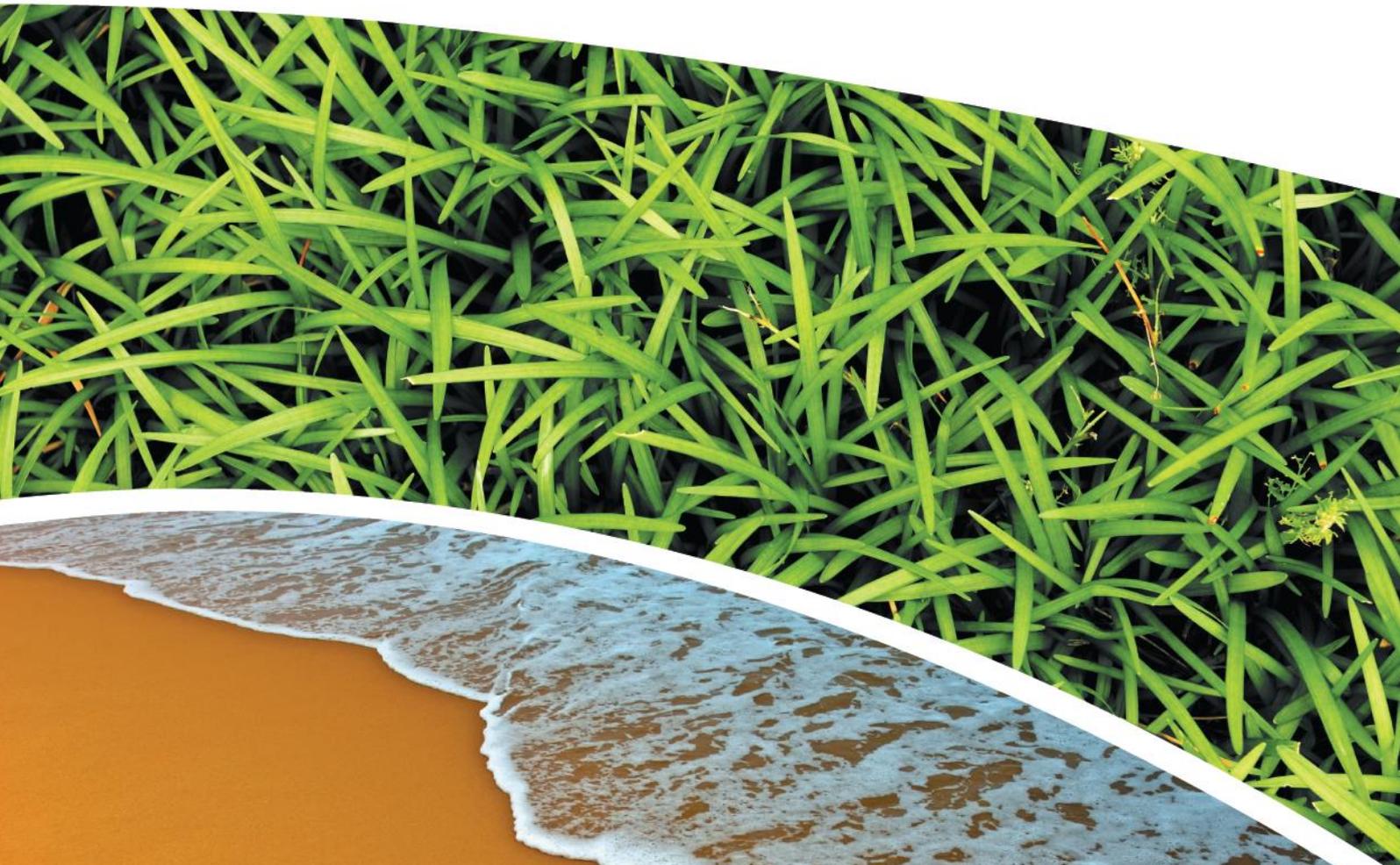


**AIR, WATER AND METEOROLOGICAL MONITORING – MARCH 2020
PINE DALE MINE, BLACKMANS FLAT**

Prepared for Pine Dale Mine Community Consultative Committee

Prepared by RCA Australia

RCA ref 6880-1822/0



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RCA ref 6880-1822/0

22 April 2020

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**REPORT COMPILED FOR COMMUNITY CONSULTATIVE COMMITTEE
DETAILING AIR, WATER AND METEOROLOGICAL MONITORING AT PINE DALE
MARCH 2020**

1 INTRODUCTION

This report presents the results of air, water and meteorological monitoring undertaken at Pine Dale Mine, Blackmans Flat during the month of March 2020.

Air and water samples were collected by RCA Laboratories – Environmental staff. Meteorological data was obtained from the site weather station.

This report satisfies the requirements to monitor environmental parameters as presented in the Pine Dale Mine Environmental Protection Licence (EPL 4911).

2 ANALYTICAL PROCEDURES

The analytical procedures used by RCA Laboratories – Environmental (NATA Accreditation number 9811) are based on established internationally recognised procedures such as APHA and Australian Standards. Analytical test methods are detailed in **Table 1**.

Table 1 *Analytical Test Methods*

Analysis	Method	Units	Analysing Laboratory	NATA Accreditation Status
Determination of Suspended Particulate Matter	ENV-LAB003	µg/m ³	RCA Laboratories – Environmental	NATA Analysis
Determination of Particulate Matter – Deposited Matter	ENV-LAB004	g/m ² per month	RCA Laboratories – Environmental	NATA Analysis
pH	ENV-LAB006	pH	RCA Laboratories – Environmental	NATA Analysis
Conductivity	ENV-LAB010	µS/cm	RCA Laboratories – Environmental	NATA Analysis
Total Suspended Solids	ENV-LAB009	mg/L	RCA Laboratories – Environmental	NATA Analysis
Turbidity	ENV-LAB037	NTU	RCA Laboratories - Environmental	NATA Analysis
Oil and Grease	ENV-LAB022	mg/L	RCA Laboratories - Environmental	Non-NATA Analysis
Major Anions (Alkalinity, Cl, SO ₄)	ED037, ED041, ED045	mg/L	ALS	NATA Analysis
Major Cations (Ca, Mg, Na, K)	ED093	mg/L	ALS	NATA Analysis
Dissolved Metals	EG020F	mg/L	ALS	NATA Analysis

ALS Environmental has been used to obtain analysis of anions, cations and dissolved metals (NATA Accreditation number 825).

