Pacific Environmental

TARGETED SOIL INVESTIGATION MOXHAM QUARRY NORTHMEAD, NSW

FOR

LHJ PTY LIMITED

Prepared by:

PACIFIC ENVIRONMENTAL

PO Box 4045, Illawong Sydney, 2234 Australia

Phone: 9543 2825

Fax: 9543 2823

Email: decontam@bigpond.net.au

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STATEMENT

This report and its contents represent the findings of a site inspection and the results of sampling and testing of five (5) discrete soil samples plus tow water samples from the site and chemical analysis testing of all those samples by a NATA Certified Laboratory. The conclusions of the investigation are to be found in the body of this report and are dependant upon the accuracy of the laboratory analysis. The accuracy of this report and its findings are dependant upon the limitation impose d by the recommended methodology imposed by the NSW DECCW. This report and its findings have been prepared and presented without influence by the client. This report has not been prepared for use in any court action and its use for such is expressly denied. Pacific Environmental accepts liability and consequential damages from any omissions up to the value of the fees paid as outlined in the relevant section of the Trade Practices Act. Pacific Environmental reserves the right to correct any omissions (if any) at its cost.

Prepared By:
STEPHEN SMITH
BSc. Eng., MEng. Sc., CPEng,
Director Pacific Environmental
28th October 2010

1.0 EXECUTIVE SUMMARY

LHJ Pty Ltd has engaged Pacific Environmental (PE) to investigate the potential for contamination in the soils at the former quarry, Known as Moxham Quarry Northmead. The site is located at the rear (west) of number 166 Windsor Road Northmead, NSW. The "site" is the indicative building area immediately west of the existing bowling club. The soils in question are those associated with the previous and existing usage of the site as a sandstone quarry. The site and sample locations are outlined at ***Appendix A – SITE PLAN***.

The site has had no previous contamination assessments.

Soils were sampled up to 0.4mBGL. The depth of the soil assessment was limited by the presence of the sandstone floor of the former quarry. The soils were overlain with nominally 600mm to 800mm of impounded stormwater at the time of the soil sampling and inspection. Five (5) discrete soil samples were taken from five (5) test bores; all samples were taken in accordance with NSW DECCW sampling guidelines). The location of the test bores is detailed at ***Appendix A- SITE PLAN.***

The site soil horizons are uniformly silt and topsoil mixed with leaf litter. Fill was not encountered on site.

The five (5) soil samples were tested by the laboratory (NATA Accreditation Number 2562) as specified by the NSW DECCW in their Guidelines "Guidelines for the NSW Site Auditor Scheme – NSW DECC 2006, Second Edition". Comparison with the following guidelines was undertaken as part of this report:

- NSW EPA's (DECC) Guidelines for Assessing Service Station Sites (Updated 21st February 2008).
- National Environment Protection Measure (NEPM) for Residential Development with un-limited access to soil.5-A - NEPM A.
- National Environment Protection Measure (NEPM) for Residential Development with minimal access to soil.5-A - NEPM D

The laboratory analysis revealed that no samples exceeded the NEPM D Guidelines; there was a minor exceedance for lead at Test site A4 for NEPM A Criteria . This exceedance is not significant; that is the site meets the requirements for residential development with access to the soils (the highest standard in Australia) after a statistical analysis for the 95% confidence limit. In summation the site is suitable for residential development with access to soils.

The two (2) water samples, taken from the impounded water, were tested by the laboratory (NATA Accreditation Number 2562) as specified by the NSW DECCW in their Guidelines "Guidelines for the NSW Site Auditor Scheme – NSW DECC 2006, Second Edition". Comparison with the following guidelines was undertaken as part of this report:

- ANZECC 2000 Guidelines 95% Freshwater Trigger Values.

The laboratory analysis revealed that no samples exceeded the ANZECC Guidelines.

No underground fuel storage tanks were found to be present during the inspection of the site.

2.0 INTRODUCTION

This investigation, site visit, intrusive soils sampling (conducted on 15th September 2010) and report is to assess the site, known as the former Moxham Quarry Northmead, for contamination when compared against the following criteria:

SOILS

- NSW EPA's (DECC) Guidelines for Assessing Service Station Sites (Updated 21st February 2008).
- National Environment Protection Measure (NEPM) for Residential Development with un-limited access to soil.5-A - NEPM A.
- National Environment Protection Measure (NEPM) for Residential Development with minimal access to soil.5-A - NEPM D.

WATER

- ANZECC 2000 Guidelines 95% Freshwater Trigger Values.

The site is currently vacant with silt and leaf litter cover that supports a dense weed growth, at the time of inspection. The site has no structures or infrastructure.

The soils in question are those associated with the material deposited on the site by stormwater and that left from the previous use as a sandstone quarry. The site and sample locations are outlined at ***Appendix A – SITE PLAN***.

3.0 SITE IDENTIFICATION

The site is located at the rear (west) of number 166 Windsor Road Northmead, NSW.

The site is identified as part Lot 7053 in DP 1028240. The part of the lot is the section nominated as the "Indicative Building Area". The building area is confined to the eastern portion of the whole Lot and is within the existing excavated area of the disused quarry.

4.0 GEOLOGY AND HYDROLOGY

The geology of the site was mapped by Clarke and Jones (1991) at a scale of 1:100 000 as mainly Hawkesbury Sandstone with a small area of Ashfield Shale in the north-east corner. However, even in the north western corner, the quarry face consists of sandstone to within 0.5m of the soil surface at the quarry's rim, with no evidence of shale.

The surface water collecting in the quarry eventually drains to a creek within 400 metres of the western boundary. It appears that groundwater exists 2m BGL at the base of the quarry.

5.0 PREVIOUS ENVIRONMENTAL REPORTS

There are no previous Environmental Site Assessments that have been carried out at the site.

6.0 SITE HISTORY

The historical data obtained during the course of this investigation is based upon a review by Perumal Murphy Alessi Heritage Consultants. They indicated that the following historical summary is applicable:

- In the 1880s the site was utilized as a quarry
- In 1914 quarrying operations ceased;
- Te quarry site has remained unused since 1914;
- In 1961 the site was described as a "*wild, rugged, uneven scrub covered area which backed onto an abandoned water filled quarry*."
- The site has had rubbish dumped within confines - this has been removed.
-

There are no NSW DECCW contamination notices that relate to the site.

7.0 EXISTING BUILDINGS & SITE FOUNDATIONS

The site has no structures or constructed infrastructure.

8.0 SEWERAGE & STORMWATER DRAINAGE

The site currently does not have a stormwater or sewer system connected.

9.0 MATERIAL ON SITE

There is no rubbish or demolition waste on site.

Enquiries with the previous site owners indicate that herbicides and pesticides are not known to be used at the site.

10.0 SOIL SAMPLES & LABORATORY RESULTS

The soils at the site were subjected to a sampling regime. Soils were sampled up to 0.4mBGL, into the silt and leaf mulch present above the sandstone base. Five (5) discrete soil samples were taken from the five (5) test pits; two (2) water samples were taken from the standing water over the site All samples were taken in accordance with NSW DECCW sampling guidelines. The location of the test bores and water sample columns are detailed at ***Appendix A- SITE PLAN.***

All these soil samples were found (after Laboratory analysis and statistical analysis) to be suitable for Residential Development with un-restricted soil access compared to NSW DECCW Service Station Guidelines and the National Environment Protection Measure - NEPM A. The site soils also meet the less restrictive criteria NEPM D – Residential Development with minimal access to soils. The soil samples could not be were taken at various depths as the soil profile was very shallow.

