



**Grounded in Quality**

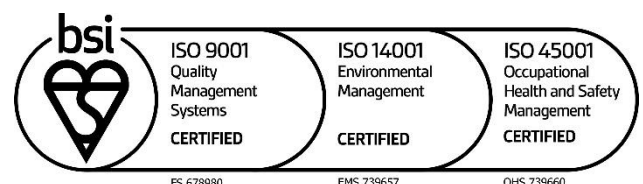
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## **Karuah Hard Rock Quarry**

### **Environmental Monitoring Report:**

**December 2022**



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# 1 INTRODUCTION

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This report has been completed to meet the requirements of Section 66(6) of the *Protection of the Environment Operations Act 1997* and the NSW Environmental Protection Authority's (EPA) *Requirements for Publishing Pollution Monitoring Data* (EPA, 2013). This report summarises the required monitoring data under *Environmental Protection Licence 11569* (the EPL) (see Table 1) and *Development Consent 265-10-2004* (the Consent) (see Table 2) for the Karuah Hard Rock Quarry (the Quarry).

**Table 1 Environmental Protection Licence 11569 information**

<b>Environmental Protection Licence Number</b>	11569
<b>Licensee's Name</b>	Hunter Quarries Pty Limited
<b>Licensee's Address</b>	Licensee Postal Address: PO Box 3284 Thornton NSW 2322.  Premises Address: Karuah Quarry, Corner of Andesite Road and The Branch Lane, Karuah NSW 2324.
<b>Link to Full Licence on the EPA Website</b>	<a href="https://apps.epa.nsw.gov.au/prpoeoapp/">https://apps.epa.nsw.gov.au/prpoeoapp/</a>

**Table 2 Development Consent 265-10-2004 information**

<b>Development Application</b>	DA 265-10-2004
<b>Applicant</b>	Hunter Quarries Pty Limited
<b>Consent Authority</b>	Minister for Infrastructure, Planning and Natural Resources
<b>Land</b>	<a href="https://mpweb.planningportal.nsw.gov.au/major-projects/project/27181">https://mpweb.planningportal.nsw.gov.au/major-projects/project/27181</a>

A summary of the environmental monitoring data for December 2022 is covered in this report.

Tables throughout this report provide key monitoring information from the EPL and the Consent, such as:

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

Monitoring locations are identified in in Appendix 1.

## 2 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 14* of the Consent (see Table 3, Table 4 and Table 5). Deposited dust and TSP/PM<sub>10</sub> monitoring is undertaken at the locations listed in Table 6.

**Table 3 DA 265-10-2004 Long Term Assessment Criteria for Deposited Dust**

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

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

**Table 4 DA 265-10-2004 Long Term Impact Assessment Criteria for Particulate Matter**

Pollutant	Average period	Criterion
Total suspended particulate (TSP) matter	Annual	90 µg/m <sup>3</sup>
Particulate matter <10 µm (PM <sub>10</sub> )	Annual	30 µg/m <sup>3</sup>

**Table 5 DA 265-10-2004 Short Term impact Assessment Criterion for Particulate Matter**

Pollutant	Averaging period	Criterion
Particulate matter <10 µm (PM <sub>10</sub> )	24 hour	50 µg/m <sup>3</sup>

**Table 6 Air quality monitoring locations**

Site ID	Location	Address	GPS Coordinates
DDG 1 (South)	South of the Karuah Quarry	5760 Pacific Hwy, Karuah NSW 2324	32°38'04"S 151°59'58"E
DDG 2 (South-East)	South of the Karuah Quarry	5770 Pacific Hwy, Karuah NSW 2324	32°38'02"S 152°00'09"E
DDG 3 (South-West)	South-West of the Karuah Quarry	DP 1024341, Karuah	32°37'57"S 151°59'41"E
DDG 4 (East)	East of the Karuah Quarry	21 Halloran Rd North Arm Cove NSW 2324	32° 37' 30.87"S 152°01'10.18"E

All dust monitoring is undertaken in accordance with the *Approved Methods of Sampling and Analysis of Air Pollutants in NSW* (EPA, 2007).

## 2.1 DEPOSITED DUST MONITORING

Deposited dust results for December 2022 and the year to date (YTD) from the Consent anniversary (16 January) are shown in Table 7.

