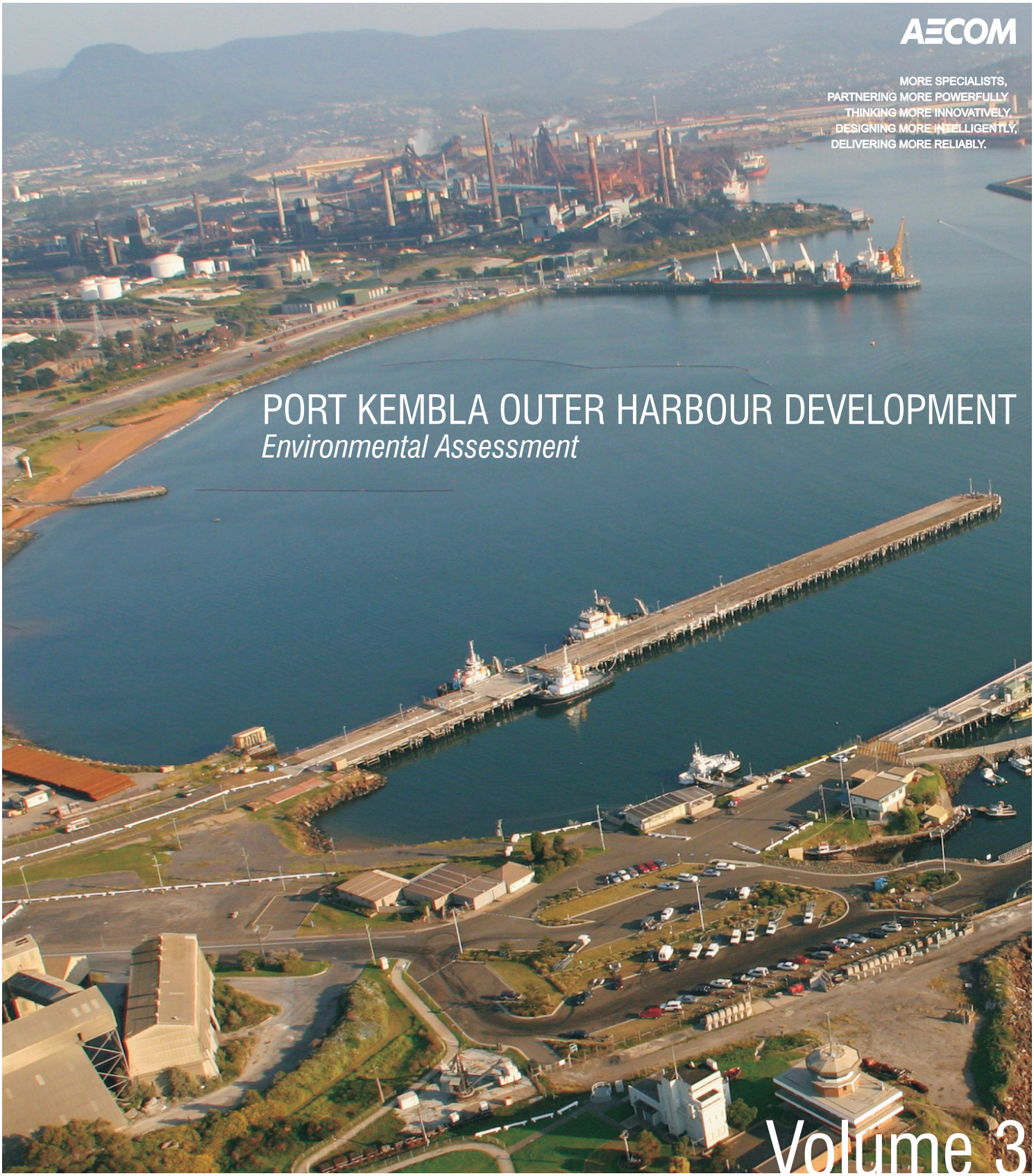


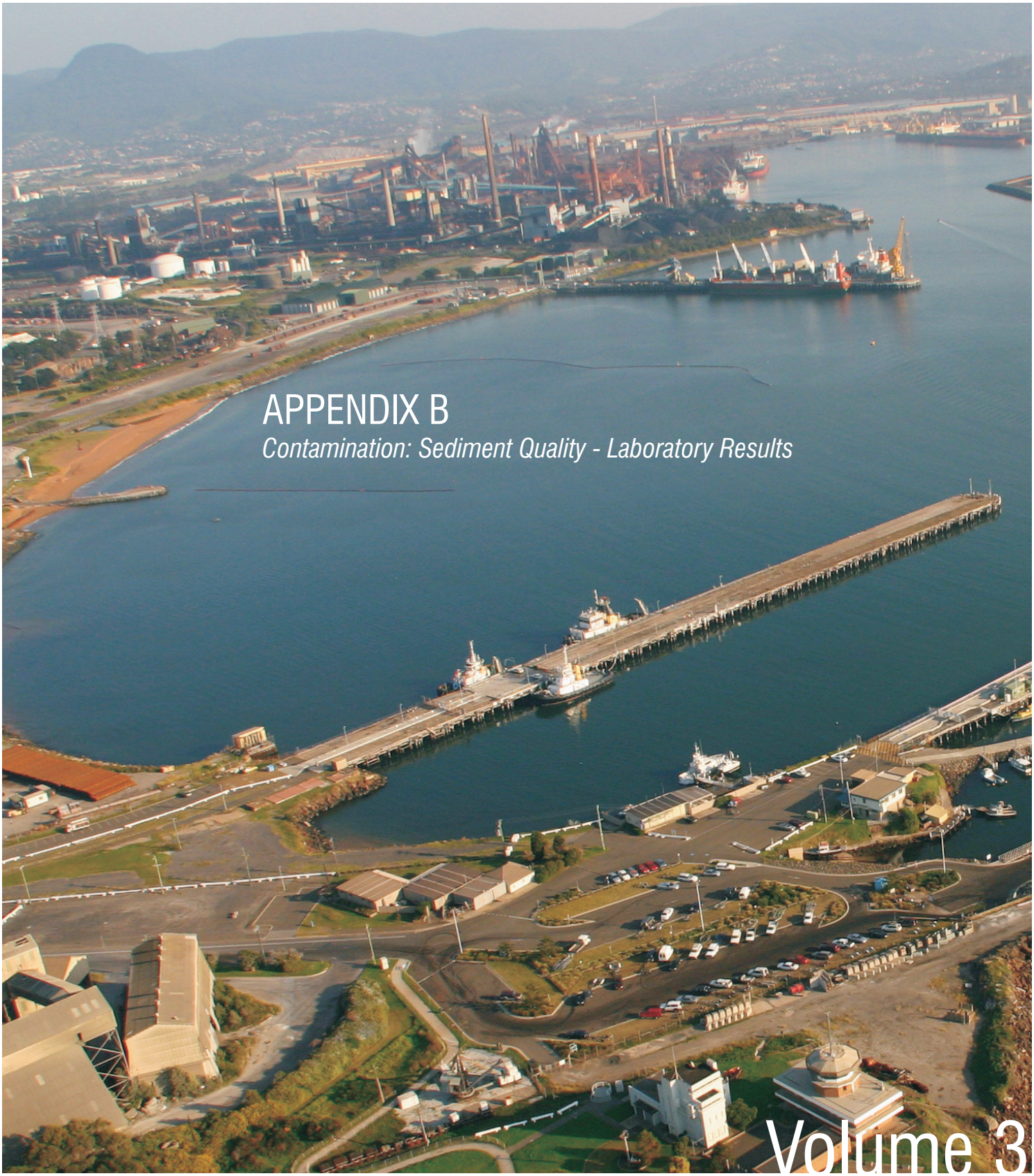
PORT KEMBLA OUTER HARBOUR DEVELOPMENT

Appendix B: Contamination: Sediment Quality - Laboratory Results

Prepared for
Port Kembla Port Corporation

March 2010

PORT KEMBLA PORT CORPORATION



APPENDIX B

Contamination: Sediment Quality - Laboratory Results

Volume 3

Appendix D

Laboratory Certificates

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES0909938**	Page	: 1 of 10
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	: 08-JUL-2009
Sampler	: RC	Issue Date	: 21-JUL-2009
Site	: ----		
		No. of samples received	: 10
Quote number	: SY/330/09 V3	No. of samples analysed	: 10

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
Hoa Nguyen	Inorganic Chemist	Inorganics
Phyu Phyu Lwin	Inorganic Chemist	Inorganics
Sanjeshni Jyoti Mala	Senior Chemist Volatile	Organics
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

- **EP080: Level of Reporting raised for toluene due to ambient background levels in the laboratory.**
- **EP132: Matrix spike recoveries could not be determined due to high background levels of contamination in the spiked sample.**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SG1	SG2	SG3	SG4	SG5
				Client sampling date / time: 06-JUL-2009 15:00	06-JUL-2009 15:00	06-JUL-2009 15:00	06-JUL-2009 15:00	06-JUL-2009 15:00
				ES0909938-001	ES0909938-002	ES0909938-003	ES0909938-004	ES0909938-005
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	56.9	50.8	46.1	46.8	50.2
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	1.15	0.70	<0.50	<0.50	0.53
Arsenic	7440-38-2	1.00	mg/kg	51.1	32.7	31.0	21.6	27.2
Cadmium	7440-43-9	0.1	mg/kg	0.8	0.2	0.2	0.2	0.2
Chromium	7440-47-3	1.0	mg/kg	100	64.2	57.3	53.8	67.3
Copper	7440-50-8	1.0	mg/kg	767	306	210	196	261
Cobalt	7440-48-4	0.5	mg/kg	12.6	9.2	12.4	9.6	11.5
Lead	7439-92-1	1.0	mg/kg	480	250	210	161	209
Nickel	7440-02-0	1.0	mg/kg	21.3	13.3	13.6	12.5	15.3
Selenium	7782-49-2	0.1	mg/kg	4.1	1.9	1.5	1.2	1.5
Silver	7440-22-4	0.1	mg/kg	2.0	0.6	0.3	0.3	0.4
Vanadium	7440-62-2	2.0	mg/kg	98.7	79.6	81.2	74.6	87.5
Zinc	7440-66-6	1.0	mg/kg	1200	587	534	458	560
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	1.3	0.6	0.4	0.3	0.4
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	1	mg/kg	----	<1	----	<1	<1
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								
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
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	10	µg/kg	<10	----	<10	----	<10
2-Methylnaphthalene	91-57-6	10	µg/kg	670	----	350	----	500
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/kg	<10	----	<10	----	<10
Acenaphthene	83-32-9	10	µg/kg	130	----	70	----	100
Acenaphthylene	208-96-8	10	µg/kg	490	----	310	----	410
Anthracene	120-12-7	10	µg/kg	480	----	350	----	440
Benz(a)anthracene	56-55-3	10	µg/kg	1060	----	1050	----	1020

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SG1	SG2	SG3	SG4	SG5
				Client sampling date / time: 06-JUL-2009 15:00	06-JUL-2009 15:00	06-JUL-2009 15:00	06-JUL-2009 15:00	06-JUL-2009 15:00
				ES0909938-001	ES0909938-002	ES0909938-003	ES0909938-004	ES0909938-005
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Benzo(a)pyrene	50-32-8	10	µg/kg	1180	----	1130	----	1070
Benzo(b)fluoranthene	205-99-2	10	µg/kg	1390	----	1320	----	1210
Benzo(e)pyrene	192-97-2	10	µg/kg	730	----	690	----	660
Benzo(g.h.i)perylene	191-24-2	10	µg/kg	840	----	720	----	680
Benzo(k)fluoranthene	207-08-9	10	µg/kg	630	----	590	----	620
Chrysene	218-01-9	10	µg/kg	1000	----	930	----	900
Coronene	191-07-1	10	µg/kg	210	----	150	----	130
Dibenz(a.h)anthracene	53-70-3	10	µg/kg	180	----	170	----	160
Fluoranthene	206-44-0	10	µg/kg	2310	----	2270	----	2200
Fluorene	86-73-7	10	µg/kg	480	----	260	----	380
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/kg	710	----	640	----	610
N-2-Fluorenyl Acetamide	53-96-3	100	µg/kg	<100	----	<100	----	<100
Naphthalene	91-20-3	10	µg/kg	6510	----	4390	----	4960
Perylene	198-55-0	10	µg/kg	290	----	270	----	310
Phenanthrene	85-01-8	10	µg/kg	1790	----	1320	----	1440
Pyrene	129-00-0	10	µg/kg	2000	----	1890	----	1820
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	87.5	----	96.2	----	95.0
Toluene-D8	2037-26-5	0.1	%	78.8	----	100	----	84.5
4-Bromofluorobenzene	460-00-4	0.1	%	82.7	----	88.7	----	83.3
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	91.3	----	81.1	----	89.8
Anthracene-d10	1719-06-8	0.1	%	89.9	----	88.4	----	95.5
4-Terphenyl-d14	1718-51-0	0.1	%	99.8	----	102	----	108

Analytical Results

Sub-Matrix: SOIL			Client sample ID	SG6	SG7	SG8	DUP 01	----
			Client sampling date / time	06-JUL-2009 15:00	06-JUL-2009 15:00	06-JUL-2009 15:00	06-JUL-2009 15:00	----
Compound	CAS Number	LOR	Unit	ES0909938-006	ES0909938-007	ES0909938-008	ES0909938-009	----
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	52.1	55.6	55.4	47.3	----
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	0.57	0.76	1.27	0.50	----
Arsenic	7440-38-2	1.00	mg/kg	27.9	34.1	48.2	33.4	----
Cadmium	7440-43-9	0.1	mg/kg	0.3	0.4	1.1	0.2	----
Chromium	7440-47-3	1.0	mg/kg	70.6	79.9	103	63.9	----
Copper	7440-50-8	1.0	mg/kg	320	543	739	228	----
Cobalt	7440-48-4	0.5	mg/kg	11.5	12.4	12.6	13.8	----
Lead	7439-92-1	1.0	mg/kg	248	342	528	236	----
Nickel	7440-02-0	1.0	mg/kg	15.3	17.5	21.8	15.2	----
Selenium	7782-49-2	0.1	mg/kg	2.0	3.1	3.7	1.5	----
Silver	7440-22-4	0.1	mg/kg	0.6	1.0	1.6	0.5	----
Vanadium	7440-62-2	2.0	mg/kg	86.5	96.9	113	93.4	----
Zinc	7440-66-6	1.0	mg/kg	596	732	1120	589	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.5	0.8	1.2	0.4	----
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	1	mg/kg	----	----	<1	----	----
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	----	----	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg	----	----	<100	<100	----
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	----
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	----
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	10	µg/kg	----	----	<10	<10	----
2-Methylnaphthalene	91-57-6	10	µg/kg	----	----	450	370	----
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/kg	----	----	<10	<10	----
Acenaphthene	83-32-9	10	µg/kg	----	----	90	70	----
Acenaphthylene	208-96-8	10	µg/kg	----	----	320	320	----
Anthracene	120-12-7	10	µg/kg	----	----	320	350	----
Benz(a)anthracene	56-55-3	10	µg/kg	----	----	550	780	----

