



Geotechnical Engineering

Engineering Geology

Hydrogeology

Contaminated Site Assessment

Construction Materials Testing

Environmental Monitoring

# GROUND WATER DEPOSITIONAL DUST HVAS AND METEOROLOGICAL MONITORING

## PINE DALE MINE

Prepared for  
**PINE DALE MINE COMMUNITY  
CONSULTATIVE COMMITTEE**

Prepared by  
**RCA AUSTRALIA**

**RCA-LE ref 6880-787/0**

**January 2012**

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RCA LE ref 6880-787/0



16 March 2012

Enhance Place Pty Ltd  
Pine Dale Mine  
PO Box 6095  
South Coast Mail Centre  
WOLLONGONG NSW 2521

Attention: Mr Hilton Goldfinch

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**REPORT COMPILED FOR  
PINE DALE MINE COMMUNITY CONSULTATIVE COMMITTEE  
DETAILING  
GROUND WATER, DEPOSITIONAL DUST  
HVAS AND METEOROLOGICAL MONITORING  
JANUARY 2012**

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## 1 GENERAL COMMENTS

Job Number: 6880.

Date Samples Received: During the month of January 2012.

Samples received were sampled by RCA Laboratories – Environmental staff.

## 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	ENV-LAB003	$\mu\text{g}/\text{m}^3$	RCA Laboratories - Environmental	NATA Analysis
Determination of Particulate Matter –	ENV-LAB004	$\text{g}/\text{m}^2/\text{month}$	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

### 3 WATER ANALYSIS RESULTS

#### 3.1 GROUNDWATER

A total of 5 groundwater samples were collected during the month of January 2012. No sample was collected from groundwater monitoring location P4 as the bore contained insufficient water to sample.

Water quality analysis results are shown in **Table 2**.

**Table 2** *Groundwater Analysis Results*

ANALYSIS	UNITS	P2	P3	P6	P7	P7a
Sample Number		01126880021	01126880022	01126880011	01126880024	01126880025
Date Sampled	-	07/02/12	07/02/12	07/02/12	07/02/12	07/02/12
Relative Standing Water Level*	m	5.15	5.70	28.46	7.16	5.46
Temperature	°C	15.5	15.0	15.0	15.0	15.5
pH	pH unit	4.6	4.6	6.5	6.7	6.8
Conductivity	µS/cm	249	405	644	682	749

**NOTES:**

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

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

## 4 AIR QUALITY MONITORING RESULTS

### 4.1 HIGH VOLUME AIR SAMPLERS (HVAS)

HVAS at this facility conform to AS/NZS 3580.9.3:2003 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 ( $\mu\text{g}/\text{m}^3$  0°C 101.3 kPa)

RUN DATE	TSP ( $\mu\text{g}/\text{m}^3$ )	SAMPLE NO	FILTER NO	DATE FILTER OFF	TIME FILTER OFF	FIELD TECH	HOURS RUN
03-Jan-12	35	12116880056	8542344	04-Jan-12	11:30	Client	24.00
09-Jan-12	38	01126880048	8542346	12-Jan-12	10:25	Client	24.00
15-Jan-12	8	01126880050	8542348	18-Jan-12	10:30	Client	24.00
21-Jan-12	20	01126880052	8524826	23-Jan-12	13:20	Client	24.00
27-Jan-12	7	01126880054	8524827	30-Jan-12	13:50	Client	24.00

**Table 5** Suspended Particulate Matter PM10 ( $\mu\text{g}/\text{m}^3$  0°C 101.3 kPa)

RUN DATE	PM10 ( $\mu\text{g}/\text{m}^3$ )	SAMPLE NO	FILTER NO	DATE FILTER OFF	TIME FILTER OFF	FIELD TECH	HOURS RUN
03-Jan-12	22	12116880057	8542345	04-Jan-12	11:30	Client	24.00
09-Jan-12	16	01126880049	8542347	12-Jan-12	10:25	Client	24.00
15-Jan-12	4	01126880051	8542349	18-Jan-12	10:30	Client	24.00
21-Jan-12	11	01126880053	8542350	23-Jan-12	13:20	Client	24.00
27-Jan-12	4	01126880055	8524828	30-Jan-12	13:50	Client	24.00

#### 4.1.1 Allowable TSP Limits

The EPA Annual Mean TSP limit is  $90\mu\text{g}/\text{m}^3$ . All TSP HVAS results during this monitoring period are in compliance with consent conditions, as the *current annual mean* (from February 2011 to January 2012) for the TSP unit is  $20.1\mu\text{g}/\text{m}^3$ , which is well below the required limit of  $90\mu\text{g}/\text{m}^3$ .

