ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 5**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	Smithfield NSW Australia 2164	**Work order**	: **ES0613375**
						Amendment No.	:
Project	:	ES0612955	**Quote number**	:	----	**Date received**	: 25 Oct 2006
Order number	:	REBATCH OF ES0612955				**Date issued**	: 1 Nov 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 1
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 1

This Interpretive Quality Control Report was issued on 1 Nov 2006 for the ALS work order reference ES0613375 and supersedes any previous reports with this reference.
This report contains the following information:

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

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Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Matrix Type: SOIL

Analysis Holding Time and Preservation

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP080: TPH Volatiles/BTEX							
Amber VOC Vial - HCl or NaHSO4							
BHA1/7.0	**31 Oct 2006**	**----**	----	----	**31 Oct 2006**	14 Nov 2006	Pass

Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Matrix Type: WATER ***Frequency of Quality Control Samples***

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	**Actual**	**Expected**	
Laboratory Duplicates (DUP)					
EP080: TPH Volatiles/BTEX	1	9	**11.1**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EP080: TPH Volatiles/BTEX	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EP080: TPH Volatiles/BTEX	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EP080: TPH Volatiles/BTEX	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). Flagged outliers on control limits for inorganics tests may be within the NEPM specified data quality objective of recoveries in the range of 70 to 130%. Where this occurs, no corrective action is taken. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

- **For all matrices, no RPD recovery outliers occur for the duplicate analysis.**
- **For all matrices, no method blank result outliers occur.**
- **For all matrices, no laboratory spike recoveries breaches occur.**
- **For all matrices, no matrix spike recoveries breaches occur.**

Surrogates

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

Outliers : Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

- **No holding time outliers occur.**

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- **No frequency outliers occur.**

Method Reference Summary

The analytical procedures used by ALS Environmental are based on established internationally-recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house procedure 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 herein. Reference methods from which ALSE methods are based are provided in parenthesis.

Matrix Type: ASTM LEACHATE ***Method Reference Summary***

Analytical Methods

EP080 : TPH Volatiles/BTEX - USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

AUSTRALIAN LABORATORY SERVICES PTY LTD ABN 84 009 936 029
277-289 Woodpark Road Smithfield NSW 2164 Australia
Telephone: +61 (02) 8784 8555 Facsimile: +61 (02) 8784 8500 http://www.alsenviro.com/

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive report

Client Details

Client	:	**CH2M HILL PTY LTD**
Contact	:	**MR ADAM SULLIVAN**
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515
Project	:	**ES0612955**
Order number	:	**REBATCH OF ES0612955**
C-O-C Number	:	**- Not provided -**
Site	:	**- Not provided -**
Sampler	:	**- Not provided -**
E-mail	:	adam.sullivan@ch2m.com.au
Telephone	:	02 9950 0200
Facsimile	:	02 9950 0600

Laboratory Details

Laboratory	:	**ALS Environmental Sydney**
Manager	:	**Greg Vogel**
Address	:	277-289 Woodpark Road Smithfield NSW Australia 2164
Quote number	:	----
Work order	:	**ES0613375**
E-mail	:	Greg.Vogel@alsenviro.com
Telephone	:	+61 (02) 8784 8555
Facsimile	:	+61 (02) 8784 8500

Dates

Date Samples Received	:	25 Oct 2006	**SRA Issue Date**	:	26 Oct 2006
Scheduled Reporting Date	:	**1 Nov 2006**	**Client Requested Date**	:	1 Nov 2006

Delivery Details

Mode of Delivery	:	Carrier.	**Temperature**	:	AMBIENT
No. of coolers/boxes	:	REBATCH	**No. of samples** - **Received**		1
Security Seal	:	Intact.	- **Analysed**		1

Comments

- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**

- Analytical work for this work order will be conducted at ALSE Sydney.
- Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.
- Please direct any queries related to sample condition / numbering / breakages to Nanthini Coilparampil
- Please direct any turn around / technical queries to the laboratory contact designated above.
- When the sampling time is not supplied on the COC documentation, ALSE defaults the sampling time to that of the COC 'relinquishment' time (if supplied). If this also is not supplied, ALSE defaults the sampling time to the 'time of receipt at Laboratory'.

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0613375
Project	: ES0612955	**ALS Quote Reference**	: ----

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Summary of Sample(s) / Container(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary for the execution of client requested tasks. Packages may contain additional analyses, such as moisture and preparation tasks, that form an implicit part of that package.

ALS Sample ID.	Client Sample ID - Sample Date	**Requested Analysis**									
		EN60Z-DI - WATER DI Water Leach ZHE	**EP080 - WATER** BTEX	**EN60Z-DI - SOIL** DI Water Leach ZHE							
ES0613375-001	**BHA1/7.0 - 25 Oct 2006**	]	]	]							
	Total(s) :	**1**	**1**	**1**							

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0613375
Project	: ES0612955	**ALS Quote Reference**	: ----

Requested Reports

l	**ALL ACCOUNTS**		
-	Invoice	Email	mogibu.rahman@ch2m.com.au
l	**MR ADAM SULLIVAN**		
-	A4 - Certificate of Analysis - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Interpretive Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	ENMRG Export Format	Email	adam.sullivan@ch2m.com.au
-	ESDAT Export Format	Email	adam.sullivan@ch2m.com.au
-	Chain of Custody Acknowledgement	Email	adam.sullivan@ch2m.com.au
-	A4 - Sample Receipt Notification - Comprehensive format	Email	adam.sullivan@ch2m.com.au