**Table 7 Deposited dust monitoring results**

Date On	Date Off	DDG 1	DDG 2	DDG 3	DDG 4
04/01/2022	03/02/2022	0.9	0.7	0.3	0.4
03/02/2022	07/03/2022	1.4	0.8	1.2	0.1
07/03/2022	05/04/2022	0.8	3.6	0.8	0.4
05/04/2022	05/05/2022	0.1	0.2	0.1	0.1
05/05/2022	03/06/2022	0.4	0.6	0.4	0.3
03/06/2022	05/07/2022	0.3	0.2	0.2	0.2
05/07/2022	03/08/2022	0.3	0.3	0.4	0.7
03/08/2022	02/09/2022	0.9	0.9	0.6	1.0
02/09/2022	04/10/2022	0.5	0.2	0.6	0.3
04/10/2022	03/11/2022	0.2	0.5	0.5	0.3
03/11/2022	05/12/2022	0.8	0.8	0.7	1.2
05/12/2022	05/01/2023	0.7	0.7	0.3	0.6
<b>YTD average</b>		0.6	0.8	0.5	0.5

Monitoring results indicate that for the period from 5 December 2022 to January 5 2023 the insoluble solid levels recorded at DDG 1 to DDG 4 monitoring locations were below the project criterion of 4 g/m<sup>2</sup>/month.

## 2.2 HIGH VOLUME AIR SAMPLING

The TSP and PM<sub>10</sub> results for December 2022, the report average and a rolling annual average are shown in are shown in Table 8.

