Monthly Environmental Data July 2015

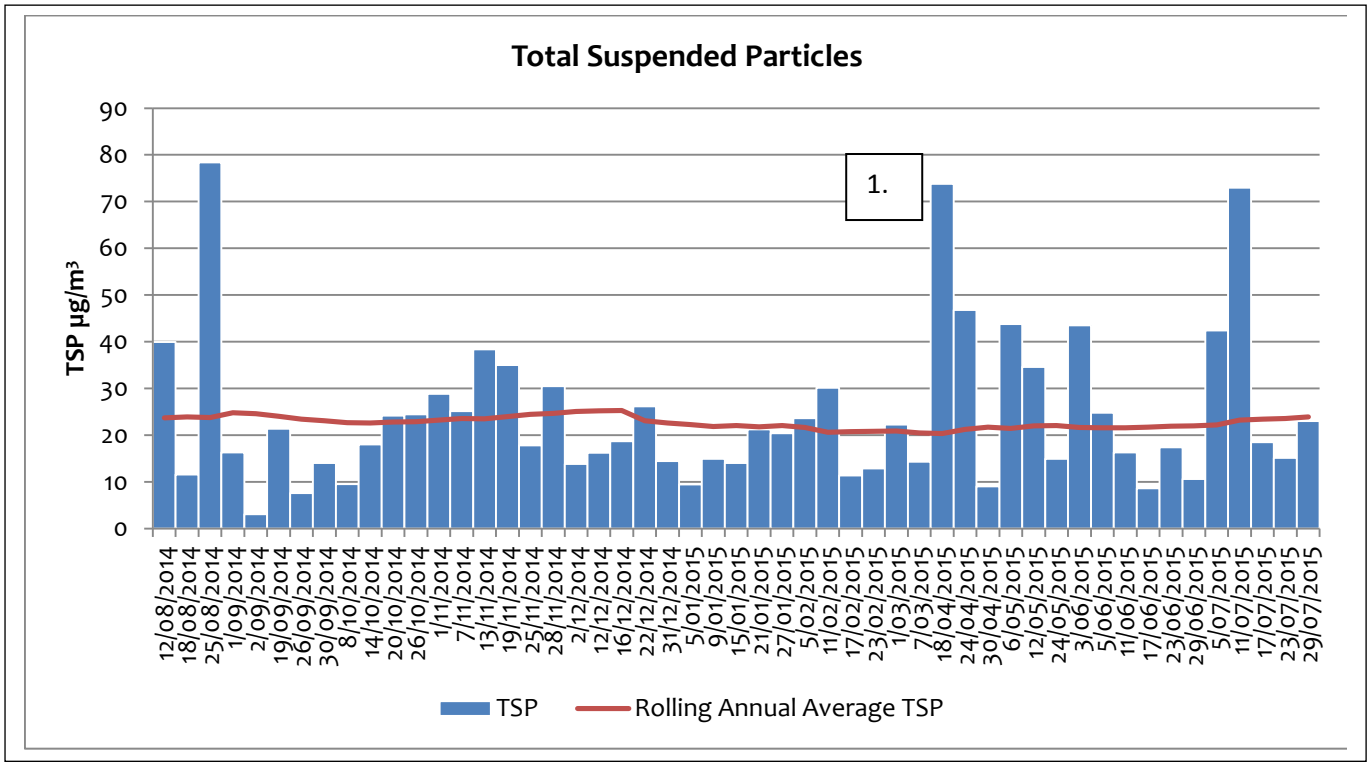
Contents

1 Air Quality

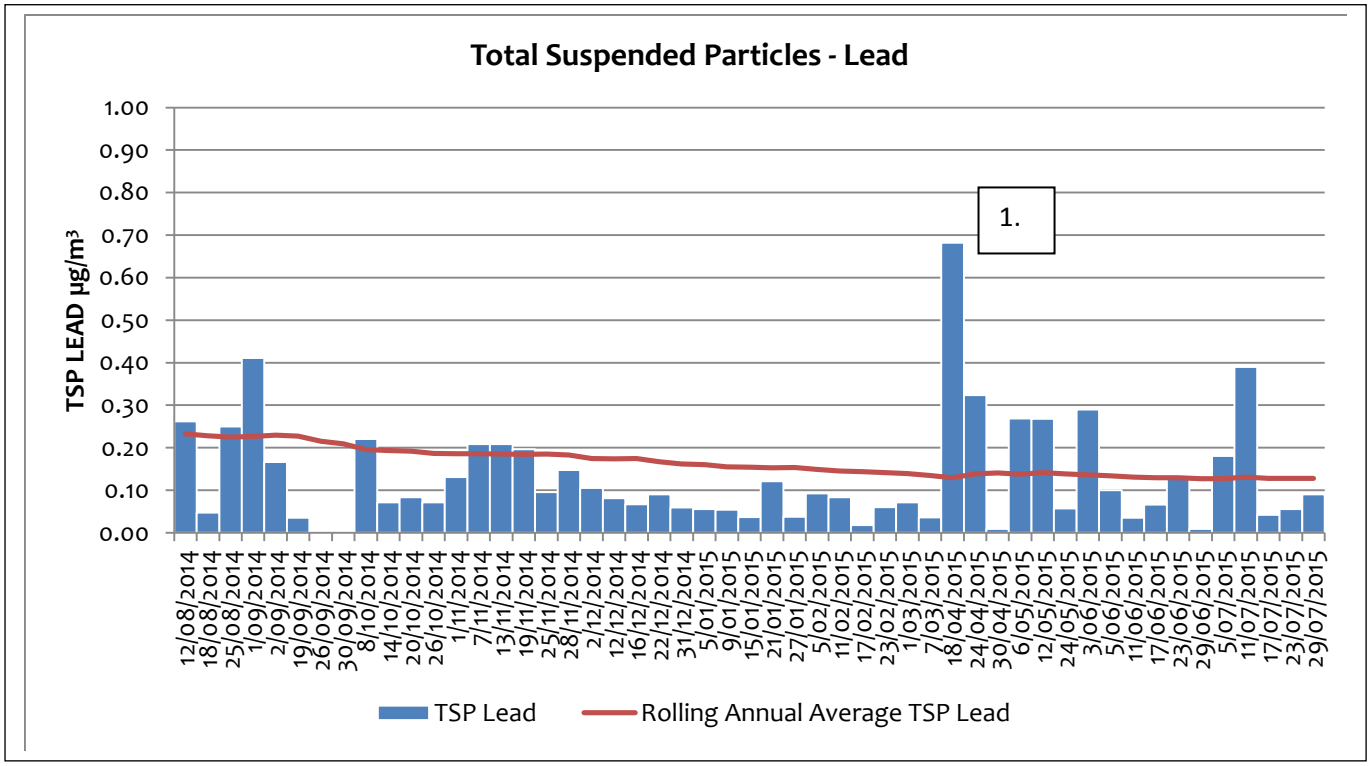
1.1 High Volume Air Samplers

EPL10 - SILVER TANK - ON SITE

DATE	TSP (µg/m^3)	Lead (µg/m^3)
5/07/2015	42.40	0.18
11/07/2015	73.00	0.39
17/07/2015	18.50	0.04
23/07/2015	15.10	0.06
29/07/2015	23.00	0.09