3 WATER MONITORING RESULTS

3.1 GROUNDWATER

A total of two (2) groundwater samples were collected from within the Pine Dale Mine site during March 2020. Water quality analysis results are shown in **Table 2**. Groundwater monitoring locations are shown in **Appendix A**.

Table 2 Groundwater Analysis Results

ANALYSIS	UNITS	P6	P7
Sample Number	-	03206880009	03206880010
Date Sampled	-	10/03/20	10/03/20
Time Sampled	-	15:20	16:10
Depth to Water from Surface	m	26.18	7.00
Water Level (AHD)	m	890.77	887.40
Temperature	°C	19.7	17.4
pH	pH	6.32	6.28
Conductivity	µS/cm	1700	721
Turbidity	NTU	63	
Dissolved Oxygen	mg/L	2.0	
Total Suspended Solids	mg/L	67	
Oil and Grease	mg/L	<5	
Bicarbonate Alkalinity (CaCO ₃)	mg/L	60	
Total Alkalinity (CaCO ₃)	mg/L	60	
Sulphate (as SO ₄)	mg/L	752	
Chloride	mg/L	60	
Calcium	mg/L	168	
Magnesium	mg/L	79	
Sodium	mg/L	87	
Potassium	mg/L	22	
Cobalt (dissolved)	mg/L	0.059	
Manganese (dissolved)	mg/L	3.32	
Nickel (dissolved)	mg/L	0.127	
Zinc (dissolved)	mg/L	0.073	
Iron (dissolved)	mg/L	42.8	
Trigger Values			
pH trigger level ^a	pH	6.2 – 8.0	6.3 – 8.0
Conductivity trigger level	µS/cm	1180	852
Water Level (AHD) ^b	m	887.90	883.28
Proposed Trigger Values^c			
pH trigger level ^d	pH	5.6	6.3

☐ Indicates analysis was not required.

^a pH trigger value is exceeded if the pH is outside the nominated range.

^b Water Level trigger is exceeded if the AHD water level drops below the nominated trigger level. Results shown in **bold italics** indicates exceedance of trigger level.

^c Proposed trigger values submitted to Department of Primary Industries in 2018 and are currently pending regulatory approval.

^d pH trigger value is exceeded if pH is below the nominated value.

3.2 SURFACE WATER MONITORING

Quarterly surface water monitoring was not required to be undertaken during March 2020.

4 AIR QUALITY RESULTS

4.1 HIGH VOLUME AIR SAMPLERS (HVAS)

Monitoring of particulate matter less than 10 micrometres (PM₁₀) and total suspended particulates (TSP) is undertaken at Pine Dale Mine using High Volume Air Samplers (HVAS). HVAS at this facility conform to AS/NZS 3580.9.3:2015, AS/NZS 3580.9.6:2015 and AS/NZS 3580.1.1:2016. The HVAS run on a one in six-day cycle, as stipulated in the *Air Quality and Greenhouse Gas Management Plan for the Pine Dale Coal Mine*. The locations of the HVAS units are shown in **Appendix A**.

HVAS Total Suspended Particulate results are shown in **Table 3**. PM₁₀ results are shown in **Table 4**. HVAS Monitoring locations are shown in **Appendix A**. Graphical HVAS result presentations are shown in **Appendix B**.

Table 3 Total Suspended Particulates (TSP)

Run Date	TSP (µg/m ³)	Sample Number	Filter Number	Date Filter Off	Time Filter Off	Field Tech	Hours Run
03-Mar-20	13	03206880030	9781196	04-Mar-20	10:50	Client	24.00
09-Mar-20	7	03206880032	9779184	14-Mar-20	12:00	Client	24.15
15-Mar-20	9	03206880034	9779189	20-Mar-20	16:30	Client	24.00
21-Mar-20	36	03206880036	9722307	23-Mar-20	14:24	Client	24.00
27-Mar-20	11	03206880038	9722361	30-Mar-20	12:00	Client	24.00

Table 4 Suspended Particulate Matter <10 µm (PM₁₀)

Run Date	PM ₁₀ (µg/m ³)	Sample Number	Filter Number	Date Filter Off	Time Filter Off	Field Tech	Hours Run
03-Mar-20	5	03206880031	9781197	04-Mar-20	10:52	Client	23.99
09-Mar-20	4	03206880033	9779187	14-Mar-20	12:05	Client	24.17
15-Mar-20	4	03206880035	9779188	20-Mar-20	16:32	Client	24.00
21-Mar-20	17	03206880037	9722360	23-Mar-20	14:28	Client	24.00
27-Mar-20	6	03206880039	9722370	30-Mar-20	12:05	Client	24.00

4.1.1 TSP SUMMARY

The NSW EPA Annual Mean TSP allowable limit is 90µg/m³. All TSP HVAS results recorded during this monitoring period are in compliance with consent conditions, as the *current rolling annual mean* (April 2019 to March 2020) for TSP is 51.4µg/m³, which is below the allowable limit of 90µg/m³.

The twelve-monthly graph is provided in **Appendix B**.

4.1.2 *PM₁₀ SUMMARY*

The NSW EPA twenty-four (24) hour maximum PM₁₀ allowable limit is 50µg/m³; there were no PM₁₀ concentrations in excess of this limit. The HVAS PM₁₀ annual average result is above the long-term assessment criterion of 25µg/m³. The annual average PM₁₀ result was 28.5µg/m³ (refer **Appendix B**) which is considered to be impacted by bushfire activity. During November 2019 – January 2020, the air quality in the Lithgow area was impacted by bushfires, predominantly the Gospers Mountain fire which occurred within Wollemi National Park, moving through to Ben Bullen State forest and Pine Dale Mine during December 2019.

