



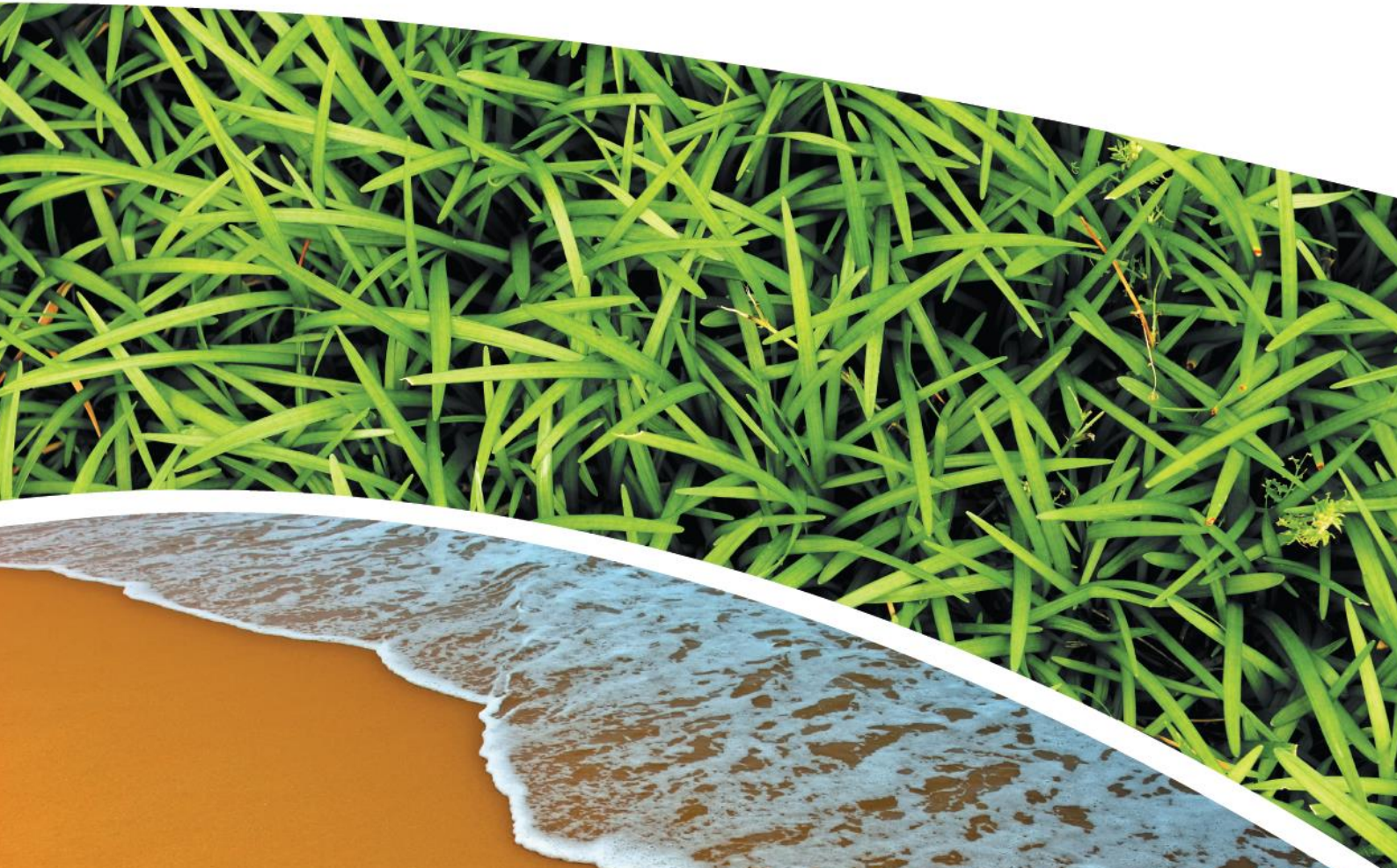
**AIR, WATER AND METEOROLOGICAL MONITORING – SEPTEMBER  
2019**

**PINE DALE MINE, BLACKMANS FLAT**

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

**Prepared by RCA Australia**

**RCA ref 6880-1808/0**



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Rev No	Comment	Author	Approved for Issue (Project Manager)		
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/0	Final	C Rocher	C Rocher		17.10.2019

DOCUMENT DISTRIBUTION				
Rev No	Copies	Format	Issued to	Date
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*DEPOSITIONAL DUST AND HVAS GRAPHS*

