



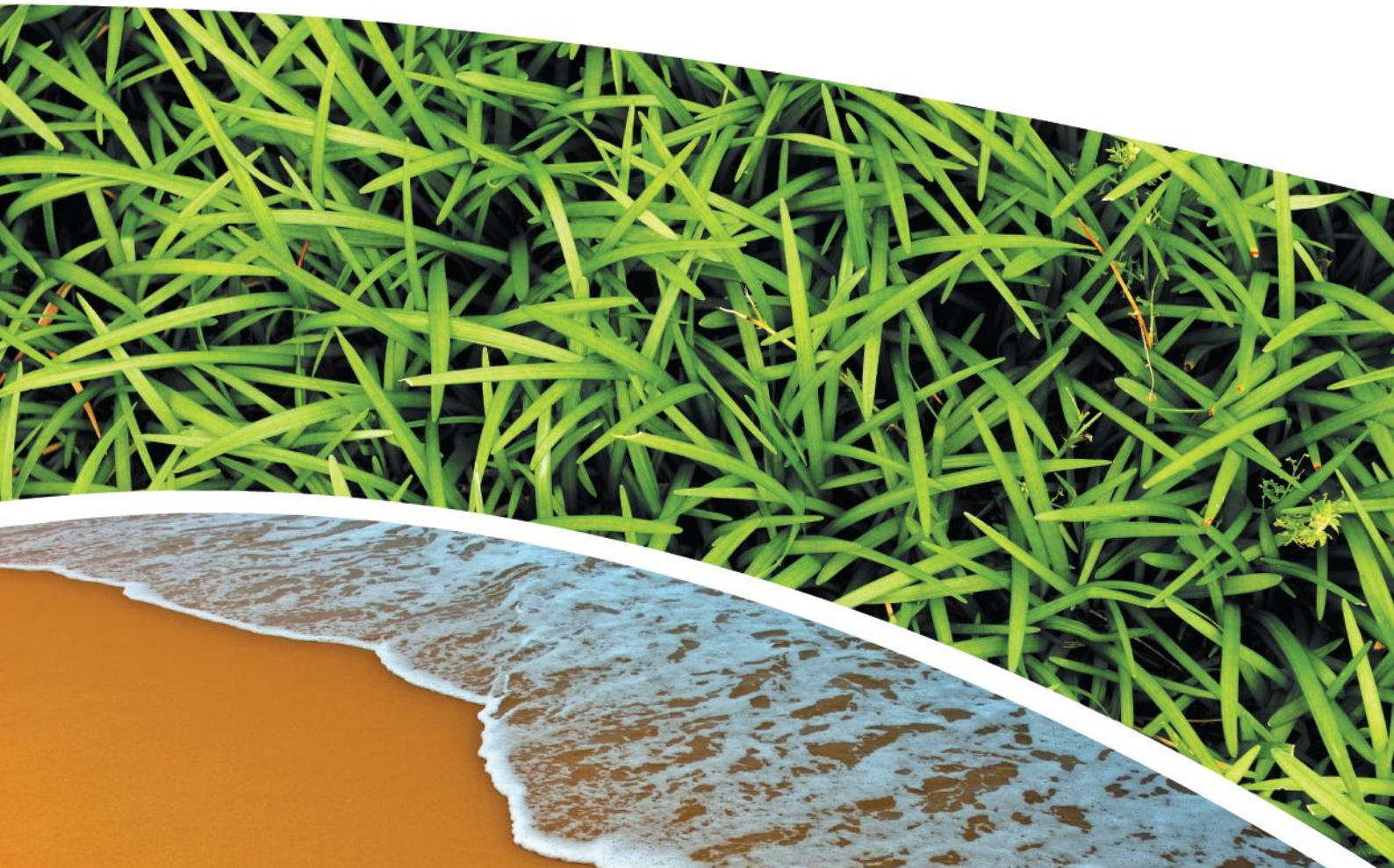
**AIR, WATER AND METEOROLOGICAL MONITORING – DECEMBER  
2019**

**PINE DALE MINE, BLACKMANS FLAT**

**Prepared for Pine Dale Mine Community Consultative Committee**

**Prepared by RCA Australia**

**RCA ref 6880-1814/0**



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### *MONITORING LOCATIONS*

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### *DEPOSITIONAL DUST AND HVAS GRAPHS*

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### *METEOROLOGICAL DATA*

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23 January 2020

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[Environmental Engineering](#)

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**REPORT COMPILED FOR COMMUNITY CONSULTATIVE COMMITTEE  
DETAILING AIR, WATER AND METEOROLOGICAL MONITORING AT PINE DALE  
DECEMBER 2019**

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## **1 INTRODUCTION**

This report presents the results of air, water and meteorological monitoring undertaken at Pine Dale Mine, Blackmans Flat during the month of December 2019.

