

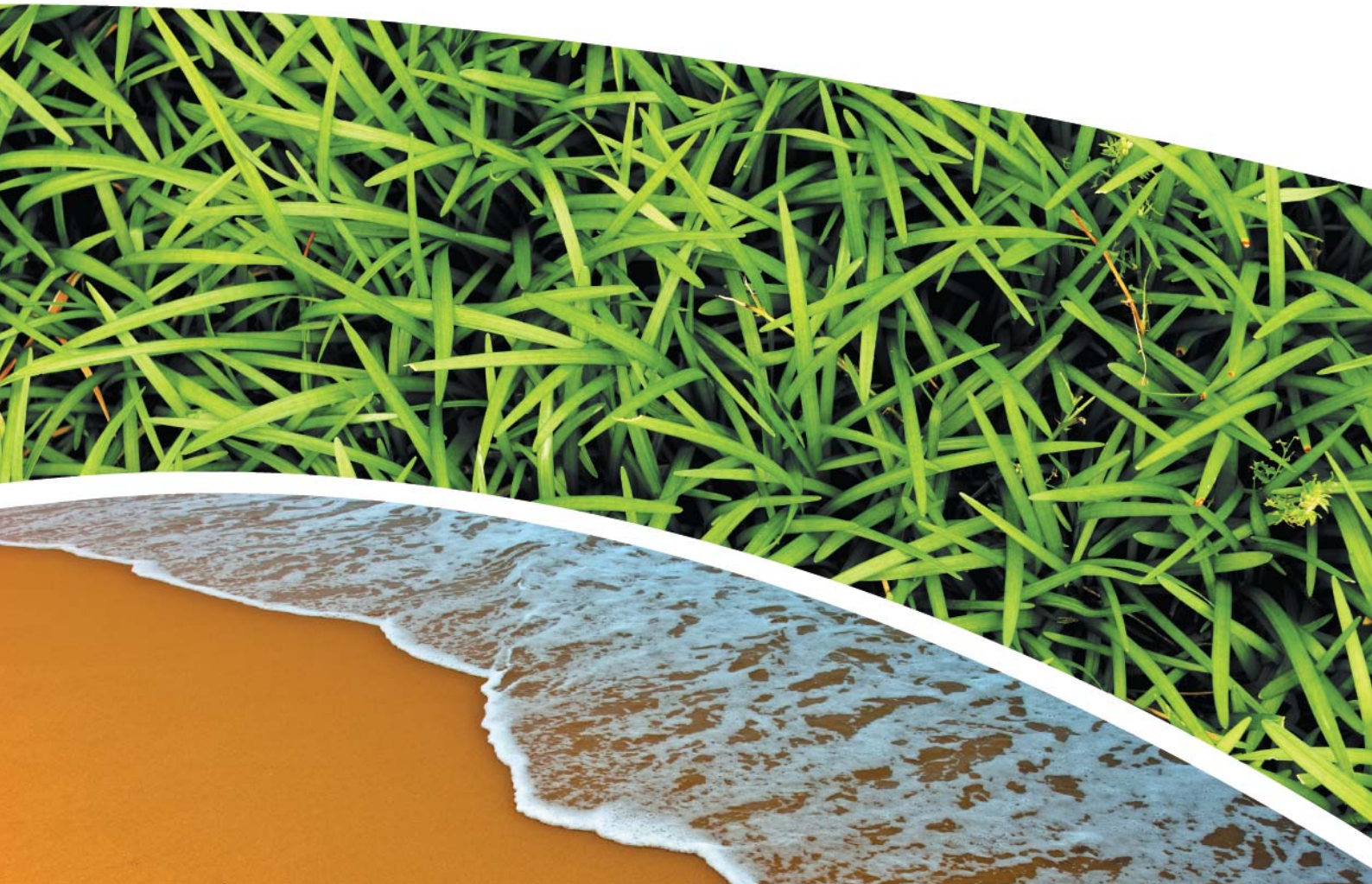
**SURFACE WATER, DEPOSITIONAL DUST,
HVAS AND METEOROLOGICAL MONITORING**

Prepared for Pine Dale Mine Community Consultative Committee

Prepared by RCA Australia

RCA ref 6880-864/0

October 2014



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RCA LE ref 6880-864/0



17 November 2014

Pine Dale Mine
PO Box 202
WALLERAWANG NSW 2845

Attention: Mr Graham Goodwin

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

1 GENERAL COMMENTS

Job Number: 6880.

Date Samples Received: During the month of October 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 ³	RCA Laboratories – Environmental	NATA Analysis
Determination of Particulate Matter – Deposited Matter	ENV-LAB004	g/m ² .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

3 WATER MONITORING RESULTS

3.1 GROUNDWATER

A total of 2 on-site groundwater samples were collected during the month of October 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**.

Table 2 Groundwater Analysis Results

ANALYSIS	UNITS	P6	P7
Sample Number	-	10146880009	10146880010
Date Sampled	-	20/10/2014	20/10/2014
Time Sampled	-	13:16	14:30
Depth to Water from Surface*	m	25.82	6.63
Water Level (AHD)	m	891.13	887.77
Temperature	°C	16.5	15.0
pH	pH	6.24	6.23
Conductivity	µS/cm	1115	738
Turbidity	NTU	35	
Dissolved Oxygen	mg/L	6.4	
TSS	mg/L	36	
Oil & Grease	mg/L	<2	
Bicarbonate Alkalinity (CaCO ₃)	mg/L	38	
Total Alkalinity (CaCO ₃)	mg/L	38	
Sulfate (as SO ₄)	mg/L	522	
Chloride	mg/L	35	
Calcium	mg/L	120	
Magnesium	mg/L	56	
Sodium	mg/L	40	
Potassium	mg/L	20	
Cobalt (dissolved)	mg/L	0.066	
Manganese (dissolved)	mg/L	2.5	
Nickel (dissolved)	mg/L	0.107	
Zinc (dissolved)	mg/L	0.206	
Iron (dissolved)	mg/L	25.0	

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 November 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**.

