Appendix G

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CERTIFICATE OF ANALYSIS 186116

Client Details

Client	Consulting Earth Scientists Pty Ltd
Attention	Darren Hanvey, Miles Thompson
Address	Suite 3, Level 1, 55 Grandview Street, Pymble, NSW, 2073

Sample Details

Your Reference	**CES180204-SGC**
Number of Samples	4 soil
Date samples received	27/02/2018
Date completed instructions received	27/02/2018

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	06/03/2018
Date of Issue	07/03/2018
Reissue Details	This report replaces R00 created on 05/03/2018 due to: result entry error

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Asbestos Approved By

Analysed by Asbestos Approved Identifier: Lucy Zhu
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Results Approved By

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Steven Luong, Senior Chemist

Authorised By

David Springer, General Manager

VHC's in soil		
Our Reference		186116-3
Your Reference	UNITS	BH2
Depth		0.3-0.6
Type of sample		soil
Date extracted	-	28/02/2018
Date analysed	-	28/02/2018
Dichlorodifluoromethane	mg/kg	<1
Chloromethane	mg/kg	<1
Vinyl Chloride	mg/kg	<1
Bromomethane	mg/kg	<1
Chloroethane	mg/kg	<1
Trichlorofluoromethane	mg/kg	<1
1,1-Dichloroethene	mg/kg	<1
trans-1,2-dichloroethene	mg/kg	<1
1,1-dichloroethane	mg/kg	<1
cis-1,2-dichloroethene	mg/kg	<1
bromochloromethane	mg/kg	<1
chloroform	mg/kg	<1
2,2-dichloropropane	mg/kg	<1
1,2-dichloroethane	mg/kg	<1
1,1,1-trichloroethane	mg/kg	<1
1,1-dichloropropene	mg/kg	<1
carbon tetrachloride	mg/kg	<1
dibromomethane	mg/kg	<1
1,2-dichloropropane	mg/kg	<1
trichloroethene	mg/kg	<1
bromodichloromethane	mg/kg	<1
trans-1,3-dichloropropene	mg/kg	<1
cis-1,3-dichloropropene	mg/kg	<1
1,1,2-trichloroethane	mg/kg	<1
1,3-dichloropropane	mg/kg	<1
dibromochloromethane	mg/kg	<1
1,2-dibromoethane	mg/kg	<1
tetrachloroethene	mg/kg	<1
1,1,1,2-tetrachloroethane	mg/kg	<1
chlorobenzene	mg/kg	<1
bromoform	mg/kg	<1
1,1,2,2-tetrachloroethane	mg/kg	<1
1,2,3-trichloropropane	mg/kg	<1
bromobenzene	mg/kg	<1
2-chlorotoluene	mg/kg	<1

VHC's in soil		
Our Reference		186116-3
Your Reference	UNITS	BH2
Depth		0.3-0.6
Type of sample		soil
4-chlorotoluene	mg/kg	<1
1,3-dichlorobenzene	mg/kg	<1
1,4-dichlorobenzene	mg/kg	<1
1,2-dichlorobenzene	mg/kg	<1
1,2-dibromo-3-chloropropane	mg/kg	<1
1,2,4-trichlorobenzene	mg/kg	<1
hexachlorobutadiene	mg/kg	<1
1,2,3-trichlorobenzene	mg/kg	<1
Surrogate Dibromofluorometha	%	101
Surrogate aaa-Trifluorotoluene	%	95
Surrogate Toluene-d_8	%	95
Surrogate 4-Bromofluorobenzene	%	83

vTRH(C6-C10)/BTEXN in Soil					
Our Reference		186116-1	186116-2	186116-3	186116-4
Your Reference	UNITS	BH3	BH3	BH2	BH2
Depth		0.3-0.6	1.2-1.5	0.3-0.6	2.0-2.3
Type of sample		soil	soil	soil	soil
Date extracted	-	28/02/2018	28/02/2018	28/02/2018	28/02/2018
Date analysed	-	28/02/2018	28/02/2018	28/02/2018	28/02/2018
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	89	93	95	88

svTRH (C10-C40) in Soil					
Our Reference		186116-1	186116-2	186116-3	186116-4
Your Reference	UNITS	BH3	BH3	BH2	BH2
Depth		0.3-0.6	1.2-1.5	0.3-0.6	2.0-2.3
Type of sample		soil	soil	soil	soil
Date extracted	-	28/02/2018	28/02/2018	28/02/2018	28/02/2018
Date analysed	-	01/03/2018	01/03/2018	01/03/2018	01/03/2018
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	280	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	160	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	400	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	400	<50
Surrogate o-Terphenyl	%	89	92	96	89