4.2 DEPOSITIONAL DUST MONITORING

The depositional dust monitoring exposure period for March 2020 was 11 February – 10 March 2020. Depositional dust gauges at this facility conform to AS/NZS 3580.10.1:2016 and AS/NZS 3580.1.1:2016. The March exposure period was 28 days which is within the 30 ± 2 days dust exposure period stipulated in AS/NZS 3508.10.1:2016. Depositional dust monitoring results are shown in **Table 5**. Depositional dust monitoring locations are shown in **Appendix A**.

Table 5 *Depositional Dust Monitoring*

Deposit Gauge	Number of Days	Notes	Insoluble Solids	Ash	Combustible Matter
D1	28	IT	1.5	1.0	0.5
D3	28	I	1.2	0.9	0.3
D4	28	I	1.2	0.8	0.4
D5	28	I	1.6	1.2	0.4
D6	28	I	0.8	0.5	0.3

All units are g/m²/month

I – Insects (eg, Ants, Spiders); T – Tree litter.

4.2.1 ALLOWABLE DEPOSITIONAL DUST LIMITS

The EPA long term (annual average) deposited dust limit is 4g/m² per month. The rolling annual depositional dust results for all sites within the period (April 2019 – March 2020) are in compliance with consent conditions. The annual average for dust gauges D1, D3, D4, D5 and D6 are all less than or equal to 1.7g/m² per month. Annual averages are shown in the depositional dust gauge graphs provided in **Appendix B**.

5 METEOROLOGICAL MONITORING

Pine Dale Mine records meteorological data continuously via an onsite weather station. Details of the weather data recorded during the period 1 to 31 March 2020 are shown in **Appendix C**.

Data availability during this period was 100%.

6 BLASTING RESULTS

No blasting was undertaken during this month as mining operations have ceased since the end of March 2014.

7 NOISE MONITORING RESULTS

Quarterly noise monitoring was undertaken during March 2020. Results are contained in *RCA Australia Report 13856-407.0 – Pine Dale Mine Environmental Noise Survey Report Q1 2020*.

8 OPERATIONAL ACTIVITIES

All of the approved minable reserves at the Pine Dale Mine have now been exhausted. Operational mining and the last coal sales ceased as of the end of March 2014.

All former operators have been made redundant; however, some statutory positions still remain. Pine Dale Mine has been placed in care and maintenance since April 2014.

9 SUMMARY

During the month of March 2020 environmental monitoring results were found to be generally in compliance with EPL 4911 with the exception of:

- Electrical conductivity in groundwater sample P6 was in excess of the site-specific trigger value.

It should be noted that the proposed trigger values pending regulatory approval do not have a limit for electrical conductivity, as such P6 would have been compliant in the event of approval of these proposed trigger values.

The rolling annual average from the TSP High Volume Air Sampler is well below the EPA Annual Mean TSP criterion of $90\mu\text{g}/\text{m}^3$. The rolling annual average from the PM_{10} High Volume Air Sampler ($28.5\mu\text{g}/\text{m}^3$) is above the EPA Annual Mean PM_{10} criterion of $25\mu\text{g}/\text{m}^3$. Currently there are no depositional dust gauge results which are greater than the EPA Long Term (annual average) criteria of $4\text{g}/\text{m}^2\cdot\text{month}$ based upon a rolling average of the past 12 months.

Meteorological monitoring was undertaken for the entire month of March with 100% data capture.

Pine Dale Mine ceased operation in March 2014 and therefore no blasting occurred at the site.

10 LIMITATIONS

This report has been prepared for Enhance Place Pty Ltd in accordance with an agreement with RCA Australia (RCA). The services performed by RCA have been conducted in a manner consistent with that generally exercised by members of its profession and consulting practice.

This report has been prepared for the sole use of Enhance Place. The report may not contain sufficient information for purposes of other uses or for parties other than Enhance Place. This report shall only be presented in full and may not be used to support objectives other than those stated in the report without written permission from RCA Australia.

The information in this report is considered accurate at the date of issue with regard to the current conditions of the site. Conditions can vary across any site that cannot be explicitly defined by investigation.

Environmental conditions including contaminant concentrations can change in a limited period of time. This should be considered if the report is used following a significant period of time after the date of issue.

