

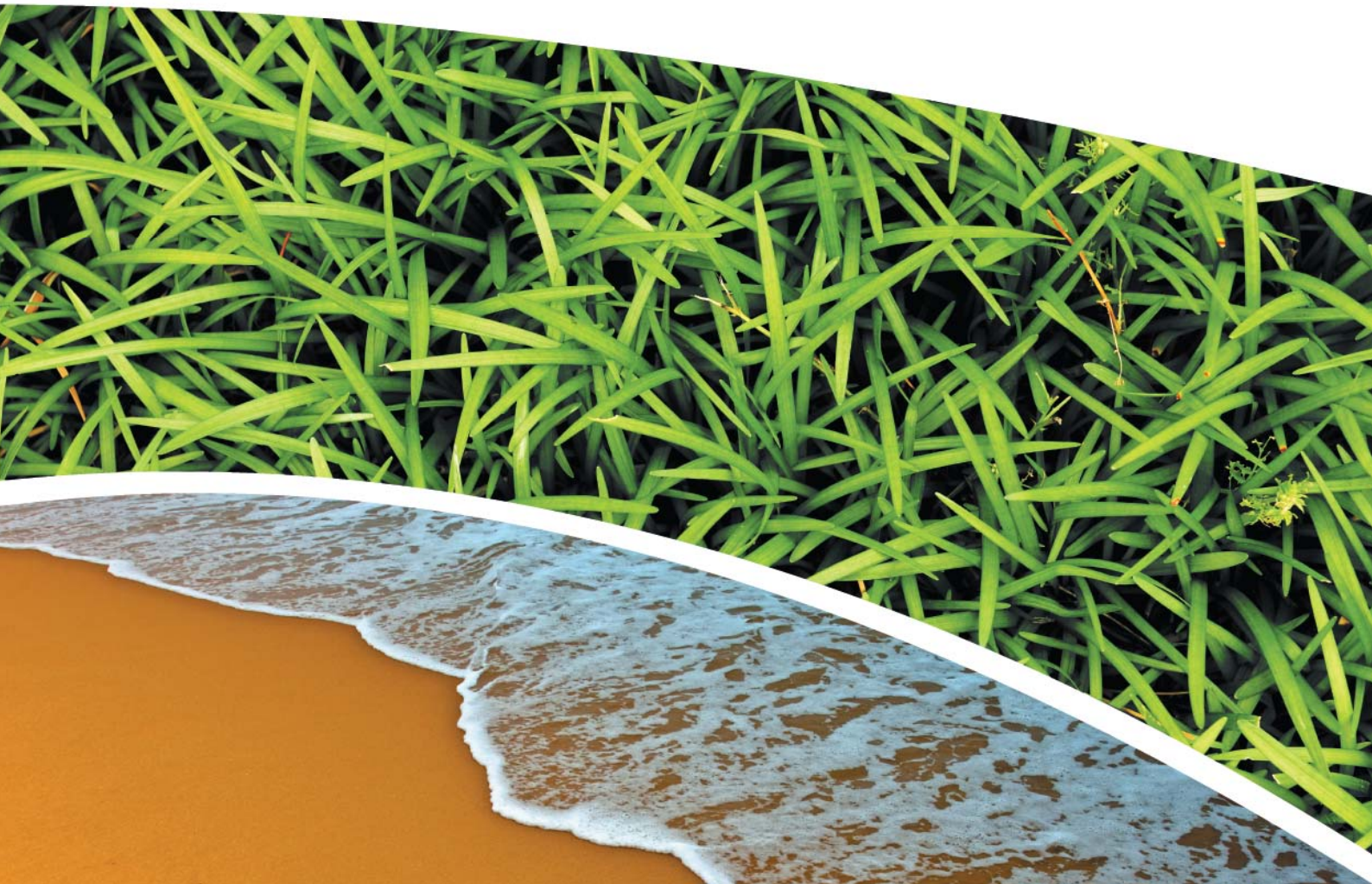
**SURFACE WATER, DEPOSITIONAL DUST,
HVAS AND METEOROLOGICAL MONITORING**

Prepared for Pine Dale Mine Community Consultative Committee

Prepared by RCA Australia

RCA ref 6880-866/0

November 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

Internet: www.rca.com.au

This document is and shall remain the property of RCA Australia. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission supplied at the time of proposal. Unauthorised use of this document in any form whatsoever is prohibited.

DOCUMENT STATUS						
Rev No	Comment	Author	Reviewer	Approved for Issue (Project Manager)		
				Name	Signature	Date
/0	Final	C Rocher	K Tripp	K Tripp		16.12.14

DOCUMENT DISTRIBUTION				
Rev No	Copies	Format	Issued to	Date
/0	1	Electronic (email)	Pine Dale Mine – Graham Goodwin graham.goodwin@energyaustralia.com.au	16.12.14
/0	1	Electronic (email)	EnergyAustralia – Tom Hurdley tom.hurdley@energyaustralia.com.au	16.12.14
/0	1	Electronic (email)	EnergyAustralia- Mark Frewin mark.frewin@energyaustralia.com.au	16.12.14
/0	1	Electronic (email)	Lithgow City Council – Andrew Muir andrew.muir@lithgow.nsw.gov.au	16.12.14
/0	1	Electronic report	RCA – job archive	16.12.14



RCA LE ref 6880-866/0



16 December 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
NOVEMBER 2014**

1 GENERAL COMMENTS

Job Number: 6880.

Date Samples Received: During the month of November 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 November 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	-	11146880011	11146880012
Date Sampled	-	18/11/14	18/11/14
Time Sampled	-	15:12	16:16
Depth to Water from Surface*	m	25.83	6.76
Water Level (AHD)	m	891.12	887.64
Temperature	°C	16.2	20.5
pH	pH	6.42	6.50
Conductivity	µS/cm	1194	705
Turbidity	NTU	27	
Dissolved Oxygen	mg/L	7.9	
TSS	mg/L	45	
Oil & Grease	mg/L	<2	
Bicarbonate Alkalinity (CaCO ₃)	mg/L	36	184
Total Alkalinity (CaCO ₃)	mg/L	36	184
Sulfate (as SO ₄)	mg/L	644	74
Chloride	mg/L	24	107
Calcium	mg/L	142	50
Magnesium	mg/L	57	46
Sodium	mg/L	45	43
Potassium	mg/L	19	8
Cobalt (dissolved)	mg/L	0.07	
Manganese (dissolved)	mg/L	2.84	
Nickel (dissolved)	mg/L	0.116	
Zinc (dissolved)	mg/L	0.157	
Iron (dissolved)	mg/L	29.5	0.18

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 water monitoring was undertaken during the month of November 2014 at three surface water sites, EPA points 2, 3 and 14. Water quality analysis results are shown in **Table 3**.

