



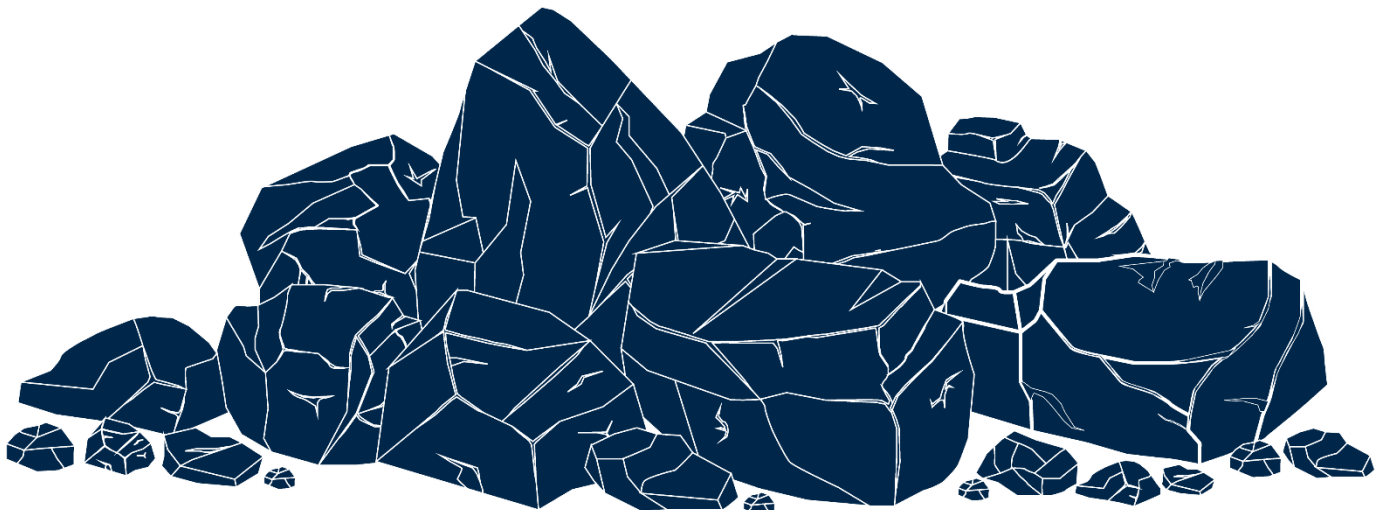
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Karuah East Quarry

Environmental Monitoring Report

June 2026



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1.0 Introduction

This report has been completed to meet the requirements of Section 66(6) of the NSW *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 20611 (the EPL) and Project Approval MP09_0175 (the Consent) for the Karuah East Quarry (the Quarry) as summarised by **Table 1** and **Table 2** respectively.

Table 1 *Summary of Environment Protection Licence, EPL 20611*

EPL Number:	EPL 20611
Licensee's Name:	Karuah East Quarry Pty Limited
Licensee's Address:	Karuah East Quarry PO Box 3284, Thornton NSW 2322 Blue Rock Close, Karuah NSW 2324
Link to Full Licence on the EPA website:	EPL 20611

Table 2 *Summary of Project Approval, MP09_0175*

Project Approval:	MP09_0175
Applicant:	Karuah East Quarry Pty Limited
Consent Authority:	NSW Planning Assessment Commission
Link to Full Project Approval on the NSW Planning website:	Project Approval MP09_0175

A summary of the environmental monitoring data for the June 2026 Reporting Period (the Reporting Period) 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 and TSP/PM10 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 (MP09-0175).

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 (MP09-0175).

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 (MP09-0175).

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

Table 6 Air Quality Monitoring Locations (EPL 20611).

Site Monitoring Point ID	EPL Monitoring Point ID	Location	Address
DDG 1	12	South-West of Karuah East Quarry	54 Mill Hill Close, Karuah NSW 2324
DDG 2	13	South-West of Karuah East Quarry	64 Mill Hill Close, Karuah NSW 2324
DDG 3	14	South-West of Karuah East Quarry	Lot 251 DP1092111, Karuah NSW 2324
DDG 4	15	East of Karuah East Quarry	21 Halloran Road, North Arm Cove NSW 2324
DDG 5*	16	South-West of Karuah East Quarry	Lot 21 DP1024341, Karuah NSW 2324
HVAS	9	South-West of Karuah East Quarry	64 Mill Hill Close, Karuah NSW 2324

NOTE: * DDG 5 discontinued monitoring from August 2025 due to deletion from the EPL following acquisition of Lot 11 DP1024564 from Wedgerock Pty Ltd.

2.1 Deposited Dust Monitoring

Deposited dust results for the 12-months prior-to and including June 2026 are summarised by **Table 7**. Monitoring results for the Reporting Period at all five DDG monitoring sites are within the long-term annual deposited dust limit of 4 g/m²/month.

Table 7 *Deposited dust monitoring results.*

Reporting Period	Start Date	End Date	Days	DDG 1 EPL ID 12	DDG 2 EPL ID 13	DDG 3 EPL ID 14	DDG 4 EPL ID 15	DDG 5 ¹ EPL ID 16
Jul-25	01/07/2025	01/08/2025	31	10.1 ²	0.5	0.4	0.2	0.9
Aug-25	01/08/2025	01/09/2025	31	0.9	2.3	0.5	0.8	–
Sep-25	01/09/2025	01/10/2025	30	1.7	1.3	1.0	0.7	–
Oct-25	01/10/2025	31/10/2025	30	1.1	1.7	1.7	1.2	–
Nov-25	31/10/2025	02/12/2025	32	1.0	2.5	2.1	1.1	–
Dec-25	02/12/2025	02/01/2026	31	1.8	1.6	1.3	1.5	–
Jan-26	02/01/2026	30/01/2026	28	1.1	1.2	0.9	0.5	–
Feb-26	30/01/2026	27/02/2026	28	0.8	1.2	1.1	1.4	–
Mar-26	27/02/2026	31/03/2026	32	1.2	7.7 ³	0.8	4.6 ³	–
Apr-26	31/03/2026	01/05/2026	31	1.9	9.2 ⁴	0.8	3.7	–
May-26	01/05/2026	01/06/2026	32	0.6	0.4	0.3	0.2	–
Jun-26	01/06/2026	01/07/2026	30	1.1	1.3	0.7	0.6	–
Progressive Annual Average				1.9	2.6	1.0	1.4	–

Notes:

- DDG 5 discontinued monitoring from August 2025 due to deletion from the EPL following acquisition of Lot 11 DP1024564 from Wedgerock Pty Ltd.
- Recorded anomalous exceedance at DDG 1 in July 2025 which was reported to the NSW Department of Planning, Housing & Infrastructure (NSW Planning), the NSW EPA and surrounding landholders in accordance with the relevant conditions of the Consent and EPL.
- Recorded exceedances at DDG 2 and DDG 4 in March 2026 which was reported to NSW Planning, the NSW EPA and surrounding landholders in accordance with relevant conditions of the Consent and EPL. The exceedances are considered unlikely to be directly attributable to quarry operations given strong easterly winds during the monitoring period placed DDG 4 upwind of the site, whilst the result at DDG 1 was not repeated at the two neighbouring monitoring locations indicating a localised dust source.
- Recorded exceedance at DDG 2 in April 2026 which was reported to NSW Planning, the NSW EPA and surrounding landholders in accordance with relevant conditions of the Consent and EPL. The result at DDG 2 was not repeated at the two neighbouring monitoring locations indicating a localised dust source.

2.2 High Volume Air Sampling

TSP and PM10 results for the Reporting Period are summarised by **Table 8** and illustrated respectively by **Figure 1** and **Figure 2**.

Monitoring results for the five HVAS run days within the Reporting Period were compliant with the long-term criteria for TSP and PM10, and short-term criteria for PM10.

Table 8 *HVAS TSP and PM10 monitoring results for the Reporting Period.*

Run Date	Total Suspended Particulates, TSP ($\mu\text{g}/\text{m}^3$)	Particulate Matter < 10 μm , PM10 ($\mu\text{g}/\text{m}^3$)
06/06/2026	7	3
12/06/2026	18	9
18/06/2026	24	11
24/06/2026	12	6
30/06/2026	27	11