Analytical Results

Sub-Matrix: SOIL				Client sample ID	SG6	SG7	SG8	DUP 01	----
				Client sampling date / time	06-JUL-2009 15:00	06-JUL-2009 15:00	06-JUL-2009 15:00	06-JUL-2009 15:00	----
Compound	CAS Number	LOR	Unit		ES0909938-006	ES0909938-007	ES0909938-008	ES0909938-009	----
EP132B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(a)pyrene	50-32-8	10	µg/kg		----	----	620	840	----
Benzo(b)fluoranthene	205-99-2	10	µg/kg		----	----	720	990	----
Benzo(e)pyrene	192-97-2	10	µg/kg		----	----	460	520	----
Benzo(g.h.i)perylene	191-24-2	10	µg/kg		----	----	390	530	----
Benzo(k)fluoranthene	207-08-9	10	µg/kg		----	----	500	440	----
Chrysene	218-01-9	10	µg/kg		----	----	570	700	----
Coronene	191-07-1	10	µg/kg		----	----	40	60	----
Dibenz(a.h)anthracene	53-70-3	10	µg/kg		----	----	60	90	----
Fluoranthene	206-44-0	10	µg/kg		----	----	1250	1730	----
Fluorene	86-73-7	10	µg/kg		----	----	330	280	----
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/kg		----	----	350	470	----
N-2-Fluorenyl Acetamide	53-96-3	100	µg/kg		----	----	<100	<100	----
Naphthalene	91-20-3	10	µg/kg		----	----	3860	3600	----
Perylene	198-55-0	10	µg/kg		----	----	180	270	----
Phenanthrene	85-01-8	10	µg/kg		----	----	1030	1060	----
Pyrene	129-00-0	10	µg/kg		----	----	1050	1420	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		----	----	83.4	91.3	----
Toluene-D8	2037-26-5	0.1	%		----	----	80.5	87.4	----
4-Bromofluorobenzene	460-00-4	0.1	%		----	----	78.1	86.2	----
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		----	----	44.4	88.3	----
Anthracene-d10	1719-06-8	0.1	%		----	----	48.1	91.5	----
4-Terphenyl-d14	1718-51-0	0.1	%		----	----	55.8	104	----

Analytical Results

Sub-Matrix: WATER				Client sample ID	RB 01	----	----	----	----
				Client sampling date / time	06-JUL-2009 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES0909938-010	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
EP080: BTEX									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<5	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
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	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**105**	----	----	----	----
Toluene-D8	2037-26-5	0.1	%		**99.7**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%		**102**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER**				Client sample ID	**RB 01**	----	----	----	----
				Client sampling date / time	06-JUL-2009 15:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**ES0909938-010**	**----**	**----**	**----**	**----**
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**59.8**	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%		**68.1**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		**70.5**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
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
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**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	80	120
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115
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	: **ES0909938**	Page	: 1 of 10
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	: 08-JUL-2009
Sampler	: RC	Issue Date	: 21-JUL-2009
Order number	: ----		
		No. of samples received	: 10
Quote number	: SY/330/09 V3	No. of samples analysed	: 10

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

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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.

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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 (%)*
EA055: Moisture Content (QC Lot: 1034285)									
ES0909864-018	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	---	1.0	%	27.7	28.5	2.7	0% - 20%
ES0909938-009	DUP 01	EA055-103: Moisture Content (dried @ 103°C)	---	1.0	%	47.3	46.5	1.6	0% - 20%
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 1044323)									
ES0909938-001	SG1	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	0.8	0.8	0.0	No Limit
		EG020-SD: Selenium	7782-49-2	0.1	mg/kg	4.1	3.8	7.4	0% - 20%
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	2.0	1.8	5.9	0% - 50%
		EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	12.6	12.3	2.2	0% - 20%
		EG020-SD: Antimony	7440-36-0	0.50	mg/kg	1.15	1.06	7.5	No Limit
		EG020-SD: Chromium	7440-47-3	1.0	mg/kg	100	99.6	0.8	0% - 20%
		EG020-SD: Copper	7440-50-8	1.0	mg/kg	767	753	1.8	0% - 20%
		EG020-SD: Lead	7439-92-1	1.0	mg/kg	480	483	0.6	0% - 20%
		EG020-SD: Nickel	7440-02-0	1.0	mg/kg	21.3	21.1	1.2	0% - 20%
		EG020-SD: Zinc	7440-66-6	1.0	mg/kg	1200	1150	3.7	0% - 20%
		EG020-SD: Arsenic	7440-38-2	1.00	mg/kg	51.1	48.9	4.4	0% - 20%
		EG020-SD: Vanadium	7440-62-2	2.0	mg/kg	98.7	99.3	0.6	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1034749)									
ES0909938-001	SG1	EG035T: Mercury	7439-97-6	0.1	mg/kg	1.3	1.2	10.8	0% - 50%
ES0909954-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	3.7	3.6	4.3	0% - 20%
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1033616)									
ES0909811-001	Anonymous	EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1033594)									
ES0909938-001	SG1	EP080: C6 - C9 Fraction	---	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1033615)									
ES0909938-001	SG1	EP071: C15 - C28 Fraction	---	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	---	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	---	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEX (QC Lot: 1033594)									
ES0909938-001	SG1	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
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1033614)									

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1033614) - continued									
ES0909938-001	SG1	EP132: 3-Methylcholanthrene	56-49-5	10	µg/kg	<10	<10	0.0	No Limit
		EP132: 2-Methylnaphthalene	91-57-6	10	µg/kg	670	620	8.1	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	130	150	12.2	0% - 50%
		EP132: Acenaphthylene	208-96-8	10	µg/kg	490	460	6.4	0% - 20%
		EP132: Anthracene	120-12-7	10	µg/kg	480	460	4.4	0% - 20%
		EP132: Benz(a)anthracene	56-55-3	10	µg/kg	1060	870	19.3	0% - 20%
		EP132: Benzo(a)pyrene	50-32-8	10	µg/kg	1180	1000	17.0	0% - 20%
		EP132: Benzo(b)fluoranthene	205-99-2	10	µg/kg	1390	1150	19.2	0% - 20%
		EP132: Benzo(e)pyrene	192-97-2	10	µg/kg	730	630	15.4	0% - 20%
		EP132: Benzo(g.h.i)perylene	191-24-2	10	µg/kg	840	680	19.8	0% - 20%
		EP132: Benzo(k)fluoranthene	207-08-9	10	µg/kg	630	530	16.7	0% - 20%
		EP132: Chrysene	218-01-9	10	µg/kg	1000	790	# 23.4	0% - 20%
		EP132: Coronene	191-07-1	10	µg/kg	210	140	# 40.0	0% - 50%
		EP132: Dibenz(a.h)anthracene	53-70-3	10	µg/kg	180	150	20.7	0% - 50%
		EP132: Fluoranthene	206-44-0	10	µg/kg	2310	1960	16.3	0% - 20%
		EP132: Fluorene	86-73-7	10	µg/kg	480	450	7.0	0% - 20%
		EP132: Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/kg	710	580	19.8	0% - 20%
		EP132: Naphthalene	91-20-3	10	µg/kg	6510	5290	# 20.6	0% - 20%
		EP132: Perylene	198-55-0	10	µg/kg	290	290	0.0	0% - 20%
		EP132: Phenanthrene	85-01-8	10	µg/kg	1790	1500	17.7	0% - 20%
		EP132: Pyrene	129-00-0	10	µg/kg	2000	1720	15.0	0% - 20%
		EP132: N-2-Fluorenyl Acetamide	53-96-3	100	µg/kg	<100	<100	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1034306)									
ES0909909-006	Anonymous	EP080: C6 - C9 Fraction	---	20	µg/L	<20	<20	0.0	No Limit
ES0909954-022	Anonymous	EP080: C6 - C9 Fraction	---	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEX (QC Lot: 1034306)									
ES0909909-006	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
ES0909954-022	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	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 (%)*
EP080: BTEX (QC Lot: 1034306) - continued									
ES0909954-022	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	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: 1044323)								
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	108	70	130
EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	2.76 mg/kg	92.0	70	130
EG020-SD: Chromium	7440-47-3	1.0	mg/kg	<1.0	60.9 mg/kg	100	70	130
EG020-SD: Copper	7440-50-8	1.0	mg/kg	<1.0	54.7 mg/kg	92.7	70	130
EG020-SD: Cobalt	7440-48-4	10	mg/kg	<10.0	24.5 mg/kg	96.9	70	130
EG020-SD: Lead	7439-92-1	1.0	mg/kg	<1.0	54.8 mg/kg	92.5	70	130
EG020-SD: Nickel	7440-02-0	1.0	mg/kg	<1.0	55.2 mg/kg	97.7	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	86.0	70	130
EG020-SD: Vanadium	7440-62-2	2	mg/kg	<2.0	34 mg/kg	96.8	70	130
EG020-SD: Zinc	7440-66-6	1.0	mg/kg	<1.0	104 mg/kg	94.8	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1034749)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	92.6	67	118
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1033616)								
EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	50 mg/kg	94.4	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1033594)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	87.8	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1033615)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	88.0	75.2	116
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	200 mg/kg	89.0	75.3	113
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	100	72.6	117
EP080: BTEX (QCLot: 1033594)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	99.0	67.5	125
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	102	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	96.7	65.3	126
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	95.7	66.5	124
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	99.6	66.7	123
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1033614)								
EP132: 3-Methylcholanthrene	56-49-5	10	µg/kg	<10	100 µg/kg	67.0	34.8	123
EP132: 2-Methylnaphthalene	91-57-6	10	µg/kg	<10	100 µg/kg	85.0	66.6	122
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/kg	<10	100 µg/kg	59.0	6.88	147
EP132: Acenaphthene	83-32-9	10	µg/kg	<10	100 µg/kg	88.0	62.9	124

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: 1033614) - continued								
EP132: Acenaphthylene	208-96-8	10	µg/kg	<10	100 µg/kg	78.0	58.2	117
EP132: Anthracene	120-12-7	10	µg/kg	<10	100 µg/kg	79.0	61.4	117
EP132: Benz(a)anthracene	56-55-3	10	µg/kg	<10	100 µg/kg	87.0	65.7	125
EP132: Benzo(a)pyrene	50-32-8	10	µg/kg	<10	100 µg/kg	77.0	60.7	119
EP132: Benzo(b)fluoranthene	205-99-2	10	µg/kg	<10	100 µg/kg	100	68.6	126
EP132: Benzo(e)pyrene	192-97-2	10	µg/kg	<10	100 µg/kg	89.5	70	129
EP132: Benzo(g.h.i)perylene	191-24-2	10	µg/kg	<10	100 µg/kg	68.5	52.4	135
EP132: Benzo(k)fluoranthene	207-08-9	10	µg/kg	<10	100 µg/kg	104	70.4	126
EP132: Chrysene	218-01-9	10	µg/kg	<10	100 µg/kg	87.5	67.5	126
EP132: Coronene	191-07-1	10	µg/kg	<10	100 µg/kg	84.5	34.7	141
EP132: Dibenz(a.h)anthracene	53-70-3	10	µg/kg	<10	100 µg/kg	68.5	61.7	129
EP132: Fluoranthene	206-44-0	10	µg/kg	<10	100 µg/kg	89.0	68.7	126
EP132: Fluorene	86-73-7	10	µg/kg	<10	100 µg/kg	81.5	66.7	123
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/kg	<10	100 µg/kg	62.5	56.6	131
EP132: N-2-Fluorenyl Acetamide	53-96-3	100	µg/kg	<100	1000 µg/kg	61.0	50	138
EP132: Naphthalene	91-20-3	10	µg/kg	<10	100 µg/kg	85.5	63.2	120
EP132: Perylene	198-55-0	10	µg/kg	<10	100 µg/kg	71.5	58.6	119
EP132: Phenanthrene	85-01-8	10	µg/kg	<10	100 µg/kg	86.5	65.4	124
EP132: Pyrene	129-00-0	10	µg/kg	<10	100 µg/kg	98.0	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
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1034078)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	82.0	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	400 µg/L	94.5	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	92.0	62.7	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1034306)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	104	75	127
EP080: BTEX (QCLot: 1034306)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	105	76.2	124
EP080: Toluene	108-88-3	2	µg/L	----	10 µg/L	102	74.4	124
		5	µg/L	<5	----	----	----	----
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	110	76.1	122
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	112	75.7	123
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	110	77.9	121
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1034094)								
EP132: 3-Methylcholanthrene	56-49-5	0.10	µg/L	<0.1	2 µg/L	79.6	65.8	121

