Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 1041652)									
ES0910204-001	PC63_0.0-0.5	EA055-103: Moisture Content (dried @ 103°C)	---	1.0	%	44.0	41.6	5.5	0% - 20%
ES0910204-010	PC54_0.0-0.3	EA055-103: Moisture Content (dried @ 103°C)	---	1.0	%	63.8	62.9	1.4	0% - 20%
EA055: Moisture Content (QC Lot: 1042989)									
EB0911093-044	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	---	1.0	%	8.6	8.8	1.8	No Limit
EB0911093-070	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	---	1.0	%	15.7	16.5	4.9	0% - 50%
EP005: Total Organic Carbon (TOC) (QC Lot: 1043588)									
ES0910204-001	PC63_0.0-0.5	EP005: Total Organic Carbon	---	0.02	%	3.97	3.92	1.1	0% - 20%
ES0910204-018	PC64_0.25-0.65	EP005: Total Organic Carbon	---	0.02	%	14.1	13.9	1.0	0% - 20%
EP090: Organotin Compounds (QC Lot: 1040678)									
ES0910122-001	Anonymous	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	2170	594	# 114	0% - 20%
ES0910204-009	PC53_0.0-0.42	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	1.3	0.9	39.3	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP005: Total Organic Carbon (TOC) (QCLot: 1043588)								
EP005: Total Organic Carbon	----	0.02	%	<0.02	100 %	99.5	70	130
EP090: Organotin Compounds (QCLot: 1040678)								
EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	12.5 µgSn/kg	75.4	28	129

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP090: Organotin Compounds (QCLot: 1040678)							
ES0910122-002	Anonymous	EP090: Tributyltin	56573-85-4	12.5 µgSn/kg	44.8	20	130

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES0910204**	Page	: 1 of 6
Client	: ENSR AUSTRALIA PTY LIMITED	Laboratory	: Environmental Division Sydney
Contact	: MR CHRISTIANN DONNETTI	Contact	: Charlie Pierce
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: christiaan.donnetti@aecom.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 02 8484 8999	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8484 8989	Facsimile	: +61-2-8784 8500
Project	: S3017805 - Port Kembla Outer Harbour	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 13-JUL-2009
Sampler	: RC	Issue Date	: 24-JUL-2009
Order number	: ----		
		No. of samples received	: 20
Quote number	: SY/330/09 V3	No. of samples analysed	: 20

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content								
Soil Glass Jar - Unpreserved								
PC63_0.0-0.5,	PC49_0.0-0.5,	**10-JUL-2009**	**----**	----	----	**16-JUL-2009**	17-JUL-2009	✓
PC50_0.0-0.4,	PC51_0.0-0.4,							
PC52_0.0-0.19,	DUP II,							
PC53_0.0-0.42,	PC54_0.0-0.3,							
PC56_0.0-0.42,	PC57_0.0-0.24,							
PC58_0.0-0.28,	PC62_0.0-0.59,							
DUP 12,	PC64_0.0-0.25,							
PC65_0.0-0.25								
Soil Glass Jar - Unpreserved								
PC63_0.95-1.05		**13-JUL-2009**	**----**	----	----	**17-JUL-2009**	20-JUL-2009	✓
EP005: Total Organic Carbon (TOC)								
Soil Glass Jar - Unpreserved								
PC63_0.0-0.5,	PC49_0.0-0.5,	**10-JUL-2009**	**17-JUL-2009**	07-AUG-2009	✓	**20-JUL-2009**	07-AUG-2009	✓
PC50_0.4-0.84,	PC51_0.0-0.4,							
PC51_0.4-0.53,	PC53_0.0-0.42,							
PC54_0.0-0.3,	PC54_0.3-0.86,							
PC57_0.0-0.24,	DUP 12,							
PC64_0.25-0.65,	PC65_0.0-0.25							
Soil Glass Jar - Unpreserved								
PC63_0.95-1.05		**13-JUL-2009**	**17-JUL-2009**	10-AUG-2009	✓	**20-JUL-2009**	10-AUG-2009	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP090: Organotin Compounds							
Soil Glass Jar - Unpreserved							
PC63_0.0-0.5, PC49_0.0-0.5, PC50_0.0-0.4, PC51_0.0-0.4, PC52_0.0-0.19, DUP II, PC53_0.0-0.42, PC54_0.0-0.3, PC56_0.0-0.42, PC57_0.0-0.24, PC58_0.0-0.28, PC62_0.0-0.59, DUP 12, PC64_0.0-0.25, PC65_0.0-0.25	**10-JUL-2009**	**16-JUL-2009**	24-JUL-2009	✓	**17-JUL-2009**	25-AUG-2009	✓
Soil Glass Jar - Unpreserved							
PC63_0.95-1.05	**13-JUL-2009**	**16-JUL-2009**	27-JUL-2009	✓	**17-JUL-2009**	25-AUG-2009	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	4	34	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Organotin Analysis	EP090	2	11	**18.2**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP005	2	13	**15.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Organotin Analysis	EP090	1	11	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP005	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Organotin Analysis	EP090	1	11	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP005	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Organotin Analysis	EP090	1	11	**9.1**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (1999) Schedule B(3) (Method 102)
Total Organic Carbon	EP005	SOIL	In-house. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a LECO furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automaticaly measured by infra-red detector.
Organotin Analysis	EP090	SOIL	(USEPA SW 846 - 8270D) Prepared sample extracts are analysed by GC/MS coupled with high volume injection, and quanitified against an established calibration curve.

Preparation Methods	Method	Matrix	Method Descriptions
Organotin Sample Preparation	ORG35	SOIL	In house. 20g sample is spiked with surrogate and leached in a methanol:acetic acid:UHP water mix and vacuum filtered. Reagents and solvents are added to the sample and the mixture tumbled. The butyltin compounds are simultaneously derivatised and extracted. The extract is further extracted with petroleum ether. The resultant extracts are combined and concentrated for analysis.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP090: Organotin Compounds	ES0910122-001	Anonymous	**Tributyltin**	56573-85-4	114 %	0-20%	**RPD exceeds LOR based limits**

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- **No Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**

TBT / TOC only

Chain of Custody

AECOM - Sydney
Level 5, 828 Pacific Highway
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail:

Laboratory Details
Lab. Name: ALS SYDNEY
Lab. Address:
Contact Name:
Lab. Ref:
Tel:
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: S4330 09

Sampled By: Richard Cole
AECOM Project No: S3017805
Project Name: Port Kembla Outer Harbour
PO No.

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☑ Email: christiaan.donneth@aecom.com richard.cole@aecom.com	

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	TOC	PAH (ultra trace)	BTEX/TPH (Std LOR)	SPOCAS	Elutriate Metals	Elutriate PAH's	Cyanide	TBT	Phenols	OCP	Total PCBs	Metals M13	Other
1	PC63_0.0-0.5	10.7.09	X					X		4x soil jars 1bag	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	CONTRACT W...
	PC63_0.5-1.05		X					X		2x soil jars												✓	WO: ES0910204
	~~PC63 MS 0.5~~ DUP15									2x soil jars									✓	✓	✓	✓	LAB: ALS Brisbane
2	PC49_0.0-0.5									2x soil jars	✓	✓	✓					✓				✓	DATE: 13/07/09
	PC49_0.5-0.97									2x soil jars									✓	✓	✓	✓	
3	PC50_0.0-0.4									2x soil jars								✓				✓	SPLIT: ALS SYD BATCH ONLY ES0910203
4	PC50_0.4-0.84									2x soil jars	✓	✓	✓									✓	ELUTRIATE: ES0910206 SPOCAS: ES0910208
	E2									1x soil jar	QA/QC JAR FOR Elutriate for PC51_0.0-0.4												
5	PC51_0.0-0.4									3x soil jars 1bag	✓	✓	✓	✓	✓	✓		✓				✓	
6	PC51_0.4-0.53									1x soil jar	✓											✓	
7	PC52_0.0-0.19		X					X		2x soil jar							✓	✓				✓	
8	DUP11	↓	X					X		2x soil jar							✓	✓				✓	

Environmental Division
Sydney
Work Order
ES0910204
Telephone : +61-2-8784 8555

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Relinquished by: Richard Cole Signed: Date: 13/7/09
Recieved by: Frank Signed: Date: 13/7/09 1:15pm

Lab Report No. | Esky ID

Relinquished by: Signed: Date:
Recieved by: Signed: Date:

Chain of Custody

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail:

Laboratory Details
Lab. Name: ALS SYDNEY
Lab. Address:
Contact Name:
Lab. Ref:
Tel:
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY330 09

Sampled By: Richard Cole
AECOM Project No: 53017805
Project Name: Port Kembla Outer Harbour
PO No.

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☑ Email : richard.cole@aecom.com christiaan.donnetti@aecom.com	

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	TOC	PAH (Ultra trace)	BTEX TPH	SOCCAS	Elutriate Metals	Elutriate PAHs	Cyanide	TRT	Phenols	OCP	Total PCBs	Metals M13	Other
9	PC53_0.0-0.42	10.7.09	X					X		2 x soil jars	✓	✓	✓					✓				✓	
10	PC54_0.0-0.3		X					X		4 x soil jars 1 bag	✓			✓	✓	✓		✓	✓	✓	✓	✓	
11	PC54_0.3-0.86		X					X		2 x soil jars	✓	✓	✓									✓	
12	PC56_0.0-0.42		X					X		2 x soil jars								✓				✓	
13	PC57_0.0-0.24		X					X		4 x soil jars 1 bag	✓	✓	✓	✓	✓	✓		✓				✓	
14	PC58_0.0-0.28		X					X		2 x soil jars								✓				✓	
15	PC62_0.0-0.59		X					X		2 x soil jars								✓				✓	
16	DUP12		X					X		2 x soil jars	✓	✓	✓					✓				✓	
17	PC64_0.0-0.25		X					X		2 x soil jars								✓	✓	✓	✓	✓	
18	PC64_0.25-0.65		X					X		5 x soil jars 1 bag	✓	✓	✓	✓	✓	✓	✓					✓	
19	PC65_0.0-0.25	↓	X					X		2 x soil jars	✓	✓	✓					✓				✓	

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Lab Report No.
Esky ID

Relinquished by:	Richard Cole	Signed:		Date: 13/7/09	
Recieved by:	Frank	Signed:		Date: 13/7/09 1:15pm	
Relinquished by:		Signed:		Date:	
Recieved by:		Signed:		Date:	

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES0910204**		
Client	: **ENSR AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRISTIANN DONNETTI	Contact	: Charlie Pierce
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: christiaan.donnetti@aecom.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 02 8484 8999	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8484 8989	Facsimile	: +61-2-8784 8500
Project	: S3017805 - Port Kembla Outer Harbour	Page	: 1 of 3
Order number	: ----		
C-O-C number	: ----	Quote number	: ES2009HLAENV0352 (SY/330/09 V3)
Site	: ----		
Sampler	: RC	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 13-JUL-2009	Issue Date	: 15-JUL-2009 13:16
Client Requested Due Date	: 22-JUL-2009	Scheduled Reporting Date	: **22-JUL-2009**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 1.8'C - Ice present
No. of coolers/boxes	: 2 HARD	No. of samples received	: 20
Sercurity Seal	: Not intact.	No. of samples analysed	: 20

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**
- **This batch is for TBT and TOC split from ES0910203, ES0910206 and ES0910208.**
- **Received extra sample PC63_0.95-1.05 added TBT and TOC analysis as per Client.**
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Please direct any queries related to sample condition / numbering / breakages to Nanthini Coilparampil
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - EP005 (solids) Total Organic Carbon (TOC) soils	SOIL - EA055-103 Moisture Content	SOIL - EP090 (solids) Organotins
ES0910204-001	10-JUL-2009 15:00	PC63_0.0-0.5	✓	✓	✓
ES0910204-002	10-JUL-2009 15:00	PC49_0.0-0.5	✓	✓	✓
ES0910204-003	10-JUL-2009 15:00	PC50_0.0-0.4		✓	✓
ES0910204-004	10-JUL-2009 15:00	PC50_0.4-0.84	✓		
ES0910204-005	10-JUL-2009 15:00	PC51_0.0-0.4	✓	✓	✓
ES0910204-006	10-JUL-2009 15:00	PC51_0.4-0.53	✓		
ES0910204-007	10-JUL-2009 15:00	PC52_0.0-0.19		✓	✓
ES0910204-008	10-JUL-2009 15:00	DUP II		✓	✓
ES0910204-009	10-JUL-2009 15:00	PC53_0.0-0.42	✓	✓	✓
ES0910204-010	10-JUL-2009 15:00	PC54_0.0-0.3	✓	✓	✓
ES0910204-011	10-JUL-2009 15:00	PC54_0.3-0.86	✓		
ES0910204-012	10-JUL-2009 15:00	PC56_0.0-0.42		✓	✓
ES0910204-013	10-JUL-2009 15:00	PC57_0.0-0.24	✓	✓	✓
ES0910204-014	10-JUL-2009 15:00	PC58_0.0-0.28		✓	✓
ES0910204-015	10-JUL-2009 15:00	PC62_0.0-0.59		✓	✓
ES0910204-016	10-JUL-2009 15:00	DUP 12	✓	✓	✓
ES0910204-017	10-JUL-2009 15:00	PC64_0.0-0.25		✓	✓
ES0910204-018	10-JUL-2009 15:00	PC64_0.25-0.65	✓		
ES0910204-019	10-JUL-2009 15:00	PC65_0.0-0.25	✓	✓	✓
ES0910204-020	[13-JUL-2009]	PC63_0.95-1.05	✓	✓	✓

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	accountsenv@aecom.com

MR CHRISTIANN DONNETTI

- *AU Certificate of Analysis - NATA (COA)	Email	christiaan.donnetti@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	christiaan.donnetti@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	christiaan.donnetti@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	christiaan.donnetti@aecom.com
- A4 - AU Tax Invoice (INV)	Email	christiaan.donnetti@aecom.com
- Default - Chain of Custody (COC)	Email	christiaan.donnetti@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	christiaan.donnetti@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	christiaan.donnetti@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	christiaan.donnetti@aecom.com
- EDI Format - XTab (XTAB)	Email	christiaan.donnetti@aecom.com

MR RICHARD COLE

- *AU Certificate of Analysis - NATA (COA)	Email	richard.cole@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	richard.cole@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	richard.cole@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	richard.cole@aecom.com
- A4 - AU Tax Invoice (INV)	Email	richard.cole@aecom.com
- Default - Chain of Custody (COC)	Email	richard.cole@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	richard.cole@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	richard.cole@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	richard.cole@aecom.com
- EDI Format - XTab (XTAB)	Email	richard.cole@aecom.com

THE RESULTS ADDRESS

- *AU Certificate of Analysis - NATA (COA)	Email	sydney@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	sydney@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	sydney@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	sydney@aecom.com
- Default - Chain of Custody (COC)	Email	sydney@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	sydney@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	sydney@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	sydney@aecom.com
- EDI Format - XTab (XTAB)	Email	sydney@aecom.com

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES0910206**	Page	: 1 of 10
Amendment	: **1**		
Client	: **ENSR AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRISTIANN DONNETTI	Contact	: Charlie Pierce
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: christiaan.donnetti@aecom.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 02 8484 8999	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8484 8989	Facsimile	: +61-2-8784 8500
Project	: S3017805 - Port Kembla Outer Harbour	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 13-JUL-2009
Sampler	: RC	Issue Date	: 30-JUL-2009
Site	: ----		
		No. of samples received	: 6
Quote number	: SY/330/09 V3	No. of samples analysed	: 6

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Organics
Wisam Abou-Maraseh	Spectroscopist	Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insuffient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **This report has been amended and re-released to allow the correction of the sample Sub-Matrix. All analysis results are as per the previous report.**

Analytical Results

Sub-Matrix: **ELUTRIATE**

Compound	CAS Number	LOR	Unit	Client sample ID: PC63_0.0-0.5	PC51_0.0-0.4	PC54_0.0-0.3	PC57_0.0-0.24	PC64_0.25-0.65
				Client sampling date / time: 15-JUL-2009 12:00	15-JUL-2009 12:00	15-JUL-2009 12:00	15-JUL-2009 12:00	15-JUL-2009 12:00
				ES0910206-001	ES0910206-002	ES0910206-003	ES0910206-004	ES0910206-005
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG093T: Total Metals in Saline Water by ORC-ICPMS								
Selenium	7782-49-2	2	µg/L	<2	<2	<2	<2	<2
Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	**28.9**	**2.4**	**6.3**
Arsenic	7440-38-2	0.5	µg/L	**17.0**	**10.8**	**103**	**3.3**	**39.2**
Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	**0.5**	<0.5	<0.5
Cobalt	7440-48-4	0.2	µg/L	<0.2	<0.2	<0.2	**0.9**	<0.2
Copper	7440-50-8	1	µg/L	<1	<1	**4**	<1	<1
Lead	7439-92-1	0.2	µg/L	<0.2	**0.3**	**0.6**	<0.2	<0.2
Nickel	7440-02-0	0.5	µg/L	**1.4**	**1.7**	**14.7**	**1.4**	**2.8**
Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	0.5	µg/L	<0.5	**2.0**	**3.8**	**0.5**	**4.2**
Zinc	7440-66-6	5	µg/L	**18**	**16**	**14**	**12**	<5
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylnaphthalene	91-57-6	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	83-32-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	208-96-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	120-12-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benz(a)anthracene	56-55-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	205-99-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	218-01-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Coronene	191-07-1	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenz(a.h)anthracene	53-70-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	206-44-0	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	86-73-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-2-Fluorenyl Acetamide	53-96-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Naphthalene	91-20-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perylene	198-55-0	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	85-01-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	129-00-0	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1

Analytical Results

Sub-Matrix: ELUTRIATE				Client sample ID	PC63_0.0-0.5	PC51_0.0-0.4	PC54_0.0-0.3	PC57_0.0-0.24	PC64_0.25-0.65
				Client sampling date / time	15-JUL-2009 12:00	15-JUL-2009 12:00	15-JUL-2009 12:00	15-JUL-2009 12:00	15-JUL-2009 12:00
Compound	*CAS Number*	*LOR*	*Unit*		ES0910206-001	ES0910206-002	ES0910206-003	ES0910206-004	ES0910206-005
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**85.0**	**76.3**	**98.0**	**98.4**	**93.8**
Anthracene-d10	1719-06-8	0.1	%		**91.5**	**82.2**	**108**	**109**	**106**
4-Terphenyl-d14	1718-51-0	0.1	%		**90.3**	**81.9**	**108**	**107**	**103**

Analytical Results

Sub-Matrix: ELUTRIATE				Client sample ID	ELUTRIATE WATER	----	----	----	----
				Client sampling date / time	15-JUL-2009 12:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES0910206-006	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EG093T: Total Metals in Saline Water by ORC-ICPMS									
Selenium	7782-49-2	2	µg/L		<2	----	----	----	----
Antimony	7440-36-0	0.5	µg/L		<0.5	----	----	----	----
Arsenic	7440-38-2	0.5	µg/L		**2.1**	----	----	----	----
Cadmium	7440-43-9	0.2	µg/L		<0.2	----	----	----	----
Chromium	7440-47-3	0.5	µg/L		<0.5	----	----	----	----
Cobalt	7440-48-4	0.2	µg/L		<0.2	----	----	----	----
Copper	7440-50-8	1	µg/L		<1	----	----	----	----
Lead	7439-92-1	0.2	µg/L		<0.2	----	----	----	----
Nickel	7440-02-0	0.5	µg/L		**0.6**	----	----	----	----
Silver	7440-22-4	0.1	µg/L		<0.1	----	----	----	----
Vanadium	7440-62-2	0.5	µg/L		**1.3**	----	----	----	----
Zinc	7440-66-6	5	µg/L		<5	----	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons									
3-Methylcholanthrene	56-49-5	0.1	µg/L		<0.1	----	----	----	----
2-Methylnaphthalene	91-57-6	0.1	µg/L		<0.1	----	----	----	----
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L		<0.1	----	----	----	----
Acenaphthene	83-32-9	0.1	µg/L		<0.1	----	----	----	----
Acenaphthylene	208-96-8	0.1	µg/L		<0.1	----	----	----	----
Anthracene	120-12-7	0.1	µg/L		<0.1	----	----	----	----
Benz(a)anthracene	56-55-3	0.1	µg/L		<0.1	----	----	----	----
Benzo(a)pyrene	50-32-8	0.05	µg/L		<0.05	----	----	----	----
Benzo(b)fluoranthene	205-99-2	0.1	µg/L		<0.1	----	----	----	----
Benzo(e)pyrene	192-97-2	0.1	µg/L		<0.1	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L		<0.1	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.1	µg/L		<0.1	----	----	----	----
Chrysene	218-01-9	0.1	µg/L		<0.1	----	----	----	----
Coronene	191-07-1	0.1	µg/L		<0.1	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.1	µg/L		<0.1	----	----	----	----
Fluoranthene	206-44-0	0.1	µg/L		<0.1	----	----	----	----
Fluorene	86-73-7	0.1	µg/L		<0.1	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L		<0.1	----	----	----	----
N-2-Fluorenyl Acetamide	53-96-3	0.1	µg/L		<0.1	----	----	----	----
Naphthalene	91-20-3	0.1	µg/L		<0.1	----	----	----	----
Perylene	198-55-0	0.1	µg/L		<0.1	----	----	----	----
Phenanthrene	85-01-8	0.1	µg/L		<0.1	----	----	----	----
Pyrene	129-00-0	0.1	µg/L		<0.1	----	----	----	----

Analytical Results

Sub-Matrix: **ELUTRIATE**				Client sample ID	**ELUTRIATE WATER**	----	----	----	----
				Client sampling date / time	15-JUL-2009 12:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**ES0910206-006**	**----**	**----**	**----**	**----**
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**99.4**	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%		**110**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		**108**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL			Client sample ID	PC63_0.0-0.5	PC51_0.0-0.4	PC54_0.0-0.3	PC57_0.0-0.24	PC64_0.25-0.65
			Client sampling date / time	10-JUL-2009 15:00	10-JUL-2009 15:00	10-JUL-2009 15:00	10-JUL-2009 15:00	10-JUL-2009 15:00
Compound	CAS Number	LOR	Unit	ES0910206-001	ES0910206-002	ES0910206-003	ES0910206-004	ES0910206-005
EN68: Seawater Elutriate Testing Procedure								
Seawater Sampling Date	----	0.1	--	**10/07/09**	**10/07/09**	**10/07/09**	**10/07/09**	**10/07/09**

Analytical Results

Sub-Matrix: SOIL				Client sample ID	ELUTRIATE WATER	----	----	----	----
				Client sampling date / time	10-JUL-2009 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES0910206-006	----	----	----	----
EN68: Seawater Elutriate Testing Procedure									
Seawater Sampling Date	----	0.1	--		**10/07/09**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **ELUTRIATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	116
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	33	141

QUALITY CONTROL REPORT

Work Order	: **ES0910206**	Page	: 1 of 8
Amendment	: **1**		
Client	: **ENSR AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRISTIANN DONNETTI	Contact	: Charlie Pierce
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: christiaan.donnetti@aecom.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 02 8484 8999	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8484 8989	Facsimile	: +61-2-8784 8500
Project	: S3017805 - Port Kembla Outer Harbour	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 13-JUL-2009
Sampler	: RC	Issue Date	: 30-JUL-2009
Order number	: ----		
		No. of samples received	: 6
Quote number	: SY/330/09 V3	No. of samples analysed	: 6

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Organics
Wisam Abou-Maraseh	Spectroscopist	Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insuffient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1042082)									
ES0910206-002	PC51_0.0-0.4	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES0910405-022	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG093T: Total Metals in Saline Water by ORC-ICPMS (QC Lot: 1049222)									
ES0910206-001	PC63_0.0-0.5	EG093A-T: Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG093A-T: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-T: Cobalt	7440-48-4	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-T: Lead	7439-92-1	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-T: Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-T: Arsenic	7440-38-2	0.5	µg/L	17.0	17.5	2.9	0% - 20%
		EG093A-T: Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-T: Nickel	7440-02-0	0.5	µg/L	1.4	1.4	0.0	No Limit
		EG093A-T: Vanadium	7440-62-2	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-T: Copper	7440-50-8	1	µg/L	<1	<1	0.0	No Limit
		EG093A-T: Zinc	7440-66-6	5	µg/L	18	14	24.2	No Limit
EG093T: Total Metals in Saline Water by ORC-ICPMS (QC Lot: 1049223)									
ES0910206-001	PC63_0.0-0.5	EG093B-T: Selenium	7782-49-2	2	µg/L	<2	<2	0.0	No Limit
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1044114)									
ES0910206-002	PC51_0.0-0.4	EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP132: 3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: 2-Methylnaphthalene	91-57-6	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Acenaphthene	83-32-9	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Acenaphthylene	208-96-8	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Anthracene	120-12-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Benz(a)anthracene	56-55-3	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Benzo(b)fluoranthene	205-99-2	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Benzo(g.h.i)perylene	191-24-2	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Chrysene	218-01-9	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Coronene	191-07-1	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Dibenz(a.h)anthracene	53-70-3	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Fluoranthene	206-44-0	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Fluorene	86-73-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	<0.1	<0.1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1044114) - continued									
ES0910206-002	PC51_0.0-0.4	EP132: N-2-Fluorenyl Acetamide	53-96-3	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Naphthalene	91-20-3	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Perylene	198-55-0	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Phenanthrene	85-01-8	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Pyrene	129-00-0	0.1	µg/L	<0.1	<0.1	0.0	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1042082)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	95.2	81	119
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 1049222)								
EG093A-T: Antimony	7440-36-0	0.5	µg/L	<0.5	----	----	----	----
EG093A-T: Arsenic	7440-38-2	0.5	µg/L	<0.5	10 µg/L	105	89	125
EG093A-T: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	93.4	78	112
EG093A-T: Chromium	7440-47-3	0.5	µg/L	<0.5	10 µg/L	98.8	86	126
EG093A-T: Cobalt	7440-48-4	0.2	µg/L	<0.2	10 µg/L	102	90	126
EG093A-T: Copper	7440-50-8	1	µg/L	<1	10 µg/L	110	87	123
EG093A-T: Lead	7439-92-1	0.2	µg/L	<0.2	10 µg/L	106	89	121
EG093A-T: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	102	85	125
EG093A-T: Silver	7440-22-4	0.1	µg/L	<0.1	1 µg/L	105	70	130
EG093A-T: Vanadium	7440-62-2	0.5	µg/L	<0.5	10 µg/L	103	87	121
EG093A-T: Zinc	7440-66-6	5	µg/L	<5	10 µg/L	98.6	82	128
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 1049223)								
EG093B-T: Selenium	7782-49-2	2	µg/L	<2	10 µg/L	101	75	130
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1044114)								
EP132: 3-Methylcholanthrene	56-49-5	0.10	µg/L	<0.1	4 µg/L	79.5	65.8	121
EP132: 2-Methylnaphthalene	91-57-6	0.10	µg/L	<0.1	4 µg/L	74.8	67.7	112
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.10	µg/L	<0.1	4 µg/L	79.8	11.6	146
EP132: Acenaphthene	83-32-9	0.10	µg/L	<0.1	4 µg/L	79.3	73.2	111
EP132: Acenaphthylene	208-96-8	0.10	µg/L	<0.1	4 µg/L	80.0	72.4	112
EP132: Anthracene	120-12-7	0.10	µg/L	<0.1	4 µg/L	78.6	73.4	113
EP132: Benz(a)anthracene	56-55-3	0.10	µg/L	<0.1	4 µg/L	83.8	73.6	114
EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	4 µg/L	81.4	75.2	117
EP132: Benzo(b)fluoranthene	205-99-2	0.10	µg/L	<0.1	4 µg/L	83.2	71.4	119
EP132: Benzo(e)pyrene	192-97-2	0.10	µg/L	<0.1	4 µg/L	81.2	75.3	118
EP132: Benzo(g.h.i)perylene	191-24-2	0.10	µg/L	<0.1	4 µg/L	81.2	66.6	121
EP132: Benzo(k)fluoranthene	207-08-9	0.10	µg/L	<0.1	4 µg/L	79.9	74.8	118
EP132: Chrysene	218-01-9	0.10	µg/L	<0.1	4 µg/L	83.3	69.6	120
EP132: Coronene	191-07-1	0.10	µg/L	<0.1	4 µg/L	77.2	47.4	131
EP132: Dibenz(a.h)anthracene	53-70-3	0.10	µg/L	<0.1	4 µg/L	83.0	71.5	117
EP132: Fluoranthene	206-44-0	0.10	µg/L	<0.1	4 µg/L	81.2	74.8	117
EP132: Fluorene	86-73-7	0.10	µg/L	<0.1	4 µg/L	80.9	72.9	114
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	0.10	µg/L	<0.1	4 µg/L	82.3	67.8	119

