

Monthly Environmental Data April 2014

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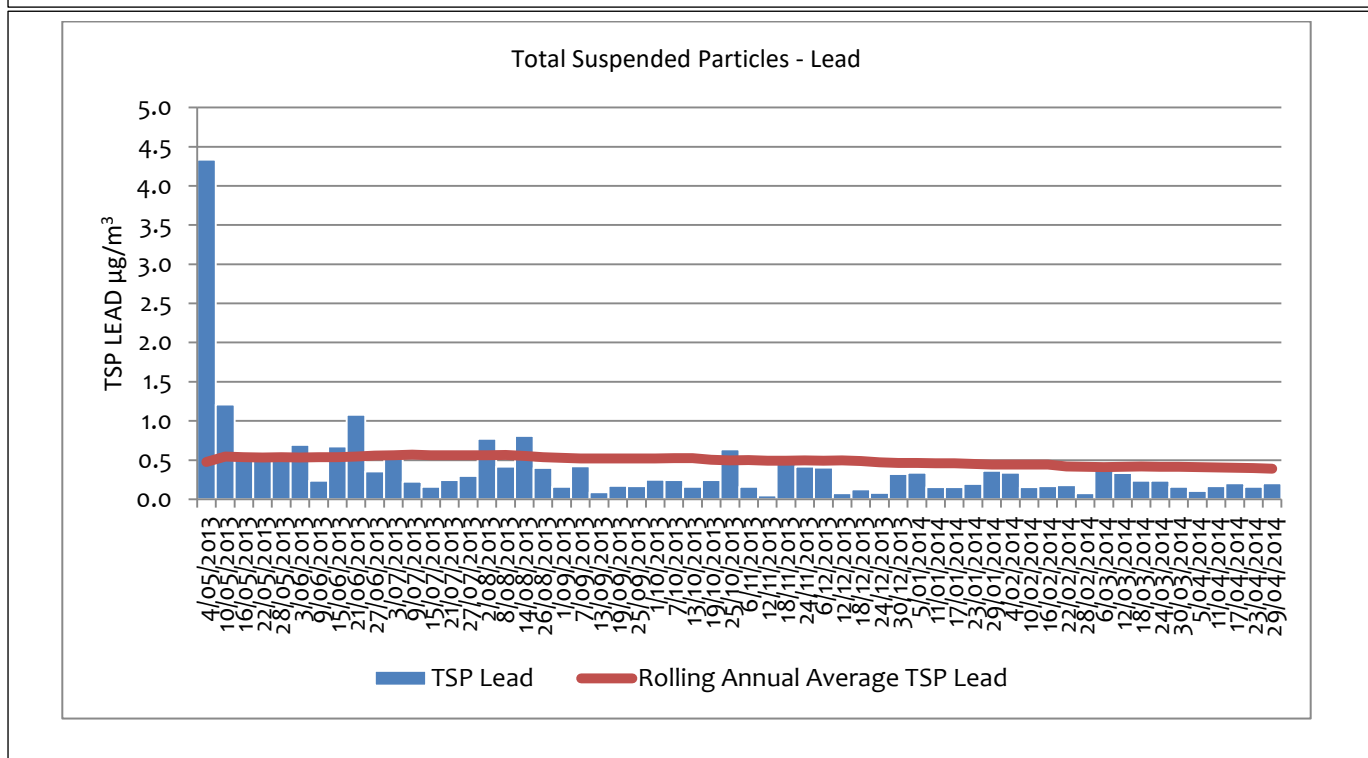
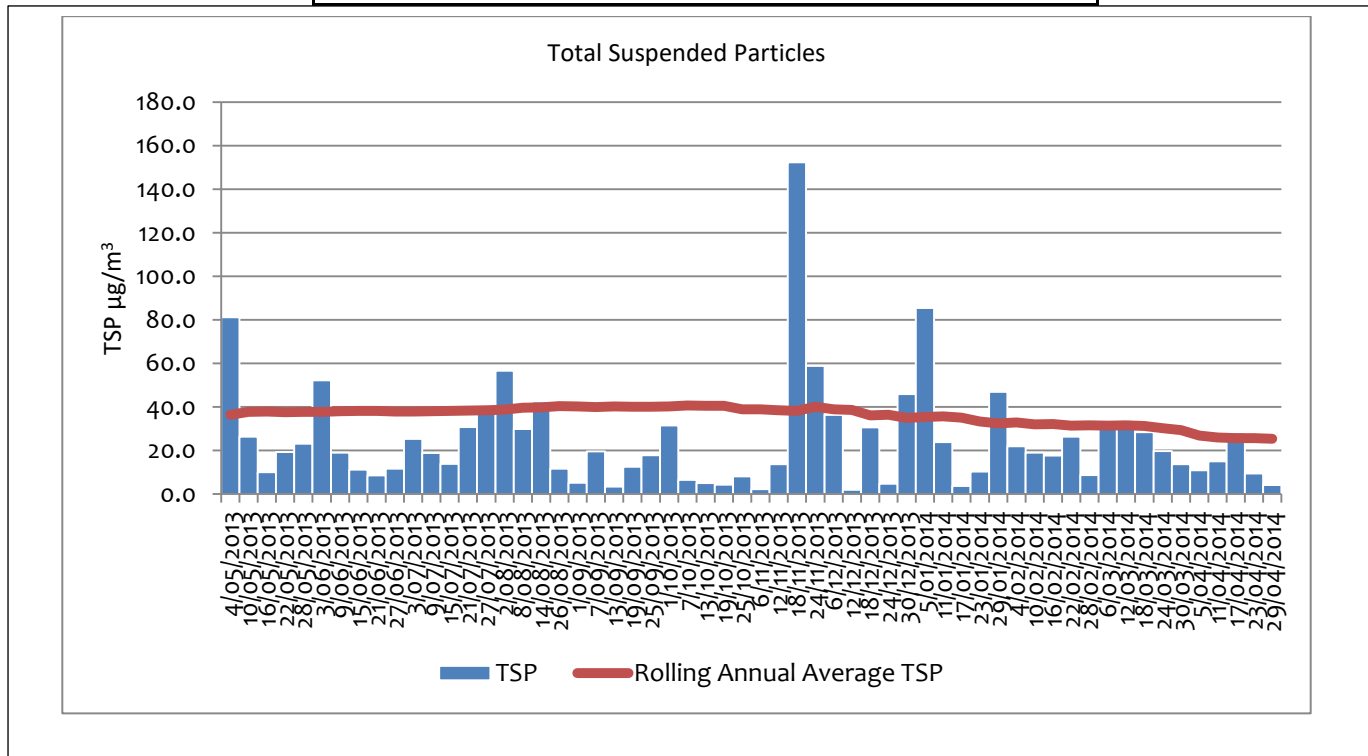
1 Air Quality

1.1 High Volume Air Samplers

Note: A number of errors have been identified in the air emission data. BHOP has engaged consultants Pacific? to review the data and data will be updated following this review.