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*

<b>Analysis</b>	<b>Method</b>	<b>Units</b>	<b>Analysing Laboratory</b>	<b>NATA Accreditation Status</b>
Determination of Suspended Particulate Matter	ENV-LAB003	µg/m <sup>3</sup>	RCA Laboratories – Environmental	NATA Analysis
Determination of Particulate Matter – Deposited Matter	ENV-LAB004	g/m <sup>2</sup> 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 <sub>4</sub> )	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 December 2019. 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	-	1219688009	12196880010
Date Sampled	-	06/12/19	06/12/19
Time Sampled	-	7:35	8:24
Depth to Water from Surface	m	27.06	10.39
Water Level (AHD)	m	890.79	884.97
Temperature	°C	15.2	15.4
pH	pH	6.70	6.77
Conductivity	µS/cm	<b>1590</b>	663
Turbidity	NTU	78	
Dissolved Oxygen	mg/L	3.0	
Total Suspended Solids	mg/L	84	
Oil and Grease	mg/L	<5	
Bicarbonate Alkalinity (CaCO <sub>3</sub> )	mg/L	46	
Total Alkalinity (CaCO <sub>3</sub> )	mg/L	46	
Sulphate (as SO <sub>4</sub> )	mg/L	830	
Chloride	mg/L	59	
Calcium	mg/L	159	
Magnesium	mg/L	77	
Sodium	mg/L	84	
Potassium	mg/L	22	
Cobalt (dissolved)	mg/L	0.064	
Manganese (dissolved)	mg/L	3.58	
Nickel (dissolved)	mg/L	0.124	
Zinc (dissolved)	mg/L	0.124	
Iron (dissolved)	mg/L	42.6	
Trigger Values			
pH trigger level <sup>^</sup>	pH	6.2 – 8.0	6.3 – 8.0
Conductivity trigger level	µS/cm	1180	852
Water Level (AHD) #	m	887.90	883.28

☐ Indicates analysis was not required.

<sup>^</sup> pH trigger value is exceeded if the pH is outside the nominated range.

# 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.

### 3.2 SURFACE WATER MONITORING

Quarterly surface water monitoring was not required to be undertaken in December 2019. The next scheduled monitoring round will be in February 2020.

## 4 AIR QUALITY RESULTS

### 4.1 HIGH VOLUME AIR SAMPLERS (HVAS)

Monitoring of particulate matter less than 10 micrometres (PM<sub>10</sub>) 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**. PM<sub>10</sub> 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 <sup>3</sup> )	Sample Number	Filter Number	Date Filter Off	Time Filter Off	Field Tech	Hours Run
04-Dec-19	53	12196880030	9720632	09-Dec-19	13:23	Client	24.00
10-Dec-19	160	12196880032	9722387	14-Dec-19	14:15	Client	24.00
16-Dec-19	310	12196880034	9722339	19-Dec-19	11:47	Client	24.00
22-Dec-19	450	12196880036	9722341	25-Dec-19	15:10	Client	24.00
28-Dec-19	265	12196880038	9722380	31-Dec-19	11:27	Client	24.00

**Table 4** Suspended Particulate Matter <10 µm (PM<sub>10</sub>)

Run Date	PM <sub>10</sub> (µg/m <sup>3</sup> )	Sample Number	Filter Number	Date Filter Off	Time Filter Off	Field Tech	Hours Run
04-Dec-19	20	12196880031	9720633	09-Dec-19	13:25	Client	24.00
10-Dec-19	98	12196880033	9722388	14-Dec-19	14:17	Client	24.00
16-Dec-19	245	12196880035	9722340	19-Dec-19	11:55	Client	24.00
22-Dec-19	355	12196880037	9722342	25-Dec-19	15:12	Client	23.48
28-Dec-19	200	12196880039	9722379	31-Dec-19	11:30	Client	24.00

#### 4.1.1 TSP SUMMARY

The NSW EPA Annual Mean TSP allowable limit is 90µg/m<sup>3</sup>. All TSP HVAS results recorded during this monitoring period are in compliance with consent conditions, as the *current rolling annual mean* (January 2018 to December 2019) for TSP is 50.1µg/m<sup>3</sup>, which is below the allowable limit of 90µg/m<sup>3</sup>.

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

#### 4.1.2 *PM<sub>10</sub> SUMMARY*

The NSW EPA twenty-four (24) hour maximum PM<sub>10</sub> allowable limit is 50µg/m<sup>3</sup>; there were four (4) exceedances of this limit during December 2019 (10<sup>th</sup>, 16<sup>th</sup>, 22<sup>nd</sup> and 28<sup>th</sup> December run dates). The highest concentration reported was 355µg/m<sup>3</sup> on the 22 December.

