



ESPERANCE PORTS
Sea & Land

TSP EXCEEDANCE REPORT

MONITORING PERIOD

23RD AND 24TH NOVEMBER 2011

Revision	Prepared	Reviewed	Approved	Date	Description
1	N. Norrish	A Leonard		14/12/2011	

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1. INTRODUCTION

On the 7th December 2011, the Esperance Ports Sea and Land (EPSL) became aware of laboratory results detailing dust (measured as Total Suspended Particles) exceeding the 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 (16th December 2011).

Table 1. Emission Concentration Targets from the Port Environmental Licence (L5099/1974/13) issued to EPSL 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 between 23rd November 2011 and 24th November 2011 and between 24th November 2011 and 25th November 2011. The recorded TSP at the monitoring sites (refer to Figure 1) is as follows:

Exceedance A occurred between 1253 hours on 23rd November 2011 and 1318 hours on 24 November 2011

- Site 4: 100 µg/m³

Exceedance B occurred between 1319 hours on 24th November 2011 and 1456 hours on 25th November 2011

- Site 4: 120 µg/m³

Note: to reflect the practical reporting errors, values exceeding 100 µg/m³ are rounded to the nearest 10 µg/m³ by MPL analytical laboratory.

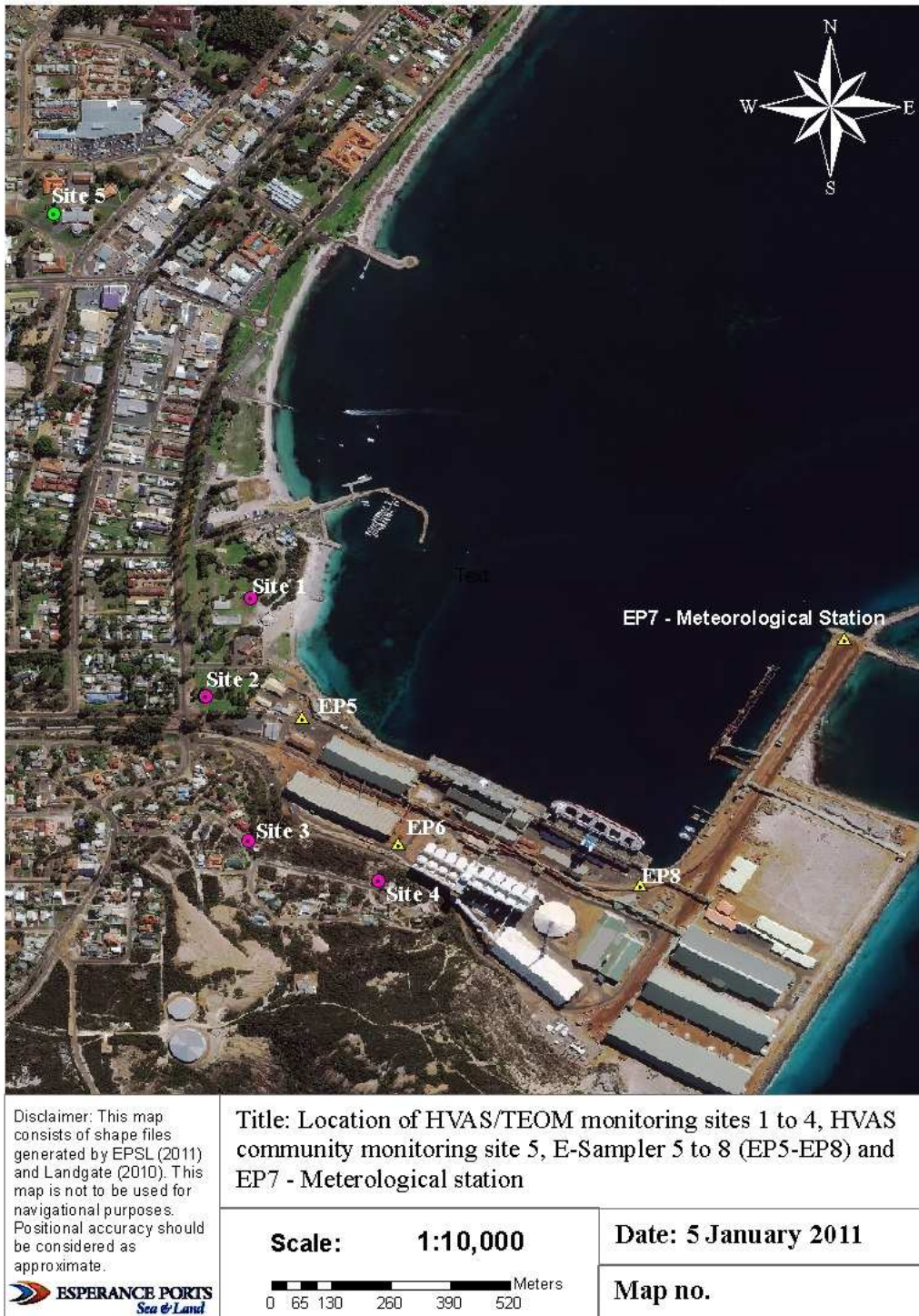


Figure 1: Location of Air Quality Monitoring Stations

2.1 Port Activities

The following Port activities occurred during the monitoring period:

Exceedance A:

- Hal Pendant was along side Berth 2 between 1155 on 18th November 2011 and 1754 on 23rd November 2011 being unloaded with empty containers and loaded with nickel containers and bulker bags.