Sample Container(s) / Preservation Non-Compliance Log

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

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

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CERTIFICATE OF ANALYSIS

Client	: CH2M HILL PTY LTD	Laboratory	: ALS Environmental Sydney	Page	: 1 of 5
Contact	: MR ADAM SULLIVAN	Contact	: Greg Vogel	Work Order	: ES0613650
Address	: PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164		
E-mail	: adam.sullivan@ch2m.com.au	E-mail	: Greg.Vogel@alsenviro.com		
Telephone	: 02 9950 0200	Telephone	: +61 (02) 8784 8555		
Facsimile	: 02 9950 0600	Facsimile	: +61 (02) 8784 8500		
Project	: 347496 Macdonaldtown Gasworks	Quote number	: EN/006/06	Date received	: 1 Nov 2006
Order number	: REBATCH OF ES0613192			Date issued	: 8 Nov 2006
C-O-C number	: - Not provided -			No. of samples	- Received : 2
Site	: - Not provided -				Analysed : 2

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NATA Accredited Laboratory 825

This document is issued in accordance with NATA's accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatory	Position	Department
EDWANDY FADJAR		Organics - NATA 825 (10911 - Sydney)
Pabi Subba		Organics - NATA 825 (10911 - Sydney)
Peter Dickenson	Senior Spectroscopist	Inorganics - NATA 825 (10911 - Sydney)

ALS Environmental

Comments

This report for the ALSE reference ES0613650 supersedes any previous reports with this reference. Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- **Analytical Results for Samples Submitted**
- **Surrogate Recovery Data**

The analytical procedures used by ALS Environmental 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 herein. Reference methods from which ALSE methods are based are provided in parenthesis.

When moisture determination has been performed, results are reported on a dry weight basis. When a reported 'less than' result is higher than the LOR, this may be due to primary sample extracts/digestion dilution and/or insuffient sample amount for analysis. Surrogate Recovery Limits are static and based on USEPA SW846 or ALS-QWI/EN38 (in the absence of specified USEPA limits). Where LOR of reported result differ from standard LOR, this may be due to high moisture, reduced sample amount or matrix interference. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number, LOR = Limit of Reporting. * Indicates failed Surrogate Recoveries.

Specific comments for Work Order **ES0613650**

EP075(SIM):Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.

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Analytical Results

			Client Sample ID :	BHF/8.5M				
			Sample Matrix Type / Description :	TCLP LEACHATE				
			Sample Date / Time :	1 Nov 2006 11:00				
			Laboratory Sample ID :	ES0613650-002				
Analyte	*CAS number*	*LOR*	*Units*					
EN33: TCLP Leach								
Initial pH		0.1	pH Unit	4.9				
Extraction Fluid Number		1	-	1				
Final pH		0.1	pH Unit	4.9				
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	101.8				
Acenaphthylene	208-96-8	1.0	µg/L	<1.8				
Acenaphthene	83-32-9	1.0	µg/L	10.9				
Fluorene	86-73-7	1.0	µg/L	29.9				
Phenanthrene	85-01-8	1.0	µg/L	20.1				
Anthracene	120-12-7	1.0	µg/L	4.4				
Fluoranthene	206-44-0	1.0	µg/L	2.4				
Pyrene	129-00-0	1.0	µg/L	2.0				
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.8				
Chrysene	218-01-9	1.0	µg/L	<1.8				
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.8				
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.8				
Benzo(a)pyrene	50-32-8	0.5	µg/L	<1.8				
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.8				
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.8				
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.8				
EP080/071: Total Petroleum Hydrocarbons								
C10 - C14 Fraction		50	µg/L	4100				
C15 - C28 Fraction		100	µg/L	500				
C29 - C36 Fraction		50	µg/L	<50				
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	22.8				
2-Chlorophenol-D4	93951-73-6	0.1	%	65.5				
2.4.6-Tribromophenol	118-79-6	0.1	%	57.8				
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	78.7				
Anthracene-d10	1719-06-8	0.1	%	70.8				
4-Terphenyl-d14	1718-51-0	0.1	%	78.6				

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Analytical Results

				Client Sample ID :	BHD/8.4M	BHF/8.5M			
				Sample Matrix Type / Description :	ZHE LEACHATE	ZHE LEACHATE			
				Sample Date / Time :	2 Nov 2006 13:00	20 Oct 2006 10:00			
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0613650-001	ES0613650-002			
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction		20	µg/L		----	600			
EP080: BTEX									
Benzene	71-43-2	1	µg/L		12	1			
Toluene	108-88-3	2	µg/L		<2	2			
Ethylbenzene	100-41-4	2	µg/L		<2	106			
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		6	265			
ortho-Xylene	95-47-6	2	µg/L		3	383			
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		108	90.4			
Toluene-D8	2037-26-5	0.1	%		107	94.7			
4-Bromofluorobenzene	460-00-4	0.1	%		114	89.9			