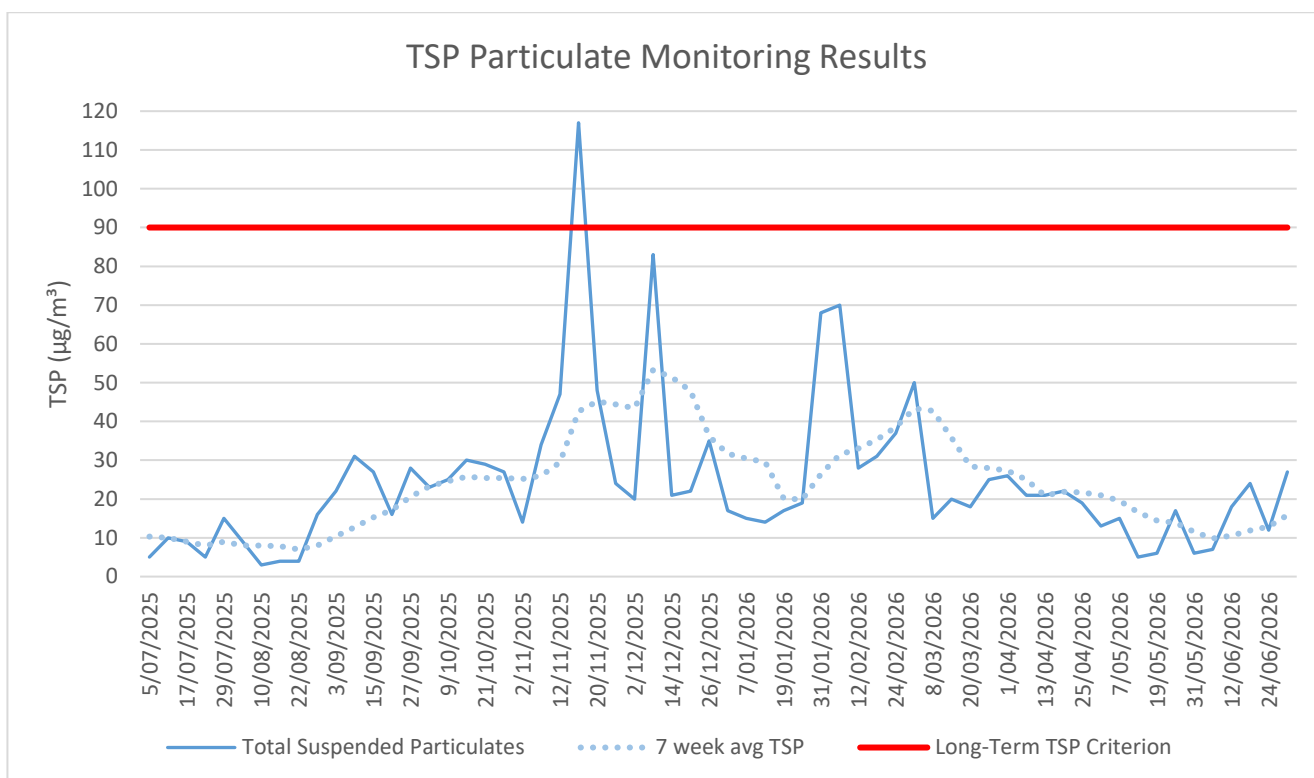


Figure 1 Long-term TSP monitoring trends.

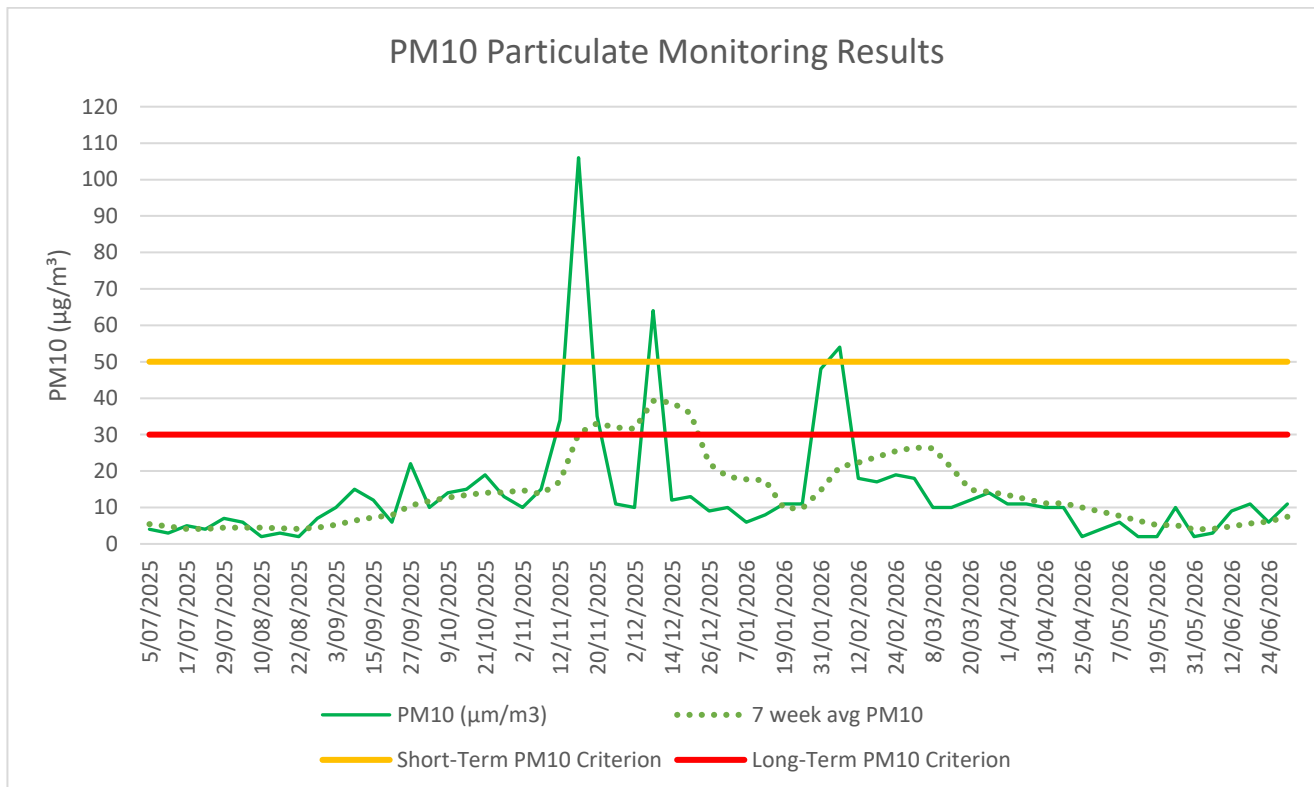


Figure 2 Long-term PM10 monitoring trends.

3.0 Blast Monitoring

Blast monitoring is undertaken for all blasts at the Quarry at the nearest residential location (EPL Monitoring Point 11) to ensure that air blast overpressure and ground vibration remain within the compliance limits, as summarised by **Table 9**; with the monitoring results summarised by **Table 10**.

There were two blasts undertaken during the Reporting Period, which were observed to be within compliance limits.

Table 9 *Blasting Airblast Overpressure and Ground Vibration Criteria (MP09-0175 & EPL 20611).*

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)
02/06/2026	01:05 pm	RL120	108.2	0.55
18/06/2026	11:41 am	RL90	112.1	0.64

Notes: *Nil Trigger events occur when both recorded overpressure is <112 dBL and recorded ground vibration is <0.5 mm/s.

4.0 Noise Monitoring

Noise monitoring is undertaken in accordance with the EPL and NSW Planning approved Noise Management Plan, which requires attended noise monitoring to be conducted on a quarterly basis.

During the Reporting Period, attended noise monitoring was conducted at the five nominated monitoring locations during the following monitoring periods:

- Thursday, 04 June 2026 during the evening monitoring period.
- Friday, 19 June 2026 during the morning shoulder and day monitoring periods.

The noise monitoring results were within the compliance limits for the Q2 2026 monitoring round as outlined by the Noise Monitoring Report provided in **Appendix 2**.

5.0 Surface Water Monitoring

Water monitoring is undertaken in accordance with the EPL and NSW Planning approved Site Water Management Plan, with daily monitoring of surface water being discharged from the Quarry via the licenced discharge point in accordance with Condition L2 and M2 of the EPL.

Four discharge events across six days occurred during the Reporting Period, as summarised by **Table 11**.

All discharge events were controlled and compliant with the limits provided by the Consent and EPL, including Total Suspended Solids (TSS) below 40 mg/L and pH within the range of 6.5 to 8.5.

Table 11 Discharge Water Monitoring Results.

Date	pH	Turbidity (NTU)	Total Suspended Solids, TSS (mg/L)	Oil and Grease	Discharge Type
LDP 1 – Dam 1					
-	-	-	-	-	-
LDP 2 – Dam 2					
15/06/2026	7.0	55	40	Not Visible	Controlled
26/06/2026	7.4	13	5	Not Visible	Controlled
LDP 3 – Dam 3					
03/06/2026	7.0	50	38	Not Visible	Controlled
04/06/2026	7.0	27	11	Not Visible	Controlled
05/06/2026	7.0	34	20	Not Visible	Controlled
09/06/2026	7.1	37	21	Not Visible	Controlled
15/06/2026	7.0	50	34	Not Visible	Controlled
26/06/2026	7.2	17	7	Not Visible	Controlled

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 Reporting Period.