PM₁₀ 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
01-Oct-14	27	10146880029	8902974	03-Oct-14	12:05	Client	24.00
07-Oct-14	21	10146880031	8902976	10-Oct-14	10:07	Client	24.00
13-Oct-14	22	10146880033	8902978	17-Oct-14	9:40	Client	24.00
19-Oct-14	16	10146880035	8902980	21-Oct-14	7:15	Client	24.00
25-Oct-14	34	10146880037	8902982	27-Oct-14	7:45	Client	24.00
31-Oct-14	64	10146880039	8902984	03-Nov-14	10:00	Client	24.00

Table 4 Suspended Particulate Matter PM₁₀ ($\mu\text{g}/\text{m}^3$ 0°C 101.3 kPa)

RUN DATE	PM ₁₀ ($\mu\text{g}/\text{m}^3$)	SAMPLE NUMBER	FILTER NUMBER	DATE FILTER OFF	TIME FILTER OFF	FIELD TECH	HOURS RUN
1-Oct-14	7	10146880030	8902975	03-Oct-14	12:08	Client	24.00
7-Oct-14	6	10146880032	8902977	10-Oct-14	10:11	Client	24.00
13-Oct-14	8	10146880034	8902979	17-Oct-14	9:42	Client	24.00
19-Oct-14	8	10146880036	8902981	21-Oct-14	7:18	Client	24.00
25-Oct-14	15	10146880038	8902983	27-Oct-14	7:47	Client	24.00
31-Oct-14	23	10146880040	8902985	03-Nov-14	10:08	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 November 2013 to October 2014) for the TSP unit is $20.6\mu\text{g}/\text{m}^3$, which is well below the allowable limit of $90\mu\text{g}/\text{m}^3$.

4.1.2 PM₁₀ Summary

The EPA 24h Maximum PM₁₀ allowable limit is $50\mu\text{g}/\text{m}^3$. The EPA Annual Mean PM₁₀ allowable limit is $30\mu\text{g}/\text{m}^3$. All PM₁₀ HVAS results recorded during this monitoring period conform to consent conditions, as the *current rolling annual mean* for the PM₁₀ unit is $11.2\mu\text{g}/\text{m}^3$, which is below the allowable limit of $30\mu\text{g}/\text{m}^3$. The 24 hour maximum allowable limit of $50\mu\text{g}/\text{m}^3$ was not exceeded during the month of October 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 October 2014*

SAMPLE NUMBER	DEPOSIT GAUGE	DATE SAMPLE STARTED	DATE SAMPLE COMPLETED	NUMBER OF DAYS	NOTES	INSOLUBLE SOLIDS (g/m ² .month)	ASH (g/m ² .month)	COMBUSTIBLE MATTER (g/m ² .month)
10146880019	D1	18/09/2014	20/10/2014	32	IT	0.9	0.4	0.5
10146880020	D2	18/09/2014	20/10/2014	32	I	0.8	0.4	0.4
10146880021	D3	18/09/2014	20/10/2014	32	I	1.0	0.5	0.5
10146880022	D4	18/09/2014	20/10/2014	32	I	0.6	0.3	0.3
10146880023	D5	18/09/2014	20/10/2014	32	EB	--	--	--
10146880024	D6	18/09/2014	20/10/2014	32	I	0.5	0.3	0.2

4.2.1 Glossary of Terms Used in Notes

I	Insects (eg, Ants, spiders)	IT	Insects (eg, Ants, spiders) and Tree litter
EB	Invalid sample: excess bird droppings		

4.2.2 Allowable Depositional Dust Limits

The EPA Long Term (Annual Average) Dust Limit is 4g/m² 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/m² per month, which is below the allowable Annual Average Long Term Limit of 4g/m² 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 this month as mining operations have ceased since the end of March 2014.

6 NOISE MONITORING RESULTS

Routine quarterly noise monitoring was not required to be undertaken this month. Noise monitoring is next scheduled to be undertaken during December 2014.

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 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.

8 SUMMARY

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

Rolling annual averages from both the TSP and PM₁₀ High Volume Air Samplers are currently well below the EPA Annual Mean TSP and PM₁₀ criterion of 90µg/m³ and 30µg/m³ respectively.

Currently there are no depositional dust gauge results which are greater than the EPA Long Term (annual average) criteria of 4g/m².month based upon a rolling average of the past 12 months.

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

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Please contact the undersigned if you have any queries.

Yours sincerely



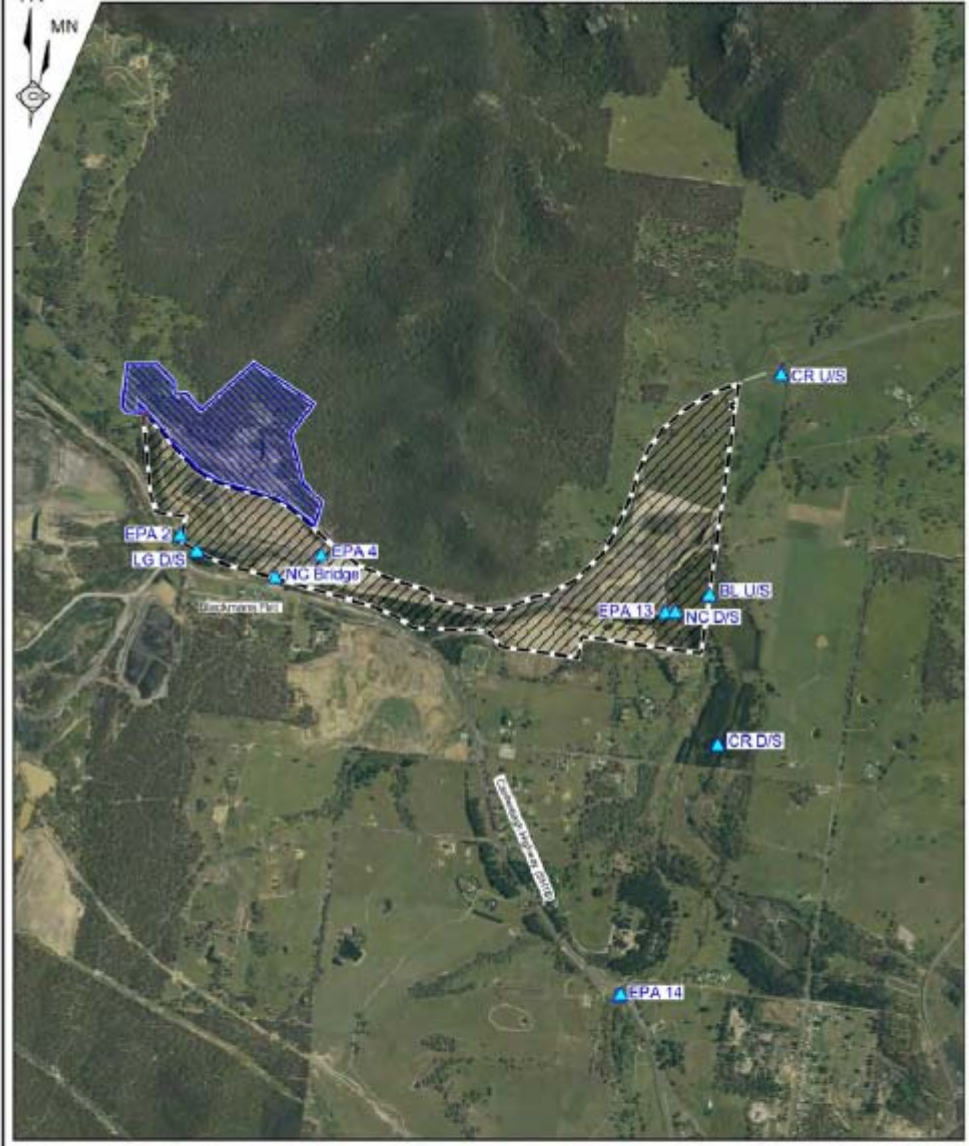
Carmen Rocher
Environmental Engineer
RCA Australia Pty Ltd trading as
RCA Laboratories – Environmental