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Surrogate Control Limits

Matrix Type: SOIL - Surrogate Control Limits ***Surrogate Control Limits***

Method name	*Analyte name*	*Lower Limit*	*Upper Limit*
EP075(SIM): PAH/Phenols (GC/MS - SIM)			
EP075(SIM)S: Phenolic Compound Surrogates	Phenol-d6	10	94
	2-Chlorophenol-D4	23	134
	2,4,6-Tribromophenol	10	123
EP075(SIM)T: PAH Surrogates	2-Fluorobiphenyl	43	116
	Anthracene-d10	27	133
	4-Terphenyl-d14	33	141
EP080: TPH Volatiles/BTEX			
EP080S: TPH(V)/BTEX Surrogates	1,2-Dichloroethane-D4	80	120
	Toluene-D8	88	110
	4-Bromofluorobenzene	86	115

545-426

Fadi Soro

FMDi 1/4/06 9am

From: Nanthini Coilparampil
Sent: Tuesday, 31 October 2006 6:16 PM
To: Samples Sydney
Subject: FW: Additional analysis

es0613192_coc.pdf

Please re-batch according to the E-mail

From: Adam.Sullivan@ch2m.com.au [mailto:Adam.Sullivan@ch2m.com.au]
Sent: Tuesday, 31 October 2006 5:00 PM
To: Nanthini Coilparampil
Subject: Additional analysis

Hi Nanthini

Are you able to analyse the following samples for TCLP and neutral leach (from attached COC):

(1) • 14 BHD/8.4m – BTEX;
(2) • 6 BHF/8.5m – BTEX, TPH and PAH (including B(a)P).

Regards

Adam

****

This e-mail has been swept by mimesweeper

through the ALS North America gateway.

****

ALS Environmental
Sydney
Work Order
ES0613650

Telephone : +61 (02) 8784 8555

ALS Environmental

QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	: ALS Environmental Sydney	**Page**	:	**1 of 6**
Contact	:	MR ADAM SULLIVAN	**Contact**	: Greg Vogel			
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	: 277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	:	**ES0613650**
					Amendment No.	:	
Project	:	347496 Macdonaldtown Gasworks	**Quote number**	: EN/006/06	**Date received**	:	31 Oct 2006
Order number	:	REBATCH OF ES0613192			**Date issued**	:	8 Nov 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	: Greg.Vogel@alsenviro.com	**No. of samples**		
Telephone	:	02 9950 0200	**Telephone**	: +61 (02) 8784 8555	**Received**	:	2
Facsimile	:	02 9950 0600	**Facsimile**	: +61 (02) 8784 8500	**Analysed**	:	2

This final report for the ALSE work order reference ES0613650 supersedes any previous reports with this reference.

Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- Laboratory Duplicates (DUP); Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Samples (LCS); Recovery and Acceptance Limits
- Matrix Spikes (MS); Recovery and Acceptance Limits

Work order specific comments

EP075(SIM):Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.

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This document is issued in accordance with NATA's accreditation requirements.

Accredited for compliance with ISO/IED 17025

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatory	Department
* Not Entered *	Organics - NATA 825 (10911 - Sydney)
EDWANDY FADJAR	Organics - NATA 825 (10911 - Sydney)
Pabi Subba	Organics - NATA 825 (10911 - Sydney)
Peter Dickenson	Inorganics - NATA 825 (10911 - Sydney)

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Quality Control Report - Laboratory Duplicates (DUP)

The quality control term **Laboratory Duplicate** refers to an intralaboratory split sample randomly selected from the sample batch. Laboratory duplicates provide information on method precision and sample heterogeneity.
- Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. *Abbreviations:* ***LOR*** = *Limit of Reporting,* ***RPD*** = *Relative Percent Difference.*
* Indicates failed QC. The permitted ranges for the RPD of Laboratory Duplicates (relative percent deviation) 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%

Matrix Type: WATER ***Laboratory Duplicates (DUP) Report***

Laboratory Sample ID	*Client Sample ID*	*Analyte name*	*LOR*	*Original Result*	*Duplicate Result*	*RPD*
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 299867)				**µg/L**	**µg/L**	**%**
ES0613706-005	Anonymous	C6 - C9 Fraction	20 µg/L	<20	<20	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 302483)				**µg/L**	**µg/L**	**%**
ES0613650-002	BHF/8.5M	C6 - C9 Fraction	20 µg/L	600	600	0.0
EP080: BTEX						
EP080: BTEX - (QC Lot: 299867)				**µg/L**	**µg/L**	**%**
ES0613706-005	Anonymous	Benzene	1 µg/L	<1	<1	0.0
		Toluene	2 µg/L	<2	<2	0.0
		Ethylbenzene	2 µg/L	<2	<2	0.0
		meta- & para-Xylene	2 µg/L	<2	<2	0.0
		ortho-Xylene	2 µg/L	<2	<2	0.0
EP080: BTEX - (QC Lot: 302483)				**µg/L**	**µg/L**	**%**
ES0613650-002	BHF/8.5M	Benzene	1 µg/L	1	<1	0.0
		Toluene	2 µg/L	2	2	0.0
		Ethylbenzene	2 µg/L	106	109	2.5
		meta- & para-Xylene	2 µg/L	265	266	0.4
		ortho-Xylene	2 µg/L	383	386	0.8

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Quality Control Report - Method Blank (MB) and Laboratory Control Samples (LCS)

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 type is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a known, interference free matrix spiked with target analytes or certified reference material. The purpose of this QC type is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of actual laboratory data. Flagged outliers on control limits for inorganics tests may be within the NEPM specified data quality objective of recoveries in the range of 70 to 130%. Where this occurs, no corrective action is taken. Abbreviations: LOR = Limit of reporting.

