Grounded in Quality

A proud member of the Hunter Construction Group

Karuah Hard Rock Quarry

Environmental Monitoring Report:

June 2022

Table of Contents

Appendix 1 Monitoring Locations

1 INTRODUCTION

This report has been completed to meet the requirements of Section 66(6) of the *Protection of the Environment Operations Act 1997* and the NSW Environmental Protection Authority's (EPA) *Requirements for Publishing Pollution Monitoring Data* (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

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

Table 2 Development Consent 265-10-2004 information

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

A summary of the environmental monitoring data for June 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_{10} 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[1]	Maximum Total Deposited Dust Level[1]
Deposited dust	Annual	2 g/m^2/month	4 g/m^2/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^3
Particulate matter <10 µm (PM_{10})	Annual	30 µg/m^3

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

Pollutant	Averaging period	Criterion
Particulate matter <10 µm (PM_{10})	24 hour	50 µg/m^3

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 June 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
05/07/2021	05/08/2021	0.5	0.4	0.5	1.0
05/08/2021	06/09/2021	2.3	0.8	1.4	0.6
06/09/2021	06/10/2021	0.7	0.4	0.5	0.4
06/10/2021	03/11/2021	3.6	0.1	0.5	0.1
03/11/2021	03/12/2021	0.5	0.2	0.4	0.2
03/12/2021	04/01/2022	1.3	0.3	0.2	1.0
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
YTD average		1.1	0.7	0.5	0.4

Monitoring results indicate that for the period 3 June 2022 to 5 July 2022 the insoluble solid levels recorded at DDG 1 to DDG 4 monitoring locations were below the project criterion of 4 g/m^2/month.

2.2 HIGH VOLUME AIR SAMPLING

The TSP and PM_{10} results for June 2022, the report average and a rolling annual average are shown in are shown in Table 8.

