



ESPERANCE PORTS

Sea & Land

TSP EXCEEDANCE REPORT

MONITORING PERIOD

15TH – 16TH MARCH 2011

Revision	Prepared	Reviewed	Approved	Date	Description
1	N. Norrish	A Leonard		1/4/2011	

CONTENTS

**FRONT PAGE
CONTENTS**

	Page No.
FIGURE	1
1. INTRODUCTION	2
2. INVESTIGATION	2
2.1 Port Activities	4
2.2 Meteorological Activities	4
2.3 Reason for exceedance	5
3. CONCLUSIONS	9
3.1 Corrective Action	9
Appendix A MPL Laboratory Report	10

FIGURES

Figure 1: Map of Air Quality Monitoring Stations.....	3
Figure 2: Wind rose for the monitoring period 1507 hrs 15/03/2011 to 1527 hrs 16/03/2011. Raw data source: EP7 monitoring station, Berth 3.	5
Figure 3: Loading rates in relation to wind direction, wind speed and time/date	7
Figure 4: Loading rates in relation to PM10 levels at Site 2 and time/date.....	8

1. INTRODUCTION

On the 28th March 2011, the Esperance Port Sea and Land (ESPL) became aware of laboratory results detailing dust (TSP) exceeding the license criteria (refer to **Table 1**). Consistent with the latest Licence (L5099/1974/13) requirement of Condition 9, this requires an exceedance report to be submitted to the DEC by 5th April 2011, within seven working days.

Table 1: Emission Concentration Targets from DEC Licence Number L5099/1974/13 issued to EPSL on 24th February 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

The recorded TSP concentration exceeded the emission concentration targets (**Table 1**) according to the Licence (L5099/1974/13) at Site 2 within the recording periods between 1507 hours 15th March 2011 and 1527 hours on 16th March 2011. The recorded TSP is as follows:

- Site 2: 110 TSP/m³

The location of the monitoring locations is illustrated in **Figure 1**.



Figure 1: Map of Air Quality Monitoring Stations

2.1 Port Activities

The following Port activities occurred during the monitoring period for the exceedance:

- Bogasari Lima was alongside Berth 1 being loaded with wheat between 1800 hours 14th March 2011 to 1042 hours 16th March 2011,;
- Anangel Prosperity was alongside Berth 3 being loaded with iron ore between 0605 hours 15th March 2011 to 2325 hours 17th March 2011;
- Rosco Palm alongside Berth 1 being between 1330 hours 16th March to 2000 hours 19th March 2011. Significant barley loading was unlikely to have occurred within the exceedance period which ended at 1527 hours on the 16th March 2011.
- 45 217 tonnes of iron ore averaged across 5 trains
- 644 tonnes of nickel concentrate across 10 trucks

2.2 Meteorological Activities

The wind directions for the 24 hour period in which the exceedance occurred are in the wind arc from E (82%) and ESE (18%) (**Figure 2**). The maximum hourly average wind speed of 11.9 m/s (23 Knots) was recorded in the exceedance period (15th to 16th March) from the E between 1600 and 1700 hours on the 15th 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 23 Knots is described as a 'strong breeze' (22-28 Knots) (BOM, 2011).