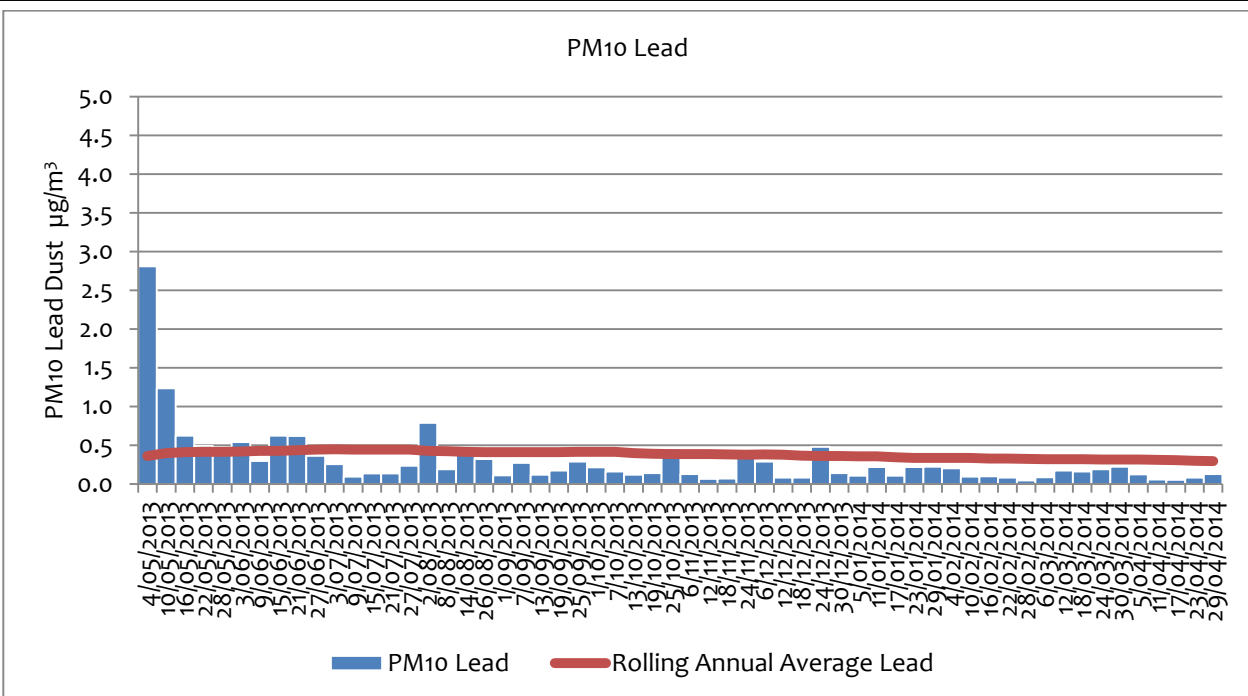
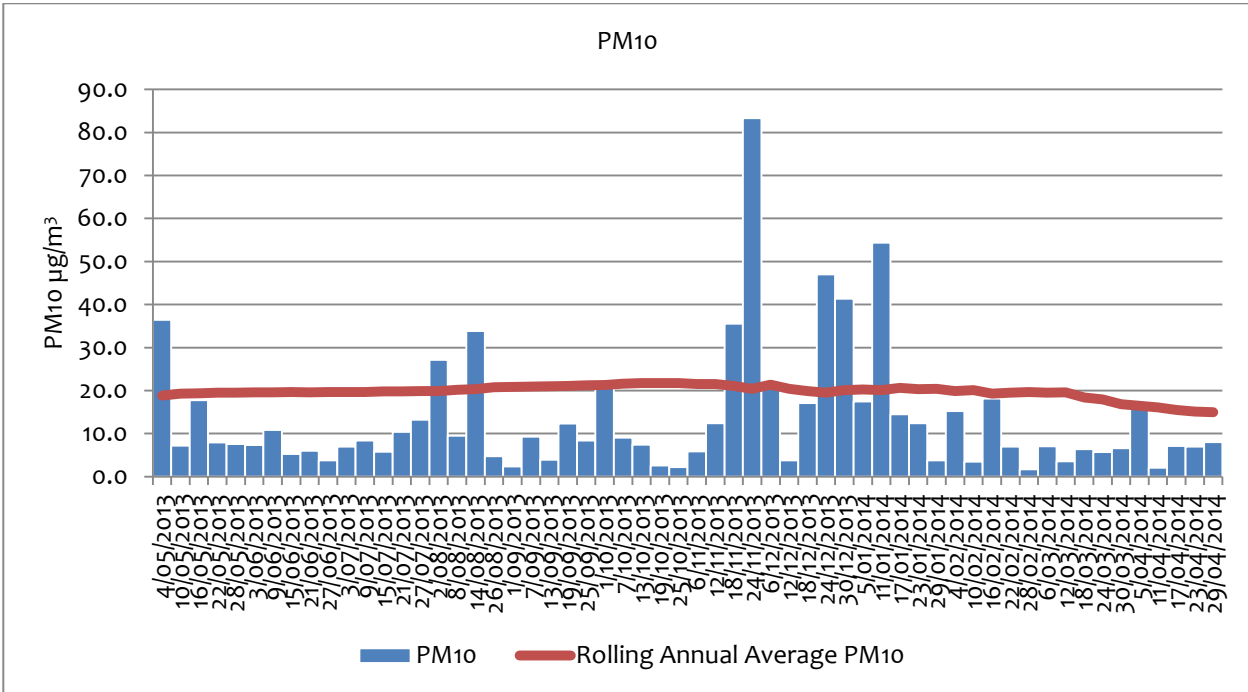
EPL10 - SILVER TANK - ON SITE

DATE	TSP ($\mu\text{g}/\text{m}^3$)	Lead ($\mu\text{g}/\text{m}^3$)
5/04/2014	11	0.11
11/04/2014	15	0.17
17/04/2014	28	0.20
23/04/2014	9	0.16
29/04/2014	4	0.20