Monthly Weather Summary

Site: **Karuah Quarry Complex**
Month: **June 2026**

Date	Day	Temperature @ 2m			Temperature @ 10m			Wind Speed			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	mm
1	Mon	19.6	5.5	13.1	18.8	6.3	13.6	18	5.2	244.1	450.8	96	0
2	Tue	17.9	7.3	10.9	17.3	7.6	11.1	15.6	3.1	218.2	418.3	95.6	0
3	Wed	20.8	9.2	13.3	19.6	10	14.4	24.1	3.1	208	548.3	70.4	1
4	Thu	21.7	8.5	15.5	20.7	9.4	16.4	25.9	7.1	236.3	585	91	0
5	Fri	19.5	11.8	14.4	18.7	12	14.3	25	11	237.2	546.6	89.3	0
6	Sat	19.1	5.9	12.3	18.2	8.2	13.1	21.2	4.5	251.4	552.5	61.8	0
7	Sun	18.4	4.6	9.6	17.4	5.3	10	18.6	3.1	235.4	400	93	0
8	Mon	20.1	8.3	12.6	19	9.3	12.8	10.6	2.3	214.2	403.3	95.3	0.2
9	Tue	18.8	7.8	12.6	17.7	8.3	12.7	9.9	2	207.6	524.9	60.5	0.8
10	Wed	21	12.3	15.2	20.3	12.2	16	15	2.9	220.6	507.5	75.7	0
11	Thu	23.7	13.1	16.9	22.6	13.8	17.3	9.2	2	201.6	511.6	86.9	0.8
12	Fri	21.6	14.7	16.9	21	15.1	16.9	9.9	1.9	213.3	612.4	62	0
13	Sat	22.1	11.6	15.5	20.8	11.8	15.5	8.6	2.1	195.8	534.2	70.3	0
14	Sun	22	12.5	15.6	21.8	12.7	15.9	9.1	1.9	220.1	390	81.6	0.2
15	Mon	22.2	15	17.1	21.4	15	17.3	22.5	4	139.2	395.1	67.1	7.4
16	Tue	22.8	7.9	15.1	21.9	8.2	15.3	22.5	3.6	170.6	551.6	64.7	7.6
17	Wed	21.8	9.8	14	21.4	10.5	14.5	8.2	1.9	251.4	394.2	91	0.2
18	Thu	21.7	11	14.9	22.2	11.8	15.4	7.7	1.5	257.5	432.4	69.5	1.4
19	Fri	21.8	11.6	15	21.3	12.9	15.6	6.7	2	203	392.4	69	0
20	Sat	20	12.3	15	19.1	13.2	15.5	14.3	3	217.2	375.8	36.9	0
21	Sun	19.4	5.3	11.2	18.8	6.5	11.8	16.7	3.3	229.6	417.5	89.7	0
22	Mon	19.3	5	10.2	18.5	5.7	10.7	13.1	2.1	223.6	423.3	85.3	0
23	Tue	18.4	4.5	9.6	17	5.4	10.2	15.3	2.8	203.5	536.7	88.1	0
24	Wed	18.4	3.9	9.7	17.1	4.8	10.1	17.4	2.7	206.9	415	90.3	0
25	Thu	19.4	9.7	13.6	18	10.5	13.6	12.8	3.5	211.9	414.1	81.2	8.8
26	Fri	18.4	7	11.6	17.8	7	11.8	13.1	2.3	204.9	532.5	62.7	0
27	Sat	17.6	6.1	10.3	16.8	6.6	10.5	10	1.8	219.8	473.3	64.8	0.2
28	Sun	17.6	8	11.2	16.8	8.5	11.4	8.1	2	225.6	464.1	63.7	0
29	Mon	17.7	8.8	11.7	16.6	9.2	11.8	11.1	1.6	193.3	437.5	50.9	0
30	Tue	18.9	8.3	13.1	17.9	9.4	13.7	12.9	2.5	171.8	548.3	68.7	0
Ave or Total		20.1	8.9	13.3	19.2	9.6	13.6	14.4	3.1	214.5	473.0	75.8	28.6
High		23.7	15.0	17.1	22.6	15.1	17.3	25.9	11.0		612.4	96.0	8.8
Low		17.6	3.9	9.6	16.6	4.8	10.0	6.7	1.5		375.8	36.9	

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

No. rain days >1mm: **4**

Figure 3 Weather Records Summary during the Reporting Period.

7.0 Production Data

Monthly monitoring of sales and truck movements are summarised by **Table 12**.

Table 12 *Quarry Production Data.*

Month	Truck Movements	Quarry Product Sales (t)
Jan-26	1,669	53,474
Feb-26	2,453	76,092
Mar-26	2,684	82,141
Apr-26	2,223	70,604
May-26	2,358	73,611
Jun-26	3,420	99,798
Progressive Annual Total	14,807	455,720

8.0 Reporting

8.1 Reportable Environmental Incidents

During the Reporting Period, no reportable environmental incidents occurred at the Quarry.

8.2 Reportable Non-Compliances

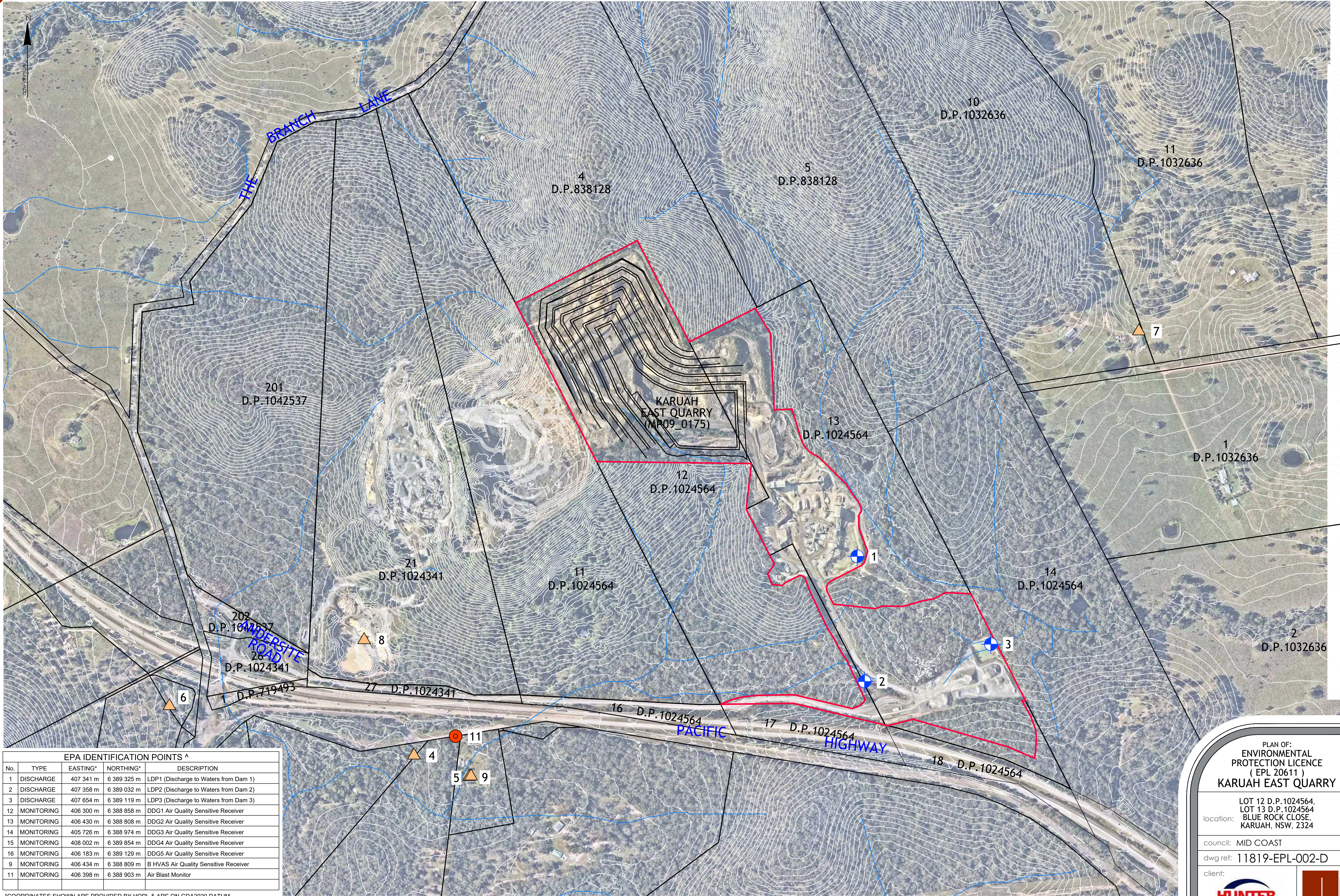
During the Reporting Period, no reportable non-compliances were identified at the Quarry.

8.3 Community Complaints

During the Reporting Period, one community complaint was reported to the Quarry, including:

- On 19 June 2026 a complaint was received from a resident on Halloran Road, North Arm Cove regarding blasting overpressure and ground vibration. KEQPL reviewed the blast event results and subsequently advised the resident that the blast monitoring parameters were within compliance limits.

Appendix 1 – EPL 20611 Monitoring Locations



EPA IDENTIFICATION POINTS ^				
No.	TYPE	EASTING*	NORTHING*	DESCRIPTION
1	DISCHARGE	407 341 m	6 389 325 m	LDP1 (Discharge to Waters from Dam 1)
2	DISCHARGE	407 358 m	6 389 032 m	LDP2 (Discharge to Waters from Dam 2)
3	DISCHARGE	407 654 m	6 389 119 m	LDP3 (Discharge to Waters from Dam 3)
12	MONITORING	406 300 m	6 388 858 m	DDG1 Air Quality Sensitive Receiver
13	MONITORING	406 430 m	6 388 808 m	DDG2 Air Quality Sensitive Receiver
14	MONITORING	405 726 m	6 388 974 m	DDG3 Air Quality Sensitive Receiver
15	MONITORING	408 002 m	6 389 854 m	DDG4 Air Quality Sensitive Receiver
16	MONITORING	406 183 m	6 389 129 m	DDG5 Air Quality Sensitive Receiver
9	MONITORING	406 434 m	6 388 809 m	B HVAS Air Quality Sensitive Receiver
11	MONITORING	406 398 m	6 388 903 m	Air Blast Monitor

*COORDINATES SHOWN ARE PROVIDED BY HQPL & ARE ON GDA2020 DATUM

ver.	date	comment	surveyed	drawn	checked	pm	co-ordinate information	level information	scale (A1 original size)	page
A	11.06.2020	INITIAL EPL PLAN	--	Z.J.	M.R.	M.R.	CO-ORDINATE SYSTEM: M.G.A. ZONE 56 FOR PLAN CONTENT GDA94 ORIGIN OF CO-ORDINATES: P.M.	DATUM: A.H.D. ORIGIN OF LEVELS: LIDAR DATA	0100200m SCALE: 1:4000 (FULL)	1 OF 1
B	24.07.2023	UPDATED EPL BOUNDARY	--	Z.J.	M.R.	M.R.				
C	17.05.2024	UPDATED MONITORING LOCATIONS	HQPL	Z.J.	M.R.	M.R.				
D	20.05.2024	UPDATED LDP NAMING & POINTS	HQPL	Z.J.	M.R.	M.R.				