The HVAS PM<sub>10</sub> annual average result is above the long-term assessment criterion of 25µg/m<sup>3</sup>. The annual average PM<sub>10</sub> result was 27.0µg/m<sup>3</sup> (refer **Appendix B**). During November and December 2019, 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. Air quality data from the Department of Planning and Industry Katoomba and Bathurst Air Quality monitoring station indicates that air quality in the region was impacted by bushfire activity.

#### 4.2 **DEPOSITIONAL DUST MONITORING**

The depositional dust monitoring exposure period for December 2019 was 4 November – 5 December 2019. Depositional dust gauges at this facility conform to AS/NZS 3580.10.1:2016 and AS/NZS 3580.1.1:2016. Depositional dust monitoring results are shown in **Table 5**. Depositional dust monitoring locations are shown in **Appendix A**.

Dust gauge D2 has been removed from EPL 4911 and monitoring is no longer required at this location.

**Table 5** *Depositional Dust Monitoring*

<b>Deposit Gauge</b>	<b>Number of Days</b>	<b>Notes</b>	<b>Insoluble Solids</b>	<b>Ash</b>	<b>Combustible Matter</b>
D1	31	I	1.5	1.0	0.5
D3	31	I	2.7	2.1	0.6
D4	31	I	2.7	2.1	0.6
D5	31	I	2.1	1.6	0.5
D6	31	I	1.8	1.4	0.4

All units are g/m<sup>2</sup>/month

I indicates insects noted to be present in sample.

#### 4.2.1 **ALLOWABLE DEPOSITIONAL DUST LIMITS**

The EPA long term (annual average) deposited dust limit is 4g/m<sup>2</sup> per month. The rolling annual depositional dust results for all sites within the period (January 2018 – December 2019) 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 1.6g/m<sup>2</sup> 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 December 2019 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 not undertaken during December 2019 as it was completed for quarter 4 in October 2019.

## 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 December 2019 environmental monitoring results were found to be generally in compliance with EPL 4911 with the exception of:

- Electrical conductivity in groundwater samples P6 and Old Shaft were in excess of the of the respective site-specific trigger value.
- pH in groundwater sample Old Shaft was below the lower level pH trigger value.

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  $\text{PM}_{10}$  High Volume Air Sampler ( $27.0\mu\text{g}/\text{m}^3$ ) is above the EPA Annual Mean  $\text{PM}_{10}$  criterion of  $25\mu\text{g}/\text{m}^3$ . The DPIE air quality data, as well as observations by mining personnel suggests that the elevated TSP and  $\text{PM}_{10}$  concentrations recorded at PDM are considered to be impacted by bushfire activity in the region. 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 December 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**