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RCA ref 6880-1808/0

17 September 2019

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**REPORT COMPILED FOR COMMUNITY CONSULTATIVE COMMITTEE  
DETAILING AIR, WATER AND METEOROLOGICAL MONITORING AT PINE DALE  
SEPTEMBER 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 September 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 September 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	-	0919688009	09196880010
Date Sampled	-	03/09/19	03/09/19
Time Sampled	-	9:35	10:25
Depth to Water from Surface	m	26.05	8.93
Water Level (AHD)	m	890.90	885.47
Temperature	°C	14.5	15.0
pH	pH	<b>5.99</b>	<b>6.17</b>
Conductivity	µS/cm	<b>1810</b>	775
Turbidity	NTU	47	
Dissolved Oxygen	mg/L	3.0	
Total Suspended Solids	mg/L	77	
Oil and Grease	mg/L	<5	
Bicarbonate Alkalinity (CaCO <sub>3</sub> )	mg/L	62	
Total Alkalinity (CaCO <sub>3</sub> )	mg/L	62	
Sulphate (as SO <sub>4</sub> )	mg/L	910	
Chloride	mg/L	57	
Calcium	mg/L	146	
Magnesium	mg/L	80	
Sodium	mg/L	80	
Potassium	mg/L	21	
Cobalt (dissolved)	mg/L	0.064	
Manganese (dissolved)	mg/L	3.1	
Nickel (dissolved)	mg/L	0.12	
Zinc (dissolved)	mg/L	0.019	
Iron (dissolved)	mg/L	44.8	
<b>Trigger Values</b>			
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 September 2019. The next scheduled monitoring round will be in November 2019.

## 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
5-Sep-19	20	09196880031	9719663	07-Sep-19	9:19	Client	24.28
11-Sep-19	22	09196880033	9720317	14-Sep-19	7:00	Client	23.99
17-Sep-19	8	09196880035	9720323	18-Sep-19	12:15	Client	23.98
23-Sep-19	28	09196880037	9720329	28-Sep-19	15:00	Client	23.98
29-Sep-19	12	09196880039	9720333	01-Oct-19	13:19	Client	23.99

**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
5-Sep-19	7	09196880032	9720327	07-Sep-19	9:22	Client	24.00
11-Sep-19	7	09196880034	9720319	14-Sep-19	7:10	Client	24.00
17-Sep-19	1	09196880036	9720318	18-Sep-19	12:20	Client	24.00
23-Sep-19	8	09196880038	9720320	28-Sep-19	15:04	Client	24.00
29-Sep-19	7	09196880040	9720334	01-Oct-19	13:22	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* (October 2018 to September 2019) for TSP is 27.2µg/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 24-hour maximum *PM*<sub>10</sub> allowable limit is 50µg/m<sup>3</sup>. The EPA annual mean *PM*<sub>10</sub> allowable limit is 25µg/m<sup>3</sup>. All *PM*<sub>10</sub> HVAS results recorded during this monitoring period conform to consent conditions, as the *current rolling annual mean* for the *PM*<sub>10</sub> unit is 11.5µg/m<sup>3</sup>, which is below the allowable annual limit (refer **Appendix B**). The 24-hour maximum allowable limit of 50µg/m<sup>3</sup> was not exceeded on any sampling event during the month of September 2019.

#### 4.2 DEPOSITIONAL DUST MONITORING

The depositional dust monitoring exposure period for September 2019 was 1 August – 2 September 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*

Deposit Gauge	Number of Days	Notes	Insoluble Solids	Ash	Combustible Matter
D1	29	I	1.1	0.7	0.4
D3	29	I	1.0	0.7	0.3
D4	29	I	0.7	0.5	0.2
D5	29	I	0.9	0.6	0.3
D6	29	I	0.6	0.4	0.2

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 (October 2018 – September 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 30 September 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 undertaken during September 2019. Results of monitoring indicated that there were no noise contributions origination form Pine Dale Mine. Results of monitoring can be found in the *RCA Australia Pine Dale Mine Environmental Noise Survey Report Q3 2019, September 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 September 2019 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 of the site-specific trigger value.
- pH in groundwater samples P6 and P7 were in excess of the lower level pH trigger value.

Rolling annual averages from both the TSP and PM<sub>10</sub> High Volume Air Samplers are currently below the EPA Annual Mean TSP and PM<sub>10</sub> criterion of 90µg/m<sup>3</sup> and 25µg/m<sup>3</sup> respectively. Currently there are no depositional dust gauge results which are greater than the EPA Long Term (annual average) criteria of 4g/m<sup>2</sup>.month based upon a rolling average of the past 12 months.