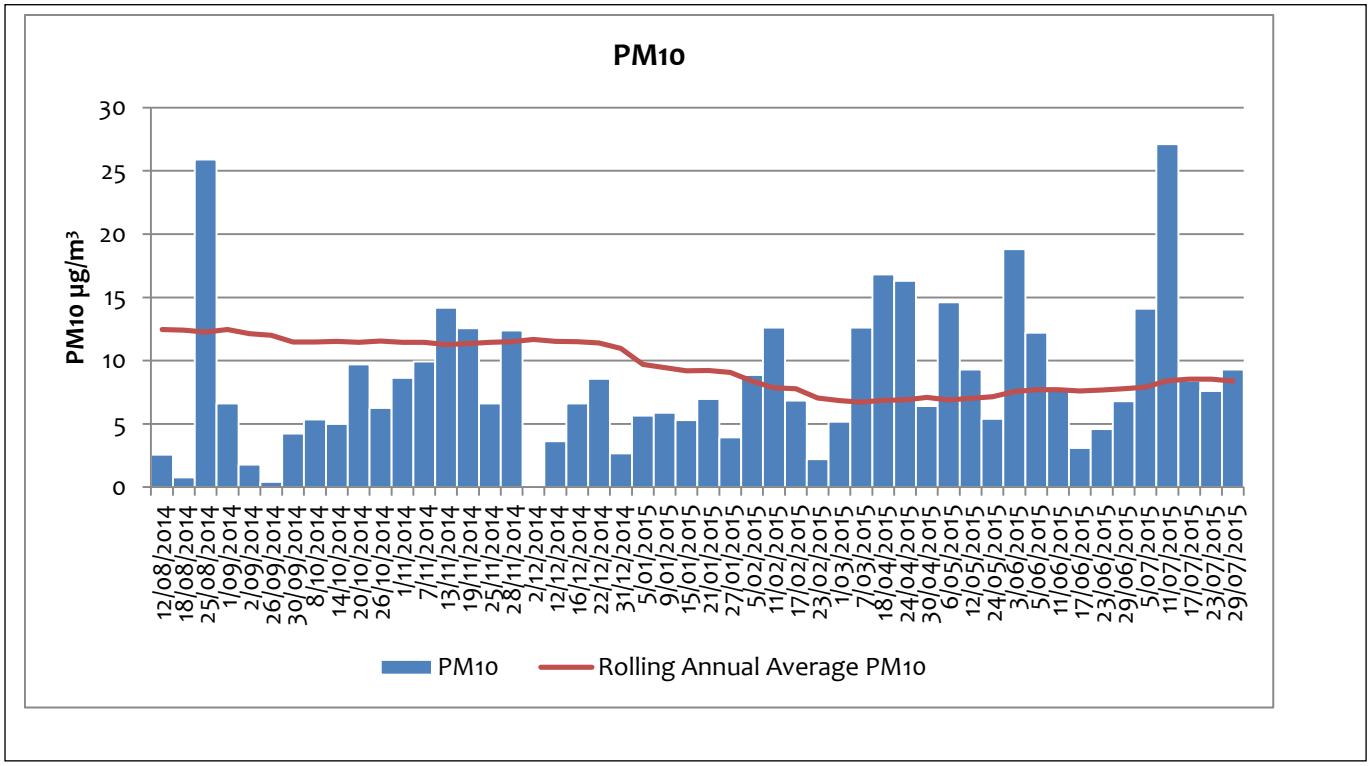
1. Spike on the 18th April was investigated. Lab QC was okay with no evidence of lab contamination. Wind conditions were not extraordinary and it rained. Field sampling methods have been checked to prevent any sample contamination. The spike on the 11th July also occurred when conditions were considered normal with 15km/h winds from a SE direction. Lab QC was okay, this may have been due to earthmoving activity (grading) in the local area.

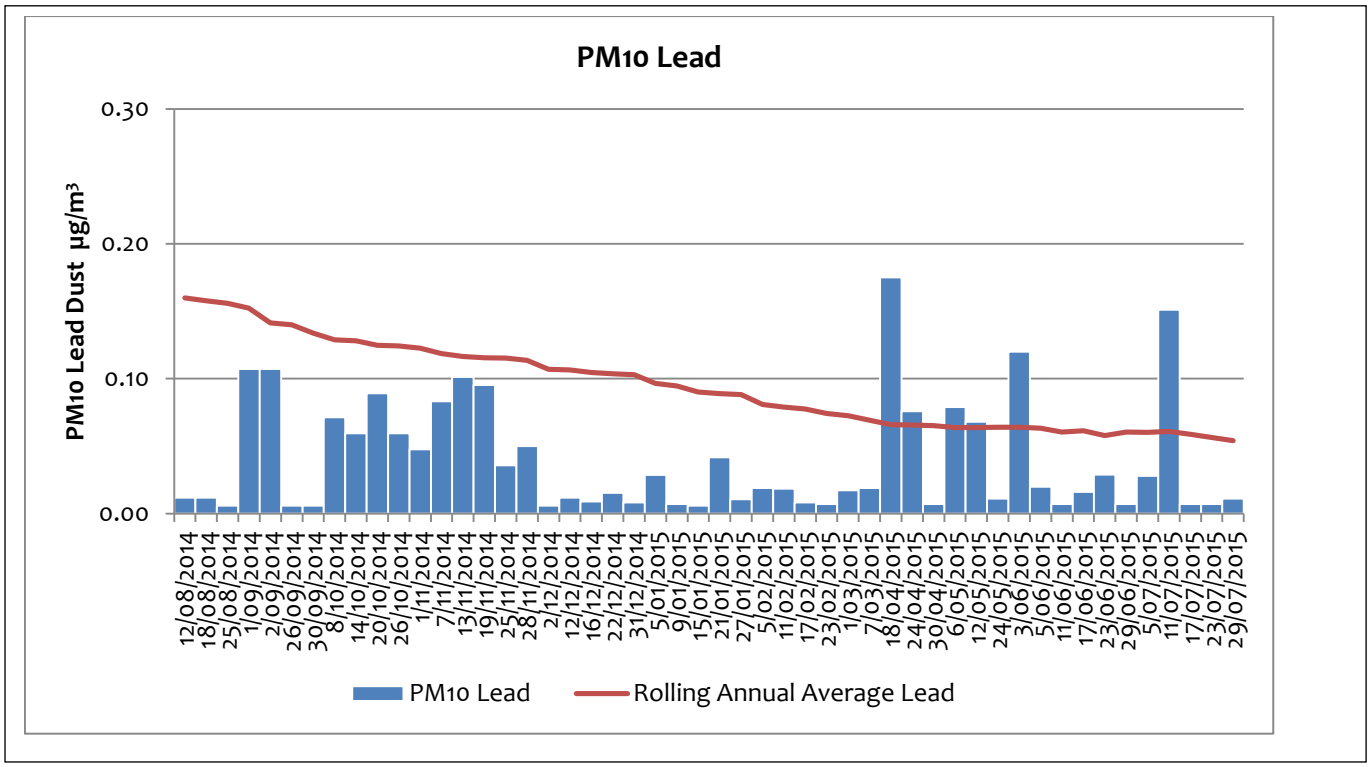


2. Spike on the 18th April was investigated. Lab QC was okay with no evidence of lab contamination. Wind conditions were not extraordinary and it rained. Field sampling methods have been checked to prevent any sample contamination.