Table 3 *EPA Surface Water Analysis Results*

ANALYSIS	UNITS	EPA Point 2 Neubeck's Ck Upstream	EPA Point 3 Neubeck's Ck Downstream	EPA Point 14 Cox's River Downstream
Sample Number	-	11146880009	11146880004	11146880010
Date Sampled	-	18/11/2014	18/11/2014	18/11/2014
Time Sampled	-	14:48	14:58	12:20
Temperature	°C	17.5	24.6	22.0
pH	pH	6.81	6.82	8.48
Conductivity	µS/cm	2398	2275	1230
Turbidity	NTU	2	4	4
Total Suspended Solids	mg/L	<5	<5	<5
Sulfate	mg/L	1370	1310	71
Dissolved Iron	mg/L	0.21	1.26	<0.05

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 4**.

PM₁₀ Suspended Particulate Matter results are shown in **Table 5**.

Table 4 *Total Suspended Particulates (µg/m³ 0°C 101.3 kPa)*

RUN DATE	TSP (µg/m ³)	SAMPLE NUMBER	FILTER NUMBER	DATE FILTER OFF	TIME FILTER OFF	FIELD TECH	HOURS RUN
06-Nov-14	20	11146880031	8902986	07-Nov-14	9:30	Client	24.00
12-Nov-14	23	11146880033	8897148	13-Nov-14	10:50	Client	24.00
18-Nov-14	29	11146880035	8897134	20-Nov-14	6:35	Client	24.11
24-Nov-14	42	11146880037	8897147	26-Nov-14	6:50	Client	24.00
30-Nov-14	21	11146880039	8897149	04-Dec-14	13:45	Client	24.00

Table 5 Suspended Particulate Matter PM_{10} ($\mu\text{g}/\text{m}^3$ @ 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
06-Nov-14	11	11146880032	8897137	07-Nov-14	9:35	Client	24.00
12-Nov-14	13	11146880034	8897119	13-Nov-14	10:55	Client	24.00
18-Nov-14	13	11146880036	8897150	20-Nov-14	6:38	Client	24.09
24-Nov-14	23	11146880038	8697545	26-Nov-14	6:56	Client	24.00
30-Nov-14	12	11146880040	8897166	04-Dec-14	13:47	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 December 2013 to November 2014) for the TSP unit is $20.8\mu\text{g}/\text{m}^3$, which is well below the allowable limit of $90\mu\text{g}/\text{m}^3$.

4.1.2 PM_{10} Summary

The EPA 24h Maximum PM_{10} allowable limit is $50\mu\text{g}/\text{m}^3$. The EPA Annual Mean PM_{10} allowable limit is $30\mu\text{g}/\text{m}^3$. All PM_{10} HVAS results recorded during this monitoring period conform to consent conditions, as the *current rolling annual mean* for the PM_{10} unit is $9.5\mu\text{g}/\text{m}^3$, 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 November 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 6**.

Table 6 *Depositional Dust Monitoring - Deposited Matter November 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)
11146880021	D1	20/10/2014	18/11/2014	29	IT	1.2	0.7	0.5
11146880022	D2	20/10/2014	18/11/2014	29	I	1.1	0.7	0.4
11146880023	D3	20/10/2014	18/11/2014	29	I	1.2	0.8	0.4
11146880024	D4	20/10/2014	18/11/2014	29	IT	0.7	0.4	0.3
11146880025	D5	20/10/2014	18/11/2014	29	I	1.9	0.7	1.2
11146880026	D6	20/10/2014	18/11/2014	29	IT	0.9	0.6	0.3

4.2.1 Glossary of Terms Used in Notes

I Insects (eg, Ants, spiders)

IT Insects (eg, Ants, spiders) and Tree litter

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 reserved 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 May 2014.

8 SUMMARY

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

Quarterly surface water sampling was undertaken this month, with all required sites sampled.

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.

This report must not be reproduced except in full. Results or figures from this report must not be used without acknowledgment.

Please contact the undersigned if you have any queries.

Yours sincerely



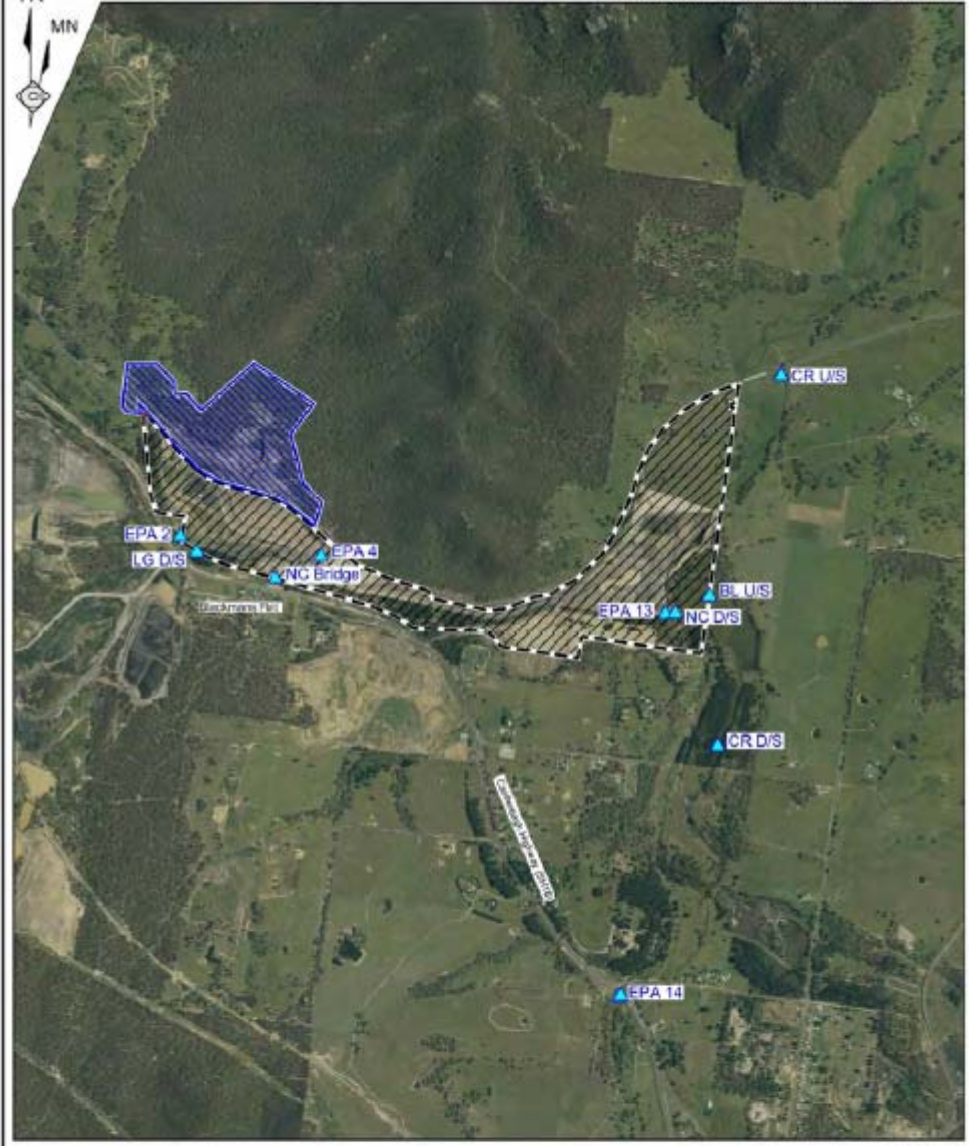
Carmen Rocher
Environmental Engineer
RCA Australia Pty Ltd trading as
RCA Laboratories – Environmental