Matrix Type: WATER

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

		Method blank result	*Actual Results*		*Recovery Limits*	
			Spike concentration	*Spike Recovery*	*Dynamic Recovery Limits*	
Analyte name	*LOR*			*LCS*	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 299535)		µg/L	µg/L	%	%	%
Acenaphthene	0.2 µg/L	----	2	85.3	62.2	113
	0.5 µg/L	<0.5	----	----	----	----
Acenaphthylene	0.2 µg/L	----	2	86.6	63.6	114
	0.5 µg/L	<0.5	----	----	----	----
Anthracene	0.2 µg/L	----	2	84.6	64.3	116
	0.5 µg/L	<0.5	----	----	----	----
Benz(a)anthracene	0.2 µg/L	----	2	87.5	64.1	117
	0.5 µg/L	<0.5	----	----	----	----
Benzo(a)pyrene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	85.2	63.3	117
Benzo(b)fluoranthene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	90.3	61.7	119
Benzo(g,h,i)perylene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	86.4	59.1	118
Benzo(k)fluoranthene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	79.1	61.7	117
Chrysene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	81.0	62.5	116
Dibenz(a,h)anthracene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	86.9	61.2	117
Fluoranthene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	85.0	63.6	118
Fluorene	0.2 µg/L	----	2	86.0	63.9	115
	0.5 µg/L	<0.5	----	----	----	----
Indeno(1,2,3,cd)pyrene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	86.9	59.9	118

Matrix Type: WATER

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

Analyte name	*LOR*	*Method blank result*	*Actual Results*		*Recovery Limits*	
			Spike concentration	*Spike Recovery*	*Dynamic Recovery Limits*	
				LCS	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 299535) - continued		µg/L	µg/L	%	%	%
Naphthalene	0.2 µg/L	----	2	88.2	62.4	114
	0.5 µg/L	<0.5	----	----	----	----
Phenanthrene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	85.8	62.6	116
Pyrene	0.2 µg/L	----	2	86.2	63.1	118
	0.5 µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 299533)		µg/L	µg/L	%	%	%
C10 - C14 Fraction	50 µg/L	----	200	102	58.9	131
	50 µg/L	<50	----	----	----	----
C15 - C28 Fraction	100 µg/L	----	200	124	73.9	138
	100 µg/L	<100	----	----	----	----
C29 - C36 Fraction	50 µg/L	----	200	77.5	62.7	131
	50 µg/L	<50	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 299867)		µg/L	µg/L	%	%	%
C6 - C9 Fraction	20 µg/L	<20	----	----	----	----
	20 µg/L	----	260	115	75	127
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 302483)		µg/L	µg/L	%	%	%
C6 - C9 Fraction	20 µg/L	<20	----	----	----	----
	20 µg/L	----	260	92.5	75	127
EP080: BTEX						
EP080: BTEX - (QC Lot: 299867)		µg/L	µg/L	%	%	%
Benzene	1 µg/L	<1	----	----	----	----
	1 µg/L	----	10	97.1	76.2	124
Ethylbenzene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	97.3	76.1	122
meta- & para-Xylene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	89.2	75.7	123

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Matrix Type: WATER

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

Analyte name	*LOR*	*Method blank result*	*Actual Results*		*Recovery Limits*	
			Spike concentration	*Spike Recovery*	*Dynamic Recovery Limits*	
				LCS	*Low*	*High*
EP080: BTEX - continued						
EP080: BTEX - (QC Lot: 299867) - continued		µg/L	µg/L	%	%	%
ortho-Xylene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	97.3	77.9	121
Toluene	2 µg/L	----	10	97.5	74.4	124
	2 µg/L	<2	----	----	----	----
EP080: BTEX - (QC Lot: 302483)		µg/L	µg/L	%	%	%
Benzene	1 µg/L	<1	----	----	----	----
	1 µg/L	----	10	94.4	76.2	124
Ethylbenzene	2 µg/L	----	10	103	76.1	122
	2 µg/L	<2	----	----	----	----
meta- & para-Xylene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	99.8	75.7	123
ortho-Xylene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	101	77.9	121
Toluene	2 µg/L	----	10	98.9	74.4	124
	2 µg/L	<2	----	----	----	----

ALS Environmental

Quality Control Report - Matrix Spikes (MS)

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 type is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQO's). 'Ideal' recovery ranges stated may be waived in the event of sample matrix interferences. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. *Abbreviations:* ***LOR*** *= Limit of Reporting,* ***RPD*** *= Relative Percent Difference.*