Yours faithfully

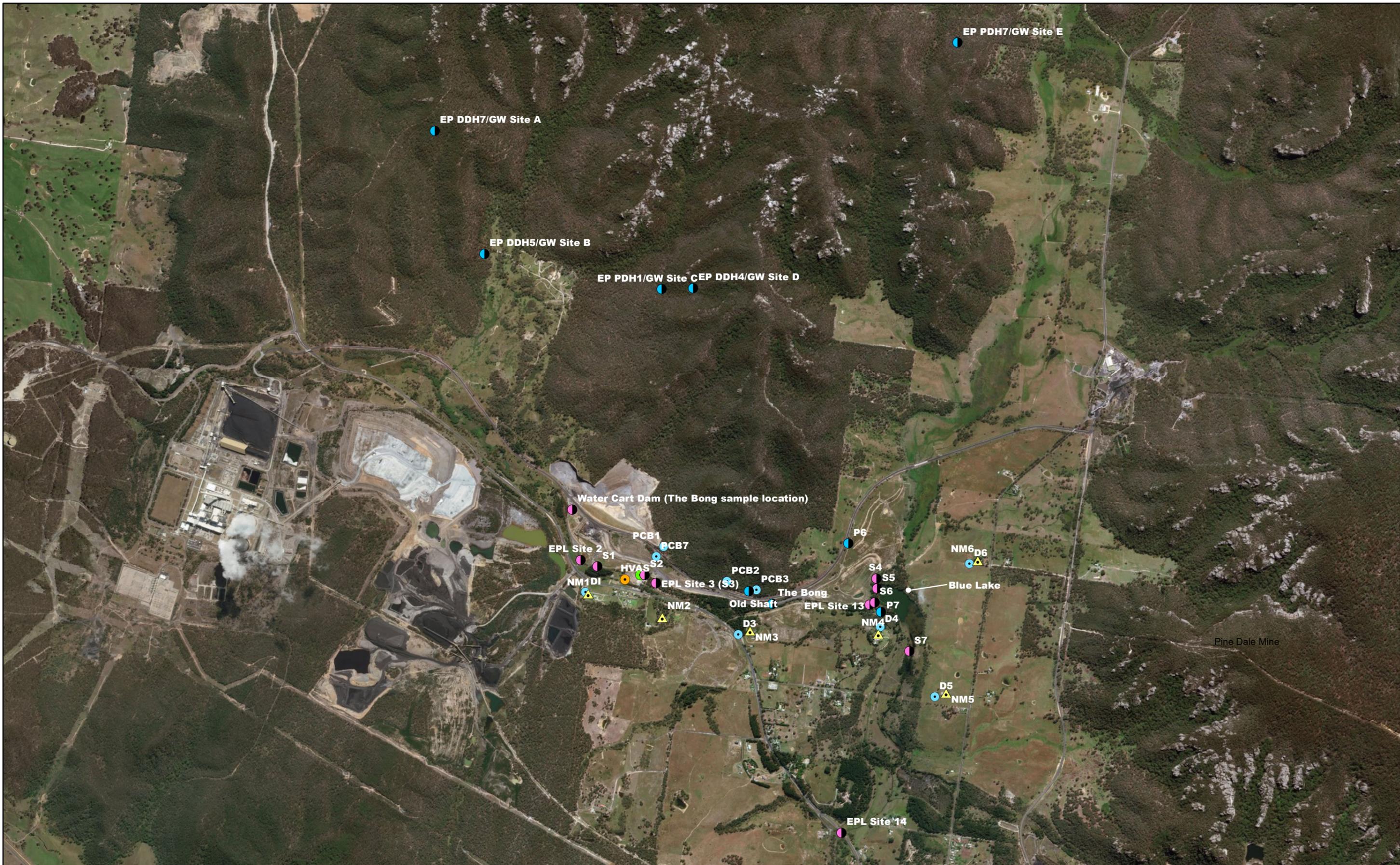
RCA AUSTRALIA



Carmen Rocher
Environmental Engineer

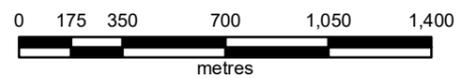
Appendix A

Monitoring Locations



LEGEND

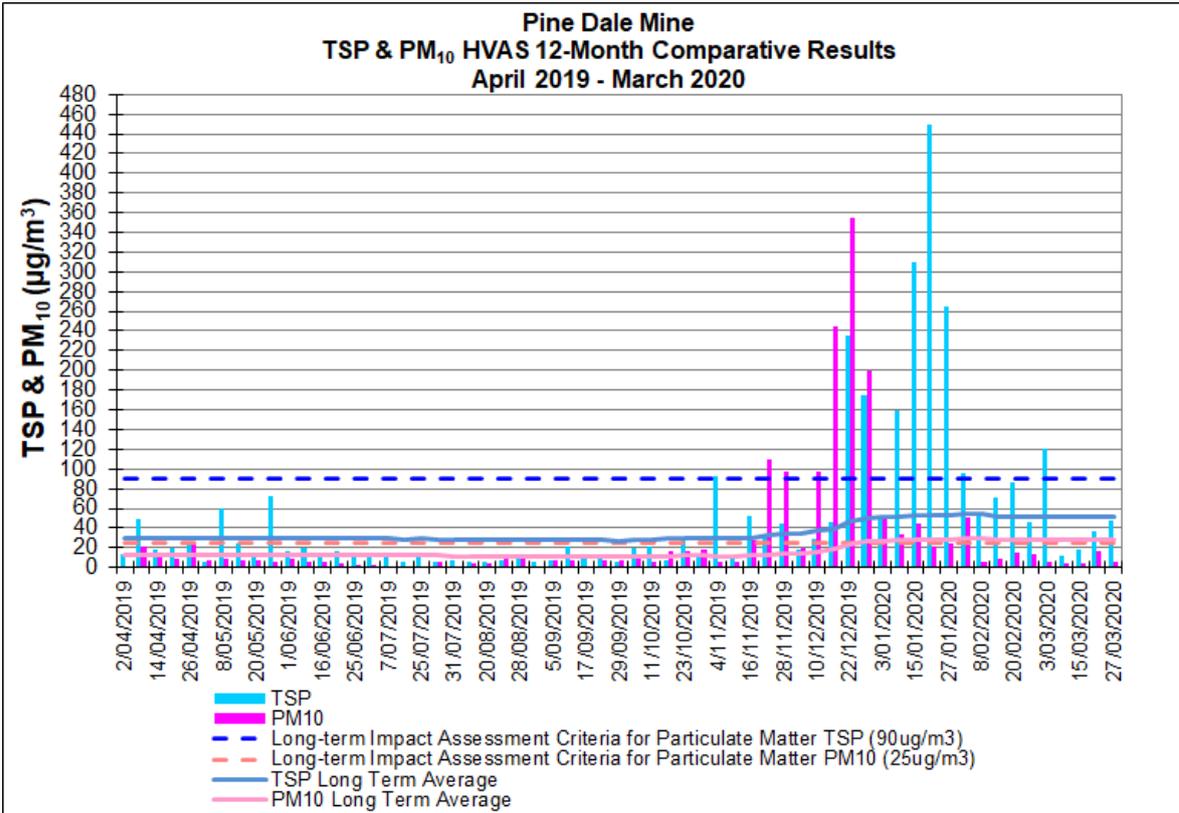
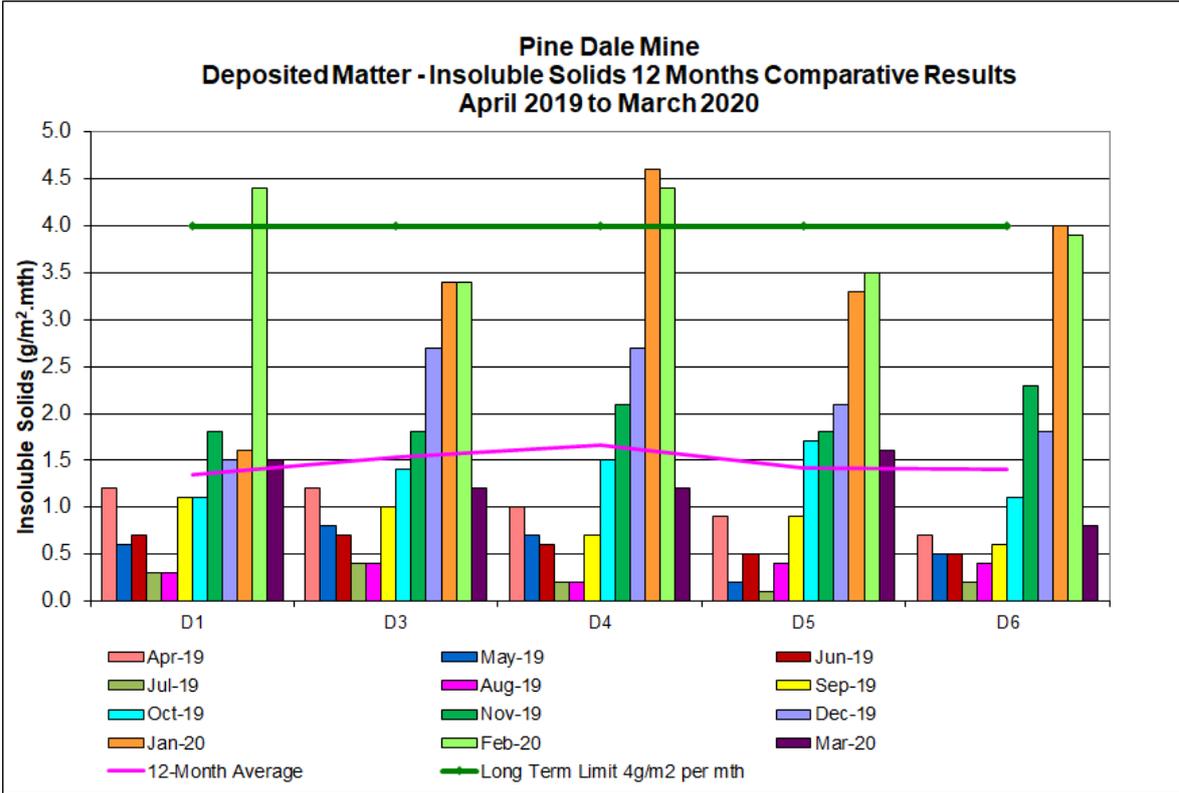
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|--|--|
|  Noise Monitoring Location |  High Volume Air Sampling Location |
|  Depositional Dust Monitoring Location |  Meteorological Monitoring Location |
|  Groundwater Monitoring Location |  Surface Water Monitoring Location |