EPL11 - Silver Tank - On Site

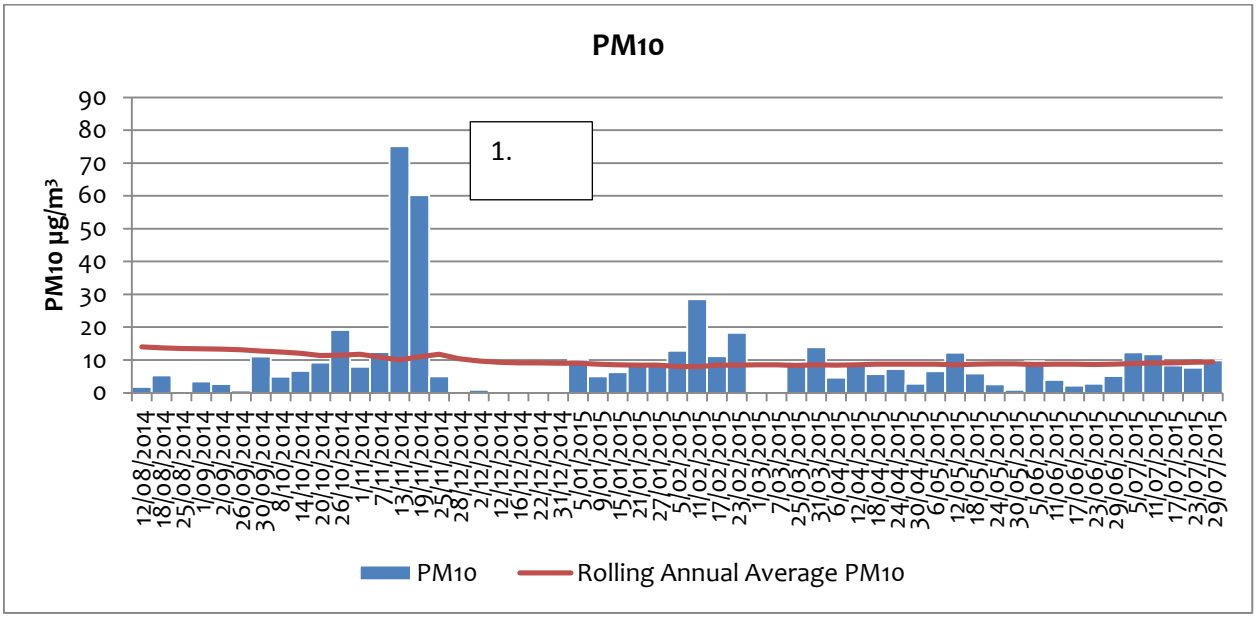
DATE	PM10 (µg/m³)	Lead (µg/m³)
5/07/2015	14.10	0.03
11/07/2015	27.10	0.15
17/07/2015	8.40	0.01
23/07/2015	7.60	0.01
29/07/2015	9.30	0.01


PM10
PM10 µg/m³
30
25
20
15
10
5
0
12/08/2014
18/08/2014
25/08/2014
1/09/2014
2/09/2014
26/09/2014
30/09/2014
8/10/2014
14/10/2014
20/10/2014
26/10/2014
1/11/2014
7/11/2014
13/11/2014
19/11/2014
25/11/2014
28/11/2014
2/12/2014
12/12/2014
16/12/2014
22/12/2014
31/12/2014
5/01/2015
9/01/2015
15/01/2015
21/01/2015
27/01/2015
5/02/2015
11/02/2015
17/02/2015
23/02/2015
1/03/2015
7/03/2015
18/04/2015
24/04/2015
30/04/2015
6/05/2015
12/05/2015
24/05/2015
3/06/2015
5/06/2015
11/06/2015
17/06/2015
23/06/2015
29/06/2015
5/07/2015
11/07/2015
17/07/2015
23/07/2015
29/07/2015
PM10
Rolling Annual Average PM10

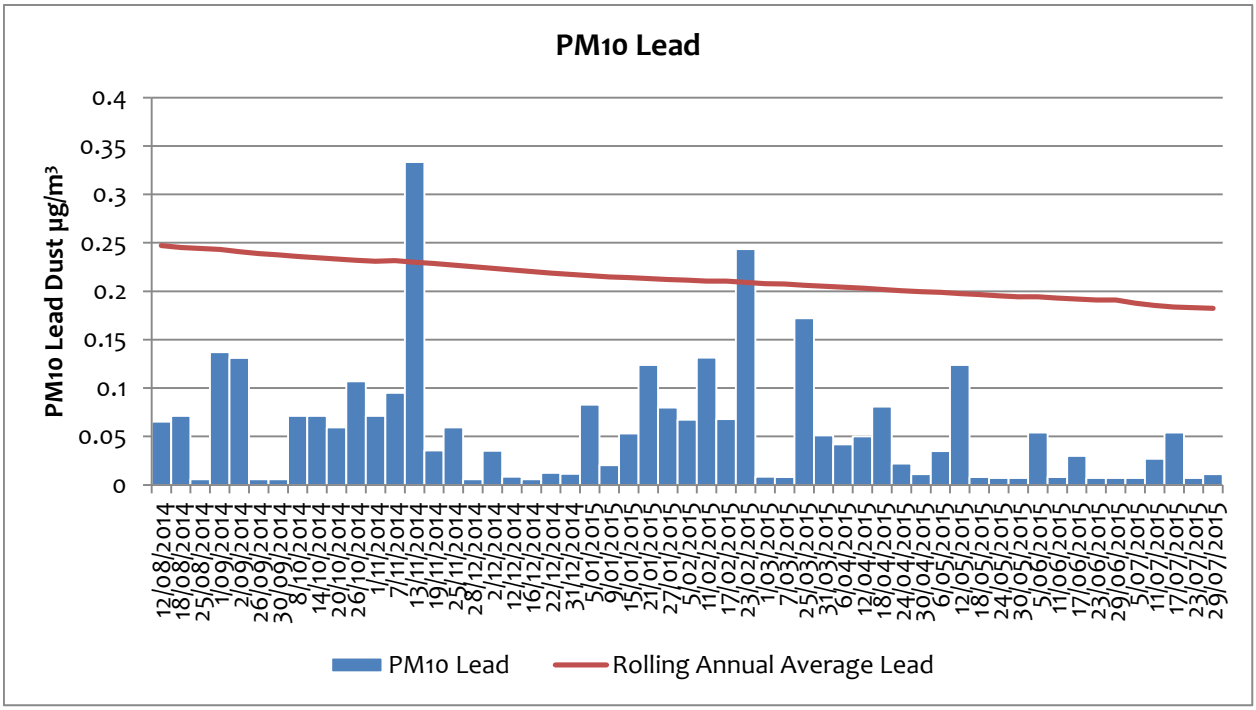

PM10 Lead
PM10 Lead Dust µg/m³
0.30
0.20
0.10
0.00
12/08/2014
18/08/2014
25/08/2014
1/09/2014
2/09/2014
26/09/2014
30/09/2014
8/10/2014
14/10/2014
20/10/2014
26/10/2014
1/11/2014
7/11/2014
13/11/2014
19/11/2014
25/11/2014
28/11/2014
2/12/2014
12/12/2014
16/12/2014
22/12/2014
31/12/2014
5/01/2015
9/01/2015
15/01/2015
21/01/2015
27/01/2015
5/02/2015
11/02/2015
17/02/2015
23/02/2015
1/03/2015
7/03/2015
18/04/2015
24/04/2015
30/04/2015
6/05/2015
12/05/2015
24/05/2015
3/06/2015
5/06/2015
11/06/2015
17/06/2015
23/06/2015
29/06/2015
5/07/2015
11/07/2015
17/07/2015
23/07/2015
29/07/2015
PM10 Lead
Rolling Annual Average Lead

