



ESPERANCE PORTS
Sea & Land

TSP EXCEEDANCE REPORT

MONITORING PERIOD

BETWEEN 1ST AND 4TH DECEMBER 2011

Revision	Prepared	Reviewed	Approved	Date	Description
1	N. Norrish	A. Leonard		19/12/2011	

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1. INTRODUCTION

On the 16th December 2011, the Esperance Ports Sea and Land (EPSL) became aware of laboratory results detailing dust, measured as Total Suspended Particles (TSP) exceeding Esperance Ports Sea and Land (EPSL) Environmental Licence criteria (refer to Table 1). Consistent with the latest Licence (L5099/1974/13) issued on the 24th February 2011 (amended 28th July 2011) requirement of Condition 9, which requires an exceedance report to be submitted to the DEC, within seven working days (on 29th December 2011).

Table 1. Emission Concentration Targets from the Esperance Ports Sea and Land Licence (L5099/1974/13) issued on 24th February 2011 (amended 28th July 2011)

Emission	Ambient concentration target
Nickel in air	0.14 µg/m ³
Dust as PM ₁₀	50 µg/m ³
Dust as TSP	90 µg/m ³
Silica in air	5 µg/m ³

2. INVESTIGATION

Measured Total Suspended Particulate (TSP) concentrations exceeded the Licence (L5099/1974/13) target of 90 µg/m³ (Table 1) for TSP over four consecutive days between 1st December 2011 and 4th December 2011 at Site 4. The recorded TSP at the monitoring sites (refer to Figure 1) is as follows:

Exceedance A

- 120 µg/m³ at Site 4 (between 1339 hrs on 1/12/2011 and 1232 hrs on 2/12/2011)

Exceedance B

- 110 µg/m³ at Site 4 (between 1233 hrs on 2/12/2011 and 1256 hrs on 3/12/2011)

Exceedance C

- 130 $\mu\text{g}/\text{m}^3$ at Site 4 (between 1257 hrs on 3/12/2011 and 1317 hrs on 4/12/2011)

Exceedance D:

- 100 $\mu\text{g}/\text{m}^3$ at Site 4 (between 1318 hrs on 4/12/2011 and 1224 hrs on 5/12/2011)

Note: to reflect the practical reporting errors, values exceeding 100 $\mu\text{g}/\text{m}^3$ are rounded to the nearest 10 $\mu\text{g}/\text{m}^3$ by MPL analytical laboratory.



Figure 1: Location of Air Quality Monitoring Stations

2.1 Port Activities

The following Port activities occurred during the monitoring period for:

Exceedance A:

- 26983 tonnes of iron ore averaged across 3 trains;
- 790 tonnes of sulphur was out-loaded across 10 trucks.

Exceedance B:

- 26891 tonnes of iron ore averaged across 3 trains;
- 165 tonnes of nickel concentrate across 2 trucks; and
- 865 tonnes of sulphur was out-loaded across 11 trucks.

Exceedance C:

- 27863 tonnes of iron ore averaged across 3 trains;
- 169 tonnes of nickel concentrate across 2 trucks; and
- 818 tonnes of sulphur was out-loaded across 11 trucks.

Exceedance D:

- Ocean Phoenix was along side Berth 1 between 0130 on 4th December 2011 and 1900 on 5th December 2011 being loaded with wheat.
- 17352 tonnes of iron ore averaged across 3 trains;
- 165 tonnes of nickel concentrate across 2 trucks; and
- 833 tonnes of sulphur was out-loaded across 11 trucks.

2.2 Meteorological Activities

Exceedance A: 1/12/2011 to 2/12/2011

The wind directions for the 24 hour period in which the exceedance occurred are in the wind arc from NE (1%), ENE (20%), E (44%), ESE (32%) and SE (3%) (Figure 2). The maximum hourly average wind speed of 14.2 m/s (51 km/h) was recorded from the ESE between 1600 and 1700 hours on 1/12/2011, typical of the afternoon winds in spring/summer on the Esperance coast. The 'Beaufort Wind Force Scale' is a measure

of understanding wind speeds in descriptive terminology. A wind speed of 51 km/h is described as 'near gale' (50-61 km/h) (BOM, 2011).

