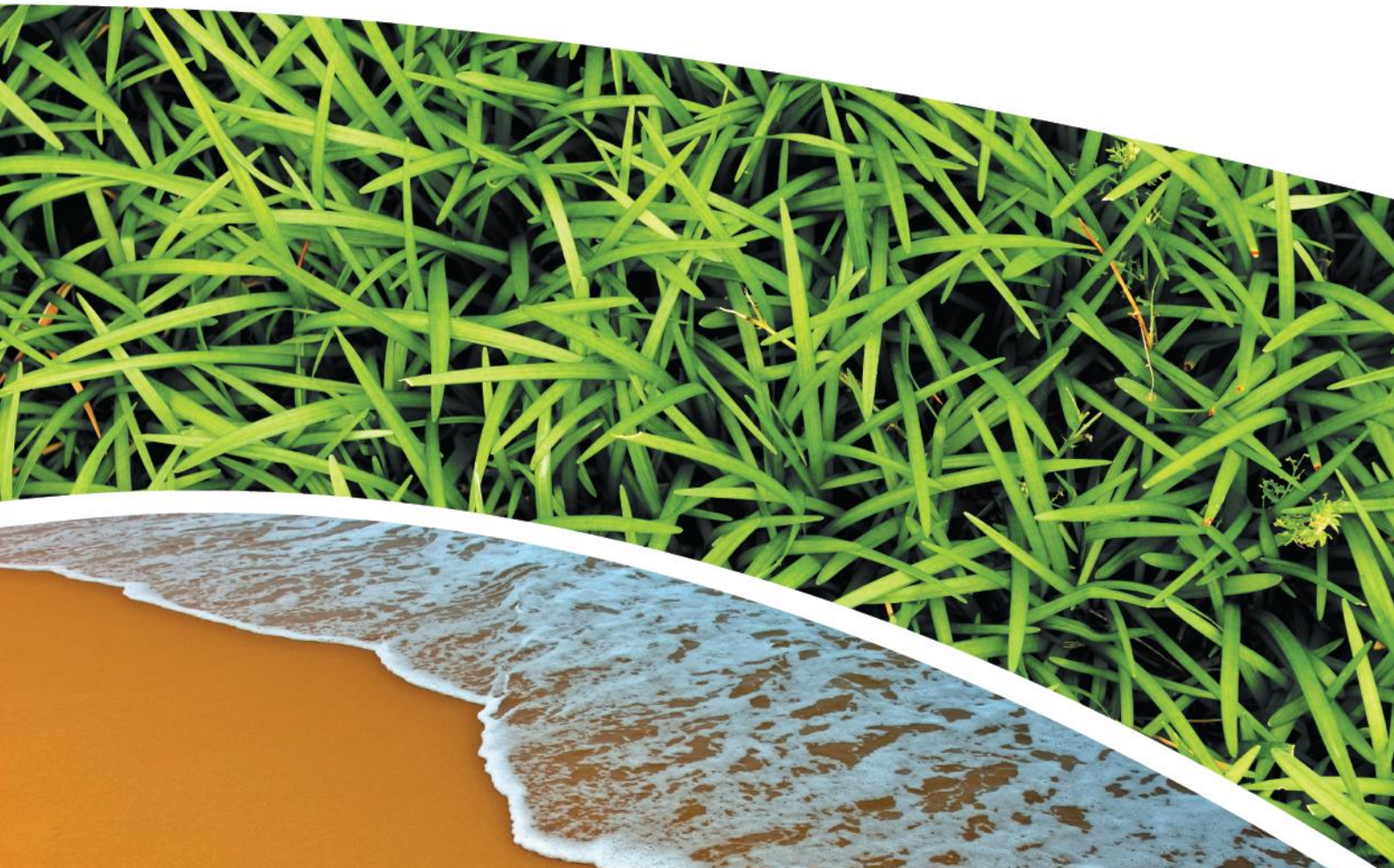


**AIR, WATER AND METEOROLOGICAL MONITORING – JULY 2018
PINE DALE MINE, BLACKMANS FLAT**

Prepared for Pine Dale Mine Community Consultative Committee

Prepared by RCA Australia

RCA ref 6880-1773/0



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. 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 Shaw	C Rocher		16.08.2018

DOCUMENT DISTRIBUTION				
Rev No	Copies	Format	Issued to	Date
/0	1	Electronic (email)	Pine Dale Mine – Graham Goodwin graham.goodwin@energyaustralia.com.au	16.08.2018
/0	1	Electronic (email)	Energy Australia- Mark Frewin mark.frewin@energyaustralia.com.au	16.08.2018
/0	1	Electronic (email)	Lithgow City Council – Andrew Muir andrew.muir@lithgow.nsw.gov.au	16.08.2018
/0	1	Electronic report	RCA – job archive	16.08.2018



Contents

1	INTRODUCTION	1
2	ANALYTICAL PROCEDURES.....	1
3	WATER MONITORING RESULTS.....	2
	3.1 GROUNDWATER.....	2
	3.2 EPA SURFACE WATER MONITORING	4
4	AIR QUALITY RESULTS	4
	4.1 HIGH VOLUME AIR SAMPLERS (HVAS).....	4
	4.1.1 TSP SUMMARY	5
	4.1.2 PM ₁₀ SUMMARY	5
	4.2 DEPOSITIONAL DUST MONITORING	5
	4.2.1 ALLOWABLE DEPOSITIONAL DUST LIMITS	5
5	METEOROLOGICAL MONITORING.....	6
6	BLASTING RESULTS.....	6
7	NOISE MONITORING RESULTS.....	6
8	OPERATIONAL ACTIVITIES	6
9	SUMMARY	6

APPENDIX A

MONITORING LOCATIONS

APPENDIX B

DEPOSITIONAL DUST AND HVAS GRAPHS

APPENDIX C

METEOROLOGICAL DATA

RCA ref 6880-1773/0

16 August 2018

Enhance Place Pty Ltd
PO Box 202
WALLERWANG NSW 2845

Attention: Mr Graham Goodwin

[Geotechnical Engineering](#)

[Engineering Geology](#)

[Environmental Engineering](#)

[Hydrogeology](#)

[Construction Materials Testing](#)

[Environmental Monitoring](#)

[Sound & Vibration](#)

[Occupational Hygiene](#)

**REPORT COMPILED FOR COMMUNITY CONSULTATIVE COMMITTEE
DETAILING AIR, WATER AND METEOROLOGICAL MONITORING AT PINE DALE
MINE
JULY 2018**

1 INTRODUCTION

This report presents the results of air, water and meteorological monitoring undertaken at Pine Dale Mine, Blackmans Flat during the month of July 2018.

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

Analysis	Method	Units	Analysing Laboratory	NATA Accreditation Status
Determination of Suspended Particulate Matter	ENV-LAB003	$\mu\text{g}/\text{m}^3$	RCA Laboratories – Environmental	NATA Analysis
Determination of Particulate Matter – Deposited Matter	ENV-LAB004	$\text{g}/\text{m}^2\cdot\text{month}$	RCA Laboratories – Environmental	NATA Analysis
pH	ENV-LAB006	pH	RCA Laboratories – Environmental	NATA Analysis
Conductivity	ENV-LAB010	$\mu\text{S}/\text{cm}$	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

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 July 2018. 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	-	07186880011	07186880012
Date Sampled	-	05/07/18	05/07/18
Time Sampled	-	10:54	11:55
Depth to Water from Surface	m	25.60	7.05
Water Level (AHD)	m	891.35	887.35
Temperature	°C	14.6	15.5
pH	pH	6.07	6.23
Conductivity	µS/cm	1620	774
Turbidity	NTU	44	
Dissolved Oxygen	mg/L	<2	
TSS	mg/L	47	
Oil and Grease	mg/L	<5	
Bicarbonate Alkalinity (CaCO ₃)	mg/L	94	
Total Alkalinity (CaCO ₃)	mg/L	94	
Sulphate (as SO ₄)	mg/L	777	
Chloride	mg/L	62	
Calcium	mg/L	149	
Magnesium	mg/L	70	
Sodium	mg/L	64	
Potassium	mg/L	20	
Cobalt (dissolved)	mg/L	0.037	
Manganese (dissolved)	mg/L	2.92	
Nickel (dissolved)	mg/L	0.034	
Zinc (dissolved)	mg/L	0.012	
Iron (dissolved)	mg/L	40.1	
Trigger Levels			
pH trigger level ^	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.