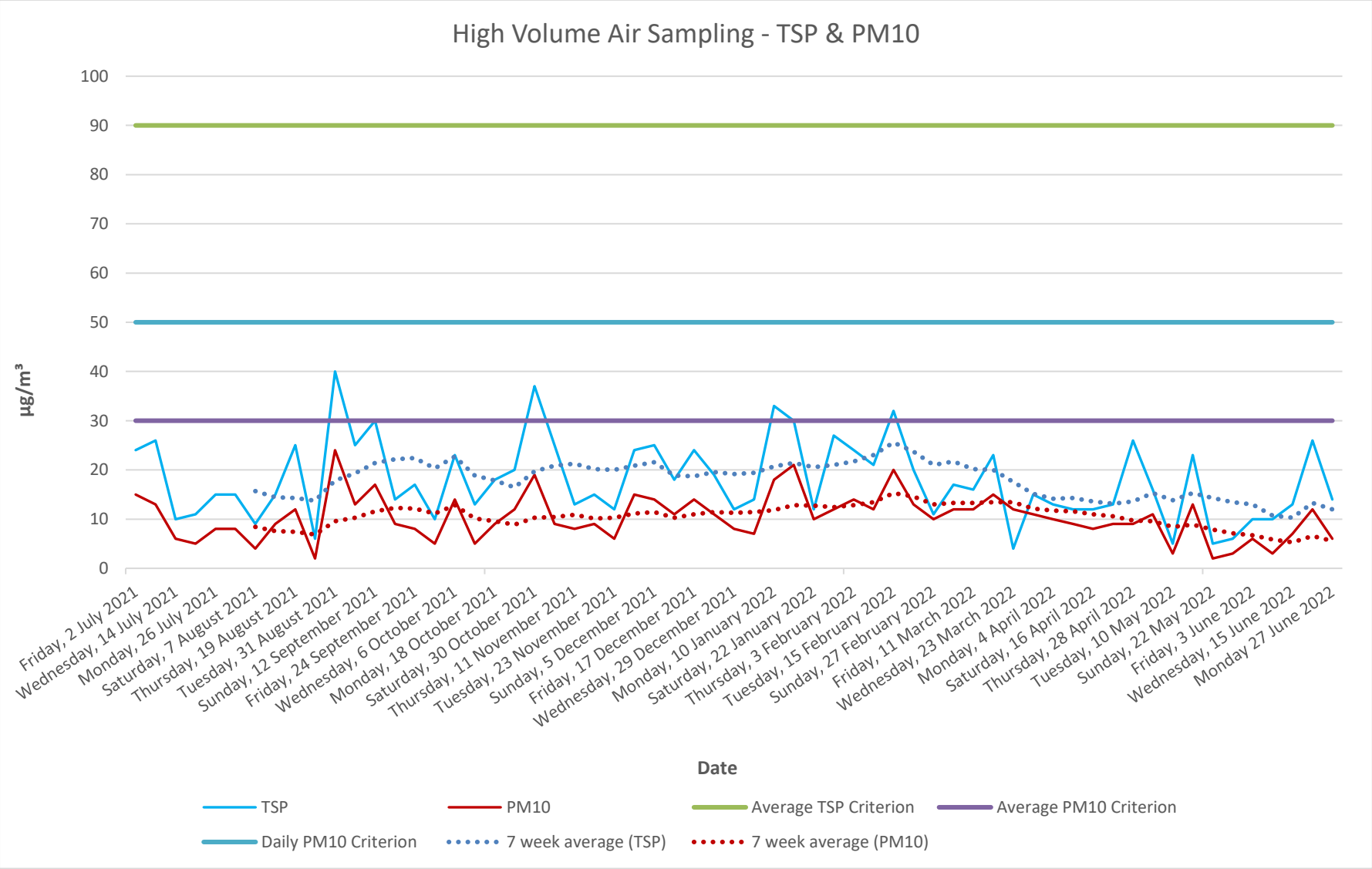

Figure 1 illustrates the year-to-date results for HVAS monitoring.

Table 8 High Volume Air Sampling (µg/m³) results

Run Date	HVAS TSP (µg/m³)	HVAS PM_{10} (µg/m³)
03/06/2022	10	6
09/06/2022	10	3
15/06/2022	13	7
21/06/2022	26	12
27/06/2022	14	6
24hr Average Criteria[1]	**N/A**	**50**
Annual Average Criteria[1]	**90**	**30**
Progressive Annual Average[2]	16.8	10.3

Note: **[1] Criteria as specified in DA 265-10-2004.**

[2] The progressive annual average is from 01/01/2022 to 27/06/2022, this is not a measure of compliance.

All HVAS monitoring results, to the end of June 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).