EPL12 - Blackwoods Pit – On Site

DATE	PM10 (µg/m^3)	Lead (µg/m^3)
5/07/2015	12.3	0.007
11/07/2015	11.8	0.027
17/07/2015	8.3	0.054
23/07/2015	7.7	0.007
29/07/2015	9.9	0.011



1. High dust values in November coincide with road works that were carried out by Broken Hill City Council on Federation Way in the vicinity of Blackwoods Pit.

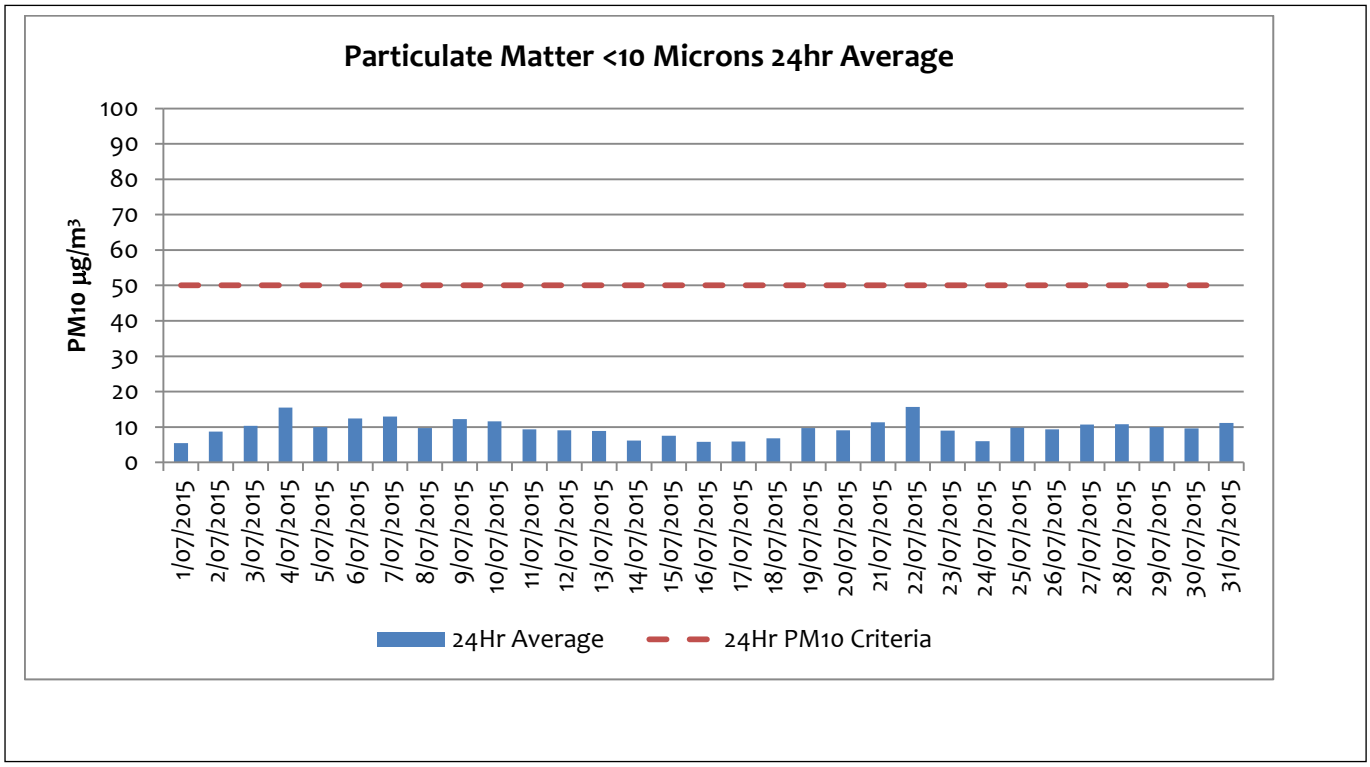

PM10 Lead
PM10 Lead Dust µg/m³
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
12/08/2014
18/08/2014
25/08/2014
1/09/2014
2/09/2014
26/09/2014
30/09/2014
8/10/2014
14/10/2014
20/10/2014
26/10/2014
1/11/2014
7/11/2014
13/11/2014
19/11/2014
25/11/2014
28/12/2014
2/12/2014
12/12/2014
16/12/2014
22/12/2014
31/12/2014
5/01/2015
9/01/2015
15/01/2015
21/01/2015
27/01/2015
5/02/2015
11/02/2015
17/02/2015
23/02/2015
1/03/2015
7/03/2015
25/03/2015
31/03/2015
6/04/2015
12/04/2015
18/04/2015
24/04/2015
30/04/2015
6/05/2015
12/05/2015
18/05/2015
24/05/2015
30/05/2015
5/06/2015
11/06/2015
17/06/2015
23/06/2015
29/06/2015
5/07/2015
11/07/2015
17/07/2015
23/07/2015
29/07/2015
PM10 Lead
Rolling Annual Average Lead

