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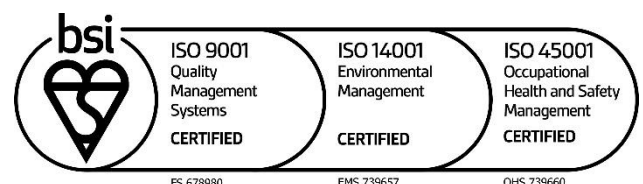
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## **Karuah Hard Rock Quarry**

### **Environmental Monitoring Report:**

**October 2021**



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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 October 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 October 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
02/11/2020	03/12/2020	3.2	2.3	0.8	0.7
03/12/2020	04/01/2021	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
06/04/2021	06/05/2021	0.7	1.4	2.2	3.7
06/05/2021	03/06/2021	0.3	0.3	0.3	0.4
03/06/2021	05/07/2021	0.2	0.4	0.2	0.2
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	06/10/2021	3.6	0.1	0.5	0.1
<b>YTD average</b>	0.9	0.8	0.8	0.8	

**Note**<sup>1</sup>: DDG4 was not able to be analysed for period 03/06/2021 to 05/07/2021 due to sample jar breaking during collection and transportation to the laboratory.

Monitoring results indicate that for the period 6 October 2021 to 3 November 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 October 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> )
6/10/2021	23	14
12/10/2021	13	5
18/10/2021	18	9
24/10/2021	20	12
30/10/2021	37	19
<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>	17.9	10.5