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1044114) - continued								
EP132: N-2-Fluorenyl Acetamide	53-96-3	0.10	µg/L	<0.1	40 µg/L	79.3	53.6	131
EP132: Naphthalene	91-20-3	0.10	µg/L	<0.1	4 µg/L	74.6	68.3	116
EP132: Perylene	198-55-0	0.10	µg/L	<0.1	4 µg/L	80.5	68	122
EP132: Phenanthrene	85-01-8	0.10	µg/L	<0.1	4 µg/L	81.1	74.8	112
EP132: Pyrene	129-00-0	0.10	µg/L	<0.1	4 µg/L	81.4	75.1	117

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1042082)							
ES0910206-002	PC51_0.0-0.4	EG035T: Mercury	7439-97-6	0.010 mg/L	91.4	70	130
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 1049222)							
ES0910206-001	PC63_0.0-0.5	EG093A-T: Arsenic	7440-38-2	50 µg/L	118	70	130
		EG093A-T: Cadmium	7440-43-9	12.5 µg/L	98.5	70	130
		EG093A-T: Chromium	7440-47-3	50 µg/L	112	70	130
		EG093A-T: Cobalt	7440-48-4	50 µg/L	113	70	130
		EG093A-T: Copper	7440-50-8	50 µg/L	112	70	130
		EG093A-T: Lead	7439-92-1	50 µg/L	105	70	130
		EG093A-T: Nickel	7440-02-0	50 µg/L	110	70	130
		EG093A-T: Vanadium	7440-62-2	50 µg/L	109	70	130
		EG093A-T: Zinc	7440-66-6	50 µg/L	74.2	70	130
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1044114)							
ES0910206-002	PC51_0.0-0.4	EP132: 3-Methylcholanthrene	56-49-5	4 µg/L	80.6	59	115
		EP132: 2-Methylnaphthalene	91-57-6	4 µg/L	83.8	46	120
		EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	4 µg/L	72.4	21	135
		EP132: Acenaphthene	83-32-9	4 µg/L	81.5	62	114
		EP132: Acenaphthylene	208-96-8	4 µg/L	82.0	61	119
		EP132: Anthracene	120-12-7	4 µg/L	82.9	68	116
		EP132: Benz(a)anthracene	56-55-3	4 µg/L	85.0	67	122
		EP132: Benzo(a)pyrene	50-32-8	4 µg/L	83.4	72	114
		EP132: Benzo(b)fluoranthene	205-99-2	4 µg/L	84.5	69	119
		EP132: Benzo(e)pyrene	192-97-2	4 µg/L	83.6	71	119
		EP132: Benzo(g.h.i)perylene	191-24-2	4 µg/L	83.3	49	133
		EP132: Benzo(k)fluoranthene	207-08-9	4 µg/L	81.4	71	124
		EP132: Chrysene	218-01-9	4 µg/L	84.5	70	118
		EP132: Coronene	191-07-1	4 µg/L	80.1	29	138
		EP132: Dibenz(a.h)anthracene	53-70-3	4 µg/L	85.2	60	122
		EP132: Fluoranthene	206-44-0	4 µg/L	83.1	65	121
		EP132: Fluorene	86-73-7	4 µg/L	82.2	63	118
		EP132: Indeno(1.2.3.cd)pyrene	193-39-5	4 µg/L	84.3	57	123
		EP132: N-2-Fluorenyl Acetamide	53-96-3	40 µg/L	91.1	29	212
		EP132: Naphthalene	91-20-3	4 µg/L	78.6	53	115
		EP132: Perylene	198-55-0	4 µg/L	82.8	71	118
		EP132: Phenanthrene	85-01-8	4 µg/L	83.8	67	120
		EP132: Pyrene	129-00-0	4 µg/L	83.3	70	117

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES0910206**	Page	: 1 of 5
Amendment	: **1**		
Client	: ENSR AUSTRALIA PTY LIMITED	Laboratory	: Environmental Division Sydney
Contact	: MR CHRISTIANN DONNETTI	Contact	: Charlie Pierce
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: christiaan.donnetti@aecom.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 02 8484 8999	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8484 8989	Facsimile	: +61-2-8784 8500
Project	: S3017805 - Port Kembla Outer Harbour	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 13-JUL-2009
Sampler	: RC	Issue Date	: 30-JUL-2009
Order number	: ----		
		No. of samples received	: 6
Quote number	: SY/330/09 V3	No. of samples analysed	: 6

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS								
Clear HDPE (U-T ORC) - UHP Nitric Acid; Unfiltered								
PC63_0.0-0.5,	PC51_0.0-0.4,	**15-JUL-2009**	**----**	----	----	**20-JUL-2009**	12-AUG-2009	✓
PC54_0.0-0.3,	PC57_0.0-0.24,							
PC64_0.25-0.65,	ELUTRIATE WATER							
EG093T: Total Metals in Saline Water by ORC-ICPMS								
Clear HDPE (U-T ORC) - UHP Nitric Acid; Unfiltered								
PC63_0.0-0.5,	PC51_0.0-0.4,	**15-JUL-2009**	**24-JUL-2009**	11-JAN-2010	✓	**24-JUL-2009**	11-JAN-2010	✓
PC54_0.0-0.3,	PC57_0.0-0.24,							
PC64_0.25-0.65,	ELUTRIATE WATER							
EN68: Seawater Elutriate Testing Procedure								
LabSplit: Leach for organics and other tests								
PC63_0.0-0.5,	PC51_0.0-0.4,	**10-JUL-2009**	**---**	---	----	**15-JUL-2009**	24-JUL-2009	✓
PC54_0.0-0.3,	PC57_0.0-0.24,							
PC64_0.25-0.65,	ELUTRIATE WATER							
EP132B: Polynuclear Aromatic Hydrocarbons								
Amber Glass Bottle - Unpreserved								
PC63_0.0-0.5,	PC51_0.0-0.4,	**15-JUL-2009**	**20-JUL-2009**	22-JUL-2009	✓	**20-JUL-2009**	29-AUG-2009	✓
PC54_0.0-0.3,	PC57_0.0-0.24,							
PC64_0.25-0.65,	ELUTRIATE WATER							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	12	**8.3**	**10.0**	×	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	1	7	**14.3**	**9.5**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-T	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	1	7	**14.3**	**4.8**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-T	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	1	7	**14.3**	**4.8**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-T	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	12	**8.3**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	1	7	**14.3**	**4.8**	✓	ALS QCS3 requirement

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	SOIL	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-T	SOIL	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	SOIL	USEPA 3640 (GPC Cleanup), 8270 GCMS Capiliary column, SIM mode. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals - ORC	EN25-ORC	SOIL	Modified USEPA SW846-3005. This is an Ultrapure Nitric acid digestion procedure used to prepare surface and ground water samples for analysis by ORC- ICPMS. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Seawater Elutriate Testing Procedure	* EN68a	SOIL	USEPA Evaluation of Dredged Material Proposed for Ocean Disposal - Testing Guide, 1991, EPA-503/8-91/001, USEPA and US Army Corps of Engineers. ANZECC Interim Ocean Disposal Guidelines, December, 1998 This Procedure outlines the preparation of leachate designed to simulate release of contaminants from sediment during the disposal of dredged material. Release can occur by physical processes or a variety of chemical changes such as oxidation of metal sulphides and release of contaminants adsorbed to particles or organic matter.
Sep. Funnel Extraction /Acetylation of Phenolic Compounds	ORG14-AC	SOIL	USEPA 3510 (Extraction)/ In-house (Acetylation): A 1L sample is extracted into dichloromethane and concentrated to 1 mL with echange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- **No Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	1	12	8.3	10.0	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Elutriates only

Chain of Custody

AECOM - Sydney
Level 5, 828 Pacific Highway
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail:

Laboratory Details
Lab. Name: ALS SYDNEY
Lab. Address:
Contact Name:
Lab. Ref:
Tel:
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: S4330 09

Sampled By: Richard Cole
AECOM Project No: S3017805
Project Name: Port Kembla Outer Harbour
PO No.

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☑ Email : christiaan.donneth@aecom.com, richard.cole@aecom.com	

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	TOC	PAH (ultra trace)	BTEX/TPH (STA LOR)	SPOCAS	Elutriate Metals	Elutriate PAHs	Cyanide	TBT	Phenols	OCP	Total PCBs	Metals M13	Other
1	PC63_0.0-0.5	10.7.09	X					X		4x soil jars 1bag	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	CONTRACT No:
	PC63_0.5-1.05		X					X		2x soil jars												✓	WO: ES0910206
	~~PC63 MS 0.5~~ DUP15									2x soil jars									✓	✓	✓	✓	LAB: 13/7/9
	PC49_0.0-0.5									2x soil jars	✓	✓	✓					✓				✓	DATE:
	PC49_0.5-0.97									2x soil jars									✓	✓	✓	✓	SPLIT: ALS SYD BATCH ON ES0910205
	PC50_0.0-0.4									2x soil jars								✓				✓	TBT + TOC: ES0910204
	PC50_0.4-0.84									2x soil jars	✓	✓	✓									✓	SPOCAS: ES0910208
2	E2									1x soil jar	QA/QC JAR FOR Elutriate for PC51_0.0-0.4												
	PC51_0.0-0.4									3x soil jars 1 bag	✓	✓	✓	✓	✓	✓		✓				✓	
	PC51_0.4-0.53									1x soil jar	✓											✓	
	PC52_0.0-0.19		X					X		2x soil jar												✓	
	DUP11	↓	X					X		2x soil jar												✓	

Environmental Division
Sydney
Work Order
ES0910206
Telephone : +61-2-8784 8555

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Relinquished by:	Richard Cole	Signed:		Date:	13/7/09
Recieved by:	Frank	Signed:		Date:	13/7/09 1:15pm
Relinquished by:		Signed:		Date:	
Recieved by:		Signed:		Date:	

Lab Report No.
Esky ID

Chain of Custody

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail:

Laboratory Details
Lab. Name: ALS SYDNEY
Lab. Address:
Contact Name:
Lab. Ref:
Tel:
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY330 09

Sampled By: Richard Cole
AECOM Project No: S3017805
Project Name: Port Kembla Outer Harbour PO No.

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☑ Email : christiaan.donnetti@aecom.com richard.cole@aecom.com	

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	TOC	PAH (ultra trace)	BTEX TPH	SPOCAS	Elutriate Metals	Elutriate PAHs	Cyanide	TRT	Phenols	OCP	Total PCBs	Metals M13	Other
	PC53_0.0-0.42	10.7.09	X					X		2 x soil jars	✓	✓	✓					✓				✓	
3	PC54_0.0-0.3		X					X		4 x soil jars 1 bag	✓			✓	✓	✓		✓	✓	✓	✓	✓	
	PC54_0.3-0.86		X					X		2 x soil jars	✓	✓	✓									✓	
	PC56_0.0-0.42		X					X		2 x soil jars								✓				✓	
4	PC57_0.0-0.24		X					X		4 x soil jars 1 bag	✓	✓	✓	✓	✓	✓		✓				✓	
	PC58_0.0-0.28		X					X		2 x soil jars								✓				✓	
	PC62_0.0-0.59		X					X		2 x soil jars								✓				✓	
	DUP12		X					X		2 x soil jars	✓	✓	✓					✓				✓	
	PC64_0.0-0.25		X					X		2 x soil jars								✓	✓	✓	✓	✓	
5	PC64_0.25-0.65		X					X		2 x soil jars 1 bag	✓	✓	✓	✓	✓	✓	✓					✓	
	PC65_0.0-0.25	↓	X					X		2 x soil jars	✓	✓	✓					✓				✓	
6	Elutriate water																						

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Lab Report No.

Esky ID

Relinquished by:	Richard Cole	Signed:		Date: 13/7/09	
Recieved by:	Frank	Signed:		Date: 13/7/9 1:15pm	
Relinquished by:		Signed:		Date:	
Recieved by:		Signed:		Date:	

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES0910206**		
Client	: **ENSR AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRISTIANN DONNETTI	Contact	: Charlie Pierce
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: christiaan.donnetti@aecom.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 02 8484 8999	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8484 8989	Facsimile	: +61-2-8784 8500
Project	: S3017805 - Port Kembla Outer Harbour	Page	: 1 of 3
Order number	: ----		
C-O-C number	: ----	Quote number	: ES2009HLAENV0352 (SY/330/09 V3)
Site	: ----		
Sampler	: RC	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 13-JUL-2009	Issue Date	: 13-JUL-2009 15:09
Client Requested Due Date	: 27-JUL-2009	Scheduled Reporting Date	: **27-JUL-2009**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 1.8'C - Ice present
No. of coolers/boxes	: 2 HARD	No. of samples received	: 6
Sercurity Seal	: Not intact.	No. of samples analysed	: 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**
- **This batch is for Elutriates split from ES0910203, ES0910204 and ES0910208.**
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Please direct any queries related to sample condition / numbering / breakages to Nanthini Coilparampil
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - EG035T Total Mercury by FIMS	SOIL - EG093A-T Total metals in Saline Water Suite A by ORC-ICPMS	SOIL - EG093B-T Total Metals in Saline Water -Suite B by ORC-ICPMS	SOIL - EP132(PAH) Ultra Trace Polynuclear Aromatic Compounds
ES0910206-001	13-JUL-2009 10:00	PC63_0.0-0.5	✓	✓	✓	✓
ES0910206-002	13-JUL-2009 10:00	PC51_0.0-0.4	✓	✓	✓	✓
ES0910206-003	13-JUL-2009 10:00	PC54_0.0-0.3	✓	✓	✓	✓
ES0910206-004	13-JUL-2009 10:00	PC57_0.0-0.24	✓	✓	✓	✓
ES0910206-005	13-JUL-2009 10:00	PC64_0.25-0.65	✓	✓	✓	✓
ES0910206-006	13-JUL-2009 10:00	ELUTRIATE WATER	✓	✓	✓	✓

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	accountsenv@aecom.com

MR CHRISTIANN DONNETTI

- *AU Certificate of Analysis - NATA (COA)	Email	christiaan.donnetti@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	christiaan.donnetti@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	christiaan.donnetti@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	christiaan.donnetti@aecom.com
- A4 - AU Tax Invoice (INV)	Email	christiaan.donnetti@aecom.com
- Default - Chain of Custody (COC)	Email	christiaan.donnetti@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	christiaan.donnetti@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	christiaan.donnetti@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	christiaan.donnetti@aecom.com
- EDI Format - XTab (XTAB)	Email	christiaan.donnetti@aecom.com

MR RICHARD COLE

- *AU Certificate of Analysis - NATA (COA)	Email	richard.cole@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	richard.cole@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	richard.cole@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	richard.cole@aecom.com
- A4 - AU Tax Invoice (INV)	Email	richard.cole@aecom.com
- Default - Chain of Custody (COC)	Email	richard.cole@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	richard.cole@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	richard.cole@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	richard.cole@aecom.com
- EDI Format - XTab (XTAB)	Email	richard.cole@aecom.com

THE RESULTS ADDRESS

- *AU Certificate of Analysis - NATA (COA)	Email	sydney@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	sydney@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	sydney@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	sydney@aecom.com
- Default - Chain of Custody (COC)	Email	sydney@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	sydney@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	sydney@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	sydney@aecom.com
- EDI Format - XTab (XTAB)	Email	sydney@aecom.com

CERTIFICATE OF ANALYSIS

Work Order	: **ES0910208**	Page	: 1 of 4
Client	: **ENSR AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRISTIANN DONNETTI	Contact	: Charlie Pierce
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: christiaan.donnetti@aecom.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 02 8484 8999	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8484 8989	Facsimile	: +61-2-8784 8500
Project	: S3017805 - Port Kembla Outer Harbour	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 13-JUL-2009
Sampler	: RC	Issue Date	: 21-JUL-2009
Site	: ----		
		No. of samples received	: 5
Quote number	: SY/330/09 V3	No. of samples analysed	: 5

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Cass Sealby	Senior Chemist - Acid Sulphate Soils	Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insuffient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO3) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m3 in-situ soil', multiply 'reported results' x 'wet bulk density of soil in t/m3'.**
- **Retained Acidity not required because pH KCl greater than or equal to 4.5**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID	PC63_0.0-0.5	PC51_0.0-0.4	PC54_0.0-0.3	PC57_0.0-0.24	PC64_0.25-0.65
				Client sampling date / time	10-JUL-2009 15:00	10-JUL-2009 15:00	10-JUL-2009 15:00	10-JUL-2009 15:00	10-JUL-2009 15:00
					ES0910208-001	ES0910208-002	ES0910208-003	ES0910208-004	ES0910208-005
EA029-A: pH Measurements									
pH KCl (23A)	----	0.1	pH Unit		8.9	9.0	8.5	6.3	8.8
pH OX (23B)	----	0.1	pH Unit		8.2	8.2	6.7	2.4	7.8
EA029-B: Acidity Trail									
Titratable Actual Acidity (23F)	----	2	mole H+ / t		<2	<2	<2	3	<2
Titratable Peroxide Acidity (23G)	----	2	mole H+ / t		<2	<2	<2	502	<2
Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t		<2	<2	<2	500	<2
sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S		<0.02	<0.02	<0.02	<0.02	<0.02
sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S		<0.02	<0.02	<0.02	0.80	<0.02
sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S		<0.02	<0.02	<0.02	0.80	<0.02
EA029-C: Sulfur Trail									
KCl Extractable Sulfur (23Ce)	----	0.02	% S		0.11	0.13	0.24	0.05	0.22
Peroxide Sulfur (23De)	----	0.02	% S		0.51	0.42	1.50	1.05	1.10
Peroxide Oxidisable Sulfur (23E)	----	0.02	% S		0.40	0.29	1.26	1.00	0.88
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t		252	181	785	624	547
EA029-D: Calcium Values									
KCl Extractable Calcium (23Vh)	----	0.02	% Ca		0.30	0.32	0.35	0.11	0.34
Peroxide Calcium (23Wh)	----	0.02	% Ca		2.07	3.80	1.43	0.15	3.06
Acid Reacted Calcium (23X)	----	0.02	% Ca		1.76	3.48	1.08	0.04	2.72
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t		881	1730	539	22	1360
sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S		1.41	2.78	0.86	0.03	2.17
EA029-E: Magnesium Values									
KCl Extractable Magnesium (23Sm)	----	0.02	% Mg		0.15	0.16	0.21	0.13	0.17
Peroxide Magnesium (23Tm)	----	0.02	% Mg		0.30	0.47	0.44	0.15	0.41
Acid Reacted Magnesium (23U)	----	0.02	% Mg		0.16	0.31	0.24	<0.02	0.24
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t		129	255	195	13	195
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S		0.21	0.41	0.31	0.02	0.31
EA029-F: Excess Acid Neutralising Capacity									
Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3		4.12	9.16	1.27	----	5.50
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t		824	1830	255	----	1100
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S		1.32	2.93	0.41	----	1.76
EA029-H: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-		1.5	1.5	1.5	1.5	1.5

Analytical Results

Sub-Matrix: SOIL			Client sample ID	PC63_0.0-0.5	PC51_0.0-0.4	PC54_0.0-0.3	PC57_0.0-0.24	PC64_0.25-0.65
			Client sampling date / time	10-JUL-2009 15:00	10-JUL-2009 15:00	10-JUL-2009 15:00	10-JUL-2009 15:00	10-JUL-2009 15:00
Compound	CAS Number	LOR	Unit	ES0910208-001	ES0910208-002	ES0910208-003	ES0910208-004	ES0910208-005
EA029-H: Acid Base Accounting - Continued								
Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	**0.15**	**1.00**	<0.02
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	**92**	**626**	<10
Liming Rate	----	1	kg CaCO3/t	<1	<1	**7**	**47**	<1

QUALITY CONTROL REPORT

Work Order	: **ES0910208**	Page	: 1 of 6
Client	: **ENSR AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRISTIANN DONNETTI	Contact	: Charlie Pierce
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: christiaan.donnetti@aecom.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 02 8484 8999	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8484 8989	Facsimile	: +61-2-8784 8500
Project	: S3017805 - Port Kembla Outer Harbour	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 13-JUL-2009
Sampler	: RC	Issue Date	: 21-JUL-2009
Order number	: ----		
		No. of samples received	: 5
Quote number	: SY/330/09 V3	No. of samples analysed	: 5

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Cass Sealby	Senior Chemist - Acid Sulphate Soils	Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insuffient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA029-A: pH Measurements (QC Lot: 1043079)									
ES0910208-001	PC63_0.0-0.5	EA029: pH KCl (23A)	----	0.1	pH Unit	8.9	8.9	0.0	0% - 20%
		EA029: pH OX (23B)	----	0.1	pH Unit	8.2	8.2	0.0	0% - 20%
EA029-B: Acidity Trail (QC Lot: 1043079)									
ES0910208-001	PC63_0.0-0.5	EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	<2	0.0	No Limit
EA029-C: Sulfur Trail (QC Lot: 1043079)									
ES0910208-001	PC63_0.0-0.5	EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	0.11	0.11	0.0	No Limit
		EA029: Peroxide Sulfur (23De)	----	0.02	% S	0.51	0.54	5.8	0% - 20%
		EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	0.40	0.43	6.8	0% - 20%
		EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	252	270	6.8	0% - 20%
EA029-D: Calcium Values (QC Lot: 1043079)									
ES0910208-001	PC63_0.0-0.5	EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	0.30	0.31	0.0	0% - 50%
		EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	2.07	2.12	2.4	0% - 20%
		EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	1.76	1.81	2.6	0% - 20%
		EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	1.41	1.45	2.6	0% - 20%
		EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	881	904	2.6	0% - 20%
EA029-E: Magnesium Values (QC Lot: 1043079)									
ES0910208-001	PC63_0.0-0.5	EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	0.15	0.15	0.0	No Limit
		EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	0.30	0.32	5.8	0% - 50%
		EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	0.16	0.17	7.6	No Limit
		EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	0.21	0.22	7.6	0% - 50%
		EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	129	139	7.6	0% - 50%
EA029-F: Excess Acid Neutralising Capacity (QC Lot: 1043079)									
ES0910208-001	PC63_0.0-0.5	EA029: Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3	4.12	4.11	0.3	0% - 20%
		EA029: sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S	1.32	1.32	0.0	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA029-F: Excess Acid Neutralising Capacity (QC Lot: 1043079) - continued									
ES0910208-001	PC63_0.0-0.5	EA029: acidity - Excess Acid Neutralising Capacity (a-23Q)	---	10	mole H+ / t	824	822	0.3	0% - 20%

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA029-B: Acidity Trail (QCLot: 1043079)								
EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	----	----	----	----
EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	----	----	----	----
EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	----	----	----	----
EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	----	----	----	----
EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	<0.02	----	----	----	----
EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.02	----	----	----	----
EA029-C: Sulfur Trail (QCLot: 1043079)								
EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	<0.02	----	----	----	----
EA029: Peroxide Sulfur (23De)	----	0.02	% S	<0.02	----	----	----	----
EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	<0.02	----	----	----	----
EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	<10	----	----	----	----
EA029-D: Calcium Values (QCLot: 1043079)								
EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	<0.02	----	----	----	----
EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	<0.02	----	----	----	----
EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	<0.02	----	----	----	----
EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	<0.02	----	----	----	----
EA029-E: Magnesium Values (QCLot: 1043079)								
EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	<0.02	----	----	----	----
EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	<0.02	----	----	----	----
EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	<0.02	----	----	----	----
EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	<0.02	----	----	----	----
EA029-F: Excess Acid Neutralising Capacity (QCLot: 1043079)								
EA029: Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3	<0.02	----	----	----	----
EA029: acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S	<0.02	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) Results are required to be reported.**

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES0910208**	Page	: 1 of 6
Client	: ENSR AUSTRALIA PTY LIMITED	Laboratory	: Environmental Division Sydney
Contact	: MR CHRISTIANN DONNETTI	Contact	: Charlie Pierce
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: christiaan.donnetti@aecom.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 02 8484 8999	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8484 8989	Facsimile	: +61-2-8784 8500
Project	: S3017805 - Port Kembla Outer Harbour	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 13-JUL-2009
Sampler	: RC	Issue Date	: 21-JUL-2009
Order number	: ----		
		No. of samples received	: 5
Quote number	: SY/330/09 V3	No. of samples analysed	: 5

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA029-A: pH Measurements							
Snap Lock Bag - frozen							
PC63_0.0-0.5, PC51_0.0-0.4, PC54_0.0-0.3, PC57_0.0-0.24, PC64_0.25-0.65	**10-JUL-2009**	**13-JUL-2009**	10-JUL-2010	✓	**20-JUL-2009**	18-OCT-2009	✓
EA029-B: Acidity Trail							
Snap Lock Bag - frozen							
PC63_0.0-0.5, PC51_0.0-0.4, PC54_0.0-0.3, PC57_0.0-0.24, PC64_0.25-0.65	**10-JUL-2009**	**13-JUL-2009**	10-JUL-2010	✓	**20-JUL-2009**	18-OCT-2009	✓
EA029-C: Sulfur Trail							
Snap Lock Bag - frozen							
PC63_0.0-0.5, PC51_0.0-0.4, PC54_0.0-0.3, PC57_0.0-0.24, PC64_0.25-0.65	**10-JUL-2009**	**13-JUL-2009**	10-JUL-2010	✓	**20-JUL-2009**	18-OCT-2009	✓
EA029-D: Calcium Values							
Snap Lock Bag - frozen							
PC63_0.0-0.5, PC51_0.0-0.4, PC54_0.0-0.3, PC57_0.0-0.24, PC64_0.25-0.65	**10-JUL-2009**	**13-JUL-2009**	10-JUL-2010	✓	**20-JUL-2009**	18-OCT-2009	✓
EA029-E: Magnesium Values							
Snap Lock Bag - frozen							
PC63_0.0-0.5, PC51_0.0-0.4, PC54_0.0-0.3, PC57_0.0-0.24, PC64_0.25-0.65	**10-JUL-2009**	**13-JUL-2009**	10-JUL-2010	✓	**20-JUL-2009**	18-OCT-2009	✓
EA029-F: Excess Acid Neutralising Capacity							
Snap Lock Bag - frozen							
PC63_0.0-0.5, PC51_0.0-0.4, PC54_0.0-0.3, PC57_0.0-0.24, PC64_0.25-0.65	**10-JUL-2009**	**13-JUL-2009**	10-JUL-2010	✓	**20-JUL-2009**	18-OCT-2009	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA029-G: Retained Acidity								
Snap Lock Bag - frozen								
PC63_0.0-0.5,	PC51_0.0-0.4,	**10-JUL-2009**	**13-JUL-2009**	10-JUL-2010	✓	**20-JUL-2009**	18-OCT-2009	✓
PC54_0.0-0.3,	PC57_0.0-0.24,							
PC64_0.25-0.65								
EA029-H: Acid Base Accounting								
Snap Lock Bag - frozen								
PC63_0.0-0.5,	PC51_0.0-0.4,	**10-JUL-2009**	**13-JUL-2009**	10-JUL-2010	✓	**20-JUL-2009**	18-OCT-2009	✓
PC54_0.0-0.3,	PC57_0.0-0.24,							
PC64_0.25-0.65								

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	SOIL	Ahern et al 2004 - a suspension peroxide oxidation method following the 'sulfur trail' by determining the level of 1M KCL extractable sulfur and the sulfur level after oxidation of soil sulphides. The 'acidity trail' is followed by measurement of TAA, TPA and TSA. Liming Rate is based on results for samples as submitted and incorporates a minimum safety factor of 1.5.