Meteorological monitoring was undertaken for the entire month of September 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**

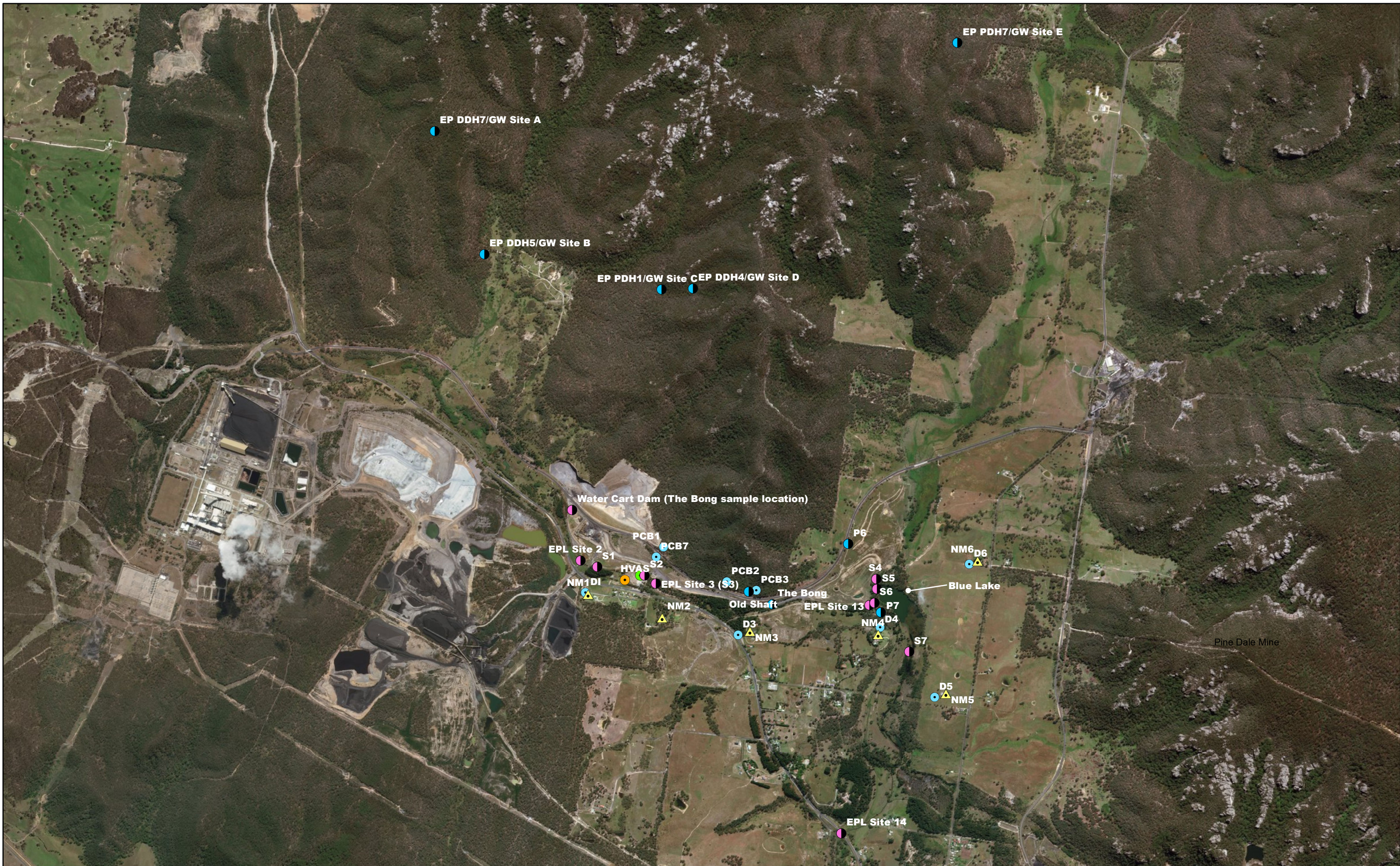


Carmen Rocher  
Environmental Engineer

# Appendix A

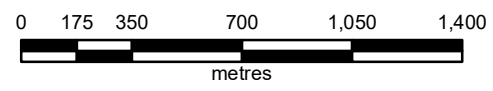
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## Monitoring Locations



