

**SURFACE WATER, DEPOSITIONAL DUST,  
HVAS AND METEOROLOGICAL MONITORING**

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

**Prepared by RCA Australia**

**RCA ref 6880-855/0**

**June 2014**



## RCA AUSTRALIA

ABN 53 063 515 711

92 Hill Street, CARRINGTON NSW 2294


Telephone: +61 2 4902 9200

Facsimile: +61 2 4902 9299

Email: [administrator@rca.com.au](mailto:administrator@rca.com.au)

Internet: [www.rca.com.au](http://www.rca.com.au)

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RCA LE ref 6880-855/0



14 July 2014

Pine Dale Mine  
PO Box 202  
WALLERAWANG NSW 2845

Attention: Mr Graham Goodwin

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**REPORT COMPILED FOR  
PINE DALE MINE COMMUNITY CONSULTATIVE COMMITTEE  
DETAILING SURFACE WATER, GROUNDWATER DEPOSITIONAL DUST,  
HVAS AND METEOROLOGICAL MONITORING  
JUNE 2014**

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## 1 GENERAL COMMENTS

Job Number: 6880.

Date Samples Received: During the month of June 2014.

Samples received were sampled by RCA Laboratories – Environmental staff.

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 are based on established internationally recognised procedures such as APHA and Australian Standards. Analytical test methods are detailed in **Table 1**. When an external testing laboratory is used to obtain the analysis of samples which become a part of this report, then the details of that laboratory's official report will be attached in an Appendix.

**Table 1** *Analytical Test Methods*

ANALYSIS	METHOD	UNITS	ANALYSING LABORATORY	NATA/ NON-NATA ANALYSIS
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> /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
Total Dissolved Solids	ENV-LAB020	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
Dissolved Oxygen	Manufacturer's Instructions	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

\*\*Dissolved oxygen measurements are undertaken in the field using the DO Meter owned by PDM.

### 3 WATER MONITORING RESULTS

#### 3.1 GROUNDWATER

A total of three on-site groundwater samples were collected during the month of June 2014. Sampling at Bores P2, P3 and P7a are no longer required under the new sampling regime undertaken in accordance with Project Approval (PA 10\_0041) and the Pine Dale Mine Water Management Plan (Report No. 613/20). The new sampling regime commenced 1 August 2013. Water quality analysis results are shown in **Table 2**.

Fortnightly sampling at Old Shaft ceased during May 2014 as the mine is now under care and maintenance.

**Table 2** Groundwater Analysis Results

ANALYSIS	UNITS	P6	P7	Old Shaft
Sample Number	-	06146880009	06146880010	06146880013
Date Sampled	-	17/06/14	17/06/14	17/06/14
Time Sampled	-	14:28	14:58	13:46
Depth to Water from Surface	m	25.75	6.84	11.3
Water Level (AHD)	m	891.20	887.56	
Temperature	°C	13.4	13.5	14.0
pH	pH	6.08	6.12	6.22
Conductivity	µS/cm	1165	764	887
Turbidity	NTU	6		25
Dissolved Oxygen	mg/L	3		
TSS	mg/L	38		
Oil & Grease	mg/L	< 2		
Bicarbonate Alkalinity (CaCO <sub>3</sub> )	mg/L	60		
Total Alkalinity (CaCO <sub>3</sub> )	mg/L	60		
Sulfate (as SO <sub>4</sub> )	mg/L	692		
Chloride	mg/L	29		
Calcium	mg/L	136		
Magnesium	mg/L	63		
Sodium	mg/L	50		
Potassium	mg/L	22		
Cobalt (dissolved)	mg/L	0.078		
Manganese (dissolved)	mg/L	3.46		
Nickel (dissolved)	mg/L	0.113		
Zinc (dissolved)	mg/L	0.061		
Iron (dissolved)	mg/L	35.8		
<b>Trigger Levels*</b>				
pH trigger level	pH	**	**	**
Conductivity trigger level	µS/cm	**	**	**
Water level trigger (AHD) <sup>#</sup>	m	--	883.28	--

**NOTES:** \*Depth relative to ground level (not standpipe height).

■ Indicates analysis was not required

Groundwater monitoring locations are shown in **Appendix 1**.



### 3.2 EPA SURFACE WATER MONITORING

Routine quarterly surface waters were not scheduled to be monitored this month. Quarterly surface water monitoring is next scheduled to be undertaken in August 2014.

## 4 AIR QUALITY MONITORING RESULTS

### 4.1 HIGH VOLUME AIR SAMPLERS (HVAS)

HVAS at this facility conform to AS/NZS 3580.9.3:2003, AS/NZS 3580.9.6:2003 and AS/NZS 3580.1.1:2007.

HVAS Total Suspended Particulate analysis results are shown in **Table 3**.

PM<sub>10</sub> Suspended Particulate Matter results are shown in **Table 4**.

**Table 3** Total Suspended Particulates ( $\mu\text{g}/\text{m}^3$  0°C 101.3 kPa)

RUN DATE	TSP ( $\mu\text{g}/\text{m}^3$ )	SAMPLE NUMBER	FILTER NUMBER	DATE FILTER OFF	TIME FILTER OFF	FIELD TECH	HOURS RUN
03-Jun-14	9	06146880029	8897125	04-Jun-14	13:20	Client	24.00
09-Jun-14	11	06146880031	8897126	11-Jun-14	18:47	Client	24.58
15-Jun-14	7	06146880033	8897128	16-Jun-14	16:20	Client	24.00
21-Jun-14	13	06146880035	8897130	23-Jun-14	14:16	Client	24.00
27-Jun-14	8	06146880037	8956461	30-Jun-14	12:00	Client	24.00

**Table 4** Suspended Particulate Matter PM<sub>10</sub> ( $\mu\text{g}/\text{m}^3$  0°C 101.3 kPa)

RUN DATE	PM <sub>10</sub> ( $\mu\text{g}/\text{m}^3$ )	SAMPLE NUMBER	FILTER NUMBER	DATE FILTER OFF	TIME FILTER OFF	FIELD TECH	HOURS RUN
03-Jun-14	3	06146880030	8897124	04-Jun-14	13:22	Client	24.00
09-Jun-14	8	06146880032	8897127	11-Jun-14	18:50	Client	24.58
15-Jun-14	1	06146880034	8897129	16-Jun-14	16:22	Client	24.00
21-Jun-14	6	06146880036	8897131	23-Jun-14	14:16	Client	24.00
27-Jun-14	4	06146880038	8956460	30-Jun-14	12:05	Client	24.00

#### 4.1.1 TSP Summary

The EPA Annual Mean TSP allowable limit is  $90\mu\text{g}/\text{m}^3$ . All TSP HVAS results recorded during this monitoring period are in compliance with consent conditions, as the *current rolling annual mean* (from July 2013 to June 2014) for the TSP unit is  $24.1\mu\text{g}/\text{m}^3$ , which is well below the allowable limit of  $90\mu\text{g}/\text{m}^3$ .