PAHs in Soil					
Our Reference		186116-1	186116-2	186116-3	186116-4
Your Reference	UNITS	BH3	BH3	BH2	BH2
Depth		0.3-0.6	1.2-1.5	0.3-0.6	2.0-2.3
Type of sample		soil	soil	soil	soil
Date extracted	-	28/02/2018	28/02/2018	28/02/2018	28/02/2018
Date analysed	-	28/02/2018	28/02/2018	28/02/2018	28/02/2018
Naphthalene	mg/kg	<0.1	<0.1	0.3	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	2.3	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	0.2	<0.1
Fluorene	mg/kg	<0.1	<0.1	0.8	<0.1
Phenanthrene	mg/kg	0.1	<0.1	10	0.1
Anthracene	mg/kg	<0.1	<0.1	2.6	<0.1
Fluoranthene	mg/kg	0.3	<0.1	18	0.3
Pyrene	mg/kg	0.3	<0.1	20	0.4
Benzo(a)anthracene	mg/kg	0.2	<0.1	9.7	0.2
Chrysene	mg/kg	0.1	<0.1	6.9	0.2
Benzo(b,j+k)fluoranthene	mg/kg	0.3	<0.2	11	0.3
Benzo(a)pyrene	mg/kg	0.2	<0.05	7.5	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	3.3	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	1.3	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	4.1	0.1
Total +ve PAH's	mg/kg	1.4	<0.05	98	1.9
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	11	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	11	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	11	<0.5
Surrogate p-Terphenyl-d14	%	107	107	117	107

Organochlorine Pesticides in soil					
Our Reference		186116-1	186116-2	186116-3	186116-4
Your Reference	UNITS	BH3	BH3	BH2	BH2
Depth		0.3-0.6	1.2-1.5	0.3-0.6	2.0-2.3
Type of sample		soil	soil	soil	soil
Date extracted	-	28/02/2018	28/02/2018	28/02/2018	28/02/2018
Date analysed	-	28/02/2018	28/02/2018	28/02/2018	28/02/2018
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	107	110	98	105

Organophosphorus Pesticides					
Our Reference		186116-1	186116-2	186116-3	186116-4
Your Reference	UNITS	BH3	BH3	BH2	BH2
Depth		0.3-0.6	1.2-1.5	0.3-0.6	2.0-2.3
Type of sample		soil	soil	soil	soil
Date extracted	-	28/02/2018	28/02/2018	28/02/2018	28/02/2018
Date analysed	-	28/02/2018	28/02/2018	28/02/2018	28/02/2018
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	107	110	98	105

PCBs in Soil					
Our Reference		186116-1	186116-2	186116-3	186116-4
Your Reference	UNITS	BH3	BH3	BH2	BH2
Depth		0.3-0.6	1.2-1.5	0.3-0.6	2.0-2.3
Type of sample		soil	soil	soil	soil
Date extracted	-	28/02/2018	28/02/2018	28/02/2018	28/02/2018
Date analysed	-	28/02/2018	28/02/2018	28/02/2018	28/02/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	107	110	98	105

Acid Extractable metals in soil					
Our Reference		186116-1	186116-2	186116-3	186116-4
Your Reference	UNITS	BH3	BH3	BH2	BH2
Depth		0.3-0.6	1.2-1.5	0.3-0.6	2.0-2.3
Type of sample		soil	soil	soil	soil
Date prepared	-	28/02/2018	28/02/2018	28/02/2018	28/02/2018
Date analysed	-	28/02/2018	28/02/2018	28/02/2018	28/02/2018
Arsenic	mg/kg	5	<4	7	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	11	<1	9	13
Copper	mg/kg	40	<1	53	21
Lead	mg/kg	440	2	220	43
Mercury	mg/kg	1.0	<0.1	0.9	0.2
Nickel	mg/kg	6	<1	6	3
Zinc	mg/kg	200	17	120	32

Misc Soil - Inorg					
Our Reference		186116-1	186116-2	186116-3	186116-4
Your Reference	UNITS	BH3	BH3	BH2	BH2
Depth		0.3-0.6	1.2-1.5	0.3-0.6	2.0-2.3
Type of sample		soil	soil	soil	soil
Date prepared	-	28/02/2018	28/02/2018	28/02/2018	28/02/2018
Date analysed	-	28/02/2018	28/02/2018	28/02/2018	28/02/2018
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5

Misc Inorg - Soil		
Our Reference		186116-2
Your Reference	UNITS	BH3
Depth		1.2-1.5
Type of sample		soil
Date prepared	-	01/03/2018
Date analysed	-	01/03/2018
pH 1:5 soil:water	pH Units	8.0