**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 31/08/2021, this is not a measure of compliance.

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

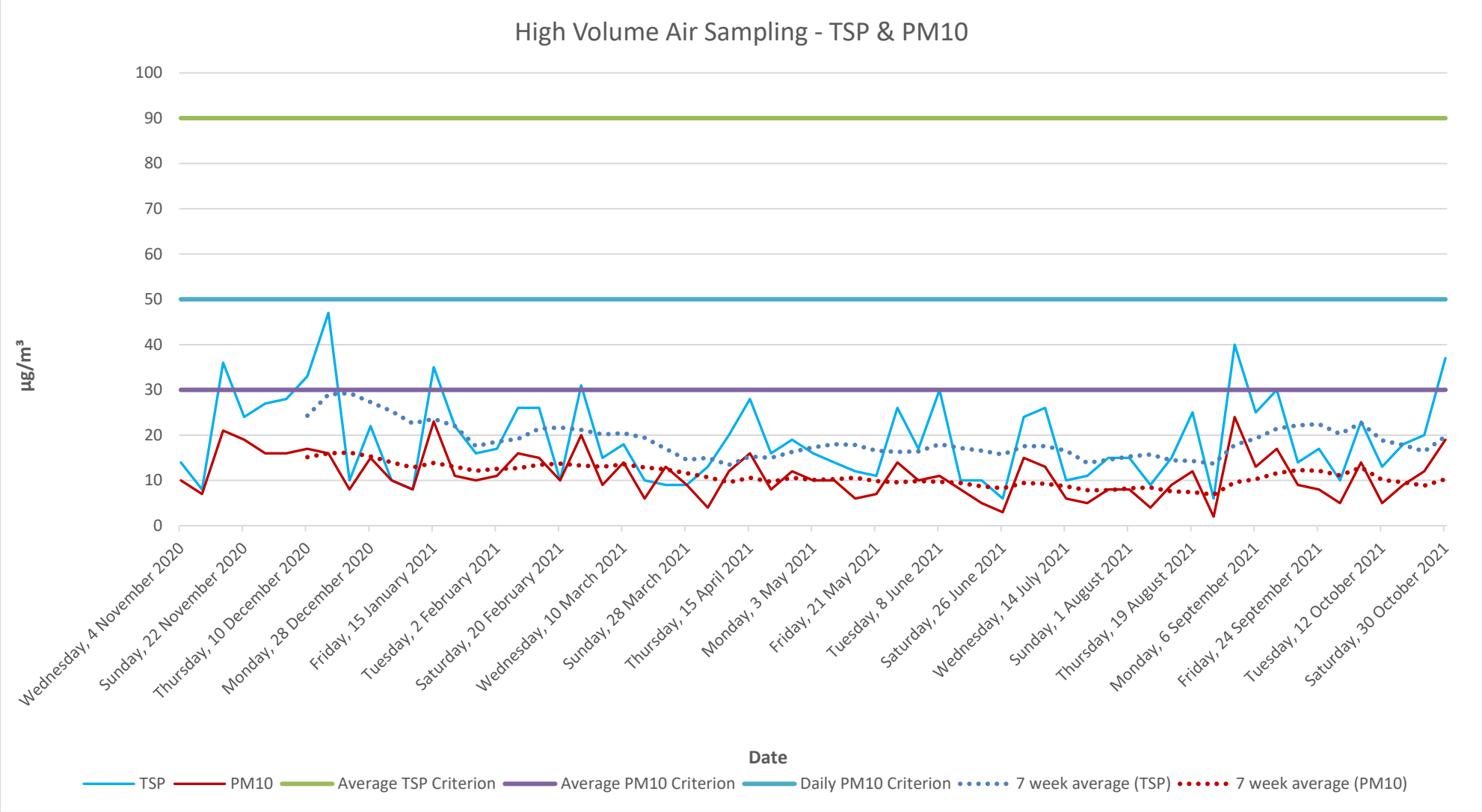


Figure 1 High Volume Air Sampling: Year-to-date results

### 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 two blasts conducted in October 2021, see Table 10 for monitoring results.

**Table 10 Blast monitoring results**

Date	Time	Overpressure (dB(L))	Vibration (mm/s)
15/10/2021	11:58:00 AM	Nil trigger	Nil trigger
26/10/2021	12:30PM	Nil trigger	Nil Trigger

The monitoring results show that the blast did not trigger the blasting equipment, and therefore demonstrate compliance with blasting criteria of the Consent and the EPL.



## 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 **Error! Reference source not found.**

**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 April, see monitoring results in **Error! Reference source not found.**

**Table 13 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	06/05/2022 2:30 PM Wind 20 kph	91	72	67	59	65	Pacific Highway 60-65  <b>Karuah Quarry Inaudible</b>
NM2	06/05/2021 3:05 PM Wind 20 kph	87	71	67	60	64	Pacific Highway 55 - 65 Birds 40-45  <b>Karuah Quarry Inaudible</b>

The results of the attended monitoring (**Error! Reference source not found.**) 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 April, see monitoring results for NM1 in

**Table 14** and NM2 in Table 15.

**Table 14 NM1 - Unattended noise monitoring results**

INP Period	L <sub>A1</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>AEQ</sub>
Day	73	69	56	63
Evening	72	68	59	63
All other times	73	70	60	61

**Table 15 NM2 - Unattended noise monitoring results**

INP Period	L <sub>A1</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>AEQ</sub>
Day	72	67	53	65
Evening	74	69	59	64
All other times	74	70	59	64

The attended noise monitoring conducted during April 2021 identified that the Quarry was not audible at location NM1 or NM2.

## 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 16.

**Table 16 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 October 2021.

## 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 October 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 October 2021.