- project management

civil engineering

infrastructure

superintendency

economic analysis

social impact

town planning

surveying

development feasibility

visualisation

urban design

^ MONITORING POINTS HAVE BEEN PROVIDED BY HUNTER QUARRIES PTY LTD.
REFER TO PLAN 'KARUAH HARD ROCK QUARRY ENVIRONMENTAL MONITORING LOCATIONS - FIGURE 1'
BY SLR CONSULTING AUSTRALIA - REFERENCE: 633.HQP00.0030 DATED 23/06/2014.

PLAN OF:
ENVIRONMENTAL
PROTECTION LICENCE
(EPL 20611)
KARUAH EAST QUARRY

location:
LOT 12 D.P.1024564,
LOT 13 D.P.1024564
BLUE ROCK CLOSE,
KARUAH, NSW, 2324

council: MID COAST

dwg ref: 11819-EPL-002-D

client:



central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411

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Appendix 2 – Q2 2026 Noise Monitoring Report

Karuah East Quarry

Quarterly attended noise monitoring - Q2 2026

Prepared for Karuah East Quarry Pty Limited

June 2026

Karuah East Quarry

Quarterly attended noise monitoring - Q2 2026

Karuah East Quarry Pty Limited

E260146 RP3

June 2026

Version	Date	Prepared by	Reviewed by	Comments
1	24 June 2026	Lucas Adamson	Robert Kirwan	Final

Approved by



Robert Kirwan
Senior Associate – Team Leader
24 June 2026

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This report has been prepared in accordance with the brief provided by Karuah East Quarry Pty Limited and, in its preparation, EMM has relied upon the information collected at the times and under the conditions specified in this report. All findings, conclusions or recommendations contained in this report are based on those aforementioned circumstances. This report is to only be used for the purpose for which it has been provided. Except as permitted by the Copyright Act 1968 (Cth) and only to the extent incapable of exclusion, any other use (including use or reproduction of this report for resale or other commercial purposes) is prohibited without EMM’s prior written consent. Except where expressly agreed to by EMM in writing, and to the extent permitted by law, EMM will have no liability (and assumes no duty of care) to any person in relation to this document, other than to Karuah East Quarry Pty Limited (and subject to the terms of EMM’s agreement with Karuah East Quarry Pty Limited).

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ABN: 28 141 736 558

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1 Introduction

1.1 Background

EMM Consulting Pty Ltd (EMM) was engaged by Karuah East Quarry Pty Limited to conduct a quarterly noise survey of operations at Karuah East Quarry (KEQ, the site) located at Blue Rock Close, Karuah NSW. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits.

Attended environmental noise monitoring described in this report was done during the evening period on 4 June 2026 and the morning shoulder and day periods on 19 June 2026 at five monitoring locations.

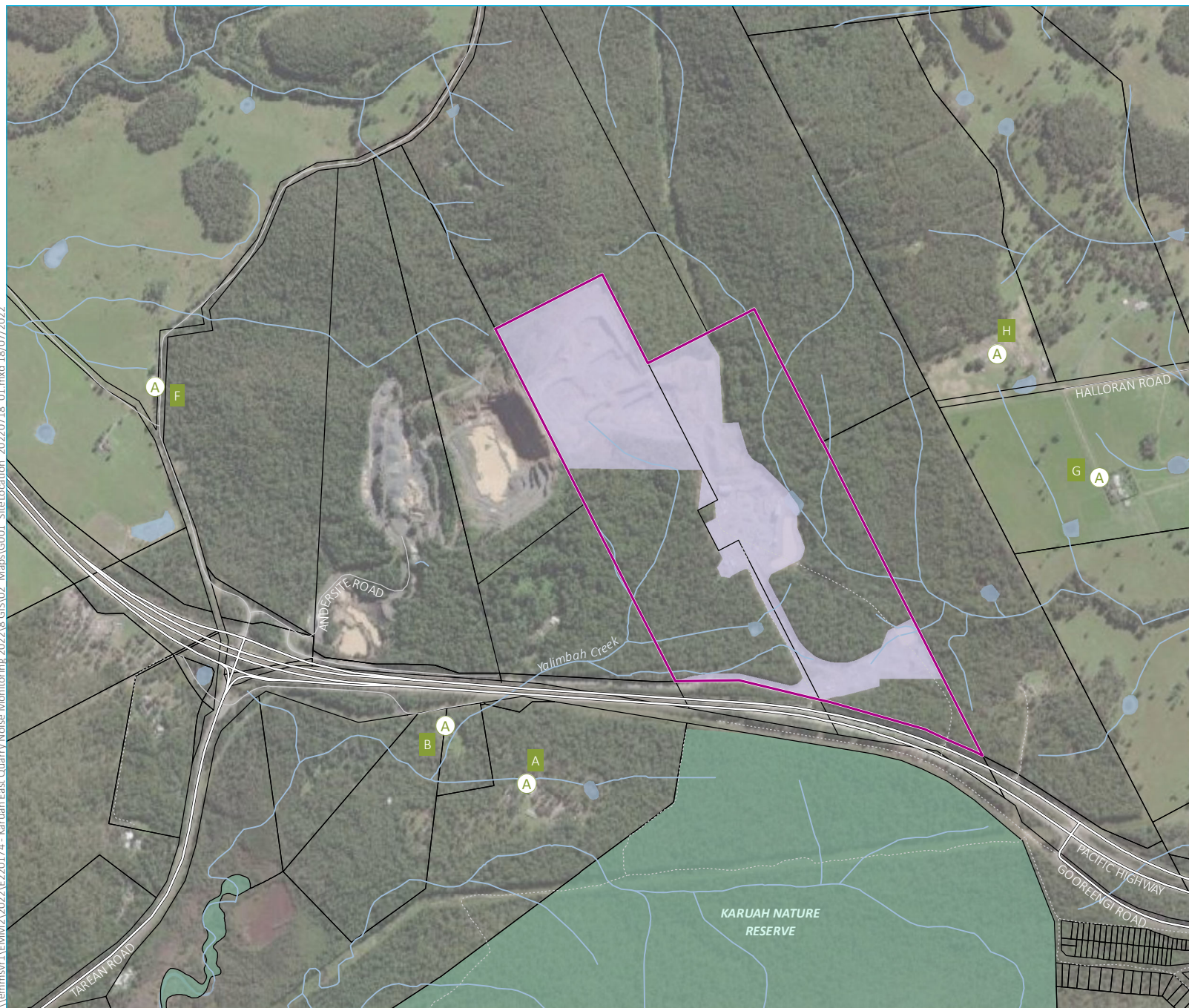
1.2 Attended monitoring locations

Site monitoring locations are detailed in Table 1.1 and shown on Figure 1.1. It should be noted that Figure 1.1 shows actual monitoring positions, not necessarily the location of residences.

Table 1.1 Attended noise monitoring locations

Location descriptor/ID	Description/address	Coordinates (MGA56)	
		Easting	Northing
A	Private residence - 74 Mill Hill Close, Karuah	406623	6388704
B	Private residence - 64 Mill Hill Close, Karuah	406405	6388859
F	Private residence - 1714 The Branch Lane, Karuah	405639	6389782
G	Private residence - 2 Halloran Road, North Arm Cove	405629	6389766
H	Private residence - 21 Halloran Road, North Arm Cove	407795	6389868

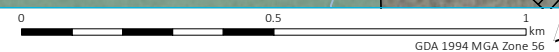
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- KEY**
- Site boundary
 - A Attended noise monitoring location
 - Approved disturbance area
 - Major road
 - Minor road
 - Vehicular track
 - Watercourse/drainage line
 - Cadastral boundary
 - Waterbody
 - NPWS reserve
 - State forest

Attended noise monitoring locations

Source: EMM (2022); ADW Johnson (2020); DFSI (2017); ICSM (2012); GA (2011); ASGC (2006)



Karuah East Quarry
Quarterly attended noise monitoring
Figure 1.1

1.3 Terminology and abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2 Terminology and abbreviations

Term/descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The “A” weighting scale is used to approximate how humans hear noise.
L _{Amax}	The maximum root mean squared A-weighted noise level over a time period.
L _{A1}	The A-weighted noise level which is exceeded for 1% of the time.
L _{A1,1minute}	The A-weighted noise level which is exceeded for 1% of the specified time period of 1 minute.
L _{A10}	The A-weighted noise level which is exceeded for 10% of the time.
L _{Aeq}	The energy average A-weighted noise level.
L _{A50}	The A-weighted noise level which is exceeded for 50% of the time, also the median noise level during a measurement period.
L _{A90}	The A-weighted noise level exceeded for 90% of the time, also referred to as the “background” noise level and commonly used to derive noise limits.
L _{Amin}	The minimum A-weighted noise level over a time period.
L _{Ceq}	The energy average C-weighted noise energy during a measurement period. The “C” weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	The vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	Monday – Saturday: 7 am to 6 pm, on Sundays and Public Holidays: 8 am to 6 pm.
Evening	Monday – Saturday: 6 pm to 10 pm, on Sundays and Public Holidays: 6 pm to 10 pm.
Morning Shoulder	Monday – Saturday: 5 am to 7 am.

