Holcim

Strength. Performance. Passion

Annual Environmental Management Review (AEMR) 2017

Jandra Quarry

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Table 1 - 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, 2016
Annual Review end date	December 31, 2016

I, Daniel Lidbetter, certify that this audit report is a true and accurate record of the compliance status of Jandra Quarry for the period of September 2015- September 2016 and that I am authorised to make this statement on behalf of Holcim (Australia) Pty Ltd.

Note.

a) The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000.

b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or $22,000, or both).

Name of authorised reporting officer	Daniel Lidbetter
Title of authorised reporting officer	NSW Planning & Environment Coordinator
Signature of authorised reporting officer	
Date	March 31, 2017.

Name of authorised reporting officer	Alana White
Title of authorised reporting officer	Senior Environment and Community Liaison
Signature of authorised reporting officer	
Date	10 November 2017

1.0 Statement of compliance

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

Table 2 - Statement of Commitments

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

Table 3 - Non Compliances

Relevant approval	**Condition #**	**Condition description (summary)**	**Compliance status**	**Where addressed in Annual Review**
DA 213-10-99 (Mod 5)	Condition 15 Schedule 3	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.	Non-compliant	**Section 5.0 (Actions required from 2015 AR)**
DA 213-10-99 (Mod 5)	Condition 20 Schedule 3	The Applicant shall manage on-site sewage to the satisfaction of Council and the EPA.	Non-compliant	**Section 9.0 (Independent Audit)**
DA 213-10-99 (Mod 5)	Condition 25(b) Schedule 3	The Applicant shall prepare and implement a Biodiversity and Rehabilitation Management Plan for the site to the satisfaction of the Secretary. This plan must: (b) be prepared in consultation with OEH and Council, and submitted to the Secretary for approval by 31 August 2015;	Non-compliant	**Section 7.0 (Rehabilitation & Landscape Mgt)**
DA 213-10-99 (Mod 5)	Condition 36 Schedule 3	Except as expressly permitted in an EPL, the Applicant must not receive waste at the site for storage, treatment, processing, reprocessing or disposal.	Non-compliant	**Section 9.0 (Independent Audit)**
DA 213-10-99 (Mod 5)	Condition 3 (g) Schedule 5	The Applicant shall ensure that the Management Plans required under this consent are prepared in accordance with any relevant guidelines, and include: (g) a protocol for managing and reporting any: - incidents; -	Non-compliant	**Section 9.0 (Independent Audit)**

Relevant approval	Condition #	Condition description (summary)	Compliance status	Where addressed in Annual Review
		complaints; - non-compliances with statutory requirements; and - exceedances of the impact assessment criteria and/or performance criteria		
DA 213-10-99 (Mod 5)	Condition P1.2 of EPL	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.	Non-compliant	**Section 9.0 (Independent Audit)**

Table 4 - Compliance status key for Table 3

Risk level	Colour code	Description
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-compliant	Non-compliance with: • potential for serious environmental consequences, but is unlikely to occur; or • potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: • potential for moderate environmental consequences, but is unlikely to occur; or • potential for low environmental consequences, but is likely to occur
Admin NC	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)

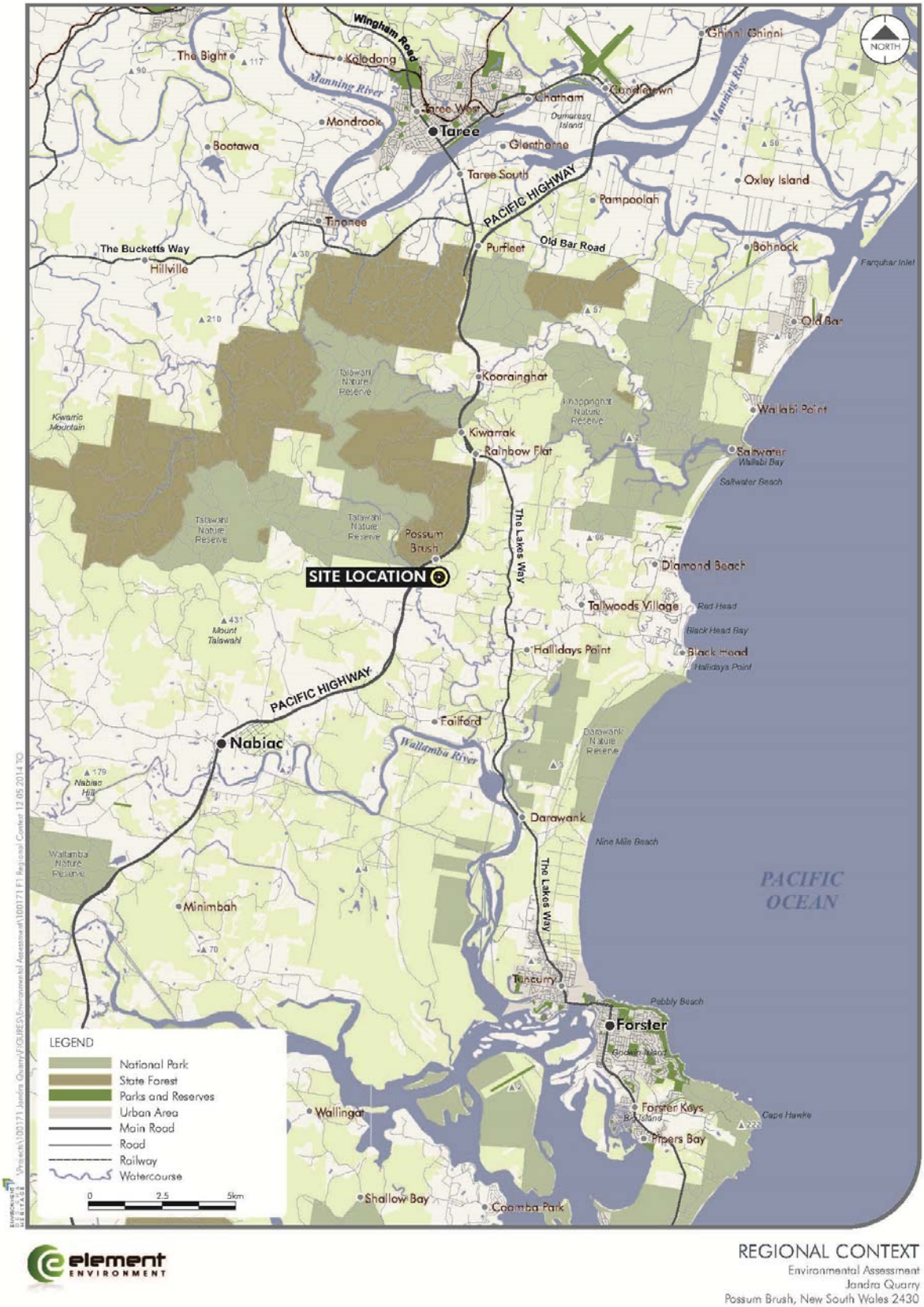
2.0 Introduction

Holcim (Australia) Pty Ltd (Holcim) operates the 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 New South Wales (NSW) Department of Planning & Environment (DP&E) on March 3, 2015.