15/03/2011 15:07 to 16/03/2011 15:27

Met Station 7 Windrose
Station: EP7Met Station

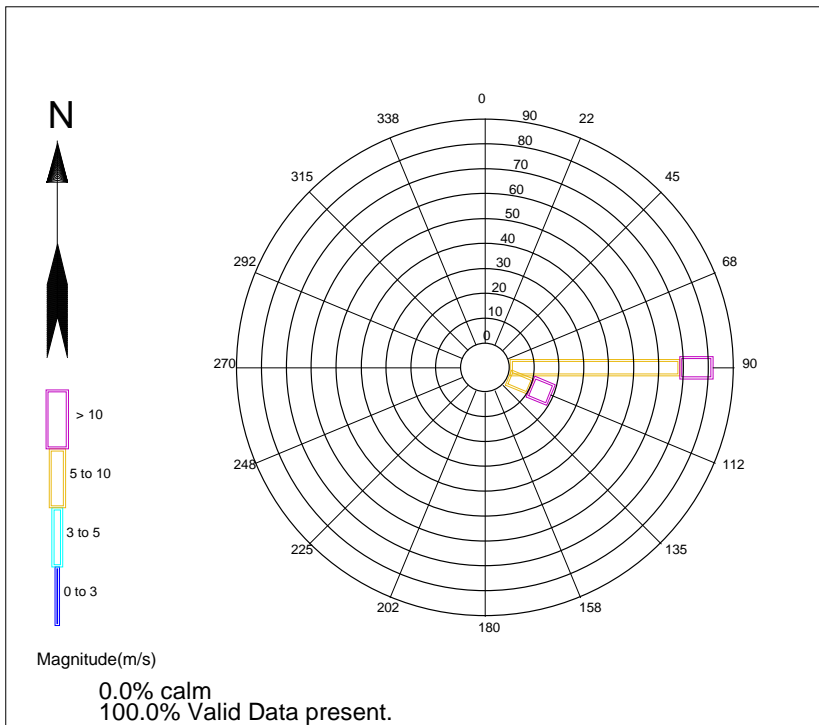


Figure 2: Wind rose for the monitoring period 1507 hrs 15/03/2011 to 1527 hrs 16/03/2011. Raw data source: EP7 monitoring station, Berth 3.