* Indicates failed QC

Matrix Type: WATER

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EP080/071: Total Petroleum Hydrocarbons								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 299867)				µg/L	µg/L	%	%	%
C6 - C9 Fraction	ES0613706-005	Anonymous	20 µg/L	250	<20	108	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 302483)				µg/L	µg/L	%	%	%
C6 - C9 Fraction	ES0613650-002	BHF/8.5M	20 µg/L	250	600	113	70	130
EP080: BTEX								
EP080: BTEX - (QC Lot: 299867)				µg/L	µg/L	%	%	%
Benzene	ES0613706-005	Anonymous	1 µg/L	25	<1	92.0	70	130
Toluene			2 µg/L	25	<2	78.1	70	130
Ethylbenzene			2 µg/L	25	<2	91.0	70	130
meta- & para-Xylene			2 µg/L	25	<2	81.9	70	130
ortho-Xylene			2 µg/L	25	<2	93.3	70	130
EP080: BTEX - (QC Lot: 302483)				µg/L	µg/L	%	%	%
Benzene	ES0613650-002	BHF/8.5M	1 µg/L	25	1	81.0	70	130
Toluene			2 µg/L	25	2	81.9	70	130
Ethylbenzene			2 µg/L	25	106	* Not Determined	70	130
meta- & para-Xylene			2 µg/L	25	265	* Not Determined	70	130
ortho-Xylene			2 µg/L	25	383	* Not Determined	70	130

ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 5**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	Smithfield NSW Australia 2164	**Work order**	: **ES0613650**
						Amendment No.	:
Project	:	347496 Macdonaldtown Gasworks	**Quote number**	:	EN/006/06	**Date received**	: 1 Nov 2006
Order number	:	REBATCH OF ES0613192				**Date issued**	: 8 Nov 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 2
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 2

This Interpretive Quality Control Report was issued on 8 Nov 2006 for the ALS work order reference ES0613650 and supersedes any previous reports with this reference.
This report contains the following information:

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

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Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Matrix Type: SOIL ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP071: TPH - Semivolatile Fraction							
Amber Glass Bottle - Unpreserved							
BHF/8.5M	**1 Nov 2006**	**2 Nov 2006**	8 Nov 2006	Pass	**2 Nov 2006**	12 Dec 2006	Pass
EP075(SIM): PAH/Phenols (GC/MS - SIM)							
Amber Glass Bottle - Unpreserved							
BHF/8.5M	**1 Nov 2006**	**2 Nov 2006**	8 Nov 2006	Pass	**3 Nov 2006**	12 Dec 2006	Pass
EP080: TPH Volatiles/BTEX							
Amber VOC Vial - HCl or NaHSO4							
BHD/8.4M	**2 Nov 2006**	**----**	----	----	**3 Nov 2006**	16 Nov 2006	Pass
Amber VOC Vial - HCl or NaHSO4							
BHF/8.5M	**20 Oct 2006**	**----**	----	**----**	**8 Nov 2006**	3 Nov 2006	**Fail by 5 days**

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Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Matrix Type: WATER ***Frequency of Quality Control Samples***

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
EP080: TPH Volatiles/BTEX	2	10	**20.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EP071: TPH - Semivolatile Fraction	1	8	**12.5**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	5	**20.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	10	**20.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EP071: TPH - Semivolatile Fraction	1	8	**12.5**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	5	**20.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	10	**20.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EP080: TPH Volatiles/BTEX	2	10	**20.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

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Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). Flagged outliers on control limits for inorganics tests may be within the NEPM specified data quality objective of recoveries in the range of 70 to 130%. Where this occurs, no corrective action is taken. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Matrix Spikes (MS)							
EP080: BTEX	WATER	ES0613650-002	BHF/8.5M	Ethylbenzene	ND	----	MS recovery not determined, background level greater than or equal to 4x spike level.
				meta- & para-Xylene	ND	----	MS recovery not determined, background level greater than or equal to 4x spike level.
				ortho-Xylene	ND	----	MS recovery not determined, background level greater than or equal to 4x spike level.

- **For all matrices, no RPD recovery outliers occur for the duplicate analysis.**
- **For all matrices, no method blank result outliers occur.**
- **For all matrices, no laboratory spike recoveries breaches occur.**

Surrogates

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

Outliers : Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP080: TPH Volatiles/BTEX							
Amber VOC Vial - HCl or NaHSO4 BHF/8.5M	**20 Oct 2006**	**----**	----	**----**	**8 Nov 2006**	3 Nov 2006	**Fail by 5 days**

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- **No frequency outliers occur.**

Method Reference Summary

The analytical procedures used by ALS Environmental are based on established internationally-recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house procedure 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 herein. Reference methods from which ALSE methods are based are provided in parenthesis.

Matrix Type: TCLP LEACHATE ***Method Reference Summary***

Preparation Methods

ORG14 : Separatory Funnel Extraction of Liquids - USEPA SW 846 - 3510B 500 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.

Analytical Methods

EN33 : TCLP for Non and Semivolatile Analytes - (USEPA SW846-1311, ALS QWI-EN/33) The TCLP procedure is designed to determine the mobility of both organic and inorganic analytes present in wastes. The standard TCLP leach is for non-volatile and Semivolatile test parameters. Extraction Fluid #1 pH 4.88 - 4.98. Extraction Fluid #2 pH 2.83 - 2.93.