**LEGEND**

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



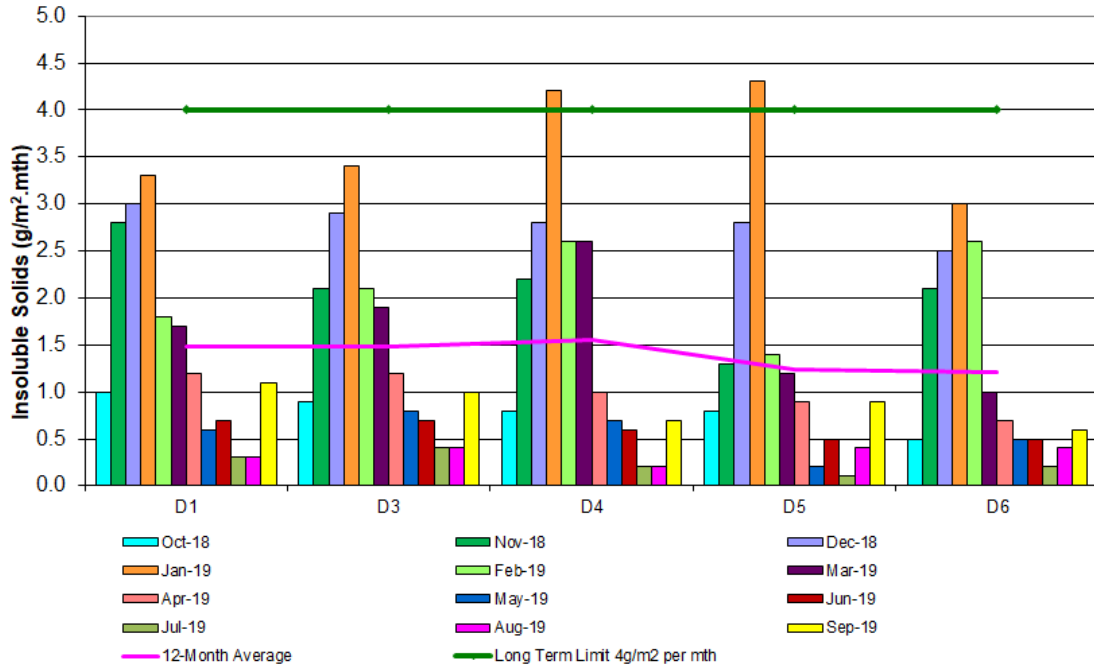
**PINE DALE MINE  
ENVIRONMENTAL MONITORING  
LOCATION PLAN**

# Appendix B

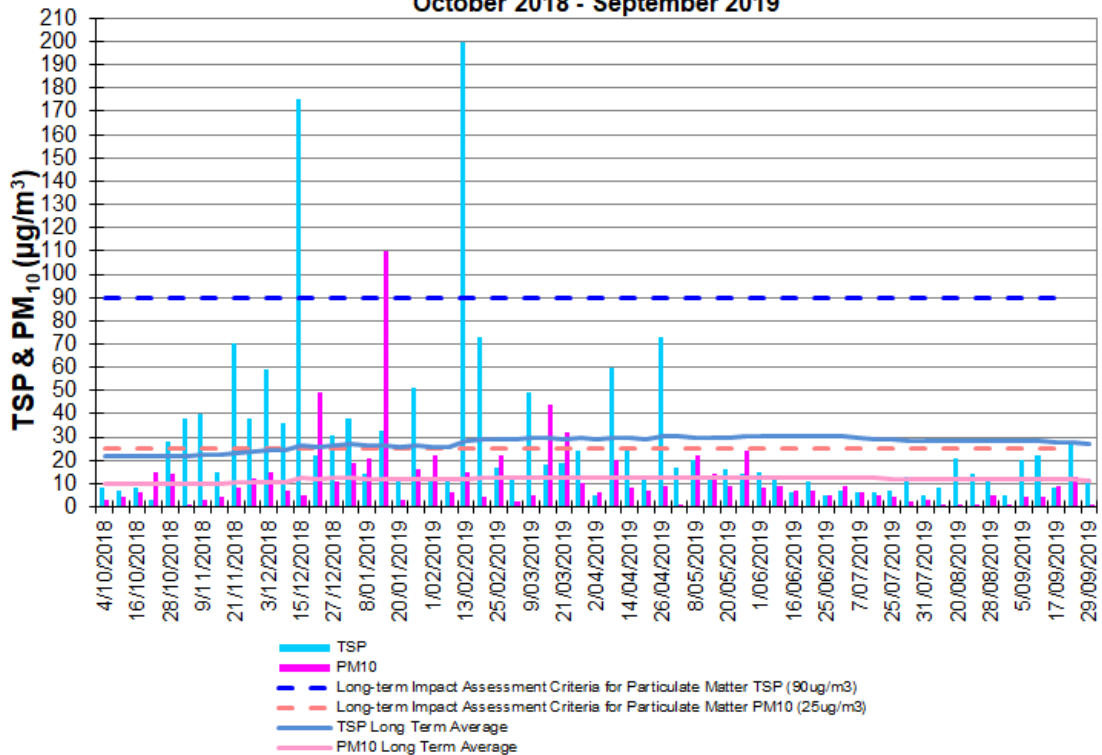
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Depositional Dust and HVAS Graphs