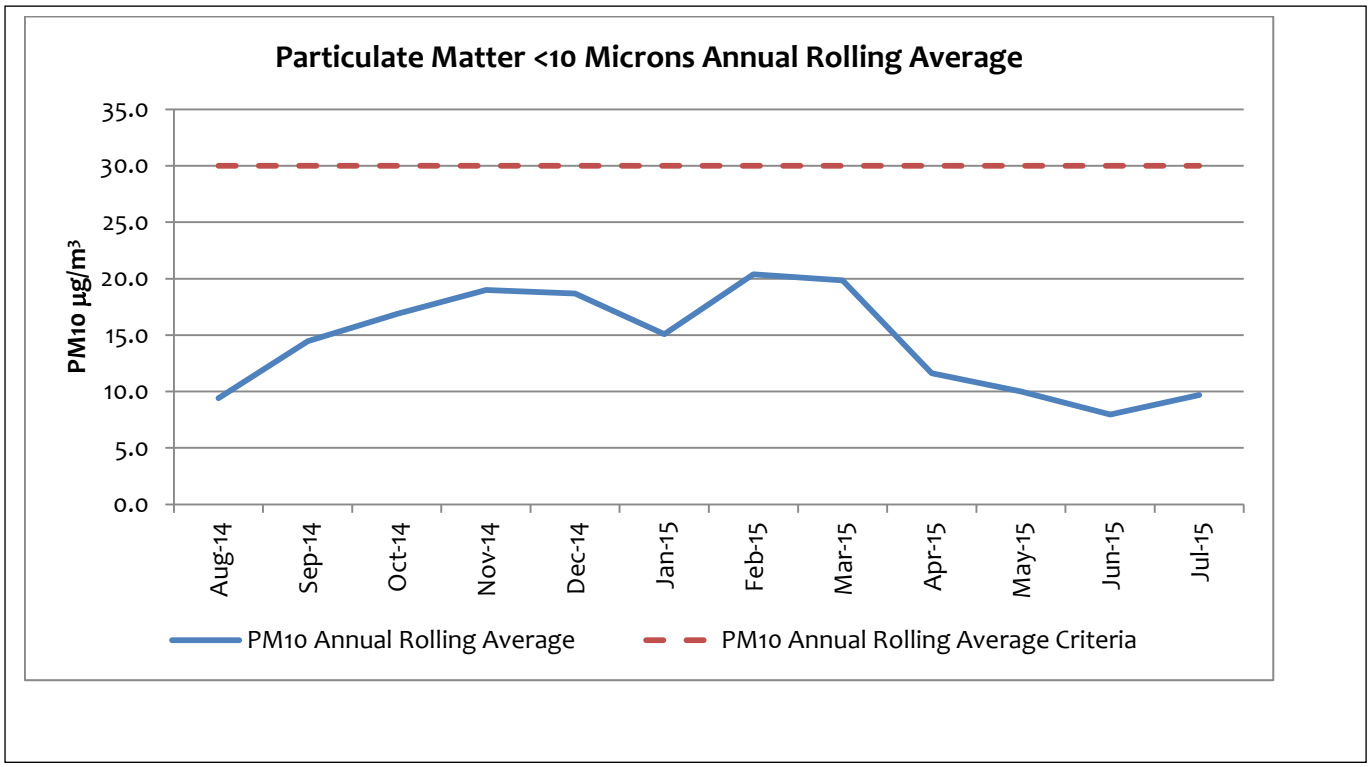
1.2 Tapered Element Oscillating Microbalance Sampling (TEOM)

Particulate Matter <10 Microns 24Hr Average		
Date	TEOM 1 - EPL 13 (μg/m^3) Essential Water – Off Site	TEOM 2 – EPL 14 (μg/m^3) Blackwoods Pit – On Site
1/07/2015	5.44	6.28
2/07/2015	8.67	10.13
3/07/2015	10.30	15.05
4/07/2015	15.53	16.54
5/07/2015	9.98	16.99
6/07/2015	12.38	13.21
7/07/2015	12.94	12.38
8/07/2015	9.67	7.54
9/07/2015	12.25	7.64
10/07/2015	11.62	9.50
11/07/2015	9.32	11.11
12/07/2015	9.08	10.42
13/07/2015	8.92	12.44
14/07/2015	6.20	6.66
15/07/2015	7.58	8.16
16/07/2015	5.79	7.45
17/07/2015	5.90	7.80
18/07/2015	6.83	9.56
19/07/2015	9.74	7.83
20/07/2015	9.10	9.77
21/07/2015	11.29	8.98
22/07/2015	15.69	11.98
23/07/2015	8.98	9.58
24/07/2015	5.98	4.99
25/07/2015	9.83	7.61
26/07/2015	9.36	10.33
27/07/2015	10.72	12.64
28/07/2015	10.80	13.85
29/07/2015	9.99	8.47
30/07/2015	9.60	8.70
31/07/2015	11.15	11.37

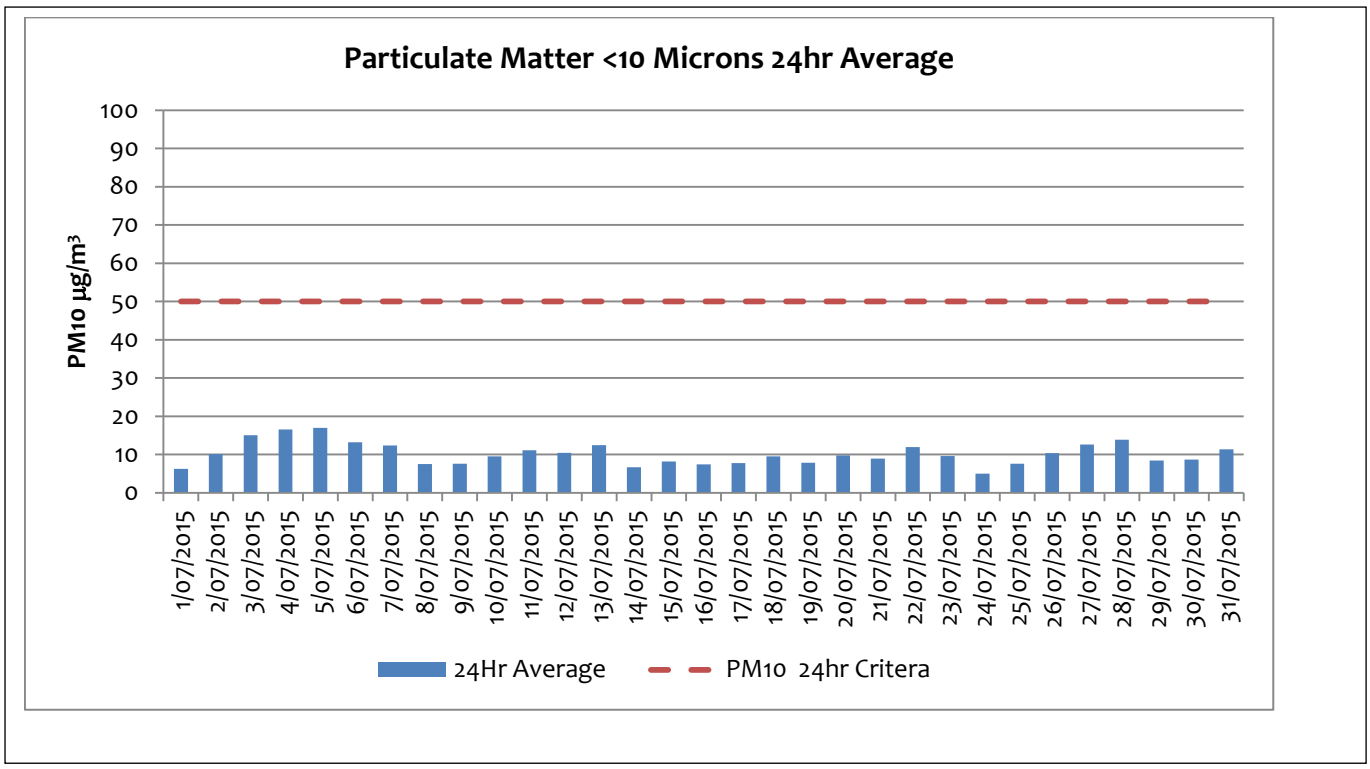
PM10 μg/m^3 12 Month Rolling Average												
	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15
TEOM 1 EPL13 Essential Water Off Site	9.4	14.4	16.9	19.0	18.7	15.1	20.4	19.8	11.6	10.0	8.0	9.7
TEOM 2 EPL14 Blackwoods Pit On Site	12.4	27.2	15.7	20.8	27.4	16.5	21.6	22.0	15.1	10.9	9.0	10.3