Preparation Methods	Method	Matrix	Method Descriptions
Drying at 85 degrees, bagging and labelling (ASS)	EN020PR	SOIL	In house

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- **No Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**

SPOCAS ONLY

Chain of Custody

AECOM - Sydney
Level 5, 828 Pacific Highway
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail:

Laboratory Details
Lab. Name: ALS SYDNEY
Lab. Address:
Contact Name:
Lab. Ref:
Tel:
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: S4330 09

Sampled By: Richard Cole
AECOM Project No: S3017805
Project Name: Port Kembla Outer Harbour PO No.

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☑ Email: christiaan.donneth@aecom.com, richard.cole@aecom.com	

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	TOC	PAH (ultra trace)	BTEX/TPH (STALOC)	SPOCAS	Elutriate Metals	Elutriate PAH's	Cyanide	TRT	Phenols	OCP	Total PCBs	Metals M13	Other
1	PC63_0.0-0.5	10.7.09	X					X		4x soil jars 1bag	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	CONTRACT WORK
	PC63_0.5-1.05		X					X		2x soil jars												✓	WO: ES0910208
	~~PC63 HG 0.5~~ DUP15									2x soil jars									✓	✓	✓	✓	LAB: ALS Brisbane
	PC49_0.0-0.5									2x soil jars	✓	✓	✓					✓				✓	DATE: 13/7/09
	PC49_0.5-0.97									2x soil jars									✓	✓	✓	✓	SPLIT: ALS SYD BATCH ONLY ES0910203
	PC50_0.0-0.4									2x soil jars								✓				✓	TBT & TOC: ES0910204
	PC50_0.4-0.84									2x soil jars	✓	✓	✓									✓	~~SPOCAS~~ ELUTRIATE: ES0910206
	E2									1 x soil jar	QA/QC JAR FOR Elutriate for PC51_0.0-0.4												
2	PC51_0.0-0.4									3 x soil jars 1bag	✓	✓	✓	✓	✓	✓		✓				✓	
	PC51_0.4-0.53									1 x soil jar	✓											✓	
	PC52_0.0-0.19		X					X		2 x soil jar						✓		✓				✓	
	DUP11	↓	X					X		2 x soil jar						✓		✓				✓	

Environmental Division Sydney
Work Order
ES0910208
Telephone : +61-2-8784 8555

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments: Email

Relinquished by:	Richard Cole	Signed:	Date:	13/7/09
Recieved by:	Frank	Signed:	Date:	13/7/09 1:15pm

Lab Report No. | Esky ID

Relinquished by:	Signed:	Date:	
Recieved by:	Signed:	Date:	

Chain of Custody

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail:

Laboratory Details
Lab. Name: ALS SYDNEY
Lab. Address:
Contact Name:
Lab. Ref:
Tel:
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY350 09

Sampled By: Richard Cole
AECOM Project No: 53017805
Project Name: Port Kembla Outer Harbour PO No.

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☑ Email : christiaan.donnetti@aecom.com richard.cole@aecom.com	

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	TOC	PAH (ultra trace)	BTEX TPH	SOCAS	Elutriate Metals	Elutriate PAHs	Cyanide	NTRT	Phenols	OCP	Total PCBs	Metals M13	Other
	PC53_0.0-0.42	10.7.09	X					X		2 x soil jars	✓	✓	✓					✓				✓	
3	PC54_0.0-0.3		X					X		4 x soil jars 1 bag	✓			✓	✓	✓		✓	✓	✓	✓	✓	
	PC54_0.3-0.86		X					X		2 x soil jars	✓	✓	✓									✓	
	PC56_0.0-0.42		X					X		2 x soil jars								✓				✓	
4	PC57_0.0-0.24		X					X		4 x soil jars 1 bag	✓	✓	✓	✓	✓	✓		✓				✓	
	PC58_0.0-0.28		X					X		2 x soil jars								✓				✓	
	PC62_0.0-0.59		X					X		2 x soil jars								✓				✓	
	DUP12		X					X		2 x soil jars	✓	✓	✓					✓				✓	
	PC64_0.0-0.25		X					X		2 x soil jars								✓	✓	✓	✓	✓	
5	PC64_0.25-0.65		X					X		5 x soil jars 1 bag	✓	✓	✓	✓	✓	✓	✓					✓	
	PC65_0.0-0.25	↓	X					X		2 x soil jars	✓	✓	✓					✓				✓	

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Lab Report No.
Esky ID

Relinquished by:	Richard Cole	Signed:		Date: 13/7/09	
Recieved by:	Frank	Signed:		Date: 13/7/09 1:15pm	
Relinquished by:		Signed:		Date:	
Recieved by:		Signed:		Date:	

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES0910208**		
Client	: **ENSR AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRISTIANN DONNETTI	Contact	: Charlie Pierce
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: christiaan.donnetti@aecom.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 02 8484 8999	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8484 8989	Facsimile	: +61-2-8784 8500
Project	: S3017805 - Port Kembla Outer Harbour	Page	: 1 of 2
Order number	: ----		
C-O-C number	: ----	Quote number	: ES2009HLAENV0352 (SY/330/09 V3)
Site	: ----		
Sampler	: RC	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 13-JUL-2009	Issue Date	: 15-JUL-2009 11:51
Client Requested Due Date	: 27-JUL-2009	Scheduled Reporting Date	: **27-JUL-2009**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 1.8'C - Ice present
No. of coolers/boxes	: 2 HARD	No. of samples received	: 5
Sercurity Seal	: Not intact.	No. of samples analysed	: 5

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**
- **This batch is for SPOCAS split from ES0910203, ES0910204 and ES0910206.**
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Please direct any queries related to sample condition / numbering / breakages to Nanthini Coilparampil
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES0910405**	Page	: 1 of 22
Amendment	: **2**		
Client	: **ENSR AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRISTIANN DONNETTI	Contact	: Charlie Pierce
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: christiaan.donnetti@aecom.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 02 8484 8999	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8484 8989	Facsimile	: +61-2-8784 8500
Project	: S3012805 - Port Kembla Outer Harbour	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 15-JUL-2009
Sampler	: KP/CD	Issue Date	: 05-AUG-2009
Site	: PORT KEMBLA		
		No. of samples received	: 28
Quote number	: SY/330/09 V3	No. of samples analysed	: 26

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Organics
Celine Conceicao	Spectroscopist	Inorganics
Hoa Nguyen	Inorganic Chemist	Inorganics
Victor Kedicioglu	Business Manager - NSW	Inorganics
Wisam Abou-Maraseh	Spectroscopist	Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insuffient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EG020-SD: Poor precision was obtained for Mnanganese and Vanadium on sample ES0910562 due to sample heterogeneity.**
- **EG093: LCS recovery for Zn falls outside ALS Dynamic Control Limit. However, it is within the acceptance criteria based on ALS DQO. No further action is required.**
- **EG093: Work order ES910405 #23, #24 - Very high Cd results have been confirmed.**
- **EP066 : Insufficient sample provided to perform Matrix spike analysis.**
- **EP132: Poor matrix spike recoveries due to sample matrix interference.**

Analytical Results

Sub-Matrix: SOIL			Client sample ID	SG9_0.0-0.7	SG10_0.0-0.7	SG11_0.0-0.7	SG12_0.0-0.04	SG13_0.0-0.05
			Client sampling date / time	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00
Compound	CAS Number	LOR	Unit	ES0910405-001	ES0910405-002	ES0910405-003	ES0910405-004	ES0910405-005
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	---	1.0	%	49.2	45.6	44.3	49.0	52.0
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	3.08	3.87	<0.50	<0.50	0.51
Arsenic	7440-38-2	1.00	mg/kg	128	122	24.4	19.9	26.7
Cadmium	7440-43-9	0.1	mg/kg	2.9	4.4	0.4	0.5	0.7
Chromium	7440-47-3	1.0	mg/kg	101	111	90.6	117	91.6
Copper	7440-50-8	1.0	mg/kg	3150	3680	263	296	416
Cobalt	7440-48-4	0.5	mg/kg	16.3	16.6	9.8	8.3	10.2
Lead	7439-92-1	1.0	mg/kg	1260	1220	204	168	231
Nickel	7440-02-0	1.0	mg/kg	54.8	55.3	16.3	18.1	20.6
Selenium	7782-49-2	0.1	mg/kg	23.1	29.8	2.1	1.9	2.6
Silver	7440-22-4	0.1	mg/kg	10.1	14.4	1.4	0.7	1.0
Vanadium	7440-62-2	2.0	mg/kg	115	104	176	522	169
Zinc	7440-66-6	1.0	mg/kg	1740	1900	562	510	622
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	2.5	2.4	0.4	0.3	0.4
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	1	mg/kg	----	----	----	<1	----
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	10	µg/kg	----	----	----	<10	----
2-Methylnaphthalene	91-57-6	10	µg/kg	----	----	----	390	----
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/kg	----	----	----	<10	----
Acenaphthene	83-32-9	10	µg/kg	----	----	----	80	----
Acenaphthylene	208-96-8	10	µg/kg	----	----	----	300	----
Anthracene	120-12-7	10	µg/kg	----	----	----	270	----
Benz(a)anthracene	56-55-3	10	µg/kg	----	----	----	660	----
Benzo(a)pyrene	50-32-8	10	µg/kg	----	----	----	860	----
Benzo(b)fluoranthene	205-99-2	10	µg/kg	----	----	----	1000	----
Benzo(e)pyrene	192-97-2	10	µg/kg	----	----	----	540	----
Benzo(g.h.i)perylene	191-24-2	10	µg/kg	----	----	----	720	----
Benzo(k)fluoranthene	207-08-9	10	µg/kg	----	----	----	430	----
Chrysene	218-01-9	10	µg/kg	----	----	----	630	----
Coronene	191-07-1	10	µg/kg	----	----	----	270	----
Dibenz(a.h)anthracene	53-70-3	10	µg/kg	----	----	----	110	----
Fluoranthene	206-44-0	10	µg/kg	----	----	----	1520	----
Fluorene	86-73-7	10	µg/kg	----	----	----	290	----
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/kg	----	----	----	390	----
N-2-Fluorenyl Acetamide	53-96-3	100	µg/kg	----	----	----	<100	----

Analytical Results

Sub-Matrix: SOIL				Client sample ID	SG9_0.0-0.7	SG10_0.0-0.7	SG11_0.0-0.7	SG12_0.0-0.04	SG13_0.0-0.05
				Client sampling date / time	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00
Compound	CAS Number	LOR	Unit		ES0910405-001	ES0910405-002	ES0910405-003	ES0910405-004	ES0910405-005
EP132B: Polynuclear Aromatic Hydrocarbons - Continued									
Naphthalene	91-20-3	10	µg/kg		---	---	---	**5060**	---
Perylene	198-55-0	10	µg/kg		---	---	---	**210**	---
Phenanthrene	85-01-8	10	µg/kg		---	---	---	**1040**	---
Pyrene	129-00-0	10	µg/kg		---	---	---	**1360**	---
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		---	---	---	**75.0**	---
Anthracene-d10	1719-06-8	0.1	%		---	---	---	**80.6**	---
4-Terphenyl-d14	1718-51-0	0.1	%		---	---	---	**94.6**	---

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID	SG14_0.0-0.03	SG15_0.0-0.11	SG16_0.0-0.05	SG17_0.0-0.06	SG18_0.0-0.04
				Client sampling date / time	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00
					ES0910405-006	ES0910405-007	ES0910405-008	ES0910405-009	ES0910405-010
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1.0	%		32.5	52.6	46.4	44.2	49.1
EG020-SD: Total Metals in Sediments by ICPMS									
Antimony	7440-36-0	0.50	mg/kg		<0.50	3.79	3.46	1.72	1.05
Arsenic	7440-38-2	1.00	mg/kg		16.0	148	126	74.6	62.0
Cadmium	7440-43-9	0.1	mg/kg		0.2	3.5	3.7	1.7	1.0
Chromium	7440-47-3	1.0	mg/kg		25.4	112	92.9	64.2	73.7
Copper	7440-50-8	1.0	mg/kg		162	3920	3940	1570	1020
Cobalt	7440-48-4	0.5	mg/kg		5.4	15.8	15.0	10.1	10.1
Lead	7439-92-1	1.0	mg/kg		111	1360	1170	568	511
Nickel	7440-02-0	1.0	mg/kg		7.9	86.8	68.4	41.2	23.9
Selenium	7782-49-2	0.1	mg/kg		1.3	37.7	37.6	11.5	6.8
Silver	7440-22-4	0.1	mg/kg		0.4	15.2	14.7	5.4	3.2
Vanadium	7440-62-2	2.0	mg/kg		52.8	122	99.6	96.1	120
Zinc	7440-66-6	1.0	mg/kg		214	1890	1650	962	820
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.2	2.6	2.5	1.6	1.0
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		----	----	<0.5	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg		----	----	<0.5	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg		----	----	<0.5	<0.5	----
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg		----	----	<1.0	<1.0	----
2-Nitrophenol	88-75-5	0.5	mg/kg		----	----	<0.5	<0.5	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		----	----	<0.5	<0.5	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		----	----	<0.5	<0.5	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		----	----	<0.5	<0.5	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg		----	----	<0.5	<0.5	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		----	----	<0.5	<0.5	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		----	----	<0.5	<0.5	----
Pentachlorophenol	87-86-5	2.0	mg/kg		----	----	<2.0	<2.0	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		----	----	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg		----	----	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg		----	----	620	290	----
C29 - C36 Fraction	----	100	mg/kg		----	----	450	220	----
EP080: BTEX									
Benzene	71-43-2	0.2	mg/kg		----	----	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg		----	----	<0.5	<0.5	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SG14_0.0-0.03	SG15_0.0-0.11	SG16_0.0-0.05	SG17_0.0-0.06	SG18_0.0-0.04
				Client sampling date / time: 13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00
				ES0910405-006	ES0910405-007	ES0910405-008	ES0910405-009	ES0910405-010
EP080: BTEX - Continued								
Ethylbenzene	100-41-4	0.5	mg/kg	----	----	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	----	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	----	----	<0.5	<0.5	----
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.50	µg/kg	----	----	<0.50	<0.50	----
alpha-BHC	319-84-6	0.50	µg/kg	----	----	<0.50	<0.50	----
beta-BHC	319-85-7	0.50	µg/kg	----	----	<0.50	<0.50	----
delta-BHC	319-86-8	0.50	µg/kg	----	----	<0.50	<0.50	----
4.4`-DDD	72-54-8	0.50	µg/kg	----	----	<0.50	<0.50	----
4.4`-DDE	72-55-9	0.50	µg/kg	----	----	<0.50	<0.50	----
4.4`-DDT	50-29-3	0.50	µg/kg	----	----	<0.50	<0.50	----
^ DDT (total)	----	0.50	µg/kg	----	----	<0.50	<0.50	----
Dieldrin	60-57-1	0.50	µg/kg	----	----	<0.50	<0.50	----
alpha-Endosulfan	959-98-8	0.50	µg/kg	----	----	<0.50	<0.50	----
beta-Endosulfan	33213-65-9	0.50	µg/kg	----	----	<0.50	<0.50	----
Endosulfan sulfate	1031-07-8	0.50	µg/kg	----	----	<0.50	<0.50	----
^ Endosulfan (sum)	115-29-7	0.50	µg/kg	----	----	<0.50	<0.50	----
Endrin	72-20-8	0.50	µg/kg	----	----	<0.50	<0.50	----
Endrin aldehyde	7421-93-4	0.50	µg/kg	----	----	<0.50	<0.50	----
Endrin ketone	53494-70-5	0.50	µg/kg	----	----	<0.50	<0.50	----
Heptachlor	76-44-8	0.50	µg/kg	----	----	<0.50	<0.50	----
Heptachlor epoxide	1024-57-3	0.50	µg/kg	----	----	<0.50	<0.50	----
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	----	----	<0.50	<0.50	----
gamma-BHC	58-89-9	0.50	µg/kg	----	----	<0.50	<0.50	----
Methoxychlor	72-43-5	0.50	µg/kg	----	----	<0.50	<0.50	----
cis-Chlordane	5103-71-9	0.50	µg/kg	----	----	<0.50	<0.50	----
trans-Chlordane	5103-74-2	0.50	µg/kg	----	----	<0.50	<0.50	----
^ Total Chlordane (sum)	----	0.50	µg/kg	----	----	<0.50	<0.50	----
Oxychlordane	27304-13-8	0.50	µg/kg	----	----	<0.50	<0.50	----
EP131B: Polychlorinated Biphenyls (as Aroclors)								
^ Total Polychlorinated biphenyls	----	5.0	µg/kg	----	----	<5.0	<5.0	----
Aroclor 1016	12974-11-2	5.0	µg/kg	----	----	<5.0	<5.0	----
Aroclor 1221	11104-28-2	5.0	µg/kg	----	----	<5.0	<5.0	----
Aroclor 1232	11141-16-5	5.0	µg/kg	----	----	<5.0	<5.0	----
Aroclor 1242	53469-21-9	5.0	µg/kg	----	----	<5.0	<5.0	----
Aroclor 1248	12672-29-6	5.0	µg/kg	----	----	<5.0	<5.0	----
Aroclor 1254	11097-69-1	5.0	µg/kg	----	----	<5.0	<5.0	----
Aroclor 1260	11096-82-5	5.0	µg/kg	----	----	<5.0	<5.0	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SG14_0.0-0.03	SG15_0.0-0.11	SG16_0.0-0.05	SG17_0.0-0.06	SG18_0.0-0.04
				Client sampling date / time: 13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00
				ES0910405-006	ES0910405-007	ES0910405-008	ES0910405-009	ES0910405-010
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	10	µg/kg	----	----	<10	<10	----
2-Methylnaphthalene	91-57-6	10	µg/kg	----	----	250	260	----
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/kg	----	----	<10	<10	----
Acenaphthene	83-32-9	10	µg/kg	----	----	60	80	----
Acenaphthylene	208-96-8	10	µg/kg	----	----	160	230	----
Anthracene	120-12-7	10	µg/kg	----	----	160	290	----
Benz(a)anthracene	56-55-3	10	µg/kg	----	----	350	850	----
Benzo(a)pyrene	50-32-8	10	µg/kg	----	----	390	940	----
Benzo(b)fluoranthene	205-99-2	10	µg/kg	----	----	520	1210	----
Benzo(e)pyrene	192-97-2	10	µg/kg	----	----	270	590	----
Benzo(g.h.i)perylene	191-24-2	10	µg/kg	----	----	160	740	----
Benzo(k)fluoranthene	207-08-9	10	µg/kg	----	----	280	290	----
Chrysene	218-01-9	10	µg/kg	----	----	320	770	----
Coronene	191-07-1	10	µg/kg	----	----	40	230	----
Dibenz(a.h)anthracene	53-70-3	10	µg/kg	----	----	40	80	----
Fluoranthene	206-44-0	10	µg/kg	----	----	660	2350	----
Fluorene	86-73-7	10	µg/kg	----	----	180	210	----
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/kg	----	----	150	550	----
N-2-Fluorenyl Acetamide	53-96-3	100	µg/kg	----	----	<100	<100	----
Naphthalene	91-20-3	10	µg/kg	----	----	1730	2740	----
Perylene	198-55-0	10	µg/kg	----	----	100	210	----
Phenanthrene	85-01-8	10	µg/kg	----	----	560	1220	----
Pyrene	129-00-0	10	µg/kg	----	----	590	2070	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	----	----	93.8	96.5	----
2-Chlorophenol-D4	93951-73-6	0.1	%	----	----	89.8	90.6	----
2.4.6-Tribromophenol	118-79-6	0.1	%	----	----	67.4	69.6	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	----	82.2	84.8	----
Anthracene-d10	1719-06-8	0.1	%	----	----	85.0	88.3	----
4-Terphenyl-d14	1718-51-0	0.1	%	----	----	99.0	105	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	----	----	83.4	81.5	----
Toluene-D8	2037-26-5	0.1	%	----	----	85.5	85.8	----
4-Bromofluorobenzene	460-00-4	0.1	%	----	----	78.5	82.1	----
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	----	----	69.2	54.5	----

Analytical Results

Sub-Matrix: SOIL				Client sample ID	SG14_0.0-0.03	SG15_0.0-0.11	SG16_0.0-0.05	SG17_0.0-0.06	SG18_0.0-0.04
				Client sampling date / time	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00
Compound	*CAS Number*	*LOR*	*Unit*		ES0910405-006	ES0910405-007	ES0910405-008	ES0910405-009	ES0910405-010
EP131T: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		---	---	**62.2**	**141**	---
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		---	---	**59.5**	**49.2**	---
Anthracene-d10	1719-06-8	0.1	%		---	---	**62.2**	**65.6**	---
4-Terphenyl-d14	1718-51-0	0.1	%		---	---	**67.5**	**80.5**	---

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID	SG19_0.0-0.01	SG20_0.0-0.04	SG21_0.0-0.02	SG28_0.0-0.01	SG30_0.0-0.01
				Client sampling date / time	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00
					ES0910405-011	ES0910405-012	ES0910405-013	ES0910405-014	ES0910405-015
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	---	1.0	%		19.2	49.0	44.8	19.4	25.3
EG020-SD: Total Metals in Sediments by ICPMS									
Antimony	7440-36-0	0.50	mg/kg		<0.50	<0.50	<0.50	0.68	0.61
Arsenic	7440-38-2	1.00	mg/kg		5.71	22.5	16.2	28.8	29.7
Cadmium	7440-43-9	0.1	mg/kg		<0.1	0.6	0.5	0.1	0.3
Chromium	7440-47-3	1.0	mg/kg		11.2	77.4	95.0	31.9	75.1
Copper	7440-50-8	1.0	mg/kg		52.8	342	213	44.2	256
Cobalt	7440-48-4	0.5	mg/kg		3.2	9.1	6.8	2.6	6.0
Lead	7439-92-1	1.0	mg/kg		36.8	194	135	103	147
Nickel	7440-02-0	1.0	mg/kg		4.6	17.1	13.8	12.1	16.7
Selenium	7782-49-2	0.1	mg/kg		0.4	2.3	1.4	0.4	0.8
Silver	7440-22-4	0.1	mg/kg		0.2	0.7	0.4	<0.1	<0.1
Vanadium	7440-62-2	2.0	mg/kg		26.0	160	346	94.1	302
Zinc	7440-66-6	1.0	mg/kg		83.2	558	419	454	710
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	0.3	0.2	<0.1	0.1
EK026G: Total Cyanide By Discrete Analyser									
Total Cyanide	57-12-5	1	mg/kg		---	---	---	---	<1
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	---	---	---	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	---	---	---	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	---	---	---	<0.5
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg		<1.0	---	---	---	<1.0
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	---	---	---	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	---	---	---	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	---	---	---	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	---	---	---	<0.5
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg		<0.5	---	---	---	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	---	---	---	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	---	---	---	<0.5
Pentachlorophenol	87-86-5	2.0	mg/kg		<2.0	---	---	---	<2.0
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg		<10	---	---	<10	<10
C10 - C14 Fraction	---	50	mg/kg		<50	---	---	<50	<50
C15 - C28 Fraction	---	100	mg/kg		<100	---	---	<100	<100
C29 - C36 Fraction	---	100	mg/kg		<100	---	---	<100	<100
EP080: BTEX									