#### 4.1.2 Allowable PM10 Limits

The EPA 24h Maximum PM10 Limit is  $50\mu\text{g}/\text{m}^3$ . The EPA Annual Mean PM10 limit is  $30\mu\text{g}/\text{m}^3$ . All PM10 HVAS results during this monitoring period are in compliance with consent conditions, as the *current annual mean* for the PM10 unit is  $10.6\mu\text{g}/\text{m}^3$ , which is below the required limit of  $30\mu\text{g}/\text{m}^3$ .

#### 4.1.3 Comments

High Volume Air Sampler calibrations were performed on 7/2/12.

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** *Deposited Matter (g/m<sup>2</sup>/month)*

SAMPLE NO	DEPOSIT GAUGE	DATE SAMPLE STARTED	DATE SAMPLE COMPLETED	NO 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)
01126880026	6880-D1	9/01/2012	7/02/2012	29	I	0.4	*	*
01126880027	6880-D2	9/01/2012	7/02/2012	29	I	0.4	0.1	0.3
01126880028	6880-D3	9/01/2012	7/02/2012	29	I	0.5	0.3	0.2
01126880029	6800-D4	9/01/2012	7/02/2012	29	I	0.5	0.4	0.1
01126880030	6800-D5	9/01/2012	7/02/2012	29	I	0.2	0.1	0.1
01126880031	6800-D6	9/01/2012	7/02/2012	29	I	3.4	1.8	1.6

### 4.2.1 Glossary of Terms Used in Notes

I Insects

### 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 all are all less than 0.9 g/m<sup>2</sup> per month, which is below the required 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**.

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Please contact the undersigned if you have any queries.

Yours sincerely,



Carl Oxenham  
Environmental Technician  
RCA Australia Pty Ltd trading as  
RCA Laboratories – Environmental