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: 1034094) - continued								
EP132: 2-Methylnaphthalene	91-57-6	0.10	µg/L	<0.1	2 µg/L	79.0	67.7	112
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.10	µg/L	<0.1	2 µg/L	81.4	11.6	146
EP132: Acenaphthene	83-32-9	0.10	µg/L	<0.1	2 µg/L	82.6	73.2	111
EP132: Acenaphthylene	208-96-8	0.10	µg/L	<0.1	2 µg/L	84.1	72.4	112
EP132: Anthracene	120-12-7	0.10	µg/L	<0.1	2 µg/L	84.4	73.4	113
EP132: Benz(a)anthracene	56-55-3	0.10	µg/L	<0.1	2 µg/L	87.9	73.6	114
EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	2 µg/L	84.6	75.2	117
EP132: Benzo(b)fluoranthene	205-99-2	0.10	µg/L	<0.1	2 µg/L	88.5	71.4	119
EP132: Benzo(e)pyrene	192-97-2	0.10	µg/L	<0.1	2 µg/L	84.6	75.3	118
EP132: Benzo(g.h.i)perylene	191-24-2	0.10	µg/L	<0.1	2 µg/L	79.2	66.6	121
EP132: Benzo(k)fluoranthene	207-08-9	0.10	µg/L	<0.1	2 µg/L	81.7	74.8	118
EP132: Chrysene	218-01-9	0.10	µg/L	<0.1	2 µg/L	87.4	69.6	120
EP132: Coronene	191-07-1	0.10	µg/L	<0.1	2 µg/L	70.0	47.4	131
EP132: Dibenz(a.h)anthracene	53-70-3	0.10	µg/L	<0.1	2 µg/L	80.4	71.5	117
EP132: Fluoranthene	206-44-0	0.10	µg/L	<0.1	2 µg/L	91.2	74.8	117
EP132: Fluorene	86-73-7	0.10	µg/L	<0.1	2 µg/L	81.4	72.9	114
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	0.10	µg/L	<0.1	2 µg/L	81.0	67.8	119
EP132: N-2-Fluorenyl Acetamide	53-96-3	0.10	µg/L	<0.1	20 µg/L	56.4	53.6	131
EP132: Naphthalene	91-20-3	0.10	µg/L	<0.1	2 µg/L	80.8	68.3	116
EP132: Perylene	198-55-0	0.10	µg/L	<0.1	2 µg/L	85.2	68	122
EP132: Phenanthrene	85-01-8	0.10	µg/L	<0.1	2 µg/L	83.5	74.8	112
EP132: Pyrene	129-00-0	0.10	µg/L	<0.1	2 µg/L	92.8	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: **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: 1044323)							
ES0909938-002	SG2	EG020-SD: Arsenic	7440-38-2	50 mg/kg	96.3	70	130
		EG020-SD: Cadmium	7440-43-9	50 mg/kg	91.4	70	130
		EG020-SD: Chromium	7440-47-3	50 mg/kg	97.0	70	130
		EG020-SD: Copper	7440-50-8	250 mg/kg	84.1	70	130
		EG020-SD: Lead	7439-92-1	250 mg/kg	89.4	70	130
		EG020-SD: Nickel	7440-02-0	50 mg/kg	89.9	70	130
		EG020-SD: Zinc	7440-66-6	250 mg/kg	89.5	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1034749)							
ES0909938-001	SG1	EG035T: Mercury	7439-97-6	5 mg/kg	92.7	70	130
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1033616)							
ES0909811-001	Anonymous	EK026G: Total Cyanide	57-12-5	50 mg/kg	94.4	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1033594)							
ES0909938-001	SG1	EP080: C6 - C9 Fraction	----	26 mg/kg	124	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1033615)							
ES0909938-001	SG1	EP071: C10 - C14 Fraction	----	640 mg/kg	120	70	130
		EP071: C15 - C28 Fraction	----	3140 mg/kg	104	70	130
		EP071: C29 - C36 Fraction	----	2860 mg/kg	102	70	130
EP080: BTEX (QCLot: 1033594)							
ES0909938-001	SG1	EP080: Benzene	71-43-2	2.5 mg/kg	72.8	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	70.3	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	# 70.0	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	70.6	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	74.0	70	130
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1033614)							
ES0909938-001	SG1	EP132: 3-Methylcholanthrene	56-49-5	100 µg/kg	50.6	21	129
		EP132: 2-Methylnaphthalene	91-57-6	100 µg/kg	120	40	130
		EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	100 µg/kg	59.3	8	158
		EP132: Acenaphthene	83-32-9	100 µg/kg	82.1	38	127
		EP132: Acenaphthylene	208-96-8	100 µg/kg	99.0	35	122
		EP132: Anthracene	120-12-7	100 µg/kg	105	44	124
		EP132: Benz(a)anthracene	56-55-3	100 µg/kg	# Not Determined	48	124
		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

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: 1033614) - continued							
ES0909938-001	SG1	EP132: Benzo(e)pyrene	192-97-2	100 µg/kg	# 136	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	# Not Determined	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	# Not Determined	46	129
		EP132: Fluoranthene	206-44-0	100 µg/kg	# Not Determined	52	125
		EP132: Fluorene	86-73-7	100 µg/kg	91.5	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	54.6	28	152
		EP132: Naphthalene	91-20-3	100 µg/kg	# Not Determined	34	130
		EP132: Perylene	198-55-0	100 µg/kg	90.2	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
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1034306)							
ES0909909-006	Anonymous	EP080: C6 - C9 Fraction	----	250 µg/L	90.7	70	130
EP080: BTEX (QCLot: 1034306)							
ES0909909-006	Anonymous	EP080: Benzene	71-43-2	25 µg/L	79.5	70	130
		EP080: Toluene	108-88-3	25 µg/L	100	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	89.9	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	102	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	88.7	70	130

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES0909938**	Page	: 1 of 9
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	: 08-JUL-2009
Sampler	: RC	Issue Date	: 21-JUL-2009
Order number	: ----		
		No. of samples received	: 10
Quote number	: SY/330/09 V3	No. of samples analysed	: 10

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							
SG1, SG2, SG3, SG4, SG5, SG6, SG7, SG8, DUP 01	**06-JUL-2009**	**----**	----	----	**09-JUL-2009**	13-JUL-2009	✓
Soil Glass Jar - Unpreserved							
SG1, SG2, SG3, SG4, SG5, SG6, SG7, SG8, DUP 01	**06-JUL-2009**	**----**	----	----	**20-JUL-2009**	13-JUL-2009	×
EG020-SD: Total Metals in Sediments by ICPMS							
Soil Glass Jar - Unpreserved							
SG1, SG2, SG3, SG4, SG5, SG6, SG7, SG8, DUP 01	**06-JUL-2009**	**20-JUL-2009**	03-AUG-2009	✓	**21-JUL-2009**	02-JAN-2010	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved							
SG1, SG2, SG3, SG4, SG5, SG6, SG7, SG8, DUP 01	**06-JUL-2009**	**09-JUL-2009**	03-AUG-2009	✓	**10-JUL-2009**	03-AUG-2009	✓
EK026G: Total Cyanide By Discrete Analyser							
Soil Glass Jar - Unpreserved							
SG2, SG4, SG5, SG8	**06-JUL-2009**	**08-JUL-2009**	13-JUL-2009	✓	**09-JUL-2009**	22-JUL-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
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved							
SG1, SG3, SG5, SG8, DUP 01	**06-JUL-2009**	**08-JUL-2009**	20-JUL-2009	✓	**09-JUL-2009**	17-AUG-2009	✓
EP080: BTEX							
Soil Glass Jar - Unpreserved							
SG1, SG3, SG5, SG8, DUP 01	**06-JUL-2009**	**08-JUL-2009**	20-JUL-2009	✓	**09-JUL-2009**	20-JUL-2009	✓
EP132B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved							
SG1, SG3, SG5, SG8, DUP 01	**06-JUL-2009**	**08-JUL-2009**	20-JUL-2009	✓	**10-JUL-2009**	17-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
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved							
RB 01	**06-JUL-2009**	**09-JUL-2009**	13-JUL-2009	✓	**10-JUL-2009**	18-AUG-2009	✓
Amber VOC Vial - HCl or NaHSO4							
RB 01	**06-JUL-2009**	**---**	---	----	**09-JUL-2009**	20-JUL-2009	✓
EP080: BTEX							
Amber VOC Vial - HCl or NaHSO4							
RB 01	**06-JUL-2009**	**---**	---	----	**09-JUL-2009**	20-JUL-2009	✓
EP132B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved							
RB 01	**06-JUL-2009**	**09-JUL-2009**	13-JUL-2009	✓	**10-JUL-2009**	18-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	13	**15.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	8	**12.5**	**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 Sediments by ICPMS	EG020-SD	1	9	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	8	**12.5**	**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 Sediments by ICPMS	EG020-SD	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	8	**12.5**	**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 Sediments by ICPMS	EG020-SD	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	5	**20.0**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	8	**12.5**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Metals in Sediments by ICPMS	EG020-SD	1	9	**11.1**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	5	**20.0**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	5	**20.0**	**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)							
TPH Volatiles/BTEX	EP080	2	11	**18.2**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	2	**50.0**	**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*	
Laboratory Control Samples (LCS) - Continued							
TPH - Semivolatile Fraction	EP071	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	11	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	2	**50.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	11	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
TPH Volatiles/BTEX	EP080	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 Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)
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)
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)
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	SOIL	8270 GCMS Capiliary column, SIM mode.
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis 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)
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)

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.

Preparation Methods	Method	Matrix	Method Descriptions
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.
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.
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.

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							
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Chrysene**	218-01-9	23.4 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Coronene**	191-07-1	40.0 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Naphthalene**	91-20-3	20.6 %	0-20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EP080: BTEX	ES0909938-001	SG1	**Ethylbenzene**	100-41-4	70.0 %	70-130%	**Recovery less than lower data quality objective**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Benz(a)anthracene**	56-55-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Benzo(a)pyrene**	50-32-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**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	ES0909938-001	SG1	**Benzo(e)pyrene**	192-97-2	136 %	46-130%	**Recovery greater than upper data quality objective**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Benzo(g.h.i)perylene**	191-24-2	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Benzo(k)fluoranthene**	207-08-9	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Chrysene**	218-01-9	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Coronene**	191-07-1	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Dibenz(a.h)anthracene**	53-70-3	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Fluoranthene**	206-44-0	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Indeno(1.2.3.cd)pyrene**	193-39-5	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**

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	ES0909938-001	SG1	**Naphthalene**	91-20-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Phenanthrene**	85-01-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Pyrene**	129-00-0	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Laboratory Control 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							
EP080S: TPH(V)/BTEX Surrogates	ES0909938-008	SG8	**Toluene-D8**	2037-26-5	80.5 %	81-117 %	**Recovery less than lower data quality objective**
EP080S: TPH(V)/BTEX Surrogates	ES0909938-001	SG1	**Toluene-D8**	2037-26-5	78.8 %	81-117 %	**Recovery less than lower 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.

Matrix: **SOIL**

Method	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)	*Date extracted*	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EA055: Moisture Content						
Soil Glass Jar - Unpreserved						
SG1, SG2, SG3, SG4, SG5, SG6, SG7, SG8, DUP 01	---	----	----	20-JUL-2009	13-JUL-2009	**7**

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.**

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES0909938**	Page	: 1 of 9
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	: 08-JUL-2009
Sampler	: RC	Issue Date	: 21-JUL-2009
Order number	: ----		
		No. of samples received	: 10
Quote number	: SY/330/09 V3	No. of samples analysed	: 10

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							
SG1, SG2, SG3, SG4, SG5, SG6, SG7, SG8, DUP 01	**06-JUL-2009**	**----**	----	----	**09-JUL-2009**	13-JUL-2009	✓
Soil Glass Jar - Unpreserved							
SG1, SG2, SG3, SG4, SG5, SG6, SG7, SG8, DUP 01	**06-JUL-2009**	**----**	----	----	**20-JUL-2009**	13-JUL-2009	×
EG020-SD: Total Metals in Sediments by ICPMS							
Soil Glass Jar - Unpreserved							
SG1, SG2, SG3, SG4, SG5, SG6, SG7, SG8, DUP 01	**06-JUL-2009**	**20-JUL-2009**	03-AUG-2009	✓	**21-JUL-2009**	02-JAN-2010	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved							
SG1, SG2, SG3, SG4, SG5, SG6, SG7, SG8, DUP 01	**06-JUL-2009**	**09-JUL-2009**	03-AUG-2009	✓	**10-JUL-2009**	03-AUG-2009	✓
EK026G: Total Cyanide By Discrete Analyser							
Soil Glass Jar - Unpreserved							
SG2, SG4, SG5, SG8	**06-JUL-2009**	**08-JUL-2009**	13-JUL-2009	✓	**09-JUL-2009**	22-JUL-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
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved							
SG1, SG3, SG5, SG8, DUP 01	**06-JUL-2009**	**08-JUL-2009**	20-JUL-2009	✓	**09-JUL-2009**	17-AUG-2009	✓
EP080: BTEX							
Soil Glass Jar - Unpreserved							
SG1, SG3, SG5, SG8, DUP 01	**06-JUL-2009**	**08-JUL-2009**	20-JUL-2009	✓	**09-JUL-2009**	20-JUL-2009	✓
EP132B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved							
SG1, SG3, SG5, SG8, DUP 01	**06-JUL-2009**	**08-JUL-2009**	20-JUL-2009	✓	**10-JUL-2009**	17-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
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved							
RB 01	**06-JUL-2009**	**09-JUL-2009**	13-JUL-2009	✓	**10-JUL-2009**	18-AUG-2009	✓
Amber VOC Vial - HCl or NaHSO4							
RB 01	**06-JUL-2009**	**---**	---	----	**09-JUL-2009**	20-JUL-2009	✓
EP080: BTEX							
Amber VOC Vial - HCl or NaHSO4							
RB 01	**06-JUL-2009**	**---**	---	----	**09-JUL-2009**	20-JUL-2009	✓
EP132B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved							
RB 01	**06-JUL-2009**	**09-JUL-2009**	13-JUL-2009	✓	**10-JUL-2009**	18-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	13	**15.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	8	**12.5**	**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 Sediments by ICPMS	EG020-SD	1	9	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	8	**12.5**	**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 Sediments by ICPMS	EG020-SD	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	8	**12.5**	**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 Sediments by ICPMS	EG020-SD	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	5	**20.0**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	8	**12.5**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Metals in Sediments by ICPMS	EG020-SD	1	9	**11.1**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	5	**20.0**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	5	**20.0**	**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)							
TPH Volatiles/BTEX	EP080	2	11	**18.2**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	2	**50.0**	**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*	
Laboratory Control Samples (LCS) - Continued							
TPH - Semivolatile Fraction	EP071	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	11	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	2	**50.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	11	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
TPH Volatiles/BTEX	EP080	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 Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)
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)
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)
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	SOIL	8270 GCMS Capiliary column, SIM mode.
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis 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)
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)

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.

Preparation Methods	Method	Matrix	Method Descriptions
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.
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.
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.

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							
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Chrysene**	218-01-9	23.4 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Coronene**	191-07-1	40.0 %	0-20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Naphthalene**	91-20-3	20.6 %	0-20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EP080: BTEX	ES0909938-001	SG1	**Ethylbenzene**	100-41-4	70.0 %	70-130%	**Recovery less than lower data quality objective**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Benz(a)anthracene**	56-55-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Benzo(a)pyrene**	50-32-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**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	ES0909938-001	SG1	**Benzo(e)pyrene**	192-97-2	136 %	46-130%	**Recovery greater than upper data quality objective**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Benzo(g.h.i)perylene**	191-24-2	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Benzo(k)fluoranthene**	207-08-9	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Chrysene**	218-01-9	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Coronene**	191-07-1	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Dibenz(a.h)anthracene**	53-70-3	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Fluoranthene**	206-44-0	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Indeno(1.2.3.cd)pyrene**	193-39-5	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**

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	ES0909938-001	SG1	**Naphthalene**	91-20-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Phenanthrene**	85-01-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132B: Polynuclear Aromatic Hydrocarbons	ES0909938-001	SG1	**Pyrene**	129-00-0	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Laboratory Control 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							
EP080S: TPH(V)/BTEX Surrogates	ES0909938-008	SG8	**Toluene-D8**	2037-26-5	80.5 %	81-117 %	**Recovery less than lower data quality objective**
EP080S: TPH(V)/BTEX Surrogates	ES0909938-001	SG1	**Toluene-D8**	2037-26-5	78.8 %	81-117 %	**Recovery less than lower 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.