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SG19_0.0-0.01	SG20_0.0-0.04	SG21_0.0-0.02	SG28_0.0-0.01	SG30_0.0-0.01
				Client sampling date / time: 13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00
				ES0910405-011	ES0910405-012	ES0910405-013	ES0910405-014	ES0910405-015
EP080: BTEX - Continued								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.50	µg/kg	<0.50	----	----	----	<0.50
alpha-BHC	319-84-6	0.50	µg/kg	<0.50	----	----	----	<0.50
beta-BHC	319-85-7	0.50	µg/kg	<0.50	----	----	----	<0.50
delta-BHC	319-86-8	0.50	µg/kg	<0.50	----	----	----	<0.50
4.4`-DDD	72-54-8	0.50	µg/kg	<0.50	----	----	----	<0.50
4.4`-DDE	72-55-9	0.50	µg/kg	<0.50	----	----	----	<0.50
4.4`-DDT	50-29-3	0.50	µg/kg	<0.50	----	----	----	<0.50
^ DDT (total)	----	0.50	µg/kg	<0.50	----	----	----	<0.50
Dieldrin	60-57-1	0.50	µg/kg	<0.50	----	----	----	<0.50
alpha-Endosulfan	959-98-8	0.50	µg/kg	<0.50	----	----	----	<0.50
beta-Endosulfan	33213-65-9	0.50	µg/kg	<0.50	----	----	----	<0.50
Endosulfan sulfate	1031-07-8	0.50	µg/kg	<0.50	----	----	----	<0.50
^ Endosulfan (sum)	115-29-7	0.50	µg/kg	<0.50	----	----	----	<0.50
Endrin	72-20-8	0.50	µg/kg	<0.50	----	----	----	<0.50
Endrin aldehyde	7421-93-4	0.50	µg/kg	<0.50	----	----	----	<0.50
Endrin ketone	53494-70-5	0.50	µg/kg	<0.50	----	----	----	<0.50
Heptachlor	76-44-8	0.50	µg/kg	<0.50	----	----	----	<0.50
Heptachlor epoxide	1024-57-3	0.50	µg/kg	<0.50	----	----	----	<0.50
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	<0.50	----	----	----	<0.50
gamma-BHC	58-89-9	0.50	µg/kg	<0.50	----	----	----	<0.50
Methoxychlor	72-43-5	0.50	µg/kg	<0.50	----	----	----	<0.50
cis-Chlordane	5103-71-9	0.50	µg/kg	<0.50	----	----	----	<0.50
trans-Chlordane	5103-74-2	0.50	µg/kg	<0.50	----	----	----	<0.50
^ Total Chlordane (sum)	----	0.50	µg/kg	<0.50	----	----	----	<0.50
Oxychlordane	27304-13-8	0.50	µg/kg	<0.50	----	----	----	<0.50
EP131B: Polychlorinated Biphenyls (as Aroclors)								
^ Total Polychlorinated biphenyls	----	5.0	µg/kg	<5.0	----	----	----	<5.0
Aroclor 1016	12974-11-2	5.0	µg/kg	<5.0	----	----	----	<5.0
Aroclor 1221	11104-28-2	5.0	µg/kg	<5.0	----	----	----	<5.0
Aroclor 1232	11141-16-5	5.0	µg/kg	<5.0	----	----	----	<5.0
Aroclor 1242	53469-21-9	5.0	µg/kg	<5.0	----	----	----	<5.0
Aroclor 1248	12672-29-6	5.0	µg/kg	<5.0	----	----	----	<5.0

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID	SG19_0.0-0.01	SG20_0.0-0.04	SG21_0.0-0.02	SG28_0.0-0.01	SG30_0.0-0.01
				Client sampling date / time	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00
					ES0910405-011	ES0910405-012	ES0910405-013	ES0910405-014	ES0910405-015
EP131B: Polychlorinated Biphenyls (as Aroclors) - Continued									
Aroclor 1254	11097-69-1	5.0	µg/kg		<5.0	----	----	----	<5.0
Aroclor 1260	11096-82-5	5.0	µg/kg		<5.0	----	----	----	<5.0
EP132B: Polynuclear Aromatic Hydrocarbons									
3-Methylcholanthrene	56-49-5	10	µg/kg		<10	----	----	<10	<10
2-Methylnaphthalene	91-57-6	10	µg/kg		**110**	----	----	<10	<10
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/kg		<10	----	----	<10	<10
Acenaphthene	83-32-9	10	µg/kg		**30**	----	----	<10	<10
Acenaphthylene	208-96-8	10	µg/kg		**90**	----	----	<10	<10
Anthracene	120-12-7	10	µg/kg		**90**	----	----	<10	<10
Benz(a)anthracene	56-55-3	10	µg/kg		**220**	----	----	<10	**20**
Benzo(a)pyrene	50-32-8	10	µg/kg		**250**	----	----	<10	**20**
Benzo(b)fluoranthene	205-99-2	10	µg/kg		**350**	----	----	<10	**30**
Benzo(e)pyrene	192-97-2	10	µg/kg		**160**	----	----	<10	**10**
Benzo(g.h.i)perylene	191-24-2	10	µg/kg		**110**	----	----	<10	<10
Benzo(k)fluoranthene	207-08-9	10	µg/kg		**140**	----	----	<10	**10**
Chrysene	218-01-9	10	µg/kg		**190**	----	----	<10	**20**
Coronene	191-07-1	10	µg/kg		**30**	----	----	<10	<10
Dibenz(a.h)anthracene	53-70-3	10	µg/kg		**30**	----	----	<10	<10
Fluoranthene	206-44-0	10	µg/kg		**520**	----	----	**20**	**40**
Fluorene	86-73-7	10	µg/kg		**90**	----	----	<10	<10
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/kg		**100**	----	----	<10	<10
N-2-Fluorenyl Acetamide	53-96-3	100	µg/kg		<100	----	----	<100	<100
Naphthalene	91-20-3	10	µg/kg		**1220**	----	----	<10	**50**
Perylene	198-55-0	10	µg/kg		**90**	----	----	<10	<10
Phenanthrene	85-01-8	10	µg/kg		**330**	----	----	**10**	**30**
Pyrene	129-00-0	10	µg/kg		**460**	----	----	**10**	**40**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		**81.0**	----	----	----	**97.1**
2-Chlorophenol-D4	93951-73-6	0.1	%		**86.3**	----	----	----	**94.6**
2.4.6-Tribromophenol	118-79-6	0.1	%		**63.1**	----	----	----	**68.8**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**76.4**	----	----	----	**81.2**
Anthracene-d10	1719-06-8	0.1	%		**80.6**	----	----	----	**87.0**
4-Terphenyl-d14	1718-51-0	0.1	%		**95.4**	----	----	----	**102**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**91.8**	----	----	**91.9**	**88.1**
Toluene-D8	2037-26-5	0.1	%		**99.2**	----	----	**101**	**93.7**
4-Bromofluorobenzene	460-00-4	0.1	%		**95.4**	----	----	**98.4**	**93.9**

Analytical Results

Sub-Matrix: SOIL				Client sample ID	SG19_0.0-0.01	SG20_0.0-0.04	SG21_0.0-0.02	SG28_0.0-0.01	SG30_0.0-0.01
				Client sampling date / time	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00
Compound	CAS Number	LOR	Unit		ES0910405-011	ES0910405-012	ES0910405-013	ES0910405-014	ES0910405-015
EP131S: OC Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.1	%		**54.9**	----	----	----	**71.6**
EP131T: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		**69.8**	----	----	----	**80.7**
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**98.9**	----	----	**56.3**	**25.4**
Anthracene-d10	1719-06-8	0.1	%		**115**	----	----	**63.0**	**30.8**
4-Terphenyl-d14	1718-51-0	0.1	%		**134**	----	----	**70.5**	**32.6**

Analytical Results

Sub-Matrix: SOIL				Client sample ID	DUP02	DUP03	PC5_0.0-0.02	SG22_0.02	----
				Client sampling date / time	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	----
Compound	CAS Number	LOR	Unit		ES0910405-018	ES0910405-019	ES0910405-027	ES0910405-028	----
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1.0	%		52.7	45.5	47.6	52.8	----
EG020-SD: Total Metals in Sediments by ICPMS									
Antimony	7440-36-0	0.50	mg/kg		<0.50	0.55	1.11	0.56	----
Arsenic	7440-38-2	1.00	mg/kg		26.7	16.8	28.5	17.2	----
Cadmium	7440-43-9	0.1	mg/kg		0.4	4.0	0.2	0.3	----
Chromium	7440-47-3	1.0	mg/kg		84.4	415	55.5	112	----
Copper	7440-50-8	1.0	mg/kg		364	136	278	291	----
Cobalt	7440-48-4	0.5	mg/kg		9.9	14.3	8.1	7.6	----
Lead	7439-92-1	1.0	mg/kg		204	287	220	144	----
Nickel	7440-02-0	1.0	mg/kg		18.2	26.8	12.7	15.7	----
Selenium	7782-49-2	0.1	mg/kg		2.5	1.8	1.4	1.5	----
Silver	7440-22-4	0.1	mg/kg		0.6	0.9	0.7	0.4	----
Vanadium	7440-62-2	2.0	mg/kg		206	144	75.5	574	----
Zinc	7440-66-6	1.0	mg/kg		580	2310	498	390	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.3	0.3	0.5	0.2	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		----	----	<10	----	----
C10 - C14 Fraction	----	50	mg/kg		----	----	<50	----	----
C15 - C28 Fraction	----	100	mg/kg		----	----	<100	----	----
C29 - C36 Fraction	----	100	mg/kg		----	----	<100	----	----
EP080: BTEX									
Benzene	71-43-2	0.2	mg/kg		----	----	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg		----	----	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		----	----	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	----	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		----	----	<0.5	----	----
EP132B: Polynuclear Aromatic Hydrocarbons									
3-Methylcholanthrene	56-49-5	10	µg/kg		----	----	<10	<10	----
2-Methylnaphthalene	91-57-6	10	µg/kg		----	----	260	310	----
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/kg		----	----	<10	<10	----
Acenaphthene	83-32-9	10	µg/kg		----	----	50	60	----
Acenaphthylene	208-96-8	10	µg/kg		----	----	190	250	----
Anthracene	120-12-7	10	µg/kg		----	----	210	230	----
Benz(a)anthracene	56-55-3	10	µg/kg		----	----	490	540	----
Benzo(a)pyrene	50-32-8	10	µg/kg		----	----	560	580	----
Benzo(b)fluoranthene	205-99-2	10	µg/kg		----	----	610	700	----

Analytical Results

Sub-Matrix: SOIL				Client sample ID	DUP02	DUP03	PC5_0.0-0.02	SG22_0.02	----
				Client sampling date / time	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	----
Compound	CAS Number	LOR	Unit		ES0910405-018	ES0910405-019	ES0910405-027	ES0910405-028	----
EP132B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(e)pyrene	192-97-2	10	µg/kg		----	----	320	410	----
Benzo(g.h.i)perylene	191-24-2	10	µg/kg		----	----	200	260	----
Benzo(k)fluoranthene	207-08-9	10	µg/kg		----	----	290	340	----
Chrysene	218-01-9	10	µg/kg		----	----	400	480	----
Coronene	191-07-1	10	µg/kg		----	----	50	70	----
Dibenz(a.h)anthracene	53-70-3	10	µg/kg		----	----	50	70	----
Fluoranthene	206-44-0	10	µg/kg		----	----	1160	1090	----
Fluorene	86-73-7	10	µg/kg		----	----	200	230	----
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/kg		----	----	200	250	----
N-2-Fluorenyl Acetamide	53-96-3	100	µg/kg		----	----	<100	<100	----
Naphthalene	91-20-3	10	µg/kg		----	----	2580	3320	----
Perylene	198-55-0	10	µg/kg		----	----	130	170	----
Phenanthrene	85-01-8	10	µg/kg		----	----	840	790	----
Pyrene	129-00-0	10	µg/kg		----	----	970	950	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		----	----	88.3	----	----
Toluene-D8	2037-26-5	0.1	%		----	----	92.3	----	----
4-Bromofluorobenzene	460-00-4	0.1	%		----	----	87.6	----	----
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		----	----	54.8	53.1	----
Anthracene-d10	1719-06-8	0.1	%		----	----	58.4	60.6	----
4-Terphenyl-d14	1718-51-0	0.1	%		----	----	66.9	69.3	----

Analytical Results

Sub-Matrix: WATER				Client sample ID	HS-L-01	HS-H-01	HS-L-02	HS-H-02	HS-H-03
				Client sampling date / time	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00
Compound	CAS Number	LOR	Unit		ES0910405-020	ES0910405-021	ES0910405-022	ES0910405-023	ES0910405-024
EA015: Total Dissolved Solids									
^ Total Dissolved Solids @180°C	GIS-210-010	1	mg/L		43800	----	----	----	----
Total Dissolved Solids @180°C	GIS-210-010	1	mg/L		----	37400	38400	39600	38200
EA025: Suspended Solids									
^ Suspended Solids (SS)	----	1	mg/L		20	2	4	8	8
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG093T: Total Metals in Saline Water by ORC-ICPMS									
Selenium	7782-49-2	2	µg/L		<2	<2	<2	<2	<2
Antimony	7440-36-0	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Arsenic	7440-38-2	0.5	µg/L		2.1	1.6	2.1	2.1	1.9
Cadmium	7440-43-9	0.2	µg/L		<0.2	<0.2	2.4	10400	65400
Chromium	7440-47-3	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	7440-48-4	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Copper	7440-50-8	1	µg/L		1	2	1	1	1
Lead	7439-92-1	0.2	µg/L		0.3	0.6	0.3	0.4	0.4
Nickel	7440-02-0	0.5	µg/L		<0.5	0.8	<0.5	0.6	0.5
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	0.5	µg/L		2.2	2.3	1.9	2.1	2.0
Zinc	7440-66-6	5	µg/L		<5	<5	<5	<5	<5
EK025G: Free cyanide by Discrete Analyser									
Free Cyanide	----	0.004	mg/L		<0.004	<0.004	<0.004	<0.004	<0.004
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	1	µg/L		<1	<1	<1	<1	<1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.02	µg/L		<0.02	0.04	<0.02	<0.02	<0.02
Acenaphthylene	208-96-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthene	83-32-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Fluorene	86-73-7	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Phenanthrene	85-01-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Anthracene	120-12-7	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Fluoranthene	206-44-0	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Pyrene	129-00-0	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Benz(a)anthracene	56-55-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Chrysene	218-01-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(b)fluoranthene	205-99-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(k)fluoranthene	207-08-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(a)pyrene	50-32-8	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: HS-L-01	HS-H-01	HS-L-02	HS-H-02	HS-H-03
				Client sampling date / time: 13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00
				ES0910405-020	ES0910405-021	ES0910405-022	ES0910405-023	ES0910405-024
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Indeno(1.2.3.cd)pyrene	193-39-5	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Dibenz(a.h)anthracene	53-70-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(g.h.i)perylene	191-24-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
^ Total PAH	---	0.005	µg/L	<0.005	**0.044**	<0.005	<0.005	<0.005
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
alpha-BHC	319-84-6	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
beta-BHC	319-85-7	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
delta-BHC	319-86-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
4.4`-DDD	72-54-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
4.4`-DDE	72-55-9	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
4.4`-DDT	50-29-3	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
^ DDT (total)	---	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Dieldrin	60-57-1	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
alpha-Endosulfan	959-98-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
beta-Endosulfan	33213-65-9	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Endosulfan sulfate	1031-07-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Endosulfan (sum)	115-29-7	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Endrin	72-20-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Endrin aldehyde	7421-93-4	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Endrin ketone	53494-70-5	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Heptachlor	76-44-8	0.005	µg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Heptachlor epoxide	1024-57-3	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Hexachlorobenzene (HCB)	118-74-1	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
gamma-BHC	58-89-9	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Methoxychlor	72-43-5	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
cis-Chlordane	5103-71-9	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
trans-Chlordane	5103-74-2	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Total Chlordane (sum)	---	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Oxychlordane	27304-13-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
EP132A: Phenolic Compounds								
2-Chlorophenol	95-57-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
m-Cresol	108-39-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
o-Cresol	95-48-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
p-Cresol	106-44-5	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
2.4-Dichlorophenol	120-83-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
2.6-Dichlorophenol	87-65-0	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1

Analytical Results

Sub-Matrix: WATER				Client sample ID	HS-L-01	HS-H-01	HS-L-02	HS-H-02	HS-H-03
				Client sampling date / time	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00
Compound	CAS Number	LOR	Unit		ES0910405-020	ES0910405-021	ES0910405-022	ES0910405-023	ES0910405-024
EP132A: Phenolic Compounds - Continued									
2.4-Dimethylphenol	105-67-9	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorophene	70-30-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
2-Nitrophenol	88-75-5	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
4-Nitrophenol	100-02-7	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Pentachlorophenol	87-86-5	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Phenol	108-95-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tetrachlorophenol	58-90-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
2.4.5-Trichlorophenol	95-95-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
2.4.6-Trichlorophenol	88-06-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		88.3	88.6	88.3	77.6	90.5
EP131S: OC Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.1	%		90.0	89.9	94.6	80.9	93.7
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		96.3	110	120	95.9	88.3
2-Fluorobiphenyl	321-60-8	0.1	%		109	97.3	82.0	86.9	88.2
Anthracene-d10	1719-06-8	0.1	%		68.7	87.6	85.7	84.3	76.2
Anthracene-d10	1719-06-8	0.1	%		114	103	88.0	92.4	91.9
4-Terphenyl-d14	1718-51-0	0.1	%		74.2	84.3	78.6	81.0	75.6
4-Terphenyl-d14	1718-51-0	0.1	%		117	105	89.8	94.0	94.5

Analytical Results

Sub-Matrix: WATER			Client sample ID	HS-L-03	DUP01	----	----	----
			Client sampling date / time	13-JUL-2009 15:00	13-JUL-2009 15:00	----	----	----
Compound	CAS Number	LOR	Unit	ES0910405-025	ES0910405-026	----	----	----
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	GIS-210-010	1	mg/L	**38300**	**39000**	----	----	----
EA025: Suspended Solids								
^ Suspended Solids (SS)	----	1	mg/L	**5**	**5**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----
EG093T: Total Metals in Saline Water by ORC-ICPMS								
Selenium	7782-49-2	2	µg/L	<2	<2	----	----	----
Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	----	----	----
Arsenic	7440-38-2	0.5	µg/L	**1.7**	**1.9**	----	----	----
Cadmium	7440-43-9	0.2	µg/L	**0.6**	**2.3**	----	----	----
Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	----	----	----
Cobalt	7440-48-4	0.2	µg/L	<0.2	<0.2	----	----	----
Copper	7440-50-8	1	µg/L	**1**	**1**	----	----	----
Lead	7439-92-1	0.2	µg/L	**0.5**	**0.3**	----	----	----
Nickel	7440-02-0	0.5	µg/L	**0.7**	<0.5	----	----	----
Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	----	----	----
Vanadium	7440-62-2	0.5	µg/L	**2.2**	**2.0**	----	----	----
Zinc	7440-66-6	5	µg/L	<5	<5	----	----	----
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	<0.004	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	1	µg/L	<1	<1	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.02	µg/L	<0.02	<0.02	----	----	----
Acenaphthylene	208-96-8	0.02	µg/L	<0.02	<0.02	----	----	----
Acenaphthene	83-32-9	0.02	µg/L	<0.02	<0.02	----	----	----
Fluorene	86-73-7	0.02	µg/L	<0.02	<0.02	----	----	----
Phenanthrene	85-01-8	0.02	µg/L	<0.02	<0.02	----	----	----
Anthracene	120-12-7	0.02	µg/L	<0.02	<0.02	----	----	----
Fluoranthene	206-44-0	0.02	µg/L	<0.02	<0.02	----	----	----
Pyrene	129-00-0	0.02	µg/L	<0.02	<0.02	----	----	----
Benz(a)anthracene	56-55-3	0.02	µg/L	<0.02	<0.02	----	----	----
Chrysene	218-01-9	0.02	µg/L	<0.02	<0.02	----	----	----
Benzo(b)fluoranthene	205-99-2	0.02	µg/L	<0.02	<0.02	----	----	----
Benzo(k)fluoranthene	207-08-9	0.02	µg/L	<0.02	<0.02	----	----	----
Benzo(a)pyrene	50-32-8	0.005	µg/L	<0.005	<0.005	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.02	µg/L	<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: WATER				Client sample ID	HS-L-03	DUP01	----	----	----
				Client sampling date / time	13-JUL-2009 15:00	13-JUL-2009 15:00	----	----	----
Compound	CAS Number	LOR	Unit		ES0910405-025	ES0910405-026	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Dibenz(a.h)anthracene	53-70-3	0.02	µg/L		<0.02	<0.02	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.02	µg/L		<0.02	<0.02	----	----	----
^ Total PAH	----	0.005	µg/L		<0.005	<0.005	----	----	----
EP131A: Organochlorine Pesticides									
Aldrin	309-00-2	0.010	µg/L		<0.010	<0.010	----	----	----
alpha-BHC	319-84-6	0.010	µg/L		<0.010	<0.010	----	----	----
beta-BHC	319-85-7	0.010	µg/L		<0.010	<0.010	----	----	----
delta-BHC	319-86-8	0.010	µg/L		<0.010	<0.010	----	----	----
4.4`-DDD	72-54-8	0.010	µg/L		<0.010	<0.010	----	----	----
4.4`-DDE	72-55-9	0.010	µg/L		<0.010	<0.010	----	----	----
4.4`-DDT	50-29-3	0.010	µg/L		<0.010	<0.010	----	----	----
^ DDT (total)	----	0.010	µg/L		<0.010	<0.010	----	----	----
Dieldrin	60-57-1	0.010	µg/L		<0.010	<0.010	----	----	----
alpha-Endosulfan	959-98-8	0.010	µg/L		<0.010	<0.010	----	----	----
beta-Endosulfan	33213-65-9	0.010	µg/L		<0.010	<0.010	----	----	----
Endosulfan sulfate	1031-07-8	0.010	µg/L		<0.010	<0.010	----	----	----
Endosulfan (sum)	115-29-7	0.010	µg/L		<0.010	<0.010	----	----	----
Endrin	72-20-8	0.010	µg/L		<0.010	<0.010	----	----	----
Endrin aldehyde	7421-93-4	0.010	µg/L		<0.010	<0.010	----	----	----
Endrin ketone	53494-70-5	0.010	µg/L		<0.010	<0.010	----	----	----
Heptachlor	76-44-8	0.005	µg/L		<0.005	<0.005	----	----	----
Heptachlor epoxide	1024-57-3	0.010	µg/L		<0.010	<0.010	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.010	µg/L		<0.010	<0.010	----	----	----
gamma-BHC	58-89-9	0.010	µg/L		<0.010	<0.010	----	----	----
Methoxychlor	72-43-5	0.010	µg/L		<0.010	<0.010	----	----	----
cis-Chlordane	5103-71-9	0.010	µg/L		<0.010	<0.010	----	----	----
trans-Chlordane	5103-74-2	0.010	µg/L		<0.010	<0.010	----	----	----
Total Chlordane (sum)	----	0.010	µg/L		<0.010	<0.010	----	----	----
Oxychlordane	27304-13-8	0.010	µg/L		<0.010	<0.010	----	----	----
EP132A: Phenolic Compounds									
2-Chlorophenol	95-57-8	0.05	µg/L		<0.05	<0.05	----	----	----
4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L		<0.05	<0.05	----	----	----
m-Cresol	108-39-4	0.1	µg/L		<0.1	<0.1	----	----	----
o-Cresol	95-48-7	0.1	µg/L		<0.1	<0.1	----	----	----
p-Cresol	106-44-5	0.1	µg/L		<0.1	<0.1	----	----	----
2.4-Dichlorophenol	120-83-2	0.1	µg/L		<0.1	<0.1	----	----	----
2.6-Dichlorophenol	87-65-0	0.1	µg/L		<0.1	<0.1	----	----	----
2.4-Dimethylphenol	105-67-9	0.1	µg/L		<0.1	<0.1	----	----	----

Analytical Results

Sub-Matrix: WATER				Client sample ID	HS-L-03	DUP01	----	----	----
				Client sampling date / time	13-JUL-2009 15:00	13-JUL-2009 15:00	----	----	----
Compound	CAS Number	LOR	Unit		ES0910405-025	ES0910405-026	----	----	----
EP132A: Phenolic Compounds - Continued									
Hexachlorophene	70-30-4	0.1	µg/L		<0.1	<0.1	----	----	----
2-Nitrophenol	88-75-5	0.1	µg/L		<0.1	<0.1	----	----	----
4-Nitrophenol	100-02-7	0.1	µg/L		<0.1	<0.1	----	----	----
Pentachlorophenol	87-86-5	0.05	µg/L		<0.05	<0.05	----	----	----
Phenol	108-95-2	0.1	µg/L		<0.1	<0.1	----	----	----
Tetrachlorophenol	58-90-2	0.1	µg/L		<0.1	<0.1	----	----	----
2.4.5-Trichlorophenol	95-95-4	0.1	µg/L		<0.1	<0.1	----	----	----
2.4.6-Trichlorophenol	88-06-2	0.1	µg/L		<0.1	<0.1	----	----	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		**95.3**	**86.4**	----	----	----
EP131S: OC Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.1	%		**97.2**	**86.1**	----	----	----
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**97.5**	**109**	----	----	----
2-Fluorobiphenyl	321-60-8	0.1	%		**80.8**	**98.4**	----	----	----
Anthracene-d10	1719-06-8	0.1	%		**82.7**	**98.6**	----	----	----
Anthracene-d10	1719-06-8	0.1	%		**84.5**	**103**	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		**84.4**	**83.8**	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		**85.0**	**104**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	24	113
2-Chlorophenol-D4	93951-73-6	23	134
2.4.6-Tribromophenol	118-79-6	19	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	30	115
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	18	137
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	10	136
EP131T: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	10	164
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	30	115
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	18	137

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	10	164
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	10	136
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	116
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	33	141

QUALITY CONTROL REPORT

Work Order	: **ES0910405**	Page	: 1 of 19
Amendment	: **2**		
Client	: **ENSR AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRISTIANN DONNETTI	Contact	: Charlie Pierce
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: christiaan.donnetti@aecom.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 02 8484 8999	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8484 8989	Facsimile	: +61-2-8784 8500
Project	: S3012805 - Port Kembla Outer Harbour	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: PORT KEMBLA		
C-O-C number	: ----	Date Samples Received	: 15-JUL-2009
Sampler	: KP/CD	Issue Date	: 05-AUG-2009
Order number	: ----		
		No. of samples received	: 28
Quote number	: SY/330/09 V3	No. of samples analysed	: 26

