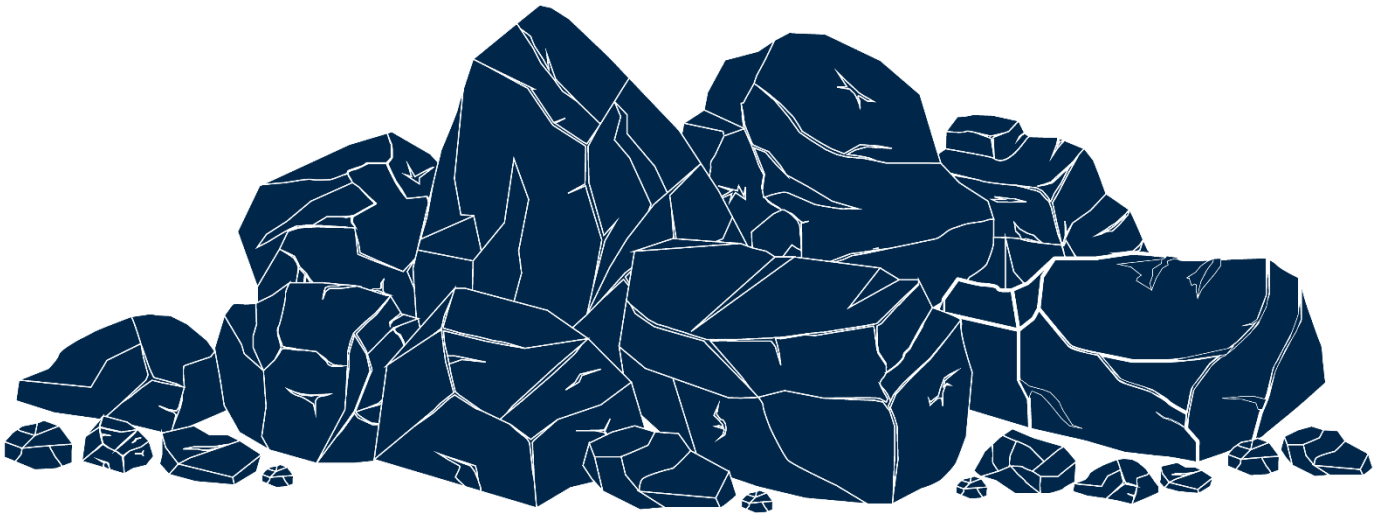
Karuah East Quarry
ABN: 80 141 505 035
Karuah East Quarry Pty Limited
Blue Rock Close, Karuah NSW 2324

W: www.hunterquarries.com.au
E: admin@hunterquarries.com.au
T: 02 4050 0304
P: PO Box 23, Thornton NSW 2322

Karuah East Quarry

Environmental Monitoring Report

May 2025



Contents

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 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 May 2025 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 $\mu g/m^3$
Particulate Matter < 10 µm (PM10)	Annual	30 $\mu g/m^3$

Table 5 Short-term Assessment Criteria for Particulate Matter (MP09-0175).

Pollutant	Averaging Period	Criterion
Particulate Matter < 10 µm (PM10)	24-hour	50 $\mu g/m^3$

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	7	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

2.1 Deposited Dust Monitoring

Deposited dust results for the 12-months prior-to and including May 2025 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/m^2/month

Table 7 Deposited dust monitoring results.

Reporting Period	Start Date	End Date	Days	DDG 1 (EPL ID 4) EPL ID 12	DDG 2 (EPL ID 5) EPL ID 13	DDG 3 (EPL ID 6) EPL ID 14	DDG 4 (EPL ID 7) EPL ID 15	DDG 5 (EPL ID 8) EPL ID 16
Jun-24	29/05/2024	28/06/2024	30	(0.7)	(0.5)	(0.5)	(0.7)	(0.4)
Jul-24	28/06/2024	30/07/2024	32	(1.1)	(0.8)	(0.6)	(0.9)	(0.7)
Aug-24	30/07/2024	30/08/2024	31	(0.7)	(0.5)	(0.7)	(0.9)	(0.6)
Sep-24	30/08/2024	30/09/2024	31	(2.2)	(1.2)	(1.3)	(1.2)	(0.9)
Oct-24	30/09/2024	31/10/2024	31	(1.0)	(0.7)	(0.7)	(5.1)[2]	(0.4)
Nov-24	31/10/2024	29/11/2024	29	(1.4)	(1.1)	(1.1)	(1.7)	(0.9)
Dec-24	29/11/2024	30/12/2024	29	(0.6)	(1.4)	(1.3)	(3.1)	(1.1)
Jan-25	30/12/2024	31/01/2025	32	(3.8)	(1.7)	(1.9)	(1.3)	(1.3)
Feb-25	31/01/2025	03/03/2025	31	(1.2)	(0.9)	(1.1)	(1.2)	(2.1)
Mar-25	03/03/2025	03/04/2025	31	(0.7)	(1.0)	(1.4)		(28.2)[1]
	04/03/2025	03/04/2025	30				(1.1)	
Apr-25	03/04/2025	05/05/2025	32	1.2	3.2	0.4	(1.0)	1.1
May-25	05/05/2025	03/06/2025	29	2.0	3.9	0.2	(0.3)	0.6
Progressive Annual Average				**1.4**	**1.4**	**0.9**	**1.5**	**3.2**

Notes:

1. *An exceedance was recorded at DDG5 during the March 2025 Monitoring Period, due to an elevated quantity of combustible matter being recorded (27.5 g). This is attributed to the development of a significant algal bloom on the collected rainwater surface within the dust gauge glassware. This event 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.*

2. *An anomalous exceedance was recorded at DDG4 during the October 2024 Monitoring Period which was subsequently reported to NSW Planning, the NSW EPA and surrounding landholders in accordance with the relevant conditions of the Consent and EPL.*

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**.