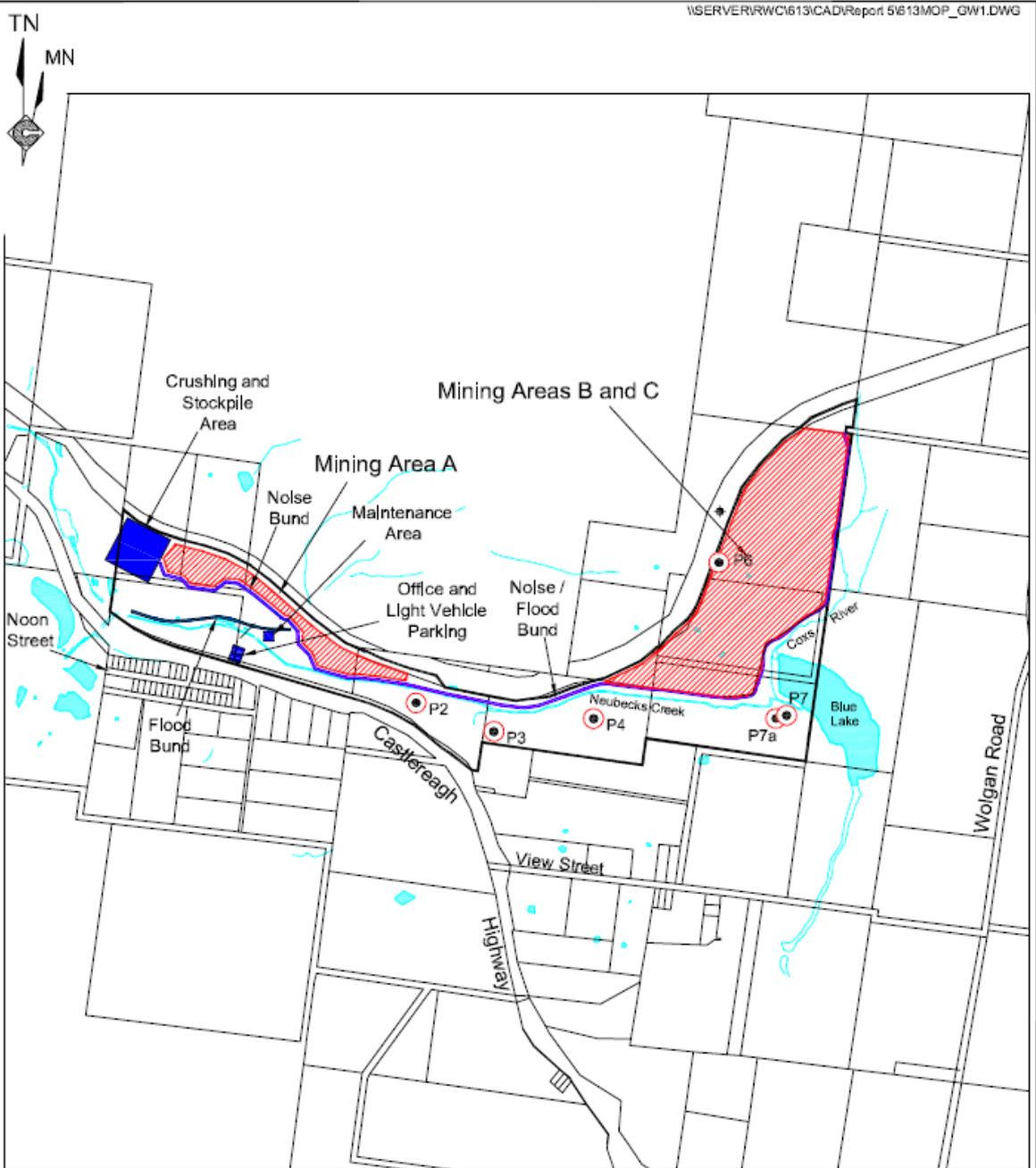


Geoff Mason  
Environmental Services Manager  
RCA Australia Pty Ltd trading as  
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# Appendix 1

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Groundwater and Air Quality Monitoring Locations



REFERENCE  
— Mine Site Boundary (ML\_XYZ)  
● P4 Groundwater Monitoring Location

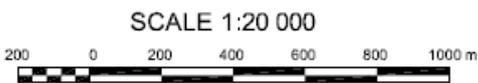
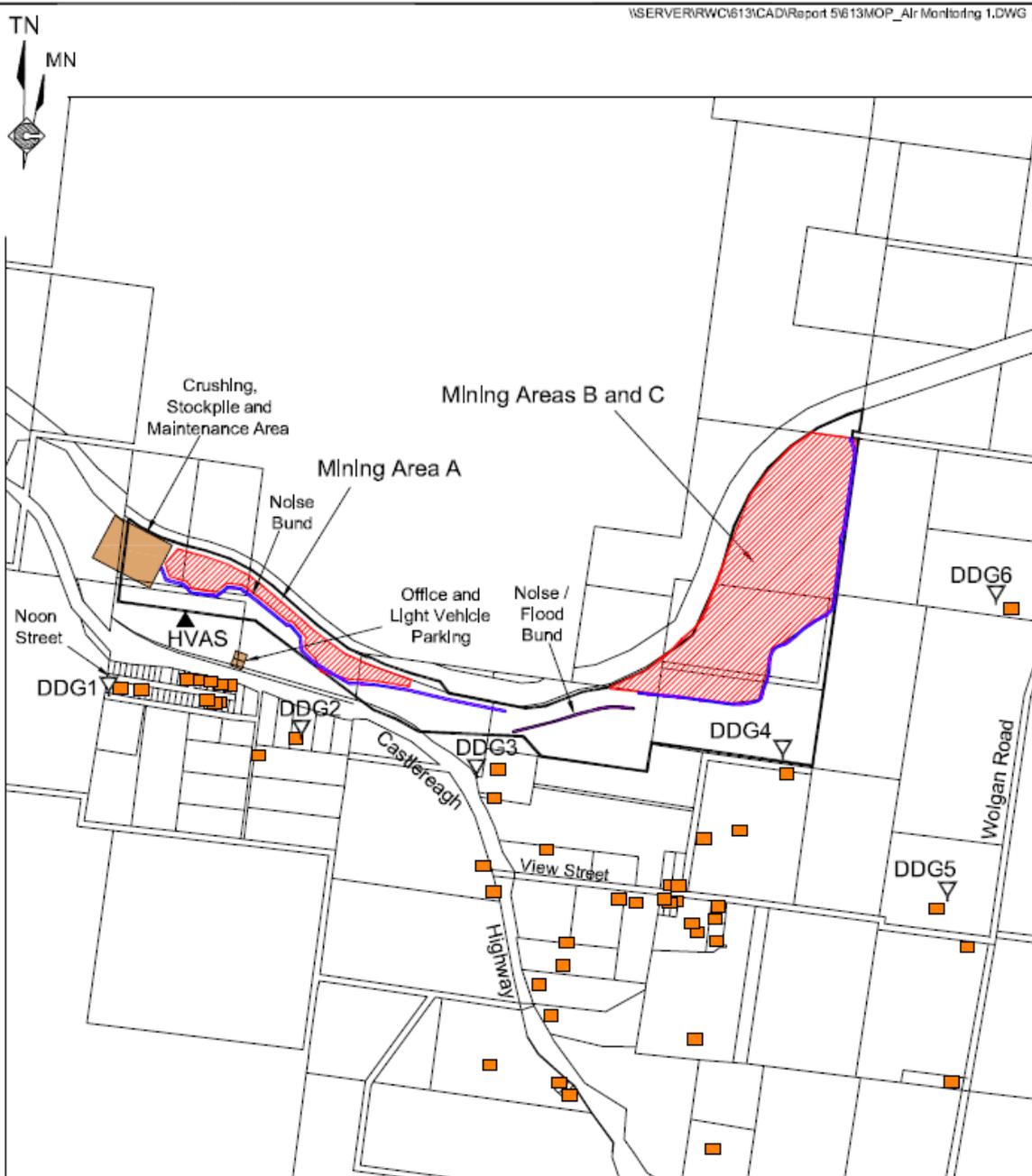