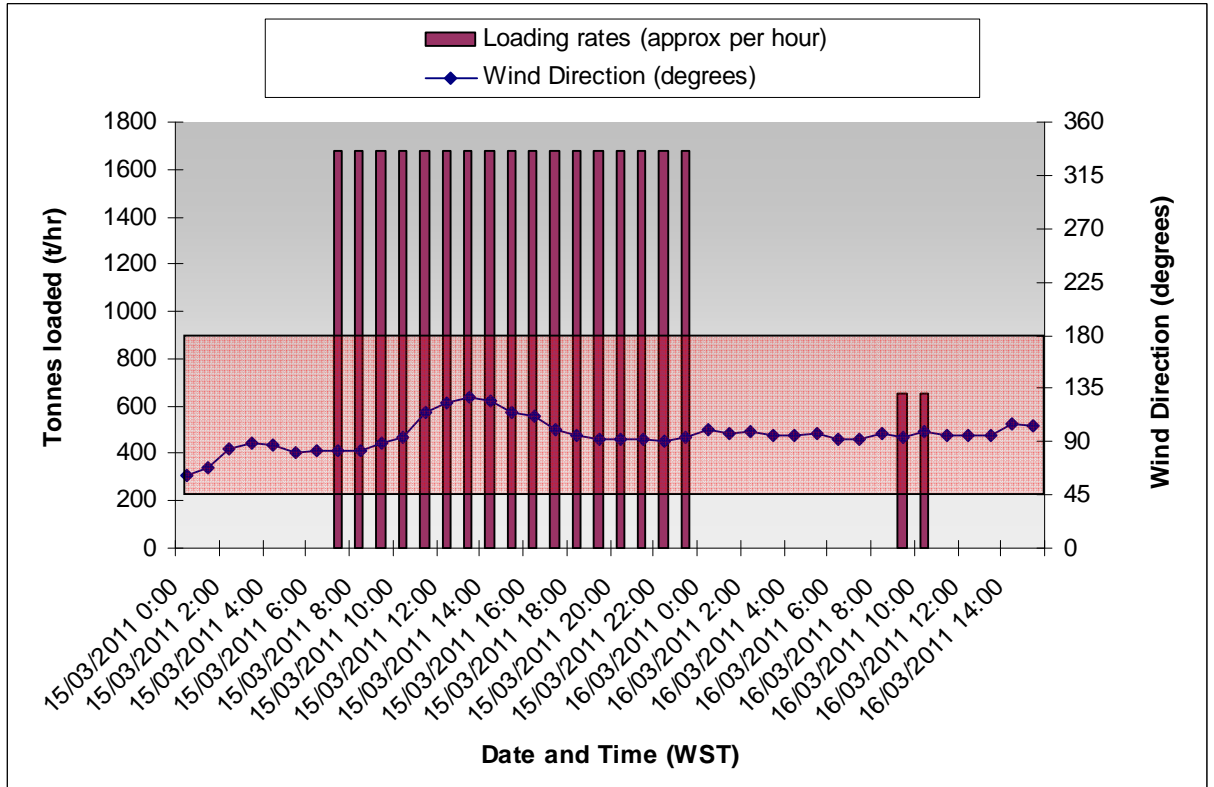
2.3 Reason for exceedance

The exceedance between the 15th and 16th March are likely to be due to strong easterly breezes (maximum of 11.9 m/s E) mobilising particulates from unsealed surfaces of the Port but it is likely that grain loading also contributed to the overall levels of TSP. Iron (0.85% Fe in TSP) and nickel (0.011% Ni in TSP) handling activities constituted less than 1% of the TSP.

The Ports internal E-samplers are used to indicate trends in TSP by measuring light scatter. However, E-sampler 5 (EP5) was producing inaccurate results; therefore the data could not be used in this report. Ecotech will be removing EP5 for repairs on 5th April 2011.

In the absence of real time TSP data, real time PM10 results for Site 2 were used (**Figure 4**) to indicate a possible correlation between wind speeds, grain loading periods and TSP. During both loading periods there was an increase in PM10 at Site 2. There was an unexplained trough in the PM10 data in the middle of the first loading period, although the PM10 still remained above the dust levels before and after the loading periods. Wind direction was relatively constant but wind speed did increase between 1000 and 1500

hours, however this was associated with the trough in PM10 levels. Therefore, increasing wind speed does not explain the rise in PM10 levels. The PM10 graph (**Figure 4**) suggests that the grain loading periods contributed to the overall TSP.