Exceedance B: 2/12/2011 to 3/12/2011

The wind directions for the 24 hour period in which the exceedance occurred are in the wind arc from ENE (27%), E (36%), ESE (35%) and SE (2%) (Figure 3). The maximum hourly average wind speed of 14.1 m/s (51 km/h) was recorded from the ESE between 1700 and 1800 hours on 2/12/2011, typical of the afternoon winds in spring/summer on the Esperance coast. The 'Beaufort Wind Force Scale' is a measure of understanding wind speeds in descriptive terminology. A wind speed of 51 km/h is described as 'near gale' (50-60 km/h) (BOM, 2011).

Exceedance C: 3/12/2011 to 4/12/2011

The wind directions for the 24 hour period in which the exceedance occurred are in the wind arc from NE (14%), ENE (39%), E (22%), ESE (22%), SE (2%) and SSE (1%) (Figure 4). The maximum hourly average wind speed of 14.3 m/s (51 km/h) was recorded from the ESE between 1500 and 1600 hours on 3/12/2011, typical of the afternoon winds in spring/summer on the Esperance coast. The 'Beaufort Wind Force Scale' is a measure of understanding wind speeds in descriptive terminology. A wind speed of 51 km/h is described as 'near gale' (51-62 km/h) (BOM, 2011).

Exceedance D: 4/12/2011 to 5/12/2011

The wind directions for the 24 hour period in which the exceedance occurred are in the wind arc from NW (1%), N (1%), NNE (2%), NE (14%), ENE (40%), E (17%), ESE (21%) and SE (4%) (Figure 5). The maximum hourly average wind speed of 11.4 m/s (41 km/h) was recorded from the ESE between 1600 and 1700 hours on 4/12/2011, typical of the afternoon winds in spring/summer on the Esperance coast. The 'Beaufort Wind Force Scale' is a measure of understanding wind speeds in descriptive terminology. A wind speed of 41 km/h is described as 'strong winds' (40-50 km/h) (BOM, 2011).

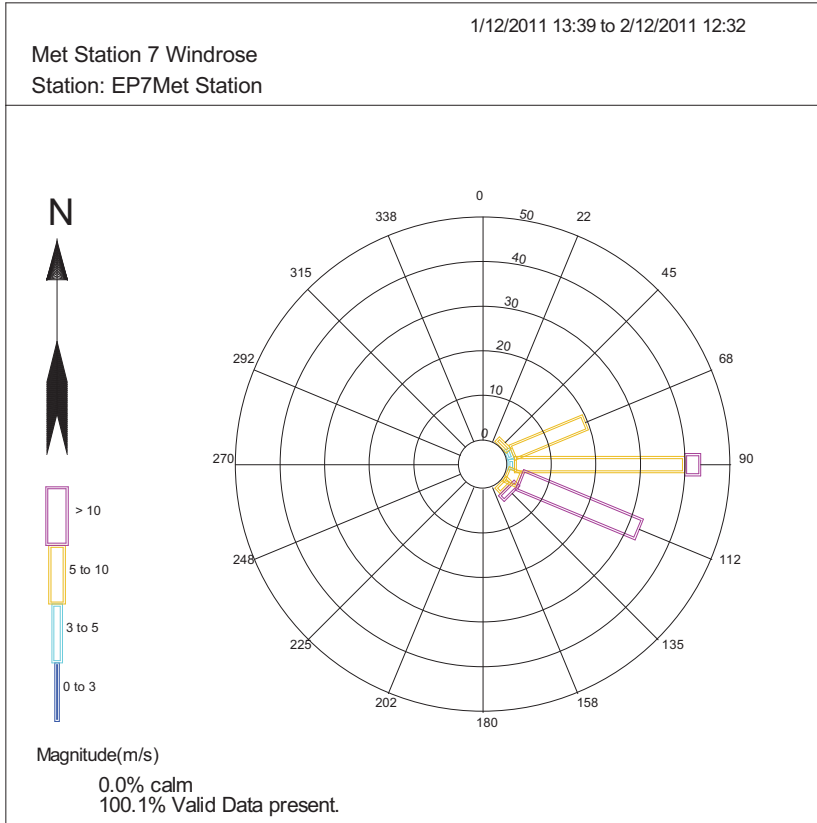


Figure 2. Wind rose for the monitoring period 1339 hrs on 1/12/2011 to 1232 hrs on 2/12/2011. Raw data source: EP7 monitoring station, Berth 3