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

Run Date	Total Suspended Particulates, TSP (µg/m^3)	Particulate Matter < 10 µm, PM10 (µg/m^3)
6/05/2025	10	6
12/05/2025	5	3
18/05/2025	7	6
24/05/2025	7	4
30/05/2025	12	7
Monthly Average	**8.2**	**5.2**

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

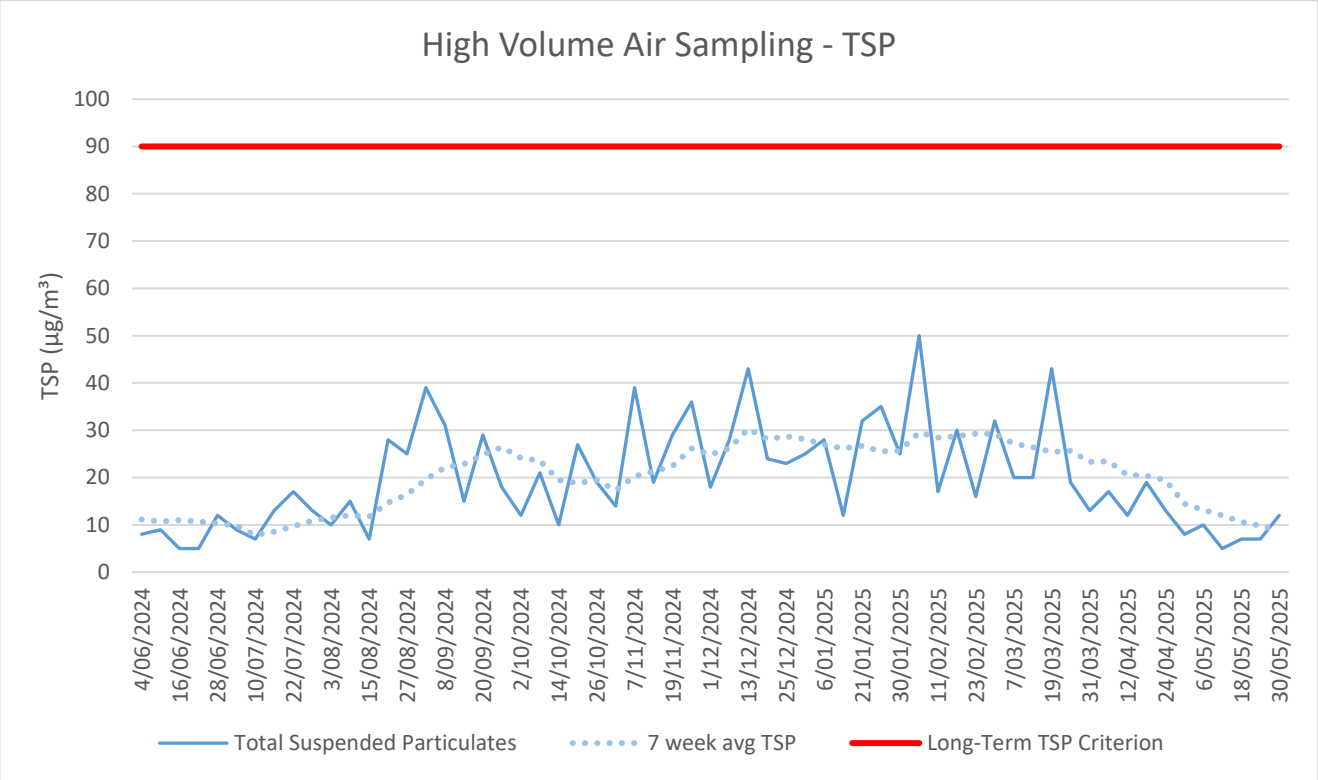


Figure 1 Long-term TSP monitoring trends.

