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Karuah Hard Rock Quarry

Environmental Monitoring Report

December 2023



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1.0 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 (EPA, 2013). This report summarises the required monitoring data under Environmental Protection Licence 11569 (the EPL) and Development Consent for the Karuah Quarry (the Quarry) as summarised by **Table 1** and **Table 2** respectively.

Table 1 *Summary of Environment Protection Licence, EPL 11569*

EPL Number:	EPL 11569
Licensee's Name:	Hunter Quarries Pty Limited
Licensee's Address:	Karuah Hard Rock Quarry 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:	EPL 11569

Table 2 *Summary of Project Approval, DA 265-10-2004*

Project Approval:	DA 265-10-2004
Applicant:	Hunter Quarries Pty Limited
Consent Authority:	Minister for Infrastructure, Planning and Natural Resources
Link to Full Project Approval on the DPE website:	Development Consent DA 265-10-2004

A summary of the environmental monitoring data for December 2023 is covered in this report. Tables throughout this report provide key monitoring information from the EPL and the Consent, including:

- location of monitoring;
- pollutant;
- unit of measurement; and
- monitoring frequency required.

Monitoring locations are illustrated by the site plan provided by **Appendix 1**.

2.0 Air Quality Monitoring

Dust emissions generated by the Quarry operation must not cause additional exceedances of ambient air quality criterion outlined in Schedule 3, Condition 13 of the Consent and summarised by **Table 3**, **Table 4** and **Table 5**.

Deposited dust monitoring is undertaken at the locations listed in **Table 6**, in accordance with the Approved Methods of Sampling and Analysis of Air Pollutants in NSW (EPA, 2022).

Table 3 Long-term Assessment Criteria for Deposited Dust (DA 265-10-2004).

Pollutant	Averaging Period	Maximum Increase in Deposited Dust Level ¹	Maximum Total Deposited Dust Level ¹
Deposited Dust	Annual	2 g/m ² /month	4 g/m ² /month

¹ Deposited dust is assessed as insoluble solids as defined by AS 3580.10.1-2003.

Table 4 Long-term Assessment Criteria for Particulate Matter (DA 265-10-2004).

Pollutant	Averaging Period	Criterion
Total Suspended Particulates	Annual	90 µg/m ³
Particulate Matter < 10 µm (PM10)	Annual	30 µg/m ³

Table 5 Short-term Assessment Criteria for Particulate Matter (DA 265-10-2004).

Pollutant	Averaging Period	Criterion
Particulate Matter < 10 µm (PM10)	24-hour	50 µg/m ³

Table 6 Air Quality Monitoring Locations (EPL 11569).

Site Monitoring Point ID	EPL Monitoring Point ID	Location	Address	Coordinates
DDG 1	2	South-West of Karuah Hard Rock Quarry	54 Mill Hill Close, Karuah NSW 2324	32°38'04"S 151°59'58"E
DDG 2	3	South-West of Karuah Hard Rock Quarry	64 Mill Hill Close, Karuah NSW 2324	32°38'02"S 152°00'09"E
DDG 3	4	South-West of Karuah Hard Rock Quarry	Lot 251 DP1092111, Karuah NSW 2324	32°37'57"S 151°59'41"E
DDG 4	5	East of Karuah Hard Rock Quarry	21 Halloran Road, North Arm Cove NSW 2324	32° 37' 30.87"S 152°01'10.18"E

Deposited dust results for the 12-months prior-to and including December 2023 are summarised by **Table 7**.

Table 7 *Deposited dust monitoring results.*

Reporting Period	Start Date	End Date	Days	DDG 1 EPL ID 2	DDG 2 EPL ID 3	DDG 3 EPL ID 4	DDG 4 EPL ID 5
Jan-23	5/01/2023	3/02/2023	29	0.2	0.4	0.8	0.1
Feb-23	3/02/2023	5/03/2023	31	0.9	0.7	0.2	0.3
Mar-23	5/03/2023	5/04/2023	30	1.1	1.5	1.1	1.1
Apr-23	5/04/2023	4/05/2023	29	0.3	0.5	0.3	0.2
May-23	4/05/2023	5/06/2023	32	0.2	0.3	0.3	0.4
Jun-23	6/06/2023	4/07/2023	28	0.6	2.5	1.8	–
Jul-23	4/07/2023	3/08/2023	30	0.4	0.9	1.2	1.1
Aug-23	3/08/2023	4/09/2023	32	0.7	0.3	0.5	0.5
Sep-23	4/09/2023	4/10/2023	30	1.5	2.6	1.4	1.4
Oct-23	4/10/2023	2/11/2023	29	1.4	2.4	2.2	1.6
Nov-23	2/11/2023	30/11/2023	28	1.6	–	1.4	1.0
Dec-23	30/11/2023	28/12/2023	28	1.1	1.0	1.3	1.3
Annual Average				0.8	1.2	1.0	0.8

Monitoring results for the December 2023 reporting period at four DDG monitoring sites are within the long-term annual deposited dust limit of 4 g/m²/month.