Matrix: **SOIL**

Method	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)	*Date extracted*	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EA055: Moisture Content						
Soil Glass Jar - Unpreserved						
SG1, SG2, SG3, SG4, SG5, SG6, SG7, SG8, DUP 01	---	----	----	20-JUL-2009	13-JUL-2009	**7**

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.**

SYDNEY BATCH (Metals, PAH(LR), TPH/BTEX, Cyanide) only

1 of 1

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: Port Kembla Lab Quote No: SY330 09
Tel:
Fax:
Preliminary Report by:
Final Report by:

Sampled By: Richard Cole
AECOM Project No: S3017805
Project Name: S3017805 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)	Metals M13 see guide	TOC	PAH (ultra trace)	BTEX (TPH (Sta LOR)	SPOCAS	Grain size	Elutriate Metals	Elutriate PAH	Cyanide	TBT	Phenols	OCP - ultra trace	Total ACBs - ultra trace	Other
1	SG1	6.7.09	X					X		5 x soil jars	✓	✓	✓	✓			✓	✓						
2	SG2		X					X		7 x soil jars, 1 bag	✓	✓			✓		✓	✓	✓	✓				
3	SG3		X					X		4 jars, 1 bag	✓	✓	✓	✓		✓								
4	SG4		X					X		7 x soil jars	✓	✓					✓	✓	✓	✓				
5	SG5		X					X		7 x soil jars	✓	✓	✓	✓	✓		✓	✓	✓	✓				
6	SG6		X					X		2 x soil jars	✓													
7	SG7		X					X		7 x soil jars	✓	✓					✓	✓						
8	SG8		X					X		3 x soil jars & bags	✓	✓	✓	✓	✓	✓			✓	✓				
	SG8										✓													
9	Dup 01	6.7.09	X					X			✓	✓	✓	✓										
10	RB 01	6.7.09		X				X		2 x Amber 2 x vials 1 x metals 1 x general	✓		✓	✓					✓		✓	✓	✓	

Environmental Division
Sydney
Work Order
ES0909938
Telephone : +61-2-8784 8555

CONTRACT WORK
WO: ES0909936
LAB: ALS Brisbane
DATE: 08/07/09
SPLIT: Elutriates: ES0909939
TBT/TOC: ES0909940
SPOCAS: ES0909941

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

Comments: Elutriate Metals & PAHs (Dredging guideline LOR)

Relinquished by: Richard Cole Signed: Date: 8.7.09

Recieved by: Frank Signed: Date: 8/7/09 11am

Relinquished by: Signed: Date:

Recieved by: Signed: Date:

Lab Report No. Esky ID

Printed copies of this document are uncontrolled

Grain Size not required as per Richard Cole 8/7/09

SYDNEY BATCH (Metals, PAH(LR), TPH/BTEX, Cyanide) only

1 of 1

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: Port Kembla Lab Quote No: SY330 09
Tel:
Fax:
Preliminary Report by:
Final Report by:

Sampled By: Richard Cole
AECOM Project No: S3017805
Project Name: S3017805 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)	Metals M13 see guide	TOC	PAH (ultra trace)	BTEX (TPH (Sta LOR)	SPOCAS	Grain size	Elutriate Metals	Elutriate PAH	Cyanide	TBT	Phenols	OCP - ultra trace	Total ACBs - ultra trace	Other
1	SG1	6.7.09	X					X		5 x soil jars	✓	✓	✓	✓			✓	✓						
2	SG2		X					X		7 x soil jars, 1 bag	✓	✓			✓		✓	✓	✓	✓				
3	SG3		X					X		4 jars, 1 bag	✓	✓	✓	✓		✓								
4	SG4		X					X		7 x soil jars	✓	✓					✓	✓	✓	✓				
5	SG5		X					X		7 x soil jars	✓	✓	✓	✓	✓		✓	✓	✓	✓				
6	SG6		X					X		2 x soil jars	✓													
7	SG7		X					X		7 x soil jars	✓	✓					✓	✓						
8	SG8		X					X		3 x soil jars & bags	✓	✓	✓	✓	✓	✓			✓	✓				
	SG8										✓													
9	Dup 01	6.7.09	X					X			✓	✓	✓	✓										
10	RB 01	6.7.09		X				X		2 x Amber 2 x vials 1 x metals 1 x general	✓		✓	✓					✓		✓	✓	✓	

Environmental Division
Sydney
Work Order
ES0909938
Telephone : +61-2-8784 8555

CONTRACT WORK
WO: ES0909936
LAB: ALS Brisbane
DATE: 08/07/09
SPLIT: Elutriates: ES0909939
TBT/TOC: ES0909940
SPOCAS: ES0909941

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

Comments: Elutriate Metals & PAHs (Dredging guideline LOR)

Relinquished by: Richard Cole Signed: Date: 8.7.09

Recieved by: Frank Signed: Date: 8/7/09 11am

Relinquished by: Signed: Date:

Recieved by: Signed: Date:

Lab Report No. Esky ID

Printed copies of this document are uncontrolled

Grain Size not required as per Richard Cole 8/7/09

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES0909938**		
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)
Site	: ----		
Sampler	: RC	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 08-JUL-2009	Issue Date	: 08-JUL-2009 15:44
Client Requested Due Date	: 20-JUL-2009	Scheduled Reporting Date	: **20-JUL-2009**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 0.8'C - Ice present
No. of coolers/boxes	: 3 HARD	No. of samples received	: 10
Sercurity Seal	: Not intact.	No. of samples analysed	: 10

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).**
- **THIS BATCH ES0909938 FOR ALS SYD BATCH ONLY AND SPLIT INTO ES0909939 (ELUTRIATE), ES0909940 (TBT/TOC) & ES0909941 (SPOCAS)**
- 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 - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EG035T (solids) Total Mercury by FIMS	SOIL - EK026G (Solids) Total Cyanide By Discrete Analyser	SOIL - EP132B Ultratrace PAH's	SOIL - S-04 TPH/BTEX
ES0909938-001	06-JUL-2009 15:00	SG1		✓	✓		✓	✓
ES0909938-002	06-JUL-2009 15:00	SG2	✓	✓	✓	✓		
ES0909938-003	06-JUL-2009 15:00	SG3		✓	✓		✓	✓
ES0909938-004	06-JUL-2009 15:00	SG4	✓	✓	✓	✓		
ES0909938-005	06-JUL-2009 15:00	SG5		✓	✓	✓	✓	✓
ES0909938-006	06-JUL-2009 15:00	SG6	✓	✓	✓			
ES0909938-007	06-JUL-2009 15:00	SG7	✓	✓	✓			
ES0909938-008	06-JUL-2009 15:00	SG8		✓	✓	✓	✓	✓
ES0909938-009	06-JUL-2009 15:00	DUP 01		✓	✓		✓	✓

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - EP132(PAH) Ultra Trace Polynuclear Aromatic Compounds	WATER - W-04 TPH/BTEX
ES0909938-010	06-JUL-2009 15:00	RB 01	✓	✓

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	: **ES0909939**	Page	: 1 of 9
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	: 08-JUL-2009
Sampler	: RC	Issue Date	: 23-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

Analytical Results

Sub-Matrix: **ELUTRIATE**

Compound	CAS Number	LOR	Unit	Client sample ID: SG1	SG2	SG4	SG5	SG7
				Client sampling date / time: 09-JUL-2009 12:00	09-JUL-2009 12:00	09-JUL-2009 12:00	09-JUL-2009 12:00	09-JUL-2009 12:00
				ES0909939-001	ES0909939-002	ES0909939-003	ES0909939-004	ES0909939-005
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	**1.2**	**1.3**	**1.4**	**1.0**	**1.6**
Arsenic	7440-38-2	0.5	µg/L	**10.5**	**14.2**	**3.9**	**3.8**	**4.3**
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	**0.3**	**0.3**	<0.2	**0.2**	**0.3**
Copper	7440-50-8	1	µg/L	**2**	**2**	<1	**2**	<1
Lead	7439-92-1	0.2	µg/L	**2.6**	**1.6**	**0.7**	**1.3**	**2.0**
Nickel	7440-02-0	0.5	µg/L	**1.5**	**1.1**	**2.3**	**1.5**	**1.0**
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	**3.8**	**5.0**	**7.2**	**5.3**	**4.0**
Zinc	7440-66-6	5	µg/L	<5	**9**	<5	<5	**13**
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	SG1	SG2	SG4	SG5	SG7
				Client sampling date / time	09-JUL-2009 12:00	09-JUL-2009 12:00	09-JUL-2009 12:00	09-JUL-2009 12:00	09-JUL-2009 12:00
Compound	*CAS Number*	*LOR*	*Unit*		**ES0909939-001**	**ES0909939-002**	**ES0909939-003**	**ES0909939-004**	**ES0909939-005**
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**101**	**105**	**87.2**	**91.2**	**96.9**
Anthracene-d10	1719-06-8	0.1	%		**103**	**110**	**95.5**	**103**	**98.5**
4-Terphenyl-d14	1718-51-0	0.1	%		**101**	**108**	**95.7**	**103**	**99.7**

Analytical Results

Sub-Matrix: ELUTRIATE				Client sample ID	ELUTRIATE WATER	----	----	----	----
				Client sampling date / time	09-JUL-2009 12:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES0909939-006	----	----	----	----
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		<0.5	----	----	----	----
Silver	7440-22-4	0.1	µg/L		<0.1	----	----	----	----
Vanadium	7440-62-2	0.5	µg/L		**1.0**	----	----	----	----
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	09-JUL-2009 12:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**ES0909939-006**	**----**	**----**	**----**	**----**
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**98.3**	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%		**102**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		**105**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL			Client sample ID	SG1	SG2	SG4	SG5	SG7
			Client sampling date / time	06-JUL-2009 15:00	06-JUL-2009 15:00	06-JUL-2009 15:00	06-JUL-2009 15:00	06-JUL-2009 15:00
Compound	CAS Number	LOR	Unit	ES0909939-001	ES0909939-002	ES0909939-003	ES0909939-004	ES0909939-005
EN68: Seawater Elutriate Testing Procedure								
Seawater Sampling Date	----	0.1	--	**6/7/09**	**6/07/09**	**6/07/09**	**6/07/09**	**6/07/09**

Analytical Results

Sub-Matrix: SOIL			Client sample ID	ELUTRIATE WATER	----	----	----	----
			Client sampling date / time	06-JUL-2009 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES0909939-006	----	----	----	----
EN68: Seawater Elutriate Testing Procedure								
Seawater Sampling Date	----	0.1	--	**6/07/09**	----	----	----	----