EP071 : TPH - Semivolatile Fraction - USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP075(SIM) : PAH/Phenols (GC/MS - SIM) - USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Matrix Type: ZHE LEACHATE ***Method Reference Summary***

Analytical Methods

EP080 : TPH Volatiles/BTEX - USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

AUSTRALIAN LABORATORY SERVICES PTY LTD ABN 84 009 936 029
277-289 Woodpark Road Smithfield NSW 2164 Australia
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ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive report

Client Details

Client	:	**CH2M HILL PTY LTD**
Contact	:	**MR ADAM SULLIVAN**
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515
Project	:	**347496 MACDONALDTOWN GASWORK**
Order number	:	**REBATCH OF ES0613192**
C-O-C Number	:	**- Not provided -**
Site	:	**- Not provided -**
Sampler	:	**- Not provided -**
E-mail	:	adam.sullivan@ch2m.com.au
Telephone	:	02 9950 0200
Facsimile	:	02 9950 0600

Laboratory Details

Laboratory	:	**ALS Environmental Sydney**
Manager	:	**Greg Vogel**
Address	:	277-289 Woodpark Road Smithfield NSW Australia 2164
Quote number	:	----
Work order	:	**ES0613650**
E-mail	:	Greg.Vogel@alsenviro.com
Telephone	:	+61 (02) 8784 8555
Facsimile	:	+61 (02) 8784 8500

Dates

Date Samples Received	:	1 Nov 2006	**SRA Issue Date**	:	1 Nov 2006
Scheduled Reporting Date	:	**8 Nov 2006**	**Client Requested Date**	:	8 Nov 2006

Delivery Details

Mode of Delivery	:	Carrier.	**Temperature**	:	AMBIENT
No. of coolers/boxes	:	REBATCH	**No. of samples** - **Received**		2
Security Seal	:	Intact.	- **Analysed**		2

Comments

- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **This is a rebatch of ES0613192.**
- **Neutral leach analysis to be conducted in work order ES0613652.**

- Analytical work for this work order will be conducted at ALSE Sydney.
- Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.
- Please direct any queries related to sample condition / numbering / breakages to Nanthini Coilparampil
- Please direct any turn around / technical queries to the laboratory contact designated above.
- When the sampling time is not supplied on the COC documentation, ALSE defaults the sampling time to that of the COC 'relinquishment' time (if supplied). If this also is not supplied, ALSE defaults the sampling time to the 'time of receipt at Laboratory'.

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0613650
Project	: 347496 MACDONALDTOWN GASWORKS	**ALS Quote Reference**	: ----

Summary of Sample(s) / Container(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary for the execution of client requested tasks. Packages may contain additional analyses, such as moisture and preparation tasks, that form an implicit part of that package.

ALS Sample ID.	Client Sample ID - Sample Date	**Requested Analysis**									
		EP080 - WATER BTEX	**TCLP - WATER** TCLP Leach	**TCLP-ZHE - WATER** TCLP ZHE Leach	**W-07 - WATER** TPH/BTEX/PAH	**TCLP - SOIL** TCLP Leach	**TCLP-ZHE - SOIL** TCLP ZHE Leach				
ES0613650-001	**BHD/8.4M - 20 Oct 2006**	⌋		⌋			⌋				
ES0613650-002	**BHF/8.5M - 20 Oct 2006**		⌋	⌋	⌋	⌋	⌋				
	Total(s) :	**1**	**1**	**2**	**1**	**1**	**2**				

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0613650
Project	: 347496 MACDONALDTOWN GASWORKS	**ALS Quote Reference**	: ----

Requested Reports

l **ALL ACCOUNTS**

- Invoice	Email	mogibu.rahman@ch2m.com.au

l **MR ADAM SULLIVAN**

- A4 - Certificate of Analysis - NEPM format	Email	adam.sullivan@ch2m.com.au
- A4 - Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
- A4 - Interpretive Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
- ENMRG Export Format	Email	adam.sullivan@ch2m.com.au
- ESDAT Export Format	Email	adam.sullivan@ch2m.com.au
- Chain of Custody Acknowledgement	Email	adam.sullivan@ch2m.com.au
- A4 - Sample Receipt Notification - Comprehensive format	Email	adam.sullivan@ch2m.com.au

Sample Container(s) / Preservation Non-Compliance Log

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

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

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CERTIFICATE OF ANALYSIS

Client	: **CH2M HILL PTY LTD**	*Laboratory*	: **ALS Environmental Sydney**	*Page*	: **1 of 5**
Contact	: **MR ADAM SULLIVAN**	*Contact*	: **Greg Vogel**	*Work Order*	: **ES0613652**
Address	: **PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515**	*Address*	: **277-289 Woodpark Road Smithfield NSW Australia 2164**		
E-mail	: **adam.sullivan@ch2m.com.au**	*E-mail*	: **Greg.Vogel@alsenviro.com**		
Telephone	: **02 9950 0200**	*Telephone*	: **+61 (02) 8784 8555**		
Facsimile	: **02 9950 0600**	*Facsimile*	: **+61 (02) 8784 8500**		
Project	: **347496 Macdonaldtown Gasworks**	*Quote number*	: **EN/006/06**	*Date received*	: **1 Nov 2006**
Order number	: **Rebatch Of ES0613192**			*Date issued*	: **8 Nov 2006**
C-O-C number	: **- Not provided -**			*No. of samples*	- *Received* : **2**
Site	: **- Not provided -**				*Analysed* : **2**

