material	Approved Limit (Schedule 2, Condition 8 & 9)	2018	2019	2020	2021	Next Reporting Period (2022)
Product Extracted Total	490 000 T	252,165 T	323,930	328,114	325,414	350,000
Product Sales Total	475 000 T	257,016 T	403,317	310,759	465,466	420,000

Schedule 2 Condition 7 outlines the applicant shall not extract more than 16.5 million tonnes of quarry product per year under this consent. This consent was granted on 13 March 2015. From the start of 2015 to the end of 2021, the site has extracted approximately 2,112,561 tonnes which is well within the limits of the Development Consent. The cumulative production is shown in **Table 8**.

Table 8: Cumulative Production for Development Consent

Year	Extraction Tonnage
2015	232,028
2016	315,205
2017	335,705
2018	252,165
2019	323,930
2020	328,114
2021	325,414
TOTAL	2,112,561

4.5 Next Reporting Period

Operational activities proposed to be carried out at Jandra Quarry in 2022, include:

- Upgrade of existing wash plant;
- Installation of new screen in secondary plant;
- Stripping of topsoil and overburden within the existing extraction limit boundary;
- Drill, blast, load and haul activities;
- Crushing, screening and stockpiling of product;
- Establishment of mobile conveyors in the stockpile area; and
- Progressive maintenance of rehabilitation.

5 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

5.1 Actions from 2020 Annual Review – DPE Review

A letter from DPE dated 13 September 2021 outlined review comments on the previous Annual Review. These comments and any associated actions Jandra has taken are outlined in **Table 9**.

Table 9: Actions from the 2020 Annual Review – DPE

DPE Comment	Site Comment / Where Addressed in this Annual Review
The 2020 Annual Review outlines that there were 4 instances where PM10 concentrations either exceeded the 24 hour criteria tabled in Schedule 3 condition 10 or were not sampled or measured. Consistent with our previous advice following the 2018 and 2019 Annual Reviews, all incidents are to be reported to the Department in accordance with Schedule 5 condition 6 of the consent.	All incidents detected in this 2021 Annual Review have been summarized and described in this Annual Review.
During the reporting period, Holcim commenced reviewing the environmental management plans for Jandra Quarry (including the Noise & Blast Management Plan, Air Quality Management Plan and Soil & Water Management Plan) and that Holcim intends to submit these to the Department for the Secretary's approval this calendar year. To ensure that the incident reporting requirements of Schedule 5 condition 6 are met, the reviews should assess the adequacy of the incident notification and reporting measures. It is important to note that incidents that must be reported are 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 the consent.	Environmental Management Plans submitted for approval address Schedule 5 Condition 6 by outlining incident procedures.
Lastly, I note that records for the transport of quarry products is not currently up-to-date on the website. Please ensure this is updated quarterly per Schedule 3 condition 33 of the consent.	Transport records have been uploaded to the Jandra Quarry website, up to date to Quarter 4 of 2021, as per Schedule 3 Condition 33 of the Consent.

5.2 Actions from 2020 Annual Review – Holcim Proposed Actions

Table 10 outlines an update on the proposed Holcim actions from the previous Annual Review.

Table 10: Proposed Actions from Holcim

Improvement Measure	Activities	Works Undertaken
Progressive Rehabilitation	The site will continue to progressively rehabilitate available areas.	Rehabilitation preparation and maintenance was undertaken in 2021, as well as rehabilitation planning for RL 62, 74, and 86 in 2022. Refer to Section 8 for more detail.
Management of	Continue inspections and assessment of	Routine inspections undertaken for

Improvement Measure	Activities	Works Undertaken
bushfire areas	the recovery of those rehabilitation areas impacted by November 2019 bushfires.	rehabilitation areas impacted by bushfires. Weed control completed in these areas. Refer to Section 8 for more detail.
Desilting of the sites main process pond/sediment Basin	The site will continue to manage sediment control structures through inspections and desilting of ponds. Tailings dams will be cleaned on an appropriate schedule.	Sediment control inspections undertaken. Refer to Section 7 for more detail.
Biodiversity	<p>Weed spraying will continue at the site during the next reporting period.</p> <p>Inspection of nest boxes will be undertaken in the next reporting period.</p> <p>A feral animal assessment will be undertaken in the next reporting period to determine if there is a need for managing feral animals in the rehabilitation area and Biodiversity Offset Area, and the development of a feral animal control program.</p>	<p>Weed spraying and control activities completed in active rehabilitation areas.</p> <p>Quarterly biodiversity monitoring across the site was undertaken by Kleinfelder.</p> <p>In 2020, Holcim approached Kleinfelder for a Rehabilitation Assessment on the rehabilitation areas and the Biodiversity Offset Area. These works were delayed due to Covid-19 restrictions but were performed in 2021. Therefore, all biodiversity actions are up-to-date.</p> <p>Ecological surveys undertaken in late 2020 and early 2021 found that there is no need for a feral animal control program in the rehabilitation area and Biodiversity Offset Area.</p> <p>Refer to Section 6.6 for more detail.</p>

6 ENVIRONMENTAL PERFORMANCE

6.1 Meteorological Monitoring

Meteorological monitoring was undertaken by Jandra Quarry in the report period using the on-site weather station. Weather conditions for 2021 are summarized in **Table 11** below. Both meteorological data collected on-site and data from the Bureau of Meteorology (BOM) were used during daily operations of the project to inform daily operations and plan future activities.

Table 11: Meteorological Monitoring Results from 2021

Month	Total Rainfall (mm)	Minimum Temperature (°C)	Maximum Temperature (°C)
January	227.2	13	33
February	194.2	14	31
March	605.8	14	31
April	101.8	8	30
May	54.0	3	26
June	100.2	3	20
July	17.4*	3	21
August	12.0*	NS	NS
September	33.0*	NS	NS
October	157.6	3	34
November	138.2	9	32
December	108.4	13	35
Annual TOTAL	1687.4		

* Results retrieved from BOM Station 060141 (Taree Airport) due to incomplete meteorological monitoring data capture for the entirety of these months.

In July, August, and September 2021 the weather station onsite was not operating correctly. As a result, there is incomplete capture of meteorological data for these months. This is a non-compliance with Schedule 3 Condition 15 of the Consent. While the station was in the process of being fixed, Jandra relied on the BOM weather data to inform daily and long-term operations which is in the vicinity of the site.

Total annual rainfall increased from 1450.1 mm in 2020 to 1687.4 mm in 2021.

6.2 Noise

6.2.1 EIS Predictions

The noise and blasting impact assessment in the Environmental Assessment (2014) considered the potential impacts of the proposed modification on nearby sensitive residential receivers.

Noise levels (without asphalt production) below the early morning shoulder project criteria, are predicted at all private residential receiver locations and for all stages of the quarry life, provided that operations are restricted during this time including:

- No works in the approved overburden emplacement area;
- No works above RL50; and
- No operation of the mobile processing plant.

Noise levels (without asphalt production) above the day / evening criteria are predicted at three private residential receivers and range from a marginal 2 dBA to 5 dBA above the criteria. Holcim is confident that these noise levels will not be perceived as a nuisance and has negotiated agreements with the potentially affected property owners.

Predicted noise levels from the Environmental Assessment (2014) from asphalt production were up to 7 dBA above the criteria at one private residential receiver R1 during all periods and all stages of the quarry development, as this receiver has a line of sight to the asphalt plant. Holcim has a negotiated agreement with the property holder of R1.

Jandra Quarry is currently only in Stage 1 of its development plan as described in the Noise and Blasting Impact Assessment detailed within the Environmental Assessment (2014). **Table 12** details the noise modelling for this stage. When compared with the data in **Table 14** all results have been below that modelled within the Environmental Assessment (2014).

Table 12: Stage 1 Assessment without asphalt plant operating (exceedances in bold)

Receptor	Day / Evening (dBA L _{eq}) 7am to 10pm		Early morning shoulder (dBA L _{eq}) 6am to 7 am		
	Project Criteria	Predicted Level	Project Criteria	Predicted level	
		Neutral		Neutral	Worst Case
R1	41	41	40	41	46
R2	38	30	38	30	35
R3	51	<30	50	<30	30
R4	41	34	40	33	38
R5	41	40	40	38	43
R6	38	32	38	32	37
R7	38	<30	38	<30	<30
R8 (Holcim)	41	33	40	32	36
R9 (Holcim)	41	38	40	36	40
R10 (Holcim)	38	44	38	43	47

6.2.2 Approved Criteria

Criteria for each of the receivers R1 – R10, as outlined in the Conditions of Consent, for both quarry operation and combined quarry and asphalt production operations are provided in **Table 13**.

Table 13: Noise Criteria

Location	Quarry Operations		Quarry Operations and Asphalt Plant Production	
	6am – 10pm	6am – 10pm	10pm – 6am	10pm – 6am
	LAeq(15min)	LAeq(15min)	LAeq(15min)	LA1(1min)
<i>R1^{1,2}</i>	46	48	46	51
R2	36	40	35	48
<i>R3^{1,2}</i>	N/A	N/A	N/A	N/A
R4	36	40	39	51
R5	40	41	39	51
R6	36	40	35	48
R7	35	36	35	48
<i>R8^{1,2}</i>	N/A	N/A	N/A	N/A
<i>R9^{1,2}</i>	N/A	N/A	N/A	N/A
<i>R10^{1,2}</i>	N/A	N/A	N/A	N/A

Note 1: Noise criteria are not applicable to these receivers as per Section 4 of the NBMP.

Note 2: Either quarry owned or excluded from the assessment as per Section 4 of the NBMP.

The variation of EPL 2796 dated 27 August 2021 approved the change of noise monitoring frequency under Condition M8.1 at Jandra Quarry from quarterly to annually.

6.2.3 Key Environmental Performance

Attended noise monitoring was undertaken by Muller Acoustic Consulting on the following dates:

- 15 & 16 March 2021; and
- 20 May 2021.

The assessments identified that noise emissions generated by Jandra Quarry were generally compliant with relevant statutory noise criteria specified in EPL and Consent.

Jandra Quarry received a Notice of Variation for EPL 2796 from the EPA on 27 August 2021, which varied the required noise monitoring frequency. The noise monitoring frequency was changed from a quarterly basis to annual on the issue of this Notice of Variation. This variation was based on zero noise complaints being received by the project since 2016 and the compliant results of previous noise monitoring results.

Noise monitoring occurred at the locations R2, R4, R5, R6, and R7 in the report period. The results shown in **Table 14** include the noise monitoring results for the Morning Shoulder and Day periods and note the project does not operate during Evening or Night hours defined by the EPL.

The result at R2 in Quarter 1 exceeded the noise criteria. Monitoring during the Morning Shoulder period of 15 March 2021 detected an uncharacteristic noise emission from the site, exceeding the noise limit of 36 dB LAeq(15 min). The site was contacted immediately, to note the noise source being a bulldozer conducting overburden maintenance. This maintenance activity is required over two weeks every two years. The site responded to this high noise result by relocating the bulldozer to a lower level in the pit. After the monitoring event, Holcim implemented a long-term management measure in a corrective action plan to ensure overburden maintenance is not conducted at times prior to 7am (during the Morning Shoulder period). Subsequent monitoring at EPA16, which is 60 metres away from R2, was below the noise criteria.

Non-quarry or extraneous sources of noise including distant traffic, wind, and fauna such as birds and insects.

Table 14: Noise Monitoring Results 2021

Assessment Period	Receiver No.	EPA ID	Quarrying Noise Criteria	Compliance (Quarry Noise Contribution)	
			L _{Aeq} (15min)	Q1	Q2
Morning Shoulder	R2	EPA13	36	<39	30
	R4	EPA14	36	<36	36
	R5	EPA15	40	<40	35
	R6	EPA16	36	<36	30
	R7	EPA17	35	<35	30
Day	R2	EPA13	36	<35	30
	R4	EPA14	36	<36	36
	R5	EPA15	40	<40	35
	R6	EPA16	36	<36	30
	R7	EPA17	35	<35	30
Evening	R2	EPA13	36	Quarry Not Operating	Quarry Not Operating
	R4	EPA14	36	Quarry Not Operating	Quarry Not Operating
	R5	EPA15	40	Quarry Not Operating	Quarry Not Operating
	R6	EPA16	36	Quarry Not Operating	Quarry Not Operating
	R7	EPA17	35	Quarry Not Operating	Quarry Not Operating

Long-term Trends:

2021 noise monitoring results were consistent with previous noise monitoring results. Noise results from 2017 to 2020 have been within criteria. All noise results in 2021 were compliant, with the exception of the R2 Morning Shoulder result in the Quarter 1. This result was impacted by uncommon overburden maintenance, with immediate and long-term corrective actions taken to address this. This exceedance was not consistent with the results of previous years.

There were no noise complaints received during 2021.

Comparison to EIS Predictions:

2021 noise results at Jandra Quarry generally remained consistent with EIS predictions.

The well-established vegetative buffer and distance between the operations and the sensitive receivers assists the Quarry in meeting these predictions.

6.2.4 Management Measures

Management measures relating to noise are outlined within the Jandra Quarry Noise and Blast Management Plan. These include:

- Defined operating hours as per Schedule 2 Condition 10 of the Development Consent;
- Work restrictions during the early morning shoulder period;
- Monitoring for noise and meteorological conditions;
- Broadband reversing beepers;
- Staff and contractors inductions; and

- Controlled blasting activities.

As a result of ongoing consultation with the EPA from 2020, noise monitoring frequency was changed in the EPL from quarterly to annually in 2021. Amendments were made to the Jandra Quarry Noise and Blast Management Plan (NBMP) to reflect this change in monitoring.

6.2.5 Proposed Improvements

The updated NBMP will be implemented when it is approved by DPE.

Jandra will continue to implement and document corrective actions when exceedances or incidents are detected. There are no further improvements proposed.

6.3 Air Quality

6.3.1 Environmental Assessment Predictions

Jandra Quarry is currently in Stage 1 of its development plan as described in the Air Quality Impact Assessment detailed within the Environmental Assessment (2014). **Table 16** and **Table 17** are the modelled dust contributions expected from Jandra Quarry. The air quality impact assessment concluded that with the implementation of existing and additional feasible management measures, all relevant air quality criteria could be met at all identified sensitive residential receivers for all stages of the quarry development.

Table 15: Summary of Contemporaneous Impact and Background – R1

Date	Highest Background (µg/m ³)	Predicted Increment (µg/m ³)	Total (µg/m ³)	Date	Background (µg/m ³)	Highest Incremental (µg/m ³)	Total (µg/m ³)
Stage 1							
22/11/2012	45.8	0.6	46.4	3/06/2013	10.8	34.3	45.1
9/01/2013	42.7	0	42.7	22/06/2013	11.6	30.2	41.8
29/06/2013	41.3	0.3	41.6	30/07/2013	13.7	25	38.7
7/11/2012	40.7	0	41.6	8/07/2013	14.2	24.9	39.1
6/10/2012	40.6	0.3	40.9	7/06/2013	9.2	22.9	32.1
Stage 2							
22/11/2012	45.8	0.3	46.1	3/06/2013	10.8	28.3	39.1
9/01/2013	42.7	0	42.7	22/06/2013	11.6	20.7	32.3
29/06/2013	41.3	0.3	41.6	17/05/2013	10.2	19	29.2
7/11/2012	40.7	0	40.7	30/07/2013	13.7	18.9	32.6
6/10/2012	40.6	0.1	40.7	8/07/2013	14.2	16.3	30.5
Stage 3							
6/10/2012	40.6	0.2	40.8	3/06/2013	10.8	33	43.8
7/11/2012	40.7	0	40.7	22/06/2013	11.6	25.3	36
22/11/2012	45.8	0.9	46.7	25/06/2013	8.7	21.1	29.8
9/01/2013	42.7	0	42.7	8/07/2013	14.2	22.8	37
29/08/2013	41.3	0.3	41.6	30/07/2013	13.7	22.9	36.6
Criteria			50				50
Note: Top 5 shown for each Stage of operation.							

Table 16: Predicted Incremental & Cumulative Annual Average TSP Concentrations (µg/m³)

Receptor ID	Increment			Cumulative		
	Stage 1	Stage 2	Stage 3	Stage 1	Stage 2	Stage 3
Privately Owned Receptors						
R1	2.5	2.6	2.8	48.5	48.6	48.8
R2	0.3	0.3	0.4	46.3	46.3	46.4
R3	0.8	0.7	0.6	46.8	46.7	46.6
R4	0.9	0.8	0.7	46.9	46.8	46.7
R5	0.6	0.5	0.5	46.6	46.5	46.5
R6	0.4	0.4	0.5	46.4	46.4	46.5
R7	0.1	0.1	0.2	46.1	46.1	46.2

R11	0.4	0.4	0.3	46.4	46.4	46.3
R12	0.3	0.3	0.3	46.3	46.3	46.3
R13	0.3	0.3	0.3	46.3	46.3	46.3
R14	0.3	0.3	0.3	46.3	46.3	46.3
R15	0.2	0.2	0.2	46.2	46.2	46.2
R16	0.3	0.2	0.2	46.3	46.2	46.2
R17	<0.1	<0.1	0.1	<46.1	<46.1	46.1
R18	<0.1	<0.1	<0.1	<46.1	<46.1	<46.1
R19	0.4	0.4	0.5	46.4	46.4	46.5
Quarry Owned Receptors						
R8	1.3	1.1	1	47.3	47.1	47
R9	1.7	1.7	1.7	47.7	47.7	47.7
R10	1.5	1.5	4.6	47.5	47.5	50.6
Criteria					90	

Table 17: Predicted Incremental Annual Average Dust Deposition Rate (g/m²/month)

Receptor ID	Stage 1	Stage 2	Stage 3
Privately Owned Receptors			
R1	<0.1	<0.1	<0.1
R2	<0.1	<0.1	<0.1
R3	<0.1	<0.1	<0.1
R4	<0.1	<0.1	<0.1
R5	<0.1	<0.1	<0.1
R6	<0.1	<0.1	<0.1
R7	<0.1	<0.1	<0.1
R11	<0.1	<0.1	<0.1
R12	<0.1	<0.1	<0.1
R13	<0.1	<0.1	<0.1
R14	<0.1	<0.1	<0.1
R15	<0.1	<0.1	<0.1
R16	<0.1	<0.1	<0.1
R17	<0.1	<0.1	<0.1
R18	<0.1	<0.1	<0.1
R19	<0.1	<0.1	<0.1
Quarry Owned Receptors			
R8	<0.1	<0.1	<0.1

6.3.2 Approved Criteria

Air Quality monitoring is required to be undertaken in accordance with the following criteria in Schedule 3 Condition 10 of the Development Consent represented in **Table 18**, **Table 19**, and **Table 20** below.

Table 18: Long-term impact assessment criteria for particulate matter

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

^a Total impact (ie incremental increase in concentrations due to the development plus background concentrations due to all other sources);

^b Incremental impact (ie incremental increase in concentration due to the development on its own);

^c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia AS/NZS 3850:10.1.2003 – Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method

^d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the Secretary in consultation with EPA.

Table 19: Short-term impact assessment criteria for particulate matter

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

^a Total impact (ie incremental increase in concentrations due to the development plus background concentrations due to all other sources);

^b Incremental impact (ie incremental increase in concentration due to the development on its own);

^c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia AS/NZS 3850:10.1.2003 – Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method

^d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the Secretary in consultation with EPA.

Table 20: Long-term impact assessment criteria for deposited dust

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

^a Total impact (ie incremental increase in concentrations due to the development plus background concentrations due to all other sources);

^b Incremental impact (ie incremental increase in concentration due to the development on its own);

^c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia AS/NZS 3850:10.1.2003 – Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method

^d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the Secretary in consultation with EPA.

The variation of EPL 2796 issued by the EPA on 27 August 2021 amended P1.1 of the EPL to allow for the removal of dust deposition monitoring points 18 to 21 (DDG 1 - 4). An application to modify the Development Consent DA 213-10-99 has been submitted by Holcim requesting the removal of the requirement to monitor depositional dust from Condition Schedule 3 Condition 10.

6.3.3 Key Environmental Performance

6.3.3.1 Depositional Dust

Dust deposition monitoring has been undertaken at the Jandra Quarry throughout the 2021 reporting period with all results within the expected levels of criteria at each monitoring point. Results are shown in **Table 21**.

Table 21: Depositional Dust Monitoring 2021

Sample Month	Insoluble Solids (g/m ² /month)			
	DDG1	DDG2	DDG3	DDG4
January	0.5	0.4	0.4	0.2
February	0.8	2.2	1.9	0.6
March	0.3	1.2	0.8	0.5
April	0.3	0.6	0.1	0.1
May	0.2	1.3	0.5	1.5
June	0.4	1.3	0.6	0.5
July	1.0	3.0	16.0	1.0
August	0.9	3.8	1.3	1.9
September	0.9	3.8	1.3	1.9
October	0.9	3.8	1.3	1.9
November	1.3	-	1.0	0.9
December	NS	NS	NS	NS
Minimum	0.2	0.4	0.1	0.1
Maximum	1.3	3.8	16	1.9
Average	0.7	2.1	2.3	1.0
Criteria Level (4 g/m²/month)	Compliant	Compliant	Compliant	Compliant

Note: NS indicates those samples which could not be taken due to sample bottle being broken.

All results were compliant with the maximum annual criteria in 2021.

Unfortunately, the samples for August, September, and October were exposed for 90 days. In accordance with AS3580.10.1 a result has been recorded by averaging the result by the sampling periods, in days. Therefore, the results for August, September, and October are valid.

There was no result collected from DDG2 for November. This is a non-compliance with the sampling program for depositional dust.

There are no results presented for December 2021 due to the sample bottles being damaged at the laboratory prior to testing. Therefore, no result is recorded. This is a non-compliance because 11 samples were collected from the reporting period rather than 12 samples as required. It should be noted that the damaged sample was out of the control of Holcim.

Depositional dust monitoring was not completed at DDG5 in 2021 as it was historically, because it is not an EPL monitoring location.

Table 22 displays the long-term depositional dust monitoring across the site. Contaminated samples have been excluded from the long-term results. The results measured at DDG1, DDG2, and DDG3 increased compared to the averages of years previous. Depositional dust levels have generally remained consistent across recent years.

Table 22: Depositional Dust Monitoring Summary (2016-2021)

Dust Depositional Gauge	Monitoring Summary for Annual Review Period	2021	2020	2019	2018	2017	2016
		(g/m ² /month)					
DDG1	Insoluble Solids Reporting Period Average	1.5	1.0	1.1	0.6	0.6	0.4
	Max. Insoluble Solids	11.0	2.3	4.4	1.8	1.2	0.8
	Min. Insoluble Solids	0.2	0.3	0.2	0.3	0.2	<0.1
DDG2	Insoluble Solids Reporting Period Average	2.2	1.7	1.4	0.8	0.8	0.9
	Max. Insoluble Solids	3.8	2.8	4	2.2	1.5	2.9
	Min. Insoluble Solids	0.4	0.8	0.2	0.1	0.3	<0.1
DDG3	Insoluble Solids Reporting Period Average	2.1	1.3	1.4	0.5	0.7	0.5
	Max. Insoluble Solids	16.0	3.6	4.6	1.4	1.3	0.7
	Min. Insoluble Solids	0.1	0.4	0.2	0.1	0.2	<0.2
DDG4	Insoluble Solids Reporting Period Average	1.1	1.1	1.0	0.5	0.6	0.7
	Max. Insoluble Solids	1.9	2.1	3.3	1.5	1.3	1.8
	Min. Insoluble Solids	0.1	0.3	0.3	0.1	0.2	0.4

6.3.3.2 PM₁₀ Monitoring

PM₁₀ monitoring is required to be undertaken in accordance with the criteria provided in **Table 18** and **Table 19**.

Monitoring for PM₁₀ first commenced in May 2017 and has continued since into the 2021 reporting period. Results are provided in **Table 23**. There were 61 valid sampling events in this report period. There were no exceedances in the short-term criteria value of 50 µg/m³.

Table 23: PM₁₀ Monitoring – 2021

Sampling Date	PM ₁₀ (µg/m ³)	Compliance Status
January 3, 2021	8.8	Within Criteria
January 9, 2021	11.9	Within Criteria
January 15, 2021	22.5	Within Criteria
January 21, 2021	16.2	Within Criteria
January 27, 2021	10.6	Within Criteria
February 2, 2021	13.1	Within Criteria
February 8, 2021	15.7	Within Criteria
February 14, 2021	18.0	Within Criteria
February 20, 2021	10.1	Within Criteria
February 26, 2021	38.8	Within Criteria
March 4, 2021	14.4	Within Criteria
March 10, 2021	18.5	Within Criteria
March 16, 2021	12.0	Within Criteria
March 22, 2021	25.5	Within Criteria
March 28, 2021	11.1	Within Criteria
April 3, 2021	7.9	Within Criteria
April 9, 2021	12.2	Within Criteria
April 15, 2021	19.4	Within Criteria
April 21, 2021	16.6	Within Criteria
April 27, 2021	12.9	Within Criteria
May 3, 2021	6.8	Within Criteria
May 9, 2021	13.8	Within Criteria
May 15, 2021	10.3	Within Criteria
May 21, 2021	12.5	Within Criteria
May 27, 2021	11.6	Within Criteria
June 2, 2021	18.7	Within Criteria
June 8, 2021	12.7	Within Criteria
June 14, 2021	10.0	Within Criteria
June 20, 2021	7.1	Within Criteria
June 26, 2021	2.9	Within Criteria
July 2, 2021	11.9	Within Criteria
July 8, 2021	10.6	Within Criteria
July 14, 2021	10.8	Within Criteria
July 20, 2021	16.6	Within Criteria

Sampling Date	PM ₁₀ (µg/m ³)	Compliance Status
July 26, 2021	10.9	Within Criteria
August 1, 2021	12.2	Within Criteria
August 7, 2021	11.3	Within Criteria
August 13, 2021	10.6	Within Criteria
August 19, 2021	17.2	Within Criteria
August 25, 2021	6.8	Within Criteria
August 31, 2021	17.8	Within Criteria
September 6, 2021	11.8	Within Criteria
September 12, 2021	22.6	Within Criteria
September 18, 2021	20.9	Within Criteria
September 24, 2021	17.3	Within Criteria
September 30, 2021	18.4	Within Criteria
October 6, 2021	12.4	Within Criteria
October 12, 2021	8.0	Within Criteria
October 18, 2021	14.3	Within Criteria
October 24, 2021	39.3	Within Criteria
October 30, 2021	10.0	Within Criteria
November 5, 2021	10.9	Within Criteria
November 11, 2021	14.4	Within Criteria
November 17, 2021	12.6	Within Criteria
November 23, 2021	8.4	Within Criteria
November 29, 2021	24.4	Within Criteria
December 5, 2021	15.9	Within Criteria
December 11, 2021	14.1	Within Criteria
December 17, 2021	15.7	Within Criteria
December 23, 2021	20.0	Within Criteria
December 29, 2021	7.7	Within Criteria
Annual Average	14.4	Within Annual Average Criteria

From 2017 to 2021, annual averages were within the impact assessment criteria. **Table 24** compares PM₁₀ results for the years 2017 to 2021.

Table 24: PM₁₀ Monitoring Trends

Monitoring Summary for Annual Review Period	2021 Period (µg/m ³)	2020 Period (µg/m ³)	2019 Period (µg/m ³)	2018 Period (µg/m ³)	May – December 2017 Period (µg/m ³)
PM ₁₀ Reporting Period Average	14.4	17.3	20	14.2	14.4
Max. PM ₁₀	39.3	102.0	94	42	40
Min. PM ₁₀	2.9	5.9	0.1	2	2

Long-term Trends:

Depositional dust monitoring commenced in 2016, once management plans were approved by the DPE. From 2016 – 2021 the annual average depositional dust levels have been within the criteria.

The annual average particulate matter levels from 2017 to 2021 have been consistently below the target criteria. The values seen for 2021 are similar to those results from 2018 and 2017, and generally lower than results for 2019 and 2020. The 2021 period had lower minimum and maximum PM₁₀ values than 2020.

There were no short-term exceedances in PM₁₀ in 2021, compared to two short term exceedances in 2020.

Comparison to EIS Predictions:

The results for depositional dust and PM₁₀ were within the predicted limits of the EIS predictions.

6.3.3.3 Total Suspended Particulate (TSP) Matter Results

In 2021 Jandra Quarry installed a Dust Sentry Pro air quality monitor which has the ability to measure TSP results. Previously, TSP was calculated based on PM₁₀ results. Due to the new Dust Sentry Pro monitor only being installed in August of 2021, this Annual Review presents calculated TSP results for consistency across the reporting period. However, it is noted in **Section 6.3.5** that 2022 will be the first full year of using the air quality monitor for TSP.

TSP results have been calculated from PM₁₀ results using conventional conversion factors. This has been done for this annual review to provide a comparison of TSP levels against the criteria outlined in **Table 18**.

Calculated TSP results for 2021 are displayed in **Table 25**. The 2021 calculated average for TSP was 34.56 µg/m³ which is less than the criteria value of 90 µg/m³. The 2021 TSP average is less than the 2020 average of 41.5 µg/m³.