Appendix A provides further information that indicates how an average person perceives changes in noise levels and examples of common noise levels.

2 Noise limits

2.1 Project approval

Karuah East Quarry noise limits are detailed in Condition 3 of Project Approval (PA) 09_0175. Relevant sections of PA 09_0175 are reproduced in Appendix B.1.

2.2 Environment protection licence

Karuah East Quarry noise limits are detailed in Condition L4.1 of Environment Protection Licence (EPL) 20611. Relevant sections of EPL 20611 are reproduced in Appendix B.2.

2.3 Noise management plan

The approved Noise Management Plan (NMP) adopts five attended noise monitoring locations that are representative of residences outlined in PA 09_0175 and EPL 20611. Relevant sections of the NMP are reproduced in Appendix B.3.

2.4 Noise limit summary

Noise limits based on PA 09_0175 and EPL 20611 are as shown in Table 2.1.

Table 2.1 Noise limits, dB

Location	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Morning Shoulder $L_{Aeq,15minute}$	Morning Shoulder $L_{A1,1minute}$
A	42	40	35	52
B	40	40	35	52
F	40	35	35	52
G	43	39	35	52
H	44	46	35	52

Notes: 1. Morning shoulder period is from 5:00 am to 7:00 am Monday to Saturday as defined in Condition L4.2 of EPL 20611.

2.5 Meteorological conditions

PA 09_0175 specifies that noise generated by the project is to be measured in accordance with the relevant requirements, and exemptions (including certain meteorological conditions), of the NSW EPA 'Noise Policy for Industry' (NPfI) issued in October 2017.

The EPA requirements in Condition L4.3 of EPL 20611 state that noise limits do not apply under the following meteorological conditions:

- wind speeds greater than 3 metres per second (m/s) at 10 m above ground level
- stability category F temperature inversion conditions and wind speeds greater than 2 m/s at 10 m above ground level, or
- stability category G temperature inversion conditions.

2.6 Additional considerations

Monitoring and reporting have been done in accordance with the NPfI and the NSW EPA 'Approved methods for the measurement and analysis of environmental noise in NSW' (Approved Methods) issued in January 2022.

2.7 Very noise-enhancing meteorological conditions

In accordance with the approved methods, noise monitoring for the site is scheduled to occur during forecasted meteorological conditions where noise limits in Table 2.1 will be applicable. However, in cases where actual meteorological conditions do not align with forecasts and noise limits are subsequently not directly applicable, it is the expectation of regulators that noise impact still be managed.

The NPfI states that:

Noise limits derived for consents and licences will apply under the meteorological conditions used in the environmental assessment process, that is, standard or noise-enhancing meteorological conditions. For 'very noise-enhancing meteorological conditions' ... a limit is set based on the limit derived under standard or noise-enhancing conditions (whichever is adopted in the assessment) plus 5 dB. In this way a development is subject to noise limits under all meteorological conditions.

Therefore, if monthly noise monitoring occurs during meteorological conditions outside of those specified in Section 2.5, site limits will be adjusted based on Table 2.1 plus 5 dB.

3 Methodology

3.1 Overview

Attended environmental noise monitoring was done in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise' and relevant EPA requirements.

Meteorological data was obtained from the KEQ on-site meteorological station which allowed correlation of atmospheric parameters with measured noise levels.

3.2 Attended noise monitoring

During this survey, attended noise monitoring was conducted during the morning shoulder, day and evening periods at each location. The duration of each measurement was 15 minutes. Atmospheric conditions were measured at each monitoring location using a handheld device.

Measured sound levels from various sources were noted during each measurement, and particular attention was given to the extent of the site's contribution (if any) to measured levels. At each monitoring location, the site-only $L_{Aeq,15\text{minute}}$ and L_{Amax} were measured directly or determined by other methods detailed in Section 7.1 of the NPfI.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may be used in this report. When site noise is noted as IA, it was inaudible at the monitoring location. When site noise is noted as NM, this means it was audible but could not be quantified. All results noted as IA or NM in this report were due to one or more of the following:

- Site noise levels were very low, typically more than 10 dB below the measured background (L_{A90}), and unlikely to be noticed.
- Site noise levels were masked by more dominant sources that are characteristic of the environment (such as breeze in foliage or continuous road traffic noise) that cannot be eliminated by monitoring at an alternate or intermediate location.
- It was not feasible or reasonable to employ methods, such as to move closer and back calculate. Cases may include rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

If exact noise levels from site could not be established due to masking by other noise sources in a similar frequency range but were determined to be at least 5 dB lower than relevant limits, then a maximum estimate may be provided. This is expressed as a 'less than' quantity, such as <20 dB or <30 dB.

For this assessment, the measured L_{Amax} has been used as a conservative estimate of $L_{A1,1\text{minute}}$. The EPA accepts sleep disturbance analysis based on either the $L_{A1,1\text{minute}}$ or L_{Amax} metrics, with the L_{Amax} representing a more conservative assessment of site noise emissions.

3.3 Meteorological data

Meteorological data for the monitoring period was sourced from the Karuah East Quarry on-site meteorological station (the site AWS) to determine the applicability of criteria in accordance with the EPL and PA.

3.4 Modifying factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Assessment of modifying factors is undertaken if the site was audible and directly quantifiable. If applicable, modifying factor penalties have been reported and added to measured site-only L_{Aeq} noise levels.

Low-frequency modifying factor penalties have only been applied to site-only L_{Aeq} levels if the site was the only contributing low-frequency noise source. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

3.5 Site operations

As required by Condition R4.3(a) of the EPL, the operations occurring at the time of monitoring are summarised per period below:

- Day
 - Routine quarry operations in the quarry pit
 - Routine plant processing operations
 - Routine material transport from the quarry pit to the processing plant and product stockpile areas
 - Routine product loading and dispatch to road trucks
- Evening
 - Routine material transport from the processing plant to product stockpile areas
 - Routine maintenance activities of plant and equipment
- Morning shoulder
 - Routine maintenance activities of plant and equipment
 - Routine product loading and dispatch to road trucks

3.6 Instrumentation

Attended noise monitoring was conducted by Isaac Hepworth. Qualifications, experience, and/or demonstration of competence is in accordance with the Approved methods and supportive documentation is available upon request.

The equipment used to measure environmental noise levels is detailed in Table 3.1. Calibration certificates are provided in Appendix C.

Table 3.1 Attended noise monitoring equipment

Item	Serial number	Calibration due date	Relevant standard
Rion NA28 sound level meter	00370304	8/11/2026	IEC 61672-1:2002
Brüel and Kjær2250 sound level meter	3029363	8/11/2026	IEC 61672-1:2013
SVAN SV-36 acoustic calibrator	138017	16/09/2027	IEC 60942:2017
SVAN SV-36 acoustic calibrator	79952	13/10/2027	IEC 60942:2017

4 Results

4.1 Total measured noise levels and atmospheric conditions

Overall noise levels measured at each location during attended measurements are provided in Table 4.1.

Table 4.1 Total measured noise levels – Q2 2026¹

Location	Start date and time	L _{Amax} dB	L _{A1} dB	L _{A10} dB	L _{Aeq} dB	L _{A50} dB	L _{A90} dB	L _{Amin} dB
A	4/06/2026 18:06	83	66	57	58	54	51	45
B	4/06/2026 18:43	77	74	69	66	64	58	52
F	4/06/2026 19:07	64	62	59	56	56	52	48
G	4/06/2026 19:34	50	48	45	44	43	41	38
H	4/06/2026 19:56	55	49	45	43	43	40	38
A	19/06/2026 5:13	57	56	54	52	52	49	42
B	19/06/2026 5:31	78	75	69	65	61	55	49
F	19/06/2026 5:50	60	57	54	51	50	46	40
G	19/06/2026 6:15	52	45	40	37	36	34	32
H	19/06/2026 6:36	56	43	39	37	36	35	32
H	19/06/2026 7:00	49	44	40	39	38	36	34
G	19/06/2026 7:19	64	54	46	44	40	37	34
F	19/06/2026 7:44	70	61	57	55	53	51	47
B	19/06/2026 8:05	76	73	69	65	64	59	54
A	19/06/2026 8:23	75	57	55	54	53	50	48

Notes: 1. Levels in this table are not necessarily the result of activity at the site.

Atmospheric condition data measured by the operator during each measurement using a hand-held weather meter is shown in Table 4.2. The wind speed, direction and temperature were measured at approximately 1.5 m above ground. Attended noise monitoring is not done during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.2 Measured atmospheric conditions – Q2 2026

Location	Start date and time	Temperature °C	Wind speed m/s	Wind direction ° Magnetic north ¹	Cloud cover 1/8s
A	4/06/2026 18:06	13.4	0.8	210	0
B	4/06/2026 18:43	14.7	1.4	270	2
F	4/06/2026 19:07	13.6	5.0	300	3
G	4/06/2026 19:34	14.3	2.3	270	4
H	4/06/2026 19:56	12.3	1.9	260	3
A	19/06/2026 5:13	13.1	<0.5	-	8
B	19/06/2026 5:31	13.4	<0.5	-	8
F	19/06/2026 5:50	13.8	<0.5	-	8
G	19/06/2026 6:15	14.1	<0.5	-	7
H	19/06/2026 6:36	14.3	<0.5	-	8
H	19/06/2026 7:00	14.5	<0.5	-	8
G	19/06/2026 7:19	14.9	<0.5	-	8
F	19/06/2026 7:44	15	<0.5	-	8
B	19/06/2026 8:05	15.3	<0.5	-	8
A	19/06/2026 8:23	15.3	<0.5	-	8

Notes: 1. “-” indicates calm conditions at the monitoring location.