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	: **ES0909939**	Page	: 1 of 6
Client	: **ENSR AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRISTIANN DONNETTI	Contact	: Charlie Pierce
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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	: 08-JUL-2009
Sampler	: RC	Issue Date	: 23-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: 1034512)									
ES0909874-004	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES0909939-001	SG1	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: 1042808)									
ES0909939-001	SG1	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	0.3	0.3	0.0	No Limit
		EG093A-T: Lead	7439-92-1	0.2	µg/L	2.6	2.7	6.8	0% - 50%
		EG093A-T: Antimony	7440-36-0	0.5	µg/L	1.2	1.2	0.0	No Limit
		EG093A-T: Arsenic	7440-38-2	0.5	µg/L	10.5	11.3	6.9	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	1.5	1.8	19.5	No Limit
		EG093A-T: Vanadium	7440-62-2	0.5	µg/L	3.8	3.8	0.0	No Limit
		EG093A-T: Copper	7440-50-8	1	µg/L	2	2	0.0	No Limit
		EG093A-T: Zinc	7440-66-6	5	µg/L	<5	<5	0.0	No Limit
ES0909950-005	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	<0.2	<0.2	0.0	No Limit
		EG093A-T: Cobalt	7440-48-4	0.2	µg/L	0.3	<0.2	0.0	No Limit
		EG093A-T: Lead	7439-92-1	0.2	µg/L	0.4	0.4	0.0	No Limit
		EG093A-T: Antimony	7440-36-0	0.5	µg/L	1.3	1.5	10.0	No Limit
		EG093A-T: Arsenic	7440-38-2	0.5	µg/L	19.8	19.8	0.0	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	1.3	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	<5	<5	0.0	No Limit
EG093T: Total Metals in Saline Water by ORC-ICPMS (QC Lot: 1042809)									
ES0909939-001	SG1	EG093B-T: Selenium	7782-49-2	2	µg/L	<2	<2	0.0	No Limit
ES0909950-005	Anonymous	EG093B-T: Selenium	7782-49-2	2	µg/L	<2	<2	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: 1034512)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	104	81	119
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 1042808)								
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	98.2	89	125
EG093A-T: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	85.4	78	112
EG093A-T: Chromium	7440-47-3	0.5	µg/L	<0.5	10 µg/L	94.5	86	126
EG093A-T: Cobalt	7440-48-4	0.2	µg/L	<0.2	10 µg/L	95.0	90	126
EG093A-T: Copper	7440-50-8	1	µg/L	<1	10 µg/L	100	87	123
EG093A-T: Lead	7439-92-1	0.2	µg/L	<0.2	10 µg/L	95.5	89	121
EG093A-T: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	100	85	125
EG093A-T: Silver	7440-22-4	0.1	µg/L	<0.1	1 µg/L	91.4	70	130
EG093A-T: Vanadium	7440-62-2	0.5	µg/L	<0.5	10 µg/L	99.4	87	121
EG093A-T: Zinc	7440-66-6	5	µg/L	<5	10 µg/L	84.6	82	128
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 1042809)								
EG093B-T: Selenium	7782-49-2	2	µg/L	<2	10 µg/L	93.3	75	130
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1034539)								
EP132: 3-Methylcholanthrene	56-49-5	0.10	µg/L	<0.1	2 µg/L	80.8	65.8	121
EP132: 2-Methylnaphthalene	91-57-6	0.10	µg/L	<0.1	2 µg/L	98.0	67.7	112
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.10	µg/L	<0.1	2 µg/L	71.6	11.6	146
EP132: Acenaphthene	83-32-9	0.10	µg/L	<0.1	2 µg/L	101	73.2	111
EP132: Acenaphthylene	208-96-8	0.10	µg/L	<0.1	2 µg/L	104	72.4	112
EP132: Anthracene	120-12-7	0.10	µg/L	<0.1	2 µg/L	105	73.4	113
EP132: Benz(a)anthracene	56-55-3	0.10	µg/L	<0.1	2 µg/L	109	73.6	114
EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	2 µg/L	88.2	75.2	117
EP132: Benzo(b)fluoranthene	205-99-2	0.10	µg/L	<0.1	2 µg/L	98.7	71.4	119
EP132: Benzo(e)pyrene	192-97-2	0.10	µg/L	<0.1	2 µg/L	92.4	75.3	118
EP132: Benzo(g.h.i)perylene	191-24-2	0.10	µg/L	<0.1	2 µg/L	# 55.8	66.6	121
EP132: Benzo(k)fluoranthene	207-08-9	0.10	µg/L	<0.1	2 µg/L	103	74.8	118
EP132: Chrysene	218-01-9	0.10	µg/L	<0.1	2 µg/L	106	69.6	120
EP132: Coronene	191-07-1	0.10	µg/L	<0.1	2 µg/L	74.6	47.4	131
EP132: Dibenz(a.h)anthracene	53-70-3	0.10	µg/L	<0.1	2 µg/L	# 61.3	71.5	117
EP132: Fluoranthene	206-44-0	0.10	µg/L	<0.1	2 µg/L	103	74.8	117
EP132: Fluorene	86-73-7	0.10	µg/L	<0.1	2 µg/L	102	72.9	114
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	0.10	µg/L	<0.1	2 µg/L	# 51.5	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: 1034539) - continued								
EP132: N-2-Fluorenyl Acetamide	53-96-3	0.10	µg/L	<0.1	20 µg/L	60.6	53.6	131
EP132: Naphthalene	91-20-3	0.10	µg/L	<0.1	2 µg/L	98.9	68.3	116
EP132: Perylene	198-55-0	0.10	µg/L	<0.1	2 µg/L	85.2	68	122
EP132: Phenanthrene	85-01-8	0.10	µg/L	<0.1	2 µg/L	103	74.8	112
EP132: Pyrene	129-00-0	0.10	µg/L	<0.1	2 µg/L	102	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: 1034512)							
ES0909874-004	Anonymous	EG035T: Mercury	7439-97-6	0.010 mg/L	110	70	130
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 1042808)							
ES0909939-001	SG1	EG093A-T: Arsenic	7440-38-2	50 µg/L	111	70	130
		EG093A-T: Cadmium	7440-43-9	12.5 µg/L	87.9	70	130
		EG093A-T: Chromium	7440-47-3	50 µg/L	99.6	70	130
		EG093A-T: Cobalt	7440-48-4	50 µg/L	104	70	130
		EG093A-T: Copper	7440-50-8	50 µg/L	107	70	130
		EG093A-T: Lead	7439-92-1	50 µg/L	92.8	70	130
		EG093A-T: Nickel	7440-02-0	50 µg/L	106	70	130
		EG093A-T: Vanadium	7440-62-2	50 µg/L	99.2	70	130
		EG093A-T: Zinc	7440-66-6	50 µg/L	91.5	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES0909939**	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
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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	: 08-JUL-2009
Sampler	: RC	Issue Date	: 23-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							
SG1, SG2, SG4, SG5, SG7, ELUTRIATE WATER	**09-JUL-2009**	**----**	----	----	**13-JUL-2009**	06-AUG-2009	✓
EG093T: Total Metals in Saline Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Unfiltered							
SG1, SG2, SG4, SG5, SG7, ELUTRIATE WATER	**09-JUL-2009**	**18-JUL-2009**	05-JAN-2010	✓	**18-JUL-2009**	05-JAN-2010	✓
EN68: Seawater Elutriate Testing Procedure							
LabSplit: Leach for organics and other tests							
SG1, SG2, SG4, SG5, SG7, ELUTRIATE WATER	**06-JUL-2009**	**---**	---	----	**09-JUL-2009**	20-JUL-2009	✓
EP132B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved							
SG1, SG2, SG4, SG5, SG7, ELUTRIATE WATER	**09-JUL-2009**	**09-JUL-2009**	16-JUL-2009	✓	**10-JUL-2009**	18-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: **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)							
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	17	**11.8**	**9.5**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-T	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	6	**16.7**	**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	17	**5.9**	**4.8**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-T	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	6	**16.7**	**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	17	**5.9**	**4.8**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-T	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
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	17	**5.9**	**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.

Elutriates only.

Chain of Custody

1 of 1

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: EN330 09

Sampled By: Richard Cole
AECOM Project No: 53017805
Project Name: 53017805 Outer Harbour Port Kembla 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. Sheli 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)	Metals M13 see quote	TOC	PAH (ultra trace)	BTEX (TPH (Std LOR)	SPOCAS	Grain Size	Elutriate Metals	Elutriate PAH	Cyanide	TBT	Phenols	OCP	Total OCBs	Other
1	SA1	6.7.09	X					✓		5 x soil jars	✓	✓	✓	✓			✓	✓						
2	SA2		✓							7 x soil jars, 1 bag	✓	✓			✓		✓	✓	✓	✓				
	SA3		✓							4 jars, 1 bag	✓	✓	✓	✓		✓								
3	SA4		✓							7 x soil jars	✓	✓					✓	✓	✓	✓				
4	SA5		✓							7 x soil jars	✓	✓	✓	✓	✓		✓	✓	✓	✓				
	SA6		✓							2 x soil jars	✓													
5	SA7		✓							7 x soil jars	✓	✓					✓	✓						
	SA8		✓							3 x soil jars & bags	✓	✓	✓	✓	✓	✓			✓	✓				
	~~SA8~~	~~▼~~	~~✓~~																					
	Dup 01	6.7.09	X					X			✓	✓	✓	✓										
	RB 01	6.7.09		X				X		2 x Amber 2 x Vials 2 x metals 1 x [illegible]	~~✓~~		✓	✓					~~✓~~		~~✓~~	~~✓~~	~~✓~~	
6	Elutriate water																							

Environmental Division
Sydney
Work Order
ES0909939
Telephone : +61-2-8784 8555

CONTRACT WORK
WO: ES0909939
LAB:
DATE: 08/07/09
SPLIT: SYD Batch only (ES0909938)
TBT/TOC ES0909940
SPOCAS ES0909941

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

Comments: Elutriate Metals & PAHs (Dredging guideline LOR)

Lab Report No. | Esky ID

Relinquished by: Richard Cole Signed: Date: 8.7.09
Recieved by: Frank Signed: Date: 8/7/9 11am

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

Printed copies of this document are uncontrolled
Page 1 of 1

BMS-PM-DV-F046

Revision: Jun 08

Grain Size not required as per Richard Cole

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES0909939**		
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)
Site	: ----		
Sampler	: RC	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 08-JUL-2009	Issue Date	: 08-JUL-2009 15:21
Client Requested Due Date	: 22-JUL-2009	Scheduled Reporting Date	: **22-JUL-2009**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 0.8'C - Ice present
No. of coolers/boxes	: 3 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 analysis split from ES0909938, ES0909940 and ES0909941.**
- 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
ES0909939-001	08-JUL-2009 10:00	SG1	✓	✓	✓	✓
ES0909939-002	08-JUL-2009 10:00	SG2	✓	✓	✓	✓
ES0909939-003	08-JUL-2009 10:00	SG4	✓	✓	✓	✓
ES0909939-004	08-JUL-2009 10:00	SG5	✓	✓	✓	✓
ES0909939-005	08-JUL-2009 10:00	SG7	✓	✓	✓	✓
ES0909939-006	08-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
- 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

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES0909940**	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	: 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	: 08-JUL-2009
Sampler	: RC	Issue Date	: 17-JUL-2009
Site	: ----		
		No. of samples received	: 8
Quote number	: SY/330/09 V3	No. of samples analysed	: 8

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*
Matt Frost	Organic Instrument Chemist	Organics
Stephen Hislop	Senior Inorganic Chemist	Inorganics
Stephen Hislop	Senior Inorganic Chemist	Stafford Minerals - AY

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

- **TBT: Sample SG2 shows poor surrogate recovery due to matrix interference. Confirmed by re-extraction and re-analysis.**

Analytical Results

Sub-Matrix: SOIL			Client sample ID	SG1	SG2	SG3	SG4	SG5
			Client sampling date / time	06-JUL-2009 15:00	06-JUL-2009 15:00	06-JUL-2009 15:00	06-JUL-2009 15:00	06-JUL-2009 15:00
Compound	CAS Number	LOR	Unit	ES0909940-001	ES0909940-002	ES0909940-003	ES0909940-004	ES0909940-005
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	----	53.4	----	48.7	51.0
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	0.02	%	5.97	4.08	4.03	3.26	4.22
EP090: Organotin Compounds								
Tributyltin	56573-85-4	0.5	µgSn/kg	----	1.3	----	3.4	2.0
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	----	26.1	----	76.3	40.2

Analytical Results

Sub-Matrix: SOIL			Client sample ID	SG7	SG8	DUP01	----	----
			Client sampling date / time	06-JUL-2009 15:00	06-JUL-2009 15:00	06-JUL-2009 15:00	----	----
Compound	CAS Number	LOR	Unit	ES0909940-006	ES0909940-007	ES0909940-008	----	----
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	----	54.7	----	----	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	0.02	%	4.62	5.15	3.63	----	----
EP090: Organotin Compounds								
Tributyltin	56573-85-4	0.5	µgSn/kg	----	8.9	----	----	----
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	----	50.2	----	----	----

Surrogate Control Limits

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

QUALITY CONTROL REPORT

Work Order	: **ES0909940**	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	: S3017805 - Port Kembla Outer Harbour	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 08-JUL-2009
Sampler	: RC	Issue Date	: 17-JUL-2009
Order number	: ----		
		No. of samples received	: 8
Quote number	: SY/330/09 V3	No. of samples analysed	: 8

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*
Matt Frost	Organic Instrument Chemist	Organics
Stephen Hislop	Senior Inorganic Chemist	Inorganics
Stephen Hislop	Senior Inorganic Chemist	Stafford Minerals - AY

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 (%)*
EA055: Moisture Content (QC Lot: 1034783)									
ES0909940-002	SG2	EA055-103: Moisture Content (dried @ 103°C)	---	1.0	%	53.4	53.7	0.4	0% - 20%
EP005: Total Organic Carbon (TOC) (QC Lot: 1038074)									
ES0909940-001	SG1	EP005: Total Organic Carbon	---	0.02	%	5.97	6.21	3.9	0% - 20%
EP090: Organotin Compounds (QC Lot: 1036329)									
ES0909946-001	Anonymous	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	2.7	1.9	34.8	No Limit
ES0909946-008	Anonymous	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	<0.5	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
EP005: Total Organic Carbon (TOC) (QCLot: 1038074)								
EP005: Total Organic Carbon	----	0.02	%	<0.02	100 %	98.9	70	130
EP090: Organotin Compounds (QCLot: 1036329)								
EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	12.5 µgSn/kg	44.1	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: 1036329)							
ES0909940-004	SG4	EP090: Tributyltin	56573-85-4	12.5 µgSn/kg	36.2	20	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES0909940**	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	: S3017805 - Port Kembla Outer Harbour	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 08-JUL-2009
Sampler	: RC	Issue Date	: 17-JUL-2009
Order number	: ----		
		No. of samples received	: 8
Quote number	: SY/330/09 V3	No. of samples analysed	: 8

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								
SG2,	SG4,	**06-JUL-2009**	**----**	----	----	**09-JUL-2009**	13-JUL-2009	✓
SG5,	SG8							
EP005: Total Organic Carbon (TOC)								
Soil Glass Jar - Unpreserved								
SG1,	SG2,	**06-JUL-2009**	**13-JUL-2009**	03-AUG-2009	✓	**14-JUL-2009**	03-AUG-2009	✓
SG3,	SG4,							
SG5,	SG7,							
SG8,	DUP01							
EP090: Organotin Compounds								
Soil Glass Jar - Unpreserved								
SG2,	SG4,	**06-JUL-2009**	**13-JUL-2009**	20-JUL-2009	✓	**15-JUL-2009**	22-AUG-2009	✓
SG5,	SG8							

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	1	10	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Organotin Analysis	EP090	2	7	**28.6**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP005	1	8	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Organotin Analysis	EP090	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP005	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Organotin Analysis	EP090	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP005	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Organotin Analysis	EP090	1	7	**14.3**	**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

- **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.**

TBT / TOC only

1 of 1

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: Port Kembla
Tel:
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY330 09

Sampled By: Richard Cole
AECOM Project No: S3017805
Project Name: S3017805 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)	Metals M13 see quote	TOC	PAH (ultra trace)	BTEX (TPH (std LOR)	SPOCAS	Grain Size	Elutriate Metals	Elutriate PAH	Cyanide	TBT	Phenols	OCP	Total ABS	Other
1	SA1	6.7.09	X					X		5 x Soil jars	✓	✓	✓	✓			✓	✓						
2	SA2									7 x soil jars, 1 bag	✓	✓			✓		✓	✓	✓	✓				
3	SA3									4 jars, 1 bag	✓	✓	✓	✓		✓								
4	SA4									7 x soil jars	✓	✓					✓	✓	✓	✓				
5	SA5									7 x soil jars	✓	✓	✓	✓	✓		✓	✓	✓	✓				
	SA6									2 x soil jars	✓													
6	SA7									7 x soil jars	✓	✓					✓	✓						
7	SA8									3 x soil jars & bags	✓	✓	✓	✓	✓	✓			✓	✓				
	SA9										✓													
8	Dup 01	6.7.09	X					X			✓	✓	✓	✓										
	RB 01	6.7.09		X				X		2 x Amber 2 x Vials 2 x one bags	✓		✓	✓					✓		✓	✓	✓	

Environmental Division
Sydney
Work Order
ES0909940
Telephone : +61-2-8784 8555

CONTRACT WORK
WO: ES0909940
LAB: ALS Brisbane
DATE: 08/07/09
SPLIT: ALS SYD Btex only ES0909958
Elutriate: ES0909930
spocas: ES0909941

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

Comments: Elutriate Metals & PAHS (Dredging guideline LOR)

Relinquished by: Richard Cole Signed: Date: 8.7.09

Recieved by: Frank Signed: Date: 8/7/9 11am

Lab Report No. | Esky ID

Relinquished by: Signed: Date:

Recieved by: Signed: Date:

Printed copies of this document are uncontrolled

BMS-PM-DV-F046

Revision: Jun 08

Grain Size not required as per Richard Cole 8/7/09

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES0909940**		
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)
Site	: ----		
Sampler	: RC	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 08-JUL-2009	Issue Date	: 09-JUL-2009 13:40
Client Requested Due Date	: 17-JUL-2009	Scheduled Reporting Date	: **17-JUL-2009**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 0.8'C - Ice present
No. of coolers/boxes	: 3 HARD	No. of samples received	: 8
Sercurity Seal	: Not intact.	No. of samples analysed	: 8