**PINE DALE MINE
ENVIRONMENTAL MONITORING
LOCATION PLAN**

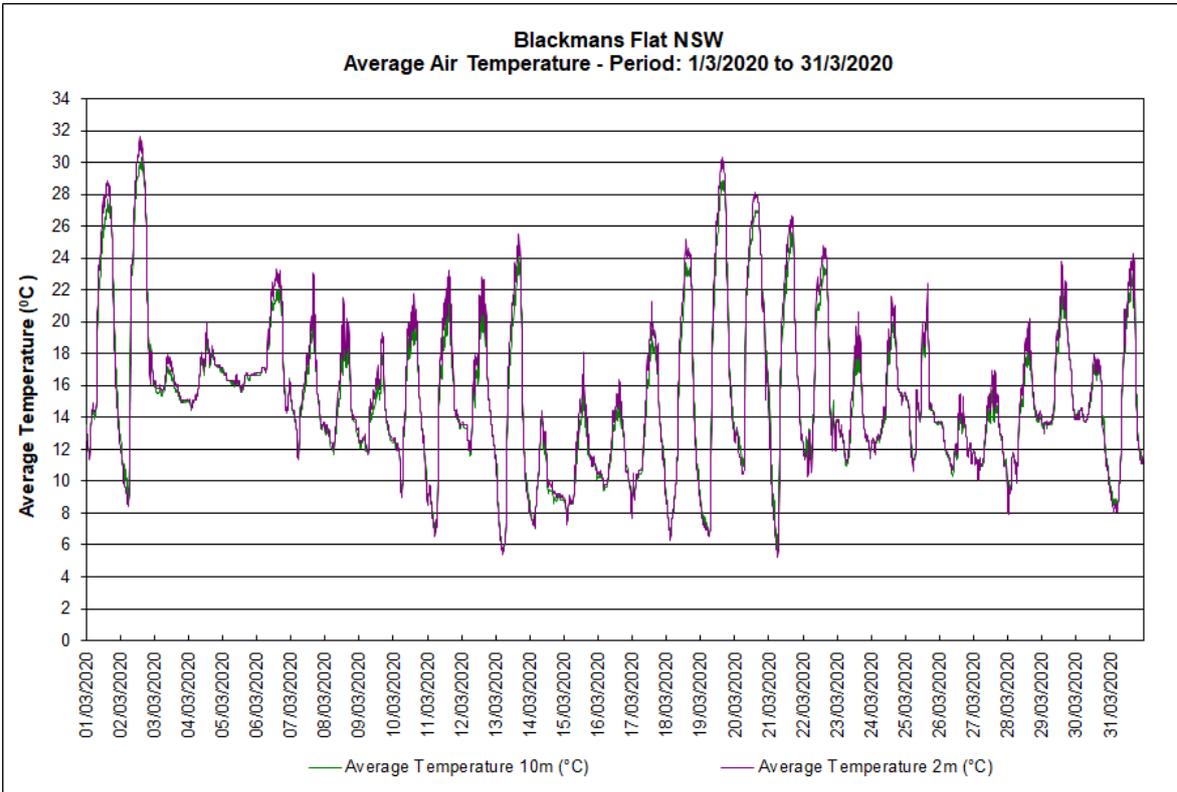
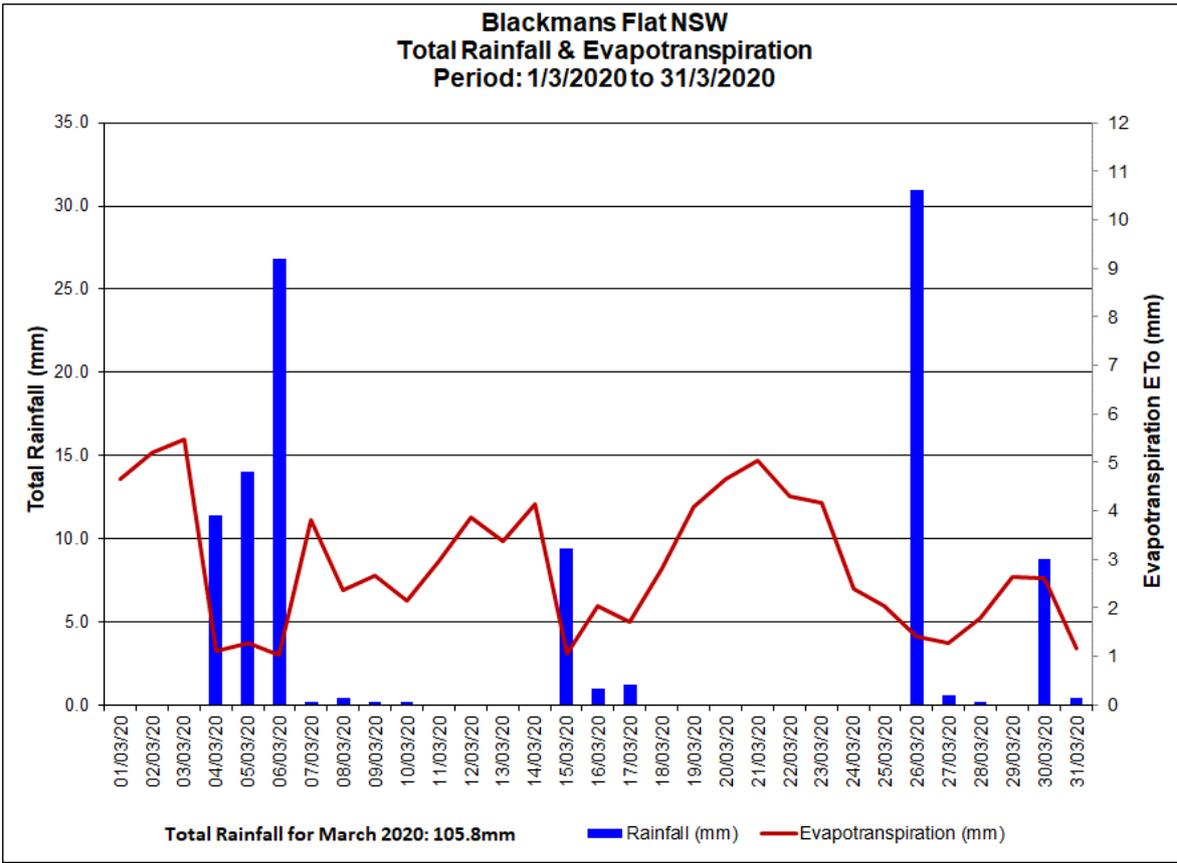
Appendix B

