



Karuah Hard Rock Quarry

Summary of Environmental Monitoring Data



For the Period: November 2012

1. Introduction

This report has been completed to meet the requirements of Section 66(6) of the *Protection of the Environment Operations Act 1997* and the NSW Environmental Protection Authority's (EPA) *Requirements for Publishing Pollution Monitoring Data* (March 2012). This report summarises the required monitoring data under Environmental Protection Licence (EPL) 11569 for the Karuah Hard Rock Quarry (Karuah Quarry). This report also includes some monitoring requirements under Development Application 265-10-2004.

A summary of the environmental monitoring data for November 2012 is covered in this report.

A summary of the licence information is provided in the tables in the report.

Table 1 – Licence Information

Environmental Protection Licence Number	11569
Licensee's Name	Hunter Quarries Pty Ltd
Licensee's Address	Licensee Postal Address: PO Box 3284 Thornton NSW 2322 Premises Address: Karuah Quarry, Corner of Andesite Road and The Branch Lane, Karuah NSW 2324
Link to Full Licence on the EPA Website	http://www.environment.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=30942&SYSUID=1&LICID=11569

2. Dust Monitoring Results

There are no specific dust criteria listed in the EPL, but the following dust criteria are listed in Schedule 3 Condition 14 of DA 265-10-2004.

Table 2 - OEH Dust Deposition Criteria for the Karuah Quarry

Averaging Period	Maximum Increase in Deposited Dust Level¹	Maximum Total Deposited Dust Level¹
Annual	2 g/m ² /month	4 g/m ² /month

Note ¹: Dust is assessed as insoluble solids as defined by AS 3580.10.1-2003.

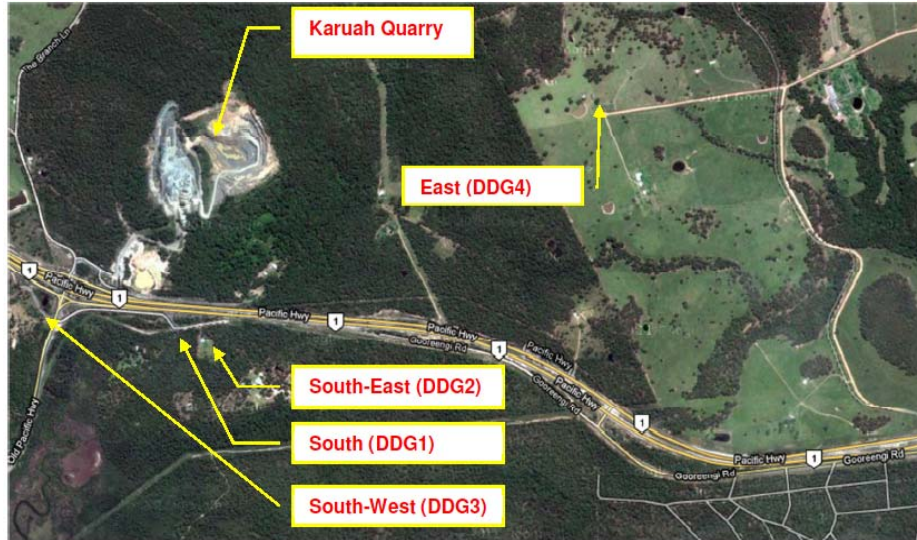
SLR Consulting Australia Pty Ltd undertakes the depositional dust monitoring at Karuah Quarry. Monitoring is completed at the locations listed in **Table 3** below.

Table 3 – Air Quality Monitoring Locations for the Karuah Quarry

Site ID	Location	Address	GPS Coordinates
South (DDG1)	South of the Karuah Quarry	5760 Pacific Hwy, Karuah NSW 2324	32°38'04"S 151°59'58"E
South-East (DDG2)	South of the Karuah Quarry	5770 Pacific Hwy, Karuah NSW 2324	32°38'02"S 152°00'09"E
South-West (DDG3)	South-West of the Karuah Quarry	DP 1024341, Karuah	32°37'57"S 151°59'41"E
East (DDG4)	East of the Karuah	21 Halloran Rd	32° 37' 30.87"S

Site ID	Location	Address	GPS Coordinates
	Quarry	North Arm Cove NSW 2324	152°01'10.18"E

Figure 1 Illustrates the air quality monitoring locations at Karuah Quarry.



Source: Google Earth

Figure 1 - Air Quality Monitoring Locations

Air Quality Monitoring was undertaken during the period 19 October 2012 to 20 November 2012 at the locations detailed in **Table 4**. Depositional dust gauge ($\text{g}/\text{m}^2/\text{month}$) results for November 2012 and the year to date are shown in **Table 4**.

