

Client : CH2M HILL PTY LTD
Project : 347496 Macdonaldtown Gasworks

Work Order : ES0613652
ALS Quote Reference : EN/006/06

Page Number : 4 of 5
Issue Date : 8 Nov 2006

Matrix Type: WATER

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

		Method blank result	Actual Results		Recovery Limits	
Analyte name	LOR		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: 301224) - continued		µg/L	µg/L	%	%	%
Naphthalene	0.2 µg/L	----	2	80.1	62.4	114
	0.5 µg/L	<0.5	----	----	----	----
Phenanthrene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	87.4	62.6	116
Pyrene	0.2 µg/L	----	2	101	63.1	118
	0.5 µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 299867)		µg/L	µg/L	%	%	%
C6 - C9 Fraction	20 µg/L	----	260	115	75	127
	20 µg/L	<20	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 301223)		µg/L	µg/L	%	%	%
C10 - C14 Fraction	50 µg/L	----	200	81.0	58.9	131
	50 µg/L	<50	----	----	----	----
C15 - C28 Fraction	100 µg/L	<100	----	----	----	----
	100 µg/L	----	200	96.0	73.9	138
C29 - C36 Fraction	50 µg/L	<50	----	----	----	----
	50 µg/L	----	200	81.0	62.7	131
EP080: BTEX						
EP080: BTEX - (QC Lot: 299867)		µg/L	µg/L	%	%	%
Benzene	1 µg/L	----	10	97.1	76.2	124
	1 µg/L	<1	----	----	----	----
Ethylbenzene	2 µg/L	----	10	97.3	76.1	122
	2 µg/L	<2	----	----	----	----
meta- & para-Xylene	2 µg/L	----	10	89.2	75.7	123
	2 µg/L	<2	----	----	----	----
ortho-Xylene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	97.3	77.9	121
Toluene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	97.5	74.4	124

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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	
Analyte name	Laboratory Sample ID	Client Sample ID	LOR	Spike Concentration	Sample Result	Spike Recovery	Static Limits	
						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: 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

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	: ES0613652
				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 ES0613652 and supersedes any previous reports with this reference.

This report contains the following information:

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

Client : CH2M HILL PTY LTD
 Project : 347496 Macdonaldtown Gasworks

Work Order : ES0613652
 ALS Quote Reference : EN/006/06

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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	6 Nov 2006	6 Nov 2006	13 Nov 2006	Pass	6 Nov 2006	16 Dec 2006	Pass
EP075(SIM): PAH/Phenols (GC/MS - SIM)							
Amber Glass Bottle - Unpreserved BHF/8.5M	6 Nov 2006	6 Nov 2006	13 Nov 2006	Pass	6 Nov 2006	16 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	8 Nov 2006	----	----	----	8 Nov 2006	22 Nov 2006	Pass

Client : CH2M HILL PTY LTD
 Project : 347496 Macdonaldtown Gasworks

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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	2	50.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	1	100.0	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	2	50.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	1	100.0	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

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

Surrogates

- 1 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'.

- 1 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'.

- 1 No frequency outliers occur.

Client : CH2M HILL PTY LTD
Project : 347496 Macdonaldtown Gasworks

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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

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

EN60-DI : Deionized Water Leach - AS4439.3 Preparation of Leachates. Using deionised water as the leaching fluid

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: TCLP 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)



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 : ES0613652
 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

- 1 Samples received in appropriately pretreated and preserved containers.
- 1 Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).
- 1 This is a rebatch of ES0613192.
- 1 TCLP analysis to be conducted in work order ES0613650.
- 1 Analytical work for this work order will be conducted at ALSE Sydney.
- 1 Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.
- 1 Please direct any queries related to sample condition / numbering / breakages to Nanthini Coilparampil
- 1 Please direct any turn around / technical queries to the laboratory contact designated above.
- 1 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'.

Disclaimer : This document contains privileged and confidential information intended only for the use of the addressee. If you are not the addressee, you are hereby notified that you must not disseminate, copy or take action of its contents. If you have received this document in error, please notify ALS immediately.