- CSK Grandeur was along side Berth 3 between 1912 on 22nd November 2011 and 1748 on 25th November 2011 being loaded with iron ore.
- 27704 tonnes of iron ore averaged across 3 trains;
- 171 tonnes of nickel concentrate across 2 trucks; and
- 857 tonnes of sulphur was out-loaded across 11 trucks.

Exceedance B:

- CSK Grandeur was along side Berth 3 between 1912 on 22nd November 2011 and 1748 on 25th November 2011 being loaded with iron
- 27445 tonnes of iron ore averaged across 3 trains;
- 168 tonnes of nickel concentrate across 2 trucks; and
- 777 tonnes of sulphur was out-loaded across 10 trucks.

2.2 Meteorological Activities

Exceedance A:

The wind directions for the 24 hour period in which the exceedance occurred are in the wind arc from NNE (20%), NE (38%), ENE (15%), E (6%), ESE (15%) and SE (6%) (Figure 2). The maximum hourly average wind speed of 12.0 m/s (23.3 knots) was recorded from the ESE (108 degrees) between 1600 and 1700 hours on the 23rd November, 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 23.3 knots is described as 'strong winds' (22-27 knots) (BOM, 2011).

Exceedance B:

The wind directions for the 24 hour period in which the exceedance occurred are in the wind arc from NNW (11%), N (19%), NNE (22%), NE (9%), ENE (7%), E (5%), ESE (16%), SE (5%), SSE (3%), S (2%) and SSW (1%) (Figure 3). The maximum hourly average wind speed of 11.4 m/s (22.2 knots) was recorded from the NNE (15 degrees) between 0400 and 0500 hours on the 25th November 2011. The ‘Beaufort Wind Force Scale’ is a measure of understanding wind speeds in descriptive terminology. A wind speed of 22.2 knots is described as ‘strong winds’ (22-27 knots) (BOM, 2011).

