



**esp**

Environmental &  
Safety Professionals

## ENVIRONMENTAL NOISE MONITORING QUARTER 1, 2017



***Northparkes Mines***  
***PO Box 995***  
***Parkes NSW 2870***

**Job No:** J35375  
**Report issued:** 26 April 2017

## **ESP – ENVIRONMENTAL & SAFETY PROFESSIONALS**

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This report relates to specific conditions existing at the time of undertaking the work. Current or future conditions of the areas reviewed may not be able to be assumed or inferred from information contained in this report.

### **REVISION HISTORY**

Revision	Revision Description	Issued	Recipient
1	<i>Final version</i>	26/04/2017	B. Ramakrishnappa

## EXECUTIVE SUMMARY

ESP – Environmental and Safety Professionals (ESP) was commissioned by Northparkes Mines (NPM) to undertake Environmental Noise Assessments at four residential/farming properties (Hubberstone, Lone Pine, Milpose and Hillview) in the vicinity of the NPM mine site. Monitoring was conducted to assess noise levels at four key receivers around the site resulting from NPM operations.

Attended noise monitoring was undertaken from the 8<sup>th</sup> to the 10<sup>th</sup> of March 2017 and unattended noise monitoring was undertaken from the 8<sup>th</sup> to the 15<sup>th</sup> of March 2017.

Attended monitoring was undertaken during favourable atmospheric conditions. Several measurements were impacted by non-NPM related noise, specifically, insect noise. Nevertheless, attended noise monitoring results indicate that noise emissions from the mine site comply with the development consent and project approval criteria.

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## 1. INTRODUCTION

ESP was commissioned by Northparkes Mines (NPM) to undertake an Environmental Noise Assessment during Quarter 1, 2017 as part of their regular noise monitoring program in accordance with Development Consent 06-0026.

This report presents:

- results of attended measurements from day, evening and night operation of the mine for the period from the 8<sup>th</sup> to the 10<sup>th</sup> of March 2017;
- results of unattended measurements from the 8<sup>th</sup> to the 15<sup>th</sup> of March 2017 and;
- an assessment of the results against Development Consent 06-0026 (DC 06-0026) requirements and the criteria described in Northparkes Mine Step Change Project Approval.

## 2. BACKGROUND

The NPM site is located approximately 27 kilometres NNW of the town of Parkes, NSW.

ESP was asked to conduct attended and unattended monitoring at four locations as per the following table.

Location name	Type
Hillview	Residential & farming
Hubberstone	Residential & farming
Milpose	Residential & farming
Lone Pine	Residential & farming

**Table 1: Monitoring location and type**

A map showing monitoring locations in relation to the mine site is presented in Appendix A of this report.

### 3. NOISE LIMITS

#### Noise Management Plan

NPM has implemented a Noise and Vibration Management Plan (NVMP) which requires noise to be monitored at key locations adjacent to the mine site.

The NVMP requires that attended noise monitoring be conducted once per quarter for three consecutive 15-minute periods at each monitoring location for the day, evening and night time periods. In addition, unattended noise monitoring must be conducted continuously for seven days per quarter.

#### Project Specific Criteria

According to DC 06-0026 and the Northparkes Mine Step Change Project Approval, the project specific criteria at each location are as follows:

Period		Project Specific Criteria dB*	
Day	0700 - 1800	$L_{Aeq(15min)}$	35
Evening	1800 – 2200	$L_{Aeq(15min)}$	35
Night	2200 – 0700	$L_{Aeq(15min)}$	35
		$L_{A1(1min)}$	45

Table 2: Project specific criteria for day, evening & night periods.

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\* Note: All noise measurements are “A-weighted” sound pressure level measurements, hence, the notation “dB” has been used in this report without the additional qualifier “(A)” for purposes of brevity and readability.

## 4. NOISE LEVEL MEASUREMENT

### Methodology - Equipment

Attended noise measurements were carried out using a Cirrus Class 1 sound level meter. Unattended noise measurement results were provided by NPM.

Calibration details are attached in Appendix B.

The equipment used is listed below:

Equipment	Model	Serial Number	Calibration due
Sound level meter (SLM)	Cirrus CR171C	GO66240	23/05/2018
SLM calibrator	Cirrus CR515	65189	31/03/2018

Table 3: Noise monitoring equipment details

Measurements were conducted in accordance with AS1055.1-1997 *Acoustics - Description and measurement of environmental noise - General procedures*.

### Methodology – Meteorological Conditions

The noise limits in PA 11\_0060 apply only in wind speeds up to 3m/s. Meteorological data from NPM's weather station, corresponding with the entire monitoring period, is attached in Appendix C.

It is noted that noise limits apply during relatively calm conditions (wind speeds up to 3 m/s equates to 10.8 km/h). Where wind speeds have exceeded this limit, measurements are marked as being not applicable using "NA". Comparison with the documented limit should only be made when measurement of wind speed conforms to the maximum allowable wind speed.

### Observations

The noise output from the mine site was found to be continuous. No adjustments were required to the measured noise level for intermittent, tonal or impulsive characteristics. Additionally, the measurement points were chosen so that no adjustment was required for reflection or indoor measurement.

It is noted that at various times during attended monitoring, extraneous noise sources, i.e. sources other than the mine, were the primary contributor to measured noise levels. Commonly, these noise sources include wildlife (e.g. birds, frogs and insects), livestock (e.g. sheep and cattle), road traffic, overhead aircraft, farm machinery and vegetation noise (i.e. rustling of foliage). Where possible, extraneous noise was excluded from the result either by pausing the sound level meter until the extraneous noise event had ceased (such as for traffic or aircraft noise) or by removing the extraneous noise via frequency analysis – i.e. subtracting the contribution to the overall sound pressure level at key frequencies not related to noise emissions from NPM.

Frequency analysis can only be utilised at frequencies where there is no overlap between the frequencies of NPM noise and extraneous noise. Peaks in the frequency spectrum of received noise are present but not caused by NPM noise (e.g. insect, frog and bird noise) at frequencies of approximately 2 kHz and above.

## Attended Noise Monitoring Results

Measurements conducted during excessive winds do not conform to the maximum wind speed requirements of PA11\_0060 and are not to be compared against the criteria. These levels are marked with the notation “NA” in the tables overleaf. Where noise levels have been adjusted due to the presence of extraneous noise such as insect or bird noise, these levels are marked with the notation “adj.”.

<b>Location</b>	<b>Date and Time</b>	<b><math>L_{A1}</math> dB</b>	<b><math>L_{A10}</math> dB</b>	<b><math>L_{Aeq}</math> dB</b>	<b><math>L_{A90}</math> dB</b>	<b>Compliance?</b>	<b>Notes</b>
<b>Milpose</b>	8/03/2017 16:00	40	30	<b>29</b>	23	Yes	Occasional low wind. Machinery from direction opposite to mine. Mine audible.
	8/03/2017 16:15	37	31	<b>29</b>	22	Yes	
	8/03/2017 16:30	39	33	<b>31</b>	25	Yes	
<b>Lone Pine</b>	8/03/2017 14:55	41	32	<b>30</b>	22	Yes	Occasional wind. Insect noise. Leaf rustling. Bird noise. Mine just audible.
	8/03/2017 15:10	38	35	<b>32</b>	25	Yes	
	8/03/2017 15:25	45	37	<b>33</b>	23	Yes	
<b>Hubberstone</b>	8/03/2017 14:00	43	35	<b>34</b>	29	Yes	Significant bird noise. Gusting wind towards end of measurement period. Mine inaudible.
	8/03/2017 14:15	42	36	<b>33</b>	27	Yes	
	8/03/2017 14:30	43	35	<b>32</b>	27	Yes	
<b>Hillview</b>	8/03/2017 13:15	41	37	<b>35</b>	28	Yes	Occasional low winds. Mine inaudible.
	8/03/2017 13:30	42	34	<b>33</b>	27	Yes	
	8/03/2017 13:45	41	35	<b>33</b>	26	Yes	

**Table 4: Daytime Attended Noise Results**

<b>Location</b>	<b>Date and Time</b>	$L_{A1}$ dB	$L_{A10}$ dB	$L_{Aeq}$ dB	$L_{A90}$ dB	<b>Compliance?</b>	<b>Notes</b>
<b>Milpose</b>	8/03/2017 18:00	39	33	<b>32</b>	25	Yes	No wind. Some insect & bird noise. Machinery noise from opposite direction to mine. Mine inaudible.
	8/03/2017 18:15	39	35	<b>34</b>	27	Yes	
	8/03/2017 18:30	39	33	<b>30</b>	25	Yes	
<b>Lone Pine</b>	9/03/2017 21:00	46	45	<b>28</b>	39	Yes (adj.)	Continuous insect noise necessitating adjustment. Dogs barking. Mine audible.
	9/03/2017 21:15	46	45	<b>28</b>	42	Yes (adj.)	
	9/03/2017 21:30	46	45	<b>28</b>	41	Yes (adj.)	
<b>Hubberstone</b>	9/03/2017 20:00	41	36	<b>33</b>	30	Yes	No wind. Continuous & periodically modulating low frequency noise audible (perhaps diesel water pump @ mine). Mine clearly audible.
	9/03/2017 20:15	37	34	<b>32</b>	30	Yes	
	9/03/2017 20:30	37	34	<b>33</b>	31	Yes	
<b>Hillview</b>	8/03/2017 18:55	36	32	<b>29</b>	23	Yes	No wind. Significant bird noise. Road traffic Noise from house. Mine inaudible.
	8/03/2017 19:10	42	36	<b>33</b>	25	Yes	
	8/03/2017 19:25	45	34	<b>33</b>	25	Yes	

**Table 5: Evening Attended Noise Results**

<b>Location</b>	<b>Date and Time</b>	<b><math>L_{A1}</math> dB</b>	<b><math>L_{A10}</math> dB</b>	<b><math>L_{Aeq}</math> dB</b>	<b><math>L_{A90}</math> dB</b>	<b>Compliance?</b>	<b>Notes</b>
<b>Milpose</b>	10/03/2017 0:50	<b>33</b>	27	<b>29</b>	23	Yes	
	10/03/2017 1:05	<b>32</b>	27	<b>26</b>	23	Yes	No wind. Mine audible.
	10/03/2017 1:20	<b>32</b>	28	<b>26</b>	23	Yes	
<b>Lone Pine</b>	9/03/2017 22:00	<b>43</b>	42	<b>41</b>	40	Yes (adj.)	Continuous insect noise necessitating adjustment. Dogs barking. Mine audible.
	9/03/2017 22:15	<b>43</b>	42	<b>41</b>	40	Yes (adj.)	
	9/03/2017 22:30	<b>44</b>	43	<b>42</b>	41	Yes (adj.)	
<b>Hubberstone</b>	9/03/2017 22:55	<b>39</b>	36	<b>34</b>	30	Yes	Alarm from mine audible. Mine audible.
	9/03/2017 23:10	<b>37</b>	34	<b>33</b>	30	Yes	
	9/03/2017 23:25	<b>38</b>	34	<b>31</b>	28	Yes	
<b>Hillview</b>	9/03/2017 23:55	<b>33</b>	30	<b>29</b>	27	Yes	No wind. Mine inaudible.
	10/03/2017 0:10	<b>34</b>	29	<b>28</b>	25	Yes	
	10/03/2017 0:25	<b>29</b>	26	<b>25</b>	24	Yes	

**Table 6: Night Attended Noise Results**

## Unattended Noise Monitoring Results

Noise levels were continuously monitored over a period of seven days from the 8<sup>th</sup> to the 15<sup>th</sup> of March. A summary, with average values tabled, is provided below and graphs of the full results are attached in Appendix D. These summarised levels include extraneous noise which cannot be excluded from the continuous monitoring conducted; the results do not include measurements where the wind speed exceeded three meters per second.

<b>Location</b>	<b><math>L_{Aeq\ (15min)}</math></b>			<b><math>L_{A1\ (1min)}</math></b>
	<b>Day</b>	<b>Evening</b>	<b>Night</b>	<b>Night</b>
<b>Hillview</b>	46	36	32	34
<b>Hubberstone</b>	44	32	31	34
<b>Lone Pine</b>	33	38	33	34
<b>Milpose</b>	43	32	29	30

Table 7: Summary of Unattended Noise Monitoring, 8/03/2017 - 15/03/2017.

## 5. DISCUSSION

### Attended Noise Monitoring

Attended monitoring during evening and night periods at Lone Pine was impacted by insect noise. Specifically, these measurements required adjustment due to insect noise that resulted in elevated noise levels in the 4kHz & 5kHz bands.

Measurements indicate compliance with the 15 minute  $L_{Aeq}$  limitation of 35 dB at all locations. This is despite noise from the mine being audible at each location at various times.

Measurements indicate compliance with the night limit of  $L_{A1}$  45 dB at all locations.

It is understood that the mine was operating as normal during the monitoring period.