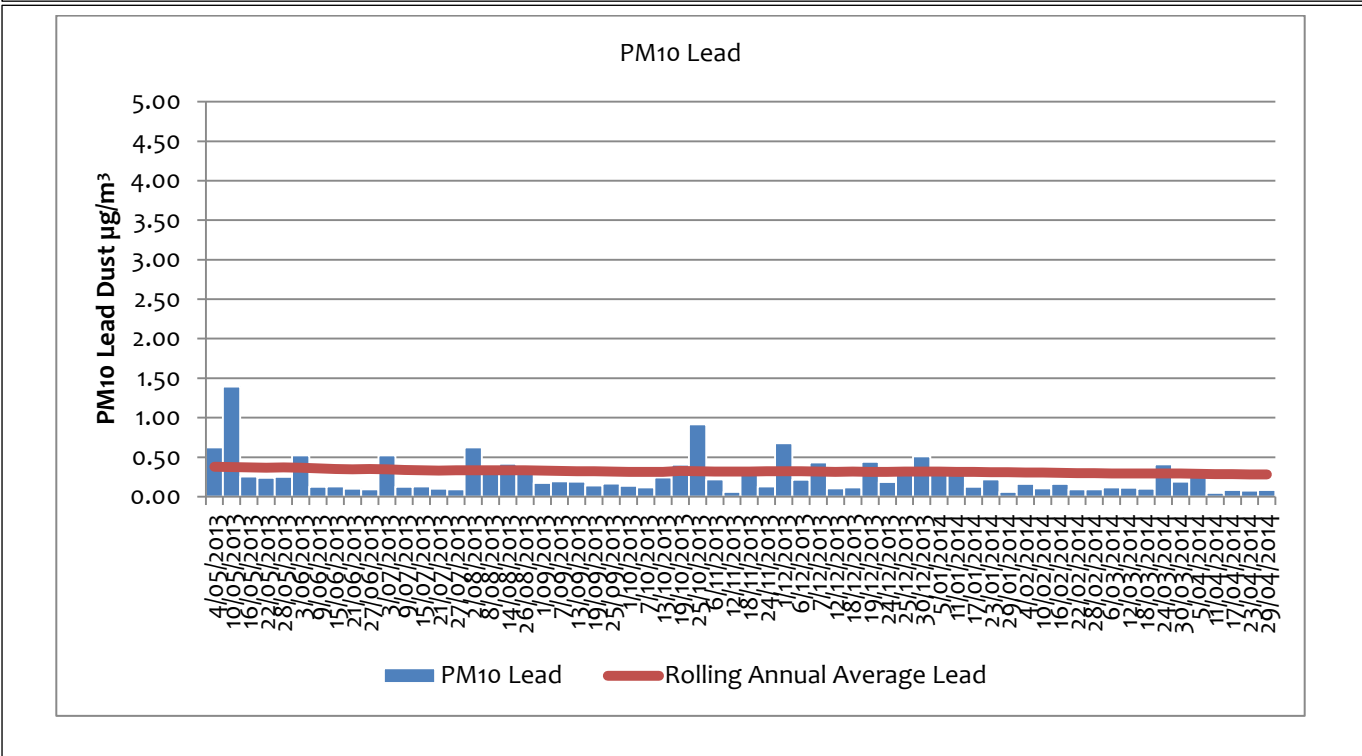
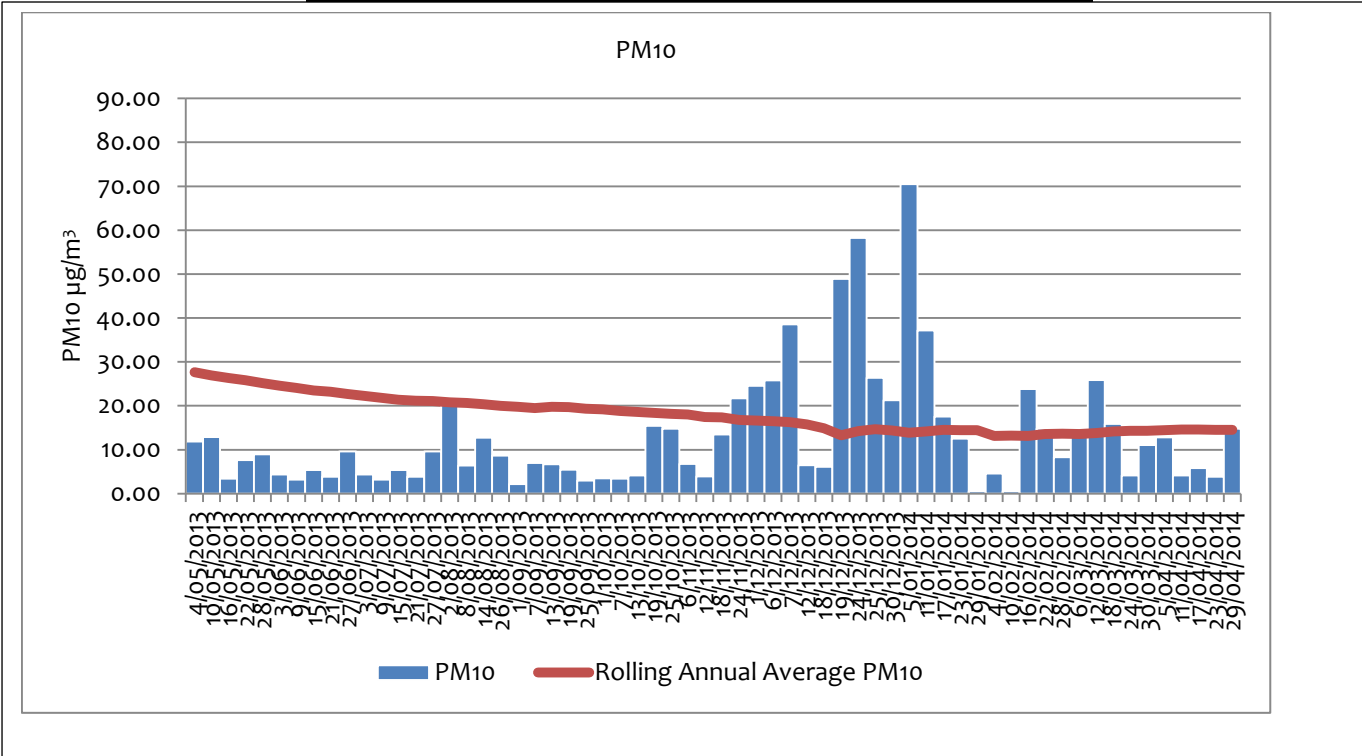
EPL11 - Silver Tank - On Site