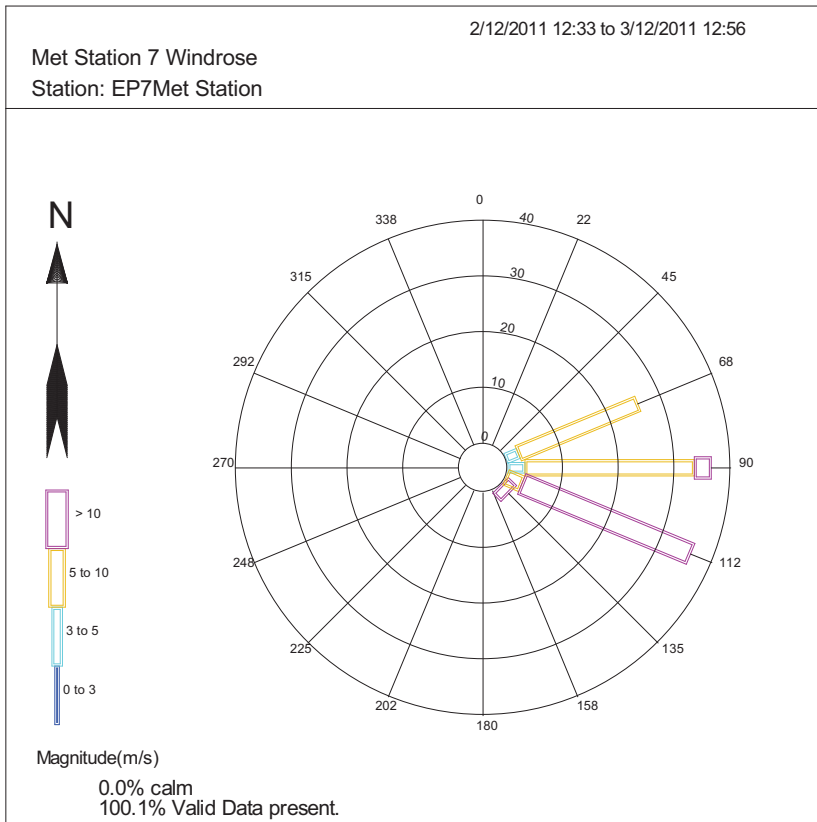


Figure 3. Wind rose for the monitoring period 1233 hrs on 2/12/2011 to 1256 hrs on 3/12/2011. Raw data source: EP7 monitoring station, Berth 3