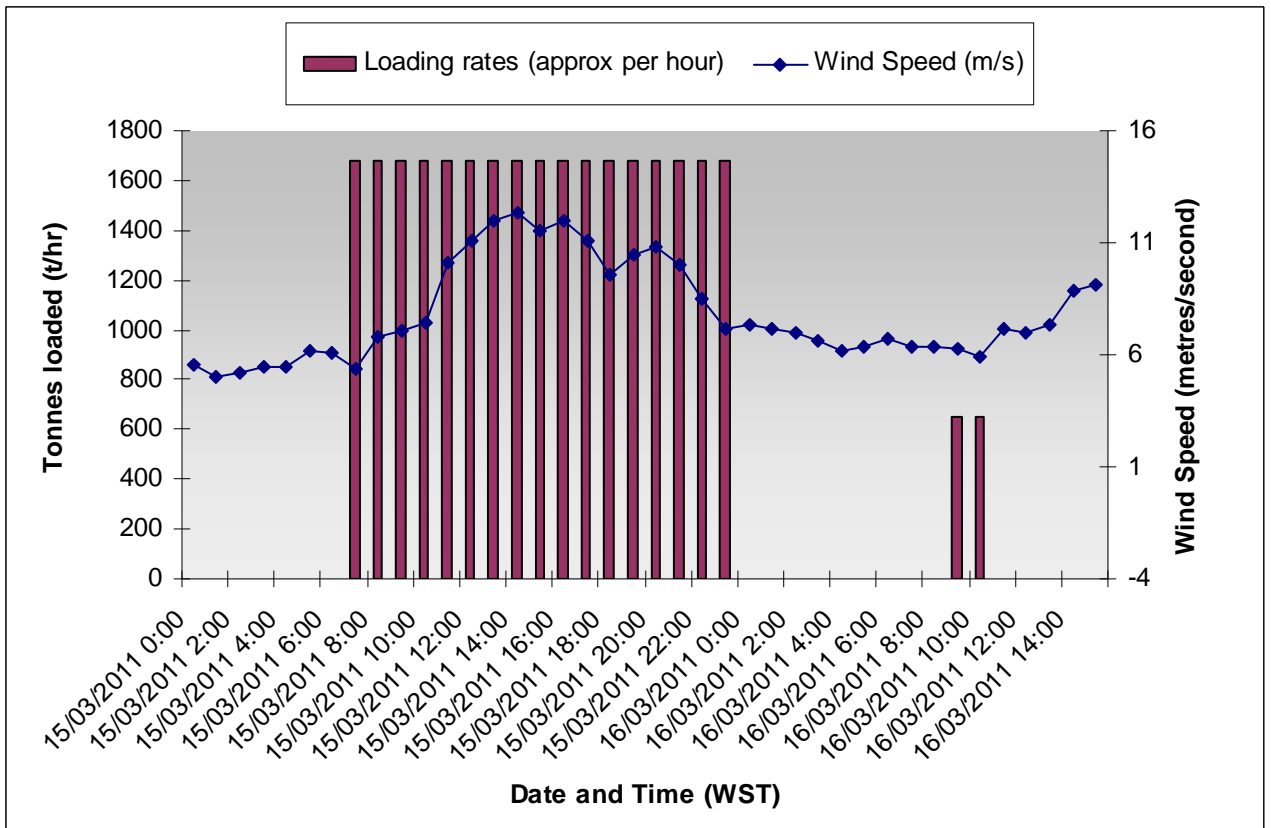


Figure 3: Loading rates in relation to wind direction, wind speed and time/date

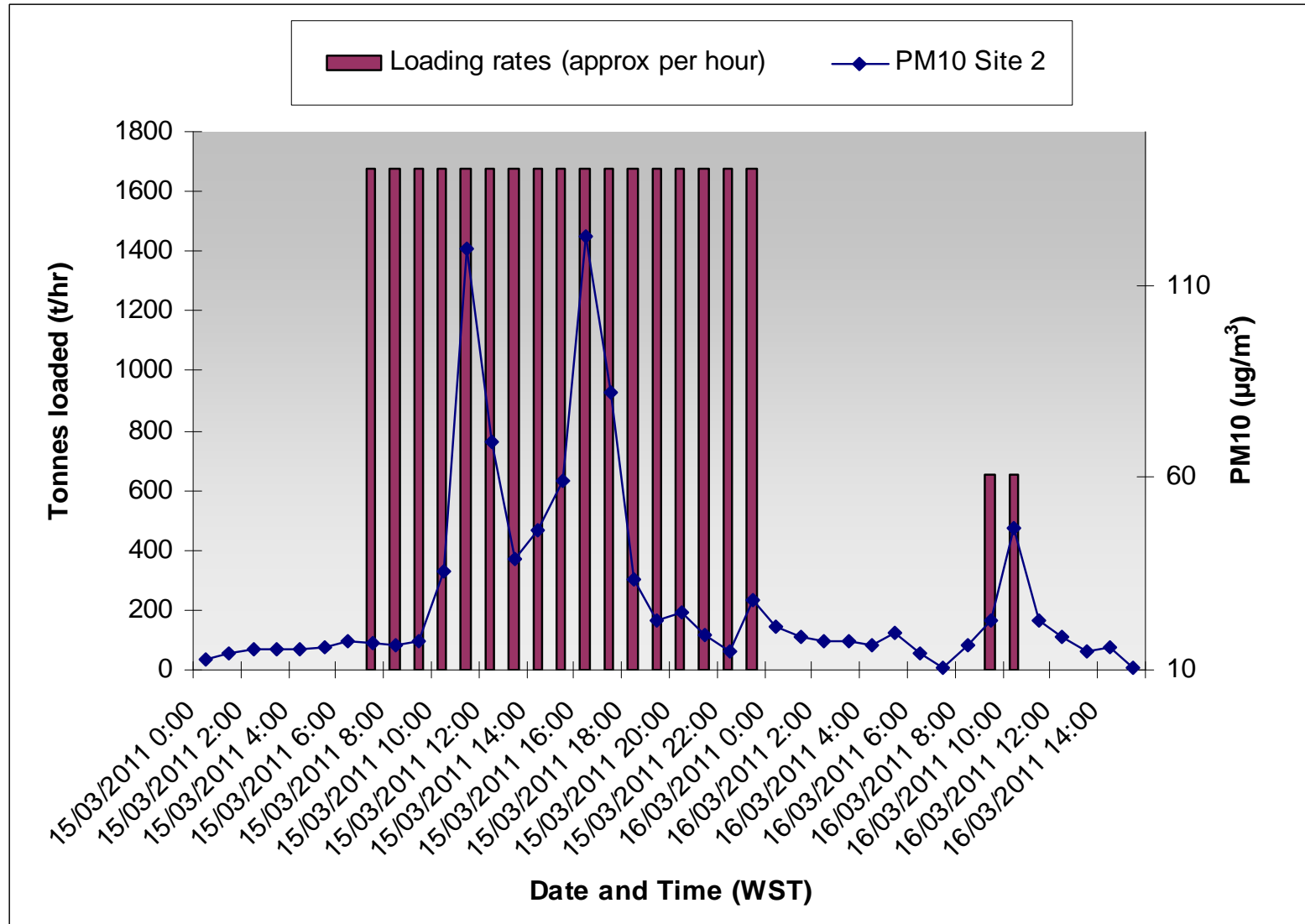


Figure 4: Loading rates in relation to PM10 levels and time/date

3. CONCLUSIONS

The exceedance between the 15th and 16th March 2011 is likely to be due to strong easterly breezes (maximum of 11.9 m/s E) mobilising particulates from unsealed surfaces of the Port but it is likely that grain loading also contributed to the overall levels of TSP. Iron (0.85% Fe in TSP) and nickel (0.011% 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

CERTIFICATE OF ANALYSIS 109884

Client:

Esperance Ports - Sea and Land

PO Box 35

Esperance

WA 6450

Attention: A Leonard

Sample log in details:

Your Reference:

No. of samples:

Date samples received:

Date completed instructions received:

Location:

Dust Analysis

24 High Volume Filters

21/03/11

21/03/11

NA

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:

28/03/11

Date of Preliminary Report:

Not issued

Issue Date:

24/03/11

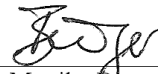
NATA accreditation number 2901. This document shall not be reproduced except in full.

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