The site also operates in accordance with the Environmental Protection Licence (EPL) No. 2796 issued by the Environmental Protection Authority.

Figure 1a shows the property boundary of Jandra Quarry and its location on the Pacific Highway. Figure 1b shows the regional context and Figure 1c shows the approved extraction boundary. The proposed biodiversity offset area is shown in Figure 1d. This area is still only proposed as the offset is not yet required. As soon as it is required, Holcim will update the Biodiversity and Rehabilitation Management plan and initiate the required actions. Figure 1d also shows the disturbance area.

Figure 1a Aerial view of the Jandra Quarry, located on the Pacific HWY, Possum Brush



element ENVIRONMENT

REGIONAL CONTEXT
Environmental Assessment
Jandra Quarry
Possum Brush, New South Wales 2430

Figure 1b Regional Context of Jandra Quarry

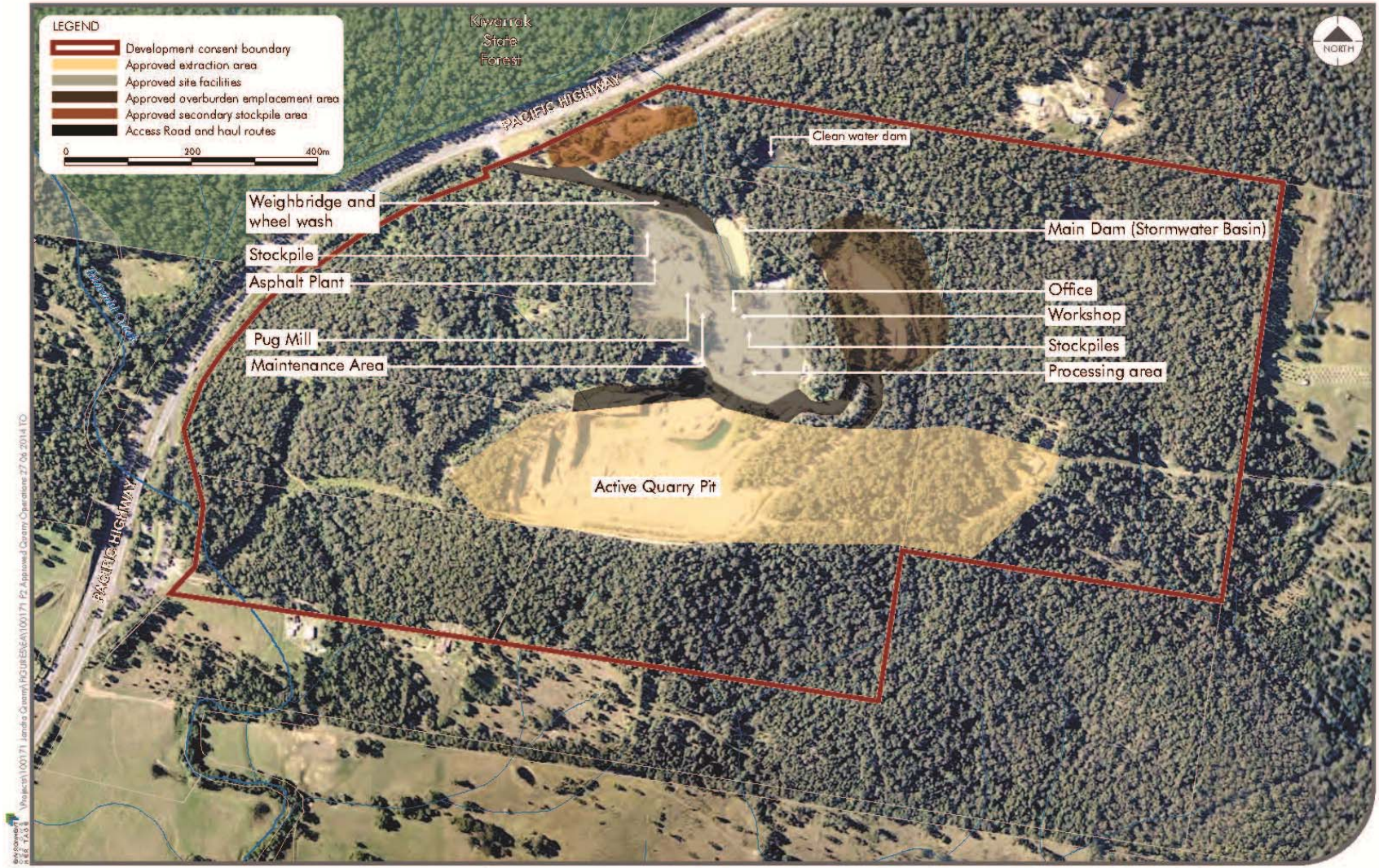


Figure 1c Approved extraction area and infrastructure

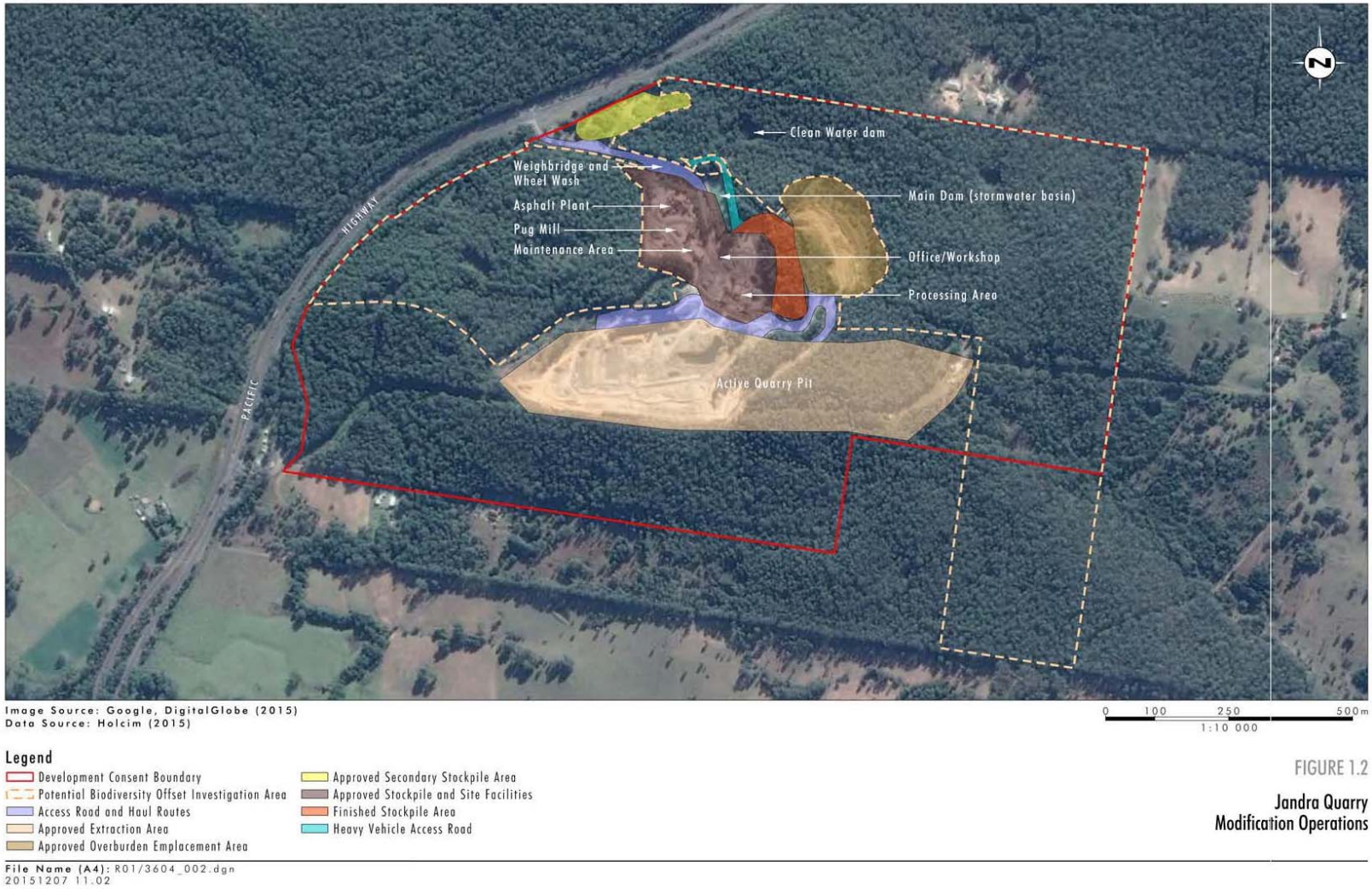


Figure 1d Proposed biodiversity offset area and disturbance area

Schedule 5 Condition 5 (below) outlines the requirements of the report.

4. Annual Review

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

> *(a) describe the development (including rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year;*
>
> *(b) include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, which includes a comparison of these results against: ¡ the relevant statutory requirements, limits or performance measures/criteria; . the monitoring results of previous years, and ¡ the relevant predictions in the documents listed in condition 2 of Schedule 2;*
>
> *(c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;*
>
> *(d) identify any trends in the monitoring data over the life of the development;*
>
> *(e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and*
>
> *(f) describe what measures will be implemented over the current calendar year to improve the environmental performance of the development*

3.0 Approvals

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

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

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

4.0 Operations Summary

Development activities undertaken at the Jandra Quarry in 2016 included: -

- Stripping of topsoil and overburden within the existing extraction limit boundary
- Drill, Blast, Load and Haul Activities
- Crushing, screening and stockpiling of product

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

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

Table 6 include a summary of the operations undertaken during the reporting period against the development consent conditions regarding product transported from Jandra Quarry. Production and Sales volumes for the reporting period have been submitted to DRE.

Table 6 - Total Product Distributed (Jandra Quarry)

Material	**Approved limit (Sch 2, Condition 8 & 9)**	**Previous reporting period**	**This reporting period**
Product Extracted Total	490 000 Tonnes	232 028 T	315 205.32 T
Product Sales Total	475 000 Tonnes	234 946.98 T	308 080.91T

The estimated cumulative total from 1992 to 2016 from the pit totals 4 906 593 tonnes including rock and overburden material.

As per Schedule 2 Condition 18, Holcim submitted Jandra Quarry's annual production as required by the Department of Resources and Energy (DRE). Due to staff movements, a copy of the submitted form could not be located at the time of submitting this report. However, a copy of the information recorded by DRE which was ascertained by our submission can be found in Appendix 1.

