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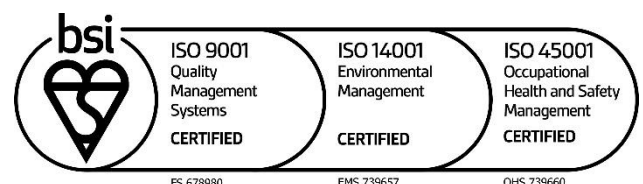
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## **Karuah Hard Rock Quarry**

### **Environmental Monitoring Report:**

**March 2021**



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## Monitoring Locations

# 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 March 2021 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 March 2021 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
09/04/2020	07/05/2020	1.2	0.9	1.0	-
07/05/2020	04/06/2020	0.2	0.3	0.3	0.7
04/06/2020	02/07/2020	0.1	0.2	0.3	0.3
02/07/2020	31/07/2020	0.2	<0.1	0.2	0.6
31/07/2020	01/09/2020	0.4	0.2	0.4	1
01/09/2020	01/10/2020	0.6	0.5	0.4	1.0
01/10/2020	02/11/2020	0.2	<0.1	1.3	0.7
02/11/2020	03/12/2020	3.2	2.3	0.8	0.7
03/12/2020	04/01/2020	0.3	0.5	<0.1	0.4
04/01/2021	04/02/2021	1.5	0.9	0.7	0.3
04/02/2021	05/03/2021	0.4	0.4	0.7	0.2
05/03/2021	06/04/2021	0.8	1.3	0.5	0.7
<b>YTD average</b>		0.8	0.6	0.6	1.1

**Note** <sup>1</sup>: DDG4 was not able to be analysed for period 9/4/2020 to 7/05/2020 due to sample jar breaking during collection and transportation to the laboratory.

Monitoring results indicate that for the period 5 March 2021 to 6 April 2021 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 March 2021, 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/m<sup>3</sup>) results**

Run Date	HVAS TSP (µg/m <sup>3</sup> )	HVAS PM <sub>10</sub> (µg/m <sup>3</sup> )
4/03/2021	15	9
10/03/2021	18	14
16/03/2021	10	6
22/03/2021	9	13
28/03/2021	9	9
<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>	22.1	12.4

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

<sup>2</sup> The progressive annual average is from 01/01/2020 to 28/03/2021, this is not a measure of compliance.

All HVAS monitoring results, to the end of March 2021 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).