Where possible, extraneous noise sources have been excluded from attended measurements by pausing the sound level meter when non-NPM sources predominate (e.g. passing traffic or aircraft) and/or subtracting the component of the frequency spectrum that is caused by non-NPM sources (e.g. wildlife noise, livestock noise or foliage noise). Extraneous noise sources may contribute as much as 15 to 20 dB to the overall measured noise levels.

### Unattended Noise Monitoring

In accordance with Project Approval 11\_0600, Appendix 5, Clause 3, "*attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent*". Specifically, unattended monitoring is therefore *not to be used* to evaluate compliance with the Project Approval criteria. Nonetheless, ESP notes that average night-time results from unattended monitoring indicated compliance with the  $L_{A1}$  45 dB limit at all locations.

Unattended noise measurements will invariably include noise levels that cannot be directly attributed to NPM. Road traffic, farm machinery, livestock, wildlife and air traffic are some of the noise sources that contribute to noise levels logged during unattended noise monitoring. Extraneous noise sources are expected to have a higher contribution during the day and evening period. It is also noted that there is an observable correlation between wind speed and recorded noise level evident in the graphs.

## 6. CONCLUSION

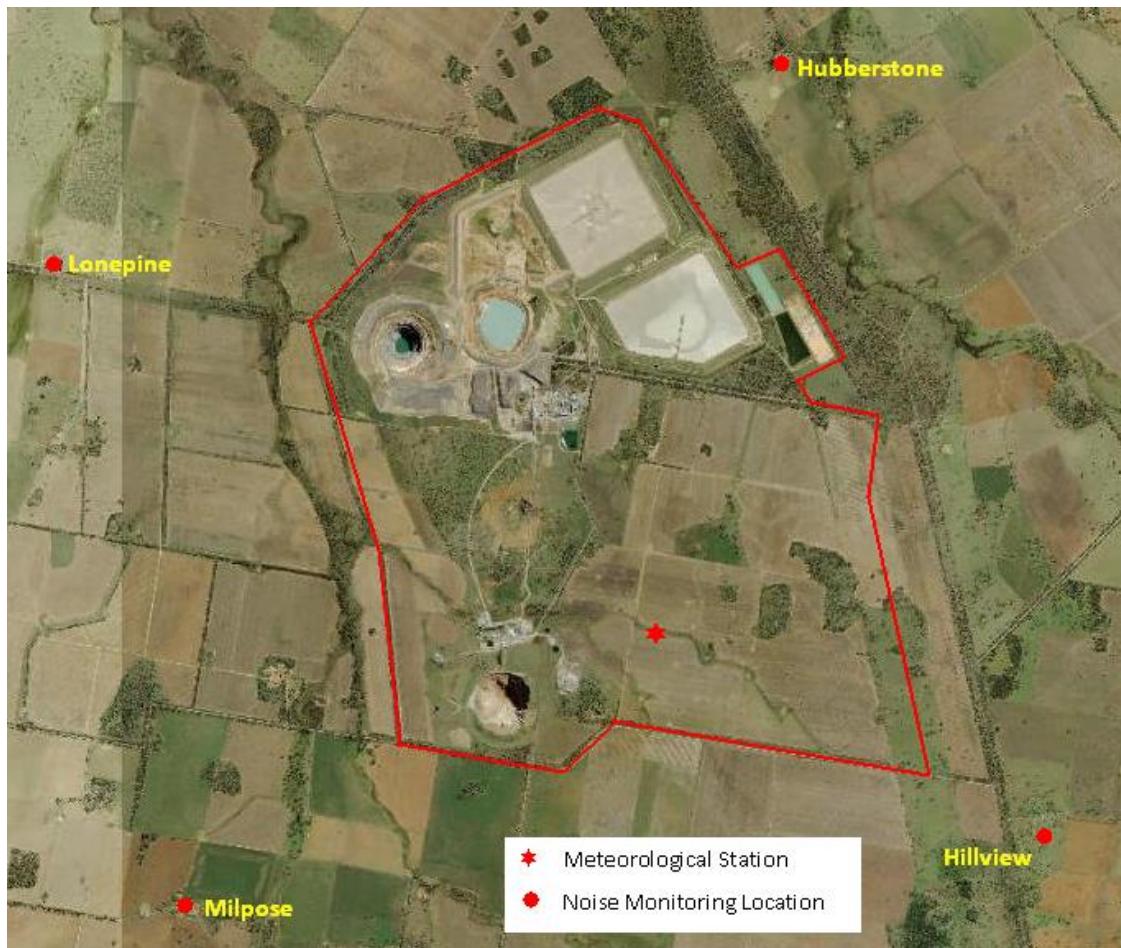
Environmental noise monitoring was conducted at four noise sensitive receptors around the Northparkes Mine site; attended monitoring was conducted from the 8<sup>th</sup> to the 10<sup>th</sup> of March 2017 and unattended monitoring was conducted from the 8<sup>th</sup> to the 15<sup>th</sup> of March 2017.

Attended noise monitoring during this round was conducted during generally favourable atmospheric conditions.

Attended noise monitoring results indicate noise emissions from the mine site comply with the development consent criteria.

Despite unattended monitoring invariably including extraneous noise, for the night period, the average unattended L<sub>A1(1min)</sub> results were below 45 dB and the average 15 minute L<sub>Aeq</sub> results were below 35 dB.

## Appendix A – Monitoring location map



## Appendix B – Equipment Calibration Details



Instrulabs Pty. Ltd.

## SOUND LEVEL METER CALIBRATION CERTIFICATE

Calibration Date : Monday, 23 May 2016

### Device and Calibration Information

Client : **Active Environmental Solutions**  
 2 Merchant Avenue  
 Thomastown  
 3074

Contact : **Jennie Culic, 03 9464 2300**

Meter : **Cirrus CR:171B (4GB), S/N: G066240, Class 1**  
 Firmware Revision: 2.5.1839

Preamp : **Cirrus, MV200F, s/n: 2335F**

Microphone : **Cirrus, MK224, s/n: 600538B**



### Laboratory Reference Equipment Used:

Brüel & Kjaer Acoustic Calibrator Type 4226, S/N: 2576010, Cal Due: 24/05/2016  
 Fluke 8846A Precision Multimeter, S/N: 2479018, Cal Due: 12/07/2016

### Test Environment (at start/at end):

23.7 °C, 1011.7 hPa, 47.3 %R.H. Acoustic stimuli for the calibration tests were generated by a Brüel & Kjaer 4226 multifunction acoustic calibrator. Electrical stimuli for the calibration tests were generated by a TTI 1241 Arbitrary Waveform Generator and signal levels were verified using a Fluke 8846A Voltmeter. All reference calibration artefacts have current NATA endorsed calibration documentation  
 23.6 °C, 1011.6 hPa, 47.3 %R.H.

### SUMMARY OF CERTIFIED RESULTS

Pass	IEC61672.3 cl 10 - Indication at the Check Frequenc	N/T	IEC61672.3 cl 17 - Linearity incl. the Range Control
Pass	IEC61672.3 cl 11 - Self Generated Noise	Pass	IEC61672.3 cl 18 - Toneburst Response
Pass	IEC61672.3 cl 12 - Frequency Weighting Acoustic	Pass	IEC61672.3 cl 19 - Peak C Sound Level
Pass	IEC61672.3 cl 13 - Electrical Frequency Weightings	Pass	IEC61672.3 cl 20 - Overload Indication
Pass	IEC61672.3 cl 14 - Frequency & Time Weightings	Pass	IEC61672.3 cl 21 - High-Level Stability
Pass	IEC61672.3 cl 15 - Long-Term Stability	Pass	AS/NZS 4476 cl 4.4 - Relative attenuation, 1/1 Oct
Pass	IEC61672.3 cl 16 - Level Linearity on the Ref. Range	Pass	AS/NZS 4476 cl 4.4 - Relative attenuation, 1/3 Oct

### STATEMENT OF CONFORMANCE

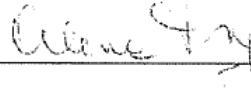
The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3 Ed. 2.0, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organization responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2 2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1 Ed. 2.0, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1 Ed. 2.0.

The tests, calibrations, or measurements covered by this document are traceable to Australian National Standards of Measurement. A "N/T" result means the device was not tested for compliance with this clause, and a "Unc" result means the measurement result lies within the range of our Uncertainty of Measurement. This certificate is issued without alteration or erasure. It may not be copied or reproduced except in full without the express written permission of the issuing laboratory.

Signature



Signature



Calibrated by Jason Dixon

Checked by Alena Fry

Lab manager, Approved Signatory

Admin Manager, Lab Assistant



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Report# C2537J2636

Accredited for compliance with ISO/IEC 17025:2005

Approved for issue by Erik Fry, 7th of April 2016. Document ID number: C013

 WORLD RECOGNISED  
ACCREDITATION

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**Instrulabs Pty. Ltd.**



## ACOUSTIC CALIBRATOR CALIBRATION CERTIFICATE

THIS IS TO CERTIFY THAT THE ACOUSTIC CALIBRATOR

MAKE : Cirrus

OWNED BY : Active Environmental Solutions

MODEL : CR515

Address: 2 Merchant Avenue

SERIAL : 65189

Thomastown VIC 3074

HAS BEEN CALIBRATED ON : 31-Mar-16

### SUMMARY

A sound level meter connected to a digital acquisition system is adjusted to a known reference sound pressure level, then the digital acquisition system records the frequency and sound pressure levels of the acoustic calibrator under test. All instruments used have current NATA endorsed calibration documentation

### CALIBRATION INSTRUMENTS USED

Rion NA-28 Sound Level Meter	s/n 01270691	Recalibration due 03-Feb-17
Brüel & Kjaer Acoustic Calibrator Type 4226	s/n 2576010	Recalibration due 24-May-16
NI USB-6221-BNC Multifunction DAQ	s/n 14E9DD2	Recalibration due 05-Aug-16

### CERTIFIED QUANTITIES

Frequency - AS IEC 60942-2004 clause B3.5	THD+N - AS IEC 60942-2004 clause B3.6
Limits $\pm$ 1%, Uncertainty $\pm$ 0.05%	Limits $\pm$ 3%, Uncertainty $\pm$ 0.8%
Frequency : 1000.4 Hz Pass	THD+N : 0.82 % Pass

### SPL - AS IEC 60942 clause B3.4.3.2

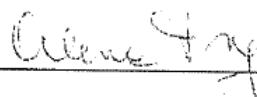
Limits  $\pm$  0.4dB, Uncertainty  $\pm$  0.2dB

Amplitude : 93.84 dB Pass

Signature \_\_\_\_\_



Signature \_\_\_\_\_



Calibrated by Jason Dixon

Checked by Alena Fry

Lab manager, Approved Signatory

Admin Manager, Lab Assistant

The tests, calibrations, or measurements covered by this document are traceable to Australian National Standards of Measurement. A "N/I" result means the device was not tested for compliance with this clause, and a "Unc" result means the measurement result lies within the range of our Uncertainty of Measurement. This certificate is issued without alteration or erasure. It may not be copied or reproduced except in full without the express written permission of the issuing laboratory.



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Approved for issue by Erik Fry, 28th of January 2012. Document ID number: C010

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## Appendix C – Weather Conditions during Monitoring Period

Note. Data provided by Northparkes Mine.