DATE	PM10 ($\mu\text{g}/\text{m}^3$)	Lead ($\mu\text{g}/\text{m}^3$)
5/04/2014	16.5	0.1
11/04/2014	2.1	0.1
17/04/2014	7.1	0.1
23/04/2014	7.0	0.1
29/04/2014	8.0	0.1



EPL12 - Blackwoods Pit – On Site

DATE	PM10 ($\mu\text{g}/\text{m}^3$)	Lead ($\mu\text{g}/\text{m}^3$)
5/04/2014	12.80	0.26
11/04/2014	4.11	0.05
17/04/2014	5.83	0.08
23/04/2014	3.87	0.08
29/04/2014	14.82	0.08

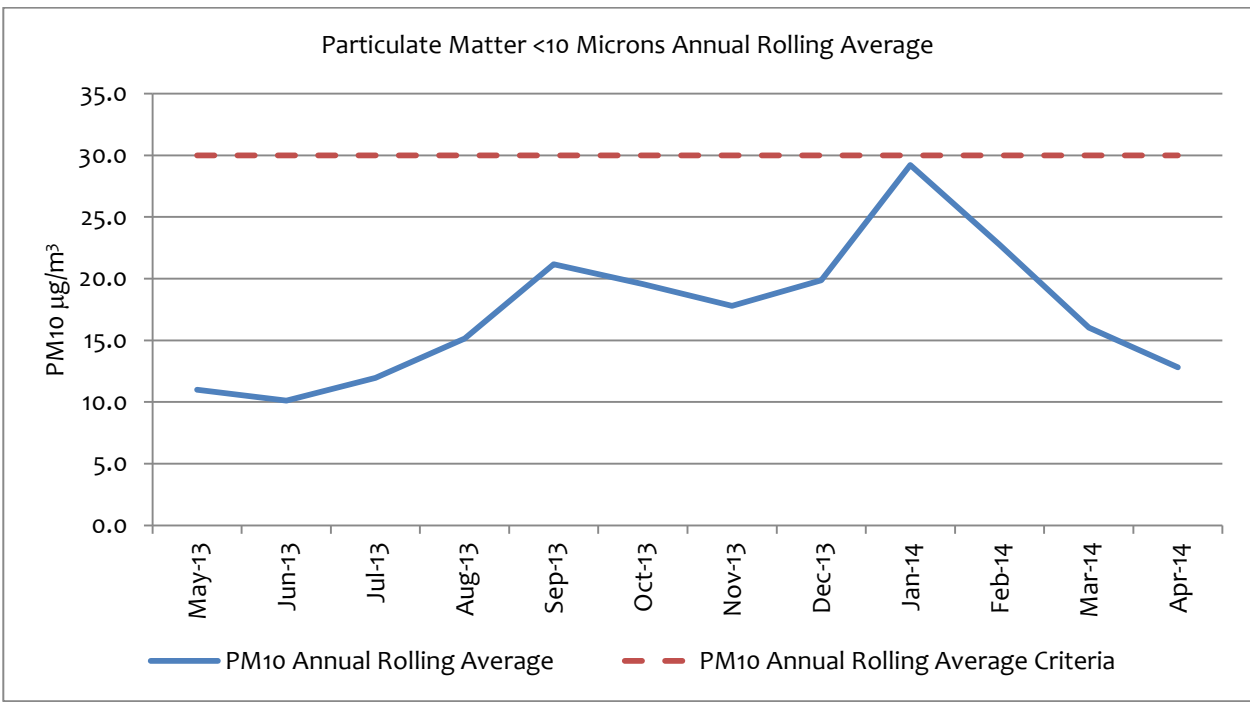
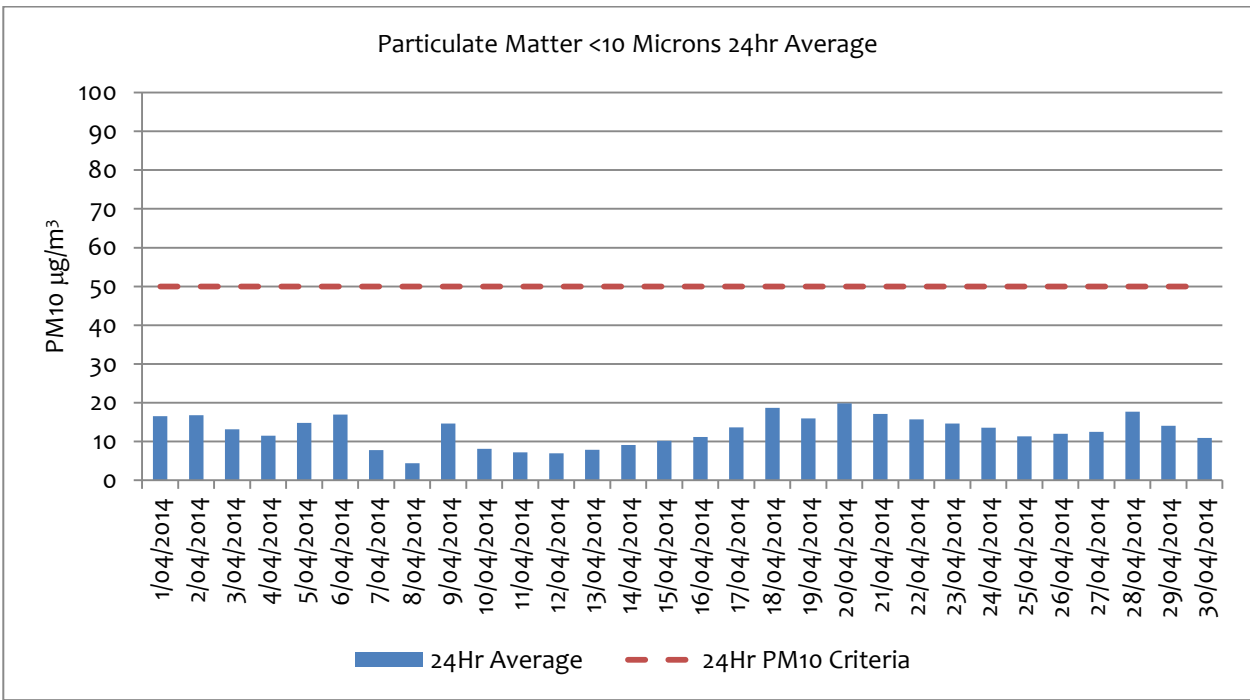


