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CERTIFICATE OF ANALYSIS 76695

Client:
Douglas Partners
96 Hermitage Rd
West Ryde
NSW 2114

Attention: Peter Oitmaa

Sample log in details:

Your Reference:	**45153.02, Sydney Olympic Park**
No. of samples:	3 Waters
Date samples received / completed instructions received	30/07/2012 / 30/07/2012

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	2/08/12 / 31/07/12
Date of Preliminary Report:	Not issued

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Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Jeremy Faircloth
Chemist

ACCREDITED FOR TECHNICAL COMPETENCE

VOCs in water Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	76695-1 G1 30/07/2012 Water	76695-2 G4 30/07/2012 Water	76695-3 G5 30/07/2012 Water
Date extracted	-	30/07/2012	30/07/2012	30/07/2012
Date analysed	-	31/07/2012	31/07/2012	31/07/2012
Dichlorodifluoromethane	µg/L	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1
Chloroform	µg/L	<1	1	1
2,2-dichloropropane	µg/L	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1
Cyclohexane	µg/L	<1	13	<1
Carbon tetrachloride	µg/L	<1	<1	<1
Benzene	µg/L	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1
Toluene	µg/L	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1
Bromoform	µg/L	<1	<1	<1
m+p-xylene	µg/L	<2	8	<2
Styrene	µg/L	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1
o-xylene	µg/L	<1	5	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1

VOCs in water Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	76695-1 G1 30/07/2012 Water	76695-2 G4 30/07/2012 Water	76695-3 G5 30/07/2012 Water
Isopropylbenzene	µg/L	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	6	<1
Tert-butyl benzene	µg/L	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1
Surrogate Dibromofluoromethane	%	108	106	109
Surrogate toluene-d8	%	98	97	98
Surrogate 4-BFB	%	96	99	96

vTRH in Water (C6-C9)				
Our Reference:	UNITS	76695-1	76695-2	76695-3
Your Reference	----------	G1	G4	G5
Date Sampled	----------	30/07/2012	30/07/2012	30/07/2012
Type of sample		Water	Water	Water
Date extracted	-	30/07/2012	30/07/2012	30/07/2012
Date analysed	-	31/07/2012	31/07/2012	31/07/2012
TRHC$_6$ - C$_9$	µg/L	<10	110	<10
Surrogate Dibromofluoromethane	%	108	106	109
Surrogate toluene-d8	%	98	97	97
Surrogate 4-BFB	%	96	99	96

Method ID	Methodology Summary
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS.

QUALITY CONTROL VOCs in water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			30/07/2012	[NT]	[NT]	LCS-W1	30/07/2012
Date analysed	-			31/07/2012	[NT]	[NT]	LCS-W1	31/07/2012
Dichlorodifluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Chloromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Vinyl Chloride	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Bromomethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Chloroethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Trichlorofluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
1,1-Dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Trans-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	116%
Cis-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Chloroform	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	110%
2,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	98%
1,1,1-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	112%
1,1-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Cyclohexane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Carbon tetrachloride	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Dibromomethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Trichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	106%
Bromodichloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	111%
trans-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
cis-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1,2-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,3-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Dibromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	108%
1,2-dibromoethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Tetrachloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	105%
1,1,1,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Chlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Ethylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromoform	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
m+p-xylene	µg/L	2	Org-013	<2	[NT]	[NT]	[NR]	[NR]
Styrene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1,2,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
o-xylene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL VOCs in water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
1,2,3-trichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Isopropylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
n-propyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
2-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
4-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,3,5-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Tert-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,4-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,3-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Sec-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,4-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
4-isopropyl toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
n-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dibromo-3-chloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,4-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Hexachlorobutadiene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,3-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-013	109	[NT]	[NT]	LCS-W1	108%
Surrogate toluene-d8	%		Org-013	99	[NT]	[NT]	LCS-W1	100%
Surrogate 4-BFB	%		Org-013	97	[NT]	[NT]	LCS-W1	97%

QUALITY CONTROL vTRH in Water (C6-C9)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			30/07/2012	[NT]	[NT]	LCS-W1	30/07/2012
Date analysed	-			31/07/2012	[NT]	[NT]	LCS-W1	31/07/2012
TRHC$_6$ - C$_9$	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	135%
Surrogate Dibromofluoromethane	%		Org-013	109	[NT]	[NT]	LCS-W1	108%
Surrogate toluene-d8	%		Org-013	99	[NT]	[NT]	LCS-W1	97%
Surrogate 4-BFB	%		Org-013	97	[NT]	[NT]	LCS-W1	99%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