## Monthly Weather Summary



Site: **Karuah Quarry**

Month: **October 2021**

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	Fri	26.8	13.0	16.1	24.6	13.9	16.0	29.6	3.4	180	783.2	168.5	0.2
2	Sat	25.8	9.6	18.3	23.7	10.4	18.6	29.6	5.6	247	923.3	199.1	4.4
3	Sun	26.3	11.4	18.8	25.0	13.1	18.8	29.6	3.8	200	925.0	187.0	
4	Mon	30.0	13.4	20.1	27.7	14.3	20.7	43.8	8.1	241	783.2	230.5	
5	Tue	24.3	8.8	16.4	22.3	11.7	16.6	42.6	8.1	257	947.4	219.2	
6	Wed	25.9	6.8	16.0	24.3	8.4	15.9	24.9	4.0	199	811.7	241.7	
7	Thu	30.0	8.1	20.6	28.8	9.1	20.4	35.5	6.1	202	922.5	182.4	
8	Fri	23.4	14.3	17.2	20.5	14.4	17.2	30.8	4.9	127	856.7	153.9	
9	Sat	31.3	11.1	21.5	28.5	12.1	22.2	22.5	4.5	173	788.3	235.8	
10	Sun	35.2	14.3	21.3	33.5	16.3	20.8	60.3	6.2	208	962.4	152.8	
11	Mon	15.2	13.8	13.3	15.0	13.7	13.3	34.3	4.3	164	375.8	51.7	24.8
12	Tue	17.6	12.0	14.1	17.2	12.1	14.1	36.7	3.7	162	356.6	64.9	10.0
13	Wed	20.5	13.4	17.4	19.2	13.3	17.3	31.9	6.9	111	897.4	144.1	20.4
14	Thu	27.1	15.4	19.8	25.3	15.8	19.8	33.1	6.2	117	839.2	231.2	1.6
15	Fri	25.3	13.3	17.1	23.6	14.5	16.8	61.5	11.8	268	892.5	232.3	0.8
16	Sat	22.6	12.2	16.1	20.9	12.6	16.3	59.2	10.4	243	863.2	254.1	0.6
17	Sun	26.1	7.5	16.5	23.3	8.5	16.3	23.7	4.6	172	853.3	256.6	
18	Mon	28.2	8.7	18.0	24.7	9.2	17.8	21.3	3.4	169	971.7	252.6	
19	Tue	30.0	10.0	18.8	27.3	11.0	18.1	37.9	6.0	190	825.8	225.2	
20	Wed	22.0	11.7	15.9	19.0	12.4	15.2	28.4	4.5	207	1133.2	164.5	2.0
21	Thu	24.2	11.3	17.0	21.5	11.7	16.6	28.4	4.9	183	1224.0	210.2	2.6
22	Fri	25.6	11.5	18.4	22.5	11.4	18.1	27.2	4.3	164	1044.2	196.5	
23	Sat	31.4	12.1	22.2	27.8	12.7	21.5	49.7	5.7	184	814.2	242.0	
24	Sun	23.9	15.3	17.5	20.5	16.1	16.9	34.3	5.6	173	1099.2	191.5	11.6
25	Mon	26.5	12.1	17.8	24.1	12.5	17.5	31.9	4.9	189	1004.2	250.8	
26	Tue	24.4	11.0	16.9	20.6	11.7	16.4	29.6	5.4	160	1066.7	210.0	0.4
27	Wed	29.2	10.3	21.0	26.0	10.9	20.6	28.4	4.3	147	866.7	269.7	0.2
28	Thu	33.8	15.1	22.0	30.8	16.1	22.2	21.3	3.7	168	974.9	198.4	
29	Fri	32.3	15.6	22.6	30.9	17.5	23.2	50.9	4.9	198	869.2	146.9	
30	Sat	22.0	12.7	16.2	19.6	14.0	15.7	34.3	7.3	173	959.1	129.9	
31	Sun	23.7	12.6	14.9	20.3	12.6	14.6	28.4	4.7	159	1094.2	212.0	0.8
Ave or Total		26.1	11.9	18.1	23.8	12.7	17.9	34.9	5.6	184.9	894.5	197.0	80.4
High		35.2	15.6	22.6	33.5	17.5	23.2	61.5	11.8		1224.0	269.7	24.8
Low		15.2	6.8	13.3	15.0	8.4	13.3	21.3	3.4		356.6	51.7	
Notes: 1. Values are for the 24 hour period from 9am to 9am next day. 2. Values are for the 24 hours to 9am.												No. rain days >1mm:	8