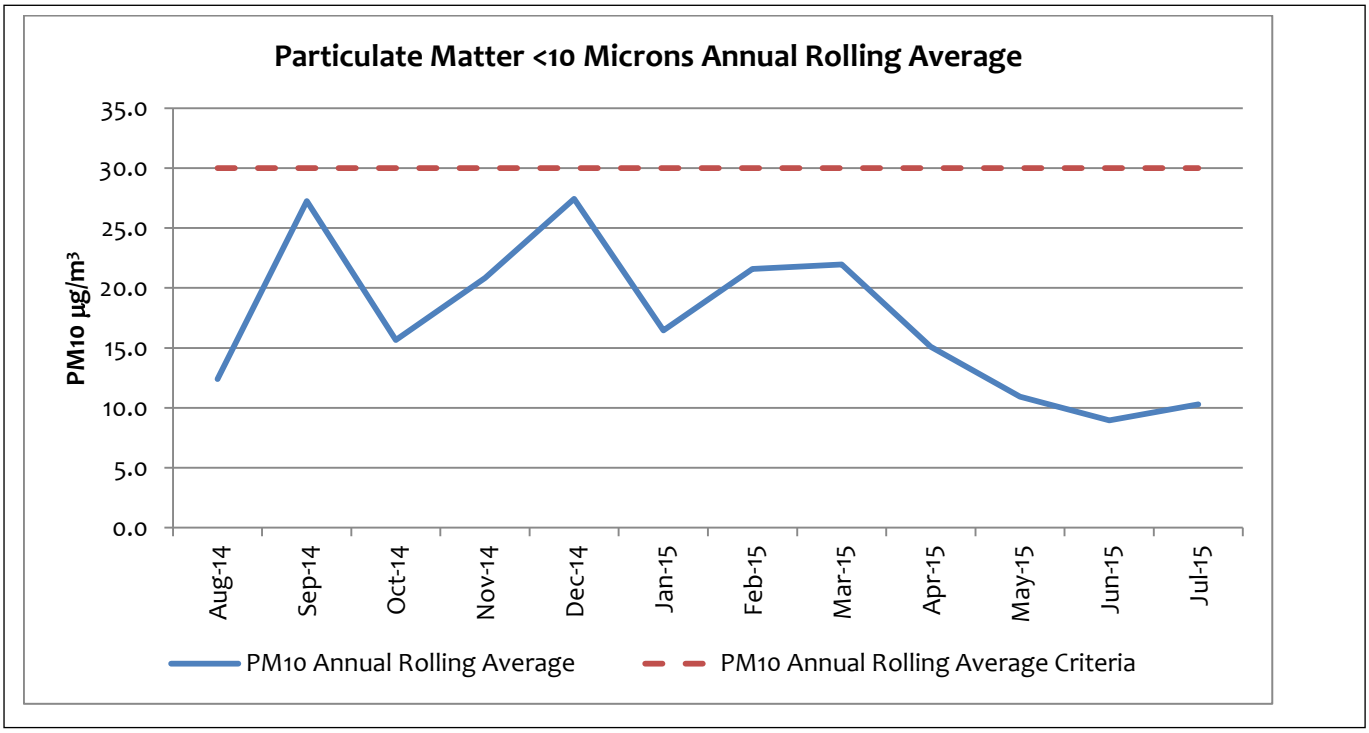
EPL13 – Essential Water – Off Site





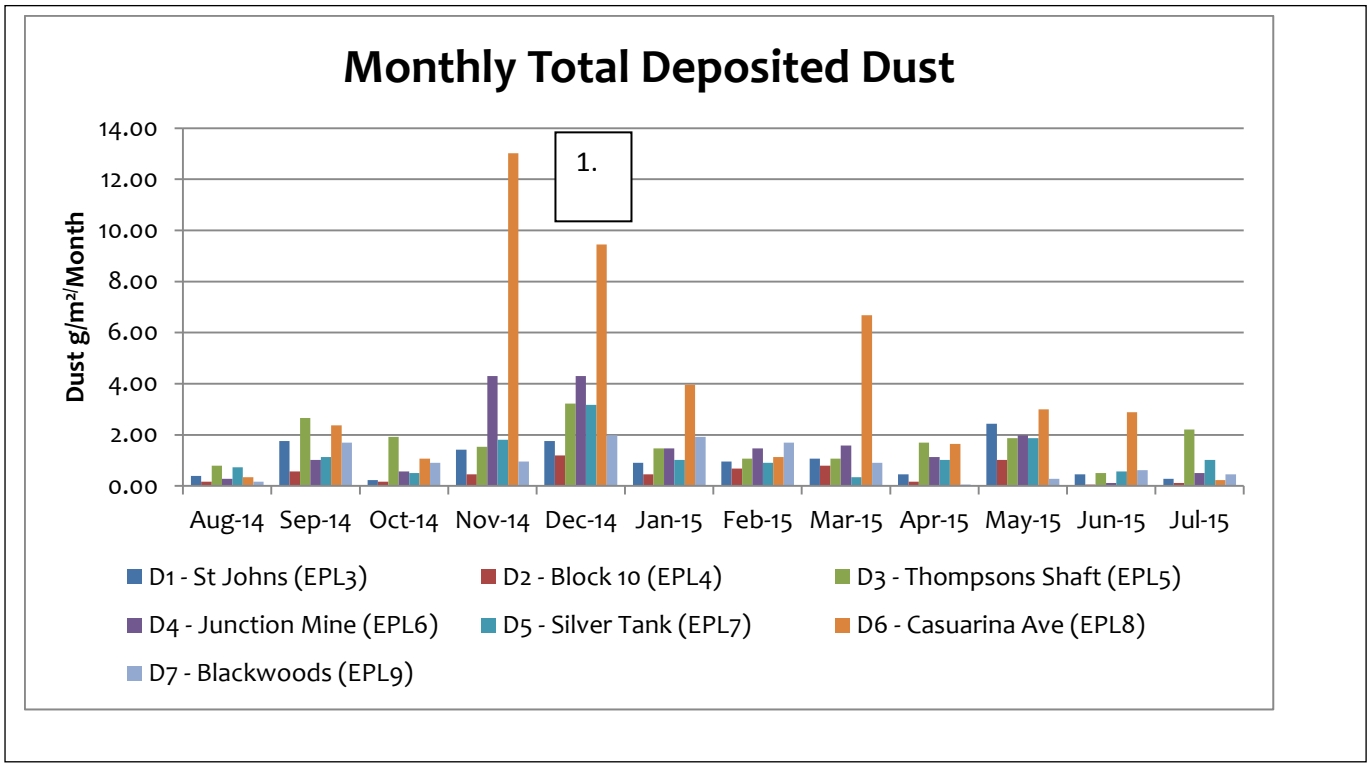
EPL14 – Blackwoods Pit – On Site





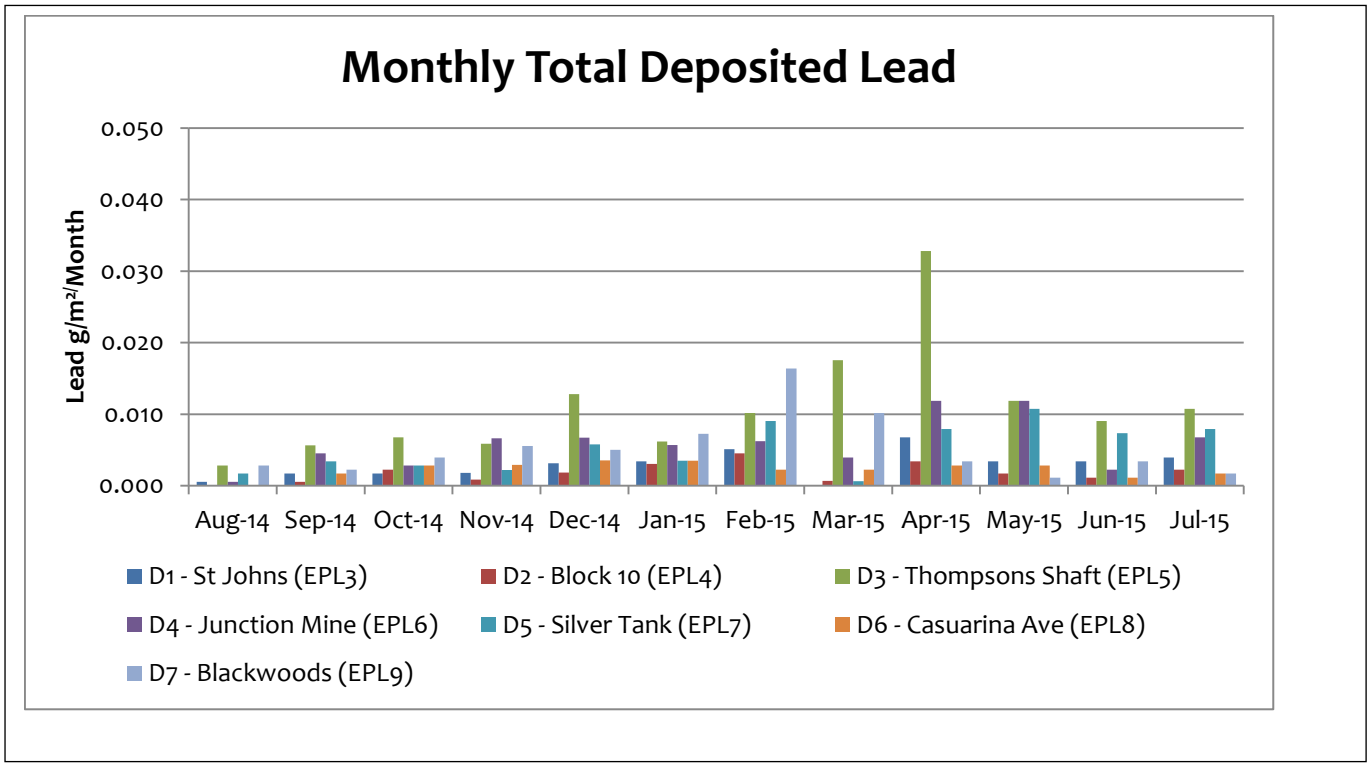
1.3 Dust Deposition Sampling

Total Deposited Dust (g/m$^{2/}$Month)							
Date	D1 (off site)	D2	D3	D4	D5	D6 (off site)	D7
July 2015	0.28	0.11	2.21	0.51	1.02	0.23	0.45
Background Average	4.0	3.1	4.3	5.7	n/a	5.8	n/a



1. Samples at Casuarina Ave appear to have been tampered with in November and December 2014 as well as March 2015. These jars when picked up had large volumes of water present.

Total Deposited Lead (g/m$^{2/}$Month)							
Date	D1 (Off Site)	D2	D3	D4	D5	D6 (Off Site)	D7
July 2015	0.004	0.002	0.011	0.007	0.008	0.002	0.002
Background Average	0.0000	0.001	0.0018	0.0040	0.0010	0.0020	0.0100



2 Blasting (Vibration and Overpressure)

***Note:** Vibration is recorded in Peak Particle Velocity (ppv), Overpressure is recorded in Decibels (dBL)*

Block 7 will not have 12 months of data until May next year, therefore no calculation on percentage of blasts over 5mm/sec can be given.

July Summary Block 7, Zinc Lode:

- 0 production firings
- 62 development firings
- 0 Blasts recorded a ppv of >3mm/s
- 0 Blasts recorded a ppv of >10mm/s
- 0 Blasts recorded an over pressure level over 115dBL
- 0 Blasts recorded an over pressure above 120dBL

July Summary Rest of Mine, Western Mineralisation and Main Lode:

- 7 production firings
- 136 development firings
- 3 Blasts recorded a ppv of >5mm/s
- 0 Blasts recorded a ppv of >10mm/s
- 0 Blasts recorded an over pressure level over 115dBL
- 0 Blasts recorded an over pressure above 120dBL

12 Month Summary Rest of Mine, Western Mineralisation and Main Lode:

- % of all blasts over 5mm/sec = **0.40%** (licence requirement <5%) calculated from 1st September 2014 until August 17, 2015.

3 Noise

Quarterly noise monitoring is continuing as per the Pollution Reduction Program on EPL 12559. Two noise assessments have been undertaken since November last year. EMGA Mitchell McLennan Pty Limited (EMM) completed the analysis for both assessments. The latest report concluded as follows:

"EMM has completed a noise monitoring assessment of operational noise from RASP Mine activities as per the site's EPL (12559). The monitoring assessment for this second quarterly survey found that noise limits were inapplicable due to meteorological conditions, notwithstanding noise from RASP Mine operations (including the crushing plant) were below the noise limits at most locations, and for most measurements. Subsequent additional attended measurements identified site noise to be below the relevant noise limits hence reaffirming compliance at all locations."

The report is published in full on the CBH website. The latest round of noise monitoring is now mostly complete, however EMM has indicated there may need to be some supplementary monitoring to get accurate data for analysis

4 Water

4.1 Ground Water Sampled 15/7/2015

		Underground	Shaft 7
pH Value	pH Unit	6.36	6.69
Electrical Conductivity @ 25°C	µS/cm	10200	11700
Total Dissolved Solids @180°C	mg/L	8480	8080
Hydroxide Alkalinity as CaCO3	mg/L	<1	<1
Carbonate Alkalinity as CaCO3	mg/L	<1	<1
Bicarbonate Alkalinity as CaCO3	mg/L	10	29
Total Alkalinity as CaCO3	mg/L	10	29
Sulfate as SO4 - Turbidimetric	mg/L	5130	5940
Chloride	mg/L	816	1240
Calcium	mg/L	461	516
Magnesium	mg/L	212	276
Sodium	mg/L	1180	1430
Cadmium	mg/L	2.06	2.2
Lead	mg/L	0.119	2.26
Manganese	mg/L	268	380
Zinc	mg/L	973	1040
Iron	mg/L	0.42	<0.05

4.2 Surface Water

Insufficient rainfall for opportunistic surface water sampling during June 2015

Surface Water Table Nov 2014 to Nov 2015

EPA Identification Number	Frequency	Comment
EPL29	2 x Per year when contains water	Insufficient water for sample
EPL30	2 x Per year when contains water	Insufficient water for sample
EPL31	2 x Per year when contains water	Sampled during January
EPL32	2 x Per year when contains water	Insufficient water for sample
EPL33 Horwood Dam	2 x Per year when contains water	Sampled in May
EPL34 Upstream	2 x Per year when contains water	Insufficient water for sample
EPL35 Downstream	2 x Per year when contains water	Insufficient water for sample

5 Weather Data

BHOP – Automatic Weather Station was unavailable for June. The new weather station was installed on June 15. The weather station continuously monitors the following parameters as per point 55 of the Environmental Protection Licence.