The results of the soil-sampling test are displayed at ***Appendix B - COMPARISON OF SOIL & STANDING WATER TEST DATA WITH RELEVANT GUIDELINES.*** Soil sample results are identified in this table by Test Bore Number, eg. A1 means sample at Test Bore A1; all samples were taken from 0.2 to 0.4 m BGL. All soil samples have met the criteria required for the assessment of service station sites as outlined in the NSW EPA's (DECCW) "Guidelines for Assessing Service Station Sites (Updated 21st February 2008)", as well as meeting the NEPM A criteria for residential development with access to the soils (the most stringent criteria in Australia) - after a 95% Confidence Limit Statistical Assessment (CLSA). The one sample that failed the NEPM A (and passed the NEPM D) criteria for lead was Sample A4 at 370mg/kg (criteria is 300mg/kg). This is not a significant exceedance and within the criteria when included in the 95% CLSA.

A PID meter was utilized to screen duplicate samples at all test pits. All displayed PID at background levels +/-5%.

All sample were sampled direct from a solid flyght auger, to avoid loss of volatile compounds.

Each soil sample was taken from the Test pit, immediately the auger was withdrawn. The samples for analysis, at a Certified NATA Laboratory, were immediately placed in clean laboratory prepared jars with teflon seals. The samples taken for on site analysis with a Portable Photo-ionization detector, accuracy +/- 0.1 ppm, range 0-2,000 ppm (PID) were tested immediately**.** Each of the field screening results indicated that there were no volatile hydrocarbon emissions from the samples taken or from the excavated holes. The test pits were located as shown at ***APPENDIX –A.***

No chemical odour or discolouration was apparent from the soil samples or from the test pits.

The above soil samples were tested by the laboratory (NATA Accreditation Number 2562) as specified by the NSW DECCW in their Guidelines "Guidelines for the NSW Site Auditor Scheme – NSW DECC 2006, Second Edition". Comparison with the following guidelines was undertaken as part of this report:

SOILS

- NSW EPA's (DECC) Guidelines for Assessing Service Station Sites (Updated 21st February 2008).
- National Environment Protection Measure (NEPM) for Residential Development with UN-limited access to soil.5-A - NEPM A.
- National Environment Protection Measure (NEPM) for Residential Development.5-A - NEPM D, with minimal access to soils.

WATER

- ANZECC 2000 Guidelines 95% Freshwater Trigger Values.

The original laboratory test results are contained at ***Appendix C – LABORATORY TEST DATA***.

The on-site testing of the headspace of duplicate samples indicated that no volatile organic hydrocarbons were present in any of the samples.

11.0 FIELD QUALITY CONTROL

The field use of the PID meter indicated that the laboratory analysis results for TRH and BTEX were at levels compatible with PID meter readings.

12.0 SAMPLING PROCEDURE

12.1 SOILS

All samples at depth were taken direct from the middle of the soil on the solid flight auger, as it was withdrawn from the measurement depth. All samples were placed in a laboratory prepared clean glass bottle with no air space after placement of the lid. Each bottle was immediately sealed with a screw cap lid incorporating a Teflon insert as a seal. All sample jars were immediately filled from the soil collected on the stainless steel trowel. All jars were filled to capacity, leaving no pockets of free space for vapors to collect in.

All samples collected at the site were assigned an individual identification number marked on the lid as well as the exterior label. Each label was marked with the Pacific Environmental name, the date as well as the name of the person taking the samples. The sample Chain of Custody Form was commenced in the field by immediately entering the sample number at the time of sampling. The site field bore logs were not undertaken at each hole, as the site soils were relatively uniform.

Sampling personnel used single use PVC-nitrile gloves when handling all samples. All samples were place in a 12 volt fridge at 4^0C and kept away from direct sun light or heat sources. Samples were transported to the NATA Certified laboratory directly by the sampler in the same day. No additional preservation was considered necessary. The laboratory notified this office immediately the samples were received.

The auger and sampling trowel used to excavated the test holes and obtain samples were cleaned by high pressure washing, decontamination with a 2% Decon-90 solution, followed by rinse with clean potable water, then a rinse with de-ionized water. This procedure was undertaken prior to excavating at each sample location and before each sample was obtained.

Duplicate samples, taken at the site, were placed in a clean laboratory prepared glass bottles and filled to a point leaving 30mm head space. The Photo-ionization detector was immediately used to assess the headspace of the sample for volatile organic carbons.

Each bottle was immediately sealed with a screw cap lid incorporating a Teflon inset as a seal. The samples were retested 60 minutes later to assess any difference in reading and to allow volatile compounds to escape to the headspace.

12.2 GROUNDWATER

12.2.1 SAMPLING EQUIPMENT - MATERIALS

The sample containers were:

- Sealed 500mL laboratory prepared clean borosilicate opaque glass jars with HDPE seals to the lids, with no preservative added to the jar.
- Sealed 200mL laboratory prepared clean borosilicate glass jars with HDPE seals to the lids, with trace hydrochloric acid added to the jar.

12.2.2 HANDLING, CONTAINMENT & TRANSPORTATION

- All daily activities were recorded, including significant events, sampling locations and numbers, observations, measurements and weather conditions.
- Sample containers were at least 250 mL capacity. Sample containers will e marked with an indelibly code.
- Handling and transportation of the samples from one authorized individual or place to another was accomplished through Chain-of-Custody procedures involving a form, similar to Appendix H of AS4482.1 – 1997.
- Samples were kept in a portable 12 volt 4^0C fridge during sampling and transport periods. The fridge was kept away from sources of heat.
- Holding times did not exceed 48 hours, and in any event complied with Table 4 of AS 4482.1 - 1997

12.2.3 DECONTAMINATION OF SAMPLING EQUIPMENT

The following procedure was adopted for sampling equipment:

- Remove soil adhering to the pump by scraping, brushing or wiping with disposal towels.
- Wash the pump thoroughly in a bucket with phosphate-free detergent using brushes and disposal towels.
- Rinse the pump thoroughly in a second bucket with grade 3 water as defined in ISO 3696
- Repeat steps.
- Rinse with Grade 3 water.
- Collect the rinsate blank and preserve in accordance with AS 203.1
- Pump two sample hose volumes of Grade 3 water through the sampling hose.

- Dry the equipment with clean disposable towels or air-dry.
- Organic solvents were not be utilized for decontamination purposes.

13.0 LABORATORY QA/QC

13.1 CHAIN OF CUSTODY FORMS

The COC forms were counter signed by the laboratory when the samples were delivered to the laboratory.

13.2 HOLDING TIMES

SGS Laboratories record the holding times for each method and they are all within acceptable limits.

13.3ANALYTICAL METHODS

The analytical methods utilized by the laboratory are specified at the Certificate of Analysis. The methods utilized are compatible with the requirements of the NSW DECC Guidelines for Laboratory Testing Techniques.

13.4 LABORATORY ACCREDITATION

The laboratory utilized is NATA Certified, number 2562. Similarly the laboratory is accredited for each of the metrologies used, as detailed in their Certificate of Analysis.

13.5 LABORATORY PERFORMANCE

Pacific Environmental batches duplicate samples to an alternative laboratory on a minimum of a bi-annual basis to ensure quality control between laboratories. Pacific Environmental also rotates the main laboratory with the duplicate sample laboratory to also check consistency. Since October 2003 the laboratories utilized have been MGT/Labmark Laboratories Cardiff and SGS laboratories Botany. Both laboratories have shown consistency within acceptable limits (70 –130%), except when sample test results are at or close to the limits of detection. This minor inconstancy is not considered significant.

13.6 SURROGATES, DUPLICATES AND SPIKES/PERCENT RECOVERIES

The recorded data is attached at ***Appendix C.*** All recorded data is within acceptable limits.

