

Attachment C14(g)

**Proponent Phase I and Phase II
Environmental Site Assessment (7/8)**



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(were) 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: **x** = Quality Control frequency not within specification ; **✓** = Quality Control frequency within specification.

Quality Control Sample Type		Method	Count		Rate (%)		Evaluation	Quality Control Specification
Analytical Methods			QC	Regular	Actual	Expected		
Laboratory Duplicates (DUP)								
Moisture Content		EA055	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)		EP075(SIM)	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS		EP068	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)		EP066	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS		EG035T	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES		EG005T	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction		EP071	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX		EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)								
PAH/Phenols (SIM)		EP075(SIM)	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS		EP068	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)		EP066	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS		EG035T	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES		EG005T	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction		EP071	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX		EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)								
PAH/Phenols (SIM)		EP075(SIM)	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS		EP068	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)		EP066	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS		EG035T	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES		EG005T	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction		EP071	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX		EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)								
PAH/Phenols (SIM)		EP075(SIM)	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS		EP068	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)		EP066	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS		EG035T	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES		EG005T	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction		EP071	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX		EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

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

Quality Control Sample Type		Method		Count		Rate (%)		Quality Control Specification	
Analytical Methods				QC	Regular	Actual	Expected	Evaluation	



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		QC	Regular		Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)								
TRH Volatiles/BTEX	EP080	2	20		10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)								
TRH Volatiles/BTEX	EP080	1	20		5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)								
TRH Volatiles/BTEX	EP080	1	20		5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)								
TRH Volatiles/BTEX	EP080	1	20		5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



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	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 6.1 and Table 1 (14 day holding time).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Asbestos Classification and Quantitation per NEPM 2013	* EA200N	SOIL	Analysis by Polarised Light Microscopy including dispersion staining Asbestos Classification and Quantitation per NEPM 2013 with Confirmation of Identification by AS 4964 - 2004 Gravimetric determination of Asbestos Containing Material, Fibrous Asbestos, Asbestos Fines and sample weight and calculation of percentage concentrations per NEPM protocols. Asbestos (Fines and Fibrous FA+AF) is reported as the equivalent weight in the sample received after accounting for sub-sampling (where applicable for the <7mm and/or <2mm fractions).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. 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 (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂) (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 SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504.505)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to 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. Compliant with NEPM amended 2013.
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to 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. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)



Preparation Methods		Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges		EN69	SOIL	In house: Referenced to USEPA 200.2. 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 (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap		ORG16	SOIL	In house: Referenced to 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		ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Volatiles Water Preparation		ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES2002766

Client : AECOM Australia Pty Ltd Contact : MR ALEX LATHAM Address : LEVEL 21, 420 GEORGE STREET SYDNEY NSW, AUSTRALIA 2000 E-mail : alex.latham@aecom.com Telephone : +61 02 8934 0000 Facsimile : +61 02 8934 0001 Project : 60623599_1.1 Order number : 60623599_1.1 C-O-C number : ---- Site : ---- Sampler : Kurtis Wathen, Rebekah Panozzo	Laboratory : Environmental Division Sydney Contact : Brenda Hong Address : 277-289 Woodpark Road Smithfield NSW Australia 2164 E-mail : Brenda.Hong@ALSGlobal.com Telephone : +61 2 8784 8555 Facsimile : +61-2-8784 8500 Page : 1 of 3 Quote number : EB2017AECOMAU0014 (EN/004/16) QC Level : NEPM 2013 B3 & ALS QC Standard
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Dates

Date Samples Received : 29-Jan-2020 15:45	Issue Date : 31-Jan-2020
Client Requested Due Date : 06-Feb-2020	Scheduled Reporting Date : 06-Feb-2020

Delivery Details

Mode of Delivery : Carrier	Security Seal : Not intact.
No. of coolers/boxes : 2	Temperature : 6.3' C - Ice present
Receipt Detail :	No. of samples received / analysed : 19 / 8

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- This is an updated SRN which indicates samples 19 and 21-28 being transferred from this work order to work order ES2003147.
- **Samples 19 and 21-28 have been transferred to work order ES2003147, as per Alex Latham.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

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

☐ **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary 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.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EA200N Asbestos in Soils - (<1 kg samples ONLY)	SOIL - S-16 TRH/BTEXN/PAH/OC/OP/PCB/8Metals	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES2002766-001	28-Jan-2020 00:00	BH109_0.3-0.4		☐	☐		☐
ES2002766-002	28-Jan-2020 00:00	BH109_0.6-0.7	☐				
ES2002766-003	28-Jan-2020 00:00	BH109_0.9-1.0		☐			☐
ES2002766-004	28-Jan-2020 00:00	BH109_1.5-1.6	☐				
ES2002766-005	28-Jan-2020 00:00	BH109_2.7-2.8	☐				
ES2002766-006	28-Jan-2020 00:00	BH109_4.5-4.6	☐				
ES2002766-007	28-Jan-2020 00:00	BH109_6.1-6.2	☐				
ES2002766-009	28-Jan-2020 00:00	BH107_0.2-0.3	☐				
ES2002766-010	28-Jan-2020 00:00	BH107_0.4-0.5			☐		
ES2002766-011	28-Jan-2020 00:00	BH107_0.5-0.6		☐			☐
ES2002766-012	28-Jan-2020 00:00	BH107_0.8-1.0	☐				
ES2002766-013	28-Jan-2020 00:00	BH107_1.5-1.7		☐			☐
ES2002766-014	29-Jan-2020 00:00	BH107_3.9-4.0	☐				
ES2002766-015	29-Jan-2020 00:00	BH107_4.8-5.0	☐				
ES2002766-016	29-Jan-2020 00:00	BH113_0.2-0.3		☐	☐	☐	
ES2002766-017	29-Jan-2020 00:00	BH113_0.4-0.5	☐				
ES2002766-018	29-Jan-2020 00:00	BH113_0.6-0.7		☐	☐		☐
ES2002766-020	29-Jan-2020 00:00	BH113_1.3-1.38	☐				

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - W-18 TRH(C6 - C9)/BTEXN
ES2002766-008	28-Jan-2020 00:00	QC300 TB	☐



Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	AP_CustomerService.ANZ@aecom.com
- Chain of Custody (CoC) (COC)	Email	AP_CustomerService.ANZ@aecom.com

ALEX LATHAM

- *AU Certificate of Analysis - NATA (COA)	Email	alex.latham@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	alex.latham@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	alex.latham@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	alex.latham@aecom.com
- Chain of Custody (CoC) (COC)	Email	alex.latham@aecom.com
- Chromatogram (CHROM)	Email	alex.latham@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	alex.latham@aecom.com
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)	Email	alex.latham@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	alex.latham@aecom.com
- EDI Format - XTab (XTAB)	Email	alex.latham@aecom.com
- Electronic SRN for EQUIS (ESRN_EQUIS)	Email	alex.latham@aecom.com

30/1/20 13:40
UPDATED COC

60623599 Burrows IE 1 of 2

CHAIN OF CUSTODY									
AECOM Australia Pty Ltd									
Sydney (420 George St)					Tel: 8784 8515				
T: 02 8934 0451					Fax:				
M: 0400 973 821					Preliminary Report by:				
AECOM Project Manager: Alex Latham					Final Report by:				
AECOM Project Manager Email: Alex.Latham@aecom.com					Lab Quote No: EN/004/16				
Sampled By: Kurtis Watten / Rebekah Panozzo					Project Name: Burrows IE				
AECOM Project No: 60623599_1.1					PO No. refer Project #				
Specifications: All reports to be emailed to AECOM Project Manager									
ESDAT & Equis & XLS format also required									
1. Urgent TAT required? (please circle: 24hr 48hr 5 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 NIEPM 5.1.1?									
5. Special storage requirements? (details:)									
Lab. ID	Sample ID	Sampling Date	Matrix		Preservation			Container (No. & type)	Analysis Request
			soil	water	other	filtered	acid	ice	
1	BH109-0.3-0.4	28/1/20	X					X	TRH > C10-C40 (EP071)
2	BH109-0.6-0.7								Asbestos (EA200N)
3	BH109-0.9-1.0								OCP, OPP, PCB
4	QC102								8 Metals
5	BH109-1.5-1.6								PAH
6	BH109-2.7-2.8								TRH C6-C40, BTEXN
7	BH109-4.5-4.6								
8	BH109-6.1-6.2								
9	QC300								
10	BH107-0.2-0.3								
11	BH107-0.4-0.5								
12	BH107-0.5-0.6								
13	BH107-0.8-1.0								
14	BH107-1.5-1.7								
Comments:									
As, Cd, Cr, Cu, Hg, Ni, Pb, Zn									
Required:									
Relinquished by: K. Watten					Signed: [Signature] Date: 29/1/20				
Received by: [Signature]					Signed: [Signature] Date: 29/1/20				

send requested
soil QC samples
to Envirolab with
crushed ice
please

Environmental Division
Sydney
Work Order Reference
ES2002766



Telephone : + 61-2-8784 8555

Lab Report No

EasyID

30/1/20 1340

60693599 Burrows IE 2 of 2

UPDATED COC

CHAIN OF CUSTODY										
AECOM Australia Pty Ltd										
Sydney (420 George St)					T: 02 8934 0451 M: 0400 973 821					
AECOM Project Manager: Alex Latham					AECOM Project No: 60623599_1.1					
AECOM Project Manager Email: Alex.Latham@aecom.com					AECOM Project No: 60623599_1.1					
Sampled By: Kurtis Wathen / Rebekah Panozzo					Project Name: Burrows IE					
Laboratory Details					Tel: 8784 8515					
Lab Name: ALS					Fax:					
Lab Address: 277 Woodpark Rd, Smithfield					Preliminary Report by:					
Contact Name: Brenda Hong					Final Report by:					
Lab Ref:					Lab Quote No: EN/004/16					
Project Name: Burrows IE					PO No. refer Project #					
Analysis Request										
TRH > C10-C40 (EP071)										
Asbestos (EA200N)										
OCP, OPP, PCB										
8 Metals										
PAH										
TRH C6-C40, BTEXN										
send requested soil QC samples to Envirolab with crushed ice please										
Yes										
1. Urgent TAT required? (please circle: 24hr 48hr 5 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 5.1.17										
5. Special storage requirements? (details:)										
Lab. ID	Sample ID	Sampling Date	Matrix	Preservation	Container	TRH C6-C40, BTEXN	8 Metals	OCP, OPP, PCB	Asbestos (EA200N)	TRH > C10-C40 (EP071)
215	34107-3.9-4.0	29/1	soil	acid	310	✓	✓	✓	✓	✓
216	BH107-4.8-5.0				313	✓	✓	✓	✓	✓
217	BH113-0.2-0.3				313	✓	✓	✓	✓	✓
218	BH113-0.4-0.5				313	✓	✓	✓	✓	✓
219	BH113-0.6-0.7				313	✓	✓	✓	✓	✓
220	QC106				313	✓	✓	✓	✓	✓
221	BH113-0.8-1.0				313	✓	✓	✓	✓	✓
222	BH113-1.3-1.38				313	✓	✓	✓	✓	✓
223	QC105				313	✓	✓	✓	✓	✓
224	QC104				313	✓	✓	✓	✓	✓
225	BH110-0.35-0.36				313	✓	✓	✓	✓	✓
226	" 0.40-0.46				313	✓	✓	✓	✓	✓
227	" 0.9-1.0				313	✓	✓	✓	✓	✓
228	" 1.2-1.3				313	✓	✓	✓	✓	✓
Comments:										
Required: As, Cd, Cr, Cu, Hg, Ni, Pb, Zn										
Relinquished by: [Signature]										
Signed: [Signature]										
Date: 29/1										
Relinquished by: [Signature]										
Signed: [Signature]										
Date: 29/1										
Relinquished by: [Signature]										
Signed: [Signature]										
Date: 29/1										

Field Worksheet FORM025 Dec04 S-5.1 21. 6.1-6.2 BH108-4.1-4.2

CHAIN OF CUSTODY

AECOM Australia Pty Ltd

Sydney (420 George St)

T: 02 8834 0451

M: 0400 973 821

AECOM Project Manager: Alex Latham

AECOM Project Manager Email: Alex.Latham@aecom.com

Laboratory Details

Lab Name: ALS

Lab Address: 277 Woodpark Rd, Smithfield

Contact Name: Brenda Hong

Lab. Ref:

Tel: 8784 8515

Fax:

Preliminary Report by:

Final Report by:

Lab Quote No: EN/004/16

Sampled By: Kurtis Wathen / Rebekah Panozzo AECOM Project No: 60623599_1.1

Project Name: Burrows IE

PO No. refer Project #

Specifications: All reports to be emailed to AECOM Project Manager

ESDAT & Equis & XLS format also required

1. Urgent TAT required? (please circle: 24hr 48hr 5 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:)

Yes

Analysis Request

send requested
soil QC samples
to Envirolab with
crushed ice
pleaseContainer
(No. & type)Preservation
acid ice otherMatrix
soil water otherSampling
Date

Sample ID

Container
(No. & type)Preservation
acid ice otherMatrix
soil water otherSampling
Date

Sample ID

Container
(No. & type)Preservation
acid ice otherMatrix
soil water otherSampling
Date

Sample ID

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soil water otherSampling
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soil water otherSampling
Date

Sample ID

Container
(No. & type)Preservation
acid ice otherMatrix
soil water otherSampling
Date

Sample ID

Container
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Sample ID



Environmental

CERTIFICATE OF ANALYSIS

Work Order : **ES2002807**

Client : **AECOM Australia Pty Ltd**
Contact : **MR ALEX LATHAM**
Address : **PO BOX Q410 QVB POST OFFICE
SYDNEY NSW, AUSTRALIA 2000**

Telephone : **+61 02 8934 0000**
Project : **60623599_1.1**
Order number : **60623599_1.1**
C-O-C number : **----**
Sampler : **Kurtis Wathen, REBEKAH PANOZZO**
Site : **----**

Quote number : **EN/004/16**
No. of samples received : **21**
No. of samples analysed : **8**

Page : 1 of 13

Laboratory : **Environmental Division Sydney**
Contact : **Brenda Hong**
Address : **277-289 Woodpark Road Smithfield NSW Australia 2164**

Telephone : **+61 2 8784 8555**
Date Samples Received : **28-Jan-2020 17:00**
Date Analysis Commenced : **31-Jan-2020**
Issue Date : **05-Feb-2020 20:53**



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

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

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Alana Smylie
Edwandy Fadjar
Edwandy Fadjar
Ivan Taylor

Asbestos Identifier
Organic Coordinator
Organic Coordinator
Analyst

Newcastle - Asbestos, Mayfield West, NSW
Sydney Inorganics, Smithfield, NSW
Sydney Organics, Smithfield, NSW
Sydney Inorganics, Smithfield, NSW



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 insufficient 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 sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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

Δ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+i) & Benzo(k)fluoranthene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EA200N: Asbestos weights and percentages are not covered under the Scope of NATA Accreditation.
Weights of Asbestos are based on extracted bulk asbestos, fibre bundles, and/or ACM and do not include respirable fibres (if present)
The Asbestos (Fines and Fibrous) weight is calculated from the extracted Fibrous Asbestos and Asbestos Fines as an equivalent weight of 100% Asbestos
Percentages for Asbestos content in ACM are based on the 2013 NEPM default values.
All calculations of percentage Asbestos under this method are approximate and should be used as a guide only.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200N: ALS laboratory procedures and methods used for the identification and quantitation of asbestos are consistent with AS4964-2004 and the requirements of the 2013 NEPM for Assessment of Site Contamination
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)											
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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH106_0.2-0.3		BH106_4.0-4.1		BH108_0.15-0.25		BH108_0.35-0.45		BH108_1.3-1.4	
		28-Jan-2020 00:00		28-Jan-2020 00:00		28-Jan-2020 00:00		28-Jan-2020 00:00		28-Jan-2020 00:00	
		ES2002807-001		ES2002807-006		ES2002807-008		ES2002807-009		ES2002807-013	
		Result		Result		Result		Result		Result	
EP068A: Organochlorine Pesticides (OC) - Continued											
gamma-BHC	58-89-9	0.05	mg/kg								
delta-BHC	319-86-8	0.05	mg/kg								
Heptachlor	76-44-8	0.05	mg/kg								
Aldrin	309-00-2	0.05	mg/kg								
Heptachlor epoxide	1024-57-3	0.05	mg/kg								
^ Total Chlordane (sum)		0.05	mg/kg								
trans-Chlordane	5103-74-2	0.05	mg/kg								
alpha-Endosulfan	959-98-8	0.05	mg/kg								
cis-Chlordane	5103-71-9	0.05	mg/kg								
Dieldrin	60-57-1	0.05	mg/kg								
4,4'-DDE	72-55-9	0.05	mg/kg								
Endrin	72-20-8	0.05	mg/kg								
beta-Endosulfan	33213-65-9	0.05	mg/kg								
^ Endosulfan (sum)	115-29-7	0.05	mg/kg								
4,4'-DDD	72-54-8	0.05	mg/kg								
Endrin aldehyde	7421-93-4	0.05	mg/kg								
Endosulfan sulfate	1031-07-8	0.05	mg/kg								
4,4'-DDT	50-29-3	0.2	mg/kg								
Endrin ketone	53494-70-5	0.05	mg/kg								
Methoxychlor	72-43-5	0.2	mg/kg								
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg								
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5	0.05	mg/kg								
EP068B: Organophosphorus Pesticides (OP)											
Dichlorvos	62-73-7	0.05	mg/kg								
Demeton-S-methyl	919-86-8	0.05	mg/kg								
Monocrotophos	6923-22-4	0.2	mg/kg								
Dimethoate	60-51-5	0.05	mg/kg								
Diazinon	333-41-5	0.05	mg/kg								
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg								
Parathion-methyl	298-00-0	0.2	mg/kg								
Malathion	121-75-5	0.05	mg/kg								
Fenthion	55-38-9	0.05	mg/kg								
Chlorpyrifos	2921-88-2	0.05	mg/kg								
Parathion	56-38-2	0.2	mg/kg								



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH106_0.2-0.3		BH106_4.0-4.1		BH108_0.15-0.25		BH108_0.35-0.45		BH108_1.3-1.4	
28-Jan-2020 00:00		28-Jan-2020 00:00		28-Jan-2020 00:00		28-Jan-2020 00:00		28-Jan-2020 00:00		28-Jan-2020 00:00	
ES2002807-001		ES2002807-006		ES2002807-008		ES2002807-009		ES2002807-013			
Result		Result		Result		Result		Result		Result	
EP068B: Organophosphorus Pesticides (OP) - Continued											
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05							
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05							
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05							
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05							
Prothiofos	34643-46-4	0.05	mg/kg	<0.05							
Ethion	563-12-2	0.05	mg/kg	<0.05							
Carbophenothion	786-19-6	0.05	mg/kg	<0.05							
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons											
Naphthalene	91-20-3	0.5	mg/kg	<0.5				<0.5			<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5				<0.5			<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5				<0.5			<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5				<0.5			<0.5
Phenanthrene	85-01-8	0.5	mg/kg	0.6				<0.5			<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5				<0.5			<0.5
Fluoranthene	206-44-0	0.5	mg/kg	2.1				<0.5			<0.5
Pyrene	129-00-0	0.5	mg/kg	2.2				<0.5			<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	1.1				<0.5			<0.5
Chrysene	218-01-9	0.5	mg/kg	1.2				<0.5			<0.5
Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	2.1				<0.5			<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	0.8				<0.5			<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	1.9				<0.5			<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	1.2				<0.5			<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5				<0.5			<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	1.6				<0.5			<0.5
^ Sum of polycyclic aromatic hydrocarbons											
		0.5	mg/kg	14.8				<0.5			<0.5
^ Benzo(a)pyrene TEQ (zero)											
		0.5	mg/kg	2.4				<0.5			<0.5
^ Benzo(a)pyrene TEQ (half LOR)											
		0.5	mg/kg	2.7				0.6			0.6
^ Benzo(a)pyrene TEQ (LOR)											
		0.5	mg/kg	2.9				1.2			1.2
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	120							<100



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)											
BH106_0.2-0.3				BH106_4.0-4.1				BH108_0.15-0.25			
28-Jan-2020 00:00				28-Jan-2020 00:00				28-Jan-2020 00:00			
ES2002807-001				ES2002807-006				ES2002807-008			
Result				Result				Result			
EP080/071: Total Petroleum Hydrocarbons - Continued											
^ C10 - C36 Fraction (sum)				120				<50			
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions											
C6 - C10 Fraction				mg/kg				mg/kg			
^ C6 - C10 Fraction minus BTEX (F1)				mg/kg				mg/kg			
>C10 - C16 Fraction				mg/kg				mg/kg			
>C16 - C34 Fraction				mg/kg				mg/kg			
>C34 - C40 Fraction				mg/kg				mg/kg			
^ >C10 - C40 Fraction (sum)				mg/kg				mg/kg			
^ >C10 - C16 Fraction minus Naphthalene (F2)				mg/kg				mg/kg			
EP080: BTEXN											
Benzene				mg/kg				mg/kg			
Toluene				mg/kg				mg/kg			
Ethylbenzene				mg/kg				mg/kg			
meta- & para-Xylene				mg/kg				mg/kg			
ortho-Xylene				mg/kg				mg/kg			
^ Sum of BTEX				mg/kg				mg/kg			
^ Total Xylenes				mg/kg				mg/kg			
Naphthalene				mg/kg				mg/kg			
EP066S: PCB Surrogate											
Decachlorobiphenyl				%				%			
EP068S: Organochlorine Pesticide Surrogate											
Dibromo-DDE				%				%			
EP068T: Organophosphorus Pesticide Surrogate											
DEF				%				%			
EP075(SIM)S: Phenolic Compound Surrogates											
Phenol-d6				%				%			
2-Chlorophenol-D4				%				%			
2,4,6-Tribromophenol				%				%			
EP075(SIM)T: PAH Surrogates											
2-Fluorobiphenyl				%				%			
Anthracene-d10				%				%			
4-Terphenyl-d14				%				%			



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH106_0.2-0.3		BH106_4.0-4.1		BH108_0.15-0.25		BH108_0.35-0.45		BH108_1.3-1.4	
28-Jan-2020 00:00		28-Jan-2020 00:00		28-Jan-2020 00:00		28-Jan-2020 00:00		28-Jan-2020 00:00		28-Jan-2020 00:00	
ES2002807-001		ES2002807-006		ES2002807-008		ES2002807-009		ES2002807-013			
Result		Result		Result		Result		Result		Result	
EP080S: TPH(V)/BTEx Surrogates											
1.2-Dichloroethane-D4		17060-07-0	0.2	%		80.7	*****		110		
Toluene-D8		2037-26-5	0.2	%		81.0	*****		103		
4-Bromofluorobenzene		460-00-4	0.2	%		72.7	*****		92.8		



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH108_2.3-2.4 28-Jan-2020 00:00 ES2002807-014 Result		BH108_4.1-4.2 28-Jan-2020 00:00 ES2002807-017 Result		QC100 28-Jan-2020 00:00 ES2002807-020 Result	
EA055: Moisture Content (Dried @ 105-110°C)		22.1		34.5		9.8	
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		No		No		No	
Asbestos Detected	1332-21-4	0.1	g/kg	No		No	
Asbestos Type	1332-21-4	-	-	-		-	
Asbestos (Trace)	1332-21-4	5	Fibres	No		No	
Sample weight (dry)	1332-21-4	0.01	g	65.1		65.1	
Synthetic Mineral Fibre	1332-21-4	0.1	g/kg	No		No	
Organic Fibre	1332-21-4	0.1	g/kg	No		No	
APPROVED IDENTIFIER:	1332-21-4	-	-	A. SMYLYE		A. SMYLYE	
EA200N: Asbestos Quantification (non-NATA)		<0.0004		<0.0004		<0.0004	
Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	<0.0004		<0.0004	
Asbestos (Fines and Fibrous FA+AF)	1332-21-4	0.001	% (w/w)	<0.001		<0.001	
Asbestos Containing Material	1332-21-4	0.1	g	<0.1		<0.1	
Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	<0.01		<0.01	
Weight Used for % Calculation	1332-21-4	0.0001	kg	0.0651		0.0651	
Fibrous Asbestos >7mm	1332-21-4	0.0004	g	<0.0004		<0.0004	
EG005(ED093)T: Total Metals by ICP-AES		48		6		6	
Arsenic	7440-38-2	5	mg/kg	48		48	
Cadmium	7440-43-9	1	mg/kg	5		5	
Chromium	7440-47-3	2	mg/kg	300		300	
Copper	7440-50-8	5	mg/kg	5050		5050	
Lead	7439-92-1	5	mg/kg	3880		3880	
Nickel	7440-02-0	2	mg/kg	65		65	
Zinc	7440-66-6	5	mg/kg	4280		4280	
EG035T: Total Recoverable Mercury by FIMS		<0.1		<0.1		<0.1	
Mercury	7439-97-6	0.1	mg/kg	<0.1		<0.1	
EP066: Polychlorinated Biphenyls (PCB)		<0.1		<0.1		<0.1	
Total Polychlorinated biphenyls	1332-21-4	0.1	mg/kg	<0.1		<0.1	
EP068A: Organochlorine Pesticides (OC)		<0.05		<0.05		<0.05	
alpha-BHC	319-84-6	0.05	mg/kg	<0.05		<0.05	
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05		<0.05	

Sub-Matrix: SOIL (Matrix: SOIL)		BH108_2.3-2.4	BH108_4.1-4.2	QC100
		28-Jan-2020 00:00	28-Jan-2020 00:00	28-Jan-2020 00:00
		ES2002807-014	ES2002807-017	ES2002807-020
		Result	Result	Result