Table 25: Calculated TSP Results

Sampling Date	PM ₁₀ (µg/m ³)	Calculated TSP (µg/m ³)
January 3, 2021	8.8	21.12
January 9, 2021	11.9	28.56
January 15, 2021	22.5	54
January 21, 2021	16.2	38.88
January 27, 2021	10.6	25.44
February 2, 2021	13.1	31.44
February 8, 2021	15.7	37.68
February 14, 2021	18	43.2
February 20, 2021	10.1	24.24
February 26, 2021	38.8	93.12
March 4, 2021	14.4	34.56
March 10, 2021	18.5	44.4

Sampling Date	PM ₁₀ (µg/m ³)	Calculated TSP (µg/m ³)
July 8, 2021	10.6	25.44
July 14, 2021	10.8	25.92
July 20, 2021	16.6	39.84
July 26, 2021	10.9	26.16
August 1, 2021	12.2	29.28
August 7, 2021	11.3	27.12
August 13, 2021	10.6	25.44
August 19, 2021	17.2	41.28
August 25, 2021	6.8	16.32
August 31, 2021	17.8	42.72
September 6, 2021	11.8	28.32
September 12, 2021	22.6	54.24

Sampling Date	PM ₁₀ (µg/m ³)	Calculated TSP (µg/m ³)
March 16, 2021	12	28.8
March 22, 2021	25.5	61.2
March 28, 2021	11.1	26.64
April 3, 2021	7.9	18.96
April 9, 2021	12.2	29.28
April 15, 2021	19.4	46.56
April 21, 2021	16.6	39.84
April 27, 2021	12.9	30.96
May 3, 2021	6.8	16.32
May 9, 2021	13.8	33.12
May 15, 2021	10.3	24.72
May 21, 2021	12.5	30
May 27, 2021	11.6	27.84
June 2, 2021	18.7	44.88
June 8, 2021	12.7	30.48
June 14, 2021	10	24
June 20, 2021	7.1	17.04
June 26, 2021	2.9	6.96
July 2, 2021	11.9	28.56

Sampling Date	PM ₁₀ (µg/m ³)	Calculated TSP (µg/m ³)
September 18, 2021	20.9	50.16
September 24, 2021	17.3	41.52
September 30, 2021	18.4	44.16
October 6, 2021	12.4	29.76
October 12, 2021	8	19.2
October 18, 2021	14.3	34.32
October 24, 2021	39.3	94.32
October 30, 2021	10	24
November 5, 2021	10.9	26.16
November 11, 2021	14.4	34.56
November 17, 2021	12.6	30.24
November 23, 2021	8.4	20.16
November 29, 2021	24.4	58.56
December 5, 2021	15.9	38.16
December 11, 2021	14.1	33.84
December 17, 2021	15.7	37.68
December 23, 2021	20	48
December 29, 2021	7.7	18.48
Minimum		6.96
Average		34.56
Maximum		94.32
Result (compared to 90 µg/m³)		Compliant

6.3.4 Management Measures

Dust minimisation and control measures implemented on site include:

- The use of a watercart that follows specified procedures to achieve the most optimal dust control measures;
- Sprays throughout the plant;

- Speed limits across the site;
- Dust covers in place across the screening building;
- Inspections;
- Defined operating hours;
- Monitoring for air quality and meteorological conditions; and
- Training of staff and contractors.

During 2021, Jandra also installed sprinkler systems on the primary haul road as a dust minimisation measure.

6.3.5 Proposed Improvements

The Jandra Quarry Air Quality Management Plan was progressively revised during 2020 to incorporate improvement actions from the 2019 IEA. The Air Quality Management Plan was submitted to DPE and approved on 25 March 2022.

Jandra has replaced calculated TSP results with a Dust Sentry Pro monitor which samples TSP levels as well as PM10. In the next Annual Review, Jandra will report on TSP data collected by this monitor, in accordance with the Air Quality Management Plan.

Holcim will also continue to improve monitoring notes for depositional dust to record when contamination occurs.

6.4 Blasting

6.4.1 Environmental Assessment Predictions

The Noise and Blasting Impact Assessment (SLR, 2014) identified the Maximum Instantaneous Charge (MIC) allows the ANZEC Guidelines for human comfort to be met, at the closest private (non-Holcim owned) residences, during all stages of the quarry development.

The design of blasts will then be optimised to limit the possibility of EPA criteria exceedances, when blast locations are closer to residences and preferred blast designs can be used for blast locations with adequate distances to residences.

6.4.2 Approved Criteria

The site undertook blasts in 2021 in accordance with the criteria listed in **Table 26**. This criteria is taken from the blasting criteria in **Table 4** of Schedule 3 Condition 5 of the Development Consent.

Table 26: Blasting Criteria for Jandra Quarry

Location	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedance
Any residence on privately owned land, or any public infrastructure	120	10	0%
	115	5	5% of the total number of blasts over a period of 12 months

6.4.3 Key Environmental Performance

Results of blasting undertaken in 2021 are shown in **Table 27**.

Table 27: 2021 Blast Monitoring Results for Jandra Quarry

Blast Number	Date	Result	
		Vibration (mm/s) (Criteria Limit 5 mm/s)	Overpressure (dBL) (Criteria Limit 115 dBL)
1	19/1/2021	0.4	109.1
2	11/02/2021	DNT	DNT
3	22/02/2021	0.12	102.4
4	15/04/2021	1	109
5	10/05/2021	DNT	DNT
6	04/05/2021	0.5	105.4
7	02/06/2021	0.8	105.6
8	01/07/2021	1	102.4
9	21/07/2021	DNT	DNT
10	26/08/2021	0.6	104.5
11	31/08/2021	DNT	DNT
12	28/09/2021	1.4	107

Blast Number	Date	Result	
		Vibration (mm/s) (Criteria Limit 5 mm/s)	Overpressure (dBL) (Criteria Limit 115 dBL)
13	08/11/2021	DNT	DNT

DNT – Did not trigger

All blasts in 2021 were within the Development Consent criteria. There were 13 blasts in this reporting period.

Sensitive receivers near the quarry are notified prior to blasting as per the *Jandra Quarry Noise and Blast Management Plan*. This process is managed by the weighbridge staff who send a text message to the tenants the day before a planned blast is undertaken.

Long-term Trends:

From 2015 – 2021 the blasting levels have been within the Development Consent criteria.

Table 28: Longterm Blasting Trends

Year	Number of Blasts	Max. Overpressure (dBL)	Average Overpressure (dBL)	Max Vibration (mm/s)	Average Vibration (mm/s)
2015	10	114.9	109.8	2.48	1.58
2016	9	116	107.8	1.3	0.84
2017	16	113.2	105.7	3.1	1.02
2018	11	111.0	99.8	1.52	0.85
2019	10	109.9	86.2	4.3	1.3
2020	11	111.9	104.5	2.4	1.5
2021	13	109.1	105.7	1.4	0.7

Comparison to EIS Predictions:

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

6.4.4 Management Measures

Management measures relating to blasting are outlined within the *Jandra Quarry Noise and Blast Management Plan*, which includes a Drill and Blast Procedure. This procedure outlines the key steps of the blasting process including design, drilling, loading and firing.

6.4.5 Proposed Improvement

The *Jandra Quarry Noise and Blast Management Plan* (NBMP) was updated during this reporting period and was submitted for approval. Jandra will operate in accordance with the approved NBMP.

There are no further improvements proposed for blast management.

6.5 Traffic Management

6.5.1 Environmental Assessment Predictions

Section 3.5.6 of the Environmental Assessment (2014) stated that at peak demand, the maximum number of heavy vehicles leaving the site to deliver product to customers would reach approximately 12 (24 truck movements) per hour. This has been calculated based on a minimum loading time of approximately 5 minutes per truck. It is unlikely that, on a typical day, these peaks in demand will occur for more than a few hours at a time. A detailed assessment of traffic and transport is outlined within Section 6.2 of the Environmental Assessment (2014).

6.5.2 Approved Criteria

The site is required to operate traffic and manage transport through compliance with the requirements of the conditions listed below:

<p>Pacific Highway Intersection</p> <p>31. The Applicant shall maintain the intersection of the Pacific Highway and the Jandra Quarry Access Road, for the duration of product transport from the site, to the satisfaction of the RMS.</p> <p>32. The Applicant shall install and subsequently maintain street lighting at the intersection of the Pacific Highway and the Jandra Quarry Access Road, to the satisfaction of the RMS, prior to transporting quarry products from the site outside of the hours 7 am to 6 pm. Any works affecting the Pacific Highway must not take place without the prior approval of the RMS.</p> <p>Monitoring of Product Transport</p> <p>33. The Applicant shall keep accurate records of:</p> <ul style="list-style-type: none">(a) the amount of quarry products, including asphalt, transported from the site (calendar month and year);(b) the number of laden vehicle movements to and from the site (day, calendar month and year); and(c) publish these records on its website at the end of each calendar quarter.
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6.5.3 Key Environmental Performance

The site has maintained the intersection at the Pacific Highway and Quarry Access Road in accordance with the conditions in **Section 6.4.2**. No impacts to the intersection have been identified during the reporting period.

The site has not operated outside the hours of 7am and 6pm. Holcim has installed solar lighting at the intersection during 2019 in accordance with Schedule 3, Condition 32 of the consent, see **Photo 1**.



Photo 1: Solar lighting installed at intersection in accordance with Schedule 3 Condition 32.

All truck movements and quarry product volumes are published on the Holcim (Jandra Quarry) webpage in accordance with Schedule 3, Condition 33 of the consent. A summary of transport data for 2021 is appended to this Annual Review as **Appendix 1**.

In summary:

- There were 15,921 truck movements; and
- There were 465,466 tonnes of material taken offsite as product.

Truck movements and materials taken offsite increased in 2021 compared to 2020 and 2019.

Management Measures

Management measures relating to traffic include:

- Defined haulage times;
- Covered loads leaving site;
- Defined haulage limits; and
- Trained transport operators.

6.5.4 Proposed Improvements

There are no proposed improvements relating to transport.

6.6 Biodiversity and Bushfires

6.6.1 Environmental Assessment Predictions

The Environmental Assessment (2014) assessed the biodiversity impacts associated with clearing an additional 1.284 hectares of native vegetation. The Flora and Fauna Assessment accompanying the EIS stated: *“With the implementation of flora and fauna management measures included in the Flora and Fauna Management Plan and this Environmental Assessment (2014), (depending on the outcome of the targeted surveys for the Eastern Underground Orchid) the proposed modification would not result in any significant impacts on biodiversity on site and in surrounding bushland”.*

6.6.2 Approved Criteria

There are no specific criteria relating to biodiversity within the Development Consent. Schedule 3 Condition 25 outlines the requirement to complete a Biodiversity and Rehabilitation Management Plan (BRMP).

Jandra revised the previous 2018 BRMP during 2020 and submitted the BRMP for approval in 2021.

6.6.3 Key Environmental Performance

Major bushfires occurred in the vicinity of Jandra Quarry during the 2019 report period. Areas of land within the buffer lands, rehabilitation areas on overburden emplacement and the pit, nest boxes located to the northwest and a Jandra Quarry shed were burnt during this event.

No bushfires occurred in this reporting period. However, recovery from the 2019 bushfire continued into 2021 including the impacted buffer land.

Weed spraying targeting Lantana (*Lantana* sp.) and Tobacco weed (*Solanum mauritianum*) were completed during the reporting period. Weed spraying was generally performed twice per month in this reporting period.

Feral animal sightings were noted during this reporting period, however the site had minimal issues with ferals. Feral animal control programs are implemented on an as-needs basis due to the infrequent sightings and issues.

Biodiversity monitoring was conducted by Kleinfelder Australia in 2021 to meet requirements of the approved BRMP (2018). Quarterly monitoring was undertaken on the following dates:

- 27, 28, and 29 January 2021;
- 11 June 2021;
- 16 September 2021; and
- 11 February 2022.

The quarter 4 monitoring was delayed to February 2022.

The resultant monitoring reports are attached to this Annual Review in **Appendix 3**. The main findings of monitoring including ongoing effects from the 2019/2020 bushfires, weed presence in the Biodiversity Offset Area and the existing rehabilitated areas, indication of native vegetation establishment in rehabilitated areas, and evidence of illegal access to the site. The primary weeds identified during monitoring such as Lantana and Red Natal Grass and were attributed due to high rainfall.

Holcim commenced an investigation in this reporting period into the use of drones to manage weeds in existing rehabilitation areas.

Nest box monitoring will be undertaken by contractors in 2022. Nest boxes were destroyed during the 2019/2020 bushfires, with replacements being installed in 2020 including in the Biodiversity Offset Area.

6.6.4 Comparison to EIS Predictions

There were limited impacts to biodiversity within the Annual Review period. This is consistent with the EIS predictions.

6.6.5 Management Measures

Management measures relating to biodiversity are outlined within the *Jandra Quarry Biodiversity Management Plan*. These include:

- Weed and feral animal management;
- Pre clearance surveys and tree felling procedures;
- Salvaging of habitat resources;
- Nest box installation;
- Bushfire management; and
- Rehabilitation and biodiversity offset area monitoring.

6.6.6 Proposed Improvements

Weed spraying will continue at the site during the next reporting period.

The biodiversity monitoring undertaken by Kleinfelder recommended the following actions:

- Weed treatment for woody weeds in the Biodiversity Offset Area, Buffer Area, and Overburden Stockpile Area;
- Repair of the eastern fence line in the Biodiversity Offset Area;
- Increase to site security or demolition of abandoned dwelling to prevent arson or further vandalism; and
- Weed control works which enable access to benches or remote rehabilitation areas, such as drone spraying.

Jandra will also investigate the use of a detailed Weed Action Plan to assist in targeted and effective weed management. Jandra will continue to assess the feasibility of options for weed management in hard-to-access rehabilitation areas such as drone spraying.

The Jandra Quarry Biodiversity and Rehabilitation Management Plan was progressively revised in 2021 and is pending approval.

6.7 Heritage

6.7.1 Environmental Assessment Predictions

An extensive AHIMS search was conducted on 5 February 2014 for the purposes of an Aboriginal Heritage Due Diligence Assessment for the Environmental Assessment (2014). The search covered an area of approximately 10 square kilometres, which encompassed the disturbance area of the new heavy vehicle access road and expansion of the existing finished product stockpile area. Seven recorded sites are within the Jandra Quarry Development Consent boundary. All seven of these sites were determined to be of low or medium significance. No Aboriginal archaeological sites registered on AHIMS are located within the disturbance area of the new heavy vehicle access road and expansion of the existing finished product stockpile area. There are no predicted detrimental impacts to Aboriginal and cultural heritage.

6.7.2 Approved Criteria

There are no specific criteria relating to Aboriginal and Cultural Heritage within the Development Consent. Schedule 3 Condition 29 outlines the requirement to prepare an Aboriginal Cultural Heritage Management Plan.

The Aboriginal Cultural Heritage Management Plan was revised in 2020, with this pending approval by DPE in 2021.

6.7.3 Key Environmental Performance

There were no issues relating to Aboriginal and Cultural Heritage in 2021.

No clearing occurred in the report period and there were no disturbances to Aboriginal or Cultural

Heritage sites. Only vegetation stripping occurred in 2021 on the eastern ridge.

6.7.4 Management Measures

Management measures relating to heritage are outlined within the Jandra Quarry Aboriginal Cultural Heritage Management Plan. These include:

- Consultation with Aboriginal stakeholders during the preparation of the Jandra Quarry Aboriginal Cultural Heritage Management Plan;
- Records of known sites of Aboriginal heritage significance;
- The Quarry Manager or delegate will undertake monthly inspections of the known Aboriginal and cultural heritage sites;
- Training of staff and contractors; and
- Procedure for impacts of unexpected finds.

6.7.5 Proposed Improvements

The Jandra Quarry Aboriginal Cultural Heritage Management Plan was revised in 2020. Jandra Quarry is currently waiting on any comments from DPE before the plan is approved.

No further improvements are proposed for 2022.

6.8 Waste Minimisation

6.8.1 Key Environmental Performance

Waste management at Jandra continued in 2021 with this including recycling and general waste. A summary of the waste generated by Jandra is shown in **Table 29**.

Table 29: Waste Summary

Waste Source	Volume (Kg)
Scrap Steel	35,292
General Waste - Rubbish	12,471
General Waste - Cardboard	9,977
Industrial Waste	3,800
Waste Oil	8,000

6.8.2 Management Measures

Wherever possible, Jandra Quarry implements initiatives to minimise the waste generated from our operations. General waste is minimised and all oil, cardboard, paper and steel is sorted on site and sent to recycling facilities in the region. This is significantly reducing the amount of waste going to landfill.

Tyres from machines are used for traffic management, garden edging and signage stabilisers. This reduces the use of raw materials as well as diverting rubber from landfill.

General waste and recycling is stored in separated into different streams and stored in a separate 3m³ bin. These bins are collected fortnightly.

6.8.3 Proposed Improvements

There are no proposed improvements to waste management 2022, however Jandra will continue to look for opportunities to reduce waste where possible.

6.9 Summary of Environmental Performance

A summary of the performance of environmental management measures and sampling results are detailed in **Table 30**.

Table 30: Summary of Performance

Aspect	Approval Criteria/EIS Prediction	Performance During the Reporting Period	Trend/Key Management Implications	Implemented/Proposed Management Actions
Noise	EIS predictions are all below Development Consent criteria.	Quarterly monitoring has met the Development Consent Criteria. Annual monitoring begun as per the varied EPL.	One exceedance of criteria due to approved but out of ordinary operational activity (bulldozer overburden maintenance). All other results compliant.	Corrective Action Plan developed as result of Morning Shoulder noise exceedance. None required.
Air Quality	EIS predictions are all below development consent criteria.	Depositional dust, PM10, and TSP results are within criteria of EPL and Development Consent.	Dust deposition has been consistent with EIS and previous Annual Review reporting. December data could not be retrieved due to damaged bottle, therefore the annual average is calculated from 11 months. DDG2 November 2021 result could not be recorded. This is a non-compliance. PM10 and TSP results are consistent with previous Annual Review results.	Continue to ensure air quality management measures are appropriately and punctually undertaken.
Blasting	EIS predictions are all below development consent criteria.	All blasts in 2021 were within the Development Consent criteria.	Blast results continue to remain within approved criteria and EIS predictions.	None required.
Water Management	EIS predictions are all below development consent criteria.	No discharges in 2021 triggered surface water monitoring.	No monitored discharges occurred in 2021, 2020, and 2019.	None required.
Biodiversity	2014 EA Mod – The proposed modification would not result in any significant impacts on biodiversity on site and in surrounding	Biodiversity and rehabilitation monitoring was undertaken in 2021. No clearing was undertaken in 2021.	Biodiversity and rehabilitation monitoring was undertaken in 2021. Jandra Quarry continues to improve biodiversity monitoring and	Continue to monitor as per the BRMP.

Aspect	Approval Criteria/EIS Prediction	Performance During the Reporting Period	Trend/Key Management Implications	Implemented/Proposed Management Actions
	bushland.		rehabilitation methods.	
Heritage	No predictions.	No impacts.	Continued to be no impacts.	None required.

7 WATER MANAGEMENT

7.1 EIS Predictions

The predictive modelling within the Environmental Assessment (July 2014) pertains to the water balance for Jandra Quarry (**Table 31**). During the reporting period, the water available on site was all that was required for operations providing Holcim with the confidence in the water balance figures. There are no other predictive figures for surface water management.

Table 31: Water Balance Modelling from Surface Water Management Assessment (2014)

Summary Results	Current			Stage 1		
	Dry Year	Mean Year	Wet Year	Dry Year	Mean Year	Wet Year
Total Runoff (ML/yr)	35	98	165	34	97	164
Total Demands (ML/yr) ¹	25.60	24.88	24.11	36.60	35.64	34.63
Stormwater Supplied (ML/yr) ²	25.46	24.88	24.11	32.13	35.45	34.63
Total Storage Top Up (ML/yr)	0.13	0.00	0.00	4.46	0.19	0.00
% Demand Met	99%	100%	100%	88%	99%	100%
Spill Volume (ML/yr)	4	68	131	3	57	112

Summary Results	Stage 2			Stage 3		
	Dry Year	Mean Year	Wet Year	Dry Year	Mean Year	Wet Year
Total Runoff (ML/yr)	39	110	186	45	129	219
Total Demands (ML/yr)	36.42	35.47	34.46	34.60	33.74	32.82
Stormwater Supplied (ML/yr)	32.32	35.34	34.46	31.85	33.74	32.82
Total Storage Top Up (ML/yr)	4.09	0.13	0.00	2.75	0.00	0.00
% Demand Met	89%	100%	100%	92%	100%	100%
Spill Volume (ML/yr)	4	70	139	9	90	174

The Environmental Assessment (2014) stated “with the implementation of surface water management measures included in the Soil and Water Management Plan, the EPL and this EA, the proposed modification would not result in any significant impacts on the downstream environments.”

7.2 Approved Criteria

The site is required to monitor and record discharge events from the Main Dam offsite in accordance with the requirements listed in **Table 32** taken from the EPL.

Table 32: EPL Discharge Monitoring Requirements

POINT 1

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

Water and land

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
1	Discharge quality monitoring	Discharge quality monitoring	Discharge from final sediment dam as shown in the CSR Readymix Site Photo - Jandra Quarry Water Monitoring Location Figure 1 provided to the EPA 13 May 2002

7.3 Water Use and Storage

Effective control of erosion and sediment movement at the site is currently achieved via the following measures:

- Sedimentation basins;
- Wash off water collection and primary treatment systems;
- Minimisation of disturbed areas;
- Diversion of clean water from undisturbed areas around working areas;
- Temporary erosion and sediment controls prior to commencement of topsoil and overburden removal;
- Sequential clearing and rehabilitation of the quarry as extraction of material proceeds; and
- Twice yearly maintenance of erosion and sediment control structures to ensure their efficiency.

In 2019 a kerbside drain and guttering was installed to harvest water into the wheel wash sump from the main Jandra Quarry driveway, as is shown in **Photo 2**.



Photo 2: Kerbside drain and gutter installed at the main Jandra Quarry driveway

7.4 Surface Water Results

Jandra Quarry began a revision of their *Soil and Water Management Plan* (SWMP) in 2020. This SWMP outlines the EPL 2796 requirement to complete monitoring of discharge events at the final sediment dam. Monthly water monitoring was discontinued in July 2018 and will only be completed if there is a discharge event. Zero discharge events occurring in 2021 were within the permissible criteria to be monitored. Therefore, there are no surface water monitoring results presented in this Annual Review.

Longterm Trends:

The results from 2015 to 2018 were reviewed for surface water in the 2018 Annual Review. Results were similar over a long period with slightly alkaline pH and a large variability in TSS results. No discharge events occurred in 2019. There was no 2020 or 2021 monitoring as this requirement was not triggered by rainfall levels. Jandra Quarry has a system in place at the site where samples are obtained prior to a discharge event, with the goal of containing water onsite if the water quality parameters are not within the EPL requirements.

Comparison to EIS Predictions:

The Environmental Assessment (2014) stated the increase in scale of the operations would not result in any significant impacts on the downstream environments. With there being no discharge events that triggered the monitoring requirements during the Annual Review period and the site operating as per the SWMP, Holcim consider this prediction has been met.

7.5 Groundwater Results

Jandra Quarry is unlikely to experience groundwater inflow and highly unlikely to impact groundwater (Soil and Water Management Plan, 2015). No groundwater monitoring program was implemented at Jandra during the Annual Review period. Some sampling was done at several bores in the previous reporting period in February 2020 as precautionary monitoring.

7.5.1 Water Take

There is no groundwater extraction licenses at Jandra Quarry, therefore there has been no water take.

8 REHABILITATION AND LANDSCAPE MANAGEMENT

8.1 Rehabilitation Performance during the Reporting Period

Holcim pursued issues related to Biodiversity and Rehabilitation Management Plan in this report period in order to fully comply with DA 213-10-99 (Mod 5) Schedule 3 Condition 27.

The Rehabilitation and Conservation Bond value was established in consultation with external advisors and DPE as per the requirements of Schedule 3 Condition 27. Instruments regarding the security of the Biodiversity Offset Area was closed out in discussion with authorities and established in 2020.

A summary of rehabilitation at Jandra Quarry is outlined in **Table 33**.

Table 33: Rehabilitation Performance

Guideline Requirement	Site Comment
Extent of the operations and rehabilitation at completion of the reporting period	<p>Rehabilitation of benches continued during the Annual Review period as per the <i>Biodiversity and Rehabilitation Management Plan</i>.</p> <p>Quarry benches are landscaped and vegetated using native tree and understorey species, to minimise the visual impact of the quarry.</p> <p>The rehabilitation process includes placing approximately 1 metre of overburden on benches, followed by 300mm of topsoil. Tubestocking is the preferred rehabilitation method on benches. Hydromulching was done on some rehabilitation areas.</p> <p>A Biodiversity Indicator and Reporting System (BIRS) Assessment was conducted in 2020.</p> <p>Maintenance of burnt-out rehabilitation areas also occurred, with continued growth since the bushfire.</p>
Agreed post-rehabilitation land use	<p>The Biodiversity and Rehabilitation Management Plan outlines the proposed rehabilitation at the site.</p> <p>The proposed final land use is native woodland.</p>
Key rehabilitation performance indicators	<p>Key performance indicators are outlined within the Biodiversity and Rehabilitation Management Plan.</p> <p>Rehabilitation inspections are completed by Holcim. Results of biodiversity monitoring and inspections by contractors enhance data collection on performance indicators.</p>
Renovation or removal of buildings	<p>No renovation or removal of buildings in 2021. Waste resulting from the 2019 bushfire, such as material from a burnt shed, was removed from site in 2020 and taken to a licensed waste facility.</p>
Any other Rehabilitation including: <ul style="list-style-type: none"> • Exploration activities; • Infrastructure; • Dams; and • The installation or maintenance of fences, bunds and any other works. 	<p>No additional new rehabilitation of exploration, infrastructure or dams undertaken during the Annual Review period.</p>
Any rehabilitation areas which have received formal sign off from the Resources Regulator	<p>None.</p>
Variations to activities undertaken to those proposed (including why there were variations and whether Resource Regulator was notified).	<p>Rehabilitation was completed as per the <i>Biodiversity and Rehabilitation Management Plan</i>. No rehabilitation was completed in 2021.</p>
Outcomes of trials, research projects and	<p>No trials.</p>

Guideline Requirement	Site Comment
other initiatives	
Key issues that may affect successful rehabilitation	<p>There are several potential issues including availability of material, seed stock, climatic events and rehabilitation methodology.</p> <p>As mentioned in Section 6.5.3 a major bushfire event occurred in 2019 which resulted in all rehabilitation areas being burnt. Assessment of the recovery of these areas has been undertaken through inspection by drone footage and foot. Furthermore, ecological surveys were conducted by Kleinfelder in 2020. The findings of these inspections and subsequent reports, and results of other environmental monitoring are informing the progressive rehabilitation of Jandra Quarry.</p>

8.2 Summary of Current Rehabilitation and Disturbance

A summary of the rehabilitation and disturbance status is outlined in **Table 34**.

Table 34: Rehabilitation and Disturbance Status

Quarry Area Type	2018 Annual Review Period (ha)	2019 Annual Review Period (ha)	2020 Annual Review Period (ha)*	2021 Review Period (ha)	2022 Annual Review (Predicted)
A. Total Quarry Footprint ¹	21	25.7	25.1	25.1	26.5
B. Total Active Disturbance ²	19.1	22.9	19.2	17.7	19.1
C. Land Being Prepared for Rehabilitation ³	0	0	0	0	0.2
D. Land Under Active Rehabilitation ⁴	1.9	2.8	5.9	(Additional 1.5) Total 7.4	7.8
E. Completed Rehabilitation ⁵	0	0	0	0	0.4

Note: *areas updated based on a review of GIS.

- 1 *Total disturbance and rehabilitation.*
- 2 *Total disturbance within the Development Consent 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 Resources Regulator.*

During 2020 an inactive bench on the south western corner of the site was prepared as a rehabilitation area with the application of overburden and topsoil over 0.15 ha.

In 2021 rehabilitation continued on 1.5 ha of inactive bench, RL50. This brought the total rehabilitation area to be 7.4 ha at the end of 2021.

Rehabilitation and nest box monitoring are required under the Development Consent and the BRMP. Rehabilitation monitoring was undertaken in 2021 in the form of inspections and reporting done by contractors on a quarterly basis. Biodiversity Offset Area monitoring continued in 2021. Those rehabilitation areas impacted by the 2019 bushfire were inspected routinely to assess recovery in 2021.

The nest boxes at Jandra were destroyed or significantly destroyed as a result of the 2019 bushfire. Consequently, new nest boxes were installed during the 2020 reporting period. Monitoring of nest boxes occurred in 2021 and will continue into 2022.