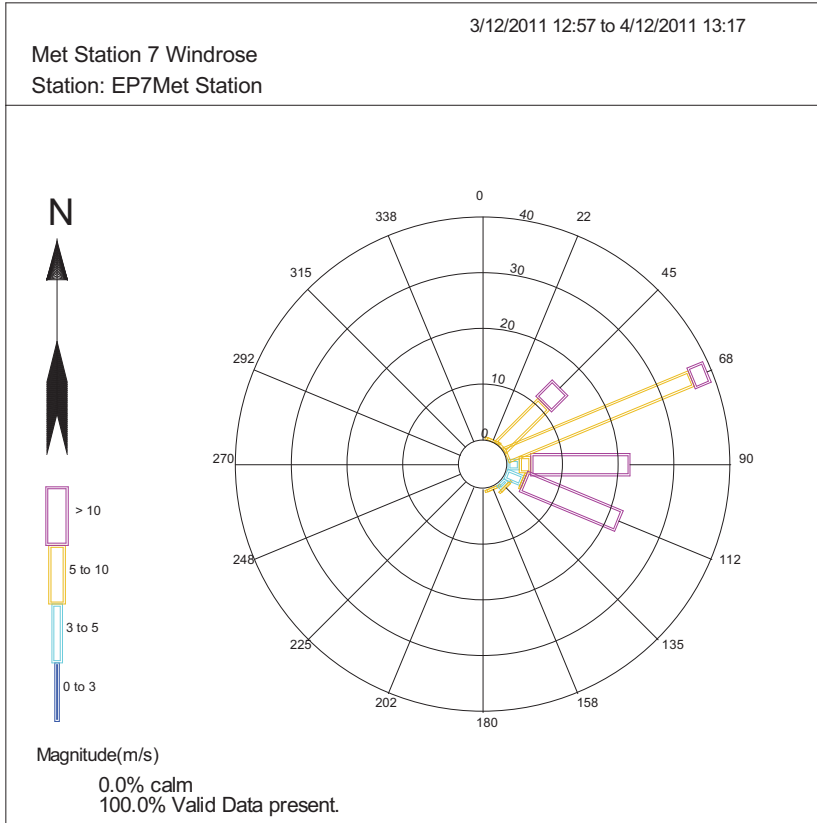


Figure 4. Wind rose for the monitoring period 1257 hrs on 3/12/2011 to 1317 hrs on 4/12/2011. Raw data source: EP7 monitoring station, Berth 3

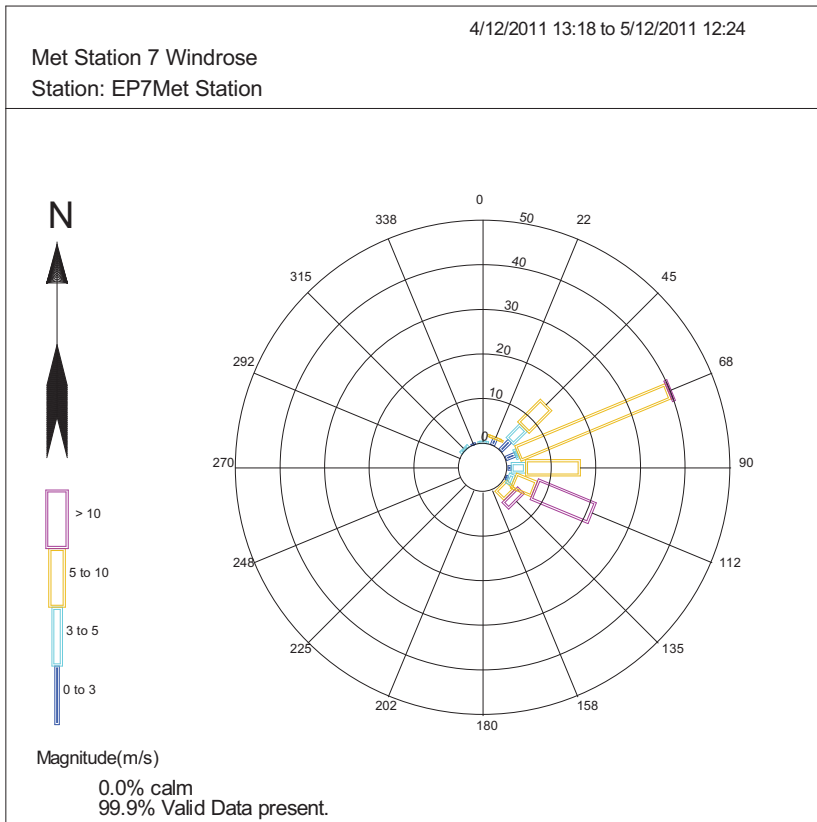


Figure 5. Wind rose for the monitoring period 1318 hrs on 4/12/2011 to 1224 hrs on 5/12/2011. Raw data source: EP7 monitoring station, Berth 3

2.3 Reason for exceedance

Exceedance A:

The exceedance at Site 4 between the 1st and 2nd December is most likely to be due to near gale winds (maximum of 14.2 m/s from ESE) mobilising particles from Dempster Head, and the unsealed surfaces within the Port including the reclaim area around Sheds 3 and 4, CBH and Summit Fertiliser lease areas. Iron (1.6% Fe in TSP) and nickel (0.009% Ni in TSP) contributed less than 2% of the TSP.

Exceedance B:

The exceedance at Site 4 between the 2nd and 3rd December is most likely to be due to strong winds (maximum of 14.1 m/s from ESE) mobilising particles from Dempster Head and the unsealed surfaces within the Port including the reclaim area around Sheds 3 and 4, CBH and Summit Fertiliser lease areas and from Dempster Head. Iron (1.9% Fe in TSP) and nickel (0.008% Ni in TSP) contributed less than 2% of the TSP.