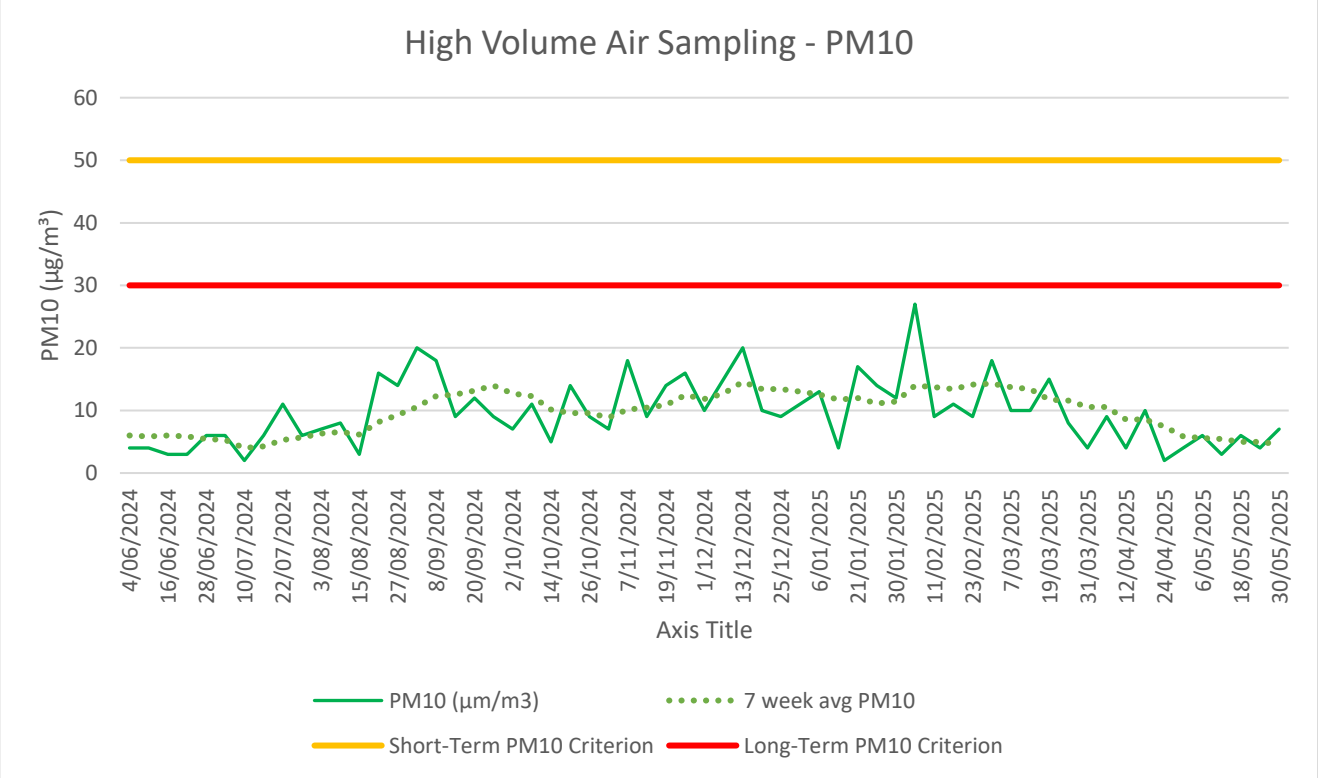


Figure 2 Long-term PM10 monitoring trends.

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 was one blast undertaken during the Reporting Period, which was observed to be within compliance limits, as summarised by **Table 10.**

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 EPL Monitoring Point ID 11	120	10	0%
	115	5	5% over 12-month reporting period.

Table 10 Blasting Monitoring Results.

Date	Time	Location	Airblast Overpressure (dB(L))	Ground Vibration (mm/s)
5/05/2025	13:39	RL 120 + 90	n/t	n/t

***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 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 monitoring locations during the following monitoring periods:

- Wednesday, 14 May 2025 during the day and evening monitoring periods.
- Wednesday, 28 May 2025 during the morning shoulder monitoring period.

The noise monitoring results were within the compliance limits for the Q2 2025 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 Water Management Plan, with daily monitoring of surface water being discharged from the Quarry via the licenced discharge points in accordance with Condition L2 and M2 of the EPL.

Discharge events that occurred during the Reporting Period are summarised by **Table 11**.

Controlled discharge events were generally 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.

However, two major rainfall events greater than the design storm event were received at the site:

- 27 April – 4 May 2025 – 318.4 mm of rainfall over six days.
- 19 May – 25 May 2025 – 451.5mm of rainfall over five days.

The exceedance of rainfall caused all sediment dams to be subject to uncontrolled discharges. TSS limits were exceeded, and the site's Pollution Incident Response Management Plan (PIRMP) was enacted.

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					
1/05/2025	7.4	>1,000	1,300	Not Visible	Uncontrolled
2/05/2025	7.3	>1,000	290	Not Visible	Uncontrolled
3/05/2025	7.4	>1,000	520	Not Visible	Uncontrolled
4/05/2025	7.4	>1,000	690	Not Visible	Uncontrolled
19/05/2025	7.4	>1,000	700	Not Visible	Uncontrolled
20/05/2025	7.3	>1000	890	Not Visible	Uncontrolled
21/05/2025	7.2	>1,000	450	Not Visible	Uncontrolled
22/05/2025	7.3	940	510	Not Visible	Uncontrolled
23/05/2025	7.3	>1,000	600	Not Visible	Uncontrolled
24/05/2025	7.3	>1,000	920	Not Visible	Uncontrolled
25/05/2025	7.3	>1,000	820	Not Visible	Uncontrolled
LDP 2 – Dam 2					
1/05/2025	6.8	330	130	Not Visible	Uncontrolled
2/05/2025	6.7	530	380	Not Visible	Uncontrolled
4/05/2025	6.7	70	46	Not Visible	Controlled
5/05/2025	7.1	60	28	Not Visible	Controlled
13/05/2025	7.1	65	34	Not Visible	Controlled
16/05/2025	7.0	70	37	Not Visible	Controlled
19/05/2025	6.7	>1,000	730	Not Visible	Uncontrolled
20/05/2025	7.0	210	110	Not Visible	Uncontrolled
21/05/2025	6.9	190	99	Not Visible	Uncontrolled
22/05/2025	7.0	300	160	Not Visible	Uncontrolled
23/05/2025	6.9	280	140	Not Visible	Uncontrolled
24/05/2025	6.8	280	160	Not Visible	Uncontrolled
30/05/2025	6.8	60	27	Not Visible	Controlled
LDP 3 – Dam 3					
1/05/2025	6.9	340	190	Not Visible	Uncontrolled
2/05/2025	6.8	330	200	Not Visible	Uncontrolled
4/05/2025	6.6	70	48	Not Visible	Controlled
5/05/2025	7.2	50	28	Not Visible	Controlled
6/05/2025	7.4	60	24	Not Visible	Controlled
15/05/2025	6.8	60	27	Not Visible	Controlled
16/05/2025	6.8	60	33	Not Visible	Controlled
17/05/2025	7.0	55	29	Not Visible	Controlled
19/05/2025	6.9	110	96	Not Visible	Uncontrolled
20/05/2025	7.0	260	120	Not Visible	Uncontrolled
21/05/2025	6.9	180	100	Not Visible	Uncontrolled
22/05/2025	7.0	150	64	Not Visible	Uncontrolled
23/05/2025	6.9	170	100	Not Visible	Uncontrolled
24/05/2025	6.7	260	150	Not Visible	Uncontrolled
30/05/2025	6.8	60	24	Not Visible	Controlled
31/05/2025	6.8	50	29	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: **May 2025**