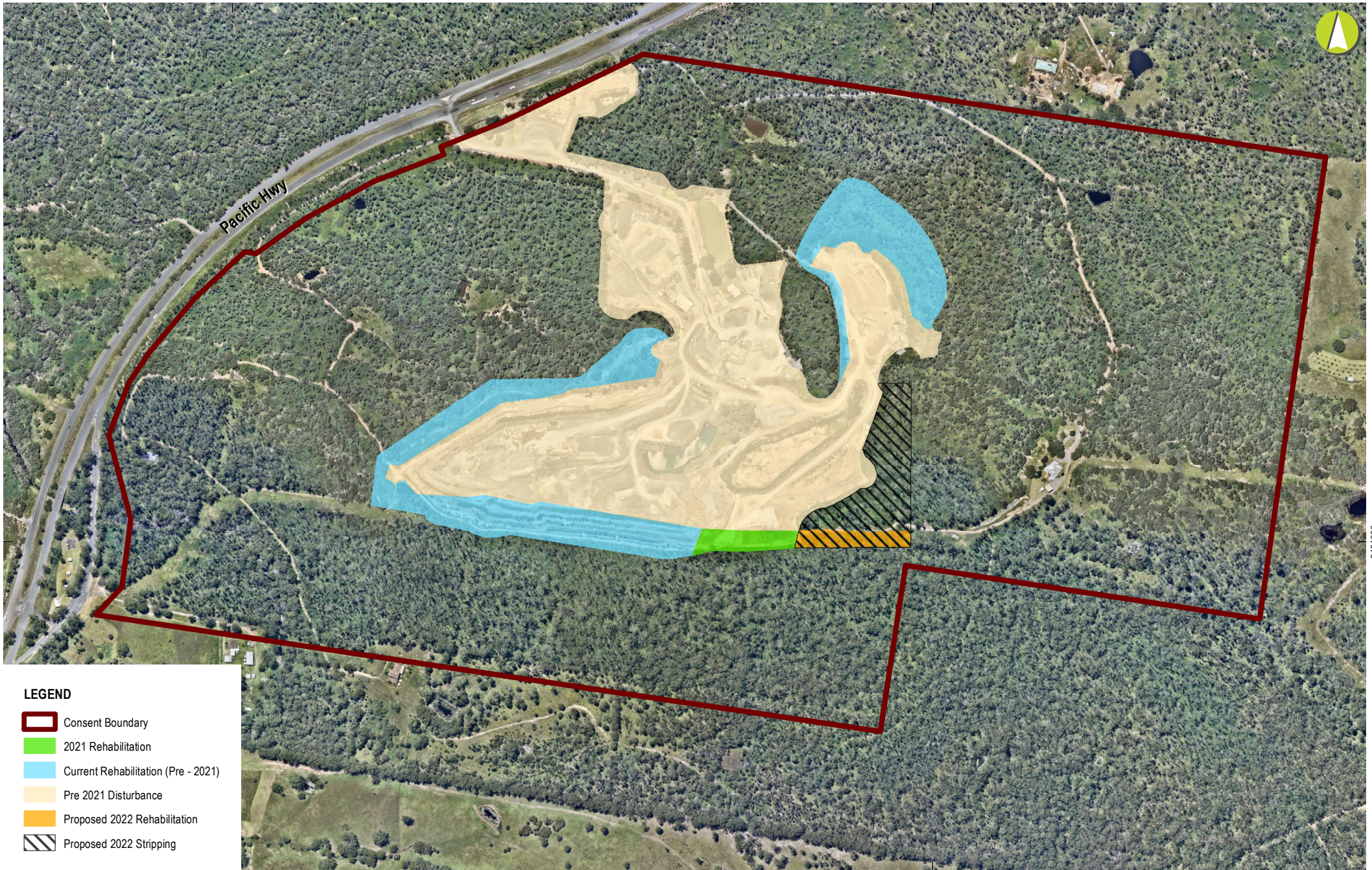
8.3 Actions for the Next Reporting Period

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 35**.

Table 35: Rehabilitation and Closure Actions for the Next Reporting Period

Requirement	Site Comment
Describe the steps to be undertaken to progress agreement during next reporting period, where final rehabilitation outcomes have not yet been agreed between stakeholders	Rehabilitation to continue as per the Biodiversity and Rehabilitation Management Plan.
Outline proposed rehabilitation trials, research projects and other initiatives to be undertaken during next reporting period	No proposed rehabilitation trials. It should be noted Holcim is trialling the use of drone on short benches which are difficult to access.
Summary of rehabilitation activities proposed for next report period	Maintenance of rehabilitation on bench RL50 will continue. Rehabilitation preparation will continue on the eastern side of this area in 2022 (Figure 3). An area of approximately 2 ha will be stripped in 2022.

The rehabilitation and disturbance areas at Jandra Quarry are outlined in **Figure 3**.



LEGEND

-  Consent Boundary
-  2021 Rehabilitation
-  Current Rehabilitation (Pre - 2021)
-  Pre 2021 Disturbance
-  Proposed 2022 Rehabilitation
-  Proposed 2022 Stripping



GDA 1994 MGA Zone 56
22/03/2022

9 COMMUNITY

9.1 Community Engagement Activities

Holcim has maintained community engagement measures during the reporting period by undertaking the following activities in accordance with Schedule 5, Condition 7 and 10 of the Development Consent:

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

9.2 Community Contributions

No community contributions were made by Jandra Quarry in 2021.

9.3 Complaints

A review of the Holcim Safety, Health & Environment (SHE) reporting database (INX) did not identify any complaints from external stakeholders during the 2021 reporting period. This was also the case in 2018, 2019, and 2020. The quarterly reports for the complaints register are available to the public on the Jandra Quarry webpage.

Information to contact the site or to make a complaint is also available on this webpage. The link to this webpage is:

<http://www.holcim.com.au/about-us/community-link/jandra-quarry-possum-brush-taree-nsw.html>

10 INDEPENDENT AUDIT

The site has previously undertaken Independent Environmental Audits (IEA) in 2016 and 2019 which occurred within the three-year timeframe outlined in the Development Consent. The 2019 IEA site inspection occurred on Tuesday 17th September 2019 and the final report was provided to DPE in December 2019. All actions raised in the 2019 IEA have been undertaken.

The next IEA is due in 2022.

11 INCIDENTS AND NON-COMPLIANCE

Table 36 summarises the incidents and non-compliances at Jandra in 2021.

Table 36: Summary of Incidents and Non-Compliances

Date	Incident/Non-Compliance	Action/Comment
July – October 2021	Non-compliance	<p>Schedule 3 Condition 15 - Meteorological Monitoring Site meteorological station was not functioning correctly for July, August, and September 2021. Therefore, complete monitoring results could not be collected for this period.</p>
December 2021	Non-compliance	<p>Schedule 3 Condition 10 - Air Quality Monitoring (Depositional Dust) Depositional dust results were not available for December 2021 due to the sample bottle being damaged. Therefore, the annual averages are calculated from 11 months of data, rather than 12. The November result at DDG2 could not be retrieved. This is a non-compliance with the monitoring requirements. It should be noted, results were consistently below the criteria levels during the other months.</p>
Quarter 1 2021	Non-compliance	<p>Schedule 3 Condition 1 and L4.2 Noise limits – Noise Exceedance</p> <p>Noise exceedance recorded at R2 during quarter 1 monitoring event for Morning Shoulder period. At the time of monitoring overburden maintenance was being completed on site. The site was immediately notified about high noise results and operations were altered to prevent ongoing exceedance. The monitoring undertaken immediately after at a neighbouring receiver found noise results had returned to below criteria levels.</p> <p>Further details are presented in the MAC Reports in Appendix 2.</p> <p>The variation of EPL 2796 dated 27 August 2021 approved the change of noise monitoring frequency under Condition M8.1 at Jandra Quarry from quarterly to annually.</p>

12 ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

Holcim staff will undertake the following works and improvement measures and projects in 2022 to ensure compliance with the consent and to ensure that effective environmental management controls are operating in accordance with the requirements of the Consent.

Table 37: Proposed Improvement Measures - 2022

Improvement Measure	Activities
Progressive Rehabilitation	The site will continue to progressively rehabilitate available areas.
Desilting of the sites main process pond/sediment Basin	The site will continue to manage sediment control structures through inspections and desilting of ponds. Tailings dams will be cleaned on an appropriate schedule.
Biodiversity	Weed spraying will continue at the site during the next reporting period. A Weed Action Plan will likely be developed to be started in 2022-2023. Inspection of nest boxes will be undertaken in the next reporting period.
Continuous Monitoring System	A new continuous environmental monitoring system will be installed at the site by the end of Quarter 2 2022. This monitor will collect data on air quality and meteorological conditions.

13 APPENDICES

APPENDIX 1

TRANSPORT SUMMARY 2021



JANDRA QUARRY TRANSPORT 2021

2021	January		February		March		April		May		June		July		August		September		October		November		December	
	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)
Day 1		0	33	688.28	53	1473.61	81	2600.72		0	84	2396.69	79	2274.34		0	46	1449.78	32	923.24	37	943.9	22	550.48
Day 2		0	29	889.81	109	3109.97		0		0	78	2210.58	51	1284.7	73	1967.97	38	1304.6		0	24	653.52	28	807.4
Day 3		0	63	1993.4	83	2668.25		0	163	4922.62	82	2428.69		0	62	1741.94	32	844.5		0	31	916.91	26	725.2
Day 4		0	112	3361.65	124	3846.54		0	68	2046.44	59	1807.01		0	78	2327.7		0		0	37	1087.06		0
Day 5		0	93	2954.74	111	3318.9		0	128	3840.1	5	163.54	88	2164.04	77	2278.56		0	35	836.78	25	791.22		0
Day 6		0		0	8	288.62	52	1566.6	132	3950.72		0	80	1834.87	52	1664.72	64	1607.14	46	1166.22		0	46	1267.26
Day 7		0		0		0	100	3254.8	92	2830.94	121	3689.08	112	3270.88		0	46	1268.12	49	1315.12		0	43	1239.05
Day 8		0	71	2326.38	114	3679.23	29	982.32	1	12.1	146	4214.45	114	3282.72		0	47	1134.96	39	824.07	26	782.24	36	870.76
Day 9		0	78	2437.87	106	3114.94	31	756.72		0	32	1089.64	39	1063.5	56	1702.51	55	1363.86		0	49	1241.2	41	866.68
Day 10		0	43	1201.26	115	3830.16		0	138	4556.92	117	3596.55	5	127.22	61	1815.18	52	1380.06		0	37	765.52	23	577.51
Day 11	29	838.72	47	1273.81	124	4053.02		0	134	4139.83	109	3203.36		0	76	2165.8		0	33	874.9	22	611.68		0
Day 12	23	649.22	76	2222.05	108	3458.49	106	2930	133	4257.85		0	36	1106.22	64	1919.66		0	15	422.08	29	756.96		0
Day 13	43	1194.42		0		0	126	4140.6	119	3248.07		0	74	2180.44	43	1268.36	54	1424.77	13	301.12		0	86	2601.72
Day 14	54	1666.4		0		0	96	3146.97	67	2091.18		0	67	1765.38	2	76.94	37	1177.04	33	834.96		0	80	1982.46
Day 15	70	2110.47	31	844.28	38	1300.03	105	3429.5		0	38	1125.76	61	1793.27		0	38	762.34	23	591.48	33	822.78	90	2552.04
Day 16		0	30	924.3	91	2789.09	100	2972.56		0	128	3715.76	83	2271.73	71	2129.3	36	832		0	34	936.32	79	2272.82
Day 17		0	33	691.45	62	1880.49		0	104	3344.39	106	3198.81		0	73	2275.11	52	1208.38		0	49	1218.26	61	1735.75
Day 18	80	2364.81	24	755.86	21	694.58		0	87	2582.26	85	2570.1		0	83	2419.89	4	100.3	39	1096.14	47	1346.43		0
Day 19	41	740.97	10	299.4		0	143	4535.9	84	2554.95		0	52	1602.71	113	3026.88		0	45	1172.26		0	33	923.82
Day 20	59	1493.3		0		0	119	3649.58	84	2411.56		0	60	1709.08	73	2085.44	67	2026.94	49	1286.08		0	82	2142.39
Day 21	69	2068.06		0		0	146	4726.04	83	2554.51	29	1012.16	59	1622.32		0	70	2017.06	112	3337.6		0	70	1958.82
Day 22	59	1849.05	6	191.49		0	124	3938.35	2	70.62	44	1425.69	52	1501.97		0	49	1138.76	52	1540.77	24	759	31	776.8
Day 23		0	29	799.34		0	105	3444.72		0	83	2007.69	47	1489.56	44	1352.36	51	1305.86		0	27	815.5	15	499.67
Day 24		0	20	664.22		0		0	89	2777.14	87	1801.73		0	49	1577.66	40	879.1		0	47	1261.2		0
Day 25	15	403	20	540.04	39	818.38		0	121	3844.94	74	1880.52		0	55	1357.8		0	58	1749.52	87	2727.41		0
Day 26		0	26	650.37	63	1910.49	144	4513.3	109	3485.46		0	60	1483.93	62	1653.51		0	73	2028.68	35	1258.8		0
Day 27	70	2315.88		0	23	735.85	172	5357.38	101	2993.84		0	69	2054.62	58	1206.68	45	1241.32	28	773.64		0		0
Day 28	63	2022.52		0		0	174	5512.52	64	2009.41	79	2185.82	68	1857.32		0	60	1502.26	35	913.68		0		0
Day 29	19	571.42		0	82	2711.32	149	4753.08		0	78	2162.61	56	1607.38		0	50	1288.17	29	827.48	40	749.06		0
Day 30		0		0	147	4944.64	121	3603.25		0	33	892.16	53	1530.9	70	1629.14	43	1052.31		0	65	2338.32		0
Day 31		0		0	142	4213.63		0	59	1784.99		0		0	37	941.9		0		0		0		0
TOTAL	694	20288.24	874	25710.00	1763	54840.23	2223	69814.91	2162	66310.84	1697	48778.40	1465	40879.10	1432	40585.01	1076	28309.63	838	22815.82	838	23707.11	859	23426.91
TOTAL VOLUME	465,466	(Q1 = 103,475 T Q2 = 184,904 T Q3 = 109,773 T Q4 = 69,950 T)																						
TOTAL TRUCK MOVEMENTS	15,921																							

APPENDIX 2
QUARTER 1 & 2 NOISE MONITORING
REPORT

Noise Monitoring Assessment

Jandra Quarry, Possum Brush, NSW
Quarter 1 Ending March 2021.

Document Information

Noise Monitoring Assessment

Jandra Quarry, Possum Brush, NSW

Quarter 1 Ending March 2021

Prepared for: Holcim (Australia) Pty Ltd



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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for the quarterly period ending March 2021 for Jandra Quarry (the 'quarry'), Possum Brush, NSW.

Noise monitoring has been conducted in accordance with the Jandra Noise and Blast Management Plan and in accordance with additional clarifications and requirements specified by the EPA in the recent variation (6 November 2019) of the EPL 2796 (EPL).

The following variations have been made to the licence:

- Amendment of condition M8.1 to clarify the requirement to undertake noise monitoring during quarrying operations and to update reference to the contemporary NSW Noise Policy for Industry;
- Amendment of condition M8.2 referencing the contemporary NSW Noise Policy for Industry; and
- Amendment to Condition R4.1 requires that noise monitoring reports contain details of all quarrying activities that were occurring during each of the monitoring periods.

Specifically, the amendment to M8.1 is reproduced below.

M8 Noise monitoring

M8.1 To assess compliance with the noise limits of this licence, attend noise monitoring must be undertaken in accordance with the conditions of this licence and:

- a) during a period of normal quarry operations;*
- b) at each one of the noise monitoring locations listed in the noise limits table of this licence;*
- c) occur quarterly in a reporting period, and*
- d) occur during the night period as defined in the NSW Industrial Noise Policy, and in conjunction with an asphalt campaign if any such campaign occurs within the quarterly monitoring period.*

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

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- Environment Protection Licence (EPL), 2796 and Variation 6 November 2019;
- Jandra Quarry Conditions of Consent (CoC), 2015;
- Jandra Quarry Noise and Blast Management Plan (NBMP), 2015; and
- Australian Standard AS 1055:2018 - Acoustics - Description and measurement of environmental noise - General Procedures.

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

The operations log during the noise monitoring is provided in **Appendix B**.

A copy of the recent licence variation is provided in **Appendix C**.

2 Noise Criteria

Section L4 of the Jandra Environment Protection Licence (EPL 2796) presents noise limits for residential receivers surrounding the quarry site, which are applicable for two different operational modes – quarrying and quarrying plus asphalt production.

Furthermore, Section 5 of the Jandra Noise and Blast Management Plan (NBMP) outlines that noise criteria do not apply at R1, R3, R8, R9, R10. Section 5 of the NBMP states:

- *'Holcim has executed a negotiated agreement with the property owner of R1 which excludes this receptor from the approved noise criteria';*
- *'R3 is not included in the approved noise criteria as this receiver represented road noise and the EA concluded that road noise impacts as a consequence of the development were below guideline thresholds and didn't warrant further assessment'; and*
- *'Receivers R8, R9 & R10 are Holcim owned residences and the approved criteria only apply to privately owned land'.*

Table 1 presents the EPL Noise Limits for the receivers where compliance is required for both quarry operation and combined quarry and asphalt production operations.

Table 1 Noise Limits				
Location	Quarry Operations ¹	Quarry Operations and Asphalt Plant Production ²		
	6am – 10pm	6am – 10pm	10pm – 6am	10pm – 6am
	dB LAeq(15min)	dB LAeq(15min)	dB LAeq(15min)	dB LA1(1min)
EPA13 (R2)	36	40	35	48
EPA14 (R4)	36	40	39	51
EPA15 (R5)	40	41	39	51
EPA16 (R6)	36	40	35	48
EPA17 (R7)	35	36	35	48

Note 1: EPL Noise Limits

Note 2: Noise criteria are applicable as per Section 5 of the NBMP.

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3 Methodology

3.1 Locality

The quarry is located at Possum Brush, NSW approximately 16km south of Taree, NSW. Receivers in the locality surrounding the quarry are primarily rural/residential. The Pacific Highway is situated to the west of the site, with highway traffic a dominant noise source at receivers within its' proximity. To the east, the quarry is bounded by rural properties with noise from The Lakes Way dominating the acoustic environment. The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan shown in **Figure 1**.

3.2 Noise Monitoring Locations

Noise measurements were conducted at five monitoring locations specified in the EPL on Monday 15 March 2021 and Tuesday 16 March 2021 during the morning shoulder and daytime periods. The measurement locations are presented in **Figure 1**.

3.3 Assessment Methodology

Attended noise surveys were conducted in general accordance with the procedures described in Australian Standard AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise" and the EPL. The measurements were carried out using Svantek Type 1, 971 noise analyser on Monday 15 March 2021 and Tuesday 16 March 2021. The acoustic instrumentation used carries current NATA calibration and complies with AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ± 0.5 dBA.

Noise measurements were of 15 minutes in duration and where possible, throughout each survey the operator quantified the contribution of each significant noise source. One measurement was conducted at each of the EPL monitoring locations during the morning shoulder and daytime periods. Monitoring during the evening period was not conducted due to the quarry not being operational.

Extraneous noise sources were excluded from the analysis to determine the LAeq(15min) noise contribution for comparison against the relevant criteria. Where the quarry was inaudible, the contribution is estimated to be at least 10dB below the ambient noise level.



KEY

- EPL Locations
- Jandra Quarry



FIGURE 1
 Jandra Quarry EPL Noise Monitoring
 REF: MAC180611-04

4 Results

4.1 Assessment Results

The monitored noise level contributions and observed meteorological conditions for each assessment period at location are presented in **Table 2** to **Table 6**.

Table 2 Operator-Attended Noise Survey Results – Location EPA13

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
15/03/2021	16:20 (Day)	71	46	40	WD:SE WS: 0.6m/s Rain: Nil	Birds 40-71
						Distant Traffic 39-41
						Insects 38-41
						Quarry Impact 42-44 (2 seconds)
						Quarry Operations 30-38 (20 seconds)
Jandra Quarry Contribution						<35 dBLAeq(15min)
16/03/2021	06:24 (Morning Shoulder)	54	44	40	WD: E WS: 0.1m/s Rain: Nil	Birds 38-54
						Insects 35-40
						Distant Traffic 39-42
						Quarry Operations 41-47 (12-15 minutes)
						Jandra Quarry Contribution

Note: Morning Shoulder – the period from 6am to 7am Monday to Saturday or 6am to 8am on Sundays and public holidays, Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Table 3 Operator-Attended Noise Survey Results – Location EPA14

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
16/03/2021	07:07 (Day)	70	52	46	WD: E WS: <0.5m/s Rain: Nil	Highway Traffic 48-58
						Local Traffic 53-70
						Birds 55-66
						Insects <40-42
						Quarry Not Audible
Jandra Quarry Contribution						<36dB LAeq(15min)
16/03/2021	06:00 (Morning Shoulder)	66	50	46	WD: E WS: <0.5m/s Rain: Nil	Highway Traffic 42-56
						Birds 36-66
						Insects 38-40
						Quarry Operation 36-40 (60 seconds)
						Jandra Quarry Contribution

Note: Morning Shoulder – the period from 6am to 7am Monday to Saturday or 6am to 8am on Sundays and public holidays, Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Table 4 Operator-Attended Noise Survey Results – Location EPA15

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
16/03/2021	07:24 (Day)	66	50	48	WD: E WS: <0.5m/s Rain: Nil	Insects 40-42
						Highway Traffic 42-57
						Birds 51-56
						Frogs 45-48
						Operator 65-66
Jandra Quarry Contribution						<40dB L _{Aeq} (15min)
16/03/2021	06:16 (Morning Shoulder)	65	51	48	WD: E WS: <0.5m/s Rain: Nil	Insects 40-42
						Highway Traffic 42-57
						Birds 44-50
						Operator 60-65
						Frogs 46-50
Jandra Quarry Contribution						<40dB L _{Aeq} (15min)

Note: Morning Shoulder – the period from 6am to 7am Monday to Saturday or 6am to 8am on Sundays and public holidays, Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Table 5 Operator-Attended Noise Survey Results – Location EPA16

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
15/03/2021	16:04 (Day)	71	43	38	WD: E WS: <0.5m/s Rain: Nil	Insects 44-53
						Birds <41-71
						Distant Traffic <41-48
						Wind 41-53
						Quarry Operation 35-37 (60 seconds)
Jandra Quarry Contribution						<36dB L _{Aeq} (15min)
16/03/2021	06:40 (Morning Shoulder)	68	48	45	WD: E WS: <0.5m/s Rain: Nil	Birds 47-68
						Distant Traffic 35-42
						Insects 35-43
						Quarry Operation 38-40 (160 seconds)
						Jandra Quarry Contribution

Note: Morning Shoulder – the period from 6am to 7am Monday to Saturday or 6am to 8am on Sundays and public holidays, Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Table 6 Operator-Attended Noise Survey Results – Location EPA17

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
16/03/2021	07:06	62	50	39	WD: E WS: <0.5m/s Rain: Nil	Insects 40-44
	(Day)					Birds 40-62 Distant Traffic 40-45 Quarry Not Audible
Jandra Quarry Contribution						<35dB L _{Aeq} (15min)
16/03/2021	06:00	60	46	37	WD: SW WS: 0.5m/s Rain: Nil	Insects 36-43
	(Morning Shoulder)					Birds 38-60 Frogs 34-50 Distant Traffic 36-46 Quarry Operation <36-38 (20 seconds)
Jandra Quarry Contribution						<35dB L _{Aeq} (15min)

Note: Morning Shoulder – the period from 6am to 7am Monday to Saturday or 6am to 8am on Sundays and public holidays, Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

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5 Discussion

5.1 Discussion of Results - Location EPA13

Quarry noise was audible for both the morning shoulder and daytime periods during monitoring conducted on Monday 15 March 2021 and Tuesday 16 March 2021. During the morning shoulder measurement, an uncharacteristic noise emission was observed that had potential to exceed the noise limits. The site was contacted upon making this observation. The noise source was a bulldozer conducting overburden maintenance, an activity that is required for approximately two weeks every two years. The resulting quarry contribution was estimated to be 39dB LAeq(15min), and above the morning shoulder noise limit of 36dB LAeq(15min).

Upon receiving the notification, the quarry modified operations by relocating the bulldozer to a lower level in the quarry pit. In the subsequent measurement at EPA16 (approx. 60m from EPA13), quarry contributed noise levels were estimated to satisfy the morning shoulder noise limit, indicating that noise contributions at location EPA13 would also satisfy the morning shoulder noise limit.

The bulldozer was also audible during the daytime period, however, noise emissions were estimated to satisfy the daytime noise limits.

As a result of the noise monitoring, the quarry will implement a management measure that ensures that the overburden maintenance activities will not occur prior to 7am.

The quarry was not operational during the evening or night period and hence, no measurements were conducted for these periods.

Non-quarry noise sources observed during the measurements included distant traffic, insects and birds.

5.2 Discussion of Results - Location EPA14

Quarry noise was audible during the morning shoulder period and inaudible during the day period on Tuesday 16 March 2021. Quarry noise contributions were estimated to satisfy the morning shoulder and daytime noise limits. The quarry was not operational during the evening or night period and hence, no measurements were conducted for these periods.

Non quarry noise sources observed during the measurements included highway traffic, local traffic, insects, and birds.

5.3 Discussion of Results - Location EPA15

Quarry noise was inaudible during the morning shoulder and daytime measurement conducted on Tuesday 16 March 2021, with background noise levels dominated by insect and highway traffic noise. Quarry noise contributions were estimated to satisfy the morning shoulder and daytime noise limits. The quarry was not operational during the evening or night period and hence, no measurements were conducted for these periods.

Non quarry noise sources observed during the measurements included highway traffic, insects, frogs and birds.

5.4 Discussion of Results - Location EPA16

Quarry noise was audible during the morning shoulder and daytime measurement conducted on Tuesday 16 March 2021, with background noise levels dominated by insect and bird noise. Quarry noise contributions were estimated to satisfy the morning shoulder and daytime noise limits. The quarry was not operational during the evening or night period and hence, no measurements were conducted for these periods.

Quarry noise sources observed during the measurement were truck movements. Non-quarry noise sources observed during the measurements included distant traffic, wind, insects, and birds.

5.5 Discussion of Results - Location EPA17

Quarry noise was audible during the morning shoulder and daytime measurement conducted on Tuesday 16 March 2021, with background noise levels dominated by insect and bird noise. Quarry noise contributions were estimated to satisfy the morning shoulder and daytime noise limits. The quarry was not operational during the evening or night period and hence, no measurements were conducted for these periods.

Quarry noise sources observed during the measurement were truck movements. Non-quarry noise sources observed during the measurements included distant traffic, frogs, insects and birds.

6 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment (NMA) for Holcim (Australia) Pty Ltd at the Jandra Quarry, Possum Brush, NSW. The assessment was completed to determine compliance with the relevant noise criteria for the quarterly period ending March 2021.

Attended noise monitoring was completed on Monday 15 March 2021 and Tuesday 16 March 2021 at five nominated EPL monitoring locations with quarry noise contributions compared against the relevant criteria. The assessment has identified that noise emissions from a bulldozer conducting overburden maintenance contributed to an exceedance of the morning shoulder noise limit at location EPA13. Upon notification, the quarry modified the operation and a subsequent measurement at EPA16 (approx. 60m from EPA13), identified that contributed noise levels were estimated to be within the morning shoulder noise limits as a result of the corrective actions. The bulldozer was also audible during the daytime period, however, noise emissions were estimated to satisfy the daytime noise limits. Furthermore, the quarry will implement a corrective action plan to avoid overburden maintenance activities prior to 7am.

The assessment has identified that noise emissions generated at Holcim Jandra Quarry during typical operations comply with relevant noise limits specified in the EPL at all assessed locations.