Exceedance C:

The exceedance at Site 4 between the 3rd and 4th December is most likely to be due to near gale winds (maximum of 14.3 m/s from ESE) mobilising particles from Dempster Head, and the unsealed surfaces within the Port including the reclaim area around Sheds 3 and 4, CBH and Summit Fertiliser lease areas. Iron (1.7% Fe in TSP) and nickel (0.009% Ni in TSP) contributed less than 2% of the TSP.

Exceedance D:

The exceedance at Site 4 between the 4th and 5th December is most likely to be due to strong winds (maximum 11.4 m/s from ESE) mobilising particles from Dempster Head, and the unsealed surfaces within the Port including the reclaim area around Sheds 3 and 4, CBH and Summit Fertiliser lease areas. Iron (2% Fe in TSP) and nickel (0.015% Ni in TSP) contributed less than 3% of the TSP.

3. CONCLUSIONS

The exceedances over four consecutive days between 1st and 4th December 2011 at Site 4 are most likely to be due to strong to near gale (maximum of 14.2 m/s ESE on 1/12/2011, 14.1 m/s ESE on 2/12/2011, 14.3 m/s ESE on 3/12/2011 and 11.4 m/s ESE on 4/12/2011), for the majority of the time from the NE to ESE, mobilising dust and particulates from Dempster Head, the unsealed surfaces within the Port, including the reclaim area, and Port lease areas (CBH and Summit Fertilizers). These winds are typical of summer winds in Esperance.

3.1 Corrective Action

The event is due to meteorological conditions mobilising particulates from the unsealed surfaces from the Esperance beaches, Dempster Head, and from unsealed surfaces within the Port. EPSL already implements a dust binding agent on unsealed surfaces. No further action can be practically taken by EPSL to further reduce dust. TSP is a poor indicator of dust from prescribed activities in the Port with iron and nickel typically constituting less than 3% of the dust.

APPENDIX A MPL LABORATORY REPORT

CERTIFICATE OF ANALYSIS 117329

Client:

Esperance Ports - Sea and Land

PO Box 35

Esperance

WA 6450

Attention: N Norrish

Sample log in details:

Your Reference:

No. of samples:

Date samples received:

Date completed instructions received:

Location:

Dust Analysis

42 High Volume Filters

8/12/11

8/12/11

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by:

15/12/11

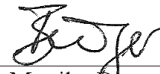
Date of Preliminary Report:

Not issued

Issue Date:

15/12/11

Results Approved By:



Dr Monika Buerger

Supervisor – Micro, Asbestos, Dust

Client Reference: Dust Analysis

Metals in High Volume Filters							
Our Reference:	UNITS	PQL	117329-1	117329-2	117329-3	117329-4	117329-5
Your Reference	--	--	EPL431	EPL432	EPL433	EPL434	EPL435
Field Sheet Number	--	--	Site 4	Site 3	Site 2	Site 1	Site 5
Date Sampled			29/11/2011	29/11/2011	29/11/2011	29/11/2011	29/11/2011
Filter No			EPL431	EPL432	EPL433	EPL434	EPL435
Dust	mg/filter	0.1	75	65	88	65	49
Dust in Air	µg/m ³	0.1	45	39	<0.1	39	29

Metals in High Volume Filters							
Our Reference:	UNITS	PQL	117329-6	117329-7	117329-8	117329-9	117329-10
Your Reference	--	--	EPL436	EPL437	EPL438	EPL439	EPL440
Field Sheet Number	--	--	Blank	Site 4	Site 3	Site 2	Site 1
Date Sampled				30/11/2011	30/11/2011	30/11/2011	30/11/2011
Filter No			EPL436	EPL437	EPL438	EPL439	EPL440
Dust	mg/filter	0.1	4.7	140	91	89	110
Dust in Air	µg/m ³	0.1	[NA]	90	59	57	73
Iron	µg/filter	5	[NA]	3,400	1,900	2,600	1,800
Iron in Air	µg/m ³	0.005	[NA]	2.2	1.2	1.7	1.2
Nickel	µg/filter	2	[NA]	16	12	20	7
Nickel in Air	µg/m ³	0.002	[NA]	0.011	0.008	0.013	0.004
Lead	µg/filter	5	[NA]	5	<5	<5	<5
Lead in Air	µg/m ³	0.005	[NA]	<0.005	<0.005	<0.005	<0.005
Lithium	µg/filter	2	[NA]	<2	<2	<2	<2
Lithium in Air	µg/m ³	0.001	[NA]	<0.001	<0.001	<0.001	<0.001
Sulfur	µg/filter	50	[NA]	3,700	3,900	2,800	1,900
Sulfur in Air	µg/m ³	0.02	[NA]	2.4	2.5	1.8	1.2
Zinc	µg/filter	5	[NA]	554	495	503	426
Zinc in Air	µg/m ³	0.002	[NA]	0.36	0.32	0.32	0.28