EP068A: Organochlorine Pesticides (OC) - Continued									
beta-BHC	319-85-7	0.05	mg/kg						<0.05
gamma-BHC	58-89-9	0.05	mg/kg						<0.05
delta-BHC	319-86-8	0.05	mg/kg						<0.05
Heptachlor	76-44-8	0.05	mg/kg						<0.05
Aldrin	309-00-2	0.05	mg/kg						<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg						<0.05
^ Total Chlordane (sum)		0.05	mg/kg						<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg						<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg						<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg						<0.05
Dieldrin	60-57-1	0.05	mg/kg						<0.05
4,4' -DDE	72-55-9	0.05	mg/kg						<0.05
Endrin	72-20-8	0.05	mg/kg						<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg						<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg						<0.05
4,4' -DDD	72-54-8	0.05	mg/kg						<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg						<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg						<0.05
4,4' -DDT	50-29-3	0.2	mg/kg						<0.2
Endrin ketone	53494-70-5	0.05	mg/kg						<0.05
Methoxychlor	72-43-5	0.2	mg/kg						<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg						<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.05	mg/kg						<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg						<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg						<0.05
Monocrotophos	6923-22-4	0.2	mg/kg						<0.2
Dimethoate	60-51-5	0.05	mg/kg						<0.05
Diazinon	333-41-5	0.05	mg/kg						<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg						<0.05
Parathion-methyl	298-00-0	0.2	mg/kg						<0.2
Malathion	121-75-5	0.05	mg/kg						<0.05
Fenthion	55-38-9	0.05	mg/kg						<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg						<0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH108_2.3-2.4 28-Jan-2020 00:00 ES2002807-014 Result		BH108_4.1-4.2 28-Jan-2020 00:00 ES2002807-017 Result		QC100 28-Jan-2020 00:00 ES2002807-020 Result	
EP068B: Organophosphorus Pesticides (OP) - Continued							
Parathion	56-38-2	0.2	mg/kg			<0.2	
Pirimphos-ethyl	23505-41-1	0.05	mg/kg			<0.05	
Chlorfenvinphos	470-90-6	0.05	mg/kg			<0.05	
Bromophos-ethyl	4824-78-6	0.05	mg/kg			<0.05	
Fenamiphos	22224-92-6	0.05	mg/kg			<0.05	
Prothiofos	34643-46-4	0.05	mg/kg			<0.05	
Ethion	563-12-2	0.05	mg/kg			<0.05	
Carbophenothion	786-19-6	0.05	mg/kg			<0.05	
Azinphos Methyl	86-50-0	0.05	mg/kg			<0.05	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Naphthalene	91-20-3	0.5	mg/kg	<0.5		<0.5	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5		<0.5	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5		<0.5	
Fluorene	86-73-7	0.5	mg/kg	<0.5		<0.5	
Phenanthrene	85-01-8	0.5	mg/kg	<0.5		1.8	
Anthracene	120-12-7	0.5	mg/kg	<0.5		0.7	
Fluoranthene	206-44-0	0.5	mg/kg	<0.5		5.3	
Pyrene	129-00-0	0.5	mg/kg	<0.5		5.0	
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5		2.3	
Chrysene	218-01-9	0.5	mg/kg	<0.5		2.3	
Benzo(b+)fluoranthene	205-99-2	0.5	mg/kg	<0.5		3.3	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5		1.2	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5		3.1	
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	mg/kg	<0.5		1.7	
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5		<0.5	
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5		2.2	
^ Sum of polycyclic aromatic hydrocarbons		0.5	mg/kg	<0.5		28.9	
^ Benzo(a)pyrene TEQ (zero)		0.5	mg/kg	<0.5		4.0	
^ Benzo(a)pyrene TEQ (half LOR)		0.5	mg/kg	0.6		4.2	
^ Benzo(a)pyrene TEQ (LOR)		0.5	mg/kg	1.2		4.5	
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	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH108_2.3-2.4 28-Jan-2020 00:00 ES2002807-014 Result		BH108_4.1-4.2 28-Jan-2020 00:00 ES2002807-017 Result		QC100 28-Jan-2020 00:00 ES2002807-020 Result	
EP080/071: Total Petroleum Hydrocarbons - Continued		100 mg/kg		<100		110	
C29 - C36 Fraction		50 mg/kg		<50		110	
^ C10 - C36 Fraction (sum)							
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
C6 - C10 Fraction		10 mg/kg		<10		<10	
^ C6 - C10 Fraction minus BTEX (F1)		10 mg/kg		<10		<10	
>C10 - C16 Fraction		50 mg/kg		<50		<50	
>C16 - C34 Fraction		100 mg/kg		<100		170	
>C34 - C40 Fraction		100 mg/kg		<100		<100	
^ >C10 - C40 Fraction (sum)		50 mg/kg		<50		170	
^ >C10 - C16 Fraction minus Naphthalene (F2)		50 mg/kg		<50		<50	
EP080: BTEXN							
Benzene	71-43-2	0.2 mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5 mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5 mg/kg	<0.5	<0.5	<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	<0.5	<0.5
ortho-Xylene	95-47-6	0.5 mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX		0.2 mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes		0.5 mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1 mg/kg	<1	<1	<1	<1	<1
EP066S: PCB Surrogate							
Decachlorobiphenyl	2051-24-3	0.1 %				102	
EP068S: Organochlorine Pesticide Surrogate							
Dibromo-DDE	21655-73-2	0.05 %				90.1	
EP068T: Organophosphorus Pesticide Surrogate							
DEF	78-48-8	0.05 %				80.9	
EP075(SIM)S: Phenolic Compound Surrogates							
Phenol-d6	13127-88-3	0.5 %	73.2			76.3	
2-Chlorophenol-D4	93951-73-6	0.5 %	81.0			84.2	
2,4,6-Tribromophenol	118-79-6	0.5 %	46.2			62.4	
EP075(SIM)T: PAH Surrogates							
2-Fluorobiphenyl	321-60-8	0.5 %	92.2			96.7	
Anthracene-d10	1719-06-8	0.5 %	91.1			91.6	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH108_2.3-2.4		BH108_4.1-4.2		QC100	
		28-Jan-2020 00:00		28-Jan-2020 00:00		28-Jan-2020 00:00	
		ES2002807-014		ES2002807-017		ES2002807-020	
		Result		Result		Result	
EP075(SIM)T: PAH Surrogates - Continued							
4-Terphenyl-d14		1718-51-0	0.5	%		94.3	
EP080S: TPH(V)/BTEx Surrogates							
1,2-Dichloroethane-D4		17060-07-0	0.2	%	116	89.3	
Toluene-D8		2037-26-5	0.2	%	107	97.4	
4-Bromofluorobenzene		460-00-4	0.2	%	102	92.8	

Analytical Results

Descriptive Results

Sub-Matrix: SOIL									
□ □									



Surrogate Control Limits

Sub-Matrix: SOIL				Recovery Limits (%)	
	□ □ □ □ □ □ □ □	□ □ □ □ □ □ □ □		Low	High
EP066S: PCB Surrogate					
Decachlorobiphenyl	2051-24-3			39	149
EP068S: Organochlorine Pesticide Surrogate					
Dibromo-DDE	21655-73-2			49	147
EP068T: Organophosphorus Pesticide Surrogate					
DEF	78-48-8			35	143
EP075(SIM)S: Phenolic Compound Surrogates					
Phenol-d6	13127-88-3			63	123
2-Chlorophenol-D4	93951-73-6			66	122
2,4,6-Tribromophenol	118-79-6			40	138
EP075(SIM)T: PAH Surrogates					
2-Fluorobiphenyl	321-60-8			70	122
Anthracene-d10	1719-06-8			66	128
4-Terphenyl-d14	1718-51-0			65	129
EP080S: TPH(V)/BTX Surrogates					
1,2-Dichloroethane-D4	17060-07-0			73	133
Toluene-D8	2037-26-5			74	132
4-Bromofluorobenzene	460-00-4			72	130



Environmental

QUALITY CONTROL REPORT

Work Order : **ES2002807**

Page : 1 of 11

Client : **AECOM Australia Pty Ltd**
Contact : **MR ALEX LATHAM**
Address : **PO BOX Q410 QVB POST OFFICE
SYDNEY NSW, AUSTRALIA 2000**
Telephone : **+61 02 8934 0000**
Project : **60623599_1.1**
Order number : **60623599_1.1**
C-O-C number : **----**
Sampler : **Kurtis Wathen, REBEKAH PANOZZO**
Site : **----**
Quote number : **EN/004/16**
No. of samples received : **21**
No. of samples analysed : **8**

Laboratory : **Environmental Division Sydney**
Contact : **Brenda Hong**
Address : **277-289 Woodpark Road Smithfield NSW Australia 2164**
Telephone : **+61 2 8784 8555**
Date Samples Received : **28-Jan-2020**
Date Analysis Commenced : **31-Jan-2020**
Issue Date : **05-Feb-2020**



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

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

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

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Alana Smylie
Edwandy Fadjar
Edwandy Fadjar
Ivan Taylor

Asbestos Identifier
Organic Coordinator
Organic Coordinator
Analyst

Newcastle - Asbestos, Mayfield West, NSW
Sydney Inorganics, Smithfield, NSW
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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 a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to higher

= Indicates failed QC

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 sample ID		Client sample ID		Method: Compound		Laboratory Duplicate (DUP) Report				
Laboratory sample ID		Client sample ID		Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2836485)												
ES2002719-001		Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit		
			EG005T: Chromium	7440-47-3	2	mg/kg	40	41	0.00	0% - 20%		
			EG005T: Nickel	7440-02-0	2	mg/kg	133	133	0.00	0% - 20%		
			EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit		
			EG005T: Copper	7440-50-8	5	mg/kg	39	40	2.80	No Limit		
			EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit		
			EG005T: Zinc	7440-66-6	5	mg/kg	51	52	2.46	0% - 50%		
ES2002807-006		BH106_4.0-4.1	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit		
			EG005T: Chromium	7440-47-3	2	mg/kg	6	7	0.00	No Limit		
			EG005T: Nickel	7440-02-0	2	mg/kg	3	3	0.00	No Limit		
			EG005T: Arsenic	7440-38-2	5	mg/kg	8	9	20.3	No Limit		
			EG005T: Copper	7440-50-8	5	mg/kg	7	7	0.00	No Limit		
			EG005T: Lead	7439-92-1	5	mg/kg	18	12	38.3	No Limit		
			EG005T: Zinc	7440-66-6	5	mg/kg	111	119	7.33	0% - 20%		
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2836488)												
ES2002719-002		Anonymous	EA055: Moisture Content	----	0.1	%	5.9	5.6	4.70	No Limit		
ES2002807-013		BH108_1.3-1.4	EA055: Moisture Content	----	0.1	%	15.8	13.3	17.2	0% - 50%		
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2836601)												
ES2002645-001		Anonymous	EA055: Moisture Content	----	0.1	%	10.0	10.8	8.20	0% - 20%		
ES2002856-003		Anonymous	EA055: Moisture Content	----	0.1	%	10.8	10.5	2.05	0% - 50%		
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2836486)												
ES2002719-001		Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit		
ES2002807-006		BH106_4.0-4.1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit		
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 2834945)												



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 (%)
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 2834945) - continued									
ES2002729-001	Anonymous	EP066: Total Polychlorinated biphenyls	---	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2834944)									
ES2002729-001	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 2834944)	Anonymous	EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit



Sub-Matrix: SOIL		Laboratory Duplicate (DUP) Report								
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 2834944) - continued										
ES2002729-001	Anonymous	EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit	
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit	
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2834942)										
ES2002807-014	BH108_2.3-2.4	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(b+)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
			205-82-3							
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		ES2002729-001	Anonymous	EP075(SIM): Benzo(a)pyrene TEQ (zero)	---	0.5	mg/kg	<0.5	<0.5	0.00
EP075(SIM): Naphthalene	91-20-3			0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP075(SIM): Acenaphthylene	208-96-8			0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP075(SIM): Acenaphthene	83-32-9			0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP075(SIM): Fluorene	86-73-7			0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP075(SIM): Phenanthrene	85-01-8			0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP075(SIM): Anthracene	120-12-7			0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP075(SIM): Fluoranthene	206-44-0			0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP075(SIM): Pyrene	129-00-0			0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP075(SIM): Benz(a)anthracene	56-55-3			0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP075(SIM): Chrysene	218-01-9			0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP075(SIM): Benzo(b+)fluoranthene	205-99-2			0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
	205-82-3									
EP075(SIM): Benzo(k)fluoranthene	207-08-9			0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP075(SIM): Benzo(a)pyrene	50-32-8			0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5			0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3			0.5	mg/kg	<0.5	<0.5	0.00	No Limit	



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2834942) - continued										
ES2002729-001	Anonymous	EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2834520)										
ES2002547-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit	
ES2002547-011	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit	
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2834894)										
ES2002719-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit	
ES2002901-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit	
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2834943)										
ES2002807-014	BH108_2.3-2.4	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit	
		EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
ES2002729-001	Anonymous	EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2834520)										
ES2002547-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit	
ES2002547-011	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2834894)										
ES2002719-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit	
ES2002901-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2834943)										
ES2002807-014	BH108_2.3-2.4	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit	
		EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
ES2002729-001	Anonymous	EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit	
EP080: BTEXN (QC Lot: 2834520)										
ES2002547-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
			106-42-3							
ES2002547-011	Anonymous	EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit	
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit	



Sub-Matrix: SOIL			Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
EP080: BTEXN (QC Lot: 2834520) - continued										
ES2002547-011	Anonymous	EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit	
EP080: BTEXN (QC Lot: 2834894)										
ES2002719-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
ES2002901-001	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit	
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
			108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: meta- & para-Xylene	106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit	

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 Spike (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.

Method Blank (MB)	Laboratory Control Spike (LCS) Report
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Sub-Matrix: SOIL									
Method: Compound				Method Blank (MB) Report		Laboratory Control Spike (LCS) Report			
CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)	Low	High		
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2836485)									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	102	86.0	126	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	96.2	83.0	113	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	111	76.0	128	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	98.9	86.0	120	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	96.7	80.0	114	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	102	87.0	123	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	102	80.0	122	
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2836486)									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	77.0	70.0	105	
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 2834945)									
EP066: Total Polychlorinated biphenyls	---	0.1	mg/kg	<0.1	1 mg/kg	89.0	62.0	126	
EP068A: Organochlorine Pesticides (OC) (QCLot: 2834944)									
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	102	69.0	113	
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	102	65.0	117	
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	90.3	67.0	119	
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	98.9	68.0	116	
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	103	65.0	117	
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	103	67.0	115	
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	103	69.0	115	
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	106	62.0	118	
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	107	63.0	117	
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	91.5	66.0	116	
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	104	64.0	116	
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	101	66.0	116	
EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	107	67.0	115	
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	103	67.0	123	
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	102	69.0	115	
EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	98.4	69.0	121	
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	87.5	56.0	120	
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	98.8	62.0	124	
EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	101	66.0	120	
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	94.2	64.0	122	
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	93.1	54.0	130	
EP068E: Organophosphorus Pesticides (OP) (QCLot: 2834944)									

Sub-Matrix: SOIL		Method Blank (MB) Report		Laboratory Control Spike (LCS) Report			
Method: Compound		CAS Number	LOR	Unit	Spike Concentration	Spike Recovery (%)	Recovery Limits (%)
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2834944) - continued							
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	105	59.0
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	99.1	62.0
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	78.2	54.0
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	97.3	67.0
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	98.9	70.0
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	91.7	72.0
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	95.8	68.0
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	101	68.0
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	96.1	69.0
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	97.0	76.0
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	106	64.0
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	97.9	70.0
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	95.2	69.0
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	100	66.0
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	84.0	68.0
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	95.2	62.0
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	101	68.0
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	99.6	65.0
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	66.3	41.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2834942)							
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	99.3	77.0
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	105	72.0
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	101	73.0
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	102	72.0
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	103	75.0
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	106	77.0
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	109	73.0
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	112	74.0
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	96.8	69.0
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	99.6	75.0
EP075(SIM): Benzo(b+)fluoranthene	205-99-2	0.5	mg/kg	<0.5	6 mg/kg	93.3	68.0
	205-82-3						
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	102	74.0
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	104	70.0
EP075(SIM): Indeno(1,2,3-cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	97.8	61.0
EP075(SIM): Dibenzo(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	98.3	62.0
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	98.4	63.0
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2834520)							
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	89.2	68.4
128							



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report		Laboratory Control Spike (LCS) Report				
Method: Compound		CAS Number	LOR	Unit	Result	Spike Concentration		Spike Recovery (%)		Recovery Limits (%)
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2834894)										
EP080: C6 - C9 Fraction		----	10	mg/kg	<10	26 mg/kg		96.1	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2834943)										
EP071: C10 - C14 Fraction		----	50	mg/kg	<50	300 mg/kg		93.6	75.0	129
EP071: C15 - C28 Fraction		----	100	mg/kg	<100	450 mg/kg		94.2	77.0	131
EP071: C29 - C36 Fraction		----	100	mg/kg	<100	300 mg/kg		89.7	71.0	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2834520)										
EP080: C6 - C10 Fraction		C6_C10	10	mg/kg	<10	31 mg/kg		84.0	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2834894)										
EP080: C6 - C10 Fraction		C6_C10	10	mg/kg	<10	31 mg/kg		96.5	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2834943)										
EP071: >C10 - C16 Fraction		----	50	mg/kg	<50	375 mg/kg		94.6	77.0	125
EP071: >C16 - C34 Fraction		----	100	mg/kg	<100	525 mg/kg		92.0	74.0	138
EP071: >C34 - C40 Fraction		----	100	mg/kg	<100	225 mg/kg		78.3	63.0	131
EP080: BTEXN (QCLot: 2834520)										
EP080: Benzene		71-43-2	0.2	mg/kg	<0.2	1 mg/kg		108	62.0	116
EP080: Toluene		108-88-3	0.5	mg/kg	<0.5	1 mg/kg		98.7	67.0	121
EP080: Ethylbenzene		100-41-4	0.5	mg/kg	<0.5	1 mg/kg		95.7	65.0	117
EP080: meta- & para-Xylene		108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg		95.2	66.0	118
EP080: ortho-Xylene		95-47-6	0.5	mg/kg	<0.5	1 mg/kg		97.8	68.0	120
EP080: Naphthalene		91-20-3	1	mg/kg	<1	1 mg/kg		89.7	63.0	119
EP080: BTEXN (QCLot: 2834894)										
EP080: Benzene		71-43-2	0.2	mg/kg	<0.2	1 mg/kg		96.9	62.0	116
EP080: Toluene		108-88-3	0.5	mg/kg	<0.5	1 mg/kg		103	67.0	121
EP080: Ethylbenzene		100-41-4	0.5	mg/kg	<0.5	1 mg/kg		104	65.0	117
EP080: meta- & para-Xylene		108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg		102	66.0	118
EP080: ortho-Xylene		95-47-6	0.5	mg/kg	<0.5	1 mg/kg		105	68.0	120
EP080: Naphthalene		91-20-3	1	mg/kg	<1	1 mg/kg		113	63.0	119

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**

Sub-Matrix: SOIL						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report		
				Spike	SpikeRecovery(%)	Recovery Limits (%)
				Concentration	MS	Low
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2836485)						

Sub-Matrix: SOIL

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike	SpikeRecovery(%)	Recovery Limits (%)	
				Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2836485) - continued							
ES2002719-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	95.6	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	89.6	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	80.7	70.0	130
		EG005T: Copper	7440-50-8	250 mg/kg	101	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	90.2	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	81.6	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2836486)	Anonymous	EG005T: Zinc	7440-66-6	250 mg/kg	84.7	70.0	130
		EG035T: Mercury	7439-97-6	5 mg/kg	88.9	70.0	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 2834945)							
ES2002729-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	102	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 2834944)							
ES2002729-001	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	85.9	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	92.9	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	92.8	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	109	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	111	70.0	130
		EP068: 4,4'-DDT	50-29-3	2 mg/kg	107	70.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2834944)							
ES2002729-001	Anonymous	EP068: Diazinon	333-41-5	0.5 mg/kg	96.7	70.0	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	77.7	70.0	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	76.9	70.0	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	93.0	70.0	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	104	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2834942)							
ES2002729-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	105	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	115	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2834520)							
ES2002547-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	99.8	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2834894)							
ES2002719-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	104	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2834943)							
ES2002729-001	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	91.0	73.0	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	85.1	53.0	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	74.4	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2834520)							



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	SpikeRecovery(%)	Recovery Limits (%)	
					MS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2834520) - continued							
ES2002547-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	95.4	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2834894)							
ES2002719-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	111	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2834943)							
ES2002729-001	Anonymous	EP071: >C10 - C16 Fraction	-----	860 mg/kg	100	73.0	137
		EP071: >C16 - C34 Fraction	-----	3223 mg/kg	79.7	53.0	131
		EP071: >C34 - C40 Fraction	-----	1058 mg/kg	54.8	52.0	132
EP080: BTEXN (QCLot: 2834520)							
ES2002547-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	106	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	99.7	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	102	70.0	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	100.0	70.0	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	102	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	91.2	70.0	130
EP080: BTEXN (QCLot: 2834894)							
ES2002719-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	93.0	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	92.2	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	109	70.0	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	106	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	111	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	121	70.0	130



Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2002807	Page	: 1 of 6
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MR ALEX LATHAM	Telephone	: +61 2 8784 8555
Project	: 60623599_1.1	Date Samples Received	: 28-Jan-2020
Site	: ----	Issue Date	: 05-Feb-2020
Sampler	: Kurtis Wathen, REBEKAH PANOZZO	No. of samples received	: 21
Order number	: 60623599_1.1	No. of samples analysed	: 8

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- NO Method Blank value outliers occur.
- NO Duplicate outliers occur.
- NO Laboratory Control outliers occur.
- NO Matrix Spike outliers occur.
- For all regular sample matrices, NO surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- NO Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- NO Quality Control Sample Frequency Outliers exist.



Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

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

Method		Sample Date	Extraction / Preparation		Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Date analysed	Due for analysis	
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)	BH106_4.0-4.1, BH108_1.3-1.4, BH108_4.1-4.2, QC100	28-Jan-2020	----	----	31-Jan-2020	11-Feb-2020	
						✓	
	EA200: AS 4964 - 2004 Identification of Asbestos in Soils	Snap Lock Bag - Friable Asbestos/PSD Bag (EA200)	28-Jan-2020	----	----	03-Feb-2020	26-Jul-2020
		BH106_0.15-0.25, BH108_1.3-1.4,					✓
EA200N: Asbestos Quantification (non-NATA)		Snap Lock Bag - Friable Asbestos/PSD Bag (EA200N)	28-Jan-2020	----	----	03-Feb-2020	26-Jul-2020
		BH106_0.15-0.25, BH108_1.3-1.4,					✓
	EG005(ED093)T: Total Metals by ICP-AES	Soil Glass Jar - Unpreserved (EG005T)	28-Jan-2020	01-Feb-2020	26-Jul-2020	03-Feb-2020	26-Jul-2020
		BH106_4.0-4.1, BH108_1.3-1.4, QC100				✓	✓
EG035T: Total Recoverable Mercury by FIMS		Soil Glass Jar - Unpreserved (EG035T)	28-Jan-2020	01-Feb-2020	25-Feb-2020	03-Feb-2020	25-Feb-2020
		BH106_4.0-4.1, BH108_1.3-1.4, QC100				✓	✓
	EP066: Polychlorinated Biphenyls (PCB)	Soil Glass Jar - Unpreserved (EP066)	28-Jan-2020	31-Jan-2020	11-Feb-2020	03-Feb-2020	11-Mar-2020
		BH106_0.2-0.3, QC100				✓	✓
EP068A: Organochlorine Pesticides (OC)		Soil Glass Jar - Unpreserved (EP068)	28-Jan-2020	31-Jan-2020	11-Feb-2020	03-Feb-2020	11-Mar-2020
		BH106_0.2-0.3, QC100				✓	✓



Matrix: **SOIL** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method		Sample Date	Extraction / Preparation		Analysis		
Container / Client Sample ID(s)	Date extracted		Due for extraction	Evaluation	Date analysed	Due for analysis	
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068)	QC100	28-Jan-2020	31-Jan-2020	11-Feb-2020	✓	03-Feb-2020	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))	BH106_4.0-4.1, BH108_1.3-1.4, QC100	28-Jan-2020	31-Jan-2020	11-Feb-2020	✓	01-Feb-2020	
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)	BH106_4.0-4.1, BH108_2.3-2.4, QC100	28-Jan-2020	31-Jan-2020	11-Feb-2020	✓	01-Feb-2020	
Soil Glass Jar - Unpreserved (EP080)		28-Jan-2020	31-Jan-2020	11-Feb-2020	✓	04-Feb-2020	
Soil Glass Jar - Unpreserved (EP080)	BH106_4.0-4.1, BH108_2.3-2.4, BH108_4.1-4.2	28-Jan-2020	31-Jan-2020	11-Feb-2020	✓	31-Jan-2020	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP071)	BH106_4.0-4.1, BH108_2.3-2.4, QC100	28-Jan-2020	31-Jan-2020	11-Feb-2020	✓	01-Feb-2020	
Soil Glass Jar - Unpreserved (EP080)		28-Jan-2020	31-Jan-2020	11-Feb-2020	✓	04-Feb-2020	
Soil Glass Jar - Unpreserved (EP080)	BH106_4.0-4.1, BH108_2.3-2.4, BH108_4.1-4.2	28-Jan-2020	31-Jan-2020	11-Feb-2020	✓	31-Jan-2020	
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)	QC100	28-Jan-2020	31-Jan-2020	11-Feb-2020	✓	04-Feb-2020	
Soil Glass Jar - Unpreserved (EP080)	BH106_4.0-4.1, BH108_2.3-2.4, BH108_4.1-4.2	28-Jan-2020	31-Jan-2020	11-Feb-2020	✓	31-Jan-2020	
Soil Glass Jar - Unpreserved (EP080)							✓



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(were) 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: **x** = Quality Control frequency not within specification ; **✓** = Quality Control frequency within specification.

Quality Control Sample Type		Method		Count		Rate (%)		Quality Control Specification	
Analytical Methods				QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)									
Moisture Content		EA055		4	33	12.12	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)		EP075(SIM)		2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS		EP068		1	3	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)		EP066		1	3	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS		EG035T		2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES		EG005T		2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction		EP071		2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX		EP080		4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)									
PAH/Phenols (SIM)		EP075(SIM)		1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS		EP068		1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)		EP066		1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS		EG035T		1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES		EG005T		1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction		EP071		1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX		EP080		2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)									
PAH/Phenols (SIM)		EP075(SIM)		1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS		EP068		1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)		EP066		1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS		EG035T		1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES		EG005T		1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction		EP071		1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX		EP080		2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)									
PAH/Phenols (SIM)		EP075(SIM)		1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS		EP068		1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)		EP066		1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS		EG035T		1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES		EG005T		1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction		EP071		1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX		EP080		2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



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	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 6.1 and Table 1 (14 day holding time).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Asbestos Classification and Quantitation per NEPM 2013	* EA200N	SOIL	Analysis by Polarised Light Microscopy including dispersion staining Asbestos Classification and Quantitation per NEPM 2013 with Confirmation of Identification by AS 4964 - 2004 Gravimetric determination of Asbestos Containing Material, Fibrous Asbestos, Asbestos Fines and sample weight and calculation of percentage concentrations per NEPM protocols. Asbestos (Fines and Fibrous FA+AF) is reported as the equivalent weight in the sample received after accounting for sub-sampling (where applicable for the <7mm and/or <2mm fractions).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. 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 (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂) (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 SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504.505)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to 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. Compliant with NEPM amended 2013.