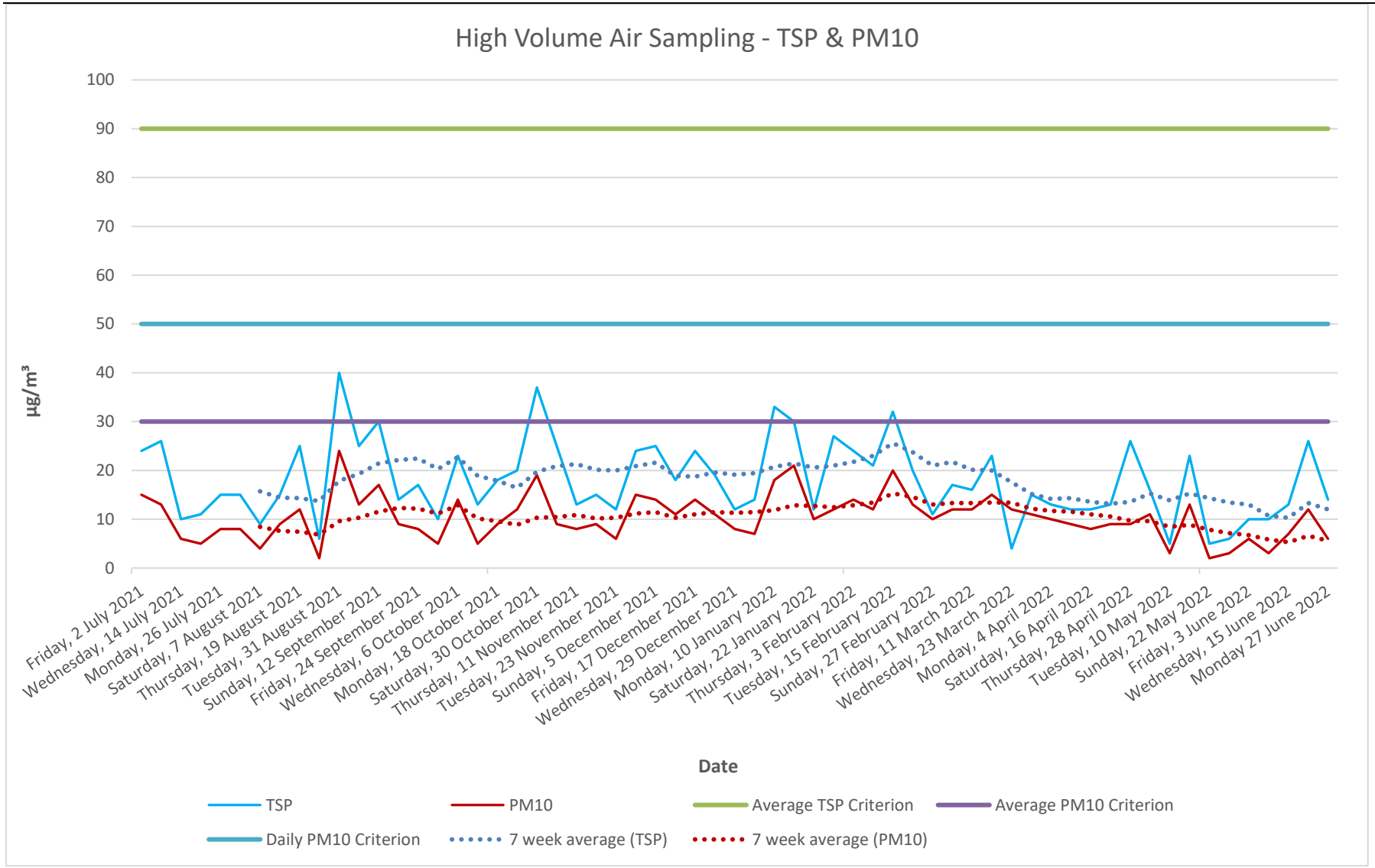

Figure 1 High Volume Air Sampling: Year-to-date results

3 BLAST MONITORING

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 June 2022.

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 1 0.

Table 10 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 11 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 June, see monitoring results in **Error! Reference source not found.**.

Table 12 Attended noise monitoring results

Location	Date	Start time (Period)	Total noise levels, dB							Site contribution, dB		EPL / PA Limits, dB	Meteorological conditions[2] EPL limits apply (Y/N)	Exceedance, dB	Comments
			L_{Amin}	L_{A90}	L_{Aeq}	L_{A10}	L_{A1}	L_{Amax}	L_{Ceq}	LFN mod. Factor [1]	L_{Aeq}	L_{Aeq}			
NM1	16/6	08:16	47	51	54	56	58	69	67	Nil	IA	48	0.3 m/s @ 297° A stability class Y	Nil	**Karuah Quarry inaudible.** Traffic on the Pacific Highway, consistently audible. Bird noise and a dog barking occasionally audible.
NM2	16/6	08:38	52	59	63	66	69	71	71	Nil	IA	48	0.3 m/s @ 307° A stability class Y	Nil	**Karuah Quarry inaudible.** Traffic on the Pacific Highway, consistently audible. Bird noise and resident noise occasionally 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 June, see monitoring results for NM1 and NM2 in table 13.

Table 13 NM1 - Unattended noise monitoring results

Location	Period	Measured noise levels, dB	
		L_{A90}	$L_{Aeq,period}$
NM1 16-28 June 2022	Day	51	69
	Evening	49	55
	Night	-	-
NM2 16-28 June 2022	Day	Results were not available due to vandalism of the unattended noise monitor located at NM2	
	Evening		
	Night		

The attended noise monitoring conducted during June 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

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 14 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 June 2022.

6 WEATHER MONITORING

Karuah Quarry has a permanent meteorological station to monitor various weather parameters. Figure 2 shows the recorded results for the local weather during June 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 June 2022.