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

Appendix 1

Surface Water Groundwater and Air Quality Monitoring Locations



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

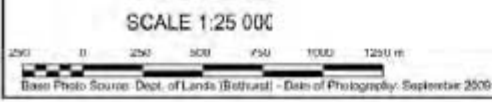
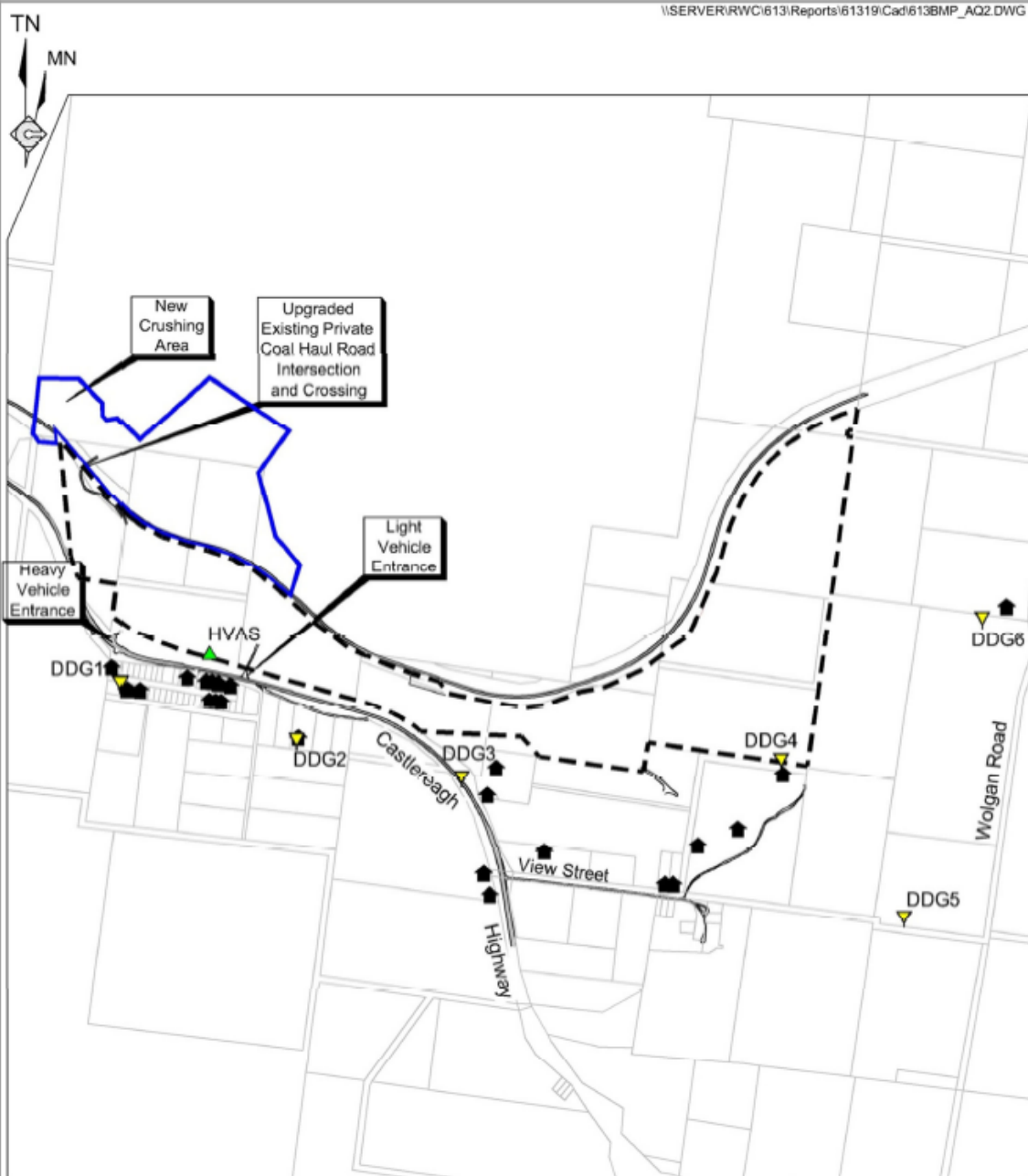


Figure WM5
SURFACE WATER
MONITORING LOCATIONS





- 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)

SCALE 1:20 000

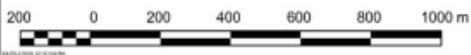
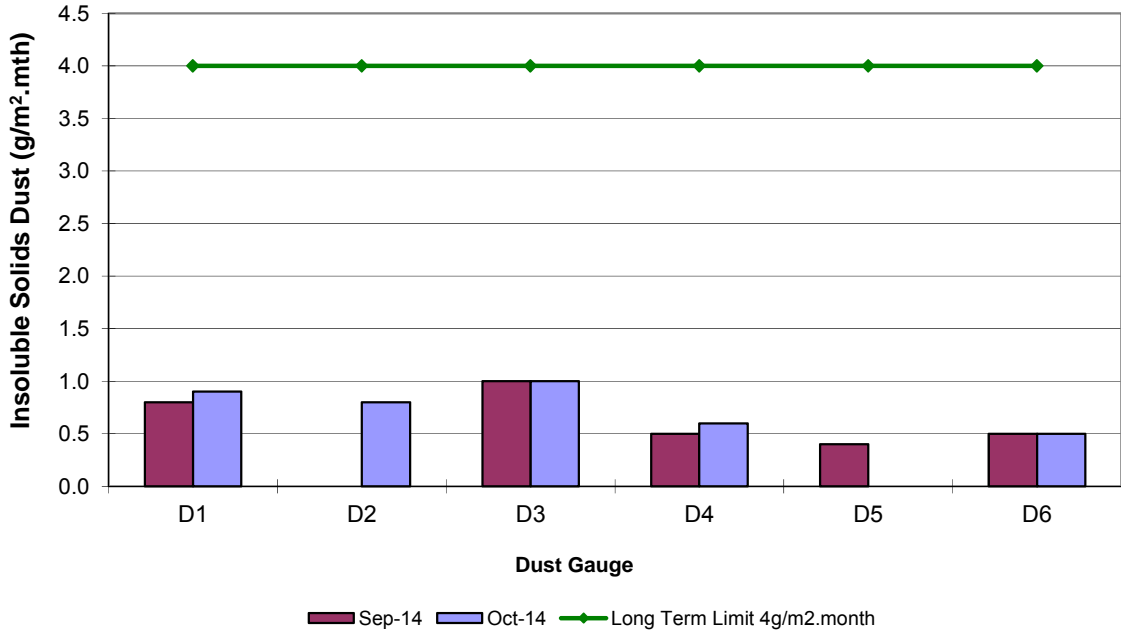