Figure GW1  
GROUNDWATER MONITORING LOCATIONS





- REFERENCE
- Mine Lease Boundary (ML1578)
  - Residence
  - ▽ DDG1 Air Quality Monitoring Location (Deposited Dust)
  - ▲ HVAS Air Quality Monitoring Location (High Volume Sampling)

SCALE 1:20 000



Figure AQ1  
AIR QUALITY MONITORING LOCATIONS

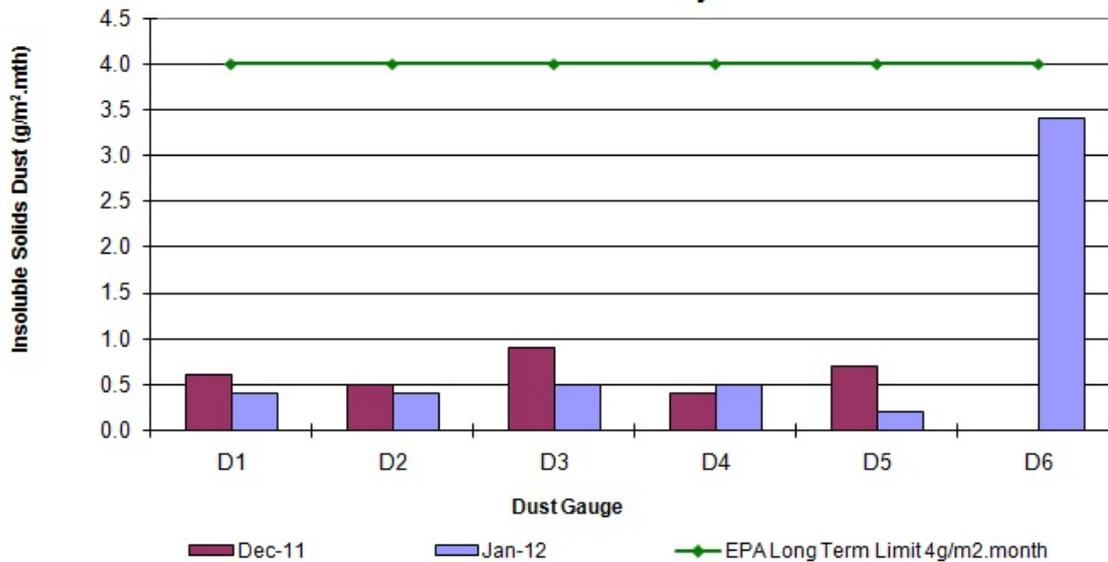


# Appendix 2

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Depositional Dust and HVAS Result Graphs

**Pine Dale Mine  
Depositional Dust Gauge Comparative Results  
December 2011 - January 2012**



**Pine Dale Mine  
Deposited Matter - Insoluble Solids 12 Months Comparative Results  
February 2011 - January 2012**