### Wind-Rose

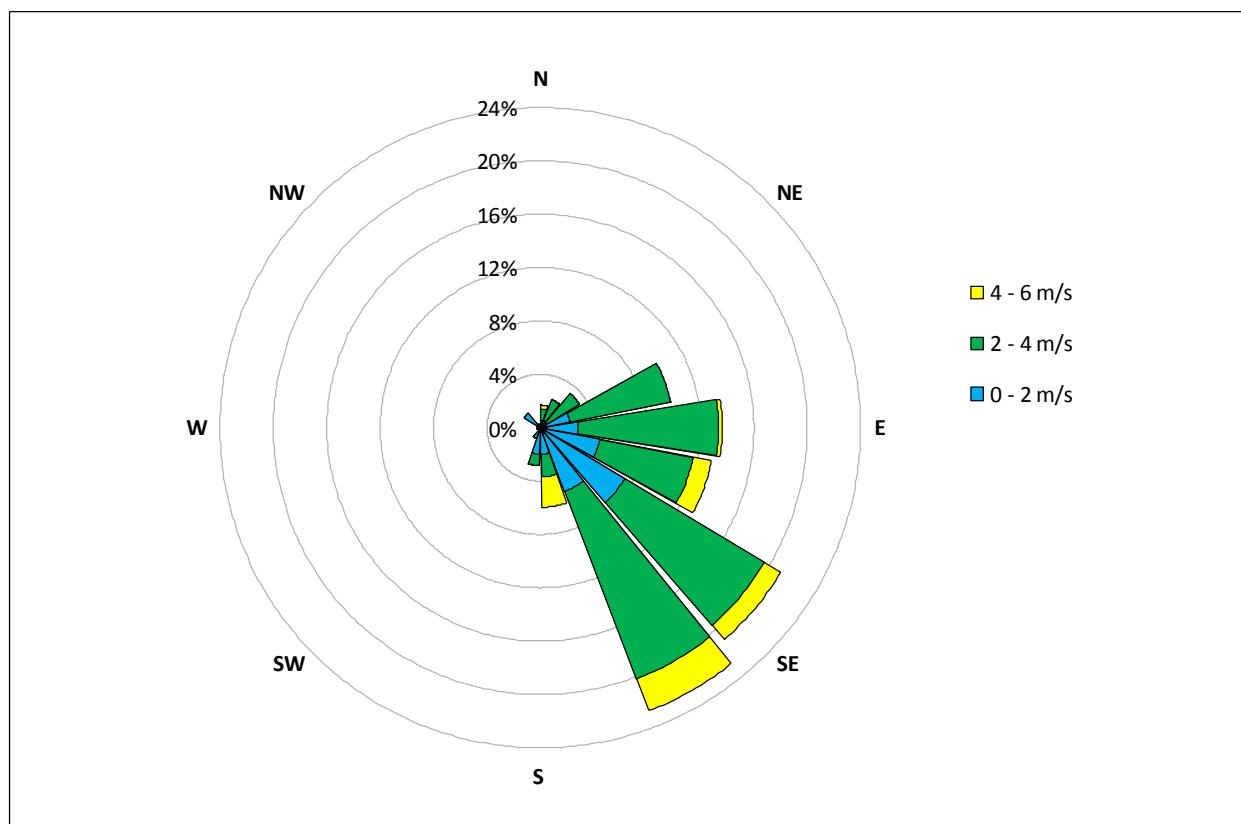


Figure 1 - Wind rose for period 8/03/2017 - 15/03/2017

## Tabulated Meteorological Conditions

Date & time	Wind speed (m/s)	Wind Direction (°)
8/03/2017 0:00	3	78
8/03/2017 0:10	3	78
8/03/2017 0:20	3	97
8/03/2017 0:30	2	96
8/03/2017 0:40	2	92
8/03/2017 0:50	2	90
8/03/2017 1:00	2	94
8/03/2017 1:10	2	83
8/03/2017 1:20	2	79
8/03/2017 1:30	2	79
8/03/2017 1:40	2	83
8/03/2017 1:50	1	116
8/03/2017 2:00	2	124
8/03/2017 2:10	2	85
8/03/2017 2:20	2	77
8/03/2017 2:30	2	77
8/03/2017 2:40	2	72
8/03/2017 2:50	2	116
8/03/2017 3:00	2	108
8/03/2017 3:10	2	100
8/03/2017 3:20	2	94
8/03/2017 3:30	3	97
8/03/2017 3:40	3	91
8/03/2017 3:50	3	94
8/03/2017 4:00	4	104
8/03/2017 4:10	3	104
8/03/2017 4:20	2	106
8/03/2017 4:30	3	107
8/03/2017 4:40	3	105
8/03/2017 4:50	3	106
8/03/2017 5:00	3	112
8/03/2017 5:10	1	126
8/03/2017 5:20	1	125
8/03/2017 5:30	2	141
8/03/2017 5:40	3	138
8/03/2017 5:50	3	140
8/03/2017 6:00	3	140
8/03/2017 6:10	3	144
8/03/2017 6:20	2	144
8/03/2017 6:30	2	143
8/03/2017 6:40	2	139
8/03/2017 6:50	2	136
8/03/2017 7:00	2	139
8/03/2017 7:10	3	138
8/03/2017 7:20	3	139
8/03/2017 7:30	4	138
8/03/2017 7:40	3	140
8/03/2017 7:50	3	139
8/03/2017 8:00	2	133
8/03/2017 8:10	3	122
8/03/2017 8:20	2	115
8/03/2017 8:30	2	118
8/03/2017 8:40	2	112

Date & time	Wind speed (m/s)	Wind Direction (°)
8/03/2017 8:50	2	4
8/03/2017 9:00	2	33
8/03/2017 9:10	3	42
8/03/2017 9:20	4	29
8/03/2017 9:30	4	17
8/03/2017 9:40	4	40
8/03/2017 9:50	2	40
8/03/2017 10:00	3	40
8/03/2017 10:10	2	17
8/03/2017 10:20	2	55
8/03/2017 10:30	2	32
8/03/2017 10:40	4	40
8/03/2017 10:50	3	3
8/03/2017 11:00	3	30
8/03/2017 11:10	2	59
8/03/2017 11:20	2	73
8/03/2017 11:30	2	109
8/03/2017 11:40	3	105
8/03/2017 11:50	2	66
8/03/2017 12:00	3	93
8/03/2017 12:10	2	140
8/03/2017 12:20	2	92
8/03/2017 12:30	2	154
8/03/2017 12:40	3	124
8/03/2017 12:50	2	22
8/03/2017 13:00	3	75
8/03/2017 13:10	3	134
8/03/2017 13:20	3	157
8/03/2017 13:30	3	140
8/03/2017 13:40	3	149
8/03/2017 13:50	4	133
8/03/2017 14:00	2	98
8/03/2017 14:10	2	130
8/03/2017 14:20	2	108
8/03/2017 14:30	2	77
8/03/2017 14:40	4	153
8/03/2017 14:50	2	194
8/03/2017 15:00	2	94
8/03/2017 15:10	3	63
8/03/2017 15:20	2	77
8/03/2017 15:30	3	163
8/03/2017 15:40	4	119
8/03/2017 15:50	3	100
8/03/2017 16:00	2	93
8/03/2017 16:10	4	120
8/03/2017 16:20	4	76
8/03/2017 16:30	3	66
8/03/2017 16:40	3	54
8/03/2017 16:50	4	95
8/03/2017 17:00	4	118
8/03/2017 17:10	5	102
8/03/2017 17:20	4	115
8/03/2017 17:30	4	93

Date & time	Wind speed (m/s)	Wind Direction (°)
8/03/2017 17:40	3	86
8/03/2017 17:50	5	102
8/03/2017 18:00	4	88
8/03/2017 18:10	3	94
8/03/2017 18:20	3	105
8/03/2017 18:30	2	91
8/03/2017 18:40	3	95
8/03/2017 18:50	3	91
8/03/2017 19:00	2	87
8/03/2017 19:10	2	81
8/03/2017 19:20	3	76
8/03/2017 19:30	3	71
8/03/2017 19:40	3	66
8/03/2017 19:50	3	71
8/03/2017 20:00	3	74
8/03/2017 20:10	3	76
8/03/2017 20:20	4	77
8/03/2017 20:30	4	73
8/03/2017 20:40	3	73
8/03/2017 20:50	3	72
8/03/2017 21:00	4	65
8/03/2017 21:10	3	66
8/03/2017 21:20	4	78
8/03/2017 21:30	4	90
8/03/2017 21:40	3	84
8/03/2017 21:50	3	90
8/03/2017 22:00	3	89
8/03/2017 22:10	4	82
8/03/2017 22:20	3	78
8/03/2017 22:30	3	92
8/03/2017 22:40	3	101
8/03/2017 22:50	3	102
8/03/2017 23:00	4	97
8/03/2017 23:10	4	88
8/03/2017 23:20	3	83
8/03/2017 23:30	2	83
8/03/2017 23:40	2	98
8/03/2017 23:50	2	99
9/03/2017 0:00	2	122
9/03/2017 0:10	3	129
9/03/2017 0:20	3	123
9/03/2017 0:30	3	126
9/03/2017 0:40	3	123
9/03/2017 0:50	3	128
9/03/2017 1:00	3	126
9/03/2017 1:10	3	138
9/03/2017 1:20	2	154
9/03/2017 1:30	3	151
9/03/2017 1:40	3	139
9/03/2017 1:50	3	133
9/03/2017 2:00	3	142
9/03/2017 2:10	2	146
9/03/2017 2:20	2	152
9/03/2017 2:30	2	139
9/03/2017 2:40	2	140
9/03/2017 2:50	1	140

Date & time	Wind speed (m/s)	Wind Direction (°)
9/03/2017 3:00	1	123
9/03/2017 3:10	2	124
9/03/2017 3:20	2	132
9/03/2017 3:30	2	150
9/03/2017 3:40	2	137
9/03/2017 3:50	2	144
9/03/2017 4:00	2	144
9/03/2017 4:10	2	134
9/03/2017 4:20	2	117
9/03/2017 4:30	2	133
9/03/2017 4:40	2	140
9/03/2017 4:50	2	146
9/03/2017 5:00	1	143
9/03/2017 5:10	2	123
9/03/2017 5:20	2	131
9/03/2017 5:30	2	127
9/03/2017 5:40	2	128
9/03/2017 5:50	3	144
9/03/2017 6:00	3	140
9/03/2017 6:10	3	149
9/03/2017 6:20	3	150
9/03/2017 6:30	3	150
9/03/2017 6:40	2	145
9/03/2017 6:50	2	138
9/03/2017 7:00	3	144
9/03/2017 7:10	3	143
9/03/2017 7:20	3	140
9/03/2017 7:30	3	143
9/03/2017 7:40	3	142
9/03/2017 7:50	4	139
9/03/2017 8:00	4	136
9/03/2017 8:10	4	137
9/03/2017 8:20	3	140
9/03/2017 8:30	3	119
9/03/2017 8:40	4	105
9/03/2017 8:50	3	92
9/03/2017 9:00	3	76
9/03/2017 9:10	2	82
9/03/2017 9:20	3	109
9/03/2017 9:30	2	102
9/03/2017 9:40	2	129
9/03/2017 9:50	2	119
9/03/2017 10:00	2	87
9/03/2017 10:10	2	136
9/03/2017 10:20	2	109
9/03/2017 10:30	2	11
9/03/2017 10:40	2	133
9/03/2017 10:50	3	95
9/03/2017 11:00	1	69
9/03/2017 11:10	3	170
9/03/2017 11:20	2	166
9/03/2017 11:30	3	103
9/03/2017 11:40	2	115
9/03/2017 11:50	3	202
9/03/2017 12:00	3	209
9/03/2017 12:10	4	157

Date & time	Wind speed (m/s)	Wind Direction (°)
9/03/2017 12:20	3	149
9/03/2017 12:30	3	161
9/03/2017 12:40	4	132
9/03/2017 12:50	2	74
9/03/2017 13:00	2	181
9/03/2017 13:10	3	198
9/03/2017 13:20	3	192
9/03/2017 13:30	4	156
9/03/2017 13:40	4	153
9/03/2017 13:50	1	91
9/03/2017 14:00	2	108
9/03/2017 14:10	3	102
9/03/2017 14:20	3	152
9/03/2017 14:30	3	152
9/03/2017 14:40	3	166
9/03/2017 14:50	4	157
9/03/2017 15:00	3	159
9/03/2017 15:10	4	137
9/03/2017 15:20	4	124
9/03/2017 15:30	4	164
9/03/2017 15:40	4	170
9/03/2017 15:50	4	163
9/03/2017 16:00	3	148
9/03/2017 16:10	5	164
9/03/2017 16:20	4	178
9/03/2017 16:30	4	161
9/03/2017 16:40	5	157
9/03/2017 16:50	5	148
9/03/2017 17:00	4	167
9/03/2017 17:10	5	175
9/03/2017 17:20	6	159
9/03/2017 17:30	5	154
9/03/2017 17:40	5	164
9/03/2017 17:50	5	153
9/03/2017 18:00	5	153
9/03/2017 18:10	5	149
9/03/2017 18:20	4	151
9/03/2017 18:30	4	150
9/03/2017 18:40	4	147
9/03/2017 18:50	3	144
9/03/2017 19:00	3	141
9/03/2017 19:10	3	145
9/03/2017 19:20	3	142
9/03/2017 19:30	3	140
9/03/2017 19:40	3	138
9/03/2017 19:50	3	136
9/03/2017 20:00	3	130
9/03/2017 20:10	3	134
9/03/2017 20:20	3	137
9/03/2017 20:30	3	135
9/03/2017 20:40	3	141
9/03/2017 20:50	3	145
9/03/2017 21:00	3	145
9/03/2017 21:10	3	141
9/03/2017 21:20	3	139
9/03/2017 21:30	3	140