^ pH trigger level 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 EPA SURFACE WATER MONITORING

Routine quarterly surface water monitoring in accordance with Environmental Protection Licence 4911 was not required to be undertaken during July 2018. The next quarterly monitoring round is scheduled for August 2018.

4 AIR QUALITY RESULTS

4.1 HIGH VOLUME AIR SAMPLERS (HVAS)

Monitoring of particulate matter less than 10 micrometres (PM₁₀) 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 locations of these HVAS units are shown in **Appendix A**.

HVAS Total Suspended Particulate results are shown in **Table 3**. PM₁₀ results are shown in **Table 4**. HVAS Monitoring locations are shown in **Appendix A**. Graphical HVAS result presentations are shown in **Appendix B**.

The field sheets indicate that the TSP HVAS run on the 6 and 18 July did not run for 24 ± 1 hours and therefore these runs do not conform to AS/NZS 3580.9.3:2015. Similarly, the PM₁₀ HVAS run on the 6 July 2018 ran for less than 24 ± 1 hours and does not conform to AS/NZS 3580.9.6:2015.

Table 3 Total Suspended Particulates (TSP)

Run Date	TSP (µg/m ³)	Sample Number	Filter Number	Date Filter Off	Time Filter Off	Field Tech	Hours Run
6-Jul-18	12	07186880031	9518079	07-Jul-18	10:50	Client	25.47
12-Jul-18	13	07186880033	9518239	16-Jul-18	7:52	Client	24.00
18-Jul-18	73	07186880035	9518510	23-Jul-18	17:10	Client	15.41
24-Jul-18	20	07186880037	9521234	28-Jul-18	10:00	Client	24.00
30-Jul-18	8	07186880039	9521232	04-Aug-18	14:40	Client	24.00

Table 4 Suspended Particulate Matter <10 µm (PM₁₀)

Run Date	PM ₁₀ (µg/m ³)	Sample Number	Filter Number	Date Filter Off	Time Filter Off	Field Tech	Hours Run
6-Jul-18	6	07186880032	9518078	07-Jul-18	10:55	Client	1.01
12-Jul-18	9	07186880034	9518505	16-Jul-18	7:54	Client	24.00
18-Jul-18	5	07186880036	9518511	23-Jul-18	17:15	Client	24.00
24-Jul-18	10	07186880038	9521233	28-Jul-18	10:05	Client	24.00
30-Jul-18	3	07186880040	9521231	04-Aug-18	14:45	Client	24.00

4.1.1 TSP SUMMARY

The NSW 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* (August 2017 to July 2018) for the TSP unit is $21.4\mu\text{g}/\text{m}^3$. The twelve monthly graph is provided in **Appendix B**.

4.1.2 PM₁₀ SUMMARY

The NSW EPA twenty four hour maximum PM₁₀ allowable limit is $50\mu\text{g}/\text{m}^3$. The EPA Annual Mean PM₁₀ allowable limit is $25\mu\text{g}/\text{m}^3$. All PM₁₀ HVAS results recorded during this monitoring period conform to consent conditions, as the *current rolling annual mean* for the PM₁₀ unit is $9.3\mu\text{g}/\text{m}^3$, which is below the allowable annual limit (refer **Appendix B**). The 24 hour maximum allowable limit of $50\mu\text{g}/\text{m}^3$ was not exceeded during any run during the month of July 2018.

4.2 DEPOSITIONAL DUST MONITORING

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 6**. Depositional dust monitoring locations are shown in **Appendix A**.

Depositional dust gauge D2 is situated on private property; this gauge was removed at the request of the property owner in March 2018 and monitoring has therefore ceased at this location.

Table 5 Depositional Dust Monitoring: 7 June – 5 July 2018

Deposit Gauge	Number of Days	Notes	Insoluble Solids	Ash	Combustible Matter
D1	28	I	0.3	<0.1	0.3
D3	28	I	<0.1	<0.1	<0.1
D4	28	I	0.3	<0.1	0.3
D5	28	I	0.6	0.3	0.3
D6	28	I	<0.1	<0.1	<0.1

All units are $\text{g}/\text{m}^2/\text{month}$

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 $4\text{g}/\text{m}^2$ per month. The rolling annual depositional dust results for all sites within the period (August 2017 – July 2018) 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 $0.9\text{g}/\text{m}^2$ per month. The depositional dust gauge graphs are provided in **Appendix B**. The average for dust gauge D2 for the period August 2017 – February 2018 is also below the annual average long term limit.

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 July 2018 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 required to be undertaken during July 2018.

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 July 2018 environmental monitoring results were found to be generally in compliance with EPL 4911:

- Standing water levels within Pine Dale Mine groundwater bores were compliant with their respective trigger levels.
- Electrical conductivity in groundwater sample P7 was within the site specific trigger level.
- 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 25µg/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.

The exception was pH in groundwater samples P6 and P7 which were below the lower trigger level and electrical conductivity in groundwater P6, which was in excess of the site specific trigger level.

Meteorological monitoring was undertaken for the entire month of July with 100% data capture.

Pine Dale Mine ceased operation in March 2014 and therefore no blasting occurred at the site. Noise monitoring was not required to be undertaken this month.

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.

Yours faithfully

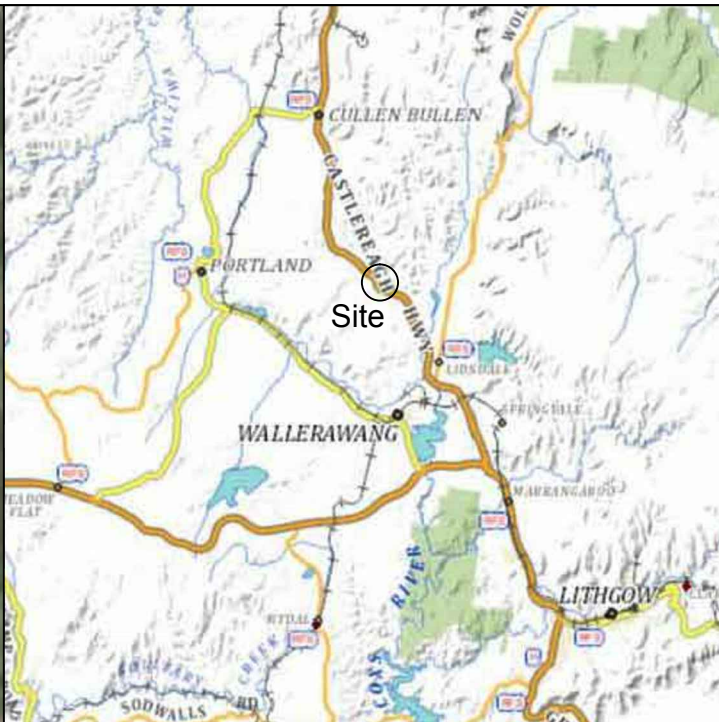
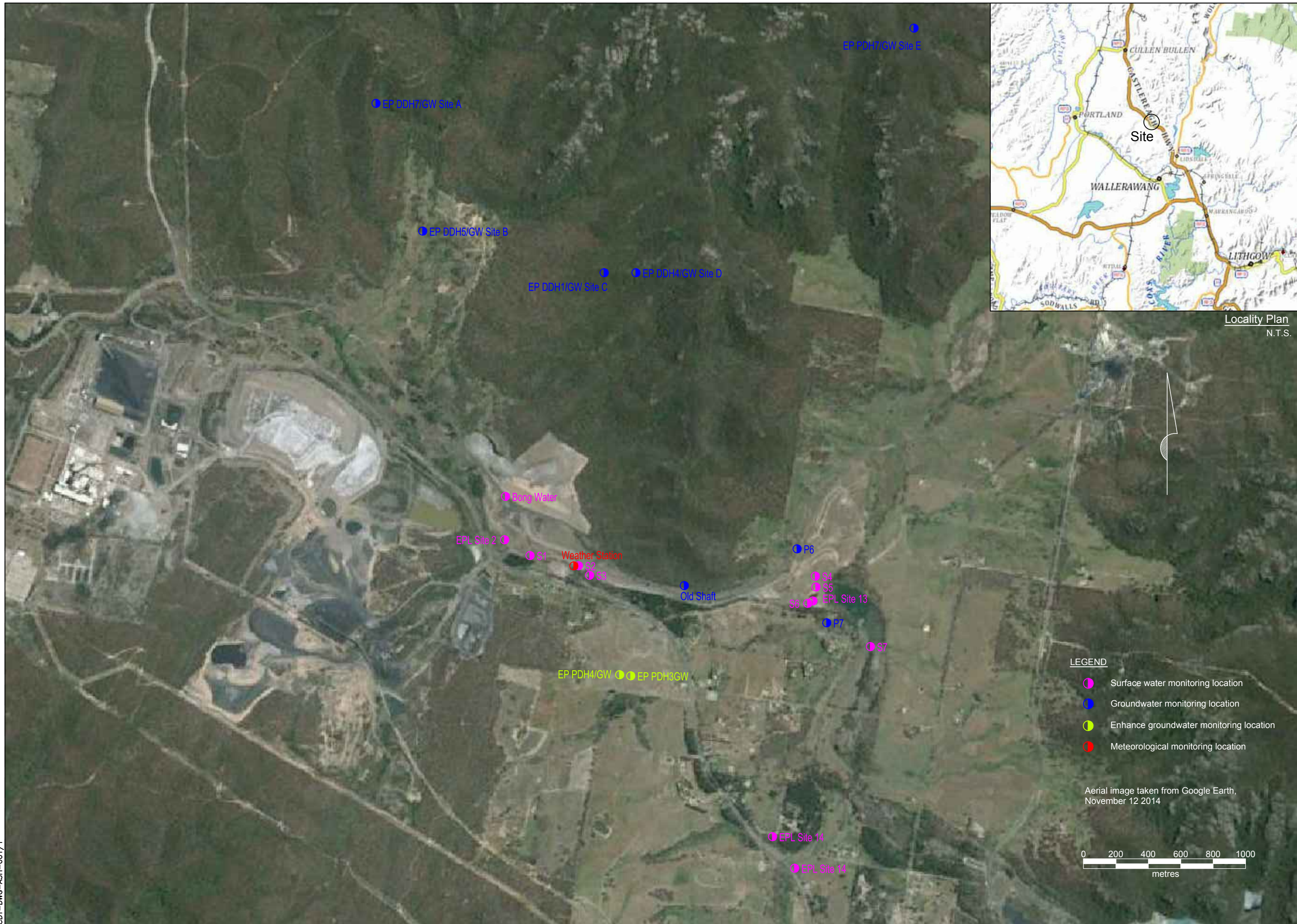
RCA AUSTRALIA