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[2]	Dir Ave[1]	Max[1]	Ave[1]	
		°C	°C	°C	°C	°C	°C	km/h	km/h	deg	W/m²	W/m²	mm
1	Thu	19.7	11.9	14.3	19.4	11.9	14.3	35.5	25.7	189	767.4	59.6	74.8
2	Fri	19.0	10.7	13.9	18.7	11.3	14.1	35.5	22.4	209	670.8	72.8	16.8
3	Sat	21.3	10.5	14.4	19.9	10.5	14.4	26.0	18.3	203	689.1	113.3	3.8
4	Sun	22.5	10.2	14.6	20.8	10.9	14.6	24.9	16.1	213	706.7	109.3	2.4
5	Mon	21.5	11.1	15.1	20.5	11.7	15.1	13.0	9.8	211	599.9	86.3	1.0
6	Tue	24.1	10.6	16.0	22.5	11.4	16.5	15.4	11.1	188	603.3	110.6	0.0
7	Wed	25.2	11.8	17.1	24.4	12.8	17.6	15.4	11.1	205	512.5	128.5	0.0
8	Thu	26.4	11.3	17.0	24.9	12.6	17.9	17.8	12.1	244	519.9	122.5	0.2
9	Fri	23.4	12.9	15.4	21.1	13.1	15.6	27.2	21.8	173	723.3	73.4	15.6
10	Sat	20.1	9.8	13.5	19.3	10.3	13.6	20.1	13.1	205	733.3	86.9	1.2
11	Sun	20.2	12.5	15.4	19.1	13.1	15.5	21.3	13.5	171	588.3	74.2	7.4
12	Mon	19.3	14.3	16.6	19.0	14.5	16.6	16.6	12.4	171	660.0	57.3	14.4
13	Tue	20.2	14.6	16.7	19.3	14.8	16.5	9.5	6.4	183	683.3	50.9	10.8
14	Wed	22.8	14.3	17.0	21.5	14.5	16.9	15.4	11.9	202	629.2	76.9	0.6
15	Thu	23.6	14.3	17.2	22.7	14.5	17.2	10.6	7.5	211	663.3	81.6	0.0
16	Fri	19.6	15.9	16.7	19.0	15.9	16.6	21.3	14.9	222	205.8	26.8	23.0
17	Sat	19.2	13.5	16.1	18.8	13.8	16.3	18.9	14.4	220	276.6	40.5	0.2
18	Sun	22.5	12.5	15.6	21.2	12.8	15.7	15.4	11.2	212	615.8	88.1	0.4
19	Mon	15.8	12.6	14.0	15.5	12.6	14.0	36.7	18.7	174	586.6	51.7	175.8
20	Tue	18.1	13.6	15.3	18.6	13.8	15.7	49.7	39.0	100	195.8	18.7	107.2
21	Wed	18.7	15.4	16.7	19.5	15.9	17.2	41.4	28.9	113	536.7	38.3	34.8
22	Thu	20.7	15.9	17.7	20.4	16.0	17.8	27.2	17.9	158	293.3	48.9	32.8
23	Fri	19.2	16.9	17.8	19.3	17.0	17.8	35.5	16.4	176	270.0	31.2	101.2
24	Sat	19.1	8.5	14.4	18.7	9.4	15.1	17.8	11.5	230	295.0	40.0	5.6
25	Sun	20.8	7.4	12.7	20.1	8.2	13.3	34.3	17.2	249	434.2	104.9	0.2
26	Mon	20.6	9.4	12.8	19.7	10.2	13.2	15.4	10.2	245	514.2	87.1	0.0
27	Tue	20.9	12.6	15.1	19.9	12.7	15.0	16.6	10.6	214	565.8	49.0	17.6
28	Wed	19.2	10.5	13.8	18.5	11.1	14.1	49.7	27.5	234	439.2	85.6	0.0
29	Thu	19.1	8.8	13.3	18.2	10.9	14.0	30.8	17.4	245	429.2	100.7	0.2
30	Fri	15.0	11.1	13.1	14.5	11.7	13.1	22.5	14.7	249	413.3	50.9	6.2
31	Sat	21.1	7.7	13.1	19.0	8.4	13.5	16.6	11.7	196	600.8	71.9	0.0
Ave or Total		**20.6**	**12.0**	**15.2**	**19.8**	**12.5**	**15.4**	**24.3**	**16.0**	**200.4**	**529.8**	**72.2**	**654.2**
High		**26.4**	**16.9**	**17.8**	**24.9**	**17.0**	**17.9**	**49.7**	**39.0**		**767.4**	**128.5**	**175.8**
Low		**15.0**	**7.4**	**12.7**	**14.5**	**8.2**	**13.1**	**9.5**	**6.4**		**195.8**	**18.7**	
												No. rain days >1mm:	**18**

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 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-25	1,822	54,080
Feb-25	3,048	95,968
Mar-25	3,001	95,438
Apr-25	2,044	63,662
May-25	2,174	65,786
Progressive Annual Total	**12,089**	**370,935**

8.0 Reporting

8.1 Reportable Environmental Incidents

During the Reporting Period, two reportable environmental incidents occurred at the Quarry, including:

- Uncontrolled discharge of sediment-laden water to Yalimbah and Bulga Creeks from Sunday 27 April to Sunday 04 May 2025 following the receipt of 318.4 mm of rainfall over six days. This rainfall event exceeded the 95th percentile 5x day rainfall depth of 90.6 mm, which the site's sediment dams are designed to withstand in accordance with Landcom's Blue Book (*Managing Urban Stormwater: Soils and Construction – Volume 2E, Mines and quarries*).

  During the event the site's Pollution Incident Response Management Plan (PIRMP) was enacted through reporting to relevant authorities, the KEQPL executive and the local community. Formal incident reports were subsequently submitted to NSW Planning and the NSW EPA.

- Uncontrolled discharge of sediment-laden water to Yalimbah and Bulga Creeks from Monday 19 May to Sunday 25 May 2025 following the receipt of 451.5mm of rainfall over five days. This rainfall event exceeded the 95th percentile 5x day rainfall depth of 90.6 mm, which the site's sediment dams are designed to withstand in accordance with Landcom's Blue Book (*Managing Urban Stormwater: Soils and Construction – Volume 2E, Mines and quarries*).

  During the event the site's Pollution Incident Response Management Plan (PIRMP) was enacted through reporting to relevant authorities, the KEQPL executive and the local community. Formal incident reports were subsequently submitted to NSW Planning and the NSW EPA.