Kirsty Nealon  
Senior Environmental Scientist

# Appendix A

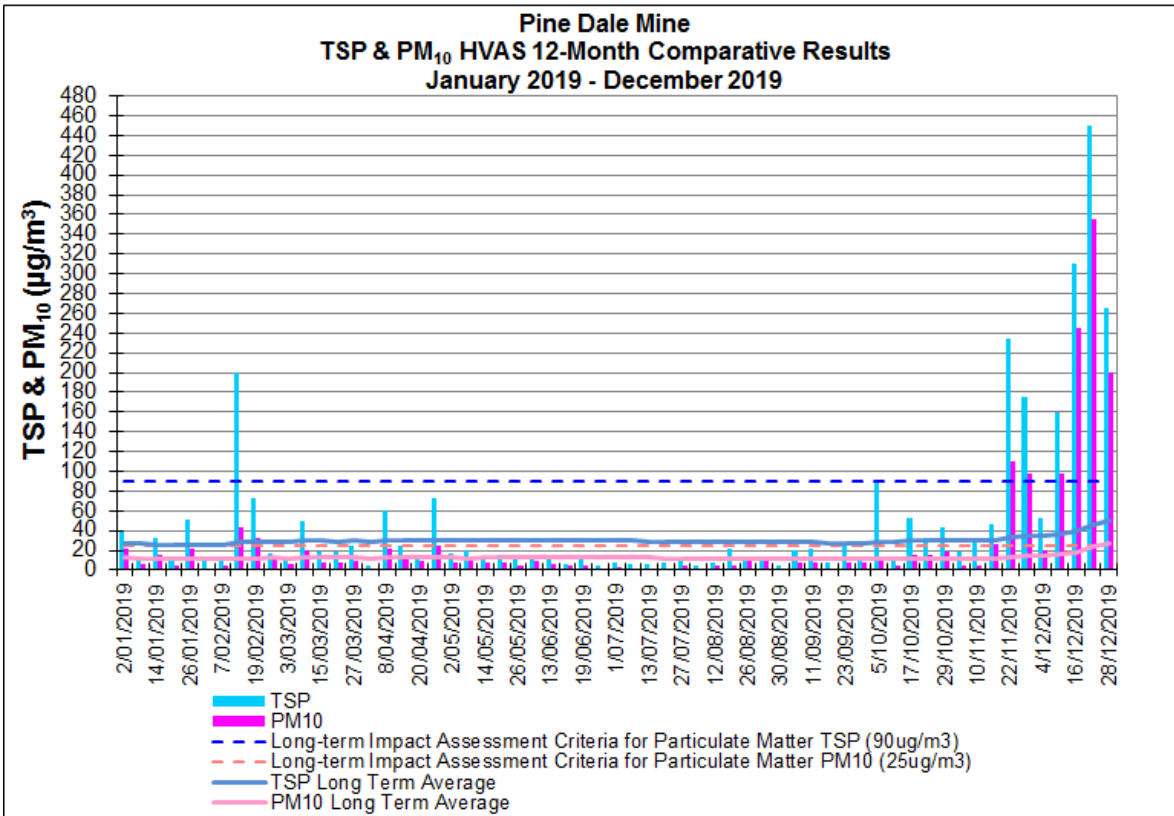
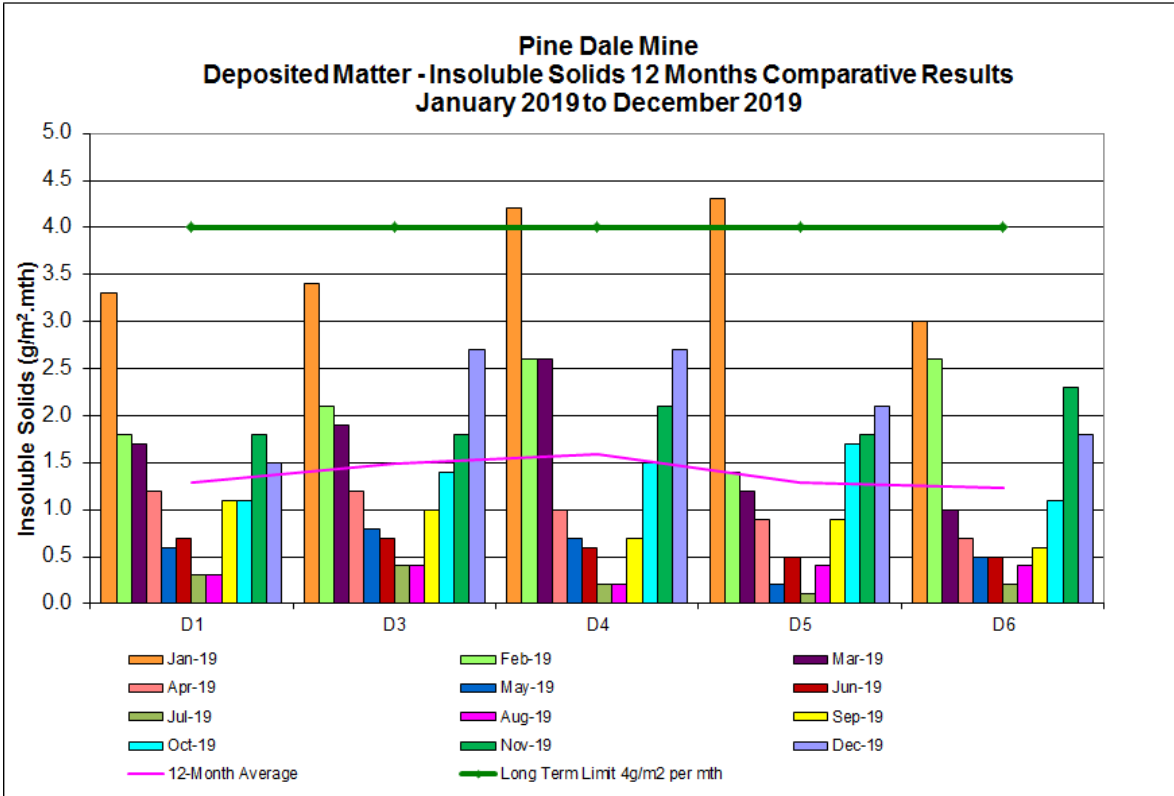
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## Monitoring Locations

# Appendix B

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Depositional Dust and HVAS Graphs