Monthly Weather Summary

Site: **Karuah Quarry**
Month: **June 2022**

Date	Day	Temperature @ 2m			Temperature @ 10m			Winds			Solar Radiation		Rain[2]
		Max[1]	Min[2]	Ave[1]	Max[1]	Min[2]	Ave[1]	Max Gust[1]	Ave Speed[1]	Dir Ave[1]	Max[1]	Ave[1]	
		°C	°C	°C	°C	°C	°C	km/h	km/h	deg	W/m²	W/m²	mm
1	Wed	14.7	9.3	9.7	13.6	9.9	10.3	52.1	10.4	274	168.3	117.2	
2	Thu	15.6	3.1	8.0	14.4	4.6	8.3	21.3	2.6	205	172.5	104.2	
3	Fri	17.1	3.3	10.6	15.7	4.3	10.7	29.6	3.2	201	180.8	86.5	
4	Sat	16.6	7.4	9.4	15.7	8.3	10.2	45.0	5.1	203	149.2	89.9	6.4
5	Sun	18.6	4.4	9.4	17.4	5.8	10.0	41.4	4.1	204	178.3	70.0	
6	Mon	17.1	3.3	10.1	16.2	3.6	11.3	58.0	8.2	232	120.8	60.3	
7	Tue	16.3	3.9	11.3	15.5	5.8	11.6	47.3	10.0	273	124.1	62.3	
8	Wed	15.4	6.0	9.0	14.4	7.4	9.9	35.5	7.2	271	125.0	71.1	
9	Thu	15.3	3.3	11.0	14.2	6.2	11.2	46.1	9.9	272	130.8	67.2	
10	Fri	17.1	8.1	11.2	16.0	9.1	11.9	35.5	7.3	266	110.8	59.6	
11	Sat	17.2	4.6	12.0	15.9	8.0	12.2	42.6	10.9	273	114.2	61.1	
12	Sun	17.2	8.5	9.8	16.2	9.3	10.9	42.6	6.1	262	120.0	66.3	
13	Mon	18.5	2.4	8.6	16.2	3.9	9.1	26.0	2.8	210	116.7	63.2	
14	Tue	19.3	2.7	8.8	17.8	4.0	9.4	11.8	1.9	195	128.3	60.8	
15	Wed	20.1	3.3	9.9	19.4	4.3	10.8	20.1	2.6	222	128.3	57.8	
16	Thu	21.5	5.0	11.5	20.2	5.8	13.2	24.9	3.2	222	103.3	56.0	
17	Fri	20.1	5.7	12.3	18.1	8.0	12.7	26.0	4.4	218	100.0	58.9	
18	Sat	17.2	6.9	12.6	16.4	8.0	12.8	20.1	3.7	224	109.2	64.8	5.4
19	Sun	18.4	10.3	12.5	17.1	10.7	12.8	17.8	3.0	185	90.8	55.0	9.8
20	Mon	20.9	9.2	10.5	18.3	9.9	10.9	18.9	2.4	214	99.2	43.9	5.4
21	Tue	20.6	5.4	11.7	20.0	5.8	12.8	13.0	2.2	191	115.0	2.3	
22	Wed	18.9	5.1	8.7	17.3	6.3	9.3	26.0	3.2	215	0.0	0.0	
23	Thu	18.3	2.6	8.7	17.3	3.8	9.6	20.1	2.5	187	0.0	0.0	
24	Fri	19.3	3.4	10.6	18.4	4.5	12.2	33.1	4.4	260	0.0	0.0	
25	Sat	20.9	5.4	10.7	19.9	6.6	11.7	28.4	2.9	183	191.7	19.1	
26	Sun	21.4	5.0	11.4	19.8	6.2	12.6	14.2	2.3	201	290.8	122.3	
27	Mon	17.2	5.5	10.5	15.3	8.5	10.9	37.9	6.5	205	141.7	86.0	
28	Tue	12.2	6.9	9.2	12.1	7.4	9.6	16.6	2.7	246	130.8	5.8	9.4
29	Wed	15.4	5.5	11.1	14.8	6.2	11.4	11.8	1.9	198	0.0	0.0	2.2
30	Thu	18.8	9.1	11.9	17.7	9.5	12.1	18.9	2.0	217	0.0	0.0	
Ave or Total		17.9	5.5	10.4	16.7	6.7	11.1	29.4	4.7	224.3	114.7	53.7	38.6
High		21.5	10.3	12.6	20.2	10.7	13.2	58.0	10.9		290.8	122.3	9.8
Low		12.2	2.4	8.0	12.1	3.6	8.3	11.8	1.9		0.0	0.0	
											No. rain days >1mm:		6

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 2 Weather Summary June 2022