Client Reference: Dust Analysis

Metals in High Volume Filters	UNITS	PQL	109884-1	109884-2	109884-3	109884-4	109884-5
Our Reference:	--	--	EAP781	EAP782	EAP783	EAP784	EAP785
Your Reference	--	--	Site 4	Site 3	Site 2	Site 1	Site 5
Location	--	--	14/03/11	14/03/11	14/03/11	14/03/11	14/03/11
Date Sampled							
Dust	mg/filter	0.1	110	140	140	130	42
Dust in Air	µg/m ³	0.1	69	85	85	79	27

Metals in High Volume Filters	UNITS	PQL	109884-6	109884-7	109884-8	109884-9	109884-10
Our Reference:	--	--	EAP786	EAP787	EAP788	EAP789	EAP790
Your Reference	--	--	Blank	Site 4	Site 3	Site 2	Site 1
Location	--	--	15/03/11	15/03/11	15/03/11	15/03/11	15/03/11
Date Sampled							
Dust	mg/filter	0.1	5.3	130	87	170	75
Dust in Air	µg/m ³	0.1	[NA]	84	55	110	47
Iron	µg/filter	5	[NA]	2,000	1,100	1,500	670
Iron in Air	µg/m ³	0.005	[NA]	1.2	0.69	0.94	0.42
Nickel	µg/filter	2	[NA]	11	7	18	3
Nickel in Air	µg/m ³	0.002	[NA]	0.007	0.004	0.012	0.002
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]	4	3	4	4
Lithium in Air	µg/m ³	0.001	[NA]	0.002	0.002	0.002	0.002
Sulfur	µg/filter	50	[NA]	1,900	1,400	7,200	2,500
Sulfur in Air	µg/m ³	0.02	[NA]	1.2	0.88	4.5	1.6
Zinc	µg/filter	5	[NA]	328	252	328	326
Zinc in Air	µg/m ³	0.002	[NA]	0.21	0.16	0.21	0.20