Carmen Rocher
Environmental Engineer

Appendix A

Monitoring Locations

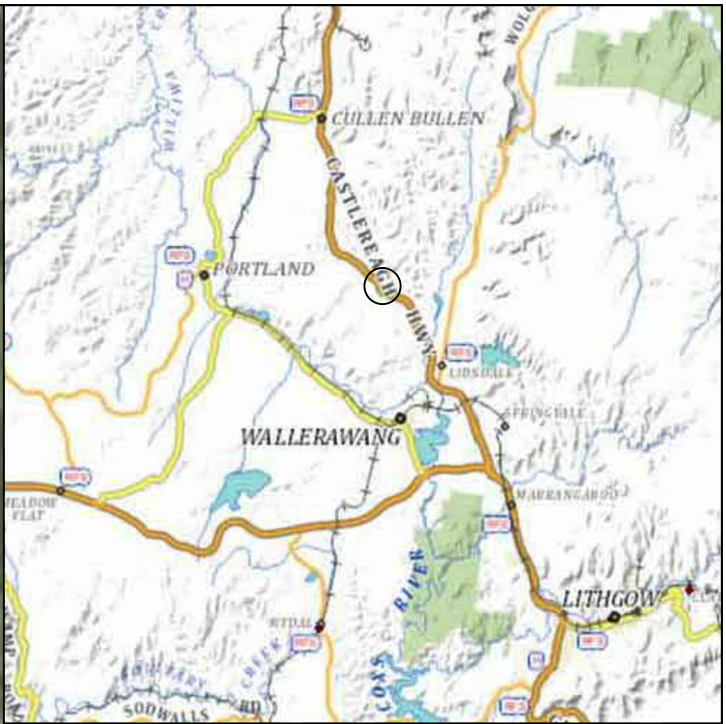
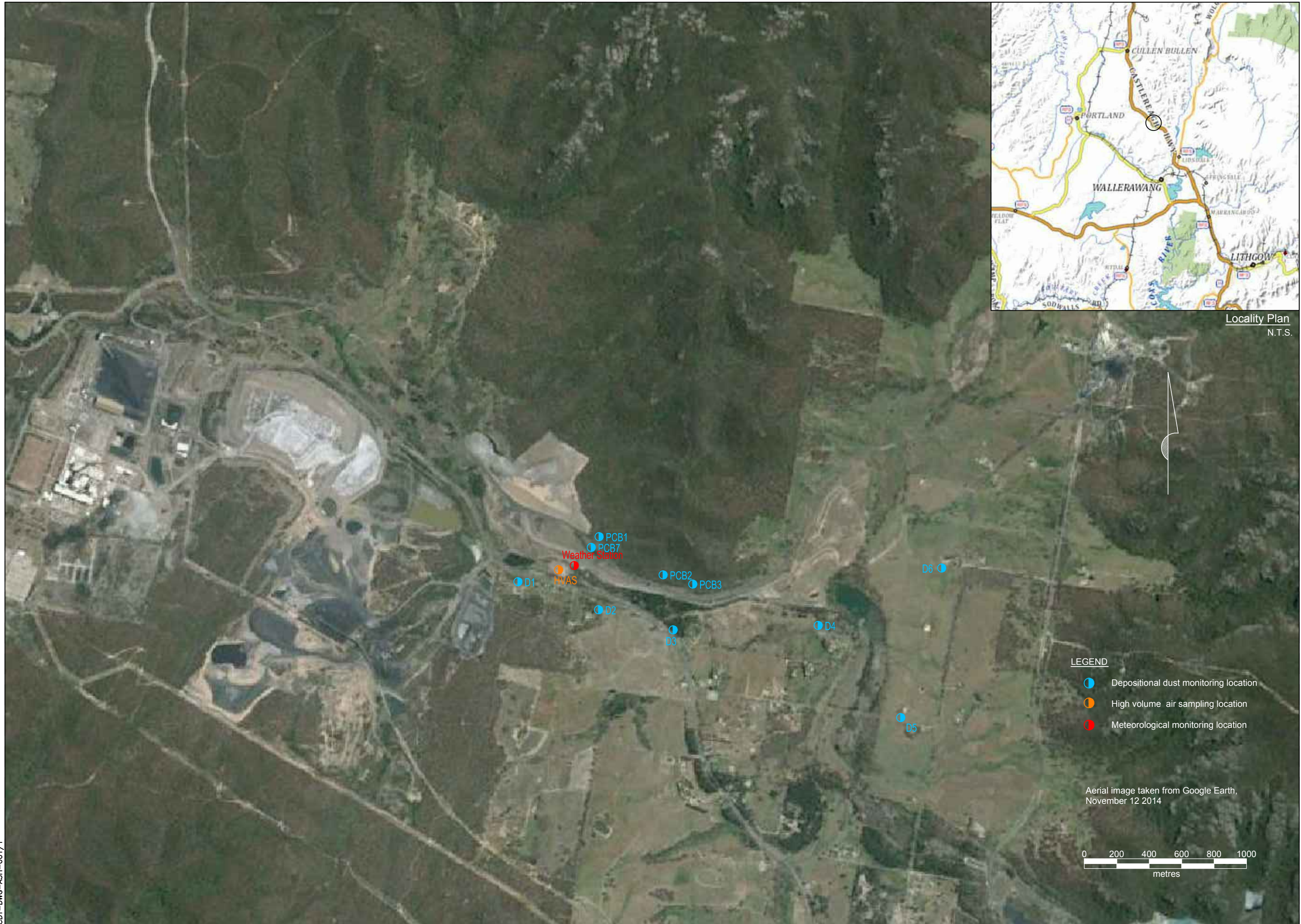


Locality Plan
N.T.S.