POINT 55

Parameter	Sampling method	Units of measure	Averaging period	Frequency
Temperature at 10 metres	AM-4	degrees Celsius	15 minutes	Continuous
Wind Direction at 10 metres	AM-4	Degrees in a clockwise direction from True North	15 minutes	Continuous
Wind Speed at 10 metres	AM-4	metres per second	15 minutes	Continuous
Rainfall	AM-4	millimetres	1 hour	Continuous
Sigma theta	AM-2 & AM-4	Degrees	15 minutes	Continuous

The continuous data can be viewed at any time at the following web site using the username and password.

www.loggermonitor.com/login

user: CBHAdmin

pass: brokenhill

Summary data was also obtained from the Bureau of Meteorology Broken Hill on the following page:

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9 am						3 pm					
		Min	Max				Dir	Spd	Time	Temp	RH	Cld	Dir	Spd	MSLP	Temp	RH	Cld	Dir	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	8th		km/h	hPa	°C	%	8th		km/h	hPa
1	Mo	7.1	11.8	0.2						8.1	86	1			1026.5	11.2	34	0	SSE	22	1026.0
2	Tu	1.8	12.2	0			SE	20	09:40	4.9	63	6		Calm	1030.7	10.9	45	1	S	13	1026.6
3	We	4.1	14.4	0			S	19	12:59	6.3	71	5	SE	7	1025.5	13.3	43	0	NE	6	1022.7
4	Th	5.8	16.9	0			NW	52	12:41	9.4	59	5	NNW	19	1022.6	16.3	47	1	NW	33	1018.8
5	Fr	7.1	15.4	0			SSW	43	10:16	8.7	87	0	SW	24	1025.5	14.5	58	7	SSW	20	1025.4
6	Sa	7.0	17.6	0			ESE	22	13:14	10.3	81	1	ENE	13	1031.4	16.5	52	1	NE	11	1028.3
7	Su	5.7	17.7	0.2			NNW	37	10:59	9.6	86	3	N	15	1028.1	17.2	51	4	NNW	20	1024.3
8	Mo	7.9	20.0	0			WNW	39	12:27	11.1	73	1	NNW	15	1024.4	19.3	37	1	NW	20	1021.5
9	Tu	9.8	18.4	0			SSW	39	15:18	12.6	76	1	WSW	15	1026.5	17.7	56	7	S	22	1025.4
10	We	4.2	13.4	0			SE	43	12:28	5.8	94	1	SE	26	1033.3	13.0	42	1	SE	26	1031.4
11	Th	2.2	15.6	0			SE	26	01:29	4.0	89	2	SE	15	1032.5	14.3	45	4	ESE	9	1030.2
12	Fr	3.9	20.1	0			ENE	39	13:50	10.9	73	7	ENE	19	1030.7	18.7	57	7	ENE	20	1027.2
13	Sa	10.3	20.4	0			NE	37	10:16	14.7	64	5	NE	20	1027.2	19.1	44	7	ENE	17	1024.0
14	Su	10.4	18.7	0			NE	24	03:02	13.1	77	5	NE	13	1024.2	18.2	62	7	ESE	13	1021.3
15	Mo	11.2	18.7	1.6			SW	24	16:26	11.7	92	7	SSW	6	1020.8	16.8	98	7	S	13	1018.3
16	Tu	10.1	15.7	1.0			W	48	14:36	11.5	100	8	E	9	1018.0	13.8	100	8	W	24	1014.3
17	We	10.5	13.8	20.8			SSW	28	09:37	10.7	99	8	SSW	17	1016.6	12.9	86	8	SW	11	1016.3
18	Th	9.6	12.9	1.0			SW	37	19:42	9.8	97	8	SW	19	1019.6	12.4	84	8	SSW	26	1018.8
19	Fr	7.5	12.6	0.6			SSW	37	04:28	7.9	97	8	S	28	1024.7	12.4	61	5	S	22	1023.8
20	Sa	6.4	11.6	0			SSE	31	10:36	7.3	69	7	SSE	17	1027.9	10.2	58	3	SE	19	1025.6
21	Su	0.0	13.1	0			N	20	09:29	5.5	86	1	N	9	1028.0	12.2	53	1	NNE	9	1024.8
22	Mo	4.9	16.7	0			N	44	10:01	8.1	73	5	NNE	20	1024.1	15.9	43	1	N	20	1020.5
23	Tu	8.0	19.4	0			NNW	35	12:49	14.2	55	4	N	15	1019.9	17.8	53	7	NNW	15	1017.3
24	We	7.7	14.4	2.8			SSW	35	12:47	8.9	96	5	SSW	19	1022.7	12.8	74	7	SSW	24	1022.9
25	Th	7.3	12.9	0.4			S	44	05:52	7.3	90	8	S	26	1031.4	12.2	65	1	S	22	1031.0
26	Fr	5.9	15.3	0			SSE	28	02:13	7.4	91	1	S	9	1034.7	14.5	54	1	ESE	6	1032.1
27	Sa	5.2	15.9	0.2			E	19	10:39	8.4	87	1	NE	9	1034.5	14.7	56	1	ESE	7	1032.0
28	Su	4.7	14.2	0.2			ESE	26	11:01	6.9	96	0	ENE	13	1034.4	12.3	68	1	ESE	15	1032.2
29	Mo	2.3	12.9	0.4			ESE	26	10:12	4.7	100	1	SE	7	1032.9	12.0	59	1	SE	15	1029.6
30	Tu	4.9	13.3	1.0			SE	26	12:43	6.3	93	7		Calm	1030.8				SSE	13	1028.2
Statistics for June 2015																					
Mean		6.5	15.5							8.9	83	4		14	1027.0	14.6	58	3		17	1024.7
Lowest		0.0	11.6	0						4.0	55	0		Calm	1016.6	10.2	34	0	#	6	1014.3
Highest		11.2	20.4	20.8			NW	52		14.7	100	8	S	28	1034.7	19.3	100	8	NW	33	1032.2
Total				30.4																	

Legend

Dir = Direction, **Spd**=Wind Speed, **Temp**=Temperature, **RH**=Relative Humidity, **CLD**=Cloud, **MSLP**=Mean Sea Level Pressure

6 Data Log

Sample	Date sent to lab	Result Received	Date Published
Hi Volume Samples	3/8/2015	12/8/2015	24/8/2015
TEOM	Real time	-	24/8/2015
Dust Deposition	31/7/2015	10/8/2015	24/8/2015
Water	22/7/2015	28/7/2015	24/8/2015
Blast Vibration and overpressure	Real Time	-	24/8/2015

7 Correction Log July 2015

There are no data corrections for July 2015. However there have been some improvements in the reported data. Concentrations of dust and lead as a component of dust in the hi vol analysis are now NATA accredited. Concentration was previously calculated in house from reported totals on the filter papers. This calculation is now performed by the laboratory.