CEC		
Our Reference		186116-2
Your Reference	UNITS	BH3
Depth		1.2-1.5
Type of sample		soil
Date prepared	-	01/03/2018
Date analysed	-	02/03/2018
Exchangeable Ca	meq/100g	1.1
Exchangeable K	meq/100g	<0.1
Exchangeable Mg	meq/100g	0.13
Exchangeable Na	meq/100g	<0.1
Cation Exchange Capacity	meq/100g	1.3

Moisture					
Our Reference		186116-1	186116-2	186116-3	186116-4
Your Reference	UNITS	BH3	BH3	BH2	BH2
Depth		0.3-0.6	1.2-1.5	0.3-0.6	2.0-2.3
Type of sample		soil	soil	soil	soil
Date prepared	-	28/02/2018	28/02/2018	28/02/2018	28/02/2018
Date analysed	-	01/03/2018	01/03/2018	01/03/2018	01/03/2018
Moisture	%	16	4.9	15	13

Asbestos ID - soils NEPM - ASB-001			
Our Reference		186116-1	186116-3
Your Reference	UNITS	BH3	BH2
Depth		0.3-0.6	0.3-0.6
Type of sample		soil	soil
Date analysed	-	05/03/2018	05/03/2018
Sample mass tested	g	1,185.5	1,428.97
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–
FA and AF Estimation*	g	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.

Method ID	Methodology Summary
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. ‘EQ PQL’values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. ‘EQ zero’values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. ‘EQ half PQL’values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing 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. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
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. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: VHC's in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Date analysed	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Dichlorodifluoromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
cis-1,2-dichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromochloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
chloroform	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
2,2-dichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
1,1,1-trichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
1,1-dichloropropene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
carbon tetrachloride	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
dibromomethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
trichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
bromodichloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
trans-1,3-dichloropropene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
dibromochloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
1,2-dibromoethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
tetrachloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
1,1,1,2-tetrachloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
chlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromoform	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: VHC's in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
hexachlorobutadiene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluorometha	%		Org-014	105	[NT]	[NT]	[NT]	[NT]	102	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-014	89	[NT]	[NT]	[NT]	[NT]	96	[NT]
Surrogate Toluene-d_8	%		Org-014	95	[NT]	[NT]	[NT]	[NT]	93	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-014	84	[NT]	[NT]	[NT]	[NT]	89	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Date analysed	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	98	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	99	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	99	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	100	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	89	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Date analysed	-			01/03/2018	[NT]	[NT]	[NT]	[NT]	01/03/2018	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	131	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	117	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH $>C_{10}$ -C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	131	[NT]
TRH $>C_{16}$ -C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	117	[NT]
TRH $>C_{34}$ -C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
Surrogate o-Terphenyl	%		Org-003	94	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Date analysed	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	[NT]	[NT]	84	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	109	[NT]	[NT]	[NT]	[NT]	120	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Date analysed	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-005	124	[NT]	[NT]	[NT]	[NT]	129	[NT]

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Date analysed	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	79	[NT]
Dimethoate	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Fenitrothion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Malathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	75	[NT]
Parathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Ronnel	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Surrogate TCMX	%		Org-008	124	[NT]	[NT]	[NT]	[NT]	116	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Date analysed	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCLMX	%		Org-006	124	[NT]	[NT]	[NT]	[NT]	116	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Date analysed	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	112	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	105	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	118	[NT]

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Date analysed	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: Misc Inorg - Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			01/03/2018	[NT]	[NT]	[NT]	[NT]	01/03/2018	[NT]
Date analysed	-			01/03/2018	[NT]	[NT]	[NT]	[NT]	01/03/2018	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			01/03/2018	2	01/03/2018	01/03/2018		01/03/2018	[NT]
Date analysed	-			02/03/2018	2	02/03/2018	02/03/2018		02/03/2018	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-009	<0.1	2	1.1	0.7	44	97	[NT]
Exchangeable K	meq/100g	0.1	Metals-009	<0.1	2	<0.1	<0.1	0	110	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-009	<0.1	2	0.13	<0.1	26	99	[NT]
Exchangeable Na	meq/100g	0.1	Metals-009	<0.1	2	<0.1	<0.1	0	99	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

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.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

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 batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.
This is reported outside our scope of NATA accreditation.

Aileen Hie

From:	Darren Hanvey <darren.hanvey@consultingearth.com.au>
Sent:	Friday, 9 March 2018 3:25 PM
To:	Ken Nguyen; SydneyMailbox
Cc:	tristan.goodbody@consultingearth.com.au; Bowen Ren
Subject:	CES180204, Additional Analyses

Ken, can you please perform the following TCLP testing on these samples (already at Envirolab) on a 48 hour turnaround;

Can you please issue results by Tuesday COB.