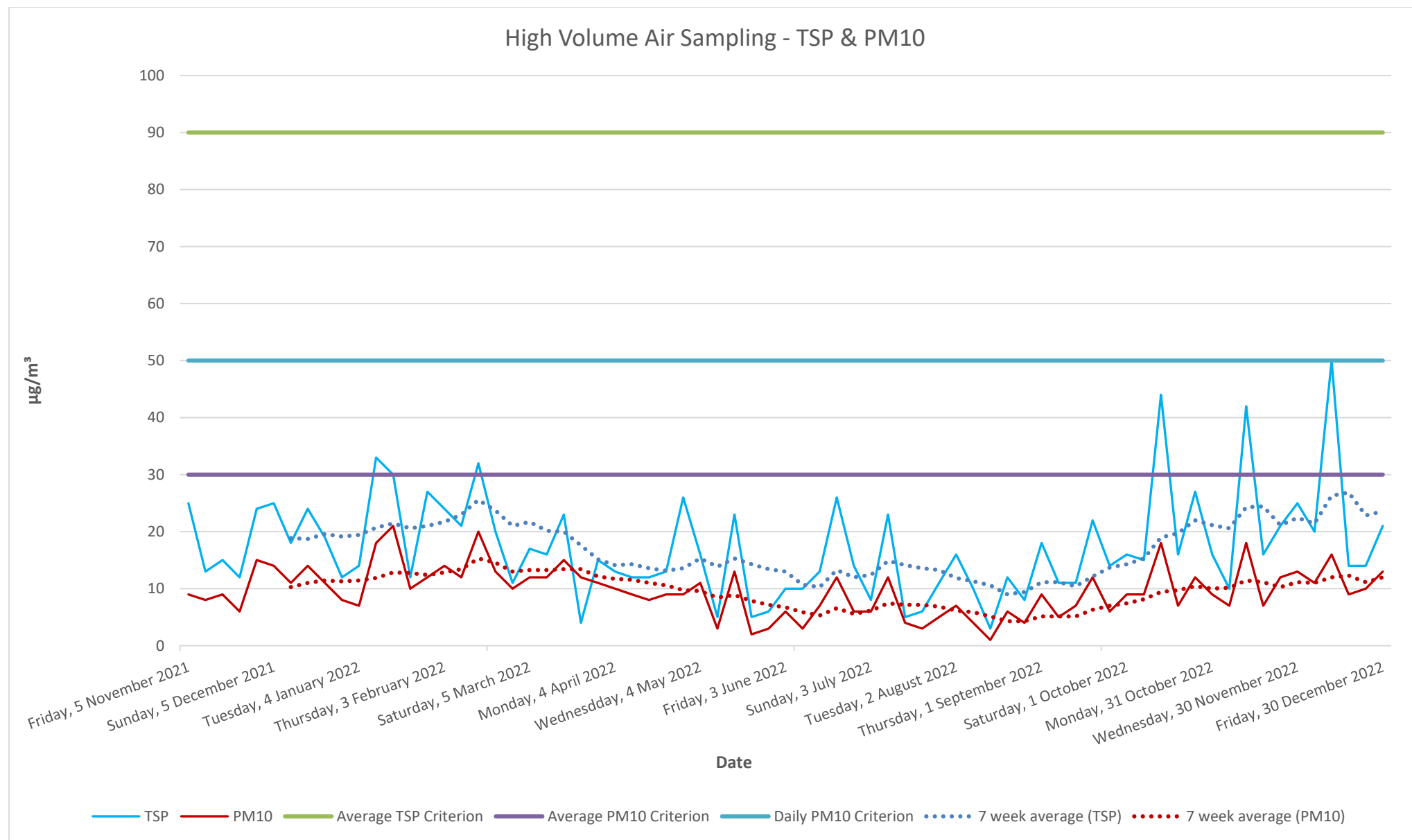


Figure 1 illustrates the year-to-date results for HVAS monitoring.

**Table 8 High Volume Air Sampling ( $\mu\text{g}/\text{m}^3$ ) results**

Run Date	HVAS TSP ( $\mu\text{g}/\text{m}^3$ )	HVAS PM <sub>10</sub> ( $\mu\text{g}/\text{m}^3$ )
06/12/2022	20	11
12/12/2022	50	16
18/12/2022	14	9
24/12/2022	14	10
30/12/2022	21	13
<b>24hr Average Criteria<sup>1</sup></b>	<b>N/A</b>	<b>50</b>
<b>Annual Average Criteria<sup>1</sup></b>	<b>90</b>	<b>30</b>
<b>Progressive Annual Average<sup>2</sup></b>	17.2	9.5

**Note:** <sup>1</sup> Criteria as specified in DA 265-10-2004.

<sup>2</sup> The progressive annual average is from 01/01/2022 to 30/12/2022, this is not a measure of compliance.

All HVAS monitoring results, to the end of December 2022 were compliant with the long term and short term impact assessment criteria outlined in *Schedule 3 Condition 13* of the Consent (see Table 3, Table 4 and Table 5).