13.7 METHOD/INSTRUMENT & LIMITS OF RECOVERY

The method/instrument and Limits of Recovery are recorded on the QA/QC sheets for each analyte. These limits are well below the levels of concern recorded in the relevant Guidelines.

14.0 RECOMMENDATIONS & CONCLUSION

A summary of the laboratory test results is attached ***Appendix B - COMPARISON OF SOIL & GROUNDWATER TEST DATA WITH RELEVANT GUIDELINES.***

THE CONCLUSIONS THAT CAN BE DRAWN FROM THE LABORATORY RESULTS ARE:

- The site soils meet all the relevant criteria being:
  - The site soil meet the requirements of the National Environment Plan Measure for Residential Development with un-limited access to the soil (NEPM A);
  - The site soil meet the requirements of the National Environment Plan Measure for Residential Development with minimal access to soil (NEPM D);
  - The site soil meet the requirements of the NSW DECCW Guideline "Guidelines for Assessing Service Station Sites (Updated 21st February 2008)" – after statical analysis for 95% Upper Confidence Limit assessment (as proscribed by the NSW DECCW. ;

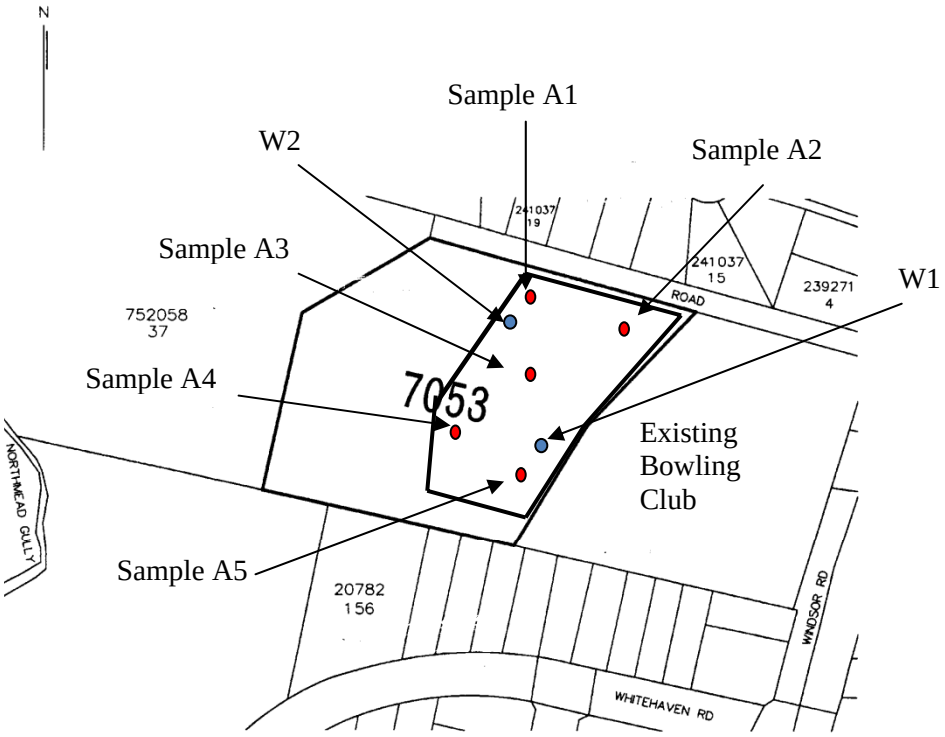
RECOMMENDATION

1. No recommendation is made with respect to remediation of the site in relation to contamination.

APPENDIX A – SITE PLAN

Groundwater Samples

Soil Samples



PACIFIC ENVIRONMENTAL

SITE: FORMER MOXHAM QUARRY
SAMPLE LOCATIONS
October 2010

APPENDIX B- COMPARISON OF SOIL TEST DATA WITH RELEVANT GUIDELINES

Soil samples – Contaminants – Page 1

ANALYTE	UNITS	PQL	A1	A2	A3	A4	A5					NEPM D	NEPM A	DEC Criteria
TPH –C6-C9	mg/kg	20	<20	<20	<20	<20	<20					-	-	65#
C10-C14	mg/kg	20	<20	25	<20	40	23					-	-	1,000#
C15-C28	mg/kg	50	96	86	190	280	92					-	-	
C29-C36	mg/kg	50	110	160	410	560	610					-	-	
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1					-	-	1#
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1					-	-	1.4#
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1					-	-	3.1#
Xylene	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3					-	-	14#
B(a)P	mg/kg	0.05	<0.05	<0.50	<0.05	<0.50	<0.05					4	1	1#+
PAH (TOTAL)	mg/kg	1.7	<1.7	<1.7	<1.7	<1.7	<1.7					80	20	20#+

Note: Locations of soil samples are identified by reference to Appendix A

- NSW EPA Service Station Guidelines; * Guidelines for NSW Site Auditor Scheme
NEPM A – Residential Criteria for access to soils
NEPM D – Residential Criteria with minimal access to soils.
Exceedances marked thus with bold and italics.

Soil samples/ continued –Metal Contaminants –Page 2 – NEPM F Criteria

ANALYTE	UNITS	A1	A2	A3	A4	A5					PQL	NEPM D	NEPM A	DECC Criteria#*
As	mg/kg	5	6	6	5	10					3	400	100	-
Cd	mg/kg	0.5	0.4	1.4	1.7	1.3					0.1	80	20	-
Cr (total)	mg/kg	3.1	2.7	5.1	10	4.4					0.3	400	100	-
Cu	mg/kg	9.3	7.9	15	23	12					0.5	4,000	1,000	
Pb	mg/kg	19	16	44	***370***	41					1	1,200	300	300
Hg	mg/kg	0.12	0.10	0.14	0.15	0.20					0.05	100	25	-
Ni	mg/kg	4.4	3.8	6.4	6.1	7.9					0.5	2,400	600	-
Zn	mg/kg	160	74	180	200	190					0.3	28,000	7,000	-

Note: Locations of soil samples are identified by reference to Appendix B

- NSW EPA Service Station Guidelines; * Guidelines for NSW Site Auditor Scheme
NEPM F – Standard Commercial etc.
NEPM D – Residential Criteria with minimal access to soils
Exceedances marked thus with bold and italics.

All OC and OP Laboratory results were less than the PQL and as such meet the requirements of NEPM A & D.

Groundwater samples – Contaminants – Page 3- NSW DECCW Criteria & ANZECC Criteria

ANALYTE	**UNITS**	LOR	W1	W2							**ANZECC**	**DECCW** **Criteria ug/L**
TRH –C6-C9	ug/L	400	<400	<400							-	Visually No Free Phase nominally 10mg/L
C10-C14	ug/L	100	<100	<100							-	
C15-C28	ug/L	200	<200	<200							-	
C29-C36	ug/L	200	<200	<200							-	
Benzene	ug/L	5	<5	<5							950	300
Toluene	ug/L	5	<5	<5							-	300
Ethylbenzene	ug/L	5	<5	<5							-	140
Xylene	ug/L	15	<15	<15							550	380
B(a)P	ug/L	0.50	<0.50	<0.50						-	-	
PAH	ug/L	9	<9	<9						-	3	
Lead	ug/L	1	1	1							3.4	5

Note: Locations of groundwater samples are identified by reference to existing bores - Appendix C
Protection of aquatic systems: * Fresh Water Systems 95% Level of Protection
PAH were not analysised as soil analysis failed ti identify these to being of concern,
Exceedances marked thus with bold and italics.

APPENDIX C – LABORATORY ANALYSIS

ANALYTICAL REPORT

22 September 2010

Pacific Environmental Pty Ltd
PO Box 4045
Illawong
NSW 2234

Attention: **Stephen Smith**

Your Reference: Northmead

Our Reference: SE81418

Samples: 5 Soils, 2 Waters
Received: 15/9/10

Preliminary Report Sent: Not Issued

These samples were analysed in accordance with your written instructions.

