TSP EXCEEDANCE REPORT

MONITORING PERIOD

1ST – 3RD MARCH 2011

Revision	Prepared	Reviewed	Approved	Date	Description
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FIGURE

1. INTRODUCTION

On the 18th March 2011, the Esperance Port Sea and Land (ESPL) became aware of laboratory results detailing dust (TSP) marginally exceeding the license criteria (refer to Table 1). Consistent with the latest amended Licence (L5099/1974/12) requirement of Condition 9, this requires an exceedance report to be submitted to the DEC by 29th March 2011, within seven working days.

Table 1: Emission Concentration Targets from DEC Licence Number L5099/1974/12 issued to EPSL on 27th January 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 TSP concentrations between 1353 hours 1/3/2011 and 1213 hours on 4/3/2011 (refer to ***Table 2***) exceeded the TSP license (L5099/1974/12_ target (***Table 1***) for Total Suspended Particulate.

Table 2: Exceedances between 1st and 4th March 2011

Start	End	Time on	Time off	Site	TSP µg/m3
1/03/2011	2/03/2011	1353	1459	Site 4	120
1/03/2011	2/03/2011	1359	1504	Site 3	92
1/03/2011	2/03/2011	1403	1506	Site 2	91
1/03/2011	2/03/2011	1418	1521	Site 1	110
1/03/2011	2/03/2011	1417	1518	Site 5	40
2/03/2011	3/03/2011	1500	1358	Site 4	96
2/03/2011	3/03/2011	1505	1405	Site 3	110
2/03/2011	3/03/2011	1507	1407	Site 2	120
2/03/2011	3/03/2011	1522	1424	Site 1	81
2/03/2011	3/03/2011	1519	1422	Site 5	28
3/03/2011	4/03/2011	1359	1311	Site 4	110
3/03/2011	4/03/2011	1406	1317	Site 3	84
3/03/2011	4/03/2011	1408	1323	Site 2	100
3/03/2011	4/03/2011	1425	1339	Site 1	52
3/03/2011	4/03/2011	1424	1337	Site 5	28

Note: All exceedances are shown

Figure 1: Map of Air Quality Monitoring Stations

2.1 Port Activities

The following Port activities occurred during the monitoring period:

- Cape Northville was along side Berth 3 being loaded with iron ore between 0634 hours 1st March 2011 to 0106 hours 4th of March 2011;
- Peace Traffic was alongside Berth 1 being loaded with barley between 0717 hours 2nd March 2011 to 2043 hours 3rd March 2011;
- Theofylaktos was alongside Berth 1 being loaded with barley between 2255 hours 3rd March 2011 to 0810 hours 5th March 2011
- 80,645 tonnes of iron ore averaged across 9 trains
- 497 tonnes of nickel concentrate across 8 trucks

2.2 Meteorological Activities

The wind directions for the 72 hour period in which the exceedances occurred are in the wind arc from NE (10%), ENE (21%), E (43%) and ESE (25%) ***(Figure 2)***. The maximum hourly average wind speed of 13.8 m/s (27 Knots) was recorded in the first exceedance period (1st to 2nd March) from the ESE between 1600 and 1700 hours on the 1st March, typical of the afternoon winds in summer on the Esperance coast. The 'Beaufort Wind Force Scale' is a measure of understanding wind speeds in descriptive terminology. A wind speed of 27 knots is described as a 'strong breeze' (22-28 knots) (BOM, 2011). The maxima recorded in the two subsequent exceedance periods are also a strong breeze and occurred from the ESE in the late afternoon (1600 to 1800 hours).