**Pine Dale Mine  
Deposited Matter - Insoluble Solids 12 Months Comparative Results  
October 2018 to September 2019**



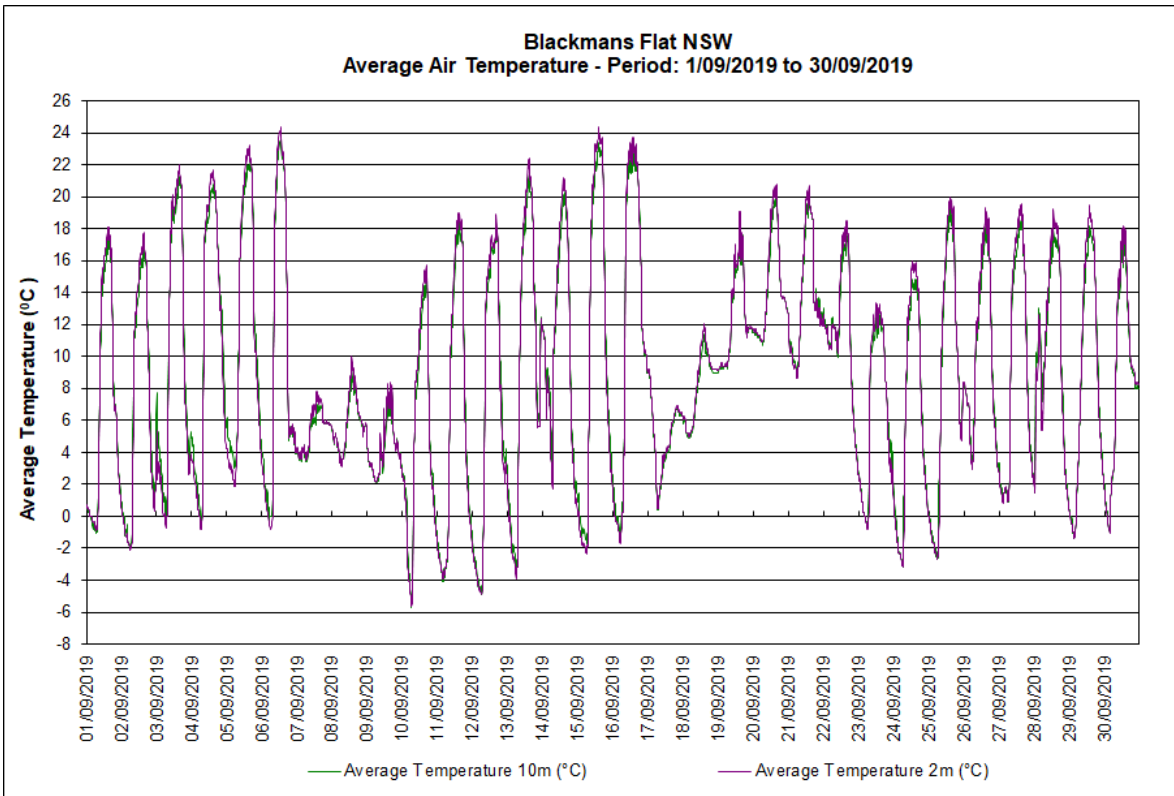
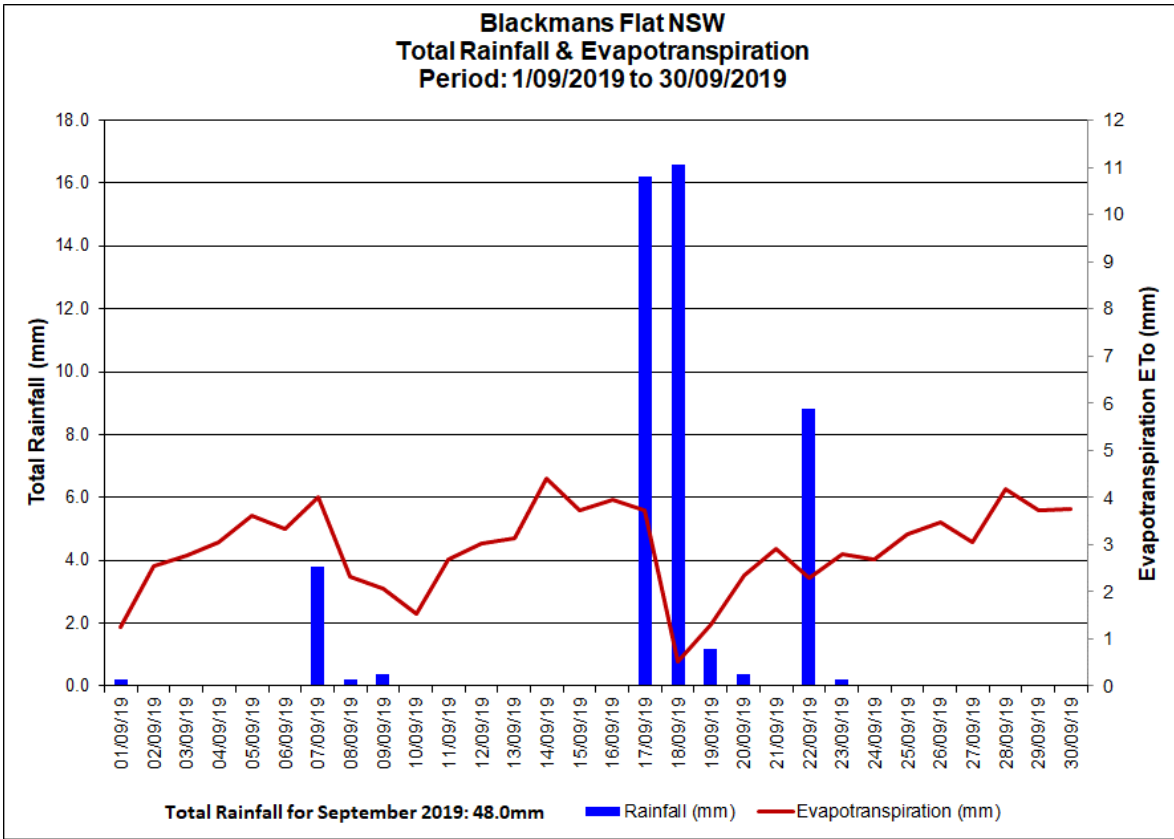
**Pine Dale Mine  
TSP & PM<sub>10</sub> HVAS 12-Month Comparative Results  
October 2018 - September 2019**