Preparation Methods	Method	Matrix	Method Descriptions
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Preparation Methods		Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges		EN69	SOIL	In house: Referenced to USEPA 200.2. 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 (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap		ORG16	SOIL	In house: Referenced to 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		ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES2002807

Client : AECOM Australia Pty Ltd Contact : MR ALEX LATHAM Address : PO BOX Q410 QVB POST OFFICE SYDNEY NSW, AUSTRALIA 2000 E-mail : alex.latham@aecom.com Telephone : +61 02 8934 0000 Facsimile : +61 02 8934 0001 Project : 60623599_1.1 Order number : 60623599_1.1 C-O-C number : ---- Site : ---- Sampler : Kurtis Wathen, REBEKAH PANOZZO	Laboratory : Environmental Division Sydney Contact : Brenda Hong Address : 277-289 Woodpark Road Smithfield NSW Australia 2164 E-mail : Brenda.Hong@ALSGlobal.com Telephone : +61 2 8784 8555 Facsimile : +61-2-8784 8500 Page : 1 of 3 Quote number : EB2017AECOMAU0014 (EN/004/16) QC Level : NEPM 2013 B3 & ALS QC Standard
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Dates

Date Samples Received : 28-Jan-2020 17:00	Issue Date : 31-Jan-2020
Client Requested Due : 05-Feb-2020	Scheduled Reporting Date : 05-Feb-2020

Delivery Details

Mode of Delivery : Undefined	Security Seal : Not Available
No. of coolers/boxes : 2	Temperature : 2.6
Receipt Detail :	No. of samples received / analysed : 21 / 8

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- This is an updated SRN which indicates the addition of samples QC100 and QC101 to this work order, as per Alex Latham.
- **Volatile organic compound analysis may be compromised as sample containers contained headspace. Please contact ALS for further information.**
- **Please note that samples BH106_0.2-0.3 and BH108_2.3-2.4 contained water upon receipt. The laboratory suspects lids were not fully secure during transit.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

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

☐ No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary 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.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EA200N Asbestos in Soils - (<1kg samples ONLY)	SOIL - EP075 SIM PAH only SIM - PAH only	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-13 OC/OP/PCB	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES2002807-001	28-Jan-2020 00:00	BH106_0.2-0.3		☐	☐			☐	☐
ES2002807-002	28-Jan-2020 00:00	BH106_0.4-0.5	☐						
ES2002807-003	28-Jan-2020 00:00	BH106_0.8-0.9	☐						
ES2002807-004	28-Jan-2020 00:00	BH106_1.7-1.8	☐						
ES2002807-005	28-Jan-2020 00:00	BH106_2.7-2.8	☐						
ES2002807-006	28-Jan-2020 00:00	BH106_4.0-4.1		☐					☐
ES2002807-007	28-Jan-2020 00:00	BH106_6.0-6.1	☐						
ES2002807-008	28-Jan-2020 00:00	BH108_0.15-0.25			☐				
ES2002807-009	28-Jan-2020 00:00	BH108_0.35-0.45		☐	☐	☐	☐		
ES2002807-010	28-Jan-2020 00:00	BH108_0.5-0.6	☐						
ES2002807-011	28-Jan-2020 00:00	BH108_0.7-0.8	☐						
ES2002807-012	28-Jan-2020 00:00	BH108_0.85-0.9	☐						
ES2002807-013	28-Jan-2020 00:00	BH108_1.3-1.4		☐	☐				☐
ES2002807-014	28-Jan-2020 00:00	BH108_2.3-2.4		☐	☐				☐
ES2002807-015	28-Jan-2020 00:00	BH108_2.5-2.6	☐						
ES2002807-016	28-Jan-2020 00:00	BH108_2.8-2.9	☐						
ES2002807-017	28-Jan-2020 00:00	BH108_4.1-4.2		☐					
ES2002807-018	28-Jan-2020 00:00	BH108_4.3-4.4	☐						
ES2002807-019	28-Jan-2020 00:00	BH108_4.9-5.0	☐						
ES2002807-020	28-Jan-2020 00:00	QC100		☐				☐	☐
ES2002807-021	28-Jan-2020 00:00	QC101	☐						



Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - S-04 TRH/BTEXN
ES2002807-017	28-Jan-2020 00:00	BH108_4.1-4.2	□

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	AP_CustomerService.ANZ@aecom.com
- Chain of Custody (CoC) (COC)	Email	AP_CustomerService.ANZ@aecom.com

ALEX LATHAM

- *AU Certificate of Analysis - NATA (COA)	Email	alex.latham@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	alex.latham@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	alex.latham@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	alex.latham@aecom.com
- Chain of Custody (CoC) (COC)	Email	alex.latham@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	alex.latham@aecom.com
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)	Email	alex.latham@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	alex.latham@aecom.com
- EDI Format - XTab (XTAB)	Email	alex.latham@aecom.com
- Electronic SRN for EQUIS (ESRN_EQUIS)	Email	alex.latham@aecom.com

Fadi Soro

From: Brenda Hong
Sent: Wednesday, 29 January 2020 8:25 AM
To: Samples Sydney
Cc: Loren Schiavoni; Helen Simpson
Subject: COC AECOM - Project 60623599_1.1
Attachments: 60623599_1.1_CoC1.pdf

COC for samples from AECOM delivered by John yesterday afternoon.

Best regards,

Brenda Hong

Client Services Manager, Environmental NSW



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brenda.hong@alsglobal.com
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EnviroMail™ 128 – Revised PFAS Bottle Requirements



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From: Latham, Alex <Alex.Latham@aecom.com>
Sent: Wednesday, 29 January 2020 8:13 AM
To: Brenda Hong <Brenda.Hong@alsglobal.com>; Wathen, Kurtis <Kurtis.Wathen@aecom.com>
Cc: Panozzo, Rebekah <Rebekah.Panozzo@aecom.com>
Subject: RE: [EXTERNAL] - Project 60623599_1.1

Hi Brenda
CoC for samples picked up yesterday. Any Qs, pls call.
Regards,

Alex Latham
Associate Director
D +61 2 8934 0451 M +61 400 973 821
Alex.Latham@aecom.com

AECOM
Level 21, 420 George Street, Sydney, NSW 2000
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www.aecom.com

Please consider the environment before printing this email.

From: Brenda Hong <Brenda.Hong@alsglobal.com>
Sent: Tuesday, 28 January 2020 12:00 PM
To: Wathen, Kurtis <Kurtis.Wathen@aecom.com>
Cc: Panozzo, Rebekah <Rebekah.Panozzo@aecom.com>; Latham, Alex <Alex.Latham@aecom.com>
Subject: RE: [EXTERNAL] - Project 60623599_1.1

Great, thanks Kurtis!

Best regards,

Brenda Hong
Client Services Manager, Environmental NSW



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From: Wathen, Kurtis <Kurtis.Wathen@aecom.com>

Sent: Tuesday, 28 January 2020 11:06 AM

To: Brenda Hong <Brenda.Hong@alsglobal.com>

Cc: Panozzo, Rebekah <Rebekah.Panozzo@aecom.com>; Latham, Alex <Alex.Latham@aecom.com>

Subject: Re: [EXTERNAL] - Project 60623599_1.1

Hi Brenda,

3 pm works, thanks for that.

Kurtis Wathen
Environmental Engineer
+61 447 224 684

From: Brenda Hong <Brenda.Hong@alsglobal.com>

Sent: Tuesday, January 28, 2020 10:25:29 AM

To: Latham, Alex <Alex.Latham@aecom.com>
Cc: Wathen, Kurtis <Kurtis.Wathen@aecom.com>; Panozzo, Rebekah <Rebekah.Panozzo@aecom.com>
Subject: RE: [EXTERNAL] - Project 60623599_1.1

No worries, just spoke to the driver and he said he can do 3pm each day, hopefully that works?

Best regards,

Brenda Hong

Client Services Manager, Environmental NSW



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From: Latham, Alex <Alex.Latham@aecom.com>

Sent: Tuesday, 28 January 2020 10:24 AM

To: Brenda Hong <Brenda.Hong@alsglobal.com>

Cc: Wathen, Kurtis <Kurtis.Wathen@aecom.com>; Panozzo, Rebekah <Rebekah.Panozzo@aecom.com>

Subject: RE: [EXTERNAL] - Project 60623599_1.1

Hey Bren
Hopefully the team will get back to you to advise. Cheers.

Alex Latham

Associate Director

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Alex.Latham@aecom.com

AECOM

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www.aecom.com

Please consider the environment before printing this email.

From: Brenda Hong <Brenda.Hong@alsglobal.com>

Sent: Tuesday, 28 January 2020 10:21 AM

To: Latham, Alex <Alex.Latham@aecom.com>

Cc: Wathen, Kurtis <Kurtis.Wathen@aecom.com>; Panozzo, Rebekah <Rebekah.Panozzo@aecom.com>

Subject: RE: [EXTERNAL] - Project 60623599_1.1

Hey AL, happy 2020! Sorry I was away for a few days... I will arrange for a dedicated driver to pick up samples from the Alexandria site address for each day.
What time is suitable for your team?

Best regards,

Brenda Hong

Client Services Manager, Environmental NSW



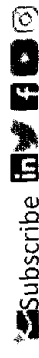
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From: Latham, Alex <Alex.Latham@aecom.com>

Sent: Friday, 24 January 2020 1:22 PM

To: Brenda Hong <Brenda.Hong@alsglobal.com>

Cc: Wathen, Kurtis <Kurtis.Wathen@aecom.com>; Panozzo, Rebekah <Rebekah.Panozzo@aecom.com>

Subject: [EXTERNAL] - Project 60623599_1.1

CAUTION: This email originated from outside of ALS. Do not click links or open attachments unless you recognize the sender and are sure content is relevant to you.

Hi Brenda,

Just wanted to let you know we are commencing a drilling program on Tuesday (for about 5 days) and will prob' need ALS to come pick up samples at the end of each day.

1-3 Burrows Rd Alexandria.

Speak soon.

Cheers,

Alex Latham

Associate Director

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Alex.Latham@aecom.com

AECOM

Level 21, 420 George Street, Sydney, NSW 2000

PO Box Q410, QVB PO, Sydney, NSW, 1230

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CHAIN OF CUSTODY

AECOM Australia Pty Ltd

Sydney (420 George St)

T: 02 8934 0451

M: 0400 973 821

AECOM Project Manager: Alex Latham

AECOM Project Manager Email: Alex.Latham@aecom.com

Sampled By: Kurtis Wathen / Rebekah Panozzo

AECOM Project No: 60623599_1.1

Project Name: Burrows IE

PO No. refer Project #

Laboratory Details

Lab Name: ALS

Lab Address: 277 Woodpark Rd, Smithfield

Contact Name: Brenda Hong

Lab. Ref:

Tel: 8784 8515

Fax:

Preliminary Report by:

Final Report by:

Lab Quote No: EN/004/16

Specifications: All reports to be emailed to AECOM Project Manager

ESDAT & Equis & XLS format also required

1. Urgent TAT required? (please circle: 24hr 48hr 5 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:)

Yes

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix		Preservation				Container (No. & type)	Analysis Request							send requested soil QC samples to Envirolab with crushed ice please
			soil	water	other	filled	acid	ice	other	PAH	8 Metals	OCF, OPP, PCB	Asbestos (EA200N)	TRH > C10-C40 (EP071)			

BH106 - 0.2-0.3

QC100

BH106 - 0.4-0.5

BH106 - 0.8-0.9

BH106 - 1.7-1.8

BH106 - 2.7-2.8

BH106 - 4.0-4.1

BH106 - 6.0-6.1

BH108 - 0.15-0.25

BH108 - 0.35-0.45

BH108 - 0.5-0.6

BH108 - 0.7-0.8

BH108 - 0.85-0.9

BH108 - 1.3-1.4

Comments:

* Metals As, Cd, Cr, Cu, Hg, Ni, Pb, Zn

Required:

Relinquished by:

Received by: JUSTIN

Signed:

Signed:

Date:

Date: 28/11/20

Relinquished by:

Received by:

Signed:

Signed:

Date:

Date:



Environmental

CERTIFICATE OF ANALYSIS

Work Order	: ES2003147	Page	: 1 of 17
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MR ALEX LATHAM	Contact	: Brenda Hong
Address	: PO BOX Q410 QVB POST OFFICE SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 8934 0000	Telephone	: +61 2 8784 8555
Project	: 60623599_1.1	Date Samples Received	: 30-Jan-2020 15:00
Order number	: 60623599_1.1	Date Analysis Commenced	: 01-Feb-2020
C-O-C number	: ---	Issue Date	: 07-Feb-2020 16:25
Sampler	: Kurtis Wathen, REBEKAH PANOZZO		
Site	: ---		
Quote number	: EN/004/16		
No. of samples received	: 38		
No. of samples analysed	: 13		



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

□ □ □ □ □ □ □ □

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

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Alana Smylie	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



Page : 2 of 17
Work Order : ES2003147
Client : AECOM Australia Pty Ltd
Project : 60623599_1.1

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 insufficient 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 sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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

Δ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenzo(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP068: Positive results have been confirmed by re-extraction and re-analysis.
- EA200N: Asbestos weights and percentages are not covered under the Scope of NATA Accreditation.
Weights of Asbestos are based on extracted bulk asbestos, fibre bundles, and/or ACM and do not include respirable fibres (if present)
The Asbestos (Fines and Fibrous) weight is calculated from the extracted Fibrous Asbestos and Asbestos Fines as an equivalent weight of 100% Asbestos
Percentages for Asbestos content in ACM are based on the 2013 NEPM default values.
All calculations of percentage Asbestos under this method are approximate and should be used as a guide only.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200N: ALS laboratory procedures and methods used for the identification and quantitation of asbestos are consistent with AS4964-2004 and the requirements of the 2013 NEPM for Assessment of Site Contamination
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH116_0.3-0.4		BH116_0.6-0.65		BH117_1.3-1.4		BH117_2.2-2.3	
30-Jan-2020 00:00		30-Jan-2020 00:00		30-Jan-2020 00:00		30-Jan-2020 00:00		30-Jan-2020 00:00	
ES2003147-001		ES2003147-002		ES2003147-005		ES2003147-007		ES2003147-008	
Result		Result		Result		Result		Result	
11.6		12.8		9.2		31.0		24.9	
%		g/kg		g/kg		g/kg		g/kg	
1.0		0.1		0.1		0.1		0.1	
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EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content									
1332-21-4									
1332-21-4									
1332-21-4									
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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH116_0.3-0.4		BH116_0.6-0.65		BH117_1.3-1.4		BH117_2.2-2.3	
30-Jan-2020 00:00		30-Jan-2020 00:00		30-Jan-2020 00:00		30-Jan-2020 00:00		30-Jan-2020 00:00	
ES2003147-001		ES2003147-002		ES2003147-005		ES2003147-007		ES2003147-008	
Result		Result		Result		Result		Result	
EP068A: Organochlorine Pesticides (OC) - Continued									
gamma-BHC	58-89-9	0.05	mg/kg	<0.05					
delta-BHC	319-86-8	0.05	mg/kg	<0.05					
Heptachlor	76-44-8	0.05	mg/kg	<0.05					
Aldrin	309-00-2	0.05	mg/kg	<0.05					
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05					
^ Total Chlordane (sum)		0.05	mg/kg	<0.05					
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05					
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05					
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05					
Dieldrin	60-57-1	0.05	mg/kg	<0.05					
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05					
Endrin	72-20-8	0.05	mg/kg	<0.05					
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05					
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05					
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05					
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05					
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05					
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2					
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05					
Methoxychlor	72-43-5	0.2	mg/kg	<0.2					
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05					
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.05	mg/kg	<0.05					
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg	<0.05					
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05					
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2					
Dimethoate	60-51-5	0.05	mg/kg	<0.05					
Diazinon	333-41-5	0.05	mg/kg	<0.05					
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05					
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2					
Malathion	121-75-5	0.05	mg/kg	<0.05					
Fenthion	55-38-9	0.05	mg/kg	<0.05					
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05					
Parathion	56-38-2	0.2	mg/kg	<0.2					



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH116_0.3-0.4		BH116_0.6-0.65		BH117_1.3-1.4		BH117_2.2-2.3	
30-Jan-2020 00:00		30-Jan-2020 00:00		30-Jan-2020 00:00		30-Jan-2020 00:00		30-Jan-2020 00:00	
ES2003147-001		ES2003147-002		ES2003147-005		ES2003147-007		ES2003147-008	
Result		Result		Result		Result		Result	
Result		Result		Result		Result		Result	
EP068B: Organophosphorus Pesticides (OP) - Continued									
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05					
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05					
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05					
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05					
Prothiofos	34643-46-4	0.05	mg/kg	<0.05					
Ethion	563-12-2	0.05	mg/kg	<0.05					
Carbophenothion	786-19-6	0.05	mg/kg	<0.05					
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05					
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	<100



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH116_0.3-0.4		BH116_0.6-0.65		BH117_1.3-1.4		BH117_2.2-2.3		
30-Jan-2020 00:00		30-Jan-2020 00:00		30-Jan-2020 00:00		30-Jan-2020 00:00		30-Jan-2020 00:00		
ES2003147-001		ES2003147-002		ES2003147-005		ES2003147-007		ES2003147-008		
Result		Result		Result		Result		Result		
Result		Result		Result		Result		Result		
EP080/071: Total Petroleum Hydrocarbons - Continued										
^ C10 - C36 Fraction (sum)		50	mg/kg	<50		-----		1450		
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions										
C6 - C10 Fraction		C6_C10	10	mg/kg	<10		-----		<10	
^ C6 - C10 Fraction minus BTEX (F1)		C6_C10-BTEX	10	mg/kg	<10		-----		<10	
>C10 - C16 Fraction		-----	50	mg/kg	<50		-----		<50	
>C16 - C34 Fraction		-----	100	mg/kg	180		-----		1310	
>C34 - C40 Fraction		-----	100	mg/kg	<100		-----		260	
^ >C10 - C40 Fraction (sum)		-----	50	mg/kg	180		-----		1570	
^ >C10 - C16 Fraction minus Naphthalene (F2)		-----	50	mg/kg	<50		-----		<50	
EP080: BTEXN										
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	
^ Sum of BTEX		-----	0.2	mg/kg	<0.2		-----		<0.2	
^ Total Xylenes		-----	0.5	mg/kg	<0.5		-----		<0.5	
Naphthalene		91-20-3	1	mg/kg	<1		-----		<1	
EP066S: PCB Surrogate										
Decachlorobiphenyl		2051-24-3	0.1	%	94.9		-----		-----	
EP068S: Organochlorine Pesticide Surrogate										
Dibromo-DDE		21655-73-2	0.05	%	104		-----		-----	
EP068T: Organophosphorus Pesticide Surrogate										
DEF		78-48-8	0.05	%	98.3		-----		-----	
EP075(SIM)S: Phenolic Compound Surrogates										
Phenol-d6		13127-88-3	0.5	%	83.4		92.9		93.8	
2-Chlorophenol-D4		93951-73-6	0.5	%	88.1		94.0		94.3	
2,4,6-Tribromophenol		118-79-6	0.5	%	64.0		75.8		70.1	
EP075(SIM)T: PAH Surrogates										
2-Fluorobiphenyl		321-60-8	0.5	%	100.0		106		107	
Anthracene-d10		1719-06-8	0.5	%	92.1		110		102	
4-Terphenyl-d14		1718-51-0	0.5	%	96.6		103		98.0	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH115_0.6-0.7										BH115_2.5-2.6										BH111_0.3-0.4										BH111_0.65-0.75										BH110_0.35-0.36									
		29-Jan-2020 00:00										29-Jan-2020 00:00										30-Jan-2020 00:00										30-Jan-2020 00:00										28-Jan-2020 00:00									
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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH115_0.6-0.7		BH115_2.5-2.6		BH111_0.3-0.4		BH111_0.65-0.75		BH110_0.35-0.36	
		29-Jan-2020 00:00		29-Jan-2020 00:00		30-Jan-2020 00:00		30-Jan-2020 00:00		28-Jan-2020 00:00	
		ES2003147-014		ES2003147-016		ES2003147-023		ES2003147-024		ES2003147-028	
		Result		Result		Result		Result		Result	
EP068A: Organochlorine Pesticides (OC) - Continued											
gamma-BHC	58-89-9	0.05	mg/kg	<0.05						<0.05	
delta-BHC	319-86-8	0.05	mg/kg	<0.05						<0.05	
Heptachlor	76-44-8	0.05	mg/kg	<0.05						<0.05	
Aldrin	309-00-2	0.05	mg/kg	<0.05						0.08	
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05						<0.05	
^ Total Chlordane (sum)	-----	0.05	mg/kg	<0.05						<0.05	
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05						<0.05	
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05						<0.05	
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05						<0.05	
Dieldrin	60-57-1	0.05	mg/kg	<0.05						1.24	
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05						<0.05	
Endrin	72-20-8	0.05	mg/kg	<0.05						<0.05	
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05						<0.05	
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05						<0.05	
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05						<0.05	
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05						<0.05	
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05						<0.05	
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2						<0.2	
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05						<0.05	
Methoxychlor	72-43-5	0.2	mg/kg	<0.2						<0.2	
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05						1.32	
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.05	mg/kg	<0.05						<0.05	
EP068B: Organophosphorus Pesticides (OP)											
Dichlorvos	62-73-7	0.05	mg/kg	<0.05						<0.05	
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05						<0.05	
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2						<0.2	
Dimethoate	60-51-5	0.05	mg/kg	<0.05						<0.05	
Diazinon	333-41-5	0.05	mg/kg	<0.05						<0.05	
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05						<0.05	
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2						<0.2	
Malathion	121-75-5	0.05	mg/kg	<0.05						<0.05	
Fenthion	55-38-9	0.05	mg/kg	<0.05						<0.05	
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05						<0.05	
Parathion	56-38-2	0.2	mg/kg	<0.2						<0.2	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH115_0.6-0.7 29-Jan-2020 00:00 ES2003147-014												BH115_2.5-2.6 29-Jan-2020 00:00 ES2003147-016												BH111_0.3-0.4 30-Jan-2020 00:00 ES2003147-023												BH111_0.65-0.75 30-Jan-2020 00:00 ES2003147-024												BH110_0.35-0.36 28-Jan-2020 00:00 ES2003147-028											
Result		Result												Result												Result												Result												Result											
EP068B: Organophosphorus Pesticides (OP) - Continued																																																													
Pirimphos-ethyl		23505-41-1 0.05 mg/kg												<0.05												-----												-----												<0.05											
Chlorfenvinphos		470-90-6 0.05 mg/kg												<0.05												-----												-----												<0.05											
Bromophos-ethyl		4824-78-6 0.05 mg/kg												<0.05												-----												-----												<0.05											
Fenamiphos		22224-92-6 0.05 mg/kg												<0.05												-----												-----												<0.05											
Prothiofos		34643-46-4 0.05 mg/kg												<0.05												-----												-----												<0.05											
Ethion		563-12-2 0.05 mg/kg												<0.05												-----												-----												<0.05											
Carbophenothion		786-19-6 0.05 mg/kg												<0.05												-----												-----												<0.05											
Azinphos Methyl		86-50-0 0.05 mg/kg												<0.05												-----												-----												<0.05											
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons																																																													
Naphthalene		91-20-3 0.5 mg/kg												<0.5												<0.5												<0.5												<0.5											
Acenaphthylene		208-96-8 0.5 mg/kg												<0.5												<0.5												<0.5												<0.5											
Acenaphthene		83-32-9 0.5 mg/kg												<0.5												<0.5												<0.5												<0.5											
Fluorene		86-73-7 0.5 mg/kg												<0.5												<0.5												<0.5												<0.5											
Phenanthrene		85-01-8 0.5 mg/kg												<0.5												<0.5												<0.5												0.9											
Anthracene		120-12-7 0.5 mg/kg												<0.5												<0.5												<0.5												<0.5											
Fluoranthene		206-44-0 0.5 mg/kg												0.5												<0.5												<0.5												3.6											
Pyrene		129-00-0 0.5 mg/kg												0.5												<0.5												<0.5												4.1											
Benz(a)anthracene		56-55-3 0.5 mg/kg												<0.5												<0.5												<0.5												2.2											
Chrysene		218-01-9 0.5 mg/kg												<0.5												<0.5												<0.5												2.0											
Benzo(b+)fluoranthene		205-99-2 0.5 mg/kg												<0.5												<0.5												<0.5												2.3											
Benzo(k)fluoranthene		207-08-9 0.5 mg/kg												<0.5												<0.5												<0.5												0.8											
Benzo(a)pyrene		50-32-8 0.5 mg/kg												<0.5												<0.5												<0.5												1.8											
Indeno(1,2,3.cd)pyrene		193-39-5 0.5 mg/kg												<0.5												<0.5												<0.5												0.8											
Dibenz(a,h)anthracene		53-70-3 0.5 mg/kg												<0.5												<0.5												<0.5												<0.5											
Benzo(g,h,i)perylene		191-24-2 0.5 mg/kg												<0.5												<0.5												<0.5												0.7											
^ Sum of polycyclic aromatic hydrocarbons		----- 0.5 mg/kg												1.0												<0.5												<0.5												19.2											
^ Benzo(a)pyrene TEQ (zero)		----- 0.5 mg/kg												<0.5												<0.5												<0.5												2.4											
^ Benzo(a)pyrene TEQ (half LOR)		----- 0.5 mg/kg												0.6												0.6												0.6												2.7											
^ Benzo(a)pyrene TEQ (LOR)		----- 0.5 mg/kg												1.2												1.2												1.2												2.9											
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												-----												430											
C29 - C36 Fraction		----- 100 mg/kg												110												<100												-----												480											