Date & time	Wind speed (m/s)	Wind Direction (°)
9/03/2017 21:40	3	138
9/03/2017 21:50	3	136
9/03/2017 22:00	4	135
9/03/2017 22:10	3	126
9/03/2017 22:20	3	129
9/03/2017 22:30	3	133
9/03/2017 22:40	2	120
9/03/2017 22:50	2	130
9/03/2017 23:00	1	133
9/03/2017 23:10	2	123
9/03/2017 23:20	2	110
9/03/2017 23:30	2	86
9/03/2017 23:40	3	75
9/03/2017 23:50	3	66
10/03/2017 0:00	3	52
10/03/2017 0:10	3	37
10/03/2017 0:20	3	39
10/03/2017 0:30	3	40
10/03/2017 0:40	2	47
10/03/2017 0:50	2	76
10/03/2017 1:00	2	99
10/03/2017 1:10	2	104
10/03/2017 1:20	1	115
10/03/2017 1:30	1	116
10/03/2017 1:40	1	91
10/03/2017 1:50	1	100
10/03/2017 2:00	2	116
10/03/2017 2:10	1	151
10/03/2017 2:20	1	161
10/03/2017 2:30	2	164
10/03/2017 2:40	2	161
10/03/2017 2:50	2	154
10/03/2017 3:00	2	139
10/03/2017 3:10	1	129
10/03/2017 3:20	1	124
10/03/2017 3:30	1	134
10/03/2017 3:40	1	139
10/03/2017 3:50	1	162
10/03/2017 4:00	1	149
10/03/2017 4:10	1	169
10/03/2017 4:20	0	189
10/03/2017 4:30	1	162
10/03/2017 4:40	1	147
10/03/2017 4:50	2	153
10/03/2017 5:00	2	152
10/03/2017 5:10	3	148
10/03/2017 5:20	3	145
10/03/2017 5:30	2	143
10/03/2017 5:40	2	144
10/03/2017 5:50	2	149
10/03/2017 6:00	2	159
10/03/2017 6:10	1	187
10/03/2017 6:20	1	195
10/03/2017 6:30	1	180
10/03/2017 6:40	1	175
10/03/2017 6:50	1	143

Date & time	Wind speed (m/s)	Wind Direction (°)
10/03/2017 7:00	1	127
10/03/2017 7:10	0	122
10/03/2017 7:20	0	112
10/03/2017 7:30	0	104
10/03/2017 7:40	0	257
10/03/2017 7:50	0	204
10/03/2017 8:00	0	294
10/03/2017 8:10	1	312
10/03/2017 8:20	1	312
10/03/2017 8:30	1	335
10/03/2017 8:40	2	311
10/03/2017 8:50	1	319
10/03/2017 9:00	1	315
10/03/2017 9:10	1	18
10/03/2017 9:20	2	357
10/03/2017 9:30	1	38
10/03/2017 9:40	1	99
10/03/2017 9:50	2	40
10/03/2017 10:00	1	116
10/03/2017 10:10	2	194
10/03/2017 10:20	1	189
10/03/2017 10:30	2	129
10/03/2017 10:40	2	144
10/03/2017 10:50	4	110
10/03/2017 11:00	3	126
10/03/2017 11:10	4	139
10/03/2017 11:20	3	159
10/03/2017 11:30	4	153
10/03/2017 11:40	5	148
10/03/2017 11:50	5	158
10/03/2017 12:00	4	148
10/03/2017 12:10	5	157
10/03/2017 12:20	4	155
10/03/2017 12:30	5	154
10/03/2017 12:40	4	144
10/03/2017 12:50	4	174
10/03/2017 13:00	5	179
10/03/2017 13:10	5	172
10/03/2017 13:20	6	149
10/03/2017 13:30	5	153
10/03/2017 13:40	6	152
10/03/2017 13:50	5	149
10/03/2017 14:00	5	161
10/03/2017 14:10	5	162
10/03/2017 14:20	4	173
10/03/2017 14:30	5	151
10/03/2017 14:40	4	156
10/03/2017 14:50	6	164
10/03/2017 15:00	6	146
10/03/2017 15:10	5	155
10/03/2017 15:20	5	149
10/03/2017 15:30	5	155
10/03/2017 15:40	5	169
10/03/2017 15:50	5	154
10/03/2017 16:00	5	159
10/03/2017 16:10	4	185

Date & time	Wind speed (m/s)	Wind Direction (°)
10/03/2017 16:20	6	161
10/03/2017 16:30	4	163
10/03/2017 16:40	5	156
10/03/2017 16:50	5	170
10/03/2017 17:00	4	157
10/03/2017 17:10	5	161
10/03/2017 17:20	5	144
10/03/2017 17:30	4	143
10/03/2017 17:40	4	158
10/03/2017 17:50	5	145
10/03/2017 18:00	4	137
10/03/2017 18:10	3	146
10/03/2017 18:20	3	164
10/03/2017 18:30	2	177
10/03/2017 18:40	2	186
10/03/2017 18:50	1	181
10/03/2017 19:00	1	171
10/03/2017 19:10	1	165
10/03/2017 19:20	1	140
10/03/2017 19:30	1	145
10/03/2017 19:40	2	146
10/03/2017 19:50	2	130
10/03/2017 20:00	2	128
10/03/2017 20:10	1	134
10/03/2017 20:20	1	135
10/03/2017 20:30	1	124
10/03/2017 20:40	1	140
10/03/2017 20:50	2	131
10/03/2017 21:00	1	109
10/03/2017 21:10	1	30
10/03/2017 21:20	1	1
10/03/2017 21:30	0	15
10/03/2017 21:40	0	101
10/03/2017 21:50	0	105
10/03/2017 22:00	1	195
10/03/2017 22:10	1	212
10/03/2017 22:20	1	202
10/03/2017 22:30	0	198
10/03/2017 22:40	0	206
10/03/2017 22:50	1	135
10/03/2017 23:00	3	81
10/03/2017 23:10	1	89
10/03/2017 23:20	0	0
10/03/2017 23:30	1	288
10/03/2017 23:40	1	226
10/03/2017 23:50	1	251
11/03/2017 0:00	1	277
11/03/2017 0:10	1	306
11/03/2017 0:20	1	306
11/03/2017 0:30	2	325
11/03/2017 0:40	1	312
11/03/2017 0:50	0	0
11/03/2017 1:00	0	0
11/03/2017 1:10	0	0
11/03/2017 1:20	0	0
11/03/2017 1:30	0	88

Date & time	Wind speed (m/s)	Wind Direction (°)
11/03/2017 1:40	0	0
11/03/2017 1:50	0	92
11/03/2017 2:00	0	80
11/03/2017 2:10	0	0
11/03/2017 2:20	0	0
11/03/2017 2:30	0	112
11/03/2017 2:40	1	110
11/03/2017 2:50	0	5
11/03/2017 3:00	2	327
11/03/2017 3:10	2	320
11/03/2017 3:20	2	323
11/03/2017 3:30	1	34
11/03/2017 3:40	1	85
11/03/2017 3:50	0	52
11/03/2017 4:00	0	23
11/03/2017 4:10	0	77
11/03/2017 4:20	0	99
11/03/2017 4:30	1	95
11/03/2017 4:40	1	89
11/03/2017 4:50	2	88
11/03/2017 5:00	1	82
11/03/2017 5:10	1	103
11/03/2017 5:20	1	111
11/03/2017 5:30	1	104
11/03/2017 5:40	1	91
11/03/2017 5:50	0	94
11/03/2017 6:00	0	109
11/03/2017 6:10	0	105
11/03/2017 6:20	1	104
11/03/2017 6:30	1	100
11/03/2017 6:40	0	137
11/03/2017 6:50	0	0
11/03/2017 7:00	0	146
11/03/2017 7:10	1	214
11/03/2017 7:20	0	227
11/03/2017 7:30	0	233
11/03/2017 7:40	0	292
11/03/2017 7:50	1	287
11/03/2017 8:00	2	279
11/03/2017 8:10	1	309
11/03/2017 8:20	2	305
11/03/2017 8:30	3	316
11/03/2017 8:40	2	324
11/03/2017 8:50	2	309
11/03/2017 9:00	2	323
11/03/2017 9:10	2	318
11/03/2017 9:20	2	312
11/03/2017 9:30	2	302
11/03/2017 9:40	2	303
11/03/2017 9:50	2	306
11/03/2017 10:00	3	320
11/03/2017 10:10	2	341
11/03/2017 10:20	2	313
11/03/2017 10:30	4	326
11/03/2017 10:40	2	356
11/03/2017 10:50	2	346

Date & time	Wind speed (m/s)	Wind Direction (°)
11/03/2017 11:00	3	5
11/03/2017 11:10	2	343
11/03/2017 11:20	1	272
11/03/2017 11:30	2	338
11/03/2017 11:40	3	348
11/03/2017 11:50	3	15
11/03/2017 12:00	2	313
11/03/2017 12:10	3	276
11/03/2017 12:20	3	255
11/03/2017 12:30	3	290
11/03/2017 12:40	2	262
11/03/2017 12:50	1	328
11/03/2017 13:00	3	346
11/03/2017 13:10	2	280
11/03/2017 13:20	2	264
11/03/2017 13:30	2	202
11/03/2017 13:40	2	205
11/03/2017 13:50	3	255
11/03/2017 14:00	3	257
11/03/2017 14:10	2	214
11/03/2017 14:20	2	275
11/03/2017 14:30	3	214
11/03/2017 14:40	3	181
11/03/2017 14:50	2	163
11/03/2017 15:00	2	87
11/03/2017 15:10	2	175
11/03/2017 15:20	2	211
11/03/2017 15:30	2	188
11/03/2017 15:40	2	256
11/03/2017 15:50	2	243
11/03/2017 16:00	1	305
11/03/2017 16:10	2	228
11/03/2017 16:20	1	287
11/03/2017 16:30	2	148
11/03/2017 16:40	3	155
11/03/2017 16:50	2	156
11/03/2017 17:00	3	154
11/03/2017 17:10	2	165
11/03/2017 17:20	3	163
11/03/2017 17:30	3	158
11/03/2017 17:40	1	119
11/03/2017 17:50	0	73
11/03/2017 18:00	1	170
11/03/2017 18:10	2	147
11/03/2017 18:20	2	137
11/03/2017 18:30	2	133
11/03/2017 18:40	1	134
11/03/2017 18:50	1	106
11/03/2017 19:00	0	98
11/03/2017 19:10	0	89
11/03/2017 19:20	0	0
11/03/2017 19:30	0	140
11/03/2017 19:40	0	107
11/03/2017 19:50	1	62
11/03/2017 20:00	1	62
11/03/2017 20:10	1	56

Date & time	Wind speed (m/s)	Wind Direction (°)
11/03/2017 20:20	0	21
11/03/2017 20:30	1	336
11/03/2017 20:40	2	339
11/03/2017 20:50	2	6
11/03/2017 21:00	2	18
11/03/2017 21:10	2	29
11/03/2017 21:20	1	14
11/03/2017 21:30	3	17
11/03/2017 21:40	3	32
11/03/2017 21:50	1	14
11/03/2017 22:00	0	4
11/03/2017 22:10	1	343
11/03/2017 22:20	1	13
11/03/2017 22:30	1	39
11/03/2017 22:40	1	51
11/03/2017 22:50	1	0
11/03/2017 23:00	1	1
11/03/2017 23:10	1	14
11/03/2017 23:20	2	1
11/03/2017 23:30	2	10
11/03/2017 23:40	1	351
11/03/2017 23:50	1	343
12/03/2017 0:00	1	1
12/03/2017 0:10	1	6
12/03/2017 0:20	1	24
12/03/2017 0:30	1	29
12/03/2017 0:40	1	20
12/03/2017 0:50	1	13
12/03/2017 1:00	2	22
12/03/2017 1:10	3	26
12/03/2017 1:20	3	34
12/03/2017 1:30	3	27
12/03/2017 1:40	2	8
12/03/2017 1:50	2	12
12/03/2017 2:00	2	37
12/03/2017 2:10	2	38
12/03/2017 2:20	3	34
12/03/2017 2:30	3	29
12/03/2017 2:40	3	18
12/03/2017 2:50	3	15
12/03/2017 3:00	2	5
12/03/2017 3:10	2	4
12/03/2017 3:20	2	15
12/03/2017 3:30	2	16
12/03/2017 3:40	2	18
12/03/2017 3:50	3	19
12/03/2017 4:00	2	10
12/03/2017 4:10	2	13
12/03/2017 4:20	2	17
12/03/2017 4:30	2	17
12/03/2017 4:40	3	17
12/03/2017 4:50	3	22
12/03/2017 5:00	3	27
12/03/2017 5:10	3	24
12/03/2017 5:20	2	17
12/03/2017 5:30	3	25