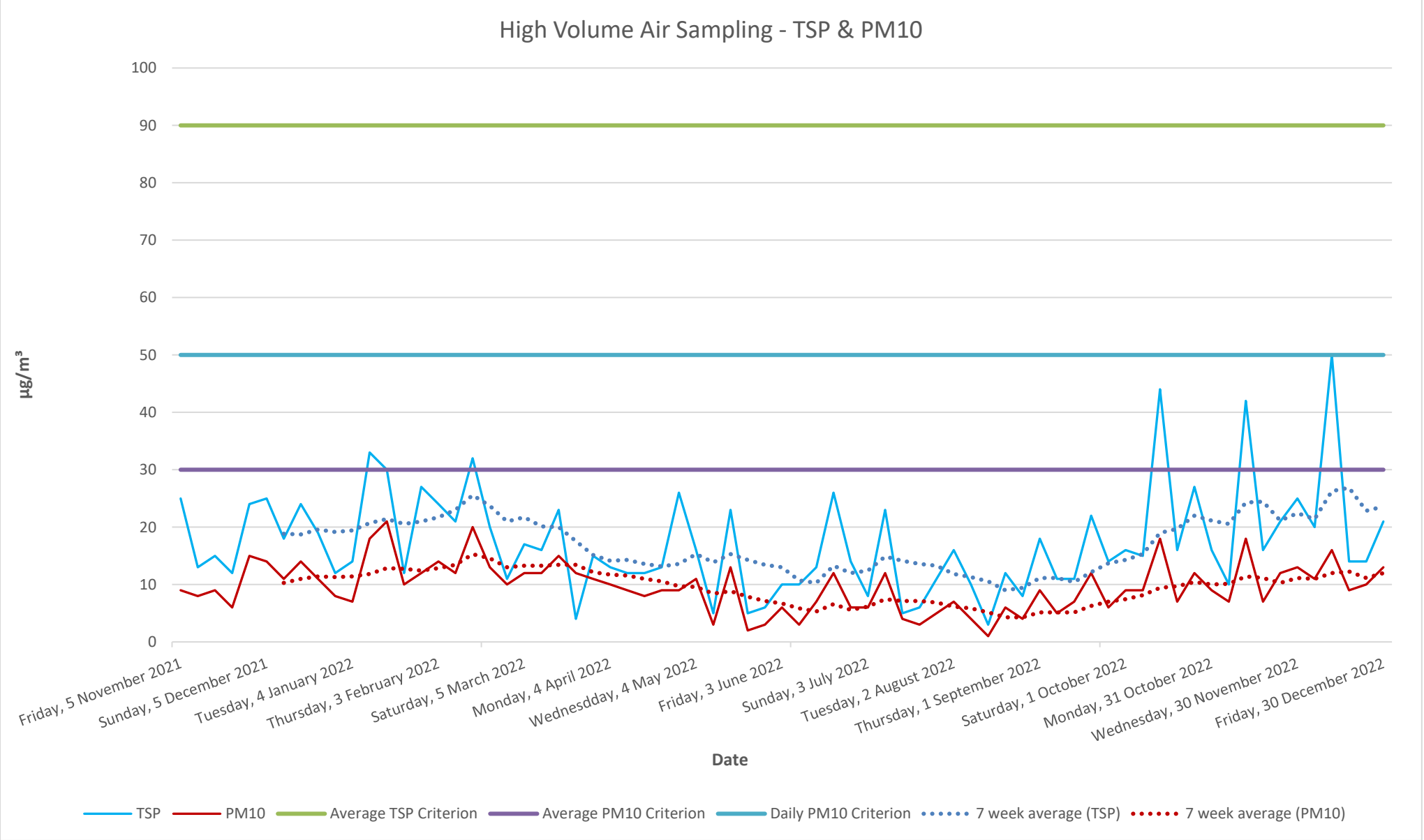


Figure 1 High Volume Air Sampling: Year-to-date results

### 3 BLAST MONITORING

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Blasting must only be carried out between the hours of 9:00 AM and 4:00 PM Monday to Friday. No blasting is permitted on Saturday, Sundays or Public Holidays. Blasting outside of the hours specified by the EPL/Consent, can only take place with the written approval of relevant regulatory authorities.

KEQ conduct monitoring at the nearest residential location (EPL 11569 EPA identification no. 11) to ensure that airblast overpressure level and ground vibration peak particle velocity do not exceed the EPL and Consent criteria (see **Error! Reference source not found.**).

**Table 9 EPL 11569 Condition M7.1 Blasting**

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

There were no blasts conducted in December 2022, for results see Table 10.

**Table 10 Blast monitoring results**

Date	Time	Location	Overpressure (dB(L))	Vibration (mm/s)
-	-	-	-	-

## 4 NOISE MONITORING

Noise generated by the Quarry operation must not exceed the criteria specified in *Schedule 3, Condition 14* of the Consent (see **Error! Reference source not found.**) at the locations identified in 10.

**Table 11 Noise impact assessment criteria**

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

**Table 12 Noise monitoring locations**

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

### 4.1 ATTENDED MONITORING

Attended noise monitoring is required to be undertaken at the two nearest residences (NM1 and NM2) biannually.

The most recent attended noise monitoring was undertaken during November, see monitoring results in **Error! Reference source not found.**

**Table 13 Attended noise monitoring results**

Location	Date	Start time (Period)	Total noise levels, dB							Site noise level, dB		EPL/PA Limits, dB	Meteorological conditions <sup>2</sup> EPL limits apply (Y/N)	Exceedance, dB	Comments
			L <sub>Amin</sub>	L <sub>A90</sub>	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A1</sub>	L <sub>Amax</sub>	L <sub>Ceq</sub>	LFN mod. Factor <sup>1</sup>	L <sub>Aeq</sub>	L <sub>Aeq</sub>			
A	23/11	07:07	43	50	54	57	59	62	65	Nil	IA	48	0.9 m/s @ 301° A stability class Y	N/A	Karuah Quarry inaudible. Traffic on the Pacific Highway, insects and birds consistently audible. A dog barking occasionally audible.
B	23/11	07:50	50	57	64	67	72	78	73	Nil	IA	48	1.9 m/s @ 284° A stability class Y	N/A	Karuah Quarry inaudible. Traffic on the Pacific Highway, insects and birds consistently audible.