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Organics
Celine Conceicao	Spectroscopist	Inorganics
Hoa Nguyen	Inorganic Chemist	Inorganics
Victor Kedicioglu	Business Manager - NSW	Inorganics
Wisam Abou-Maraseh	Spectroscopist	Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insuffient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG020-SD: Total Metals in Sediments by ICPMS	ES0910562-049	Anonymous	**Chromium**	7440-47-3	25.9 %	0-20%	**RPD exceeds LOR based limits**
EG020-SD: Total Metals in Sediments by ICPMS	ES0910562-049	Anonymous	**Vanadium**	7440-62-2	73.1 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Anthracene**	120-12-7	23.5 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Benz(a)anthracene**	56-55-3	37.4 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Benzo(a)pyrene**	50-32-8	32.3 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Benzo(b)fluoranthene**	205-99-2	41.8 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Benzo(e)pyrene**	192-97-2	31.3 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Benzo(g.h.i)perylene**	191-24-2	32.1 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Chrysene**	218-01-9	37.8 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Coronene**	191-07-1	35.0 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Fluoranthene**	206-44-0	34.1 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Indeno(1.2.3.cd)pyrene**	193-39-5	65.8 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Perylene**	198-55-0	29.0 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Phenanthrene**	85-01-8	25.3 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Pyrene**	129-00-0	32.6 %	0-20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EG020-SD: Total Metals in Sediments by ICPMS	ES0910203-021	Anonymous	**Copper**	7440-50-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020-SD: Total Metals in Sediments by ICPMS	ES0910203-021	Anonymous	**Zinc**	7440-66-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Acenaphthylene**	208-96-8	125 %	35-122%	**Recovery greater than upper data quality objective**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Anthracene**	120-12-7	131 %	44-124%	**Recovery greater than upper data quality objective**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Benz(a)anthracene**	56-55-3	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Benzo(a)pyrene**	50-32-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 1042400)									
ES0910304-025	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	---	1.0	%	15.2	16.2	6.5	0% - 50%
ES0910405-009	SG17_0.0-0.06	EA055-103: Moisture Content (dried @ 103°C)	---	1.0	%	44.2	43.5	1.4	0% - 20%
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 1042817)									
ES0910203-021	Anonymous	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	11.8	10.5	11.6	0% - 20%
		EG020-SD: Selenium	7782-49-2	0.1	mg/kg	35.7	30.6	15.4	0% - 20%
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	11.6	12.8	9.8	0% - 20%
		EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	11.0	9.8	12.1	0% - 50%
		EG020-SD: Antimony	7440-36-0	0.50	mg/kg	4.19	4.54	7.9	No Limit
		EG020-SD: Chromium	7440-47-3	1.0	mg/kg	160	145	9.9	0% - 20%
		EG020-SD: Copper	7440-50-8	1.0	mg/kg	2240	2170	3.0	0% - 20%
		EG020-SD: Lead	7439-92-1	1.0	mg/kg	1170	1230	4.7	0% - 20%
		EG020-SD: Nickel	7440-02-0	1.0	mg/kg	37.4	41.5	10.4	0% - 20%
		EG020-SD: Zinc	7440-66-6	1.0	mg/kg	2550	2310	10.0	0% - 20%
		EG020-SD: Arsenic	7440-38-2	1.00	mg/kg	104	102	1.9	0% - 20%
		EG020-SD: Vanadium	7440-62-2	2.0	mg/kg	85.1	74.0	13.9	0% - 20%
ES0910405-008	SG16_0.0-0.05	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	3.7	3.8	5.0	0% - 20%
		EG020-SD: Selenium	7782-49-2	0.1	mg/kg	37.6	34.6	8.4	0% - 20%
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	14.7	13.5	8.7	0% - 20%
		EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	15.0	13.4	10.6	0% - 20%
		EG020-SD: Antimony	7440-36-0	0.50	mg/kg	3.46	3.46	0.0	No Limit
		EG020-SD: Chromium	7440-47-3	1.0	mg/kg	92.9	90.0	3.2	0% - 20%
		EG020-SD: Copper	7440-50-8	1.0	mg/kg	3940	3740	5.3	0% - 20%
		EG020-SD: Lead	7439-92-1	1.0	mg/kg	1170	1150	1.8	0% - 20%
		EG020-SD: Nickel	7440-02-0	1.0	mg/kg	68.4	64.6	5.8	0% - 20%
		EG020-SD: Zinc	7440-66-6	1.0	mg/kg	1650	1590	3.5	0% - 20%
		EG020-SD: Arsenic	7440-38-2	1.00	mg/kg	126	124	1.1	0% - 20%
		EG020-SD: Vanadium	7440-62-2	2.0	mg/kg	99.6	99.1	0.6	0% - 20%
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 1046029)									
ES0910562-041	Anonymous	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	0.2	0.3	0.0	No Limit
		EG020-SD: Selenium	7782-49-2	0.1	mg/kg	0.7	0.6	15.5	No Limit
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	0.2	71.4	No Limit
		EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	10.9	12.5	14.2	0% - 20%
		EG020-SD: Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	0.0	No Limit
		EG020-SD: Chromium	7440-47-3	1.0	mg/kg	22.8	22.6	0.6	0% - 20%
		EG020-SD: Copper	7440-50-8	1.0	mg/kg	23.2	25.3	8.6	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 1046029) - continued									
ES0910562-041	Anonymous	EG020-SD: Lead	7439-92-1	1.0	mg/kg	21.1	20.6	2.2	0% - 20%
		EG020-SD: Nickel	7440-02-0	1.0	mg/kg	14.5	16.4	12.3	0% - 50%
		EG020-SD: Zinc	7440-66-6	1.0	mg/kg	112	112	0.5	0% - 20%
		EG020-SD: Arsenic	7440-38-2	1.00	mg/kg	11.9	13.7	13.9	0% - 50%
		EG020-SD: Vanadium	7440-62-2	2.0	mg/kg	56.2	54.5	3.0	0% - 20%
ES0910562-049	Anonymous	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	0.2	0.2	0.0	No Limit
		EG020-SD: Selenium	7782-49-2	0.1	mg/kg	0.7	0.5	21.4	No Limit
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	0.1	<0.1	0.0	No Limit
		EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	4.8	5.4	13.1	0% - 50%
		EG020-SD: Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	0.0	No Limit
		EG020-SD: Chromium	7440-47-3	1.0	mg/kg	47.6	61.8	# 25.9	0% - 20%
		EG020-SD: Copper	7440-50-8	1.0	mg/kg	17.5	15.5	12.2	0% - 50%
		EG020-SD: Lead	7439-92-1	1.0	mg/kg	29.2	28.8	1.4	0% - 20%
		EG020-SD: Nickel	7440-02-0	1.0	mg/kg	7.4	12.0	48.0	0% - 50%
		EG020-SD: Zinc	7440-66-6	1.0	mg/kg	197	184	6.4	0% - 20%
		EG020-SD: Arsenic	7440-38-2	1.00	mg/kg	5.98	6.94	14.8	No Limit
		EG020-SD: Vanadium	7440-62-2	2.0	mg/kg	250	539	# 73.1	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1042816)									
ES0910203-021	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	2.6	3.0	11.5	0% - 20%
ES0910405-008	SG16_0.0-0.05	EG035T: Mercury	7439-97-6	0.1	mg/kg	2.5	2.6	0.0	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1046028)									
ES0910562-041	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES0910562-049	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1042189)									
ES0910329-001	Anonymous	EK026G: Total Cyanide	57-12-5	1	mg/kg	36	37	0.0	0% - 20%
EP075(SIM)A: Phenolic Compounds (QC Lot: 1042044)									
ES0910359-001	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
ES0910359-009	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)A: Phenolic Compounds (QC Lot: 1042044) - continued									
ES0910359-009	Anonymous	EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1042028)									
ES0910314-021	Anonymous	EP080: C6 - C9 Fraction	---	10	mg/kg	<10	<10	0.0	No Limit
ES0910449-001	Anonymous	EP080: C6 - C9 Fraction	---	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1042043)									
ES0910359-001	Anonymous	EP071: C15 - C28 Fraction	---	100	mg/kg	130	130	0.0	No Limit
		EP071: C29 - C36 Fraction	---	100	mg/kg	140	120	11.4	No Limit
		EP071: C10 - C14 Fraction	---	50	mg/kg	<50	<50	0.0	No Limit
ES0910359-009	Anonymous	EP071: C15 - C28 Fraction	---	100	mg/kg	100	110	0.0	No Limit
		EP071: C29 - C36 Fraction	---	100	mg/kg	120	130	0.0	No Limit
		EP071: C10 - C14 Fraction	---	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEX (QC Lot: 1042028)									
ES0910314-021	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES0910449-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP131A: Organochlorine Pesticides (QC Lot: 1042812)									
ES0910405-008	SG16_0.0-0.05	EP131A: Aldrin	309-00-2	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-BHC	319-84-6	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-BHC	319-85-7	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: delta-BHC	319-86-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP131A: Organochlorine Pesticides (QC Lot: 1042812) - continued									
ES0910405-008	SG16_0.0-0.05	EP131A: 4.4`-DDD	72-54-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDE	72-55-9	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDT	50-29-3	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: DDT (total)	---	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Dieldrin	60-57-1	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-Endosulfan	959-98-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-Endosulfan	33213-65-9	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan sulfate	1031-07-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan (sum)	115-29-7	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin	72-20-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin aldehyde	7421-93-4	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin ketone	53494-70-5	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor	76-44-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor epoxide	1024-57-3	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: gamma-BHC	58-89-9	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Methoxychlor	72-43-5	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: cis-Chlordane	5103-71-9	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: trans-Chlordane	5103-74-2	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Total Chlordane (sum)	---	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
EP131B: Polychlorinated Biphenyls (as Aroclors) (QC Lot: 1042813)									
ES0910405-008	SG16_0.0-0.05	EP131B: Total Polychlorinated biphenyls	---	5.0	µg/kg	<5.0	<5.0	0.0	No Limit
		EP131B: Aroclor 1016	12974-11-2	5.0	µg/kg	<5.0	<5.0	0.0	No Limit
		EP131B: Aroclor 1221	11104-28-2	5.0	µg/kg	<5.0	<5.0	0.0	No Limit
		EP131B: Aroclor 1232	11141-16-5	5.0	µg/kg	<5.0	<5.0	0.0	No Limit
		EP131B: Aroclor 1242	53469-21-9	5.0	µg/kg	<5.0	<5.0	0.0	No Limit
		EP131B: Aroclor 1248	12672-29-6	5.0	µg/kg	<5.0	<5.0	0.0	No Limit
		EP131B: Aroclor 1254	11097-69-1	5.0	µg/kg	<5.0	<5.0	0.0	No Limit
		EP131B: Aroclor 1260	11096-82-5	5.0	µg/kg	<5.0	<5.0	0.0	No Limit
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1042093)									
ES0910405-004	SG12_0.0-0.04	EP132: 3-Methylcholanthrene	56-49-5	10	µg/kg	<10	<10	0.0	No Limit
		EP132: 2-Methylnaphthalene	91-57-6	10	µg/kg	390	430	10.3	0% - 20%
		EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Acenaphthene	83-32-9	10	µg/kg	80	90	0.0	No Limit
		EP132: Acenaphthylene	208-96-8	10	µg/kg	300	360	16.5	0% - 20%
		EP132: Anthracene	120-12-7	10	µg/kg	270	340	# 23.5	0% - 20%
		EP132: Benz(a)anthracene	56-55-3	10	µg/kg	660	960	# 37.4	0% - 20%
		EP132: Benzo(a)pyrene	50-32-8	10	µg/kg	860	1190	# 32.3	0% - 20%
		EP132: Benzo(b)fluoranthene	205-99-2	10	µg/kg	1000	1530	# 41.8	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1042093) - continued									
ES0910405-004	SG12_0.0-0.04	EP132: Benzo(e)pyrene	192-97-2	10	µg/kg	540	730	# 31.3	0% - 20%
		EP132: Benzo(g.h.i)perylene	191-24-2	10	µg/kg	720	990	# 32.1	0% - 20%
		EP132: Benzo(k)fluoranthene	207-08-9	10	µg/kg	430	410	3.9	0% - 20%
		EP132: Chrysene	218-01-9	10	µg/kg	630	920	# 37.8	0% - 20%
		EP132: Coronene	191-07-1	10	µg/kg	270	380	# 35.0	0% - 20%
		EP132: Dibenz(a.h)anthracene	53-70-3	10	µg/kg	110	160	35.8	0% - 50%
		EP132: Fluoranthene	206-44-0	10	µg/kg	1520	2140	# 34.1	0% - 20%
		EP132: Fluorene	86-73-7	10	µg/kg	290	340	13.7	0% - 20%
		EP132: Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/kg	390	770	# 65.8	0% - 20%
		EP132: Naphthalene	91-20-3	10	µg/kg	5060	5550	9.2	0% - 20%
		EP132: Perylene	198-55-0	10	µg/kg	210	280	# 29.0	0% - 20%
		EP132: Phenanthrene	85-01-8	10	µg/kg	1040	1340	# 25.3	0% - 20%
		EP132: Pyrene	129-00-0	10	µg/kg	1360	1890	# 32.6	0% - 20%
		EP132: N-2-Fluorenyl Acetamide	53-96-3	100	µg/kg	<100	<100	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA015: Total Dissolved Solids (QC Lot: 1042283)									
ES0910325-012	Anonymous	EA015: Total Dissolved Solids @180°C	GIS-210-010	1	mg/L	18500	20000	7.5	0% - 20%
ES0910405-021	HS-H-01	EA015: Total Dissolved Solids @180°C	GIS-210-010	1	mg/L	37400	34500	8.1	0% - 20%
EA025: Suspended Solids (QC Lot: 1042759)									
ES0910289-004	Anonymous	EA025: Suspended Solids (SS)	---	1	mg/L	36	38	5.4	0% - 20%
ES0910289-005	Anonymous	EA025: Suspended Solids (SS)	---	1	mg/L	128	116	9.8	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1042082)									
ES0910206-002	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES0910405-022	HS-L-02	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG093T: Total Metals in Saline Water by ORC-ICPMS (QC Lot: 1047996)									
ES0910405-022	HS-L-02	EG093A-T: Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG093A-T: Cadmium	7440-43-9	0.2	µg/L	2.4	2.4	0.0	0% - 50%
		EG093A-T: Cobalt	7440-48-4	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-T: Lead	7439-92-1	0.2	µg/L	0.3	0.4	0.0	No Limit
		EG093A-T: Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-T: Arsenic	7440-38-2	0.5	µg/L	2.1	1.8	13.6	No Limit
		EG093A-T: Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-T: Nickel	7440-02-0	0.5	µg/L	<0.5	0.5	0.0	No Limit
		EG093A-T: Vanadium	7440-62-2	0.5	µg/L	1.9	1.9	0.0	No Limit
		EG093A-T: Copper	7440-50-8	1	µg/L	1	1	0.0	No Limit
		EG093A-T: Zinc	7440-66-6	5	µg/L	<5	<5	0.0	No Limit
ES0910408-004	Anonymous	EG093A-T: Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG093A-T: Cadmium	7440-43-9	0.2	µg/L	0.3	0.3	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG093T: Total Metals in Saline Water by ORC-ICPMS (QC Lot: 1047996) - continued									
ES0910408-004	Anonymous	EG093A-T: Cobalt	7440-48-4	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-T: Lead	7439-92-1	0.2	µg/L	0.7	0.4	51.8	No Limit
		EG093A-T: Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-T: Arsenic	7440-38-2	0.5	µg/L	2.2	2.3	0.0	No Limit
		EG093A-T: Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-T: Nickel	7440-02-0	0.5	µg/L	0.8	0.7	0.0	No Limit
		EG093A-T: Vanadium	7440-62-2	0.5	µg/L	3.8	3.7	0.0	No Limit
		EG093A-T: Copper	7440-50-8	1	µg/L	11	11	0.0	0% - 50%
		EG093A-T: Zinc	7440-66-6	5	µg/L	<5	<5	0.0	No Limit
EG093T: Total Metals in Saline Water by ORC-ICPMS (QC Lot: 1047997)									
ES0910405-022	HS-L-02	EG093B-T: Selenium	7782-49-2	2	µg/L	<2	<2	0.0	No Limit
ES0910408-004	Anonymous	EG093B-T: Selenium	7782-49-2	2	µg/L	<2	<2	0.0	No Limit
EK025G: Free cyanide by Discrete Analyser (QC Lot: 1042765)									
ES0910405-020	HS-L-01	EK025G: Free Cyanide	---	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 1045875)									
ES0910405-022	HS-L-02	EP066: Total Polychlorinated biphenyls	---	1	µg/L	<1	<1	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1045077)									
ES0910405-022	HS-L-02	EP132-LL: Benzo(a)pyrene	50-32-8	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP132-LL: Total PAH	---	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP132-LL: Naphthalene	91-20-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP132-LL: Acenaphthylene	208-96-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP132-LL: Acenaphthene	83-32-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP132-LL: Fluorene	86-73-7	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP132-LL: Phenanthrene	85-01-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP132-LL: Anthracene	120-12-7	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP132-LL: Fluoranthene	206-44-0	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP132-LL: Pyrene	129-00-0	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP132-LL: Benz(a)anthracene	56-55-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP132-LL: Chrysene	218-01-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP132-LL: Benzo(b)fluoranthene	205-99-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP132-LL: Benzo(k)fluoranthene	207-08-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP132-LL: Indeno(1.2.3.cd)pyrene	193-39-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP132-LL: Dibenz(a.h)anthracene	53-70-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP132-LL: Benzo(g.h.i)perylene	191-24-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP131A: Organochlorine Pesticides (QC Lot: 1045082)									
ES0910405-022	HS-L-02	EP131A: Heptachlor	76-44-8	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP131A: Aldrin	309-00-2	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: alpha-BHC	319-84-6	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: beta-BHC	319-85-7	0.010	µg/L	<0.010	<0.010	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP131A: Organochlorine Pesticides (QC Lot: 1045082) - continued									
ES0910405-022	HS-L-02	EP131A: delta-BHC	319-86-8	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: 4.4`-DDD	72-54-8	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: 4.4`-DDE	72-55-9	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: 4.4`-DDT	50-29-3	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: DDT (total)	----	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: Dieldrin	60-57-1	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: alpha-Endosulfan	959-98-8	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: beta-Endosulfan	33213-65-9	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: Endosulfan sulfate	1031-07-8	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: Endosulfan (sum)	115-29-7	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: Endrin	72-20-8	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: Endrin aldehyde	7421-93-4	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: Endrin ketone	53494-70-5	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: Heptachlor epoxide	1024-57-3	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: Hexachlorobenzene (HCB)	118-74-1	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: gamma-BHC	58-89-9	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: Methoxychlor	72-43-5	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: cis-Chlordane	5103-71-9	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: trans-Chlordane	5103-74-2	0.010	µg/L	<0.010	<0.010	0.0	No Limit
		EP131A: Total Chlordane (sum)	----	0.010	µg/L	<0.010	<0.010	0.0	No Limit
EP132A: Phenolic Compounds (QC Lot: 1045076)									
ES0910405-022	HS-L-02	EP132: 2-Chlorophenol	95-57-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP132: 4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP132: Pentachlorophenol	87-86-5	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP132: m-Cresol	108-39-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: o-Cresol	95-48-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: p-Cresol	106-44-5	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: 2.4-Dichlorophenol	120-83-2	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: 2.6-Dichlorophenol	87-65-0	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: 2.4-Dimethylphenol	105-67-9	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Hexachlorophene	70-30-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: 2-Nitrophenol	88-75-5	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: 4-Nitrophenol	100-02-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Phenol	108-95-2	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Tetrachlorophenol	58-90-2	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: 2.4.5-Trichlorophenol	95-95-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: 2.4.6-Trichlorophenol	88-06-2	0.1	µg/L	<0.1	<0.1	0.0	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 1042817)								
EG020-SD: Antimony	7440-36-0	0.5	mg/kg	<0.50	----	----	----	----
EG020-SD: Arsenic	7440-38-2	1.0	mg/kg	<1.00	13.1 mg/kg	106	70	130
EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	2.76 mg/kg	95.7	70	130
EG020-SD: Chromium	7440-47-3	1.0	mg/kg	<1.0	60.9 mg/kg	104	70	130
EG020-SD: Copper	7440-50-8	1.0	mg/kg	<1.0	54.7 mg/kg	92.2	70	130
EG020-SD: Cobalt	7440-48-4	10	mg/kg	<10.0	24.5 mg/kg	99.0	70	130
EG020-SD: Lead	7439-92-1	1.0	mg/kg	<1.0	54.8 mg/kg	92.0	70	130
EG020-SD: Nickel	7440-02-0	1.0	mg/kg	<1.0	55.2 mg/kg	101	70	130
EG020-SD: Selenium	7782-49-2	0.1	mg/kg	<0.1	----	----	----	----
EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	5.6 mg/kg	123	70	130
EG020-SD: Vanadium	7440-62-2	2	mg/kg	<2.0	34 mg/kg	102	70	130
EG020-SD: Zinc	7440-66-6	1.0	mg/kg	<1.0	104 mg/kg	94.0	70	130
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 1046029)								
EG020-SD: Antimony	7440-36-0	0.5	mg/kg	<0.50	----	----	----	----
EG020-SD: Arsenic	7440-38-2	1.0	mg/kg	<1.00	13.1 mg/kg	109	70	130
EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	2.76 mg/kg	98.8	70	130
EG020-SD: Chromium	7440-47-3	1.0	mg/kg	<1.0	60.9 mg/kg	108	70	130
EG020-SD: Copper	7440-50-8	1.0	mg/kg	<1.0	54.7 mg/kg	98.8	70	130
EG020-SD: Cobalt	7440-48-4	10	mg/kg	<10.0	24.5 mg/kg	108	70	130
EG020-SD: Lead	7439-92-1	1.0	mg/kg	<1.0	54.8 mg/kg	101	70	130
EG020-SD: Nickel	7440-02-0	1.0	mg/kg	<1.0	55.2 mg/kg	103	70	130
EG020-SD: Selenium	7782-49-2	0.1	mg/kg	<0.1	----	----	----	----
EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	5.6 mg/kg	107	70	130
EG020-SD: Vanadium	7440-62-2	2	mg/kg	<2.0	34 mg/kg	104	70	130
EG020-SD: Zinc	7440-66-6	1.0	mg/kg	<1.0	104 mg/kg	97.3	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1042816)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	85.1	67	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1046028)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	87.6	67	118
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1042189)								
EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	50 mg/kg	108	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 1042044)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	101	73.9	115
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	86.2	80.2	115

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)A: Phenolic Compounds (QCLot: 1042044) - continued								
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	79.5	76.8	114
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	8 mg/kg	81.5	72	119
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	85.5	60.3	117
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	87.1	74.5	119
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	80.2	71.6	113
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	81.8	74.8	115
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	97.3	76.4	114
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	98.7	62.2	115
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	105	68.9	112
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1.0	8 mg/kg	82.9	1.23	91.6
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1042028)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	73.1	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1042043)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	97.0	75.2	116
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	200 mg/kg	98.0	75.3	113
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	94.0	72.6	117
EP080: BTEX (QCLot: 1042028)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	82.6	67.5	125
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	72.5	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	79.3	65.3	126
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	84.3	66.5	124
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	78.5	66.7	123
EP131A: Organochlorine Pesticides (QCLot: 1042812)								
EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	5 µg/kg	88.3	31.7	140
EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	5 µg/kg	112	24.5	150
EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	5 µg/kg	111	36.9	139
EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	5 µg/kg	93.1	38.2	137
EP131A: 4.4`-DDD	72-54-8	0.5	µg/kg	<0.50	5 µg/kg	104	42.5	141
EP131A: 4.4`-DDE	72-55-9	0.5	µg/kg	<0.50	5 µg/kg	85.4	34.8	140
EP131A: 4.4`-DDT	50-29-3	0.5	µg/kg	<0.50	5 µg/kg	90.5	38	143
EP131A: DDT (total)	----	0.5	µg/kg	<0.50	----	----	----	----
EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.50	5 µg/kg	107	43.2	134
EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.50	5 µg/kg	63.5	23.7	139
EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.50	5 µg/kg	92.2	35.8	138
EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.50	5 µg/kg	107	7.45	158
EP131A: Endosulfan (sum)	115-29-7	0.5	µg/kg	<0.50	----	----	----	----
EP131A: Endrin	72-20-8	0.5	µg/kg	<0.50	5 µg/kg	98.0	21.6	162
EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.50	5 µg/kg	60.1	19.3	131

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP131A: Organochlorine Pesticides (QCLot: 1042812) - continued								
EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.50	5 µg/kg	88.5	17.9	141
EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.50	5 µg/kg	105	31	153
EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.50	5 µg/kg	106	34.3	138
EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.50	5 µg/kg	107	18.6	146
EP131A: gamma-BHC	58-89-9	0.5	µg/kg	<0.50	5 µg/kg	104	30.7	145
EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.50	5 µg/kg	127	15	157
EP131A: cis-Chlordane	5103-71-9	0.5	µg/kg	<0.50	5 µg/kg	92.7	22.3	145
EP131A: trans-Chlordane	5103-74-2	0.5	µg/kg	<0.50	5 µg/kg	87.3	42.4	139
EP131A: Total Chlordane (sum)	----	0.5	µg/kg	<0.50	----	----	----	----
EP131B: Polychlorinated Biphenyls (as Aroclors) (QCLot: 1042813)								
EP131B: Total Polychlorinated biphenyls	----	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1016	12974-11-2	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1221	11104-28-2	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1232	11141-16-5	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1242	53469-21-9	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1248	12672-29-6	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1254	11097-69-1	5	µg/kg	<5.0	50 µg/kg	79.0	61.3	121
EP131B: Aroclor 1260	11096-82-5	5	µg/kg	<5.0	----	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1042093)								
EP132: 3-Methylcholanthrene	56-49-5	10	µg/kg	<10	100 µg/kg	104	34.8	123
EP132: 2-Methylnaphthalene	91-57-6	10	µg/kg	<10	100 µg/kg	101	66.6	122
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/kg	<10	100 µg/kg	120	6.88	147
EP132: Acenaphthene	83-32-9	10	µg/kg	<10	100 µg/kg	101	62.9	124
EP132: Acenaphthylene	208-96-8	10	µg/kg	<10	100 µg/kg	93.8	58.2	117
EP132: Anthracene	120-12-7	10	µg/kg	<10	100 µg/kg	100	61.4	117
EP132: Benz(a)anthracene	56-55-3	10	µg/kg	<10	100 µg/kg	110	65.7	125
EP132: Benzo(a)pyrene	50-32-8	10	µg/kg	<10	100 µg/kg	104	60.7	119
EP132: Benzo(b)fluoranthene	205-99-2	10	µg/kg	<10	100 µg/kg	108	68.6	126
EP132: Benzo(e)pyrene	192-97-2	10	µg/kg	<10	100 µg/kg	109	70	129
EP132: Benzo(g.h.i)perylene	191-24-2	10	µg/kg	<10	100 µg/kg	110	52.4	135
EP132: Benzo(k)fluoranthene	207-08-9	10	µg/kg	<10	100 µg/kg	109	70.4	126
EP132: Chrysene	218-01-9	10	µg/kg	<10	100 µg/kg	112	67.5	126
EP132: Coronene	191-07-1	10	µg/kg	<10	100 µg/kg	104	34.7	141
EP132: Dibenz(a.h)anthracene	53-70-3	10	µg/kg	<10	100 µg/kg	110	61.7	129
EP132: Fluoranthene	206-44-0	10	µg/kg	<10	100 µg/kg	110	68.7	126
EP132: Fluorene	86-73-7	10	µg/kg	<10	100 µg/kg	106	66.7	123
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/kg	<10	100 µg/kg	110	56.6	131
EP132: N-2-Fluorenyl Acetamide	53-96-3	100	µg/kg	<100	100 µg/kg	62.7	50	138
EP132: Naphthalene	91-20-3	10	µg/kg	<10	100 µg/kg	100	63.2	120