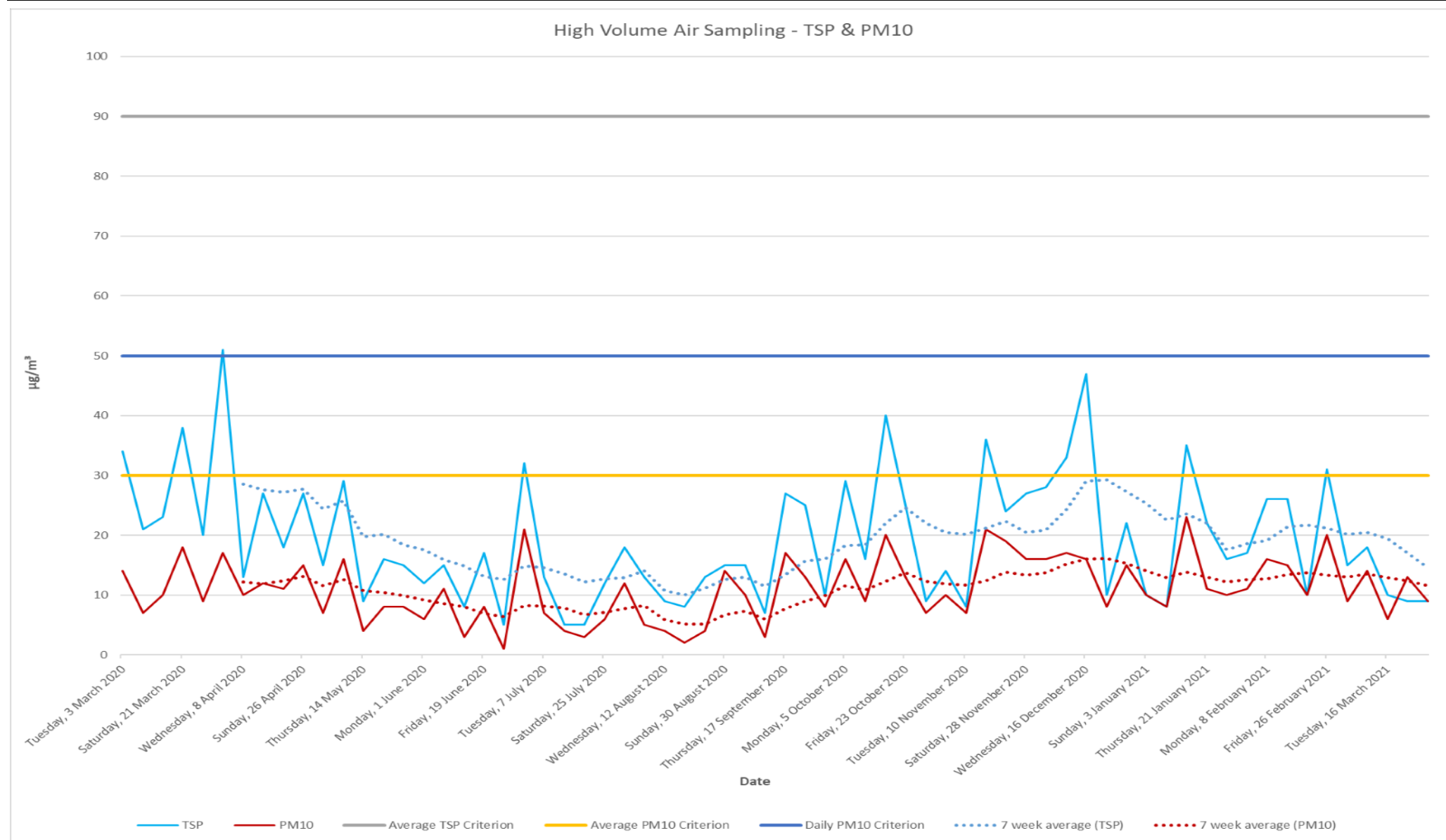


Figure 1 High Volume Air Sampling: Year-to-date results

### 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 March 2021.



## 4 NOISE MONITORING

Noise generated by the Quarry operation must not exceed the criteria specified in *Schedule 3, Condition 14* of the Consent (see Table 10) at the locations identified in Table 11.

**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 residence (NM1 and NM2) biannually.

The most recent attended noise monitoring was undertaken during November, see monitoring results in Table 12.

**Table 12 Attended noise monitoring results**

Location	Date/Start Time/ Weather	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emissions and Typical Maximum Noise Levels (dBA)
		LA <sub>max</sub>	LA1	LA10	LA90	LA <sub>eq</sub>	
NM1	4/11/2020 1:20 PM Calm	66	62	55	41	49	Pacific Highway 50-55  <b>Karuah Quarry Inaudible</b>
NM2	4/11/2020 11:35 AM Calm	75	70	66	57	63	Pacific Highway 55 - 65 Birds 40-45  <b>Karuah Quarry Inaudible</b>

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 residence (NM1 and NM2) biannually.

The most recent unattended noise monitoring was undertaken during November, see monitoring results for NM1 in Table 13 and NM2 in Table 14.

Table 13 NM1 - Unattended noise monitoring results

INP Period	L <sub>A1</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>AEQ</sub>
Day	64	60	51	57
Evening	66	62	49	59
All other times	66	63	47	58

Table 14 NM2 - Unattended noise monitoring results

INP Period	L <sub>A1</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>AEQ</sub>
Day	70	67	54	63
Evening	71	66	52	63
All other times	71	66	47	62

The attended noise monitoring conducted during November 2020 identified that the Quarry was not audible at location NM1 or NM2.

## 5 SURFACE WATER MONITORING

### 5.1 DISCHARGE MONITORING

Condition L2 of the EPL outlines the requirement to monitor surface water discharges from the Quarry via the licensed discharge point (LDP001), see **Error! Reference source not found..**

**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

#### 5.2.1 Dam 1 (LDP1)

Dam 1 had a total of Six days discharging during the month of March (see Table 16). Due to extreme rainfall received in March, there were six days of uncontrolled discharge during which there were exceedances of TSS concentration limits; see Section 7.2 for further information.

**Table 16 Discharge monitoring – LDP1**

Date	pH	Total suspended solids	Oil and grease	Controlled
Thursday, 18 March 2021	7.4	<b>138</b>	NV	No
Friday, 19 March 2021	7.2	<b>246</b>	NV	No
Saturday, 20 March 2021	7.1	<b>328</b>	NV	No
Sunday, 21 March 2021	7.1	<b>436</b>	NV	No
Monday, 22 March 2021	7.3	<b>92</b>	NV	No
Tuesday, 23 March 2021	7	<b>307</b>	NV	No

## 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 March 2021. 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 March 2021.

