



**ESPERANCE PORTS**  
*Sea & Land*

## **TSP EXCEEDANCE REPORT**

### **MONITORING PERIOD**

**7 – 8<sup>TH</sup> FEBRUARY 2011**

<b>Revision</b>	<b>Prepared</b>	<b>Reviewed</b>	<b>Approved</b>	<b>Date</b>	<b>Description</b>
1	A. Leonard	C. Magana	A Leonard	28/02/2011	

## CONTENTS

**FRONT PAGE  
CONTENTS**

**Page No.**

<b>TABLE &amp; FIGURE .....</b>	<b>1</b>
<b>1. INTRODUCTION .....</b>	<b>2</b>
<b>2. INVESTIGATION .....</b>	<b>2</b>
<b>2.1 Date and time of the exceedance .....</b>	<b>2</b>
<b>2.2 Port Activities.....</b>	<b>4</b>
<b>2.3 Meterorological Activities .....</b>	<b>4</b>
<b>2.4 Reason for exceedance.....</b>	<b>5</b>
<b>3. CONCLUSIONS .....</b>	<b>5</b>
<b>3.1 Corrective Action.....</b>	<b>5</b>
<b>Appendix A MPL Laboratory Report .....</b>	<b>6</b>

### **TABLE & FIGURE**

<b>Figure 1: Map of Air Quality Monitoring Stations.....</b>	<b>3</b>
<b>Figure 2 Wind rose for the monitoring period 1200 hrs 7/02/2011 to 1200 hrs 8/02/2011. Raw data source: EP7 monitoring station, Berth 3. ....</b>	<b>4</b>

## 1. INTRODUCTION

On the 18<sup>th</sup> of February 2011, the Esperance Port Sea and Land (ESPL) became aware of laboratory results detailing dust (TSP) exceedences of 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 on 1<sup>st</sup> of 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 <sup>3</sup>
Dust as PM <sub>10</sub>	50 µg/m <sup>3</sup>
Dust as TSP	90 µg/m <sup>3</sup>
Silica in air	5 µg/m <sup>3</sup>