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

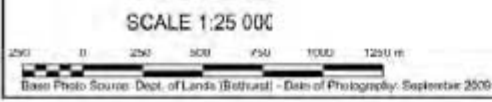
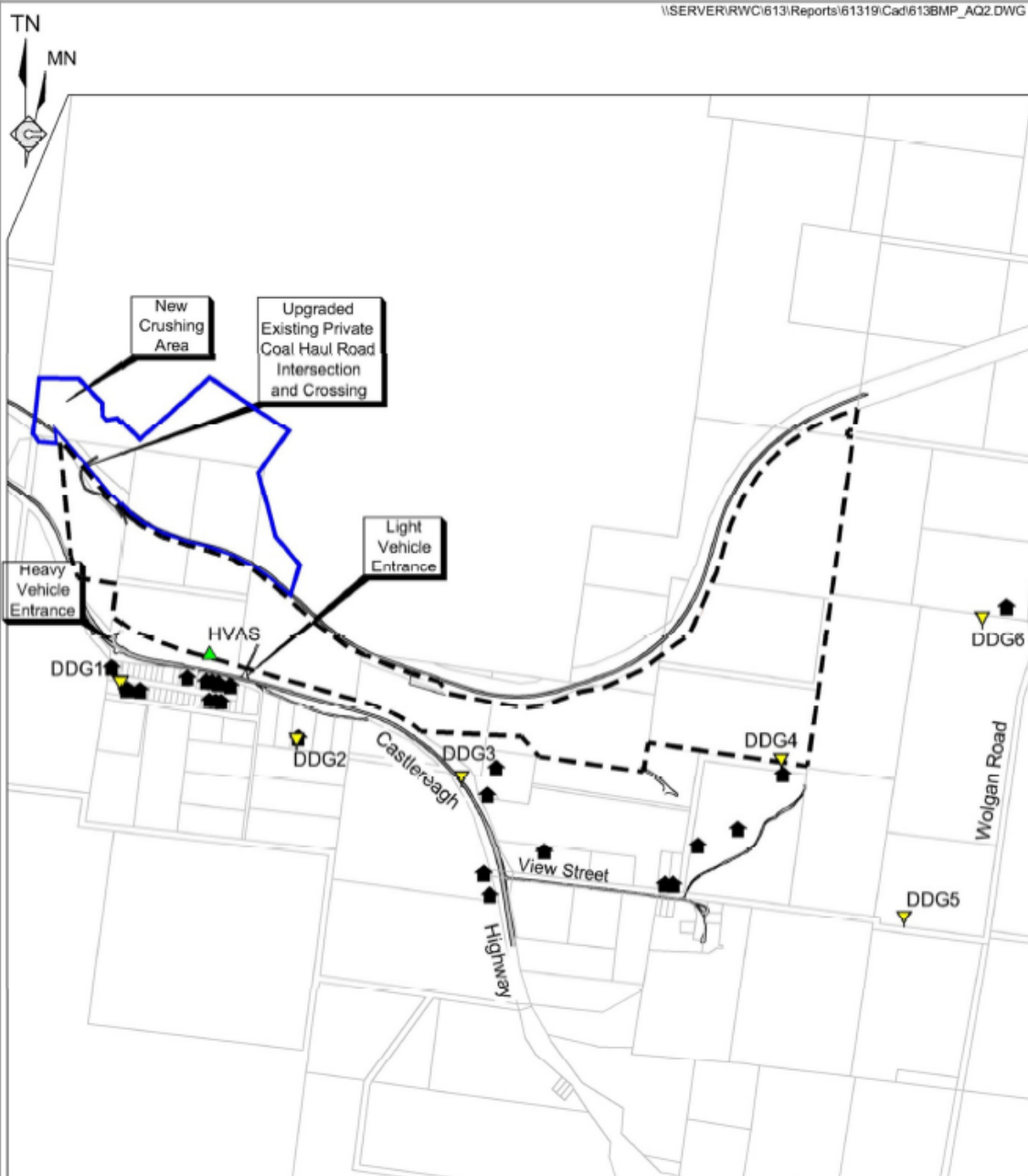


Figure WM5
SURFACE WATER
MONITORING LOCATIONS





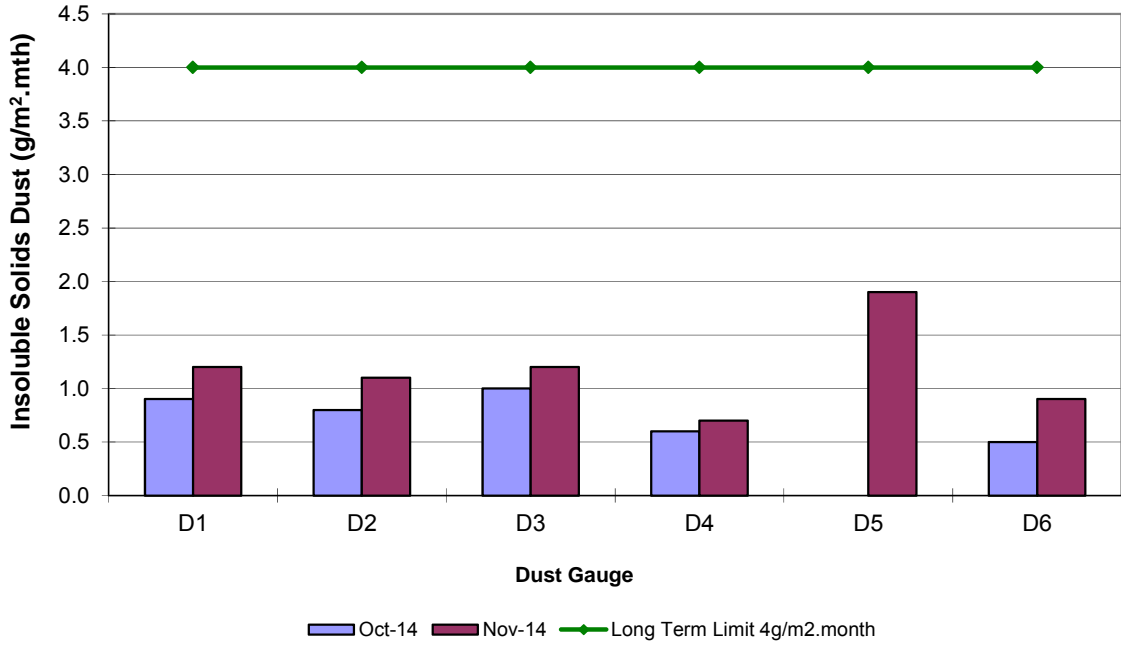
- REFERENCE
- Pine Dale Coal Mine
 - Yarraboldy Extension
 - Cadastral Boundary
 - 🏠 Residence
 - ▼ DDG1 Air Quality Monitoring Location (Deposited Dust)
 - ▲ HVAS Air Quality Monitoring Location (High Volume Sampling)