It should be noted that DDG 4 and DDG 2 samples in the June 2023 and November 2023 respective reporting periods, become contaminated with vegetation matter and are therefore discounted from averaging. These two ‘failure to monitor events’ were reported to the NSW Department of Planning & Environment (DPE), the NSW EPA, and surrounding landholders in accordance with the relevant conditions of the Consent and EPL.

3.0 Blast Monitoring

Blast monitoring is undertaken for all blasts at the Quarry at the nearest residential location to ensure that air blast overpressure and ground vibration remain within the compliance limits, as summarised by **Table 9**.

There was one blast within the December 2023 reporting period, as summarised by **Table 10**.

Table 9 *Blasting Airblast Overpressure and Ground Vibration Criteria (DA 265-10-2004 & EPL 11569).*

Location	Airblast Overpressure (dB(L))	Ground Vibration (mm/s)	Allowable Exceedance
Private Residence B	120	10	0%
EPL Monitoring Point ID 11	115	5	5% over 12-month reporting period.

Table 10 *Blasting Monitoring Results*

Date	Time	Location	Airblast Overpressure (dB(L))	Ground Vibration (mm/s)
21 December 2023	15:24	R.L 110	<115	~1.4

*Not triggered = n/t
Ground Vibration < 0.5 mm/s
Overpressure < 108 dB(L)

4.0 Noise Monitoring

Noise monitoring is undertaken in accordance with the EPL and DPE approved Environmental Monitoring Program, which requires attended and unattended noise monitoring to be conducted on a 6 monthly basis.

No noise monitoring was conducted during the December 2023 reporting period.

5.0 Surface Water Monitoring

Water monitoring is undertaken in accordance with the EPL and DPE approved Water Management Plan, which includes 6 monthly surveillance sampling and daily sampling during discharge events, with results summarised in **Table 11** and **Table 12** respectively.

Surface water surveillance monitoring was undertaken on 28 December 2023 with the results summarised by **Table 11**.

Table 11 *Surface Water Monitoring Results.*

Parameter	Units	EPL Discharge Limits	Sed Dam 2
Oil and Grease	mg/L	5 and/or non-visible	<5
pH	pH	6.5 – 8.5	8.3
Total Suspended Solids	mg/L	50	64
Parameter	Units	ANZECC Guidelines ¹	Sed Dam 2
Conductivity	µS/cm	125 – 2,200	587

¹ Key default trigger values presented in ANZECC 2000 for slightly disturbed upland rivers in NSW. Heavy metals based on hard water (120-179 mg CaCO₃/L).

Daily discharge monitoring was conducted when discharging surface water from the Quarry via the licenced discharge points in accordance with Condition L2 and M2 of the EPL, as summarised by **Table 12**.

No discharging events occurred in December 2023.

Table 12 *Discharge Water Monitoring Results.*

Date	pH	Total Suspended Solids, TSS (mg/L)	Oil and Grease	Nitrogen (total) (mg/L)	Phosphorus (total) (mg/L)	Discharge Type
LDP 1 – Sediment Dam 2						
-	-	-	-	-	-	-

6.0 Weather Station Monitoring

The Quarry operates and maintains a permanent meteorological monitoring station to record weather parameters including temperature, wind speed and direction, solar radiation and rainfall. **Figure 3** below outlines the weather records for the December 2023 reporting period.