Table 4 – Insoluble Solids ($\text{g}/\text{m}^2/\text{month}$) for the Year to Date

EPL	11569			
Date Sampled	20 November 2012			
Obtained by Hunter Quarries	8 January 2012			
Published by Hunter Quarries	8 January 2012			
Date	DDG1	DDG2	DDG3	DDG4
10/01/2012 to 6/02/2012	0.2	0.1	0.8	0.4
6/02/2012 to 6/03/2012	0.7	4.5	0.9	0.3
6/03/2012 to 3/04/2012	1.2	2.4	0.8	0.5
3/04/2012 to 2/05/2012	1.2	0.5	0.4	0.7
2/05/2012 to 30/05/2012	2.2	1.7	0.7	0.4
30/05/2012 to 27/06/2012	1.5	0.6	0.4	0.3
27/06/2012 to 26/07/2012	0.6	0.9	0.5	0.5
26/07/2012 to 22/08/2012	2.6	1.1	0.8	0.8
22/08/2012 to 19/09/2012	1.6	1.2	0.7	0.7
19/09/2012 to 19/10/2012	1.3	0.5	0.6	0.4
19/10/2012 to 20/11/2012	0.6	0.5	0.7	0.4
Average	1.4	1.3	1.2	0.6
Rolling Annual Average	1.4	1.3	1.3	0.7

Dust monitoring results have been consistently lower than $4\text{g/m}^2/\text{month}$ in 2012. All monitoring locations in November 2012 were below $4\text{g/m}^2/\text{month}$.

3. Blast Monitoring Results

The following conditions in EPL 11569 refer to blast management.

M6.1 The licensee must monitor all blasts carried out in or on the premises at or near the nearest residence or noise sensitive location (such as a school or hospital) that is likely to be most affected by the blast and that is not owned by the licensee or subject of a private agreement between the owner of the residence or noise sensitive location and the licensee relating to alternative blasting limits.

L4.1 Blasting in or on the premises must only be carried out between 0900 hours and 1500 hours, Monday to Friday. Blasting in or on the premises must not take place on weekends or Public Holidays without the prior approval of the EPA.

L4.2 The overpressure level from blasting operations carried out in or on the premises must not:

- a) exceed 115 dB(L) for more than 5% of the total number of blasts carried out on the premises within the 12 months annual reporting period; and*
- b) exceed 120 dB(L) at any time*

at any residence or noise sensitive location (such as a school or hospital) that is not owned by the licensee or subject of a private agreement between the owner of the residence or noise sensitive location and the licensee as to an alternative overpressure level.

L4.3 The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not:

- a) exceed 5mm/second for more than 5% of the total number of blasts carried out on the premises within the 12 months annual reporting period; and*
- b) exceed 10mm/second at any time at any residence or noise sensitive location (such as a school or hospital) that is not owned by the licensee or subject of a private agreement between the owner of the residence or noise sensitive location and the licensee as to an alternative ground vibration level.*

There was no blasting completed during November 2012.

4. Noise Monitoring Results

Condition 1 of the Development Consent requires Hunter Quarries to ensure noise generated by the development does not exceed criteria outlined in **Table 5** at any residence, or any noise sensitive receptor on privately owned land.

Table 5 – Development Consent Noise Impact Criteria – Karuah Quarry

Time Period	Noise Limit (dBA) 1 LAeq(15minute)
Day 7:00am to 6:00pm Monday to Friday 7:00am to 1:00pm Saturday	48
Evening 6:00pm to 10:00pm Monday to Friday	47
At All Other Times	46

Table 6 illustrates the operator attended and unattended noise monitoring locations at Karuah Quarry.

Table 6 – Development Consent Noise Impact Criteria – Karuah Quarry

Noise Monitoring Location	Property Name	Distance from Karuah Quarry
NM1	Lot 3 DP785172 5772 Pacific Hwy, Karuah	317 metres South of the Karuah Quarry
NM2	Lot 2 DP 785172 5760 Pacific Hwy, Karuah	200 metres South of the Karuah Quarry
NM3	Lot 22 DP 1024341	370 metres South West of the Karuah Quarry

Figure 2 below illustrates the noise monitoring locations at Karuah Quarry.



Figure 2 - Noise Monitoring Locations

SLR Consulting Australia Pty Ltd was engaged by Hunter Quarries to prepare and implement a noise monitoring program for the Karuah Quarry in accordance with the Conditions of Development Consent for the operation. There was no noise monitoring completed in November 2012.

Operator Attended Results

An operator attended noise survey was conducted at each of the three (3) monitoring locations on 6 November 2012. The purpose of the noise surveys was to verify the unattended logging results and to determine the character and contribution of noise sources to the total ambient noise level. **Table 7** below summarises the Operator Attended Noise Results.