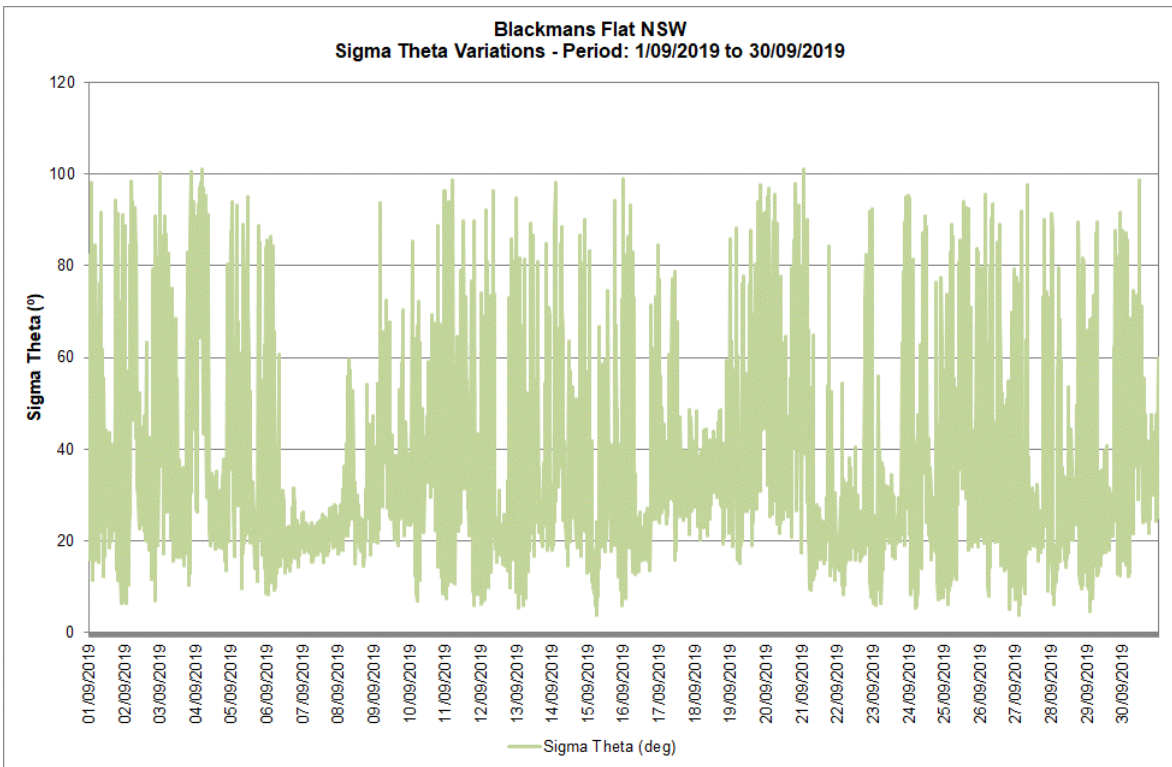
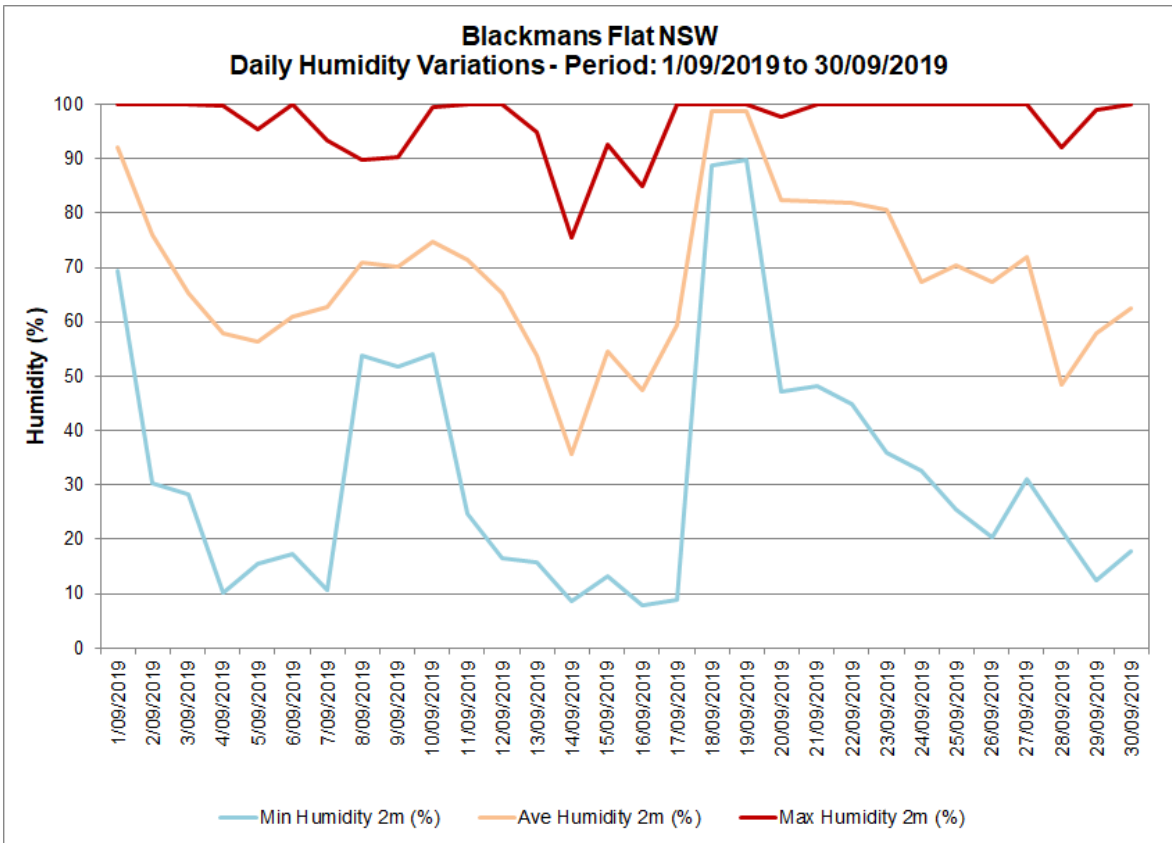
# Appendix C