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Appendix A – Glossary of Terms

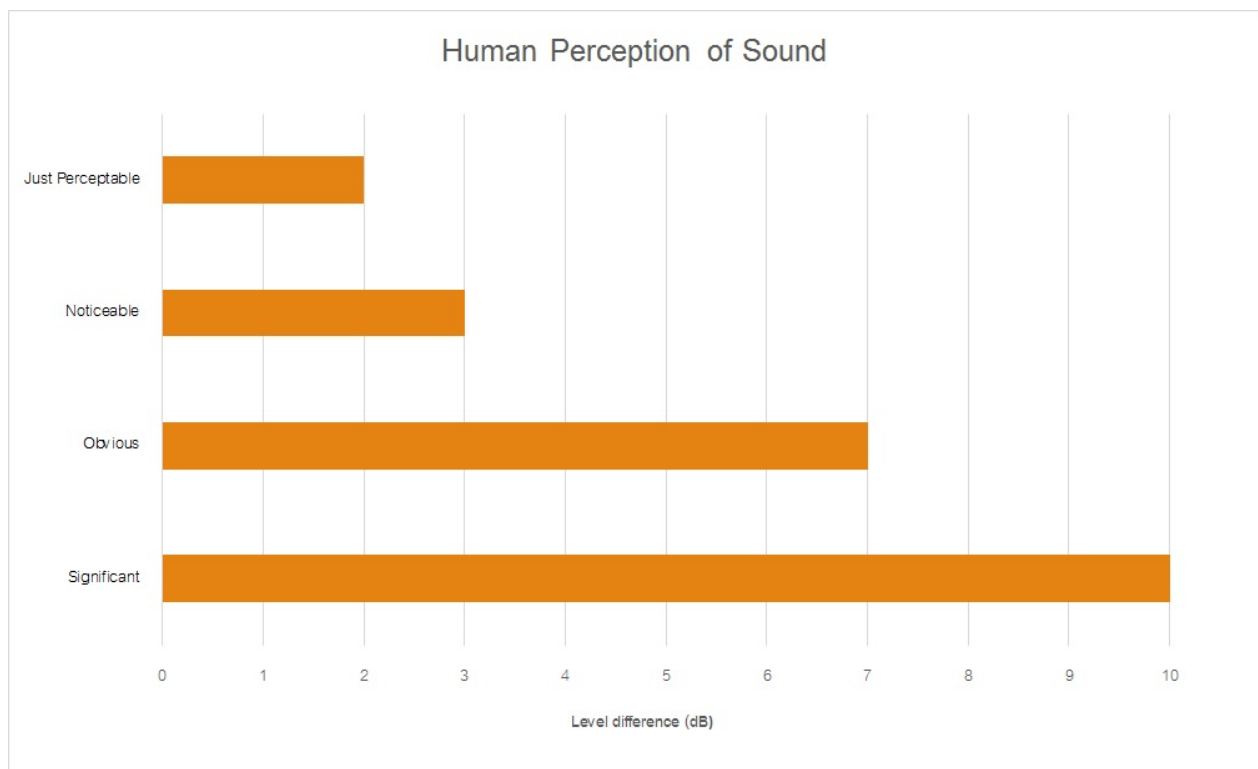
Table A1 provides a number of technical terms have been used in this report.

Table A1 Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAm _{ax}	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by : $= 10 \cdot \log_{10} (W/W_0)$ Where : W is the sound power in watts and W ₀ is the sound reference power at 10-12 watts.

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

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

Figure A1 – Human Perception of Sound



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Appendix B – Operations Log

Operations Log – Jandra Quarry

Date	Time (15min ending)	Pit	Plant
15.3.2021	4.00pm	Dozer working in the Overburden Dump	Production 1 x WA500 loader at ROM 1 x WA500-8 loading Road Trucks
15.3.2021	4.15pm	Dozer working in the Overburden Dump	Production 1 x WA500 loader at ROM 1 x WA500-8 loading Road Trucks
15.3.2021	4.30pm	Dozer working in the Overburden Dump	Production 1 x WA500 loader at ROM 1 x WA500-8 loading Road Trucks
15.3.2021	4.45pm	Dozer working in the Overburden Dump	Production 1 x WA500 loader at ROM 1 x WA500-8 loading Road Trucks
15.3.2021	5.00pm	Dozer parked up	Plant and loaders shut down
15.3.2021	5.15pm	No operations	No operations

Operations Log – Jandra Quarry

Date	Time (15min ending)	Pit	Plant
15.3.2021	5.30pm	No operations	No operations
15.3.2021	5.45pm	No operations	No operations
15.3.2021	6.00pm	No operations	No operations
16.3.2021	6.00am	Prestart meetings	Prestart meetings
16.3.2021	6.15am	Dozer working in the Overburden Dump Loading Road trucks with overburden	Sales loader loading trucks on the sales floor
16.3.2021	6.30am	Dozer working in the Overburden Dump Loading Road trucks with overburden Load and Haul from RL35	Sales loader loading trucks on the sales floor
16.3.2021	6.45am	Dozer working in the Overburden Dump Loading Road trucks with overburden Load and Haul from RL35	Sales loader loading trucks on the sales floor

Operations Log – Jandra Quarry

Date	Time (15min ending)	Pit	Plant
16.3.2021	7.00am	Dozer working in the Overburden Dump Loading Road trucks with overburden Load and Haul from RL35	Sales loader loading trucks on the sales floor Fixed plant production
16.3.2021	7.15am	Dozer working in the Overburden Dump Loading Road trucks with overburden Load and Haul from RL35	Sales loader loading trucks on the sales floor Fixed plant production
16.3.2021	7.30am	Dozer working in the Overburden Dump Loading Road trucks with overburden Load and Haul from RL35	Sales loader loading trucks on the sales floor Fixed plant production
16.3.2021	7.45am	Dozer working in the Overburden Dump Loading Road trucks with overburden Load and Haul from RL35	Sales loader loading trucks on the sales floor Fixed plant production

Operations Log – Jandra Quarry

Date	Time (15min ending)	Pit	Plant
16.3.2021	8.00am	Dozer working in the Overburden Dump Loading Road trucks with overburden Load and Haul from RL35	Sales loader loading trucks on the sales floor Fixed plant production
16.3.2021	8.15am	Dozer working in the Overburden Dump Loading Road trucks with overburden Load and Haul from RL35	Sales loader loading trucks on the sales floor Fixed plant production
16.3.2021	8.30am	Dozer working in the Overburden Dump Loading Road trucks with overburden Load and Haul from RL35	Sales loader loading trucks on the sales floor Fixed plant production
16.3.2021	8.45am	Dozer working in the Overburden Dump Loading Road trucks with overburden Load and Haul from RL35	Sales loader loading trucks on the sales floor Fixed plant production

Operations Log – Jandra Quarry

Date	Time (15min ending)	Pit	Plant
16.3.2021	9.00am	Dozer working in the Overburden Dump Loading Road trucks with overburden Load and Haul from RL35	Sales loader loading trucks on the sales floor Fixed plant production

Appendix C – EPL Variation

Licence Variation



Licence - 2796

HOLCIM (AUSTRALIA) PTY LTD
ABN 87 099 732 297 ACN 099 732 297
LOCKED BAG 5007
BAULKHAM HILLS NSW 1755

Attention: Ian Vernon & Matt Neil

Notice Number 1585343
File Number EF13/3895
Date 06-Nov-2019

The Proper Officer

NOTICE OF VARIATION OF LICENCE NO. 2796

BACKGROUND

- A. HOLCIM (AUSTRALIA) PTY LTD ("the licensee") is the holder of Environment Protection Licence No. 2796 ("the licence") issued under the *Protection of the Environment Operations Act 1997* ("the POEO Act"). The licence authorises the carrying out of activities at PACIFIC HIGHWAY, POSSUM BRUSH, NSW, 2430 ("the premises").
- B. On 3 September 2019, the Environment Protection Authority ("the EPA") conducted a compliance inspection of the premises. During the compliance inspection, the EPA discussed relevant noise conditions with the licensee including the location and timing of noise monitoring.
- C. Condition L4.2 states "noise from the premises during quarrying operations only must not exceed the limits specified in the following table". Noise monitoring at a time when the quarry is operating is required to determine compliance with the noise limits specified at condition L4.2.
- D. Condition M8.1 of the licence outlines the requirements for noise compliance monitoring and includes the requirement to undertake attended noise monitoring that "c) occur during the night period as defined in the NSW Industrial Noise Policy, and in conjunction with an asphalt campaign if any such campaign occurs within the quarterly monitoring period".
- E. During the discussions with the EPA, the licensee's representative advised that the premises does not operate after 4:30pm, however noise compliance monitoring by the licensee's consultant has occurred at times when the quarry is not operating. The licensee's representative also advised that the quarry has not had an asphalt plant for some time, however development consent allows for such a plant.
- F. The EPA has made an amendment to condition M8.1 to clarify the requirement to monitor during quarrying operations and update reference to contemporary noise policy. Condition M8.2 has also been amended to reference the contemporary noise policy.

Licence Variation



- G. The NSW Industrial Noise Policy has been superseded by the NSW Noise Policy for Industry. Definition of the "night" period remains unchanged between the two policy documents.
- H. The EPA has made an amendment to condition R4.1 to require in reports of noise monitoring that details be provided of all quarrying activities that were occurring during each of the periods of monitoring.
- I. This Notice does not authorise a significant increase in the environmental impact of the activities authorised or controlled by the licence.
- J. This variation has been undertaken with consideration of section 45 of the POEO Act.

VARIATION OF LICENCE NO. 2796

- 1. By this Notice the EPA varies the licence. The attached licence document contains all variations that are made to the licence by this notice.
- 2. The following variations have been made to the licence:
 - Amendment of condition M8.1 to clarify the requirement to undertake noise monitoring during quarrying operations and to update reference to the contemporary NSW Noise Policy for Industry.
 - Amendment of condition M8.2 to reference the contemporary NSW Noise Policy for Industry.
 - Amendment to Condition R4.1 to require in reports of noise monitoring that details be provided of all quarrying activities that were occurring during each of the periods of monitoring.

A handwritten signature in blue ink, appearing to read 'Matthew Corradin'.

.....
MATTHEW CORRADIN
A/Unit Head Hunter North
Environment Protection Authority
(by Delegation)

INFORMATION ABOUT THIS NOTICE

- This Notice is issued under Section 58(5) of the POEO Act.
- Details provided in this Notice, along with an updated version of the licence, will be available on the EPA's Public Register (<http://www.epa.nsw.gov.au/prpoeo/index.htm>) in accordance with section 308 of the POEO Act.

Licence Variation



Appeals against this decision

- You can appeal to the Land and Environment Court against this decision. The deadline for lodging the appeal is 21 days after you were given notice of this decision.

When this notice begins to operate

- The variations to the licence specified in this Notice begin to operate immediately from the date of this Notice, unless another date is specified in this Notice.
- If an appeal is made against this decision to vary the licence and the Land and Environment Court directs that the decision is stayed the decision does not operate until the stay ceases to have effect or the Land and Environment Court confirms the decision or the appeal is withdrawn (whichever occurs first).

Licence Variation



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Environment Protection Licence

Licence - 2796

Licence Details	
Number:	2796
Anniversary Date:	01-May

Licensee
HOLCIM (AUSTRALIA) PTY LTD
LOCKED BAG 5007
BAULKHAM HILLS NSW 1755

Premises
JANDRA QUARRY
PACIFIC HIGHWAY
POSSUM BRUSH NSW 2430

Scheduled Activity
Crushing, grinding or separating
Extractive activities
Resource recovery
Waste storage

Fee Based Activity	Scale
Crushing, grinding or separating	> 100000-500000 T annual processing capacity
Extractive activities	> 100000-500000 T annual capacity to extract or process
Recovery of general waste	Any general waste recovered
Waste storage - other types of waste	Any other types of waste stored

Region
North - Hunter
Ground Floor, NSW Govt Offices, 117 Bull Street NEWCASTLE WEST NSW 2302
Phone: (02) 4908 6800
Fax: (02) 4908 6810
PO Box 488G NEWCASTLE NSW 2300



Environment Protection Licence

Licence - 2796

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Environment Protection Licence

Licence - 2796



Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 (“the Act”) and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

Environment Protection Licence



Licence - 2796

The EPA publication “A Guide to Licensing” contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

HOLCIM (AUSTRALIA) PTY LTD
LOCKED BAG 5007
BAULKHAM HILLS NSW 1755

subject to the conditions which follow.

Environment Protection Licence

Licence - 2796

1 Administrative Conditions

A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity	Fee Based Activity	Scale
Crushing, grinding or separating	Crushing, grinding or separating	> 100000 - 500000 T annual processing capacity
Extractive activities	Extractive activities	> 100000 - 500000 T annual capacity to extract or process
Resource recovery	Recovery of general waste	Any general waste recovered
Waste storage	Waste storage - other types of waste	Any other types of waste stored

Note: The condition titled "Waste" under the Limit Conditions of this licence restricts what types of waste may be received at the Premises.

A1.2 Notwithstanding the fee scales noted above, the licensee must not:

- (a) extract more than 490,000 tonnes of quarry products from the premises per calendar year; and
- (b) transport more than 475,000 tonnes of quarry products from the premises per calendar year

Note: This condition has been added to be consistent with development consent DA231-10-99 MOD 5.

A2 Premises or plant to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
JANDRA QUARRY
PACIFIC HIGHWAY
POSSUM BRUSH
NSW 2430
LOT 2 DP 255621, LOT 11 DP 790056, LOT 12 DP 790056, LOT 13 DP 790056, LOT 14 DP 790056, LOT 15 DP 790056

Environment Protection Licence

Licence - 2796

A3 Information supplied to the EPA

- A3.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:

- a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
- b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

2 Discharges to Air and Water and Applications to Land

P1 Location of monitoring/discharge points and areas

- P1.1 The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.

<i>Air</i>			
EPA identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
11	Ambient PM10 monitoring		Receiver location R1 identified on map titled "Jandra Environmental Monitoring Locations" within the Holcim Environmental Management Strategy - Jandra Quarry. See EPA document DOC16/387391, EF13/3895.
18	Dust deposition monitoring		Dust monitoring point on the northern site boundary identified on "Figure 1 Surrounding land use, residences and environmental monitoring locations" within the Holcim Air Quality Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391.
19	Dust deposition monitoring		Dust monitoring point on southern site boundary identified on "Figure 1 Surrounding land use, residences and environmental monitoring locations" within the Holcim Air Quality Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391.
20	Dust deposition monitoring		Dust monitoring point on the eastern site boundary identified on "Figure 1 Surrounding land use, residences and environmental monitoring locations" within the Holcim Air Quality Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391.

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21	Dust deposition monitoring	Dust monitoring point on the western site boundary identified on "Figure 1 Surrounding land use, residences and environmental monitoring locations" within the Holcim Air Quality Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391.
----	----------------------------	---

P1.2 The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.

P1.3 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

Water and land

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
1	Discharge quality monitoring	Discharge quality monitoring	Discharge from final sediment dam as shown in the CSR Readymix Site Photo - Jandra Quarry Water Monitoring Location Figure 1 provided to the EPA 13 May 2002

P1.4 The following points referred to in the table below are identified in this licence for the purposes of weather and/or noise monitoring and/or setting limits for the emission of noise from the premises.

Noise/Weather

EPA identification no.	Type of monitoring point	Location description
2	Air blast overpressure & ground vibration peak particle velocity monitoring	Receiver location R4 in accordance with development consent 231-10-99 MOD 5 and identified on "Figure 1 Surrounding land use, residence and environmental monitoring locations" within the Holcim Noise and Blast Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391, EF13/3895.
3	Air blast overpressure & ground vibration peak particle velocity monitoring	Receiver location R2 in accordance with development consent 231-10-99 MOD 5 and identified on "Figure 1 Surrounding land use, residence and environmental monitoring locations" within the Holcim Noise and Blast Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391, EF13/3895.

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4	Meteorological Station – to determine meteorological conditions for noise monitoring	Meteorological station adjacent to the "Main Dam" and identified on "Figure 1 Surrounding land use, residences and environmental monitoring locations" within the Holcim Air Quality Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391, EF13/3895.
13	Noise monitoring	Monitoring location R2 in accordance with development consent 231-10-99 MOD 5 and identified on "Figure 1 Surrounding land use, residences and environmental monitoring locations" within the Holcim Noise and Blast Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391, EF13/3895.
14	Noise monitoring	Monitoring location R4 in accordance with development consent 231-10-99 MOD 5 and identified on "Figure 1 Surrounding land use, residences and environmental monitoring locations" within the Holcim Noise and Blast Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391, EF13/3895.
15	Noise monitoring	Monitoring location R5 in accordance with development consent 231-10-99 MOD 5 and identified on "Figure 1 Surrounding land use, residences and environmental monitoring locations" within the Holcim Noise and Blast Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391, EF13/3895.
16	Noise monitoring	Monitoring location R6 in accordance with development consent 231-10-99 MOD 5 and identified on "Figure 1 Surrounding land use, residences and environmental monitoring locations" within the Holcim Noise and Blast Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391, EF13/3895.
17	Noise monitoring	Monitoring location R7 in accordance with development consent 231-10-99 MOD 5 and identified on "Figure 1 Surrounding land use, residences and environmental monitoring locations" within the Holcim Noise and Blast Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391, EF13/3895.

3 Limit Conditions

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L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Concentration limits

L2.1 For each monitoring/discharge point or utilisation area specified in the table\ below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.

L2.2 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.

L2.3 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\.

L2.4 Water and/or Land Concentration Limits

POINT 1

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

L3 Waste

L3.1 The licensee must not cause, permit or allow any waste to be received at the premises, except concrete "wash-out" waste from concrete batch plants. All other wastes are not permitted on the premises, except as expressly permitted by this licence.

L3.2 The licensee must not:

- Process more than 3000 tonnes of concrete "wash-out" per annum;
- Store more than 1000 tonnes of concrete "wash-out" on the premises at any one time.

L3.3 Concrete 'wash-out' must be stockpiled on site in bunded areas and can be processed and blended with

Environment Protection Licence

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quarry raw product to produce quarry product(s).

L4 Noise limits

L4.1 Noise generated at the premises must not exceed the noise limits in the tables below. The locations referred to in the tables below are indicated in the document titled: "Jandra Quarry Intensification of Production Environmental Assessment (DA 231-10-99 MOD 5)" Dated July 2014

L4.2 Noise from the premises during quarrying operations only must not exceed the limits specified in the following table:

EPA identification no.	Limit dB(A) LAeq(15 min) Shoulder, Day & Evening
15	40
13, 14, 16	36
17	35

L4.3 Noise from the premises during operations including asphalt plant must not exceed the limits specified in the following table:

EPA identification no.	Limit dB(A) LAeq(15 min) Shoulder, Day & Evening	Limit dB(A) LAeq(15 minute) Night	Limit dB(A) LA1(1 minute) Night
15	41	39	51
14	40	39	51
13,16	40	35	48
17	36	35	48

Note:

1. Condition 10 of Schedule 2 of development consent DA 213 -10-99 MOD 5 prohibits quarrying operations during the hours of 10 pm-6 am;
2. Receiver locations are shown on the figure in Appendix 2 of development consent DA 213-10-99 a copy of which has been filed as EPA document DOC15/85830;
3. Noise limits are in accordance with development consent DA 231-10-99 MOD 5;
4. A negotiated agreement is in place for Residence R1 as referred to in development consent DA 231-10-99 MOD 5 & any noise issues from this premises will be addressed by the Department of Planning and Environment.

L4.4 For the purpose of the conditions above:

- Shoulder, Day and Evening is defined as the period from 6am - 10pm

Environment Protection Licence



Licence - 2796

- Night is defined as the period from 10pm - 6am

L4.5 The noise limits set out in the above tables apply under all meteorological conditions except the following:

- a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
- b) Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
- c) Stability category G temperature inversion conditions.

L4.6 For the purpose of the conditions above:

- a) Data recorded by the meteorological station identified in this licence must be used to determine meteorological conditions; and
- b) Temperature inversion conditions (stability category) when determined by the sigma-theta method must be determined in accordance with Part E3 of the NSW Industrial Noise Policy. Temperature inversion conditions (determined by vertical temperature gradient in degrees C) are to be determined by direct measurement over a minimum 50m height interval as referred to in Part E2 to the NSW Industrial Noise Policy

L4.7 To determine compliance:

a) with Leq (15 minute) noise limits in this licence, the noise measurement equipment must be located:

- approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
- within 30 metres of a dwelling façade, but not closer than 3m, where any dwelling on the property is situated more than 30 metres from the property boundary closest to the premises; or
- where applicable within approximately 50 metres of the boundary of a National Park or a Nature Reserve.

b) With the LA1 (1 minute) noise limits in this licence, the noise measurement equipment must be located within 1 metre of a dwelling façade.

c) with the noise limits in this licence, the noise measurement equipment must be located:

- at the most affected point at a location where there is no dwelling at the location; or
- at the most affected point within an area at a location prescribed by this licence.

L4.8 A non-compliance of the noise limit conditions will still occur where noise generated from the premises in excess of the appropriate limit is measured:

- at a location other than an area prescribed by this licence; and/or
- at a point other than the most affected point at a location

Environment Protection Licence



Licence - 2796

L5 Blasting

- L5.1 Blasting in or on the premises must only be carried out between 9am and 5pm, Monday to Friday and 9am and 3pm, Saturday. Blasting in or on the premises must not take place on Sundays or Public Holidays without the prior approval of the EPA.
- L5.2 The airblast overpressure level from blasting operations in or on the premises must not exceed: 115 dB (Lin Peak) for more than 5% of the total number of blasts during each reporting period; at either monitoring point 2 or 3 of this licence.
- L5.3 The airblast overpressure level from blasting operations in or on the premises must not exceed: 120 dB (Lin Peak) at any time; at either monitoring point 2 or 3 of this licence.
- L5.4 The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed: 5 mm/second for more than 5% of the total number of blasts during each reporting period; at either monitoring point 2 or 3 of this licence.
- L5.5 The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed: 10 mm/second at any time; at either monitoring point 2 or 3 of this licence.
- L5.6 Error margins associated with any monitoring equipment used to measure blasts must not be taken into account when determining whether or not the limit has been exceeded.
- L5.7 Offensive blast fume must not be emitted from the premises.

Definition:

Offensive blast fume means post-blast gases from the detonation of explosives at the premises that by reason of their nature, duration, character or quality, or the time at which they are emitted, or any other circumstances:

- 1. are harmful to (or likely to be harmful to) a person that is outside the premises from which it is emitted, or*
- 2. interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted.*

L6 Hours of operation

- L6.1 In accordance with development consent DA 231-10-99 MOD 5, hours of operation for the premises are specified in the table below:

Environment Protection Licence



Licence - 2796

Day	Extraction and processing operations	Transportation operations	Asphalt Plant & associated transport (campaigns)
Monday - Friday	6am to 10pm	6am to 10pm	24 hours a day
Saturday	6am to 6pm	6am to 10 pm	24 hours a day
Sunday and Public Holidays	None	None	24 hours a day

- L6.2 In accordance with development consent DA 231-10-99 MOD 5, the following activities may be conducted at the premises outside the hours specified in the table above:
- (a) return of trucks to the premises prior to midnight Monday to Saturday;
 - (b) delivery or dispatch of materials as requested by Police, Fire Brigade or other similar authorities;
 - (c) emergency work to avoid the loss of lives, property and/or prevent environmental harm; and
 - (d) maintenance activities provided it is inaudible at residential premises.
- In circumstances outlines in (b) and (c), the Licensee shall notify affected residents prior to undertaking the activities, or as soon as practical thereafter

L7 Potentially offensive odour

- L7.1 The licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises.

4 Operating Conditions

O1 Activities must be carried out in a competent manner

- O1.1 Licensed activities must be carried out in a competent manner.
This includes:
- a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
 - b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

- O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
- a) must be maintained in a proper and efficient condition; and
 - b) must be operated in a proper and efficient manner.

O3 Dust

- O3.1 The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.

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O4 Emergency response

Note: The licensee must maintain, and implement as necessary, a current Pollution Incident Response Management Plan (PIRMP) for the premises. The PIRMP must be developed in accordance with the requirements in Part 5.7A of the POEO Act and Regulations.

The licensee must keep the PIRMP on the premises at all times. The PIRMP must document systems and procedures to deal with all types of incidents (e.g. spills, explosions or fire) that may occur at the premises or that may be associated with the activities that occur at the premises and which are likely to cause harm to the environment. The PIRMP must be tested at least annually or following a pollution incident.

O5 Processes and management

O5.1 The licensee must take all reasonable measures to prevent the tracking of mud and debris onto the Pacific Highway including, but not limited to, ensuring all vehicles leaving the premises pass through the vehicular wheel wash.

O6 Waste management

O6.1 The licensee must comply with the conditions as specified in this licence or where no specific conditions outlined in this licence, this licensee must comply with the *Protection of the Environment Operations (Waste) Regulation 2014*.

5 Monitoring and Recording Conditions

M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:

- a) in a legible form, or in a form that can readily be reduced to a legible form;
- b) kept for at least 4 years after the monitoring or event to which they relate took place; and
- c) produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:

- a) the date(s) on which the sample was taken;
- b) the time(s) at which the sample was collected;
- c) the point at which the sample was taken; and
- d) the name of the person who collected the sample.

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M2 Requirement to monitor concentration of pollutants discharged

M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

M2.2 Air Monitoring Requirements

POINT 11

Pollutant	Units of measure	Frequency	Sampling Method
PM10	micrograms per cubic metre	Every 6 days	AM-18

POINT 18,19,20,21

Pollutant	Units of measure	Frequency	Sampling Method
Particulates - Deposited Matter	grams per square metre per month	Monthly	AM-19

M2.3 Water and/ or Land Monitoring Requirements

POINT 1

Pollutant	Units of measure	Frequency	Sampling Method
pH	pH	Each overflow event	Grab sample
Total suspended solids	milligrams per litre	2 times daily during discharge	Grab sample
Turbidity	nephelometric turbidity units	2 times daily during discharge	Grab sample

M3 Testing methods - concentration limits

M3.1 Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:

- any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or
- if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or
- if no such requirement is imposed by or under the Act or by a condition of this licence, any

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methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.

- M3.2 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

Note: The *Protection of the Environment Operations (Clean Air) Regulation 2010* requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".

M4 Weather monitoring

- M4.1 At the point(s) identified below, the licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1 of the table below, using the corresponding sampling method, units of measure, averaging period and sampling frequency, specified opposite in the Columns 2, 3, 4 and 5 respectively.

POINT 4

Parameter	Sampling method	Units of measure	Averaging period	Frequency
Temperature at 10 metres	AM-4	degrees Celsius	1 hour	Continuous
Wind Direction at 10 metres	AM-2 & AM-4	Degrees	15 minutes	Continuous
Wind Speed	AM-2 & AM-4	metres per second	15 minutes	Continuous
Sigma Theta	AM-2 & AM-4	Degrees	15 minutes	Continuous
Rainfall	AM-4	millimetres	15 minutes	Continuous
Relative humidity	AM-4	percent	1 hour	Continuous

- M4.2 Rainfall at the premises must be measured and recorded in millimetres per 24 hour period, at the same time each day.

Note: The rainfall monitoring data collected in compliance with the above condition will assist in interpreting the effectiveness of stormwater management at the quarry.

M5 Recording of pollution complaints

- M5.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

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M5.2 The record must include details of the following:

- a) the date and time of the complaint;
- b) the method by which the complaint was made;
- c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
- d) the nature of the complaint;
- e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
- f) if no action was taken by the licensee, the reasons why no action was taken.

M5.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M5.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M6 Telephone complaints line

M6.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M6.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

M6.3 The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.

M7 Blasting

M7.1 To determine compliance with the blasting limits of this licence:

- a) Airblast overpressure and ground vibration levels must be measured and electronically recorded for monitoring points 2 and 3 for the parameters specified in Column 1 of the table below; and
- b) The licensee must use the units of measure, sampling method, and sample at the frequency specified opposite in the other columns.

Parameters	Units of Measure	Frequency	Sampling Method
Airblast Overpressure	Decibels (Linear Peak)	All blasts	Australian Standard AS 2187.2-2006
Ground Vibration Peak Particle Velocity	millimetres/second	All blasts	Australian Standard AS 2187.2-2006

M8 Noise monitoring

M8.1 To assess compliance with the noise limits of this licence, attend noise monitoring must be undertaken in accordance with the conditions of this licence and:

- a) during a period of normal quarry operations;

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- b) at each one of the noise monitoring locations listed in the noise limits table of this licence;
- c) occur quarterly in the reporting period; and
- d) occur during the night period as defined in the NSW Noise Policy for Industry, and in conjunction with an asphalt campaign if any such campaign occurs within the quarterly monitoring period.

Note: The extent and frequency of noise monitoring required by this licence will be reviewed upon request after eight quarterly monitoring campaigns.

M8.2 Noise monitoring must be carried out in accordance with Australian Standard AS 2659.1 - 1998: Guide to the use of sound measuring equipment - Portable sound level metres and in accordance with any relevant factors provided in the NSW Noise Policy for Industry.

6 Reporting Conditions

R1 Annual return documents

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:

1. a Statement of Compliance,
2. a Monitoring and Complaints Summary,
3. a Statement of Compliance - Licence Conditions,
4. a Statement of Compliance - Load based Fee,
5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan,
6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and
7. a Statement of Compliance - Environmental Management Systems and Practices.

At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

R1.3 Where this licence is transferred from the licensee to a new licensee:

- a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
- b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:

- a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is

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given; or

b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

R1.5 The Annual Return for the reporting period must be supplied to the EPA via eConnect *EPA* or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

R1.7 Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:

a) the licence holder; or

b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

R2 Notification of environmental harm

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:

a) where this licence applies to premises, an event has occurred at the premises; or

b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,

and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:

a) the cause, time and duration of the event;

b) the type, volume and concentration of every pollutant discharged as a result of the event;

c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;

d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;

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- e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
- f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
- g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

R4 Other reporting conditions

R4.1 Noise Compliance Assessment Report

A noise compliance assessment report(s) must be submitted to the EPA with each Annual Return. The assessment must be prepared by a suitably qualified and experienced acoustical consultant and include:

- a) an assessment of compliance with noise limits detailed in the limit conditions of this licence;
- b) details of all quarrying activities that were occurring during each of the periods of monitoring, and
- c) an outline of any management actions taken within the monitoring period to address any exceedences of the limits detailed in the limit conditions of this licence.

R4.2 Blast Monitoring Report

The licensee must supply, with each Annual Return, a Blast Monitoring Report which must include the following information relating to each blast carried out within the premises during the reporting period covered by the Annual Return:

- a) the date and time of the blast;
- b) the location of the blast on the premises;
- c) the blast monitoring results at each blast monitoring station; and
- d) an explanation for any missing blast monitoring results.