Other operations

The site has progressed in a westerly direction, within the existing footprint of the quarry, throughout 2016. No new activities such as construction of the stockpile area or access road (approved under Modification No. 5 Development Consent) have been undertaken.

Conditions relating to these activities include: -

- *Schedule 2, Condition 11: The Applicant shall ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.*
- *Schedule 2, Condition 12: The Applicant shall ensure that all demolition work is carried out in accordance with Australian Standard AS 2601-2001: The Demolition of Structures, or its latest version.*

Next reporting period

Development activities proposed to be carried out at Jandra Quarry in 2017, include: -

- Stripping of topsoil and overburden within the existing extraction limit boundary.
- Drill, Blast, Load and Haul Activities. -
- Crushing, screening and stockpiling of product. - -
- Progressive maintenance of rehabilitation in the completed bench at RL 50 on the northern face.

5.0 Actions required from 2015 Annual Review

The actions listed in the table below were required as part of the findings of the 2015 Annual Review. These items have been closed out in accordance with the conditions of the Development Consent.

Table 7 - Actions required from Annual Review

Condition	**Requirement**	**Compliance Status**

Schedule 3, Condition 15	Suitable meteorological station operating in the vicinity of the site.	**Compliant** **A weather station has been installed and is compliant with the *Approved Methods for Sampling Air Pollutants in New South Wales* guideline.**
Schedule 3, Condition 33	Publication of vehicle movement records has not been completed for each calendar quarter.	**Compliant** **Truck movements recorded quarterly and on Holcim webpage.**
Schedule 4, Condition 10	Publication of relevant information to the Holcim website has not been completed. It should be noted that all EPL monitoring data is available via the public website.	**Compliant** **Holcim Jandra Holcim webpage has been completed.**

6.0 Environmental Performance

6.1 Noise

Noise monitoring is required to be undertaken in accordance with the following consent conditions:

Table 2: Noise criteria – quarrying operations only dB(A)

Location	6 am – 10 pm ($L_{Aeq(15\ min)}$)
R1	46
R5	40
R2, R4, R6	36
R7	35

Table 3: Noise criteria – quarrying operations & asphalt plant production combined dB(A)

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

Notes:

- *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.*

Figure 2: Noise Monitoring Criteria for Jandra Quarry (DA 213-10-99 (Modification No. 5).

Noise monitoring was undertaken by Muller Acoustics in Quarter 4, 2016. The results of this monitoring were found to be within the development consent criteria (See Appendix 2 for full report). A copy of the noise monitoring has been detailed in the table below:

The noise monitoring was undertaken post the approval of the management plan by the Department of Planning and the independent audit. Nevertheless, there were no noise complaints during the reporting period and the operations consistently meet noise criteria. This coupled with the well-established vegetative buffer and distance between the operations and the nearest sensitive receiver, we are confident there was no impact caused through noise emissions during the reporting period.

To ensure all noise monitoring is completed in 2017 an annual contract was awarded to a third party noise specialist in January 2017.