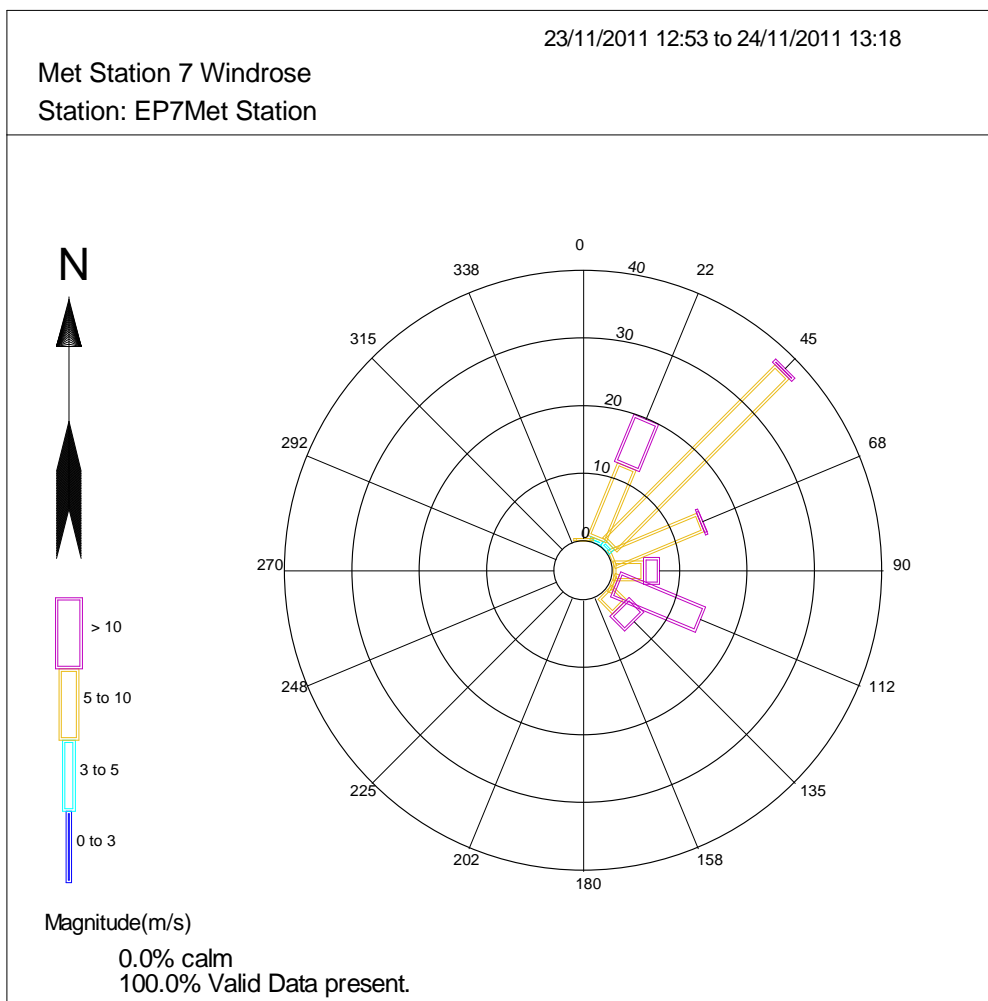


Figure 2. Wind rose for the monitoring period 1253 hrs on 23/11/2011 to 1318 hrs on 24/11/2011. Raw data source: EP7 monitoring station, Berth 3