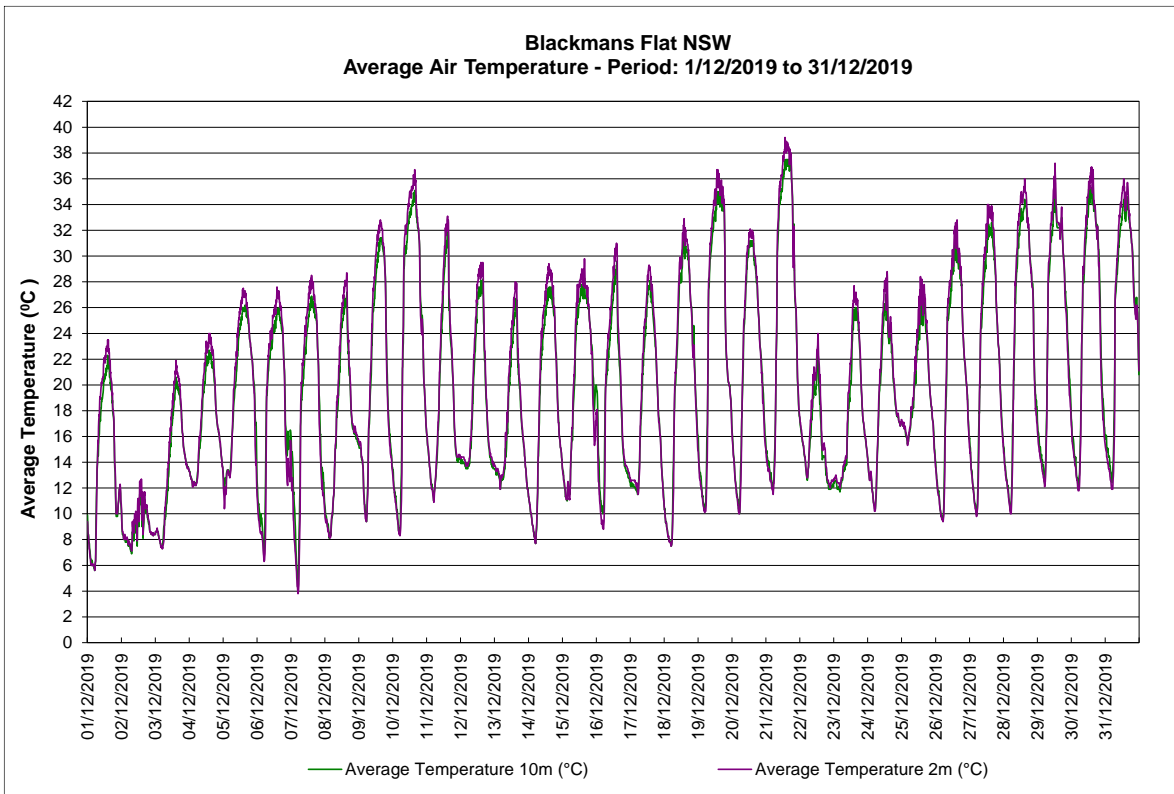
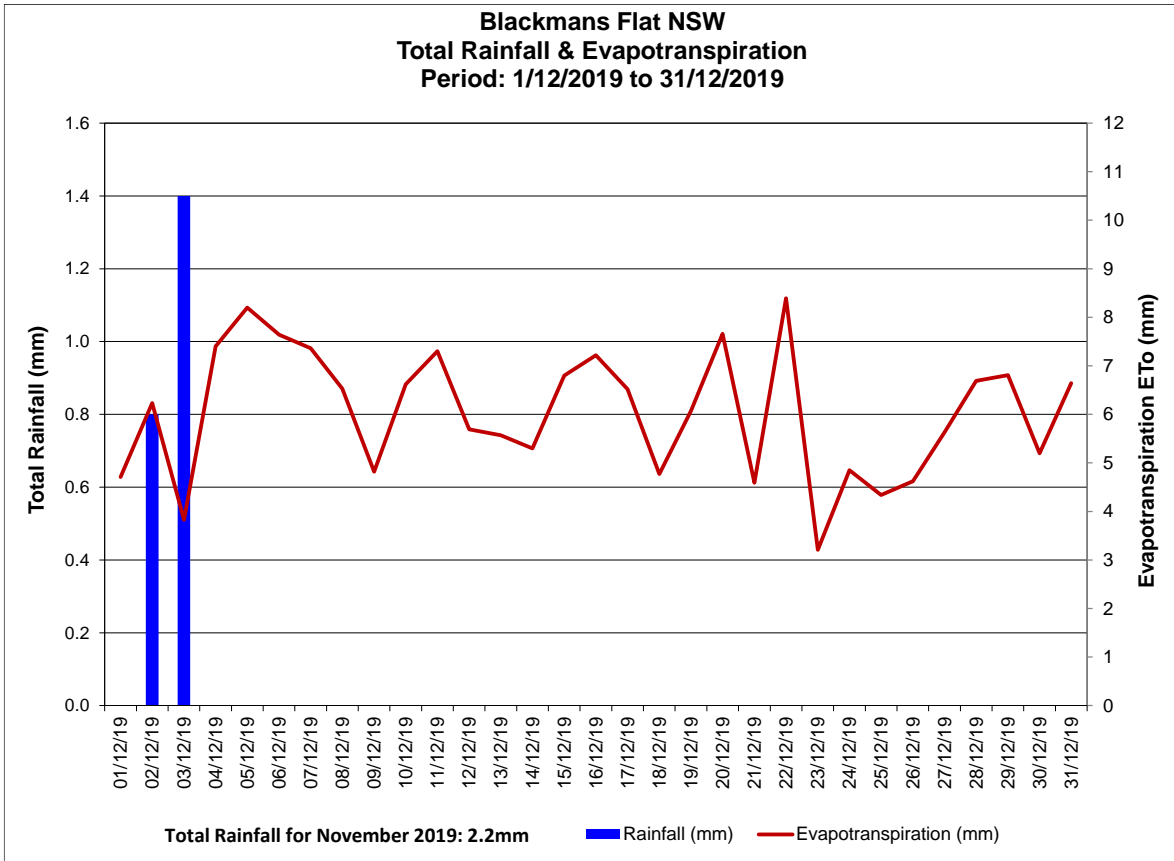