ALSE - Excellence in Analytical Testing

NATA Accredited Laboratory 825

This document is issued in accordance with NATA's accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatory	*Position*	*Department*
EDWANDY FADJAR		**Organics - NATA 825 (10911 - Sydney)**
Pabi Subba		**Organics - NATA 825 (10911 - Sydney)**
Peter Dickenson	**Senior Spectroscopist**	**Inorganics - NATA 825 (10911 - Sydney)**
PHALAK INTHAKESONE	**Organics Co-ordinator**	**Organics - NATA 825 (10911 - Sydney)**

ALS Environmental

Comments

This report for the ALSE reference ES0613652 supersedes any previous reports with this reference. Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- **Analytical Results for Samples Submitted**
- **Surrogate Recovery Data**

The analytical procedures used by ALS Environmental 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 herein. Reference methods from which ALSE methods are based are provided in parenthesis.

When moisture determination has been performed, results are reported on a dry weight basis. When a reported 'less than' result is higher than the LOR, this may be due to primary sample extracts/digestion dilution and/or insuffient sample amount for analysis. Surrogate Recovery Limits are static and based on USEPA SW846 or ALS-QWI/EN38 (in the absence of specified USEPA limits). Where LOR of reported result differ from standard LOR, this may be due to high moisture, reduced sample amount or matrix interference. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number, LOR = Limit of Reporting. * Indicates failed Surrogate Recoveries.

Specific comments for Work Order **ES0613652**

Insufficient sample volume BHF/8.5M for ZHE BTEX analysis.
EP075(SIM): Sample required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.

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Analytical Results

			Client Sample ID :	BHF/8.5M				
			Sample Matrix Type / Description :	ASTM LEACHATE				
			Sample Date / Time :	6 Nov 2006 12:00				
			Laboratory Sample ID :	ES0613652-002				
Analyte	CAS number	LOR	Units					
EN60-DI: Bottle Leaching Procedure								
Final pH		0.1	pH Unit	4.9				
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	3130				
Acenaphthylene	208-96-8	1.0	µg/L	2.4				
Acenaphthene	83-32-9	1.0	µg/L	13.5				
Fluorene	86-73-7	1.0	µg/L	34.6				
Phenanthrene	85-01-8	1.0	µg/L	21.3				
Anthracene	120-12-7	1.0	µg/L	5.4				
Fluoranthene	206-44-0	1.0	µg/L	2.5				
Pyrene	129-00-0	1.0	µg/L	1.9				
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0				
Chrysene	218-01-9	1.0	µg/L	<1.0				
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0				
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0				
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5				
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0				
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0				
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0				
EP080/071: Total Petroleum Hydrocarbons								
C10 - C14 Fraction		50	µg/L	6990				
C15 - C28 Fraction		100	µg/L	600				
C29 - C36 Fraction		50	µg/L	<50				
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	34.1				
2-Chlorophenol-D4	93951-73-6	0.1	%	69.6				
2.4.6-Tribromophenol	118-79-6	0.1	%	79.5				
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	73.5				
Anthracene-d10	1719-06-8	0.1	%	75.5				
4-Terphenyl-d14	1718-51-0	0.1	%	77.0				

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Analytical Results

			Client Sample ID :	BHD/8.4M				
			Sample Matrix Type / Description :	TCLP LEACHATE				
			Sample Date / Time :	2 Nov 2006 13:00				
			Laboratory Sample ID :	ES0613652-001				
Analyte	*CAS number*	*LOR*	*Units*					
EP080: BTEX								
Benzene	71-43-2	1	µg/L	10				
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	3				
ortho-Xylene	95-47-6	2	µg/L	2				
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	101				
Toluene-D8	2037-26-5	0.1	%	100				
4-Bromofluorobenzene	460-00-4	0.1	%	105				

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Surrogate Control Limits

Matrix Type: SOIL - Surrogate Control Limits ***Surrogate Control Limits***

Method name	*Analyte name*	*Lower Limit*	*Upper Limit*
EP075(SIM): PAH/Phenols (GC/MS - SIM)			
EP075(SIM)S: Phenolic Compound Surrogates	Phenol-d6	10	94
	2-Chlorophenol-D4	23	134
	2,4,6-Tribromophenol	10	123
EP075(SIM)T: PAH Surrogates	2-Fluorobiphenyl	43	116
	Anthracene-d10	27	133
	4-Terphenyl-d14	33	141
EP080: TPH Volatiles/BTEX			
EP080S: TPH(V)/BTEX Surrogates	1,2-Dichloroethane-D4	80	120
	Toluene-D8	88	110
	4-Bromofluorobenzene	86	115

545-426

FYDI 1/11/06 9am

Fadi Soro

From: Nanthini Coilparampil
Sent: Tuesday, 31 October 2006 6:16 PM
To: Samples Sydney
Subject: FW: Additional analysis

es0613192_coc.pdf

CONTRACT WORK
WO: .....
LAB: .....
DATE: .....
SPLIT: from ES0613650. TC4
Neutral leach -

Please re-batch according to the E-mail

From: Adam.Sullivan@ch2m.com.au [mailto:Adam.Sullivan@ch2m.com.au]
Sent: Tuesday, 31 October 2006 5:00 PM
To: Nanthini Coilparampil
Subject: Additional analysis

Hi Nanthini

Are you able to analyse the following samples for TCLP and neutral leach (from attached COC):

1. • 14 BHD/8.4m – BTEX;
2. • 6 BHF/8.5m – BTEX, TPH and PAH (including B(a)P).