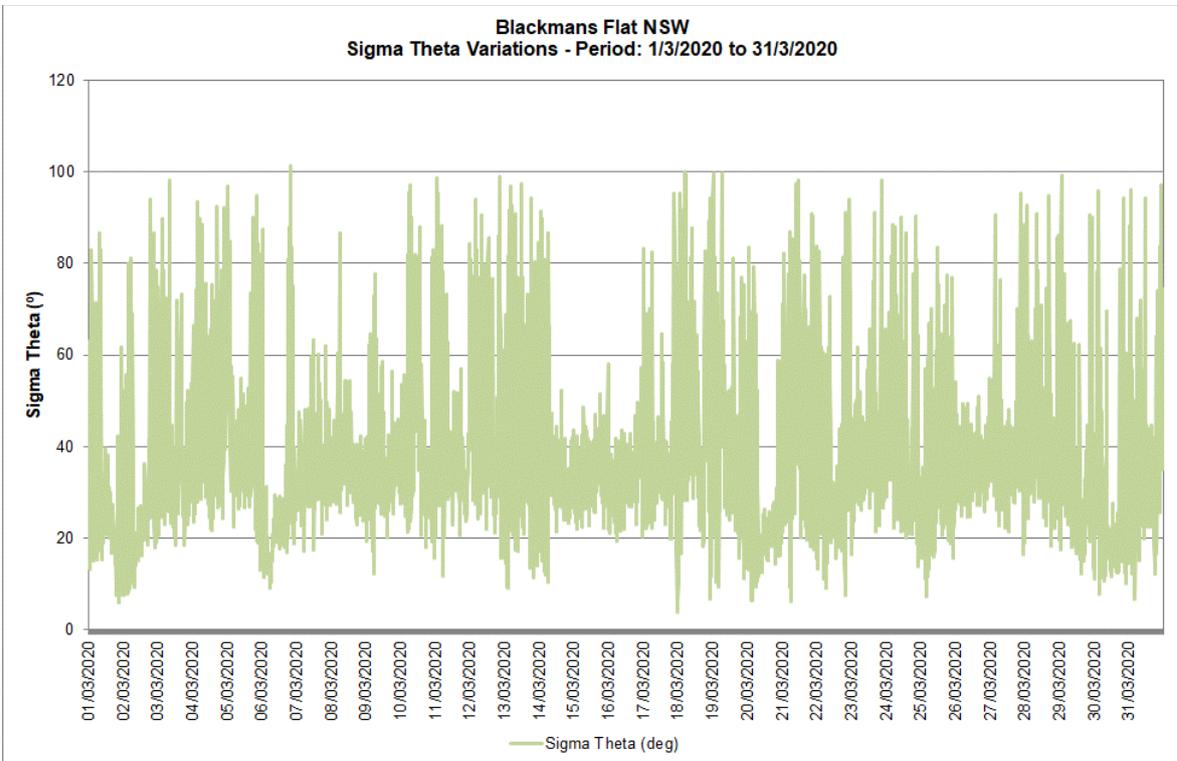
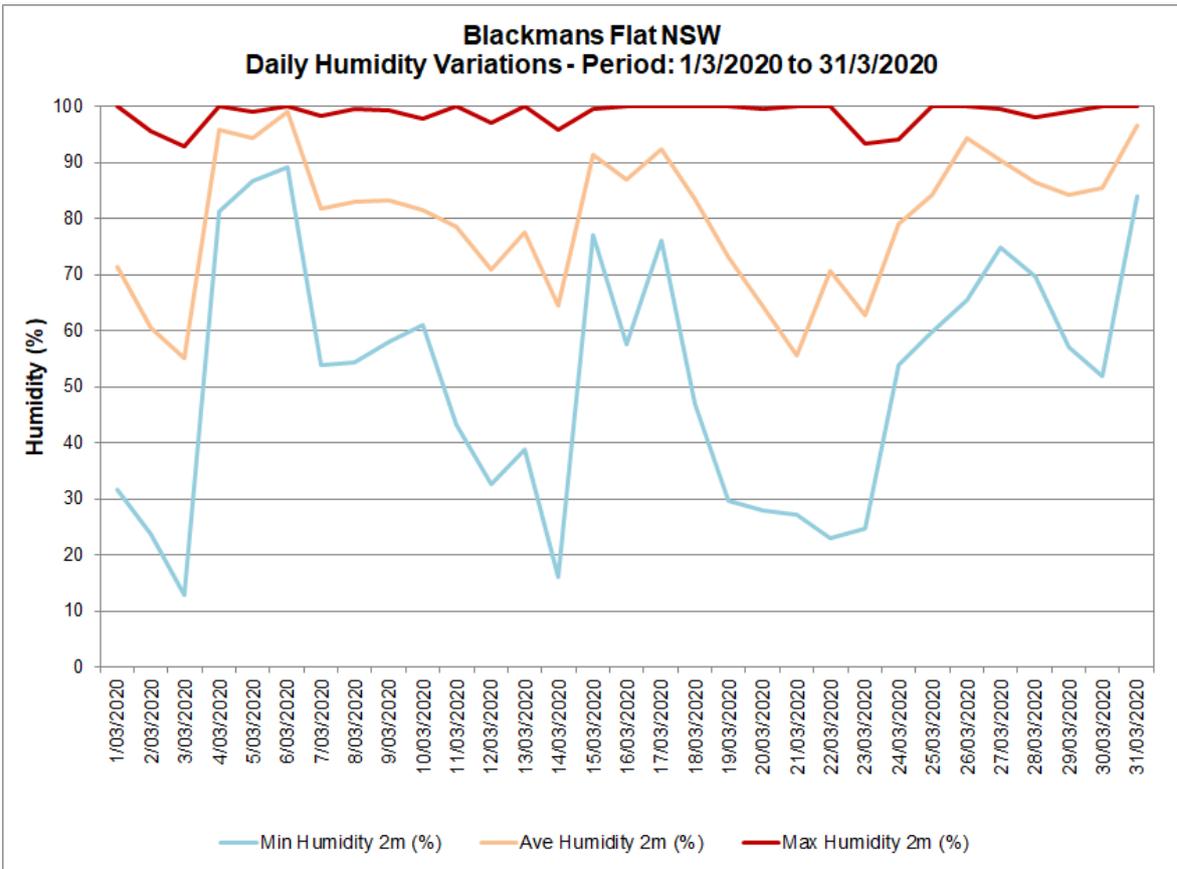
Depositional Dust and HVAS Graphs