Figure AQ2
AIR QUALITY MONITORING
LOCATIONS

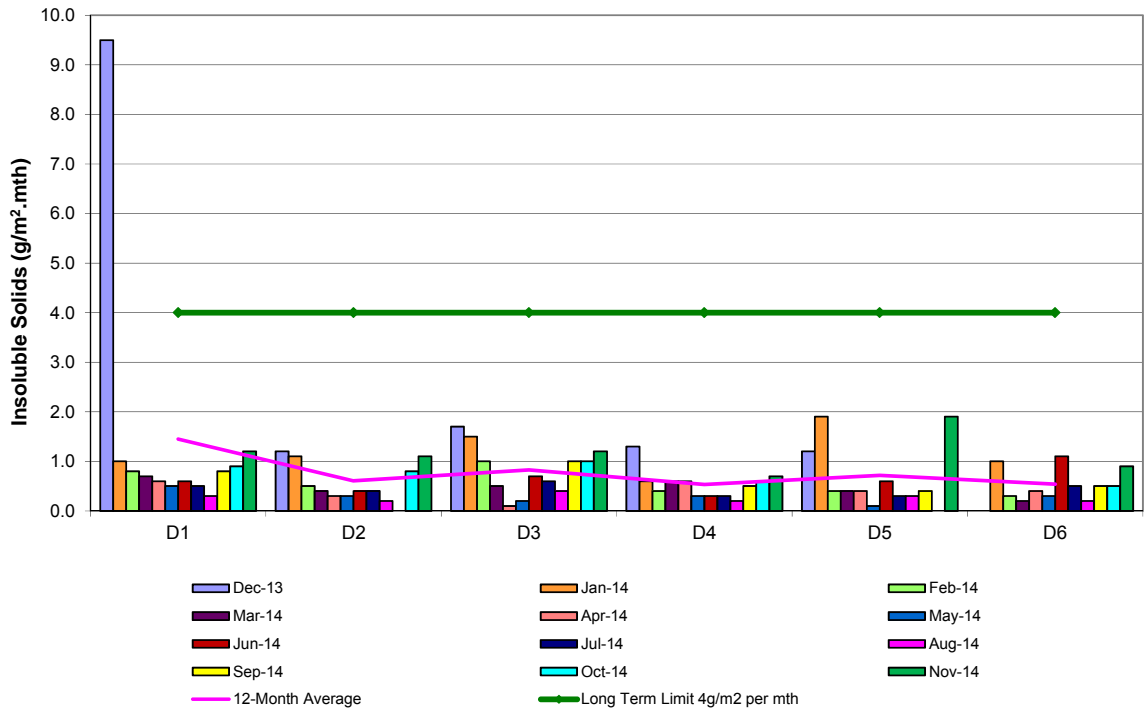
Appendix 2

Depositional Dust and HVAS Graphs

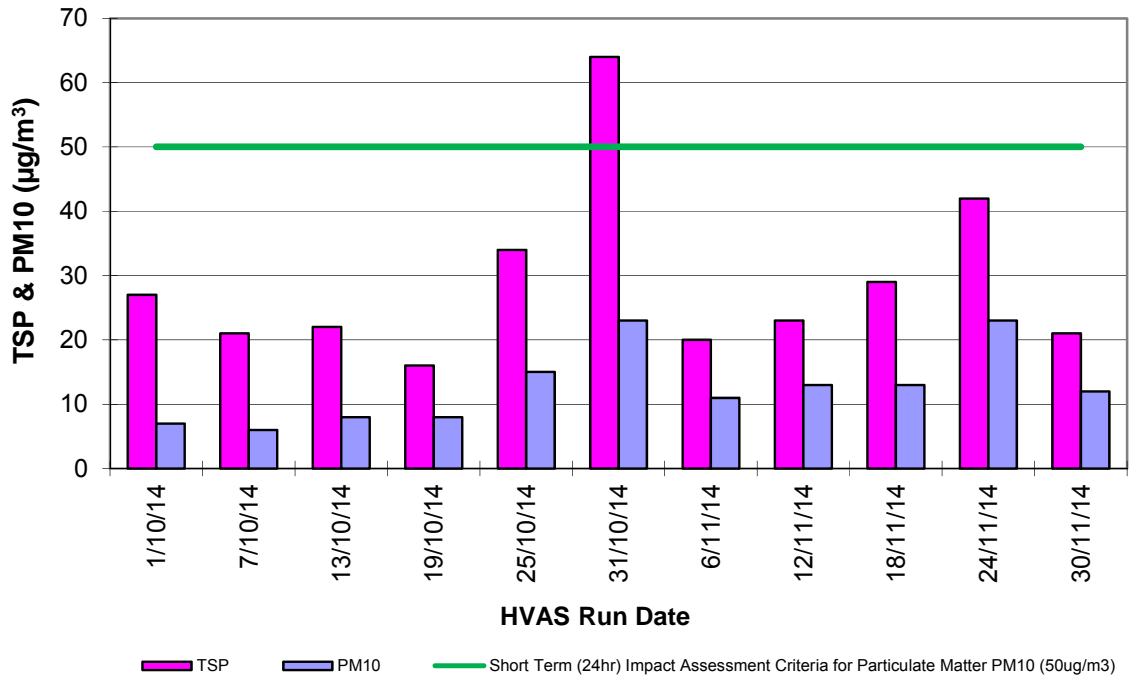
**Pine Dale Mine
Depositional Dust Gauge Comparative Results
October 2014 to November 2014**