- LEGEND**
- Surface water monitoring location
 - Groundwater monitoring location
 - Enhance groundwater monitoring location
 - Meteorological monitoring location

Aerial image taken from Google Earth,
November 12 2014





Locality Plan
N.T.S.

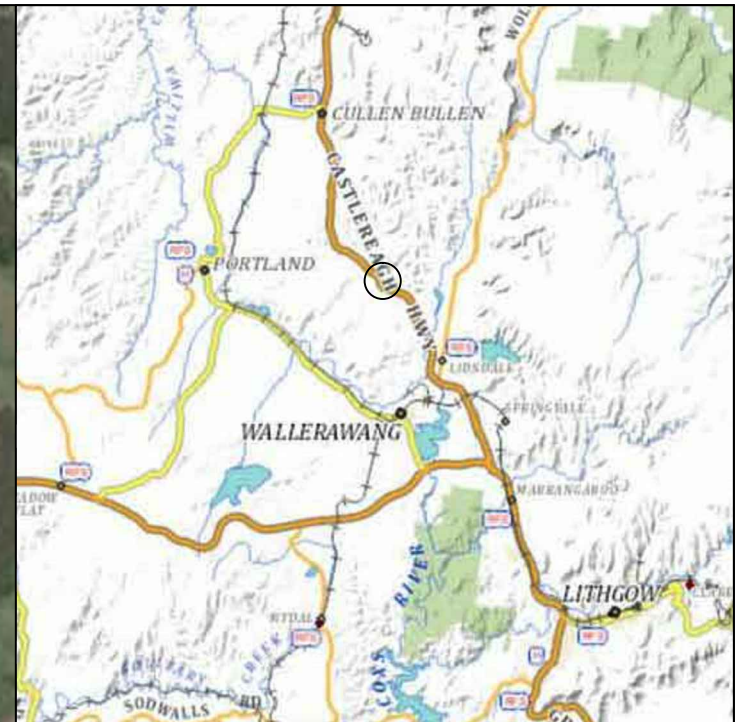
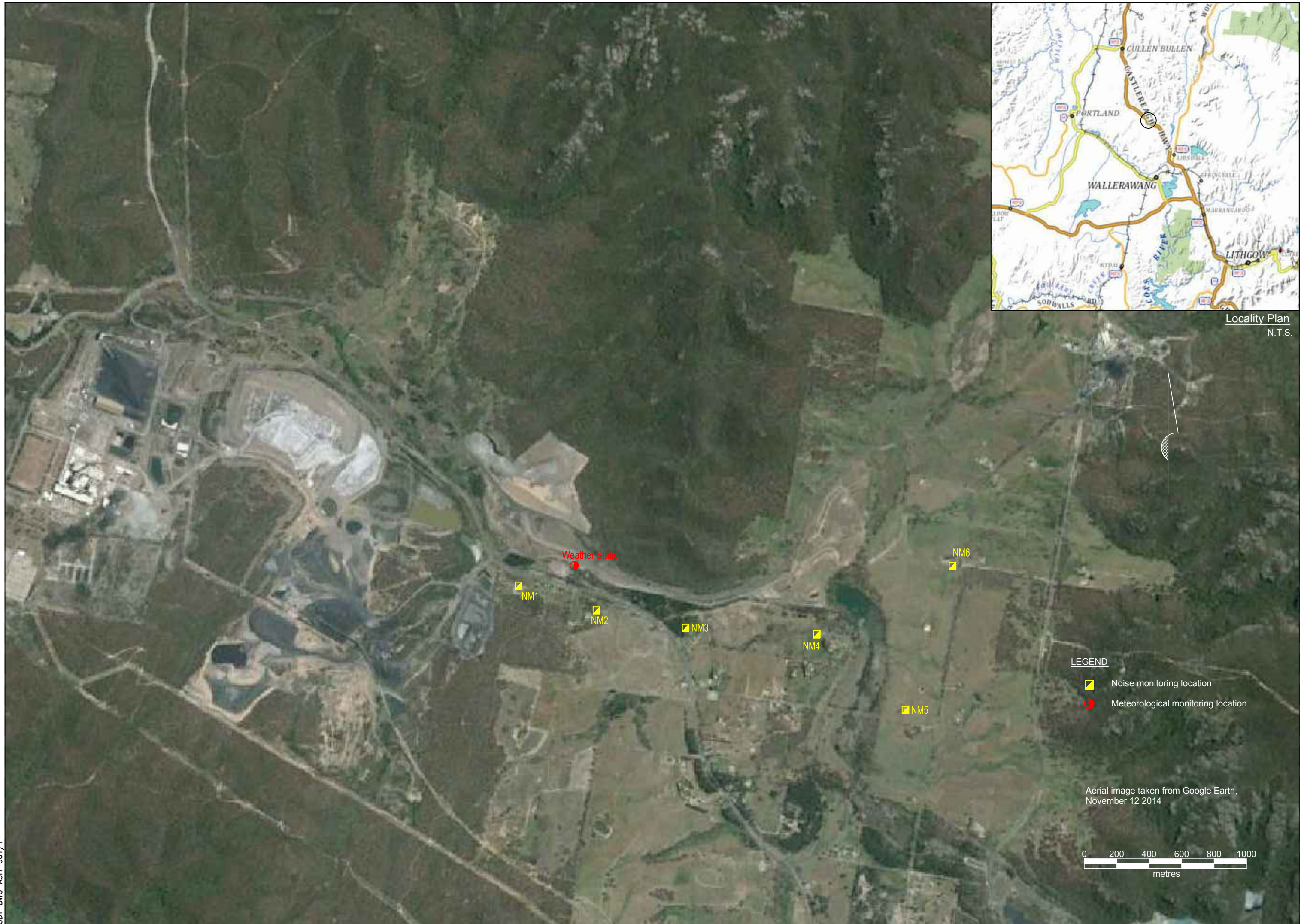


LEGEND

- Depositional dust monitoring location
- High volume air sampling location
- Meteorological monitoring location

Aerial image taken from Google Earth,
November 12 2014





Locality Plan
N.T.S.