1.2 Tapered Element Oscillating Microbalance Sampling (TEOM)

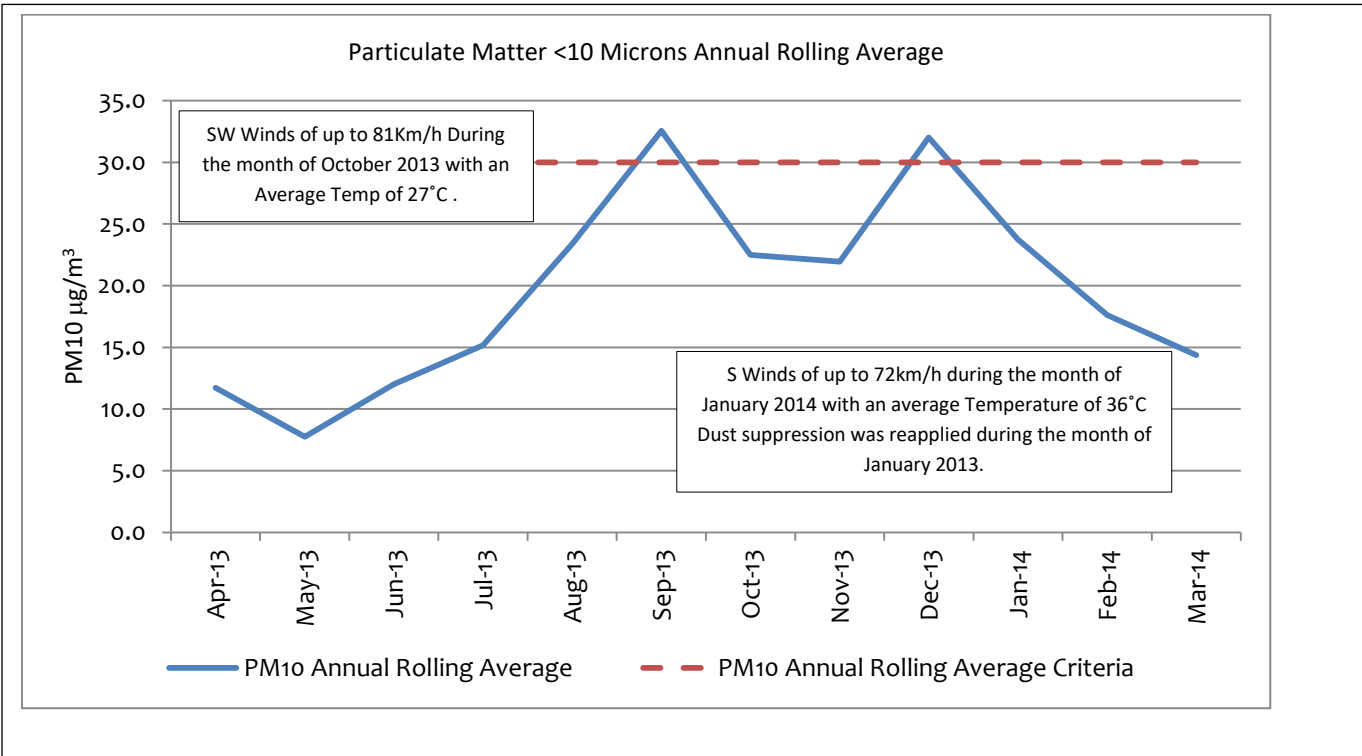
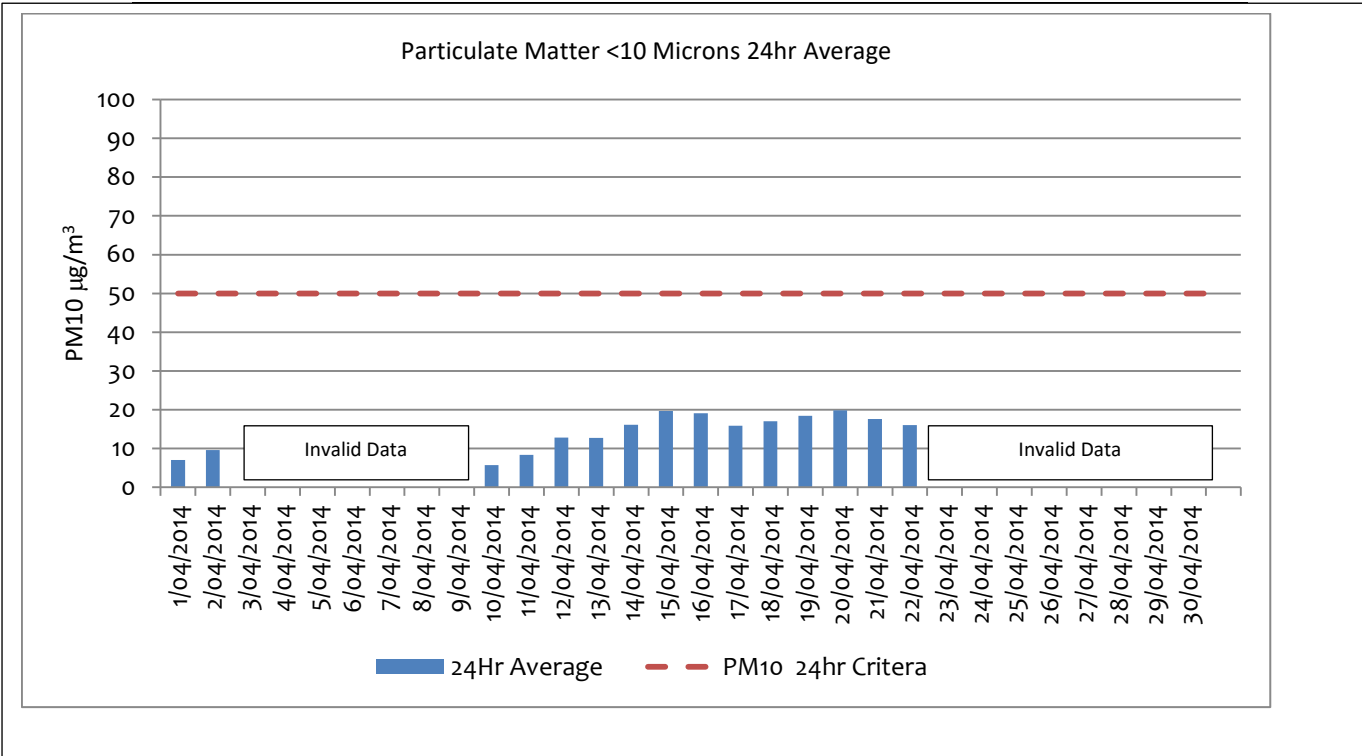
Particulate Matter <10 Microns 24Hr Average				
Date	TEOM 1 - EPL 13 ($\mu\text{g}/\text{m}^3$) Essential Water – Off Site	TEOM 2 – EPL 14 ($\mu\text{g}/\text{m}^3$) Blackwoods Pit – On Site		
1/04/2014	16.49	7		
2/04/2014	16.8	9.58		
3/04/2014	13.14		Machine Down during this period for unknown reasons. Consultant engaged and booked for 14/05/2014 to complete repairs.	
4/04/2014	11.45			
5/04/2014	14.79			
6/04/2014	16.9			
7/04/2014	7.75			
8/04/2014	4.39			
9/04/2014	14.65			
10/04/2014	8.12	5.72		
11/04/2014	7.23	8.37		
12/04/2014	6.95	12.83		
13/04/2014	7.85	12.7		
14/04/2014	9.09	16.09		
15/04/2014	10.15	19.64		
16/04/2014	11.17	19.05		
17/04/2014	13.65	15.83		
18/04/2014	18.71	16.99		
19/04/2014	15.95	18.46		
20/04/2014	19.86	19.81		
21/04/2014	17.08	17.58		
22/04/2014	15.67	16.02		
23/04/2014	14.61		Machine began to work again on the 10 th April 2014 however failed again on the 23 rd April 2014. Consultant engaged and booked for 14/05/2014 to complete repairs.	
24/04/2014	13.58			
25/04/2014	11.31			
26/04/2014	11.96			
27/04/2014	12.49			
28/04/2014	17.64			
29/04/2014	14.03			
30/04/2014	10.88			