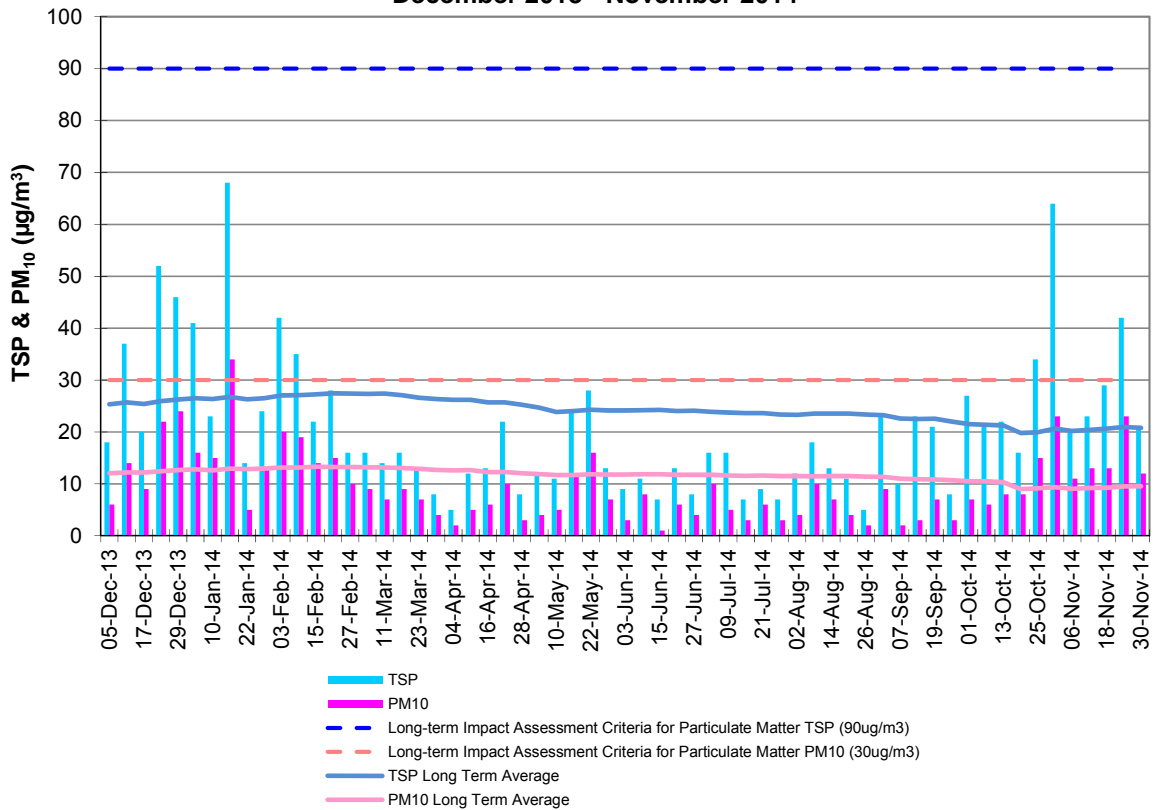
**Pine Dale Mine
Deposited Matter - Insoluble Solids 12 Months Comparative Results
December 2013 to November 2014**



Pine Dale Mine TSP & PM₁₀ Results October to November 2014



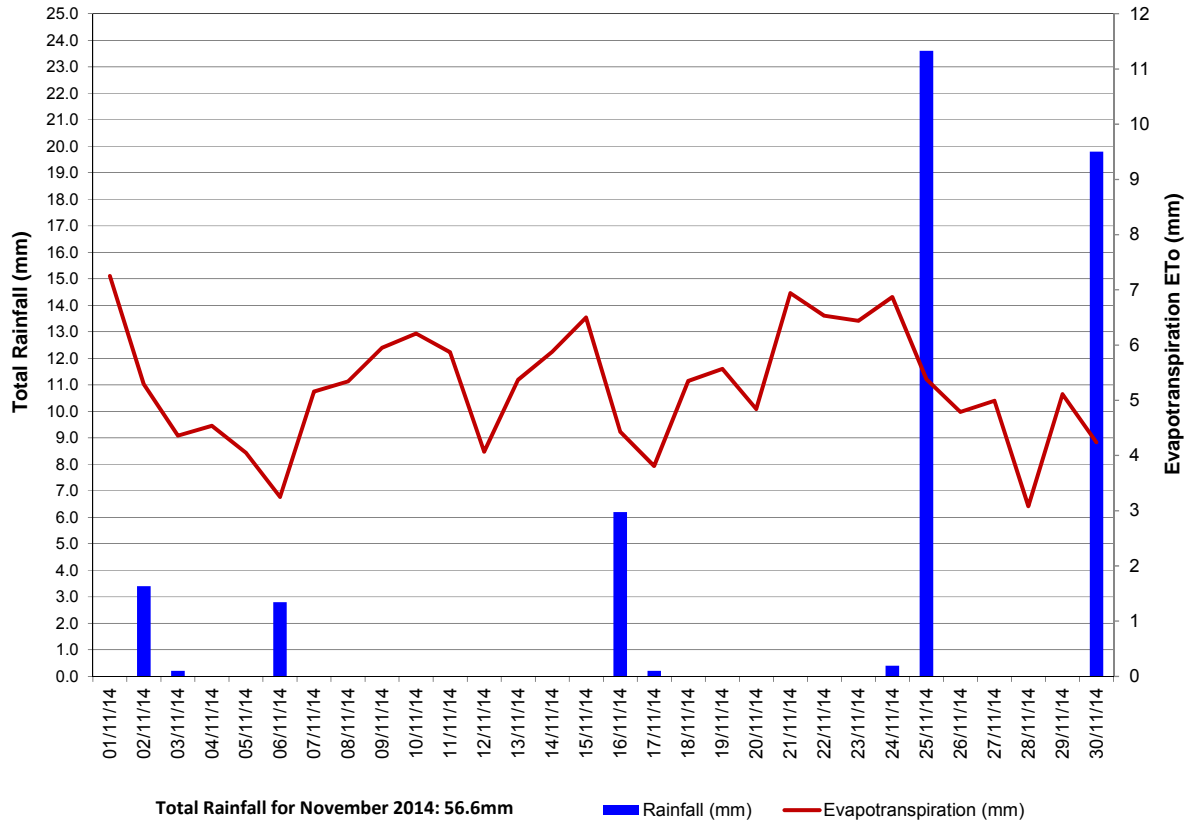
Pine Dale Mine TSP & PM₁₀ HVAS 12-Month Comparative Results December 2013 - November 2014