Weather Station

NM1

NM2



NM3

NM4

NM5

NM6

LEGEND

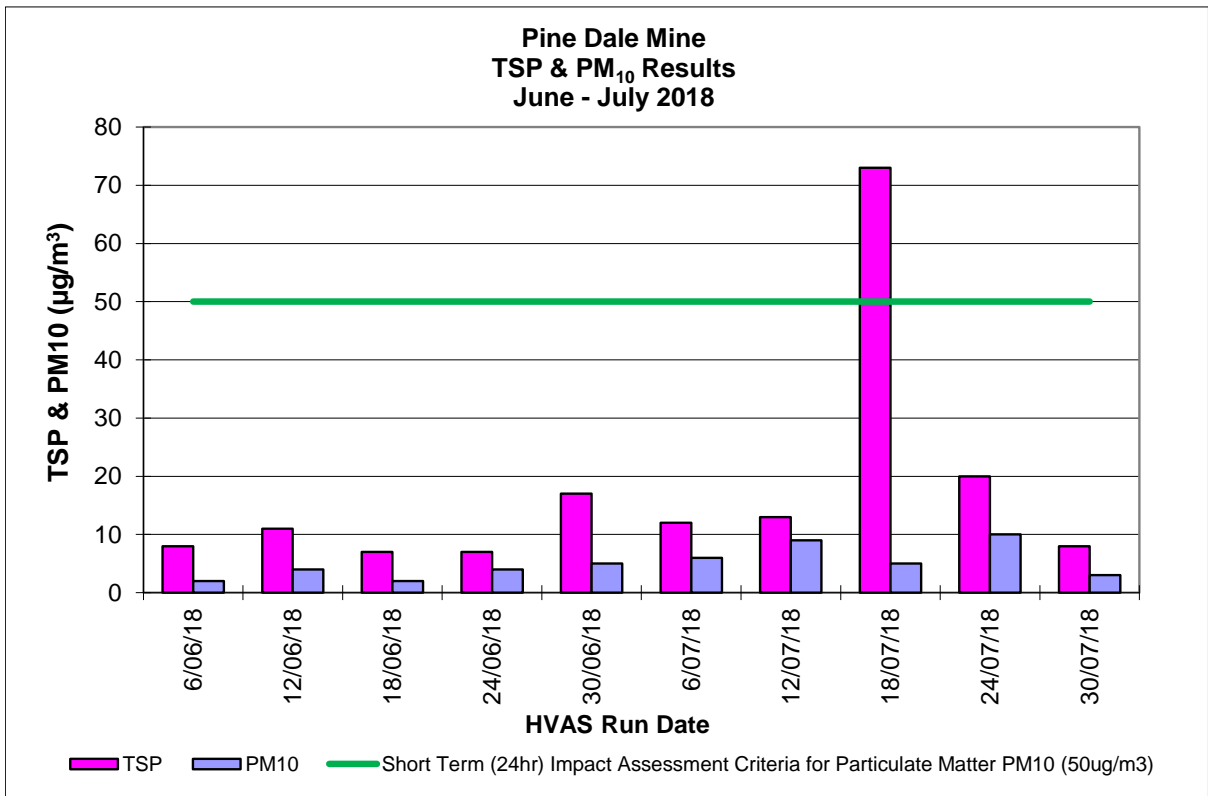
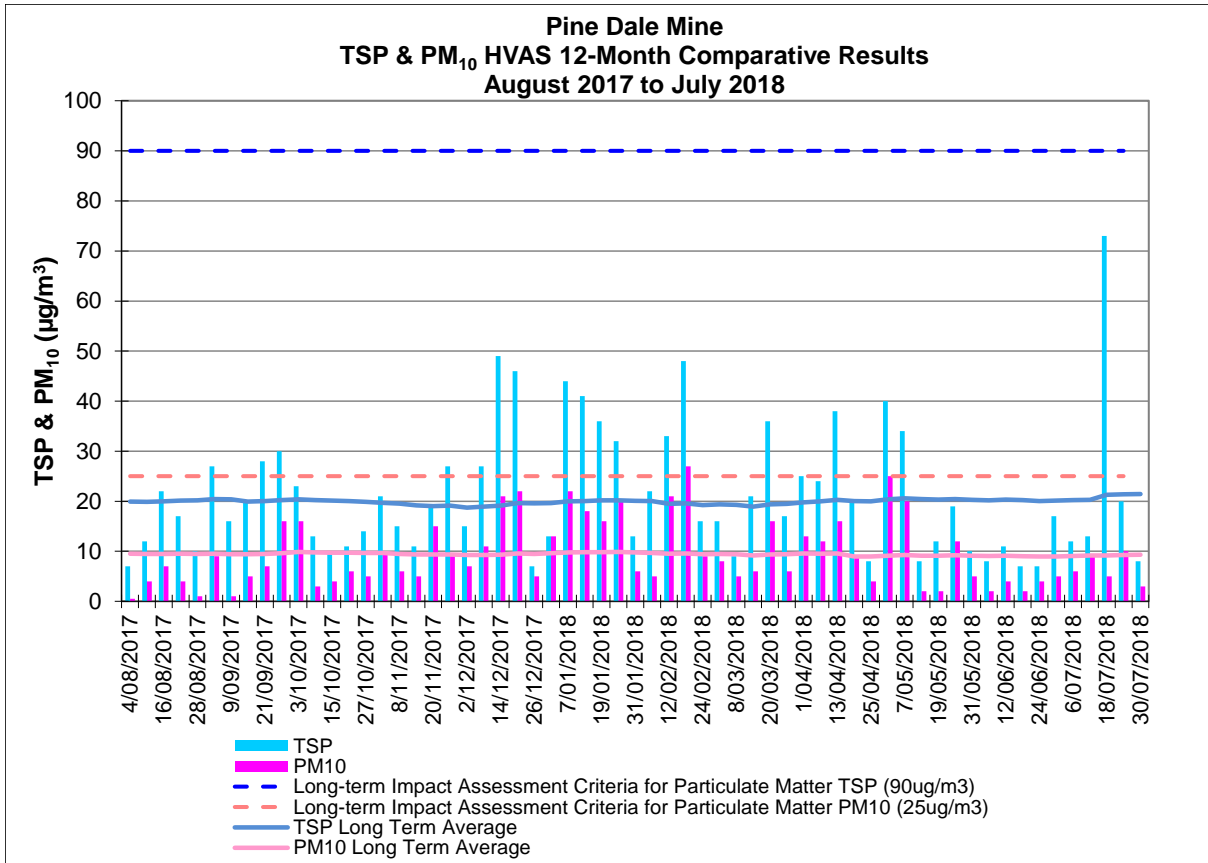
-  Noise monitoring location
-  Meteorological monitoring location