Figure AQ2
AIR QUALITY MONITORING
LOCATIONS

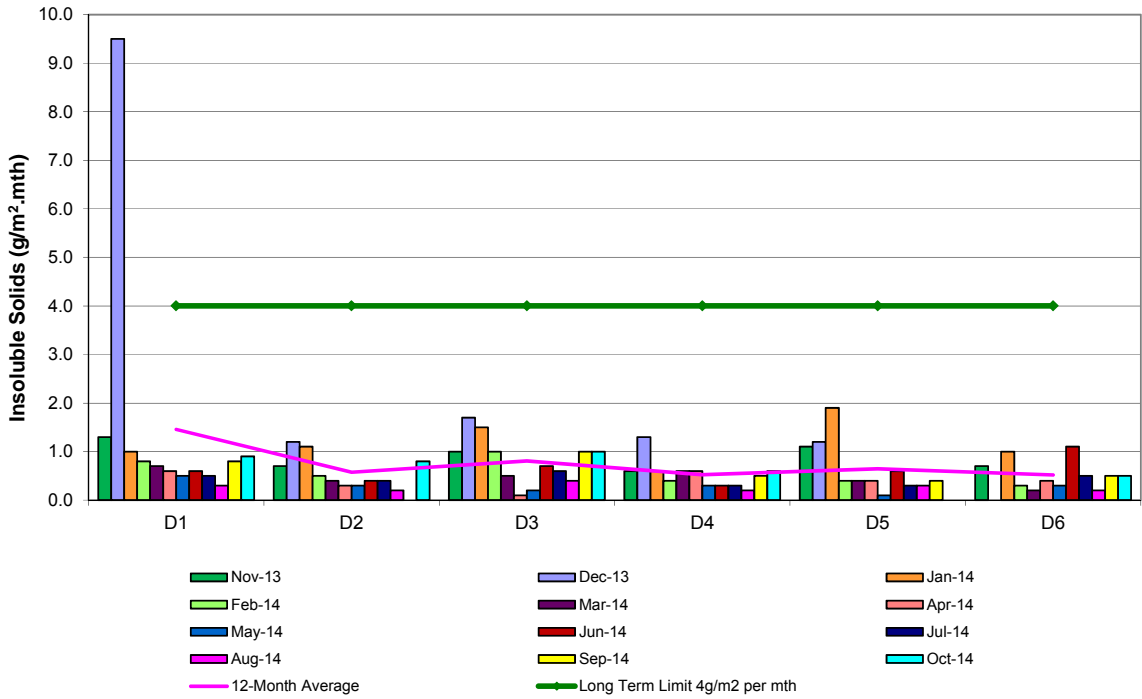
Appendix 2

Depositional Dust, HVAS and Blast Result Graphs

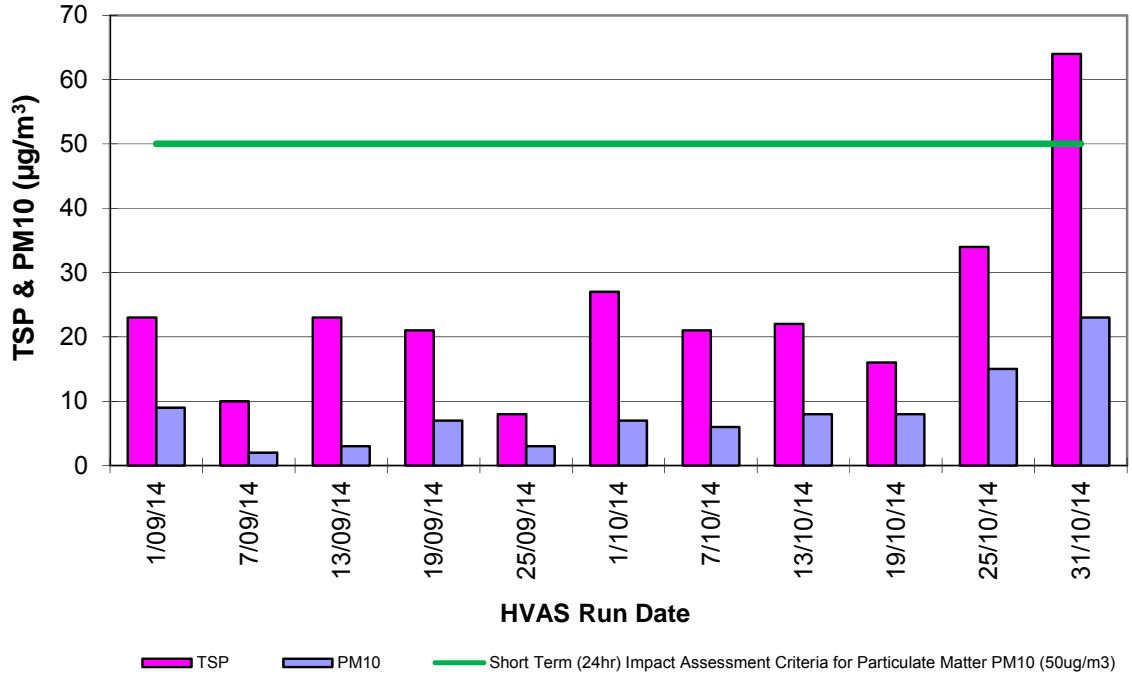
**Pine Dale Mine
Depositional Dust Gauge Comparative Results
September 2014 to October 2014**