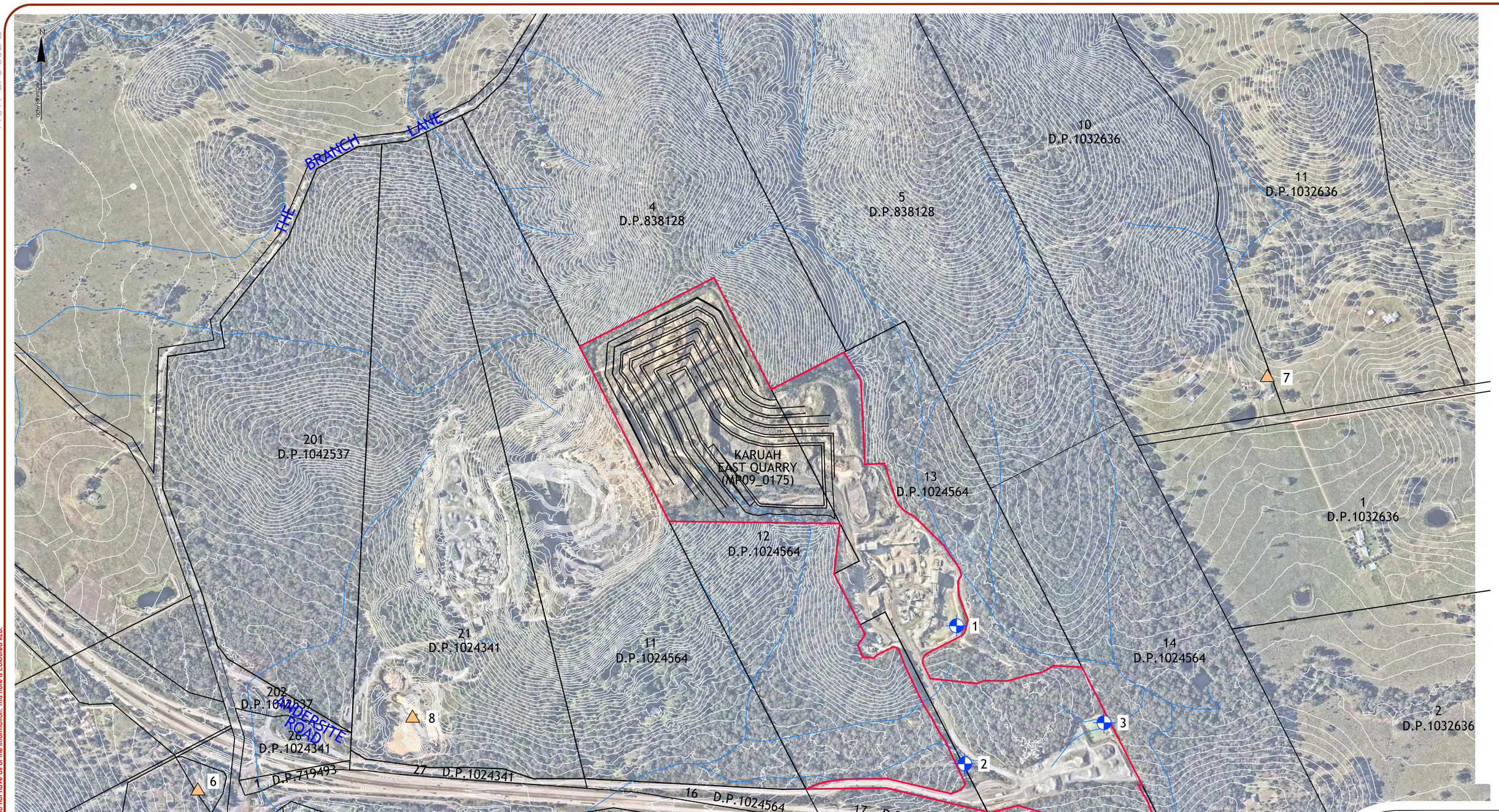
8.2 Reportable Non-Compliances

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

8.3 Community Complaints

During the Reporting Period, no community complaints were received by the Quarry.

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
A	11.06.2020	INITIAL EPL PLAN	- -	Z.J.	M.R.	M.R.
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.

co-ordinate information
CO-ORDINATE SYSTEM: M.G.A. ZONE 56
FOR PLAN CONTENT GDA94
ORIGIN OF CO-ORDINATES: P.M.

level information
DATUM: A.H.D. CONTOUR INTERVAL:
ORIGIN OF LEVELS: LiDAR DATA 2.0 m

scale (A1 original size)
0 100 200m
SCALE: 1:4000 (FULL)

page
1 OF 1

^ 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: HUNTER KARUAH EAST

adw johnson
central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
www.adwjohnson.com.au

working beyond expectations

Plotted By: Zachary Jarvie Plot Date: 20/05/24 8:22:45PM Cad File: N:\11819\DWG\11819-EPL-002-D.DWG
This plan includes coloured information. If you have a black and white copy you do not have all of the information. This note is coloured RED.
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Appendix 2 – Q2 2025 Noise Monitoring Report

Karuah East Quarry

Quarterly attended noise monitoring - Q2 2025

Prepared for Karuah East Quarry Pty Limited

May 2025

Karuah East Quarry

Quarterly attended noise monitoring - Q2 2025

Karuah East Quarry Pty Limited

E250042 RP#2

May 2025

Version	Date	Prepared by	Reviewed by	Comments
1	30 May 2025	Lucas Adamson	Robert Kirwan	Final

Approved by

Robert Kirwan
Associate Acoustics Consultant – Team Leader
30 May 2025

Level 3 175 Scott Street
Newcastle NSW 2300
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.