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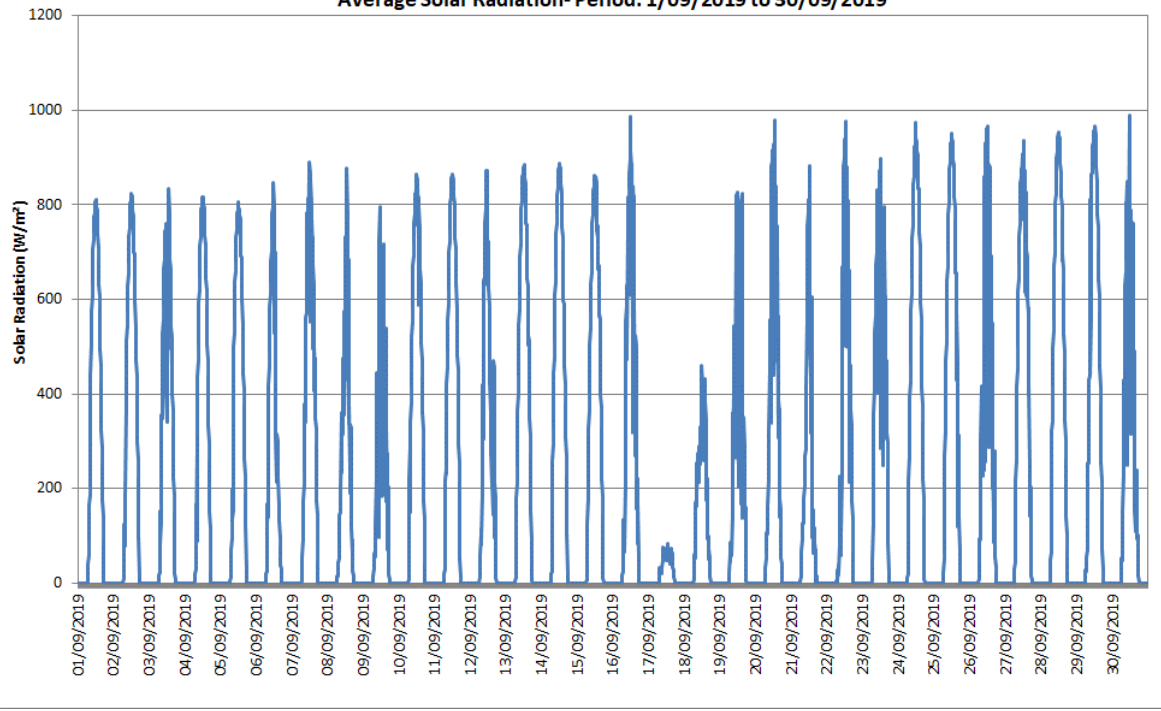
## Meteorological Data