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 ES0909938, ES0909939 and ES0909941.**
- 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
ES0909940-001	06-JUL-2009 15:00	SG1	✓		
ES0909940-002	06-JUL-2009 15:00	SG2	✓	✓	✓
ES0909940-003	06-JUL-2009 15:00	SG3	✓		
ES0909940-004	06-JUL-2009 15:00	SG4	✓	✓	✓
ES0909940-005	06-JUL-2009 15:00	SG5	✓	✓	✓
ES0909940-006	06-JUL-2009 15:00	SG7	✓		
ES0909940-007	06-JUL-2009 15:00	SG8	✓	✓	✓
ES0909940-008	06-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	: **ES0909941**	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	: 08-JUL-2009
Sampler	: RC	Issue Date	: 20-JUL-2009
Site	: ----		
		No. of samples received	: 3
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

- **Analysis conducted by ALS Brisbane, NATA Site No. 818.**
- **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	SG2	SG5	SG8	----	----
				Client sampling date / time	06-JUL-2009 15:00	06-JUL-2009 15:00	06-JUL-2009 15:00	----	----
Compound	CAS Number	LOR	Unit		ES0909941-001	ES0909941-002	ES0909941-003	----	----
EA029-A: pH Measurements									
pH KCl (23A)	----	0.1	pH Unit		8.7	8.7	8.5	----	----
pH OX (23B)	----	0.1	pH Unit		8.2	8.1	8.0	----	----
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		0.11	0.11	0.15	----	----
Peroxide Sulfur (23De)	----	0.02	% S		0.24	0.25	0.42	----	----
Peroxide Oxidisable Sulfur (23E)	----	0.02	% S		0.14	0.15	0.26	----	----
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t		85	91	164	----	----
EA029-D: Calcium Values									
KCl Extractable Calcium (23Vh)	----	0.02	% Ca		0.33	0.32	0.40	----	----
Peroxide Calcium (23Wh)	----	0.02	% Ca		5.58	3.50	2.22	----	----
Acid Reacted Calcium (23X)	----	0.02	% Ca		5.25	3.17	1.82	----	----
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t		2620	1580	906	----	----
sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S		4.20	2.54	1.45	----	----
EA029-E: Magnesium Values									
KCl Extractable Magnesium (23Sm)	----	0.02	% Mg		0.14	0.14	0.19	----	----
Peroxide Magnesium (23Tm)	----	0.02	% Mg		0.45	0.39	0.43	----	----
Acid Reacted Magnesium (23U)	----	0.02	% Mg		0.31	0.25	0.24	----	----
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t		256	206	199	----	----
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S		0.41	0.33	0.32	----	----
EA029-F: Excess Acid Neutralising Capacity									
Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3		16.4	9.12	5.17	----	----
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t		3280	1820	1030	----	----
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S		5.25	2.92	1.65	----	----
EA029-H: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-		1.5	1.5	1.5	----	----

Analytical Results

Sub-Matrix: SOIL			Client sample ID	SG2	SG5	SG8	----	----
			Client sampling date / time	06-JUL-2009 15:00	06-JUL-2009 15:00	06-JUL-2009 15:00	----	----
Compound	CAS Number	LOR	Unit	ES0909941-001	ES0909941-002	ES0909941-003	----	----
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	: **ES0909941**	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	: 08-JUL-2009
Sampler	: RC	Issue Date	: 20-JUL-2009
Order number	: ----		
		No. of samples received	: 3
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: 1039875)									
ES0909941-001	SG2	EA029: pH KCl (23A)	----	0.1	pH Unit	8.7	8.7	0.0	0% - 20%
		EA029: pH OX (23B)	----	0.1	pH Unit	8.2	8.2	0.0	0% - 20%
ES0909943-008	Anonymous	EA029: pH KCl (23A)	----	0.1	pH Unit	8.5	8.5	0.0	0% - 20%
		EA029: pH OX (23B)	----	0.1	pH Unit	8.0	8.0	0.0	0% - 20%
EA029-B: Acidity Trail (QC Lot: 1039875)									
ES0909941-001	SG2	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
ES0909943-008	Anonymous	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: 1039875)									
ES0909941-001	SG2	EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	0.11	0.11	0.0	No Limit
		EA029: Peroxide Sulfur (23De)	----	0.02	% S	0.24	0.26	6.9	0% - 50%
		EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	0.14	0.15	12.2	No Limit
		EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	85	96	12.2	No Limit
ES0909943-008	Anonymous	EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	0.14	0.13	0.0	No Limit
		EA029: Peroxide Sulfur (23De)	----	0.02	% S	0.45	0.46	0.0	0% - 20%
		EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	0.31	0.33	4.3	0% - 50%
		EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	195	203	4.3	0% - 20%
EA029-D: Calcium Values (QC Lot: 1039875)									
ES0909941-001	SG2	EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	0.33	0.34	0.0	0% - 50%
		EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	5.58	6.02	7.6	0% - 20%

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA029-D: Calcium Values (QC Lot: 1039875) - continued									
ES0909941-001	SG2	EA029: Acid Reacted Calcium (23X)	---	0.02	% Ca	5.25	5.68	8.0	0% - 20%
		EA029: sulfidic - Acid Reacted Calcium (s-23X)	---	0.02	% S	4.20	4.55	8.0	0% - 20%
		EA029: acidity - Acid Reacted Calcium (a-23X)	---	10	mole H+ / t	2620	2840	8.0	0% - 20%
ES0909943-008	Anonymous	EA029: KCl Extractable Calcium (23Vh)	---	0.02	% Ca	0.36	0.36	0.0	0% - 50%
		EA029: Peroxide Calcium (23Wh)	---	0.02	% Ca	1.80	1.78	1.5	0% - 20%
		EA029: Acid Reacted Calcium (23X)	---	0.02	% Ca	1.44	1.42	1.8	0% - 20%
		EA029: sulfidic - Acid Reacted Calcium (s-23X)	---	0.02	% S	1.15	1.13	1.8	0% - 20%
		EA029: acidity - Acid Reacted Calcium (a-23X)	---	10	mole H+ / t	719	706	1.8	0% - 20%
EA029-E: Magnesium Values (QC Lot: 1039875)									
ES0909941-001	SG2	EA029: KCl Extractable Magnesium (23Sm)	---	0.02	% Mg	0.14	0.14	0.0	No Limit
		EA029: Peroxide Magnesium (23Tm)	---	0.02	% Mg	0.45	0.47	3.9	0% - 20%
		EA029: Acid Reacted Magnesium (23U)	---	0.02	% Mg	0.31	0.32	4.2	0% - 50%
		EA029: sulfidic - Acid Reacted Magnesium (s-23U)	---	0.02	% S	0.41	0.43	4.2	0% - 20%
		EA029: Acidity - Acid Reacted Magnesium (a-23U)	---	10	mole H+ / t	256	267	4.2	0% - 20%
ES0909943-008	Anonymous	EA029: KCl Extractable Magnesium (23Sm)	---	0.02	% Mg	0.14	0.13	0.0	No Limit
		EA029: Peroxide Magnesium (23Tm)	---	0.02	% Mg	0.35	0.35	0.0	0% - 50%
		EA029: Acid Reacted Magnesium (23U)	---	0.02	% Mg	0.21	0.21	0.0	0% - 50%
		EA029: sulfidic - Acid Reacted Magnesium (s-23U)	---	0.02	% S	0.28	0.28	0.0	0% - 50%
		EA029: Acidity - Acid Reacted Magnesium (a-23U)	---	10	mole H+ / t	176	174	1.0	0% - 50%
EA029-F: Excess Acid Neutralising Capacity (QC Lot: 1039875)									
ES0909941-001	SG2	EA029: Excess Acid Neutralising Capacity (23Q)	---	0.02	% CaCO3	16.4	16.3	0.8	0% - 20%
		EA029: sulfidic - Excess Acid Neutralising Capacity (s-23Q)	---	0.02	% S	5.25	5.21	0.8	0% - 20%
		EA029: acidity - Excess Acid Neutralising Capacity (a-23Q)	---	10	mole H+ / t	3280	3250	0.8	0% - 20%
ES0909943-008	Anonymous	EA029: Excess Acid Neutralising Capacity (23Q)	---	0.02	% CaCO3	3.61	3.76	4.2	0% - 20%
		EA029: sulfidic - Excess Acid Neutralising Capacity (s-23Q)	---	0.02	% S	1.15	1.20	4.2	0% - 20%
		EA029: acidity - Excess Acid Neutralising Capacity (a-23Q)	---	10	mole H+ / t	721	752	4.2	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: 1039875)								
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: 1039875)								
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: 1039875)								
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: 1039875)								
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: 1039875)								
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	: **ES0909941**	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	: 08-JUL-2009
Sampler	: RC	Issue Date	: 20-JUL-2009
Order number	: ----		
		No. of samples received	: 3
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 SG2, SG5, SG8	**06-JUL-2009**	**08-JUL-2009**	06-JUL-2010	✓	**17-JUL-2009**	13-OCT-2009	✓
EA029-B: Acidity Trail							
Snap Lock Bag - frozen SG2, SG5, SG8	**06-JUL-2009**	**08-JUL-2009**	06-JUL-2010	✓	**17-JUL-2009**	13-OCT-2009	✓
EA029-C: Sulfur Trail							
Snap Lock Bag - frozen SG2, SG5, SG8	**06-JUL-2009**	**08-JUL-2009**	06-JUL-2010	✓	**17-JUL-2009**	13-OCT-2009	✓
EA029-D: Calcium Values							
Snap Lock Bag - frozen SG2, SG5, SG8	**06-JUL-2009**	**08-JUL-2009**	06-JUL-2010	✓	**17-JUL-2009**	13-OCT-2009	✓
EA029-E: Magnesium Values							
Snap Lock Bag - frozen SG2, SG5, SG8	**06-JUL-2009**	**08-JUL-2009**	06-JUL-2010	✓	**17-JUL-2009**	13-OCT-2009	✓
EA029-F: Excess Acid Neutralising Capacity							
Snap Lock Bag - frozen SG2, SG5, SG8	**06-JUL-2009**	**08-JUL-2009**	06-JUL-2010	✓	**17-JUL-2009**	13-OCT-2009	✓
EA029-G: Retained Acidity							
Snap Lock Bag - frozen SG2, SG5, SG8	**06-JUL-2009**	**08-JUL-2009**	06-JUL-2010	✓	**17-JUL-2009**	13-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							
SG2, SG5, SG8	**06-JUL-2009**	**08-JUL-2009**	06-JUL-2010	✓	**17-JUL-2009**	13-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	2	11	**18.2**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	11	**9.1**	**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.

1 of 1

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: Port Kembla
Tel:
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY330 09

Sampled By: Richard Cole
AECOM Project No: 53017805
Project Name: 53017805 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)	Metals M13 see quote	TOC	PAH (ultra trace)	BTEX (TPH std LOR)	SPOCAS	Grain size	Elutriate Metals	Elutriate PAH	Cyanide	TBT	Phenols	OCP	Total ACBC	Other
	SG1	6.7.09	✓							5 x soil jars	✓	✓	✓	✓			✓	✓						
1	SG2									7 x soil jars, 1 bag	✓	✓			✓		✓	✓	✓	✓				
	SG3									4 jars, 1 bag	✓	✓	✓	✓		✓								
	SG4									7 x soil jars	✓	✓					✓	✓	✓	✓				
2	SG5									7 x soil jars	✓	✓	✓	✓	✓		✓	✓	✓	✓				
	SG6									2 x soil jars	✓													
	SG7									7 x soil jars	✓	✓					✓	✓						
3	SG8									3 x soil jars & bags	✓	✓	✓	✓	✓	✓			✓	✓				
	~~SG8~~	~~~~	~~X~~						~~X~~		~~✓~~													
	Dup 01	6.7.09	X						X		✓	✓	✓	✓										
	RB 01	6.7.09		X					X	2 x Amber 2 x vials 2 x metals 1 x organics	✓		✓	✓					✓		✓	✓	✓	

Environmental Division
Sydney
Work Order
ES0909941
Telephone : +61-2-8784 8555

CONTRACT WORK
WO: ES0909941
LAB: ALS Brisbane
DATE: 08-07-09
SPLIT: ALS SYD BAFEH ONLY (ES0909938)
Elutriate: ES0909939
TOC/TBT: ES0909940

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

Comments: Elutriate Metals & PAHs (Dredging guideline LOR)

Relinquished by: Richard Cole Signed: Date: 8.7.09
Recieved by: Frank Signed: Date: 8/7/9 11am

Lab Report No. | Esky ID

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

Printed copies of this document are uncontrolled

BMS-PM-DV-F046

Revision: Jun 08

Grain size not required as per Richard Cole email

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES0909941**		
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)
Site	: ----		
Sampler	: RC	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 08-JUL-2009	Issue Date	: 09-JUL-2009 13:53
Client Requested Due Date	: 22-JUL-2009	Scheduled Reporting Date	: **22-JUL-2009**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 0.8'C
No. of coolers/boxes	: 3 HARD	No. of samples received	: 3
Sercurity Seal	: Not 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.**
- **Sample(s) have been received within recommended holding times.**
- **This batch is for SPOCAS split from ES0909938, ES0909939 and ES0909940.**
- 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 - EA029 SPOCAS
ES0909941-001	06-JUL-2009 15:00	SG2	✓
ES0909941-002	06-JUL-2009 15:00	SG5	✓
ES0909941-003	06-JUL-2009 15:00	SG8	✓

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	: **ES0909943**	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
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 08-JUL-2009
Sampler	: RC	Issue Date	: 21-JUL-2009
Site	: ----		
		No. of samples received	: 9
Quote number	: SY/330/09 V3	No. of samples analysed	: 8

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
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**