Sample ID	Batch	TCLP	
BH3_0.3-0.6	186116	Metals	1
BH2_0.3-0.6	186116	PAHs, Lead	3
BH1_0.4-0.8	186212	PAHs, Lead	
BH4_0.3-0.8	186295	Metals	
BH6_0.3-0.8	186376	Metals, PAHs	
BH5_0.3-0.9	186376	Metals	
BH7_0.3-0.9	186376	PAHs, Metals	
BH8_0.3-0.9	186376	PAHs, Metals, PFAS	
BH9_0.3-0.9	186376	PAHs, Metals	
BH10_0.3-0.9	186597	PAHs	
BH11_0.3-0.7	186597	PAHs, Metals	

ELS: 186116-A
Rec: 9/3/13
TAT: 2 DAYS
[signature]

Can you also please perform the following analyses (Samples at Envirolab):

- Batch 186597, Envirolab Sample ID 4, CES Sample ID BH11-Nat_1.3-1.6, PAHs, Metals

All results reported by Tuesday COB (48 hour analyses).

Thanks,

Darren Hanvey
Principal Geo-Environmental Engineer
Certified Practitioner – Site Assessment and Management

CONSULTING EARTH SCIENTISTS

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CERTIFICATE OF ANALYSIS 186116-A

Client Details

Client	Consulting Earth Scientists Pty Ltd
Attention	Tristan Goodbody, Darren Hanvey
Address	Suite 3, Level 1, 55 Grandview Street, Pymble, NSW, 2073

Sample Details

Your Reference	**CES180204-SGC**
Number of Samples	4 soil
Date samples received	27/02/2018
Date completed instructions received	09/03/2018

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.

Report Details

Date results requested by	13/03/2018
Date of Issue	13/03/2018

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

Results Approved By
Long Pham, Team Leader, Metals
Steven Luong, Senior Chemist

Authorised By

David Springer, General Manager

PAHs in TCLP (USEPA 1311)		
Our Reference		186116-A-3
Your Reference	UNITS	BH2
Depth		0.3-0.6
Type of sample		soil
Date extracted	-	12/03/2018
Date analysed	-	13/03/2018
Naphthalene in TCLP	mg/L	<0.001
Acenaphthylene in TCLP	mg/L	<0.001
Acenaphthene in TCLP	mg/L	<0.001
Fluorene in TCLP	mg/L	<0.001
Phenanthrene in TCLP	mg/L	<0.001
Anthracene in TCLP	mg/L	<0.001
Fluoranthene in TCLP	mg/L	<0.001
Pyrene in TCLP	mg/L	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001
Chrysene in TCLP	mg/L	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001
Total +ve PAH's	mg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	114

Metals in TCLP USEPA1311			
Our Reference		186116-A-1	186116-A-3
Your Reference	UNITS	BH3	BH2
Depth		0.3-0.6	0.3-0.6
Type of sample		soil	soil
Date extracted	-	12/03/2018	12/03/2018
Date analysed	-	12/03/2018	12/03/2018
pH of soil for fluid# determ.	pH units	8.8	8.8
pH of soil TCLP (after HCl)	pH units	1.8	1.9
Extraction fluid used	-	1	1
pH of final Leachate	pH units	5.1	5.6
Arsenic in TCLP	mg/L	<0.05	[NA]
Cadmium in TCLP	mg/L	<0.01	[NA]
Chromium in TCLP	mg/L	0.02	[NA]
Copper in TCLP	mg/L	0.01	[NA]
Lead in TCLP	mg/L	0.30	0.1
Mercury in TCLP	mg/L	<0.0005	[NA]
Nickel in TCLP	mg/L	<0.02	[NA]
Zinc in TCLP	mg/L	0.7	[NA]

Method ID	Methodology Summary
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-012	Leachates are extracted with Dichloromethane and analysed by GC-MS.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Date analysed	-			13/03/2018	[NT]	[NT]	[NT]	[NT]	13/03/2018	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	81	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	91	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	92	[NT]
Anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	89	[NT]
Pyrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	89	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	97	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	100	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	115	[NT]	[NT]	[NT]	[NT]	105	[NT]