Date & time	Wind speed (m/s)	Wind Direction (°)
12/03/2017 5:40	2	21
12/03/2017 5:50	2	20
12/03/2017 6:00	2	18
12/03/2017 6:10	3	20
12/03/2017 6:20	2	16
12/03/2017 6:30	3	17
12/03/2017 6:40	2	11
12/03/2017 6:50	3	17
12/03/2017 7:00	2	15
12/03/2017 7:10	2	6
12/03/2017 7:20	3	2
12/03/2017 7:30	3	360
12/03/2017 7:40	3	351
12/03/2017 7:50	4	351
12/03/2017 8:00	5	351
12/03/2017 8:10	5	340
12/03/2017 8:20	6	330
12/03/2017 8:30	7	330
12/03/2017 8:40	7	330
12/03/2017 8:50	7	333
12/03/2017 9:00	7	326
12/03/2017 9:10	8	331
12/03/2017 9:20	7	327
12/03/2017 9:30	8	322
12/03/2017 9:40	7	323
12/03/2017 9:50	7	329
12/03/2017 10:00	7	319
12/03/2017 10:10	9	331
12/03/2017 10:20	8	319
12/03/2017 10:30	8	318
12/03/2017 10:40	8	326
12/03/2017 10:50	8	321
12/03/2017 11:00	9	313
12/03/2017 11:10	7	315
12/03/2017 11:20	8	325
12/03/2017 11:30	7	316
12/03/2017 11:40	8	323
12/03/2017 11:50	8	308
12/03/2017 12:00	8	305
12/03/2017 12:10	8	324
12/03/2017 12:20	7	314
12/03/2017 12:30	7	304
12/03/2017 12:40	7	327
12/03/2017 12:50	7	324
12/03/2017 13:00	7	326
12/03/2017 13:10	6	323
12/03/2017 13:20	7	324
12/03/2017 13:30	7	333
12/03/2017 13:40	8	330
12/03/2017 13:50	6	329
12/03/2017 14:00	7	320
12/03/2017 14:10	7	319
12/03/2017 14:20	7	320
12/03/2017 14:30	6	316
12/03/2017 14:40	8	338
12/03/2017 14:50	8	334

Date & time	Wind speed (m/s)	Wind Direction (°)
12/03/2017 15:00	7	335
12/03/2017 15:10	7	341
12/03/2017 15:20	8	327
12/03/2017 15:30	7	338
12/03/2017 15:40	7	346
12/03/2017 15:50	7	330
12/03/2017 16:00	6	321
12/03/2017 16:10	8	327
12/03/2017 16:20	6	320
12/03/2017 16:30	7	323
12/03/2017 16:40	6	322
12/03/2017 16:50	7	325
12/03/2017 17:00	7	330
12/03/2017 17:10	6	324
12/03/2017 17:20	5	331
12/03/2017 17:30	4	325
12/03/2017 17:40	4	334
12/03/2017 17:50	4	335
12/03/2017 18:00	3	331
12/03/2017 18:10	4	329
12/03/2017 18:20	4	325
12/03/2017 18:30	3	326
12/03/2017 18:40	3	326
12/03/2017 18:50	3	326
12/03/2017 19:00	2	335
12/03/2017 19:10	2	346
12/03/2017 19:20	2	359
12/03/2017 19:30	2	356
12/03/2017 19:40	1	12
12/03/2017 19:50	2	11
12/03/2017 20:00	2	10
12/03/2017 20:10	2	20
12/03/2017 20:20	4	74
12/03/2017 20:30	8	185
12/03/2017 20:40	10	178
12/03/2017 20:50	11	178
12/03/2017 21:00	9	177
12/03/2017 21:10	9	176
12/03/2017 21:20	8	161
12/03/2017 21:30	9	155
12/03/2017 21:40	9	168
12/03/2017 21:50	9	157
12/03/2017 22:00	9	165
12/03/2017 22:10	8	171
12/03/2017 22:20	8	168
12/03/2017 22:30	6	171
12/03/2017 22:40	5	170
12/03/2017 22:50	7	159
12/03/2017 23:00	6	151
12/03/2017 23:10	6	140
12/03/2017 23:20	6	138
12/03/2017 23:30	6	135
12/03/2017 23:40	7	124
12/03/2017 23:50	7	126
13/03/2017 0:00	6	119
13/03/2017 0:10	6	112

Date & time	Wind speed (m/s)	Wind Direction (°)
13/03/2017 0:20	8	113
13/03/2017 0:30	8	107
13/03/2017 0:40	6	84
13/03/2017 0:50	7	100
13/03/2017 1:00	6	101
13/03/2017 1:10	6	92
13/03/2017 1:20	6	94
13/03/2017 1:30	7	87
13/03/2017 1:40	8	86
13/03/2017 1:50	7	79
13/03/2017 2:00	8	82
13/03/2017 2:10	8	82
13/03/2017 2:20	8	82
13/03/2017 2:30	8	78
13/03/2017 2:40	8	80
13/03/2017 2:50	7	79
13/03/2017 3:00	7	81
13/03/2017 3:10	6	77
13/03/2017 3:20	6	77
13/03/2017 3:30	6	78
13/03/2017 3:40	4	81
13/03/2017 3:50	4	86
13/03/2017 4:00	5	80
13/03/2017 4:10	6	64
13/03/2017 4:20	5	40
13/03/2017 4:30	5	14
13/03/2017 4:40	4	348
13/03/2017 4:50	4	236
13/03/2017 5:00	4	187
13/03/2017 5:10	2	113
13/03/2017 5:20	1	18
13/03/2017 5:30	3	83
13/03/2017 5:40	6	60
13/03/2017 5:50	6	57
13/03/2017 6:00	8	62
13/03/2017 6:10	7	60
13/03/2017 6:20	5	56
13/03/2017 6:30	5	65
13/03/2017 6:40	4	67
13/03/2017 6:50	5	65
13/03/2017 7:00	5	39
13/03/2017 7:10	6	18
13/03/2017 7:20	4	44
13/03/2017 7:30	3	40
13/03/2017 7:40	3	26
13/03/2017 7:50	4	49
13/03/2017 8:00	5	56
13/03/2017 8:10	5	79
13/03/2017 8:20	6	51
13/03/2017 8:30	5	52
13/03/2017 8:40	5	55
13/03/2017 8:50	7	35
13/03/2017 9:00	9	31
13/03/2017 9:10	8	36
13/03/2017 9:20	7	41
13/03/2017 9:30	9	19

Date & time	Wind speed (m/s)	Wind Direction (°)
13/03/2017 9:40	9	76
13/03/2017 9:50	8	86
13/03/2017 10:00	6	88
13/03/2017 10:10	7	80
13/03/2017 10:20	4	114
13/03/2017 10:30	6	216
13/03/2017 10:40	5	147
13/03/2017 10:50	5	100
13/03/2017 11:00	5	98
13/03/2017 11:10	5	85
13/03/2017 11:20	5	103
13/03/2017 11:30	5	97
13/03/2017 11:40	4	103
13/03/2017 11:50	4	104
13/03/2017 12:00	6	108
13/03/2017 12:10	5	114
13/03/2017 12:20	3	155
13/03/2017 12:30	4	187
13/03/2017 12:40	6	133
13/03/2017 12:50	7	122
13/03/2017 13:00	5	115
13/03/2017 13:10	6	145
13/03/2017 13:20	3	151
13/03/2017 13:30	4	126
13/03/2017 13:40	8	98
13/03/2017 13:50	8	101
13/03/2017 14:00	7	99
13/03/2017 14:10	5	78
13/03/2017 14:20	8	91
13/03/2017 14:30	9	86
13/03/2017 14:40	9	88
13/03/2017 14:50	9	98
13/03/2017 15:00	9	91
13/03/2017 15:10	8	94
13/03/2017 15:20	10	113
13/03/2017 15:30	12	113
13/03/2017 15:40	12	109
13/03/2017 15:50	11	100
13/03/2017 16:00	11	104
13/03/2017 16:10	11	102
13/03/2017 16:20	10	102
13/03/2017 16:30	9	98
13/03/2017 16:40	8	102
13/03/2017 16:50	5	80
13/03/2017 17:00	5	60
13/03/2017 17:10	7	73
13/03/2017 17:20	5	87
13/03/2017 17:30	4	61
13/03/2017 17:40	6	300
13/03/2017 17:50	5	319
13/03/2017 18:00	1	36
13/03/2017 18:10	1	278
13/03/2017 18:20	1	177
13/03/2017 18:30	2	177
13/03/2017 18:40	3	194
13/03/2017 18:50	4	128

Date & time	Wind speed (m/s)	Wind Direction (°)
13/03/2017 19:00	4	105
13/03/2017 19:10	4	81
13/03/2017 19:20	6	68
13/03/2017 19:30	4	44
13/03/2017 19:40	6	50
13/03/2017 19:50	6	71
13/03/2017 20:00	7	85
13/03/2017 20:10	6	75
13/03/2017 20:20	8	80
13/03/2017 20:30	9	79
13/03/2017 20:40	9	83
13/03/2017 20:50	9	85
13/03/2017 21:00	10	84
13/03/2017 21:10	10	85
13/03/2017 21:20	9	85
13/03/2017 21:30	8	83
13/03/2017 21:40	7	83
13/03/2017 21:50	7	87
13/03/2017 22:00	6	79
13/03/2017 22:10	4	65
13/03/2017 22:20	4	60
13/03/2017 22:30	2	26
13/03/2017 22:40	3	50
13/03/2017 22:50	4	68
13/03/2017 23:00	5	76
13/03/2017 23:10	3	73
13/03/2017 23:20	2	66
13/03/2017 23:30	3	38
13/03/2017 23:40	6	55
13/03/2017 23:50	5	53
14/03/2017 0:00	4	60
14/03/2017 0:10	3	78
14/03/2017 0:20	2	88
14/03/2017 0:30	2	115
14/03/2017 0:40	2	87
14/03/2017 0:50	2	64
14/03/2017 1:00	4	67
14/03/2017 1:10	3	64
14/03/2017 1:20	3	70
14/03/2017 1:30	3	66
14/03/2017 1:40	3	54
14/03/2017 1:50	2	63
14/03/2017 2:00	3	108
14/03/2017 2:10	2	146
14/03/2017 2:20	1	174
14/03/2017 2:30	1	145
14/03/2017 2:40	2	124
14/03/2017 2:50	2	150
14/03/2017 3:00	3	159
14/03/2017 3:10	4	156
14/03/2017 3:20	2	159
14/03/2017 3:30	1	193
14/03/2017 3:40	1	184
14/03/2017 3:50	1	195
14/03/2017 4:00	2	243
14/03/2017 4:10	2	222

Date & time	Wind speed (m/s)	Wind Direction (°)
14/03/2017 4:20	2	222
14/03/2017 4:30	2	182
14/03/2017 4:40	2	155
14/03/2017 4:50	3	128
14/03/2017 5:00	4	119
14/03/2017 5:10	2	108
14/03/2017 5:20	1	154
14/03/2017 5:30	2	169
14/03/2017 5:40	3	163
14/03/2017 5:50	3	153
14/03/2017 6:00	2	137
14/03/2017 6:10	2	134
14/03/2017 6:20	2	130
14/03/2017 6:30	3	128
14/03/2017 6:40	2	125
14/03/2017 6:50	2	142
14/03/2017 7:00	3	145
14/03/2017 7:10	2	125
14/03/2017 7:20	1	22
14/03/2017 7:30	1	282
14/03/2017 7:40	2	277
14/03/2017 7:50	1	247
14/03/2017 8:00	1	127
14/03/2017 8:10	2	110
14/03/2017 8:20	2	108
14/03/2017 8:30	2	80
14/03/2017 8:40	4	58
14/03/2017 8:50	5	58
14/03/2017 9:00	5	57
14/03/2017 9:10	5	52
14/03/2017 9:20	6	46
14/03/2017 9:30	6	40
14/03/2017 9:40	7	41
14/03/2017 9:50	7	37
14/03/2017 10:00	7	39
14/03/2017 10:10	7	39
14/03/2017 10:20	6	47
14/03/2017 10:30	7	46
14/03/2017 10:40	6	42
14/03/2017 10:50	6	58
14/03/2017 11:00	5	49
14/03/2017 11:10	5	42
14/03/2017 11:20	7	45
14/03/2017 11:30	6	34
14/03/2017 11:40	6	36
14/03/2017 11:50	6	27
14/03/2017 12:00	7	33
14/03/2017 12:10	6	21
14/03/2017 12:20	8	33
14/03/2017 12:30	7	31
14/03/2017 12:40	7	32
14/03/2017 12:50	8	27
14/03/2017 13:00	8	37
14/03/2017 13:10	7	28
14/03/2017 13:20	7	27
14/03/2017 13:30	7	28