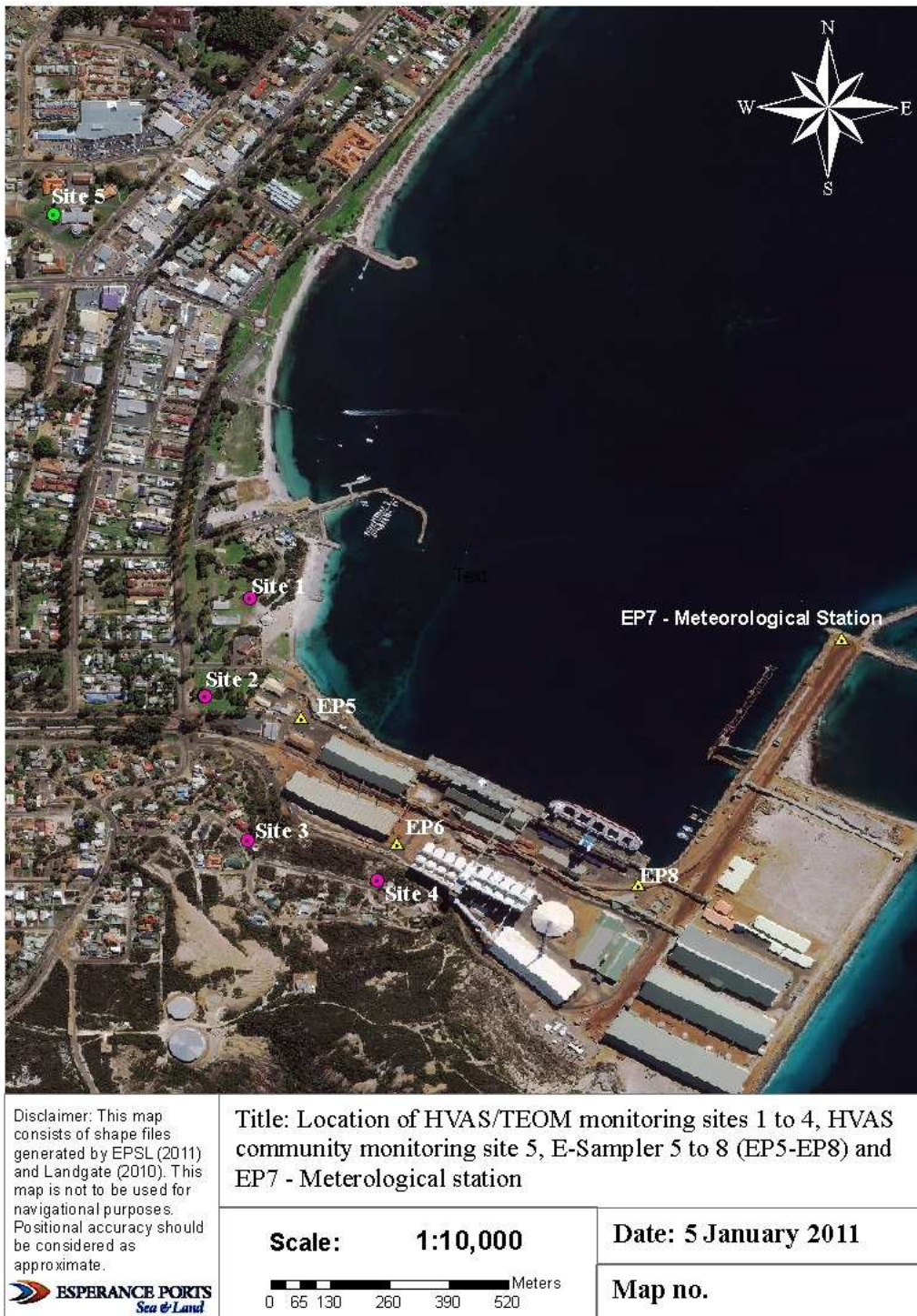
## 2. INVESTIGATION

### 2.1 Date and time of the exceedance

The recorded TSP concentration exceeded the emission concentration target (**Table 1**) according to the Licence L5099/1974/12 within the **exceedance periods**, from **1140 7/2/2011 to 1230 8/2/2011**)

- 140 µg TSP/m<sup>3</sup> at site 1;
- 160 µg TSP/m<sup>3</sup> at site 2; and
- 92 µg TSP/m<sup>3</sup> at site 4.

These TSP exceedences came as no surprise, since an exceedance report was previously submitted to DEC for this same period. This PM10 report describes near gale winds mobilising dust from particulates from the unsealed surfaces of Dempster Head, the reclaim area around sheds 3 and 4, and the CBH lease area. The same forces will be in action to cause the TSP exceedences described in this report.