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

The EPA 24h Maximum *PM*<sub>10</sub> allowable limit is 50µg/m<sup>3</sup>. The EPA Annual Mean *PM*<sub>10</sub> allowable limit is 30µg/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 11.7µg/m<sup>3</sup>, which is below the allowable limit of 30µg/m<sup>3</sup>. The 24 hour maximum allowable limit of 50µg/m<sup>3</sup> was not exceeded during the month of June 2014.

#### 4.1.3 Comments

HVAS monitoring locations are shown in **Appendix 1**.

Graphical HVAS results presentations are shown in **Appendix 2**.

## 4.2 DEPOSITIONAL DUST

Depositional Dust Gauges at this facility conform to AS/NZS 3580.10.1:2003 and AS/NZS 3580.1.1:2007. Depositional Dust monitoring results are shown in **Table 5**.

**Table 5** *Depositional Dust Monitoring - Deposited Matter June 2014*

SAMPLE NUMBER	DEPOSIT GAUGE	DATE SAMPLE STARTED	DATE SAMPLE COMPLETED	NUMBER OF DAYS	NOTES	INSOLUBLE SOLIDS (g/m <sup>2</sup> .month)	ASH (g/m <sup>2</sup> .month)	COMBUSTIBLE MATTER (g/m <sup>2</sup> .month)
06146880019	D1	16/05/2014	17/06/2014	32	I	0.6	0.3	0.3
06146880020	D2	16/05/2014	17/06/2014	32	I	0.4	0.1	0.3
06146880021	D3	16/05/2014	17/06/2014	32	I	0.7	0.4	0.3
06146880022	D4	16/05/2014	17/06/2014	32	I	0.3	0.1	0.2
06146880023	D5	16/05/2014	17/06/2014	32	I	0.6	0.1	0.5
06146880024	D6	16/05/2014	17/06/2014	32	I	1.1	0.3	0.8

### 4.2.1 Glossary of Terms Used in Notes

I Insects (eg, Ants, spiders)

### 4.2.2 Allowable Depositional Dust Limits

The EPA Long Term (Annual Average) Dust Limit is 4g/m<sup>2</sup> per month. All Depositional Dust results during this monitoring period are in compliance with consent conditions. The Annual Average for Dust Gauges D1, D2, D3, D4, D5 and D6 are all less than or equal to 1.5g/m<sup>2</sup> per month, which is below the allowable Annual Average Long Term Limit of 4g/m<sup>2</sup> per month.

Depositional Dust monitoring locations are shown in **Appendix 1**.

Graphical Depositional Dust results are shown in **Appendix 2**.



## 5 BLASTING RESULTS

No blasting was undertaken during the month of June 2014 as mining operations have ceased.

## 6 NOISE MONITORING RESULTS

Routine quarterly noise monitoring was not required to be undertaken this month. Quarterly noise monitoring is scheduled to be undertaken during the July 2014 monitoring period.

## 7 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 at 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 May 2014.

## 8 SUMMARY

During the month of June 2014 all environmental monitoring constituents were found to be in compliance with EPL 4911.

Quarterly surface water sampling was not required to be conducted this month, with sampling next scheduled for August 2014.

Rolling annual averages from both the TSP and PM<sub>10</sub> High Volume Air Samplers are currently well below the EPA Annual Mean TSP and PM<sub>10</sub> criterion of 90µg/m<sup>3</sup> and 30µg/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.

Pine Dale Mine ceased operation in March 2014 and therefore there are no blasting results.

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Please contact the undersigned if you have any queries.

Yours sincerely



Carmen Rocher  
Environmental Engineer  
RCA Australia Pty Ltd trading as  
RCA Laboratories – Environmental

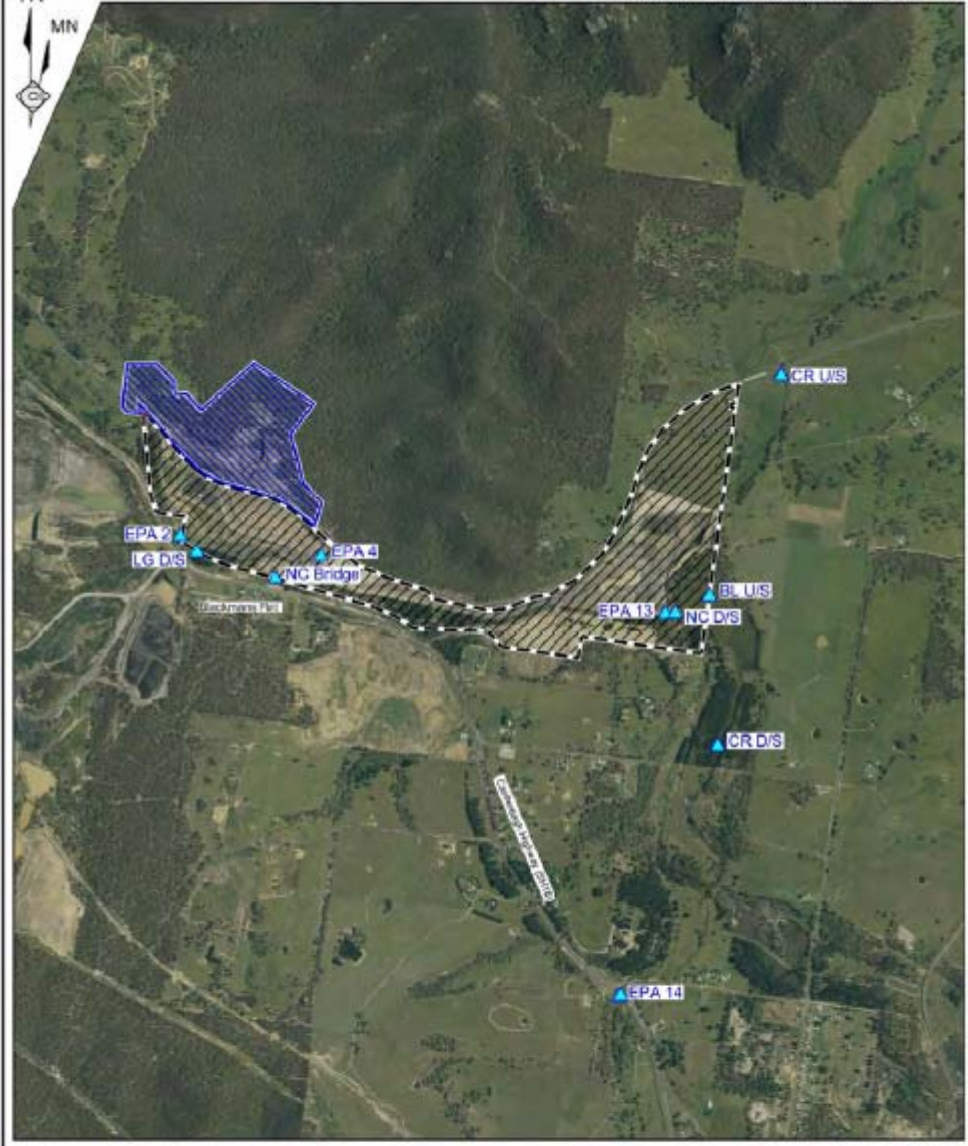


Karen Tripp  
Senior Environmental Scientist/Hygienist  
RCA Australia Pty Ltd trading as  
RCA Laboratories – Environmental