For and on Behalf of:
SGS ENVIRONMENTAL SERVICES

Sample Receipt:	Angela Mamalicos	AU.SampleReceipt.Sydney@sgs.com
Production Manager:	Huong Crawford	Huong.Crawford@sgs.com

Results Approved and/or Authorised by:

Ly Kim Ha
Organics Signatory

Huong Crawford
Metals Signatory

SGS Australia Pty Ltd
ABN 44 000 964 278
Environmental Services Unit 16/33 Maddox Street Alexandria NSW 2015 Australia
t +61 (0)2 8594 0400 f + 61 (0)2 8594 0499 www.au.sgs.com

MBTEX in Soil Our Reference: Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS ---------- ----------	SE81418-3 A1 Soil 12/09/2010 9.50	SE81418-4 A2 Soil 12/09/2010 10.15	SE81418-5 A3 Soil 12/09/2010 10.40	SE81418-6 A4 Soil 12/09/2010 11.00	SE81418-7 A5 Soil 12/09/2010 11.30
Date Extracted (MBTEX)		17/09/2010	17/09/2010	17/09/2010	17/09/2010	17/09/2010
Date Analysed (MBTEX)		17/09/2010	17/09/2010	17/09/2010	17/09/2010	17/09/2010
Methyl-tert-butyl ether (MtBE)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
BTEX Surrogate (%)	%	74	70	67	77	68

SGS Australia Pty Ltd
ABN 44 000 964 278
Environmental Services Unit 16/33 Maddox Street Alexandria NSW 2015 Australia
t +61 (0)2 8594 0400 f + 61 (0)2 8594 0499 www.au.sgs.com

TRH in soil with C6-C9 by P/T						
Our Reference:	UNITS	SE81418-3	SE81418-4	SE81418-5	SE81418-6	SE81418-7
Your Reference	----------	A1	A2	A3	A4	A5
Sample Matrix	----------	Soil	Soil	Soil	Soil	Soil
Date Sampled		12/09/2010	12/09/2010	12/09/2010	12/09/2010	12/09/2010
Time Sample Taken		9.50	10.15	10.40	11.00	11.30
Date Extracted (TRH C6-C9 PT)		17/09/2010	17/09/2010	17/09/2010	17/09/2010	17/09/2010
Date Analysed (TRH C6-C9 PT)		17/09/2010	17/09/2010	17/09/2010	17/09/2010	17/09/2010
TRH C_6 - C_9 P&T	mg/kg	<20	<20	<20	<20	<20
Date Extracted (TRH C10-C36)		19/09/2010	19/09/2010	19/09/2010	19/09/2010	19/09/2010
Date Analysed (TRH C10-C36)		19/09/2010	19/09/2010	19/09/2010	19/09/2010	19/09/2010
TRH C_{10} - C_{14}	mg/kg	<20	25	<20	40	23
TRH C_{15} - C_{28}	mg/kg	96	86	190	280	92
TRH C_{29} - C_{36}	mg/kg	110	160	410	560	610

SGS Australia Pty Ltd
ABN 44 000 964 278
Environmental Services Unit 16/33 Maddox Street Alexandria NSW 2015 Australia
t +61 (0)2 8594 0400 f + 61 (0)2 8594 0499 www.au.sgs.com

PAHs in Soil Our Reference: Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS ---------- ----------	SE81418-3 A1 Soil 12/09/2010 9.50	SE81418-4 A2 Soil 12/09/2010 10.15	SE81418-5 A3 Soil 12/09/2010 10.40	SE81418-6 A4 Soil 12/09/2010 11.00	SE81418-7 A5 Soil 12/09/2010 11.30
Date Extracted		19/09/2010	19/09/2010	19/09/2010	19/09/2010	19/09/2010
Date Analysed		19/09/2010	19/09/2010	19/09/2010	19/09/2010	19/09/2010
Naphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
2-Methylnaphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
1-Methylnaphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Fluorene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Phenanthrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Fluoranthene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Pyrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[*a*]anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Chrysene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[*b,k*]fluoranthene	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo[*a*]pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno[*123-cd*]pyrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Dibenzo[*ah*]anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[*ghi*]perylene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Total PAHs (sum)	mg/kg	<1.7	<1.7	<1.7	<1.7	<1.7
Nitrobenzene-d5	%	92	72	74	72	84
2-Fluorobiphenyl	%	94	100	92	92	104
p -Terphenyl-*d14*	%	92	88	94	94	104

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OC Pesticides in Soil Our Reference: Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS ---------- ----------	SE81418-3 A1 Soil 12/09/2010 9.50	SE81418-4 A2 Soil 12/09/2010 10.15	SE81418-5 A3 Soil 12/09/2010 10.40	SE81418-6 A4 Soil 12/09/2010 11.00	SE81418-7 A5 Soil 12/09/2010 11.30
Date Extracted		19/09/2010	19/09/2010	19/09/2010	19/09/2010	19/09/2010
Date Analysed		21/09/2010	21/09/2010	21/09/2010	21/09/2010	21/09/2010
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC (Lindane)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
o,p-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-Endosulfan	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Chlordane *(gamma)*	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
cis-Chlordane *(alpha)*	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
p,p-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
o,p-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
o,p-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-Endosulfan	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
p,p-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
p,p-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,5,6-Tetrachloro-m-xylene *(Surrogate*	%	111	103	104	106	103

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OP Pesticides in Soil by GCMS Our Reference: Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS ---------- ----------	SE81418-3 A1 Soil 12/09/2010 9.50	SE81418-4 A2 Soil 12/09/2010 10.15	SE81418-5 A3 Soil 12/09/2010 10.40	SE81418-6 A4 Soil 12/09/2010 11.00	SE81418-7 A5 Soil 12/09/2010 11.30
Date Extracted		19/09/2010	19/09/2010	19/09/2010	19/09/2010	19/09/2010
Date Analysed		19/09/2010	19/09/2010	19/09/2010	19/09/2010	19/09/2010
Dichlorvos	mg/kg	<1	<1	<1	<1	<1
Dimethoate	mg/kg	<1	<1	<1	<1	<1
Diazinon	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorpyrifos-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Bromofos-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
2-fluorobiphenyl (Surr)	%	94	100	92	92	104
d14-p-Terphenyl (Surr)	%	92	88	94	94	104

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Metals in Soil by ICP-OES						
Our Reference:	UNITS	SE81418-3	SE81418-4	SE81418-5	SE81418-6	SE81418-7
Your Reference	----------	A1	A2	A3	A4	A5
Sample Matrix	----------	Soil	Soil	Soil	Soil	Soil
Date Sampled		12/09/2010	12/09/2010	12/09/2010	12/09/2010	12/09/2010
Time Sample Taken		9.50	10.15	10.40	11.00	11.30
Date Extracted (Metals)		20/09/2010	20/09/2010	20/09/2010	20/09/2010	20/09/2010
Date Analysed (Metals)		20/09/2010	20/09/2010	20/09/2010	20/09/2010	20/09/2010
Arsenic	mg/kg	5	6	6	5	10
Cadmium	mg/kg	0.5	0.4	1.4	1.7	1.3
Chromium	mg/kg	3.1	2.7	5.1	10	4.4
Copper	mg/kg	9.3	7.9	15	23	12
Lead	mg/kg	19	16	44	370	41
Nickel	mg/kg	4.4	3.8	6.4	6.1	7.9
Zinc	mg/kg	160	74	180	200	190