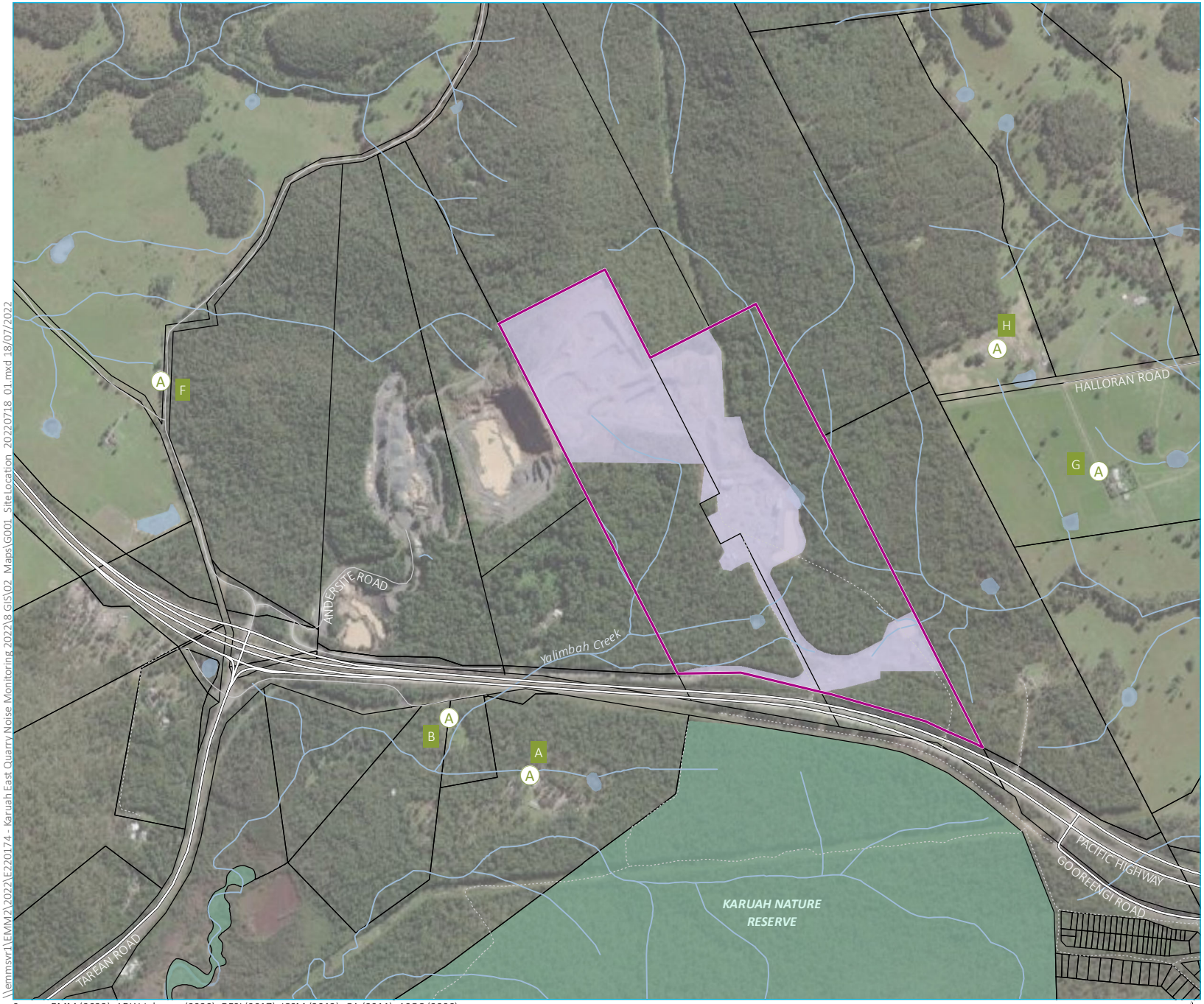
Attended environmental noise monitoring described in this report was done during day and evening periods on Wednesday 14 May 2025 and during the morning shoulder period on Wednesday 28 May 2025 at five monitoring locations

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



KEY

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

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

0 0.5 1 km

GDA 1994 MGA Zone 56

N

\\emmsvr1\EMM2\2022\E220174 - Karuah East Quarry Noise Monitoring 2022\8 GIS\02 Maps\G001 Site Location 20220718 01.mxd 18/07/2022

Attended noise monitoring locations

Karuah East Quarry
Quarterly attended noise monitoring
Figure 1.1

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creating opportunities

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 per cent of the time.
$L_{A1,1minute}$	The A-weighted noise level which is exceeded for 1 per cent of the specified time period of 1 minute.
L_{A10}	The A-weighted noise level which is exceeded for 10 per cent of the time.
L_{Aeq}	The energy average A-weighted noise level.
L_{A50}	The A-weighted noise level which is exceeded for 50 per cent of the time, also the median noise level during a measurement period.
L_{A90}	The A-weighted noise level exceeded for 90 per cent 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 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 $L_{Aeq,15minute}$ 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 $L_{A1,1minute}$. The EPA accepts sleep disturbance analysis based on either the $L_{A1,1minute}$ 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	30131882	06/02/2027	IEC 61672-1:2002
SVAN SV-36 acoustic calibrator	138014	07/08/2025	IEC 60942:2003

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 2025[1]

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
H	14/05/2025 15:42	48	42	37	35	34	32	29
G	14/05/2025 16:05	52	47	42	39	37	36	31
F	14/05/2025 16:35	58	56	53	51	50	47	45
A	14/05/2025 16:58	60	58	55	53	52	48	43
B	14/05/2025 17:35	73	70	67	63	61	55	47
B	14/05/2025 18:01	72	70	66	62	60	54	47
A	14/05/2025 18:23	58	56	54	51	49	44	39
F	14/05/2025 18:47	60	57	54	51	49	45	43
G	14/05/2025 19:14	61	57	51	49	48	45	42
H	14/05/2025 19:42	52	49	47	45	44	42	36
H	28/05/2025 5:00	52	46	43	42	41	39	36
G	28/05/2025 5:22	49	44	42	40	39	37	35
F	28/05/2025 5:50	58	57	54	51	50	46	42
B	28/05/2025 6:13	72	71	67	63	61	54	48
A	28/05/2025 6:35	64	61	57	55	55	51	46

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 metres 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 2025

Location	Start date and time	Temperature °C	Wind speed m/s	Wind direction °Magnetic north[1]	Cloud cover 1/8s
H	14/05/2025 15:42	23.2	<0.5	-	6
G	14/05/2025 16:05	25.9	<0.5	-	6
F	14/05/2025 16:35	23.5	<0.5	-	5
A	14/05/2025 16:58	23.7	<0.5	-	6
B	14/05/2025 17:35	23.9	<0.5	-	6

Location	Start date and time	Temperature °C	Wind speed m/s	Wind direction °Magnetic north[1]	Cloud cover 1/8s
B	14/05/2025 18:01	23.9	<0.5	-	6
A	14/05/2025 18:23	22.8	<0.5	-	6
F	14/05/2025 18:47	19.9	<0.5	-	6
G	14/05/2025 19:14	19.5	<0.5	-	6
H	14/05/2025 19:42	23.4	<0.5	-	6
H	28/05/2025 5:00	13.1	0.9	310	0
G	28/05/2025 5:22	12.5	2.3	310	0
F	28/05/2025 5:50	13.3	0.9	0	0
B	28/05/2025 6:13	14.2	0.8	220	0
A	28/05/2025 6:35	13.7	0.5	320	0

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 NPfI.