# Appendix 1

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## Surface Water Groundwater and Air Quality Monitoring Locations

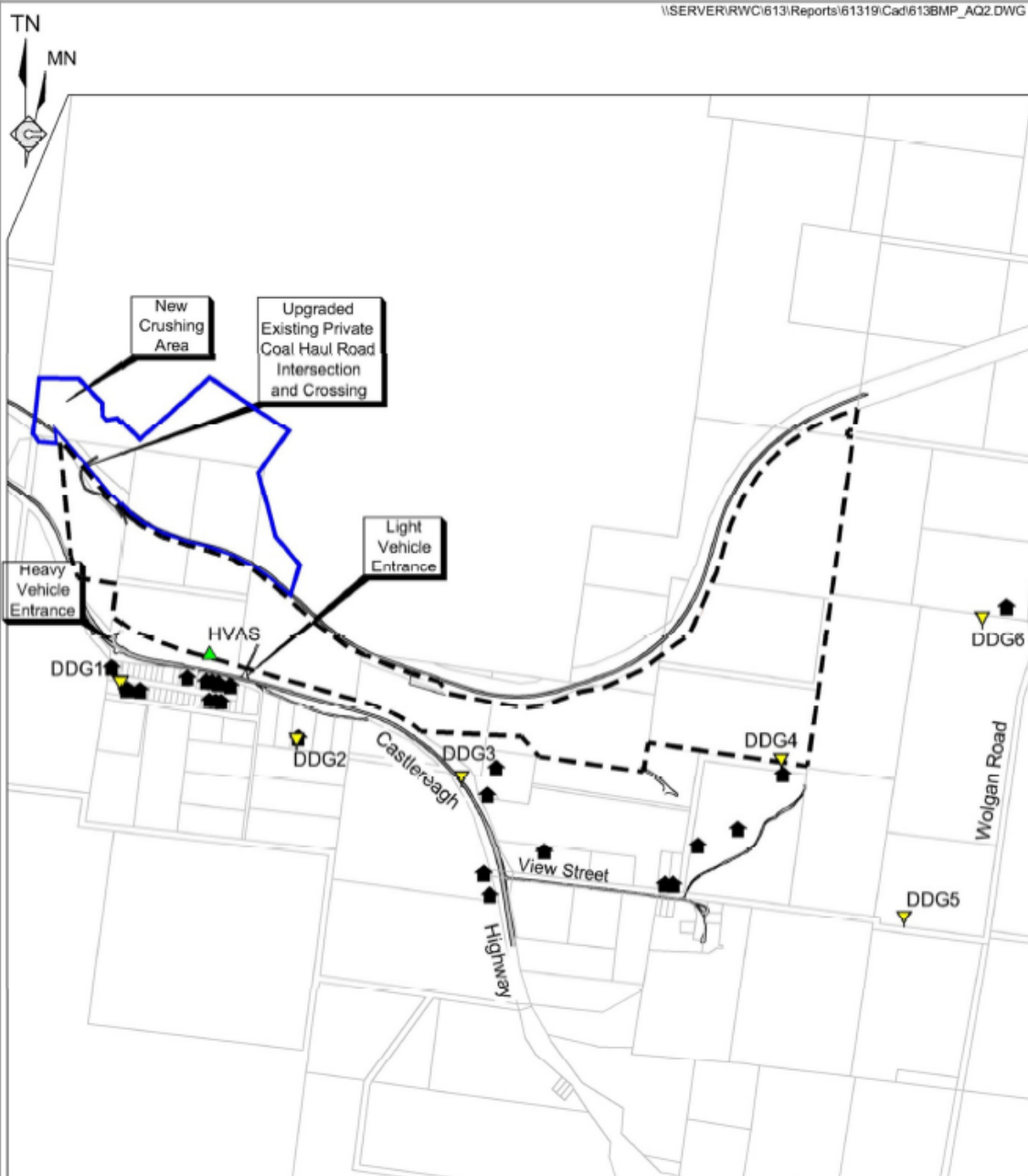


REFERENCE  
Pine Dale Coal Mine  
Yarraboldy Extension  
EPA 14 Surface Water Monitoring Location

SCALE 1:25 000  
0 250 500 750 1000 1250 ft  
Aerial Photo Source: Dept. of Lands (Bathurst) - Date of Photography: September 2009

Figure WM5  
SURFACE WATER  
MONITORING LOCATIONS





- REFERENCE
- Pine Dale Coal Mine
  - Yarraboldy Extension
  - Cadastral Boundary
  - 🏠 Residence
  - DDG1 ▾ Air Quality Monitoring Location (Deposited Dust)
  - HVAS ▲ Air Quality Monitoring Location (High Volume Sampling)