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Mercury Cold Vapor/Hg Analyser Our Reference: Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS ---------- ---------- 	SE81418-3 A1 Soil 12/09/2010 9.50	SE81418-4 A2 Soil 12/09/2010 10.15	SE81418-5 A3 Soil 12/09/2010 10.40	SE81418-6 A4 Soil 12/09/2010 11.00	SE81418-7 A5 Soil 12/09/2010 11.30
Date Extracted (Mercury)		20/09/2010	20/09/2010	20/09/2010	20/09/2010	20/09/2010
Date Analysed (Mercury)		20/09/2010	20/09/2010	20/09/2010	20/09/2010	20/09/2010
Mercury	mg/kg	0.12	0.10	0.14	0.15	0.20

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MBTEX in Water (µg/L) Our Reference: Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS ---------- ----------	SE81418-1 W1 Water 12/09/2010 9.00	SE81418-2 W2 Water 12/09/2010 9.20
Date Extracted (MBTEX)		17/09/2010	17/09/2010
Date Analysed (MBTEX)		17/09/2010	17/09/2010
Methyl-tert-butyl ether (MtBE)	µg/L	<10	<10
Benzene	µg/L	<5	<5
Toluene	µg/L	<5	<5
Ethylbenzene	µg/L	<5	<5
Total Xylenes	µg/L	<15	<15
Surrogate	%	85	84

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TRH in water with C6-C9 by P/T Our Reference: Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS ---------- ----------	SE81418-1 W1 Water 12/09/2010 9.00	SE81418-2 W2 Water 12/09/2010 9.20
Date Extracted (TRH C6-C9 PT)		17/09/2010	17/09/2010
Date Analysed (TRH C6-C9 PT)		17/09/2010	17/09/2010
TRH C_6 - C_9 P&T in µg/L	µg/L	<400	<400
Date Extracted (TRH C10-C36)		17/09/2010	17/09/2010
Date Analysed (TRH C10-C36)		17/09/2010	17/09/2010
TRH C_{10} - C_{14}	µg/L	<100	<100
TRH C_{15} - C_{28}	µg/L	<200	<200
TRH C_{29} - C_{36}	µg/L	<200	<200

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PAHs in Water Our Reference: Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS ---------- ----------	SE81418-1 W1 Water 12/09/2010 9.00	SE81418-2 W2 Water 12/09/2010 9.20
Date Extracted		17/09/2010	17/09/2010
Date Analysed		17/09/2010	17/09/2010
Naphthalene	µg/L	<0.50	<0.50
2-Methylnaphthalene	µg/L	<0.5	<0.5
1-Methylnaphthalene	µg/L	<0.5	<0.5
Acenaphthylene	µg/L	<0.50	<0.50
Acenaphthene	µg/L	<0.50	<0.50
Fluorene	µg/L	<0.50	<0.50
Phenanthrene	µg/L	<0.50	<0.50
Anthracene	µg/L	<0.50	<0.50
Fluoranthene	µg/L	<0.50	<0.50
Pyrene	µg/L	<0.50	<0.50
Benzo[*a*]anthracene	µg/L	<0.50	<0.50
Chrysene	µg/L	<0.50	<0.50
Benzo[*b,k*]fluoranthene	µg/L	<1.0	<1.0
Benzo[*a*]pyrene	µg/L	<0.50	<0.50
Indeno[*123-cd*]pyrene	µg/L	<0.50	<0.50
Dibenzo[*ah*]anthracene	µg/L	<0.50	<0.50
Benzo[*ghi*]perylene	µg/L	<0.50	<0.50
Total PAHs	µg/L	<9	<9
Nitrobenzene-d5	%	#	#
2-Fluorobiphenyl	%	#	#
p -Terphenyl-*d14*	%	#	#

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OC Pesticides in Water Our Reference: Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS ---------- ----------	SE81418-1 W1 Water 12/09/2010 9.00	SE81418-2 W2 Water 12/09/2010 9.20
Date Extracted		21/09/2010	21/09/2010
Date Analysed		21/09/2010	21/09/2010
HCB	µg/L	<0.2	<0.2
alpha-BHC	µg/L	<0.2	<0.2
gamma-BHC(Lindane)	µg/L	<0.2	<0.2
Heptachlor	µg/L	<0.2	<0.2
Aldrin	µg/L	<0.2	<0.2
beta-BHC	µg/L	<0.2	<0.2
delta-BHC	µg/L	<0.2	<0.2
Heptachlor Epoxide	µg/L	<0.2	<0.2
o,p-DDE	µg/L	<0.2	<0.2
alpha-Endosulfan	µg/L	<0.2	<0.2
trans-Chlordane	µg/L	<0.2	<0.2
cis-Chlordane	µg/L	<0.2	<0.2
trans-Nonachlor	µg/L	<0.2	<0.2
p,p-DDE	µg/L	<0.2	<0.2
Dieldrin	µg/L	<0.2	<0.2
Endrin	µg/L	<0.2	<0.2
o,p-DDD	µg/L	<0.2	<0.2
o,p-DDT	µg/L	<0.2	<0.2
beta-Endosulfan	µg/L	<0.2	<0.2
p,p-DDD	µg/L	<0.2	<0.2
p,p-DDT	µg/L	<0.2	<0.2
Endosulfan Sulphate	µg/L	<0.2	<0.2
Endrin Aldehyde	µg/L	<0.2	<0.2
Methoxychlor	µg/L	<0.2	<0.2
Endrin Ketone	µg/L	<0.2	<0.2
2,4,5,6-Tetrachloro-m-xylene *(Surrogate*	%	39	43

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OP Pesticides in Water by GCMS Our Reference: Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS ---------- ----------	SE81418-1 W1 Water 12/09/2010 9.00	SE81418-2 W2 Water 12/09/2010 9.20
Date Extracted		17/09/2010	17/09/2010
Date Analysed		17/09/2010	17/09/2010
Dichlorvos	µg/L	<1	<1
Dimethoate	µg/L	<1	<1
Diazinon	µg/L	<0.5	<0.5
Fenitrothion	µg/L	<0.2	<0.2
Malathion	µg/L	<0.20	<0.20
Chlorpyrifos-ethyl	µg/L	<0.2	<0.2
Parathion-ethyl	µg/L	<0.2	<0.2
Bromofos-ethyl	µg/L	<0.2	<0.2
Methidathion	µg/L	<0.5	<0.5
Ethion	µg/L	<0.2	<0.2
Azinphos-methyl	µg/L	<0.20	<0.20
2-fluorobiphenyl (Surr)	%	#	#
d14-p-Terphenyl (Surr)	%	#	#

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Trace HM (ICP-MS)-Dissolved Our Reference: Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS ---------- ----------	SE81418-1 W1 Water 12/09/2010 9.00	SE81418-2 W2 Water 12/09/2010 9.20
Date Extracted (Metals-ICPMS)		16/09/2010	16/09/2010
Date Analysed (Metals-ICPMS)		16/09/2010	16/09/2010
Arsenic	µg/L	1	1
Cadmium	µg/L	<0.1	<0.1
Chromium	µg/L	<1	<1
Copper	µg/L	3	1
Lead	µg/L	1	1
Nickel	µg/L	1	<1
Zinc	µg/L	4	4

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Mercury Cold Vapor/Hg Analyser Our Reference: Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS ---------- ----------	SE81418-1 W1 Water 12/09/2010 9.00	SE81418-2 W2 Water 12/09/2010 9.20
Date Extracted (Mercury)		16/09/2010	16/09/2010
Date Analysed (Mercury)		16/09/2010	16/09/2010
Mercury (Dissolved)	mg/L	<0.0001	<0.0001