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH115_0.6-0.7		BH115_2.5-2.6		BH111_0.3-0.4		BH111_0.65-0.75		BH110_0.35-0.36	
		29-Jan-2020 00:00		29-Jan-2020 00:00		30-Jan-2020 00:00		30-Jan-2020 00:00		28-Jan-2020 00:00	
		ES2003147-014		ES2003147-016		ES2003147-023		ES2003147-024		ES2003147-028	
		Result		Result		Result		Result		Result	
EP080/071: Total Petroleum Hydrocarbons - Continued											
^ C10 - C36 Fraction (sum)		50	mg/kg	<50		<50		----		910	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions											
C6 - C10 Fraction		10	mg/kg	<10		<10		----		<10	
^ C6 - C10 Fraction minus BTEX (F1)		10	mg/kg	<10		<10		----		<10	
>C10 - C16 Fraction		50	mg/kg	<50		<50		----		<50	
>C16 - C34 Fraction		100	mg/kg	<100		<100		----		740	
>C34 - C40 Fraction		100	mg/kg	<100		<100		----		340	
^ >C10 - C40 Fraction (sum)		50	mg/kg	<50		<50		----		1080	
^ >C10 - C16 Fraction minus Naphthalene (F2)		50	mg/kg	<50		<50		----		<50	
EP080: BTEXN											
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	
^ Sum of BTEX	----	0.2	mg/kg	<0.2		<0.2		----		<0.2	
^ Total Xylenes	----	0.5	mg/kg	<0.5		<0.5		----		<0.5	
Naphthalene	91-20-3	1	mg/kg	<1		<1		----		<1	
EP066S: PCB Surrogate											
Decachlorobiphenyl	2051-24-3	0.1	%	112		----		----		88.7	
EP068S: Organochlorine Pesticide Surrogate											
Dibromo-DDE	21655-73-2	0.05	%	137		----		----		90.1	
EP068T: Organophosphorus Pesticide Surrogate											
DEF	78-48-8	0.05	%	68.9		----		----		101	
EP075(SIM)S: Phenolic Compound Surrogates											
Phenol-d6	13127-88-3	0.5	%	81.2		94.4		91.3		83.0	
2-Chlorophenol-D4	93951-73-6	0.5	%	86.2		97.7		87.8		81.9	
2,4,6-Tribromophenol	118-79-6	0.5	%	81.5		79.5		43.8		92.0	
EP075(SIM)T: PAH Surrogates											
2-Fluorobiphenyl	321-60-8	0.5	%	98.2		107		109		98.0	
Anthracene-d10	1719-06-8	0.5	%	88.9		114		117		84.6	
4-Terphenyl-d14	1718-51-0	0.5	%	94.2		105		109		89.0	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH115_0.6-0.7		BH115_2.5-2.6		BH111_0.3-0.4		BH111_0.65-0.75		BH110_0.35-0.36	
29-Jan-2020 00:00		29-Jan-2020 00:00		29-Jan-2020 00:00		30-Jan-2020 00:00		30-Jan-2020 00:00		28-Jan-2020 00:00	
ES2003147-014		ES2003147-016		ES2003147-023		ES2003147-024		ES2003147-028			
Result		Result		Result		Result		Result		Result	
EP080S: TPH(V)/BTEx Surrogates											
1.2-Dichloroethane-D4		17060-07-0	0.2	%		100		103		93.2	
Toluene-D8		2037-26-5	0.2	%		91.1		95.0		82.2	
4-Bromofluorobenzene		460-00-4	0.2	%		85.8		92.2		73.5	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH110_0.4-0.6		BH110_1.2-1.3			
28-Jan-2020 00:00		28-Jan-2020 00:00		28-Jan-2020 00:00			
ES2003147-029		ES2003147-029		ES2003147-031			
Result		Result		Result			



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH110_0.4-0.6		BH110_1.2-1.3					
28-Jan-2020 00:00		28-Jan-2020 00:00		28-Jan-2020 00:00					
ES2003147-029		ES2003147-031		Result					
Result		Result		Result					
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5				
Fluoranthene	206-44-0	0.5	mg/kg	1.7	3.8				
Pyrene	129-00-0	0.5	mg/kg	1.4	5.7				
Benzo(a)anthracene	56-55-3	0.5	mg/kg	0.5	2.5				
Chrysene	218-01-9	0.5	mg/kg	0.5	2.9				
Benzo(b+)fluoranthene	205-99-2	0.5	mg/kg	0.7	3.1				
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	0.9				
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	2.8				
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	mg/kg	<0.5	1.2				
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5				
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	1.7				
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	6.3	25.7				
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	3.6				
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.7	3.9				
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	4.1				
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	96.9	91.0				
2-Chlorophenol-D4	93951-73-6	0.5	%	97.1	96.0				
2,4,6-Tribromophenol	118-79-6	0.5	%	72.2	93.4				
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	114	107				
Anthracene-d10	1719-06-8	0.5	%	105	109				
4-Terphenyl-d14	1718-51-0	0.5	%	104	102				



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		QC302		30-Jan-2020 00:00		ES2003147-012		Result	
EP080/071: Total Petroleum Hydrocarbons		20		µg/L		<20			
C6 - C9 Fraction		20		µg/L		<20			
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions		20		µg/L		<20			
C6 - C10 Fraction		20		µg/L		<20			
^ C6 - C10 Fraction minus BTEX (F1)		20		µg/L		<20			
EP080: BTEXN		1		µg/L		<1			
Benzene		71-43-2		µg/L		<1			
Toluene		108-88-3		µg/L		<2			
Ethylbenzene		100-41-4		µg/L		<2			
meta- & para-Xylene		108-38-3 106-42-3		µg/L		<2			
ortho-Xylene		95-47-6		µg/L		<2			
^ Total Xylenes		2		µg/L		<2			
^ Sum of BTEX		1		µg/L		<1			
Naphthalene		91-20-3		µg/L		<5			
EP080S: TPH(V)/BTEX Surrogates		2		%		104			
1,2-Dichloroethane-D4		17060-07-0		%		109			
Toluene-D8		2037-26-5		%		106			
4-Bromofluorobenzene		460-00-4		%					



Analytical Results

Sub-Matrix: SOIL

[illegible]



Surrogate Control Limits

Sub-Matrix: SOIL				Recovery Limits (%)	
	□ □ □ □ □ □	□ □ □ □ □ □		Low	High
EP066S: PCB Surrogate					
Decachlorobiphenyl		2051-24-3		39	149
EP068S: Organochlorine Pesticide Surrogate					
Dibromo-DDE		21655-73-2		49	147
EP068T: Organophosphorus Pesticide Surrogate					
DEF		78-48-8		35	143
EP075(SIM)S: Phenolic Compound Surrogates					
Phenol-d6		13127-88-3		63	123
2-Chlorophenol-D4		93951-73-6		66	122
2,4,6-Tribromophenol		118-79-6		40	138
EP075(SIM)T: PAH Surrogates					
2-Fluorobiphenyl		321-60-8		70	122
Anthracene-d10		1719-06-8		66	128
4-Terphenyl-d14		1718-51-0		65	129
EP080S: TPH(V)/BTX Surrogates					
1,2-Dichloroethane-D4		17060-07-0		73	133
Toluene-D8		2037-26-5		74	132
4-Bromofluorobenzene		460-00-4		72	130
Sub-Matrix: WATER					
	□ □ □ □ □ □	□ □ □ □ □ □		Low	High
EP080S: TPH(V)/BTX Surrogates					
1,2-Dichloroethane-D4		17060-07-0		71	137
Toluene-D8		2037-26-5		79	131
4-Bromofluorobenzene		460-00-4		70	128



Environmental

QUALITY CONTROL REPORT

Work Order : **ES2003147**

Page : 1 of 14

Client : **AECOM Australia Pty Ltd**
Contact : **MR ALEX LATHAM**
Address : **PO BOX Q410 QVB POST OFFICE
SYDNEY NSW, AUSTRALIA 2000**
Telephone : **+61 02 8934 0000**
Project : **60623599_1.1**
Order number : **60623599_1.1**
C-O-C number : **----**
Sampler : **Kurtis Wathen, REBEKAH PANOZZO**
Site : **----**
Quote number : **EN/004/16**
No. of samples received : **38**
No. of samples analysed : **13**

Laboratory : **Environmental Division Sydney**
Contact : **Brenda Hong**
Address : **277-289 Woodpark Road Smithfield NSW Australia 2164**
Telephone : **+61 2 8784 8555**
Date Samples Received : **30-Jan-2020**
Date Analysis Commenced : **01-Feb-2020**
Issue Date : **07-Feb-2020**



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

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

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

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Alana Smylie
Edwandy Fadjar
Edwandy Fadjar
Ivan Taylor

Asbestos Identifier
Organic Coordinator
Organic Coordinator
Analyst

Newcastle - Asbestos, Mayfield West, NSW
Sydney Inorganics, Smithfield, NSW
Sydney Organics, Smithfield, NSW
Sydney Inorganics, Smithfield, NSW

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 a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high:

CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

= Indicates failed QC

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 sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2839957)									
EM2001381-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	11	11	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	3	3	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	79	82	3.98	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	29	27	9.48	No Limit
ES2003147-016	BH115_2.5-2.6	EG005T: Cadmium	7440-43-9	1	mg/kg	13	11	15.4	0% - 50%
		EG005T: Chromium	7440-47-3	2	mg/kg	38	38	0.00	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	145	155	6.48	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	117	99	16.8	0% - 20%
		EG005T: Copper	7440-50-8	5	mg/kg	872	1040	17.9	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	6390	5870	8.46	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	2930	3080	4.99	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2839968)									
ES2002923-001	Anonymous	EA055: Moisture Content	----	0.1	%	9.9	9.0	8.93	No Limit
ES2003147-024	BH111_0.65-0.75	EA055: Moisture Content	----	0.1	%	15.0	14.9	0.754	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2839956)									
EM2001381-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES2003147-016	BH115_2.5-2.6	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 2836713)									
ES2002677-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES2003046-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2836716)									



Sub-Matrix: **SOIL**

Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report			
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2836716) - continued							Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
ES2002677-001	Anonymous		EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
			EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
			EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
ES2003046-001	Anonymous		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
			EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit



Sub-Matrix: **SOIL**

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 (%)	
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2836716) - continued										
ES2003046-001	Anonymous	EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit	
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit	
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 2836716)										
ES2002677-001	Anonymous	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit	
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit	
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit	
		ES2003046-001	Anonymous	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00
EP068: Demeton-S-methyl	919-86-8			0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
EP068: Dimethoate	60-51-5			0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
EP068: Diazinon	333-41-5			0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
EP068: Chlorpyrifos-methyl	5598-13-0			0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
EP068: Malathion	121-75-5			0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
EP068: Fenthion	55-38-9			0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
EP068: Chlorpyrifos	2921-88-2			0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
EP068: Pirimphos-ethyl	23505-41-1			0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
EP068: Chlorfenvinphos	470-90-6			0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
EP068: Bromophos-ethyl	4824-78-6			0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
EP068: Fenamiphos	22224-92-6			0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
EP068: Prothiofos	34643-46-4			0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
EP068: Ethion	563-12-2			0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
EP068: Carbophenothion	786-19-6			0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
EP068: Azinphos Methyl	86-50-0			0.05	mg/kg	<0.05	<0.05	0.00	No Limit	
EP068: Monocrotophos	6923-22-4			0.2	mg/kg	<0.2	<0.2	0.00	No Limit	
EP068: Parathion-methyl	298-00-0			0.2	mg/kg	<0.2	<0.2	0.00	No Limit	



Sub-Matrix: **SOIL**

Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report			
Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 2836716) - continued										
ES2003046-001	Anonymous		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2836715)										
ES2002677-001	Anonymous		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Benzo(b+)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
				205-82-3						
			EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Indeno(1,2,3-cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Dibenzo(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES2003046-001	Anonymous		EP075(SIM): Benzo(a)pyrene TEQ (zero)	---	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Benzo(b+)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
				205-82-3						
			EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Indeno(1,2,3-cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Dibenzo(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit



Sub-Matrix: SOIL		Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2836715) - continued									
ES2003046-001	Anonymous	EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2836719)									
ES2003147-002	BH116_0.6-0.65	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	0.7	1.0	30.6	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	0.7	1.0	25.9	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	0.7	0.6	17.1	No Limit
			205-82-3						
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	0.6	<0.5	22.2	No Limit
		EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	3.2	2.6	20.7	No Limit
		ES2003046-008	Anonymous	EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	0.7	<0.5
EP075(SIM): Naphthalene	91-20-3			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Acenaphthylene	208-96-8			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Acenaphthene	83-32-9			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Fluorene	86-73-7			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Phenanthrene	85-01-8			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Anthracene	120-12-7			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Fluoranthene	206-44-0			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Pyrene	129-00-0			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Benz(a)anthracene	56-55-3			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Chrysene	218-01-9			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
	205-82-3								
EP075(SIM): Benzo(k)fluoranthene	207-08-9			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Benzo(a)pyrene	50-32-8			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Dibenz(a,h)anthracene	53-70-3			0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2836719) - continued									
ES2003046-008	Anonymous	EP075(SIM): Benzo(g,h,i)perylene	191-24-2 ----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons		0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)		0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2836694)									
ES2003147-001	BH116_0.3-0.4	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EW2000476-004	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2836714)									
ES2002677-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
ES2003046-001	Anonymous	EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2836718)									
ES2003147-002	BH116_0.6-0.65	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
ES2003046-008	Anonymous	EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
ES2003046-008	Anonymous	EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2836694)									
ES2003147-001	BH116_0.3-0.4	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
		EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2836714)									
ES2002677-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
ES2003046-001	Anonymous	EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2836718)									
ES2003147-002	BH116_0.6-0.65	EP071: >C16 - C34 Fraction	----	100	mg/kg	180	130	28.5	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES2003046-008	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080: BTEXN (QC Lot: 2836694)									



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL									
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 2836694) - continued									
ES2003147-001	BH116_0.3-0.4	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
EW2000476-004	Anonymous	EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Sub-Matrix: **WATER**

Sub-Matrix: WATER									
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/074: Total Petroleum Hydrocarbons (QC Lot: 2843462)									
ES2003147-012	QC302	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/074: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2843462)									
ES2003147-012	QC302	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 2843462)									
ES2003147-012	QC302	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphtthalene	91-20-3	5	µg/L	<5	<5	0.00	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 Spike (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

Sub-Matrix: SOIL		Method Blank (MB) Report			Laboratory Control Spike (LCS) Report					
Method: Compound		CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2839957)										
EG005T: Arsenic		7440-38-2	5	mg/kg	<5	21.7 mg/kg	105		86.0	126
EG005T: Cadmium		7440-43-9	1	mg/kg	<1	4.64 mg/kg	96.2		83.0	113
EG005T: Chromium		7440-47-3	2	mg/kg	<2	43.9 mg/kg	102		76.0	128
EG005T: Copper		7440-50-8	5	mg/kg	<5	32 mg/kg	94.0		86.0	120
EG005T: Lead		7439-92-1	5	mg/kg	<5	40 mg/kg	95.4		80.0	114
EG005T: Nickel		7440-02-0	2	mg/kg	<2	55 mg/kg	90.6		87.0	123
EG005T: Zinc		7440-66-6	5	mg/kg	<5	60.8 mg/kg	81.4		80.0	122
EG035T : Total Recoverable Mercury by FIMS (QCLot: 2839956)										
EG035T: Mercury		7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	84.9		70.0	105
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 2836713)										
EP066: Total Polychlorinated biphenyls		---	0.1	mg/kg	<0.1	1 mg/kg	105		62.0	126
EP068A: Organochlorine Pesticides (OC) (QCLot: 2836716)										
EP068: alpha-BHC		319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	102		69.0	113
EP068: Hexachlorobenzene (HCB)		118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	103		65.0	117
EP068: beta-BHC		319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	103		67.0	119
EP068: gamma-BHC		58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	104		68.0	116
EP068: delta-BHC		319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	104		65.0	117
EP068: Heptachlor		76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	102		67.0	115
EP068: Aldrin		309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	108		69.0	115
EP068: Heptachlor epoxide		1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	98.3		62.0	118
EP068: trans-Chlordane		5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	105		63.0	117
EP068: alpha-Endosulfan		959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	108		66.0	116
EP068: cis-Chlordane		5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	106		64.0	116
EP068: Dieldrin		60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	98.1		66.0	116
EP068: 4,4'-DDE		72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	106		67.0	115
EP068: Endrin		72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	102		67.0	123
EP068: beta-Endosulfan		33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	99.2		69.0	115
EP068: 4,4'-DDD		72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	99.4		69.0	121
EP068: Endrin aldehyde		7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	81.0		56.0	120
EP068: Endosulfan sulfate		1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	107		62.0	124
EP068: 4,4'-DDT		50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	101		66.0	120
EP068: Endrin ketone		53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	105		64.0	122
EP068: Methoxychlor		72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	100		54.0	130
EP068E: Organophosphorus Pesticides (OP) (QCLot: 2836716)										



Sub-Matrix: **SOIL**

Method: Compound				Method Blank (MB) Report		Laboratory Control Spike (LCS) Report			
CAS Number				Result	Concentration	Spike Recovery (%)	LCS	Low	High
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2836716) - continued									
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	83.1	59.0	119	
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	105	62.0	128	
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	76.7	54.0	126	
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	89.7	67.0	119	
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	97.4	70.0	120	
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	90.4	72.0	120	
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	90.4	68.0	120	
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	92.5	68.0	122	
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	93.8	69.0	117	
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	97.6	76.0	118	
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	89.9	64.0	122	
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	83.8	70.0	116	
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	87.0	69.0	121	
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	96.1	66.0	118	
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	80.0	68.0	124	
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	100	62.0	112	
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	93.5	68.0	120	
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	101	65.0	127	
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	91.4	41.0	123	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2836715)									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	91.2	77.0	125	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	94.9	72.0	124	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	96.1	73.0	127	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	97.1	72.0	126	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	97.5	75.0	127	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	93.1	77.0	127	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	95.3	73.0	127	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	98.0	74.0	128	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	93.1	69.0	123	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	97.6	75.0	127	
EP075(SIM): Benzo(b+h)fluoranthene	205-99-2	0.5	mg/kg	<0.5	6 mg/kg	95.9	68.0	116	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	89.1	74.0	126	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	92.8	70.0	126	
EP075(SIM): Indeno(1,2,3-cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	95.2	61.0	121	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	94.0	62.0	118	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	92.2	63.0	121	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2836719)									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	114	77.0	125	



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Laboratory Control Spike (LCS) Report							
Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Spike		Spike Recovery (%)		Recovery Limits (%)		
				Result	Concentration	LCS	Low	High			
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2836719) - continued											
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	114	72.0	124			
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	112	73.0	127			
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	114	72.0	126			
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	119	75.0	127			
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	121	77.0	127			
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	120	73.0	127			
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	125	74.0	128			
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	109	69.0	123			
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	113	75.0	127			
EP075(SIM): Benzo(b+)fluoranthene	205-99-2	0.5	mg/kg	<0.5	6 mg/kg	111	68.0	116			
	205-82-3										
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	110	74.0	126			
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	113	70.0	126			
EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	107	61.0	121			
EP075(SIM): Dibenzo(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	103	62.0	118			
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	103	63.0	121			
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2836694)											
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	88.5	68.4	128			
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2836714)											
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	105	75.0	129			
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	107	77.0	131			
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	106	71.0	129			
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2836718)											
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	108	75.0	129			
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	117	77.0	131			
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	115	71.0	129			
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2836694)											
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	90.8	68.4	128			
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2836714)											
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	103	77.0	125			
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	103	74.0	138			
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	111	63.0	131			
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2836718)											
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	112	77.0	125			
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	113	74.0	138			
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	118	63.0	131			
EP080: BTEXN (QCLot: 2836694)											
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	102	62.0	116			

Sub-Matrix: SOIL

Sub-Matrix: WATER

Matrix Spike (MS) Report

Sub-Matrix: SOIL

EG035T: Total Recoverable Mercury by FIMS (QCLot: 2839956)



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%)	Recovery Limits (%)	
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2839956) - continued							
EM2001381-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	80.7	70.0	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 2836713)							
ES2002677-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	92.0	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 2836716)							
ES2002677-001	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	97.3	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	102	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	103	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	80.4	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	93.1	70.0	130
		EP068: 4,4'-DDT	50-29-3	2 mg/kg	87.6	70.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2836716)							
ES2002677-001	Anonymous	EP068: Diazinon	333-41-5	0.5 mg/kg	93.2	70.0	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	80.4	70.0	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	72.7	70.0	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	74.6	70.0	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	72.4	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2836715)							
ES2002677-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	97.2	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	93.2	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2836719)							
ES2003046-008	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	114	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	122	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2836694)							
ES2003147-001	BH116_0.3-0.4	EP080: C6 - C9 Fraction	----	32.5 mg/kg	109	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2836714)							
ES2002677-001	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	96.1	73.0	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	106	53.0	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	126	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2836718)							
ES2003046-008	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	94.8	73.0	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	111	53.0	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	114	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2836694)							
ES2003147-001	BH116_0.3-0.4	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	108	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2836714)							
ES2002677-001	Anonymous						



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL							
			Matrix Spike (MS) Report				
			Spike		SpikeRecovery(%)		Recovery Limits (%)
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/074: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2836714) - continued							
ES2002677-001	Anonymous	EP071: >C10 - C16 Fraction	-----	860 mg/kg	104	73.0	137
		EP071: >C16 - C34 Fraction	-----	3223 mg/kg	118	53.0	131
		EP071: >C34 - C40 Fraction	-----	1058 mg/kg	118	52.0	132
EP080/074: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2836718)							
ES2003046-008	Anonymous	EP071: >C10 - C16 Fraction	-----	860 mg/kg	102	73.0	137
		EP071: >C16 - C34 Fraction	-----	3223 mg/kg	114	53.0	131
		EP071: >C34 - C40 Fraction	-----	1058 mg/kg	106	52.0	132
EP080: BTEXN (QCLot: 2836694)							
ES2003147-001	BH116_0.3-0.4	EP080: Benzene	71-43-2	2.5 mg/kg	117	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	104	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	104	70.0	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	104	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	106	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	91.1	70.0	130

Sub-Matrix: **WATER**

Sub-Matrix: WATER		Matrix Spike (MS) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike		SpikeRecovery(%)		Recovery Limits (%)	
				Concentration	MS	Low	High		
EP080/074: Total Petroleum Hydrocarbons (QCLot: 2843462)									
ES2003147-012	QC302	EP080: C6 - C9 Fraction	-----	325 µg/L	92.5	70.0	130		
EP080/074: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2843462)									
ES2003147-012	QC302	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	93.5	70.0	130		
EP080: BTEXN (QCLot: 2843462)									
ES2003147-012	QC302	EP080: Benzene	71-43-2	25 µg/L	88.7	70.0	130		
		EP080: Toluene	108-88-3	25 µg/L	93.0	70.0	130		
		EP080: Ethylbenzene	100-41-4	25 µg/L	103	70.0	130		
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	101	70.0	130		
			106-42-3						
		EP080: ortho-Xylene	95-47-6	25 µg/L	102	70.0	130		
		EP080: Naphthalene	91-20-3	25 µg/L	107	70.0	130		



Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2003147	Page	: 1 of 9
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MR ALEX LATHAM	Telephone	: +61 2 8784 8555
Project	: 60623599_1.1	Date Samples Received	: 30-Jan-2020
Site	: ----	Issue Date	: 07-Feb-2020
Sampler	: Kurtis Wathen, REBEKAH PANOZZO	No. of samples received	: 38
Order number	: 60623599_1.1	No. of samples analysed	: 13

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- **NO** Matrix Spike outliers occur.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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



Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

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

Method		Sample Date	Extraction / Preparation		Analysis	
Container / Client Sample ID(s)	Date extracted		Due for extraction	Evaluation	Date analysed	Due for analysis
EA055: Moisture Content (Dried @ 105-110°C)						
Soil Glass Jar - Unpreserved (EA055) BH110_0.35-0.36, BH110_1.2-1.3	28-Jan-2020	----	----	----	04-Feb-2020	11-Feb-2020
						✓
	29-Jan-2020	----	----	----	04-Feb-2020	12-Feb-2020
						✓
Soil Glass Jar - Unpreserved (EA055) BH116_0.3-0.4, BH117_0.3-0.4, BH117_2.2-2.3, BH111_0.65-0.75	30-Jan-2020	----	----	----	04-Feb-2020	13-Feb-2020
						✓
	EA200: AS 4964 - 2004 Identification of Asbestos in Soils					
Snap Lock Bag - Friable Asbestos/PSD Bag (EA200) BH110_0.35-0.36, BH115_0.6-0.7	28-Jan-2020	----	----	----	04-Feb-2020	26-Jul-2020
						✓
	29-Jan-2020	----	----	----	04-Feb-2020	27-Jul-2020
						✓
Snap Lock Bag - Friable Asbestos/PSD Bag (EA200) BH116_0.3-0.4, BH117_0.3-0.4, BH111_0.3-0.4,	30-Jan-2020	----	----	----	04-Feb-2020	28-Jul-2020
						✓
	EA200N: Asbestos Quantification (non-NATA)					
Snap Lock Bag - Friable Asbestos/PSD Bag (EA200N) BH110_0.35-0.36, BH115_0.6-0.7	28-Jan-2020	----	----	----	04-Feb-2020	26-Jul-2020
						✓
	29-Jan-2020	----	----	----	04-Feb-2020	27-Jul-2020
						✓
Snap Lock Bag - Friable Asbestos/PSD Bag (EA200N) BH116_0.3-0.4, BH117_0.3-0.4, BH111_0.3-0.4,	30-Jan-2020	----	----	----	04-Feb-2020	28-Jul-2020
						✓