Figure AQ2  
AIR QUALITY MONITORING  
LOCATIONS

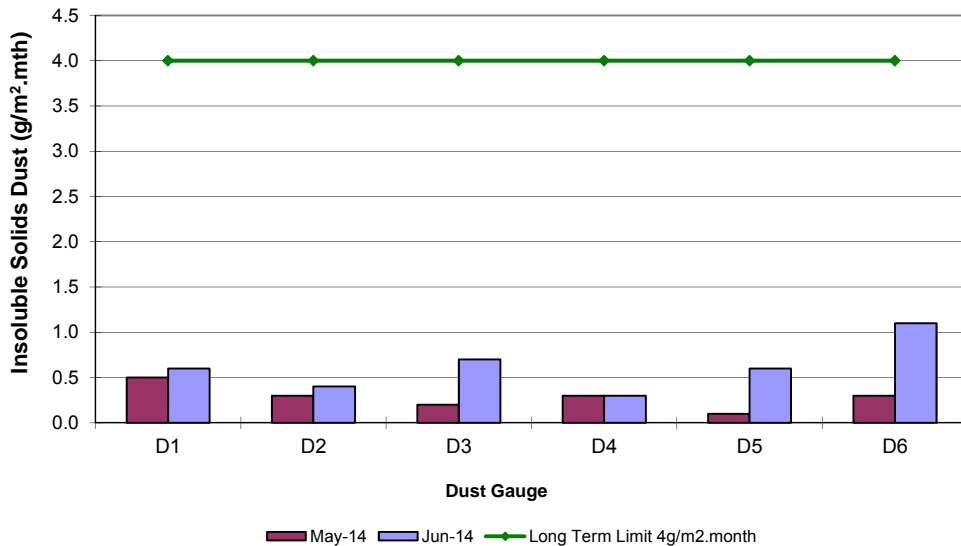
# Appendix 2

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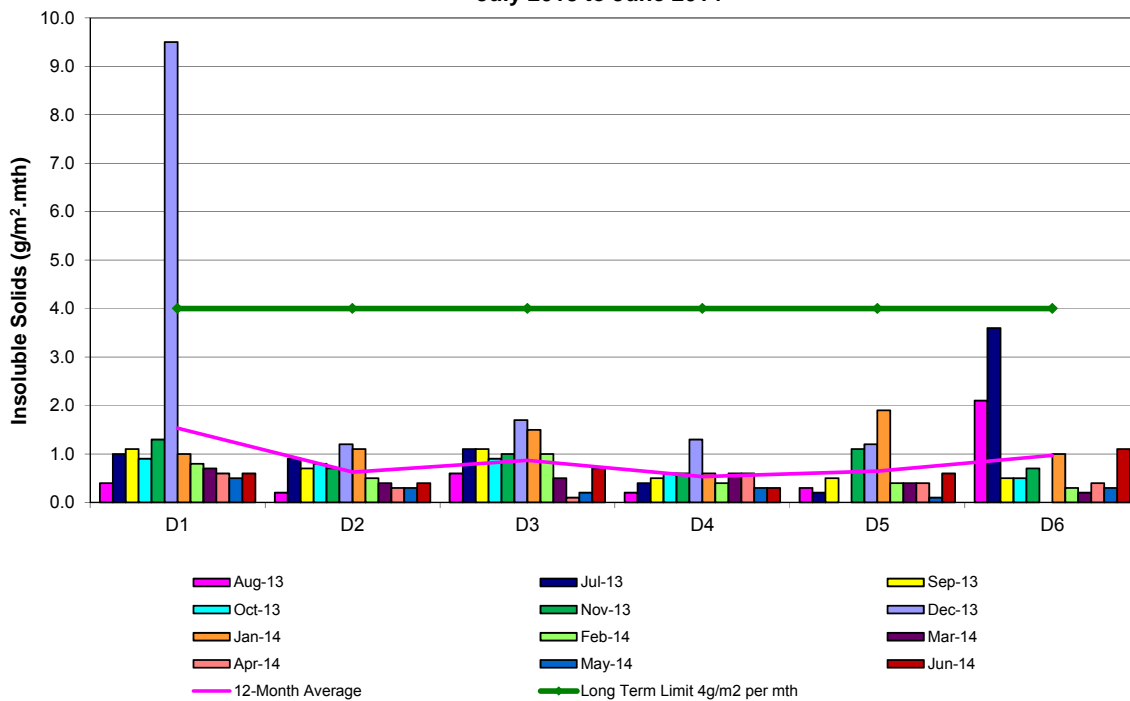
Depositional Dust, HVAS and Blast Result Graphs