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1042093) - continued								
EP132: Perylene	198-55-0	10	µg/kg	<10	100 µg/kg	102	58.6	119
EP132: Phenanthrene	85-01-8	10	µg/kg	<10	100 µg/kg	107	65.4	124
EP132: Pyrene	129-00-0	10	µg/kg	<10	100 µg/kg	112	67.9	127

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EA015: Total Dissolved Solids (QCLot: 1042283)								
EA015: Total Dissolved Solids @180°C	GIS-210-010	1	mg/L	<1	293 mg/L	99.6	77.9	122
EA025: Suspended Solids (QCLot: 1042759)								
EA025: Suspended Solids (SS)	----	1	mg/L	<1	150 mg/L	105	88.4	124
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1042082)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	95.2	81	119
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 1047996)								
EG093A-T: Antimony	7440-36-0	0.5	µg/L	<0.5	----	----	----	----
EG093A-T: Arsenic	7440-38-2	0.5	µg/L	<0.5	10 µg/L	90.4	89	125
EG093A-T: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	87.7	78	112
EG093A-T: Chromium	7440-47-3	0.5	µg/L	<0.5	10 µg/L	87.4	86	126
EG093A-T: Cobalt	7440-48-4	0.2	µg/L	<0.2	10 µg/L	90.9	90	126
EG093A-T: Copper	7440-50-8	1	µg/L	<1	10 µg/L	88.2	87	123
EG093A-T: Lead	7439-92-1	0.2	µg/L	<0.2	10 µg/L	92.4	89	121
EG093A-T: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	91.8	85	125
EG093A-T: Silver	7440-22-4	0.1	µg/L	<0.1	1 µg/L	74.2	70	130
EG093A-T: Vanadium	7440-62-2	0.5	µg/L	<0.5	10 µg/L	91.5	87	121
EG093A-T: Zinc	7440-66-6	5	µg/L	<5	10 µg/L	# 79.2	82	128
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 1047997)								
EG093B-T: Selenium	7782-49-2	2	µg/L	<2	10 µg/L	105	75	130
EK025G: Free cyanide by Discrete Analyser (QCLot: 1042765)								
EK025G: Free Cyanide	----	0.004	mg/L	<0.004	0.50 mg/L	102	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1045875)								
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	1 µg/L	# 135	61.6	107
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1045077)								
EP132-LL: Naphthalene	91-20-3	0.02	µg/L	<0.02	0.025 µg/L	109	68.3	116
EP132-LL: Acenaphthylene	208-96-8	0.02	µg/L	<0.02	0.025 µg/L	102	72.4	112
EP132-LL: Acenaphthene	83-32-9	0.02	µg/L	<0.02	0.025 µg/L	103	73.2	111
EP132-LL: Fluorene	86-73-7	0.02	µg/L	<0.02	0.025 µg/L	80.6	72.9	114
EP132-LL: Phenanthrene	85-01-8	0.02	µg/L	<0.02	0.025 µg/L	91.2	74.8	112
EP132-LL: Anthracene	120-12-7	0.02	µg/L	<0.02	0.025 µg/L	88.1	73.4	113

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1045077) - continued								
EP132-LL: Fluoranthene	206-44-0	0.02	µg/L	<0.02	0.025 µg/L	93.4	74.8	117
EP132-LL: Pyrene	129-00-0	0.02	µg/L	<0.02	0.025 µg/L	112	74.1	117
EP132-LL: Benz(a)anthracene	56-55-3	0.02	µg/L	<0.02	0.025 µg/L	83.8	73.6	114
EP132-LL: Chrysene	218-01-9	0.02	µg/L	<0.02	0.025 µg/L	90.5	69.6	120
EP132-LL: Benzo(b)fluoranthene	205-99-2	0.02	µg/L	<0.02	0.025 µg/L	78.9	71.4	119
EP132-LL: Benzo(k)fluoranthene	207-08-9	0.02	µg/L	<0.02	0.025 µg/L	80.2	74.8	118
EP132-LL: Benzo(a)pyrene	50-32-8	0.005	µg/L	<0.005	0.025 µg/L	# 72.4	75.2	117
EP132-LL: Indeno(1.2.3.cd)pyrene	193-39-5	0.02	µg/L	<0.02	0.025 µg/L	98.5	67.8	119
EP132-LL: Dibenz(a.h)anthracene	53-70-3	0.02	µg/L	<0.02	0.025 µg/L	88.6	71.5	117
EP132-LL: Benzo(g.h.i)perylene	191-24-2	0.02	µg/L	<0.02	0.025 µg/L	87.2	66.6	121
EP132-LL: Total PAH	----	0.005	µg/L	<0.005	----	----	----	----
EP131A: Organochlorine Pesticides (QCLot: 1045082)								
EP131A: Aldrin	309-00-2	0.001	µg/L	----	0.1 µg/L	109	35.8	139
		0.01	µg/L	<0.010	----	----	----	----
EP131A: alpha-BHC	319-84-6	0.001	µg/L	----	0.1 µg/L	123	19.7	153
		0.01	µg/L	<0.010	----	----	----	----
EP131A: beta-BHC	319-85-7	0.001	µg/L	----	0.1 µg/L	101	43.8	136
		0.01	µg/L	<0.010	----	----	----	----
EP131A: delta-BHC	319-86-8	0.001	µg/L	----	0.1 µg/L	112	37.4	144
		0.01	µg/L	<0.010	----	----	----	----
EP131A: 4.4`-DDD	72-54-8	0.001	µg/L	----	0.1 µg/L	92.0	37.5	145
		0.01	µg/L	<0.010	----	----	----	----
EP131A: 4.4`-DDE	72-55-9	0.001	µg/L	----	0.1 µg/L	93.5	30.5	146
		0.01	µg/L	<0.010	----	----	----	----
EP131A: 4.4`-DDT	50-29-3	0.001	µg/L	----	0.1 µg/L	99.4	31	151
		0.01	µg/L	<0.010	----	----	----	----
EP131A: DDT (total)	----	0.01	µg/L	<0.010	----	----	----	----
EP131A: Dieldrin	60-57-1	0.001	µg/L	----	0.1 µg/L	116	34.4	145
		0.01	µg/L	<0.010	----	----	----	----
EP131A: alpha-Endosulfan	959-98-8	0.001	µg/L	----	0.1 µg/L	73.5	30.2	141
		0.01	µg/L	<0.010	----	----	----	----
EP131A: beta-Endosulfan	33213-65-9	0.001	µg/L	----	0.1 µg/L	97.5	30.3	148
		0.01	µg/L	<0.010	----	----	----	----
EP131A: Endosulfan sulfate	1031-07-8	0.001	µg/L	----	0.1 µg/L	122	19.1	150
		0.01	µg/L	<0.010	----	----	----	----
EP131A: Endosulfan (sum)	115-29-7	0.01	µg/L	<0.010	----	----	----	----
EP131A: Endrin	72-20-8	0.001	µg/L	----	0.1 µg/L	138	13	165
		0.01	µg/L	<0.010	----	----	----	----
EP131A: Endrin aldehyde	7421-93-4	0.001	µg/L	----	0.1 µg/L	70.5	28.3	134
		0.01	µg/L	<0.010	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP131A: Organochlorine Pesticides (QCLot: 1045082) - continued								
EP131A: Endrin ketone	53494-70-5	0.001	µg/L	----	0.1 µg/L	101	15.1	146
		0.01	µg/L	<0.010	----	----	----	----
EP131A: Heptachlor	76-44-8	0.001	µg/L	----	0.1 µg/L	124	33.2	148
		0.005	µg/L	<0.005	----	----	----	----
EP131A: Heptachlor epoxide	1024-57-3	0.001	µg/L	----	0.1 µg/L	104	36	143
		0.01	µg/L	<0.010	----	----	----	----
EP131A: Hexachlorobenzene (HCB)	118-74-1	0.001	µg/L	----	0.1 µg/L	101	14	146
		0.01	µg/L	<0.010	----	----	----	----
EP131A: gamma-BHC	58-89-9	0.001	µg/L	----	0.1 µg/L	96.2	27.2	147
		0.01	µg/L	<0.010	----	----	----	----
EP131A: Methoxychlor	72-43-5	0.001	µg/L	----	0.1 µg/L	137	34.4	150
		0.01	µg/L	<0.010	----	----	----	----
EP131A: cis-Chlordane	5103-71-9	0.001	µg/L	----	0.1 µg/L	95.2	15.4	152
		0.01	µg/L	<0.010	----	----	----	----
EP131A: trans-Chlordane	5103-74-2	0.001	µg/L	----	0.1 µg/L	80.5	45.1	140
		0.01	µg/L	<0.010	----	----	----	----
EP131A: Total Chlordane (sum)	----	0.01	µg/L	<0.010	----	----	----	----
EP132A: Phenolic Compounds (QCLot: 1045076)								
EP132: 2-Chlorophenol	95-57-8	0.05	µg/L	<0.05	2 µg/L	100	74.2	119
EP132: 4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.05	2 µg/L	99.9	70.1	115
EP132: m-Cresol	108-39-4	0.10	µg/L	<0.1	2 µg/L	# 99.0	45.3	93.3
EP132: o-Cresol	95-48-7	0.10	µg/L	<0.1	2 µg/L	99.7	46	103
EP132: p-Cresol	106-44-5	0.10	µg/L	<0.1	2 µg/L	98.5	43.6	102
EP132: 2.4-Dichlorophenol	120-83-2	0.10	µg/L	<0.1	2 µg/L	98.8	70.2	117
EP132: 2.6-Dichlorophenol	87-65-0	0.10	µg/L	<0.1	2 µg/L	98.2	69.8	115
EP132: 2.4-Dimethylphenol	105-67-9	0.10	µg/L	<0.1	2 µg/L	97.7	40	128
EP132: Hexachlorophene	70-30-4	0.10	µg/L	<0.1	2 µg/L	84.4	24.4	102
EP132: 2-Nitrophenol	88-75-5	0.10	µg/L	<0.1	2 µg/L	# 27.1	49.7	112
EP132: 4-Nitrophenol	100-02-7	0.10	µg/L	<0.1	2 µg/L	# 32.3	32.8	109
EP132: Pentachlorophenol	87-86-5	0.05	µg/L	<0.05	2 µg/L	36.4	32.6	89.4
EP132: Phenol	108-95-2	0.10	µg/L	<0.1	2 µg/L	# 95.0	26.5	58.7
EP132: Tetrachlorophenol	58-90-2	0.10	µg/L	<0.1	2 µg/L	55.1	34.4	108
EP132: 2.4.5-Trichlorophenol	95-95-4	0.10	µg/L	<0.1	2 µg/L	87.8	56.4	117
EP132: 2.4.6-Trichlorophenol	88-06-2	0.10	µg/L	<0.1	2 µg/L	93.6	56.8	117

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 1042817)							
ES0910203-021	Anonymous	EG020-SD: Arsenic	7440-38-2	50 mg/kg	87.9	70	130
		EG020-SD: Cadmium	7440-43-9	50 mg/kg	89.3	70	130
		EG020-SD: Chromium	7440-47-3	50 mg/kg	87.2	70	130
		EG020-SD: Copper	7440-50-8	250 mg/kg	# Not Determined	70	130
		EG020-SD: Lead	7439-92-1	250 mg/kg	84.6	70	130
		EG020-SD: Nickel	7440-02-0	50 mg/kg	92.7	70	130
		EG020-SD: Zinc	7440-66-6	250 mg/kg	# Not Determined	70	130
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 1046029)							
ES0910562-041	Anonymous	EG020-SD: Arsenic	7440-38-2	50 mg/kg	95.0	70	130
		EG020-SD: Cadmium	7440-43-9	50 mg/kg	94.7	70	130
		EG020-SD: Chromium	7440-47-3	50 mg/kg	114	70	130
		EG020-SD: Copper	7440-50-8	250 mg/kg	95.2	70	130
		EG020-SD: Lead	7439-92-1	250 mg/kg	98.5	70	130
		EG020-SD: Nickel	7440-02-0	50 mg/kg	95.6	70	130
		EG020-SD: Zinc	7440-66-6	250 mg/kg	103	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1042816)							
ES0910203-021	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	91.6	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1046028)							
ES0910562-041	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	92.9	70	130
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1042189)							
ES0910329-001	Anonymous	EK026G: Total Cyanide	57-12-5	50 mg/kg	117	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 1042044)							
ES0910359-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	75.1	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	85.5	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	72.3	60	130
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	10 mg/kg	78.6	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	39.3	20	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1042028)							
ES0910449-001	Anonymous	EP080: C6 - C9 Fraction	----	26 mg/kg	93.2	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1042043)							
ES0910359-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	110	70	130
		EP071: C15 - C28 Fraction	----	3140 mg/kg	105	70	130
		EP071: C29 - C36 Fraction	----	2860 mg/kg	116	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080: BTEX (QCLot: 1042028)							
ES0910449-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	71.8	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	75.2	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	72.8	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	78.7	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	72.1	70	130
EP131A: Organochlorine Pesticides (QCLot: 1042812)							
ES0910405-008	SG16_0.0-0.05	EP131A: Aldrin	309-00-2	5 µg/kg	76.9	31.7	140
		EP131A: alpha-BHC	319-84-6	5 µg/kg	98.6	24.5	150
		EP131A: beta-BHC	319-85-7	5 µg/kg	93.1	36.9	139
		EP131A: delta-BHC	319-86-8	5 µg/kg	67.0	38.2	137
		EP131A: 4.4`-DDD	72-54-8	5 µg/kg	118	42.5	141
		EP131A: 4.4`-DDE	72-55-9	5 µg/kg	97.2	34.8	140
		EP131A: 4.4`-DDT	50-29-3	5 µg/kg	108	38	143
		EP131A: Dieldrin	60-57-1	5 µg/kg	110	43.2	134
		EP131A: alpha-Endosulfan	959-98-8	5 µg/kg	100	23.7	139
		EP131A: beta-Endosulfan	33213-65-9	5 µg/kg	70.0	35.8	138
		EP131A: Endosulfan sulfate	1031-07-8	5 µg/kg	63.2	7.45	158
		EP131A: Endrin	72-20-8	5 µg/kg	113	21.6	162
		EP131A: Endrin aldehyde	7421-93-4	5 µg/kg	79.9	19.3	131
		EP131A: Endrin ketone	53494-70-5	5 µg/kg	61.3	17.9	141
		EP131A: Heptachlor	76-44-8	5 µg/kg	115	31	153
		EP131A: Heptachlor epoxide	1024-57-3	5 µg/kg	110	34.3	138
		EP131A: Hexachlorobenzene (HCB)	118-74-1	5 µg/kg	120	18.6	146
		EP131A: gamma-BHC	58-89-9	5 µg/kg	86.4	30.7	145
		EP131A: Methoxychlor	72-43-5	5 µg/kg	83.6	15	157
		EP131A: cis-Chlordane	5103-71-9	5 µg/kg	86.5	22.3	145
		EP131A: trans-Chlordane	5103-74-2	5 µg/kg	108	42.4	139
EP131B: Polychlorinated Biphenyls (as Aroclors) (QCLot: 1042813)							
ES0910405-008	SG16_0.0-0.05	EP131B: Aroclor 1254	11097-69-1	50 µg/kg	88.4	61.3	121
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1042093)							
ES0910405-004	SG12_0.0-0.04	EP132: 3-Methylcholanthrene	56-49-5	100 µg/kg	61.2	21	129
		EP132: 2-Methylnaphthalene	91-57-6	100 µg/kg	106	40	130
		EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	100 µg/kg	74.5	8	158
		EP132: Acenaphthene	83-32-9	100 µg/kg	77.3	38	127
		EP132: Acenaphthylene	208-96-8	100 µg/kg	# 125	35	122
		EP132: Anthracene	120-12-7	100 µg/kg	# 131	44	124
		EP132: Benz(a)anthracene	56-55-3	100 µg/kg	# Not Determined	48	124

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Spike Recovery (%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1042093) - continued							
ES0910405-004	SG12_0.0-0.04	EP132: Benzo(a)pyrene	50-32-8	100 µg/kg	# Not Determined	44	123
		EP132: Benzo(b)fluoranthene	205-99-2	100 µg/kg	# Not Determined	43	129
		EP132: Benzo(e)pyrene	192-97-2	100 µg/kg	# Not Determined	46	130
		EP132: Benzo(g.h.i)perylene	191-24-2	100 µg/kg	# Not Determined	43	129
		EP132: Benzo(k)fluoranthene	207-08-9	100 µg/kg	120	54	123
		EP132: Chrysene	218-01-9	100 µg/kg	# Not Determined	55	122
		EP132: Coronene	191-07-1	100 µg/kg	# Not Determined	33	134
		EP132: Dibenz(a.h)anthracene	53-70-3	100 µg/kg	82.4	46	129
		EP132: Fluoranthene	206-44-0	100 µg/kg	# Not Determined	52	125
		EP132: Fluorene	86-73-7	100 µg/kg	120	45	121
		EP132: Indeno(1.2.3.cd)pyrene	193-39-5	100 µg/kg	# Not Determined	41	132
		EP132: N-2-Fluorenyl Acetamide	53-96-3	1000 µg/kg	130	28	152
		EP132: Naphthalene	91-20-3	100 µg/kg	# Not Determined	34	130
		EP132: Perylene	198-55-0	100 µg/kg	120	38	124
		EP132: Phenanthrene	85-01-8	100 µg/kg	# Not Determined	45	124
		EP132: Pyrene	129-00-0	100 µg/kg	# Not Determined	51	129

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Spike Recovery (%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1042082)							
ES0910206-002	Anonymous	EG035T: Mercury	7439-97-6	0.010 mg/L	91.4	70	130
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 1047996)							
ES0910405-022	HS-L-02	EG093A-T: Arsenic	7440-38-2	50 µg/L	89.7	70	130
		EG093A-T: Cadmium	7440-43-9	12.5 µg/L	86.3	70	130
		EG093A-T: Chromium	7440-47-3	50 µg/L	89.6	70	130
		EG093A-T: Cobalt	7440-48-4	50 µg/L	93.6	70	130
		EG093A-T: Copper	7440-50-8	50 µg/L	88.1	70	130
		EG093A-T: Lead	7439-92-1	50 µg/L	88.3	70	130
		EG093A-T: Nickel	7440-02-0	50 µg/L	92.1	70	130
		EG093A-T: Vanadium	7440-62-2	50 µg/L	89.0	70	130
		EG093A-T: Zinc	7440-66-6	50 µg/L	76.6	70	130
EK025G: Free cyanide by Discrete Analyser (QCLot: 1042765)							
ES0910405-020	HS-L-01	EK025G: Free Cyanide	----	0.50 mg/L	98.4	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1045077)							
ES0910405-022	HS-L-02	EP132-LL: Naphthalene	91-20-3	0.025 µg/L	108	70	130
		EP132-LL: Acenaphthylene	208-96-8	0.025 µg/L	78.8	70	130
		EP132-LL: Acenaphthene	83-32-9	0.025 µg/L	73.3	70	130

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Spike Recovery (%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1045077) - continued							
ES0910405-022	HS-L-02	EP132-LL: Fluorene	86-73-7	0.025 µg/L	87.9	70	130
		EP132-LL: Phenanthrene	85-01-8	0.025 µg/L	97.2	70	130
		EP132-LL: Anthracene	120-12-7	0.025 µg/L	92.3	70	130
		EP132-LL: Fluoranthene	206-44-0	0.025 µg/L	# 69.1	70	130
		EP132-LL: Pyrene	129-00-0	0.025 µg/L	79.5	70	130
		EP132-LL: Benz(a)anthracene	56-55-3	0.025 µg/L	# 62.8	70	130
		EP132-LL: Chrysene	218-01-9	0.025 µg/L	77.0	70	130
		EP132-LL: Benzo(b)fluoranthene	205-99-2	0.025 µg/L	93.1	70	130
		EP132-LL: Benzo(k)fluoranthene	207-08-9	0.025 µg/L	88.2	70	130
		EP132-LL: Benzo(a)pyrene	50-32-8	0.025 µg/L	# 66.5	70	130
		EP132-LL: Indeno(1.2.3.cd)pyrene	193-39-5	0.025 µg/L	# 65.5	70	130
		EP132-LL: Dibenz(a.h)anthracene	53-70-3	0.025 µg/L	# 62.0	70	130
		EP132-LL: Benzo(g.h.i)perylene	191-24-2	0.025 µg/L	# 68.0	70	130
EP131A: Organochlorine Pesticides (QCLot: 1045082)							
ES0910405-022	HS-L-02	EP131A: Aldrin	309-00-2	0.1 µg/L	86.4	35.8	139
		EP131A: alpha-BHC	319-84-6	0.1 µg/L	101	19.7	153
		EP131A: beta-BHC	319-85-7	0.1 µg/L	88.6	43.8	136
		EP131A: delta-BHC	319-86-8	0.1 µg/L	86.9	37.4	144
		EP131A: 4.4`-DDD	72-54-8	0.1 µg/L	65.9	37.5	145
		EP131A: 4.4`-DDE	72-55-9	0.1 µg/L	72.4	30.5	146
		EP131A: 4.4`-DDT	50-29-3	0.1 µg/L	74.1	31	151
		EP131A: Dieldrin	60-57-1	0.1 µg/L	88.8	34.4	145
		EP131A: alpha-Endosulfan	959-98-8	0.1 µg/L	54.7	30.2	141
		EP131A: beta-Endosulfan	33213-65-9	0.1 µg/L	75.6	30.3	148
		EP131A: Endosulfan sulfate	1031-07-8	0.1 µg/L	98.0	19.1	150
		EP131A: Endrin	72-20-8	0.1 µg/L	81.7	13	165
		EP131A: Endrin aldehyde	7421-93-4	0.1 µg/L	57.7	28.3	134
		EP131A: Endrin ketone	53494-70-5	0.1 µg/L	78.6	15.1	146
		EP131A: Heptachlor	76-44-8	0.1 µg/L	99.3	33.2	148
		EP131A: Heptachlor epoxide	1024-57-3	0.1 µg/L	81.8	36	143
		EP131A: Hexachlorobenzene (HCB)	118-74-1	0.1 µg/L	83.2	14	146
		EP131A: gamma-BHC	58-89-9	0.1 µg/L	80.3	27.2	147
		EP131A: Methoxychlor	72-43-5	0.1 µg/L	104	34.4	150
		EP131A: cis-Chlordane	5103-71-9	0.1 µg/L	73.7	15.4	152
		EP131A: trans-Chlordane	5103-74-2	0.1 µg/L	63.5	45.1	140

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES0910405**	Page	: 1 of 14
Amendment	: **2**		
Client	: ENSR AUSTRALIA PTY LIMITED	Laboratory	: Environmental Division Sydney
Contact	: MR CHRISTIANN DONNETTI	Contact	: Charlie Pierce
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Project	: S3012805 - Port Kembla Outer Harbour	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: PORT KEMBLA		
C-O-C number	: ----	Date Samples Received	: 15-JUL-2009
Sampler	: KP/CD	Issue Date	: 05-AUG-2009
Order number	: ----		
		No. of samples received	: 28
Quote number	: SY/330/09 V3	No. of samples analysed	: 26