Matrix: **SOIL** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method		Sample Date	Extraction / Preparation		Evaluation	Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction		Date analysed	Due for analysis	Evaluation
EG005(ED093)T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)	BH110_0.35-0.36, BH110_1.2-1.3	28-Jan-2020	04-Feb-2020	26-Jul-2020	✓	04-Feb-2020	26-Jul-2020	✓
	BH115_2.5-2.6	29-Jan-2020	04-Feb-2020	27-Jul-2020	✓	04-Feb-2020	27-Jul-2020	✓
	BH116_0.6-0.65, BH117_1.3-1.4, BH117_2.2-2.3, BH111_0.3-0.4, BH111_0.65-0.75	30-Jan-2020	04-Feb-2020	28-Jul-2020	✓	04-Feb-2020	28-Jul-2020	✓
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T)	BH110_0.35-0.36, BH110_1.2-1.3	28-Jan-2020	04-Feb-2020	25-Feb-2020	✓	06-Feb-2020	25-Feb-2020	✓
	BH115_2.5-2.6	29-Jan-2020	04-Feb-2020	26-Feb-2020	✓	06-Feb-2020	26-Feb-2020	✓
	BH116_0.6-0.65, BH117_1.3-1.4, BH117_2.2-2.3, BH111_0.3-0.4, BH111_0.65-0.75	30-Jan-2020	04-Feb-2020	27-Feb-2020	✓	06-Feb-2020	27-Feb-2020	✓
EP066: Polychlorinated Biphenyls (PCB)								
Soil Glass Jar - Unpreserved (EP066)	BH110_0.35-0.36	28-Jan-2020	01-Feb-2020	11-Feb-2020	✓	04-Feb-2020	12-Mar-2020	✓
	BH115_0.6-0.7	29-Jan-2020	01-Feb-2020	12-Feb-2020	✓	04-Feb-2020	12-Mar-2020	✓
	BH116_0.3-0.4	30-Jan-2020	01-Feb-2020	13-Feb-2020	✓	04-Feb-2020	12-Mar-2020	✓
EP068A: Organochlorine Pesticides (OC)								
Soil Glass Jar - Unpreserved (EP068)	BH110_0.35-0.36	28-Jan-2020	01-Feb-2020	11-Feb-2020	✓	04-Feb-2020	12-Mar-2020	✓
	BH115_0.6-0.7	29-Jan-2020	01-Feb-2020	12-Feb-2020	✓	04-Feb-2020	12-Mar-2020	✓
	BH116_0.3-0.4	30-Jan-2020	01-Feb-2020	13-Feb-2020	✓	04-Feb-2020	12-Mar-2020	✓
EP068B: Organophosphorus Pesticides (OP)								
Soil Glass Jar - Unpreserved (EP068)	BH110_0.35-0.36	28-Jan-2020	01-Feb-2020	11-Feb-2020	✓	04-Feb-2020	12-Mar-2020	✓
	BH115_0.6-0.7	29-Jan-2020	01-Feb-2020	12-Feb-2020	✓	04-Feb-2020	12-Mar-2020	✓
	BH116_0.3-0.4	30-Jan-2020	01-Feb-2020	13-Feb-2020	✓	04-Feb-2020	12-Mar-2020	✓



Matrix: **SOIL** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method		Sample Date	Extraction / Preparation		Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) BH110_0.4-0.6, BH110_1.2-1.3	28-Jan-2020	01-Feb-2020	11-Feb-2020	✓	03-Feb-2020	12-Mar-2020	✓
	28-Jan-2020	01-Feb-2020	11-Feb-2020	✓	04-Feb-2020	12-Mar-2020	✓
	29-Jan-2020	01-Feb-2020	12-Feb-2020	✓	03-Feb-2020	12-Mar-2020	✓
	29-Jan-2020	01-Feb-2020	12-Feb-2020	✓	04-Feb-2020	12-Mar-2020	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) BH116_0.6-0.65, BH117_1.3-1.4, BH111_0.3-0.4, BH111_0.65-0.75	30-Jan-2020	01-Feb-2020	13-Feb-2020	✓	03-Feb-2020	12-Mar-2020	✓
	30-Jan-2020	01-Feb-2020	13-Feb-2020	✓	04-Feb-2020	12-Mar-2020	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071) BH110_0.35-0.36	28-Jan-2020	01-Feb-2020	11-Feb-2020	✓	04-Feb-2020	12-Mar-2020	✓
	28-Jan-2020	01-Feb-2020	11-Feb-2020	✓	06-Feb-2020	11-Feb-2020	✓
	29-Jan-2020	01-Feb-2020	12-Feb-2020	✓	04-Feb-2020	12-Mar-2020	✓
	29-Jan-2020	01-Feb-2020	12-Feb-2020	✓	06-Feb-2020	12-Feb-2020	✓
Soil Glass Jar - Unpreserved (EP071) BH116_0.3-0.4, BH117_2.2-2.3,	30-Jan-2020	01-Feb-2020	13-Feb-2020	✓	04-Feb-2020	12-Mar-2020	✓
	30-Jan-2020	01-Feb-2020	13-Feb-2020	✓	06-Feb-2020	13-Feb-2020	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP071) BH110_0.35-0.36	28-Jan-2020	01-Feb-2020	11-Feb-2020	✓	04-Feb-2020	12-Mar-2020	✓
	28-Jan-2020	01-Feb-2020	11-Feb-2020	✓	06-Feb-2020	11-Feb-2020	✓
	29-Jan-2020	01-Feb-2020	12-Feb-2020	✓	04-Feb-2020	12-Mar-2020	✓
	29-Jan-2020	01-Feb-2020	12-Feb-2020	✓	06-Feb-2020	12-Feb-2020	✓
Soil Glass Jar - Unpreserved (EP071) BH116_0.3-0.4, BH117_2.2-2.3,	30-Jan-2020	01-Feb-2020	13-Feb-2020	✓	04-Feb-2020	12-Mar-2020	✓
	30-Jan-2020	01-Feb-2020	13-Feb-2020	✓	06-Feb-2020	13-Feb-2020	✓



Matrix: **SOIL** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method		Sample Date	Extraction / Preparation		Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Date analysed	Due for analysis
EP080: BTEXN						
Soil Glass Jar - Unpreserved (EP080) BH110_0.35-0.36		28-Jan-2020	01-Feb-2020	11-Feb-2020	06-Feb-2020	11-Feb-2020
Soil Glass Jar - Unpreserved (EP080) BH115_0.6-0.7, BH115_2.5-2.6		29-Jan-2020	01-Feb-2020	12-Feb-2020	06-Feb-2020	12-Feb-2020
Soil Glass Jar - Unpreserved (EP080) BH116_0.6-0.65, BH117_2.2-2.3, BH117_0.3-0.4		30-Jan-2020	01-Feb-2020	13-Feb-2020	06-Feb-2020	13-Feb-2020

Matrix: **WATER** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method	Sample Date	Extraction / Preparation		Analysis	
Container / Client Sample ID(s)		Date extracted	Due for extraction	Date analysed	Due for analysis
EP080/071: Total Petroleum Hydrocarbons					
Amber VOC Vial - Sulfuric Acid (EP080) QC302	30-Jan-2020	05-Feb-2020	13-Feb-2020	05-Feb-2020	13-Feb-2020
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions					
Amber VOC Vial - Sulfuric Acid (EP080) QC302	30-Jan-2020	05-Feb-2020	13-Feb-2020	05-Feb-2020	13-Feb-2020
EP080: BTEXN					
Amber VOC Vial - Sulfuric Acid (EP080) QC302	30-Jan-2020	05-Feb-2020	13-Feb-2020	05-Feb-2020	13-Feb-2020



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(were) 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		Method	Count		Rate (%)		Quality Control Specification
Analytical Methods			QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)							
Moisture Content		EA055	2	20	10.00	10.00	✓
PAH/Phenols (SIM)		EP075(SIM)	4	39	10.26	10.00	✓
Pesticides by GCMS		EP068	2	20	10.00	10.00	✓
Polychlorinated Biphenyls (PCB)		EP066	2	20	10.00	10.00	✓
Total Mercury by FIMS		EG035T	2	20	10.00	10.00	✓
Total Metals by ICP-AES		EG005T	2	20	10.00	10.00	✓
TRH - Semivolatile Fraction		EP071	4	34	11.76	10.00	✓
TRH Volatiles/BTEX		EP080	2	17	11.76	10.00	✓
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)		EP075(SIM)	2	39	5.13	5.00	✓
Pesticides by GCMS		EP068	1	20	5.00	5.00	✓
Polychlorinated Biphenyls (PCB)		EP066	1	20	5.00	5.00	✓
Total Mercury by FIMS		EG035T	1	20	5.00	5.00	✓
Total Metals by ICP-AES		EG005T	1	20	5.00	5.00	✓
TRH - Semivolatile Fraction		EP071	2	34	5.88	5.00	✓
TRH Volatiles/BTEX		EP080	1	17	5.88	5.00	✓
Method Blanks (MB)							
PAH/Phenols (SIM)		EP075(SIM)	2	39	5.13	5.00	✓
Pesticides by GCMS		EP068	1	20	5.00	5.00	✓
Polychlorinated Biphenyls (PCB)		EP066	1	20	5.00	5.00	✓
Total Mercury by FIMS		EG035T	1	20	5.00	5.00	✓
Total Metals by ICP-AES		EG005T	1	20	5.00	5.00	✓
TRH - Semivolatile Fraction		EP071	2	34	5.88	5.00	✓
TRH Volatiles/BTEX		EP080	1	17	5.88	5.00	✓
Matrix Spikes (MS)							
PAH/Phenols (SIM)		EP075(SIM)	2	39	5.13	5.00	✓
Pesticides by GCMS		EP068	1	20	5.00	5.00	✓
Polychlorinated Biphenyls (PCB)		EP066	1	20	5.00	5.00	✓
Total Mercury by FIMS		EG035T	1	20	5.00	5.00	✓
Total Metals by ICP-AES		EG005T	1	20	5.00	5.00	✓
TRH - Semivolatile Fraction		EP071	2	34	5.88	5.00	✓
TRH Volatiles/BTEX		EP080	1	17	5.88	5.00	✓

Matrix: **WATER**

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

Quality Control Sample Type		Method		Count		Rate (%)		Quality Control Specification	
Analytical Methods				QC	Regular	Actual	Expected	Evaluation	



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		QC	Regular		Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)								
TRH Volatiles/BTEX	EP080	1	3		33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)								
TRH Volatiles/BTEX	EP080	1	3		33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)								
TRH Volatiles/BTEX	EP080	1	3		33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)								
TRH Volatiles/BTEX	EP080	1	3		33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard



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	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 6.1 and Table 1 (14 day holding time).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Asbestos Classification and Quantitation per NEPM 2013	* EA200N	SOIL	Analysis by Polarised Light Microscopy including dispersion staining Asbestos Classification and Quantitation per NEPM 2013 with Confirmation of Identification by AS 4964 - 2004 Gravimetric determination of Asbestos Containing Material, Fibrous Asbestos, Asbestos Fines and sample weight and calculation of percentage concentrations per NEPM protocols. Asbestos (Fines and Fibrous FA+AF) is reported as the equivalent weight in the sample received after accounting for sub-sampling (where applicable for the <7mm and/or <2mm fractions).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. 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 (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂) (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 SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504.505)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to 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. Compliant with NEPM amended 2013.
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to 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. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)



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Work Order : ES2003147
Client : AECOM Australia Pty Ltd
Project : 60623599_1.1

Preparation Methods		Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges		EN69	SOIL	In house: Referenced to USEPA 200.2. 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 (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap		ORG16	SOIL	In house: Referenced to 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		ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Volatiles Water Preparation		ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES2003147

Client : AECOM Australia Pty Ltd Contact : MR ALEX LATHAM Address : PO BOX Q410 QVB POST OFFICE SYDNEY NSW, AUSTRALIA 2000 E-mail : alex.latham@aecom.com Telephone : +61 02 8934 0000 Facsimile : +61 02 8934 0001 Project : 60623599_1.1 Order number : 60623599_1.1 C-O-C number : ---- Site : ---- Sampler : Kurtis Wathen, REBEKAH PANOZZO	Laboratory : Environmental Division Sydney Contact : Brenda Hong Address : 277-289 Woodpark Road Smithfield NSW Australia 2164 E-mail : Brenda.Hong@ALSGlobal.com Telephone : +61 2 8784 8555 Facsimile : +61-2-8784 8500 Page : 1 of 3 Quote number : EB2017AECOMAU0014 (EN/004/16) QC Level : NEPM 2013 B3 & ALS QC Standard
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Dates

Date Samples Received : 30-Jan-2020 15:00 Client Requested Due Date : 06-Feb-2020	Issue Date : 05-Feb-2020 Scheduled Reporting Date : 06-Feb-2020
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Delivery Details

Mode of Delivery : Undefined No. of coolers/boxes : 2 Receipt Detail :	Security Seal : Not Available Temperature : 13.1 - Ice present No. of samples received / analysed : 38 / 13
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General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- This is an updated SRN to include TPH (C6-C9)/BTEXN analysis on sample QC302.
- **Samples 27-35 have been transferred from ES2002766, as per Alex Latham.**
- **Please note that sample QC107 contained two soil jars. Samples BH117_3.9-4.0 and BH111_4.3-4.4 did not contain an Asbestos bag. Two VOC vials were received for sample QC302 (30/1/20), however no VOC vial was received for sample QC302(29/01/2020) - both VOC vials had the sampling date of 30/01/20. Sample BH115_4.4-4.6 had the depth of 4.4-4.5 on the soil jar. Samples BH111_1.5-1.6 and BH110_6.1-6.2 did not received soil jars. Samples BH111_1.4-1.5, BH115_0.7-0.8 and QC301 were received extra.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

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

☐ **No sample container / preservation non-compliance exists.**

Any sample identifications that cannot be displayed entirely in the analysis summary table will be listed below.

ES2003147-018 : [29-Jan-2020] : BH115_4.4-4.5 - BH115_4.4-4.5

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary 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.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EA200N Asbestos in Soils - (<1kg samples ONLY)	SOIL - EP075 SIM PAH only SIM - PAH only	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-13 OC/OP/PCB	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES2003147-001	30-Jan-2020 00:00	BH116_0.3-0.4		☐	☐			☐	☐
ES2003147-002	30-Jan-2020 00:00	BH116_0.6-0.65		☐	☐				☐
ES2003147-003	30-Jan-2020 00:00	BH116_0.75-0.78	☐						
ES2003147-004	30-Jan-2020 00:00	QC107	☐						
ES2003147-005	30-Jan-2020 00:00	BH117_0.3-0.4		☐	☐	☐	☐		
ES2003147-006	30-Jan-2020 00:00	BH117_0.8-0.9	☐						
ES2003147-007	30-Jan-2020 00:00	BH117_1.3-1.4		☐	☐	☐	☐		
ES2003147-008	30-Jan-2020 00:00	BH117_2.2-2.3		☐					☐
ES2003147-009	30-Jan-2020 00:00	BH117_3.1-3.2	☐						
ES2003147-010	30-Jan-2020 00:00	BH117_3.9-4.0	☐						
ES2003147-011	30-Jan-2020 00:00	BH117_4.4-4.5	☐						
ES2003147-013	29-Jan-2020 00:00	BH115_0.1-0.2	☐						
ES2003147-014	29-Jan-2020 00:00	BH115_0.6-0.7		☐	☐			☐	☐
ES2003147-015	29-Jan-2020 00:00	BH115_1.0-1.1	☐						
ES2003147-016	29-Jan-2020 00:00	BH115_2.5-2.6		☐					☐
ES2003147-017	29-Jan-2020 00:00	BH115_3.8-3.9	☐						
ES2003147-018	29-Jan-2020 00:00	BH115_4.4-4.5 BH115...	☐						
ES2003147-019	30-Jan-2020 00:00	BH111_2.3-2.4	☐						
ES2003147-020	30-Jan-2020 00:00	BH111_3.2-3.3	☐						
ES2003147-021	30-Jan-2020 00:00	BH111_4.3-4.5	☐						
ES2003147-022	30-Jan-2020 00:00	BH111_0.15-0.20	☐						
ES2003147-023	30-Jan-2020 00:00	BH111_0.3-0.4		☐	☐				☐
ES2003147-024	30-Jan-2020 00:00	BH111_0.65-0.75		☐	☐	☐	☐		
ES2003147-025	30-Jan-2020 00:00	BH111_1.5-1.6	☐						
ES2003147-026	29-Jan-2020 00:00	BH113_1.0-1.1	☐						
ES2003147-027	28-Jan-2020 00:00	QC104	☐						
ES2003147-028	28-Jan-2020 00:00	BH110_0.35-0.36		☐	☐			☐	☐
ES2003147-029	28-Jan-2020 00:00	BH110_0.4-0.6		☐	☐	☐	☐		
ES2003147-030	28-Jan-2020 00:00	BH110_0.9-1.0	☐						
ES2003147-031	28-Jan-2020 00:00	BH110_1.2-1.3		☐		☐	☐		
ES2003147-032	28-Jan-2020 00:00	BH110_5-5.1	☐						
ES2003147-033	28-Jan-2020 00:00	BH110_6.1-6.2	☐						
ES2003147-034	28-Jan-2020 00:00	BH108_4.1-4.2	☐						



			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EA200N Asbestos in Soils - (<1kg samples ONLY)	SOIL - EP075 SIM PAH only	SIM - PAH only	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-13 OC/OP/PCB	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES2003147-035	30-Jan-2020 00:00	QC108	☐							
ES2003147-036	30-Jan-2020 00:00	BH111_1.4-1.5	☐							
ES2003147-037	29-Jan-2020 00:00	BH115_0.7-0.8	☐							

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) WATER No analysis requested	WATER - W-18 TRH(C6 - C9)/BTEXN
ES2003147-012	30-Jan-2020 00:00	QC302		☐
ES2003147-038	29-Jan-2020 00:00	QC301	☐	

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email AP_CustomerService.ANZ@aecom.com

- Chain of Custody (CoC) (COC)

Email AP_CustomerService.ANZ@aecom.com

ALEX LATHAM

- *AU Certificate of Analysis - NATA (COA)

Email alex.latham@aecom.com

- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)

Email alex.latham@aecom.com

- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)

Email alex.latham@aecom.com

- A4 - AU Sample Receipt Notification - Environmental HT (SRN)

Email alex.latham@aecom.com

- Chain of Custody (CoC) (COC)

Email alex.latham@aecom.com

- EDI Format - ENMRG (ENMRG)

Email alex.latham@aecom.com

- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)

Email alex.latham@aecom.com

- EDI Format - ESDAT (ESDAT)

Email alex.latham@aecom.com

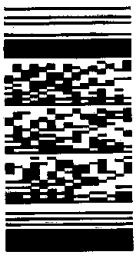
- EDI Format - XTab (XTAB)

Email alex.latham@aecom.com

- Electronic SRN for EQUIS (ESRN_EQUIS)

Email alex.latham@aecom.com

Environmental Division
Sydney
Work Order Reference
ES2003147



Telephone : + 61-2-8784 8555

Attached By PO / Internal Sheet:

CHAIN OF CUSTODY										
AECOM Australia Pty Ltd										
Sydney (420 George St) T: 02 8934 0451 Tel: 9840-6200										
Laboratory Details Lab Name: Environlab ALS Smithfield Lab Address: 19-21 Railway St, Chatswood Contact Name: D. Springer B. Hong Lab Ref: PO No. see project #										
Project Name: Burrows IE AECOM Project No. 60623599_1.1 AECOM Project Manager: Alex Latham AECOM Project Manager Email: Alex.Latham@aecom.com Sampled By: Kurtis Wathen / Rebekah Panozzo PO No. see project #										
Analysis Request										
Lab ID	Sample ID	Sampling Date	Matrix			Preservation			Container (No. & type)	Other
			soil	water	other	filled	acid	ice		
13	BH115-0.1-0.2	24/11	Y					Y	JB	
14	BH115-0.6-0.7								JB	
15	BH115-1.0-1.1								JB	
16	BH115-2.5-2.6								JB	
17	BH115-3.8-3.9								JB	
18	QC302		Y						Y	
19	BH115-4.4-4.6 (4.4-4.5)	30/11	X						JB	
20	BH111-2.3-2.4	30/11	X						JB	
21	BH111-3.2-3.3								JB	
22	BH111-4.3-4.5								JB	
23	BH111-0.15-0.20								JB	
24	BH111-0.3-0.4								JB	
25	BH111-0.65-0.75								JB	
26	QC106								Y	
* Metals Required: As, Cd, Cr, Cu, Hg, Ni, Pb, Zn Relinquished by: 36/11 Date: 19/07/2019 Signed: Shahid Received by: Nojar JB Date: 25/11/2019										

25 BH111-1.5-1.6

Nojar JB

V (HOLD)

 both QC302 valid
 same date as
 different date
 to previous
 QC302

3 of 3

CHAIN OF CUSTODY										
AECOM Australia Pty Ltd					Laboratory Details					
Sydney (420 George St)					Tel: 8784 8515					
T: 02 8934 0451					Lab Name: ALS					
M: 0400 973 821					Fax:					
AECOM Project Manager: Alex Latham					Lab Address: 277 Woodpark Rd, Smithfield					
AECOM Project Manager Email: Alex.Latham@aecom.com					Preliminary Report by:					
Sampled By: Kuris Wathen / Rebekah Panozo					Contact Name: Brenda Hong					
AECOM Project No: 80623599_1.1					Lab Report by:					
Project Name: Burrows IE					Lab Quote No: EN/004/16					
PO No. refer Project #										
Specifications: All reports to be emailed to AECOM Project Manager ESDAT & Equis & XLS format also required 1. Urgent TAT required? (please circle: 24hr 48hr 5 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 NIEPM 5.1.1? 5. Special storage requirements? (details:)										
Lab. ID	Sample ID	Sampling Date	Matrix			Preservation			Container (No. & type)	Analysis Request
			soil	water	other	filtered	add	ice	other	
26	BH113-0.8-1.0	29/1/20	✓					✓	J+B	TRH C8-C40, BTEXN
27	QC104	28/1/20							Jar	TRH > C10-C40 (EP071)
28	BH110-0.35-0.36	28/1/20							J+B	Asbestos (EA200N)
29	BH110-0.4-0.6								J+B	OCP, OPP, PCB
30	BH110-0.9-1.0								J+B	B Metals
31	BH110-1.2-1.3								J+B	PAH
32	BH110-5-5.1								J	
33	BH110-6.1-6.2								J	
34	BH108-4.1-4.2	28/1/20	✓					✓	B	
35	QC108	30/1/20	✓					✓	correct ID	
* Metals Required: As, Cd, Cr, Cu, Hg, Ni, Pb, Zn Requisitioned by: _____ Date: _____ Received by: _____ Date: _____										

Field Worksheet FORM025_37 4 BH115-0.7-0.8 38 QC301

36 BH111-1.4-1.5 30/1/20 Jar

29/1/20 Jar + Bag

29/1/20 2x VOC vials

Received extra

AECOM Australia Pty Ltd

T: 02 8934 0451

Laboratory Details

Lab. Ref:

Lab Quote No:

Project Name: Burrows IE

ESDAT & Equis format also required

2. Fast TAT Guarantee Required?

4. % extraneous material removed from samples to be reported as per NIEPM.5.1.1?