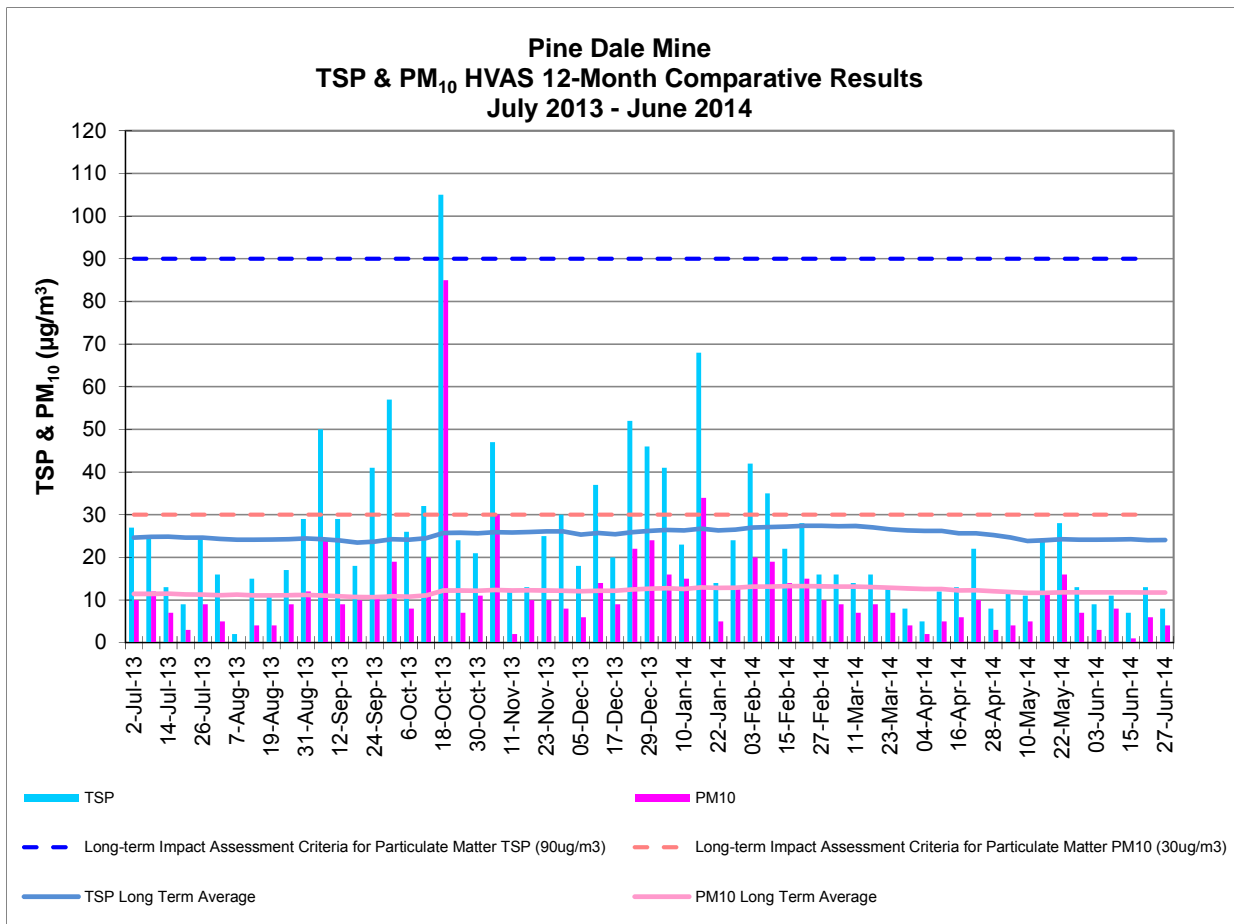
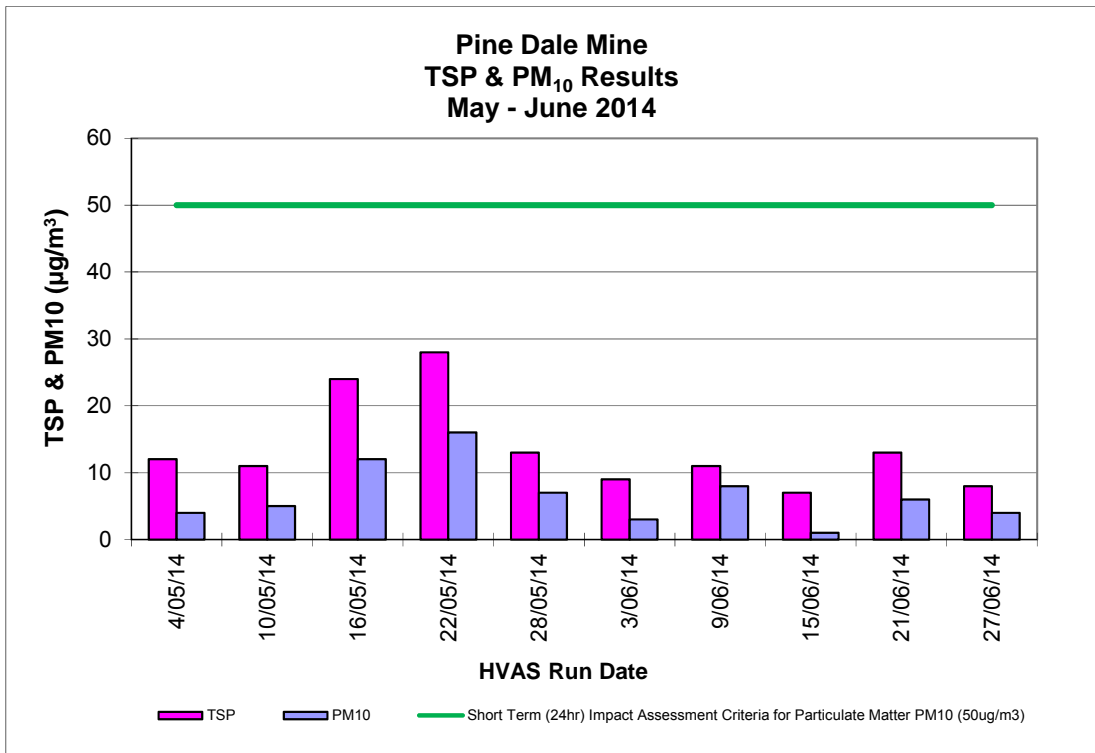