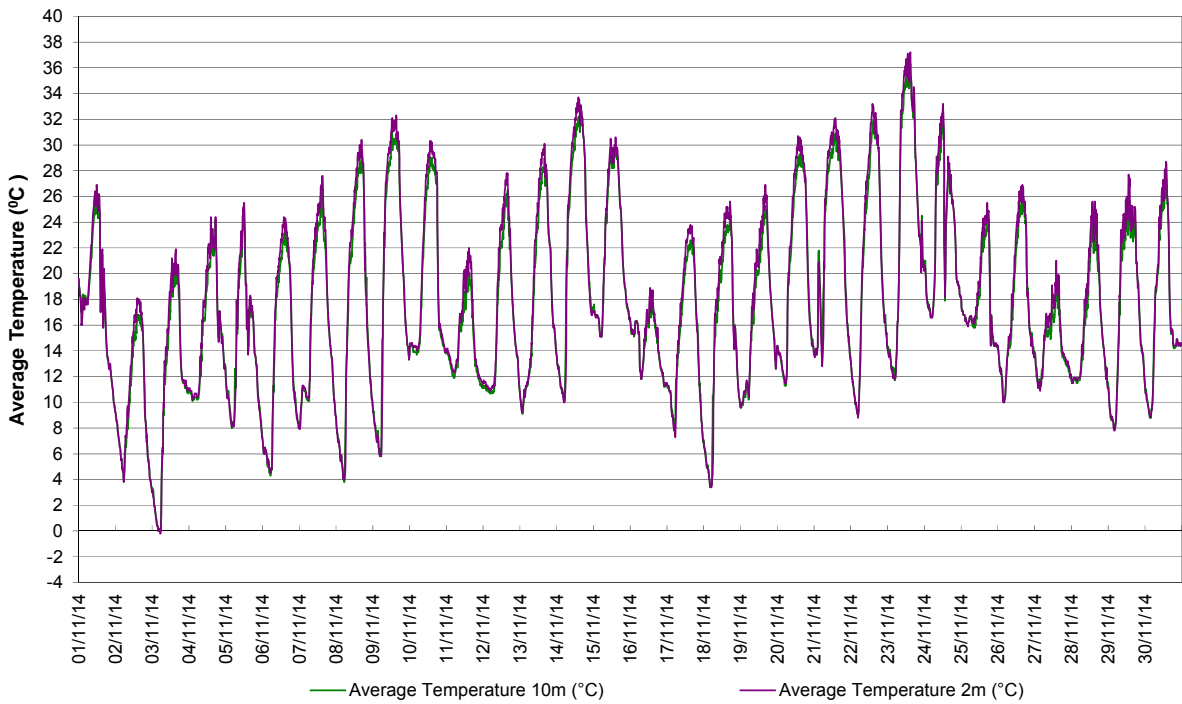
Appendix 3

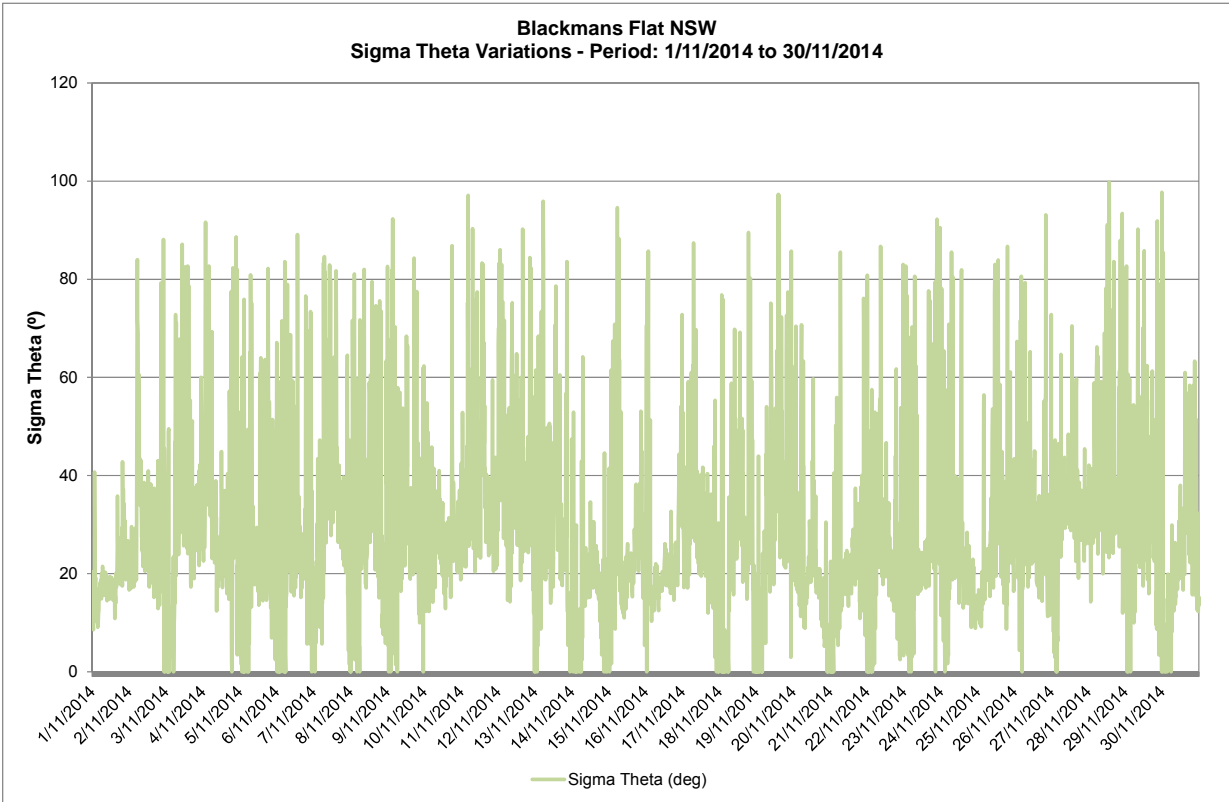
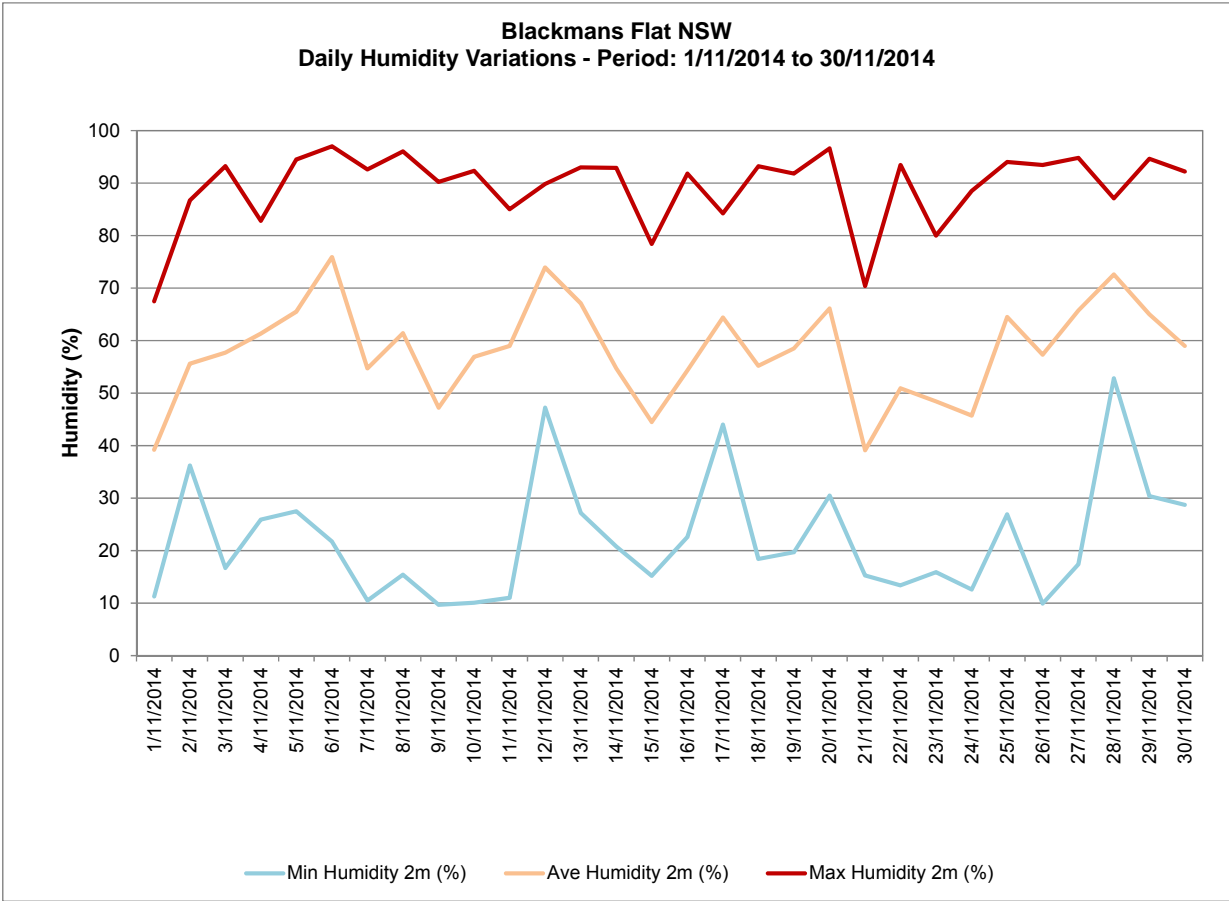
Meteorological Data