PM10 $\mu\text{g}/\text{m}^3$ 12 Month Rolling Average												
	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-13
TEOM 1 EPL13 Essential Water Off Site	11.0	10.1	12.0	15.1	21.2	19.6	17.8	19.9	29.2	22.7	16.0	12.8
TEOM 2 EPL14 Blackwoods Pit On Site	11.7	7.8	12.0	15.2	23.4	32.6	22.5	22.0	32.0	23.7	17.6	14.4

EPL13 – Essential Water – Off Site



EPL14 – Blackwoods Pit – On Site



1.3 Dust Deposition Sampling

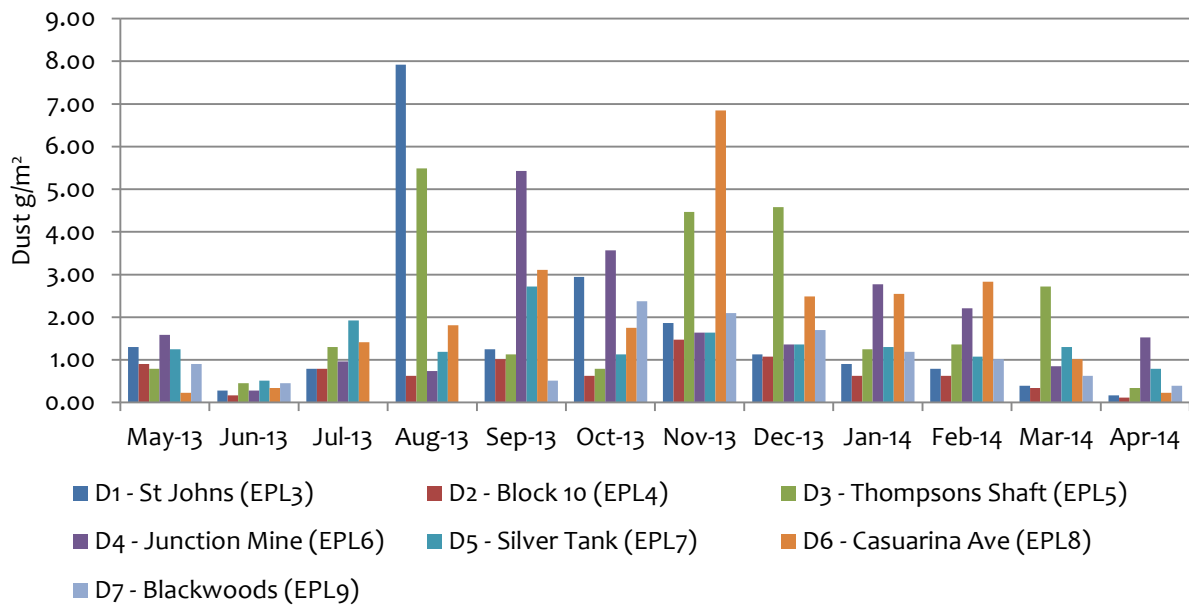
Total Deposited Dust (g/m²/Month)

Date	D1 (off site)	D2	D3	D4	D5	D6 (off site)	D7
Mar 2014	0.17	0.11	0.34	1.53	0.79	0.23	0.40
Background Average	4.0	3.1	4.3	5.7	n/a	5.8	n/a

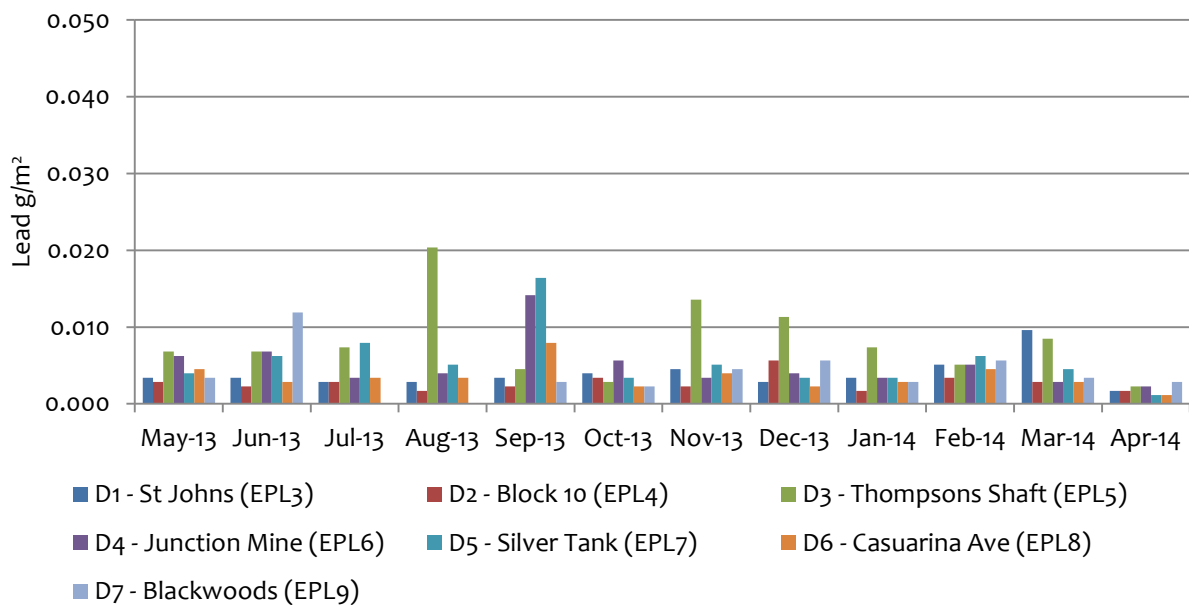
Total Deposited Lead (g/m²/Month)