Monthly Weather Summary



Site: Karuah Quarry
Month: December 2023

Date	Day	Temperature @ 2m			Temperature @ 10m			Winds			Solar Radiation		Rain ²
		Max ¹	Min ²	Ave ¹	Max ¹	Min ²	Ave ¹	Max Gust ¹	Ave Speed ¹	Dir Ave ¹	Max ¹	Ave ¹	
		°C	°C	°C	°C	°C	°C	km/h	km/h	deg	W/m ²	W/m ²	
1	Wed	31.5	15.9	24.1	30.3	16.9	24.3	42.6	5.9	231.7	1204.9	270.5	0.0
2	Thu	31.3	19.4	23.6	27.8	19.3	22.7	28.4	6.0	169.0	1156.7	252.1	2.2
3	Fri	26.3	16.9	20.5	23.7	17.6	20.4	18.9	3.3	170.0	1269.3	142.4	4.0
4	Sat	30.3	17.5	22.6	26.8	18.3	21.8	33.1	6.7	154.8	1025.8	303.2	0.0
5	Sun	27.3	13.1	19.9	23.8	13.9	19.3	26.0	4.8	161.2	1218.2	246.3	0.0
6	Mon	35.2	18.8	25.7	32.4	20.3	25.4	34.3	4.9	160.9	980.8	320.0	0.0
7	Tue	29.3	16.7	22.3	25.8	16.9	21.1	30.8	5.3	197.1	948.3	293.2	0.0
8	Wed	33.5	18.2	23.9	30.3	18.7	23.0	34.3	6.0	164.8	969.9	276.8	0.0
9	Thu	38.7	22.2	29.4	36.0	23.6	29.0	33.1	5.0	139.3	1062.4	311.1	0.0
10	Fri	42.6	21.5	30.1	38.7	21.2	29.2	36.7	7.8	181.4	964.2	259.4	0.2
11	Sat	33.0	17.1	24.5	29.7	17.9	23.8	30.8	5.5	153.3	1241.7	260.2	0.0
12	Sun	35.9	19.2	25.9	31.8	19.5	24.7	23.7	5.3	151.2	970.8	319.7	0.0
13	Mon	31.1	19.1	24.1	27.6	19.6	23.2	37.9	7.3	138.9	1215.7	289.5	0.0
14	Tue	34.7	20.5	27.1	31.5	21.0	26.1	33.1	5.6	162.0	951.7	311.8	0.0
15	Wed	40.1	21.8	29.0	38.7	21.4	28.6	39.0	6.9	235.3	1108.3	221.1	0.0
16	Thu	29.4	16.6	23.0	25.6	17.3	22.0	28.4	5.7	171.1	1176.7	258.8	0.0
17	Fri	39.4	20.5	27.2	37.5	20.8	26.5	45.0	8.3	188.1	1030.0	307.2	0.0
18	Sat	27.0	22.2	24.0	24.7	22.3	23.1	29.6	7.5	142.8	1161.7	180.4	0.0
19	Sun	33.1	21.8	26.7	29.8	22.0	25.8	30.8	5.5	142.5	1110.8	219.7	0.0
20	Mon	38.6	19.2	23.5	35.5	19.2	23.3	43.8	5.9	205.0	1022.4	154.8	22.4
21	Tue	22.0	16.7	18.8	21.6	16.7	18.8	31.9	6.0	229.2	284.2	49.0	17.0
22	Wed	24.2	17.2	19.7	22.4	17.4	19.5	40.2	7.0	201.0	964.2	125.6	2.6
23	Thu	25.9	15.1	19.9	22.8	15.3	19.1	29.6	5.8	193.6	1035.0	289.1	1.0
24	Fri	27.7	17.0	21.5	24.3	17.2	20.8	26.0	5.3	158.3	1124.9	290.3	0.0
25	Sat	28.5	15.9	21.2	26.1	16.4	20.8	22.5	3.9	198.6	1166.6	179.8	0.6
26	Sun	28.6	18.1	23.3	26.0	18.6	22.7	27.2	5.5	151.9	1340.8	253.2	0.2
27	Mon	32.7	16.6	23.6	29.5	17.7	23.4	24.9	3.9	164.8	1174.2	225.4	1.0
28	Tue	31.7	16.1	22.9	28.2	17.1	22.2	27.2	4.6	183.1	1049.2	291.4	0.2
29	Wed	35.3	17.0	25.3	32.9	17.3	24.8	27.2	5.2	217.3	1091.6	270.4	0.0
30	Thu	31.7	18.1	23.3	28.4	19.3	23.1	27.2	3.8	180.8	1101.6	191.2	0.6
31	Fri	29.6	18.2	22.9	26.2	18.4	21.9	35.5	7.9	156.6	958.3	275.7	4.8
Ave or Total		31.8	18.2	23.9	28.9	18.7	23.2	31.6	5.7	176.0	1067.1	246.4	56.8
High		42.6	22.2	30.1	38.7	23.6	29.2	45.0	8.3		1340.8	320.0	22.4
Low		22.0	13.1	18.8	21.6	13.9	18.8	18.9	3.3		284.2	49.0	
												No. rain days >1mm:	5.00

Notes: 1. Values are for the 24 hour period from 9am to 9am next day.

2. Values are for the 24 hours to 9am.

Figure 3 Weather Records Summary – December 2023.

7.0 Production Data

Monthly monitoring of sales and truck movements are summarised by **Table 13**.

Table 13 *Quarry Production Data.*

Month	Truck Movements	Quarry Product Sales (t)
Jan-23	422	12,109
Feb-23	842	24,606
Mar-23	668	18,737
Apr-23	616	18,013
May-23	776	21,807
Jun-23	903	27,048
Jul-23	769	24,880
Aug-23	563	18,090
Sep-23	599	18,790
Oct-23	606	19,527
Nov-23	821	23,165
Dec-23	1,129	33,316

8.0 Reporting

8.1 Reportable Environmental Incidents

During the December 2023 reporting period, no reportable environmental incidents occurred at the Quarry.