Table 5 Daytime Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution LAeq(15min)	Quarrying Noise Criteria LAeq(15min)	Compliant	Quarrying & Asphalt Production Criteria LAeq(15min)	Compliant
R2	Nil	36	✓	40	✓
R4	Nil	36	✓	40	✓
R5	Nil	40	✓	41	✓
R6	Nil	36	✓	40	✓
R7	Nil	35	✓	36	✓

Table 6 Evening Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution LAeq(15min)	Quarrying Noise Criteria LAeq(15min)	Compliant	Quarrying & Asphalt Production Criteria LAeq(15min)	Compliant
R2	Nil	36	✓	40	✓
R4	Nil	36	✓	40	✓
R5	Nil	40	✓	41	✓
R6	Nil	36	✓	40	✓
R7	Nil	35	✓	36	✓

Table 7 Night-time Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution LAeq(15min)	Quarrying & Asphalt Production Criteria LAeq(15min)	Compliant	Quarry Noise Contribution LA1(1min)	Quarrying & Asphalt Production Criteria LA1(1min)	Compliant
R2	Nil	35	✓	Nil	48	✓
R4	Nil	39	✓	Nil	51	✓
R5	Nil	39	✓	Nil	51	✓
R6	Nil	35	✓	Nil	48	✓
R7	Nil	35	✓	Nil	48	✓

Figure 3: Noise monitoring results for Jandra Quarry Quarter 4, 2016 (Muller Acoustics 2016).

6.2 Air Quality

Dust minimisation and control measures implemented on site include the use of a watercart that follows specified prodeedures to achieve the most optimal dust control measures, sprays throughout the plant, speed limits across the site and dust covers in place across the screening building. All of these measures ensure Jandra Quarry is compliant with the Air Quality Management Plan and the development consent requirements.

Air Quality monitoring is required to be undertaken in accordance with the following development consent conditions:

Table 5: 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

Table 6: 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

Table 7: Long-term impact assessment criteria for deposited dust

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

Notes for Tables 5 to 7:

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

Figure 4: Air Quality Monitoring Criteria for Jandra Quarry (DA 213-10-99 (Modification No. 5).

Dust deposition monitoring has been undertaken at the Jandra Quarry throughout the 2016 reporting period with all results within the expected levels of criteria at each monitoring point. Results are shown in the table below:

Table 8 - Dust Monitoring (Dust Deposition)

Start Date	End Date	DDG 1	DDG 2	DDG 3	DDG 4	DDG 5
10/12/2015	7/01/2016	0.3	0.9	0.6	0.5	0.8
7/01/2016	5/02/2016	0.3	0.6	0.1	0.2	0.2
5/02/2016	4/03/2016	0.8	1.6	0.7	0.8	0.5
4/03/2016	4/04/2016	0.4	0.5	0.5	0.5	1.8
4/04/2016	6/05/2016	0.6	2.9	1	0.6	1.7
6/05/2016	3/06/2016	<0.1	0.1	<0.2	0.1	0.5
3/06/2016	1/07/2016	0.2	<0.1	0.3	0.3	0.5
1/07/2016	1/08/2016	0.2	0.7	0.3	0.5	1.9
1/08/2016	2/09/2016	0.5	0.6	0.2	0.6	1.9
2/09/2016	4/10/2016	0.4	0.3	0.4	1.6	1.8
4/10/2016	4/11/2016	0.8	1.6	1	1.8	1.1
4/11/2016	6/12/2016	0.3	0.6	0.6	0.5	1.4
Annual Average (4g/m2/year)		**0.75**	**0.75**	**0.75**	**0.75**	**0.77**
Result		**PASS**	**PASS**	**PASS**	**PASS**	**PASS**

The site commenced works to install a PM10 monitor in 2016 however, it was identified during an electrical hazards audit that the approved location would not meet Holcim's minimum Safety Health & Environment (SHE) electrical standards.

Several actions were required to meet these minimum safety standards. These have now been completed and the site will commence PM10 monitoring by March 31, 2017.

6.3 Blasting

The site undertook blasts in 2016 in accordance with the criteria listed in the table below (Figure 5):

Blasting Impact Assessment Criteria

5. The Applicant shall ensure that blasting on site does not cause any exceedance of the criteria in Table 4.

Table 4: Blasting criteria

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

However, these criteria do not apply if the Applicant has a written agreement with the relevant owner to exceed the limits in Table 4, and the Applicant has advised the Department in writing of the terms of this agreement.

Figure 5: Blast monitoring criteria for Jandra Quarry (DA 213-10-99 (Modification No. 5).

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

Table 9 - Blast monitoring results.

Location	Test	Sample Date	Result	Comments
Residence	Overpressure	11/01/2016	104.2	Compliant
	Vibration	11/01/2016	0.86	Compliant
Residence	Overpressure	9/02/2016	107.9	Compliant
	Vibration	9/02/2016	0.66	Compliant
Residence	Overpressure	22/03/2016	116	Non-compliant.
	Vibration	22/03/2016	1.3	Compliant
Residence	Overpressure	26/04/2016	107.2	Compliant
	Vibration	26/04/2016	1.29	Compliant
Residence	Overpressure	5/04/2016	107	Compliant
	Vibration	5/04/2016	0.49	Compliant
Residence	Overpressure	10/05/2016	0	Compliant
	Vibration	10/05/2016	0	Compliant

Location	Test	Sample Date	Result	Comments
Residence	Overpressure	6/06/2016	106.6	Compliant
	Vibration	6/06/2016	0.58	Compliant
Residence	Overpressure	15/08/2016	103.8	Compliant
	Vibration	15/08/2016	1.01	Compliant
Residence	Overpressure	5/12/2016	109.8	Compliant
	Vibration	5/12/2016	0.57	Compliant

In accordance with the recommendation noted in the Jandra Independent Environmental Audit, the site has verified the nearest sensitive receivers and alerts these locations within 24 hours of a proposed blast. This process is managed by the weighbridge staff who send a text message to the tenants the day before a planned blast is undertaken.

In accordance with the recommendation made in the Independent Environmental Audit, an updated copy of the Blast Fume Management Protocol for the site has been updated and attached to the Noise and Blast Management Plan.

6.4 Traffic Management

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

Pacific Highway Intersection

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.

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.

Monitoring of Product Transport

33. The Applicant shall keep accurate records of:
    (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.

Figure 6: Traffic Management Conditions in accordance with DA 213-10-99 (Modification No. 5).