Date	D1 (Off Site)	D2	D3	D4	D5	D6 (Off Site)	D7
Mar 2014	0.002	0.002	0.002	0.002	0.001	0.001	0.002
Background Average	0.0034	0.0045	0.0046	0.0060	n/a	0.0036	n/a

Monthly Total Deposited Dust



Monthly Total Deposited Lead



2 Blasting (Vibration and Overpressure)

Note:

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

- During the month of April blasting occurred daily there was a total number of 62 blasts 8 of which were production firings all inside licensing criteria.
- 54 blast were below a ppv of 0.75mm/s and did not trigger an event
- 4 Blasts recorded a ppv of >5mm/s
- 0 Blasts recorded a ppv of >10mm/s
- All overpressure readings were inside limits.

Date / Location	Peak Vibration (PPV mm/s)	Peak Over Pressure (dBL)
03/04/2014	5.69	109.2
V1	>0.75	No Event Triggered
V2	3.72	109.2
V3	5.69	101.9
04/04/2014	0.779	88
V1	>0.75	No Event Triggered
V2	>0.75	No Event Triggered
V3	0.779	88
07/04/2014	8.07	101.9
V1	>0.75	No Event Triggered
V2	5.4	98.8
V3	7.07	101.9
12/04/2014	3.84	100
V1	>0.75	No Event Triggered
V2	1.27	100
V3	3.84	100
16/04/2014	4.5	101.9
V1	>0.75	No Event Triggered
V2	>0.75	No Event Triggered
V3	4.5	101.9
19/04/2014	4.41	103.5
V1	>0.75	No Event Triggered
V2	1.01	94
V3	4.41	103.5
23/04/2014	6.84	105.5
V1	>0.75	No Event Triggered
V2	>0.75	No Event Triggered
V3	6.84	105.5
27/04/2014	5.15	104.9
V1	>0.75	No Event Triggered
V2	1.3	94.4
V3	5.15	104.9

3 Noise

Note:

- No noise monitoring was scheduled for the month of April 2014
- Last sampled March 2014 by EMM consultants for crusher project approval modification

4 Water

4.1 Ground Water

Note: Awaiting Analysis From Lab.

Water Sample Results March 2014
Date
Sample ID
pH Value (pH)
Electrical conductivity (uS/cm)
Total Dissolved Solids (mg/L)
Hydroxide Alkalinity as CaCO ₃ (mg/L)
Carbonate Alkalinity CaCO ₃ (mg/L)
Bicarbonate Alkalinity as CaCO ₃ (mg/L)
Total Alkalinity (mg/L)
Sulphate as SO ₄ (mg/L)
Chloride (mg/L)
Calcium (mg/L)
Magnesium (mg/L)
Sodium (mg/L)
Cadmium (mg/L)
Manganese (mg/L)
Lead (mg/L)
Zinc (mg/L)
Iron (mg/L)

Groundwater Table

EPA Identification Number	Frequency	Comment
EPL37	Quarterly	Awaiting Analysis
EPL38	Quarterly	Awaiting Analysis
EPL39	Quarterly	Awaiting Analysis
EPL40	Quarterly	Awaiting Analysis
EPL41	Quarterly	Awaiting Analysis
EPL42	Quarterly	Awaiting Analysis
EPL43	Quarterly	Awaiting Analysis
EPL44	Quarterly	Awaiting Analysis
EPL45	Quarterly	Awaiting Analysis
EPL46	Quarterly	Awaiting Analysis
EPL47	Quarterly	Awaiting Analysis
EPL48	Quarterly	Awaiting Analysis
EPL49	Quarterly	Awaiting Analysis
EPL50	Quarterly	Awaiting Analysis
EPL51	Quarterly	Awaiting Analysis
EPL52	Quarterly	Awaiting Analysis
EPL53	Monthly	Awaiting Analysis
EPL54	Monthly	Awaiting Analysis

4.2 Surface Water

Insufficient water was available for samples at surface water locations.

Surface Water Table

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	Insufficient water for sample
EPL32	2 x Per year when contains water	Insufficient water for sample
EPL33	2 x Per year when contains water	Insufficient water for sample
EPL34	2 x Per year when contains water	Insufficient water for sample
EPL35	2 x Per year when contains water	Insufficient water for sample

5 Weather Data

Note:

(BHOP – Automatic Weather Station was unavailable for the month of April, repairs are scheduled for June 2014.