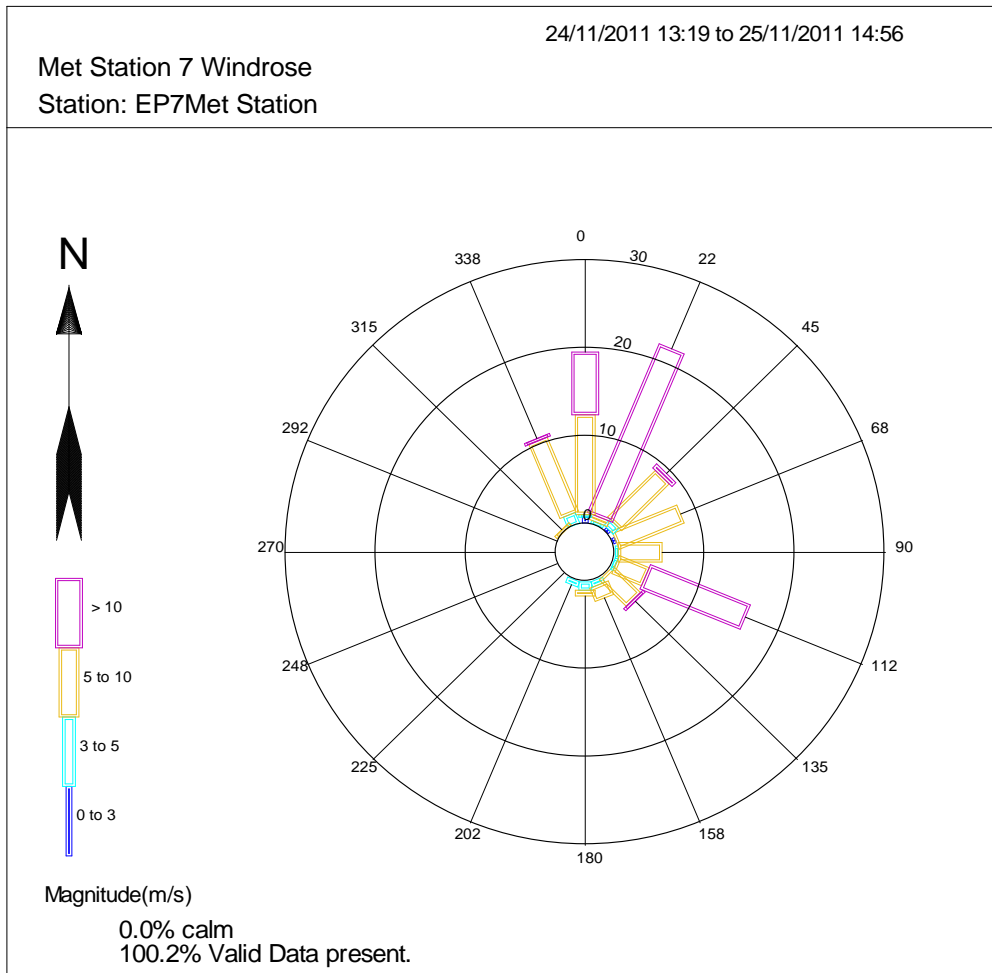


Figure 3. Wind rose for the monitoring period 1319 hrs on 24/11/2011 to 1456 hrs on 25/11/2011. Raw data source: EP7 monitoring station, Berth 3

2.3 Reason for exceedance

Exceedance A:

The exceedance at Site 4 between the 23rd and 24th November is most likely to be due to strong winds (maximum of 12 m/s from ESE) mobilising particles from the Esperance foreshore and 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 (5% Fe in TSP) and nickel (0.03% Ni in TSP) contributed less than 6% of the TSP.

Exceedance B:

The exceedance at Site 4 between the 24th and 25th November is most likely to be due strong winds mobilising particles from the Esperance foreshore and 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 (3.7% Fe in TSP) and nickel (0.01% Ni in TSP) contributed less than 4% of the TSP.

3. CONCLUSIONS

The exceedances between the 23rd and 24th November and 24th to 25th November 2011 at Site 4 are most likely to be due to strong winds (maximum of 12 m/s ESE on 23rd November 2011 and 11.4 m/s from NNE on 24th November 2011) mobilising dust and particulates from Esperance foreshore and unsealed surfaces within the Port, including the reclaim area, Port lease areas (CBH and Summit Fertilizers) and Dempster Head. 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 in the Port and from Dempster Head. EPSL already implements a dust binding agent on unsealed surfaces. The annual road grading and dust bind agent application has been carried out since these TSP exceedances. No further action can be practically taken by EPSL to further reduce dust.

APPENDIX A MPL LABORATORY REPORT

CERTIFICATE OF ANALYSIS 116965

Client:

Esperance Ports - Sea and Land

PO Box 35

Esperance

WA 6450

Attention: N Norrih

Sample log in details:

Your Reference:

No. of samples:

Date samples received:

Date completed instructions received:

Location:

Dust Analysis

18 High Volume Filters

28/11/11

28/11/11

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:

5/12/11

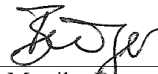
Date of Preliminary Report:

Not issued

Issue Date:

7/12/11

Results Approved By:



Dr Monika Buerger
Supervisor – Micro, Asbestos, Dust

Client Reference: Dust Analysis

Metals in High Volume Filters							
Our Reference:	UNITS	PQL	116965-1	116965-2	116965-3	116965-4	116965-5
Your Reference	--	--	EPL389 Lot T02802	EPL390 Lot T02802	EPL391 Lot T02802	EPL392 Lot T02802	EPL393 Lot T02802
Field Sheet Number	--	--	Site 4	Site 3	Site 2	Site 1	Site 5
Date Sampled			22/11/2011	22/11/2011	22/11/2011	22/11/2011	22/11/2011
Filter No			EPL389	EPL390	EPL391	EPL392	EPL393
Dust	mg/filter	0.1	140	90	68	77	46
Dust in Air	µg/m ³	0.1	88	57	40	49	29
Iron	µg/filter	5	5,400	4,100	3,500	3,000	1,100
Iron in Air	µg/m ³	0.005	3.4	2.6	2.0	1.9	0.70
Nickel	µg/filter	2	38	24	26	20	16
Nickel in Air	µg/m ³	0.002	0.024	0.015	0.015	0.013	0.010
Lead	µg/filter	5	6	<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	3,600	3,100	2,300	2,800	2,200
Sulfur in Air	µg/m ³	0.02	2.3	2.0	1.4	1.8	1.4
Zinc	µg/filter	5	3,859	4,128	4,136	4,047	4,046
Zinc in Air	µg/m ³	0.002	2.4	2.6	2.4	2.6	2.5