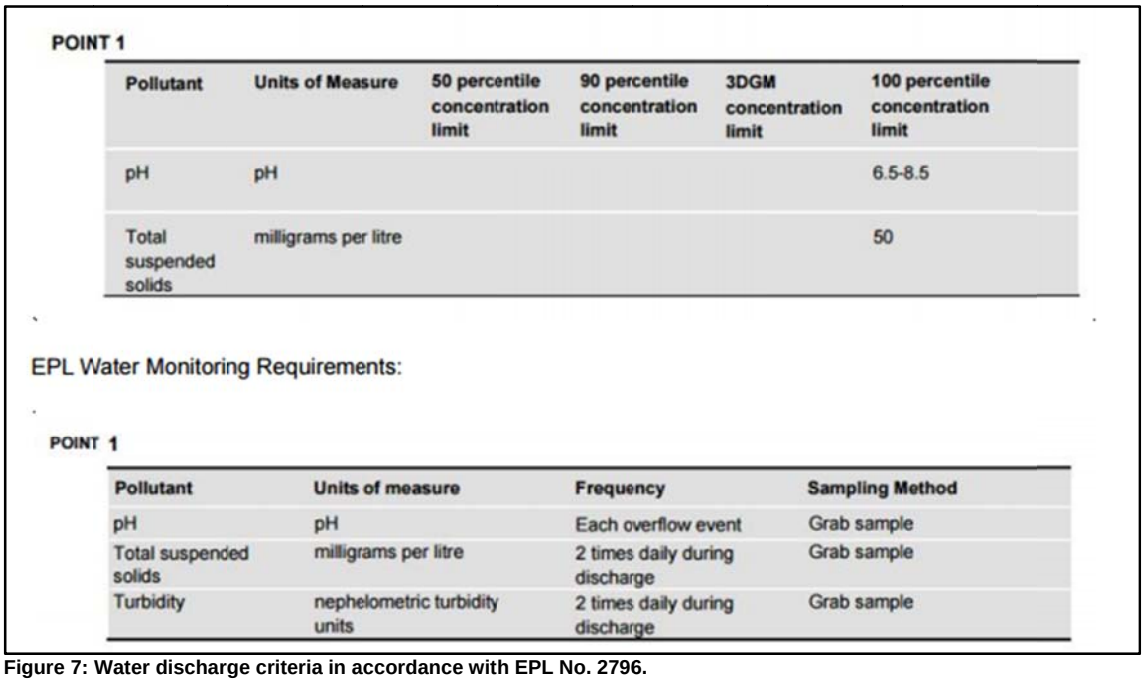
The site has maintained the intersection at the Pacific Highway and Quarry Access Road in accordance with this condition. No impacts to the intersection have been identified during the reporting period.

The site has not operated outside the hours of 7am and 6pm. Holcim are investigating a solar lighting option to install at the intersection in accordance with Schedule 3, Condition 32 of the consent. No operations outside the approved hours will occur until the solar lights are signed off by RMS and installed at the intersection.

All truck movements are published on the Holcim (Jandra Quarry) webpage in accordance with Schedule 3, Condition 33 of the consent.

6.5 Water Management

The site is required to monitor and record discharge events from the Main Dam offsite in accordance with the requirements listed in the EPL table below:



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

EPL Water 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

Figure 7: Water discharge criteria in accordance with EPL No. 2796.

The results of discharge water monitoring undertaken in accordance with the condition above have been detailed in the table below. All discharge events have been undertaken in accordance with the criteria listed in the EPL.

Table 10 - Water discharge results (Jandra Quarry).

Date	Sample	pH	Turbidity (NTU)	TSS (mg/L)	Result
5/01/2016	1	7.6	50	30	**PASS**
5/01/2016	2	7.9	45	29	**PASS**
6/01/2016	3	7.9	45	29	**PASS**
Date	**Sample**	**pH**	**Turbidity (NTU)**	**TSS (mg/L)**	**Result**
6/01/2016	4	7.9	50	28	**PASS**
7/01/2016	5	7.9	45	29	**PASS**
1/09/2016	1	8.2	19	17	**PASS**
2/09/2016	2	8.2	22	23	**PASS**

6.6 Summary of Environmental Performance

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

See Section 6.1 for noise criteria, Section 6.2 for dust criteria, Section 6.3 for blasting criteria, Section 6.4 for traffic management criteria and Section 6.5 for water management criteria as outlined in the development consent.

Table 11 – Environmental performance

Aspect	Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented/ proposed management actions
Noise	EIS predictions are all below development consent criteria. See Section 6.6.1	Quarter 4 monitoring has met the Development Consent Criteria.	Meets criteria.	None Required.
Air quality	EIS predictions are all below development consent criteria. See Section 6.6.2	Dust deposition results are within criteria of EPL, EIS and Development Consent. PM10 monitoring has not been undertaken.	Dust deposition has been consistent with EIS and previous Annual Review reporting. PM10 monitoring has not been undertaken.	PM10 monitor installed and operational for 2017 reporting period.
Water Mgt	EIS predictions are all below development consent criteria. See Section 6.6.3	Discharge criteria meets EIS, EPL and Development Consent criteria.	Surface water consistently meets criteria.	Groundwater assessment will be undertaken during the 2017 reporting period.

6.6.1 Noise criteria as per Environmental Assessment

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). Figure 8 details the noise modelling for this stage. When compared with the data in Figure 3 all results have been below that modelled within the Environmental Assessment (2014).

Table 26 Stage 1 Assessment without asphalt plant operating (exceedances shown in **bold**)

Receptor	Day / Evening (dBA Leq) 7 am to 10 pm		Early morning shoulder (dBA Leq) 6 am to 7 am		
	Project Criteria	Predicted level Neutral	Project criteria	Predicted level 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**

Figure 8 Stage 1 noise modelling - Environmental Assessment

6.6.2 Air criteria as per Environmental Assessment

Jandra Quarry is currently only in Stage 1 of its development plan as described in the Air Quality Impact Assessment detailed within the Environmental Assessment (2014).Figure 9, 10 and 11 are the modelled dust contributions expected from the Jandra Quarry. The dust deposition gauges are all below the criteria. TSP and PM10 were not monitored during the reporting period as already communicated to the department. This has been rectified with the PM10 monitor installed in 2017.

Table 13 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 Increment (µg/m^3)	Total (µg/m^3)
			Stage 1				
22-11-2012	45.8	0.6	46.4	03-06-2013	10.8	34.3	45.1
09-01-2013	42.7	0.0	42.7	22-06-2013	11.6	30.2	41.8
29-08-2013	41.3	0.3	41.6	30-07-2013	13.7	25.0	38.7
07-11-2012	40.7	0.0	40.7	08-07-2013	14.2	24.9	39.1
06-10-2012	40.6	0.3	40.9	07-06-2013	9.2	22.9	32.1
			Stage 2				
22-11-2012	45.8	0.3	46.1	03-06-2013	10.8	28.3	39.1
09-01-2013	42.7	0.0	42.7	22-06-2013	11.6	20.7	32.3
29-08-2013	41.3	0.3	41.6	17-05-2013	10.2	19.0	29.2
07-11-2012	40.7	0.0	40.7	30-07-2013	13.7	18.9	32.6
06-10-2012	40.6	0.1	40.7	08-07-2013	14.2	16.3	30.5
			Stage 2				
06-10-2012	40.6	0.2	40.8	03-06-2013	10.8	33.0	43.8
07-11-2012	40.7	0.0	40.7	22-06-2013	11.6	25.3	36.9
22-11-2012	45.8	0.9	46.7	25-06-2013	8.7	21.1	29.8
09-01-2013	42.7	0.0	42.7	08-07-2013	14.2	22.8	37.0
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

Figure 9 PM10 modelled dust contribution – Air Quality Management Plan

Table 14 Predicted Incremental and 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	1.0	47.3	47.1	47.0
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**	

Figure 10 TSP modelled dust contribution – Air Quality Management Plan

Table 15 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

Figure 11 Dust deposition modelled dust contribution – Air Quality Management Plan

6.6.3 Water Criteria as per Environmental Assessment

The predictive modelling within the Environmental Assessment pertains to the water balance for Jandra Quarry (Figure 12). 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.