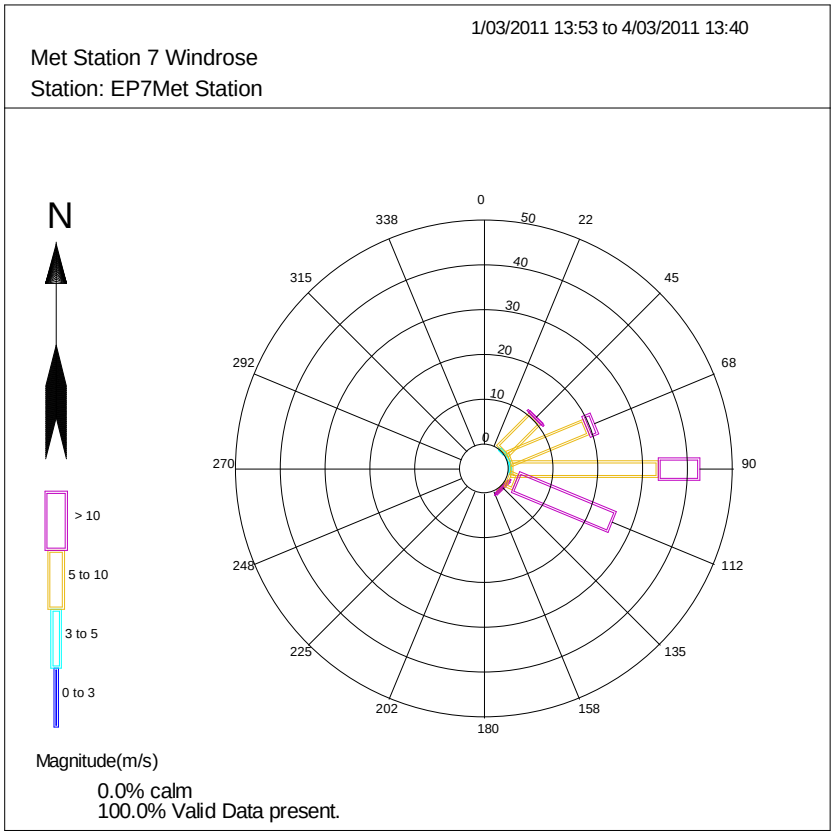

Figure 2: Wind rose for the monitoring period 1352 hrs 1/03/2011 to 1425 hrs 26/02/2011. Raw data source: EP7 monitoring station, Berth 3.

2.3 Reason for exceedance

The exceedances between the 1st and 4th March are likely to be due to strong easterly breezes (maximum of 13.8 m/s ESE) mobilising particulates from unsealed surfaces of the Port but it is likely that grain loading also contributed to the overall levels of TSP. Iron (0.7% Fe in TSP) and nickel (<0.001% Ni in TSP) handling activities constituted less than 1% of the TSP.

The Ports internal Esamplers are used to indicate trends in TSP by measuring light scatter , but unlike the HVAS, Esamplers are not accurate enough to provide quantitative levels. Therefore, the data presented in ***Figure 4*** is only used to indicate trends in dust. The data shown at EP5, is measured dust levels downwind of sources including Berth 1 and the Port beach. These levels were several fold higher than the other three gauges within the Port. It is noted that even as wind speed declines during the third loading period (***Figure 3***), dust levels at EP5 increase. This suggests the dust increase is being driven by Berth 1 loading activity. This conclusion cannot be drawn for the other loading periods since increases in dust are confounded by increases in wind speed which will increase dust. However, the contribution of grain dust cannot be eliminated for these two earlier loading periods.