R4.3 The licensee must report any exceedence of the licence blasting limits to the regional office of the EPA as soon as practicable after the exceedence becomes known to the licensee or to one of the licensee's employees or agents.

7 General Conditions

G1 Copy of licence kept at the premises or plant

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

G2 Other general conditions

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G2.1 Completed Programs

Program	Description	Completed Date
PRP 1: Installation and Use of a Wheel Wash at the Premises	Construction and Utilisation of a vehicular wheel wash for all vehicles exiting the premises.	28-October-2011

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Dictionary

General Dictionary

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

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flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 months. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .

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TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non - putrescible), special waste or hazardous waste

Mr Nigel Sargent

Environment Protection Authority

(By Delegation)

Date of this edition: 10-March-2000

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End Notes

- 1 Licence varied by notice 1006152, issued on 21-Feb-2002, which came into effect on 18-Mar-2002.
- 2 Licence varied by notice 1016675, issued on 20-Jun-2002, which came into effect on 15-Jul-2002.
- 3 Licence transferred through application 141653, approved on 19-Dec-2002, which came into effect on 01-Oct-2002.
- 4 Licence varied by notice 1042128, issued on 14-Jan-2005, which came into effect on 08-Feb-2005.
- 5 Condition A1.3 Not applicable varied by notice issued on <issue date> which came into effect on <effective date>
- 6 Licence varied by notice 1106247, issued on 08-Sep-2009, which came into effect on 08-Sep-2009.
- 7 Licence varied by notice 1503538 issued on 04-Jan-2012
- 8 Licence varied by notice 1507470 issued on 26-Sep-2012
- 9 Licence varied by notice 1535107 issued on 17-Oct-2016
- 10 Licence varied by notice 1577456 issued on 12-Jun-2019
- 11 Licence format updated on 18-Jul-2019

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Noise Monitoring Assessment

Jandra Quarry, Possum Brush, NSW
Quarter 2 Ending June 2021.



Document Information

Noise Monitoring Assessment

Jandra Quarry, Possum Brush, NSW

Quarter 2 Ending June 2021

Prepared for: Holcim (Australia) Pty Ltd

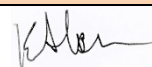
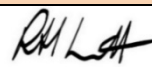
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APPENDIX B – OPERATIONS LOG

APPENDIX C – EPL VARIATION

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for the quarterly period ending June 2021 for Jandra Quarry (the 'quarry'), Possum Brush, NSW.

Noise monitoring has been conducted in accordance with the Jandra Noise and Blast Management Plan and in accordance with additional clarifications and requirements specified by the EPA in the recent variation (6 November 2019) of the EPL 2796 (EPL).

The following variations have been made to the licence:

- Amendment of condition M8.1 to clarify the requirement to undertake noise monitoring during quarrying operations and to update reference to the contemporary NSW Noise Policy for Industry;
- Amendment of condition M8.2 referencing the contemporary NSW Noise Policy for Industry; and
- Amendment to Condition R4.1 requires that noise monitoring reports contain details of all quarrying activities that were occurring during each of the monitoring periods.

Specifically, the amendment to M8.1 is reproduced below.

M8 Noise monitoring

M8.1 *To assess compliance with the noise limits of this licence, attend noise monitoring must be undertaken in accordance with the conditions of this licence and:*

- a) during a period of normal quarry operations;*
- b) at each one of the noise monitoring locations listed in the noise limits table of this licence;*
- c) occur quarterly in a reporting period, and*
- d) occur during the night period as defined in the NSW Industrial Noise Policy, and in conjunction with an asphalt campaign if any such campaign occurs within the quarterly monitoring period.*

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

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- Environment Protection Licence (EPL), 2796 and Variation 6 November 2019;
- Jandra Quarry Conditions of Consent (CoC), 2015;
- Jandra Quarry Noise and Blast Management Plan (NBMP), 2015; and
- Australian Standard AS 1055:2018 - Acoustics - Description and measurement of environmental noise - General Procedures.

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

The operations log during the noise monitoring is provided in **Appendix B**.

A copy of the recent licence variation is provided in **Appendix C**.

2 Noise Criteria

Section L4 of the Jandra Environment Protection Licence (EPL 2796) presents noise criteria for residential receivers surrounding the quarry site, which are applicable for two different operational modes – quarrying and quarrying plus asphalt production.

Furthermore, Section 5 of the Jandra Noise and Blast Management Plan (NBMP) outlines that noise criteria do not apply at R1, R3, R8, R9, R10. Section 5 of the NBMP states:

- *'Holcim has executed a negotiated agreement with the property owner of R1 which excludes this receptor from the approved noise criteria';*
- *'R3 is not included in the approved noise criteria as this receiver represented road noise and the EA concluded that road noise impacts as a consequence of the development were below guideline thresholds and didn't warrant further assessment'; and*
- *'Receivers R8, R9 & R10 are Holcim owned residences and the approved criteria only apply to privately owned land'.*

Table 1 presents the criteria for the receivers where compliance is required for both quarry operation and combined quarry and asphalt production operations.

Table 1 Noise Criteria				
Location	Quarry Operations	Quarry Operations and Asphalt Plant Production		
	6am – 10pm	6am – 10pm	10pm – 6am	10pm – 6am
	dB LAeq(15min)	dB LAeq(15min)	dB LAeq(15min)	dB LA1(1min)
EPA13 (R2)	36	40	35	48
EPA14 (R4)	36	40	39	51
EPA15 (R5)	40	41	39	51
EPA16 (R6)	36	40	35	48
EPA17 (R7)	35	36	35	48

Note 1: Noise criteria are not applicable to these receivers as per Section 5 of the NBMP.

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3 Methodology

3.1 Locality

The quarry is located at Possum Brush, NSW approximately 16km south of Taree, NSW. Receivers in the locality surrounding the quarry are primarily rural/residential. The Pacific Highway is situated to the west of the site, with highway traffic a dominant noise source at receivers within its proximity. To the east, the quarry is bounded by rural properties with noise from The Lakes Way dominating the acoustic environment. The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan shown in **Figure 1**.

3.2 Noise Monitoring Locations

Noise measurements were conducted at five monitoring locations specified in the EPL on Wednesday 28 April 2021 and Thursday 29 April 2021 during the morning shoulder and daytime periods. The measurement locations are presented in **Figure 1**.

3.3 Assessment Methodology

Attended noise surveys were conducted in general accordance with the procedures described in Australian Standard AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise" and the EPL. The measurements were carried out using a Svantek Type 1, 971 noise analyser on Wednesday 28 April 2021 and Thursday 29 April 2021. The acoustic instrumentation used carries current NATA calibration and complies with AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ± 0.5 dBA.

Noise measurements were of 15 minutes in duration and where possible, throughout each survey the operator quantified the contribution of each significant noise source. One measurement was conducted at each of the EPL monitoring locations during the morning shoulder and daytime periods. Monitoring during the evening period was not conducted due to the quarry not being operational.

Extraneous noise sources were excluded from the analysis to determine the LAeq(15min) noise contribution for comparison against the relevant criteria. Where the quarry was inaudible, the contribution is estimated to be at least 10dB below the ambient noise level.



KEY

- EPL Locations
- Jandra Quarry



4 Results

4.1 Assessment Results

The monitored noise level contributions and observed meteorological conditions for each assessment period at each location are presented in **Table 2** to **Table 6**.

Table 2 Operator-Attended Noise Survey Results – Location EPA13

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
28/04/21	08:43 (Day)	74	45	37	WD: NE	Birds 33-74
					WS: 0.1m/s	Distant Traffic 36-41
					Rain: Nil	Quarry – Machinery <33 (<5 second duration)
Jandra Quarry Contribution						<30 L _{Aeq} (15min)
28/04/21	06:28 (Morning Shoulder)	75	50	38	WD: N	Birds 33-75
					WS: 0.5m/s	Distant Traffic 36-43
					Rain: Nil	Quarry Inaudible
Jandra Quarry Contribution						<30 L _{Aeq} (15min)

Note: Morning Shoulder – the period from 6am to 7am Monday to Saturday or 6am to 8am on Sundays and public holidays, Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Table 3 Operator-Attended Noise Survey Results – Location EPA14

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
28/04/21	09:45 (Day)	67	50	44	WD: N	Birds 37-67
					WS: 0.5m/s	Highway Traffic 40-58
					Rain: Nil	Quarry Inaudible
Jandra Quarry Contribution						<36 L _{Aeq} (15min)
29/04/21	06:15 (Morning Shoulder)	66	52	47	WD: N	Birds 40-66
					WS: 0.1m/s	Highway Traffic 43-58
					Rain: Nil	Insects <38 Residential noise 40-44 Quarry Inaudible
Jandra Quarry Contribution						<36 L _{Aeq} (15min)

Note: Morning Shoulder – the period from 6am to 7am Monday to Saturday or 6am to 8am on Sundays and public holidays, Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Table 4 Operator-Attended Noise Survey Results – Location EPA15

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
28/04/21	10:01	67	46	42	WD: N	Birds 34-67
	(Day)				WS: 1.0m/s	Highway Traffic 37-48
						Insects <34-43
						Quarry Inaudible
Jandra Quarry Contribution						<35 L _{Aeq} (15min)
29/04/21	06:32	62	47	43	WD: N	Birds 37-62
	(Morning Shoulder)				WS: 0.1m/s	Highway Traffic 40-52
						Insects <37-44
						Quarry Inaudible
Jandra Quarry Contribution						<35 L _{Aeq} (15min)

Note: Morning Shoulder – the period from 6am to 7am Monday to Saturday or 6am to 8am on Sundays and public holidays, Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Table 5 Operator-Attended Noise Survey Results – Location EPA16

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
28/04/21	09:02	64	39	35	WD: NW	Birds 30-64
	(Day)				WS: 0.5m/s	Distant Traffic 33-39
						Quarry Inaudible
Jandra Quarry Contribution						<30 L _{Aeq} (15min)
28/04/21	06:46	63	43	38	WD: NE	Birds 33-63
	(Morning Shoulder)				WS: 0.5m/s	Distant Traffic 36-44
						Quarry Inaudible
Jandra Quarry Contribution						<30 L _{Aeq} (15min)

Note: Morning Shoulder – the period from 6am to 7am Monday to Saturday or 6am to 8am on Sundays and public holidays, Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Table 6 Operator-Attended Noise Survey Results – Location EPA17

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}		
28/04/21	08:18 (Day)	75	53	37	WD: NW WS: 0.1m/s Rain: Nil	Birds 31-68
						Distant Traffic 34-43
						Local Traffic 50-75
						Dogs Barking 38-51
						Residential Noise 45-58
Quarry Inaudible						
Jandra Quarry Contribution						<30dB L _{Aeq} (15min)
28/04/21	06:01 (Morning Shoulder)	63	44	37	WD: N WS: 0.1m/s Rain: Nil	Birds 31-63
						Distant Traffic 34-40
						Quarry Inaudible
Jandra Quarry Contribution						<30 L _{Aeq} (15min)

Note: Morning Shoulder – the period from 6am to 7am Monday to Saturday or 6am to 8am on Sundays and public holidays, Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

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5 Discussion

5.1 Discussion of Results - Location EPA13

Quarry noise was inaudible during the morning shoulder measurement and barely audible for a very brief period during daytime measurement conducted on Wednesday 28 April 2021. Quarry noise contributions were estimated to satisfy the morning shoulder and daytime noise limits. The quarry was not operational during the evening period and hence, no measurements were conducted for this period.

Quarry noise sources observed during the measurements included machinery noise. Non-quarry noise sources included distant traffic and birds.

5.2 Discussion of Results - Location EPA14

Quarry noise was inaudible during the morning shoulder and daytime measurements conducted on Wednesday 28 April 2021 and Thursday 29 April 2021, with background noise levels dominated by highway traffic. Quarry noise contributions were estimated to satisfy the morning shoulder and daytime noise limits. The quarry was not operational during the evening period and hence, no measurements were conducted for this period.

Non-quarry noise sources observed during the measurements included highway traffic, insects, residential noise and birds.

5.3 Discussion of Results - Location EPA15

Quarry noise was inaudible during the morning shoulder and daytime measurements conducted on Wednesday 28 April 2021 and Thursday 29 April 2021 with background noise levels dominated by highway traffic. Quarry noise contributions were estimated to satisfy the morning shoulder and daytime noise limits. The quarry was not operational during the evening period and hence, no measurements were conducted for this period.

Non-quarry noise sources observed during the measurements included highway traffic, insects, and birds.

5.4 Discussion of Results - Location EPA16

Quarry noise was inaudible during the morning shoulder and daytime measurements conducted on Wednesday 28 April 2021. Quarry noise contributions were estimated to satisfy the morning shoulder and daytime noise limits. The quarry was not operational during the evening period and hence, no measurements were conducted for this period.

Non-quarry noise sources observed during the measurements included distant traffic and birds.

5.5 Discussion of Results - Location EPA17

Quarry noise was inaudible during the morning shoulder and daytime measurements conducted on Wednesday 28 April 2021. Quarry noise contributions were estimated to satisfy the morning shoulder and daytime noise limits. The quarry was not operational during the evening period and hence, no measurements were conducted for this period.

Non-quarry noise sources observed during the measurements included distant and local traffic, residential noise, birds and dogs barking.

6 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment (NMA) for Holcim (Australia) Pty Ltd at the Jandra Quarry, Possum Brush, NSW. The assessment was completed to determine compliance with the relevant noise criteria for the quarterly period ending June 2021.

Attended noise monitoring was completed on Wednesday 28 April 2021 and Thursday 29 April 2021 at five nominated EPL monitoring locations with quarry noise contributions compared against the relevant criteria. The assessment has identified that noise emissions generated by Holcim Jandra Quarry comply with relevant noise criteria specified in the EPL at all assessed locations.

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Appendix A – Glossary of Terms

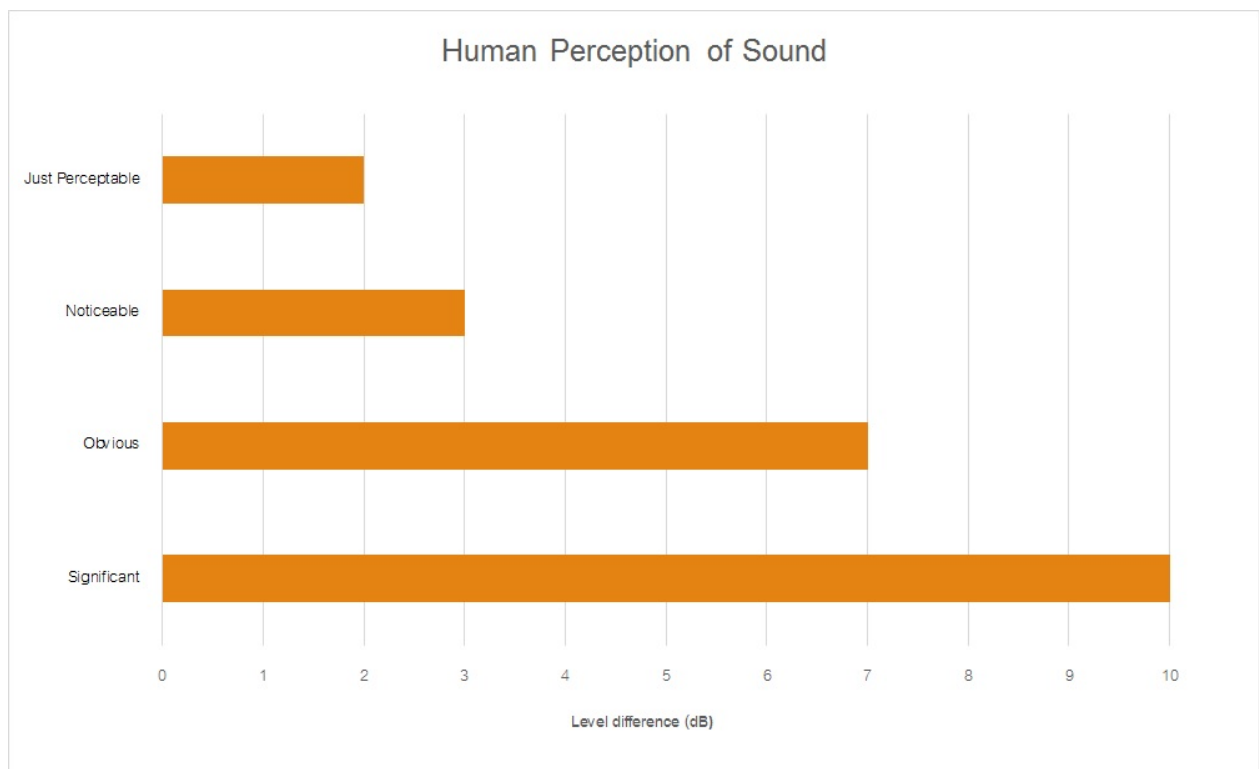
Table A1 provides a number of technical terms have been used in this report.

Table A1 Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAm _{ax}	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by : $= 10 \cdot \log_{10} (W/W_0)$ Where : W is the sound power in watts and W ₀ is the sound reference power at 10-12 watts.

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

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

Figure A1 – Human Perception of Sound



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Appendix B – Operations Log

Operations Log – Jandra Quarry 28 April 2021

Period ending	Pit	Plant
6:00	NA – Prestart meeting	NA – Prestart meeting
6:15	NA – Prestart meeting	NA – Prestart meeting
6:30	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
6:45	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
7:00	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
7:15	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
7:30	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
7:45	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
8:00	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
8:15	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
8:30	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks

Period ending	Pit	Plant
8:45	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
9:00	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
9:15	Morning Tea	Production Sales Loader Road Trucks
9:30	Morning Tea	Production Sales Loader Road Trucks
9:45	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
10:00	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
10:15	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
10:30	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
10:45	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
11:00	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
11:15	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks

Period ending	Pit	Plant
11:30	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
11:45	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
12:00	Load and haul Dozer pushing material to the mobile screen CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks

Operations Log – Jandra Quarry 29 April 2021

Period ending	Pit	Plant
6:00	NA – Prestart meeting	NA – Prestart meeting
6:15	NA – Prestart meeting	NA – Prestart meeting
6:30	Load and haul Dozer pushing material to the mobile screen Mobile screen operating CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
6:45	Load and haul Dozer pushing material to the mobile screen Mobile screen operating CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
7:00	Load and haul Dozer pushing material to the mobile screen Mobile screen operating CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
7:15	Load and haul Dozer pushing material to the mobile screen Mobile screen operating CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
7:30	Load and haul Dozer pushing material to the mobile screen Mobile screen operating CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
7:45	Load and haul Dozer pushing material to the mobile screen Mobile screen operating CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
8:00	Load and haul Dozer pushing material to the mobile screen Mobile screen operating CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks

Period ending	Pit	Plant
8:15	Load and haul Dozer pushing material to the mobile screen Mobile screen operating CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
8:30	Load and haul Dozer pushing material to the mobile screen Mobile screen operating CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
8:45	Load and haul Dozer pushing material to the mobile screen Mobile screen operating CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks
9:00	Load and haul Dozer pushing material to the mobile screen Mobile screen operating CAT775 and CAT349 RL35 to ROM	Production Sales Loader Road Trucks

Appendix C – EPL Variation

Licence Variation



Licence - 2796

HOLCIM (AUSTRALIA) PTY LTD
ABN 87 099 732 297 ACN 099 732 297
LOCKED BAG 5007
BAULKHAM HILLS NSW 1755

Attention: Ian Vernon & Matt Neil

Notice Number 1585343
File Number EF13/3895
Date 06-Nov-2019

The Proper Officer

NOTICE OF VARIATION OF LICENCE NO. 2796

BACKGROUND

- A. HOLCIM (AUSTRALIA) PTY LTD ("the licensee") is the holder of Environment Protection Licence No. 2796 ("the licence") issued under the *Protection of the Environment Operations Act 1997* ("the POEO Act"). The licence authorises the carrying out of activities at PACIFIC HIGHWAY, POSSUM BRUSH, NSW, 2430 ("the premises").
- B. On 3 September 2019, the Environment Protection Authority ("the EPA") conducted a compliance inspection of the premises. During the compliance inspection, the EPA discussed relevant noise conditions with the licensee including the location and timing of noise monitoring.
- C. Condition L4.2 states "noise from the premises during quarrying operations only must not exceed the limits specified in the following table". Noise monitoring at a time when the quarry is operating is required to determine compliance with the noise limits specified at condition L4.2.
- D. Condition M8.1 of the licence outlines the requirements for noise compliance monitoring and includes the requirement to undertake attended noise monitoring that "c) occur during the night period as defined in the NSW Industrial Noise Policy, and in conjunction with an asphalt campaign if any such campaign occurs within the quarterly monitoring period".
- E. During the discussions with the EPA, the licensee's representative advised that the premises does not operate after 4:30pm, however noise compliance monitoring by the licensee's consultant has occurred at times when the quarry is not operating. The licensee's representative also advised that the quarry has not had an asphalt plant for some time, however development consent allows for such a plant.
- F. The EPA has made an amendment to condition M8.1 to clarify the requirement to monitor during quarrying operations and update reference to contemporary noise policy. Condition M8.2 has also been amended to reference the contemporary noise policy.

Licence Variation



- G. The NSW Industrial Noise Policy has been superseded by the NSW Noise Policy for Industry. Definition of the "night" period remains unchanged between the two policy documents.
- H. The EPA has made an amendment to condition R4.1 to require in reports of noise monitoring that details be provided of all quarrying activities that were occurring during each of the periods of monitoring.
- I. This Notice does not authorise a significant increase in the environmental impact of the activities authorised or controlled by the licence.
- J. This variation has been undertaken with consideration of section 45 of the POEO Act.

VARIATION OF LICENCE NO. 2796

- 1. By this Notice the EPA varies the licence. The attached licence document contains all variations that are made to the licence by this notice.
- 2. The following variations have been made to the licence:
 - Amendment of condition M8.1 to clarify the requirement to undertake noise monitoring during quarrying operations and to update reference to the contemporary NSW Noise Policy for Industry.
 - Amendment of condition M8.2 to reference the contemporary NSW Noise Policy for Industry.
 - Amendment to Condition R4.1 to require in reports of noise monitoring that details be provided of all quarrying activities that were occurring during each of the periods of monitoring.

A handwritten signature in blue ink, appearing to read 'Matthew Corradin'.

.....
MATTHEW CORRADIN
A/Unit Head Hunter North
Environment Protection Authority
(by Delegation)

INFORMATION ABOUT THIS NOTICE

- This Notice is issued under Section 58(5) of the POEO Act.
- Details provided in this Notice, along with an updated version of the licence, will be available on the EPA's Public Register (<http://www.epa.nsw.gov.au/prpoeo/index.htm>) in accordance with section 308 of the POEO Act.

Licence Variation



Appeals against this decision

- You can appeal to the Land and Environment Court against this decision. The deadline for lodging the appeal is 21 days after you were given notice of this decision.

When this notice begins to operate

- The variations to the licence specified in this Notice begin to operate immediately from the date of this Notice, unless another date is specified in this Notice.
- If an appeal is made against this decision to vary the licence and the Land and Environment Court directs that the decision is stayed the decision does not operate until the stay ceases to have effect or the Land and Environment Court confirms the decision or the appeal is withdrawn (whichever occurs first).

Licence Variation



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Environment Protection Licence

Licence - 2796

Licence Details	
Number:	2796
Anniversary Date:	01-May

Licensee
HOLCIM (AUSTRALIA) PTY LTD
LOCKED BAG 5007
BAULKHAM HILLS NSW 1755

Premises
JANDRA QUARRY
PACIFIC HIGHWAY
POSSUM BRUSH NSW 2430

Scheduled Activity
Crushing, grinding or separating
Extractive activities
Resource recovery
Waste storage

Fee Based Activity	Scale
Crushing, grinding or separating	> 100000-500000 T annual processing capacity
Extractive activities	> 100000-500000 T annual capacity to extract or process
Recovery of general waste	Any general waste recovered
Waste storage - other types of waste	Any other types of waste stored

Region
North - Hunter
Ground Floor, NSW Govt Offices, 117 Bull Street NEWCASTLE WEST NSW 2302
Phone: (02) 4908 6800
Fax: (02) 4908 6810
PO Box 488G NEWCASTLE NSW 2300



Environment Protection Licence

Licence - 2796

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Environment Protection Licence

Licence - 2796



Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

Environment Protection Licence

Licence - 2796



The EPA publication “A Guide to Licensing” contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

HOLCIM (AUSTRALIA) PTY LTD
LOCKED BAG 5007
BAULKHAM HILLS NSW 1755

subject to the conditions which follow.

Environment Protection Licence

Licence - 2796

1 Administrative Conditions

A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity	Fee Based Activity	Scale
Crushing, grinding or separating	Crushing, grinding or separating	> 100000 - 500000 T annual processing capacity
Extractive activities	Extractive activities	> 100000 - 500000 T annual capacity to extract or process
Resource recovery	Recovery of general waste	Any general waste recovered
Waste storage	Waste storage - other types of waste	Any other types of waste stored

Note: The condition titled "Waste" under the Limit Conditions of this licence restricts what types of waste may be received at the Premises.

A1.2 Notwithstanding the fee scales noted above, the licensee must not:

- (a) extract more than 490,000 tonnes of quarry products from the premises per calendar year; and
- (b) transport more than 475,000 tonnes of quarry products from the premises per calendar year

Note: This condition has been added to be consistent with development consent DA231-10-99 MOD 5.

A2 Premises or plant to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
JANDRA QUARRY
PACIFIC HIGHWAY
POSSUM BRUSH
NSW 2430
LOT 2 DP 255621, LOT 11 DP 790056, LOT 12 DP 790056, LOT 13 DP 790056, LOT 14 DP 790056, LOT 15 DP 790056

Environment Protection Licence

Licence - 2796

A3 Information supplied to the EPA

- A3.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:

- the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
- the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

2 Discharges to Air and Water and Applications to Land

P1 Location of monitoring/discharge points and areas

- P1.1 The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.

<i>Air</i>			
EPA identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
11	Ambient PM10 monitoring		Receiver location R1 identified on map titled "Jandra Environmental Monitoring Locations" within the Holcim Environmental Management Strategy - Jandra Quarry. See EPA document DOC16/387391, EF13/3895.
18	Dust deposition monitoring		Dust monitoring point on the northern site boundary identified on "Figure 1 Surrounding land use, residences and environmental monitoring locations" within the Holcim Air Quality Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391.
19	Dust deposition monitoring		Dust monitoring point on southern site boundary identified on "Figure 1 Surrounding land use, residences and environmental monitoring locations" within the Holcim Air Quality Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391.
20	Dust deposition monitoring		Dust monitoring point on the eastern site boundary identified on "Figure 1 Surrounding land use, residences and environmental monitoring locations" within the Holcim Air Quality Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391.

Environment Protection Licence

Licence - 2796



21	Dust deposition monitoring	Dust monitoring point on the western site boundary identified on "Figure 1 Surrounding land use, residences and environmental monitoring locations" within the Holcim Air Quality Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391.
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P1.2 The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.

P1.3 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

Water and land

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
1	Discharge quality monitoring	Discharge quality monitoring	Discharge from final sediment dam as shown in the CSR Readymix Site Photo - Jandra Quarry Water Monitoring Location Figure 1 provided to the EPA 13 May 2002

P1.4 The following points referred to in the table below are identified in this licence for the purposes of weather and/or noise monitoring and/or setting limits for the emission of noise from the premises.

Noise/Weather

EPA identification no.	Type of monitoring point	Location description
2	Air blast overpressure & ground vibration peak particle velocity monitoring	Receiver location R4 in accordance with development consent 231-10-99 MOD 5 and identified on "Figure 1 Surrounding land use, residence and environmental monitoring locations" within the Holcim Noise and Blast Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391, EF13/3895.
3	Air blast overpressure & ground vibration peak particle velocity monitoring	Receiver location R2 in accordance with development consent 231-10-99 MOD 5 and identified on "Figure 1 Surrounding land use, residence and environmental monitoring locations" within the Holcim Noise and Blast Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391, EF13/3895.

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4	Meteorological Station – to determine meteorological conditions for noise monitoring	Meteorological station adjacent to the "Main Dam" and identified on "Figure 1 Surrounding land use, residences and environmental monitoring locations" within the Holcim Air Quality Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391, EF13/3895.
13	Noise monitoring	Monitoring location R2 in accordance with development consent 231-10-99 MOD 5 and identified on "Figure 1 Surrounding land use, residences and environmental monitoring locations" within the Holcim Noise and Blast Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391, EF13/3895.
14	Noise monitoring	Monitoring location R4 in accordance with development consent 231-10-99 MOD 5 and identified on "Figure 1 Surrounding land use, residences and environmental monitoring locations" within the Holcim Noise and Blast Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391, EF13/3895.
15	Noise monitoring	Monitoring location R5 in accordance with development consent 231-10-99 MOD 5 and identified on "Figure 1 Surrounding land use, residences and environmental monitoring locations" within the Holcim Noise and Blast Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391, EF13/3895.
16	Noise monitoring	Monitoring location R6 in accordance with development consent 231-10-99 MOD 5 and identified on "Figure 1 Surrounding land use, residences and environmental monitoring locations" within the Holcim Noise and Blast Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391, EF13/3895.
17	Noise monitoring	Monitoring location R7 in accordance with development consent 231-10-99 MOD 5 and identified on "Figure 1 Surrounding land use, residences and environmental monitoring locations" within the Holcim Noise and Blast Management Plan, Jandra Quarry 31/08/2015. See EPA document DOC16/387391, EF13/3895.