Figure 12 Water balance modelling – Surface Water Management Plan

Table 4-5: Water Balance Results for varying stages of quarry development

	Current			Stage 1		
Summary Results	**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

	Stage 2			Stage 3		
Summary Results	**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

7.0 Rehabilitation and Landscape Management

The sites Biodiversity and Rehabilitation Management Plan (BRMP) for the site is in the final stages of approval from the DP&E. A biodiversity offset area has been established at the site in accordance with the requirements of the Development Consent.

Rehabilitation will be undertaken in accordance with the BRMP along the exhausted quarry bench located at RL 50 on the northern face.

8.0 Community

Holcim has maintained community engagement measures during the reporting period by undertaking the following activities in accordance with Schedule 5, Condition 7 & 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.
- All documents and items displayed on the website are regularly updated by Holcim staff.

A review of the Holcim Safety, Health & Environment (SHE) reporting database (INX) did not identify any complaints from external stakeholders during the 2016 reporting period.

A link to all publicly listed information including complaints registers and contacts for locals in the community is attached below showing compliance with this condition.

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

8.1 Community Complaints

Jandra Quarry had no community complaints during the reporting period. This is consistent with historical records of Holcim's incident recording software program that show no community complaints have been received for Jandra Quarry.

9.0 Independent Audit

The site undertook an Independent Environmental Audit (IEA) in 2016 in accordance with the timeframes of the Development Consent. All actions raised in IEA have been undertaken in accordance with the recommendations made by GHD Consultants.

Table 12- Independent Audit Recommendations Status

Condition No.	Recommendation	Status
Condition 18 Schedule 2	The Applicant shall provide annual quarry production data to DRE using the standard form for that purpose; and report these data in the Annual Review	**Complete** **See Section 4.0**
Condition 1 Schedule 3	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	**Complete** **See Section 6.1**
Condition 8(b) Schedule 3	Operate a suitable system to enable the public to get up-to-date information on the proposed blasting schedule on site	**Complete** **See Section 6.3**
Condition 9(d) Schedule 3	Include a blast fume management protocol to demonstrate how emissions will be minimized including risk management strategies if blast fumes are generated	**Complete** **See Section 6.3**
Condition 10 Schedule 3	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.	**Complete** **See Section 6.2**
Condition 15 Schedule 3	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.	**Complete** **A meteorological station has been installed at the site in accordance with this condition.**
Condition 13 (a), Schedule 3	The site Quarry Manager will notify the tenant at the location specified in this condition on the risks associated with exceedances of particulate matter criteria.	**Complete** **The Quarry Manager has spoken with the tenants**

Condition No.	Recommendation	Status
Condition 19 Schedule 3	The Applicant shall prepare and implement a Soil and Water Management Plan for the development to the satisfaction of the Secretary.	**Complete** **A Soil & Water Management Plan has been prepared in accordance with this condition.**
Condition 20 Schedule 3	The Applicant shall manage on-site sewage to the satisfaction of Council and the EPA.	**Complete** **Site staff liaised with GTCC to resolve the issue of on-site OSSM systems.** **Council confirmed that they were happy with R & G Dobbs servicing the envirocycle units at the site.**
Condition 25 (b) Schedule 3	The Applicant shall prepare and implement a Biodiversity and Rehabilitation Management Plan for the site to the satisfaction of the Secretary. This plan must: (b) be prepared in consultation with OEH and Council, and submitted to the Secretary for approval by 31 August 2015;	**Complete** **See Section 7.0**
Condition 36 Schedule 3	Except as expressly permitted in an EPL, the Applicant must not receive waste at the site for storage, treatment, processing, reprocessing or disposal.	**Complete** **The site EPL was modified in 2016 to allow the storage and processing of concrete wash out.**
Condition 3(g) Schedule 5	The Applicant shall ensure that the Management Plans required under this consent are prepared in accordance with any relevant guidelines, and include: (g) a protocol for managing and reporting any: - incidents; - complaints; - non-compliances with statutory requirements; and - exceedances of the impact assessment criteria and/or performance criteria	**Complete** **All management plans were developed during 2015 & 2016 in accordance with this condition.**
Condition 10 Schedule 5	By 31 August 2015, the Applicant shall: (a) make the following information publicly available on its website: - the documents listed in condition 2 of Schedule 2; - current statutory approvals for the development; - approved strategies, plans or programs; - a summary of the monitoring results of the development, which have been reported in accordance with the various plans and programs approved under the conditions of this consent; - a complaints register, which is to be updated on a quarterly basis; - the annual reviews (over the last 5 years); - any independent environmental audit, and the Applicant's response to the recommendations in any audit; and - any other matter required by the Secretary;	**Complete** **Holcim have developed a webpage in accordance with the requirements of this condition.**
Condition P1.2 of EPL	Prepare a field record sheet for environmental monitoring rather than use the chain of custody and include the field sheet as an Appendix to the SWMP.	**Complete** **A field record sheet for environmental monitoring rather than use the chain of custody has been prepared and attached to SWMP. The updated SWMP will be submitted in 2017 to the Department of Planning for Approval.**

10.0 Incidents and non compliance

No further incidents or non-compliances were identified during the 2016 period.

11.0 Waste minimisation

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

12.0 Activities to be completed in the next reporting period

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

Table 11 - Improvement Measures (implemented in next reporting period)

Improvement Measure	Activities
Progressive Rehabilitation	The site will continue to progressively rehabilitate available areas .
Installation of Solar Lighting	If required, the site will install solar lighting (with approval from RMS) at the intersection to the Pacific Highway and Quarry Access Road to allow dispatch prior to 7am and after 6pm.

Appendix 1 – Evidence of Information Provided to DRE

RETURN OF NON ROYALTY AND STATISTICS

Clause 64(1) of the Mining Regulation 2010

Trade & Investment NSW - Resources & Energy Division

PO BOX 344, HUNTER REGION MC NSW 2310

516 High Street, Maitland NSW 2320

Telephone: (1300) 736 122 or (02) 4931 6666

Facsimile: (02) 4931 6796

Client Name: HOLCIM (AUSTRALIA) PTY LTD

Address: PO BOX 1689,
MILTON QLD 4064

Reference: 6968

Client ID: 400098

Period: 01/07/2015 to 30/06/2016

Employees: 9

Location: Possum Brush

Status: Approved

Return Type: Statistic

Category:

Mining Division:

LGA: Greater Taree

Old Quarry ID:

ABS Division: 125 Mid-North Coast

Mineral	All Qty	All Amt	Sydney Qty	Sydney Amt	Gross Value All Sales Amt
Greywacke (30-75mm)	2,172				
Greywacke (5-30mm)	112,653				
Greywacke (Over 75mm)	2,793				5,513,871.00
Greywacke (Under 5mm)	33,066				
Other Unprocessed Materials Virgin Materials	1,248				
Prepared Road Base & Sub Base	128,683				
Sand (Cement)	69				

Appendix 2 Noise Report

Quarterly Noise Monitoring Assessment

Jandra Quarry, March 2017.