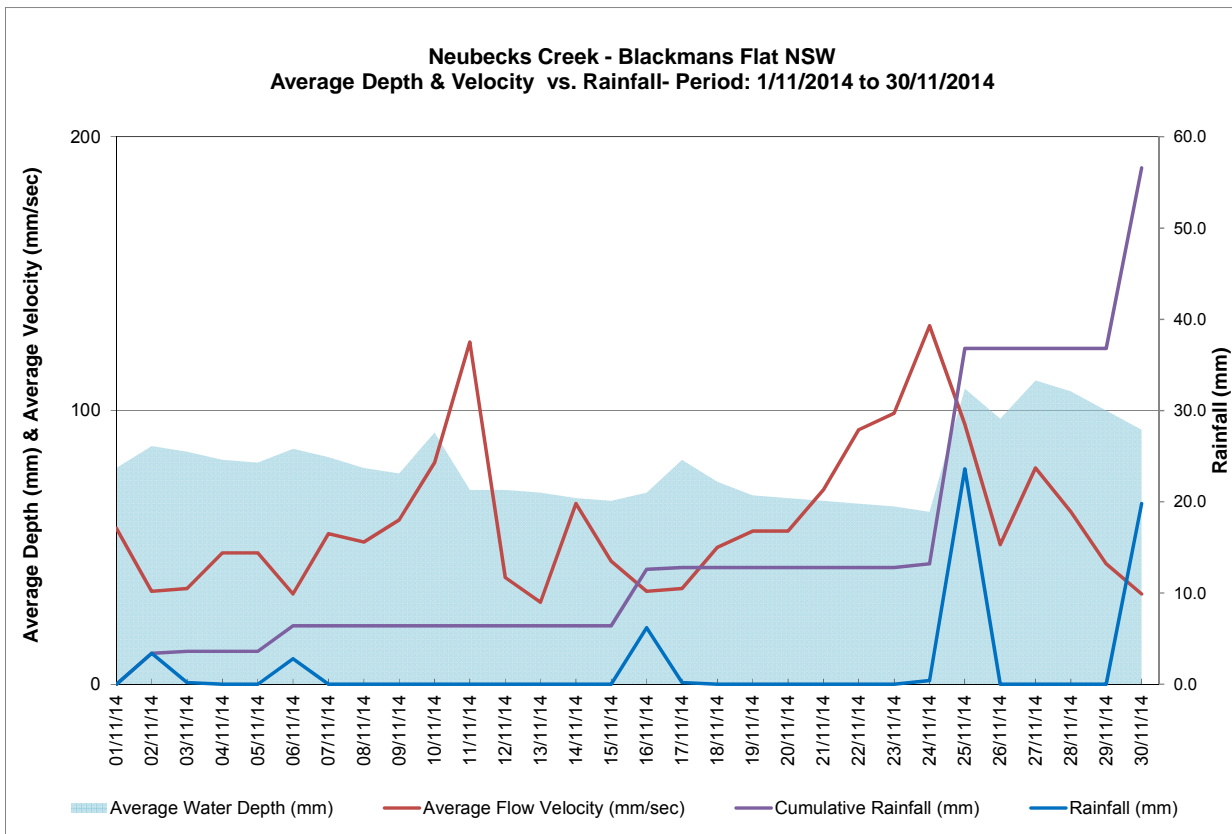
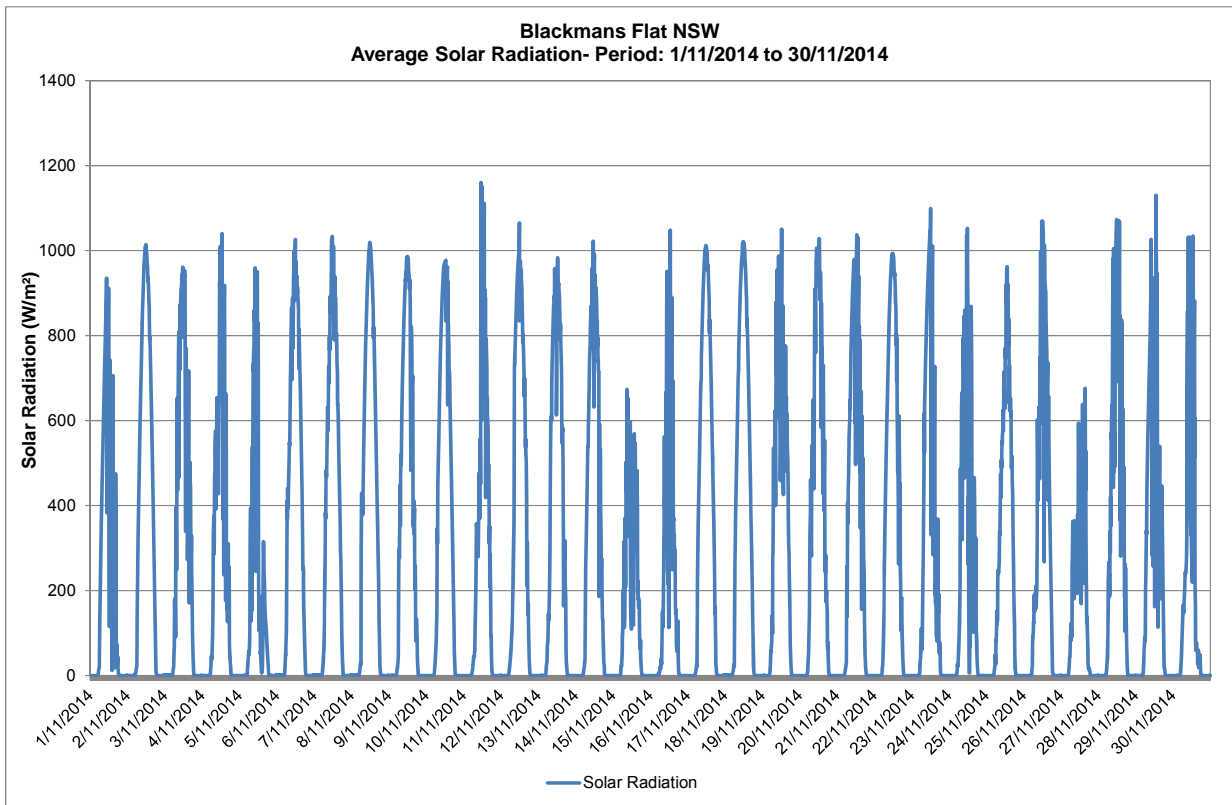
Blackmans Flat NSW
Total Rainfall & Evapotranspiration
Period: 1/11/14 to 30/11/14