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 2025

Location	Start Date and Time (Period)	Wind		Stability Class	Very enhancing? [1]	Limit, dB		Site level, dB [2]		Exceedance	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	L_{Amax}	$L_{Aeq,15minute}$	L_{Amax}	$L_{Aeq,15minute}$	L_{Amax}
H	14/05/2025 15:42 (D)	1.4	324	A	No	44	N/A	IA	IA	No	N/A
G	14/05/2025 16:05 (D)	0.5	48	A	No	43	N/A	IA	IA	No	N/A
F	14/05/2025 16:35 (D)	0.7	3	A	No	40	N/A	IA	IA	No	N/A
A	14/05/2025 16:58 (D)	1.0	338	A	No	42	N/A	IA	IA	No	N/A
B	14/05/2025 17:35 (D)	0.7	79	A	No	40	N/A	IA	IA	No	N/A
B	14/05/2025 18:01 (E)	1.8	92	F	No	40	N/A	IA	N/A	No	N/A
A	14/05/2025 18:23 (E)	1.1	58	F	No	40	N/A	IA	N/A	No	N/A
F	14/05/2025 18:47 (E)	0.3	302	F	No	35	N/A	IA	N/A	No	N/A
G	14/05/2025 19:14 (E)	0.6	132	F	No	39	N/A	IA	N/A	No	N/A
H	14/05/2025 19:42 (E)	1.2	249	F	No	46	N/A	IA	N/A	No	N/A
H	28/05/2025 5:00	1.7	236	F	No	35	52	IA	IA	No	No
G	28/05/2025 5:22	1.4	247	F	No	35	52	IA	IA	No	No
F	28/05/2025 5:50	1.9	237	F	No	35	52	IA	IA	No	No
B	28/05/2025 6:13	1.8	240	F	No	35	52	IA	IA	No	No
A	28/05/2025 6:35	1.6	239	F	No	35	52	IA	IA	No	No

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

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

3. Degrees magnetic north, "-" indicates calm conditions.

4. MS = Morning Shoulder period; D = Day period; E = Evening period.

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 day and evening periods on Wednesday 14 May 2025 and during the morning shoulder period on Wednesday 28 May 2025 at five monitoring locations.

Noise levels from the site complied with relevant limits at all monitoring locations during the Q2 2025 survey.

Appendix A
Noise perception and examples

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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

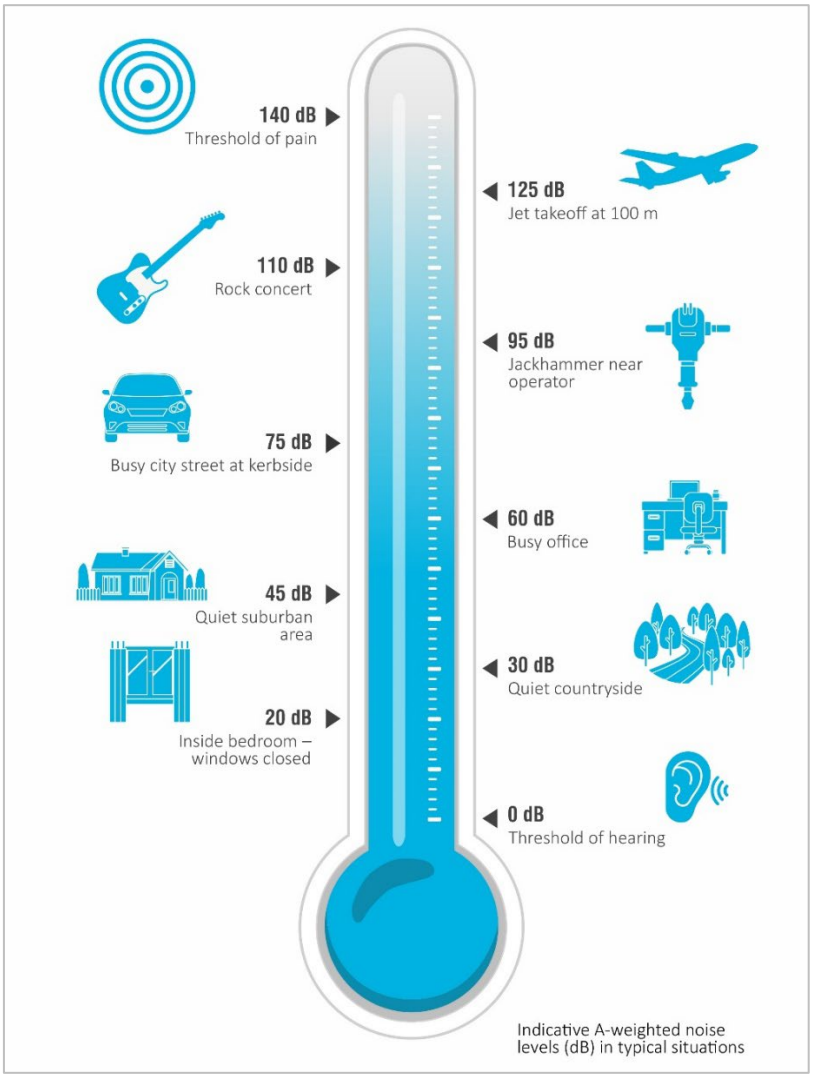

Figure A.1 Common noise levels

Appendix B
Regulator documents

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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 $L_{Aeq\ (15\ min)}$	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

[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 NPfI);
   (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 NPfI);
   (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.

