TSP EXCEEDANCE REPORT

MONITORING PERIOD

ON 5TH DECEMBER 2011

Revision	Prepared	Reviewed	Approved	Date	Description
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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 the Esperance Ports Sea and Land 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 target of 90 µg/m^3 (Table 1) for TSP on 5th December 2011. The recorded TSP at the monitoring sites (refer to Figure 1) is as follows:

Site 1: 190 µg/m^3 (between 1240 hrs on 5/12/2011 to 1353 hrs on 6/12/2011)

Site 2: 180 µg/m^3 (between 1230 hrs on 5/12/2011 to 1343 hrs on 6/12/2011)

Site 3: 140 µg/m^3 (between 1225 hrs on 5/12/2011 to 1341 hrs on 6/12/2011)

Site 4: 140 µg/m^3 (between 1225 hrs on 5/12/2011 to 1339 hrs on 6/12/2011)

Note: to reflect the practical reporting errors, values exceeding 100 µg/m^3 are rounded to the nearest 10 µg/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:

- MV Ocean Phoenix was alongside Berth 1 between 0130 4th December 2011 and 1900 5th December 2011, being loaded with wheat;
- MV Pearler was alongside Berth 2 between 1430 5th December 2011 and 0400 8th December 2011, being loaded with containers of nickel sulphide; and
- MV Medi Venizia was alongside Berth 3 between 2026 4th December 2011 and 1230 6th December 2011, being loaded with iron ore.

Other activities include:

- 27865 tonnes of iron ore averaged across 3 trains;
- 168 tonnes of nickel sulphide, averaged across 2 trucks; and
- 776 tonnes of formed sulphur was out-loaded 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 NE (1%), ENE (2%), E (29%), ESE (61%) and SE (7%) (Figure 2). The maximum hourly average wind speed of 11.6 m/s (42 km/h) was recorded from the ESE between 1100 and 1200 hours on the 6th December. The 'Beaufort Wind Force Scale' is a measure of understanding wind speeds in descriptive terminology. A wind speed of 42 km/h is described as 'strong winds' (40-50 km/h) (BOM, 2011).