4.2 Site only noise levels

4.2.1 Modifying factors

No modifying factors were applicable during the survey, as defined in the NPfl.

4.2.2 Monitoring results

Table 4.3 provides site noise levels in the absence of other sources, where possible, and includes weather data obtained from the site AWS. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.3 **Site noise levels and limits – Q2 2026**

Location	Start date and time (period)	Wind		Stability class	Very enhancing? ¹	Limit, dB		Site level, dB ²		Exceedance	
		Speed (m/s)	Direction ³			L _{Aeq,15minute}	L _{Amax}	L _{Aeq,15minute}	L _{Amax}	L _{Aeq,15minute}	L _{Amax}
A	4/06/2026 18:06 (E)	1.1	241	F	No	40	N/A	IA	N/A	Nil	N/A
B	4/06/2026 18:43 (E)	3.4	241	E	Yes	45 ¹	N/A	IA	N/A	Nil	N/A
F	4/06/2026 19:07 (E)	4.2	237	D	Yes	40 ¹	N/A	IA	N/A	Nil	N/A
G	4/06/2026 19:34 (E)	3.2	230	D	Yes	44 ¹	N/A	IA	N/A	Nil	N/A
H	4/06/2026 19:56 (E)	2.8	245	F	Yes	51 ¹	N/A	IA	N/A	Nil	N/A
A	19/06/2026 5:13 (MS)	0.4	347	F	No	35	52	IA	IA	Nil	Nil
B	19/06/2026 5:31 (MS)	0.4	8	F	No	35	52	IA	IA	Nil	Nil
F	19/06/2026 5:50 (MS)	0.4	320	F	No	35	52	IA	IA	Nil	Nil
G	19/06/2026 6:15 (MS)	0.3	33	F	No	35	52	IA	IA	Nil	Nil
H	19/06/2026 6:36 (MS)	0.2	19	F	No	35	52	<23	39	Nil	Nil
H	19/06/2026 7:00 (D)	0.4	333	A	No	44	N/A	37	N/A	Nil	N/A
G	19/06/2026 7:19 (D)	0.2	322	A	No	43	N/A	34	N/A	Nil	N/A
F	19/06/2026 7:44 (D)	0.4	336	A	No	40	N/A	IA	N/A	Nil	N/A
B	19/06/2026 8:05 (D)	0.4	261	A	No	40	N/A	IA	N/A	Nil	N/A
A	19/06/2026 8:23 (D)	0.3	55	A	No	42	N/A	IA	N/A	Nil	N/A

Notes: 1. Noise limits are adjusted by +5 dB during ‘very noise-enhancing meteorological conditions’ in accordance with the NPfl.

2. Site-only L_{Aeq,15minute}, includes modifying factor penalties if applicable.

3. Degrees magnetic north, “-” indicates calm conditions.

4. ‘N/A’ = Not Applicable.

5 Mitigation and management

5.1 Proposed management actions

EPL Condition 4.3(c) requires details of any management actions taken within the monitoring period to address any exceedances of the limits. As there were no exceedances, no management actions were required.

6 Summary

EMM Consulting Pty Ltd (EMM) was engaged by Karuah East Quarry Pty Limited to conduct a quarterly noise survey of operations at the site. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified PA and EPL noise limits.

Attended environmental noise monitoring described in this report was done during the evening period on 4 June 2026 and the morning shoulder and day periods on 19 June 2026 at five monitoring locations.

Noise levels from the site complied with relevant limits at all monitoring locations during the Q2 2026 survey.

Appendix A

Noise perception and examples

A.1 Noise levels

Table A.1 indicates how an average person perceives changes in noise level. Examples of common noise levels are provided in Figure A.1.

Table A.1 Perceived change in noise

Change in sound pressure level (dB)	Perceived change in noise
Up to 2	Not perceptible
3	Just perceptible
5	Noticeable difference
10	Twice (or half) as loud
15	Large change
20	Four times (or a quarter) as loud

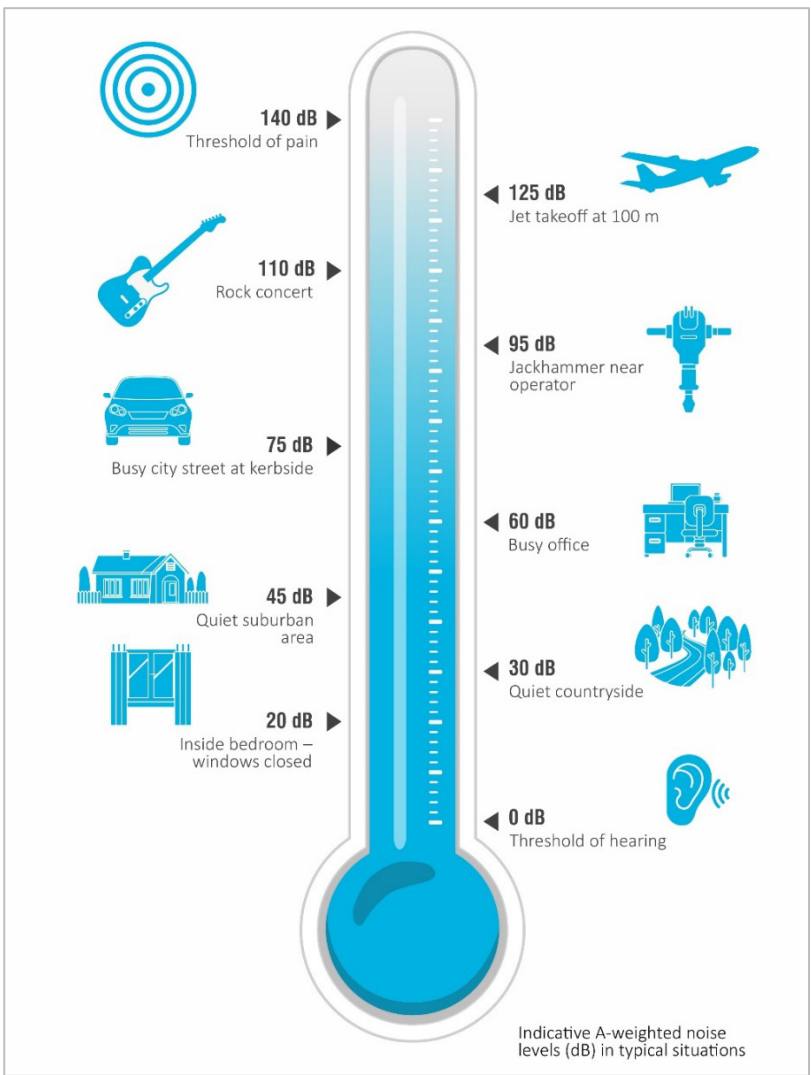


Figure A.1 Common noise levels

Appendix B

Regulator documents

B.1 Project approval

SCHEDULE 3 ENVIRONMENTAL PERFORMANCE CONDITIONS

IDENTIFICATION OF APPROVED LIMITS OF EXTRACTION

1. The Applicant shall, prior to carrying out quarrying operations on the site:
 - (a) engage a registered surveyor to mark out the boundaries of the approved limits of extraction within the Extraction Area; and
 - (b) submit a survey plan of the extraction boundaries, to the satisfaction of the Planning Secretary.
2. The Applicant must ensure that the extraction boundaries are clearly marked at all times while quarrying operations are being carried out, in a manner that allows the limits of extraction to be clearly identified.

NOISE

Operational Noise Criteria

3. Except for the carrying out of construction works, the Applicant must ensure that the operational noise generated by the development does not exceed the criteria in Table 2 at any residence^a on privately-owned land.

Table 2: Operational noise criteria dB

Noise Assessment Location ^a	Morning Shoulder <i>L_{Aeq} (15 min)</i>	Morning Shoulder <i>L_{Amax}</i>	Day <i>L_{Aeq} (15 min)</i>	Evening <i>L_{Aeq} (15 min)</i>
A	35	52	42	40
B	35	52	40	40
G	35	52	43	39
H	35	52	44	46
I	35	52	40	37
All other residences	35	52	40	35

^a Noise Assessment Locations referred to in Table 2 are shown in Appendix 2.

Noise generated by the development must be monitored and measured in accordance with the relevant procedures and modifications (including certain meteorological conditions) of the NPfI.

- 3A. The noise criteria in Table 2 do not apply if the Applicant has an agreement with the owner/s of the relevant residence or land to exceed the noise criteria, and the Applicant has advised the Department in writing of the terms of this agreement.

Road Traffic Noise Criteria

4. The Applicant must take all reasonable and feasible measures to ensure that the traffic noise generated by the development does not cause additional exceedances of the criteria in Table 3 at any residence on privately-owned land.

Table 3: Road traffic noise criteria

Road	Criteria (Day ^a)
Pacific Highway	60 dB(A) L _{Aeq} (15 hour)
Local roads	55 dB(A) L _{Aeq} (1 hour)

^a Day is the period from 7 am to 10 pm every day in accordance with the EPA's NSW Road Noise Policy (2011).