The following data was obtained from the Bureau of Meteorology Broken Hill)

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	%	g th	km/h	hPa	°C	%	g th	km/h	hPa
1	Tu	21.0	33.8	0			NE	41	10:56	23.4	48	2	NNE	22	1016.7	33.1	25	1	ENE	13	1012.9
2	We	23.1	35.3	0			SSW	46	15:21	25.2	62	3	N	11	1014.0	33.7	35	6	W	19	1011.2
3	Th	12.7	13.9	4.2			SSW	48	00:25	12.8	100	8	SSW	28	1019.0	12.8	100	8	S	22	1018.3
4	Fr	11.9	22.0	32.0			S	43	11:52	13.0	89	1	S	20	1019.2	21.0	60	3	S	19	1017.7
5	Sa	9.6	23.2	0			SSW	26	08:02	10.7	87	3	SSW	20	1021.8	21.9	49	1	S	13	1019.7
6	Su	10.3	24.9	0			SE	33	11:06	14.2	75	1	SSW	13	1022.9	24.1	41	1	E	19	1018.7
7	Mo	14.2	27.4	0			NE	30	10:20	19.7	67	7	NNE	19	1019.6	25.8	41	7	ENE	17	1015.8
8	Tu	18.2	30.0	0			SSW	35	18:40	22.3	59	7	NNE	22	1017.0	28.7	40	7	NW	4	1014.5
9	We	17.6	19.7	0.4			NE	35	16:22	17.8	94	8	SSE	15	1015.4	18.2	100	8	ENE	24	1012.5
10	Th	17.7	26.0	28.2			NE	39	02:18	18.3	100	8	NNE	20	1011.1	25.8	68	6	NNW	17	1007.5
11	Fr	15.4	20.7	9.2			SSW	46	07:28	15.7	91	8	SSW	30	1014.8	19.3	68	7	SSW	30	1012.6
12	Sa	11.8	20.5	0			S	39	07:05	12.8	91	8	S	26	1017.8	19.7	64	5	S	30	1014.9
13	Su	10.9	22.8	0.2			S	33	15:25	13.8	85	1	SSW	19	1019.0	22.1	55	4	S	20	1016.7
14	Mo	11.2	22.6	0.2			SSW	37	12:33	12.5	97	8	SSW	19	1020.2	21.5	52	4	SSW	17	1017.6
15	Tu	11.6	23.6	0			S	30	16:01	13.3	78	3	SSW	19	1021.2	22.1	42	1	SE	17	1018.8
16	We	10.9	24.4	0			SW	28	13:36	14.3	68	2	SSW	9	1021.4	23.7	35	1	SW	13	1018.1
17	Th	14.2	26.3	0			SSW	26	14:47	20.2	44	0	WNW	6	1021.8	25.8	33	2	WSW	13	1019.2
18	Fr	15.0	23.7	0			SSW	50	13:09	18.7	55	6	SW	26	1020.6	23.2	41	1	SSW	31	1018.2
19	Sa	7.9	20.4	0			SW	30	14:48	11.3	69	1	SSW	11	1022.3	19.2	38	1	SW	17	1018.1
20	Su	11.2	25.2	0			NW	35	11:37	19.4	41	6	N	13	1019.4	24.3	37	1	WSW	11	1016.3
21	Mo	12.3	27.7	0			W	41	14:34	18.7	55	6	N	15	1019.7	26.7	34	6	NW	15	1016.3
22	Tu	17.1	29.4	0			S	41	20:12	22.7	35	5	NNW	20	1017.0	28.8	25	1	WNW	22	1014.2
23	We	11.2	28.1	0			NW	39	14:43	14.9	66	1	SE	11	1017.1	27.4	29	1	NW	20	1013.3
24	Th	10.9	22.5	0			SSE	39	10:00	15.1	63	1	S	28	1018.0	21.9	42	1	SE	20	1015.2
25	Fr	10.9	25.4	0			E	30	10:28	15.3	69	2	ENE	13	1018.7	24.7	29	3	NNE	9	1013.6
26	Sa	15.6	20.3	0.6			NW	30	06:05	17.2	78	8	NW	7	1015.3	19.2	68	7	WNW	19	1014.3
27	Su	10.7	22.1	0.6			SSE	33	01:57	13.7	77	1	ESE	20	1022.7	21.3	51	1	ESE	19	1019.1
28	Mo	13.2	27.8	0			N	39	12:44	15.5	61	7	NE	19	1019.6	27.3	37	2	NNE	20	1015.3
29	Tu	15.2	23.2	0			SW	57	12:22	21.2	57	8	N	26	1011.8	13.8	100	8	S	6	1012.8
30	We	9.3	16.3	13.2			SSW	39	12:37	11.7	92	1	S	22	1020.3	14.9	61	7	S	20	1018.9
Statistics for April 2014																					
Mean		13.4	24.3							16.5	71	4		18	1018.5	23.1	50	3		17	1015.7
Lowest		7.9	13.9	0						10.7	35	0	WNW	6	1011.1	12.8	25	1	NW	4	1007.5
Highest		23.1	35.3	32.0			SW	57		25.2	100	8	SSW	30	1022.9	33.7	100	8	SSW	31	1019.7
Total				88.8																	

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	26/05/2014	16/06/2014	18/06/2014
TEOM	Real time (Downloading Issues)	Corrected by Lear Siegler (14/05/2014)	18/06/2014
Dust Deposition	26/05/2014	16/06/2014	18/06/2014
Water	30/05/2014	Awaiting Analysis	18/06/2014
Blast Vibration and overpressure	Real Time	Real Time	18/06/2014

7 Correction Log 1st May 2013 to 31st April 2014

Sample ID#	Date Of Sample	Original Data		Corrected Data		Date Corrected	Date Originally Published	Reason
EPL10	3/06/2013	TSP	Lead	TSP	Lead	07/05/2014	14/06/2013	Contamination during analysis at lab
		52.26	2.90	52.26	0.70			
EPL10	9/06/2013	TSP	Lead	TSP	Lead	07/05/2014	14/06/2013	Contamination during analysis at lab
		18.99	1.43	18.99	0.24			
EPL11	3/06/2013	TSP	Lead	TSP	Lead	07/05/2014	14/06/2013	Contamination during analysis at lab
		7.3	3.1	7.32	0.54			
EPL11	9/06/2013	TSP	Lead	TSP	Lead	07/05/2014	14/06/2013	Contamination during analysis at lab
		10.8	2.2	10.83	0.30			
EPL12	3/06/2013	TSP	Lead	TSP	Lead	07/05/2014	14/06/2013	Contamination during analysis at lab
		11.43	5.05	4.35	0.52			
EPL12	9/06/2013	TSP	Lead	TSP	Lead	07/05/2014	14/06/2013	Contamination during analysis at lab
		5.30	0.25	3.21	0.13			
EPL12	15/06/2013	TSP	Lead	TSP	Lead	07/05/2014	14/06/2013	Contamination during analysis at lab
		2.86	.024	5.36	0.13			
EPL12	21/06/2013	TSP	Lead	TSP	Lead	07/05/2014	14/06/2013	Contamination during analysis at lab
		3.10	0.48	3.87	0.10			
EPL12	27/06/2013	TSP	Lead	TSP	Lead	07/05/2014	14/06/2013	Contamination during analysis at lab
		3.27	0.25	9.64	0.10			