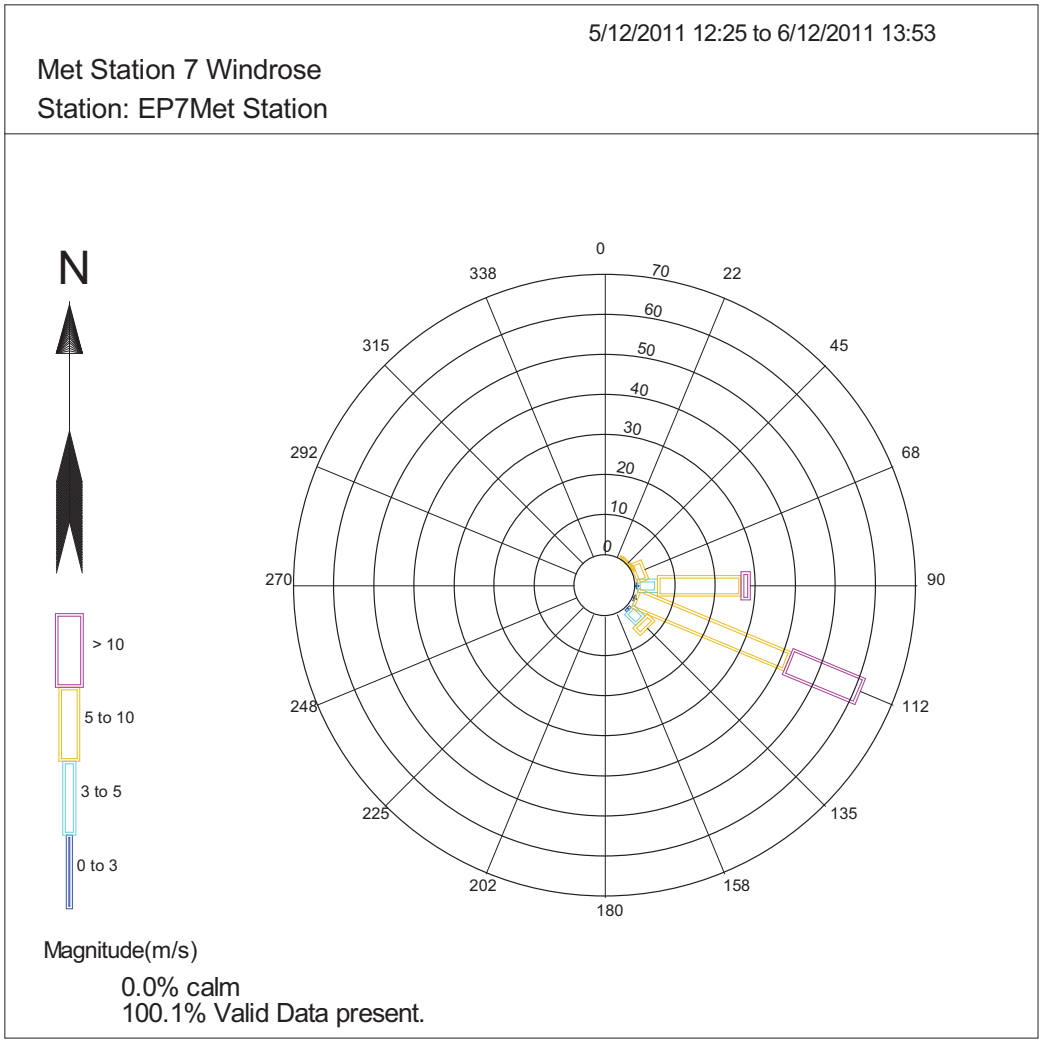

Figure 2. Wind rose for the monitoring period 1225 hrs on 5/12/2011 to 1353 hrs on 6/12/2011. Raw data source: EP7 monitoring station, Berth 3

2.3 Reason for exceedance

The exceedances at Sites 1 and 2 are most likely due to strong winds (maximum of 42 km/h from ESE) mobilising particles from the Port Beach and unsealed surfaces within the Port and from grain loading activities on Berth 1. Particles from Dempster Head may have also contributed to the exceedance. At Site 1 iron (1.1% Fe in TSP) and nickel (0.008% Ni in TSP) contributed less then 2% of the TSP. Site 2 Iron (0.6% Fe in TSP) and nickel (0.005% Ni in TSP) contributed less then 1% of the TSP, indicating iron ore loading and nickel container loading did not contribute to the exceedances.

The exceedances at Sites 3 and 4 are most likely due to strong winds mobilising particles from Dempster Head, and from unsealed surfaces within the Port, including

the reclaim area around Sheds 3 and 4, CBH and Summit Fertiliser lease areas. At Site 3 iron (1.1% Fe in TSP) and nickel (0.004% Ni in TSP) contributed less than 2% of the TSP. At Site 4 iron (0.9% Fe in TSP) and nickel (0.004% Ni in TSP) contributed less than 1% of the TSP, indicating that iron ore and nickel container loading did not contribute to the exceedances.

3. CONCLUSIONS

The exceedances between the 5th and 6th December 2011 at Site 1 and 2 are most likely due to strong winds from the E and ESE mobilising particles from Dempster Head, unsealed surfaces within the Port and from grain loading activity on Berth 1. The strong winds from the E and ESE are typical of summer winds in Esperance. The exceedances at Site 3 and 4 are most likely to be due to strong winds mobilising dust and particulates from Esperance beaches, Dempster Head and unsealed surfaces within the Port, including the reclaim area, Port lease areas (CBH and Summit Fertilizers) and Dempster Head. The proportion of iron and nickel levels contributing to the TSP at each site was less than 2% indicating TSP is a poor indicator of the prescribed mineral handling activities.

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. No further action can be practically taken by EPSL to further reduce dust. EPSL has been expecting CBH to increase dust controls during grain ship loading.