**Figure 1:** Map of Air Quality Monitoring Stations

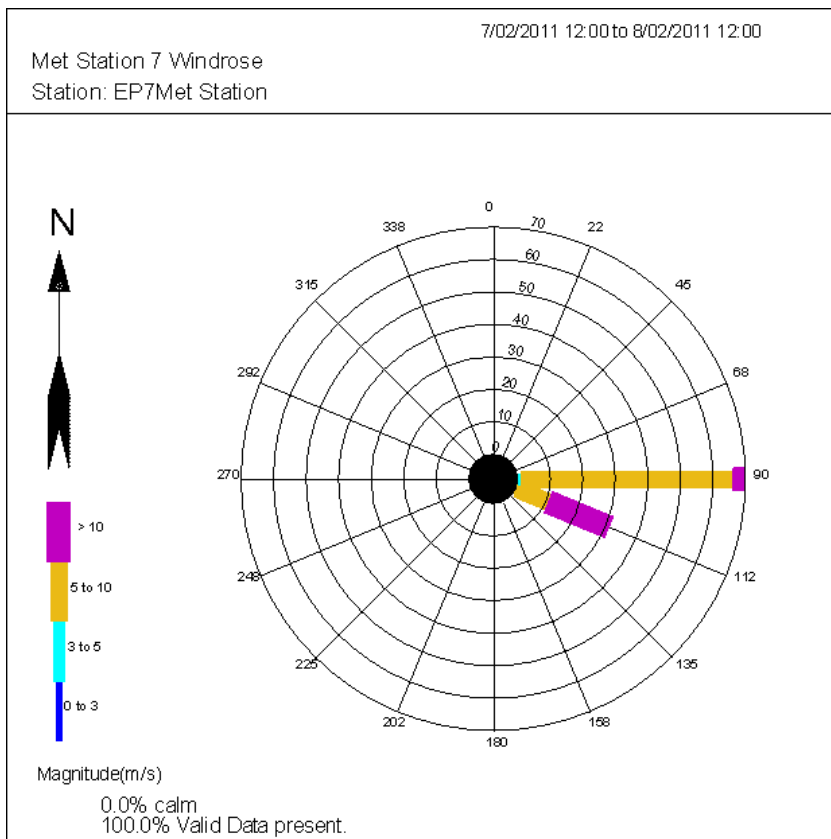
## 2.2 Port Activities

The following Port activities occurred during the monitoring period:

- GCL Argentina was along side Berth 3 being loaded with iron ore between 0812 hours 7<sup>th</sup> of February 2011 to 1218 hours 8<sup>th</sup> of February 2011.
- 26,093 tonnes of iron ore averaged across 3 trains
- 120 tonnes of nickel concentrate across 2 trucks

## 2.3 Meteorological Activities

The wind directions for the 24 hour period are in the wind arc from E (69%) to ESE (31%) (**Figure 2**). The maximum hourly average wind speed of 14.4 m/s (51.8 km/hr) was recorded from the ESE at 1500 on the 7<sup>th</sup> of February, 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 14.4 m/s is described as a ‘near gale winds’ (BOM, 2011).



**Figure 2** Wind rose for the monitoring period 1200 hrs 7/02/2011 to 1200 hrs 8/02/2011. Raw data source: EP7 monitoring station, Berth 3.

## **2.4 Reason for exceedance**

The TSP exceedances for Sites 1, 2 and 4 were due to wind speeds increasing to about 14 m/s and shifting to an ESE direction (approximately 125 degrees) refer to **Figure 3**. These conditions may have mobilised TSP particulates from the unsealed surfaces of Dempster Head, the reclaim area around sheds 3 and 4, and the CBH lease area. Sites 1 and 2 were affected by the dust more than sites 3 and 4 due to the influence of the Port beach in the near gale ESE winds. The marginal exceedance at site 4 is likely to be due to dust from unsealed surfaces on the EPSL reclaim area, the CBH lease area and Dempster Head. Iron (<1.3% TSP) and nickel (<0.01% TSP) handling activities did not contribute significantly to the dust (TSP).

## **3. CONCLUSIONS**

These TSP exceedences came as no surprise, since an exceedance report was previously submitted to DEC for this same period. This PM10 report describes near gale winds mobilising dust from particulates from the unsealed surfaces of Dempster Head, the reclaim area around sheds 3 and 4, and the CBH lease area. The same forces will be in action to cause the TSP exceedances described in this report.

### **3.1 Corrective Action**

The event is predominately due to meteorological conditions and the unsealed surfaces. EPSL already implements a dust binding agent on unsealed surfaces. No further action can be practically taken by EPSL to further reduce dust in near gale winds.