Aerial image taken from Google Earth,
November 12 2014

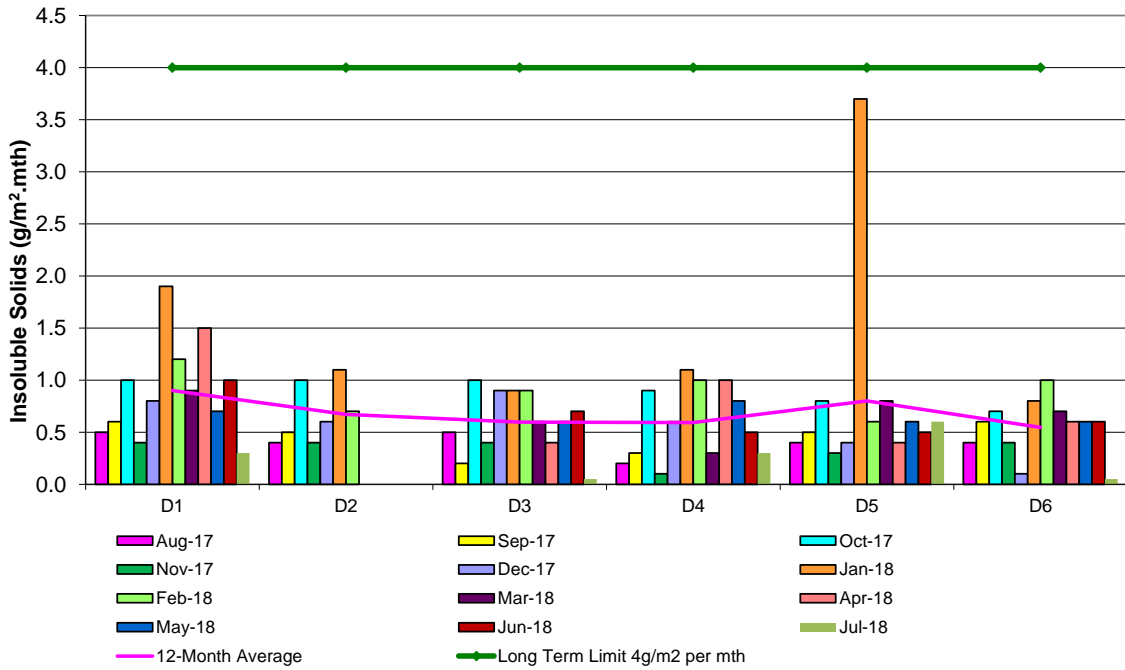


Appendix B

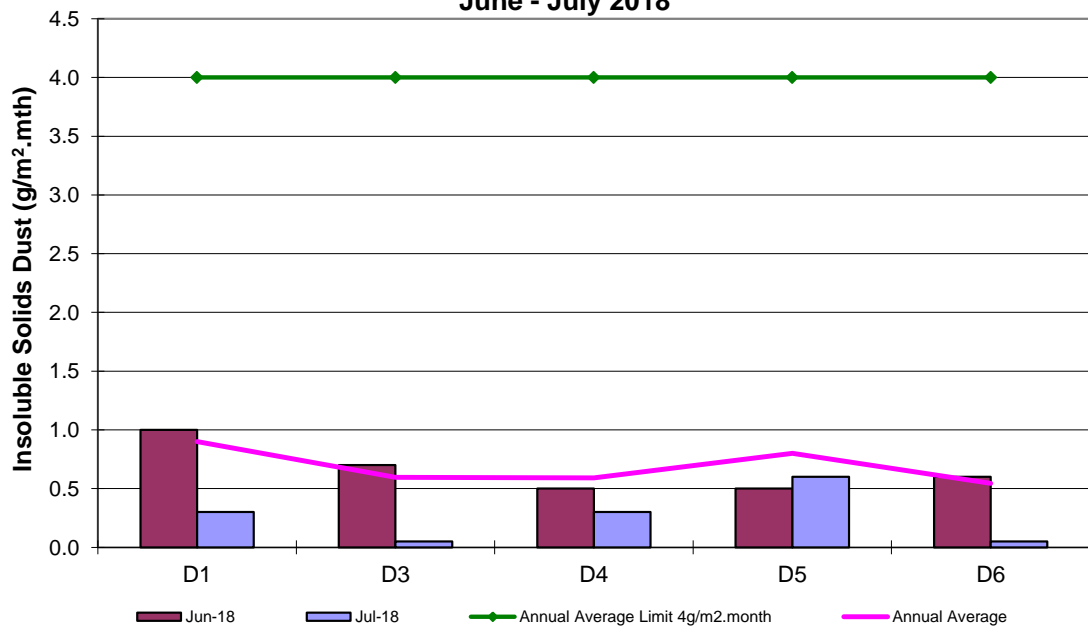
Depositional Dust and HVAS Graphs



**Pine Dale Mine
Deposited Matter - Insoluble Solids 12 Months Comparative Results
August 2017 to July 2018**

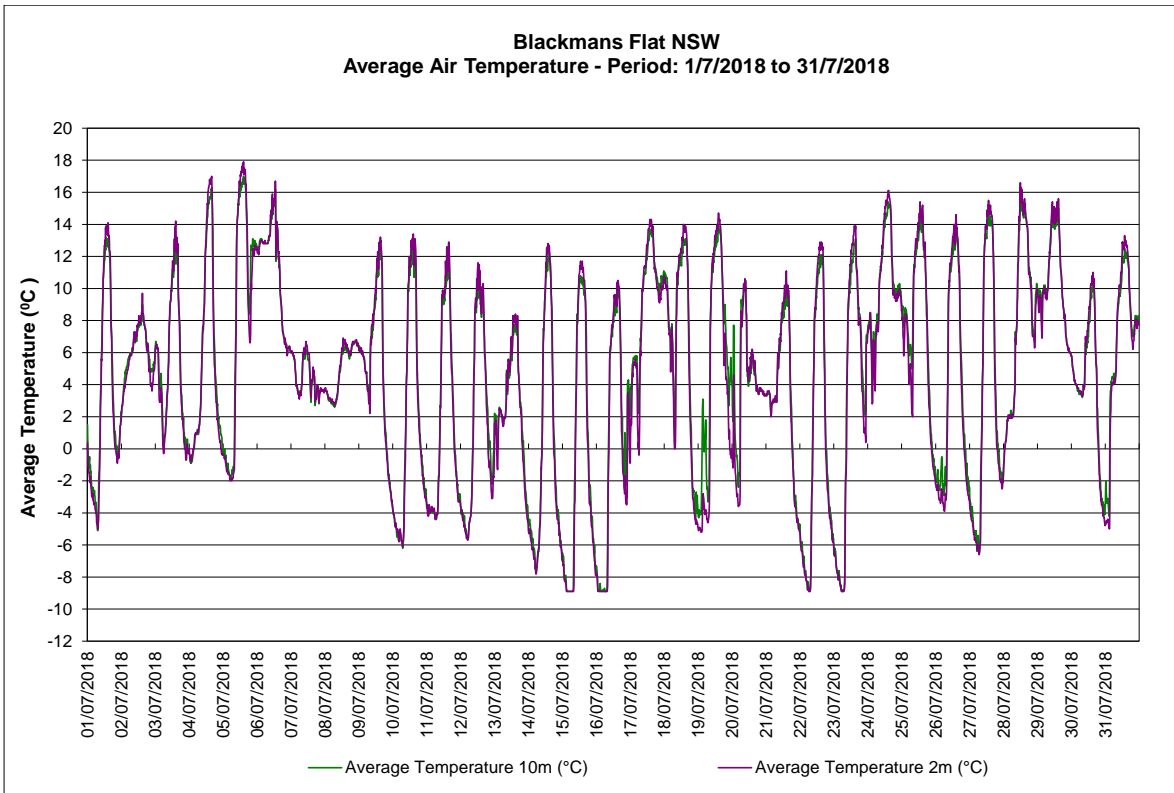
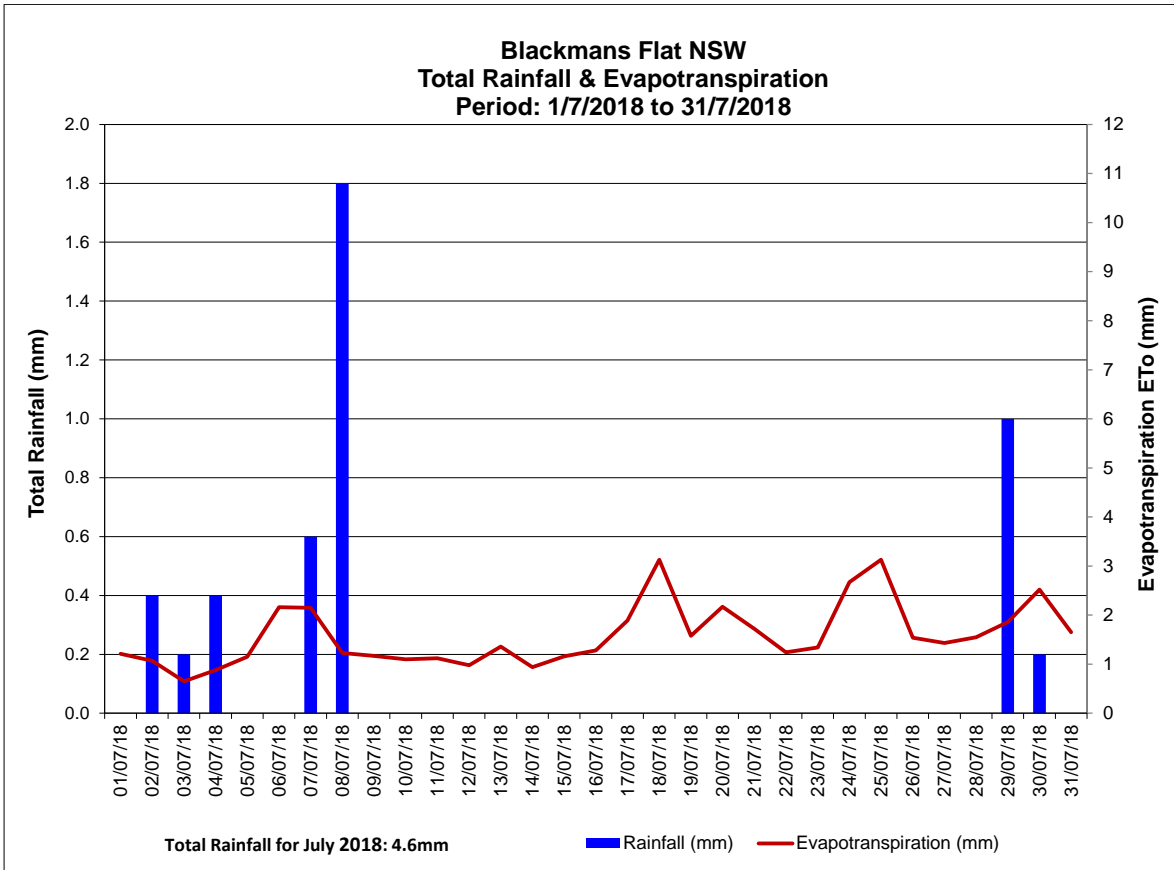