Prepared for : VGT Pty Limited (on behalf of Holcim Pty Ltd)

April 2017

MAC
Muller Acoustic Consulting

Document Information

Quarterly Noise Monitoring Assessment

Jandra Quarry, Possum Brush, NSW

March 2017

Prepared for: VGT Pty Limited (on behalf of Holcim Pty Ltd)

Prepared by: Muller Acoustic Consulting Pty Ltd
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www.mulleracoustic.com

Document ID	Status	Date	Prepared By	Signed	Reviewed By	Signed
MAC160381RP2	Final	13 April 2017	Robin Heaton		Oliver Muller	

CONTENTS

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by VGT Pty Limited (VGT) on behalf of Holcim Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for the March 2017 quarter for Jandra Quarry ('the quarry'), Possum Brush, NSW.

The monitoring has been conducted in accordance with the Jandra Noise Management Plan and in general accordance with Conditions L4.2 to L4.8 of the EPL #2796 (EPL); at three representative monitoring locations. This assessment has been undertaken during Quarter 1, 2017 and forms part of the annual noise monitoring program to address conditions of the EPL.

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

- NSW Environment Protection Authority (EPA), Industrial Noise Policy (INP), 2000;
- Environment Protection Licence EPL #2796; and
- Standards Australia AS 1055.1:1997 - Acoustics - Description and measurement of environmental noise - General Procedures.

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

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2 Noise Criteria

Schedule 3, Section 1 of the Jandra Quarry Conditions of Consent, first approved on 30 March 2000 and modified on 13 March 2015, outlines the applicable noise criteria for residential receivers R1 – R7 surrounding the quarry site. Schedule 3 presents noise criteria which are applicable for two different operational activities undertaken onsite.

The first set of criteria (presented in Table 2 of the consent) are applicable when the site undertakes quarrying operations during the hours of 6am to 10pm.

The second set of criteria (presented in Table 3 of the consent) are applicable to 24 hour operations when quarrying operations and asphalt production occur simultaneously.

Furthermore, Section 5 of the Jandra Noise and Blasting Management Plan (NBMP) outlines that noise criteria do not apply at R1, R3, R8 - 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 each of the receivers R1 – R10 as outlined in the Conditions of Consent for both quarry operation and combined quarry and asphalt production operations taking into account notes outlined in the NBMP.

Table 1 Noise Criteria				
Location	Quarry Operations		Quarry Operations and Asphalt Plant Production	
	6am – 10pm	6am – 10pm	10pm – 6am	10pm – 6am
	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{A1(1min)}$
R1[1,2]	*46*	*48*	*46*	*51*
R2	36	40	35	48
R3[1, 2]	*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
R8[1, 2]	*N/A*	*N/A*	*N/A*	*N/A*
R9[1, 2]	*N/A*	*N/A*	*N/A*	*N/A*
R10[1, 2]	*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.

3 Methodology

3.1 Locality

The quarry is located in 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 all assessed receivers. To the east, the quarry is bounded by rural properties with noise from Tuncurry Road 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

Three monitoring locations have been selected as part of the NMA and in accordance with the NBMP. M1 is located adjacent to R1 to the north of the quarry and is used as a reference location for the northern catchment. It is noted that this assessment location has a negotiated agreement with Holcim, hence noise criteria are not mandatory. M2 is representative of receivers R2, R6 and R7, to the east of the quarry and M3 is situated to the west of the quarry and is representative of receivers R4 and R5.

3.3 Assessment Methodology

The attended noise surveys were conducted in general accordance with the procedures described in Australian Standard AS 1055-1997, "Acoustics - Description and Measurement of Environmental Noise" and the EPL. The measurements were carried out using Svantek Type 1, 977 noise analyser on Thursday 30 March 2017 and Friday 31 March 2017. The acoustic instrumentation used carries current NATA calibration and complies with AS IEC 61672.1-2004-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ±0.5dBA.

Noise measurements were of 15 minutes in duration and where possible, throughout each survey the operator quantified the contribution of each significant noise source. One measurement was conducted at each of the monitoring locations during the day monitoring period. Although the site was not undertaking Asphalt batching, evening and night measurements were undertaken for completeness. However due to the unprecedented April 2017 rainfall during the evening and night, measurements could not be completed at M1 and M3 during the evening period and all locations (M1 – M3) during the night period. An additional round of noise measurements was undertaken during the night/morning shoulder period (5.45am to 7.00am).

Extraneous noise sources were excluded from the analysis to calculate the $L_{Aeq(15min)}$ quarry noise contribution for comparison against the relevant EPL criteria (criteria). In the event of quarry attributed noise being above criteria, prevailing meteorological conditions for the monitoring period were sourced from Taree airport's meteorological station and analysed in accordance with Appendix E4 of the INP to determine the stability category present at the time of each attended measurement.

The meteorological analysis has been completed to determine applicability of results in accordance with Condition L4.5 of the EPL. Results obtained during non-prevailing meteorological conditions (ie F Class Stability in conjunction with a 2m/s drainage wind or a G Class Stability) are considered not applicable against the EPL criteria.

FIGURE 1

LOCALITY PLAN

REF: MAC160381

0 300m

KEY	
R7	RECEIVER / MONITORING LOCATION
	PROJECT SITE

MAC
Muller Acoustic Consulting

*Imagery Source : nearmap

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4 Results

4.1 Assessment Results - Location M1

The monitored noise level contributions and observed meteorological conditions for each assessment period at location M1 for Friday 31 March 2017 are presented in **Table 2**.

Table 2 Operator-Attended Noise Survey Results – Location M1

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		LAmax	L_{Aeq}	L_{A90}		
31/03/2017	8:56 (Day)	54	46	43	Dir: Westerly Wind Speed: 0.5m/s Rain: Nil	Leaves Rustling 46 – 48 Insects 43 – 45 Highway traffic 45 – 48 Quarry Bang 47 Faint Engine Revs at Site 37
Jandra Quarry $L_{Aeq(15min)}$ Contribution						37
31/03/2017	6:40 (Night / Morning Shoulder)	56	44	42	Dir: Westerly Wind Speed: 0.4m/s Rain: Nil	Highway Traffic 44 - 46 Insects and Frogs 42 - 45 Quarry Hum 36 - 41 Leaves Rustling and Dripping 40 - 48 Aircraft Overhead 44 - 47
Jandra Quarry $L_{Aeq(15min)}$ Contribution						36

4.2 Assessment Results - Location M2

The monitored noise level contributions and observed meteorological conditions for each assessment period at location M2 for Thursday 30 March and Friday 31 March 2017 are presented in **Table 3**.