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content								
Soil Glass Jar - Unpreserved								
SG9_0.0-0.7,	SG10_0.0-0.7,	**13-JUL-2009**	**----**	----	----	**16-JUL-2009**	20-JUL-2009	✓
SG11_0.0-0.7,	SG12_0.0-0.04,							
SG13_0.0-0.05,	SG14_0.0-0.03,							
SG15_0.0-0.11,	SG16_0.0-0.05,							
SG17_0.0-0.06,	SG18_0.0-0.04,							
SG19_0.0-0.01,	SG20_0.0-0.04,							
SG21_0.0-0.02,	SG28_0.0-0.01,							
SG30_0.0-0.01,	DUP02,							
DUP03,	PC5_0.0-0.02,							
SG22_0.02								
EG020-SD: Total Metals in Sediments by ICPMS								
Soil Glass Jar - Unpreserved								
SG9_0.0-0.7,	SG10_0.0-0.7,	**13-JUL-2009**	**17-JUL-2009**	10-AUG-2009	✓	**17-JUL-2009**	09-JAN-2010	✓
SG11_0.0-0.7,	SG12_0.0-0.04,							
SG13_0.0-0.05,	SG14_0.0-0.03,							
SG15_0.0-0.11,	SG16_0.0-0.05,							
SG17_0.0-0.06,	SG18_0.0-0.04,							
SG19_0.0-0.01,	SG20_0.0-0.04,							
SG21_0.0-0.02,	SG28_0.0-0.01,							
SG30_0.0-0.01,	DUP02,							
DUP03								
Soil Glass Jar - Unpreserved								
PC5_0.0-0.02,	SG22_0.02	**13-JUL-2009**	**21-JUL-2009**	10-AUG-2009	✓	**22-JUL-2009**	09-JAN-2010	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved								
SG9_0.0-0.7,	SG10_0.0-0.7,	**13-JUL-2009**	**17-JUL-2009**	10-AUG-2009	✓	**17-JUL-2009**	10-AUG-2009	✓
SG11_0.0-0.7,	SG12_0.0-0.04,							
SG13_0.0-0.05,	SG14_0.0-0.03,							
SG15_0.0-0.11,	SG16_0.0-0.05,							
SG17_0.0-0.06,	SG18_0.0-0.04,							
SG19_0.0-0.01,	SG20_0.0-0.04,							
SG21_0.0-0.02,	SG28_0.0-0.01,							
SG30_0.0-0.01,	DUP02,							
DUP03								
Soil Glass Jar - Unpreserved								
PC5_0.0-0.02,	SG22_0.02	**13-JUL-2009**	**21-JUL-2009**	10-AUG-2009	✓	**22-JUL-2009**	10-AUG-2009	✓
EK026G: Total Cyanide By Discrete Analyser								
Soil Glass Jar - Unpreserved								
SG12_0.0-0.04,	SG30_0.0-0.01	**13-JUL-2009**	**16-JUL-2009**	20-JUL-2009	✓	**17-JUL-2009**	30-JUL-2009	✓
EP075(SIM)A: Phenolic Compounds								
Soil Glass Jar - Unpreserved								
SG16_0.0-0.05,	SG17_0.0-0.06,	**13-JUL-2009**	**16-JUL-2009**	27-JUL-2009	✓	**17-JUL-2009**	25-AUG-2009	✓
SG19_0.0-0.01,	SG30_0.0-0.01							
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved								
SG16_0.0-0.05,	SG17_0.0-0.06,	**13-JUL-2009**	**16-JUL-2009**	27-JUL-2009	✓	**16-JUL-2009**	27-JUL-2009	✓
SG19_0.0-0.01,	SG28_0.0-0.01,							
SG30_0.0-0.01,	PC5_0.0-0.02							
Soil Glass Jar - Unpreserved								
SG16_0.0-0.05,	SG17_0.0-0.06,	**13-JUL-2009**	**16-JUL-2009**	27-JUL-2009	✓	**17-JUL-2009**	25-AUG-2009	✓
SG19_0.0-0.01,	SG28_0.0-0.01,							
SG30_0.0-0.01,	PC5_0.0-0.02							
EP080: BTEX								
Soil Glass Jar - Unpreserved								
SG16_0.0-0.05,	SG17_0.0-0.06,	**13-JUL-2009**	**16-JUL-2009**	27-JUL-2009	✓	**16-JUL-2009**	27-JUL-2009	✓
SG19_0.0-0.01,	SG28_0.0-0.01,							
SG30_0.0-0.01,	PC5_0.0-0.02							
EP131A: Organochlorine Pesticides								
Soil Glass Jar - Unpreserved								
SG16_0.0-0.05,	SG17_0.0-0.06,	**13-JUL-2009**	**23-JUL-2009**	27-JUL-2009	✓	**23-JUL-2009**	01-SEP-2009	✓
SG19_0.0-0.01,	SG30_0.0-0.01							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP131B: Polychlorinated Biphenyls (as Aroclors)							
Soil Glass Jar - Unpreserved							
SG16_0.0-0.05, SG17_0.0-0.06, SG19_0.0-0.01, SG30_0.0-0.01	**13-JUL-2009**	**23-JUL-2009**	27-JUL-2009	✓	**23-JUL-2009**	01-SEP-2009	✓
EP132B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved							
SG12_0.0-0.04, SG16_0.0-0.05, SG17_0.0-0.06, SG19_0.0-0.01, SG28_0.0-0.01, SG30_0.0-0.01, PC5_0.0-0.02, SG22_0.02	**13-JUL-2009**	**16-JUL-2009**	27-JUL-2009	✓	**19-JUL-2009**	25-AUG-2009	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA015: Total Dissolved Solids							
Clear Plastic Bottle - Natural							
HS-L-01, HS-H-01, HS-L-02, HS-H-02, HS-H-03, HS-L-03, DUP01	**13-JUL-2009**	**----**	----	----	**16-JUL-2009**	20-JUL-2009	✓
EA025: Suspended Solids							
Clear Plastic Bottle - Natural							
HS-L-01, HS-H-01, HS-L-02, HS-H-02, HS-H-03, HS-L-03, DUP01	**13-JUL-2009**	**----**	----	----	**17-JUL-2009**	20-JUL-2009	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered							
HS-L-01, HS-H-01, HS-L-02, HS-H-02, HS-H-03, HS-L-03, DUP01	**13-JUL-2009**	**----**	----	----	**20-JUL-2009**	10-AUG-2009	✓
EG093T: Total Metals in Saline Water by ORC-ICPMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered							
HS-L-01, HS-H-01, HS-L-02, HS-H-02, HS-H-03, HS-L-03, DUP01	**13-JUL-2009**	**23-JUL-2009**	09-JAN-2010	✓	**23-JUL-2009**	09-JAN-2010	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK025G: Free cyanide by Discrete Analyser							
White Plastic Bottle - NaOH/Cadmium Nitrate							
HS-L-01, HS-H-01, HS-L-02, HS-H-02, HS-H-03, HS-L-03, DUP01	**13-JUL-2009**	**17-JUL-2009**	27-JUL-2009	✓	**17-JUL-2009**	27-JUL-2009	✓
EP066: Polychlorinated Biphenyls (PCB)							
Amber Glass Bottle - Unpreserved							
HS-L-01, HS-H-01, HS-L-02, HS-H-02, HS-H-03, HS-L-03, DUP01	**13-JUL-2009**	**20-JUL-2009**	20-JUL-2009	✓	**22-JUL-2009**	30-AUG-2009	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved							
HS-L-01, HS-H-01, HS-L-02, HS-H-02, HS-H-03, HS-L-03, DUP01	**13-JUL-2009**	**20-JUL-2009**	20-JUL-2009	✓	**23-JUL-2009**	31-AUG-2009	✓
EP131A: Organochlorine Pesticides							
Amber Glass Bottle - Unpreserved							
HS-L-01, HS-H-01, HS-L-02, HS-H-02, HS-H-03, HS-L-03, DUP01	**13-JUL-2009**	**17-JUL-2009**	20-JUL-2009	✓	**22-JUL-2009**	31-AUG-2009	✓
EP132A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved							
HS-L-01, HS-H-01, HS-L-02, HS-H-02, HS-H-03, HS-L-03, DUP01	**13-JUL-2009**	**20-JUL-2009**	20-JUL-2009	✓	**22-JUL-2009**	31-AUG-2009	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Organochlorine Pesticides (Ultra-trace)	EP131A	1	4	**25.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	14	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PCB's (Ultra-trace)	EP131B	1	4	**25.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	9	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	4	**25.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals in Sediments by ICPMS	EG020-SD	4	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	14	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Organochlorine Pesticides (Ultra-trace)	EP131A	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PCB's (Ultra-trace)	EP131B	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals in Sediments by ICPMS	EG020-SD	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Organochlorine Pesticides (Ultra-trace)	EP131A	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PCB's (Ultra-trace)	EP131B	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals in Sediments by ICPMS	EG020-SD	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Organochlorine Pesticides (Ultra-trace)	EP131A	1	4	**25.0**	**5.0**	✓	ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.1**	**5.0**	✓	ALS QCS3 requirement
PCB's (Ultra-trace)	EP131B	1	4	**25.0**	**5.0**	✓	ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	9	**11.1**	**5.0**	✓	ALS QCS3 requirement

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Matrix Spikes (MS) - Continued							
Total Cyanide By Discrete Analyser	EK026G	1	4	**25.0**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	37	**5.4**	**5.0**	✓	ALS QCS3 requirement
Total Metals in Sediments by ICPMS	EG020-SD	2	37	**5.4**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	14	**7.1**	**5.0**	✓	ALS QCS3 requirement

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Free CN by Discrete Analyser	EK025G	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Organochlorine Pesticides (Ultra-trace)	EP131A	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH Compounds in Water	EP132-LL	1	8	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	13	**7.7**	**10.0**	×	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Suspended Solids	EA025	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids	EA015	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	2	12	**16.7**	**9.5**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-T	2	12	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Free CN by Discrete Analyser	EK025G	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Organochlorine Pesticides (Ultra-trace)	EP131A	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH Compounds in Water	EP132-LL	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Suspended Solids	EA025	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids	EA015	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	1	12	**8.3**	**4.8**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-T	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Free CN by Discrete Analyser	EK025G	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Organochlorine Pesticides (Ultra-trace)	EP131A	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH Compounds in Water	EP132-LL	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Suspended Solids	EA025	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids	EA015	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	1	12	**8.3**	**4.8**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-T	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Free CN by Discrete Analyser	EK025G	1	7	**14.3**	**5.0**	✓	ALS QCS3 requirement
Organochlorine Pesticides (Ultra-trace)	EP131A	1	7	**14.3**	**5.0**	✓	ALS QCS3 requirement
PAH Compounds in Water	EP132-LL	1	8	**12.5**	**5.0**	✓	ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	13	**7.7**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	1	12	**8.3**	**4.8**	✓	ALS QCS3 requirement

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (1999) Schedule B(3) (Method 102)
Total Metals in Sediments by ICPMS	EG020-SD	SOIL	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector. Analyte list and LORs per NODG.
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)
Total Cyanide By Discrete Analyser	EK026G	SOIL	APHA 21st 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)
Organochlorine Pesticides (Ultra-trace)	EP131A	SOIL	USEPA Method 3640 (GPC cleanup),3620 (Florisil), 8081/8082 (GC/uECD/uECD) This technique is compliant with NEPM (1999) Schedule B(3) (Method 504)
PCB's (Ultra-trace)	EP131B	SOIL	USEPA Method 3640 (GPC cleanup),3620 (Florisil), 8081/8082 (GC/uECD/uECD) This technique is compliant with NEPM (1999) Schedule B(3) (Method 504)
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	SOIL	8270 GCMS Capiliary column, SIM mode.
Total Dissolved Solids	EA015	WATER	APHA 21st ed., 2540C A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Suspended Solids	EA025	WATER	APHA 21st ed., 2540D A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-T	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Free CN by Discrete Analyser	EK025G	WATER	APHA 21st ed., 4500-CN-C&N Free Cyanide is determined on samples after distillation using a pyridine-barbituric acid colouring reagent followed with an Discrete Analyser finish. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Polychlorinated Biphenyls (PCB)	EP066	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Organochlorine Pesticides (Ultra-trace)	EP131A	WATER	USEPA Method 3640 (GPC cleanup),3620 (Florisil), 8081/8082 (GC/uECD/uECD). This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	WATER	USEPA 3640 (GPC Cleanup), 8270 GCMS Capiliary column, SIM mode. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
PAH Compounds in Water	EP132-LL	WATER	8270 GCMS, LVI, Capiliary column, SIM mode. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
NaOH leach for TCN in Soils	EK026PR	SOIL	APHA 21st ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids/ Acetylation	ORG17A-AC	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to 1 mL with exchange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace analysis.

Preparation Methods	Method	Matrix	Method Descriptions
Tumbler Extraction of Solids/ Sample Cleanup	ORG17A-UTP	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. Samples are extracted, concentrated (by KD) and exchanged into an appropriate solvent for GPC and florisil cleanup as required.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.
Free Cyanide	EK025-PR	WATER	APHA 21st ed., 4500 CN- C&N. The sample is distilled at natural pH. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Digestion for Total Recoverable Metals - ORC	EN25-ORC	WATER	Modified USEPA SW846-3005. This is an Ultrapure Nitric acid digestion procedure used to prepare surface and ground water samples for analysis by ORC- ICPMS. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 500 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.
Sep. Funnel Extraction /Acetylation of Phenolic Compounds	ORG14-AC	WATER	USEPA 3510 (Extraction)/ In-house (Acetylation): A 1L sample is extracted into dichloromethane and concentrated to 1 mL with echange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.
Sep. Funnel Extraction of Liquids (Ultra-trace pesticides.)	ORG14-UTP	WATER	USEPA 3510 Samples are extracted into dichloromethane, concentrated and exchanged into an apporpriate solvent for GPC and florisil cleanup as required. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG020-SD: Total Metals in Sediments by ICPMS	ES0910562-049	Anonymous	**Chromium**	7440-47-3	25.9 %	0-20%	**RPD exceeds LOR based limits**
EG020-SD: Total Metals in Sediments by ICPMS	ES0910562-049	Anonymous	**Vanadium**	7440-62-2	73.1 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Anthracene**	120-12-7	23.5 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Benz(a)anthracene**	56-55-3	37.4 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Benzo(a)pyrene**	50-32-8	32.3 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Benzo(b)fluoranthene**	205-99-2	41.8 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Benzo(e)pyrene**	192-97-2	31.3 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Benzo(g.h.i)perylene**	191-24-2	32.1 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Chrysene**	218-01-9	37.8 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Coronene**	191-07-1	35.0 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Fluoranthene**	206-44-0	34.1 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Indeno(1.2.3.cd)pyrene**	193-39-5	65.8 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Perylene**	198-55-0	29.0 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Phenanthrene**	85-01-8	25.3 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Pyrene**	129-00-0	32.6 %	0-20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EG020-SD: Total Metals in Sediments by ICPMS	ES0910203-021	Anonymous	**Copper**	7440-50-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020-SD: Total Metals in Sediments by ICPMS	ES0910203-021	Anonymous	**Zinc**	7440-66-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Acenaphthylene**	208-96-8	125 %	35-122%	**Recovery greater than upper data quality objective**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Anthracene**	120-12-7	131 %	44-124%	**Recovery greater than upper data quality objective**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Benz(a)anthracene**	56-55-3	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Benzo(a)pyrene**	50-32-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries - Continued							
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Benzo(b)fluoranthene**	205-99-2	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Benzo(e)pyrene**	192-97-2	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Benzo(g.h.i)perylene**	191-24-2	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Chrysene**	218-01-9	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Coronene**	191-07-1	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Fluoranthene**	206-44-0	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Indeno(1.2.3.cd)pyrene**	193-39-5	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Naphthalene**	91-20-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Phenanthrene**	85-01-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0910405-004	SG12_0.0-0.04	**Pyrene**	129-00-0	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EG093T: Total Metals in Saline Water by ORC-ICPMS	1204681-003	----	**Zinc**	7440-66-6	79.2 %	82-128%	**Recovery less than lower control limit**
EP066: Polychlorinated Biphenyls (PCB)	1202049-002	----	**Total Polychlorinated biphenyls**	----	135 %	61.6-107%	**Recovery greater than upper control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1201075-007	----	**Benzo(a)pyrene**	50-32-8	72.4 %	75.2-117%	**Recovery less than lower control limit**
EP132A: Phenolic Compounds	1201075-002	----	**m-Cresol**	108-39-4	99.0 %	45.3-93.3%	**Recovery greater than upper control limit**
EP132A: Phenolic Compounds	1201075-002	----	**2-Nitrophenol**	88-75-5	27.1 %	49.7-112%	**Recovery less than lower control limit**
EP132A: Phenolic Compounds	1201075-002	----	**4-Nitrophenol**	100-02-7	32.3 %	32.8-109%	**Recovery less than lower control limit**
EP132A: Phenolic Compounds	1201075-002	----	**Phenol**	108-95-2	95.0 %	26.5-58.7%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries - Continued							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES0910405-022	HS-L-02	**Fluoranthene**	206-44-0	69.1 %	70-130%	**Recovery less than lower data quality objective**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES0910405-022	HS-L-02	**Benz(a)anthracene**	56-55-3	62.8 %	70-130%	**Recovery less than lower data quality objective**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES0910405-022	HS-L-02	**Benzo(a)pyrene**	50-32-8	66.5 %	70-130%	**Recovery less than lower data quality objective**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES0910405-022	HS-L-02	**Indeno(1.2.3.cd)pyrene**	193-39-5	65.5 %	70-130%	**Recovery less than lower data quality objective**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES0910405-022	HS-L-02	**Dibenz(a.h)anthracene**	53-70-3	62.0 %	70-130%	**Recovery less than lower data quality objective**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES0910405-022	HS-L-02	**Benzo(g.h.i)perylene**	191-24-2	68.0 %	70-130%	**Recovery less than lower data quality objective**

- **For all matrices, no Method Blank value outliers occur.**

Regular Sample Surrogates

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP132T: Base/Neutral Extractable Surrogates	ES0910405-015	SG30_0.0-0.01	**2-Fluorobiphenyl**	321-60-8	25.4 %	30-115 %	**Recovery less than lower data quality objective**

Sub-Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP132T: Base/Neutral Extractable Surrogates	ES0910405-022	HS-L-02	**2-Fluorobiphenyl**	321-60-8	120 %	57.6-113 %	**Recovery greater than upper data quality objective**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- **No Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	1	13	7.7	10.0	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

ALS Sydney: 277-289 Woodpark Road, Smithfield, NSW 2164. Phone (02) 8784 8555; Facsimile (02 8784 8500. Email Samples.Sydney@alsenviro.com

CHAIN OF CUSTODY DOCUMENTATION

ALS Laboratory Group

CLIENT: AECOM
ADDRESS / OFFICE: GORDON
PROJECT MANAGER (PM): CHRIS DONNETTI
PROJECT ID: 53017805
SITE: PORT KEMBLA
P.O. NO.:
RESULTS REQUIRED (Date):
QUOTE NO.: SY-330-093

SAMPLER: KP/CD
MOBILE: 0415803884.
PHONE 02 - 84848915
EMAIL REPORT TO: christiaan.donnetti@aecom.com
EMAIL INVOICE TO: (if different to report)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected".
Extra volume for QC or trace LORs etc.

SYD W/O

ALS ID	SAMPLE ID	MATRIX	DATE	Time	CONTAINER INFORMATION Type / Code	Total bottles	Metals (M13)	TOC	PAH (Ultrace)	BTEX/TPH	SPOCAS	ELUT. METALS	ELUT. PAH	CYANIDE	TBT	PHENOLS	OCP (UT)	PCB (UT)
1	SG9_0.0-0.7	S	13/7				✓											
2	SG10_0.0-0.7	S	"				✓	✓				✓	✓					
3	SG11_0.0-0.7	S	"				✓											
4	SG12_0.0-0.04	S	"				✓	✓	✓		✓	✓	✓	✓	✓			
5	SG13_0.0-0.05	S	"				✓											
6	SG14_0.0-0.03	S	"								✓							
7	SG15_0.0-0.11	S	"															
8	SG16_0.0-0.03	S	"					✓	✓	✓	✓	✓	✓			✓	✓	✓
9	SG17_0.0-0.06	S	"					✓	✓	✓						✓	✓	✓
10	SG18_0.0-0.04	S	"															
11	SG19_0.0-0.01	S	"					✓	✓	✓						✓	✓	✓
12	SG20_0.0-0.04	S	"															

Environmental Division
Sydney
Work Order
ES0910405

Telephone : +61-2-8784 8555

CONTRACT WORK
WO: ES0910405
LAB: ALS Brisbane
DATE: 15/7/19
COA: Elutriates: ES0910408
SPOCAS: ES0910406
TBT/TOC: ES0910407

RELINQUISHED BY		RECEIVED BY		METHOD OF SHIPMENT
Name:		Name: Frank	Date: 15/7/19	Con' Note No:
Of:		Of: ALS	Time: 5pm	
Name:	Date:	Name:	Date:	Transport Co:
Of:	Time:	Of:	Time:	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserveed Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bad for Acid Sulphate Soils; B = Unpreserved Bag.

ALS LABORATORY GROUP - ENVIRONMENTAL DIVISION

ALS Sydney: 277-289 Woodpark Road, Smithfield, NSW 2164. Phone (02) 8784 8555; Facsimile (02 8784 8500. Email Samples.Sydney@alsenviro.com

CHAIN OF CUSTODY DOCUMENTATION

ALS Laboratory Group

CLIENT:	SAMPLER:
ADDRESS / OFFICE:	MOBILE:
PROJECT MANAGER (PM):	PHONE
PROJECT ID:	EMAIL REPORT TO:
SITE: P.O. NO.:	EMAIL INVOICE TO: (if different to report)
RESULTS REQUIRED (Date): QUOTE NO.:	**ANALYSIS REQUIRED including SUITES** (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected".
Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION		Metals (MCS)	TOC	PAH (UT)	BTEX/TPH	SPOCAS	ELUT METALS	ELUT PAH	CYANIDE	TBT	PHENOLS	OCP (UT)	PCB (UT)		
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles														
13	SG-21_0.0-0.02	S	13/7				✓													
14	SG-28_0.0-0.02	S	11				✓	✓	✓	✓		✓	✓							
15	SG-30_0.0-0.02	S	11				✓	✓	✓	✓				✓	✓	✓	✓	✓		
16	PC44_0.0-0.02	S	11																	
17	PC66_0.0-0.02	S	11																	
Not received	PC9	S	11																	
18	DUP02	S	11				✓													
19	DUP03	S	11				✓													
	HS_2-01	W	11																	
	HS_H-01	W	11																	
	HS_L-02	W	11																	
	HS-H-02	W	11																	

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name:	Date:	Name: Frank	Date: 15/7/19	Con' Note No:
Of:	Time:	Of: ALS	Time: 5pm	
Name:	Date:	Name:	Date:	Transport Co:
Of:	Time:	Of:	Time:	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserveed Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bad for Acid Sulphate Soils; B = Unpreserved Bag.

Extra: (27) PC5_0.0-0.02
(28) SG23_0.0-0.02

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CHAIN OF CUSTODY DOCUMENTATION

ALS Laboratory Group

CLIENT:	SAMPLER:
ADDRESS / OFFICE:	MOBILE:
PROJECT MANAGER (PM):	PHONE
PROJECT ID:	EMAIL REPORT TO:
SITE: P.O. NO.:	EMAIL INVOICE TO: (if different to report)
RESULTS REQUIRED (Date): QUOTE NO.:	**ANALYSIS REQUIRED including SUITES** (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE INFORMATION (note: S = Soil, W=Water) | CONTAINER INFORMATION

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	TSS (LL)	TDS (LL)	METALS (13 total)	CN (FREE)	OC (UT)	PAH (SUT)	PHENOL (UT)	TOTAL PCB (STD)	MERCURY					
20	HS-L-01	W	"				✓	✓	✓	✓	✓	✓	✓	✓	✓					
21	HS-H-01	W	"				✓	✓	✓	✓	✓	✓	✓	✓	✓					
22	HS-L-02	W	"				✓	✓	✓	✓	✓	✓	✓	✓	✓					4 AMBERS FOR LAB DUPES + MATRIX SPIKES.
23	HS-H-02	W	"				✓	✓	✓	✓	✓	✓	✓	✓	✓					
24	HS-H-03	W	"				✓	✓	✓	✓	✓	✓	✓	✓	✓					
25	HS-L-03	W	"				✓	✓	✓	✓	✓	✓	✓	✓	✓					
26	Extra sample DUP01																			

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected".
Extra volume for QC or trace LORs etc.

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name:	Date:	Name: Frank	Date: 15/7/19	Con' Note No:
Of:	Time:	Of: ALS	Time: 5pm	
Name:	Date:	Name:	Date:	Transport Co:
Of:	Time:	Of:	Time:	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserveed Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bad for Acid Sulphate Soils; B = Unpreserved Bag.