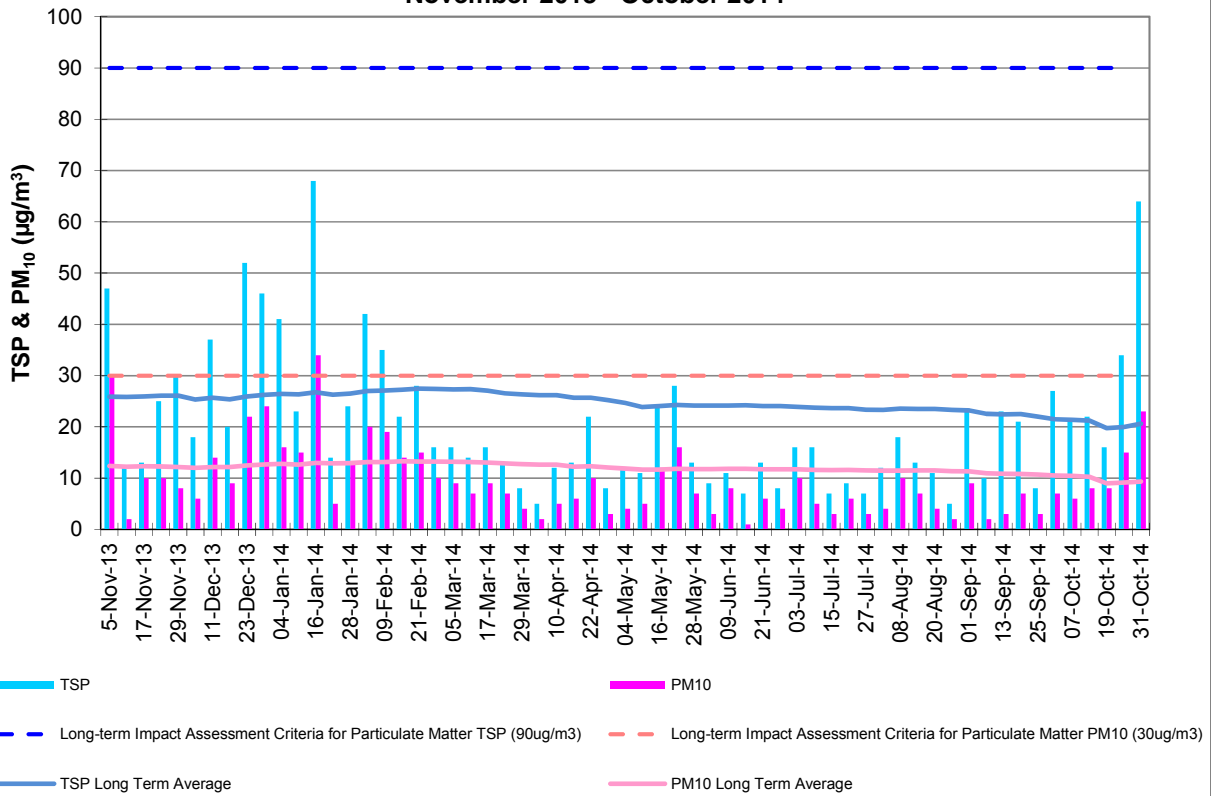
**Pine Dale Mine
Deposited Matter - Insoluble Solids 12 Months Comparative Results
November 2013 to October 2014**



**Pine Dale Mine
TSP & PM₁₀ Results
September - October 2014**

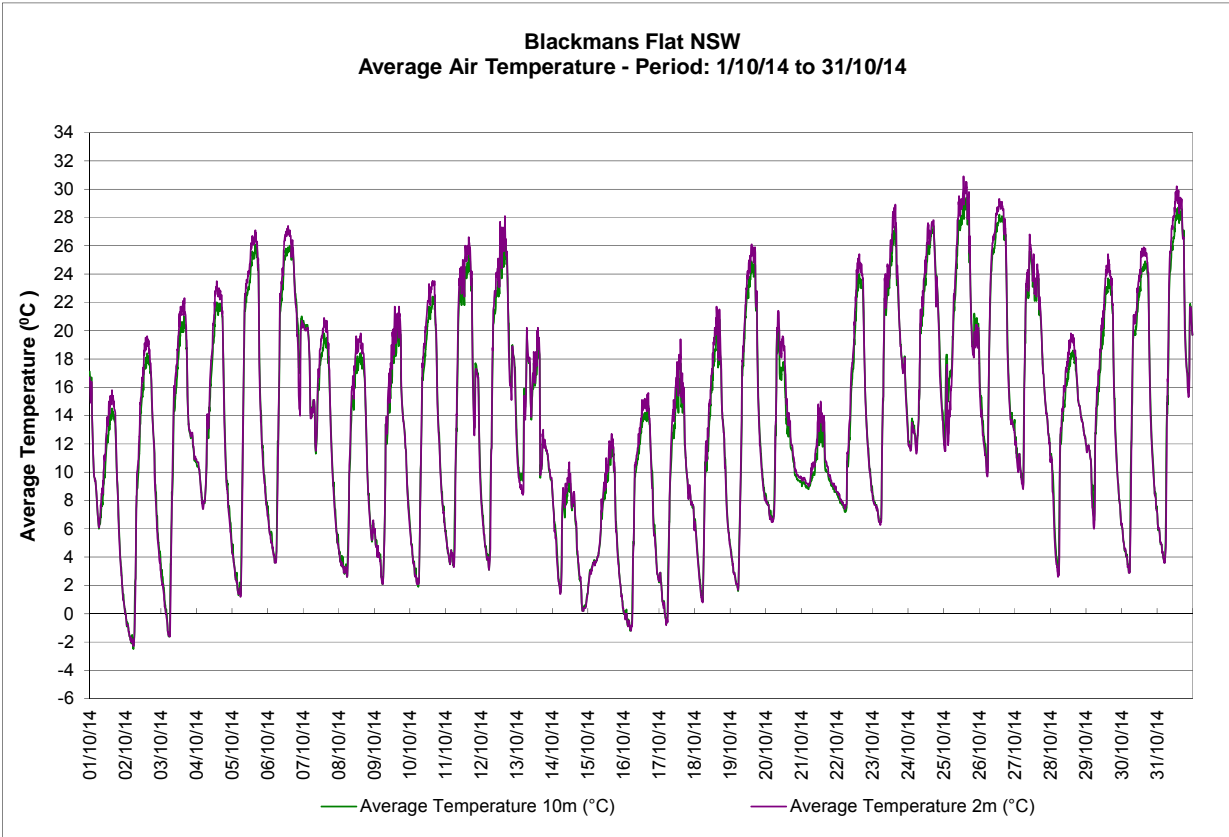
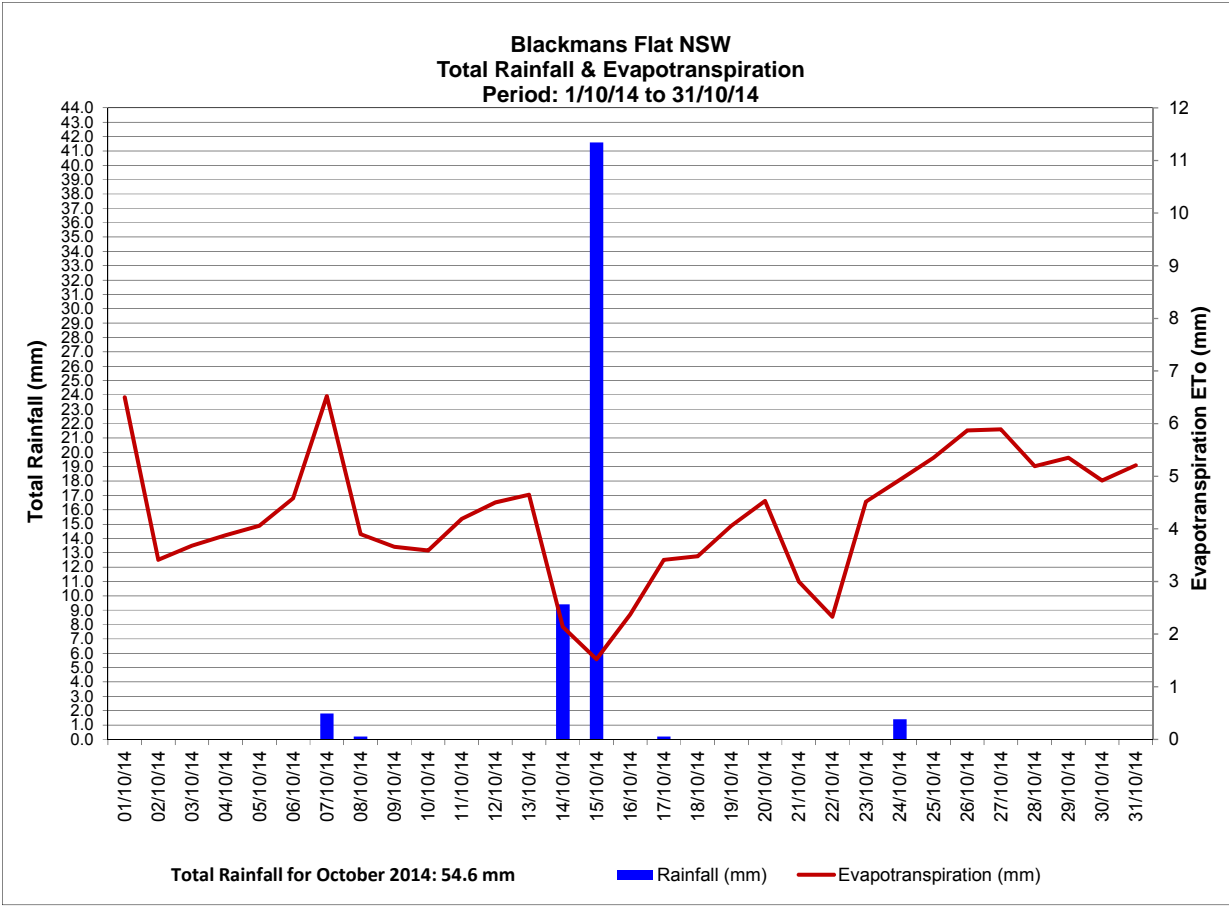