5. Special storage requirements? (details:

* Metals Required: As, Cd, Cr, Cu, Hg, Ni, Pb, Zn	Comments:	Lab Report No.	Esty ID
			301120

* Metals Required: As, Cd, Cr, Cu, Hg, Ni, Pb, Zn

Relinquished by:

Date:

Received by: C

Date: _____

AECOM Australia Pty Ltd

T: 02 8934 0451

Tel: 9910 6200

Fax:

Preliminary Report by:

Final Report by:

Lab Quote No:

PO No. see project #

Project Name: Burrows (E)

AECOM Project No: 60623599 1.1

Specifications: All reports to be emailed to AECOM Project Manager

ESDAT & Equis format also required

	24hr	48hr	5 days
1. Urgent TAT required? (please circle:)			

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:

Lab. ID	Sample ID	Sampling Date	Matrix			Preservation				Container (No. & type)	TRH C	PAH	8 Metal	OCP, C		Hold
			soil	water	other	filled	acid	ice	other							
	BH115-0.1-0.2	29/1	✓						Y	JB						Y
	BH115-0.6-0.7									JB						
	BH115-1.0-1.1									JB						
	BH115-2.5-2.6									J						
	BH115-3.8-3.9									J						
	QC302					Y				Y						
	BH115-4.24-4.6		X							J						
	BH111-2.3-2.4	30/1	X							JB						
	BH111-3.2-3.3									JB						
	BH111-4.3-4.5									JB						
	BH111-0.15-0.20									JB						
	BH111-0.3-0.4									JB						
	BH111-0.65-0.75									JB						
	QC106									J						

* Metals Required: As. Cd. Cr. Cu. Hg. Ni. Pb. Zn

193

Comments:

Relinquished by:

Signed:

Date:

19/07/2019

Relinquished by:

Signed:

15 JULY 2004

Date:

Recieved by:

Signed:

Date:

100

Received by:

Signed:

1

Date: _____

BH111-1.5-1.6



Environmental

CERTIFICATE OF ANALYSIS

Work Order : ES2003366

Client : AECOM Australia Pty Ltd
Contact : MR ALEX LATHAM
Address : LEVEL 21, 420 GEORGE STREET
SYDNEY NSW, AUSTRALIA 2000
Telephone : +61 02 8934 0000
Project : 60623599_1.1-Burrows IE
Order number : 60623599_1.1
C-O-C number : ---
Sampler : KURTIS WATHEN/REBEKAH PANOZZO
Site : ---
Quote number : EN/004/16
No. of samples received : 29
No. of samples analysed : 13

Page : 1 of 13

Laboratory : Environmental Division Sydney
Contact : Brenda Hong
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61 2 8784 8555
Date Samples Received : 03-Feb-2020 16:00
Date Analysis Commenced : 05-Feb-2020
Issue Date : 11-Feb-2020 13:50



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

□ □ □ □ □ □ □ □

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

□ □ □ □ □ □ □ □

□ □ □ □ □ □ □ □

□ □ □ □ □ □ □ □ □ □ □ □ □ □

□ □ □ □

Alana Smylie

Celine Conceicao

Edwandy Fadjar

Edwandy Fadjar

Ivan Taylor

Asbestos Identifier

Senior Spectroscopist

Organic Coordinator

Organic Coordinator

Analyst

Newcastle - Asbestos, Mayfield West, NSW

Sydney Inorganics, Smithfield, NSW

Sydney Inorganics, Smithfield, NSW

Sydney Inorganics, Smithfield, NSW

Sydney Inorganics, Smithfield, NSW



Page : 2 of 13
Work Order : ES2003366
Client : AECOM Australia Pty Ltd
Project : 60623599_1.1-Burrows IE

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 insufficient 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 sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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

Δ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenzo(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP071: Results of samples QC111 and QC114 have been confirmed by re-extraction and re-analysis.
- EA200N: Asbestos weights and percentages are not covered under the Scope of NATA Accreditation.
Weights of Asbestos are based on extracted bulk asbestos, fibre bundles, and/or ACM and do not include respirable fibres (if present)
The Asbestos (Fines and Fibrous) weight is calculated from the extracted Fibrous Asbestos and Asbestos Fines as an equivalent weight of 100% Asbestos
Percentages for Asbestos content in ACM are based on the 2013 NEPM default values.
All calculations of percentage Asbestos under this method are approximate and should be used as a guide only.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200N: ALS laboratory procedures and methods used for the identification and quantitation of asbestos are consistent with AS4964-2004 and the requirements of the 2013 NEPM for Assessment of Site Contamination
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH103_0.15-0.25										BH103_0.85-0.95										BH103_2.0-2.1										BH104_0.8-0.9										BH104_1.6-1.7																																							
		03-Feb-2020 00:00										03-Feb-2020 00:00										03-Feb-2020 00:00										03-Feb-2020 00:00										03-Feb-2020 00:00										03-Feb-2020 00:00																													
ES2003366-001		ES2003366-002										ES2003366-004										ES2003366-008										ES2003366-010										ES2003366-010																																							
Result		Result										Result										Result										Result										Result																																							
26.1		26.1										26.1										26.1										26.1										26.1																																							
EA055: Moisture Content (Dried @ 105-110°C)																																																																																	
Moisture Content		1.0										%										4.6										11.6										26.0										11.3										26.1																			
EA200: AS 4964 - 2004 Identification of Asbestos in Soils																																																																																	
Asbestos Detected		1332-21-4										0.1										g/kg										No										No										No										No																			
Asbestos Type		1332-21-4										-										-										-										-										-										-																			
Asbestos (Trace)		1332-21-4										5										Fibres										No										No										No										No																			
Sample weight (dry)		0.01										g										499										446										531										431																													
Synthetic Mineral Fibre		0.1										g/kg										No										No										No										No																													
Organic Fibre		0.1										g/kg										No										No										No										No																													
APPROVED IDENTIFIER:		A. SMYLYIE										A. SMYLYIE										A. SMYLYIE										A. SMYLYIE										A. SMYLYIE																																							
EA200N: Asbestos Quantification (non-NATA)																																																																																	
Asbestos (Fines and Fibrous <7mm)		1332-21-4										0.0004										g										<0.0004										<0.0004										<0.0004																													
Asbestos (Fines and Fibrous FA+AF)		0.001										%										(w/w)										<0.001										<0.001										<0.001																													
Asbestos Containing Material		1332-21-4										0.1										g										<0.1										<0.1										<0.1																													
Asbestos Containing Material (as 15% Asbestos in ACM >7mm)		1332-21-4										0.01										%										(w/w)										<0.01										<0.01										<0.01																			
Weight Used for % Calculation		0.0001										kg										0.499										0.446										0.531										0.431																													
Fibrous Asbestos >7mm		0.0004										g										<0.0004										<0.0004										<0.0004										<0.0004																													
EG005(ED093)T: Total Metals by ICP-AES																																																																																	
Arsenic		7440-38-2										5										mg/kg										<5										40										10										31																			
Cadmium		7440-43-9										1										mg/kg										<1										13										<1										5																			
Chromium		7440-47-3										2										mg/kg										6										9										34										8										42									
Copper		7440-50-8										5										mg/kg										10										93										2540										53										540									
Lead		7439-92-1										5										mg/kg										19										319										1090										171										1610									
Nickel		7440-02-0										2										mg/kg										3										12										39										19										66									
Zinc		7440-66-6										5										mg/kg										31										304										17500										170										3720									
EG035T: Total Recoverable Mercury by FIMS																																																																																	
Mercury		7439-97-6										0.1										mg/kg										<0.1										0.7										1.4										0.7										1.1									
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons																																																																																	
Naphthalene		91-20-3										0.5										mg/kg										<0.5										<0.5										<0.5										<0.5																			
Acenaphthylene		208-96-8										0.5										mg/kg										<0.5										1.3										<0.5										0.6										0.7									
Acenaphthene		83-32-9										0.5										mg/kg										<0.5										<0.5										<0.5										<0.5										<0.5									
Fluorene		86-73-7										0.5										mg/kg										<0.5										<0.5										<0.5										<0.5										<0.5									
Phenanthrene		85-01-8										0.5										mg/kg										<0.5										4.7										1.7										2.4										3.0									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH103_0.15-0.25		BH103_0.85-0.95		BH103_2.0-2.1		BH104_0.8-0.9		BH104_1.6-1.7	
03-Feb-2020 00:00		03-Feb-2020 00:00		03-Feb-2020 00:00		03-Feb-2020 00:00		03-Feb-2020 00:00		03-Feb-2020 00:00	
ES2003366-001		ES2003366-002		ES2003366-004		ES2003366-008		ES2003366-010			
Result		Result		Result		Result		Result		Result	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued											
Anthracene	120-12-7	0.5	mg/kg	<0.5	1.5	<0.5	0.8	1.0			
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	9.5	5.3	4.8	6.2			
Pyrene	129-00-0	0.5	mg/kg	<0.5	8.9	4.6	4.6	6.2			
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4.3	3.6	2.2	3.0			
Chrysene	218-01-9	0.5	mg/kg	<0.5	3.9	3.3	1.9	2.7			
Benzo(b+)fluoranthene	205-99-2	0.5	mg/kg	<0.5	5.2	4.9	2.7	4.4			
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	2.1	1.7	0.9	1.4			
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4.6	3.4	2.3	3.6			
Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	2.1	1.5	1.0	1.8			
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5			
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	2.7	1.8	1.4	2.5			
^ Sum of polycyclic aromatic hydrocarbons	-----	0.5	mg/kg	<0.5	50.8	31.8	25.6	36.5			
^ Benzo(a)pyrene TEQ (zero)	-----	0.5	mg/kg	<0.5	6.0	4.6	3.0	4.7			
^ Benzo(a)pyrene TEQ (half LOR)	-----	0.5	mg/kg	0.6	6.3	4.9	3.3	5.0			
^ Benzo(a)pyrene TEQ (LOR)	-----	0.5	mg/kg	1.2	6.5	5.1	3.5	5.2			
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	-----	-----	470	760			
C29 - C36 Fraction	-----	100	mg/kg	<100	-----	-----	170	370			
^ C10 - C36 Fraction (sum)	-----	50	mg/kg	<50	-----	-----	640	1130			
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions											
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	-----	-----	<10	<10			
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	-----	-----	<10	<10			
>C10 - C16 Fraction	-----	50	mg/kg	<50	-----	-----	<50	<50			
>C16 - C34 Fraction	-----	100	mg/kg	<100	-----	-----	580	1000			
>C34 - C40 Fraction	-----	100	mg/kg	<100	-----	-----	<100	210			
^ >C10 - C40 Fraction (sum)	-----	50	mg/kg	<50	-----	-----	580	1210			
^ >C10 - C16 Fraction minus Naphthalene (F2)	-----	50	mg/kg	<50	-----	-----	<50	<50			
EP080: BTEXN											
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			



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH103_0.15-0.25		BH103_0.85-0.95		BH103_2.0-2.1		BH104_0.8-0.9		BH104_1.6-1.7	
03-Feb-2020 00:00		03-Feb-2020 00:00		03-Feb-2020 00:00		03-Feb-2020 00:00		03-Feb-2020 00:00		03-Feb-2020 00:00	
ES2003366-001		ES2003366-002		ES2003366-004		ES2003366-008		ES2003366-010			
Result		Result		Result		Result		Result		Result	
EP080: BTEXN - Continued											
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
^ Sum of BTEX			0.2	mg/kg	<0.2				<0.2		<0.2
^ Total Xylenes			0.5	mg/kg	<0.5				<0.5		<0.5
Naphthalene	91-20-3	1		mg/kg	<1				<1		<1
EP075(SIM)S: Phenolic Compound Surrogates											
Phenol-d6	13127-88-3	0.5		%	85.6	85.2	86.2	85.5			90.4
2-Chlorophenol-D4	93951-73-6	0.5		%	90.1	88.9	89.6	89.6			94.0
2,4,6-Tribromophenol	118-79-6	0.5		%	61.2	72.2	72.3	72.6			79.7
EP075(SIM)T: PAH Surrogates											
2-Fluorobiphenyl	321-60-8	0.5		%	97.5	96.9	96.0	95.7			98.8
Anthracene-d10	1719-06-8	0.5		%	92.4	87.6	89.5	89.8			92.8
4-Terphenyl-d14	1718-51-0	0.5		%	103	102	101	100			105
EP080S: TPH(V)/BTEX Surrogates											
1,2-Dichloroethane-D4	17060-07-0	0.2		%	94.3			94.0			84.8
Toluene-D8	2037-26-5	0.2		%	93.7			105			93.5
4-Bromofluorobenzene	460-00-4	0.2		%	83.1			89.7			74.8

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Sub-Matrix: SOIL (Matrix: SOIL)									
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Phenanthrene	85-01-8	0.5	mg/kg	-----	2.2	4.3	<0.5	<0.5	BH114_0.45-0.55
Anthracene	120-12-7	0.5	mg/kg	-----	0.7	1.4	<0.5	<0.5	03-Feb-2020 00:00
Fluoranthene	206-44-0	0.5	mg/kg	-----	4.9	7.6	<0.5	<0.5	ES2003366-017
Pyrene	129-00-0	0.5	mg/kg	-----	4.9	7.1	<0.5	<0.5	ES2003366-016
Benz(a)anthracene	56-55-3	0.5	mg/kg	-----	2.4	3.5	<0.5	<0.5	03-Feb-2020 00:00
Chrysene	218-01-9	0.5	mg/kg	-----	2.3	2.9	<0.5	<0.5	ES2003366-021
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	-----	3.8	4.0	<0.5	<0.5	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	-----	1.3	1.5	<0.5	<0.5	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	-----	3.1	3.6	<0.5	<0.5	
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	mg/kg	-----	1.6	1.5	<0.5	<0.5	
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	-----	<0.5	<0.5	<0.5	<0.5	
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	-----	2.2	1.8	<0.5	<0.5	
^ Sum of polycyclic aromatic hydrocarbons	-----	0.5	mg/kg	-----	29.9	40.2	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (zero)	-----	0.5	mg/kg	-----	4.0	4.7	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (half LOR)	-----	0.5	mg/kg	-----	4.3	4.9	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (LOR)	-----	0.5	mg/kg	-----	4.6	5.2	<0.5	<0.5	
EP080/074 : Total Petroleum Hydrocarbons									
C6 - C9 Fraction	-----	10	mg/kg	<10	<10	<10	<10	<10	
C10 - C14 Fraction	-----	50	mg/kg	<50	<50	<50	<50	<50	
C15 - C28 Fraction	-----	100	mg/kg	650	430	150	<100	<100	
C29 - C36 Fraction	-----	100	mg/kg	390	300	120	<100	<100	
^ C10 - C36 Fraction (sum)	-----	50	mg/kg	1040	730	270	<50	<50	
EP080/074 : Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10	
>C10 - C16 Fraction	-----	50	mg/kg	<50	<50	<50	<50	<50	
>C16 - C34 Fraction	-----	100	mg/kg	930	620	230	<100	<100	
>C34 - C40 Fraction	-----	100	mg/kg	200	180	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	-----	50	mg/kg	1130	800	230	<50	<50	
^ >C10 - C16 Fraction minus Naphthalene (F2)	-----	50	mg/kg	<50	<50	<50	<50	<50	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH104_2.0-2.2		QC111		BH100_0.7-0.8		BH100_0.8-0.9		BH114_0.45-0.55	
03-Feb-2020 00:00		03-Feb-2020 00:00		03-Feb-2020 00:00		03-Feb-2020 00:00		03-Feb-2020 00:00		03-Feb-2020 00:00	
ES2003366-011		ES2003366-014		ES2003366-016		ES2003366-017		ES2003366-021			
Result		Result		Result		Result		Result		Result	
EP080: BTEXN - Continued											
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<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	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates											
Phenol-d6	13127-88-3	0.5	%	83.6	83.6	83.5	83.5	86.7	86.7	88.4	88.4
2-Chlorophenol-D4	93951-73-6	0.5	%	88.1	88.4	88.4	88.4	91.5	91.5	92.8	92.8
2,4,6-Tribromophenol	118-79-6	0.5	%	74.6	73.2	73.2	73.2	69.6	69.6	69.8	69.8
EP075(SIM)T: PAH Surrogates											
2-Fluorobiphenyl	321-60-8	0.5	%	92.9	93.8	93.8	93.8	97.8	97.8	99.8	99.8
Anthracene-d10	1719-06-8	0.5	%	86.6	87.3	87.3	87.3	93.9	93.9	92.9	92.9
4-Terphenyl-d14	1718-51-0	0.5	%	98.5	98.5	98.5	98.5	103	103	105	105
EP080S: TPH(V)/BTEX Surrogates											
1,2-Dichloroethane-D4	17060-07-0	0.2	%	86.9	84.3	84.3	84.3	84.6	84.6	105	105
Toluene-D8	2037-26-5	0.2	%	89.2	86.7	86.7	86.7	86.2	86.2	114	114
4-Bromofluorobenzene	460-00-4	0.2	%	86.4	85.7	85.7	85.7	76.5	76.5	89.9	89.9



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)									
BH114_1.3-1.4		QC114							
03-Feb-2020 00:00		03-Feb-2020 00:00							
ES2003366-023		ES2003366-024							
Result		Result							
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content		1.0		%		37.2		20.6	
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic		7440-38-2		5		mg/kg		55	
Cadmium		7440-43-9		1		mg/kg		23	
Chromium		7440-47-3		2		mg/kg		1240	
Copper		7440-50-8		5		mg/kg		2870	
Lead		7439-92-1		5		mg/kg		4600	
Nickel		7440-02-0		2		mg/kg		885	
Zinc		7440-66-6		5		mg/kg		9880	
EG035T: Total Recoverable Mercury by FIMS									
Mercury		7439-97-6		0.1		mg/kg		2.8	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene		91-20-3		0.5		mg/kg		<0.5	
Acenaphthylene		208-96-8		0.5		mg/kg		<0.5	
Acenaphthene		83-32-9		0.5		mg/kg		<0.5	
Fluorene		86-73-7		0.5		mg/kg		<0.5	
Phenanthrene		85-01-8		0.5		mg/kg		<0.5	
Anthracene		120-12-7		0.5		mg/kg		<0.5	
Fluoranthene		206-44-0		0.5		mg/kg		<0.5	
Pyrene		129-00-0		0.5		mg/kg		<0.5	
Benz(a)anthracene		56-55-3		0.5		mg/kg		<0.5	
Chrysene		218-01-9		0.5		mg/kg		<0.5	
Benzo(b+)fluoranthene		205-99-2		0.5		mg/kg		<0.5	
Benzo(k)fluoranthene		207-08-9		0.5		mg/kg		<0.5	
Benzo(a)pyrene		50-32-8		0.5		mg/kg		<0.5	
Indeno(1.2.3.cd)pyrene		193-39-5		0.5		mg/kg		<0.5	
Dibenz(a,h)anthracene		53-70-3		0.5		mg/kg		<0.5	
Benzo(g,h,i)perylene		191-24-2		0.5		mg/kg		<0.5	
^ Sum of polycyclic aromatic hydrocarbons				0.5		mg/kg		2.1	
^ Benzo(a)pyrene TEQ (zero)				0.5		mg/kg		<0.5	
^ Benzo(a)pyrene TEQ (half LOR)				0.5		mg/kg		0.6	
^ Benzo(a)pyrene TEQ (LOR)				0.5		mg/kg		1.2	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction				10		mg/kg		<10	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH114_1.3-1.4		QC114	
03-Feb-2020 00:00		03-Feb-2020 00:00		03-Feb-2020 00:00	
ES2003366-023		ES2003366-024		ES2003366-024	
Result		Result		Result	
EP080/071: Total Petroleum Hydrocarbons - Continued					
C10 - C14 Fraction	50	mg/kg	<50	<50	
C15 - C28 Fraction	100	mg/kg	140	160	
C29 - C36 Fraction	100	mg/kg	140	160	
^ C10 - C36 Fraction (sum)	50	mg/kg	280	320	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions					
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10
>C10 - C16 Fraction	50	mg/kg	<50	<50	
>C16 - C34 Fraction	100	mg/kg	240	290	
>C34 - C40 Fraction	100	mg/kg	<100	<100	
^ >C10 - C40 Fraction (sum)	50	mg/kg	240	290	
^ >C10 - C16 Fraction minus Naphthalene (F2)	50	mg/kg	<50	<50	
EP080: BTEXN					
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
^ Sum of BTEX		0.2	mg/kg	<0.2	<0.2
^ Total Xylenes		0.5	mg/kg	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates					
Phenol-d6	13127-88-3	0.5	%	88.6	85.9
2-Chlorophenol-D4	93951-73-6	0.5	%	92.4	90.1
2,4,6-Tribromophenol	118-79-6	0.5	%	73.2	69.6
EP075(SIM)T: PAH Surrogates					
2-Fluorobiphenyl	321-60-8	0.5	%	98.3	96.4
Anthracene-d10	1719-06-8	0.5	%	93.6	94.1
4-Terphenyl-d14	1718-51-0	0.5	%	104	104
EP080S: TPH(V)/BTEX Surrogates					
1,2-Dichloroethane-D4	17060-07-0	0.2	%	87.6	97.6
Toluene-D8	2037-26-5	0.2	%	92.9	107



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH114_1.3-1.4		QC114							
		03-Feb-2020 00:00		03-Feb-2020 00:00							
		ES2003366-023		ES2003366-024							
		Result		Result							
		83.7		90.0							
		%									
		0.2									
		460-00-4									
		EP080S: TPH(V)/BTEx Surrogates - Continued									
		4-Bromofluorobenzene									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		QC304		03-Feb-2020 00:00		ES2003366-029		Result	
EP080/071: Total Petroleum Hydrocarbons		C6 - C9 Fraction		20		µg/L		<20	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions		C6 - C10 Fraction		20		µg/L		<20	
^ C6 - C10 Fraction minus BTEX (F1)		C6_C10-BTEX		20		µg/L		<20	
EP080: BTEXN		Benzene		71-43-2		1		µg/L	
		Toluene		108-88-3		2		µg/L	
		Ethylbenzene		100-41-4		2		µg/L	
		meta- & para-Xylene		108-38-3 106-42-3		2		µg/L	
		ortho-Xylene		95-47-6		2		µg/L	
		^ Total Xylenes		2		µg/L		<2	
		^ Sum of BTEX		1		µg/L		<1	
		Naphthalene		91-20-3		5		µg/L	
EP080S: TPH(V)/BTEX Surrogates		1,2-Dichloroethane-D4		17060-07-0		2		%	
		Toluene-D8		2037-26-5		2		%	
		4-Bromofluorobenzene		460-00-4		2		%	

Analytical Results

Descriptive Results

Sub-Matrix: SOIL		EA200: AS 4964 - 2004 Identification of Asbestos in Soils		BH103_0.15-0.25 - 03-Feb-2020 00:00		Mid brown soli.	
		EA200: Description		BH103_2.0-2.1 - 03-Feb-2020 00:00		Mid brown soli.	
		EA200: Description		BH104_0.8-0.9 - 03-Feb-2020 00:00		Mid brown soli.	
		EA200: Description		BH104_1.6-1.7 - 03-Feb-2020 00:00		Mid brown soli.	
		EA200: Description		BH100_0.7-0.8 - 03-Feb-2020 00:00		Mid brown soli.	
		EA200: Description		BH100_0.8-0.9 - 03-Feb-2020 00:00		Mid brown soli.	
		EA200: Description		BH114_0.45-0.55 - 03-Feb-2020 00:00		Mid brown soil containing one piece of fibrous asbestos fibre board approximately 20x10x5mm and several pieces of asbestos cement sheeting approximately 30x30x5mm with plenty of smaller fragments of fibrous asbestos fibre board.	



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)			
□ □ □ □ □ □ □ □	□ □ □ □ □ □ □ □	Low	High		
EP075(SIM)S: Phenolic Compound Surrogates					
Phenol-d6	13127-88-3	63	123		
2-Chlorophenol-D4	93951-73-6	66	122		
2,4,6-Tribromophenol	118-79-6	40	138		
EP075(SIM)T: PAH Surrogates					
2-Fluorobiphenyl	321-60-8	70	122		
Anthracene-d10	1719-06-8	66	128		
4-Terphenyl-d14	1718-51-0	65	129		
EP080S: TPH(V)/BTEX Surrogates					
1,2-Dichloroethane-D4	17060-07-0	73	133		
Toluene-D8	2037-26-5	74	132		
4-Bromofluorobenzene	460-00-4	72	130		
Sub-Matrix: WATER		Recovery Limits (%)			
□ □ □ □ □ □ □ □	□ □ □ □ □ □ □ □	Low	High		
EP080S: TPH(V)/BTEX Surrogates					
1,2-Dichloroethane-D4	17060-07-0	71	137		
Toluene-D8	2037-26-5	79	131		
4-Bromofluorobenzene	460-00-4	70	128		



Environmental

QUALITY CONTROL REPORT

Work Order : **ES2003366**

Page : 1 of 9

Client : **AECOM Australia Pty Ltd**
Contact : **MR ALEX LATHAM**
Address : **LEVEL 21, 420 GEORGE STREET
SYDNEY NSW, AUSTRALIA 2000**
Telephone : **+61 02 8934 0000**
Project : **60623599_1.1-Burrows IE**
Order number : **60623599_1.1**
C-O-C number : **----**
Sampler : **KURTIS WATHEN/REBEKAH PANOZZO**
Site : **----**
Quote number : **EN/004/16**
No. of samples received : **29**
No. of samples analysed : **13**

Laboratory : **Environmental Division Sydney**
Contact : **Brenda Hong**
Address : **277-289 Woodpark Road Smithfield NSW Australia 2164**
Telephone : **+61 2 8784 8555**
Date Samples Received : **03-Feb-2020**
Date Analysis Commenced : **05-Feb-2020**
Issue Date : **11-Feb-2020**



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

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

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

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Alana Smylie
Celine Conceicao
Edwandy Fadjar
Edwandy Fadjar
Ivan Taylor

Asbestos Identifier
Senior Spectroscopist
Organic Coordinator
Organic Coordinator
Analyst

Newcastle - Asbestos, Mayfield West, NSW
Sydney Inorganics, Smithfield, NSW
Sydney Inorganics, Smithfield, NSW
Sydney Inorganics, Smithfield, NSW
Sydney Inorganics, Smithfield, NSW

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 high primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

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

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 (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2847589)									
ES2003366-023	BH114_1.3-1.4	EG005T: Copper	7440-50-8	5	mg/kg	2870	3000	4.44	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	4600	3790	19.4	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	9880	9230	6.86	0% - 20%
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
	ES2002853-001	Anonymous	EG005T: Chromium	7440-47-3	2	mg/kg	6	6	0.00
EG005T: Nickel			7440-02-0	2	mg/kg	7	6	0.00	No Limit
EG005T: Arsenic			7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
EG005T: Copper			7440-50-8	5	mg/kg	166	149	10.6	0% - 20%
EG005T: Lead			7439-92-1	5	mg/kg	24	23	4.92	No Limit
ES2003366-023	BH114_1.3-1.4	EG005T: Zinc	7440-66-6	5	mg/kg	98	83	15.9	0% - 50%
		EG005T: Cadmium	7440-43-9	1	mg/kg	23	27	18.2	0% - 20%
		EG005T: Chromium	7440-47-3	2	mg/kg	1240	1200	2.79	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	885	801	9.98	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	55	37	38.9	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2847593)									
ES2003366-002	BH103_0.85-0.95	EA055: Moisture Content	----	0.1	%	11.6	11.7	0.00	0% - 50%
ES2003476-002	Anonymous	EA055: Moisture Content	----	0.1	%	11.1	11.5	3.40	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2849180)									
ES2003337-012	Anonymous	EA055: Moisture Content	----	0.1	%	3.4	3.2	6.92	0% - 20%
ES2003518-011	Anonymous	EA055: Moisture Content	----	0.1	%	4.2	4.0	3.96	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2847590)									
ES2002853-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES2003366-023	BH114_1.3-1.4	EG035T: Mercury	7439-97-6	0.1	mg/kg	2.8	2.5	11.9	0% - 20%
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2841968)									



Sub-Matrix: **SOIL**

Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report			
Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2841968) - continued										
ES2003366-001		BH103_0.15-0.25	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Benzo(b+i)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
				205-82-3						
			EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Dibenzo(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES2003366-024		QC14	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	0.8	0.5	43.0	No Limit
			EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	0.7	<0.5	36.3	No Limit
			EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Benzo(b+i)fluoranthene	205-99-2	0.5	mg/kg	0.6	0.5	0.00	No Limit
				205-82-3						
			EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Dibenzo(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	2.1	1.0	71.0	No Limit
			EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit



Sub-Matrix: **SOIL**

Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report			
							Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/074: Total Petroleum Hydrocarbons (QC Lot: 2841969)										
ES2003366-001		BH103_0.15-0.25	EP071: C15 - C28 Fraction	---	100	mg/kg	<100	<100	0.00	No Limit
			EP071: C29 - C36 Fraction	---	100	mg/kg	<100	<100	0.00	No Limit
			EP071: C10 - C14 Fraction	---	50	mg/kg	<50	<50	0.00	No Limit
			EP071: C15 - C28 Fraction	---	100	mg/kg	160	190	15.6	No Limit
			EP071: C29 - C36 Fraction	---	100	mg/kg	160	170	0.00	No Limit
ES2003366-024		QC114	EP071: C10 - C14 Fraction	---	50	mg/kg	<50	<50	0.00	No Limit
EP080/074: Total Petroleum Hydrocarbons (QC Lot: 2843136)										
ES2003366-001		BH103_0.15-0.25	EP080: C6 - C9 Fraction	---	10	mg/kg	<10	<10	0.00	No Limit
ES2003463-001		Anonymous	EP080: C6 - C9 Fraction	---	10	mg/kg	<10	<10	0.00	No Limit
EP080/074: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2841969)										
ES2003366-001		BH103_0.15-0.25	EP071: >C16 - C34 Fraction	---	100	mg/kg	<100	<100	0.00	No Limit
			EP071: >C34 - C40 Fraction	---	100	mg/kg	<100	<100	0.00	No Limit
			EP071: >C10 - C16 Fraction	---	50	mg/kg	<50	<50	0.00	No Limit
			EP071: >C16 - C34 Fraction	---	100	mg/kg	290	310	8.44	No Limit
			EP071: >C34 - C40 Fraction	---	100	mg/kg	<100	<100	0.00	No Limit
ES2003366-024		QC114	EP071: >C10 - C16 Fraction	---	50	mg/kg	<50	<50	0.00	No Limit
EP080/074: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2843136)										
ES2003366-001		BH103_0.15-0.25	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES2003463-001		Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 2843136)										
ES2003366-001		BH103_0.15-0.25	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
			EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
				106-42-3						
			EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
			EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
			EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES2003463-001		Anonymous	EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
				106-42-3						
			EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report			
							Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/074: Total Petroleum Hydrocarbons (QC Lot: 2845751)										
ES2003311-001		Anonymous	EP080: C6 - C9 Fraction	---	20	µg/L	<20	<20	0.00	No Limit
ES2003311-007		Anonymous	EP080: C6 - C9 Fraction	---	20	µg/L	<20	<20	0.00	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 (%)	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2845751)										
ES2003311-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit	
ES2003311-007	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit	
EP080: BTEXN (QC Lot: 2845751)										
ES2003311-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.00	No Limit	
			106-42-3							
	Anonymous	EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	<5	0.00	No Limit
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	0.00	No Limit
ES2003311-007	Anonymous	EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	<2	0.00	No Limit
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	<5	0.00	No Limit

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 Spike (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.