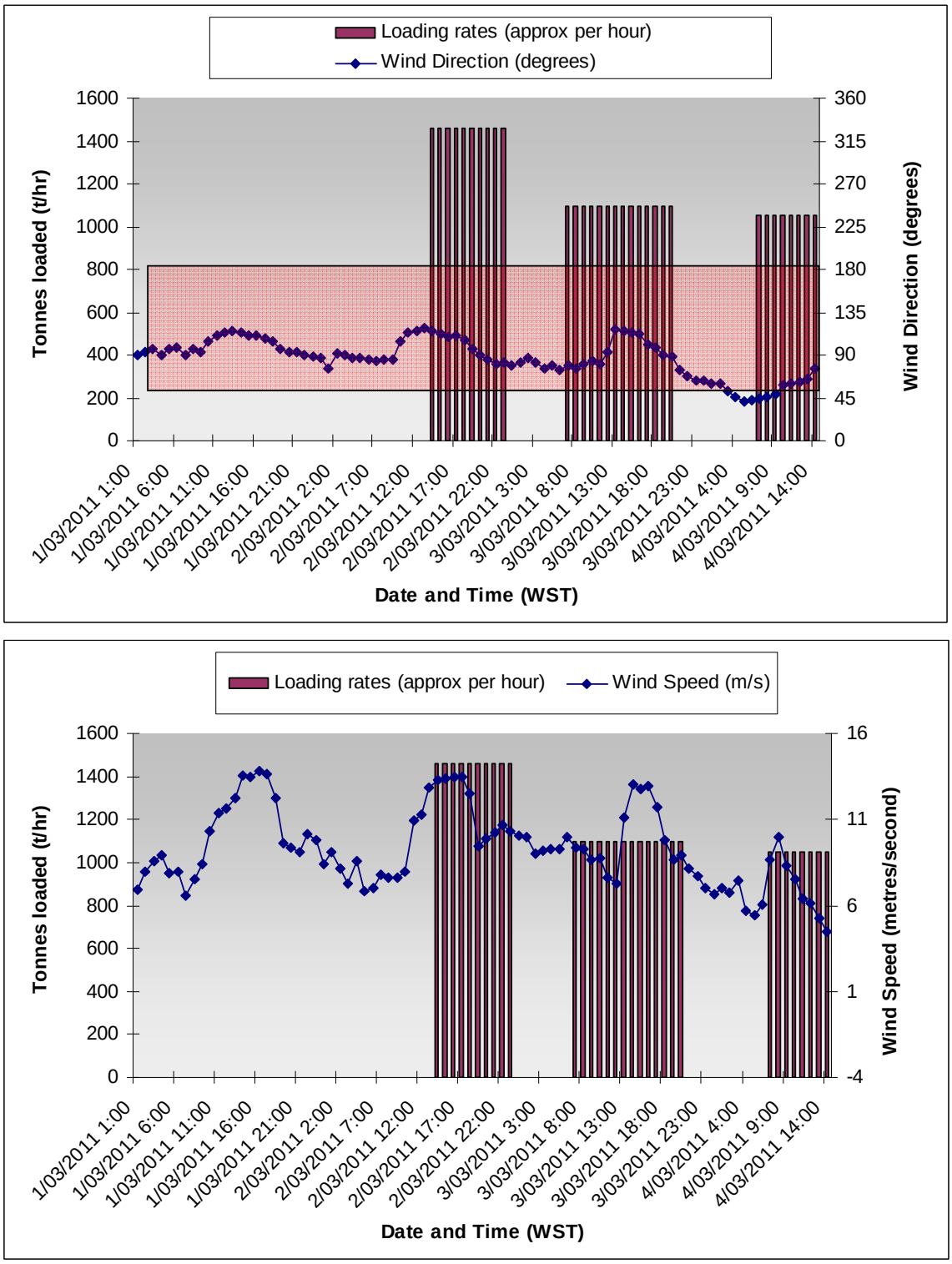

Figure 3: Loading rates in relation to wind direction, wind speed and time/date

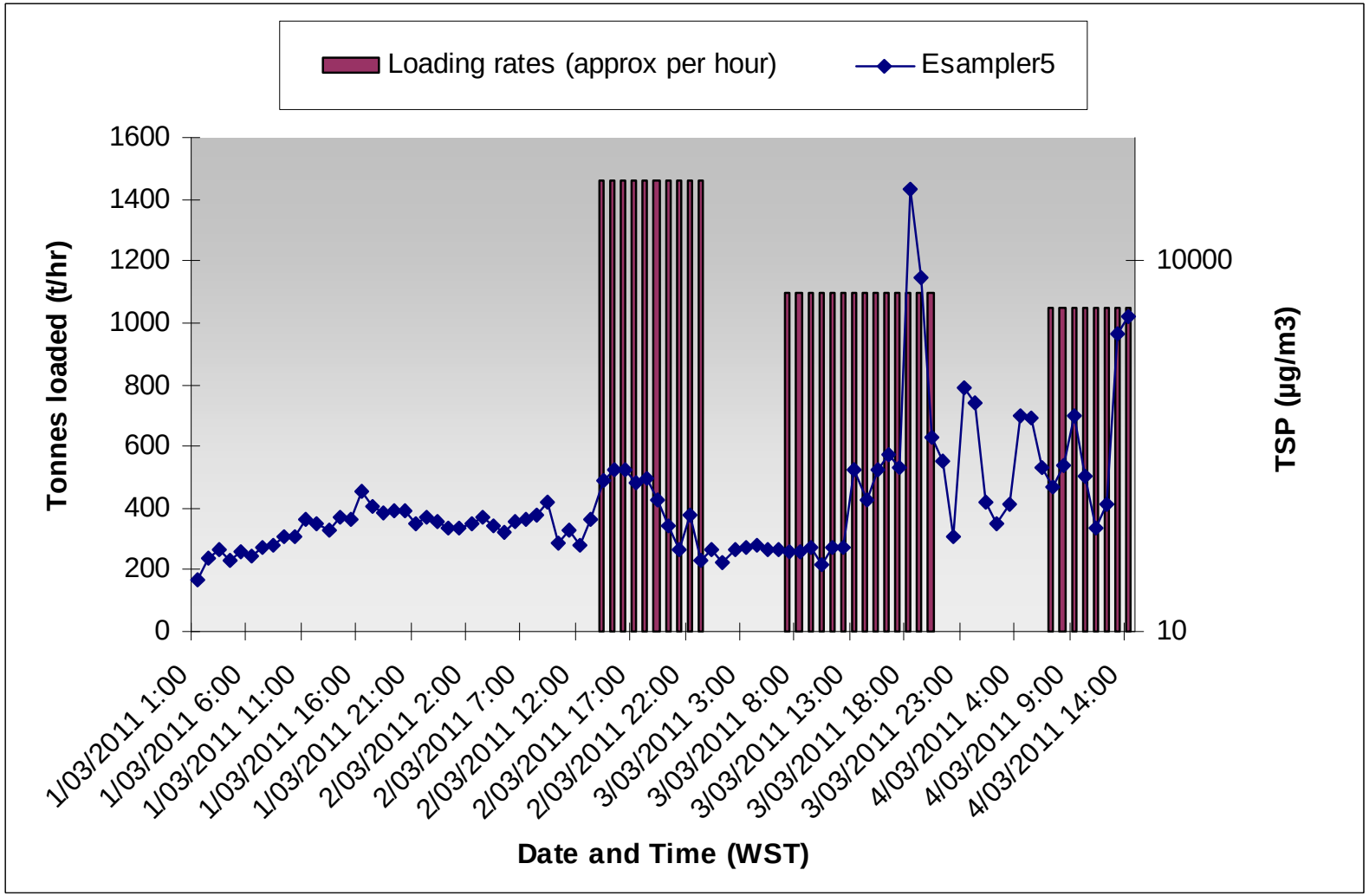

Figure 4: Loading rates in relation to TSP levels and time/date

3. CONCLUSIONS

The exceedances between the 1st and 4th March are likely to be due to strong easterly breezes (maximum of 13.8 m/s ESE) mobilising particulates from unsealed surfaces of the Port but it is likely that grain loading also contributed to the overall levels of TSP. Grain dust was particularly likely to contribute to dust loads during the last loading period between the 3rd and 4th March 2011 when dust levels increased, despite the wind speed declining. Iron (0.7% Fe in TSP) and nickel (<0.001% Ni in TSP) handling activities constituted less than 1% of the TSP.

3.1 Corrective Action

CBH began fogging trials on their shiploader on the 20th March 2011 to determine if this will provide an effective means of dust control.