**Pine Dale Mine  
Depositional Dust Gauge Comparative Results  
May 2014 to June 2014**



**Pine Dale Mine  
Deposited Matter - Insoluble Solids 12 Months Comparative Results  
July 2013 to June 2014**



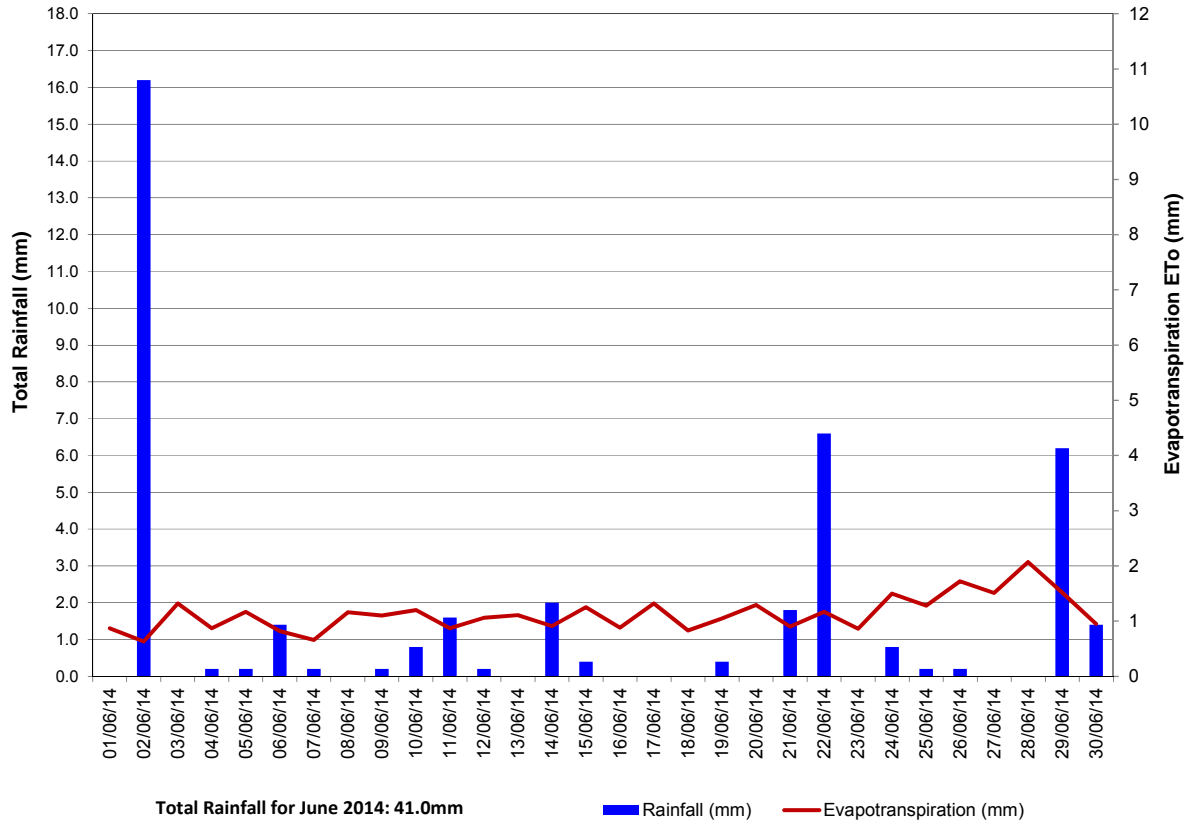


# Appendix 3

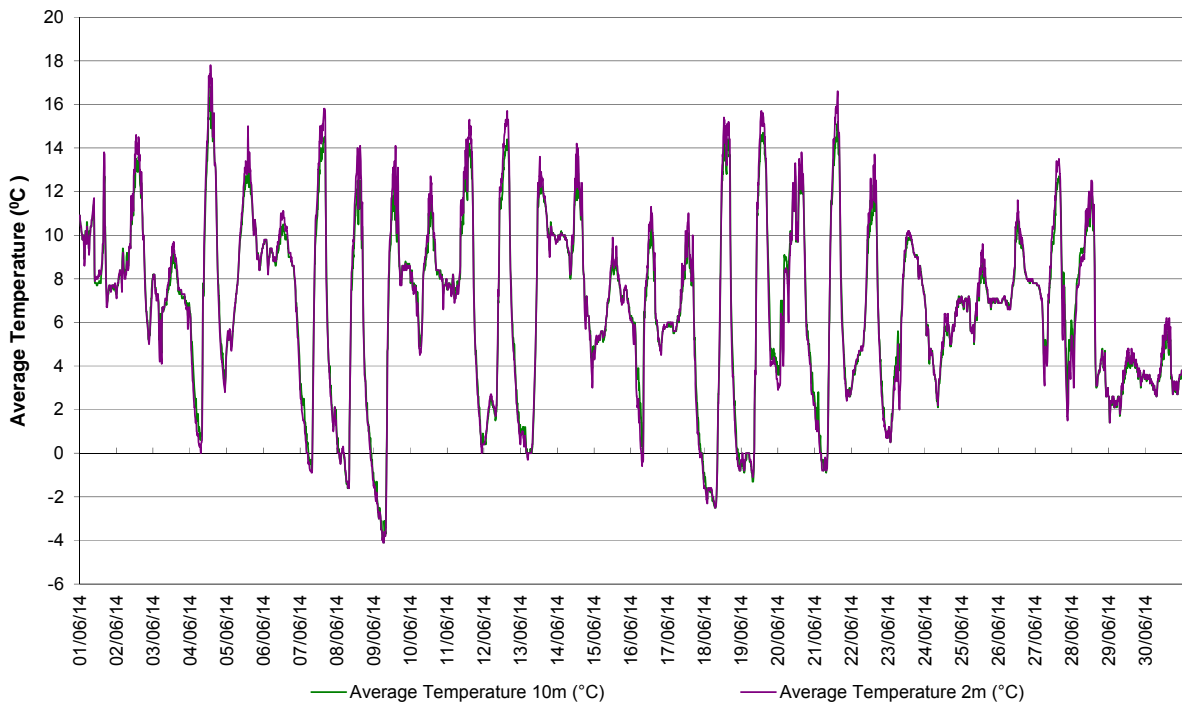
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Meteorological Data

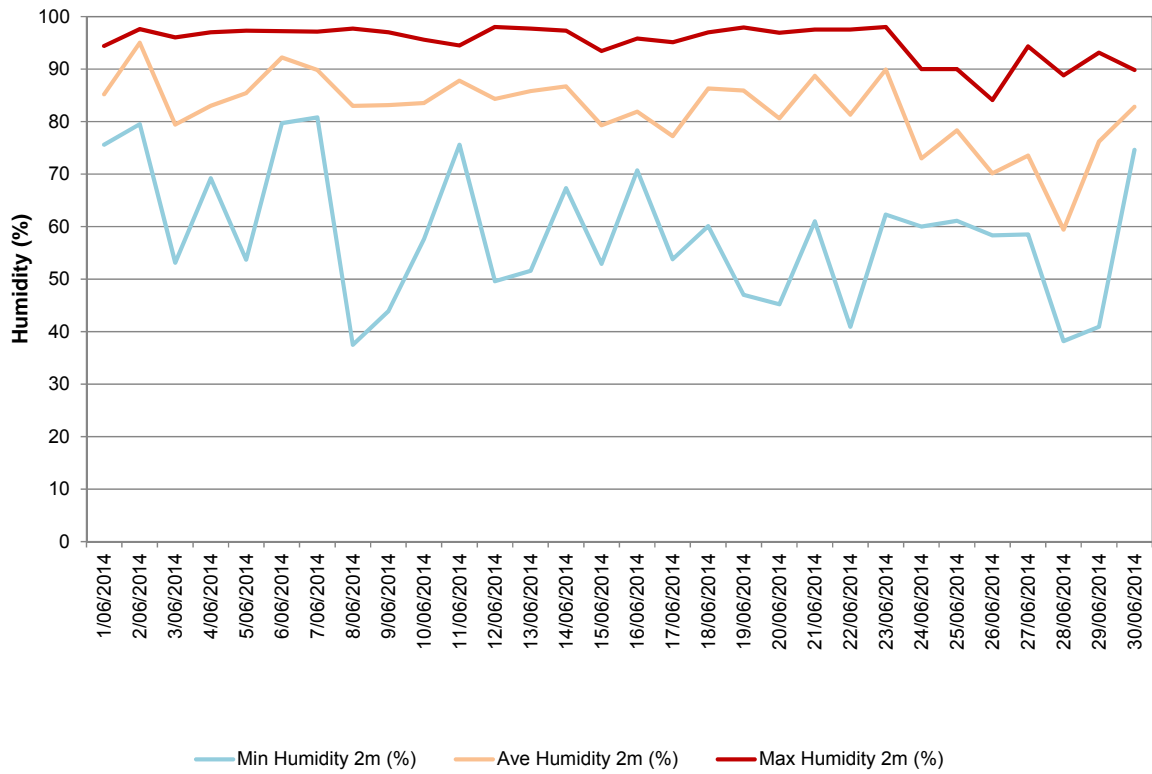
**Blackmans Flat NSW**  
**Total Rainfall & Evapotranspiration**  
**Period: 1/6/14 to 30/6/14**