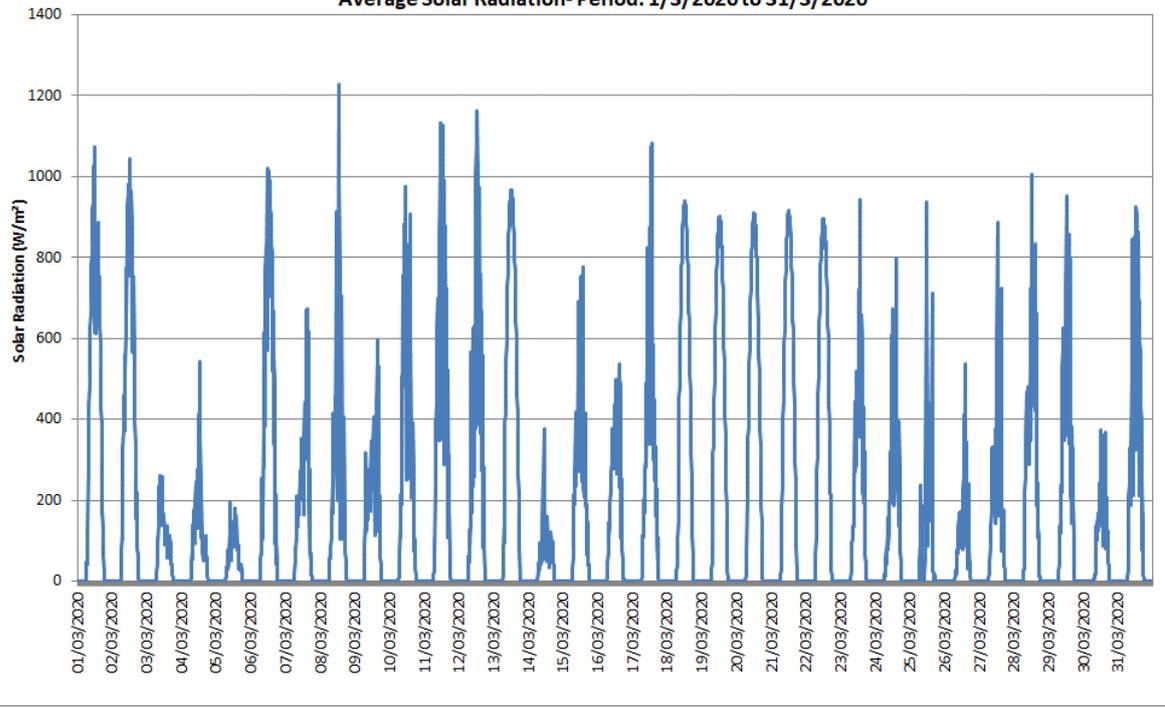
Appendix C

Meteorological Data



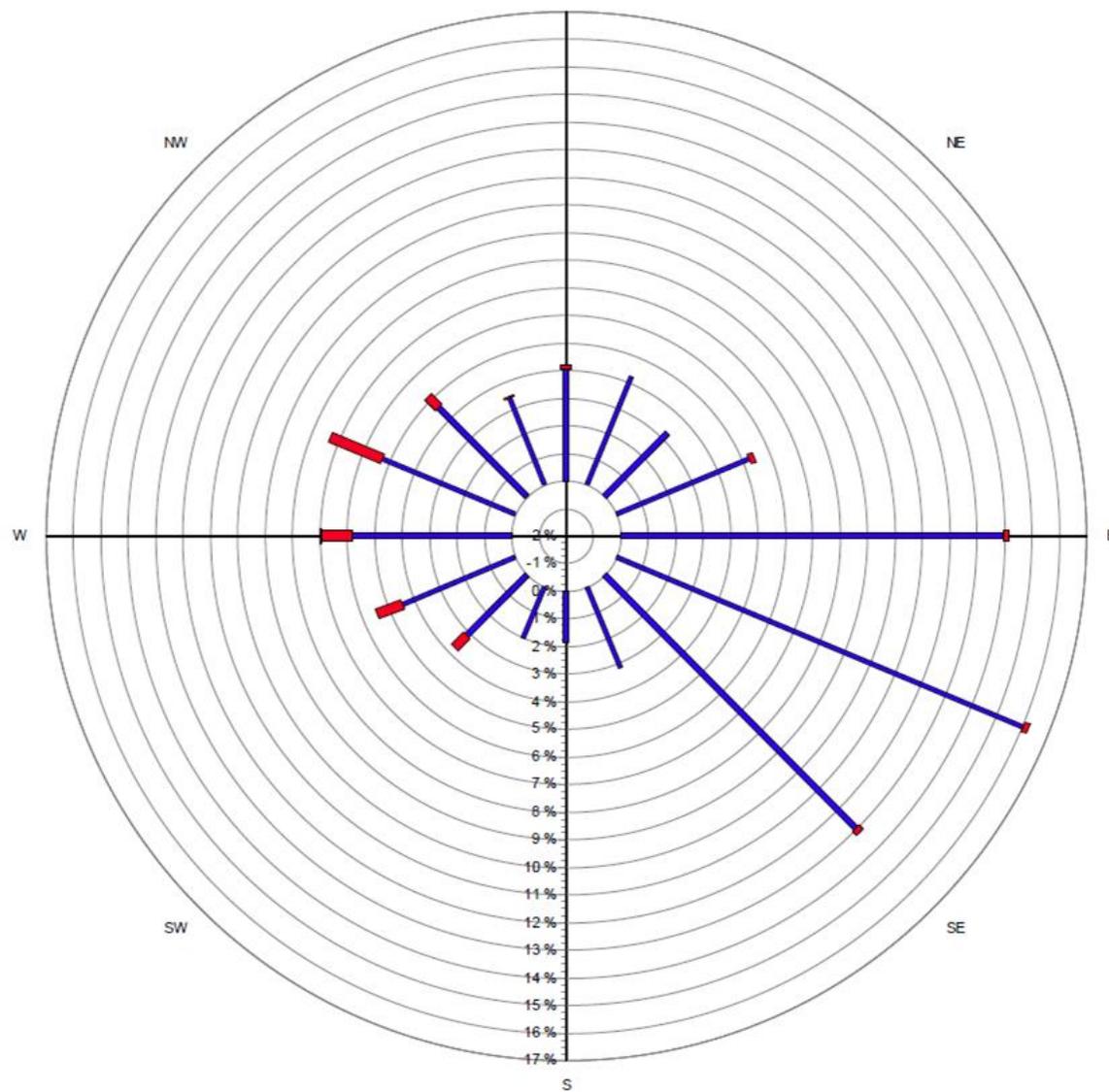
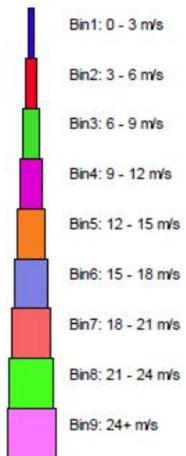


Blackmans Flat NSW
Average Solar Radiation- Period: 1/3/2020 to 31/3/2020



Blackmans Flat Windrose

1/03/2020 to 31/03/2020
N



Source data:
PineDale.SCM
10 minutely data - Ave WndDir (deg)
10 minutely data - Ave WndSpd (m/sec)