Regards

Adam

****

This e-mail has been swept by mimesweeper

through the ALS North America gateway.

****

ALS Environmental
Sydney
Work Order
ES0613652
Telephone : +61 (02) 8784 8555

ALS Environmental

QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 5**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	: **ES0613652**
						Amendment No.	:
Project	:	347496 Macdonaldtown Gasworks	**Quote number**	:	EN/006/06	**Date received**	: 31 Oct 2006
Order number	:	Rebatch Of ES0613192				**Date issued**	: 8 Nov 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 2
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 2

This final report for the ALSE work order reference ES0613652 supersedes any previous reports with this reference.

Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- Laboratory Duplicates (DUP); Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Samples (LCS); Recovery and Acceptance Limits
- Matrix Spikes (MS); Recovery and Acceptance Limits

Work order specific comments

Insufficient sample volume BHF/8.5M for ZHE BTEX analysis.

EP075(SIM): Sample required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.

ALSE - Excellence in Analytical Testing

NATA

WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory - 825

This document is issued in accordance with NATA's accreditation requirements.

Accredited for compliance with ISO/IED 17025

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatory	Department
* Not Entered *	Organics - NATA 825 (10911 - Sydney)
EDWANDY FADJAR	Organics - NATA 825 (10911 - Sydney)
Pabi Subba	Organics - NATA 825 (10911 - Sydney)
Peter Dickenson	Inorganics - NATA 825 (10911 - Sydney)
PHALAK INTHAKESONE	Organics - NATA 825 (10911 - Sydney)

ALS Environmental

Quality Control Report - Laboratory Duplicates (DUP)

The quality control term **Laboratory Duplicate** refers to an intralaboratory split sample randomly selected from the sample batch. Laboratory duplicates provide information on method precision and sample heterogeneity.
- Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. *Abbreviations:* ***LOR*** = *Limit of Reporting,* ***RPD*** = *Relative Percent Difference.*
* Indicates failed QC. The permitted ranges for the RPD of Laboratory Duplicates (relative percent deviation) 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%

Matrix Type: WATER ***Laboratory Duplicates (DUP) Report***

Laboratory Sample ID	*Client Sample ID*	*Analyte name*	*LOR*	*Original Result*	*Duplicate Result*	*RPD*
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 299867)				**µg/L**	**µg/L**	**%**
ES0613706-005	Anonymous	C6 - C9 Fraction	20 µg/L	<20	<20	0.0
EP080: BTEX						
EP080: BTEX - (QC Lot: 299867)				**µg/L**	**µg/L**	**%**
ES0613706-005	Anonymous	Benzene	1 µg/L	<1	<1	0.0
		Toluene	2 µg/L	<2	<2	0.0
		Ethylbenzene	2 µg/L	<2	<2	0.0
		meta- & para-Xylene	2 µg/L	<2	<2	0.0
		ortho-Xylene	2 µg/L	<2	<2	0.0

Quality Control Report - Method Blank (MB) and Laboratory Control Samples (LCS)

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 type is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a known, interference free matrix spiked with target analytes or certified reference material. The purpose of this QC type is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of actual laboratory data. Flagged outliers on control limits for inorganics tests may be within the NEPM specified data quality objective of recoveries in the range of 70 to 130%. Where this occurs, no corrective action is taken. Abbreviations: LOR = Limit of reporting.

Matrix Type: WATER

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

		Method blank result	*Actual Results*		*Recovery Limits*	
			Spike concentration	*Spike Recovery*	*Dynamic Recovery Limits*	
Analyte name	*LOR*			*LCS*	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 301224)		µg/L	µg/L	%	%	%
Acenaphthene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	84.8	62.2	113
Acenaphthylene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	89.2	63.6	114
Anthracene	0.2 µg/L	----	2	86.9	64.3	116
	0.5 µg/L	<0.5	----	----	----	----
Benz(a)anthracene	0.2 µg/L	----	2	87.4	64.1	117
	0.5 µg/L	<0.5	----	----	----	----
Benzo(a)pyrene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	87.2	63.3	117
Benzo(b)fluoranthene	0.2 µg/L	----	2	84.2	61.7	119
	0.5 µg/L	<0.5	----	----	----	----
Benzo(g,h,i)perylene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	83.5	59.1	118
Benzo(k)fluoranthene	0.2 µg/L	----	2	89.5	61.7	117
	0.5 µg/L	<0.5	----	----	----	----
Chrysene	0.2 µg/L	----	2	88.4	62.5	116
	0.5 µg/L	<0.5	----	----	----	----
Dibenz(a,h)anthracene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	81.2	61.2	117
Fluoranthene	0.2 µg/L	----	2	88.3	63.6	118
	0.5 µg/L	<0.5	----	----	----	----
Fluorene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	88.2	63.9	115
Indeno(1,2,3,cd)pyrene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	82.8	59.9	118