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Moisture Our Reference: Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS ---------- ----------	SE81418-3 A1 Soil 12/09/2010 9.50	SE81418-4 A2 Soil 12/09/2010 10.15	SE81418-5 A3 Soil 12/09/2010 10.40	SE81418-6 A4 Soil 12/09/2010 11.00	SE81418-7 A5 Soil 12/09/2010 11.30
Date Analysed (moisture)		20/09/2010	20/09/2010	20/09/2010	20/09/2010	20/09/2010
Moisture	%	89	89	88	85	93

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Method ID	Methodology Summary
SEO-018	BTEX / C6-C9 Hydrocarbons - Soil samples are extracted with methanol, purged and concentrated by a purge and trap apparatus, and then analysed using GC/MS technique. Water samples undergo the same analysis without the extraction step. Based on USEPA 5030B and 8260B.
SEO-020	Total Recoverable Hydrocarbons - determined by solvent extraction with dichloromethane / acetone for soils and dichloromethane for waters, followed by instrumentation analysis using GC/FID. Where applicable Solid Phase Extraction Manifold technique is used for aliphatic / aromatic fractionation.
SEO-030	Polynuclear Aromatic Hydrocarbons - determined by solvent extraction with dichloromethane / acetone for soils and dichloromethane for waters, followed by instrumentation analysis using GC/MS SIM mode.
SEO-005	OC/OP/PCB - Determination of a suite of Organchlorine Pesticides, Chlorinated Organo-phosphorus Pesticides and Polychlorinated Biphenyls (PCB's) by liquid-liquid extraction using dichloromethane for waters, or mechanical extraction using acetone / hexane for soils, followed by instrumentation analysis using GC/ECD. Based on USEPA 8081/8082.
AN420	Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates, and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD/FID technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
SEM-010	Determination of elements by ICP-OES following appropriate sample preparation / digestion process. Based on USEPA 6010C / APHA 21st Edition, 3120B.
SEM-005	Mercury - determined by Cold-Vapour AAS following appropriate sample preparation or digestion process. Based on APHA 21st Edition, 3112B.
AN318	Determination of elements at trace level in waters by ICP-MS technique, in accordance with USEPA 6020A.
AN002	Preparation of soils, sediments and sludges undergo analysis by either air drying, compositing, subsampling and 1:5 soil water extraction where required. Moisture content is determined by drying the sample at 105 ± 5°C.

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QUALITY CONTROL MBTEX in Soil	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted (MBTEX)				17/09/10	[NT]	[NT]	LCS	17/09/10
Date Analysed (MBTEX)				17/09/10	[NT]	[NT]	LCS	17/09/10
Methyl-tert-butyl ether (MtBE)	mg/kg	0.1	SEO-018	<0.1	[NT]	[NT]	LCS	115%
Benzene	mg/kg	0.1	SEO-018	<0.1	[NT]	[NT]	LCS	100%
Toluene	mg/kg	0.1	SEO-018	<0.1	[NT]	[NT]	LCS	98%
Ethylbenzene	mg/kg	0.1	SEO-018	<0.1	[NT]	[NT]	LCS	96%
Total Xylenes	mg/kg	0.3	SEO-018	<0.3	[NT]	[NT]	LCS	102%
BTEX Surrogate (%)	%	0	SEO-018	112	[NT]	[NT]	LCS	108%

QUALITY CONTROL TRH in soil with C6-C9 by P/T	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted (TRH C6-C9 PT)				17/09/10	SE81418-3	17/09/2010 || 17/09/2010	LCS	17/09/10
Date Analysed (TRH C6-C9 PT)				17/09/10	SE81418-3	17/09/2010 || 17/09/2010	LCS	17/09/10
TRH C_6 - C_9 P&T	mg/kg	20	SEO-018	<20	SE81418-3	<20 || [N/T]	LCS	115%
Date Extracted (TRH C10-C36)				19/09/2010	SE81418-3	19/09/2010 || 19/09/2010	LCS	19/09/2010
Date Analysed (TRH C10-C36)				19/09/2010	SE81418-3	19/09/2010 || 19/09/2010	LCS	19/09/2010
TRH C_{10} - C_{14}	mg/kg	20	SEO-020	<20	SE81418-3	<20 || 21	LCS	107%
TRH C_{15} - C_{28}	mg/kg	50	SEO-020	<50	SE81418-3	96 || 110 || RPD: 14	LCS	99%
TRH C_{29} - C_{36}	mg/kg	50	SEO-020	<50	SE81418-3	110 || 97 || RPD: 13	LCS	95%

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QUALITY CONTROL PAHs in Soil	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted				19/09/10	SE81418-3	19/09/2010 || 19/09/2010	LCS	19/09/10
Date Analysed				19/09/10	SE81418-3	19/09/2010 || 19/09/2010	LCS	19/09/10
Naphthalene	mg/kg	0.1	SEO-030	<0.10	SE81418-3	<0.10 || <0.10	LCS	102%
2-Methylnaphthalene	mg/kg	0.1	SEO-030	<0.10	SE81418-3	<0.10 || <0.10	[NR]	[NR]
1-Methylnaphthalene	mg/kg	0.1	SEO-030	<0.10	SE81418-3	<0.10 || <0.10	[NR]	[NR]
Acenaphthylene	mg/kg	0.1	SEO-030	<0.10	SE81418-3	<0.10 || <0.10	LCS	85%
Acenaphthene	mg/kg	0.1	SEO-030	<0.10	SE81418-3	<0.10 || <0.10	LCS	103%
Fluorene	mg/kg	0.1	SEO-030	<0.10	SE81418-3	<0.10 || <0.10	[NR]	[NR]
Phenanthrene	mg/kg	0.1	SEO-030	<0.10	SE81418-3	<0.10 || <0.10	LCS	98%
Anthracene	mg/kg	0.1	SEO-030	<0.10	SE81418-3	<0.10 || <0.10	LCS	104%
Fluoranthene	mg/kg	0.1	SEO-030	<0.10	SE81418-3	<0.10 || <0.10	LCS	90%
Pyrene	mg/kg	0.1	SEO-030	<0.10	SE81418-3	<0.10 || <0.10	LCS	101%
Benzo[*a*]anthracene	mg/kg	0.1	SEO-030	<0.10	SE81418-3	<0.10 || <0.10	[NR]	[NR]
Chrysene	mg/kg	0.1	SEO-030	<0.10	SE81418-3	<0.10 || <0.10	[NR]	[NR]
Benzo[*b,k*]fluoranthene	mg/kg	0.2	SEO-030	<0.20	SE81418-3	<0.20 || <0.20	[NR]	[NR]
Benzo[*a*]pyrene	mg/kg	0.05	SEO-030	<0.05	SE81418-3	<0.05 || <0.05	LCS	100%
Indeno[*123-cd*]pyrene	mg/kg	0.1	SEO-030	<0.10	SE81418-3	<0.10 || <0.10	[NR]	[NR]
Dibenzo[*ah*]anthracene	mg/kg	0.1	SEO-030	<0.10	SE81418-3	<0.10 || <0.10	[NR]	[NR]
Benzo[*ghi*]perylene	mg/kg	0.1	SEO-030	<0.10	SE81418-3	<0.10 || <0.10	[NR]	[NR]
Total PAHs (sum)	mg/kg	1.75	SEO-030	<1.7	SE81418-3	<1.7 || <1.7	[NR]	[NR]
Nitrobenzene-d5	%	0	SEO-030	82	SE81418-3	92 || 76 || RPD: 19	LCS	88%
2-Fluorobiphenyl	%	0	SEO-030	100	SE81418-3	94 || 100 || RPD: 6	LCS	102%
p -Terphenyl-*d*14	%	0	SEO-030	90	SE81418-3	92 || 96 || RPD: 4	LCS	76%