## Monthly Weather Summary



Site: **Karuah Quarry**  
Month: **March 2021**

		Temperature @ 2m			Temperature @ 10m			Winds			Solar Radiation		Rain <sup>2</sup>
Date	Day	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>	
1	Mon	33.8	19.1	25.8	31.7	19.4	25.4	24.9	4.2	170	993.2	227.8	0.2
2	Tue	28.1	20.1	21.9	25.0	20.3	20.9	33.1	7.1	159	970.0	225.5	
3	Wed	25.3	16.9	18.0	23.0	16.9	17.8	34.3	4.4	184	1030.8	133.3	1.0
4	Thu	27.9	13.7	19.8	25.9	13.9	19.7	22.5	3.9	160	965.0	228.5	0.4
5	Fri	28.4	12.9	21.2	25.2	13.5	20.5	36.7	6.5	169	1057.5	180.3	
6	Sat	27.0	16.7	19.0	23.2	16.7	18.4	27.2	4.7	178	1089.1	198.1	1.0
7	Sun	27.5	13.4	22.3	25.2	14.1	21.8	28.4	5.7	129	1034.1	207.7	0.2
8	Mon	34.3	17.7	20.4	30.7	18.0	20.0	53.3	3.1	196	802.5	152.1	
9	Tue	33.3	16.0	24.2	31.6	16.4	23.8	27.2	5.4	192	876.6	199.1	26.4
10	Wed	26.3	19.6	21.5	24.3	19.7	21.2	24.9	4.2	158	1080.0	131.0	0.2
11	Thu	27.8	17.2	23.3	25.5	17.9	22.8	26.0	5.4	117	1056.6	177.0	
12	Fri	27.5	20.9	22.3	26.0	21.2	22.1	22.5	3.5	135	660.0	101.3	
13	Sat	33.4	17.7	25.4	30.1	18.3	25.1	22.5	3.7	140	871.6	200.6	
14	Sun	23.9	20.3	17.4	22.9	20.9	17.4	41.4	7.5	202	249.9	24.6	0.2
15	Mon	24.7	14.3	17.3	22.1	14.5	17.1	24.9	4.2	212	1108.2	145.5	51.0
16	Tue	23.5	12.5	18.4	21.9	12.8	18.2	33.1	4.5	179	985.7	93.8	0.6
17	Wed	23.7	15.2	19.4	22.5	14.9	19.4	39.0	6.9	165	1024.2	106.3	6.2
18	Thu	20.2	17.6	18.7	21.1	17.7	18.9	30.8	5.8	165	216.7	28.8	92.8
19	Fri	21.9	17.6	19.8	21.9	17.5	20.0	39.0	11.7	151	331.6	45.6	106.2
20	Sat	23.1	18.7	20.2	22.5	18.8	20.2	35.5	5.9	162	555.8	54.1	84.4
21	Sun	19.5	19.1	18.4	19.6	19.1	18.5	31.9	4.6	173	165.8	26.4	60.0
22	Mon	19.6	16.9	18.1	19.6	16.9	18.3	24.9	3.8	138	173.3	39.8	48.4
23	Tue	21.4	17.4	19.4	21.8	17.5	20.0	30.8	5.6	155	265.0	49.3	17.0
24	Wed	28.4	17.6	20.2	27.3	18.4	20.8	43.8	6.1	223	786.7	207.0	12.2
25	Thu	28.0	13.0	19.7	26.4	14.4	20.1	27.2	4.7	209	846.7	181.8	
26	Fri	26.9	13.0	18.8	23.5	14.4	18.5	20.1	3.2	170	752.5	200.7	
27	Sat	28.6	14.3	19.2	26.3	14.9	19.3	24.9	3.2	166	793.3	182.1	
28	Sun	28.3	12.8	20.0	25.1	13.4	19.6	55.6	4.3	164	810.0	183.5	
29	Mon	26.1	14.6	18.7	23.3	15.0	18.4	23.7	3.8	183	779.2	179.4	84.0
30	Tue	24.5	14.3	18.2	22.1	14.9	17.7	35.5	5.3	194	839.2	147.4	3.2
31	Wed	23.3	15.1	17.4	21.4	15.0	17.3	28.4	3.4	198	882.4	110.0	11.0
Ave or Total		26.3	16.3	20.1	24.5	16.7	20.0	31.4	5.0	170.9	775.9	140.9	606.6
High		34.3	20.9	25.8	31.7	21.2	25.4	55.6	11.7		1108.2	228.5	106.2
Low		19.5	12.5	17.3	19.6	12.8	17.1	20.1	3.1		165.8	24.6	
Notes: 1. Values are for the 24 hour period from 9am to 9am next day.												No. rain days >1mm:	13