**APPENDIX A    MPL LABORATORY REPORT**

## CERTIFICATE OF ANALYSIS 109011

Client:

**Esperance Ports - Sea and Land**

PO Box 35  
Esperance  
WA 6450

Attention: C Magana

Sample log in details:

Your Reference:	<u>Dust Analysis</u>
No. of samples:	24 High Volume Filters
Date samples received:	14/02/11
Date completed instructions received:	14/02/11
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:	21/02/11
Date of Preliminary Report:	Not sent
Issue Date:	18/02/11

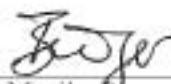
NATA accreditation number 2901. This document shall not be reproduced except in full.

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 Berger  
Supervisor - Micro, Asbestos, Dust

Metals in High Volume Filters Our Reference: Your Reference Location Date Sampled	UNITS	PQL	109011-1 EAP577 Site 4 6/02/11	109011-2 EAP578 Site 3 6/02/11	109011-3 EAP579 Site 2 6/02/11	109011-4 EAP580 Site 1 6/02/11	109011-5 EAP581 Site 5 6/02/11
Dust	mg/filter	0.1	110	100	130	120	140
Dust in Air	µg/m <sup>3</sup>	0.1	68	62	79	75	87

Metals in High Volume Filters Our Reference: Your Reference Location Date Sampled	UNITS	PQL	109011-6 EAP582 Blank	109011-7 EAP583 Site 4 7/02/11	109011-8 EAP584 Site 3 7/02/11	109011-9 EAP585 Site 2 7/02/11	109011-10 EAP586 Site 1 7/02/11
Dust	mg/filter	0.1	1.5	150	120	250	220
Dust in Air	µg/m <sup>3</sup>	0.1	[NA]	92	72	160	140
Iron	µg/filter	20	[NA]	2,000	1,500	2,700	1,400
Iron in Air	µg/m <sup>3</sup>	0.01	[NA]	1.2	0.92	1.7	0.89
Nickel	µg/filter	5	[NA]	10	8.0	36	13
Nickel in Air	µg/m <sup>3</sup>	0.002	[NA]	0.010	<0.002	0.020	0.010
Lead	µg/filter	5	[NA]	<5.0	<5.0	11	<5.0
Lead in Air	µg/m <sup>3</sup>	0.003	[NA]	<0.003	<0.003	0.010	<0.003
Lithium	µg/filter	5	[NA]	<5.0	<5.0	<5.0	<5.0
Lithium in Air	µg/m <sup>3</sup>	0.002	[NA]	<0.002	<0.002	<0.002	<0.002
Sulfur	µg/filter	50	[NA]	1,700	2,000	7,100	4,500
Sulfur in Air	µg/m <sup>3</sup>	0.03	[NA]	1.0	1.3	4.4	2.8
Zinc	µg/filter	5	[NA]	267	293	305	265
Zinc Oxide in Air	µg/m <sup>3</sup>	0.001	[NA]	0.21	0.23	0.24	0.20

Metals in High Volume Filters Our Reference: Your Reference Location Date Sampled	UNITS	PQL	109011-11 EAP587 Site 5 7/02/11	109011-12 EAP588 Blank	109011-13 EAP589 Site 4 8/02/11	109011-14 EAP590 Site 3 8/02/11	109011-15 EAP591 Site 2 8/02/11
Dust	mg/filter	0.1	85	4.5	43	54	79
Dust in Air	µg/m <sup>3</sup>	0.1	53	[NA]	27	34	50
Iron	µg/filter	20	340	120	310	440	830
Iron in Air	µg/m <sup>3</sup>	0.01	0.21	[NA]	0.19	0.27	0.52
Nickel	µg/filter	5	<5.0	<5.0	7.0	8.0	14
Nickel in Air	µg/m <sup>3</sup>	0.002	<0.002	[NA]	<0.002	0.010	0.010
Lead	µg/filter	5	<5.0	<5.0	<5.0	<5.0	<5.0
Lead in Air	µg/m <sup>3</sup>	0.003	<0.003	[NA]	<0.003	<0.003	<0.003
Lithium	µg/filter	5	<5.0	<5.0	<5.0	<5.0	<5.0
Lithium in Air	µg/m <sup>3</sup>	0.002	<0.002	[NA]	<0.002	<0.002	<0.002
Sulfur	µg/filter	50	1,600	730	3,500	3,800	5,900
Sulfur in Air	µg/m <sup>3</sup>	0.03	0.97	[NA]	2.2	2.4	3.7
Zinc	µg/filter	5	256	227	216	256	239
Zinc Oxide in Air	µg/m <sup>3</sup>	0.001	0.20	[NA]	0.17	0.20	0.19