Compound	CAS Number	LOR	Unit	Client sample ID	PC1_0.0-0.3	PC2_0.3-0.85	PC4_0.0-0.33	PC7_0.0-0.2	PC32_0.0-0.23
				Client sampling date / time	07-JUL-2009 15:00	07-JUL-2009 15:00	07-JUL-2009 15:00	07-JUL-2009 15:00	07-JUL-2009 15:00
					ES0909943-001	ES0909943-002	ES0909943-003	ES0909943-004	ES0909943-005
EA029-A: pH Measurements									
pH KCl (23A)	----	0.1	pH Unit		8.6	8.1	8.2	8.7	8.5
pH OX (23B)	----	0.1	pH Unit		8.2	7.9	7.7	8.0	8.0
EA029-B: Acidity Trail									
Titratable Actual Acidity (23F)	----	2	mole H+ / t		<2	<2	<2	<2	<2
Titratable Peroxide Acidity (23G)	----	2	mole H+ / t		<2	<2	<2	<2	<2
Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t		<2	<2	<2	<2	<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	<0.02	<0.02
sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S		<0.02	<0.02	<0.02	<0.02	<0.02
EA029-C: Sulfur Trail									
KCl Extractable Sulfur (23Ce)	----	0.02	% S		0.17	0.37	0.30	0.12	0.22
Peroxide Sulfur (23De)	----	0.02	% S		0.47	1.24	1.25	0.32	0.69
Peroxide Oxidisable Sulfur (23E)	----	0.02	% S		0.30	0.87	0.95	0.20	0.47
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t		185	545	592	124	295
EA029-D: Calcium Values									
KCl Extractable Calcium (23Vh)	----	0.02	% Ca		0.41	0.67	0.58	0.34	0.44
Peroxide Calcium (23Wh)	----	0.02	% Ca		6.93	4.43	2.76	8.13	6.91
Acid Reacted Calcium (23X)	----	0.02	% Ca		6.52	3.75	2.17	7.79	6.47
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t		3250	1870	1080	3890	3230
sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S		5.21	3.00	1.74	6.23	5.18
EA029-E: Magnesium Values									
KCl Extractable Magnesium (23Sm)	----	0.02	% Mg		0.17	0.18	0.18	0.10	0.12
Peroxide Magnesium (23Tm)	----	0.02	% Mg		0.48	0.52	0.49	0.44	0.56
Acid Reacted Magnesium (23U)	----	0.02	% Mg		0.31	0.34	0.31	0.34	0.43
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t		254	280	258	280	357
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S		0.41	0.45	0.41	0.45	0.57
EA029-F: Excess Acid Neutralising Capacity									
Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3		17.2	8.82	4.73	21.4	17.8
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t		3440	1760	945	4270	3550
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S		5.51	2.82	1.51	6.84	5.69
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	PC1_0.0-0.3	PC2_0.3-0.85	PC4_0.0-0.33	PC7_0.0-0.2	PC32_0.0-0.23
			Client sampling date / time	07-JUL-2009 15:00	07-JUL-2009 15:00	07-JUL-2009 15:00	07-JUL-2009 15:00	07-JUL-2009 15:00
Compound	CAS Number	LOR	Unit	ES0909943-001	ES0909943-002	ES0909943-003	ES0909943-004	ES0909943-005
EA029-H: Acid Base Accounting - Continued								
Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	<0.02	<0.02	<0.02
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	<10	<10	<10
Liming Rate	----	1	kg CaCO3/t	<1	<1	<1	<1	<1

Analytical Results

Sub-Matrix: SOIL				Client sample ID	PC18_0.26-0.52	PC30_0.3-0.68	PC17_0.0-0.7	----	----
				Client sampling date / time	07-JUL-2009 15:00	07-JUL-2009 15:00	07-JUL-2009 15:00	----	----
Compound	CAS Number	LOR	Unit		ES0909943-006	ES0909943-007	ES0909943-008	----	----
EA029-A: pH Measurements									
pH KCl (23A)	----	0.1	pH Unit		8.2	8.3	8.5	----	----
pH OX (23B)	----	0.1	pH Unit		7.8	7.9	8.0	----	----
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		0.28	0.15	0.14	----	----
Peroxide Sulfur (23De)	----	0.02	% S		2.18	0.69	0.45	----	----
Peroxide Oxidisable Sulfur (23E)	----	0.02	% S		1.90	0.53	0.31	----	----
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t		1180	332	195	----	----
EA029-D: Calcium Values									
KCl Extractable Calcium (23Vh)	----	0.02	% Ca		0.55	0.40	0.36	----	----
Peroxide Calcium (23Wh)	----	0.02	% Ca		4.43	10.7	1.80	----	----
Acid Reacted Calcium (23X)	----	0.02	% Ca		3.88	10.3	1.44	----	----
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t		1940	5140	719	----	----
sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S		3.10	8.24	1.15	----	----
EA029-E: Magnesium Values									
KCl Extractable Magnesium (23Sm)	----	0.02	% Mg		0.14	0.11	0.14	----	----
Peroxide Magnesium (23Tm)	----	0.02	% Mg		0.48	0.65	0.35	----	----
Acid Reacted Magnesium (23U)	----	0.02	% Mg		0.35	0.54	0.21	----	----
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t		286	448	176	----	----
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S		0.46	0.72	0.28	----	----
EA029-F: Excess Acid Neutralising Capacity									
Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3		6.53	26.6	3.61	----	----
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t		1300	5320	721	----	----
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S		2.09	8.52	1.15	----	----
EA029-H: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-		1.5	1.5	1.5	----	----

Analytical Results

Sub-Matrix: SOIL			Client sample ID	PC18_0.26-0.52	PC30_0.3-0.68	PC17_0.0-0.7	----	----
			Client sampling date / time	07-JUL-2009 15:00	07-JUL-2009 15:00	07-JUL-2009 15:00	----	----
Compound	CAS Number	LOR	Unit	ES0909943-006	ES0909943-007	ES0909943-008	----	----
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	: **ES0909943**	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	: 08-JUL-2009
Sampler	: RC	Issue Date	: 21-JUL-2009
Order number	: ----		
		No. of samples received	: 9
Quote number	: SY/330/09 V3	No. of samples analysed	: 8

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
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: 1039875)									
ES0909941-001	Anonymous	EA029: pH KCl (23A)	----	0.1	pH Unit	8.7	8.7	0.0	0% - 20%
		EA029: pH OX (23B)	----	0.1	pH Unit	8.2	8.2	0.0	0% - 20%
ES0909943-008	PC17_0.0-0.7	EA029: pH KCl (23A)	----	0.1	pH Unit	8.5	8.5	0.0	0% - 20%
		EA029: pH OX (23B)	----	0.1	pH Unit	8.0	8.0	0.0	0% - 20%
EA029-B: Acidity Trail (QC Lot: 1039875)									
ES0909941-001	Anonymous	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
ES0909943-008	PC17_0.0-0.7	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: 1039875)									
ES0909941-001	Anonymous	EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	0.11	0.11	0.0	No Limit
		EA029: Peroxide Sulfur (23De)	----	0.02	% S	0.24	0.26	6.9	0% - 50%
		EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	0.14	0.15	12.2	No Limit
		EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	85	96	12.2	No Limit
ES0909943-008	PC17_0.0-0.7	EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	0.14	0.13	0.0	No Limit
		EA029: Peroxide Sulfur (23De)	----	0.02	% S	0.45	0.46	0.0	0% - 20%
		EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	0.31	0.33	4.3	0% - 50%
		EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	195	203	4.3	0% - 20%
EA029-D: Calcium Values (QC Lot: 1039875)									
ES0909941-001	Anonymous	EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	0.33	0.34	0.0	0% - 50%
		EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	5.58	6.02	7.6	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 (%)*
EA029-D: Calcium Values (QC Lot: 1039875) - continued									
ES0909941-001	Anonymous	EA029: Acid Reacted Calcium (23X)	---	0.02	% Ca	5.25	5.68	8.0	0% - 20%
		EA029: sulfidic - Acid Reacted Calcium (s-23X)	---	0.02	% S	4.20	4.55	8.0	0% - 20%
		EA029: acidity - Acid Reacted Calcium (a-23X)	---	10	mole H+ / t	2620	2840	8.0	0% - 20%
ES0909943-008	PC17_0.0-0.7	EA029: KCl Extractable Calcium (23Vh)	---	0.02	% Ca	0.36	0.36	0.0	0% - 50%
		EA029: Peroxide Calcium (23Wh)	---	0.02	% Ca	1.80	1.78	1.5	0% - 20%
		EA029: Acid Reacted Calcium (23X)	---	0.02	% Ca	1.44	1.42	1.8	0% - 20%
		EA029: sulfidic - Acid Reacted Calcium (s-23X)	---	0.02	% S	1.15	1.13	1.8	0% - 20%
		EA029: acidity - Acid Reacted Calcium (a-23X)	---	10	mole H+ / t	719	706	1.8	0% - 20%
EA029-E: Magnesium Values (QC Lot: 1039875)									
ES0909941-001	Anonymous	EA029: KCl Extractable Magnesium (23Sm)	---	0.02	% Mg	0.14	0.14	0.0	No Limit
		EA029: Peroxide Magnesium (23Tm)	---	0.02	% Mg	0.45	0.47	3.9	0% - 20%
		EA029: Acid Reacted Magnesium (23U)	---	0.02	% Mg	0.31	0.32	4.2	0% - 50%
		EA029: sulfidic - Acid Reacted Magnesium (s-23U)	---	0.02	% S	0.41	0.43	4.2	0% - 20%
		EA029: Acidity - Acid Reacted Magnesium (a-23U)	---	10	mole H+ / t	256	267	4.2	0% - 20%
ES0909943-008	PC17_0.0-0.7	EA029: KCl Extractable Magnesium (23Sm)	---	0.02	% Mg	0.14	0.13	0.0	No Limit
		EA029: Peroxide Magnesium (23Tm)	---	0.02	% Mg	0.35	0.35	0.0	0% - 50%
		EA029: Acid Reacted Magnesium (23U)	---	0.02	% Mg	0.21	0.21	0.0	0% - 50%
		EA029: sulfidic - Acid Reacted Magnesium (s-23U)	---	0.02	% S	0.28	0.28	0.0	0% - 50%
		EA029: Acidity - Acid Reacted Magnesium (a-23U)	---	10	mole H+ / t	176	174	1.0	0% - 50%
EA029-F: Excess Acid Neutralising Capacity (QC Lot: 1039875)									
ES0909941-001	Anonymous	EA029: Excess Acid Neutralising Capacity (23Q)	---	0.02	% CaCO3	16.4	16.3	0.8	0% - 20%
		EA029: sulfidic - Excess Acid Neutralising Capacity (s-23Q)	---	0.02	% S	5.25	5.21	0.8	0% - 20%
		EA029: acidity - Excess Acid Neutralising Capacity (a-23Q)	---	10	mole H+ / t	3280	3250	0.8	0% - 20%
ES0909943-008	PC17_0.0-0.7	EA029: Excess Acid Neutralising Capacity (23Q)	---	0.02	% CaCO3	3.61	3.76	4.2	0% - 20%
		EA029: sulfidic - Excess Acid Neutralising Capacity (s-23Q)	---	0.02	% S	1.15	1.20	4.2	0% - 20%
		EA029: acidity - Excess Acid Neutralising Capacity (a-23Q)	---	10	mole H+ / t	721	752	4.2	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: 1039875)								
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: 1039875)								
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: 1039875)								
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: 1039875)								
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: 1039875)								
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.**

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES0909943**	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	: 08-JUL-2009
Sampler	: RC	Issue Date	: 21-JUL-2009
Order number	: ----		
		No. of samples received	: 9
Quote number	: SY/330/09 V3	No. of samples analysed	: 8

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								
PC1_0.0-0.3,	PC2_0.3-0.85,	**07-JUL-2009**	**08-JUL-2009**	07-JUL-2010	✓	**17-JUL-2009**	13-OCT-2009	✓
PC4_0.0-0.33,	PC7_0.0-0.2,							
PC32_0.0-0.23,	PC18_0.26-0.52,							
PC30_0.3-0.68,	PC17_0.0-0.7							
EA029-B: Acidity Trail								
Snap Lock Bag - frozen								
PC1_0.0-0.3,	PC2_0.3-0.85,	**07-JUL-2009**	**08-JUL-2009**	07-JUL-2010	✓	**17-JUL-2009**	13-OCT-2009	✓
PC4_0.0-0.33,	PC7_0.0-0.2,							
PC32_0.0-0.23,	PC18_0.26-0.52,							
PC30_0.3-0.68,	PC17_0.0-0.7							
EA029-C: Sulfur Trail								
Snap Lock Bag - frozen								
PC1_0.0-0.3,	PC2_0.3-0.85,	**07-JUL-2009**	**08-JUL-2009**	07-JUL-2010	✓	**17-JUL-2009**	13-OCT-2009	✓
PC4_0.0-0.33,	PC7_0.0-0.2,							
PC32_0.0-0.23,	PC18_0.26-0.52,							
PC30_0.3-0.68,	PC17_0.0-0.7							
EA029-D: Calcium Values								
Snap Lock Bag - frozen								
PC1_0.0-0.3,	PC2_0.3-0.85,	**07-JUL-2009**	**08-JUL-2009**	07-JUL-2010	✓	**17-JUL-2009**	13-OCT-2009	✓
PC4_0.0-0.33,	PC7_0.0-0.2,							
PC32_0.0-0.23,	PC18_0.26-0.52,							
PC30_0.3-0.68,	PC17_0.0-0.7							
EA029-E: Magnesium Values								
Snap Lock Bag - frozen								
PC1_0.0-0.3,	PC2_0.3-0.85,	**07-JUL-2009**	**08-JUL-2009**	07-JUL-2010	✓	**17-JUL-2009**	13-OCT-2009	✓
PC4_0.0-0.33,	PC7_0.0-0.2,							
PC32_0.0-0.23,	PC18_0.26-0.52,							
PC30_0.3-0.68,	PC17_0.0-0.7							

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-F: Excess Acid Neutralising Capacity								
Snap Lock Bag - frozen								
PC1_0.0-0.3,	PC2_0.3-0.85,	**07-JUL-2009**	**08-JUL-2009**	07-JUL-2010	✓	**17-JUL-2009**	13-OCT-2009	✓
PC4_0.0-0.33,	PC7_0.0-0.2,							
PC32_0.0-0.23,	PC18_0.26-0.52,							
PC30_0.3-0.68,	PC17_0.0-0.7							
EA029-G: Retained Acidity								
Snap Lock Bag - frozen								
PC1_0.0-0.3,	PC2_0.3-0.85,	**07-JUL-2009**	**08-JUL-2009**	07-JUL-2010	✓	**17-JUL-2009**	13-OCT-2009	✓
PC4_0.0-0.33,	PC7_0.0-0.2,							
PC32_0.0-0.23,	PC18_0.26-0.52,							
PC30_0.3-0.68,	PC17_0.0-0.7							
EA029-H: Acid Base Accounting								
Snap Lock Bag - frozen								
PC1_0.0-0.3,	PC2_0.3-0.85,	**07-JUL-2009**	**08-JUL-2009**	07-JUL-2010	✓	**17-JUL-2009**	13-OCT-2009	✓
PC4_0.0-0.33,	PC7_0.0-0.2,							
PC32_0.0-0.23,	PC18_0.26-0.52,							
PC30_0.3-0.68,	PC17_0.0-0.7							

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	2	11	**18.2**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	11	**9.1**	**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.**

SPOCAS only

1 of 2

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: ~~SY0~~ 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.donnelli@aecom.com	

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	Metals M13 (see QVD)	TPC	PAH (ultra trace)	BTEX TPH	SPOCAS	Grain Size	Elutriate Metals	Elutriate PAH	Cyanide	VTRT	Phenols	OCP	Total PCB	Other
1	PC1_0.0-0.3	7.7.09	X					X		4x soil jars 1 bags	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	
	PC1_0.3-0.6		X					X		2x soil jars	✓								✓					
	PC2_0.0-0.3									2x soil jars	✓									✓				
2	PC2_0.3-0.85									4x soil jars 1 bags	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	
	PC3_0.0-0.3									2x soil jars	✓	✓	✓	✓						✓				
	PC3_0.3-0.75									1x soil jars	✓													
3	PC4_0.0-0.33									4x soil jars 1 bag	✓	✓			✓	✓	✓	✓		✓				
	PC6_0.0-0.27									2x soil jars	✓	✓			✓					✓				
4	PC7_0.0-0.2									4x soil jars 2 bags	✓	✓	✓	✓	✓	✓	✓	✓		✓				
	QAQC04 Dup05									1x soil jars	✓									✓	✓	✓	✓	
	E1		X					X		1 x soil jar	QA	QC	Jar	for	Elutriate	for	PC2	0.3	-0.6					
	Dup07	↓	X					X		130,1 Jar	✓													

Environmental Division
Sydney
Work Order
ES0909943
Telephone : +61-2-8784 8555

CONTRACT WORK
WO: ES0909943
LAB: ALS Brisbane
DATE: 08/07/09
SPLIT: ALS SYD BATCH ONLY ES0909456
Eluviate: ES0909450
ES0909446

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

Comments: E1 = QA/QC for PC30_0.3-0.6 Elutriates!!