Client Reference: Dust Analysis

Metals in High Volume Filters	UNITS	PQL	117329-11	117329-12	117329-13	117329-14	117329-15
Our Reference:	--	--	EPL441	EPL442	EPL443	EPL444	EPL445
Your Reference	--	--	Site 5	Blank	Site 4	Site 3	Site 2
Field Sheet Number	--	--	30/11/2011		1/12/2011	1/12/2011	1/12/2011
Date Sampled			EPL441	EPL442	EPL443	EPL444	EPL445
Filter No							
Dust	mg/filter	0.1	45	5.1	170	120	110
Dust in Air	µg/m ³	0.1	29	[NA]	120	78	72
Iron	µg/filter	5	330	130	2,800	2,400	2,500
Iron in Air	µg/m ³	0.005	0.21	[NA]	1.9	1.6	1.6
Nickel	µg/filter	2	3	<2	17	16	26
Nickel in Air	µg/m ³	0.002	<0.002	[NA]	0.011	0.011	0.017
Lead	µg/filter	5	<5	<5	<5	<5	13
Lead in Air	µg/m ³	0.005	<0.005	[NA]	<0.005	<0.005	0.009
Lithium	µg/filter	2	<2	<2	<2	<2	<2
Lithium in Air	µg/m ³	0.001	<0.001	[NA]	<0.001	<0.001	<0.001
Sulfur	µg/filter	50	1,400	890	2,700	3,600	3,700
Sulfur in Air	µg/m ³	0.02	0.89	[NA]	1.8	2.4	2.4
Zinc	µg/filter	5	416	469	482	464	396
Zinc in Air	µg/m ³	0.002	0.27	[NA]	0.32	0.31	0.26

Metals in High Volume Filters	UNITS	PQL	117329-16	117329-17	117329-18	117329-19	117329-20
Our Reference:	--	--	EPL446	EPL447	EPL448	EPL449	EPL450
Your Reference	--	--	Site 1	Site 5	Blank	Site 4	Site 3
Field Sheet Number	--	--	1/12/2011	1/12/2011		2/12/2011	2/12/2011
Date Sampled			EPL446	EPL447	EPL448	EPL449	EPL450
Filter No							
Dust	mg/filter	0.1	140	47	5.0	170	120
Dust in Air	µg/m ³	0.1	90	31	[NA]	110	73
Iron	µg/filter	5	2,100	380	110	3,300	2,800
Iron in Air	µg/m ³	0.005	1.4	0.25	[NA]	2.1	1.7
Nickel	µg/filter	2	9	4	<2	14	12
Nickel in Air	µg/m ³	0.002	0.006	0.003	[NA]	0.009	0.007
Lead	µg/filter	5	<5	<5	<5	<5	<5
Lead in Air	µg/m ³	0.005	<0.005	<0.005	[NA]	<0.005	<0.005
Lithium	µg/filter	2	<2	<2	<2	<2	<2
Lithium in Air	µg/m ³	0.001	<0.001	<0.001	[NA]	<0.001	<0.001
Sulfur	µg/filter	50	1,600	1,500	740	1,900	1,600
Sulfur in Air	µg/m ³	0.02	1.1	0.99	[NA]	1.2	0.96
Zinc	µg/filter	5	469	483	429	520	473
Zinc in Air	µg/m ³	0.002	0.31	0.31	[NA]	0.32	0.29