Metals in High Volume Filters Our Reference: Your Reference Location Date Sampled	UNITS	PQL	109011-16 EAP592 Site 1 8/02/11	109011-17 EAP593 Site 5 8/02/11	109011-18 EAP594 Blank	109011-19 EAP595 Site 4 9/02/11	109011-20 EAP596 Site 3 9/02/11
Dust	mg/filter	0.1	44	13	3.9	23	23
Dust in Air	$\mu\text{g}/\text{m}^3$	0.1	28	8.5	[NA]	15	15
Iron	$\mu\text{g}/\text{filter}$	20	300	200	120	[NA]	[NA]
Iron in Air	$\mu\text{g}/\text{m}^3$	0.01	0.19	0.12	[NA]	[NA]	[NA]
Nickel	$\mu\text{g}/\text{filter}$	5	9.0	<5.0	<5.0	[NA]	[NA]
Nickel in Air	$\mu\text{g}/\text{m}^3$	0.002	0.010	<0.002	[NA]	[NA]	[NA]
Lead	$\mu\text{g}/\text{filter}$	5	<5.0	<5.0	<5.0	[NA]	[NA]
Lead in Air	$\mu\text{g}/\text{m}^3$	0.003	<0.003	<0.003	[NA]	[NA]	[NA]
Lithium	$\mu\text{g}/\text{filter}$	5	<5.0	<5.0	<5.0	[NA]	[NA]
Lithium in Air	$\mu\text{g}/\text{m}^3$	0.002	<0.002	<0.002	[NA]	[NA]	[NA]
Sulfur	$\mu\text{g}/\text{filter}$	50	3,500	1,300	650	[NA]	[NA]
Sulfur in Air	$\mu\text{g}/\text{m}^3$	0.03	2.2	0.84	[NA]	[NA]	[NA]
Zinc	$\mu\text{g}/\text{filter}$	5	171	244	218	[NA]	[NA]
Zinc Oxide in Air	$\mu\text{g}/\text{m}^3$	0.001	0.13	0.19	[NA]	[NA]	[NA]

Metals in High Volume Filters Our Reference: Your Reference Location Date Sampled	UNITS	PQL	109011-21 EAP597 Site 2 9/02/11	109011-22 EAP598 Site 1 9/02/11	109011-23 EAP599 Site 5 9/02/11	109011-24 EAP600 Blank	109011-25 Lab Blank
Dust	mg/filter	0.1	49	37	25	3.2	[NA]
Dust in Air	$\mu\text{g}/\text{m}^3$	0.1	32	24	16	[NA]	[NA]
Iron	$\mu\text{g}/\text{filter}$	20	[NA]	[NA]	[NA]	[NA]	100
Nickel	$\mu\text{g}/\text{filter}$	5	[NA]	[NA]	[NA]	[NA]	<5.0
Lead	$\mu\text{g}/\text{filter}$	5	[NA]	[NA]	[NA]	[NA]	<5.0
Lithium	$\mu\text{g}/\text{filter}$	5	[NA]	[NA]	[NA]	[NA]	<5.0
Sulfur	$\mu\text{g}/\text{filter}$	50	[NA]	[NA]	[NA]	[NA]	590
Zinc	$\mu\text{g}/\text{filter}$	5	[NA]	[NA]	[NA]	[NA]	162

Method ID	Methodology Summary
WLAB 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. Sample tested as received, accreditation does not cover sampling.
WLAB 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 and 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.