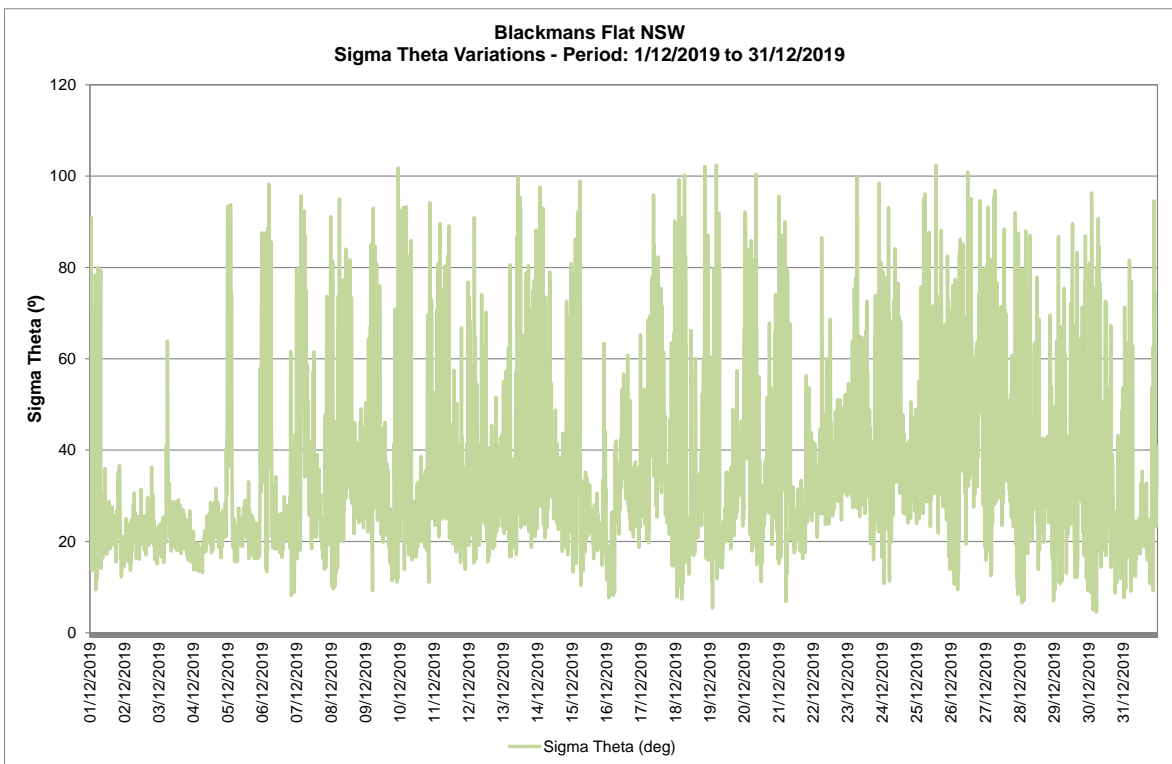
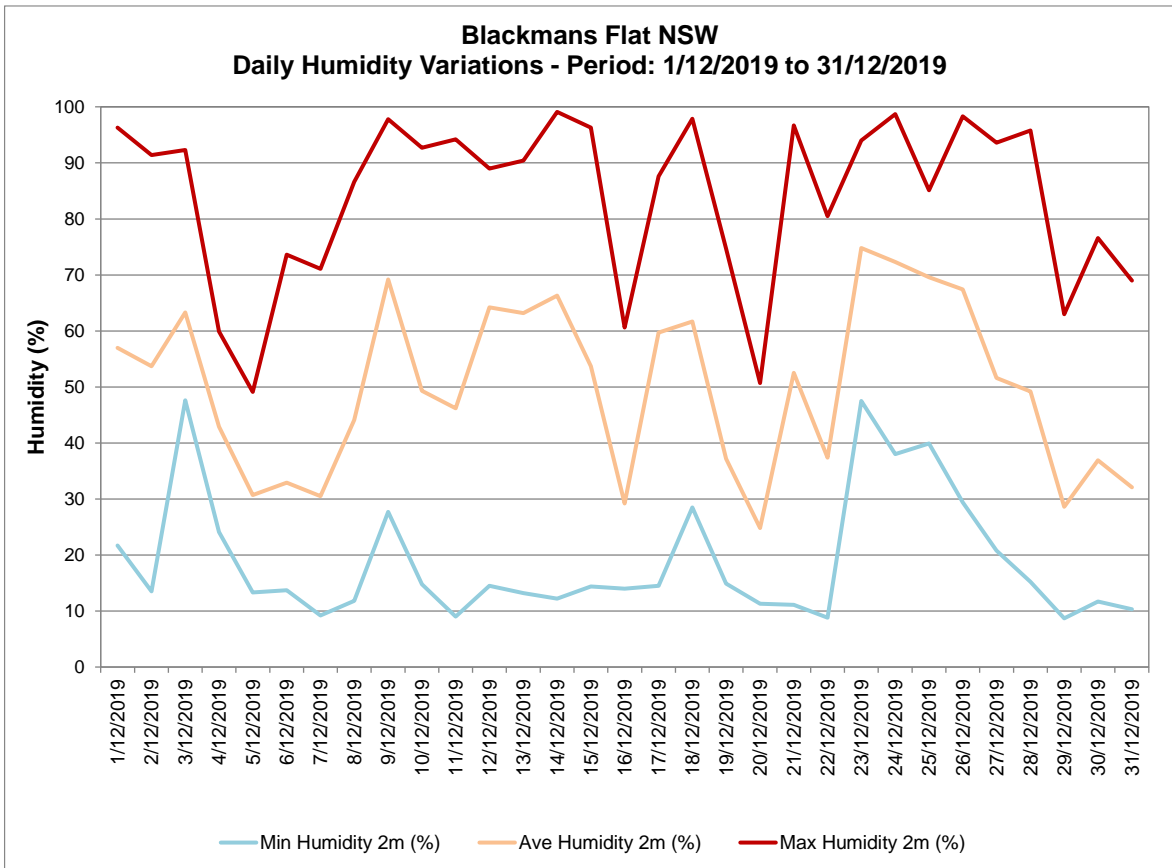
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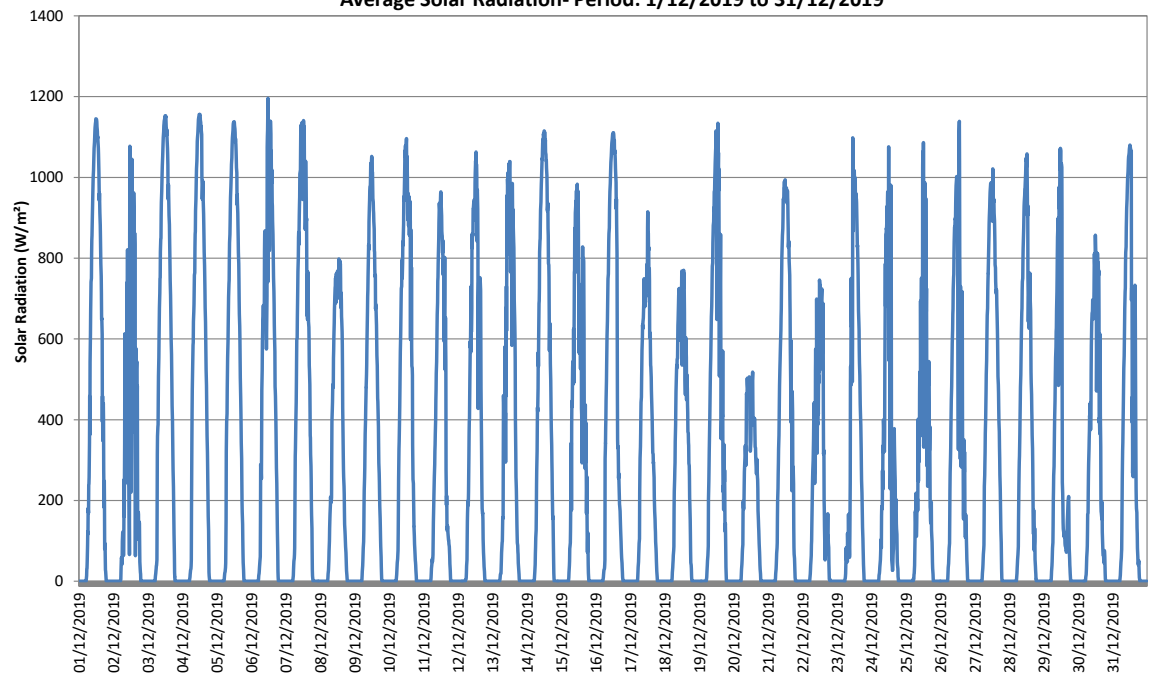