Date & time	Wind speed (m/s)	Wind Direction (°)
14/03/2017 13:40	6	36
14/03/2017 13:50	6	46
14/03/2017 14:00	6	47
14/03/2017 14:10	5	28
14/03/2017 14:20	5	44
14/03/2017 14:30	4	19
14/03/2017 14:40	5	17
14/03/2017 14:50	5	34
14/03/2017 15:00	5	27
14/03/2017 15:10	5	29
14/03/2017 15:20	6	3
14/03/2017 15:30	6	357
14/03/2017 15:40	6	352
14/03/2017 15:50	8	357
14/03/2017 16:00	8	48
14/03/2017 16:10	10	75
14/03/2017 16:20	8	87
14/03/2017 16:30	6	95
14/03/2017 16:40	5	99
14/03/2017 16:50	3	78
14/03/2017 17:00	4	81
14/03/2017 17:10	3	78
14/03/2017 17:20	3	56
14/03/2017 17:30	3	19
14/03/2017 17:40	2	0
14/03/2017 17:50	0	329
14/03/2017 18:00	1	154
14/03/2017 18:10	1	116
14/03/2017 18:20	2	136
14/03/2017 18:30	1	104
14/03/2017 18:40	1	93
14/03/2017 18:50	1	91
14/03/2017 19:00	1	79
14/03/2017 19:10	1	80
14/03/2017 19:20	1	52
14/03/2017 19:30	1	44
14/03/2017 19:40	1	96
14/03/2017 19:50	1	120
14/03/2017 20:00	2	116
14/03/2017 20:10	3	100
14/03/2017 20:20	3	54
14/03/2017 20:30	3	57
14/03/2017 20:40	2	73
14/03/2017 20:50	3	57
14/03/2017 21:00	3	59
14/03/2017 21:10	3	61
14/03/2017 21:20	2	45
14/03/2017 21:30	2	64
14/03/2017 21:40	2	64
14/03/2017 21:50	1	39
14/03/2017 22:00	1	54
14/03/2017 22:10	2	71
14/03/2017 22:20	2	84
14/03/2017 22:30	1	156
14/03/2017 22:40	1	152
14/03/2017 22:50	2	75

Date & time	Wind speed (m/s)	Wind Direction (°)
14/03/2017 23:00	3	66
14/03/2017 23:10	4	58
14/03/2017 23:20	4	66
14/03/2017 23:30	3	68
14/03/2017 23:40	4	72
14/03/2017 23:50	5	78
15/03/2017 0:00	5	76
15/03/2017 0:10	5	67
15/03/2017 0:20	5	66
15/03/2017 0:30	5	64
15/03/2017 0:40	4	72
15/03/2017 0:50	2	67
15/03/2017 1:00	2	59
15/03/2017 1:10	2	46
15/03/2017 1:20	3	51
15/03/2017 1:30	5	52
15/03/2017 1:40	5	53
15/03/2017 1:50	5	56
15/03/2017 2:00	5	56
15/03/2017 2:10	5	55
15/03/2017 2:20	5	53
15/03/2017 2:30	4	42
15/03/2017 2:40	4	43
15/03/2017 2:50	2	27
15/03/2017 3:00	1	0
15/03/2017 3:10	1	31
15/03/2017 3:20	2	48
15/03/2017 3:30	3	55
15/03/2017 3:40	3	45
15/03/2017 3:50	4	47
15/03/2017 4:00	3	42
15/03/2017 4:10	2	41
15/03/2017 4:20	4	52
15/03/2017 4:30	3	49
15/03/2017 4:40	3	48
15/03/2017 4:50	2	55
15/03/2017 5:00	2	57
15/03/2017 5:10	3	53
15/03/2017 5:20	3	45
15/03/2017 5:30	3	36
15/03/2017 5:40	4	49
15/03/2017 5:50	4	51
15/03/2017 6:00	5	55
15/03/2017 6:10	5	50
15/03/2017 6:20	5	46
15/03/2017 6:30	5	48
15/03/2017 6:40	4	47
15/03/2017 6:50	4	47
15/03/2017 7:00	4	38
15/03/2017 7:10	4	25
15/03/2017 7:20	4	32
15/03/2017 7:30	5	36
15/03/2017 7:40	5	34
15/03/2017 7:50	4	40
15/03/2017 8:00	4	39
15/03/2017 8:10	4	41

Date & time	Wind speed (m/s)	Wind Direction (°)
15/03/2017 8:20	5	39
15/03/2017 8:30	6	43
15/03/2017 8:40	5	37
15/03/2017 8:50	5	44
15/03/2017 9:00	6	35
15/03/2017 9:10	6	35
15/03/2017 9:20	6	40
15/03/2017 9:30	6	50
15/03/2017 9:40	6	43
15/03/2017 9:50	6	38
15/03/2017 10:00	6	38
15/03/2017 10:10	7	32
15/03/2017 10:20	7	26
15/03/2017 10:30	7	35
15/03/2017 10:40	7	43
15/03/2017 10:50	7	43
15/03/2017 11:00	6	28
15/03/2017 11:10	6	33
15/03/2017 11:20	6	49
15/03/2017 11:30	6	38
15/03/2017 11:40	5	45
15/03/2017 11:50	7	28
15/03/2017 12:00	6	28
15/03/2017 12:10	6	16
15/03/2017 12:20	6	21
15/03/2017 12:30	6	34
15/03/2017 12:40	6	32
15/03/2017 12:50	6	21
15/03/2017 13:00	6	51
15/03/2017 13:10	6	39
15/03/2017 13:20	6	36
15/03/2017 13:30	6	39
15/03/2017 13:40	6	37
15/03/2017 13:50	6	31
15/03/2017 14:00	6	25
15/03/2017 14:10	6	49
15/03/2017 14:20	7	46
15/03/2017 14:30	5	35
15/03/2017 14:40	6	40
15/03/2017 14:50	6	49
15/03/2017 15:00	5	60
15/03/2017 15:10	6	33
15/03/2017 15:20	6	53
15/03/2017 15:30	5	50
15/03/2017 15:40	5	36
15/03/2017 15:50	5	54
15/03/2017 16:00	5	41
15/03/2017 16:10	5	51
15/03/2017 16:20	5	48
15/03/2017 16:30	6	31
15/03/2017 16:40	6	28
15/03/2017 16:50	5	47
15/03/2017 17:00	6	32
15/03/2017 17:10	6	37
15/03/2017 17:20	6	41
15/03/2017 17:30	5	42

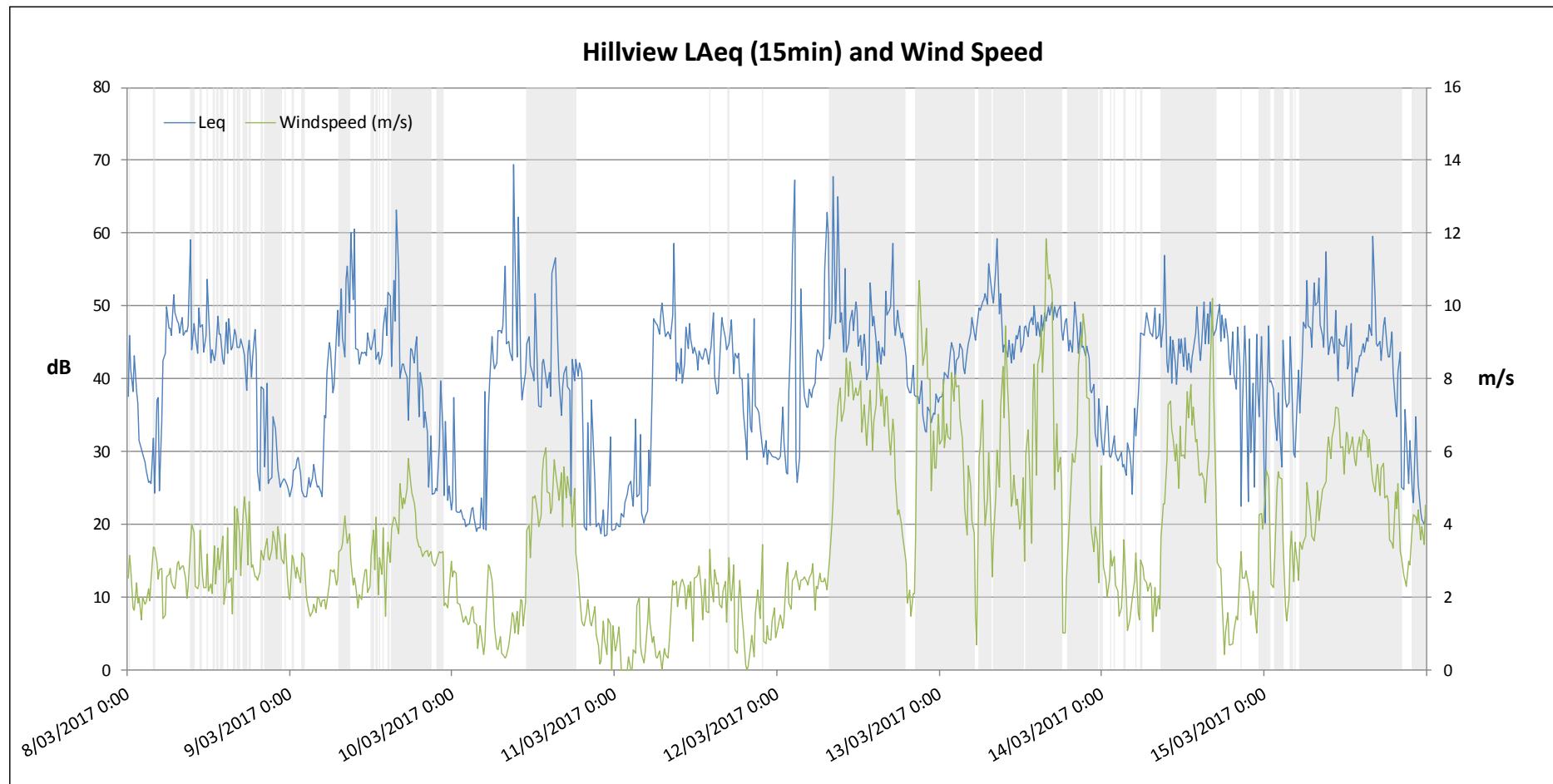
Date & time	Wind speed (m/s)	Wind Direction (°)
15/03/2017 17:40	5	39
15/03/2017 17:50	5	39
15/03/2017 18:00	4	41
15/03/2017 18:10	5	45
15/03/2017 18:20	4	41
15/03/2017 18:30	3	32
15/03/2017 18:40	3	34
15/03/2017 18:50	3	44
15/03/2017 19:00	5	56
15/03/2017 19:10	5	57
15/03/2017 19:20	4	58
15/03/2017 19:30	4	56
15/03/2017 19:40	5	58
15/03/2017 19:50	3	67
15/03/2017 20:00	3	62
15/03/2017 20:10	3	60
15/03/2017 20:20	3	67
15/03/2017 20:30	2	64
15/03/2017 20:40	2	46
15/03/2017 20:50	2	50
15/03/2017 21:00	3	51
15/03/2017 21:10	3	36
15/03/2017 21:20	3	37
15/03/2017 21:30	3	34
15/03/2017 21:40	4	41
15/03/2017 21:50	4	37
15/03/2017 22:00	4	32
15/03/2017 22:10	4	30
15/03/2017 22:20	4	29
15/03/2017 22:30	4	30
15/03/2017 22:40	4	29
15/03/2017 22:50	4	21
15/03/2017 23:00	4	20
15/03/2017 23:10	4	25
15/03/2017 23:20	3	25
15/03/2017 23:30	4	23
15/03/2017 23:40	5	18
15/03/2017 23:50	4	14