Notes: 1. Modifying factor correction for LFN in accordance with Fact sheet C of the NPfI.  
2. Meteorological data were taken as an average over 15 minutes from the Karuah Quarry on-site weather station (Refer to Section 5.1).  
3. IA = inaudible.  
4. N/A = not applicable.

The results of the attended monitoring (Table 12) show ambient noise levels include noise sources such as traffic from the nearby Pacific Highway and wildlife such as birds. The Quarry operation was inaudible at location NM1 and NM2.

## 4.2 UNATTENDED NOISE MONITORING

Unattended noise monitoring is required to be undertaken at the two nearest residences (NM1 and NM2) biannually.

The most recent unattended noise monitoring was undertaken during November, see monitoring results for NM1 and NM2 in table 13.

**Table 14 - Unattended noise monitoring results**

Location	Period	Measured noise levels, dB	
		L <sub>A90</sub>	L <sub>Aeq,period</sub>
NM1 23 November- 1 December 2022	Day	45	52
	Evening	46	55
	Night	43	51
NM2 23 November- 1 December 2022	Day	56	64
	Evening	49	63
	Night	39	62

The attended noise monitoring conducted during November 2022 identified that the Quarry was not audible at location NM1 or NM2. At the end of the monitoring period, the equipment located at NM2 was found to be vandalised and as such, the results from this location were not viable.

## 5 SURFACE WATER MONITORING

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Condition L2 of the EPL outlines the requirement to monitor surface water discharges from the Quarry via the licensed discharge point (LDP001), see Table 14.

**Table 15 EPL 11569 - Pollutant concentration limits**

Pollutant	Units of Measure	Concentration Limit
Oil and Grease	Visible	5 &/or non-visible
pH	pH units	6.5 – 8.5
Total suspended solids	Milligrams per litre	50

There were no controlled discharges from LDP001 during the month of December 2022.

## 6 WEATHER MONITORING

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Karuah Quarry has a permanent meteorological station to monitor various weather parameters. Figure 2 shows the recorded results for the local weather during December 2022. Weather data is significant from an environmental perspective, especially when regarding the total rainfall in the area as this effects multiple variables particularly erosion and sediment control as well as water quality management.

A wind rose is a graphic tool used to depict the average direction and speed of the wind over a recorded period. Figure 3 shows the wind rose generated from data gathered during December 2022.