QUALITY CONTROL: Metals in TCLP USEPA1311					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Date analysed	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Arsenic in TCLP	mg/L	0.05	Metals-020 ICP-AES	<0.05	[NT]	[NT]	[NT]	[NT]	111	[NT]
Cadmium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	110	[NT]
Chromium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	110	[NT]
Copper in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	113	[NT]
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	[NT]	[NT]	111	[NT]
Mercury in TCLP	mg/L	0.0005	Metals-021 CV-AAS	<0.0005	[NT]	[NT]	[NT]	[NT]	93	[NT]
Nickel in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	[NT]	[NT]	110	[NT]
Zinc in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	[NT]	[NT]	108	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

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.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

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 batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

ENVIROLAB GROUP

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National Phone number 1300 42 43 44

19777

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Client: Consulting Earth Scientists
Contact Person: Miles Thompson
Project Mgr: Darren Harvey
Sampler: M.T
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Client Project Name / Number / Site etc (ie report title): CES180204-SGA
PO No.: CES180204-SGA
Envirolab Quote No. :
Date results required:
Or choose: standard / same day / 1 day / 2 day / 3 day
Note: Inform lab in advance if urgent turnaround is required - surcharges apply
Lab comments:

Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Combo 8	NEPM Asbestos	pH, CEC	UHC	Comments: Provide as much information about the sample as you can
1	BH3 0.3-0.6			Soil	x	x			
2	BH3 1.2-1.5			Soil	x		x		
3	BH2 0.3-0.6			Soil	x	x		x	
4	BH2 2.0-2.3			Soil	x				

ENVIROLAB
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 186116
Date Received: 27.2.18
Time Received: 17:30
Received by: JE
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished by (company): Consulting Earth Scientists
Print Name: Miles Thompson
Date & Time: 1415 27/2/18
Signature:

Received by (company): ELS
Print Name: JE
Date & Time: 27.2.18 17:30
Signature:

Lab use only:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: 9 °C **(if applicable)**
Transported by: Hand delivered / courier

White - Lab copy / Blue - Client copy / Pink - Retain in Book

Page No:

Envirolab Services Pty Ltd
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customerservice@envirolab.com.au
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CERTIFICATE OF ANALYSIS 186212

Client Details

Client	Consulting Earth Scientists Pty Ltd
Attention	Miles Thompson
Address	Suite 3, Level 1, 55 Grandview Street, Pymble, NSW, 2073

Sample Details

Your Reference	**CES180204**
Number of Samples	1 Water, 5 Soil
Date samples received	28/02/2018
Date completed instructions received	28/02/2018

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	07/03/2018
Date of Issue	07/03/2018

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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Matt Tang
Authorised by Asbestos Approved Signatory: Paul Ching

Results Approved By
Diego Bigolin, Team Leader, Inorganics
Jeremy Faircloth, Organics Supervisor
Long Pham, Team Leader, Metals
Paul Ching, Senior Analyst
Phalak Inthakesone, Organics Development Manager, Sydney
Steven Luong, Senior Chemist

Authorised By

David Springer, General Manager

VHC's in soil		
Our Reference		186212-5
Your Reference	UNITS	BH1
Depth		0.4-0.8
Type of sample		Soil
Date extracted	-	01/03/2018
Date analysed	-	02/03/2018
Dichlorodifluoromethane	mg/kg	<1
Chloromethane	mg/kg	<1
Vinyl Chloride	mg/kg	<1
Bromomethane	mg/kg	<1
Chloroethane	mg/kg	<1
Trichlorofluoromethane	mg/kg	<1
1,1-Dichloroethene	mg/kg	<1
trans-1,2-dichloroethene	mg/kg	<1
1,1-dichloroethane	mg/kg	<1
cis-1,2-dichloroethene	mg/kg	<1
bromochloromethane	mg/kg	<1
chloroform	mg/kg	<1
2,2-dichloropropane	mg/kg	<1
1,2-dichloroethane	mg/kg	<1
1,1,1-trichloroethane	mg/kg	<1
1,1-dichloropropene	mg/kg	<1
carbon tetrachloride	mg/kg	<1
dibromomethane	mg/kg	<1
1,2-dichloropropane	mg/kg	<1
trichloroethene	mg/kg	<1
bromodichloromethane	mg/kg	<1
trans-1,3-dichloropropene	mg/kg	<1
cis-1,3-dichloropropene	mg/kg	<1
1,1,2-trichloroethane	mg/kg	<1
1,3-dichloropropane	mg/kg	<1
dibromochloromethane	mg/kg	<1
1,2-dibromoethane	mg/kg	<1
tetrachloroethene	mg/kg	<1
1,1,1,2-tetrachloroethane	mg/kg	<1
chlorobenzene	mg/kg	<1
bromoform	mg/kg	<1
1,1,2,2-tetrachloroethane	mg/kg	<1
1,2,3-trichloropropane	mg/kg	<1
bromobenzene	mg/kg	<1
2-chlorotoluene	mg/kg	<1