ALS LABORATORY GROUP - ENVIRONMENTAL DIVISION

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES0910405**		
Client	: **ENSR AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRISTIANN DONNETTI	Contact	: Charlie Pierce
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: christiaan.donnetti@aecom.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 02 8484 8999	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8484 8989	Facsimile	: +61-2-8784 8500
Project	: S3012805 - Port Kembla Outer Harbour	Page	: 1 of 4
Order number	: ----		
C-O-C number	: ----	Quote number	: ES2009HLAENV0352 (SY/330/09 V3)
Site	: PORT KEMBLA		
Sampler	: KP/CD	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 15-JUL-2009	Issue Date	: 16-JUL-2009 14:18
Client Requested Due Date	: 24-JUL-2009	Scheduled Reporting Date	: **24-JUL-2009**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 3.0'C - Ice present
No. of coolers/boxes	: 4 HARD	No. of samples received	: 28
Sercurity Seal	: Intact.	No. of samples analysed	: 26

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Sample id PC9 not received, but received extra sample id PC5_0.0-0.2 conducted Metal. PAH, TPH/BEX analysis and SG23_0.0-0.02 conduted metal and PAH analysis as per Kate on 16/07/09**
- **Sample id DUP01 received extra and conducted analysis as same as HS_L_01 as per Kate on 16/07/09**
- **This batch split into ES0910408(ELUTRIATES), ES0910406(SPOCAS), ES0910407(TBT/TOC)**
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Please direct any queries related to sample condition / numbering / breakages to Nanthini Coilparampil
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EG020-SD Total Metals in Sediments by ICPMS (NODG)	SOIL - EG035T (solids) Total Mercury by FIMS	SOIL - EK026G (Solids) Total Cyanide By Discrete Analyser	SOIL - EP075 SIM Phenols only SIM - Phenols only	SOIL - EP132B Ultratrace PAH's	SOIL - S-04 TPH/BTEX
ES0910405-001	13-JUL-2009 15:00	SG9_0.0-0.7		✓	✓	✓				
ES0910405-002	13-JUL-2009 15:00	SG10_0.0-0.7		✓	✓	✓				
ES0910405-003	13-JUL-2009 15:00	SG11_0.0-0.7		✓	✓	✓				
ES0910405-004	13-JUL-2009 15:00	SG12_0.0-0.04		✓	✓	✓	✓		✓	
ES0910405-005	13-JUL-2009 15:00	SG13_0.0-0.05		✓	✓	✓				
ES0910405-006	13-JUL-2009 15:00	SG14_0.0-0.03		✓	✓	✓				
ES0910405-007	13-JUL-2009 15:00	SG15_0.0-0.11		✓	✓	✓				
ES0910405-008	13-JUL-2009 15:00	SG16_0.0-0.5		✓	✓	✓		✓	✓	✓
ES0910405-009	13-JUL-2009 15:00	SG17_0.0-0.06		✓	✓	✓		✓	✓	✓
ES0910405-010	13-JUL-2009 15:00	SG18_0.0-0.04		✓	✓	✓				
ES0910405-011	13-JUL-2009 15:00	SG19_0.0-0.01		✓	✓	✓		✓	✓	✓
ES0910405-012	13-JUL-2009 15:00	SG20_0.0-0.04		✓	✓	✓				
ES0910405-013	13-JUL-2009 15:00	SG21_0.0-0.02		✓	✓	✓				
ES0910405-014	13-JUL-2009 15:00	SG28_0.0-0.01		✓	✓	✓			✓	✓
ES0910405-015	13-JUL-2009 15:00	SG30_0.0-0.01		✓	✓	✓	✓	✓	✓	✓
ES0910405-016	13-JUL-2009 15:00	PC44_0.0-0.06	✓							
ES0910405-017	13-JUL-2009 15:00	PC66_0.0-0.02	✓							
ES0910405-018	13-JUL-2009 15:00	DUP02		✓	✓	✓				
ES0910405-019	13-JUL-2009 15:00	DUP03		✓	✓	✓				
ES0910405-027	13-JUL-2009 15:00	PC5_0.0-0.2		✓	✓	✓			✓	✓
ES0910405-028	13-JUL-2009 15:00	SG23_0.0-0.02		✓	✓	✓			✓	

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - UTO-2S Ultratrace OC PCB Pesticides
ES0910405-008	13-JUL-2009 15:00	SG16_0.0-0.5	✓
ES0910405-009	13-JUL-2009 15:00	SG17_0.0-0.06	✓
ES0910405-011	13-JUL-2009 15:00	SG19_0.0-0.01	✓
ES0910405-015	13-JUL-2009 15:00	SG30_0.0-0.01	✓

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - EA015 Total Dissolved Solids	WATER - EA025 Suspended Solids	WATER - EG035T Total Mercury by FIMS	WATER - EG093A-T Total metals in Saline Water Suite A by ORC-ICPMS	WATER - EG093B-T Total Metals in Saline Water -Suite B by ORC-ICPMS	WATER - EK025G Free CN By Discrete Analyser	WATER - EP066-PCB-WA Polychlorinated Biphenyls (PCB)	WATER - EP131A Ultra Trace Organochlorine Pesticides
ES0910405-020	13-JUL-2009 15:00	HS-L-01	✓	✓	✓	✓	✓	✓	✓	✓
ES0910405-021	13-JUL-2009 15:00	HS-H-01	✓	✓	✓	✓	✓	✓	✓	✓
ES0910405-022	13-JUL-2009 15:00	HS-L-02	✓	✓	✓	✓	✓	✓	✓	✓
ES0910405-023	13-JUL-2009 15:00	HS-H-02	✓	✓	✓	✓	✓	✓	✓	✓
ES0910405-024	13-JUL-2009 15:00	HS-H-03	✓	✓	✓	✓	✓	✓	✓	✓
ES0910405-025	13-JUL-2009 15:00	HS-L-03	✓	✓	✓	✓	✓	✓	✓	✓
ES0910405-026	13-JUL-2009 15:00	DUP01	✓	✓	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - EP132A Phenols Ultratrace - 16 analytes	WATER - EP132-LL Super Ultra Trace PAH
ES0910405-020	13-JUL-2009 15:00	HS-L-01	✓	✓
ES0910405-021	13-JUL-2009 15:00	HS-H-01	✓	✓
ES0910405-022	13-JUL-2009 15:00	HS-L-02	✓	✓
ES0910405-023	13-JUL-2009 15:00	HS-H-02	✓	✓
ES0910405-024	13-JUL-2009 15:00	HS-H-03	✓	✓
ES0910405-025	13-JUL-2009 15:00	HS-L-03	✓	✓
ES0910405-026	13-JUL-2009 15:00	DUP01	✓	✓

Requested Deliverables

ACCOUNTS PAYABLE		
- A4 - AU Tax Invoice (INV)	Email	accountsenv@aecom.com
MR CHRISTIANN DONNETTI		
- *AU Certificate of Analysis - NATA (COA)	Email	christiaan.donnetti@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	christiaan.donnetti@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	christiaan.donnetti@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	christiaan.donnetti@aecom.com
- A4 - AU Tax Invoice (INV)	Email	christiaan.donnetti@aecom.com
- Default - Chain of Custody (COC)	Email	christiaan.donnetti@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	christiaan.donnetti@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	christiaan.donnetti@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	christiaan.donnetti@aecom.com
- EDI Format - XTab (XTAB)	Email	christiaan.donnetti@aecom.com
MR RICHARD COLE		
- *AU Certificate of Analysis - NATA (COA)	Email	richard.cole@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	richard.cole@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	richard.cole@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	richard.cole@aecom.com
- A4 - AU Tax Invoice (INV)	Email	richard.cole@aecom.com
- Default - Chain of Custody (COC)	Email	richard.cole@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	richard.cole@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	richard.cole@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	richard.cole@aecom.com
- EDI Format - XTab (XTAB)	Email	richard.cole@aecom.com
THE RESULTS ADDRESS		
- *AU Certificate of Analysis - NATA (COA)	Email	sydney@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	sydney@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	sydney@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	sydney@aecom.com
- A4 - AU Tax Invoice (INV)	Email	sydney@aecom.com
- Default - Chain of Custody (COC)	Email	sydney@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	sydney@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	sydney@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	sydney@aecom.com
- EDI Format - XTab (XTAB)	Email	sydney@aecom.com

CERTIFICATE OF ANALYSIS

Work Order	: **ES0910406**	Page	: 1 of 4
Client	: **ENSR AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRISTIANN DONNETTI	Contact	: Charlie Pierce
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: christiaan.donnetti@aecom.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 02 8484 8999	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8484 8989	Facsimile	: +61-2-8784 8500
Project	: S3012805 - Port Kembla Outer Harbour	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 15-JUL-2009
Sampler	: KP/CD	Issue Date	: 23-JUL-2009
Site	: PORT KEMBLA		
		No. of samples received	: 5
Quote number	: SY/330/09 V3	No. of samples analysed	: 3

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insuffient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO3) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m3 in-situ soil', multiply 'reported results' x 'wet bulk density of soil in t/m3'.**
- **Retained Acidity not required because pH KCl greater than or equal to 4.5**

Analytical Results

Sub-Matrix: SOIL				Client sample ID	SG12_0.0-0.04	SG14_0.0-0.03	SG16_0.0-0.05	----	----
				Client sampling date / time	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	----	----
Compound	CAS Number	LOR	Unit		ES0910406-001	ES0910406-002	ES0910406-003	----	----
EA029-A: pH Measurements									
pH KCl (23A)	----	0.1	pH Unit		10.4	9.2	8.7	----	----
pH OX (23B)	----	0.1	pH Unit		8.4	8.3	7.9	----	----
EA029-B: Acidity Trail									
Titratable Actual Acidity (23F)	----	2	mole H+ / t		<2	<2	<2	----	----
Titratable Peroxide Acidity (23G)	----	2	mole H+ / t		<2	<2	<2	----	----
Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t		<2	<2	<2	----	----
sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S		<0.02	<0.02	<0.02	----	----
sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S		<0.02	<0.02	<0.02	----	----
sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S		<0.02	<0.02	<0.02	----	----
EA029-C: Sulfur Trail									
KCl Extractable Sulfur (23Ce)	----	0.02	% S		0.17	0.05	0.15	----	----
Peroxide Sulfur (23De)	----	0.02	% S		0.46	0.18	0.66	----	----
Peroxide Oxidisable Sulfur (23E)	----	0.02	% S		0.29	0.13	0.51	----	----
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t		184	84	317	----	----
EA029-D: Calcium Values									
KCl Extractable Calcium (23Vh)	----	0.02	% Ca		0.62	0.19	0.32	----	----
Peroxide Calcium (23Wh)	----	0.02	% Ca		2.80	0.90	1.84	----	----
Acid Reacted Calcium (23X)	----	0.02	% Ca		2.18	0.71	1.53	----	----
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t		1080	354	762	----	----
sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S		1.74	0.57	1.22	----	----
EA029-E: Magnesium Values									
KCl Extractable Magnesium (23Sm)	----	0.02	% Mg		<0.02	0.08	0.16	----	----
Peroxide Magnesium (23Tm)	----	0.02	% Mg		0.92	0.20	0.40	----	----
Acid Reacted Magnesium (23U)	----	0.02	% Mg		0.90	0.13	0.24	----	----
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t		741	104	196	----	----
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S		1.19	0.17	0.31	----	----
EA029-F: Excess Acid Neutralising Capacity									
Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3		7.98	1.98	3.55	----	----
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t		1590	395	709	----	----
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S		2.55	0.63	1.14	----	----
EA029-H: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-		1.5	1.5	1.5	----	----

Analytical Results

Sub-Matrix: SOIL			Client sample ID	SG12_0.0-0.04	SG14_0.0-0.03	SG16_0.0-0.05	----	----
			Client sampling date / time	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	----	----
Compound	CAS Number	LOR	Unit	ES0910406-001	ES0910406-002	ES0910406-003	----	----
EA029-H: Acid Base Accounting - Continued								
Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	<0.02	----	----
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	<10	----	----
Liming Rate	----	1	kg CaCO3/t	<1	<1	<1	----	----

QUALITY CONTROL REPORT

Work Order	: **ES0910406**	Page	: 1 of 6
Client	: **ENSR AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRISTIANN DONNETTI	Contact	: Charlie Pierce
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: christiaan.donnetti@aecom.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 02 8484 8999	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8484 8989	Facsimile	: +61-2-8784 8500
Project	: S3012805 - Port Kembla Outer Harbour	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: PORT KEMBLA		
C-O-C number	: ----	Date Samples Received	: 15-JUL-2009
Sampler	: KP/CD	Issue Date	: 23-JUL-2009
Order number	: ----		
		No. of samples received	: 5
Quote number	: SY/330/09 V3	No. of samples analysed	: 3

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insuffient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA029-A: pH Measurements (QC Lot: 1045794)									
ES0910406-001	SG12_0.0-0.04	EA029: pH KCl (23A)	----	0.1	pH Unit	10.4	10.4	0.0	0% - 20%
		EA029: pH OX (23B)	----	0.1	pH Unit	8.4	8.4	0.0	0% - 20%
EA029-B: Acidity Trail (QC Lot: 1045794)									
ES0910406-001	SG12_0.0-0.04	EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	<2	0.0	No Limit
EA029-C: Sulfur Trail (QC Lot: 1045794)									
ES0910406-001	SG12_0.0-0.04	EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	0.17	0.17	0.0	No Limit
		EA029: Peroxide Sulfur (23De)	----	0.02	% S	0.46	0.46	0.0	0% - 20%
		EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	0.29	0.29	0.0	0% - 50%
		EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	184	184	0.0	0% - 50%
EA029-D: Calcium Values (QC Lot: 1045794)									
ES0910406-001	SG12_0.0-0.04	EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	0.62	0.63	0.0	0% - 20%
		EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	2.80	2.77	1.2	0% - 20%
		EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	2.18	2.14	1.8	0% - 20%
		EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	1.74	1.71	1.8	0% - 20%
		EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	1080	1070	1.8	0% - 20%
EA029-E: Magnesium Values (QC Lot: 1045794)									
ES0910406-001	SG12_0.0-0.04	EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	<0.02	<0.02	0.0	No Limit
		EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	0.92	0.91	0.0	0% - 20%
		EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	0.90	0.90	0.0	0% - 20%
		EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	1.19	1.18	0.0	0% - 20%
		EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	741	737	0.5	0% - 20%
EA029-F: Excess Acid Neutralising Capacity (QC Lot: 1045794)									
ES0910406-001	SG12_0.0-0.04	EA029: Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3	7.98	7.98	0.0	0% - 20%
		EA029: sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S	2.55	2.55	0.0	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA029-F: Excess Acid Neutralising Capacity (QC Lot: 1045794) - continued									
ES0910406-001	SG12_0.0-0.04	EA029: acidity - Excess Acid Neutralising Capacity (a-23Q)	---	10	mole H+ / t	1590	1590	0.0	0% - 20%

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA029-B: Acidity Trail (QCLot: 1045794)								
EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	----	----	----	----
EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	----	----	----	----
EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	----	----	----	----
EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	----	----	----	----
EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	<0.02	----	----	----	----
EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.02	----	----	----	----
EA029-C: Sulfur Trail (QCLot: 1045794)								
EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	<0.02	----	----	----	----
EA029: Peroxide Sulfur (23De)	----	0.02	% S	<0.02	----	----	----	----
EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	<0.02	----	----	----	----
EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	<10	----	----	----	----
EA029-D: Calcium Values (QCLot: 1045794)								
EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	<0.02	----	----	----	----
EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	<0.02	----	----	----	----
EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	<0.02	----	----	----	----
EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	<0.02	----	----	----	----
EA029-E: Magnesium Values (QCLot: 1045794)								
EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	<0.02	----	----	----	----
EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	<0.02	----	----	----	----
EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	<0.02	----	----	----	----
EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	<0.02	----	----	----	----
EA029-F: Excess Acid Neutralising Capacity (QCLot: 1045794)								
EA029: Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3	<0.02	----	----	----	----
EA029: acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S	<0.02	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) Results are required to be reported.**

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES0910406**	Page	: 1 of 6
Client	: ENSR AUSTRALIA PTY LIMITED	Laboratory	: Environmental Division Sydney
Contact	: MR CHRISTIANN DONNETTI	Contact	: Charlie Pierce
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: christiaan.donnetti@aecom.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 02 8484 8999	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8484 8989	Facsimile	: +61-2-8784 8500
Project	: S3012805 - Port Kembla Outer Harbour	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: PORT KEMBLA		
C-O-C number	: ----	Date Samples Received	: 15-JUL-2009
Sampler	: KP/CD	Issue Date	: 23-JUL-2009
Order number	: ----		
		No. of samples received	: 5
Quote number	: SY/330/09 V3	No. of samples analysed	: 3

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA029-A: pH Measurements							
Snap Lock Bag - frozen SG12_0.0-0.04, SG14_0.0-0.03, SG16_0.0-0.05	**13-JUL-2009**	**15-JUL-2009**	13-JUL-2010	✓	**22-JUL-2009**	20-OCT-2009	✓
EA029-B: Acidity Trail							
Snap Lock Bag - frozen SG12_0.0-0.04, SG14_0.0-0.03, SG16_0.0-0.05	**13-JUL-2009**	**15-JUL-2009**	13-JUL-2010	✓	**22-JUL-2009**	20-OCT-2009	✓
EA029-C: Sulfur Trail							
Snap Lock Bag - frozen SG12_0.0-0.04, SG14_0.0-0.03, SG16_0.0-0.05	**13-JUL-2009**	**15-JUL-2009**	13-JUL-2010	✓	**22-JUL-2009**	20-OCT-2009	✓
EA029-D: Calcium Values							
Snap Lock Bag - frozen SG12_0.0-0.04, SG14_0.0-0.03, SG16_0.0-0.05	**13-JUL-2009**	**15-JUL-2009**	13-JUL-2010	✓	**22-JUL-2009**	20-OCT-2009	✓
EA029-E: Magnesium Values							
Snap Lock Bag - frozen SG12_0.0-0.04, SG14_0.0-0.03, SG16_0.0-0.05	**13-JUL-2009**	**15-JUL-2009**	13-JUL-2010	✓	**22-JUL-2009**	20-OCT-2009	✓
EA029-F: Excess Acid Neutralising Capacity							
Snap Lock Bag - frozen SG12_0.0-0.04, SG14_0.0-0.03, SG16_0.0-0.05	**13-JUL-2009**	**15-JUL-2009**	13-JUL-2010	✓	**22-JUL-2009**	20-OCT-2009	✓
EA029-G: Retained Acidity							
Snap Lock Bag - frozen SG12_0.0-0.04, SG14_0.0-0.03, SG16_0.0-0.05	**13-JUL-2009**	**15-JUL-2009**	13-JUL-2010	✓	**22-JUL-2009**	20-OCT-2009	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA029-H: Acid Base Accounting							
Snap Lock Bag - frozen							
SG12_0.0-0.04, SG14_0.0-0.03, SG16_0.0-0.05	**13-JUL-2009**	**15-JUL-2009**	13-JUL-2010	✓	**22-JUL-2009**	20-OCT-2009	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	3	**33.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	SOIL	Ahern et al 2004 - a suspension peroxide oxidation method following the 'sulfur trail' by determining the level of 1M KCL extractable sulfur and the sulfur level after oxidation of soil sulphides. The 'acidity trail' is followed by measurement of TAA, TPA and TSA. Liming Rate is based on results for samples as submitted and incorporates a minimum safety factor of 1.5.

Preparation Methods	Method	Matrix	Method Descriptions
Drying only	EN020D	SOIL	In House
Drying at 85 degrees, bagging and labelling (ASS)	EN020PR	SOIL	In house

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- **No Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**

ALS Sydney: 277-289 Woodpark Road, Smithfield, NSW 2164. Phone (02) 8784 8555; Facsimile (02 8784 8500. Email Samples.Sydney@alsenviro.com

CHAIN OF CUSTODY DOCUMENTATION

ALS Laboratory Group

CLIENT: AECOM
ADDRESS / OFFICE: GORDON
PROJECT MANAGER (PM): CHRIS DONNETTI
PROJECT ID: 53017505
SITE: PORT KEMBLA. P.O. NO.:
RESULTS REQUIRED (Date): QUOTE NO.: SY-330-093

SAMPLER: KP/CD
MOBILE: 0415803884.
PHONE 02-84848915
EMAIL REPORT TO: christiaan.donnetti@aecom.com
EMAIL INVOICE TO: (if different to report)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

Notes: e.g. Highly contaminated samples e.g. "High PAHs expected". Extra volume for QC or trace LORs etc.

SPOCAS ONLY

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION		Metals (13)	TOC	PAH (Ultrace)	BTEX/TPH	SPOCAS	ELUT. METALS	ELUT. PAH	CYANIDE	TBT	PHENOLS	OCP (UT)	PCB (UT)
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles												
	SG9_0.0-0.7	S	13/7				✓											
	SG10_0.0-0.7	S	"				✓	✓				✓	✓					
	SG11_0.0-0.7	S	"				✓											
1	SG12_0.0-0.04	S	"				✓	✓	✓		✓	✓	✓	✓	✓			
	SG13_0.0-0.05	S	"				✓											
2	SG14_0.0-0.03	S	"				✓				✓							
	SG15_0.0-0.11	S					✓											
3	SG16_0.0-0.05	S					✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
	SG17_0.0-0.06	S					✓	✓	✓	✓						✓	✓	✓
	SG18_0.0-0.04	S					✓											
④	SG19_0.0-0.01	S					✓	✓	✓	✓						✓	✓	✓
	SG20_0.0-0.04	S					✓											

CONTRACT WORK NO: ES0910406
LAB: ALS Brisbane
DATE: 15/7/9
SPLIT ELUTRIATE: ES0910408
TBT/TOC: ES0910407
ALS SYD BATCH ONLY: ES0910408

Environmental Division Sydney
Work Order
ES0910406

Telephone : +61-2-8784 8555

RELINQUISH
Name:
Of:
Name:
Of:
Time:

RECEIVED BY
Name: Frank Date: 15/7/9
Of: ALS Time: 5pm
Name: Date:
Of: Time:

METHOD OF SHIPMENT
Con' Note No:
Transport Co:

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserveed Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bad for Acid Sulphate Soils; B = Unpreserved Bag.

Extra Sig

ALS LABORATORY GROUP - ENVIRONMENTAL DIVISION

ALS Sydney: 277-289 Woodpark Road, Smithfield, NSW 2164. Phone (02) 8784 8555; Facsimile (02 8784 8500. Email Samples.Sydney@alsenviro.com

CHAIN OF CUSTODY DOCUMENTATION

ALS Laboratory Group

CLIENT:
ADDRESS / OFFICE:
PROJECT MANAGER (PM):
PROJECT ID:
SITE: P.O. NO.:
RESULTS REQUIRED (Date): QUOTE NO.:

SAMPLER:
MOBILE:
PHONE
EMAIL REPORT TO:
EMAIL INVOICE TO: (if different to report)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected".
Extra volume for QC or trace LORs etc.

ALS ID	SAMPLE ID	MATRIX	DATE	Time	CONTAINER INFORMATION Type / Code	Total bottles	Metals (MC3)	TOC	PAH (UT)	BTEX/TPH	SPOCAS	ELUT METALS	ELUT PAH	CYANIDE	TBT	PHENOLS	OCP (UT)	PCB (UT)
	SG21_0.0-0.02	S	13/7	—			✓											
	SG28_0.0-0.02	S	11	—			✓	✓	✓	✓		✓	✓					
	SG30_0.0-0.02	S	11	—			✓	✓	✓	✓				✓	✓	✓	✓	✓
(5)	PC44_0.0-0.02	S	11	—														
	PC66_0.0-0.02	S	11	—														
Not received	PC9	S	11	—														
	DUP02	S	11	—			✓											
	DUP03	S	11	—			✓											
	HS_H_01	W	11	—														
	HS_H_01	W	11	—														
	HS_H_02	W	11	—														
	HS-H-02	W	11	—														

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name:	Date:	Name: Frank	Date: 15/7/19	Con' Note No:
Of:	Time:	Of: ALS	Time: 5pm	
Name:	Date:	Name:	Date:	Transport Co:
Of:	Time:	Of:	Time:	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserveed Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bad for Acid Sulphate Soils; B = Unpreserved Bag.

ALS LABORATORY GROUP - ENVIRONMENTAL DIVISION

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES0910406**		
Client	: **ENSR AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRISTIANN DONNETTI	Contact	: Charlie Pierce
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: christiaan.donnetti@aecom.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 02 8484 8999	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8484 8989	Facsimile	: +61-2-8784 8500
Project	: S3012805 - Port Kembla Outer Harbour	Page	: 1 of 3
Order number	: ----		
C-O-C number	: ----	Quote number	: ES2009HLAENV0352 (SY/330/09 V3)
Site	: PORT KEMBLA		
Sampler	: KP/CD	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 15-JUL-2009	Issue Date	: 17-JUL-2009 12:29
Client Requested Due Date	: 29-JUL-2009	Scheduled Reporting Date	: **29-JUL-2009**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 3.0'C - Ice present
No. of coolers/boxes	: 4 HARD	No. of samples received	: 5
Sercurity Seal	: Intact.	No. of samples analysed	: 3

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- Samples received in appropriately pretreated and preserved containers.
- (Spocas) Analysis to be conducted by ALS Brisbane
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**
- **This batch for SPOCAS only and split ES0910405 (ALS SYD BATCH ONLY), ES0910407 (TBT/TOC), & ES0910408 (ELUTRIATE)**
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Please direct any queries related to sample condition / numbering / breakages to Nanthini Coilparampil
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	(On Hold) SOIL No analysis requested	SOIL - EA029 SPOCAS
ES0910406-001	13-JUL-2009 15:00	SG12_0.0-0.04		✓
ES0910406-002	13-JUL-2009 15:00	SG14_0.0-0.03		✓
ES0910406-003	13-JUL-2009 15:00	SG16_0.0-0.05		✓
ES0910406-004	13-JUL-2009 15:00	SG19_0.0-0.01	✓	
ES0910406-005	13-JUL-2009 15:00	PC44_0.0-0.06	✓	

Requested Deliverables

ACCOUNTS PAYABLE		
- A4 - AU Tax Invoice (INV)	Email	accountsenv@aecom.com
MR CHRISTIANN DONNETTI		
- *AU Certificate of Analysis - NATA (COA)	Email	christiaan.donnetti@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	christiaan.donnetti@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	christiaan.donnetti@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	christiaan.donnetti@aecom.com
- A4 - AU Tax Invoice (INV)	Email	christiaan.donnetti@aecom.com
- Default - Chain of Custody (COC)	Email	christiaan.donnetti@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	christiaan.donnetti@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	christiaan.donnetti@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	christiaan.donnetti@aecom.com
- EDI Format - XTab (XTAB)	Email	christiaan.donnetti@aecom.com
MR RICHARD COLE		
- *AU Certificate of Analysis - NATA (COA)	Email	richard.cole@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	richard.cole@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	richard.cole@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	richard.cole@aecom.com
- A4 - AU Tax Invoice (INV)	Email	richard.cole@aecom.com
- Default - Chain of Custody (COC)	Email	richard.cole@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	richard.cole@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	richard.cole@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	richard.cole@aecom.com
- EDI Format - XTab (XTAB)	Email	richard.cole@aecom.com
THE RESULTS ADDRESS		
- *AU Certificate of Analysis - NATA (COA)	Email	sydney@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	sydney@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	sydney@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	sydney@aecom.com
- A4 - AU Tax Invoice (INV)	Email	sydney@aecom.com
- Default - Chain of Custody (COC)	Email	sydney@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	sydney@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	sydney@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	sydney@aecom.com
- EDI Format - XTab (XTAB)	Email	sydney@aecom.com

CERTIFICATE OF ANALYSIS

Work Order	: **ES0910407**	Page	: 1 of 5
Client	: **ENSR AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRISTIANN DONNETTI	Contact	: Charlie Pierce
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: christiaan.donnetti@aecom.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 02 8484 8999	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8484 8989	Facsimile	: +61-2-8784 8500
Project	: S3012805 - PKOH	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 15-JUL-2009
Sampler	: KP/CD	Issue Date	: 28-JUL-2009
Site	: PORT KEMBLA		
		No. of samples received	: 11
Quote number	: SY/330/09 V3	No. of samples analysed	: 9

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Stafford Minerals - AY
Matthew Goodwin	Senior Organic Chemist	Inorganics
Matthew Goodwin	Senior Organic Chemist	Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insuffient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

Analytical Results

Sub-Matrix: SOIL				Client sample ID	SG10_0.0-0.7	SG12_0.0-0.04	SG16_0.0-0.05	SG17_0.0-0.06	SG19_0.0-0.01
				Client sampling date / time	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00
Compound	CAS Number	LOR	Unit		ES0910407-001	ES0910407-002	ES0910407-003	ES0910407-004	ES0910407-005
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1.0	%		----	45.4	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	0.02	%		6.12	3.26	5.31	4.50	1.22
EP090: Organotin Compounds									
Tributyltin	56573-85-4	0.5	µgSn/kg		----	4.4	----	----	----
EP090S: Organotin Surrogate									
Tripropyltin	----	0.1	%		----	48.8	----	----	----

Analytical Results

Sub-Matrix: SOIL			Client sample ID	SG28_0.0-0.01	SG30_0.0-0.01	PC5_0.0-0.02	SG23_0.0-0.02	----
			Client sampling date / time	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	13-JUL-2009 15:00	----
Compound	CAS Number	LOR	Unit	ES0910407-006	ES0910407-007	ES0910407-010	ES0910407-011	----
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	---	29.4	49.3	----	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	0.02	%	0.28	0.89	3.03	2.56	----
EP090: Organotin Compounds								
Tributyltin	56573-85-4	0.5	µgSn/kg	---	3.1	3.6	----	----
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	---	48.1	56.2	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP090S: Organotin Surrogate			
Tripropyltin	---	34	108