Envirolab Services Pty Ltd
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12 Ashley St Chatswood NSW 2067
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SAMPLE RECEIPT ADVICE

Client:

Douglas Partners
96 Hermitage Rd
West Ryde NSW 2114

ph: 02 9809 0666
Fax: 02 9809 4095

Attention: Peter Oitmaa

Sample log in details:

Your reference:	**45153.02, Sydney Olympic Park**
Envirolab Reference:	**76695**
Date received:	30/07/2012
Date results expected to be reported:	**2/08/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	3 Waters
Turnaround time requested:	72hr
Temperature on receipt	Cool
Cooling Method:	Ice Pack
Sampling Date Provided:	YES

Comments:

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples.

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

Douglas Partners
Geotechnics · Environment · Groundwater

CHAIN OF CUSTODY

Project Name: Sydney Olympic Park
Project No: 45153.02 Sampler: SB
Project Mgr: PMD Mob. Phone:
Email: peter-s@dtmaa @douglaspartners.com.au
Date Required: Lab Quote No. 3 day turnaround

To: Envirolab Services
12 Ashley Street, Chatswood NSW 2068
Attn: Tania Notaras
Phone: 02 9910 6200 Fax: 02 9910 6201
Email: tnotaras@envirolabservices.com.au

ENVIROLAB
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 76695
Date Received: 30/7/12
Time Received: 14:45
Received by: PT
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Sample ID	Sample Depth	Lab ID	Sampling Date	Sample Type S - soil W - water	Container type	Analytes													
							VOC	TRH											
G1		1)	30/7/12	W	4xVial		•	•											
G4		2)	" "	W	" "		•	•											
G5		3)	" "	W	" "		•	•											

Lab Report No.
Send Results to: Douglas Partners Address: 96 Hermitage Road, West Ryde 2114
Phone: (02) 9809 0666
Fax: (02) 9809 4095

Relinquished by:	SB	Signed:	Date & Time: 30/7/12	14:00	Received By: Pratistha	Date & Time: 30/7/12 14:45
Relinquished by:		Signed:	Date & Time:		Received By:	Date & Time:

Appendix G

QA/QC Information

Quality Assurance/Quality Control Procedures and Results

Field QA/QC for Soil Samples

The field QA/QC procedures for sampling described in the Douglas Partners *Field Procedures Manual* were followed at all times during the field work. Soil sampling was undertaken using disposable equipment and hence rinsate collection was not undertaken.

Laboratory-prepared Trip Blank and Trip Spike soil samples were taken to site during the field work, stored in the same container used to store the field samples, and transported to the laboratory with the field samples selected for analysis. The purpose of the Trip Blank was to determine whether cross-contamination of the samples was likely to have occurred. The purpose of the Trip Spike was to determine whether significant loss of volatile contaminants may have occurred.

The results for the Trip Blank and Trip Spike soil samples are provided in Table G1.

Table G1: Trip Blank and Trip Spike QA/QC Results for Hydrocarbons in Soils

Sample ID	Total Concentration (mg/kg) or % Recovery				
	Benzene	Toluene	Ethyl-benzene	Xylene	TRH $C_6 - C_9$
TB	<0.2	<0.5	<1	<3	<25
TS	100%	102%	99%	98%	NT

Notes: TRH = Total recoverable hydrocarbons; NT = Not tested; TB = Trip blank; TS = Trip spike

The concentrations of analytes in the Trip Blank were below the laboratory detection limits which indicates that cross-contamination is unlikely to have occurred. The recovery rates for the Trip Spike analytes were within an acceptable range which indicates that the significant loss of volatile contaminants is unlikely to have occurred. The field sampling protocols for soils are therefore considered appropriate.

Field QA/QC for Water Samples

The field QA/QC procedures for sampling described in the Douglas Partners *Field Procedures Manual* were followed at all times during the field work. Groundwater sampling was undertaken using a decontaminated low-flow pump and disposable tubing. A rinsate sample was collected during groundwater sampling by decontaminating the pump with Decon90 phosphate-free detergent and collecting a sample of demineralised water that had been washed through the pump. The sample was analysed for a range of volatile contaminants and heavy metals.