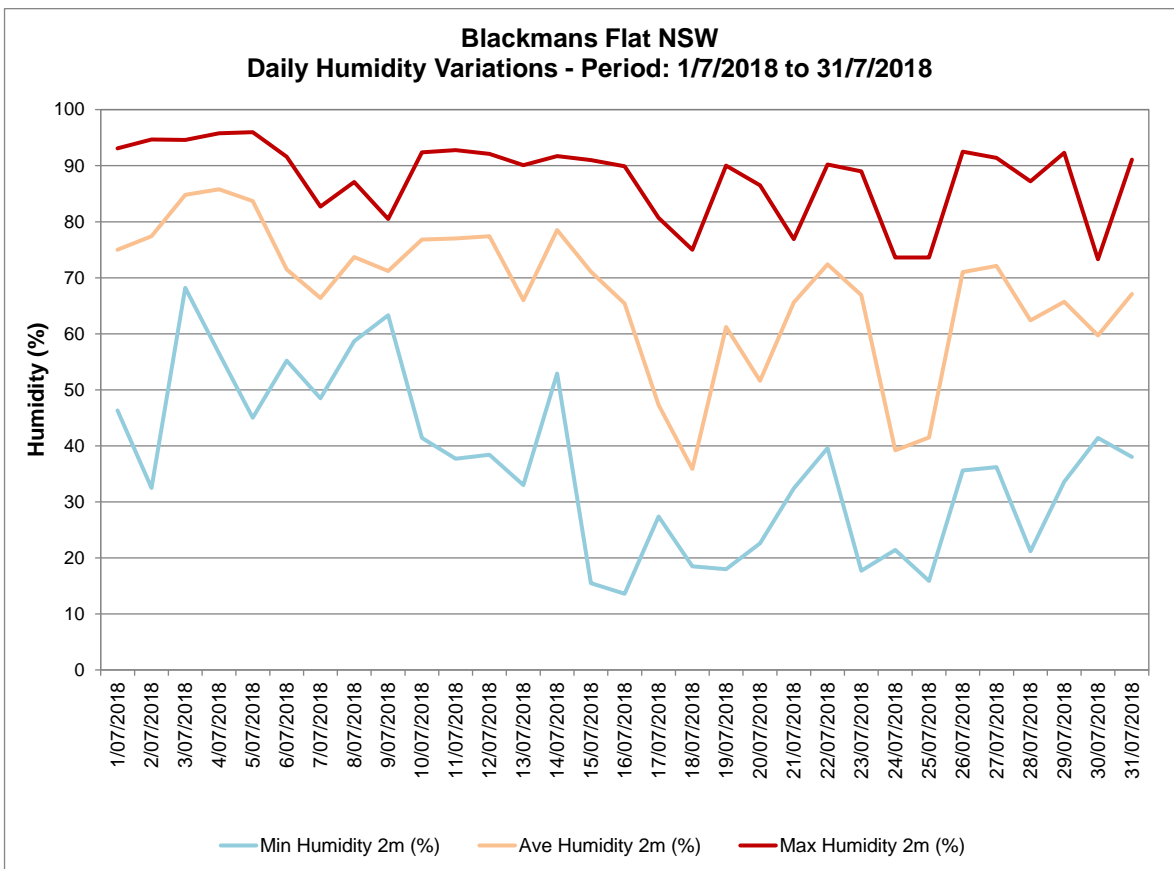
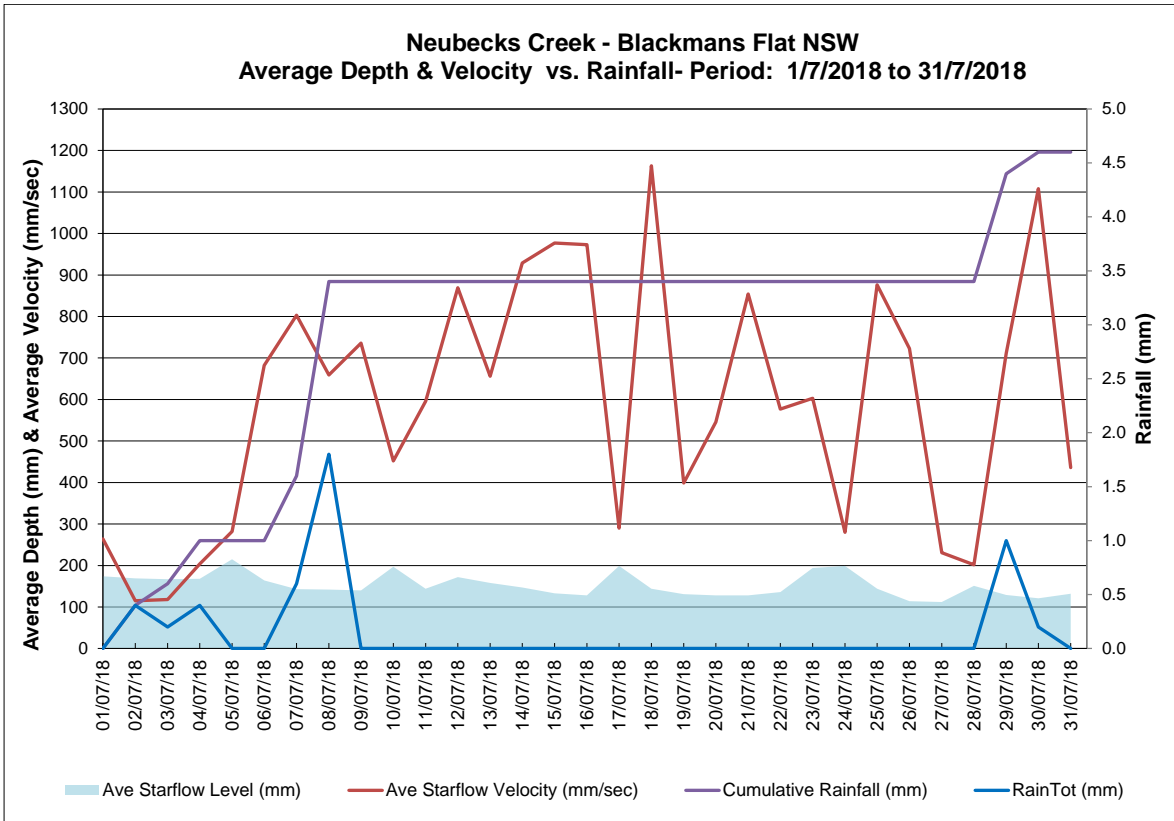
**Pine Dale Mine
Depositional Dust Gauge Comparative Results
June - July 2018**