SAMPLE RECEIPT NOTIFICATION (SRN) - continued

Client : CH2M HILL PTY LTD
Project : 347496 MACDONALDTOWN GASWORKS

Work Order : ES0613652
ALS Quote Reference : ----



Summary of Sample(s) / Container(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 moisture and preparation tasks, that form an implicit part of that package.

ALS Sample ID.	Client Sample ID - Sample Date	Requested Analysis							
		EN60-DI Suite - WATER Deionised Water Leach	EN60Z-DI - WATER DI Water Leach ZHE	EP080 - WATER BTEX	W-07 - WATER TPH/BTEX/PAH	EN60-DI Suite - SOIL Deionised Water Leach	EN60Z-DI - SOIL DI Water Leach ZHE		
ES0613652-001	BHD/8.4M - 20 Oct 2006		1	1			1		
ES0613652-002	BHF/8.5M - 20 Oct 2006	1	1		1	1	1		
Total(s) :		1	2	1	1	1	2		

SAMPLE RECEIPT NOTIFICATION (SRN) - continued

Client : CH2M HILL PTY LTD
Project : 347496 MACDONALDTOWN GASWORKS

Work Order : ES0613652
ALS Quote Reference : ----



Requested Reports

1	ALL ACCOUNTS		
	- Invoice	Email	mogibu.rahman@ch2m.com.au
1	MR ADAM SULLIVAN		
	- A4 - Certificate of Analysis - NEPM format	Email	adam.sullivan@ch2m.com.au
	- A4 - Interpretive Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
	- A4 - 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.

1 No sample container / preservation non-compliance exist.

Certificate of Analysis



Client: CH2M Hill Australia Pty Ltd
Level 7, 9 Help Street
Chatswood
NSW 2067
Australia

Attention: Adam Sullivan

Date Received: 27 Feb 2007

AgriQuality Lab. Reference: 23154

Sample Type(s): Solid

Analysis: **Polychlorinated dibenzo-p-dioxins (PCDDs)**
Polychlorinated dibenzofurans (PCDFs)

Method: Based on USEPA Method 1613B (Isotope Dilution)

Results are reported in picograms per gram (pg/g), equivalent to ppt, on an as received basis to three significant figures. The DL value is reported to three significant figures. Results have been corrected for recoveries. The sum of PCDDs and PCDFs is calculated and reported to three significant figures as a lower, medium, and upper bound.

The total toxic equivalence (TEQ) was calculated for each sample using both WHO toxic equivalency factors (WHO-TEFs; Van den Berg et al., 2005) and international toxic equivalency factors (I-TEFs; Kutz et al., 1990). The total WHO-TEQ and I-TEQ level is reported as a lower, medium, and upper bound to three significant figures.

Unless requested, samples will be disposed of three months from the date of this report.

Comments:

A handwritten signature in black ink, appearing to read 'Phil Bridgen'.