APPENDIX A MPL LABORATORY REPORT

Part of the Envirolab Group

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CERTIFICATE OF ANALYSIS 109544

Client:
Esperance Ports - Sea and Land
PO Box 35
Esperance
WA 6450

Attention: C Magana

Sample log in details:

Your Reference:	**Dust Analysis**
No. of samples:	23 High Volume Filters
Date samples received:	8/03/11
Date completed instructions received:	8/03/11
Location:	

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:	15/03/11
Date of Preliminary Report:	Not issued
Issue Date:	15/03/11

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This document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025.
Tests not covered by NATA are denoted with *.

Results Approved By:

Dr Monika Buerger
Supervisor – Micro, Asbestos, Dust

Metals in High Volume Filters Our Reference: Your Reference Location Date Sampled	UNITS -- --	PQL -- --	109544-1 EAP691 Site 4 27/02/11	109544-2 EAP692 Site 3 27/02/11	109544-3 EAP693 Site 2 27/02/11	109544-4 EAP695 Site 5 27/02/11	109544-5 EAP696 Blank
Dust	mg/filter	0.1	93	58	69	34	0.10
Dust in Air	µg/m^3	0.1	62	38	46	23	[NA]
Iron	µg/filter	5	1,400	1,000	2,500	140	190
Iron in Air	µg/m^3	0.005	0.95	0.67	1.7	0.090	[NA]
Nickel	µg/filter	2	7	5	16	<2	<2
Nickel in Air	µg/m^3	0.002	0.005	0.003	0.010	<0.002	[NA]
Lead	µg/filter	5	<5	<5	6	<5	<5
Lead in Air	µg/m^3	0.005	<0.005	<0.005	<0.005	<0.005	[NA]
Lithium	µg/filter	2	4	3	5	<2	3
Lithium in Air	µg/m^3	0.001	<0.001	<0.001	<0.001	<0.001	[NA]
Sulfur	µg/filter	50	1,200	1,100	1,300	400	630
Sulfur in Air	µg/m^3	0.02	0.78	0.73	0.85	0.27	[NA]
Zinc	µg/filter	5	1,109	1,094	1,217	357	996
Zinc in Air	µg/m^3	0.002	0.74	0.72	0.81	0.24	[NA]

Metals in High Volume Filters Our Reference: Your Reference Location Date Sampled	UNITS -- --	PQL -- --	109544-6 EAP697 Site 4 28/02/11	109544-7 EAP698 Site 3 28/02/11	109544-8 EAP699 Site 2 28/02/11	109544-9 EAP700 Site 1 28/02/11	109544-10 EAP701 Site 5 28/02/11
Dust	mg/filter	0.1	130	74	53	80	34
Dust in Air	µg/m^3	0.1	83	48	35	52	22
Iron	µg/filter	5	920	800	1,100	720	260
Iron in Air	µg/m^3	0.005	0.60	0.52	0.73	0.47	0.17
Nickel	µg/filter	2	4	4	10	6	<2
Nickel in Air	µg/m^3	0.002	0.003	0.002	0.006	0.004	<0.002
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	4	4	3	3	3
Lithium in Air	µg/m^3	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulfur	µg/filter	50	1,200	1,200	1,700	2,500	980
Sulfur in Air	µg/m^3	0.02	0.81	0.80	1.1	1.6	0.64
Zinc	µg/filter	5	1,090	1,100	1,047	983	975
Zinc in Air	µg/m^3	0.002	0.71	0.72	0.68	0.64	0.63