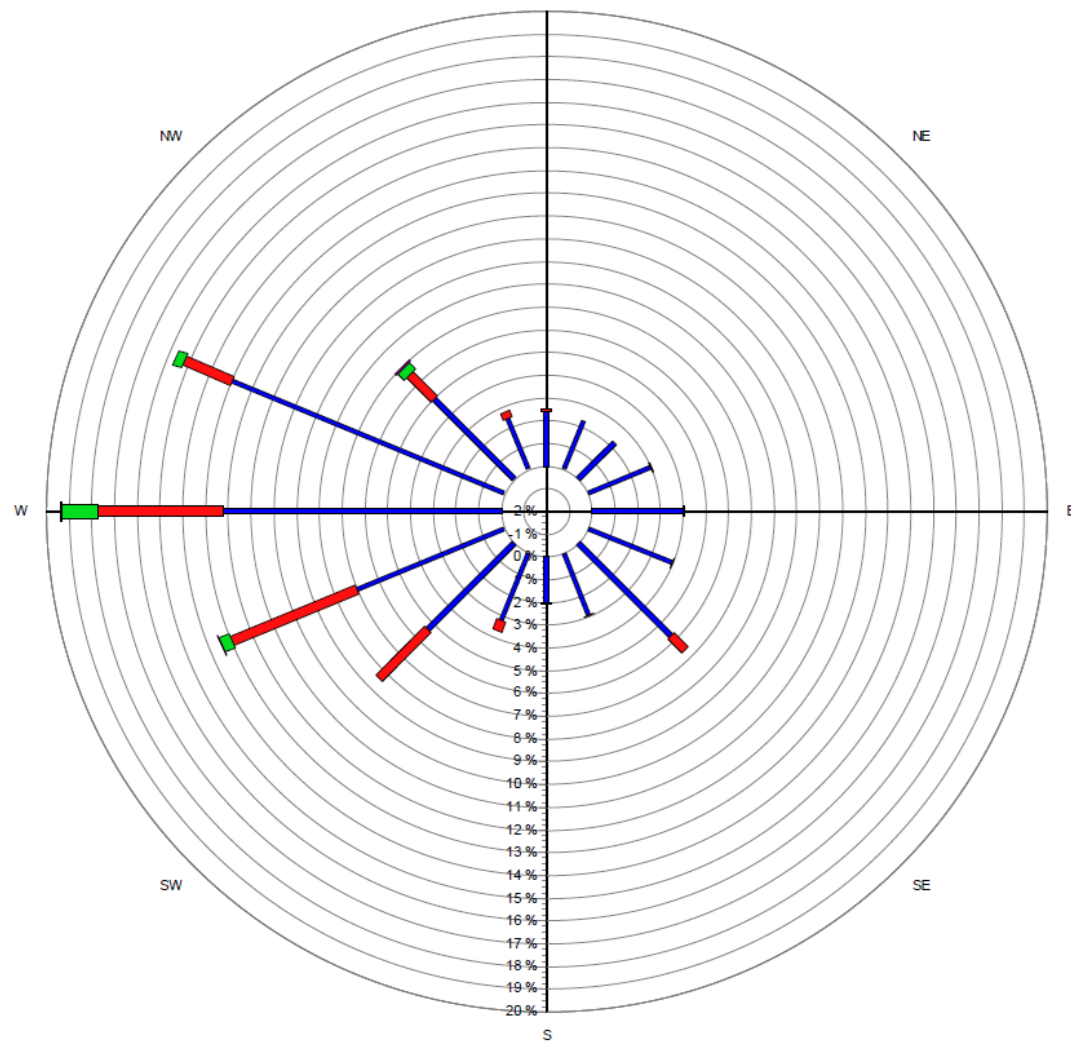
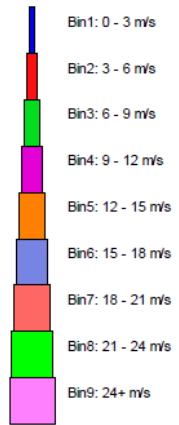


**Blackmans Flat NSW**  
**Average Solar Radiation- Period: 1/09/2019 to 30/09/2019**



### Blackmans Flat Windrose

1/09/2019 to 30/09/2019  
N



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