## Monthly Weather Summary



Site: **Karuah Quarry**

Month: **December 2022**

Date	Day	Temperature @ 2m			Temperature @ 10m			Winds			Solar Radiation		Rain <sup>2</sup>
		Max <sup>1</sup>	Min <sup>2</sup>	Ave <sup>1</sup>	Max <sup>1</sup>	Min <sup>2</sup>	Ave <sup>1</sup>	Max Gust <sup>1</sup>	Ave Speed <sup>1</sup>	Dir Ave <sup>1</sup>	Max <sup>1</sup>	Ave <sup>1</sup>	
		°C	°C	°C	°C	°C	°C	km/h	km/h	deg	W/m <sup>2</sup>	W/m <sup>2</sup>	mm
1	Thu	23.1	13.0	18.4	20.8	13.3	18.0	34.3	7.7	150	691.6	158.1	
2	Fri	24.5	14.9	18.1	21.3	15.1	17.5	36.7	6.4	185	1219.9	251.4	1.6
3	Sat	24.6	10.9	17.7	21.9	11.5	17.5	27.2	5.1	165	1315.0	224.2	
4	Sun	26.2	10.6	19.7	23.3	11.8	19.2	31.9	5.3	129	1257.5	229.4	
5	Mon	35.6	12.8	25.3	32.1	14.1	24.4	23.7	5.8	166	1100.0	319.2	
6	Tue	26.0	18.6	19.7	22.1	18.8	18.6	31.9	5.7	172	1264.2	285.1	1.6
7	Wed	29.8	13.2	22.7	27.9	14.1	22.6	35.5	6.5	246	1229.2	172.4	0.2
8	Thu	26.6	17.7	18.2	24.2	18.8	17.2	35.5	6.6	194	1204.2	310.6	
9	Fri	22.5	12.0	18.3	19.2	12.7	17.5	27.2	7.0	157	1241.7	195.2	1.0
10	Sat	21.9	15.8	17.5	19.8	15.8	17.2	18.9	5.0	145	533.3	129.4	
11	Sun	32.1	11.8	25.1	29.0	12.7	24.5	29.6	5.7	145	1172.5	291.1	
12	Mon	27.0	20.3	19.0	26.5	19.6	19.9	49.7	5.8	210	1223.2	131.8	
13	Tue	29.6	8.1	19.2	27.3	9.8	19.0	36.7	5.9	189	1069.2	353.8	17.2
14	Wed	27.0	9.8	19.0	25.4	11.2	19.3	34.3	6.4	198	1285.8	281.2	0.2
15	Thu	25.1	9.0	18.9	21.0	11.1	17.7	35.5	9.4	171	1147.5	315.4	
16	Fri	22.7	14.4	16.6	19.0	14.3	15.9	30.8	6.4	188	1192.5	202.1	
17	Sat	20.6	11.8	15.8	18.0	11.4	15.4	34.3	6.0	205	1239.2	160.3	2.8
18	Sun	24.7	13.1	17.0	20.7	13.2	16.2	39.0	7.1	206	1303.2	225.1	3.6
19	Mon	23.9	12.9	18.0	20.4	12.9	17.1	37.9	7.4	187	1351.5	262.6	1.2
20	Tue	24.5	13.4	16.9	20.9	13.5	16.0	34.3	5.9	200	1409.2	265.3	
21	Wed	26.0	10.6	17.0	21.8	11.2	16.2	27.2	5.1	174	1429.2	309.0	
22	Thu	30.4	9.2	20.7	26.7	10.4	20.1	28.4	4.7	164	1319.0	254.5	
23	Fri	29.6	16.3	23.3	28.1	16.5	22.8	20.1	3.7	190	1082.4	198.8	0.4
24	Sat	35.1	18.0	23.6	31.2	18.1	23.0	30.8	4.6	211	1180.8	261.0	0.2
25	Sun	31.8	15.4	24.3	29.2	16.0	23.4	28.4	6.0	136	1134.2	319.0	
26	Mon	34.5	16.1	24.8	32.2	17.3	24.4	33.1	5.3	136	1157.5	326.5	
27	Tue	31.1	15.9	23.2	28.3	17.1	22.5	34.3	7.9	132	1069.2	344.2	
28	Wed	34.0	16.0	24.9	30.9	17.1	24.1	30.8	6.7	134	1048.3	346.0	
29	Thu	33.4	18.4	24.7	30.1	19.0	23.6	33.1	6.4	165	1108.3	304.8	
30	Fri	28.5	19.6	22.3	25.4	20.0	21.6	33.1	7.7	135	1275.8	233.2	
31	Sat	29.0	17.7	22.6	25.3	18.1	21.9	34.3	6.1	147	1380.8	215.0	
Ave or Total		27.8	14.1	20.4	24.8	14.7	19.8	32.2	6.2	171.9	1181.8	254.1	30.0
High		35.6	20.3	25.3	32.2	20.0	24.5	49.7	9.4		1429.2	353.8	17.2
Low		20.6	8.1	15.8	18.0	9.8	15.4	18.9	3.7		533.3	129.4	