Client Reference: Dust Analysis

Metals in High Volume Filters Our Reference: Your Reference Location Date Sampled	UNITS -- --	PQL -- --	109544-11 EAP702 Blank	109544-12 EAP703 Site 4 1/03/11	109544-13 EAP704 Site 3 1/03/11	109544-14 EAP705 Site 2 1/03/11	109544-15 EAP706 Site 1 1/03/11
Dust	mg/filter	0.1	3.6	200	150	150	190
Dust in Air	µg/m^3	0.1	[NA]	120	92	91	110
Iron	µg/filter	5	190	3,000	2,100	3,900	2,500
Iron in Air	µg/m^3	0.005	[NA]	1.8	1.3	2.4	1.5
Nickel	µg/filter	2	<2	15	13	34	15
Nickel in Air	µg/m^3	0.002	[NA]	0.009	0.008	0.021	0.009
Lead	µg/filter	5	<5	<5	<5	12	5
Lead in Air	µg/m^3	0.005	[NA]	<0.005	<0.005	0.010	<0.005
Lithium	µg/filter	2	3	4	3	5	5
Lithium in Air	µg/m^3	0.001	[NA]	<0.001	<0.001	<0.001	<0.001
Sulfur	µg/filter	50	640	1,500	3,300	4,500	3,900
Sulfur in Air	µg/m^3	0.02	[NA]	0.92	2.0	2.8	2.4
Zinc	µg/filter	5	1,051	968	996	1,255	1,020
Zinc in Air	µg/m^3	0.002	[NA]	0.59	0.61	0.77	0.62

Metals in High Volume Filters Our Reference: Your Reference Location Date Sampled	UNITS -- --	PQL -- --	109544-16 EAP707 Site 5 1/03/11	109544-17 EAP708 Blank	109544-18 EAP709 Site 4 2/03/11	109544-19 EAP710 Site 3 2/03/11	109544-20 EAP711 Site 2 2/03/11
Dust	mg/filter	0.1	65	3.7	140	160	170
Dust in Air	µg/m^3	0.1	40	[NA]	96	110	120
Iron	µg/filter	5	350	170	2,400	2,300	2,900
Iron in Air	µg/m^3	0.005	0.22	[NA]	1.6	1.5	1.9
Nickel	µg/filter	2	2	<2	12	25	26
Nickel in Air	µg/m^3	0.002	<0.002	[NA]	0.008	0.016	0.017
Lead	µg/filter	5	<5	<5	<5	<5	12
Lead in Air	µg/m^3	0.005	<0.005	[NA]	<0.005	<0.005	0.010
Lithium	µg/filter	2	3	3	4	3	4
Lithium in Air	µg/m^3	0.001	<0.001	[NA]	<0.001	<0.001	<0.001
Sulfur	µg/filter	50	1,200	580	2,700	4,800	4,200
Sulfur in Air	µg/m^3	0.02	0.73	[NA]	1.8	3.2	2.8
Zinc	µg/filter	5	973	985	1,081	1,037	730
Zinc in Air	µg/m^3	0.002	0.59	[NA]	0.72	0.69	0.49

Client Reference: Dust Analysis

Metals in High Volume Filters Our Reference: Your Reference Location Date Sampled	UNITS -- --	PQL -- --	109544-21 EAP712 Site 1 2/03/11	109544-22 EAP713 Site 5 2/03/11	109544-23 EAP714 Blank
Dust	mg/filter	0.1	120	43	3.1
Dust in Air	µg/m^3	0.1	81	28	[NA]
Iron	µg/filter	5	980	330	170
Iron in Air	µg/m^3	0.005	0.65	0.22	[NA]
Nickel	µg/filter	2	6	<2	<2
Nickel in Air	µg/m^3	0.002	0.004	<0.002	[NA]
Lead	µg/filter	5	<5	<5	<5
Lead in Air	µg/m^3	0.005	<0.005	<0.005	[NA]
Lithium	µg/filter	2	3	3	3
Lithium in Air	µg/m^3	0.001	<0.001	<0.001	[NA]
Sulfur	µg/filter	50	2,000	1,200	680
Sulfur in Air	µg/m^3	0.02	1.3	0.79	[NA]
Zinc	µg/filter	5	594	741	692
Zinc in Air	µg/m^3	0.002	0.39	0.49	[NA]

Method ID	Methodology Summary
WILAB 4	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.
WILAB 17	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 of 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.