Figure 2 Weather Summary October 2021

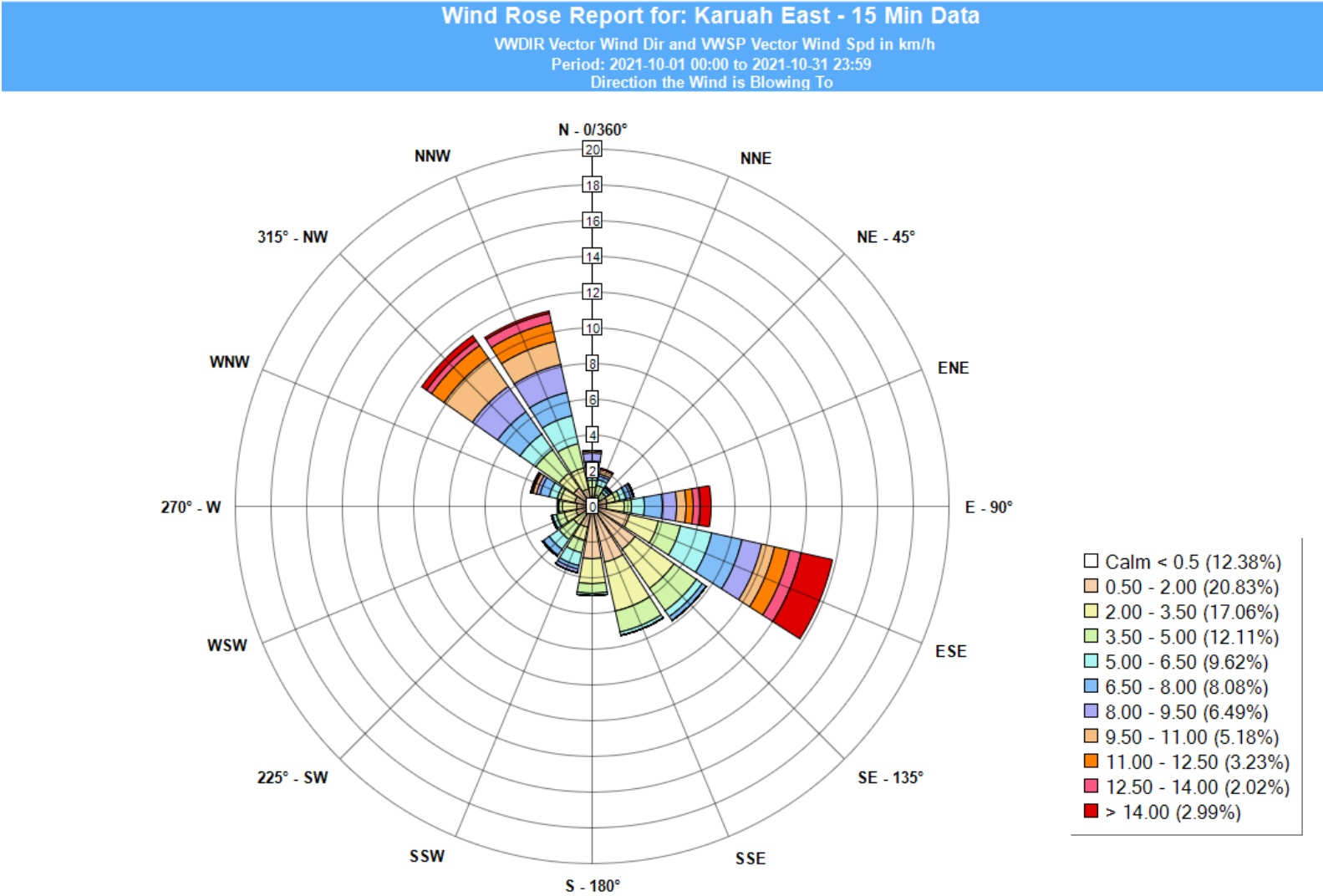


Figure 3 Wind rose October 2021

## **7 REPORTING**

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### **7.1 INCIDENT**

There were nil environmental incidents during October 2021 to report.

### **7.2 NON-COMPLIANCE**

There were nil non-compliance events during October 2021 to report.

### **7.3 COMPLAINTS**

There were nil complaints received during October 2021.

## Appendix 1 – Monitoring Locations



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Source: Nearmap (June 2020)

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GDA 1994 MGA Zone 56

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