VHC's in soil		
Our Reference		186212-5
Your Reference	UNITS	BH1
Depth		0.4-0.8
Type of sample		Soil
4-chlorotoluene	mg/kg	<1
1,3-dichlorobenzene	mg/kg	<1
1,4-dichlorobenzene	mg/kg	<1
1,2-dichlorobenzene	mg/kg	<1
1,2-dibromo-3-chloropropane	mg/kg	<1
1,2,4-trichlorobenzene	mg/kg	<1
hexachlorobutadiene	mg/kg	<1
1,2,3-trichlorobenzene	mg/kg	<1
Surrogate Dibromofluorometha	%	103
Surrogate aaa-Trifluorotoluene	%	105
Surrogate Toluene-d_8	%	102
Surrogate 4-Bromofluorobenzene	%	96

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		186212-2	186212-3	186212-4	186212-5	186212-6
Your Reference	UNITS	TB	TS	QAQC1	BH1	BH2
Depth		-	-	-	0.4-0.8	1.2-1.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/03/2018	01/03/2018	01/03/2018	01/03/2018	01/03/2018
Date analysed	-	02/03/2018	02/03/2018	02/03/2018	02/03/2018	02/03/2018
TRH C_6 - C_9	mg/kg	<25	[NA]	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	[NA]	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	[NA]	[NA]	<25	<25	<25
Benzene	mg/kg	<0.2	110%	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	112%	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	111%	<1	<1	<1
m+p-xylene	mg/kg	<2	114%	<2	<2	<2
o-Xylene	mg/kg	<1	107%	<1	<1	<1
naphthalene	mg/kg	[NA]	[NA]	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	[NA]	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	103	110	99	105	94

svTRH (C10-C40) in Soil				
Our Reference		186212-4	186212-5	186212-6
Your Reference	UNITS	QAQC1	BH1	BH2
Depth		-	0.4-0.8	1.2-1.5
Type of sample		Soil	Soil	Soil
Date extracted	-	01/03/2018	01/03/2018	01/03/2018
Date analysed	-	02/03/2018	02/03/2018	02/03/2018
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50
Surrogate o-Terphenyl	%	93	91	89

PAHs in Soil				
Our Reference		186212-4	186212-5	186212-6
Your Reference	UNITS	QAQC1	BH1	BH2
Depth		-	0.4-0.8	1.2-1.5
Type of sample		Soil	Soil	Soil
Date extracted	-	01/03/2018	01/03/2018	01/03/2018
Date analysed	-	02/03/2018	02/03/2018	02/03/2018
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.7	0.2
Anthracene	mg/kg	<0.1	0.2	<0.1
Fluoranthene	mg/kg	0.2	1.5	0.4
Pyrene	mg/kg	0.2	1.7	0.3
Benzo(a)anthracene	mg/kg	0.1	0.8	0.2
Chrysene	mg/kg	0.1	1.0	0.2
Benzo(b,j+k)fluoranthene	mg/kg	0.4	3.6	0.6
Benzo(a)pyrene	mg/kg	0.1	1.1	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.8	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	0.2	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.9	<0.1
Total +ve PAH's	mg/kg	1.2	13	2.0
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	1.8	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	1.8	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	1.8	<0.5
Surrogate p-Terphenyl-d14	%	101	92	99

Organochlorine Pesticides in soil				
Our Reference		186212-4	186212-5	186212-6
Your Reference	UNITS	QAQC1	BH1	BH2
Depth		-	0.4-0.8	1.2-1.5
Type of sample		Soil	Soil	Soil
Date extracted	-	01/03/2018	01/03/2018	01/03/2018
Date analysed	-	02/03/2018	02/03/2018	02/03/2018
HCB	mg/kg	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	107	104	104

Organophosphorus Pesticides				
Our Reference		186212-4	186212-5	186212-6
Your Reference	UNITS	QAQC1	BH1	BH2
Depth		-	0.4-0.8	1.2-1.5
Type of sample		Soil	Soil	Soil
Date extracted	-	01/03/2018	01/03/2018	01/03/2018
Date analysed	-	02/03/2018	02/03/2018	02/03/2018
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	107	104	104

PCBs in Soil				
Our Reference		186212-4	186212-5	186212-6
Your Reference	UNITS	QAQC1	BH1	BH2
Depth		-	0.4-0.8	1.2-1.5
Type of sample		Soil	Soil	Soil
Date extracted	-	01/03/2018	01/03/2018	01/03/2018
Date analysed	-	02/03/2018	02/03/2018	02/03/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCLMX	%	107	104	104