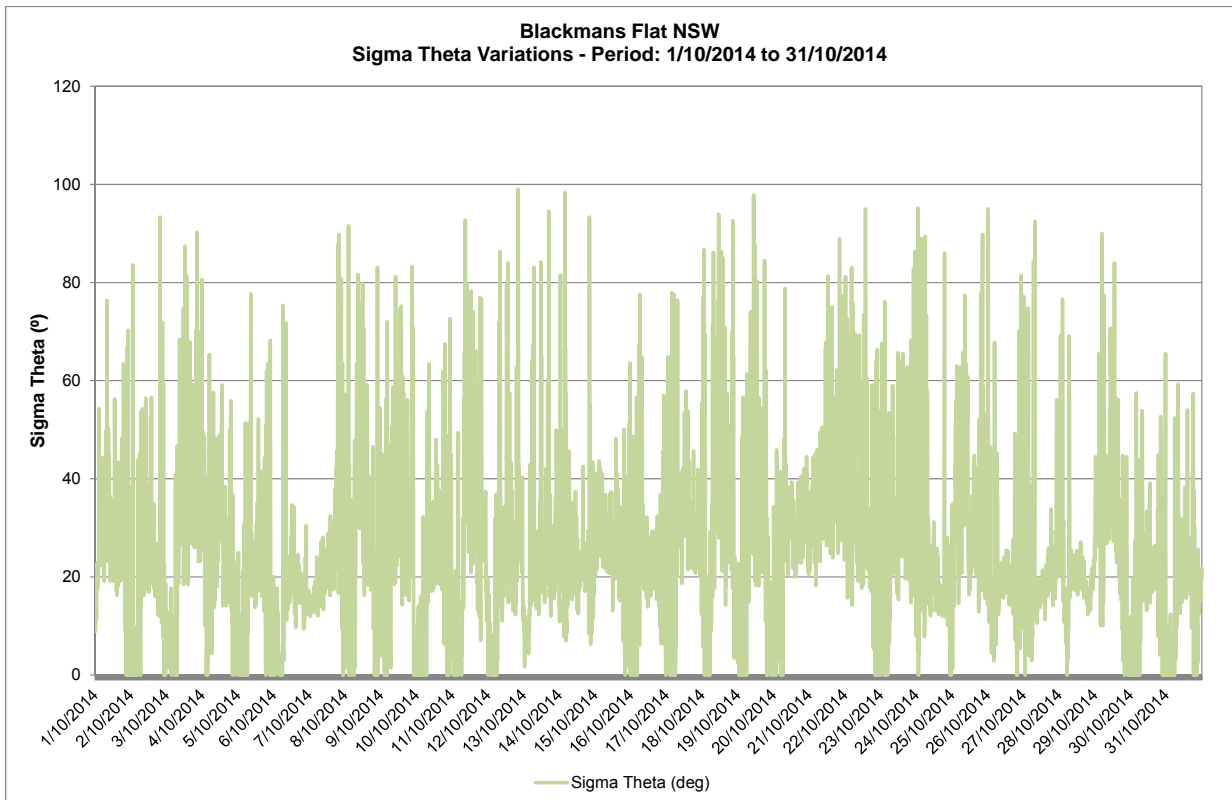
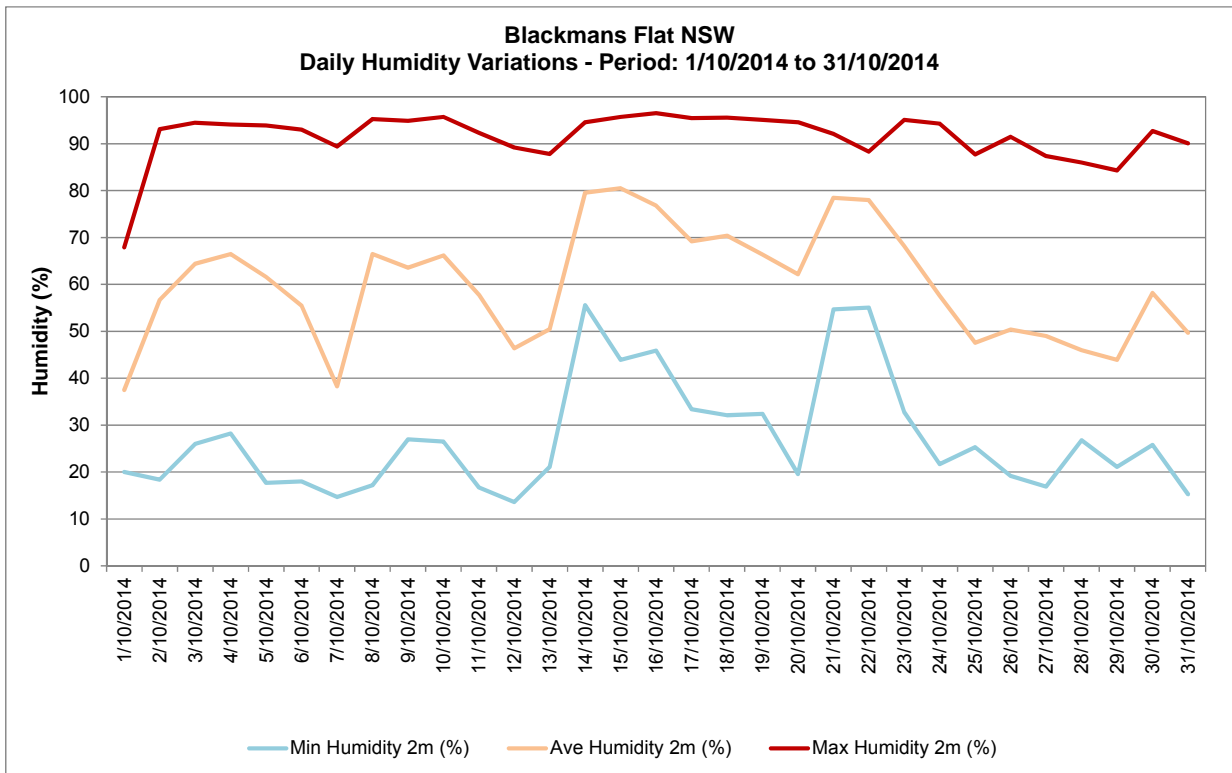
**Pine Dale Mine
TSP & PM₁₀ HVAS 12-Month Comparative Results
November 2013 - October 2014**