Table 3 Operator-Attended Noise Survey Results – Location M2

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		LAmax	L_{Aeq}	L_{A90}		
31/03/2017	8:06 (Day)	72	47	39	Dir: Westerly Wind Speed: 0.5m/s Rain: Nil	Aircraft Noise 46 - 49 Insects 42 - 47 Traffic Hum 42 - 47 Passing Car 56 - 70
Jandra Quarry $L_{Aeq(15min)}$ Contribution						Quarry Inaudible
30/03/2017	18:33 (Evening)	58	40	33	Dir: Northerly Wind Speed: 0.1m/s Rain: Nil	Insects 36 - 43 Traffic Hum 37 - 40 Birds 41 - 52 Leaves Rustling 42 - 44
Jandra Quarry $L_{Aeq(15min)}$ Contribution						Quarry Inaudible
31/03/2017	5:37 (Morning shoulder)	59	49	44	Dir: Westerly Wind Speed: 1.0m/s Rain: Nil	Insects 47 - 53 Traffic Hum 44 - 51 Leaves Dripping 45 - 50 Leaves Rustling 44 - 48
Jandra Quarry $L_{Aeq(15min)}$ Contribution						Quarry Inaudible

4.3 Assessment Results - Location M3

The monitored noise level contributions and observed meteorological conditions for each assessment period at location M3 for Friday 31 March 2017 are presented in **Table 4**.

Table 4 Operator-Attended Noise Survey Results – Location M3

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		LAmax	L_{Aeq}	L_{A90}		
31/03/2017	8:34 (Day)	74	50	46	Dir: Westerly Wind Speed: 0. 3m/s Rain: Nil	Leaves Rustling 46 - 50 Leaves Dripping 45 - 48 Highway traffic 48 - 60
Jandra Quarry $L_{Aeq(15min)}$ Contribution						Quarry Inaudible
31/03/2017	6:06 (Night / Morning Shoulder)	60	50	45	Dir: Westerly Wind Speed: m/s Rain: Nil	Insects 45 - 48 Highway Traffic 46 - 60 Birds 46 - 50
Jandra Quarry $L_{Aeq(15min)}$ Contribution						Quarry Inaudible

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5 Noise Compliance Assessment

The compliance assessment for each residential receiver R2, R4, R5, R6 and R7 are presented in **Table 5** to **Table 7** for day, evening and night assessment periods.

Table 5 Daytime Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant	Quarrying & Asphalt Production Criteria	Compliant
	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$		$L_{Aeq(15min)}$	
R2	Nil	36	✓	40	✓
R4	Nil	36	✓	40	✓
R5	Nil	40	✓	41	✓
R6	Nil	36	✓	40	✓
R7	Nil	35	✓	36	✓

Table 6 Evening Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant	Quarrying & Asphalt Production Criteria	Compliant
	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$		$L_{Aeq(15min)}$	
R2	Nil	36	✓	40	✓
R4	Nil	36	✓	40	✓
R5	Nil	40	✓	41	✓
R6	Nil	36	✓	40	✓
R7	Nil	35	✓	36	✓

Table 7 Night-time Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarrying & Asphalt Production Criteria	Compliant	Quarry Noise Contribution	Quarrying & Asphalt Production Criteria	Compliant
	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$		$L_{A1(1min)}$	$L_{A1(1min)}$	
R2	Nil	35	✓	Nil	48	✓
R4	Nil	39	✓	Nil	51	✓
R5	Nil	39	✓	Nil	51	✓
R6	Nil	35	✓	Nil	48	✓
R7	Nil	35	✓	Nil	48	✓

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6 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a noise monitoring assessment for VGT Pty Ltd on behalf of Holcim Pty Ltd at the Jandra Quarry, Possum Brush, NSW. The assessment was completed to assess the quarry's compliance with the relevant criteria outlined in their EPL (EPL#2796) for several residential receivers surrounding the quarry.

Attended noise monitoring was undertaken on Thursday 30 March 2017 and Friday 31 March 2017 at representative monitoring locations with quarry noise contributions compared against the relevant criteria. The assessment has identified that noise emissions generated by Jandra Quarry comply with relevant statutory noise criteria specified in the conditions of consent at all assessed residential receivers.

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Appendix A - Glossary of Terms

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

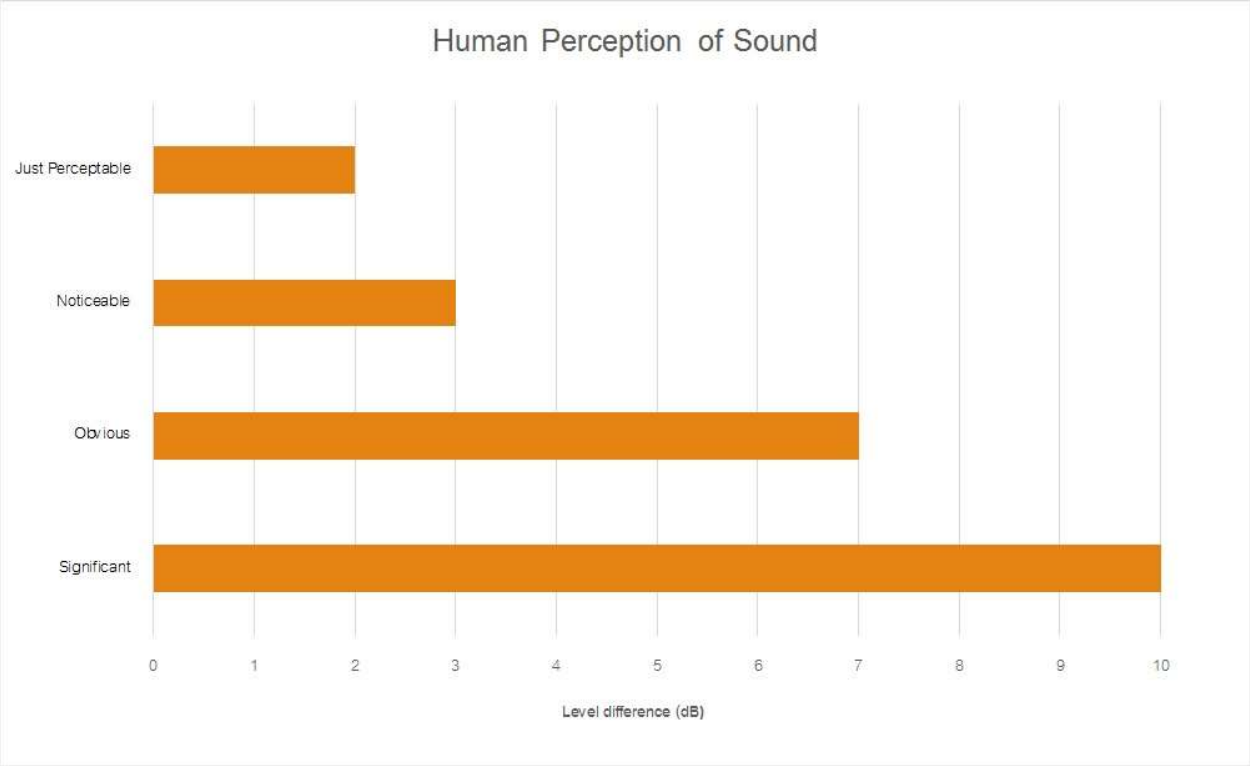
Table 1A Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the INP as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAmax	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by : = 10.log10 (W/Wo) Where : W is the sound power in watts and Wo 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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