Acid Extractable metals in soil				
Our Reference		186212-4	186212-5	186212-6
Your Reference	UNITS	QAQC1	BH1	BH2
Depth		-	0.4-0.8	1.2-1.5
Type of sample		Soil	Soil	Soil
Date prepared	-	01/03/2018	01/03/2018	01/03/2018
Date analysed	-	02/03/2018	02/03/2018	02/03/2018
Arsenic	mg/kg	7	41	9
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	4	5	4
Copper	mg/kg	8	24	10
Lead	mg/kg	31	100	32
Mercury	mg/kg	0.2	0.9	0.2
Nickel	mg/kg	1	4	2
Zinc	mg/kg	28	170	28

Misc Soil - Inorg				
Our Reference		186212-4	186212-5	186212-6
Your Reference	UNITS	QAQC1	BH1	BH2
Depth		-	0.4-0.8	1.2-1.5
Type of sample		Soil	Soil	Soil
Date prepared	-	01/03/2018	01/03/2018	01/03/2018
Date analysed	-	01/03/2018	01/03/2018	01/03/2018
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5

PFAs in Soils Short		
Our Reference		186212-5
Your Reference	UNITS	BH1
Depth		0.4-0.8
Type of sample		Soil
Date prepared	-	02/03/2018
Date analysed	-	04/03/2018
Perfluorohexanesulfonic acid	µg/kg	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	0.3
Perfluorooctanoic acid PFOA	µg/kg	<0.1
6:2 FTS	µg/kg	<0.1
8:2 FTS	µg/kg	<0.1
Surrogate $^{13}C_8$ PFOS	%	78
Surrogate $^{13}C_2$ PFOA	%	79

Moisture				
Our Reference		186212-4	186212-5	186212-6
Your Reference	UNITS	QAQC1	BH1	BH2
Depth		-	0.4-0.8	1.2-1.5
Type of sample		Soil	Soil	Soil
Date prepared	-	01/03/2018	01/03/2018	01/03/2018
Date analysed	-	02/03/2018	02/03/2018	02/03/2018
Moisture	%	7.5	10	11

Asbestos ID - soils NEPM - ASB-001		
Our Reference		186212-5
Your Reference	UNITS	BH1
Depth		0.4-0.8
Type of sample		Soil
Date analysed	-	06/03/2018
Sample mass tested	g	1,426.8
Sample Description	-	Grey sandy soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected
Total Asbestos#1	g/kg	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected
ACM >7mm Estimation*	g	–
FA and AF Estimation*	g	–
ACM >7mm Estimation*	%(w/w)	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001

vTRH(C6-C10)/BTEXN in Water		
Our Reference		186212-1
Your Reference	UNITS	R1
Depth		-
Type of sample		Water
Date extracted	-	01/03/2018
Date analysed	-	01/03/2018
TRH C_6 - C_9	µg/L	57
TRH C_6 - C_{10}	µg/L	130
TRH C_6 - C_{10} less BTEX (F1)	µg/L	110
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	2
m+p-xylene	µg/L	11
o-xylene	µg/L	6
Naphthalene	µg/L	2
Surrogate Dibromofluoromethane	%	101
Surrogate toluene-d8	%	95
Surrogate 4-BFB	%	97

svTRH (C10-C40) in Water		
Our Reference		186212-1
Your Reference	UNITS	R1
Depth		-
Type of sample		Water
Date extracted	-	01/03/2018
Date analysed	-	01/03/2018
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Surrogate o-Terphenyl	%	90

PAHs in Water		
Our Reference		186212-1
Your Reference	UNITS	R1
Depth		-
Type of sample		Water
Date extracted	-	01/03/2018
Date analysed	-	01/03/2018
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b,j+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	113

OCP in water		
Our Reference		186212-1
Your Reference	UNITS	R1
Depth		-
Type of sample		Water
Date extracted	-	01/03/2018
Date analysed	-	02/03/2018
HCB	µg/L	<0.2
alpha-BHC	µg/L	<0.2
gamma-BHC	µg/L	<0.2
beta-BHC	µg/L	<0.2
Heptachlor	µg/L	<0.2
delta-BHC	µg/L	<0.2
Aldrin	µg/L	<0.2
Heptachlor Epoxide	µg/L	<0.2
gamma-Chlordane	µg/L	<0.2
alpha-Chlordane	µg/L	<0.2
Endosulfan I	µg/L	<0.2
pp-DDE	µg/L	<0.2
Dieldrin	µg/L	<0.2
Endrin	µg/L	<0.2
pp-DDD	µg/L	<0.2
Endosulfan II	µg/L	<0.2
pp-DDT	µg/L	<0.2
Endrin Aldehyde	µg/L	<0.2
Endosulfan Sulphate	µg/L	<0.2
Methoxychlor	µg/L	<0.2
Surrogate TCMX	%	85