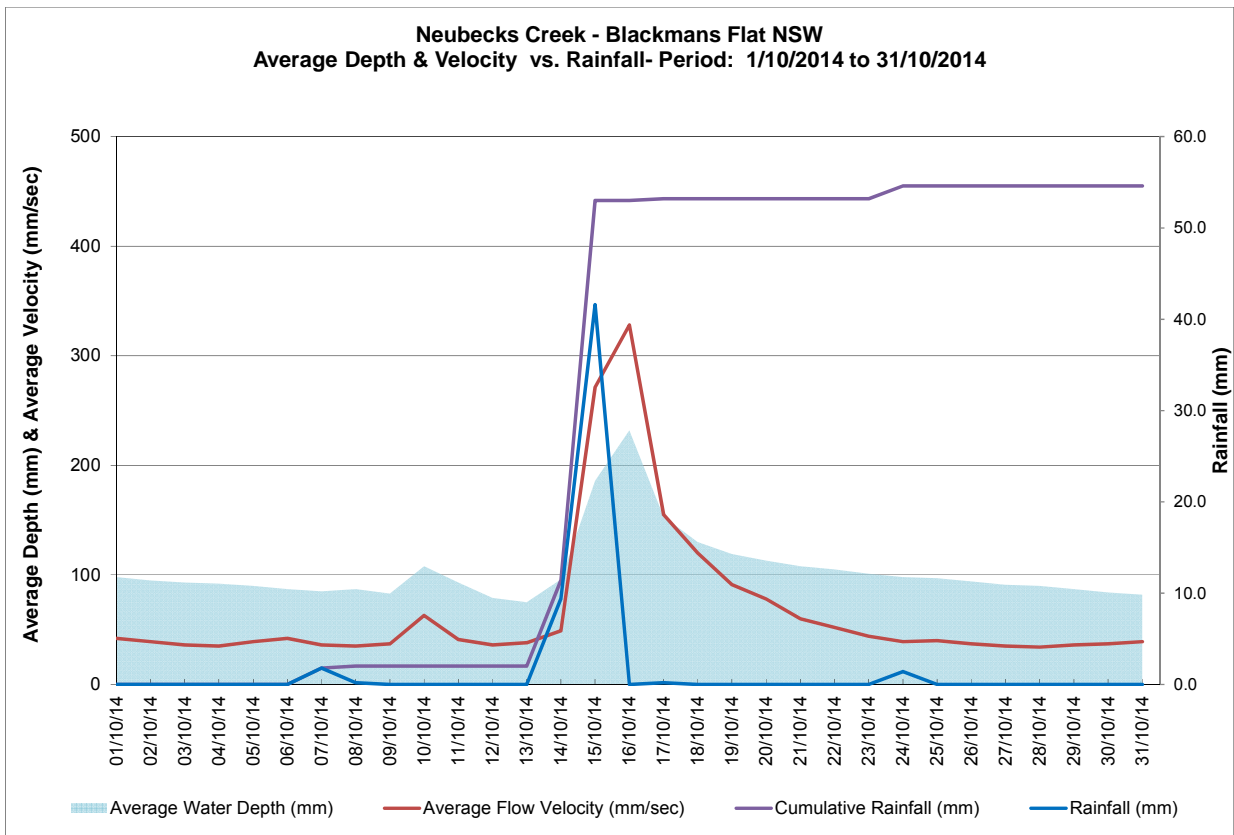
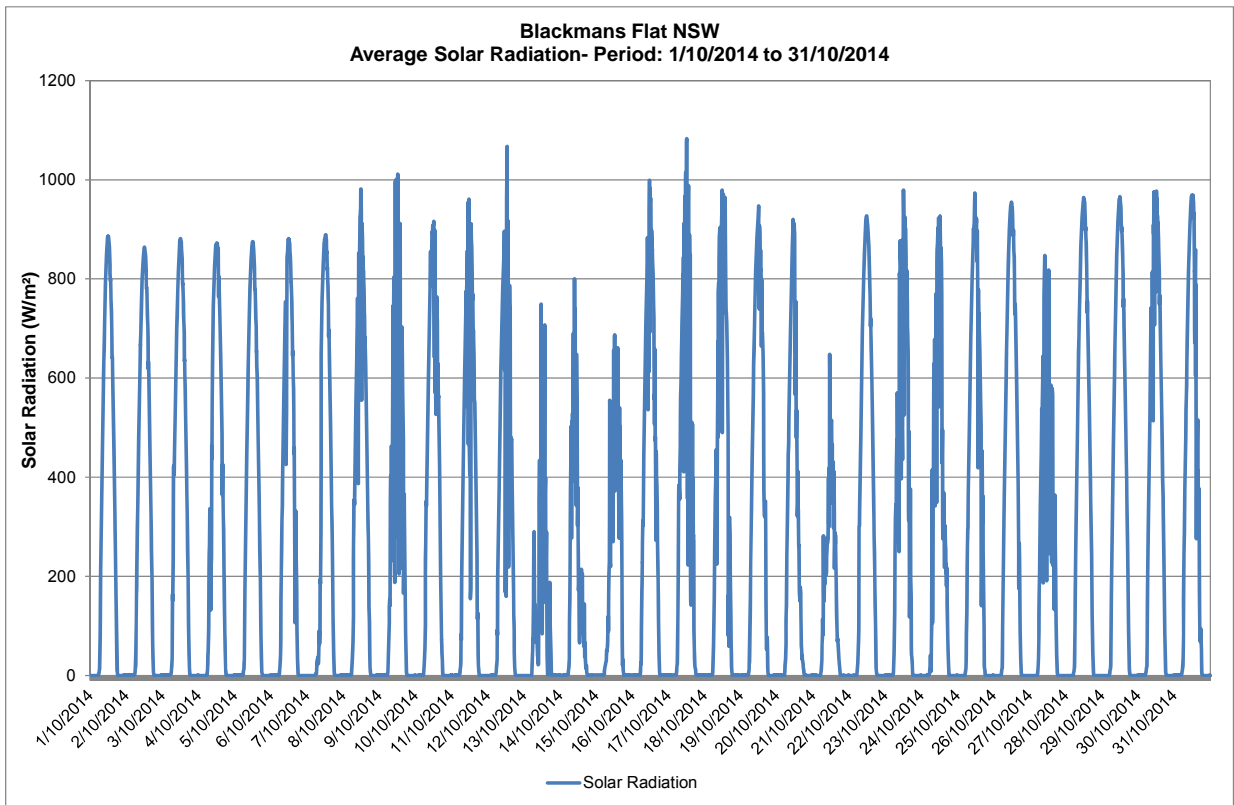