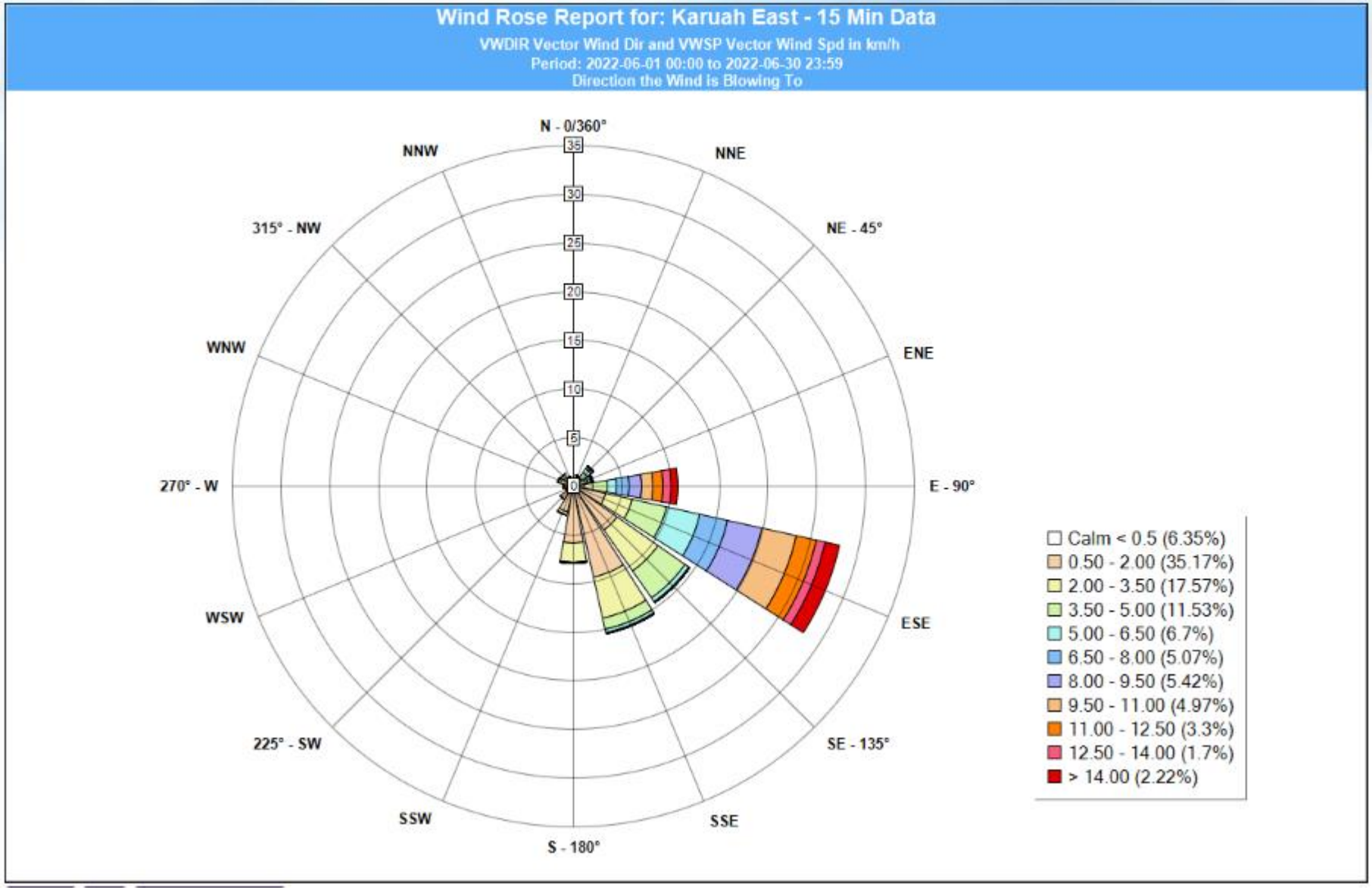

Figure 3 Wind rose June 2022

7 REPORTING

7.1 INCIDENT

There were nil environmental incidents during June 2022 to report.

7.2 NON-COMPLIANCE

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

7.3 COMPLAINTS

There were nil complaints received during June 2022.

Appendix 1 – Monitoring Location

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

05-Aug-2020
630.30036

Source: Nearmap (June 2020)

Sheet Size : A4

SLR
www.slrconsulting.com

Karuah Hard Rock Quarry
Environmental Monitoring Locations

APPENDIX B