APPENDIX A MPL LABORATORY REPORT

Part of the Envirolab Group

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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:	**Dust Analysis**
No. of samples:	42 High Volume Filters
Date samples received:	8/12/11
Date completed instructions received:	8/12/11
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:	15/12/11
Date of Preliminary Report:	Not issued
Issue Date:	15/12/11

Results Approved By:

Dr Monika Buerger
Supervisor – Micro, Asbestos, Dust

Metals in High Volume Filters Our Reference: Your Reference Field Sheet Number Date Sampled Filter No	UNITS -- --	PQL -- --	117329-1 EPL431 Site 4 29/11/2011 EPL431	117329-2 EPL432 Site 3 29/11/2011 EPL432	117329-3 EPL433 Site 2 29/11/2011 EPL433	117329-4 EPL434 Site 1 29/11/2011 EPL434	117329-5 EPL435 Site 5 29/11/2011 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: Your Reference Field Sheet Number Date Sampled Filter No	UNITS -- --	PQL -- --	117329-6 EPL436 Blank EPL436	117329-7 EPL437 Site 4 30/11/2011 EPL437	117329-8 EPL438 Site 3 30/11/2011 EPL438	117329-9 EPL439 Site 2 30/11/2011 EPL439	117329-10 EPL440 Site 1 30/11/2011 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 Our Reference: Your Reference Field Sheet Number Date Sampled Filter No	UNITS -- --	PQL -- --	117329-11 EPL441 Site 5 30/11/2011 EPL441	117329-12 EPL442 Blank EPL442	117329-13 EPL443 Site 4 1/12/2011 EPL443	117329-14 EPL444 Site 3 1/12/2011 EPL444	117329-15 EPL445 Site 2 1/12/2011 EPL445
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 Our Reference: Your Reference Field Sheet Number Date Sampled Filter No	UNITS -- --	PQL -- --	117329-16 EPL446 Site 1 1/12/2011 EPL446	117329-17 EPL447 Site 5 1/12/2011 EPL447	117329-18 EPL448 Blank EPL448	117329-19 EPL449 Site 4 2/12/2011 EPL449	117329-20 EPL450 Site 3 2/12/2011 EPL450
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 Our Reference: Your Reference Field Sheet Number Date Sampled Filter No	UNITS -- --	PQL -- --	117329-21 EPL451 Site 2 2/12/2011 EPL451	117329-22 EPL452 Site 1 2/12/2011 EPL452	117329-23 EPL453 Site 5 2/12/2011 EPL453	117329-24 EPL454 Blank EPL454	117329-25 EPL455 Site 4 3/12/2011 EPL455
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 Our Reference: Your Reference Field Sheet Number Date Sampled Filter No	UNITS -- --	PQL -- --	117329-26 EPL456 Site 3 3/12/2011 EPL456	117329-27 EPL457 Site 2 3/12/2011 EPL457	117329-28 EPL458 Site 1 3/12/2011 EPL458	117329-29 EPL459 Site 5 3/12/2011 EPL459	117329-30 EPL460 Blank EPL460
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]

Metals in High Volume Filters Our Reference: Your Reference Field Sheet Number Date Sampled Filter No	UNITS -- --	PQL -- --	117329-31 EPL461 Site 4 4/12/2011 EPL461	117329-32 EPL462 Site 3 4/12/2011 EPL462	117329-33 EPL463 Site 2 4/12/2011 EPL463	117329-34 EPL464 Site 1 4/12/2011 EPL464	117329-35 EPL465 Site 5 4/12/2011 EPL465
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 Our Reference: Your Reference Field Sheet Number Date Sampled Filter No	UNITS -- --	PQL -- --	117329-36 EPL466 Blank EPL466	117329-37 EPL467 Site 4 5/12/2011 EPL467	117329-38 EPL468 Site 3 5/12/2011 EPL468	117329-39 EPL469 Site 2 5/12/2011 EPL469	117329-40 EPL470 Site 1 5/12/2011 EPL470
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 Our Reference: Your Reference Field Sheet Number Date Sampled Filter No	UNITS -- --	PQL -- --	117329-41 EPL471 Site 5 5/12/2011 EPL471	117329-42 EPL472 Blank EPL472	117329-43 Lab Blank
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 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.