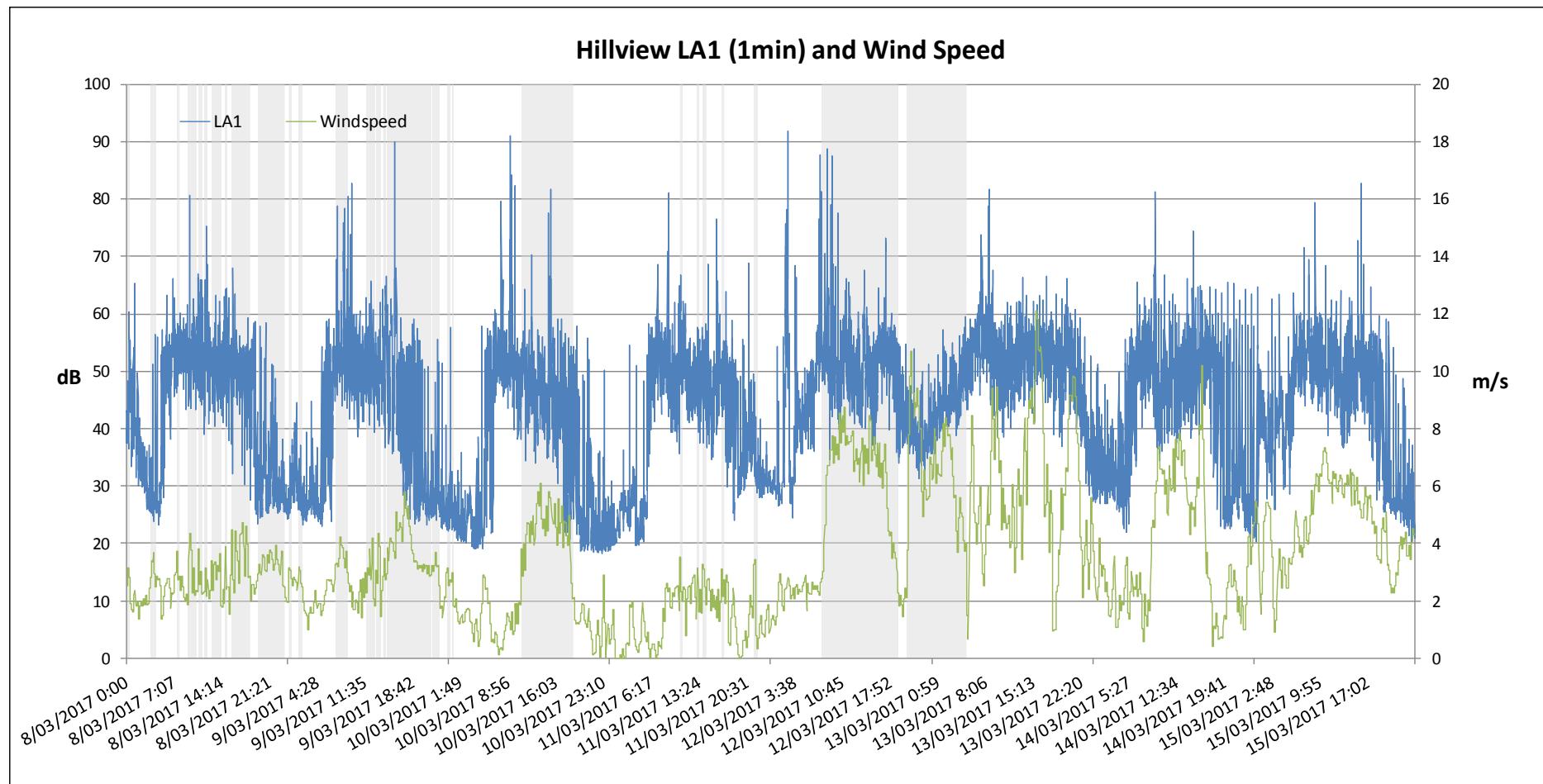
## Appendix D – Full Results Graphs

Note:

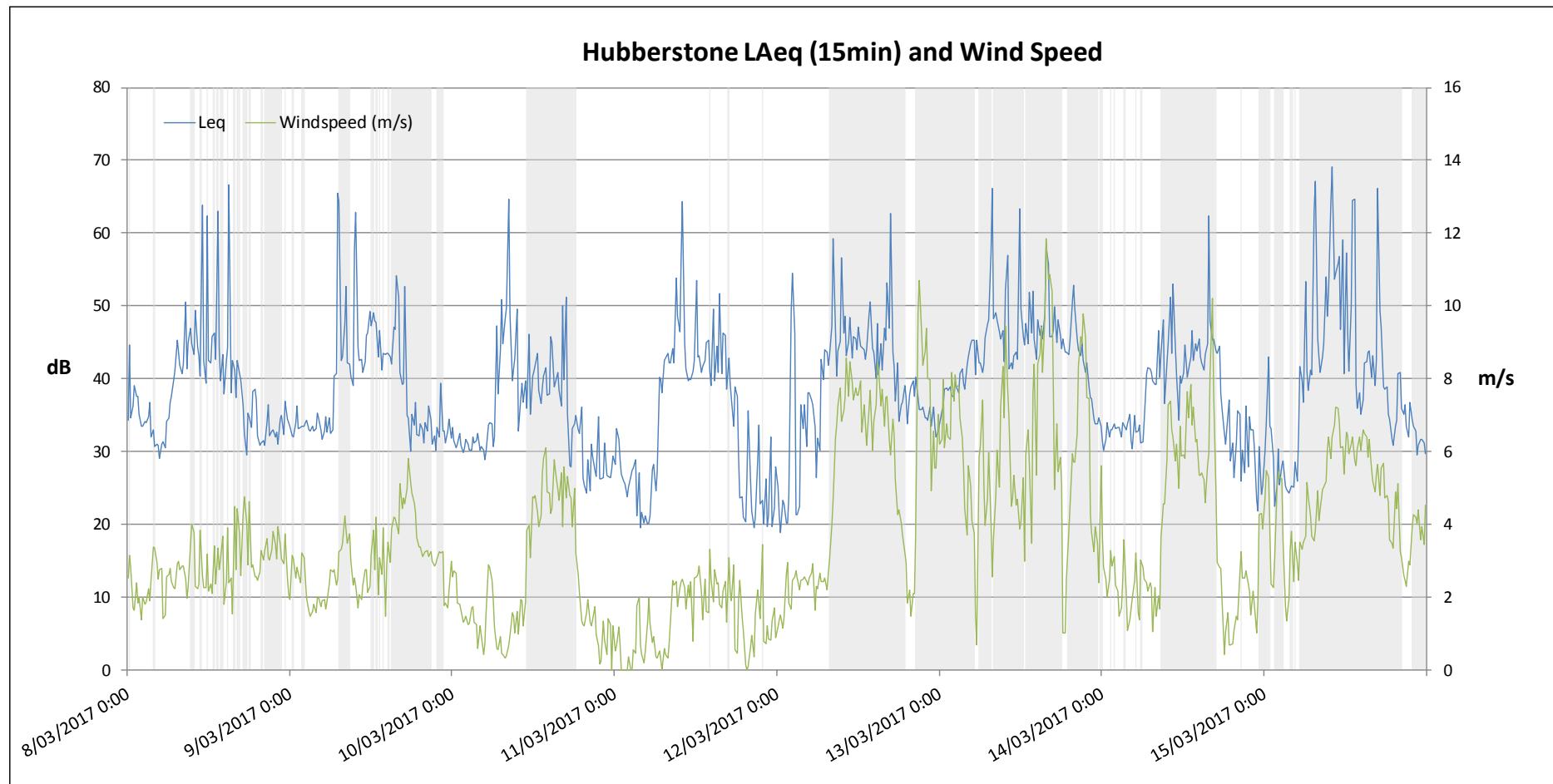
- Grey shaded areas indicate periods when wind speeds were in excess of 3 m/s; data from these periods have been excluded in the calculation for average results presented in Table 7.
- $L_{A1}$  data is only plotted for night periods, which is when the  $L_{A1}$  criteria applies.