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QUALITY CONTROL OC Pesticides in Soil	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted				19/09/10	SE81418-5	19/09/2010 || 19/09/2010	SE81418-6	19/09/10
Date Analysed				21/09/10	SE81418-5	21/09/2010 || 21/09/2010	SE81418-6	21/09/10
HCB	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	[NR]	[NR]
gamma-BHC (Lindane)	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	[NR]	[NR]
Heptachlor	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	SE81418-6	130%
Aldrin	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	SE81418-6	127%
beta-BHC	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	[NR]	[NR]
delta-BHC	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	SE81418-6	108%
Heptachlor Epoxide	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	[NR]	[NR]
o,p-DDE	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	[NR]	[NR]
alpha-Endosulfan	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	[NR]	[NR]
trans-Chlordane *(gamma)*	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	[NR]	[NR]
cis-Chlordane *(alpha)*	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	[NR]	[NR]
trans-Nonachlor	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	[NR]	[NR]
p,p-DDE	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	[NR]	[NR]
Dieldrin	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	SE81418-6	130%
Endrin	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	SE81418-6	136%
o,p-DDD	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	[NR]	[NR]
o,p-DDT	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	[NR]	[NR]
beta-Endosulfan	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	[NR]	[NR]
p,p-DDD	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	[NR]	[NR]
p,p-DDT	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	SE81418-6	76%
Endosulfan Sulphate	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	[NR]	[NR]
Methoxychlor	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	[NR]	[NR]
Endrin Ketone	mg/kg	0.1	SEO-005	<0.1	SE81418-5	<0.1 || <0.1	[NR]	[NR]
2,4,5,6-Tetrachloro-m-xylene *(Surrogate*	%	0	SEO-005	111	SE81418-5	104 || 109 || RPD: 5	SE81418-6	111%

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QUALITY CONTROL OP Pesticides in Soil by GCMS	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted				19/09/10	SE81418-3	19/09/2010 || 19/09/2010	SE81418-4	19/09/10
Date Analysed				19/09/10	SE81418-3	19/09/2010 || 19/09/2010	SE81418-4	19/09/10
Dichlorvos	mg/kg	1	AN420	<1	SE81418-3	<1 || <1	SE81418-4	106%
Dimethoate	mg/kg	1	AN420	<1	SE81418-3	<1 || <1	[NR]	[NR]
Diazinon	mg/kg	0.5	AN420	<0.5	SE81418-3	<0.5 || <0.5	SE81418-4	83%
Fenitrothion	mg/kg	0.2	AN420	<0.2	SE81418-3	<0.2 || <0.2	[NR]	[NR]
Malathion	mg/kg	0.2	AN420	<0.20	SE81418-3	<0.20 || <0.20	[NR]	[NR]
Chlorpyrifos-ethyl	mg/kg	0.2	AN420	<0.2	SE81418-3	<0.2 || <0.2	SE81418-4	107%
Parathion-ethyl	mg/kg	0.2	AN420	<0.2	SE81418-3	<0.2 || <0.2	[NR]	[NR]
Bromofos-ethyl	mg/kg	0.2	AN420	<0.2	SE81418-3	<0.2 || <0.2	[NR]	[NR]
Methidathion	mg/kg	0.5	AN420	<0.5	SE81418-3	<0.5 || <0.5	[NR]	[NR]
Ethion	mg/kg	0.2	AN420	<0.2	SE81418-3	<0.2 || <0.2	SE81418-4	87%
Azinphos-methyl	mg/kg	0.2	AN420	<0.20	SE81418-3	<0.20 || <0.20	[NR]	[NR]
2-fluorobiphenyl (Surr)	%	0	AN420	100	SE81418-3	94 || 100 || RPD: 6	SE81418-4	96%
d14-p-Terphenyl (Surr)	%	0	AN420	90	SE81418-3	92 || 96 || RPD: 4	SE81418-4	98%

QUALITY CONTROL Metals in Soil by ICP-OES	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted (Metals)				20/09/2010	[NT]	[NT]	LCS	20/09/2010
Date Analysed (Metals)				20/09/2010	[NT]	[NT]	LCS	20/09/2010
Arsenic	mg/kg	3	SEM-010	<3	[NT]	[NT]	LCS	92%
Cadmium	mg/kg	0.3	SEM-010	<0.3	[NT]	[NT]	LCS	98%
Chromium	mg/kg	0.3	SEM-010	<0.3	[NT]	[NT]	LCS	103%
Copper	mg/kg	0.5	SEM-010	<0.5	[NT]	[NT]	LCS	104%
Lead	mg/kg	1	SEM-010	<1	[NT]	[NT]	LCS	101%
Nickel	mg/kg	0.5	SEM-010	<0.5	[NT]	[NT]	LCS	103%
Zinc	mg/kg	0.5	SEM-010	<0.5	[NT]	[NT]	LCS	104%

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QUALITY CONTROL Mercury Cold Vapor/Hg Analyser	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted (Mercury)				20/09/2010	[NT]	[NT]	LCS	20/09/2010
Date Analysed (Mercury)				20/09/2010	[NT]	[NT]	LCS	20/09/2010
Mercury	mg/kg	0.05	SEM-005	<0.05	[NT]	[NT]	LCS	106%

QUALITY CONTROL MBTEX in Water (µg/L)	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted (MBTEX)				17/09/10	[NT]	[NT]	LCS	17/09/10
Date Analysed (MBTEX)				17/09/10	[NT]	[NT]	LCS	17/09/10
Methyl-tert-butyl ether (MtBE)	µg/L	1	SEO-018	<1	[NT]	[NT]	LCS	105%
Benzene	µg/L	0.5	SEO-018	<0.5	[NT]	[NT]	LCS	102%
Toluene	µg/L	0.5	SEO-018	<0.5	[NT]	[NT]	LCS	103%
Ethylbenzene	µg/L	0.5	SEO-018	<0.5	[NT]	[NT]	LCS	103%
Total Xylenes	µg/L	1.5	SEO-018	<1.5	[NT]	[NT]	LCS	102%
Surrogate	%	0	SEO-018	89	[NT]	[NT]	LCS	78%

QUALITY CONTROL TRH in water with C6-C9 by P/T	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted (TRH C6-C9 PT)				17/09/10	[NT]	[NT]	LCS	17/09/10
Date Analysed (TRH C6-C9 PT)				17/09/10	[NT]	[NT]	LCS	17/09/10
TRH C_6 - C_9 P&T in µg/L	µg/L	40	SEO-018	<40	[NT]	[NT]	LCS	99%
Date Extracted (TRH C10-C36)				17/09/2010	[NT]	[NT]	LCS	17/09/2010
Date Analysed (TRH C10-C36)				17/09/2010	[NT]	[NT]	LCS	17/09/2010
TRH C_{10} - C_{14}	µg/L	100	SEO-020	<100	[NT]	[NT]	LCS	110%
TRH C_{15} - C_{28}	µg/L	200	SEO-020	<200	[NT]	[NT]	LCS	115%
TRH C_{29} - C_{36}	µg/L	200	SEO-020	<200	[NT]	[NT]	LCS	109%