The results for the rinsate sample are provided in Tables G2 and G3.

Table G2: Rinsate QA/QC Results for Hydrocarbons in Water

Sample ID	Total Concentration (µg/L)				
	Benzene	Toluene	Ethylbenzene	Xylene	TRH C_6 – C_9
R1	<1	<1	<1	<3	<10

Notes: TRH = Total recoverable hydrocarbons

Table G3: Rinsate QA/QC Results for Heavy Metals in Water

Sample ID	Total Concentration (µg/L)							
	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
R1	<1	<0.1	<1	<1	<1	<0.05	<1	<1

Notes: As = Arsenic; Cd = Cadmium; Cr = Chromium; Cu = Copper; Pb = Lead, Hg = Mercury; Ni = Nickel; Zn = Zinc

The concentrations of analytes in the rinsate sample were below the laboratory detection limits which indicates appropriate decontamination was undertaken during sampling. The field sampling protocols for groundwater are therefore considered appropriate.

Intra-Laboratory QA/QC Analysis on Soil Samples

Intra-laboratory analysis of duplicate soil samples was conducted as an internal check of the reproducibility of the results from the laboratories and as a measure of consistency of sampling techniques. The results are compared within the duplicate pairs to determine the relative percentage difference (RPD) between the samples. The RPD can then be used to determine whether unacceptable errors may be present in the sample data.

Selected comparative results of the analysis of the duplicate soil samples are summarised in Tables G4 to G6.

Table G4: Intra-Laboratory QA/QC Results for BTEX in Soil

Sample ID	Total Concentration (mg/kg)				
	Benzene	Toluene	Ethylbenzene	m + p xylene	o xylene
C4/0.5	<0.2	<0.5	<1	<2	<1
BD1	<0.2	<0.5	<1	<2	<1
RPD	0%	0%	0%	0%	0%
G3/0.5	<0.2	<0.5	<1	<2	<1
BD2	<0.2	<0.5	<1	<2	<1
RPD	0%	0%	0%	0%	0%
T4/1.0	<0.2	<0.5	<1	<2	<1
BD3	<0.5	<0.5	<0.5	<1	<0.5
RPD	0%	0%	0%	0%	0%

Table G5: Intra-Laboratory QA/QC Results for TRH in Soil

Sample ID	Total Concentration (mg/kg)			
	$C_6 - C_9$	$C_{10} - C_{14}$	$C_{15} - C_{28}$	$C_{29} - C_{36}$
C4/0.5	<25	<50	<100	<100
BD1	<25	<50	<100	<100
RPD	0%	0%	0%	0%
G3/0.5	<25	<50	<100	<100
BD2	<25	<50	<100	<100
RPD	0%	0%	0%	0%
T4/1.0	<25	<50	<100	<100
BD3	<25	<50	140	150
RPD	0%	0%	33%	40%

Table G6: Intra-Laboratory QA/QC Results for Heavy Metals in Soil

Sample ID	Total Concentration (mg/kg)							
	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
C4/0.5	260	<0.5	20	21	38	<0.1	6	85
BD1	170	<0.5	15	18	38	<0.1	5	71
RPD	42%	0%	29%	15%	0%	0%	18%	19%
G3/0.5	34	<0.5	15	23	34	<0.1	7	70
BD2	24	<0.5	17	24	32	<0.1	6	59
RPD	34%	0%	13%	4%	6%	0%	15%	17%
T4/1.0	87	<0.5	19	28	130	<0.1	10	280
BD3	64	<0.5	19	34	120	<0.1	7	270
RPD	30%	0%	0%	19%	8%	0%	35%	4%

Notes: As = Arsenic; Cd = Cadmium; Cr = Chromium; Cu = Copper; Pb = Lead, Hg = Mercury; Ni = Nickel; Zn = Zinc

A RPD of ± 30% is generally considered acceptable for inorganic analytes and a wider range may be acceptable for organic analytes. The RPD values outside the generally acceptable range of ± 30% are indicated by yellow shading in the tables. These values are not considered significant due to the heterogenous nature of filling materials from which the samples were obtained.

It is therefore considered that the results indicate acceptable consistency between the duplicate soil samples, that suitable field sampling methodology was adopted and that adequate laboratory precision was achieved.