5. Deleted

Noise Operating Conditions

6. The Applicant must:
 - (a) take all reasonable steps to minimise noise from construction and operational activities, including low frequency noise and other audible characteristics, associated with the development;
 - (b) implement reasonable and feasible noise attenuation measures on all plant and equipment that will operate in noise sensitive areas;
 - (c) operate a comprehensive noise management system commensurate with the risk of impact;
 - (d) take all reasonable steps to minimise the noise impacts of the development during noise-enhancing meteorological conditions when the noise criteria in this consent do not apply (see NPfl);
 - (e) carry out quarterly attended noise monitoring (unless otherwise agreed by the Planning Secretary) to determine whether the development is complying with the relevant conditions of this consent; and
 - (f) regularly assess the noise monitoring data and modify or stop operations on the site to ensure compliance with the relevant conditions of this consent.

Noise Management Plan

7. The Applicant must prepare a Noise Management Plan for the development to the satisfaction of the Planning Secretary. This plan must:
 - (a) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary;
 - (b) be prepared in consultation with the EPA;
 - (c) describe the measures to be implemented to ensure:
 - (i) compliance with the noise criteria and operating conditions in this consent;
 - (ii) best practice management is being employed;
 - (iii) noise impacts of the development are minimised during noise-enhancing meteorological conditions when the noise criteria in this consent do not apply (see NPfl);
 - (d) describe the noise management system in detail; and
 - (e) include a monitoring program that:
 - (i) is capable of evaluating the performance of the development;
 - (ii) monitors noise at the nearest and/or most affected residences;
 - (iii) adequately supports the noise management system;
 - (iv) includes a protocol for distinguishing noise emissions of the development from any neighbouring developments; and
 - (v) includes a protocol for identifying any noise-related exceedance, incident or non-compliance and for notifying the Department and relevant stakeholders of any such event.

- 7A. The Applicant must implement the plan as approved by the Planning Secretary.

BLASTING

Blasting Criteria

8. The Applicant **must** ensure that blasting on the site does not cause exceedances of the criteria in Table 5.

B.2 Environmental protection licence



Environment Protection Licence

Licence - 20611

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's.
- L2.4 Water and/or Land Concentration Limits

POINT 1,2,3

Pollutant	Units of Measure	50 Percentile concentration limit	90 Percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
Oil and Grease	milligrams per litre				5 &/or none visible
pH	pH				6.5 - 8.5
Total suspended solids	milligrams per litre				40

L3 Waste

- L3.1 The licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by the licence.

L4 Noise limits

- L4.1 Noise generated at the premises must not exceed the noise limits in the table below. The locations referred to in the table below are indicated in Table 2: Operational Noise Criteria, and Figure 1 of the document titled Project Approval 09_0175 Modification 9 (MOD 9) Department of Planning, Industry& Environment - which has been filed on EPA file Doc22/715570-1.

Noise Assesment Location	Morning Shoulder LAeq(15 min)	Morning shoulder LAmax	Day LAeq (15 min)	Evening LAeq (15 min)
A (74 Mill Hill Close, Karuah, Lot 100 DP 1028885)	35	52	42	40

Environment Protection Licence

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B (64 Mill Hill Close, Karuah, Lot 3 DP785172)	35	52	40	40
G (2 Halloran Road, North Arm Cove Lot 1 DP1032636)	35	52	43	39
H (21 Halloran Road, North Arm Cove Lot 10 DP1032636)	35	52	44	46
All other residences	35	52	40	35

- L4.2** Noise limit definitions - For the purpose of the table at L4.1, the following definitions apply:
 Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays;
 Morning Shoulder is defined as the period from 5:00am to 7:00am Monday to Saturday;
 Evening is defined as the period from 6:00pm to 10:00pm Monday to Saturday.
- L4.3** The noise limits set out in this licence apply under all meteorological conditions except for the following:
- Wind speed greater than 3 metres/second at 10 metres above ground level; or
 - Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
 - Stability category G temperature inversion conditions.
- L4.4 Determining Compliance**
- To determine compliance with the noise limits set out in the table above, the licensee must locate monitoring equipment:
- within 30 metres of a dwelling façade (but not closer than 3 metres) where any dwelling on the property is situated more than 30 metres from the property boundary that is closest to the premises;
 - approximately on the boundary where any dwelling is situated 30 metres or less from the property boundary that is closest to the premises;
 - at the most affected point at a location where there is no dwelling at the location; and
 - within approximately 50 metres of the boundary of a national park or nature reserve.
- Note:** A non-compliance of the Noise Limits table 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 in part (a) and part (b); and/or
 - at a point other than the most affected point at a location.
- L4.5** For the purposes of determining the noise generated at the premises the modification factors in Fact Sheet C of the EPA's "Noise Policy for Industry" must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.



Environment Protection Licence

Licence - 20611

line so that the impacted community knows how to make a complaint.

M6.3 The preceding two conditions do not apply until 1 month after the date of the issue of this licence.

M7 Blasting

- M7.1 To determine compliance with Blast Limit conditions of this licence:
- a) Airblast overpressure and ground vibration levels must be measured and electronically recorded for monitoring point 11 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.

Parameter	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 for this premises attended noise monitoring must be undertaken in accordance with all noise conditions and:
- a) during a period of normal quarry operations;
 - b) at each one of the locations listed in the noise limits table of this licence;
 - c) occur quarterly in the reporting period;
 - d) occur during each day period as defined in the NSW Noise Policy for Industry.

Note: Quarterly attended noise monitoring must be completed (unless otherwise agreed by the Planning Secretary) to determine whether the development is complying with the relevant conditions of this consent. The frequency of noise monitoring will be reviewed, upon request.

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

4.3 Operational Noise Criteria

Schedule 3, Condition 3 of the Project Approval provides operational noise limits for all noise-sensitive receivers surrounding the site, as summarised by **Table 5**.

Table 5 *Noise Impact Criteria.*

Noise Assessment Location	Morning Shoulder L _{Aeq} (15 min)	Morning Shoulder L _{Amax}	Day L _{Aeq} (15 min)	Evening L _{Aeq} (15 min)
A	35	52	42	40
B	35	52	40	40
G	35	52	43	39
H	35	52	44	46
I	35	52	40	37
All other residences	35	52	40	35

Noise generated by the development must be monitored and measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions as well as corrections to account for characteristics of a noise source) of the NPfl (EPA 2017).

The noise limits provided in **Table 5** apply under standard and noise-enhancing meteorological conditions (as defined in the NPfl) determined by monitoring at the relevant weather station. In accordance with Condition L4.3 of the EPL and the Project Approval, the noise limits provided in **Table 5** apply under all meteorological conditions except for the following:

- wind speeds greater than 3 m/s at 10 m above ground level;
- stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or
- stability category G temperature inversion conditions.

In accordance with Fact Sheet D of the NPfl, for ‘very noise enhancing meteorological conditions’ the applicable noise limit is set at 5dB above those provided in **Table 5**.

Noise limits do not apply if KEQ has an agreement with the owner/s of the relevant residence or land to exceed the noise criteria, and KEQ has advised the Department in writing of the terms of this agreement. No agreements have been required or implemented to-date.

4.4 Road Traffic Noise

Schedule 3, Condition 4 of the Project Approval states that all reasonable and feasible measures must be taken to ensure that the traffic generated by KEQ does not cause additional exceedances of the criteria provided in **Table 6** at any residence on privately-owned land.

Table 6 *Road traffic noise criteria.*

Road	Criteria (Day)
Pacific Highway	60 dB L _{Aeq} (15 hour)
Local Roads	55 dB L _{Aeq} (1 hour)

Based on the annual production limit, the following summarises the average daily traffic generation:

- a total of 432 vehicle movements per day (216 despatched loads per day); and
- a maximum hourly traffic flow of 44 vehicle movements (22 despatched loads during that hour).

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Appendix C

Calibration certificates

CERTIFICATE OF CALIBRATION

CERTIFICATE No: **SLM51838**

EQUIPMENT TESTED: Sound Level Meter

Manufacturer: B&K

Type No: 2250

Mic. Type: B&K 4189

Pre-Amp. Type: B&K ZC0032

Serial No: 3029363

Serial No: 3260501

Serial No: 30109

Filter Type: 1/3 Octave

Test No: F051839

Owner: EMM Consulting
Suite 01, 20 Chandos St
St Leonards NSW 2065

Tests Performed: IEC 61672-3:2013 & IEC 61260-3:2016

Comments: All Test passed for Class 1. (See overleaf for details)

CONDITIONS OF TEST:

Ambient Pressure 997 hPa ± 1 hPa

Temperature 25 $^{\circ}\text{C} \pm 1^{\circ}\text{C}$

Relative Humidity 53 % $\pm 5\%$

Date of Receipt : 05/11/2024

Date of Calibration : 08/11/2024

Date of Issue : 08/11/2024

Acu-Vib Test Procedure: AVP10 (SLM) & AVP06 (Filters)

CHECKED BY:

AUTHORISED

SIGNATURE:

Bruce Meldrum

Accredited for compliance with ISO/IEC 17025 - Calibration

Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

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The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.