Figure 2 Weather Summary March 2021

### Wind Rose Report for: Karuah East - 15 Min Data

VWDIR Vector Wind Dir and VWSP Vector Wind Spd in km/h

Period: 2021-03-01 00:00 to 2021-03-31 23:59

Direction the Wind is Blowing To

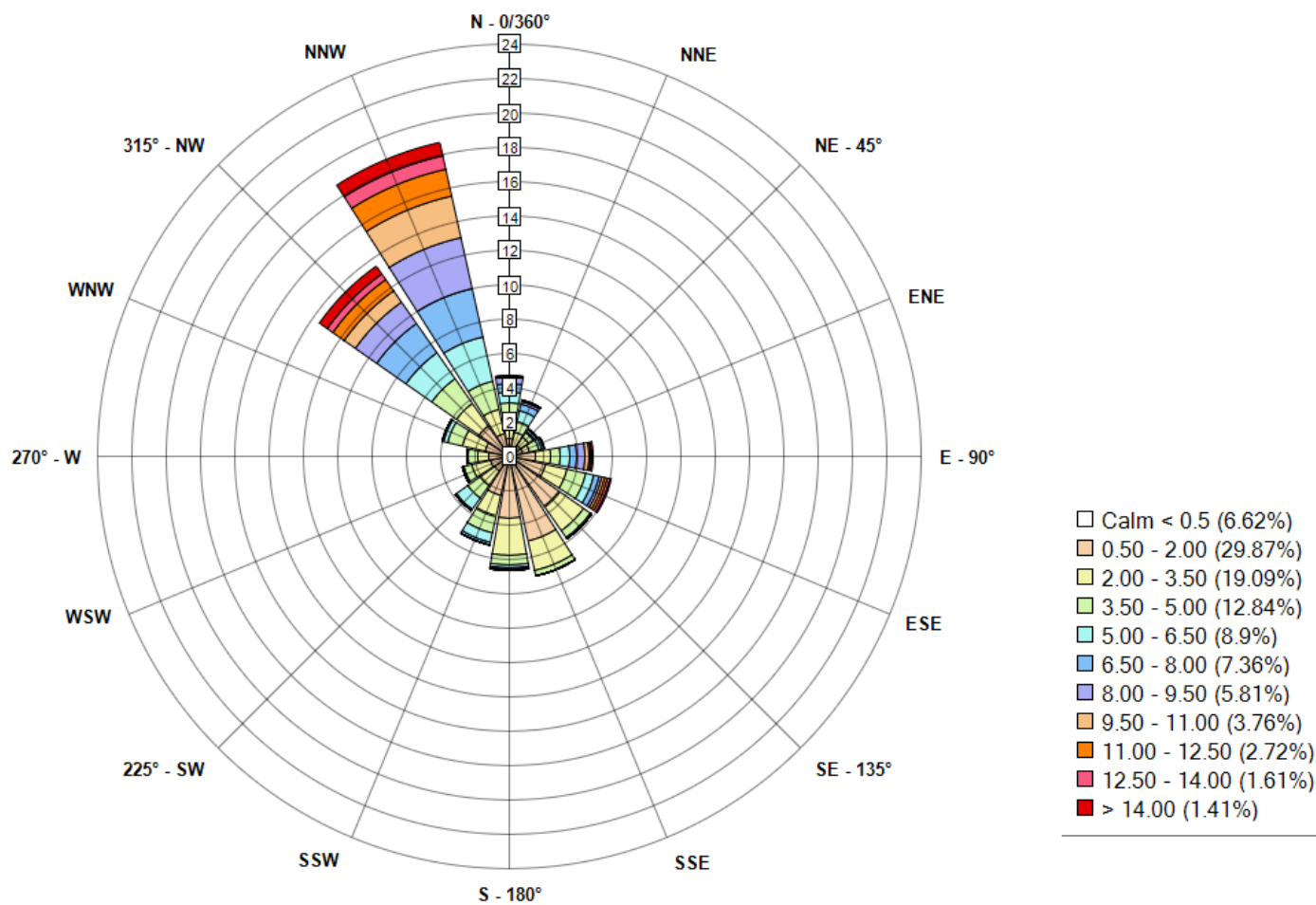


Figure 3 Wind rose March 2021

## 7 REPORTING

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### 7.1 INCIDENT

There were nil environmental incidents during March 2021 to report.

### 7.2 NON-COMPLIANCE

The uncontrolled discharge from LDP001 was caused by extreme rainfall experienced in March 2021, where the Quarry received 606.6mm. The *Pollution Incident Response Management Plan* was enacted, this involved:

- Immediately contacting appropriate regulatory authorities (DPIE, EPA).
- Notifying nearby residents of incident.
- Monitor water quality while discharging.
- Prepare and submit incident report to ARAs.

### 7.3 COMPLAINTS

There were nil complaints received during March 2021.

## Appendix 1 – Monitoring Locations



\\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



#### LEGEND

- Blast Monitoring Site
- Air Quality Monitoring Site
- Noise Monitoring Site
- Water Monitoring Site
- Watercourse
- Lot Boundary

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

Source: Nearmap (June 2020)

Sheet Size : A4