Intra-Laboratory QA/QC Analysis on Water Samples

Intra-laboratory analysis of a duplicate water sample was conducted as an internal check of the reproducibility of the results from the laboratory and as a measure of consistency of sampling techniques. The results are compared within the duplicate pair to determine the relative percentage difference (RPD) between the samples. The RPD can then be used to determine whether unacceptable errors may be present in the sample data.

Selected comparative results of the analysis of the duplicate water sample are summarised in Tables G7 to G9.

Table G7: Intra-Laboratory QA/QC Results for BTEX in Water

Sample ID	Total Concentration (µg/L)				
	Benzene	Toluene	Ethylbenzene	m + p xylene	o xylene
G5/10 Jul 2012	<1	1	1	10	5
BD1	<1	1	1	12	6
RPD	0%	0%	0%	18%	18%

Table G8: Intra-Laboratory QA/QC Results for TRH in Water

Sample ID	Total Concentration (µg/L)			
	$C_6 - C_9$	$C_{10} - C_{14}$	$C_{15} - C_{28}$	$C_{29} - C_{36}$
G5/10 Jul 2012	73	90	<100	<100
BD1	110	<50	<100	<100
RPD	40%	57%	0%	0%

Table G9: Intra-Laboratory QA/QC Results for Heavy Metals in Water

Sample ID	Total Concentration (µg/L)							
	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
G5/10 Jul 2012	1	0.3	<1	3	<1	<0.05	39	140
BD1	1	0.3	<1	6	1	<0.05	43	180
RPD	0%	0%	0%	67%	0%	0%	10%	25%

Notes: As = Arsenic; Cd = Cadmium; Cr = Chromium; Cu = Copper; Pb = Lead, Hg = Mercury; Ni = Nickel; Zn = Zinc

A RPD of ± 30% is generally considered acceptable for inorganic analytes and a wider range may be acceptable for organic analytes. The RPD values outside the generally acceptable range of ± 30% are indicated by yellow shading in the tables. These values are not considered significant due to the relatively small actual differences between the contaminant concentrations.

It is therefore considered that the results indicate acceptable consistency between the duplicate water samples, that suitable field sampling methodology was adopted and that adequate laboratory precision was achieved.

Laboratory QA/QC Procedures

Quality control procedures used during the analyses include:

Reagent Blank

A reagent blank sample is prepared and analysed at the beginning of every analytical run, following calibration of the analytical apparatus. The laboratory results for reagent blanks indicated that concentrations of all analytes were below respective laboratory practical quantitation limits.

Duplicate

This is the complete duplicate of a sample from the process batch. The results of the two samples are compared to laboratory acceptance criteria and exceedences highlighted. No exceedences were detected.

Matrix Spike

A portion of a sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and determine whether matrix interference exists. The matrix spike recovery is compared to laboratory acceptance criteria. No exceedences were noted.

Laboratory Control Sample

This is a standard reference sample or control matrix used to check the analytical process. The results were within acceptable limits.

Surrogate Spike

Surrogates are known additions of known compounds to each sample, blank, matrix spike and laboratory control sample. The surrogates are similar to the analyte of interest, however are not expected to be detected in real samples. The results were acceptable.

Appendix H

PID Calibration Certificate

ThermoFisher SCIENTIFIC

The world leader in serving science

SERVICE OR REPAIR: MINIRAE2000 PID

COMPANY	Douglas Partners		
CONTACT	Narilee Edwards		
SERIAL NO.	110003382	**LAMP TYPE**	10.6eV
CALL NO.	96413	**RECEIVED**	03/01/2012

REQUEST/PROBLEM DESCRIPTION
Service & calibration.

This equipment has been calibrated to the manufacturer's specifications, using the standards shown below:

ISOBUTYLENE STANDARD (ppm)	TRACEABILITY LOT NO.	POST CALIBRATION READING (ppm)
0	-	0.0
97		97.6

Cleaned sensor assembly, sensor housing and metal filter
Cleaned and checked lamp and lamp housing
Cleaned pump
Checked battery condition

COMMENTS/ADDITIONAL REPAIRS/SERVICES PERFORMED
The pump is due for rebuilding during the next service. The instrument is sent with the alkaline battery pack.

SERVICED BY	Milenko	**COMPLETED**	05/01/2012
SIGNATURE			