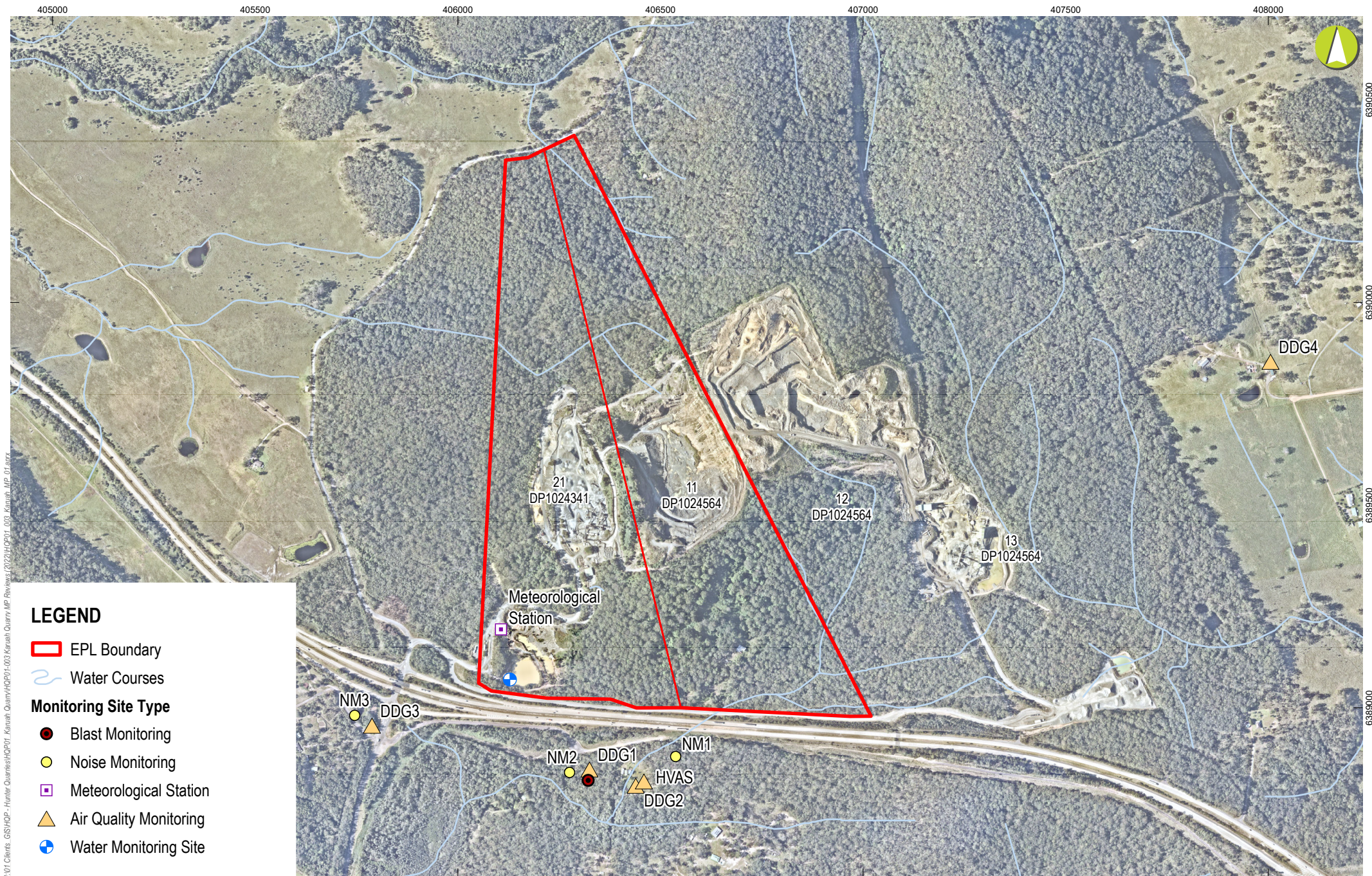
8.2 Reportable Non-Compliances

During the December 2023 reporting period, no reportable environmental incidents occurred at the Quarry.

8.3 Community Complaints

During the December 2023 reporting period, there were no community complaints reported to the Quarry.

Appendix 1 – EPL 11569 Monitoring Locations



LEGEND

▭ EPL Boundary

~ Water Courses

Monitoring Site Type

● Blast Monitoring

● Noise Monitoring

▣ Meteorological Station

▲ Air Quality Monitoring

⊕ Water Monitoring Site