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QUALITY CONTROL PAHs in Water	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted				17/09/10	[NT]	[NT]	LCS	17/09/10
Date Analysed				17/09/10	[NT]	[NT]	LCS	17/09/10
Naphthalene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	LCS	110%
2-Methylnaphthalene	µg/L	0.5	SEO-030	<0.5	[NT]	[NT]	[NR]	[NR]
1-Methylnaphthalene	µg/L	0.5	SEO-030	<0.5	[NT]	[NT]	[NR]	[NR]
Acenaphthylene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	LCS	94%
Acenaphthene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	LCS	115%
Fluorene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	[NR]	[NR]
Phenanthrene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	LCS	107%
Anthracene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	LCS	110%
Fluoranthene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	LCS	105%
Pyrene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	LCS	124%
Benzo[*a*]anthracene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	[NR]	[NR]
Benzo[*b,k*]fluoranthene	µg/L	1	SEO-030	<1.0	[NT]	[NT]	[NR]	[NR]
Benzo[*a*]pyrene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	LCS	111%
Indeno[*123-cd*]pyrene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	[NR]	[NR]
Dibenzo[*ah*]anthracene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	[NR]	[NR]
Benzo[*ghi*]perylene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	[NR]	[NR]
Total PAHs	µg/L	9	SEO-030	<9	[NT]	[NT]	[NR]	[NR]
Nitrobenzene-d5	%	0	SEO-030	80	[NT]	[NT]	LCS	78%
2-Fluorobiphenyl	%	0	SEO-030	102	[NT]	[NT]	LCS	102%
p -Terphenyl-*d*14	%	0	SEO-030	106	[NT]	[NT]	LCS	92%

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QUALITY CONTROL OC Pesticides in Water	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted				21/09/2010	[NT]	[NT]	LCS	21/09/2010
Date Analysed				21/09/2010	[NT]	[NT]	LCS	21/09/2010
HCB	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	[NR]	[NR]
alpha-BHC	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	[NR]	[NR]
gamma-BHC(Lindane)	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	[NR]	[NR]
Heptachlor	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	LCS	105%
Aldrin	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	LCS	96%
beta-BHC	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	[NR]	[NR]
delta-BHC	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	LCS	82%
Heptachlor Epoxide	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	[NR]	[NR]
o,p-DDE	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	[NR]	[NR]
alpha-Endosulfan	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	[NR]	[NR]
trans-Chlordane	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	[NR]	[NR]
cis-Chlordane	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	[NR]	[NR]
trans-Nonachlor	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	[NR]	[NR]
p,p-DDE	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	[NR]	[NR]
Dieldrin	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	LCS	106%
Endrin	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	LCS	114%
o,p-DDD	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	[NR]	[NR]
o,p-DDT	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	[NR]	[NR]
beta-Endosulfan	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	[NR]	[NR]
p,p-DDD	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	[NR]	[NR]
p,p-DDT	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	LCS	103%
Endosulfan Sulphate	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	[NR]	[NR]
Methoxychlor	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	[NR]	[NR]
Endrin Ketone	µg/L	0.2	SEO-005	<0.2	[NT]	[NT]	[NR]	[NR]
2,4,5,6-Tetrachloro-m-xylene *(Surrogate*	%	0	SEO-005	107	[NT]	[NT]	LCS	99%

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QUALITY CONTROL OP Pesticides in Water by GCMS	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted				17/09/10	[NT]	[NT]	LCS	17/09/10
Date Analysed				17/09/10	[NT]	[NT]	LCS	17/09/10
Dichlorvos	µg/L	1	AN420	<1	[NT]	[NT]	LCS	75%
Dimethoate	µg/L	1	AN420	<1	[NT]	[NT]	[NR]	[NR]
Diazinon	µg/L	0.5	AN420	<0.5	[NT]	[NT]	LCS	77%
Fenitrothion	µg/L	0.2	AN420	<0.2	[NT]	[NT]	[NR]	[NR]
Malathion	µg/L	0.2	AN420	<0.20	[NT]	[NT]	[NR]	[NR]
Chlorpyrifos-ethyl	µg/L	0.2	AN420	<0.2	[NT]	[NT]	LCS	85%
Parathion-ethyl	µg/L	0.2	AN420	<0.2	[NT]	[NT]	[NR]	[NR]
Bromofos-ethyl	µg/L	0.2	AN420	<0.2	[NT]	[NT]	[NR]	[NR]
Methidathion	µg/L	0.5	AN420	<0.5	[NT]	[NT]	[NR]	[NR]
Ethion	µg/L	0.2	AN420	<0.2	[NT]	[NT]	LCS	67%
Azinphos-methyl	µg/L	0.2	AN420	<0.20	[NT]	[NT]	[NR]	[NR]
2-fluorobiphenyl (Surr)	%	0	AN420	102	[NT]	[NT]	LCS	108%
d14-p-Terphenyl (Surr)	%	0	AN420	106	[NT]	[NT]	LCS	96%

QUALITY CONTROL Trace HM (ICP-MS)-Dissolved	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted (Metals-ICPMS)				16/09/2010	[NT]	[NT]	LCS	16/09/2010
Date Analysed (Metals-ICPMS)				16/09/2010	[NT]	[NT]	LCS	16/09/2010
Arsenic	µg/L	1	AN318	<1	[NT]	[NT]	LCS	101%
Cadmium	µg/L	0.1	AN318	<0.1	[NT]	[NT]	LCS	96%
Chromium	µg/L	1	AN318	<1	[NT]	[NT]	LCS	94%
Copper	µg/L	1	AN318	<1	[NT]	[NT]	LCS	91%
Lead	µg/L	1	AN318	<1	[NT]	[NT]	LCS	90%
Nickel	µg/L	1	AN318	<1	[NT]	[NT]	LCS	91%
Zinc	µg/L	1	AN318	<1	[NT]	[NT]	LCS	95%

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QUALITY CONTROL Mercury Cold Vapor/Hg Analyser	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted (Mercury)				16/09/2010	[NT]	[NT]	LCS	16/09/2010
Date Analysed (Mercury)				16/09/2010	[NT]	[NT]	LCS	16/09/2010
Mercury (Dissolved)	mg/L	0.0001	SEM-005	<0.0001	[NT]	[NT]	LCS	102%

QUALITY CONTROL Moisture	UNITS	LOR	METHOD	Blank
Date Analysed (moisture)				[NT]
Moisture	%	1	AN002	<1

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Result Codes

[INS] : Insufficient Sample for this test
[NR] : Not Requested
[NT] : Not tested
[LOR] : Limit of reporting
[RPD] : Relative Percentage Difference
* : Not part of NATA Accreditation
[N/A] : Not Applicable

Report Comments

MBTEX/C6-C9 TRH- LOR raised due to sample matrix interference.
PAH/OPMS water Surrogate not reported due to sample matrix interference.
OC WATER SURROGATE NOT RECOVERED WITHIN ACCEPTANCE CRITERIA DUE TO SAMPLE MATRIX INTERFERENCE.

TRH C10-C36 - Results may be overestimated due to high level of moisture content in the sample >80% moisture.
Samples analysed as received. Solid samples expressed on a dry weight basis.
Date Organics extraction commenced:
NATA Corporate Accreditation No. 2562, Site No 4354
Note: Test results are not corrected for recovery (excluding Air-toxics and Dioxins/Furans*)

Quality Control Protocol

Method Blank: An analyte free matrix to which all reagents are added in the same volume or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. A method blank is prepared every 20 samples.
Duplicate: A separate portion of a sample being analysed that is treated the same as the other samples in the batch. One duplicate is processed at least every 10 samples.
Surrogate Spike: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. Surrogates are added to samples before extraction to monitor extraction efficiency and percent recovery in each sample.
Internal Standard: Added to all samples requiring analysis for organics (where relevant) or metals by ICP after the extraction/digestion process; the compounds/elements serve to give a standard of retention time and/or response, which is invariant from run-to-run with the instruments.
Laboratory Control Sample: A known matrix spiked with compound(s) representative of the target analytes. It is used to document laboratory performance. When the results of the matrix spike analysis indicates a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.
Matrix Spike: An aliquot of sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Quality Acceptance Criteria

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-09.pdf

SGS Australia Pty Ltd
ABN 44 000 964 278
Environmental Services Unit 16/33 Maddox Street Alexandria NSW 2015 Australia
t +61 (0)2 8594 0400 f + 61 (0)2 8594 0499 www.au.sgs.com