Phil Bridgen
Team Leader - Dioxins
AgriQuality Limited



Results: USEPA Method 1613B

Laboratory Reference: **23154-1**Sample Identification: **SOLID TAR/SYDNEY**

Date Received: 27 Feb 2007

Date Analysed U2: 13 Mar 2007

Date Extracted: 07 Mar 2007

Date Analysed SP2331: Not applicable

Analyte	Conc. [†] (pg/g)	DL	EMPC	¹³ C%RE	LCL-UCL	Qualifiers
2378 TCDF	ND	0.439		126	24 - 169	
Total TCDF	ND	0.439				
2378 TCDD	ND	0.996		75	25 - 164	
Total TCDD	ND	0.996				
37Cl ₄ TCDD				99	35 - 197	
12378 PeCDF	ND	0.296		63	24 - 185	
23478 PeCDF	ND	0.279		53	21 - 178	
Total PeCDF	ND	0.296				
12378 PeCDD	ND	0.522		78	25 - 181	
Total PeCDD	1.32					
123478 HxCDF	ND	0.388		91	26 - 152	
123678 HxCDF	ND	0.447		88	26 - 123	
234678 HxCDF	ND	0.355		103	28 - 136	
123789 HxCDF	ND	0.583		108	29 - 147	
Total HxCDF	ND	0.583				
123478 HxCDD	ND	0.871		87	32 - 141	
123678 HxCDD	ND	0.997		82	28 - 130	
123789 HxCDD	ND	0.891				
Total HxCDD	2.14					
1234678 HpCDF	ND	0.686		89	28 - 143	
1234789 HpCDF	ND	0.856		138	26 - 138	
Total HpCDF	ND	0.856				
1234678 HpCDD	1.72			94	23 - 140	
Total HpCDD	3.42					
OCDF	ND	4.87				
OCDD	78.9			47	17 - 157	

	Lower Bound	Medium Bound	Upper Bound	Units
Sum of congeners:	85.8	89.8	93.8	pg/g
Total I-TEQ:	0.0961	1.06	2.02	pg/g
Total WHO-TEQ:	0.0409	1.10	2.17	pg/g

† = Results are reported on an as received basis

DL: Sample Specific Estimated Detection Limit

ND = Not Detected

EMPC: Estimated Maximum Possible Concentration

¹³C %RE: Labelled Compound Recovery

LCL-UCL: Lower Control Limit - Upper Control Limit

³⁷Cl₄ TCDD: Clean-up recovery spike

Lab Analyst: TG

Data Analyst: PB

Authorised: Phil Bridgen

Results: USEPA Method 1613B

Laboratory Reference: **23154 BLANK**Sample Identification: **Laboratory Blank**

Date Received: Not applicable

Date Analysed U2: 13 Mar 2007

Date Extracted: 07 Mar 2007

Date Analysed SP2331: Not applicable

Analyte	Conc. [†] (pg/g)	DL	EMPC	¹³ C%RE	LCL-UCL	Qualifiers
2378 TCDF	ND	0.209		67	24 - 169	
Total TCDF	ND	0.209				
2378 TCDD	ND	0.388		74	25 - 164	
Total TCDD	ND	0.388				
37Cl ₄ TCDD				80	35 - 197	
12378 PeCDF	ND	0.226		82	24 - 185	
23478 PeCDF	ND	0.205		90	21 - 178	
Total PeCDF	ND	0.226				
12378 PeCDD	ND	0.422		74	25 - 181	
Total PeCDD	ND	0.422				
123478 HxCDF	ND	0.474		89	26 - 152	
123678 HxCDF	ND	0.455		93	26 - 123	
234678 HxCDF	ND	0.445		101	28 - 136	
123789 HxCDF	ND	0.759		105	29 - 147	
Total HxCDF	ND	0.759				
123478 HxCDD	ND	0.492		96	32 - 141	
123678 HxCDD	ND	0.525		95	28 - 130	
123789 HxCDD	ND	0.504				
Total HxCDD	ND	0.525				
1234678 HpCDF	ND	0.634		90	28 - 143	
1234789 HpCDF	ND	0.951		106	26 - 138	
Total HpCDF	ND	0.951				
1234678 HpCDD	ND	0.758		89	23 - 140	
Total HpCDD	ND	0.758				
OCDF	ND	1.09				
OCDD	ND	1.32		68	17 - 157	

	Lower Bound	Medium Bound	Upper Bound	Units
Sum of congeners:	0	3.32	6.65	pg/g
Total I-TEQ:	0	0.562	1.12	pg/g
Total WHO-TEQ:	0	0.644	1.29	pg/g

† = Results are calculated using the average weight of samples in this batch

ND = Not Detected

DL: Sample Specific Estimated Detection Limit

EMPC: Estimated Maximum Possible Concentration

¹³C %RE: Labelled Compound Recovery

LCL-UCL: Lower Control Limit - Upper Control Limit

³⁷Cl₄ TCDD: Clean-up recovery spike

Lab Analyst: TG

Data Analyst: PB

Authorised: Phil Bridgen