Laboratory Control Spike (LCS) Report

Sub-Matrix: SOIL		Method Blank (MB) Report				Laboratory Control Spike (LCS) Report			
Method: Compound		Result		Spike Concentration		Spike Recovery (%)		Recovery Limits (%)	
CAS Number	LOR	Unit				LCS	Low	High	
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2847589)									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	100	86.0	126	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	93.6	83.0	113	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	100	76.0	128	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	96.7	86.0	120	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	93.4	80.0	114	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	102	87.0	123	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	101	80.0	122	
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2847590)									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	83.2	70.0	105	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2841968)									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	100	77.0	125	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	101	72.0	124	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	97.0	73.0	127	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	102	72.0	126	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	102	75.0	127	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	100	77.0	127	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	104	73.0	127	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	102	74.0	128	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	91.0	69.0	123	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	92.1	75.0	127	
EP075(SIM): Benzo(b+g)fluoranthene	205-99-2	0.5	mg/kg	<0.5	6 mg/kg	88.3	68.0	116	
	205-82-3								
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	92.6	74.0	126	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	92.1	70.0	126	
EP075(SIM): Indeno(1,2,3-cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	75.8	61.0	121	
EP075(SIM): Dibenzo(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	71.1	62.0	118	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	78.2	63.0	121	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2841969)									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	110	75.0	129	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	109	77.0	131	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	97.3	71.0	129	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2843136)									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	77.3	68.4	128	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2841969)									



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL		Method Blank (MB) Report		Laboratory Control Spike (LCS) Report					
				Spike		Spike Recovery (%)		Recovery Limits (%)	
Method: Compound		CAS Number	LOR	Unit	Concentration	LCS	Low	High	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2841969) - continued									
EP071: >C10 - C16 Fraction		----	50	mg/kg	<50	375 mg/kg	107	77.0	125
EP071: >C16 - C34 Fraction		----	100	mg/kg	<100	525 mg/kg	106	74.0	138
EP071: >C34 - C40 Fraction		----	100	mg/kg	<100	225 mg/kg	85.0	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2843136)									
EP080: C6 - C10 Fraction		C6_C10	10	mg/kg	<10	31 mg/kg	76.6	68.4	128
EP080: BTEXN (QCLot: 2843136)									
EP080: Benzene		71-43-2	0.2	mg/kg	<0.2	1 mg/kg	80.2	62.0	116
EP080: Toluene		108-88-3	0.5	mg/kg	<0.5	1 mg/kg	83.9	67.0	121
EP080: Ethylbenzene		100-41-4	0.5	mg/kg	<0.5	1 mg/kg	89.6	65.0	117
EP080: meta- & para-Xylene		108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	87.6	66.0	118
EP080: ortho-Xylene		95-47-6	0.5	mg/kg	<0.5	1 mg/kg	87.4	68.0	120
EP080: Naphthalene		91-20-3	1	mg/kg	<1	1 mg/kg	84.0	63.0	119

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report		Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)	Recovery Limits (%)		
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2845751)									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	83.8	75.0	127	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2845751)									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	90.5	75.0	127	
EP080: BTEXN (QCLot: 2845751)									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	90.7	70.0	122	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	89.2	69.0	123	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	86.6	70.0	120	
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	85.2	69.0	121	
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	88.9	72.0	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	95.0	70.0	120	

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**

Sub-Matrix: SOIL			Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	Spike		Recovery Limits (%)	
			Concentration	SpikeRecovery(%)	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2847589)						
ES2002853-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	99.6	70.0
						130



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL		Matrix Spike (MS) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike	SpikeRecovery(%)	Recovery Limits (%)		
				Concentration	MS	Low	High	
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2847589) - continued								
ES2002853-001	Anonymous	EG005T: Cadmium	7440-43-9	50 mg/kg	91.5	70.0	130	
		EG005T: Chromium	7440-47-3	50 mg/kg	99.3	70.0	130	
		EG005T: Copper	7440-50-8	250 mg/kg	84.0	70.0	130	
		EG005T: Lead	7439-92-1	250 mg/kg	91.7	70.0	130	
		EG005T: Nickel	7440-02-0	50 mg/kg	92.0	70.0	130	
		EG005T: Zinc	7440-66-6	250 mg/kg	73.8	70.0	130	
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2847590)								
ES2002853-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	90.9	70.0	130	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2841968)								
ES2003366-001	BH103_0.15-0.25	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	92.4	70.0	130	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	95.4	70.0	130	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2841969)								
ES2003366-001	BH103_0.15-0.25	EP071: C10 - C14 Fraction	-----	523 mg/kg	105	73.0	137	
		EP071: C15 - C28 Fraction	-----	2319 mg/kg	117	53.0	131	
		EP071: C29 - C36 Fraction	-----	1714 mg/kg	132	52.0	132	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2843136)								
ES2003366-001	BH103_0.15-0.25	EP080: C6 - C9 Fraction	-----	32.5 mg/kg	102	70.0	130	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2841969)								
ES2003366-001	BH103_0.15-0.25	EP071: >C10 - C16 Fraction	-----	860 mg/kg	109	73.0	137	
		EP071: >C16 - C34 Fraction	-----	3223 mg/kg	121	53.0	131	
		EP071: >C34 - C40 Fraction	-----	1058 mg/kg	126	52.0	132	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2843136)								
ES2003366-001	BH103_0.15-0.25	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	110	70.0	130	
EP080: BTEXN (QCLot: 2843136)								
ES2003366-001	BH103_0.15-0.25	EP080: Benzene	71-43-2	2.5 mg/kg	88.1	70.0	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	87.1	70.0	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	91.3	70.0	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	88.0	70.0	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	89.2	70.0	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	88.4	70.0	130		



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike		Recovery Limits (%)	
				Concentration	MS	Low	High
EP080/074 : Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2845751)							
ES2003311-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	123	70.0	130
EP080: BTEXN (QCLot: 2845751)							
ES2003311-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	90.6	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	90.6	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	94.1	70.0	130
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	91.8	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	25 µg/L	93.7	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	96.1	70.0	130



Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2003366	Page	: 1 of 8
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MR ALEX LATHAM	Telephone	: +61 2 8784 8555
Project	: 60623599_1.1-Burrows IE	Date Samples Received	: 03-Feb-2020
Site	: ----	Issue Date	: 11-Feb-2020
Sampler	: KURTIS WATHEN/REBEKAH PANOZZO	No. of samples received	: 29
Order number	: 60623599_1.1	No. of samples analysed	: 13

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- NO Method Blank value outliers occur.
- NO Duplicate outliers occur.
- NO Laboratory Control outliers occur.
- NO Matrix Spike outliers occur.
- For all regular sample matrices, NO surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- NO Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- NO Quality Control Sample Frequency Outliers exist.



Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

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

Method		Sample Date	Extraction / Preparation		Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Date analysed	Due for analysis
EA055: Moisture Content (Dried @ 105-110°C)						
Snap Lock Bag: Separate bag received (EA055)						
BH114_0.45-0.55		03-Feb-2020	----	----	07-Feb-2020	17-Feb-2020
Soil Glass Jar - Unpreserved (EA055)						
BH103_0.15-0.25, BH103_2.0-2.1, BH104_1.6-1.7, BH100_0.7-0.8, BH114_1.3-1.4,	BH103_0.85-0.95, BH104_0.8-0.9, QC111, BH100_0.8-0.9, QC114	03-Feb-2020	----	----	07-Feb-2020	17-Feb-2020
Soil Glass Jar - Unpreserved (EA055)						
BH104_2.0-2.2		03-Feb-2020	----	----	09-Feb-2020	17-Feb-2020
EA200: AS 4964 - 2004 Identification of Asbestos in Soils						
Snap Lock Bag - Friable Asbestos/PSD Bag (EA200)						
BH103_0.15-0.25, BH104_0.8-0.9, BH100_0.7-0.8,	BH103_2.0-2.1, BH104_1.6-1.7, BH100_0.8-0.9	03-Feb-2020	----	----	06-Feb-2020	01-Aug-2020
Soil Glass Jar - Unpreserved (EA200)						
BH114_0.45-0.55		03-Feb-2020	----	----	06-Feb-2020	01-Aug-2020
EA200N: Asbestos Quantification (non-NATA)						
Snap Lock Bag - Friable Asbestos/PSD Bag (EA200N)						
BH103_0.15-0.25, BH104_0.8-0.9, BH100_0.7-0.8,	BH103_2.0-2.1, BH104_1.6-1.7, BH100_0.8-0.9	03-Feb-2020	----	----	06-Feb-2020	01-Aug-2020
Soil Glass Jar - Unpreserved (EA200N)						
BH114_0.45-0.55		03-Feb-2020	----	----	06-Feb-2020	01-Aug-2020



Matrix: **SOIL** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method		Sample Date	Extraction / Preparation		Analysis				
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EG005(ED093)T: Total Metals by ICP-AES									
Snap Lock Bag: Separate bag received (EG005T)			03-Feb-2020	07-Feb-2020	01-Aug-2020	✓	08-Feb-2020	01-Aug-2020	✓
BH114_0.45-0.55									
Soil Glass Jar - Unpreserved (EG005T)			03-Feb-2020	07-Feb-2020	01-Aug-2020	✓	08-Feb-2020	01-Aug-2020	✓
BH103_0.15-0.25, BH104_0.8-0.9, QC111, BH100_0.7-0.8, BH114_1.3-1.4,						✓			
EG035T: Total Recoverable Mercury by FIMS									
Snap Lock Bag: Separate bag received (EG035T)			03-Feb-2020	07-Feb-2020	02-Mar-2020	✓	08-Feb-2020	02-Mar-2020	✓
BH114_0.45-0.55									
Soil Glass Jar - Unpreserved (EG035T)			03-Feb-2020	07-Feb-2020	02-Mar-2020	✓	08-Feb-2020	02-Mar-2020	✓
BH103_0.15-0.25, BH103_2.0-2.1, BH104_1.6-1.7, BH100_0.7-0.8, BH114_1.3-1.4,						✓			
BH103_0.85-0.95, BH104_0.8-0.9, QC111, BH100_0.8-0.9, QC114									
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Snap Lock Bag: Separate bag received (EP075(SIM))			03-Feb-2020	06-Feb-2020	17-Feb-2020	✓	06-Feb-2020	17-Mar-2020	✓
BH114_0.45-0.55									
Soil Glass Jar - Unpreserved (EP075(SIM))			03-Feb-2020	06-Feb-2020	17-Feb-2020	✓	06-Feb-2020	17-Mar-2020	✓
BH103_0.15-0.25, BH103_2.0-2.1, BH104_1.6-1.7, BH100_0.7-0.8, BH114_1.3-1.4,									
BH103_0.85-0.95, BH104_0.8-0.9, QC111, BH100_0.8-0.9, QC114									



Matrix: **SOIL** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method		Sample Date	Extraction / Preparation		Evaluation	Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction		Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons								
Snap Lock Bag: Separate bag received (EP080)		03-Feb-2020	05-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Feb-2020	✓
BH114_0.45-0.55			06-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Mar-2020	✓
Snap Lock Bag: Separate bag received (EP071)		03-Feb-2020	05-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Feb-2020	✓
BH114_0.45-0.55								
Soil Glass Jar - Unpreserved (EP080)		03-Feb-2020						
BH103_0.15-0.25,								
BH104_2.0-2.2,								
BH100_0.7-0.8,								
QC111,								
BH100_0.8-0.9,		03-Feb-2020						
BH114_1.3-1.4,								
QC114								
Soil Glass Jar - Unpreserved (EP071)			06-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Mar-2020	✓
BH103_0.15-0.25,								
BH104_1.6-1.7,		03-Feb-2020						
QC111,								
BH100_0.8-0.9,								
QC114								
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Snap Lock Bag: Separate bag received (EP080)		03-Feb-2020	05-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Feb-2020	✓
BH114_0.45-0.55			06-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Mar-2020	✓
Snap Lock Bag: Separate bag received (EP071)		03-Feb-2020	05-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Feb-2020	✓
BH114_0.45-0.55								
Soil Glass Jar - Unpreserved (EP080)		03-Feb-2020						
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,								
BH100_0.8-0.9,								
QC114		03-Feb-2020						
Soil Glass Jar - Unpreserved (EP071)			06-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Mar-2020	✓
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,								
BH100_0.8-0.9,		03-Feb-2020						
QC114								
Soil Glass Jar - Unpreserved (EP071)								
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,		03-Feb-2020						
BH100_0.8-0.9,								
QC114								
Soil Glass Jar - Unpreserved (EP071)			06-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Mar-2020	✓
BH103_0.15-0.25,								
BH104_1.6-1.7,		03-Feb-2020						
QC111,								
BH100_0.8-0.9,								
QC114								
EP080: BTEXN								
Snap Lock Bag: Separate bag received (EP080)		03-Feb-2020	05-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Feb-2020	✓
BH114_0.45-0.55			05-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Feb-2020	✓
Soil Glass Jar - Unpreserved (EP080)		03-Feb-2020						
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,								
BH100_0.8-0.9,								
QC114		03-Feb-2020						
Soil Glass Jar - Unpreserved (EP071)								
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,								
BH100_0.8-0.9,		03-Feb-2020						
QC114								
Soil Glass Jar - Unpreserved (EP071)								
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,		03-Feb-2020						
BH100_0.8-0.9,								
QC114								
Soil Glass Jar - Unpreserved (EP071)			06-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Mar-2020	✓
BH103_0.15-0.25,								
BH104_1.6-1.7,		03-Feb-2020						
QC111,								
BH100_0.8-0.9,								
QC114								
EP080: BTEXN								
Snap Lock Bag: Separate bag received (EP080)		03-Feb-2020	05-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Feb-2020	✓
BH114_0.45-0.55			05-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Feb-2020	✓
Soil Glass Jar - Unpreserved (EP080)		03-Feb-2020						
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,								
BH100_0.8-0.9,								
QC114		03-Feb-2020						
Soil Glass Jar - Unpreserved (EP071)								
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,								
BH100_0.8-0.9,		03-Feb-2020						
QC114								
Soil Glass Jar - Unpreserved (EP071)								
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,		03-Feb-2020						
BH100_0.8-0.9,								
QC114								
Soil Glass Jar - Unpreserved (EP071)			06-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Mar-2020	✓
BH103_0.15-0.25,								
BH104_1.6-1.7,		03-Feb-2020						
QC111,								
BH100_0.8-0.9,								
QC114								
EP080: BTEXN								
Snap Lock Bag: Separate bag received (EP080)		03-Feb-2020	05-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Feb-2020	✓
BH114_0.45-0.55			05-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Feb-2020	✓
Soil Glass Jar - Unpreserved (EP080)		03-Feb-2020						
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,								
BH100_0.8-0.9,								
QC114		03-Feb-2020						
Soil Glass Jar - Unpreserved (EP071)								
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,								
BH100_0.8-0.9,		03-Feb-2020						
QC114								
Soil Glass Jar - Unpreserved (EP071)								
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,		03-Feb-2020						
BH100_0.8-0.9,								
QC114								
Soil Glass Jar - Unpreserved (EP071)			06-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Mar-2020	✓
BH103_0.15-0.25,								
BH104_1.6-1.7,		03-Feb-2020						
QC111,								
BH100_0.8-0.9,								
QC114								
EP080: BTEXN								
Snap Lock Bag: Separate bag received (EP080)		03-Feb-2020	05-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Feb-2020	✓
BH114_0.45-0.55			05-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Feb-2020	✓
Soil Glass Jar - Unpreserved (EP080)		03-Feb-2020						
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,								
BH100_0.8-0.9,								
QC114		03-Feb-2020						
Soil Glass Jar - Unpreserved (EP071)								
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,								
BH100_0.8-0.9,		03-Feb-2020						
QC114								
Soil Glass Jar - Unpreserved (EP071)								
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,		03-Feb-2020						
BH100_0.8-0.9,								
QC114								
Soil Glass Jar - Unpreserved (EP071)			06-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Mar-2020	✓
BH103_0.15-0.25,								
BH104_1.6-1.7,		03-Feb-2020						
QC111,								
BH100_0.8-0.9,								
QC114								
EP080: BTEXN								
Snap Lock Bag: Separate bag received (EP080)		03-Feb-2020	05-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Feb-2020	✓
BH114_0.45-0.55			05-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Feb-2020	✓
Soil Glass Jar - Unpreserved (EP080)		03-Feb-2020						
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,								
BH100_0.8-0.9,								
QC114		03-Feb-2020						
Soil Glass Jar - Unpreserved (EP071)								
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,								
BH100_0.8-0.9,		03-Feb-2020						
QC114								
Soil Glass Jar - Unpreserved (EP071)								
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,		03-Feb-2020						
BH100_0.8-0.9,								
QC114								
Soil Glass Jar - Unpreserved (EP071)			06-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Mar-2020	✓
BH103_0.15-0.25,								
BH104_1.6-1.7,		03-Feb-2020						
QC111,								
BH100_0.8-0.9,								
QC114								
EP080: BTEXN								
Snap Lock Bag: Separate bag received (EP080)		03-Feb-2020	05-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Feb-2020	✓
BH114_0.45-0.55			05-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Feb-2020	✓
Soil Glass Jar - Unpreserved (EP080)		03-Feb-2020						
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,								
BH100_0.8-0.9,								
QC114		03-Feb-2020						
Soil Glass Jar - Unpreserved (EP071)								
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,								
BH100_0.8-0.9,		03-Feb-2020						
QC114								
Soil Glass Jar - Unpreserved (EP071)								
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,		03-Feb-2020						
BH100_0.8-0.9,								
QC114								
Soil Glass Jar - Unpreserved (EP071)			06-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Mar-2020	✓
BH103_0.15-0.25,								
BH104_1.6-1.7,		03-Feb-2020						
QC111,								
BH100_0.8-0.9,								
QC114								
EP080: BTEXN								
Snap Lock Bag: Separate bag received (EP080)		03-Feb-2020	05-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Feb-2020	✓
BH114_0.45-0.55			05-Feb-2020	17-Feb-2020	✓	07-Feb-2020	17-Feb-2020	✓
Soil Glass Jar - Unpreserved (EP080)		03-Feb-2020						
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,								
BH100_0.8-0.9,								
QC114		03-Feb-2020						
Soil Glass Jar - Unpreserved (EP071)								
BH103_0.15-0.25,								
BH104_1.6-1.7,								
QC111,								
BH100_0.8-0.9,</								



Matrix: **WATER** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method	Sample Date	Extraction / Preparation		Analysis	
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Due for analysis
EP080/071: Total Petroleum Hydrocarbons					
Amber VOC Vial - Sulfuric Acid (EP080)	03-Feb-2020	07-Feb-2020	17-Feb-2020	✓	17-Feb-2020
QC304					✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions					
Amber VOC Vial - Sulfuric Acid (EP080)	03-Feb-2020	07-Feb-2020	17-Feb-2020	✓	17-Feb-2020
QC304					✓
EP080: BTEXN					
Amber VOC Vial - Sulfuric Acid (EP080)	03-Feb-2020	07-Feb-2020	17-Feb-2020	✓	17-Feb-2020
QC304					✓



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(were) 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		Method	Count		Rate (%)		Quality Control Specification
Analytical Methods			QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)							
Moisture Content		EA055	4	40	10.00	10.00	✓
PAH/Phenols (SIM)		EP075(SIM)	2	17	11.76	10.00	✓
Total Mercury by FIMS		EG035T	2	20	10.00	10.00	✓
Total Metals by ICP-AES		EG005T	3	20	15.00	10.00	✓
TRH - Semivolatile Fraction		EP071	2	18	11.11	10.00	✓
TRH Volatiles/BTEX		EP080	2	15	13.33	10.00	✓
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)		EP075(SIM)	1	17	5.88	5.00	✓
Total Mercury by FIMS		EG035T	1	20	5.00	5.00	✓
Total Metals by ICP-AES		EG005T	1	20	5.00	5.00	✓
TRH - Semivolatile Fraction		EP071	1	18	5.56	5.00	✓
TRH Volatiles/BTEX		EP080	1	15	6.67	5.00	✓
Method Blanks (MB)							
PAH/Phenols (SIM)		EP075(SIM)	1	17	5.88	5.00	✓
Total Mercury by FIMS		EG035T	1	20	5.00	5.00	✓
Total Metals by ICP-AES		EG005T	1	20	5.00	5.00	✓
TRH - Semivolatile Fraction		EP071	1	18	5.56	5.00	✓
TRH Volatiles/BTEX		EP080	1	15	6.67	5.00	✓
Matrix Spikes (MS)							
PAH/Phenols (SIM)		EP075(SIM)	1	17	5.88	5.00	✓
Total Mercury by FIMS		EG035T	1	20	5.00	5.00	✓
Total Metals by ICP-AES		EG005T	1	20	5.00	5.00	✓
TRH - Semivolatile Fraction		EP071	1	18	5.56	5.00	✓
TRH Volatiles/BTEX		EP080	1	15	6.67	5.00	✓

Matrix: **WATER**

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

Quality Control Sample Type		Method	Count		Rate (%)		Quality Control Specification
Analytical Methods			QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)							
TRH Volatiles/BTEX		EP080	2	20	10.00	10.00	✓
Laboratory Control Samples (LCS)							
TRH Volatiles/BTEX		EP080	1	20	5.00	5.00	✓
Method Blanks (MB)							
TRH Volatiles/BTEX		EP080	1	20	5.00	5.00	✓
Matrix Spikes (MS)							
TRH Volatiles/BTEX		EP080	1	20	5.00	5.00	✓



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	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 6.1 and Table 1 (14 day holding time).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Asbestos Classification and Quantitation per NEPM 2013	* EA200N	SOIL	Analysis by Polarised Light Microscopy including dispersion staining Asbestos Classification and Quantitation per NEPM 2013 with Confirmation of Identification by AS 4964 - 2004 Gravimetric determination of Asbestos Containing Material, Fibrous Asbestos, Asbestos Fines and sample weight and calculation of percentage concentrations per NEPM protocols. Asbestos (Fines and Fibrous FA+AF) is reported as the equivalent weight in the sample received after accounting for sub-sampling (where applicable for the <7mm and/or <2mm fractions).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. 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 (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂) (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 SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A. Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to 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. Compliant with NEPM amended 2013.
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to 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. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. 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 (2013) Schedule B(3) (Method 202)



Preparation Methods		Method	Matrix	Method Descriptions
Methanolic Extraction of Soils for Purge and Trap		ORG16	SOIL	In house: Referenced to 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		ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Volatiles Water Preparation		ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES2003366

Client : AECOM Australia Pty Ltd Contact : MR ALEX LATHAM Address : LEVEL 21, 420 GEORGE STREET SYDNEY NSW, AUSTRALIA 2000 E-mail : alex.latham@aecom.com Telephone : +61 02 8934 0000 Facsimile : +61 02 8934 0001 Project : 60623599_1.1-Burrows IE Order number : 60623599_1.1 C-O-C number : ---- Site : ---- Sampler : KURTIS WATHEN/REBEKAH PANOZZO	Laboratory : Environmental Division Sydney Contact : Brenda Hong Address : 277-289 Woodpark Road Smithfield NSW Australia 2164 E-mail : Brenda.Hong@ALSGlobal.com Telephone : +61 2 8784 8555 Facsimile : +61-2-8784 8500 Page : 1 of 4 Quote number : EB2017AECOMAU0014 (EN/004/16) QC Level : NEPM 2013 B3 & ALS QC Standard
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Dates

Date Samples Received : 03-Feb-2020 16:00	Issue Date : 05-Feb-2020
Client Requested Due : 10-Feb-2020	Scheduled Reporting Date : 10-Feb-2020
Date	

Delivery Details

Mode of Delivery : Carrier	Security Seal : Not Available
No. of coolers/boxes : 2	Temperature : 5.2°C - Ice present
Receipt Detail :	No. of samples received / analysed : 29 / 13

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

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

Method Client sample ID	Sample Container Received	Preferred Sample Container for Analysis
Asbestos Classification and Quantitation per NEPM 2013 : EA200N		
BH114_0.45-0.55	- Soil Glass Jar - Unpreserved	- Snap Lock Bag: Separate bag received
Moisture Content : EA055		
BH114_0.45-0.55	- Snap Lock Bag: Separate bag received	- Soil Glass Jar - Unpreserved
PAH/Phenols (SIM) : EP075(SIM)		
BH114_0.45-0.55	- Snap Lock Bag: Separate bag received	- Soil Glass Jar - Unpreserved
Total Mercury by FIMS : EG035T		
BH114_0.45-0.55	- Snap Lock Bag: Separate bag received	- Soil Glass Jar - Unpreserved
Total Metals by ICP-AES : EG005T		
BH114_0.45-0.55	- Snap Lock Bag: Separate bag received	- Soil Glass Jar - Unpreserved
TRH - Semivolatile Fraction : EP071		
BH114_0.45-0.55	- Snap Lock Bag: Separate bag received	- Soil Glass Jar - Unpreserved
TRH Volatiles/BTEX : EP080		
BH114_0.45-0.55	- Snap Lock Bag: Separate bag received	- Soil Glass Jar - Unpreserved