Metals in High Volume Filters	UNITS	PQL	109884-11	109884-12	109884-13	109884-14	109884-15
Our Reference:	--	--	EAP791	EAP792	EAP793	EAP794	EAP795
Your Reference	--	--	Site 5	Blank	Site 4	Site 3	Site 2
Location	--	--	15/03/11	16/03/11	16/03/11	16/03/11	16/03/11
Date Sampled							
Dust	mg/filter	0.1	45	8.0	38	35	68
Dust in Air	µg/m ³	0.1	27	[NA]	24	22	43
Iron	µg/filter	5	250	130	[NA]	[NA]	[NA]
Iron in Air	µg/m ³	0.005	0.15	[NA]	[NA]	[NA]	[NA]
Nickel	µg/filter	2	<2	<2	[NA]	[NA]	[NA]
Nickel in Air	µg/m ³	0.002	<0.002	[NA]	[NA]	[NA]	[NA]
Lead	µg/filter	5	<5	<5	[NA]	[NA]	[NA]
Lead in Air	µg/m ³	0.005	<0.005	[NA]	[NA]	[NA]	[NA]
Lithium	µg/filter	2	3	2	[NA]	[NA]	[NA]
Lithium in Air	µg/m ³	0.001	0.002	[NA]	[NA]	[NA]	[NA]
Sulfur	µg/filter	50	1,500	620	[NA]	[NA]	[NA]
Sulfur in Air	µg/m ³	0.02	0.92	[NA]	[NA]	[NA]	[NA]
Zinc	µg/filter	5	552	233	[NA]	[NA]	[NA]
Zinc in Air	µg/m ³	0.002	0.33	[NA]	[NA]	[NA]	[NA]

Client Reference: Dust Analysis

Metals in High Volume Filters	UNITS	PQL	109884-16	109884-17	109884-18	109884-19	109884-20
Our Reference:	--	--	EAP796	EAP797	EAP798	EAP799	EAP800
Your Reference	--	--	Site 1	Site 5	Blank	Site 4	Site 3
Location	--	--	16/03/11	16/03/11		17/03/11	17/03/11
Date Sampled							
Dust	mg/filter	0.1	37	24	4.1	36	39
Dust in Air	µg/m ³	0.1	23	15	[NA]	24	26

Metals in High Volume Filters	UNITS	PQL	109884-21	109884-22	109884-23	109884-24	109884-25
Our Reference:	--	--	EAP801	EAP802	EAP803	EAP804	Lab Blank
Your Reference	--	--	Site 2	Site 1	Site 5	Blank	Blank
Location	--	--	17/03/11	17/03/11	17/03/11		
Date Sampled							
Dust	mg/filter	0.1	63	17	14	4.6	[NA]
Dust in Air	µg/m ³	0.1	42	12	9.1	[NA]	[NA]
Iron	µg/filter	5	[NA]	[NA]	[NA]	[NA]	160
Nickel	µg/filter	2	[NA]	[NA]	[NA]	[NA]	<2
Lead	µg/filter	5	[NA]	[NA]	[NA]	[NA]	<5
Lithium	µg/filter	2	[NA]	[NA]	[NA]	[NA]	3
Sulfur	µg/filter	50	[NA]	[NA]	[NA]	[NA]	840
Zinc	µg/filter	5	[NA]	[NA]	[NA]	[NA]	161

Client Reference: Dust Analysis

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 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.