Appendix 3

Meteorological Data

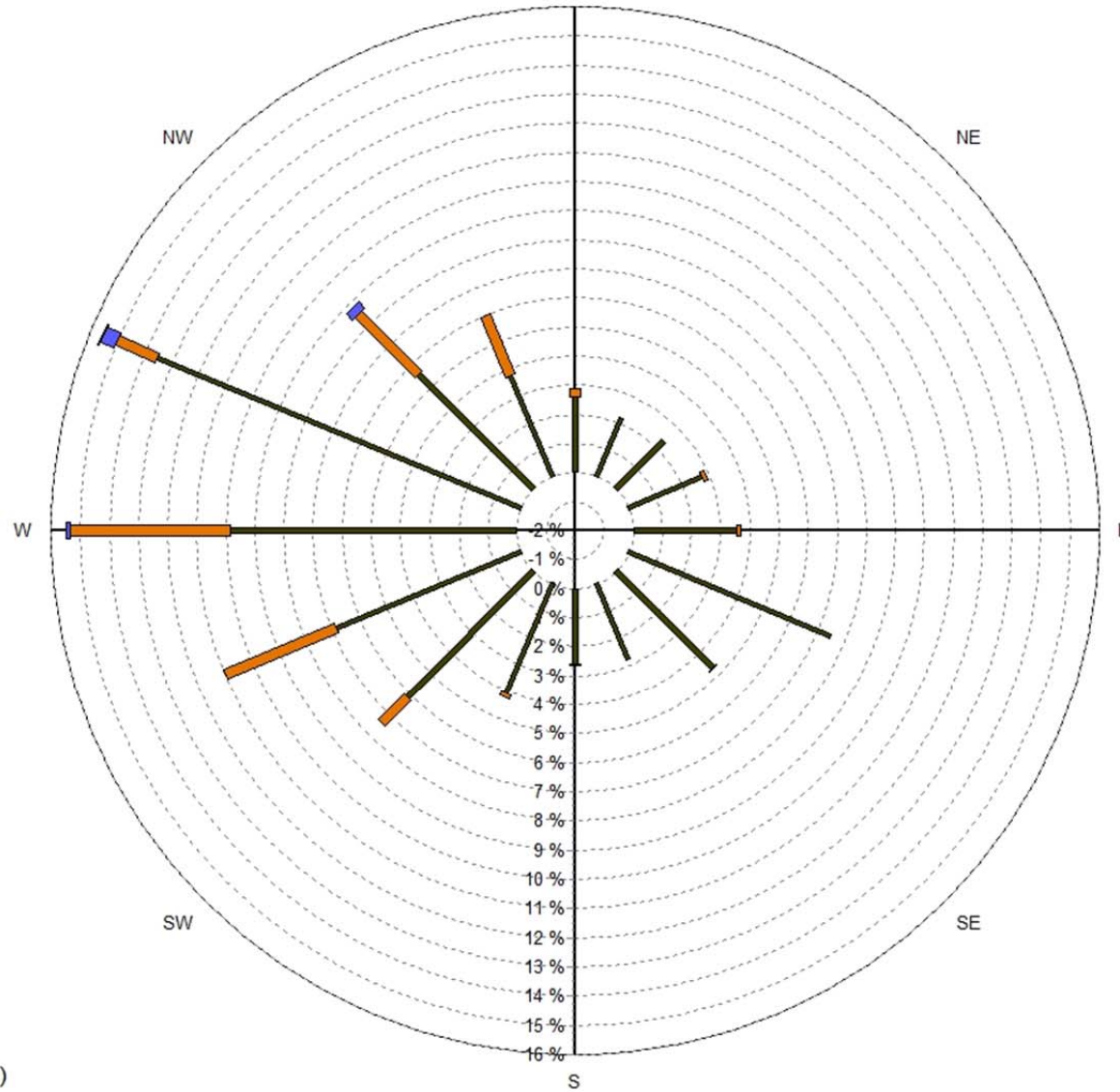
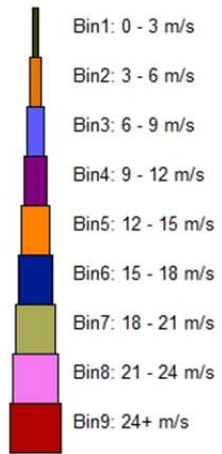






Blackmans Flat Windrose

1/10/2014 to 31/10/2014
N



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