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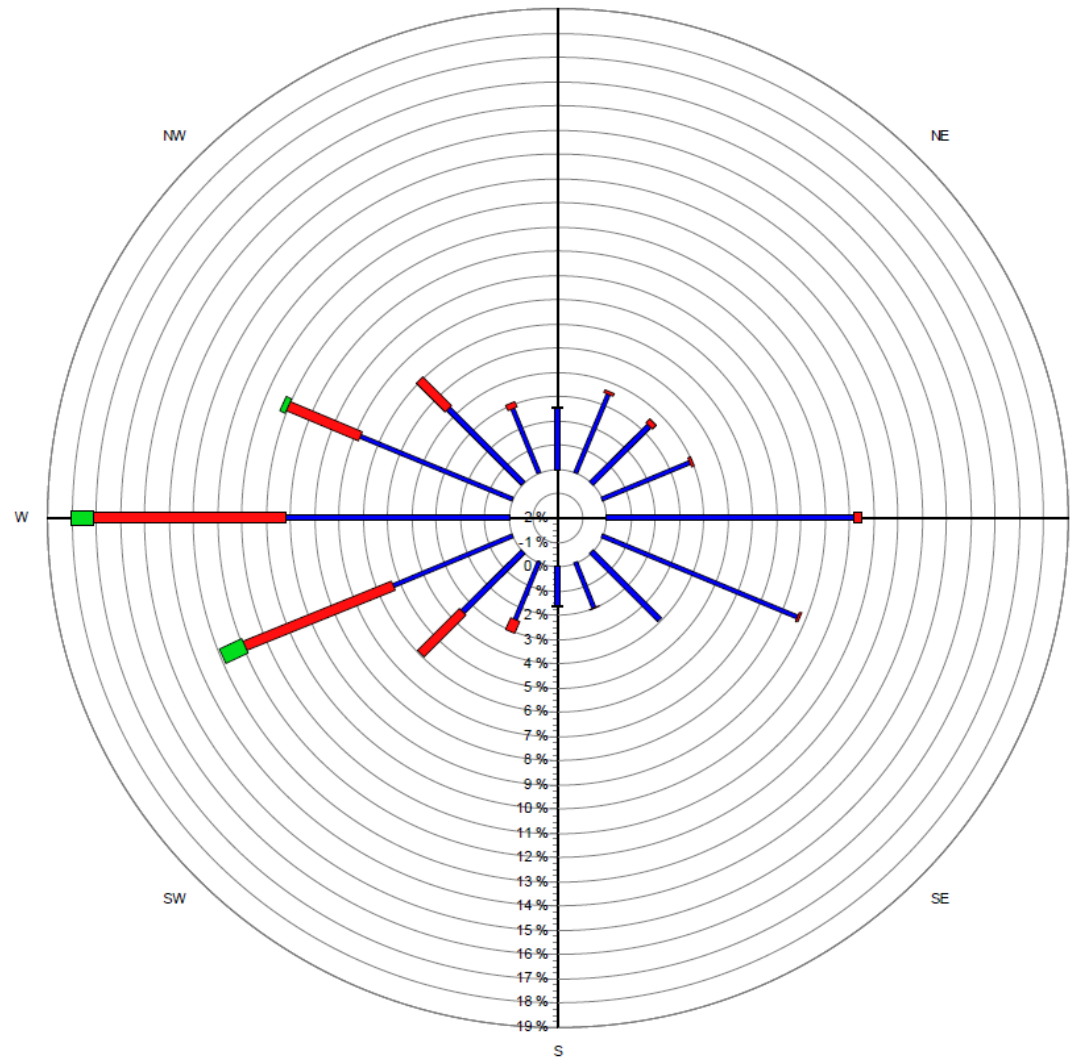
Blackmans Flat NSW  
Average Solar Radiation- Period: 1/12/2019 to 31/12/2019



### Blackmans Flat Windrose

1/12/2019 to 31/12/2019

N



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