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

No. rain days >1mm: 6

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

Figure 2 Weather Summary December 2022

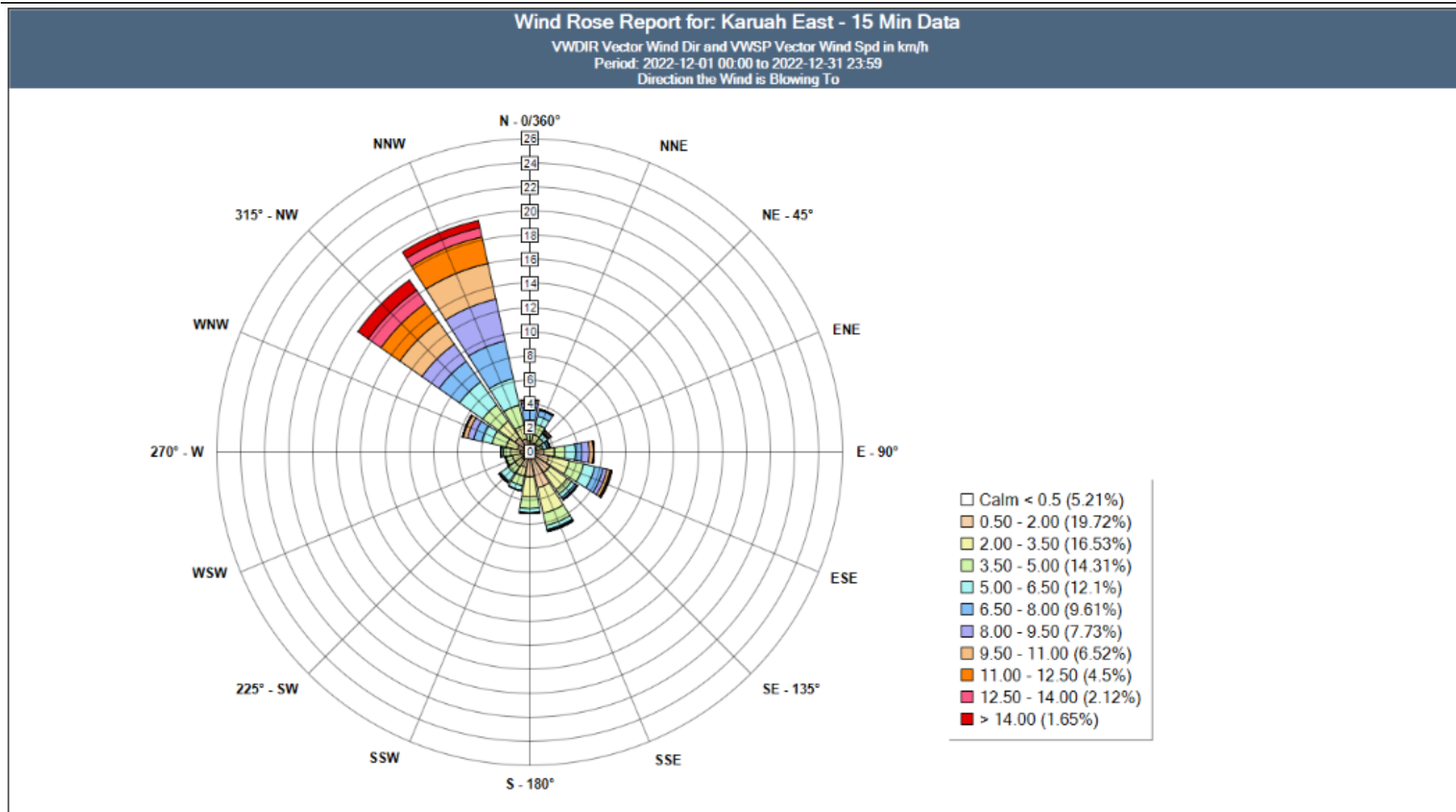


Figure 3 Wind Rose December 2022



## **7 REPORTING**

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### **7.1 INCIDENT**

There were nil environmental incidents during December 2022 to report.

### **7.2 NON-COMPLIANCE**

There were nil non-compliance events during December 2022 to report.

### **7.3 COMPLAINTS**

There were nil complaints received during December 2022.

## Appendix 1 – Monitoring Location



\\slr.local\Corporate\Projects\SLR\630-Sv\NTL\630-NTL\630.30036.00000 Karuah Quarry EMS 2020 Review\06 SLR Data\01 CAD\GIS\SLR\630303036\_EMP\_Monitoring\_01.mxd



Source: Nearmap (June 2020)

Sheet Size : A4

Scale: 1:12,000  
GDA 1994 MGA Zone 56

05-Aug-2020  
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