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

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

L4.4 **Determining Compliance**

To determine compliance with the noise limits set out in the table above, the licensee must locate monitoring equipment:
a) 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;
b) approximately on the boundary where any dwelling is situated 30 metres or less from the property boundary that is closest to the premises;
c) at the most affected point at a location where there is no dwelling at the location; and
d) 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:
i) at a location other than an area prescribed in part (a) and part (b); and/or
ii) 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.

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 complaince 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 NPfI (EPA 2017).

The noise limits provided in **Table 5** apply under standard and noise-enhancing meteorological conditions (as defined in the NPfI) 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 then 2m/s at 10m above ground level; or
- stability category G temperature inversion conditions.

In accordance with Fact Sheet D of the NPfI, 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).

Appendix C
Calibration certificates

EMM
creating opportunities

CERTIFICATE OF CALIBRATION

CERTIFICATE NO: SLM52717

EQUIPMENT TESTED: Sound Level Meter

Manufacturer:	Rion		
Type No:	NA-28	**Serial No:**	30131882
Mic. Type:	Rion UC-59	**Serial No:**	04739
Pre-Amp. Type:	Rion NH-23	**Serial No:**	11942
Filter Type:	1/3 Octave	**Test No:**	FILT9709

Owner: EMM Consulting
Level 1, 175 Scott Street
Newcastle, NSW 2300

Tests Performed: IEC 61672-3:2013,
IEC 1260:1995, & AS/NZS 4476:1997

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

CONDITIONS OF TEST:

Ambient Pressure	1000	hPa ±1 hPa	**Date of Receipt :**	31/01/2025
Temperature	24	°C ±1° C	**Date of Calibration :**	06/02/2025
Relative Humidity	46	% ±5%	**Date of Issue :**	06/02/2025

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

CHECKED BY: .....

AUTHORISED SIGNATURE: .....

Hein Soe

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.

This report applies only to the item identified in the report and may not be reproduced in part.

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%.

Acu-Vib Electronics
ACOUSTICS AND VIBRATIONS
Head Office & Calibration Laboratory
Unit 14, 22 Hudson Avenue, Castle Hill NSW 2154
(02) 9680 8133
www.acu-vib.com.au

NATA
WORLD RECOGNISED
ACCREDITATION
Accredited Laboratory
No. 9262
Acoustic and Vibration
Measurements

CERTIFICATE NO: SLM52717

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

Tests Performed:	*Clause*	*Result*
Absolute Calibration	10	Pass
Acoustical Frequency Weighting	12	Pass
Self-Generated Noise	11.1	Observed
Electrical Noise	11.2	Observed
Long Term Stability	15	Pass
Electrical Frequency Weightings	13	Pass
Frequency and Time Weightings	14	Pass
Reference Level Linearity	16	Pass
Range Level Linearity	17	Pass
Toneburst	18	Pass
Peak C Sound Level	19	Pass
Overload Indicator	20	Pass
High Level Stability	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 1260: 1995 and AS/NZS 4476 - 1997 and were conducted to test the following performance characteristics:

1. Relative attenuation clause 5.3

A full technical report is available on request.

CERTIFICATE OF CALIBRATION

CERTIFICATE NO: C50817

EQUIPMENT TESTED : Acoustic Calibrator

Manufacturer: Svantek
Type No: SV 36 **Serial No:** 138014
Class: 1
Owner: EMM Consulting
Suite 01, 20 Chandos St
St Leonards NSW 2065
Tests Performed: Measured Output Pressure level, Frequency & Distortion
Comments: See Details and Class Tolerance overleaf.

CONDITION OF TEST:

Ambient Pressure	1013	hPa ±1 hPa	**Date of Receipt :**	05/08/2024
Temperature	22	°C ±1° C	**Date of Calibration :**	07/08/2024
Relative Humidity	41	% ±5%	**Date of Issue :**	07/08/2024

Acu-Vib Test Procedure: AVP02 (Calibrators)
Test Method: AS IEC 60942 - 2017

CHECKED BY: ..... **AUTHORISED SIGNATURE:** .....

Hein Soe

Accredited for compliance with ISO/IEC 17025 - Calibration

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ACOUSTICS AND VIBRATIONS
Head Office & Calibration Laboratory
Unit 14, 22 Hudson Avenue, Castle Hill NSW 2154
(02) 9680 8133
www.acu-vib.com.au

NATA
WORLD RECOGNISED ACCREDITATION
Accredited Laboratory No. 9262
Acoustic and Vibration Measurements

Australia

SYDNEY
Level 10 201 Pacific Highway
St Leonards NSW 2065
T 02 9493 9500

NEWCASTLE
Level 3 175 Scott Street
Newcastle NSW 2300
T 02 4907 4800

BRISBANE
Level 1 87 Wickham Terrace
Spring Hill QLD 4000
T 07 3648 1200

CANBERRA
Suite 2.04 Level 2
15 London Circuit
Canberra City ACT 2601

ADELAIDE
Level 4 74 Pirie Street
Adelaide SA 5000
T 08 8232 2253

MELBOURNE
Suite 9.01 Level 9
454 Collins Street
Melbourne VIC 3000
T 03 9993 1900

PERTH
Suite 3.03
111 St Georges Terrace
Perth WA 6000
T 08 6430 4800

Canada

TORONTO
2345 Yonge Street Suite 300
Toronto ON M4P 2E5
T 647 467 1605

VANCOUVER
2015 Main Street
Vancouver BC V5T 3C2
T 604 999 8297

CALGARY
700 2nd Street SW Floor 19
Calgary AB T2P 2W2

linkedin.com/company/emm-consulting-pty-limited

emmconsulting.com.au

E250042_KEQ_Q2_V1

Final Audit Report 2025-05-30

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