3 Limit Conditions

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L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Concentration limits

L2.1 For each monitoring/discharge point or utilisation area specified in the table\ below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.

L2.2 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.

L2.3 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\.

L2.4 Water and/or Land Concentration Limits

POINT 1

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

L3 Waste

L3.1 The licensee must not cause, permit or allow any waste to be received at the premises, except concrete "wash-out" waste from concrete batch plants. All other wastes are not permitted on the premises, except as expressly permitted by this licence.

L3.2 The licensee must not:

- Process more than 3000 tonnes of concrete "wash-out" per annum;
- Store more than 1000 tonnes of concrete "wash-out" on the premises at any one time.

L3.3 Concrete 'wash-out' must be stockpiled on site in bunded areas and can be processed and blended with

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quarry raw product to produce quarry product(s).

L4 Noise limits

L4.1 Noise generated at the premises must not exceed the noise limits in the tables below. The locations referred to in the tables below are indicated in the document titled: "Jandra Quarry Intensification of Production Environmental Assessment (DA 231-10-99 MOD 5)" Dated July 2014

L4.2 Noise from the premises during quarrying operations only must not exceed the limits specified in the following table:

EPA identification no.	Limit dB(A) LAeq(15 min) Shoulder, Day & Evening
15	40
13, 14, 16	36
17	35

L4.3 Noise from the premises during operations including asphalt plant must not exceed the limits specified in the following table:

EPA identification no.	Limit dB(A) LAeq(15 min) Shoulder, Day & Evening	Limit dB(A) LAeq(15 minute) Night	Limit dB(A) LA1(1 minute) Night
15	41	39	51
14	40	39	51
13,16	40	35	48
17	36	35	48

Note:

1. Condition 10 of Schedule 2 of development consent DA 213 -10-99 MOD 5 prohibits quarrying operations during the hours of 10 pm-6 am;
2. Receiver locations are shown on the figure in Appendix 2 of development consent DA 213-10-99 a copy of which has been filed as EPA document DOC15/85830;
3. Noise limits are in accordance with development consent DA 231-10-99 MOD 5;
4. A negotiated agreement is in place for Residence R1 as referred to in development consent DA 231-10-99 MOD 5 & any noise issues from this premises will be addressed by the Department of Planning and Environment.

L4.4 For the purpose of the conditions above:

- Shoulder, Day and Evening is defined as the period from 6am - 10pm

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- Night is defined as the period from 10pm - 6am

L4.5 The noise limits set out in the above tables apply under all meteorological conditions except the following:

- a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
- b) Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
- c) Stability category G temperature inversion conditions.

L4.6 For the purpose of the conditions above:

- a) Data recorded by the meteorological station identified in this licence must be used to determine meteorological conditions; and
- b) Temperature inversion conditions (stability category) when determined by the sigma-theta method must be determined in accordance with Part E3 of the NSW Industrial Noise Policy. Temperature inversion conditions (determined by vertical temperature gradient in degrees C) are to be determined by direct measurement over a minimum 50m height interval as referred to in Part E2 to the NSW Industrial Noise Policy

L4.7 To determine compliance:

a) with Leq (15 minute) noise limits in this licence, the noise measurement equipment must be located:

- approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
- within 30 metres of a dwelling façade, but not closer than 3m, where any dwelling on the property is situated more than 30 metres from the property boundary closest to the premises; or
- where applicable within approximately 50 metres of the boundary of a National Park or a Nature Reserve.

b) With the LA1 (1 minute) noise limits in this licence, the noise measurement equipment must be located within 1 metre of a dwelling façade.

c) with the noise limits in this licence, the noise measurement equipment must be located:

- at the most affected point at a location where there is no dwelling at the location; or
- at the most affected point within an area at a location prescribed by this licence.

L4.8 A non-compliance of the noise limit conditions will still occur where noise generated from the premises in excess of the appropriate limit is measured:

- at a location other than an area prescribed by this licence; and/or
- at a point other than the most affected point at a location

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L5 Blasting

- L5.1 Blasting in or on the premises must only be carried out between 9am and 5pm, Monday to Friday and 9am and 3pm, Saturday. Blasting in or on the premises must not take place on Sundays or Public Holidays without the prior approval of the EPA.
- L5.2 The airblast overpressure level from blasting operations in or on the premises must not exceed: 115 dB (Lin Peak) for more than 5% of the total number of blasts during each reporting period; at either monitoring point 2 or 3 of this licence.
- L5.3 The airblast overpressure level from blasting operations in or on the premises must not exceed: 120 dB (Lin Peak) at any time; at either monitoring point 2 or 3 of this licence.
- L5.4 The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed: 5 mm/second for more than 5% of the total number of blasts during each reporting period; at either monitoring point 2 or 3 of this licence.
- L5.5 The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed: 10 mm/second at any time; at either monitoring point 2 or 3 of this licence.
- L5.6 Error margins associated with any monitoring equipment used to measure blasts must not be taken into account when determining whether or not the limit has been exceeded.
- L5.7 Offensive blast fume must not be emitted from the premises.

Definition:

Offensive blast fume means post-blast gases from the detonation of explosives at the premises that by reason of their nature, duration, character or quality, or the time at which they are emitted, or any other circumstances:

- 1. are harmful to (or likely to be harmful to) a person that is outside the premises from which it is emitted, or*
- 2. interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted.*

L6 Hours of operation

- L6.1 In accordance with development consent DA 231-10-99 MOD 5, hours of operation for the premises are specified in the table below:

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Day	Extraction and processing operations	Transportation operations	Asphalt Plant & associated transport (campaigns)
Monday - Friday	6am to 10pm	6am to 10pm	24 hours a day
Saturday	6am to 6pm	6am to 10 pm	24 hours a day
Sunday and Public Holidays	None	None	24 hours a day

- L6.2 In accordance with development consent DA 231-10-99 MOD 5, the following activities may be conducted at the premises outside the hours specified in the table above:
- (a) return of trucks to the premises prior to midnight Monday to Saturday;
 - (b) delivery or dispatch of materials as requested by Police, Fire Brigade or other similar authorities;
 - (c) emergency work to avoid the loss of lives, property and/or prevent environmental harm; and
 - (d) maintenance activities provided it is inaudible at residential premises.
- In circumstances outlines in (b) and (c), the Licensee shall notify affected residents prior to undertaking the activities, or as soon as practical thereafter

L7 Potentially offensive odour

- L7.1 The licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises.

4 Operating Conditions

O1 Activities must be carried out in a competent manner

- O1.1 Licensed activities must be carried out in a competent manner.
This includes:
- a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
 - b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

- O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
- a) must be maintained in a proper and efficient condition; and
 - b) must be operated in a proper and efficient manner.

O3 Dust

- O3.1 The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.

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O4 Emergency response

Note: The licensee must maintain, and implement as necessary, a current Pollution Incident Response Management Plan (PIRMP) for the premises. The PIRMP must be developed in accordance with the requirements in Part 5.7A of the POEO Act and Regulations.

The licensee must keep the PIRMP on the premises at all times. The PIRMP must document systems and procedures to deal with all types of incidents (e.g. spills, explosions or fire) that may occur at the premises or that may be associated with the activities that occur at the premises and which are likely to cause harm to the environment. The PIRMP must be tested at least annually or following a pollution incident.

O5 Processes and management

O5.1 The licensee must take all reasonable measures to prevent the tracking of mud and debris onto the Pacific Highway including, but not limited to, ensuring all vehicles leaving the premises pass through the vehicular wheel wash.

O6 Waste management

O6.1 The licensee must comply with the conditions as specified in this licence or where no specific conditions outlined in this licence, this licensee must comply with the *Protection of the Environment Operations (Waste) Regulation 2014*.

5 Monitoring and Recording Conditions

M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:

- in a legible form, or in a form that can readily be reduced to a legible form;
- kept for at least 4 years after the monitoring or event to which they relate took place; and
- produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:

- the date(s) on which the sample was taken;
- the time(s) at which the sample was collected;
- the point at which the sample was taken; and
- the name of the person who collected the sample.

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M2 Requirement to monitor concentration of pollutants discharged

M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

M2.2 Air Monitoring Requirements

POINT 11

Pollutant	Units of measure	Frequency	Sampling Method
PM10	micrograms per cubic metre	Every 6 days	AM-18

POINT 18,19,20,21

Pollutant	Units of measure	Frequency	Sampling Method
Particulates - Deposited Matter	grams per square metre per month	Monthly	AM-19

M2.3 Water and/ or Land Monitoring Requirements

POINT 1

Pollutant	Units of measure	Frequency	Sampling Method
pH	pH	Each overflow event	Grab sample
Total suspended solids	milligrams per litre	2 times daily during discharge	Grab sample
Turbidity	nephelometric turbidity units	2 times daily during discharge	Grab sample

M3 Testing methods - concentration limits

M3.1 Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:

- any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or
- if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or
- if no such requirement is imposed by or under the Act or by a condition of this licence, any

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methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.

- M3.2 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

Note: The *Protection of the Environment Operations (Clean Air) Regulation 2010* requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".

M4 Weather monitoring

- M4.1 At the point(s) identified below, the licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1 of the table below, using the corresponding sampling method, units of measure, averaging period and sampling frequency, specified opposite in the Columns 2, 3, 4 and 5 respectively.

POINT 4

Parameter	Sampling method	Units of measure	Averaging period	Frequency
Temperature at 10 metres	AM-4	degrees Celsius	1 hour	Continuous
Wind Direction at 10 metres	AM-2 & AM-4	Degrees	15 minutes	Continuous
Wind Speed	AM-2 & AM-4	metres per second	15 minutes	Continuous
Sigma Theta	AM-2 & AM-4	Degrees	15 minutes	Continuous
Rainfall	AM-4	millimetres	15 minutes	Continuous
Relative humidity	AM-4	percent	1 hour	Continuous

- M4.2 Rainfall at the premises must be measured and recorded in millimetres per 24 hour period, at the same time each day.

Note: The rainfall monitoring data collected in compliance with the above condition will assist in interpreting the effectiveness of stormwater management at the quarry.

M5 Recording of pollution complaints

- M5.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

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M5.2 The record must include details of the following:

- a) the date and time of the complaint;
- b) the method by which the complaint was made;
- c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
- d) the nature of the complaint;
- e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
- f) if no action was taken by the licensee, the reasons why no action was taken.

M5.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M5.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M6 Telephone complaints line

M6.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M6.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

M6.3 The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.

M7 Blasting

M7.1 To determine compliance with the blasting limits of this licence:

- a) Airblast overpressure and ground vibration levels must be measured and electronically recorded for monitoring points 2 and 3 for the parameters specified in Column 1 of the table below; and
- b) The licensee must use the units of measure, sampling method, and sample at the frequency specified opposite in the other columns.

Parameters	Units of Measure	Frequency	Sampling Method
Airblast Overpressure	Decibels (Linear Peak)	All blasts	Australian Standard AS 2187.2-2006
Ground Vibration Peak Particle Velocity	millimetres/second	All blasts	Australian Standard AS 2187.2-2006

M8 Noise monitoring

M8.1 To assess compliance with the noise limits of this licence, attend noise monitoring must be undertaken in accordance with the conditions of this licence and:

- a) during a period of normal quarry operations;

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- b) at each one of the noise monitoring locations listed in the noise limits table of this licence;
- c) occur quarterly in the reporting period; and
- d) occur during the night period as defined in the NSW Noise Policy for Industry, and in conjunction with an asphalt campaign if any such campaign occurs within the quarterly monitoring period.

Note: The extent and frequency of noise monitoring required by this licence will be reviewed upon request after eight quarterly monitoring campaigns.

M8.2 Noise monitoring must be carried out in accordance with Australian Standard AS 2659.1 - 1998: Guide to the use of sound measuring equipment - Portable sound level metres and in accordance with any relevant factors provided in the NSW Noise Policy for Industry.

6 Reporting Conditions

R1 Annual return documents

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:

1. a Statement of Compliance,
2. a Monitoring and Complaints Summary,
3. a Statement of Compliance - Licence Conditions,
4. a Statement of Compliance - Load based Fee,
5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan,
6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and
7. a Statement of Compliance - Environmental Management Systems and Practices.

At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

R1.3 Where this licence is transferred from the licensee to a new licensee:

- a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
- b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:

- a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is

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given; or

b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

R1.5 The Annual Return for the reporting period must be supplied to the EPA via eConnect *EPA* or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

R1.7 Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:

a) the licence holder; or

b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

R2 Notification of environmental harm

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:

a) where this licence applies to premises, an event has occurred at the premises; or

b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,

and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:

a) the cause, time and duration of the event;

b) the type, volume and concentration of every pollutant discharged as a result of the event;

c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;

d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;

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- e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
- f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
- g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

R4 Other reporting conditions

R4.1 Noise Compliance Assessment Report

A noise compliance assessment report(s) must be submitted to the EPA with each Annual Return. The assessment must be prepared by a suitably qualified and experienced acoustical consultant and include:

- a) an assessment of compliance with noise limits detailed in the limit conditions of this licence;
- b) details of all quarrying activities that were occurring during each of the periods of monitoring, and
- c) an outline of any management actions taken within the monitoring period to address any exceedences of the limits detailed in the limit conditions of this licence.

R4.2 Blast Monitoring Report

The licensee must supply, with each Annual Return, a Blast Monitoring Report which must include the following information relating to each blast carried out within the premises during the reporting period covered by the Annual Return:

- a) the date and time of the blast;
- b) the location of the blast on the premises;
- c) the blast monitoring results at each blast monitoring station; and
- d) an explanation for any missing blast monitoring results.

R4.3 The licensee must report any exceedence of the licence blasting limits to the regional office of the EPA as soon as practicable after the exceedence becomes known to the licensee or to one of the licensee's employees or agents.

7 General Conditions

G1 Copy of licence kept at the premises or plant

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

G2 Other general conditions

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G2.1 Completed Programs

Program	Description	Completed Date
PRP 1: Installation and Use of a Wheel Wash at the Premises	Construction and Utilisation of a vehicular wheel wash for all vehicles exiting the premises.	28-October-2011

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Dictionary

General Dictionary

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

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flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 months. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .

Environment Protection Licence



Licence - 2796

TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non - putrescible), special waste or hazardous waste

Mr Nigel Sargent

Environment Protection Authority

(By Delegation)

Date of this edition: 10-March-2000

Environment Protection Licence

Licence - 2796



End Notes

- 1 Licence varied by notice 1006152, issued on 21-Feb-2002, which came into effect on 18-Mar-2002.
- 2 Licence varied by notice 1016675, issued on 20-Jun-2002, which came into effect on 15-Jul-2002.
- 3 Licence transferred through application 141653, approved on 19-Dec-2002, which came into effect on 01-Oct-2002.
- 4 Licence varied by notice 1042128, issued on 14-Jan-2005, which came into effect on 08-Feb-2005.
- 5 Condition A1.3 Not applicable varied by notice issued on <issue date> which came into effect on <effective date>
- 6 Licence varied by notice 1106247, issued on 08-Sep-2009, which came into effect on 08-Sep-2009.
- 7 Licence varied by notice 1503538 issued on 04-Jan-2012
- 8 Licence varied by notice 1507470 issued on 26-Sep-2012
- 9 Licence varied by notice 1535107 issued on 17-Oct-2016
- 10 Licence varied by notice 1577456 issued on 12-Jun-2019
- 11 Licence format updated on 18-Jul-2019

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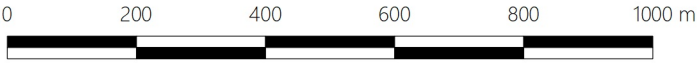


FIGURE 2
Jandra Quarry EPL Noise Monitoring
REF: MAC180611-04

APPENDIX 3
BIODIVERSITY MONITORING
REPORTS

Jandra Quarry Annual Biodiversity and Rehabilitation Monitoring

15284 Pacific Hwy, Possum Brush, NSW 2430

NCA21R125825

13 May 2021



Suite 3, 240-244 Pacific Highway,
Charlestown, NSW 2290
Phone: +61 2 4949 5200



Jandra Quarry Annual Biodiversity and Rehabilitation Monitoring

15284 Pacific Hwy, Possum Brush, NSW 2430

Kleinfelder Project: 20213185

Kleinfelder Document: NCA21R125825

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Nigel Fisher	D Millburn	B Grant
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Nigel Fisher		

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EXECUTIVE SUMMARY

Holcim (Australia) operates the Jandra Quarry, a hard quarry located approximately 18 kilometres south of Taree, New South Wales. The original development proposal for the quarry was granted on March 30, 2000 (DA231-1-99). A modification to the consent (MOD) was granted on March 13, 2015 (DA231-101-99 Mod 5) allowing for an increase in production and transportation of quarry products to maximum limit of 475,000 tonnes per annum.

A Biodiversity and Rehabilitation Plan (BRMP) was completed by Umwelt Pty Ltd in 2018 in accordance with Condition 25 of Schedule 3 of the MOD in consultation with the NSW Office of Environment and Heritage (OEH). The BRMP outlines the requirements for monitoring for the Jandra Quarry as outlined in Section 6.0 including:

- Rehabilitated areas of the active quarry, forming the first of the quarterly inspections (Section 6.1)
- The Biodiversity Offsets Area (BOA) (Section 6.2).

This report details the findings of the monitoring conducted by Kleinfelder Australia on the 27th, 28th and 29th of January 2021.

The survey methodology was conducted in accordance with the BRMP and included an inspection of the Rehabilitated areas to assess stability, drainage and sediment control structures, run-off water quality, health of the revegetation, germination rates, natural regeneration and presence and density of any weed infestations.

Flora monitoring was conducted in the Biodiversity Offsets Area where two permanent flora monitoring quadrats were established using Biodiversity Assessment Methodology (BAM). Fauna monitoring established two transects where nocturnal spotlighting, diurnal surveys for birds, diurnal and nocturnal herpetological surveys, remote cameras and Anabat bat-call recording devices were conducted and deployed. Opportunistic surveys of the BOA were also conducted while moving between quadrats and transects.

A walkover style survey of the Buffer Areas was also conducted assessing weed infestations, feral animal presence and illegal access and activity.

Results of the Rehabilitated areas assessment showed good vegetation coverage with some weed presence such as *Lantana camara*. Safety and operational requirements prevented a more detailed walkover assessment, but generally native vegetation has become established on the older benches with native canopy and shrub species visible. Recommendations included modification of the survey methods to allow for a walkover and/or fly over by drone to determine what if any further revegetation and weed control works will be required.

The BOAs flora monitoring recorded a total of 57 different native species at an average of 37 native species per quadrat. A total of 12 different weed species were recorded including four “high threat” species. Woody weeds were recorded in both quadrats and scattered throughout the BOAs, but not in high density at this stage. The effects of the 2018/19 fires were visible with epicormic growth on *Eucalyptus* trees widespread. Seedlings and saplings of canopy, midstorey and shrubs were observed through the BOA and the Buffer Areas indicating good recovery and resilience the fires.

Fauna monitoring recorded the presence of three native mammal species and the introduced Black Rat, six species of amphibians and reptiles, and 27 bird species were recorded during the diurnal surveys and two nocturnal bird species. The Anabat recordings showed the presence of six micro-bat species including the three listed as rare/threatened.

The eastern fence had been damaged in several places due to falling trees and/or limbs after the fire and requires repairs.

The Buffer Areas recorded some woody weeds that were scattered but not dense in nature at this stage. Illegal access was noted as damage to derelict dwellings.

Recommendations made included treatment of the woody weeds in the BOA and Buffer Areas to prevent increased infestations, repair of the eastern fence line in the BOA, increased security or demolition of the abandoned dwellings to prevent further vandalism including the threat of arson. There were no recommendations



for revegetation or feral fauna control in the BOA. The rehabilitated areas require some weed control works which may necessitate some form of physical access to the benches or remote e.g. drone, or long range e.g. splatter gun, weed control methods to be implemented.



1 INTRODUCTION

1.1 PROJECT DESCRIPTION

Holcim (Australia) operates the Jandra Quarry, a hard quarry located approximately 18 kilometres south of Taree, New South Wales (**Figure 1.1**). The original development proposal for the quarry was granted on March 30, 2000 (DA231-1-99). A modification to the consent (MOD) was granted on March 13, 2015 (DA231-101-99 Mod 5) allowing for an increase in production and transportation of quarry products to maximum limit of 475,000 tonnes per annum.

1.2 SCOPE AND PURPOSE

A Biodiversity and Rehabilitation Plan (BRMP) was completed by Umwelt Pty Ltd in 2018 in accordance with Condition 25 of Schedule 3 of the MOD in consultation with the NSW Office of Environment and Heritage (OEH). The BRMP outlines the requirements for monitoring for the Jandra Quarry as outlined in Section 6.0 including:

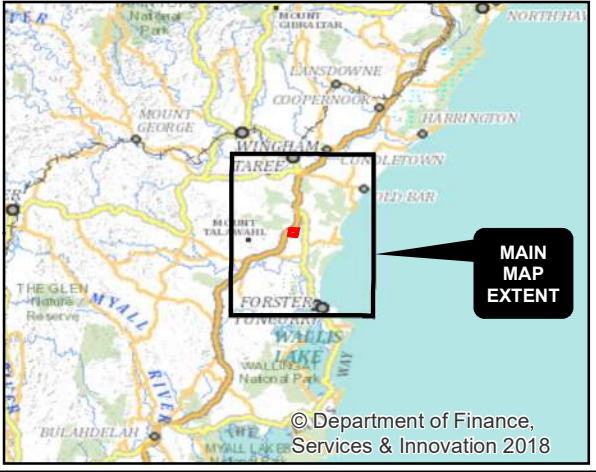
- Rehabilitated areas of the active quarry, forming the first of the quarterly inspections (Section 6.1)
- The Biodiversity Offsets Area (BOA) (Section 6.2).

Please note that nest box monitoring was not conducted as part of this monitoring effort.

This report details the findings of the monitoring conducted by two Kleinfelder Australia ecologists, Ben Stewart and Mark Dean, on the 27th, 28th and 29th of January 2021.

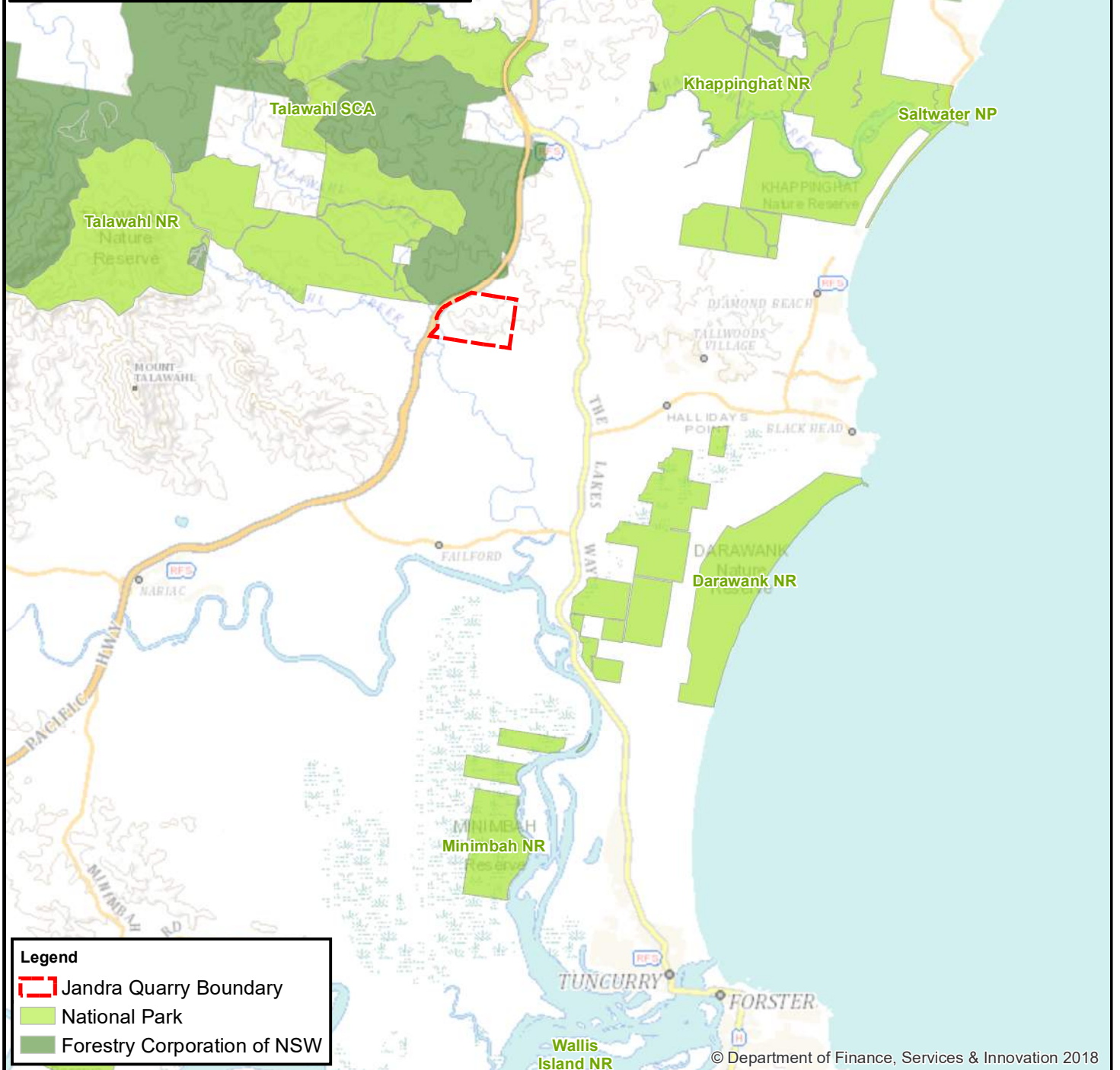
Regional Context

0 5 10 20 30 40 50 km



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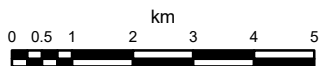
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Legend

- Jandra Quarry Boundary
- National Park
- Forestry Corporation of NSW

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PROJECT REFERENCE: 20213185

DATE DRAWN: 7/05/2021 11:15 Version 1

DRAWN BY: BDeane

DATA SOURCE:
NSW DFSI - 2018
NSW OEH - 2019
Holcim - 2021

Locality

FIGURE:

1



Holcim (Australia)
Jandra Quarry Biodiversity Offsets Area
Annual Biodiversity and Rehabilitation Monitoring

2 METHODS

2.1 REHABILITATION MONITORING

Quarterly inspections of the rehabilitation areas conducted to assess the following:

- Soil conditions and erosion (stability).
- Drainage and sediment control structures.
- Runoff water quality.
- Germination rates.
- Plant Health.
- Natural Regeneration, and,
- Weed infestations.

Due to operational restrictions, direct access to the benches was not possible, so visual inspections with photo monitoring was conducted.

2.2 BIODIVERSITY OFFSETS AREA

The BOA methodology stipulated the establishment of flora quadrats and fauna transects (**Figure 2**).

2.2.1 Flora Monitoring

Two permanent flora quadrats were established within the BOA with monitoring to occur every two years. Species diversity and structural composition were sampled using floristic and vegetation integrity assessments in accordance with the Biodiversity Assessment Methodology (BAM), including photo monitoring to provide a visual assessment of vegetation changes over time.

In addition to the above data collection, surveys will also record the following:

- General vegetation health.
- Evidence of natural regeneration.
- Occurrence and abundance of weeds.
- Presence of threatened or other significant species.
- Signs of disturbance by stock, feral animals, or humans, and,
- Any observable impacts of the quarry, such as the effectiveness of fencing and weed control efforts.