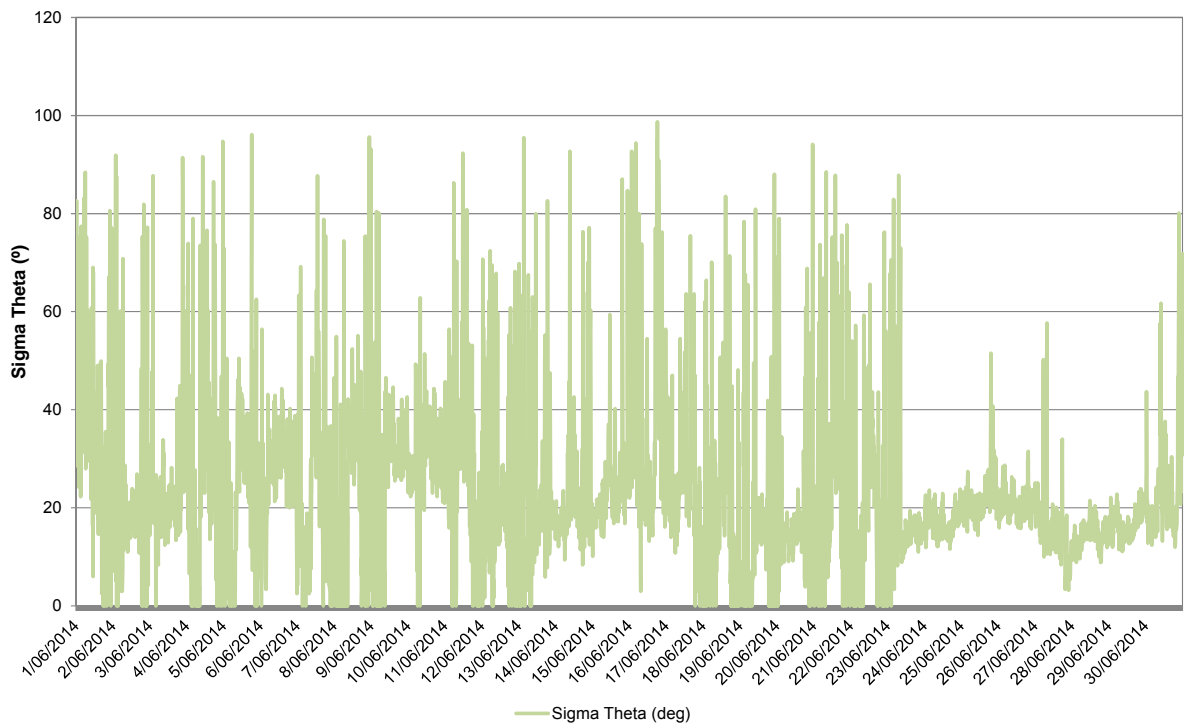
**Blackmans Flat NSW**  
**Average Air Temperature - Period: 1/6/14 to 30/6/14**

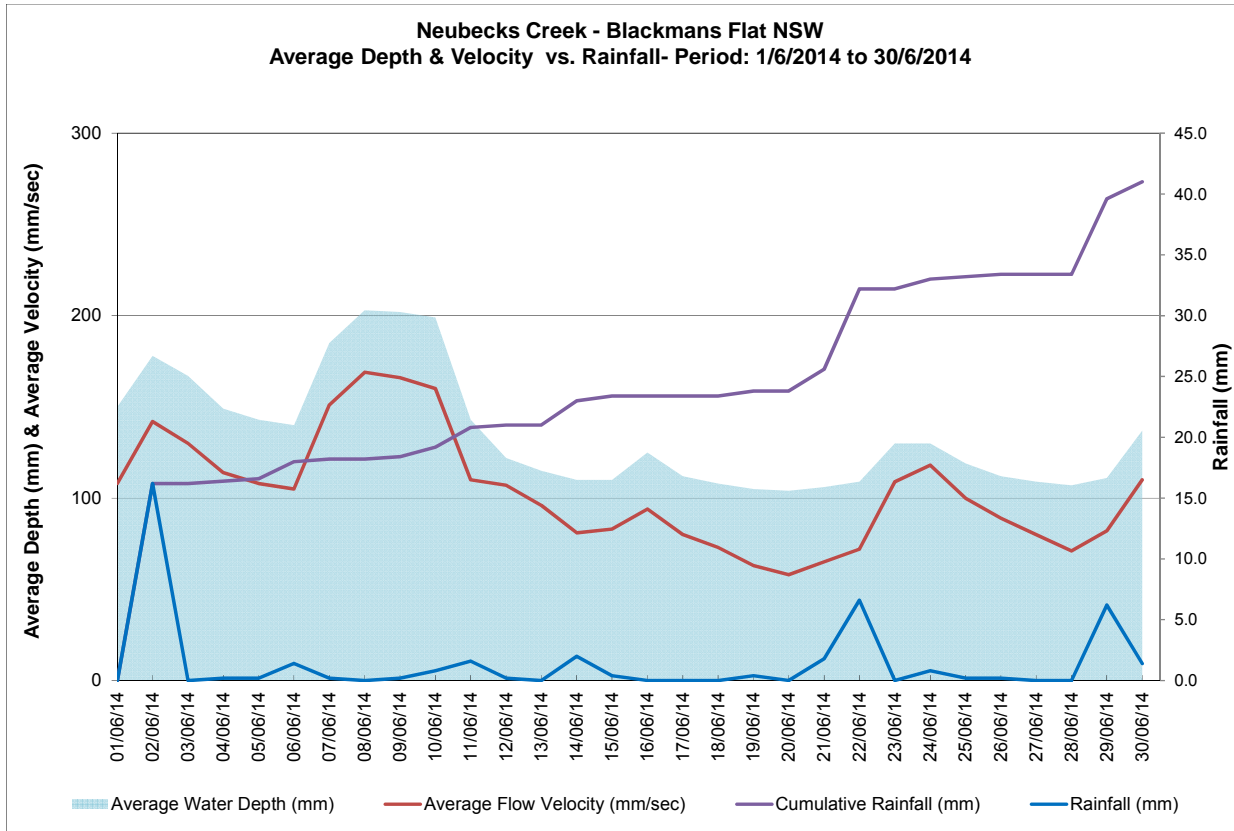
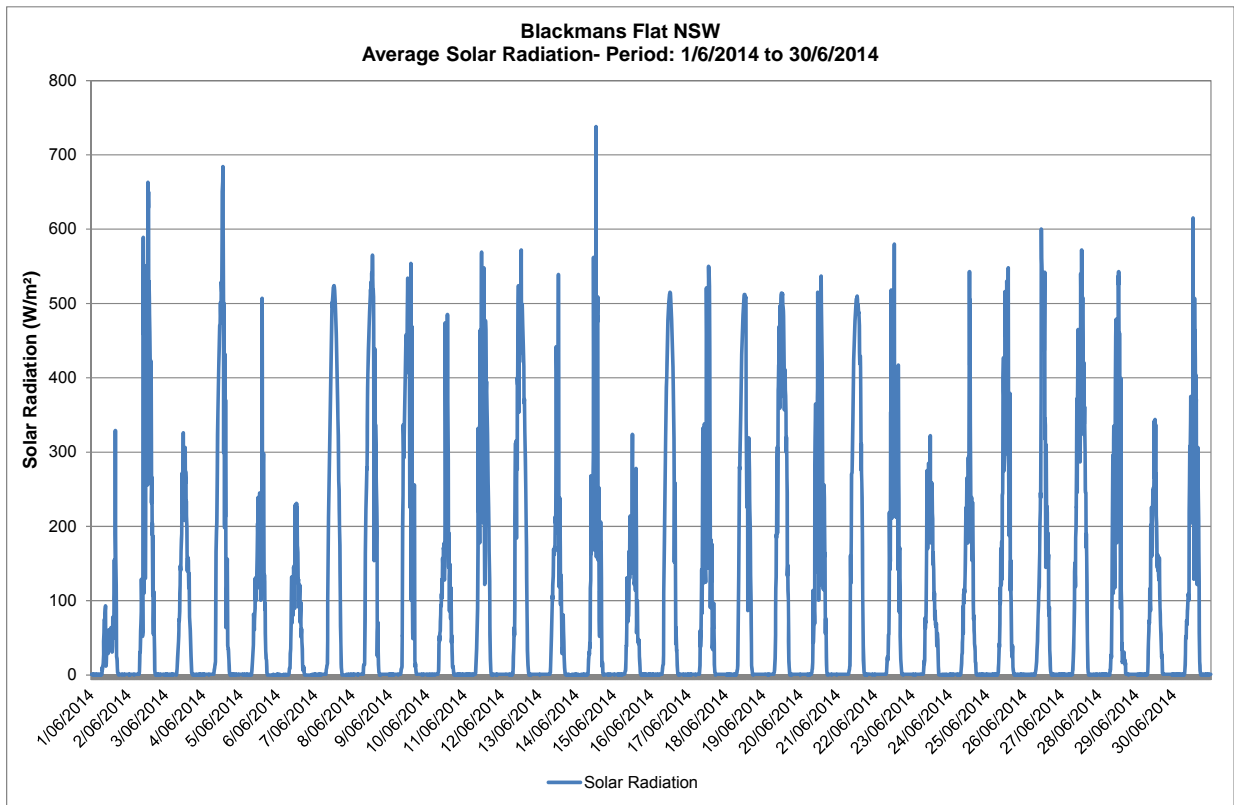