Table 7 – Operator Attended Noise Survey Results for Karuah Quarry

Location (Serial No.)	Date/Start Time/ Weather	Primary Noise Descriptor (dBA re 20 µPa)						Description of Noise Emissions and Typical Maximum Noise Levels (dBA)
		LAMAX	LA1	LA10	LA90	LAeq	Lmin	
NM1 Lot 3 DP785172 Northern Boundary (16-203-531)	6/11/2012 10:34 AM Wind: NE 2.3m/s Temp 30°C	69	65	61	51	57	45	Pacific Highway ~ 61-69 Birds 45 Quarry inaudible
		Estimated Quarry LAeq(15minute) Contribution not measurable above background noise.						
NM2 Lot 2 DP 785172 Northern Boundary (16-306-039)	6/11/2012 10:53 AM Wind: NE 2.3m/s Temp 30°C	81	69	63	52	60	45	Pacific Highway ~ 63-81 Birds 45 Quarry inaudible
		Estimated Quarry LAeq(15minute) Contribution not measurable above background noise.						
NM3 Lot 22 DP 1024341 Northern Boundary (16-301-473)	6/11/2012 11:10 AM Wind: NE 2.3m/s Temp 30°C	75	71	66	53	62	48	Pacific Highway ~ 66- 75 Quarry inaudible
		Estimated Quarry LAeq(15minute) Contribution not measurable above background noise.						

Noise generated by traffic on the Pacific Highway and natural noise sources such as birds and insects dominated ambient noise levels at all noise monitoring locations (NM1, NM2 and NM3). The quarry was inaudible at all measurement locations. Typically noise sources that are inaudible are at least 10 dB below the minimum noise level. For this reason it is expected that the quarry noise contribution at Locations NM1, NM2 and NM3 is at least 10 dB below the recorded minimum noise level of 45 dBA at NM1 and NM2 and 48 dBA at NM3 and therefore well below the consent criteria of 48 dBA.

Unattended Continuous Noise Monitoring

A summary of the results of the unattended continuous noise monitoring is given in **Table 8**. The ambient noise level data quantifies the overall noise level at a given location independent of its source or character.

The measured ambient noise levels were divided into three periods representing day, evening and night as designated in the INP. The INP time classifications differ slightly from the conditions of consent in that the INP includes Saturday 7:00am to 6:00pm rather than Saturday 7:00am to 1:00pm, as well as Sunday 8:00am to 6:00pm. The evening time classifications are the same and where the conditions of consent refer to all other times, the INP nominates this as "night".

Table 8 – Unattended Continuous Monitoring Ambient Noise Levels

INP Period	LA1	LA10	LA90	LAeq
NM1				
Daytime during Operational Hours	72	67	54	64
Daytime outside Operational Hours	73	68	55	64
Evening	73	68	50	63
Night	74	66	37	60
NM2				
Daytime during Operational Hours	65	60	50	57
Daytime outside Operational Hours	65	60	49	56
Evening	66	61	46	56
Night	66	60	32	54
NM3				
Daytime during Operational Hours	64	61	49	58
Daytime outside Operational Hours	65	62	52	58
Evening	66	62	51	58
Night	66	62	46	56

Note: Periods used for the Industrial Noise Policy (INP) are defined as Daytime - 7.00 am to 6.00 pm Monday to Saturday, 8.00 am to 6.00 pm Sunday; Evening - 6.00 pm 10.00 pm; Night - 10.00 pm to 7.00 am pm Monday to Saturday, 10.00 pm to 8.00 am Sunday.

Unattended Continuous Monitoring Summary

Location NM1

Ambient noise levels during the daytime period outside the quarry’s operational hours are consistent with or higher than those during operational hours. The main contributors to ambient noise levels at this monitoring location are considered to be the result of traffic along the Pacific Highway and natural sources such as birds and insects.

Location NM2

Ambient noise levels during the daytime period outside the quarry’s operational hours are consistent with or higher than those during operational hours. The main contributors to ambient noise levels at this monitoring location are considered to be the result of traffic along the Pacific Highway and natural sources such as birds and insects.

Location NM3

Ambient noise levels during the daytime period outside the quarry’s operational hours are consistent with or higher than those during operational hours. The main contributors to ambient noise levels at this monitoring location are considered to be the result of traffic along the Pacific Highway and natural sources such as birds and insects.

Conclusion

Both operator attended and unattended noise monitoring was conducted at the three (3) nearest residences to determine noise levels produced by Karuah Quarry operations.

The noise contribution of Karuah Quarry operations remained insignificant compared to road traffic noise from the Pacific Highway during all attended noise surveys. The Karuah Quarry operations contribution (LAeq(15minute)) was estimated to be less than 35 dBA, at NM1 and NM2 and 38 dBA at NM3 and therefore in compliance with the consent criteria of 48 dBA LAeq(15minute) at all monitoring locations.

Results from the ambient unattended noise logger measurements conducted at three (3) noise monitoring locations indicate that the main contributors to ambient noise levels at all three locations are considered to be the result of traffic along the Pacific Highway and birds/insects.

5. Surface Water Monitoring Results

Condition L2 of the EPL outlines the requirement to monitor surface water discharges from Karuah Quarry via the licensed discharge point (LDP001).

Table 9 summarises discharge monitoring at Karuah Quarry.

Table 9 - Surface Water Discharge Monitoring Results

Sampling Point	Monitoring Frequency	Pollutant	Measurement	EPL Limit
LDP001	During Discharge	pH	<i>No discharge during November 2012</i>	6.5 – 8.5