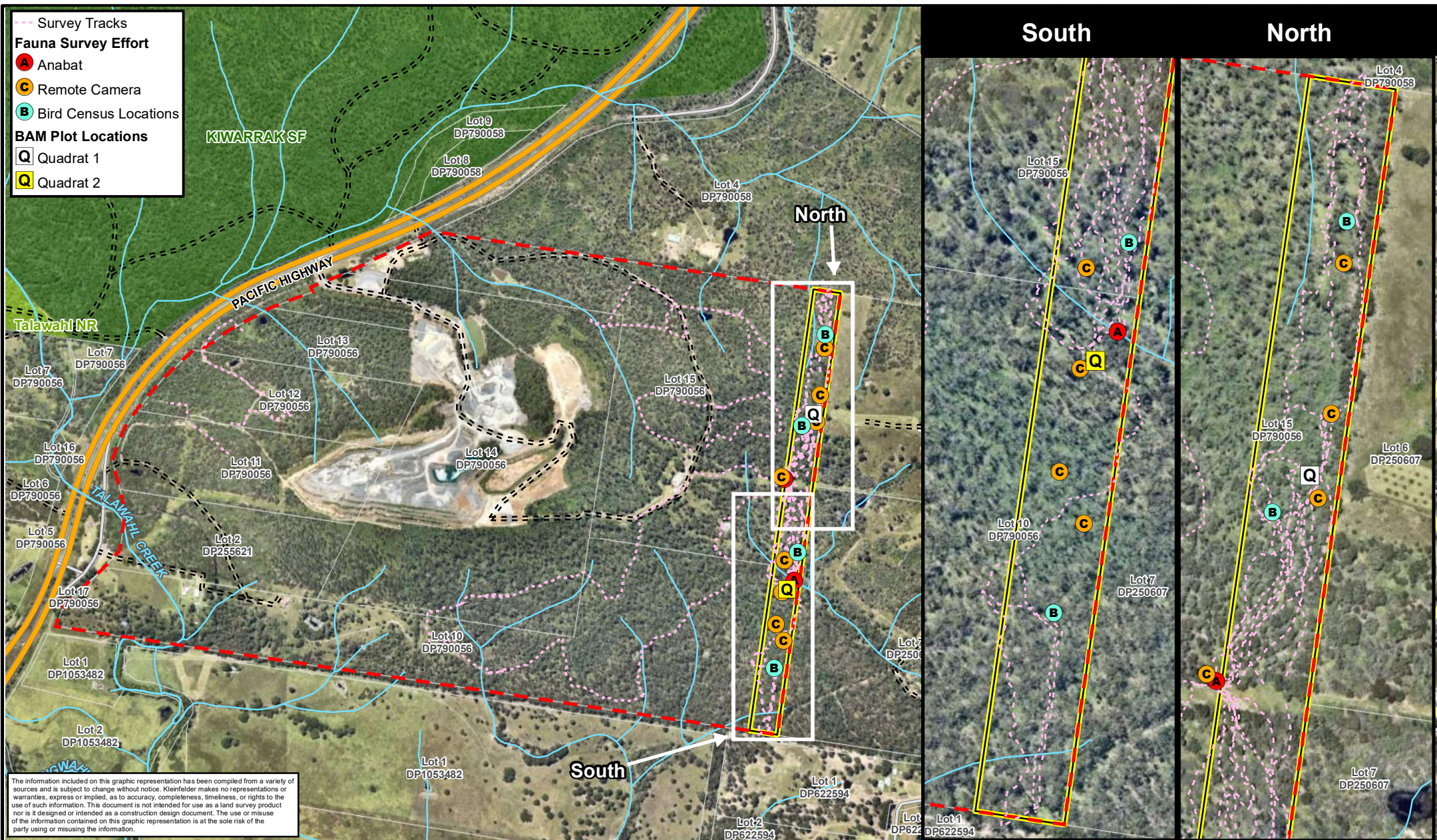
2.2.2 Fauna Monitoring

Fauna monitoring is to be conducted in the first year of the project and then every three years after that utilising several techniques. Two fauna transects will be established in the BOA and at each of the transects the following will be conducted:

- Spotlight surveys – 1 hour each fauna transect.
- Diurnal bird survey – 2 x 20 minute surveys for each site per day. Eight surveys in total.
- Diurnal herpetological survey – 1.5 hours per transect
- Nocturnal herpetological surveys 1 hour each transect.
- Anabat surveys – 2 x Anabats for 2 nights.
- Remote camera surveys targeting ground and arboreal fauna – 8 cameras in total, 2 ground and 2 arboreal per transect for 2 nights.
- Opportunistic surveys during walkovers of the BOA including identification of any feral animal species.

2.3 JANDRA QUARRY BUFFER AREAS

In addition to the above mandated monitoring, Kleinfelder was commissioned to conduct a walkover survey of the buffer areas assessing weed infestations, disturbance by human activity including illegal access and rubbish dumping, and signs or presence of feral animals.



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- Legend**
- Jandra Quarry Boundary
 - Biodiversity Offsets Area Boundary
 - National Park
 - Lot Boundaries
 - Forestry Corporation of NSW
 - Primary Road
 - Arterial Road
 - Local Road
 - Track
 - Named Watercourse
 - Unnamed Watercourse

Metres

0 50 100 200 300 400 500

N

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PROJECT REFERENCE: 20213185

DATE DRAWN: 7/05/2021 12:29 Version 1

DRAWN BY: BDeane

DATA SOURCE:
NSW DFSI - 2018
OEH - 2019
Nearmap - 2021
Holcim - 2021

Annual Monitoring

Holcim (Australia)
Jandra Quarry Biodiversity Offsets Area
Annual Biodiversity and Rehabilitation Monitoring

FIGURE:
2

3 RESULTS

3.1 REHABILITATED AREAS

The rehabilitated benches were not able to be surveyed directly due to operational and safety considerations. Observations were made from a distance and using photographs. Overall, vegetation has become well established, with the older benches having established tree and shrub species (**Plate 1, Plate 2, Plate 3**). Germination rates, vegetation coverage and species composition cannot be accurately determined from this style of survey. *Lantana camara* (Lantana), grass covered areas (grasses not able to be identified), taller herbaceous weeds tentatively identified as *Conyza* species (Fleabanes) were recognised from observations.



Plate 1: View of rehabilitated benches from RL 62, looking southwest.

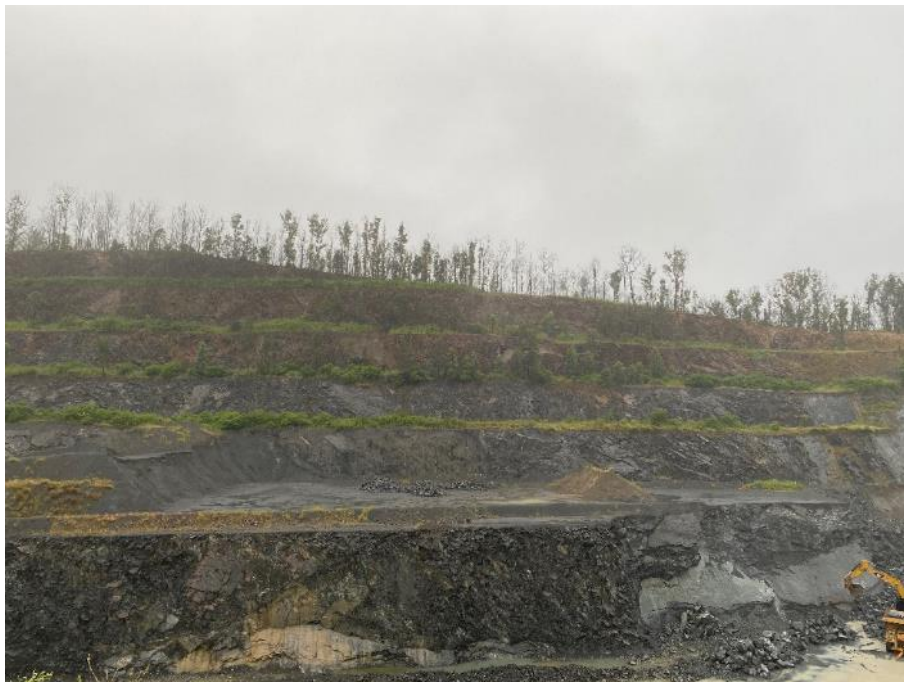


Plate 2: View of rehabilitated benches from RL 62 looking south.



Plate 3: View of the rehabilitated benches from RL 62 looking southeast.

The wet conditions experienced on the day of the rehabilitation survey (29th January) showed that erosion did not appear to be a major issue where vegetation had become established. The fire experienced in late 2019 and early 2020 has affected the mature trees at the top of the extraction area and has resulted in the quarry becoming more visible from the selected vantage points. It is expected that natural regeneration and epicormic growth of surviving trees will eventually be able to provide the amenity screen required.

3.2 VISUAL AMENITY

Two locations were chosen by Holcim Quarry staff to monitor the visual amenity of the quarry. These locations have been formally established as photo monitoring points. The weather conditions were not conducive for clear, good quality photographs to be taken. These locations will be photographed at each of the Quarterly Monitoring events for comparison.

Visual amenity Site 1 is located along Blackbutt Drive and looks south towards the overburden stockpile and the rehabilitated benches (**Plate 4**).

Visual amenity Site 2 is located at the intersection of the Pacific Hwy and Bullocky Way and looks south towards the rehabilitated benches (**Plate 5**).



Plate 4: View of overburden and benches looking south from Blackbutts Rd.



Plate 5: View of quarry from the Pacific Hwy and Bullock Way intersection, looking south towards the quarry.

3.3 BIODIVERSITY OFFSETS AREA

3.3.1 Flora Monitoring

A total of 57 native species were recorded from the across the two vegetation quadrats with an average of 37 native flora species. The northern quadrat (Q1) (**Plate 6**) recorded 30 native species, while the southern quadrat (Q2) (**Plate 7**) recorded 44 native species (**Table 1**). A full species list is provided in **Appendix A**, including estimated numbers and coverage of each quadrat.

Table 1: Summary of the flora monitoring by stratum of the BOA at Jandra Quarry

Strata	Northern Quadrat (Q1)	Southern Quadrat (Q2)
Tree (TG)	5	5
Shrub (SG)	2	7
Forb (FG)	9	16
Grass & grasslike (GG)	8	11
Other (OG)	6	4
Fern (EG)	0	1
Total Native	30	44
Total Exotic	10	6
Total Species Richness	40	50

A total of 12 different exotic species were recorded from the monitoring quadrats with Q1 recording 10 exotic species and Q2 only six exotic species. Four of these species – *Bidens pilosa* (Cobblers Pegs), *Senecio madagascariensis* (Fireweed), *Chloris gayana* (Rhodes Grass) and *Megathyrsus maximus* (Guinea Grass) – are listed as “High Threat” indicating that they have the potential to rapidly colonise areas of disturbance e.g. after fires. Of the remaining weed species, the woody weeds *Phytolacca octandra* (Inkweed) and *Solanum mauritianum* (Wild Tobacco) were recorded in both quadrats and can also pose a threat to revegetating or recovering native communities.

3.3.2 Fauna Monitoring

Fauna surveys were conducted over two nights and days, with eight remote cameras (four located to target ground fauna and four targeting arboreal fauna) and two Anabat bat call recording devices deployed during the survey period.

Remote cameras recorded three native mammal species, *Rattus lutreolus* (Swamp Rat), *Rattus fuscipes* (Bush Rat) and *Trichosurus vulpecula* (Brushtail Possum) (one recording each), and multiple recordings of the introduced *Rattus rattus* (Black Rat).

Nocturnal spotlighting and herpetological searches recorded six species of amphibians, Bush Rat and two nocturnal bird species (**Table 2**).

Please note, that due to weather conditions only a single night of spotlighting was conducted.



Plate 6: Quadrat Q1 in the BOA. Note the lush regrowth of the groundcover, shrubby growth and epicormic growth on the canopy species



Plate 7: Quadrat Q2 in the BOA. Note the area appears to be more open with fewer shrubs than Q1.

Table 2: Results of nocturnal spotlighting fauna searches conducted at Jandra Quarry BOA.

Nocturnal Spotlighting 28 January 2021	
Species	Common Name
Northern Transect	
<i>Litoria fallax</i>	Eastern Dwarf Tree Frog
<i>Aegotheles cristatus</i>	Owlet Nightjar
<i>Eurostopodus mystacalis</i>	White-throated Nightjar
Southern Transect	
<i>Litoria tyleri</i>	Tyler's Tree Frog
<i>Pseudophryne coriacea</i>	Red-backed Toadlet
<i>Limnodynastes peronii</i>	Striped Marsh Frog
<i>Rattus fuscipes</i>	Bush Rat
<i>Litoria dentata</i>	Bleating Tree Frog
Diurnal Herp Searches 28 and 29 January 2021	
Northern Transect	
<i>Litoria fallax</i>	Eastern Dwarf Tree Frog
Southern Transect	
<i>Litoria fallax</i>	Eastern Dwarf Tree Frog
<i>Litoria dentata</i>	Bleating Tree Frog

Bird surveys were conducted twice each day at each of the two fauna search transects on the 28th and 29th of January – a total of eight surveys (**Table 3**). A total of 27 species were observed during the surveys, plus the two nocturnal bird species observed during the spotlighting surveys brings the total to 29 bird species.

Table 3: Results of the bird surveys conducted at the Jandra Quarry BOA. “+” indicates observation.

Bird Surveys 28 and 29 January 2021		Survey			
Species	Common Name	1	2	3	4
<i>Acanthiza nana</i>	Yellow Thornbill		+		
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo			+	+
<i>Calyptorhynchus lathami</i>	Glossy Black-cockatoo	Opportunistic sighting within survey area			
<i>Colluricincla harmonica</i>	Grey Shrike-thrush		+		+
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	+	+	+	
<i>Cormobates leucophaea</i>	White-throated Treecreeper	+	+	+	
<i>Corvus coronoides</i>	Australian Raven	+			+
<i>Coturnix ypsilophora</i>	Brown Quail	+		+	
<i>Cracticus nigrogularis</i>	Pied Butcherbird		+		
<i>Cracticus tibicen</i>	Australian Magpie	+			
<i>Cracticus torquatus</i>	Grey Butcherbird	+	+		
<i>Dacelo novaeguineae</i>	Laughing Kookaburra			+	
<i>Eopsaltria australis</i>	Eastern Yellow Robin	+	+	+	
<i>Falcunculus frontatus</i>	Crested Shrike-tit	+			
<i>Lichenostomus chrysops</i>	Yellow-faced Honeyeater			+	
<i>Malurus cyaneus</i>	Superb Fairy-wren	+	+		+
<i>Malurus lamberti</i>	Variiegated Fairy-wren			+	

Bird Surveys 28 and 29 January 2021		Survey			
<i>Manorina melanocephala</i>	Noisy Miner	+	+		
<i>Meliphaga lewinii</i>	Lewin's Honeyeater				+
<i>Neochmia temporalis</i>	Red-browed Finch	+	+	+	
<i>Pachycephala rufiventris</i>	Rufous Whistler	+	+	+	+
<i>Philemon corniculatus</i>	Noisy Friarbird	+	+	+	
<i>Platycercus eximius</i>	Eastern Rosella	+			
<i>Ptilonorhynchus violaceus</i>	Satin Bowerbird			+	+
<i>Rhipidura albiscapa</i>	Grey Fantail	+			
<i>Rhipidura leucophrys</i>	Willie Wagtail	+			
<i>Scythrops novaehollandiae</i>	Channel-billed Cuckoo				+

Bat surveys were conducted by installation of Anabat bat-call recording devices for two nights. One device was located at each of the two fauna transects. A total of six bat species were “Confidently” identified from the recordings, with another species identified as “Probable” (Table 3). Three of these species are listed as threatened/vulnerable.

Table 4: Results of Anabat recordings at Jandra Quarry BOA

Scientific Name	Common Name	Northern	Southern
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat	C	C
<i>Miniopterus australis</i> #	Little Bent-winged Bat	C	
<i>Micronomus norfolkensis</i> #	Eastern Coastal Free-tailed Bat	C	
<i>Myotis macropus/Nyctophilus</i> sp.#	Southern Myotis/Long-eared Bat	Pr	
<i>Nyctophilus</i> sp.	Unidentified Long-eared Bat	C	C
<i>Vespadelus pumilus</i>	Eastern Forest Bat	C	C
<i>Vespadelus vulturnus</i>	Little Forest Bat	C	C
Total		7	4
Confident	C	95%-100%	
Probable	Pr	60%-95%	
Possible	Po	<60%	
Threatened/vulnerable	#		

3.4 BUFFER AREA WALKOVER

Like the BOA, this area has been heavily affected by the recent bushfire. A similar trend to the BOA was evident, where ridge lines and upper slope canopy cover was severely reduced, and the understorey was prolific and dense. Parts of the southern section of the Buffer Area still had intact canopy cover. Some large hollow-bearing trees were observed to be unaffected by the fire. Many small trees were seen uprooted and fallen over, most likely from the effects of fire. The midstorey containing *Allocasuarina* sp. was largely affected over majority of the Buffer Area. The northern portion of the Buffer Area typically follows a ridge-line and the vegetation was greatly affected by the recent bushfire as evidenced by the epicormic growth on *Eucalyptus* trees throughout most of this area. In areas of dense ground cover the dominant species were *Entolasia stricta*, *Kennedia rubicunda* and *Oplismenus* sp.. Some areas on the southern section of the buffer area still had intact midstorey layer with *Allocasuarina littoralis* and *A. torulosa* present. Good regeneration of *Eucalyptus*, *Allocasuarina* and *Acacia* species were observed throughout. Other species, such as *Dodonaea triquetra*, were observed in localised areas.

Weed species were much the same as those encountered in the BOA, with Inkweed, Tobacco bush and Fleabane generally the most abundant. Still, the cover of these species was usually sparse (1-5%) and negligible (<1%) throughout the area, with isolated patches at higher concentrations. A higher cover of weed species were present along old vehicle tracks, powerline easements and around old dwellings. *Lantana camara* was encountered within the Buffer Area, but generally in very low concentrations. A small patch of Mother of Millions (*Bryophyllum sp.*) was localised around a dilapidated building on the western side of the Buffer Area.

Signs of illegal access, in the form of recently broken windows of a former dwelling on the southern side of the Buffer Area, were observed.

4 DISCUSSION AND RECOMMENDATIONS

Biodiversity Offsets and Buffer Zone Areas

Fire has affected the vegetation in the BOA and in the Buffer Area at the Jandra Quarry, especially along ridge lines. The vegetation is however displaying good resilience and recovering with early pioneering species that respond to disturbance currently dominating the ground and shrub layers – *Kennedia rubicunda* in particular has responded to the fire. Natural regeneration was observed throughout the BOA and buffer areas, with seedlings of canopy, midstorey and shrub species observed. Weeds were present, but not dense at this stage and targeted weed control efforts would prevent them from becoming an issue. Apart from weed control as outlined below there are no recommendations made for the vegetation in the BOA and Buffer Areas.

Native fauna are present in the BOA, and by extension the buffer areas, with several vulnerable species of bats recorded. No threatened or vulnerable ground dwelling or arboreal fauna were recorded during the surveys, Although extending the time period for the deployment of cameras may provide further evidence of fauna usage. While not specific to the scope of this works, the areas surveyed did contain trees with hollows indicating that the area is potential habitat for more arboreal and hollow-dependant fauna. The presence of Black Rats is unavoidable given that they have become naturalised in the Australian ecosystem and there are no measures that can be implemented for control that would be cost effective or efficacious.

The fire and associated tree damage has resulted in fencing on the eastern boundary of the BOA being damaged at several locations, while evidence of illegal access was observed in damage to the abandoned dwellings on site. The fencing requires a suitably qualified and experienced contractor to conduct repairs. The derelict dwellings may require upgraded security or demolition to prevent further vandalism up to and including arson.

Weed control of the woody weeds in the BOA, Buffer Areas and Rehabilitated benches should be undertaken by suitably qualified and experienced contractors. For the BOA and Buffer Areas a walkover or sweep by land management technicians with back-pack sprayers and hand tools to control the Inkweed, Lantana, and Wild Tobacco plants could be conducted biannually or annually. This is very straightforward and can be commenced at any time, although control works before spring and the next seeding event would be advantageous. More detailed weed mapping would be advantageous in determining the extent and density of these weeds.

Rehabilitated Areas

The rehabilitated benches require a more detailed survey effort, either on foot where accessible and/or safe to so or by drone photography. Low level, high definition drone photography can be used to identify vegetation down to species level in some circumstances, e.g. where that species has readily recognisable features or habit such as Lantana. Certainly, total vegetation coverage of the benches can be determined from such aerial surveys.

The rehabilitated benches require careful consideration for methods to control weeds or perform revegetation works. Given the obvious and justified safety concerns associated with movement along high, narrow benches, alternative methods or enhanced safety techniques may have to be used.

Herbicide application by drone can be conducted with the understanding that drones of suitable size to carry sufficient herbicide may result in off-target spraying due to the downdraft from the rotors. Where accessible, splatter guns and other longer-range sprays can be quite accurate with minimal off-target spraying if weather conditions are suitable i.e. no wind.

Placing personnel onto the benches may be achieved if suitable and appropriate safety procedures, processes and/or equipment can be arranged. Walking the benches is the preferred methodology to allow for accurate data collection and targeted weed control measures. A discussion with site management will be arranged before the next monitoring of the rehabilitation is undertaken to determine the course of action.

Improvements to the rehabilitation process to reduce weed colonization and spread and to improve the success of the native revegetation are suggested below, recognizing that some or all these practices may already be in place.

Direct application of recently stripped topsoil is recognised as best practice rehabilitation and revegetation. However, operational limitations may require topsoil to be stockpiled for considerable periods of time – in excess

of six months – before application. Topsoil management can reduce weed infestations and improve the success of native revegetation.

Reduction of the height of the stockpile (space allowing) by making piles lower and wider preserves seed propagules and soil microbiota through maintenance of the aerobic capacity of the soil. It also allows for more germination of the native seed bank within the soil, which is beneficial, particularly if stockpiled for more than one year i.e. a period of time that allows for natural life cycles of grasses, forbs and shrubs to occur and the plants to set seed.

Prevention of the establishment of weeds onto the stockpile should also be a priority, as herbaceous and grassy weeds have high and rapid seed set, which when spread over the target area causes a weed infestation that then requires management. Seeding of target native species onto the stockpile can help to reduce the colonization by weeds, while also acting to improve the seed bank of native species, which will germinate when the soil is respread.

The BRMP Section 5.1, also provides a suitable list and there is some overlap between the species in that section and the table below. An appropriate seed mix for this area can be obtained from commercial seed suppliers or by employing suitably qualified and experienced seed collectors to collect seed from on-site. Any, or all of the species can be utilised for the rehabilitation. The latter may be necessary if the outcome of the rehabilitation is the revegetation to a recognised vegetation community i.e. Grey Gum – Tallowwood shrubby open forest on coastal foothills of the southern North Coast. **Table 5** makes suggestions for species that are endemic to the site and whether they are commercially available or will require seed collection from site.

Table 5: Suggested species list for rehabilitation at Jandra Quarry

Scientific Name	Common Name	Strata	Available Commercially	On site Collection
<i>Corymbia intermedia</i>	Pink Bloodwood	Canopy	Yes	
<i>Corymbia maculata</i>	Spotted Gum	Canopy	Yes	
<i>Eucalyptus acmenoides</i>	White Mahogany	Canopy	Yes	
<i>Eucalyptus carnea</i>	Think-leaved Mahogany	Canopy	No	Yes
<i>Eucalyptus microcorys</i>	Tallowwood	Canopy	Yes	
<i>Eucalyptus propinqua</i>	Small-fruited Grey Gum	Canopy	Yes	
<i>Eucalyptus siderophloia</i>	Grey Ironbark	Canopy	Yes	
<i>Allocasuarina torulosa</i>	Forest Oak	Midstorey	Yes	
<i>Lophostemon confertus</i>	Brush Box	Midstorey	Yes	
<i>Acacia maidenii</i>	Maiden's Wattle	Midstorey	Yes	
<i>Acacia falcata</i>	Hickory Wattle	Shrub	Yes	
<i>Breynia oblongifolia</i>	Coffee Bush	Shrub	Yes	
<i>Daviesia ulicifolia</i>	Gorse Bitter Pea	Shrub	Yes	
<i>Pultenaea linophylla</i>	-	Shrub	No	Yes
<i>Hardenbergia violacea</i>	Purple Coral Pea	Climber/Twiner	Yes	
<i>Kennedia rubicunda</i>	Dusky Coral Pea	Climber/Twiner	Yes	
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush	Groundcover	Yes	
<i>Imperata cylindrica</i>	Blady Grass	Grass	Yes	
<i>Microlaena stipoides</i>	Weeping Grass	Grass	Yes	
<i>Themeda triandra</i>	Kangaroo Grass	Grass	Yes	

Native grass has a high cost – up \$180.00/kg – and suggested application rates of between 5kg and 10kg per hectare, do impose a price penalty. This upfront cost is however offset by reduced weed control measures and a better rehabilitation outcome.

Normal seed application over small areas would be undertaken manually using a “belly seeder” (a small chest mounted device that holds up to 9kg of seed with a hand cranked seed spreader). Here, with the safety concerns, it is suggested that seed can mixed into the topsoil stockpile prior to spreading. This will result in some loss of seed as topsoil is generally spread at approximately 10 cm deep (more is better if available) and will require more seed to account for loss due to burial.

5 REFERENCES

Umwelt (2018) *Jandra Quarry Biodiversity and Rehabilitation Management Plan*. Report prepared for Holcim (Australia) by Umwelt Pty Ltd.



APPENDIX A: BIOVERSITY OFFSET AREA FLORISTIC PLOT DATA

Family	Scientific Name	Plot ID	Q1		Q2	
		BAM Growth Form / High Threat Weeds	C (foliage cover) (%)	Ab (abundance rating)	C (foliage cover) (%)	Ab (abundance rating)
Acanthaceae	<i>Brunoniella australis</i>	Forb (FG)			0.1	2
Apiaceae	<i>Hydrocotyle laxiflora</i>	Forb (FG)			0.3	100
Apocynaceae	<i>Gomphocarpus fruticosus</i>	Exotic	0.1	2		
Asteraceae	<i>Bidens pilosa</i>	High Threat			0.1	1
Asteraceae	<i>Conyza bonariensis</i>	Exotic			0.2	5
Asteraceae	<i>Conyza canadensis</i>	Exotic	0.1	1		
Asteraceae	<i>Euchiton sphaericus</i>	Forb (FG)	0.1	1		
Asteraceae	<i>Hypochaeris radicata</i>	Exotic	0.1	1	0.1	1
Asteraceae	<i>Lagenophora stipitata</i>	Forb (FG)			0.1	5
Asteraceae	<i>Ozothamnus diosmifolius</i>	Shrub (SG)	0.1	1	0.1	3
Asteraceae	<i>Senecio madagascariensis</i>	High Threat	0.1	2	0.1	1
Asteraceae	<i>Sigesbeckia orientalis subsp. orientalis</i>	Forb (FG)	5	100		
Asteraceae	<i>Vernonia cinerea</i>	Forb (FG)			0.2	20
Bignoniaceae	<i>Pandorea pandorana</i>	Other (OG)	0.5	20		
Casuarinaceae	<i>Allocasuarina torulosa</i>	Tree (TG)	2	5	0.5	20
Convolvulaceae	<i>Dichondra repens</i>	Forb (FG)	1	2000	0.5	200
Cyperaceae	<i>Cyperus sanguinolentus</i>	Grass & grasslike (GG)	2	200		
Cyperaceae	<i>Fimbristylis dichotoma</i>	Grass & grasslike (GG)			5	1000
Cyperaceae	<i>Lepidosperma laterale</i>	Grass & grasslike (GG)			0.5	10
Dennstaedtiaceae	<i>Pteridium esculentum</i>	Fern (EG)			0.1	1
Dilleniaceae	<i>Hibbertia scandens</i>	Other (OG)			0.1	1
Fabaceae (Faboideae)	<i>Chorizema parviflorum</i>	Shrub (SG)			0.1	5
Fabaceae (Faboideae)	<i>Daviesia ulicifolia</i>	Shrub (SG)			1	50
Fabaceae (Faboideae)	<i>Desmodium gunnii</i>	Forb (FG)	0.2	50	0.1	20
Fabaceae (Faboideae)	<i>Glycine microphylla</i>	Other (OG)	5	200		
Fabaceae (Faboideae)	<i>Glycine tabacina</i>	Other (OG)			5	1000
Fabaceae (Faboideae)	<i>Hardenbergia violacea</i>	Other (OG)	1	50		
Fabaceae (Faboideae)	<i>Kennedia rubicunda</i>	Other (OG)	20	500	0.2	20
Fabaceae (Faboideae)	<i>Pultenaea linophylla</i>	Shrub (SG)			0.5	20
Fabaceae (Mimosoideae)	<i>Acacia falcata</i>	Shrub (SG)			0.5	5
Fabaceae (Mimosoideae)	<i>Acacia maidenii</i>	Tree (TG)	0.5	4	0.5	5
Goodeniaceae	<i>Goodenia heterophylla</i>	Forb (FG)			0.5	50
Haloragaceae	<i>Gonocarpus teucroides</i>	Forb (FG)			0.1	10
Hypoxidaceae	<i>Hypoxis hygrometrica</i>	Forb (FG)			0.2	50



Family	Scientific Name	Plot ID	Q1		Q2	
		BAM Growth Form / High Threat Weeds	C (foliage cover) (%)	Ab (abundance rating)	C (foliage cover) (%)	Ab (abundance rating)
Lamiaceae	<i>Plectranthus parviflorus</i>	Forb (FG)	0.2	50	0.5	20
Lobeliaceae	<i>Pratia purpurascens</i>	Forb (FG)	0.5	100	0.1	50
Lomandraceae	<i>Lomandra longifolia</i>	Grass & grasslike (GG)			25	300
Myrtaceae	<i>Corymbia maculata</i>	Tree (TG)	5	5	10	7
Myrtaceae	<i>Eucalyptus carnea</i>	Tree (TG)	1	1		
Myrtaceae	<i>Eucalyptus propinqua</i>	Tree (TG)			5	2
Myrtaceae	<i>Eucalyptus siderophloia</i>	Tree (TG)	3	2	1	3
Orchidaceae	<i>Dipodium variegatum</i>	Forb (FG)			1	1
Other	<i>Euchiton japonicus</i>	Other (OG)			0.1	3
Other	<i>Geranium gardneri</i>	Other (OG)	5	500		
Phormiaceae	<i>Dianella caerulea</i>	Forb (FG)	0.1	5	0.1	10
Phyllanthaceae	<i>Breynia oblongifolia</i>	Shrub (SG)			0.2	5
Phytolaccaceae	<i>Phytolacca octandra</i>	Exotic	1	10	0.1	5
Poaceae	<i>Chloris gayana</i>	High Threat	0.1	10		
Poaceae	<i>Digitaria parviflora</i>	Grass & grasslike (GG)	1	100		
Poaceae	<i>Digitaria</i> spp.	Grass & grasslike (GG)			5	100
Poaceae	<i>Echinopogon caespitosus</i>	Grass & grasslike (GG)			0.5	50
Poaceae	<i>Entolasia stricta</i>	Grass & grasslike (GG)	30	20000	25	5000
Poaceae	<i>Imperata cylindrica</i>	Grass & grasslike (GG)	2	100	3	500
Poaceae	<i>Megathyrsus maximus</i>	High Threat	0.1	5		
Poaceae	<i>Microlaena stipoides</i>	Grass & grasslike (GG)	5	1000	2	200
Poaceae	<i>Oplismenus aemulus</i>	Grass & grasslike (GG)	20	10000	1	50
Poaceae	<i>Oplismenus imbecillis</i>	Grass & grasslike (GG)	10	5000		
Poaceae	<i>Panicum simile</i>	Grass & grasslike (GG)	2	200	25	2000
Poaceae	<i>Setaria parviflora</i>	Exotic	0.2	5		
Poaceae	<i>Themeda triandra</i>	Grass & grasslike (GG)			0.5	20
Proteaceae	<i>Persoonia linearis</i>	Shrub (SG)			0.1	2
Rosaceae	<i>Rubus parvifolius</i>	Shrub (SG)	0.2	5		
Rubiaceae	<i>Opercularia diphylla</i>	Forb (FG)			0.1	10
Solanaceae	<i>Solanum mauritianum</i>	Exotic	0.5	10	0.1	1
Solanaceae	<i>Solanum nigrum</i>	Exotic	0.1	2		
Solanaceae	<i>Solanum prinophyllum</i>	Forb (FG)	0.2	10	0.1	10



Family	Scientific Name	Plot ID	Q1		Q2	
		BAM Growth Form / High Threat Weeds	C (foliage cover) (%)	Ab (abundance rating)	C (foliage cover) (%)	Ab (abundance rating)
Stackhousiaceae	<i>Stackhousia viminea</i>	Forb (FG)			0.5	50
Violaceae	<i>Hybanthus stellarioides</i>	Forb (FG)	0.1	1		
Vitaceae	<i>Cayratia clematidea</i>	Other (OG)	0.2	10		
	Total Native species		30		44	
	Total Exotic species		10		6	
	Total Species Richness		40		50	

Jandra Quarry Quarterly Monitoring, June 2021

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NCA21L127368

09/07/2021



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09/07/2021

NCA21L127368

Holcim Pty Ltd
Jandra Quarry
15284 Pacific Highway
Possum Brush NSW 2430

Attention: Shilpa Shashi and Matt Neil

Subject: Jandra Quarry Quarterly Monitoring, June 2021
15284 Pacific Highway, Possum Brush NSW 2430

1 INTRODUCTION

Holcim (Australia) operates the Jandra Quarry, a hard quarry located approximately 18 kilometres south of Taree, New South Wales. The original development proposal for the quarry was granted on March 30, 2000 (DA231-1-99). A modification to the consent (MOD) was granted on March 13, 2015 (DA231-101-99 Mod 5) allowing for an increase in production and transportation of quarry products to maximum limit of 475,000 tonnes per annum.