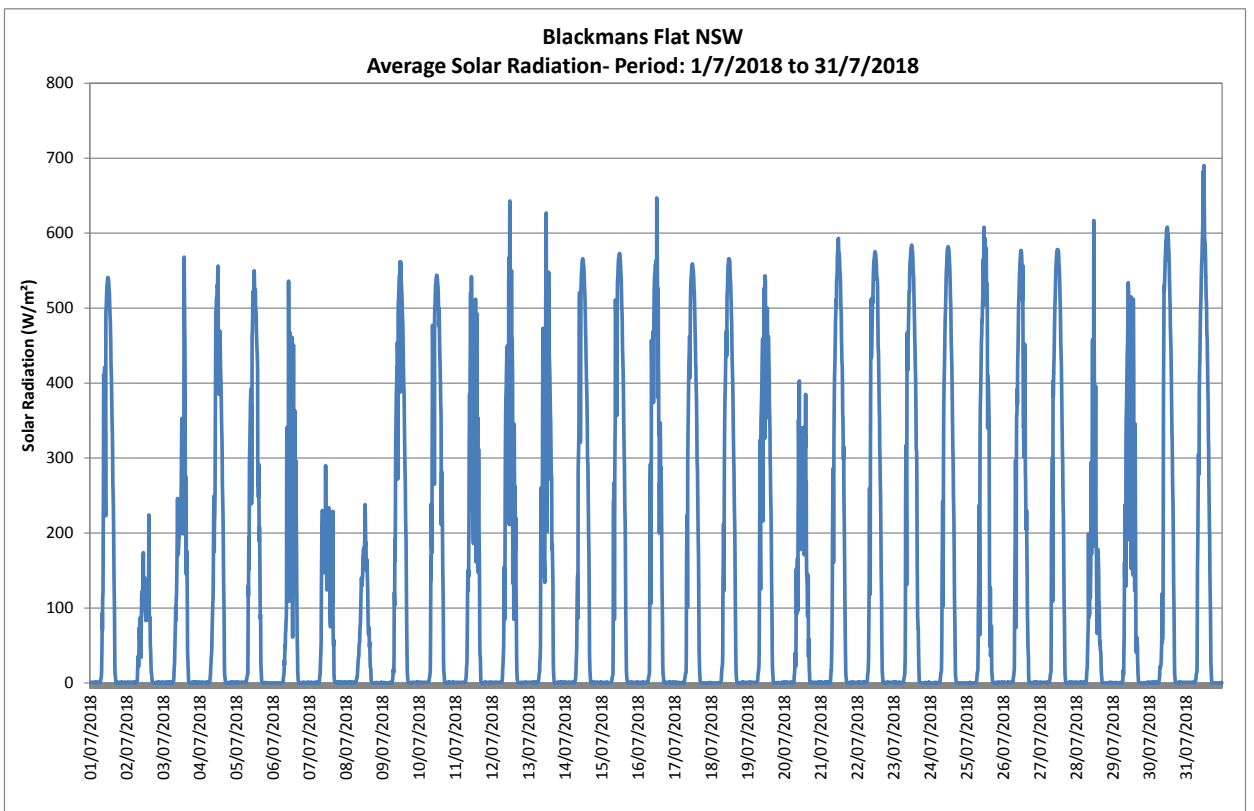
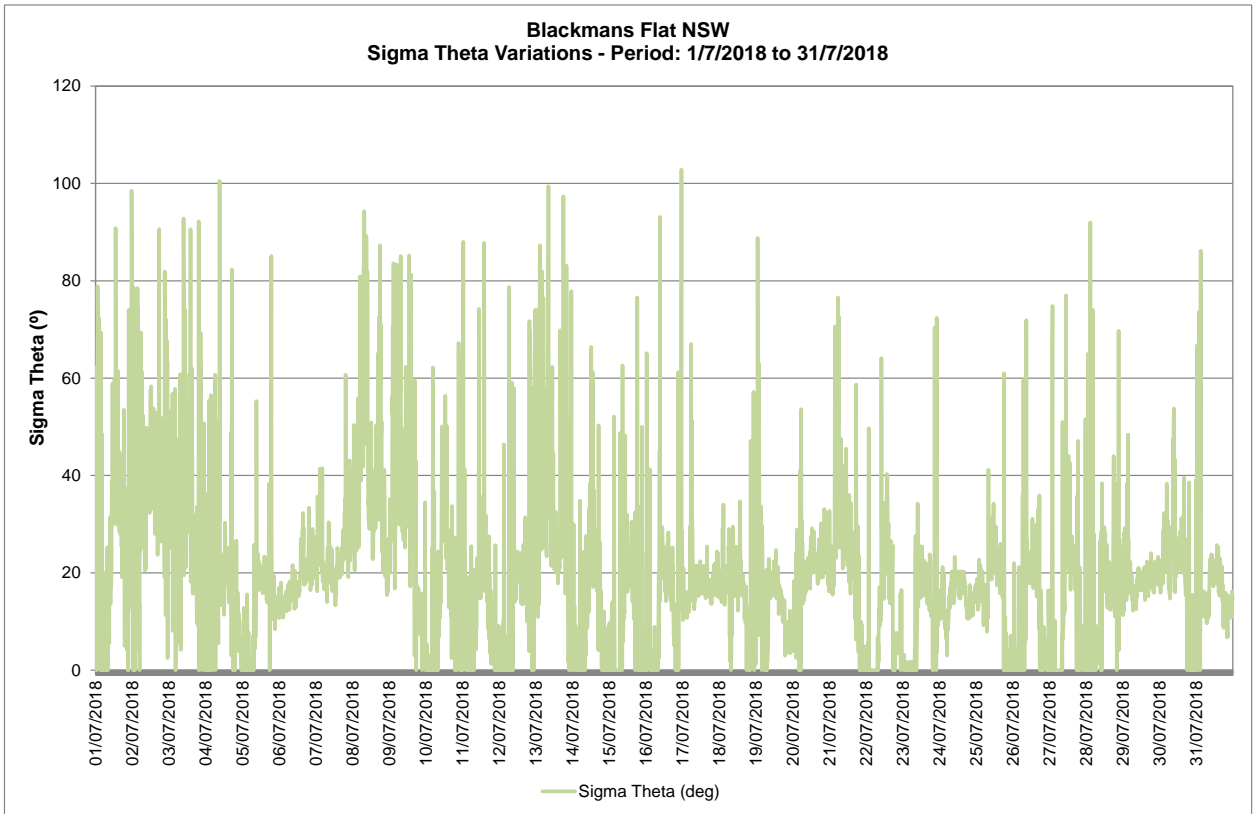


Appendix C

Meteorological Data



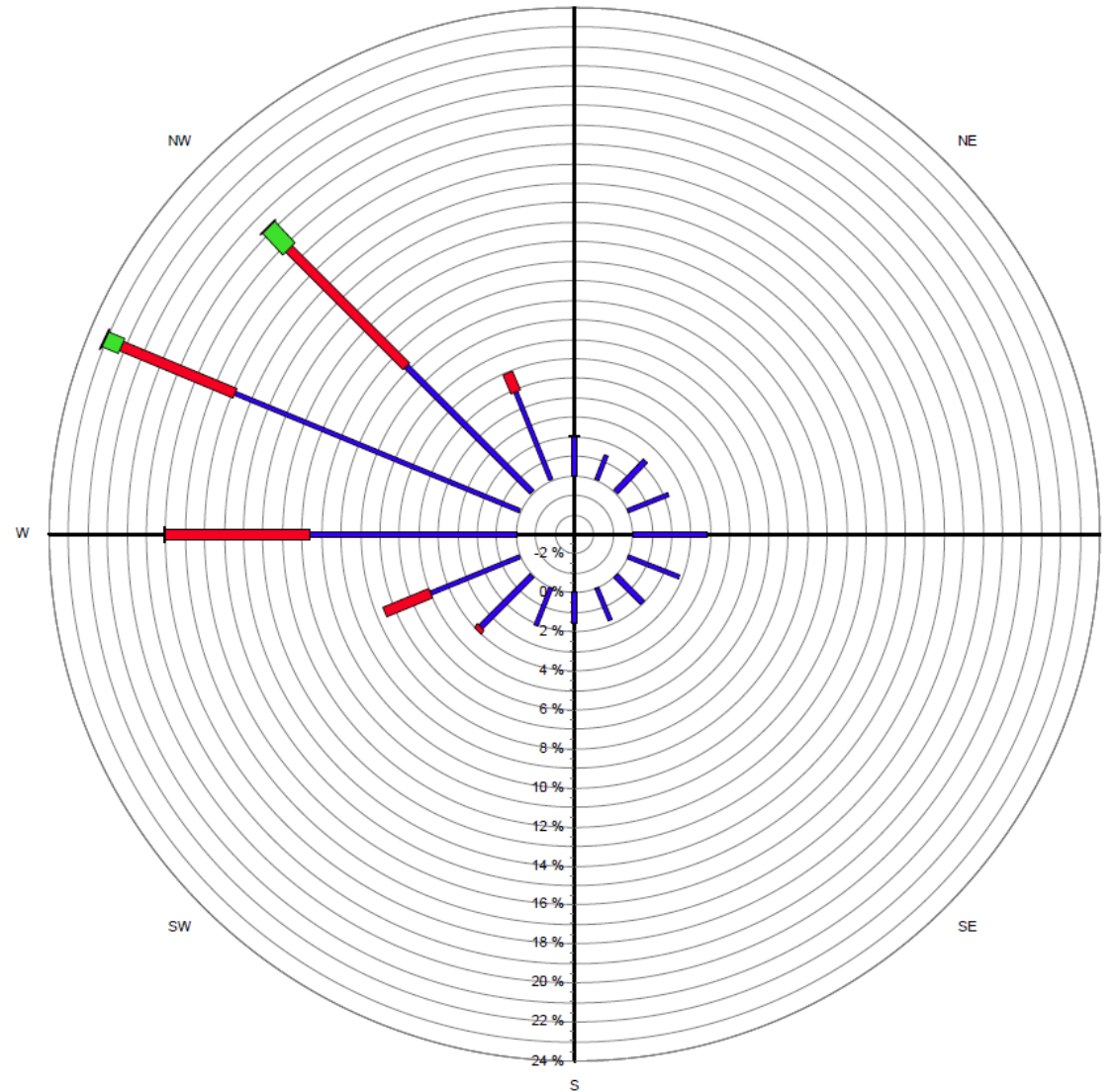




Blackmans Flat Windrose

1/07/2018 to 31/07/2018

N



- Bin1: 0 - 3 m/s
- Bin2: 3 - 6 m/s
- Bin3: 6 - 9 m/s
- Bin4: 9 - 12 m/s
- Bin5: 12 - 15 m/s
- Bin6: 15 - 18 m/s
- Bin7: 18 - 21 m/s
- Bin8: 21 - 24 m/s
- Bin9: 24+ m/s

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