Relinquished by: Richard Cole Signed: Date: 8.7.09
Recieved by: Frank Signed: Date: 8/7/9 11am

Lab Report No. | Esky ID

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

Printed copies of this document are uncontrolled

BMS-PM-DV-F046

Revision: Jun 08

Grain size not required as per Richard Cole 8/7/09

Chain of Custody

1 of 2

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 Hbr
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.donnett@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)	Metals M12 (see note)	TOC	PAH (ultra trace)	BTEX /TPH	SPOCAS	Grain Size	Fluoride Metals	Fluoride PAH	Cyanide	TRT	Phenols	OCP	Tot ACR	Other
	PC21 - 0.0 - 0.35	7.7.09	X					X		4x soil jars 1 bag	✓	✓	✓	✓						✓	✓	✓	✓	
5	PC32 - 0.0 - 0.23		X					X		4x soil jar 1x bags	✓	✓			✓	✓	✓	✓		✓				
	PC31 - 0.0 - 0.26		X					X		2x soil jars	✓	✓	✓	✓						✓	✓	✓	✓	
	PC31 - 0.26 - 0.52		X					X		1x soil jars	✓													
	PC18 - 0.0 - 0.26		X					X		1 x soil jar	✓									✓				
6	PC18 - 0.26 - 0.52		X					X		4x soil jars 1x bags	✓	✓	✓	✓	✓	✓	✓	✓						
	PC30 - 0.0 - 0.3		X					X		2x soil jars	✓									✓				
7 *	PC30 - 0.3 - 0.68		X					X		5x soil jars 1x bags	✓	✓	✓	✓	✓	✓	✓	✓	✓					* Extra volume supplied for lab dup / MS on elutriate PAH
8	PC17 - 0.0 - 0.7		X					X		4x soil jars 1x bags	✓	✓	✓	✓	✓	✓	✓	✓		✓				
	PC17 - 0.7 - 1.0		X					X		1 x soil jar	✓													
	RB02	↓								2V, 2A			✓	✓										

* 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: 8.7.09
Recieved by: Frank Signed: Date: 8/7/09 11am

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

Printed copies of this document are uncontrolled

Grain size not required as per Richard Cole

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES0909943**		
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)
Site	: ----		
Sampler	: RC	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 08-JUL-2009	Issue Date	: 09-JUL-2009 13:58
Client Requested Due Date	: 22-JUL-2009	Scheduled Reporting Date	: **22-JUL-2009**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 0.8'C - Ice present
No. of coolers/boxes	: 3 HARD	No. of samples received	: 9
Sercurity Seal	: Not intact.	No. of samples analysed	: 8

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 ES0909943 FOR SPOCAS ONLY AND SPLIT INTO ES0909954 (ALS SYD BATCH ONLY), ES0909950 (ELUTRIATE) & ES0909946 (TOC/TBT)**
- 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
ES0909943-001	07-JUL-2009 15:00	PC1_0.0-0.3		✓
ES0909943-002	07-JUL-2009 15:00	PC2_0.3-0.85		✓
ES0909943-003	07-JUL-2009 15:00	PC4_0.0-0.33		✓
ES0909943-004	07-JUL-2009 15:00	PC7_0.0-0.2		✓
ES0909943-005	07-JUL-2009 15:00	PC32_0.0-0.23		✓
ES0909943-006	07-JUL-2009 15:00	PC18_0.26-0.52		✓
ES0909943-007	07-JUL-2009 15:00	PC30_0.3-0.68		✓
ES0909943-008	07-JUL-2009 15:00	PC17_0.0-0.7		✓
ES0909943-009	07-JUL-2009 15:00	PC21_0.0-0.35	✓	

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	: **ES0909944**	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	: 08-JUL-2009
Sampler	: RC	Issue Date	: 16-JUL-2009
Site	: ----		
		No. of samples received	: 1
Quote number	: SY/330/09 V3	No. of samples analysed	: 1

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				Client sample ID	PC33_0.3-0.5	----	----	----	----
				Client sampling date / time	06-JUL-2009 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES0909944-001	----	----	----	----
EA029-A: pH Measurements									
pH KCl (23A)	----	0.1	pH Unit	**8.3**	----	----	----	----
pH OX (23B)	----	0.1	pH Unit	**7.9**	----	----	----	----
EA029-B: Acidity Trail									
Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	----	----	----	----
Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	----	----	----	----
Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	----	----	----	----
sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	----	----	----	----
sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	<0.02	----	----	----	----
sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.02	----	----	----	----
EA029-C: Sulfur Trail									
KCl Extractable Sulfur (23Ce)	----	0.02	% S	**0.24**	----	----	----	----
Peroxide Sulfur (23De)	----	0.02	% S	**0.93**	----	----	----	----
Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	**0.68**	----	----	----	----
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	**426**	----	----	----	----
EA029-D: Calcium Values									
KCl Extractable Calcium (23Vh)	----	0.02	% Ca	**0.45**	----	----	----	----
Peroxide Calcium (23Wh)	----	0.02	% Ca	**2.30**	----	----	----	----
Acid Reacted Calcium (23X)	----	0.02	% Ca	**1.85**	----	----	----	----
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	**922**	----	----	----	----
sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	**1.48**	----	----	----	----
EA029-E: Magnesium Values									
KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	**0.18**	----	----	----	----
Peroxide Magnesium (23Tm)	----	0.02	% Mg	**0.47**	----	----	----	----
Acid Reacted Magnesium (23U)	----	0.02	% Mg	**0.29**	----	----	----	----
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	**239**	----	----	----	----
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	**0.38**	----	----	----	----
EA029-F: Excess Acid Neutralising Capacity									
Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3	**4.26**	----	----	----	----
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	**852**	----	----	----	----
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S	**1.36**	----	----	----	----
EA029-H: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-	**1.5**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL				Client sample ID	PC33_0.3-0.5	----	----	----	----
				Client sampling date / time	06-JUL-2009 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES0909944-001	----	----	----	----
EA029-H: Acid Base Accounting - Continued									
Net Acidity (sulfur units)	----	0.02	% S		<0.02	----	----	----	----
Net Acidity (acidity units)	----	10	mole H+ / t		<10	----	----	----	----
Liming Rate	----	1	kg CaCO3/t		<1	----	----	----	----

QUALITY CONTROL REPORT

Work Order	: **ES0909944**	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	: S3017805 Port Kembla Outer Harbour	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 08-JUL-2009
Sampler	: RC	Issue Date	: 16-JUL-2009
Order number	: ----		
		No. of samples received	: 1
Quote number	: SY/330/09 V3	No. of samples analysed	: 1

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: 1038035)									
EM0906249-015	Anonymous	EA029: pH KCl (23A)	----	0.1	pH Unit	5.0	5.0	0.0	0% - 20%
		EA029: pH OX (23B)	----	0.1	pH Unit	2.6	2.6	0.0	0% - 20%
EA029-B: Acidity Trail (QC Lot: 1038035)									
EM0906249-015	Anonymous	EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	0.05	0.04	0.0	No Limit
		EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	0.64	0.64	0.0	0% - 20%
		EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	0.59	0.60	0.0	0% - 20%
		EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	30	27	11.7	0% - 50%
		EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	400	399	0.0	0% - 20%
		EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	369	372	0.7	0% - 20%
EA029-C: Sulfur Trail (QC Lot: 1038035)									
EM0906249-015	Anonymous	EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	0.61	0.66	9.2	0% - 20%
		EA029: Peroxide Sulfur (23De)	----	0.02	% S	1.23	1.28	4.1	0% - 20%
		EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	0.63	0.62	0.0	0% - 20%
		EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	390	386	1.0	0% - 20%
EA029-D: Calcium Values (QC Lot: 1038035)									
EM0906249-015	Anonymous	EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	0.89	0.97	8.7	0% - 20%
		EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	0.99	0.94	5.2	0% - 20%
		EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	0.10	<0.02	133	No Limit
		EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	0.08	<0.02	119	No Limit
		EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	49	<10	133	No Limit
EA029-E: Magnesium Values (QC Lot: 1038035)									
EM0906249-015	Anonymous	EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	0.08	0.08	0.0	No Limit
		EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	0.09	0.09	0.0	No Limit
		EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	<0.02	<0.02	0.0	No Limit
		EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	<0.02	<0.02	0.0	No Limit
		EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	10	<10	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
EA029-B: Acidity Trail (QCLot: 1038035)								
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: 1038035)								
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: 1038035)								
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: 1038035)								
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: 1038035)								
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.**

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES0909944**	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	: S3017805 Port Kembla Outer Harbour	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 08-JUL-2009
Sampler	: RC	Issue Date	: 16-JUL-2009
Order number	: ----		
		No. of samples received	: 1
Quote number	: SY/330/09 V3	No. of samples analysed	: 1

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							
PC33_0.3-0.5	**06-JUL-2009**	**08-JUL-2009**	06-JUL-2010	✓	**14-JUL-2009**	11-OCT-2009	✓
EA029-B: Acidity Trail							
Snap Lock Bag - frozen							
PC33_0.3-0.5	**06-JUL-2009**	**08-JUL-2009**	06-JUL-2010	✓	**14-JUL-2009**	11-OCT-2009	✓
EA029-C: Sulfur Trail							
Snap Lock Bag - frozen							
PC33_0.3-0.5	**06-JUL-2009**	**08-JUL-2009**	06-JUL-2010	✓	**14-JUL-2009**	11-OCT-2009	✓
EA029-D: Calcium Values							
Snap Lock Bag - frozen							
PC33_0.3-0.5	**06-JUL-2009**	**08-JUL-2009**	06-JUL-2010	✓	**14-JUL-2009**	11-OCT-2009	✓
EA029-E: Magnesium Values							
Snap Lock Bag - frozen							
PC33_0.3-0.5	**06-JUL-2009**	**08-JUL-2009**	06-JUL-2010	✓	**14-JUL-2009**	11-OCT-2009	✓
EA029-F: Excess Acid Neutralising Capacity							
Snap Lock Bag - frozen							
PC33_0.3-0.5	**06-JUL-2009**	**08-JUL-2009**	06-JUL-2010	✓	**14-JUL-2009**	11-OCT-2009	✓
EA029-G: Retained Acidity							
Snap Lock Bag - frozen							
PC33_0.3-0.5	**06-JUL-2009**	**08-JUL-2009**	06-JUL-2010	✓	**14-JUL-2009**	11-OCT-2009	✓
EA029-H: Acid Base Accounting							
Snap Lock Bag - frozen							
PC33_0.3-0.5	**06-JUL-2009**	**08-JUL-2009**	06-JUL-2010	✓	**14-JUL-2009**	11-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	4	**25.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	4	**25.0**	**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

1 of 1

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:

Sampled By: Richard Cole
AECOM Project No: 53017805

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

Project Name: Port Kembla Outer Mbr 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)	Metals M13 (see Quote for metals)	TOC	PAH (ultra trace)	BTEX / TPH	SPOCAS	Grain Size	Eluviate Metals	Eluviate PAH	Cyanide	TBT	Phenols	OCP	Total PCBs	Other
	PC22_0.0-0.2	6.7.09	X					X			✓									✓	✓	✓	✓	
	PC22_0.3-0.5	↓	X					X			✓	✓	✓	✓					✓					
	PC33_0.0-0.2		X					X		2x soil jars	✓	✓	✓	✓						✓	✓	✓	✓	
1	PC33_0.3-0.5		X					X		4x soil jar & bags	✓	✓			✓	✓	✓	✓						
	DUP04	↓	X					X		4 x soil jars	✓									✓	✓	✓	✓	

Environmental Division
Sydney
Work Order
ES0909944
Telephone : +61-2-8784 8555

CONTRACT WORK
WO: ES0909944
LAB: ALS Brisbane
DATE: 08/07/09
SPLIT: ALS SYD ~~EST~~ Eluviate ONLY
(ES0909955)

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

Relinquished by: Richard Cole Signed: Date: 7/7/09 11am
Recieved by: Frank Signed: Date:

Lab Report No. Desktop ES0909944
Eluviate ES0909947
TBT/Tod ES0909955

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

Printed copies of this document are uncontrolled
Page 1 of 1

Grain size not required as per Richard Cole 8/7/09

BMS-PM-DV-F046 Revision: Jun 08

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES0909944**		
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)
Site	: ----		
Sampler	: RC	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 08-JUL-2009	Issue Date	: 09-JUL-2009 14:01
Client Requested Due Date	: 22-JUL-2009	Scheduled Reporting Date	: **22-JUL-2009**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 0.8'C - Ice present
No. of coolers/boxes	: 3 HARD	No. of samples received	: 1
Sercurity Seal	: Not intact.	No. of samples analysed	: 1

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 ES0909944 FOR SPOCAS ONLY AND SPLIT INTO ES0909955 (ALS SYD BATCH ONLY), ES0909947 (ELUTRIATE) & ES0909952 (TOC/TBT)**
- 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 - EA029 SPOCAS
ES0909944-001	06-JUL-2009 15:00	PC33_0.3-0.5	✓

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
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- EDI Format - ESDAT (ESDAT)	Email	sydney@aecom.com
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- EDI Format - XTab (XTAB)	Email	sydney@aecom.com