Kleinfelder have been engaged to conduct biodiversity monitoring of the Jandra Quarry rehabilitation areas on a quarterly basis, as stipulated in Section 6.1.1 of the Biodiversity Rehabilitation and Management Plan (BRMP) (Umwelt, 2018). Monitoring has previously been undertaken by Umwelt, until 2021. The outcomes of the quarterly monitoring will be included as part of the annual biodiversity monitoring report (Kleinfelder) for Jandra Quarry.

2 SCOPE

On 11th June 2021 a Kleinfelder ecologist, Ben Stewart, attended Jandra Quarry to conduct a site-based inspection. Survey methodology was conducted in accordance with the BRMP and included an inspection of the rehabilitated areas to assess the following parameters:

- Stability and condition of the soil.
- Drainage and sediment control structures.
- Runoff water quality.
- Germination rates.
- Plant health.
- Natural regeneration, and;
- Weed infestations.

Each rehabilitated area, where accessible, was inspected on foot and observational data collected by a hand-held Trimble GPS.

Due to operational restrictions of the open-pit, the east, south and west benches could not be inspected on foot. Monitoring of these areas was recommended to be conducted via a remote flyover using a drone and camera. Footage can then be analysed to best determine their condition based on the abovementioned parameters.

3 RESULTS

Rehabilitated areas adjacent to the Overburden Stockpiling Area (OSA) and the Active Pit (AP), were inspected.



3.1 OVERBURDEN STOCKPILE AREA

A walkover of the OSA rehabilitation area revealed a high vegetation cover, indicating good overall soil stability. Only minor rill erosion was evident along the northern side of the OSA (**Plate 1**). Although vegetation cover in this area was high, majority of the cover consisted of a mixture of woody exotic species and exotic grasses. The most dominant species observed were *Melinis repens* (Red Natal Grass), *Lantana camara* (Lantana), *Solanum mauritianum* (Tobacco Bush), *Ageratina adenophora* (Crofton Weed) and *Setaria sphacelata* (South African Pigeon Grass) (**Plate 2**). A variety of other exotic species were also observed throughout this area and as such, native species cover appeared to be limited, including evidence of previous native tubestock planting. Species such as *Acacia longifolia*, *Acacia maidenii* and some *Eucalyptus spp.* are evident in low abundances. The quarry area, and the broader locality, are still recovering from the effects of the late 2019 / early 2020 bushfires. In addition to this, large amounts of rainfall early in the year has likely stimulated the observed prolific weed growth. Despite high weed cover, larger areas of *Kennedia rubicunda* (Dusky Coral Pea), a native species, are evident across the OSA.

Two constructed channels on the northern side of the OSA were evident and suggest that these were manually installed as drainage control for the area (no photos available).

3.2 ACTIVE PIT AREA

An inspection of the benches via drone was not conducted during this round of monitoring. Bench condition was interpreted as best as possible from a visual inspection at a safe distance, and via photos (**Plate 3** and **Plate 4**).

Rill erosion was present along a small portion of the northern wall. One section along the southern wall had significant rill erosion which extended from the top of the pit down to the lower benches. Apart from these areas, no other erosion was evident during the walkover. There is an overall high cover of vegetation along the benches, although, cover is mostly comprising of exotic species, such as *Lantana camara* and *Melinis repens* (**Plate 3** and **Plate 4**).

Along the top of the pit, natural regeneration of native species was observed. Species such as *Ozothamnus diosmifolius* (White Dogwood), *Callistemon saligna* (Willow Bottlebrush), *Acacia longifolia* subsp. *sophorae* (Coastal Wattle), *Allocasuarina littoralis* (Black She-oak), *Podolobium ilicifolium* (Prickly Shaggy Pea) and *Acacia maidenii* (Maiden's Wattle) were scattered throughout (**Plate 5**). Small forbs and ferns such as *Gonocarpus teucroides* (Raspwort), *Opercularia diphylla* and *Cheilanthes sieberi* (Poison Rock Fern) were common along the top of the pit. Areas of high weed cover, consisting of *Melinis repens*, *Tagetes minuta* (Stinking Roger) and *Setaria sphacelata* (South African Pigeon Grass) were observed intermittently along the top of the pit.

4 CONCLUSION

Most of the rehabilitated areas had only minor signs of rill erosion, which is likely attributed to their high vegetation cover increasing stability of the benches. Native species regeneration was limited, with some *Acacia spp.* and *Eucalyptus spp.* evident. Bushfires in late 2019 and early 2020 heavily effected the quarry and surrounding areas. Post-fire regeneration of native shrubs and groundcover species was mostly evident along the top of the active pit area. Extensive areas of exotic species cover are present throughout all rehabilitated areas, with species such as Lantana, Red Natal Grass and Pigeon Grass being the most dominant. Exotic species cover is likely attributed to disturbance from bushfires and substantial amounts of rainfall in the past 12 months.

5 RECOMMENDATIONS

Recommendations have been developed based on the outcome of the site-based quarterly inspection of the OSA and AP areas. The following items are recommended.

- Weed control to prevent further spread of exotic species into bordering vegetation. It is recommended that woody weed species, such as Lantana and Tobacco Bush, are prioritised, as opposed to exotic grasses, as these species are likely to spread further into vegetation surrounding the OSA. Intensive weed control targeting exotic grasses is not recommended, as exotic grasses are currently helping stabilise the benches. This approach should be staged over time and should be supported by additional native species plantings.



- Mature tree and shrub planting along the benches of the OSA. The outer benches of the OSA would benefit from additional planting as the current shrub and tree cover is limited. Furthermore, planting mature trees and shrubs would contribute to shading out some of the exotic grasses.

If you require additional information or clarification, please contact the undersigned at +61 4 2748 7991.

Sincerely,

Kleinfelder Australia Pty Ltd

Ben Stewart

Ecologist

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ATTACHMENT 1 SITE PHOTOS





Plate 1 Rill erosion along the outer edge of the Overburden Stockpile area.



Plate 2 Extensive Lantana (*Lantana camara*) growth along the rehabilitated area of the Overburden Stockpile.



Plate 3 **Vegetation along the benches of the active quarry pit.**



Plate 4 **Vegetation along the benches of the active quarry pit.**



Plate 5 **Regeneration of *Callistemon saligna* and *Acacia* spp. along the top of the active quarry pit.**



Jandra Quarry Quarterly Monitoring, September 2021

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1 INTRODUCTION

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Kleinfelder have been engaged to conduct biodiversity monitoring of the Jandra Quarry rehabilitation areas on a quarterly basis, as stipulated in Section 6.1.1 of the Biodiversity Rehabilitation and Management Plan (BRMP) (Umwelt, 2018). Monitoring has previously been undertaken by Umwelt, until 2021. The outcomes of the quarterly monitoring will be included as part of the annual biodiversity monitoring report (Kleinfelder) for Jandra Quarry.

2 SCOPE

On 16th September 2021 a Kleinfelder ecologist, Ben Stewart, attended Jandra Quarry to conduct a site-based inspection. Survey methodology was conducted in accordance with the BRMP and included an inspection of the rehabilitated areas to assess the following parameters:

- Stability and condition of the soil.
- Drainage and sediment control structures.
- Runoff water quality.
- Germination rates.
- Plant health.
- Natural regeneration, and;
- Weed infestations.

Each rehabilitated area, where accessible, was inspected on foot and observational data collected by a hand-held Trimble GPS.

Due to operational restrictions of the open-pit benches, monitoring of these areas was conducted via a remote flyover using a drone and camera. Footage of these areas was then analysed to best determine their condition based on the abovementioned parameters.

3 RESULTS

Rehabilitated areas adjacent to the Overburden Stockpiling area (OSA) and the active pit (AP) were inspected. Overall, not many changes were observed between the previous (June) and this monitoring event. Monitoring and weed observations are show in Figure 1 and detailed in Table 1.



3.1 OVERBURDEN STOCKPILE AREA (OSA)

A walkover of the OSA rehabilitation area revealed a high vegetation cover, indicating good overall soil stability. Only minor rill erosion was evident along the northern side of the OSA, which was a good result given the high rainfall experienced in the intervening period (**Plate 1**). Vegetation cover in this area was not as high as the previous Quarterly survey, possible to die-back over winter, most of the cover consisted of a mixture of woody exotic species and exotic grasses. The most dominant species observed were *Melinis repens* (Red Natal Grass), *Lantana camara* (Lantana), *Solanum mauritianum* (Tobacco Bush), *Ageratina adenophora* (Crofton Weed) and *Setaria sphacelata* (South African Pigeon Grass) (**Plate 2**). A variety of other exotic species were also observed throughout this area and as such, native species cover appeared to be limited, including evidence of previous native tubestock planting. Species such as *Acacia longifolia*, *Acacia maidenii* and some *Eucalyptus spp.* are evident in low abundances. The quarry area, and the broader locality, are still recovering from the effects of the late 2019 / early 2020 bushfires. In addition to this, large amounts of rainfall throughout the year has stimulated the observed prolific weed growth. Numerous small erosion points – usually riling – were also recorded during the monitoring.

3.2 ACTIVE PIT AREA

Rill erosion was present along a small portion of the northern wall. One section along the southern wall had significant rill erosion which extended from the top of the pit down to the lower benches. Apart from these areas, no other erosion was evident during the walkover. There is an overall high cover of vegetation along the benches, although, cover is mostly comprising of exotic species, such as *Lantana camara* and *Melinis repens*.

Along the top of the pit, the lingering effects of the bushfire were evident with dead trees and epicormic growth of *Eucalyptus species*. Natural regeneration of native species was also observed (**Plate 3**). Species such as *Ozothamnus diosmifolius* (White Dogwood), *Callistemon saligna* (Willow Bottlebrush), *Acacia longifolia* subsp. *sophorae* (Coastal Wattle), *Allocasuarina littoralis* (Black She-oak), *Podolobium ilicifolium* (Prickly Shaggy Pea) and *Acacia maidenii* (Maiden’s Wattle) were scattered throughout. Small forbs and ferns such as *Gonocarpus teucroides* (Raspwort), *Opercularia diphylla* and *Cheilanthes sieberi* (Poison Rock Fern) were common along the top of the pit. Areas of moderate weed cover, consisting of *Melinis repens*, *Tagetes minuta* (Stinking Roger) and *Setaria sphacelata* (South African Pigeon Grass) were observed intermittently along the top of the pit (**Plate 4**).

Table 1: Attribution table for monitoring observations for the September Quarterly Monitoring

Point Label	Description	Comments
E1	Erosion - Notch	Drainage channel / notch now blocked off from top of overburden stockpile
E2	Erosion - Notch	
E3	Erosion - Rill	Common on this easterly slope
E4	Erosion - Rill	Roll erosion along haul road extending into adjacent vegetation
E5	Erosion - Rill	Minor rilling along track near water treatment dam
E6	Erosion - Surface	Small land slip above haul road RL 86
E7	Erosion - Rill	Minor
E8	Erosion - Rill	Minor
E9	Erosion - Rill	Erosion from parking area to dam
E10	Erosion - Rill	Slight erosion into dam
E11	Erosion - Rill	
O1	Other	Established Eucalypts on lower benches. Good native shrub cover - Acacia spp.
O2	Other	Good cover of Eucalyptus species and some Acacias.



Point Label	Description	Comments
O3	Other	Upper bench above RL 86 has Eucalyptus regeneration.
O4	Other	Low weed cover on very top bench. Native shrub regeneration post fire good
O5	Other	Lantana may be spot sprayed with splatter mix from foot in between RL 86 and ROM - seek access approval with Matt
O6	Other	Splatter mix from the ROM - advice needed from Matt Neill
O7	Other	Southern benches have moderate - high woody weed cover
O8	Other	Very low weed cover
O9	Other	Area dominated by Chloris gayana
O11		Minimal weeds, control not required
O12		Very low weed cover - no weed control recommended
O13		Fallen stag tree with hollows
O14		Very minimal native species regen. Woody weed cover moderate-high.
O15		Low woody weed cover
O16		Remnant Eucalyptus canopy - some shrub cover
W1	Other	Edges of overburden stockpile too steep to hand work. Recommend backpack / quick spray.
W2	Other	Mid benches too overgrown to walk- recommend quick spray / backpack with splatter mix for woody weeds
W3	Other	Occasional woody weeds and high cover of native species - hand control (cut/paint) recommended here. Access via discontinued road
W4	Other	Lantana can be spot sprayed on foot from haul road. Quick spray not recommended.



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Jandra Quarry Boundary	Primary Road
Biodiversity Offsets Area Boundary	Local Road
National Park	Track
Lot Boundaries	Named Watercourse
Forestry Corporation of NSW	Unnamed Watercourse

Metres
0 25 50 100 150 200 250

N

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PROJECT REFERENCE: 20222372
DATE DRAWN: 2022/02/15 09:34 Version 1
DRAWN BY: GJoyce
DATA SOURCE:
NSW DFSI - 2018
OEH - 2019
Nearmap - 2021
Holcim - 2021

Quarterly Monitoring

Holcim (Australia)
Jandra Quarry Monitoring Report

FIGURE:
1



4 CONCLUSION

Most of the rehabilitated areas had only minor signs of rill erosion, although with the high rainfall experienced this year the number of erosion points has increased (**Figure 1**). Native species regeneration has increased due to the high rainfall experienced in the area, with some *Acacia spp.* and *Eucalyptus spp.* evident. Bushfires in late 2019 and early 2020 heavily effected the quarry and surrounding areas and the effect of these fires is still evident. Post-fire regeneration of native shrubs and groundcover species was mostly evident along the top of the active pit area. Extensive areas of exotic species cover are present throughout all rehabilitated areas, with species such as Lantana, Red Natal Grass and Pigeon Grass being the most dominant. Exotic species cover is likely attributed to disturbance from bushfires and substantial amounts of rainfall in the past 12 months.

5 RECOMMENDATIONS

Recommendations have been developed based on the outcome of the site-based quarterly inspection of the OSA and AP areas. The following items are recommended.

- Weed control to prevent further spread of exotic species into bordering vegetation. It is recommended that woody weed species, such as Lantana and Tobacco Bush, are prioritised, opposed to exotic grasses, as these species are likely to spread further into vegetation surrounding the OSA. Intensive weed control targeting exotic grasses is not recommended, as exotic grasses are currently helping stabilise the benches. This approach should be staged over time and should be supported by additional native species plantings. Kleinfelder has been tasked to produce a Weed Management Action Plan to assist with weed control works.
- Native tree and shrub species should be planted or seeded along the benches of the OSA. The outer benches of the OSA would benefit from additional planting as the current shrub and tree cover is limited. Furthermore, planting mature trees and shrubs would contribute to shading out some of the exotic grasses.
- The OSA should be seeded with native vegetation, especially native legume species such as *Acacias*. These quick growing pioneer species will improve stability and provide litter and a seed bank when the over burden is re-used for revegetation.
- A more detailed Weed action Plan has been commissioned by Holcim for Jandra Quarry and in in the process of compilation.

If you require additional information or clarification, please contact the undersigned at +61 4 2748 7991.

Sincerely,

Kleinfelder Australia Pty Ltd

Nigel Fisher

Senior Restoration Ecologist

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ATTACHMENT 1 SITE PHOTOS





Plate 1 Potential for erosion along the outer edge of the Overburden Stockpile area.



Plate 2 Extensive Lantana (*Lantana camara*) growth along the edges of the Overburden Stockpile.



Plate 3 **Vegetation above RL86 showing lingering effects of the fire, natural regeneration and rill erosion.**



Plate 4 **Vegetation along the benches of the active quarry pit.**

Jandra Quarry Quarterly Monitoring, February 2022

15284 Pacific Highway, Possum Brush NSW 2430

NCA22L136614

15/02/2022



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NCA22L136614

Holcim Pty Ltd
Jandra Quarry
15284 Pacific Highway
Possum Brush NSW 2430

Attention: Shilpa Shashi and Matt Neil

Subject: Jandra Quarry Quarterly Monitoring, February 2022
15284 Pacific Highway, Possum Brush NSW 2430

1 INTRODUCTION

Holcim (Australia) operates the Jandra Quarry, a hard quarry located approximately 18 kilometres south of Taree, New South Wales. The original development proposal for the quarry was granted on March 30, 2000 (DA231-1-99). A modification to the consent (MOD) was granted on March 13, 2015 (DA231-101-99 Mod 5) allowing for an increase in production and transportation of quarry products to maximum limit of 475,000 tonnes per annum.

Kleinfelder have been engaged to conduct biodiversity monitoring of the Jandra Quarry rehabilitation areas on a quarterly basis, as stipulated in Section 6.1.1 of the Biodiversity Rehabilitation and Management Plan (BRMP) (Umwelt, 2018). Monitoring has previously been undertaken by Umwelt, until 2021. The outcomes of the quarterly monitoring will be included as part of the annual biodiversity monitoring report (Kleinfelder) for Jandra Quarry.

2 SCOPE

On 11th February 2022 a Kleinfelder ecologist, Ben Stewart, attended Jandra Quarry to conduct a site-based inspection. Survey methodology was conducted in accordance with the BRMP and included an inspection of the rehabilitated areas to assess the following parameters:

- Stability and condition of the soil.
- Drainage and sediment control structures.
- Runoff water quality.
- Germination rates.
- Plant health.
- Natural regeneration, and;
- Weed infestations.

Each rehabilitated area, where accessible, was inspected on foot and observational data collected by a hand-held Trimble GPS. Two (2) photo monitoring points, one at the corner of Blackbutts Road and the Pacific Highway and one along Winmurra Drive, were established in 2021. Photos are taken at each location during each monitoring round as a means of visually comparing the aesthetics of the quarry over time.

Due to operational restrictions of the open-pit, the east, south and west benches could not be inspected on foot. Monitoring of these areas was recommended to be conducted via a remote flyover using a drone and camera. Footage can then be analysed to best determine their condition based on the abovementioned parameters.

3 RESULTS

Rehabilitated areas adjacent to the Overburden Stockpiling Area (OSA), the Active Pit (AP) and the Settlement Dam near the site office were inspected.



3.1 OVERBURDEN STOCKPILE AREA

Since the previous round of monitoring (September 2021), minor works (depositing overburden material and regrading the top of the OSA) have occurred. An increase in the cover of exotic species, namely annual and short-lived perennials, such as *Setaria sphacelata* (Pigeon Grass), *Melinis repens* (Red Natal Grass) and *Tagetes minuta* (Stinking Roger), are evident along the upper rehabilitated benches of the OSA. Other exotic species with a high cover include *Lantana camara* (Lantana), *Solanum mauritianum* (Tobacco Bush), *Ageratina adenophora* (Crofton Weed) and *Crotalaria lanceolata*. A variety of other exotic species were also observed throughout this area and as such, native species cover still appears to be limited, including evidence of previous native tubestock planting. Native species such as *Acacia longifolia* (Coastal Wattle), *Acacia maidenii* (Maiden's Wattle) and some *Eucalyptus spp.* are evident in low abundances, but appear to be in a healthy condition, except for some *Acacia spp.* Evidence of smothering (dieback) to some *Acacia spp.* from vines, such as *Kennedia rubicunda* (Dusky Coral Pea) were evident along the northern OSA (**Plate 1**). Some native species recruitment, typically by *Hardenbergia violacea* (Purple Coral Pea) along the southern bund of the OSA is evident (**Plate 2**). Some small seedlings of *Eucalyptus spp.* are also evident within vegetation bordering the southern OSA.

The channels manually installed as a means of water drainage from the active overburden area are now partially vegetated, with the main cover being exotic species (**Plate 3**). Apart from the constructed channel, only some minor rill erosion is evident along the upper rehabilitation benches. No significant areas of erosion are apparent along the lower rehabilitation benches. No sediment control structures exist along the boundary of the active OSA and the rehabilitation benches.

3.2 ACTIVE PIT AREA

An inspection of the benches via drone was not conducted during this round of monitoring. Bench condition was interpreted as best as possible from a visual inspection at a safe distance, and via photos (**Plate 4** and **Plate 5**). Areas of minor rill erosion identified in the previous monitoring round are still evident. Some new erosion (minor land slip from heavy rainfall) was identified along the high wall (above the "white line") access track along the western AP area (**Plate 6**) causing some under-cut along the top of the wall. A small amount of erosion was apparent along the north-eastern AP area (ROM) with excavated material falling into a Settlement Dam (**Plate 7**). Furthermore, this area contains a high cover of Lantana (**Plate 8**).

Along the eastern rehabilitated benches, the upper benches show the highest cover of native species (namely *Eucalyptus spp.*) which are evidence of previous tubestock planting. The lower benches have been allowed to naturally regenerate. These areas typically contain a greater cover of exotic species, such as *Lantana camara* (Lantana) (**Plate 5**).

3.3 SETTLEMENT DAM

A walkover of the edge of the Settlement Dam revealed good vegetation coverage along the dam walls and no areas of erosion or unintended water leakage were apparent. Some exotic species, such as *Lantana camara* (Lantana), *Solanum mauritianum* (Tobacco Bush) and *Paspalum sp.* have established themselves along the dam walls. Despite this, there is still good native species coverage, with species such as *Acacia longifolia*, *Acacia maidenii* and *Eucalyptus spp.* being the most common (**Plate 9**).

Water quality within the dam did not appear to be poor, with little signs of eutrophication (algal blooms). Furthermore, native emergent vegetation such as *Typha sp.* and *Bolboschoenus sp.* are evident along the margins of the dam and appear to be in good health.

3.4 PHOTO MONITORING

No apparent visual change is discernible compared to previous rounds of monitoring.

4 CONCLUSION

Native species coverage (tubestock plantings) appears to be limited in most areas where active rehabilitation has taken place. Although, on the older benches, established individuals of *Eucalyptus spp.* and *Acacia spp.* are present. Much of the ground and shrub stratum, however, is occupied by well-established exotic species like Lantana and Tobacco Bush, with the remaining areas usually densely occupied by Pigeon Grass and other short-lived perennial exotics. While much of the rehabilitated areas are dominated by exotic species, soil stability



appears to be quite good, with minimal areas of rill erosion. This is likely attributed to the high cover of vegetation on most areas.

Areas of tubestock plantings (older benches) around the AP appear to be more successful than areas of the benches allowed to naturally regenerate. This is apparent through the higher cover of exotic species (mainly Lantana) along areas of 'natural regeneration'.

Bushfires in late 2019 and early 2020 heavily effected the quarry and surrounding areas. Post-fire regeneration of native shrubs and groundcover species was mostly evident along the top of the AP area.

No areas of poor water quality, or dieback of vegetation from surface water runoff, were observed. The Settlement Dam had a low overall cover of algae and was vegetated with native aquatic vegetation along its margins.

5 RECOMMENDATIONS

Recommendations have been developed based on the outcome of the site-based quarterly inspection of the OSA, AP and Settlement Pond areas. The following items are recommended.

- Intensive weed control along areas of high woody weed cover, i.e., north-eastern AP area (the 'ROM') where there is high cover of Lantana, Lower rehab benches along the eastern side of the AP area and upper benches of the OSA.
- Weed control should be structured so that methods are appropriate:
 - backpack spraying and hand removal of weeds should be prioritised in areas accessible on foot and which contain a mix of native and exotic species.
 - Quick spray areas of dense woody weed infestations with little native species mix, i.e., the 'ROM'
 - Drone / aerial weed control prioritised for areas not accessible via foot, i.e., lower benches of the AP area. A fly-over of the intended areas of control should be conducted first to gain a more accurate idea of species composition so as to reduce the risk of non-target damaged.
- Weed control should be conducted systematically to avoid large-scale initial removal of weeds, resulting in open areas of bare soil, leading to erosion.
- High-threat woody weeds should be prioritised for control before non-woody and annual weeds. Weeds such as Lantana and Tobacco Bush are a high priority.
- Intensive weed control targeting exotic grasses is not recommended, as exotic grasses are currently helping stabilise the benches. This approach should be staged over time and should be supported by additional native species plantings.
- Mature tree and shrub planting along the benches of the OSA. The outer benches of the OSA would benefit from additional planting as the current shrub and tree cover is limited. Furthermore, planting mature trees and shrubs would contribute to shading out some of the exotic grasses.

If you require additional information or clarification, please contact the undersigned at +61 427 487 991.

Sincerely,

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ATTACHMENT 1 SITE PHOTOS





Plate 1 Smothering of *Acacia* sp. by native vines in the foreground of the image.



Plate 2 *Hardenbergia violacea* (Purple Coral Pea) growing on bund in OSA.



Plate 3 Constructed drainage channel now vegetated with weeds, such as *Conyza bonariensis* (Fleabane).



Plate 4 Rehabilitated benches along the eastern side of the AP area.



Plate 5 **Rehabilitated benches along the eastern side of the AP area.**



Plate 6 **Under-cut from erosion along the high-wall of the western AP area.**



Plate 7 Excavated material falling into a settlement dam in the AP area near the ROM.



Plate 8 Dense covering of Lantana along an area of the ROM (north-eastern side of the AP area).



Plate 9 Native species growth (*Acacia longifolia* and *Eucalyptus spp.*) along the Settlement Dam wall.