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary 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.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EA200N Asbestos in Soils - (<1kg samples ONLY)	SOIL - EP075 SIM PAH only SIM - PAH only	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-04 TRH/BTEXN	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES2003366-001	03-Feb-2020 00:00	BH103_0.15-0.25		✓	✓				✓
ES2003366-002	03-Feb-2020 00:00	BH103_0.85-0.95		✓		✓	✓		
ES2003366-003	03-Feb-2020 00:00	BH103_1.3-1.4	✓						
ES2003366-004	03-Feb-2020 00:00	BH103_2.0-2.1		✓	✓	✓	✓		
ES2003366-005	03-Feb-2020 00:00	BH103_4.4-4.5	✓						
ES2003366-006	03-Feb-2020 00:00	QC112	✓						
ES2003366-007	03-Feb-2020 00:00	BH104_0.15-0.25	✓						
ES2003366-008	03-Feb-2020 00:00	BH104_0.8-0.9		✓	✓				✓
ES2003366-009	03-Feb-2020 00:00	BH104_1.4-1.5	✓						
ES2003366-010	03-Feb-2020 00:00	BH104_1.6-1.7		✓	✓				✓
ES2003366-011	03-Feb-2020 00:00	BH104_2.0-2.2		✓				✓	
ES2003366-012	03-Feb-2020 00:00	BH104_3.3-3.4	✓						
ES2003366-013	03-Feb-2020 00:00	BH104_4.4-4.5	✓						
ES2003366-014	03-Feb-2020 00:00	QC111		✓					✓
ES2003366-015	03-Feb-2020 00:00	BH100_0.15-0.25	✓						
ES2003366-016	03-Feb-2020 00:00	BH100_0.7-0.8		✓	✓				✓
ES2003366-017	03-Feb-2020 00:00	BH100_0.8-0.9		✓	✓				✓
ES2003366-018	03-Feb-2020 00:00	BH100_3.4-.35	✓						
ES2003366-019	03-Feb-2020 00:00	QC113	✓						



			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EA200N Asbestos in Soils - (<1kg samples ONLY)	SOIL - EP075 SIM PAH only	SIM - PAH only	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-04 TRH/BTEXN	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES2003366-020	03-Feb-2020 00:00	BH114_0.15-0.25	✓							
ES2003366-021	03-Feb-2020 00:00	BH114_0.45-0.55		✓	✓					✓
ES2003366-022	03-Feb-2020 00:00	BH114_0.8-0.9	✓							
ES2003366-023	03-Feb-2020 00:00	BH114_1.3-1.4		✓						✓
ES2003366-024	03-Feb-2020 00:00	QC114		✓						✓
ES2003366-025	03-Feb-2020 00:00	BH114_2.3-2.4	✓							
ES2003366-026	03-Feb-2020 00:00	BH114_2.75-2.85	✓							
ES2003366-027	03-Feb-2020 00:00	BH114_3.3-3.4	✓							
ES2003366-028	03-Feb-2020 00:00	BH114_5.0-5.1	✓							

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	
ES2003366-029	03-Feb-2020 00:00	QC304	✓

WATER - W-18
TRH(C6 - C9)/BTEXN

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



Requested Deliverables

ACCOUNTS PAYABLE

- | | | |
|--------------------------------|-------|----------------------------------|
| - A4 - AU Tax Invoice (INV) | Email | AP_CustomerService.ANZ@aecom.com |
| - Chain of Custody (CoC) (COC) | Email | AP_CustomerService.ANZ@aecom.com |

ALEX LATHAM

- | | | |
|--|-------|-----------------------|
| - *AU Certificate of Analysis - NATA (COA) | Email | alex.latham@aecom.com |
| - *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) | Email | alex.latham@aecom.com |
| - *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) | Email | alex.latham@aecom.com |
| - A4 - AU Sample Receipt Notification - Environmental HT (SRN) | Email | alex.latham@aecom.com |
| - Chain of Custody (CoC) (COC) | Email | alex.latham@aecom.com |
| - EDI Format - ENMRG (ENMRG) | Email | alex.latham@aecom.com |
| - EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM) | Email | alex.latham@aecom.com |
| - EDI Format - ESDAT (ESDAT) | Email | alex.latham@aecom.com |
| - EDI Format - XTab (XTAB) | Email | alex.latham@aecom.com |
| - Electronic SRN for EQUIS (ESRN_EQUIS) | Email | alex.latham@aecom.com |

updated COC - 10:59am 4/2/2020

1/2

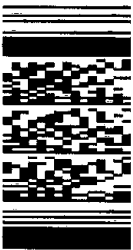
CUSTODY

AECOM Australia Pty Ltd
Sydney (420 George St)
Tel: 02 8934 0451
M: 0400 973 821
Fax: 02 8784 8515
Preliminary Report by: Alex Latham
Final Report by: Alex Latham
Lab Address: 277 Woodpark Rd, Smithfield
Contact Name: Brenda Hong
Lab. Ref: EN/004/16
Project Name: Burrows IE
PO No. refer Project #

Laboratory Details
Lab Name: ALS
Lab Address: 277 Woodpark Rd, Smithfield
Contact Name: Brenda Hong
Lab. Ref: EN/004/16
Project Name: Burrows IE
PO No. refer Project #

Lab. ID	Sample ID	Sampling Date	Matrix			Preservation				Container (No. & type)	Analysis Request						
			soil	water	other	filled	acid	ice	other		TRH C6-C10	PAH	8 Metals	OCP, OPP	Asbestos	TRH > C10	
1	BH103-0.15-0.25	3/2/20	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓
2	BH103-0.65-0.95									✓	✓	✓	✓	✓	✓	✓	✓
3	BH103-1.3-1.4									✓	✓	✓	✓	✓	✓	✓	✓
4	PH103-2.0-2.1									✓	✓	✓	✓	✓	✓	✓	✓
5	BH103-4.4-4.5									✓	✓	✓	✓	✓	✓	✓	✓
6	QC111 # GC12									✓	✓	✓	✓	✓	✓	✓	✓
7	BH104-0.15-0.25									✓	✓	✓	✓	✓	✓	✓	✓
8	BH104-0.8-0.9									✓	✓	✓	✓	✓	✓	✓	✓
9	BH104-1.4-1.5									✓	✓	✓	✓	✓	✓	✓	✓
10	BH104-1.6-1.7									✓	✓	✓	✓	✓	✓	✓	✓
11	BH104-2.0-2.2									✓	✓	✓	✓	✓	✓	✓	✓
12	BH104-3.3-3.4									✓	✓	✓	✓	✓	✓	✓	✓
13	BH104-4.4-4.5									✓	✓	✓	✓	✓	✓	✓	✓
14	QC110 # GC11									✓	✓	✓	✓	✓	✓	✓	✓

Environmental Division
Sydney
Work Order Reference
ES20033366



Telephone : + 61-2-8784 9555

Analysis Request
send requested soil QC samples to Envirolab with crushed ice please

Environmental Division Sydney
Work Order Reference
ES2003366

Telephone : +61-2-8784 8555

Lab Report No. Env/ID

Signed: 12/4 Date: 3/2/20
Relinquished by: R. Panozzo Date: 3/2/20
Received by: R. Panozzo Date: 3/2/20

2/2.

CHAIN OF CUSTODY																		
AECOM Australia Pty Ltd Sydney (420 George St) T: 02 8934 0451					Laboratory Details Lab Name: <u>Essex</u> ALS Lab Address: <u>12 Ashley St</u> St Helenswood Contact Name: <u>B. Springer</u> Brenda Lab. Ref: _____ Tel: 0910 6200 Fax: _____ Preliminary Report by: _____ Final Report by: _____ Lab Quote No: _____													
AECOM Project No: <u>60623599_1.1</u> Project Name: <u>Burrows IE</u> PO No. see project # _____																		
Specifications: All reports to be emailed to AECOM Project Manager ESDAT & Equis format also required																		
1. Urgent TAT required? (please circle: 24hr 48hr 5 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: _____)																		
Lab. ID	Sample ID	Sampling Date	Matrix			Preservation			Container (No. & type)	Analysis Request								
			soil	water	other	filled	acid	ice		other	TRH C6-C40, BTEX	PAH	8 Metals	OC, OPP, PCB	ASB (E+200N)	TRH C6-10 / BTEX	Hold	Other
15	4100-0.15-0.25	3/2	Y					Y		TRH C6-10 / BTEX								OC 304 for TRH C6-10 BTEX
16	BH100-0.7-0.8																	
17	BH100-0.8-0.9																	
18	BH100-3.4-3.5																	
19	GC117																	
20	BH114-0.15-0.25																	
21	BH114-0.45-0.55																	
22	BH114-0.8-0.9																	
23	BH114-1.3-1.4																	
24	GC114																	
25	BH114-2.3-2.4																	
26	BH114-2.75-2.95																	
27	BH114-3.3-3.4																	
28	BH114-5.0-5.1																	
Comments: _____ Date: <u>3/2/20</u>										Lab Report No: _____ Date: <u>3/2/20</u>								
Relinquished by: <u>R. Latham</u> Date: <u>19/07/2019</u>										Signed: _____ Date: <u>3/2/20</u>								
Received by: <u>29 020304</u> Date: <u>2/2/20</u>										Signed: _____ Date: <u>3/2/20</u>								



Environmental

CERTIFICATE OF ANALYSIS

Work Order : **ES2003481**

Client : **AECOM Australia Pty Ltd**
Contact : **MR ALEX LATHAM**
Address : **LEVEL 21, 420 GEORGE STREET
SYDNEY NSW, AUSTRALIA 2000**
Telephone : **+61 02 8934 0000**
Project : **60623599_1.1-Burrows IE**
Order number : **60623599_1.1**
C-O-C number : **----**
Sampler : **Kurtis Wathen, REBEKAH PANOZZO**
Site : **----**
Quote number : **EN/004/16**
No. of samples received : **23**
No. of samples analysed : **10**

Page : 1 of 12

Laboratory : **Environmental Division Sydney**
Contact : **Brenda Hong**
Address : **277-289 Woodpark Road Smithfield NSW Australia 2164**
Telephone : **+61 2 8784 8555**
Date Samples Received : **31-Jan-2020 18:00**
Date Analysis Commenced : **05-Feb-2020**
Issue Date : **10-Feb-2020 19:31**



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

□ □ □ □ □ □ □ □

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

□ □ □ □ □ □ □ □

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□ □ □ □ □ □ □ □

Alana Smylie

Celine Conceicao

Edwandy Fadjar

Edwandy Fadjar

Asbestos Identifier

Senior Spectroscopist

Organic Coordinator

Organic Coordinator

Newcastle - Asbestos, Mayfield West, NSW

Sydney Inorganics, Smithfield, NSW

Sydney Inorganics, Smithfield, NSW

Sydney Organics, Smithfield, NSW

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 insufficient 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 sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+i) & Benzo(k)fluoranthene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EA200N: Asbestos weights and percentages are not covered under the Scope of NATA Accreditation.
Weights of Asbestos are based on extracted bulk asbestos, fibre bundles, and/or ACM and do not include respirable fibres (if present)
The Asbestos (Fines and Fibrous) weight is calculated from the extracted Fibrous Asbestos and Asbestos Fines as an equivalent weight of 100% Asbestos
Percentages for Asbestos content in ACM are based on the 2013 NEPM default values.
All calculations of percentage Asbestos under this method are approximate and should be used as a guide only.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200N: ALS laboratory procedures and methods used for the identification and quantitation of asbestos are consistent with AS4964-2004 and the requirements of the 2013 NEPM for Assessment of Site Contamination
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH105_0.4-0.5										BH105_0.85-0.95										BH105_1.7-1.8										BH102_0.3-0.4										BH102_0.5-0.6									
		31-Jan-2020 00:00										31-Jan-2020 00:00										31-Jan-2020 00:00										31-Jan-2020 00:00										31-Jan-2020 00:00									
		ES2003481-002										ES2003481-004										ES2003481-005										ES2003481-010										ES2003481-011									
Result		Result		Result		Result		Result		Result		Result		Result		Result		Result		Result		Result		Result		Result		Result																							
12.4		12.4		12.4		12.4		12.4		12.4		12.4		12.4		12.4		12.4		12.4		12.4		12.4		12.4		12.4																							
EA055: Moisture Content (Dried @ 105-110°C)																																																			
Moisture Content		1.0		%		22.5		29.6		21.9		7.6		12.4																																					
EA200: AS 4964 - 2004 Identification of Asbestos in Soils																																																			
Asbestos Detected		1332-21-4		0.1		g/kg		No						No																																					
Asbestos Type		1332-21-4		-		---		-						-																																					
Asbestos (Trace)		1332-21-4		5		Fibres		No						No																																					
Sample weight (dry)		0.01		g		336								336																																					
Synthetic Mineral Fibre		0.1		g/kg		No								No																																					
Organic Fibre		0.1		g/kg		No								No																																					
APPROVED IDENTIFIER:		-		---		A. SMYLYIE								A. SMYLYIE																																					
EA200N: Asbestos Quantification (non-NATA)																																																			
ø Asbestos (Fines and Fibrous <7mm)		1332-21-4		0.0004		g		<0.0004						<0.0004																																					
ø Asbestos (Fines and Fibrous FA+AF)		1332-21-4		0.001		% (w/w)		<0.001						<0.001																																					
ø Asbestos Containing Material		1332-21-4		0.1		g		<0.1						<0.1																																					
ø Asbestos Containing Material (as 15% Asbestos in ACM >7mm)		1332-21-4		0.01		% (w/w)		<0.01						<0.01																																					
ø Weight Used for % Calculation		0.0001		kg		0.336								0.336																																					
ø Fibrous Asbestos >7mm		0.0004		g		<0.0004								<0.0004																																					
EG005(ED093)T: Total Metals by ICP-AES																																																			
Arsenic		7440-38-2		5		mg/kg		8		25		66		<5		9																																			
Cadmium		7440-43-9		1		mg/kg		<1		3		7		<1		<1																																			
Chromium		7440-47-3		2		mg/kg		16		20		76		5		19																																			
Copper		7440-50-8		5		mg/kg		336		2130		431		23		367																																			
Lead		7439-92-1		5		mg/kg		606		2260		11800		71		2010																																			
Nickel		7440-02-0		2		mg/kg		20		135		283		3		12																																			
Zinc		7440-66-6		5		mg/kg		676		4890		1320		49		712																																			
EG035T: Total Recoverable Mercury by FIMS																																																			
Mercury		7439-97-6		0.1		mg/kg		0.1		0.4		0.3		0.1		56.4																																			
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons																																																			
Naphthalene		91-20-3		0.5		mg/kg		<0.5		<0.5		<0.5		<0.5		<0.5																																			
Acenaphthylene		208-96-8		0.5		mg/kg		<0.5		<0.5		<0.5		<0.5		<0.5																																			
Acenaphthene		83-32-9		0.5		mg/kg		<0.5		<0.5		<0.5		<0.5		<0.5																																			
Fluorene		86-73-7		0.5		mg/kg		<0.5		<0.5		<0.5		<0.5		<0.5																																			
Phenanthrene		85-01-8		0.5		mg/kg		<0.5		1.2		<0.5		<0.5		3.3																																			



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH105_0.4-0.5		BH105_0.85-0.95		BH105_1.7-1.8		BH102_0.3-0.4		BH102_0.5-0.6	
31-Jan-2020 00:00		31-Jan-2020 00:00		31-Jan-2020 00:00		31-Jan-2020 00:00		31-Jan-2020 00:00		31-Jan-2020 00:00	
ES2003481-002		ES2003481-004		ES2003481-005		ES2003481-010		ES2003481-011			
Result		Result		Result		Result		Result		Result	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued											
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.9
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3.1	<0.5	<0.5	<0.5	<0.5	<0.5	6.2
Pyrene	129-00-0	0.5	mg/kg	<0.5	3.1	<0.5	<0.5	<0.5	<0.5	<0.5	6.0
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	2.4	<0.5	<0.5	<0.5	<0.5	<0.5	2.8
Chrysene	218-01-9	0.5	mg/kg	<0.5	3.0	<0.5	<0.5	<0.5	<0.5	<0.5	2.6
Benzo(b+)fluoranthene	205-99-2	0.5	mg/kg	<0.5	5.3	<0.5	<0.5	<0.5	<0.5	<0.5	3.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	2.1	<0.5	<0.5	<0.5	<0.5	<0.5	1.2
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3.4	<0.5	<0.5	<0.5	<0.5	<0.5	3.3
Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	2.7	<0.5	<0.5	<0.5	<0.5	<0.5	1.1
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4.3	<0.5	<0.5	<0.5	<0.5	<0.5	1.4
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	31.2	<0.5	<0.5	<0.5	<0.5	<0.5	32.3
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	5.3	<0.5	<0.5	<0.5	<0.5	<0.5	4.2
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	5.3	0.6	0.6	0.6	0.6	0.6	4.4
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	5.3	1.2	1.2	1.2	1.2	1.2	4.7
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	140	----	----	----	----	----	140
C29 - C36 Fraction	----	100	mg/kg	180	260	----	----	----	----	----	110
^ C10 - C36 Fraction (sum)	----	50	mg/kg	180	400	----	----	----	----	----	250
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions											
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	----	----	----	----	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	----	----	----	----	----	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	----	----	----	----	<50
>C16 - C34 Fraction	----	100	mg/kg	210	330	----	----	----	----	----	200
>C34 - C40 Fraction	----	100	mg/kg	140	150	----	----	----	----	----	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	350	480	----	----	----	----	----	200
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	----	----	----	----	<50
EP080: BTEXN											
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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH105_0.4-0.5		BH105_0.85-0.95		BH105_1.7-1.8		BH102_0.3-0.4		BH102_0.5-0.6	
31-Jan-2020 00:00		31-Jan-2020 00:00		31-Jan-2020 00:00		31-Jan-2020 00:00		31-Jan-2020 00:00		31-Jan-2020 00:00	
ES2003481-002		ES2003481-004		ES2003481-005		ES2003481-010		ES2003481-011			
Result		Result		Result		Result		Result		Result	
EP080: BTEXN - Continued											
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	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2					<0.2	
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5					<0.5	
Naphthalene	91-20-3	1	mg/kg	<1	<1					<1	
EP075(SIM)S: Phenolic Compound Surrogates											
Phenol-d6	13127-88-3	0.5	%	81.0	80.6	84.7	83.0			85.2	
2-Chlorophenol-D4	93951-73-6	0.5	%	83.8	83.1	87.0	87.6			87.5	
2,4,6-Tribromophenol	118-79-6	0.5	%	54.8	69.5	60.7	61.9			71.8	
EP075(SIM)T: PAH Surrogates											
2-Fluorobiphenyl	321-60-8	0.5	%	81.3	79.7	79.8	82.2			83.6	
Anthracene-d10	1719-06-8	0.5	%	82.7	85.2	87.8	88.5			87.4	
4-Terphenyl-d14	1718-51-0	0.5	%	91.5	89.5	92.2	91.7			90.8	
EP080S: TPH(V)/BTEX Surrogates											
1,2-Dichloroethane-D4	17060-07-0	0.2	%	89.5	98.6					84.9	
Toluene-D8	2037-26-5	0.2	%	91.0	101					89.6	
4-Bromofluorobenzene	460-00-4	0.2	%	82.4	92.7					84.6	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH101_0.16-0.26		BH101_0.7-0.8		BH101_1.3-1.4		BH101_2.2-2.3	
31-Jan-2020 00:00		31-Jan-2020 00:00		31-Jan-2020 00:00		31-Jan-2020 00:00		31-Jan-2020 00:00	
ES2003481-015		ES2003481-017		ES2003481-019		ES2003481-020			
Result		Result		Result		Result		Result	
EA055: Moisture Content (Dried @ 105-110°C)		13.4		31.4		26.2			
Moisture Content		1.0							
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected		1332-21-4		0.1		g/kg			
Asbestos Type		1332-21-4		-		Fibres			
Asbestos (Trace)		1332-21-4		5		g			
Sample weight (dry)		0.1		0.1		g/kg			
Synthetic Mineral Fibre		0.1		0.1		g/kg			
Organic Fibre		-		-		A. SMYLYE			
APPROVED IDENTIFIER:									
EA200N: Asbestos Quantification (non-NATA)									
ø Asbestos (Fines and Fibrous <7mm)		1332-21-4		0.0004		g		0.125	
ø Asbestos (Fines and Fibrous FA+AF)		1332-21-4		0.001		% (w/w)		0.031	
ø Asbestos Containing Material		1332-21-4		0.1		g		<0.1	
ø Asbestos Containing Material (as 15% Asbestos in ACM >7mm)		1332-21-4		0.01		% (w/w)		<0.01	
ø Weight Used for % Calculation		0.0001		kg		0.402			
ø Fibrous Asbestos >7mm		0.0004		g		<0.0004			
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic		7440-38-2		5		mg/kg		59	
Cadmium		7440-43-9		1		mg/kg		4	
Chromium		7440-47-3		2		mg/kg		50	
Copper		7440-50-8		5		mg/kg		1310	
Lead		7439-92-1		5		mg/kg		2490	
Nickel		7440-02-0		2		mg/kg		81	
Zinc		7440-66-6		5		mg/kg		2410	
EG035T: Total Recoverable Mercury by FIMS									
Mercury		7439-97-6		0.1		mg/kg		1.2	
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls		0.1		mg/kg		<0.1			
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC		319-84-6		0.05		mg/kg		<0.05	
Hexachlorobenzene (HCB)		118-74-1		0.05		mg/kg		<0.05	
beta-BHC		319-85-7		0.05		mg/kg		<0.05	

Analytical Results

[illegible]



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)									
BH101_0.16-0.26									
BH101_0.7-0.8									
BH101_1.3-1.4									
BH101_2.2-2.3									
31-Jan-2020 00:00									
ES2003481-015									
ES2003481-017									
ES2003481-019									
ES2003481-020									
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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH101_0.16-0.26		BH101_0.7-0.8		BH101_1.3-1.4		BH101_2.2-2.3	
31-Jan-2020 00:00		31-Jan-2020 00:00		31-Jan-2020 00:00		31-Jan-2020 00:00		31-Jan-2020 00:00	
ES2003481-015		ES2003481-017		ES2003481-019		ES2003481-020			
Result		Result		Result		Result		Result	
EP080/071: Total Petroleum Hydrocarbons - Continued									
^ C10 - C36 Fraction (sum)		50	mg/kg	260		340			
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction		C6_C10	10	mg/kg	<10		<10		
^ C6 - C10 Fraction minus BTEX (F1)		C6_C10-BTEX	10	mg/kg	<10		<10		
>C10 - C16 Fraction			50	mg/kg	<50		<50		
>C16 - C34 Fraction			100	mg/kg	230		280		
>C34 - C40 Fraction			100	mg/kg	<100		110		
^ >C10 - C40 Fraction (sum)			50	mg/kg	230		390		
^ >C10 - C16 Fraction minus Naphthalene (F2)			50	mg/kg	<50		<50		
EP080: BTEXN									
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		
^ Sum of BTEX			0.2	mg/kg	<0.2		<0.2		
^ Total Xylenes			0.5	mg/kg	<0.5		<0.5		
Naphthalene		91-20-3	1	mg/kg	<1		<1		
EP066S: PCB Surrogate									
Decachlorobiphenyl		2051-24-3	0.1	%	98.3				
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE		21655-73-2	0.05	%	98.4				
EP068T: Organophosphorus Pesticide Surrogate									
DEF		78-48-8	0.05	%	87.1				
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6		13127-88-3	0.5	%	86.8		83.8		
2-Chlorophenol-D4		93951-73-6	0.5	%	89.4		85.4		
2,4,6-Tribromophenol		118-79-6	0.5	%	72.9		71.6		
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl		321-60-8	0.5	%	83.3		80.1		
Anthracene-d10		1719-06-8	0.5	%	89.2		84.6		
4-Terphenyl-d14		1718-51-0	0.5	%	91.9		87.2		



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		BH101_0.16-0.26		BH101_0.7-0.8		BH101_1.3-1.4		BH101_2.2-2.3	
31-Jan-2020 00:00		31-Jan-2020 00:00		31-Jan-2020 00:00		31-Jan-2020 00:00		31-Jan-2020 00:00	
ES2003481-015		ES2003481-017		ES2003481-019		ES2003481-020			
Result		Result		Result		Result		Result	
1.2-Dichloroethane-D4		17060-07-0		0.2		%		90.2	
Toluene-D8		2037-26-5		0.2		%		86.0	
4-Bromofluorobenzene		460-00-4		0.2		%		77.9	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		QC303		31-Jan-2020 00:00		ES2003481-022		Result	
EP080/071: Total Petroleum Hydrocarbons		20		µg/L		<20			
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions		20		µg/L		<20			
C6 - C10 Fraction		20		µg/L		<20			
^ C6 - C10 Fraction minus BTEX (F1)		20		µg/L		<20			
EP080: BTEXN									
Benzene	71-43-2	1		µg/L		<1			
Toluene	108-88-3	2		µg/L		<2			
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			
^ Total Xylenes		2		µg/L		<2			
^ Sum of BTEX		1		µg/L		<1			
Naphthalene	91-20-3	5		µg/L		<5			
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2		%		79.1			
Toluene-D8	2037-26-5	2		%		99.8			
4-Bromofluorobenzene	460-00-4	2		%		99.5			

Analytical Results

Descriptive Results

Sub-Matrix: SOIL		R		u			
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
EA200: Description	BH105_0.4-0.5 - 31-Jan-2020 00:00					Mid brown soil.	
EA200: Description	BH102_0.5-0.6 - 31-Jan-2020 00:00					Mid brown soil.	
EA200: Description	BH101_1.3-1.4 - 31-Jan-2020 00:00					Mid brown soil containing many large asbestos fibre bundles approximately 10x4x2mm.	