Metals in High Volume Filters							
Our Reference:	UNITS	PQL	116965-6	116965-7	116965-8	116965-9	116965-10
Your Reference	--	--	EPL394 Lot T02802	EPL395 Lot T02802	EPL396 Lot T02802	EPL397 Lot T02802	EPL398 Lot T02802
Field Sheet Number	--	--	Blank	Site 4	Site 3	Site 2	Site 1
Date Sampled				23/11/2011	23/11/2011	23/11/2011	23/11/2011
Filter No			EPL394	EPL395	EPL396	EPL397	EPL398
Dust	mg/filter	0.1	2.2	160	98	79	90
Dust in Air	µg/m ³	0.1	[NA]	100	64	48	60
Iron	µg/filter	5	240	7,600	5,100	2,800	3,000
Iron in Air	µg/m ³	0.005	[NA]	5.0	3.3	1.7	2.0
Nickel	µg/filter	2	6	38	30	21	13
Nickel in Air	µg/m ³	0.002	[NA]	0.025	0.020	0.013	0.009
Lead	µg/filter	5	<5	7	<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	980	4,000	4,000	2,200	2,600
Sulfur in Air	µg/m ³	0.02	[NA]	2.6	2.6	1.3	1.7
Zinc	µg/filter	5	4,021	4,010	4,054	3,103	3,301
Zinc in Air	µg/m ³	0.002	[NA]	2.6	2.6	1.9	2.2

Client Reference: Dust Analysis

Metals in High Volume Filters Our Reference: Your Reference Field Sheet Number Date Sampled Filter No	UNITS -- --	PQL -- --	116965-11 EPL399 Lot T02802 Site 5 23/11/2011 EPL399	116965-12 EPL400 Lot T01454 Blank EPL400	116965-13 EPL401 Lot T02455 Site 4 24/11/2011 EPL401	116965-14 EPL402 Lot T02455 Site 3 24/11/2011 EPL402	116965-16 EPL404 Lot T02455 Site 1 24/11/2011 EPL404
Dust	mg/filter	0.1	45	1.1	180	130	110
Dust in Air	µg/m ³	0.1	37	[NA]	120	81	67
Iron	µg/filter	5	820	210	6,900	3,500	3,200
Iron in Air	µg/m ³	0.005	0.67	[NA]	4.4	2.2	2.0
Nickel	µg/filter	2	5	<2	21	11	9
Nickel in Air	µg/m ³	0.002	0.004	[NA]	0.013	0.007	0.006
Lead	µg/filter	5	<5	<5	<5	<5	<5
Lead in Air	µg/m ³	0.005	<0.005	[NA]	<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	[NA]	<0.001	<0.001	<0.001
Sulfur	µg/filter	50	1,500	760	2,600	2,500	2,500
Sulfur in Air	µg/m ³	0.02	1.2	[NA]	1.7	1.6	1.6
Zinc	µg/filter	5	3,500	785	635	570	538
Zinc in Air	µg/m ³	0.002	2.9	[NA]	0.40	0.36	0.34

Metals in High Volume Filters Our Reference: Your Reference Field Sheet Number Date Sampled Filter No	UNITS -- --	PQL -- --	116965-17 EPL405 Lot T02455 Site 5 24/11/2011 EPL405	116965-18 EPL406 Lot T02455 Blank EPL406	116965-19 Lab Blank Lot T02802	116965-20 Lab Blank Lot T01454	116965-21 Lab Blank Lot T02455
Dust	mg/filter	0.1	80	2.4	[NA]	[NA]	[NA]
Dust in Air	µg/m ³	0.1	51	[NA]	[NA]	[NA]	[NA]
Iron	µg/filter	5	1,700	190	190	220	200
Iron in Air	µg/m ³	0.005	1.1	[NA]	[NA]	[NA]	[NA]
Nickel	µg/filter	2	4	<2	4	2	<2
Nickel in Air	µg/m ³	0.002	0.002	[NA]	[NA]	[NA]	[NA]
Lead	µg/filter	5	<5	<5	<5	<5	<5
Lead in Air	µg/m ³	0.005	<0.005	[NA]	[NA]	[NA]	[NA]
Lithium	µg/filter	2	<2	<2	<2	<2	<2
Lithium in Air	µg/m ³	0.001	<0.001	[NA]	[NA]	[NA]	[NA]
Sulfur	µg/filter	50	1,300	680	760	820	840
Sulfur in Air	µg/m ³	0.02	0.84	[NA]	[NA]	[NA]	[NA]
Zinc	µg/filter	5	556	521	3,200	870	350
Zinc in Air	µg/m ³	0.002	0.36	[NA]	[NA]	[NA]	[NA]

Client Reference: Dust Analysis

MethodID	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:

This report replaces the one dated 06-12-11 due to omit sample no 15

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.