Client Reference: Dust Analysis

Metals in High Volume Filters	UNITS	PQL	117329-21	117329-22	117329-23	117329-24	117329-25
Our Reference:	--	--	EPL451	EPL452	EPL453	EPL454	EPL455
Your Reference	--	--	Site 2	Site 1	Site 5	Blank	Site 4
Field Sheet Number	--	--	2/12/2011	2/12/2011	2/12/2011		3/12/2011
Date Sampled			EPL451	EPL452	EPL453	EPL454	EPL455
Filter No							
Dust	mg/filter	0.1	100	110	44	4.2	200
Dust in Air	µg/m ³	0.1	62	66	28	[NA]	130
Iron	µg/filter	5	2,500	1,800	330	150	3,600
Iron in Air	µg/m ³	0.005	1.5	1.1	0.21	[NA]	2.2
Nickel	µg/filter	2	16	8	3	2	19
Nickel in Air	µg/m ³	0.002	0.01	0.005	<0.002	[NA]	0.012
Lead	µg/filter	5	6	<5	<5	<5	<5
Lead in Air	µg/m ³	0.005	<0.005	<0.005	<0.005	[NA]	<0.005
Lithium	µg/filter	2	<2	<2	<2	<2	<2
Lithium in Air	µg/m ³	0.001	<0.001	<0.001	<0.001	[NA]	<0.001
Sulfur	µg/filter	50	1,500	1,700	1,500	900	4,800
Sulfur in Air	µg/m ³	0.02	0.91	1.0	0.97	[NA]	3.0
Zinc	µg/filter	5	427	434	457	500	473
Zinc in Air	µg/m ³	0.002	0.26	0.27	0.29	[NA]	0.30

Metals in High Volume Filters	UNITS	PQL	117329-26	117329-27	117329-28	117329-29	117329-30
Our Reference:	--	--	EPL456	EPL457	EPL458	EPL459	EPL460
Your Reference	--	--	Site 3	Site 2	Site 1	Site 5	Blank
Field Sheet Number	--	--	3/12/2011	3/12/2011	3/12/2011	3/12/2011	
Date Sampled			EPL456	EPL457	EPL458	EPL459	EPL460
Filter No							
Dust	mg/filter	0.1	140	110	94	48	<0.1
Dust in Air	µg/m ³	0.1	88	66	60	31	[NA]
Iron	µg/filter	5	2,600	2,300	1,200	350	160
Iron in Air	µg/m ³	0.005	1.7	1.4	0.73	0.22	[NA]
Nickel	µg/filter	2	15	17	4	2	10
Nickel in Air	µg/m ³	0.002	0.009	0.011	0.003	<0.002	[NA]
Lead	µg/filter	5	<5	6	<5	<5	<5
Lead in Air	µg/m ³	0.005	<0.005	<0.005	<0.005	<0.005	[NA]
Lithium	µg/filter	2	<2	<2	<2	<2	<2
Lithium in Air	µg/m ³	0.001	<0.001	<0.001	<0.001	<0.001	[NA]
Sulfur	µg/filter	50	5,600	2,300	1,700	1,400	860
Sulfur in Air	µg/m ³	0.02	3.6	1.4	1.1	0.90	[NA]
Zinc	µg/filter	5	462	445	441	466	497
Zinc in Air	µg/m ³	0.002	0.30	0.28	0.28	0.30	[NA]

Client Reference: Dust Analysis

Metals in High Volume Filters	UNITS	PQL	117329-31	117329-32	117329-33	117329-34	117329-35
Our Reference:	--	--	EPL461	EPL462	EPL463	EPL464	EPL465
Your Reference	--	--	Site 4	Site 3	Site 2	Site 1	Site 5
Field Sheet Number	--	--	4/12/2011	4/12/2011	4/12/2011	4/12/2011	4/12/2011
Date Sampled			EPL461	EPL462	EPL463	EPL464	EPL465
Filter No							
Dust	mg/filter	0.1	150	130	100	93	54
Dust in Air	µg/m ³	0.1	100	86	68	62	36
Iron	µg/filter	5	2,900	2,000	1,400	860	450
Iron in Air	µg/m ³	0.005	2.0	1.3	0.90	0.57	0.30
Nickel	µg/filter	2	23	18	9	6	5
Nickel in Air	µg/m ³	0.002	0.015	0.012	0.006	0.004	0.003
Lead	µg/filter	5	<5	<5	<5	<5	<5
Lead in Air	µg/m ³	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Lithium	µg/filter	2	<2	<2	<2	<2	<2
Lithium in Air	µg/m ³	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulfur	µg/filter	50	7,900	9,100	3,200	2,600	1,700
Sulfur in Air	µg/m ³	0.02	5.3	6.0	2.1	1.7	1.2
Zinc	µg/filter	5	516	457	457	424	486
Zinc in Air	µg/m ³	0.002	0.34	0.30	0.30	0.28	0.32