Blackmans Flat NSW
Average Air Temperature - Period: 1/11/14 to 30/11/14



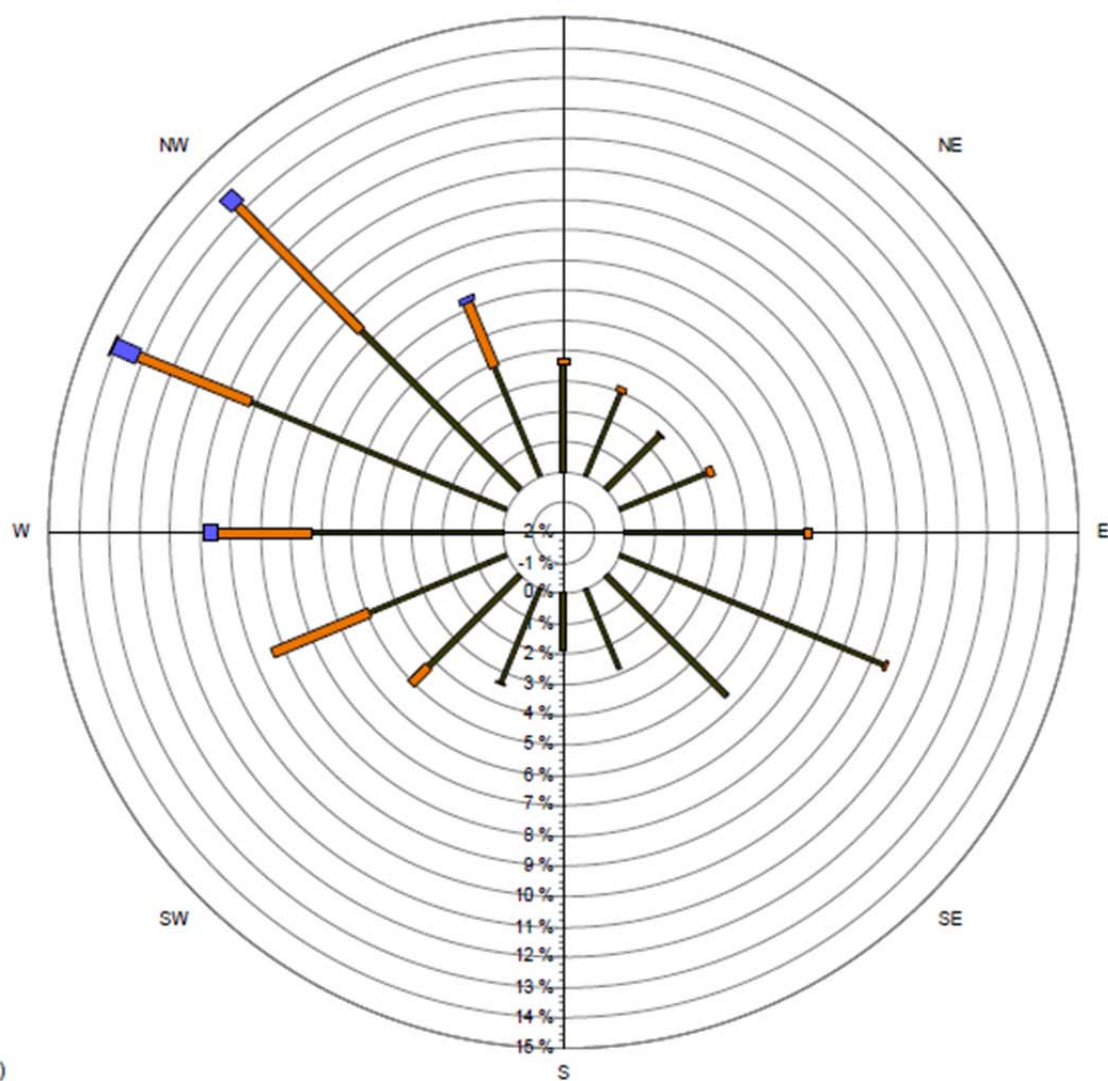
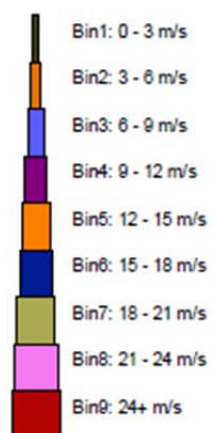




Blackmans Flat Windrose

1/11/2014 to 30/11/2014

N



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