**Blackmans Flat NSW**  
**Daily Humidity Variations - Period: 1/6/2014 to 30/6/2014**



**Blackmans Flat NSW**  
**Sigma Theta Variations - Period: 1/6/2014 to 30/6/2014**



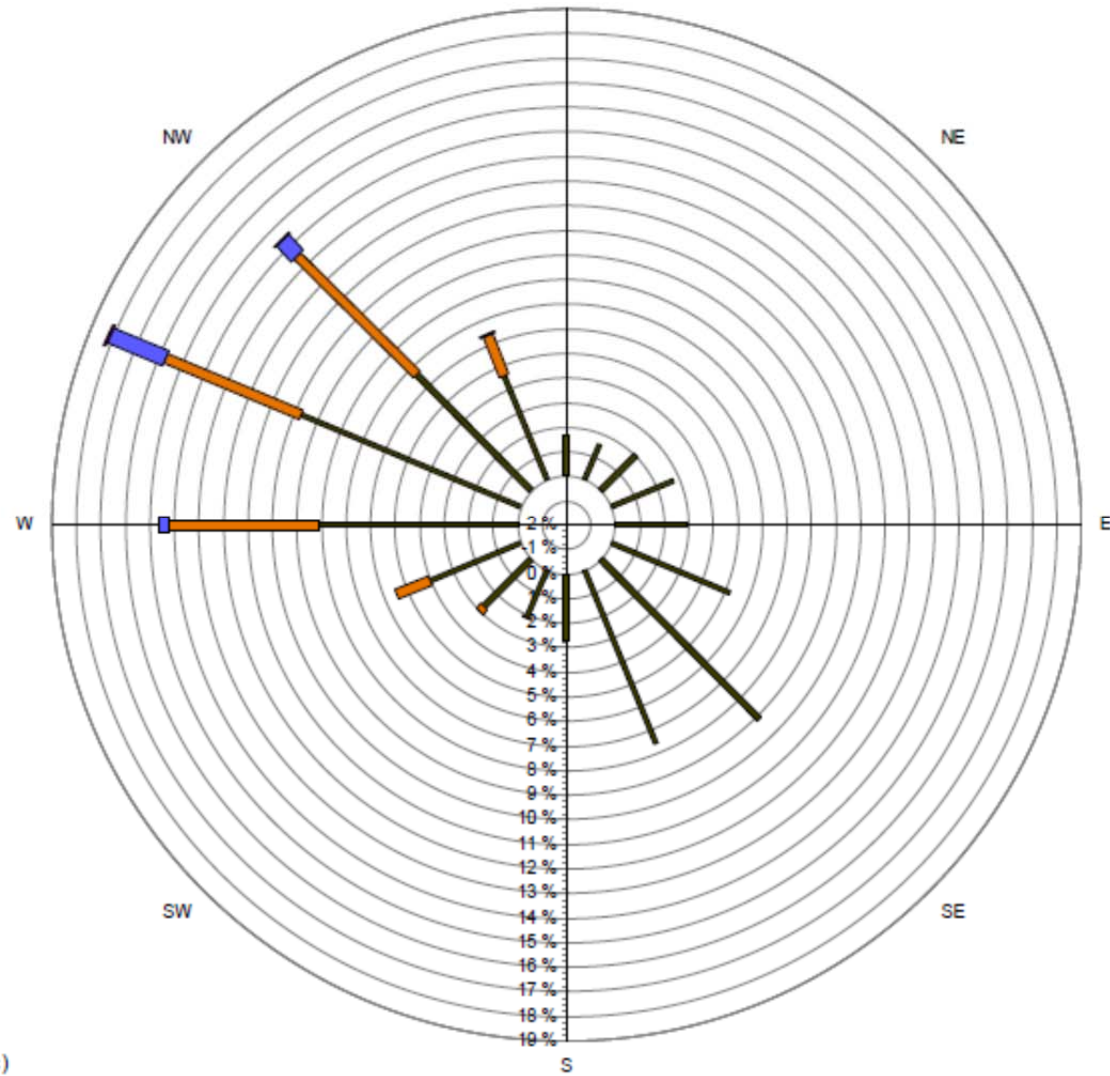
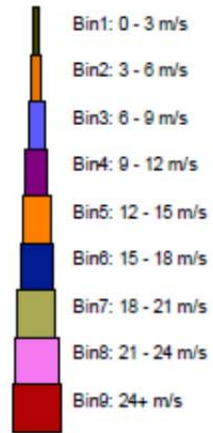




### Blackmans Flat Windrose

1/06/2014 to 30/06/2014

N



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