Metals in High Volume Filters	UNITS	PQL	117329-36	117329-37	117329-38	117329-39	117329-40
Our Reference:	--	--	EPL466	EPL467	EPL468	EPL469	EPL470
Your Reference	--	--	Blank	Site 4	Site 3	Site 2	Site 1
Field Sheet Number	--	--		5/12/2011	5/12/2011	5/12/2011	5/12/2011
Date Sampled			EPL466	EPL467	EPL468	EPL469	EPL470
Filter No							
Dust	mg/filter	0.1	4.8	230	230	300	310
Dust in Air	µg/m ³	0.1	[NA]	140	140	180	190
Iron	µg/filter	5	130	2,200	2,600	3,300	1,800
Iron in Air	µg/m ³	0.005	[NA]	1.3	1.6	2.0	1.1
Nickel	µg/filter	2	5	10	10	25	15
Nickel in Air	µg/m ³	0.002	[NA]	0.006	0.006	0.015	0.009
Lead	µg/filter	5	<5	<5	<5	<5	<5
Lead in Air	µg/m ³	0.005	[NA]	<0.005	<0.005	<0.005	<0.005
Lithium	µg/filter	2	<2	<2	<2	<2	<2
Lithium in Air	µg/m ³	0.001	[NA]	<0.001	<0.001	<0.001	<0.001
Sulfur	µg/filter	50	820	2,500	3,200	9,800	7,500
Sulfur in Air	µg/m ³	0.02	[NA]	1.5	1.9	6.0	4.6
Zinc	µg/filter	5	446	492	519	543	433
Zinc in Air	µg/m ³	0.002	[NA]	0.30	0.32	0.33	0.27

Client Reference: Dust Analysis

Metals in High Volume Filters	UNITS	PQL	117329-41	117329-42	117329-43
Our Reference:	--	--	EPL471	EPL472	Lab Blank
Your Reference	--	--	Site 5	Blank	
Field Sheet Number			5/12/2011		
Date Sampled			EPL471	EPL472	
Filter No					
Dust	mg/filter	0.1	230	4.8	[NA]
Dust in Air	µg/m ³	0.1	87	[NA]	[NA]
Iron	µg/filter	5	410	100	91
Iron in Air	µg/m ³	0.005	0.16	[NA]	[NA]
Nickel	µg/filter	2	3	<2	<2
Nickel in Air	µg/m ³	0.002	<0.002	[NA]	[NA]
Lead	µg/filter	5	<5	<5	<5
Lead in Air	µg/m ³	0.005	<0.005	[NA]	[NA]
Lithium	µg/filter	2	<2	<2	<2
Lithium in Air	µg/m ³	0.001	<0.001	[NA]	[NA]
Sulfur	µg/filter	50	2,000	710	700
Sulfur in Air	µg/m ³	0.02	0.76	[NA]	[NA]
Zinc	µg/filter	5	395	347	220
Zinc in Air	µg/m ³	0.002	0.15	[NA]	[NA]

Method ID	Methodology Summary
DUST-004	Airborne samples analysed according to AS 2985 for Respirable Dust or AS 3640 for Inhalable Dust . Sample results based on volume data supplied by client. Samples tested as received, *accreditation does not cover sampling.
METALS-020	Metals in soil and water by ICP-OES.

Report Comments:

INS: Insufficient sample for this test; NT: Not tested; PQL: Practical Quantitation Limit; <: Less than; >: Greater than
RPD: Relative Percent Difference; NA: Test not required; LCS: Laboratory Control Sample; NR: Not requested
NS: Not specified; NEPM: National Environmental Protection Measure
DOL: Sample rejected due to particulate overload

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD a matrix spike recoveries for the sample batch were within laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spike and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and Speciated Phenols is acceptable.

Surrogates: 60-140% is acceptable for general organics and 10-140% for SVOC and Speciated Phenols.