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No. 9262
Acoustic and Vibration
Measurements

CERTIFICATE NO: SLM51838

The performance characteristics listed below were tested. The tests are based on the relevant clauses of IEC 61672-3:2013

Tests Performed:	Clause	Result
<i>Absolute Calibration</i>	10	Pass
<i>Acoustical Frequency Weighting</i>	12	Pass
<i>Self-Generated Noise</i>	11.1	Observed
<i>Electrical Noise</i>	11.2	Observed
<i>Long Term Stability</i>	15	Pass
<i>Electrical Frequency Weightings</i>	13	Pass
<i>Frequency and Time Weightings</i>	14	Pass
<i>Reference Level Linearity</i>	16	Pass
<i>Range Level Linearity</i>	17	Pass
<i>Toneburst</i>	18	Pass
<i>Peak C Sound Level</i>	19	Pass
<i>Overload Indicator</i>	20	Pass
<i>High Level Stability</i>	21	Pass

Statement of Compliance: The sound level meter submitted for testing successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 because evidence was not publically available, from an independent testing organization responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

This Sound Level Meter included an Octave Filter Set. Tests were based on IEC 61260-3:2016 and were conducted to test the following performance characteristics:

Tests performed	Clause	Result
<i>Test of relative attenuation at filter midband frequency</i>	10	Pass
<i>Linear operating range including range control if fitted</i>	11	Pass
<i>Test of lower limit of linear operating range</i>	12	Pass
<i>Measurement of relative attenuation (filter shape)</i>	13	Pass

The filter submitted for testing successfully completed the tests listed above for the environmental conditions under which the tests were performed. If the filter type has successfully completed the pattern-evaluation tests of IEC 61260-2 then it can be stated that the filter set continues to conform to the specifications of IEC 61260-1.

A full technical report is available on request.

CERTIFICATE OF CALIBRATION

CERTIFICATE NO: **SLM51832**

EQUIPMENT TESTED: Sound Level Meter

Manufacturer: Rion

Type No: NA-28

Mic. Type: UC-59

Pre-Amp. Type: NH-23

Serial No: 00370304

Serial No: 10421

Serial No: 60313

Filter Type: 1/3 Octave

Test No: F051834

Owner: EMM Consulting
Suite 01, 20 Chandos St
St Leonards NSW 2065

Tests Performed: IEC 61672-3:2013 & IEC 61260-3:2016

Comments: All Test passed for Class 1. (See overleaf for details)

CONDITIONS OF TEST:

Ambient Pressure 993 hPa ± 1 hPa

Temperature 24 $^{\circ}\text{C} \pm 1^{\circ}\text{C}$

Relative Humidity 47 % $\pm 5\%$

Date of Receipt : 05/11/2024

Date of Calibration : 08/11/2024

Date of Issue : 08/11/2024

Acu-Vib Test Procedure: AVP10 (SLM) & AVP06 (Filters)

CHECKED BY:

AUTHORISED

SIGNATURE:

Bruce Meldrum

Accredited for compliance with ISO/IEC 17025 - Calibration

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CERTIFICATE NO: SLM51832

The performance characteristics listed below were tested. The tests are based on the relevant clauses of IEC 61672-3:2013

Tests Performed:	Clause	Result
<i>Absolute Calibration</i>	10	Pass
<i>Acoustical Frequency Weighting</i>	12	Pass
<i>Self-Generated Noise</i>	11.1	Observed
<i>Electrical Noise</i>	11.2	Observed
<i>Long Term Stability</i>	15	Pass
<i>Electrical Frequency Weightings</i>	13	Pass
<i>Frequency and Time Weightings</i>	14	Pass
<i>Reference Level Linearity</i>	16	Pass
<i>Range Level Linearity</i>	17	Pass
<i>Toneburst</i>	18	Pass
<i>Peak C Sound Level</i>	19	Pass
<i>Overload Indicator</i>	20	Pass
<i>High Level Stability</i>	21	Pass

Statement of Compliance: The sound level meter submitted for testing successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 because evidence was not publically available, from an independent testing organization responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

This Sound Level Meter included an Octave Filter Set. Tests were based on IEC 61260-3:2016 and were conducted to test the following performance characteristics:

Tests performed	Clause	Result
<i>Test of relative attenuation at filter midband frequency</i>	10	Pass
<i>Linear operating range including range control if fitted</i>	11	Pass
<i>Test of lower limit of linear operating range</i>	12	Pass
<i>Measurement of relative attenuation (filter shape)</i>	13	Pass

The filter submitted for testing successfully completed the tests listed above for the environmental conditions under which the tests were performed. If the filter type has successfully completed the pattern-evaluation tests of IEC 61260-2 then it can be stated that the filter set continues to conform to the specifications of IEC 61260-1.

A full technical report is available on request.

CERTIFICATE OF CALIBRATION

CERTIFICATE No: **C55754**

EQUIPMENT TESTED : Acoustic Calibrator

Make & Model: Svantek SV 36

Serial No: 79952

Class: 1

Owner: EMM Consulting Pty Ltd
L3, 175 Scott Street
Newcastle, NSW 2300

Tests Performed: Measured Output Pressure level, Frequency & Distortion

Comments: See Details and Class Tolerance overleaf.

CONDITION OF TEST:

Ambient Pressure 1003 hPa ± 1 hPa

Temperature 23 $^{\circ}\text{C} \pm 1^{\circ}\text{C}$

Relative Humidity 34 % $\pm 5\%$

Date of Receipt : 10/10/2025

Date of Calibration : 13/10/2025

Date of Issue : 13/10/2025

Acu-Vib Test AVP02 (Calibrators)

Procedure: Test Method: AS IEC 60942 - 2017

CHECKED BY:

L. Gail
L. Gail

**AUTHORISED
SIGNATURE:**

H. Soe
H. Soe
Lab Manager

Accredited for compliance with ISO/IEC 17025 - Calibration

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CERTIFICATE No: C55754

The Calibrator described in this report has been tested to the requirements of the standard IEC 60942-[Ed 4]:2017-11.

The tests described in Annex B of the standard (Periodic tests) were carried out under the environmental conditions listed above to the following clauses:

Clause Test description

B4.6 Sound Pressure Level

(By comparison with a reference calibrator).

B4.7 Frequency

(By measurement with a calibrated frequency meter).

B4.8 Total distortion and noise.

(By measurement with a calibrated Noise and Distortion meter).

Notes:

1. The calibrator was calibrated with the main axis vertical and facing down.
2. No corrections have been made for atmospheric pressure, temperature, or humidity.

Parameter	Pre-Adj	Adj Y/N	Output: (dB re 20 µPa)	Frequency (Hz)	THD&N (%)
Level1:	NA	N	94.05 dB	999.99 Hz	0.50 %
Level2:	NA	N	114.00 dB	1000.01 Hz	0.71 %
Uncertainty			±0.11 dB	±0.05%	±0.40 %
Uncertainty (at 95% c.l.) k=2					

Parameter	Class 1		Class 2	
Nominal Frequency	250 Hz	1 kHz	250 Hz	1 kHz
Output dB SPL	0.25 dB	0.25 dB	0.40 dB	0.40 dB
Frequency Hz	0.7 % (1.75 Hz)	0.7 % (7 Hz)	1.7 % (4.25 Hz)	1.7 % (17 Hz)
THD&N	2.5 %	2.5 %	3.0 %	3.0 %

Tolerance limits from AS/IEC60942 (edition 4)

Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.

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CERTIFICATE OF CALIBRATION

CERTIFICATE No: **C55448**

EQUIPMENT TESTED : Acoustic Calibrator

Make & Model: Svantek SV 36

Serial No: 138017

Class: 1

Owner: EMM Consulting
Level 3, 175 Scott Street
Newcastle NSW 2300

Tests Performed: Measured Output Pressure level, Frequency & Distortion

Comments: See Details and Class Tolerance overleaf.

CONDITION OF TEST:

Ambient Pressure 997 hPa ± 1 hPa

Temperature 24 $^{\circ}\text{C} \pm 1^{\circ}\text{C}$

Relative Humidity 41 % $\pm 5\%$

Date of Receipt : 08/09/2025

Date of Calibration : 16/09/2025

Date of Issue : 29/09/2025

Acu-Vib Test AVP02 (Calibrators)

Procedure: Test Method: AS IEC 60942 - 2017

CHECKED BY:

L. Gail

AUTHORISED

SIGNATURE:

H. Soe

Lab Manager

Accredited for compliance with ISO/IEC 17025 - Calibration

Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

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CERTIFICATE No: C55448

The Calibrator described in this report has been tested to the requirements of the standard IEC 60942-[Ed 4]:2017-11.

The tests described in Annex B of the standard (Periodic tests) were carried out under the environmental conditions listed above to the following clauses:

Clause	Test description
--------	------------------

B4.6	Sound Pressure Level
------	----------------------

(By comparison with a reference calibrator).

B4.7	Frequency
------	-----------

(By measurement with a calibrated frequency meter).

B4.8	Total distortion and noise.
------	-----------------------------

(By measurement with a calibrated Noise and Distortion meter).

Notes:

1. The calibrator was calibrated with the main axis vertical and facing down.
2. No corrections have been made for atmospheric pressure, temperature, or humidity.

Parameter	Pre-Adj	Adj Y/N	Output: (dB re 20 µPa)	Frequency (Hz)	THD&N (%)
Level1:	NA	N	93.96 dB	1000.02 Hz	0.28 %
Level2:	NA	N	114.03 dB	999.99 Hz	0.20 %
Uncertainty			±0.11 dB	±0.05%	±0.40 %
Uncertainty (at 95% c.l.) k=2					

Parameter	Class 1		Class 2	
Nominal Frequency	250 Hz	1 kHz	250 Hz	1 kHz
Output dB SPL	0.25 dB	0.25 dB	0.40 dB	0.40 dB
Frequency Hz	0.7 % (1.75 Hz)	0.7 % (7 Hz)	1.7 % (4.25 Hz)	1.7 % (17 Hz)
THD&N	2.5 %	2.5 %	3.0 %	3.0 %

Tolerance limits from AS/IEC60942 (edition 4)

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