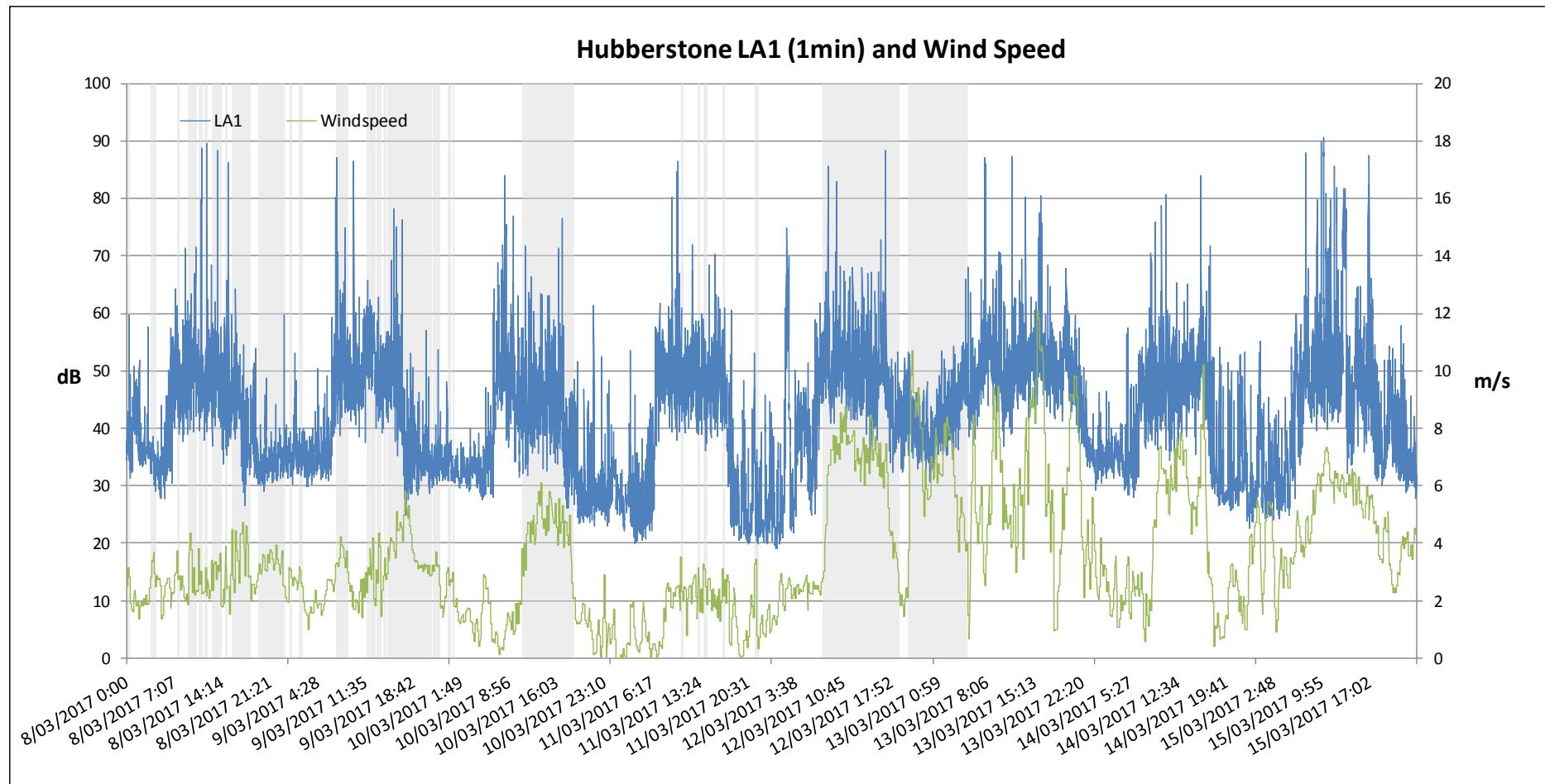
## Hillview



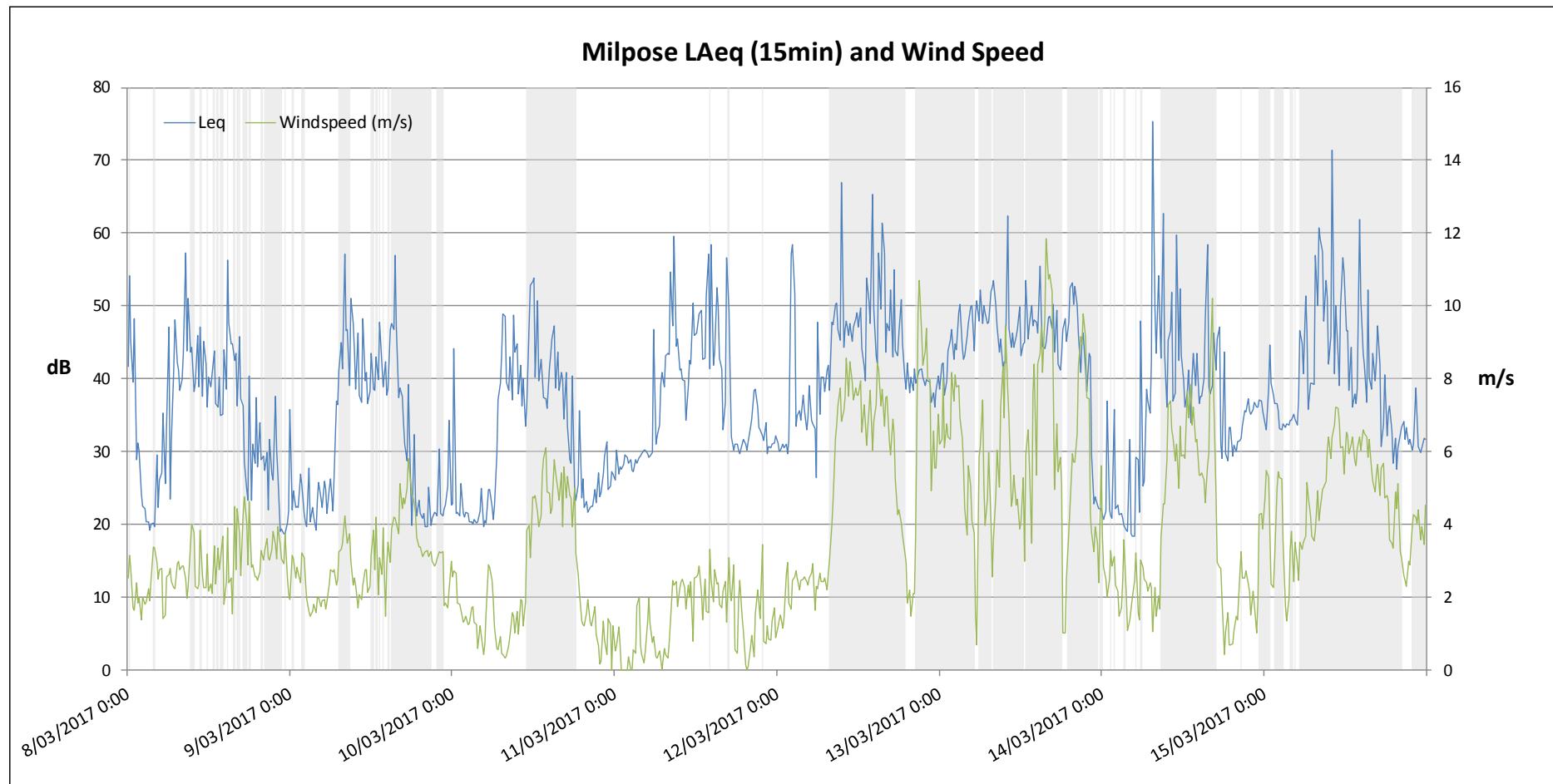


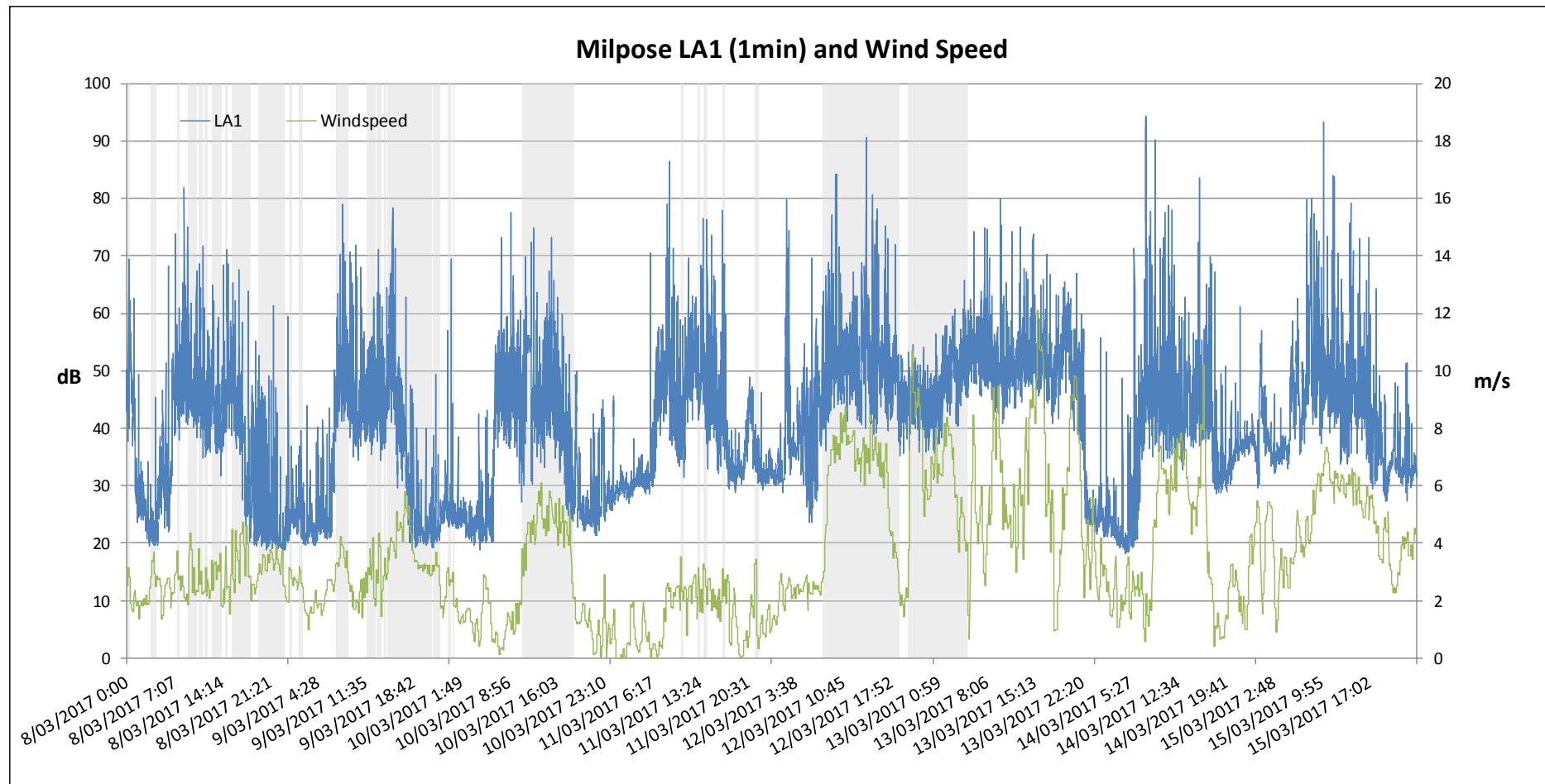
## Hubberstone



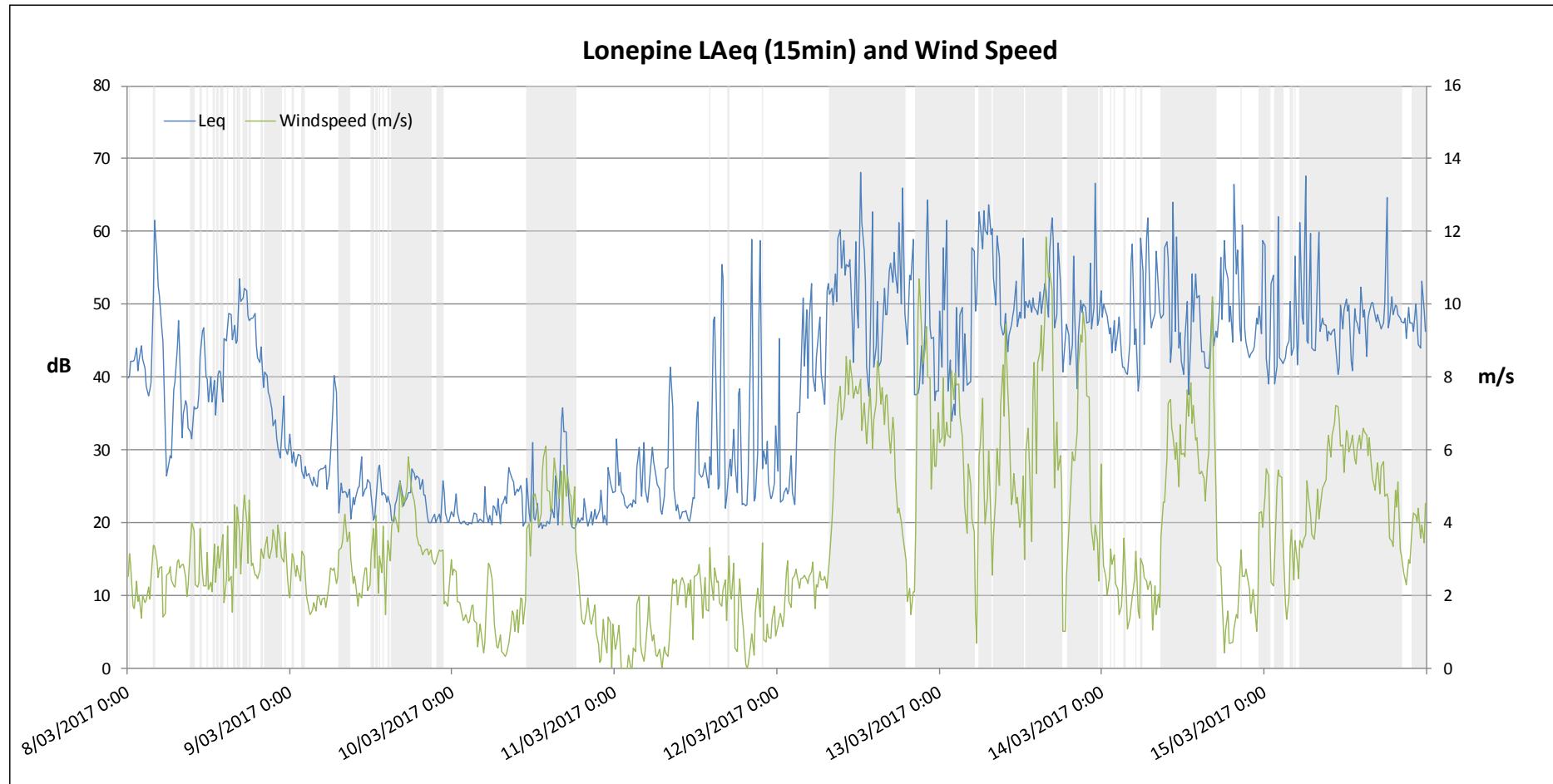


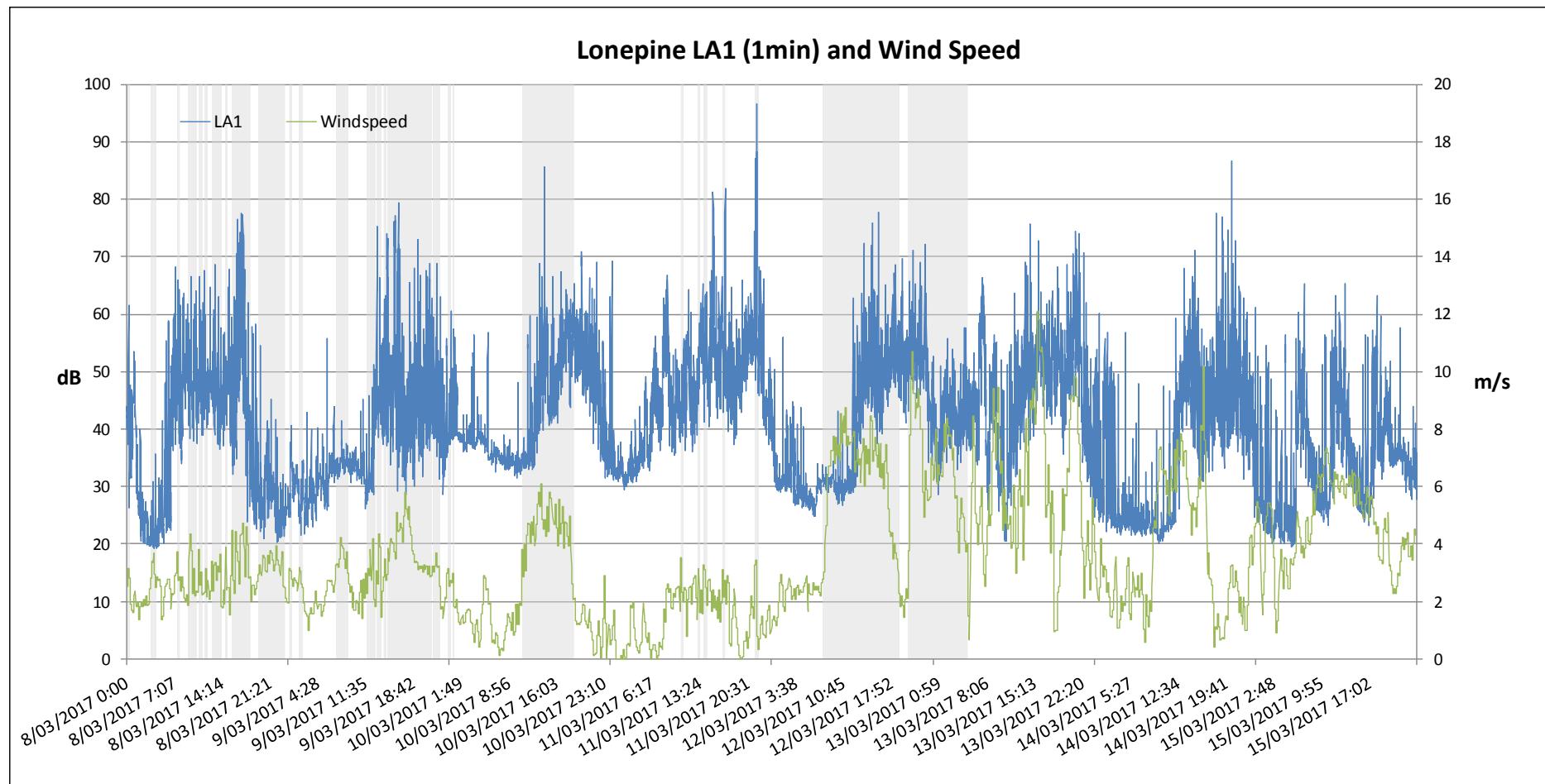
## Milpose





## Lone Pine





*-End of report-*