OP Pesticides in water		
Our Reference		186212-1
Your Reference	UNITS	R1
Depth		-
Type of sample		Water
Date extracted	-	01/03/2018
Date analysed	-	02/03/2018
Azinphos-methyl (Guthion)	µg/L	<0.2
Bromophos ethyl	µg/L	<0.2
Chlorpyriphos	µg/L	<0.2
Chlorpyriphos-methyl	µg/L	<0.2
Diazinon	µg/L	<0.2
Dichlorovos	µg/L	<0.2
Dimethoate	µg/L	<0.2
Ethion	µg/L	<0.2
Fenitrothion	µg/L	<0.2
Malathion	µg/L	<0.2
Parathion	µg/L	<0.2
Ronnel	µg/L	<0.2
Surrogate TCMX	%	85

PCBs in Water		
Our Reference		186212-1
Your Reference	UNITS	R1
Depth		-
Type of sample		Water
Date extracted	-	01/03/2018
Date analysed	-	02/03/2018
Aroclor 1016	µg/L	<2
Aroclor 1221	µg/L	<2
Aroclor 1232	µg/L	<2
Aroclor 1242	µg/L	<2
Aroclor 1248	µg/L	<2
Aroclor 1254	µg/L	<2
Aroclor 1260	µg/L	<2
Surrogate TCLMX	%	85

Metals in Water - Dissolved		
Our Reference		186212-1
Your Reference	UNITS	R1
Depth		-
Type of sample		Water
Date digested	-	02/03/2018
Date analysed	-	02/03/2018
Arsenic - Dissolved	mg/L	<0.05
Cadmium - Dissolved	mg/L	<0.01
Chromium - Dissolved	mg/L	<0.01
Copper - Dissolved	mg/L	<0.01
Lead - Dissolved	mg/L	<0.03
Mercury - Dissolved	mg/L	<0.0005
Nickel - Dissolved	mg/L	<0.02
Zinc - Dissolved	mg/L	<0.02

Total Phenolics in Water		
Our Reference		186212-1
Your Reference	UNITS	R1
Depth		-
Type of sample		Water
Date extracted	-	01/03/2018
Date analysed	-	01/03/2018
Total Phenolics (as Phenol)	mg/L	<0.05

PFAS in Waters Short		
Our Reference		186212-1
Your Reference	UNITS	R1
Depth		-
Type of sample		Water
Date prepared	-	06/03/2018
Date analysed	-	06/03/2018
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01
6:2 FTS	µg/L	<0.01
8:2 FTS	µg/L	<0.01
Surrogate $^{13}C_8$ PFOS	%	92
Surrogate $^{13}C_2$ PFOA	%	93

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.

Method ID	Methodology Summary
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing 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. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
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. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

Method ID	Methodology Summary
Org-035D	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are NOT corrected for Surrogates (mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample - also known as Extracted Internal Standards) UNLESS contractually requested. Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.
Org-035D_2	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are NOT corrected for Surrogates (mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample - also known as Extracted Internal Standards) UNLESS contractually requested. Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.
Org-035E	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are NOT corrected for Surrogates (mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample - also known as Extracted Internal Standards) UNLESS contractually requested. Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.
Org-035E_2	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are NOT corrected for Surrogates (mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample - also known as Extracted Internal Standards) UNLESS contractually requested. Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: VHC's in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	[NT]
Date extracted	-			01/03/2018	[NT]	[NT]	[NT]	[NT]	01/03/2018	[NT]
Date analysed	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
Dichlorodifluoromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
cis-1,2-dichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromochloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
chloroform	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
2,2-dichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	83	[NT]
1,1,1-trichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
1,1-dichloropropene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
carbon tetrachloride	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
dibromomethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
trichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	83	[NT]
bromodichloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
trans-1,3-dichloropropene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
dibromochloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
1,2-dibromoethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
tetrachloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
1,1,1,2-tetrachloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
chlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromoform	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: VHC's in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	[NT]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
hexachlorobutadiene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluorometha	%		Org-014	104	[NT]	[NT]	[NT]	[NT]	103	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-014	106	[NT]	[NT]	[NT]	[NT]	98	[NT]
Surrogate Toluene-d_8	%		Org-014	103	[NT]	[NT]	[NT]	[NT]	96	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-014	98	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			01/03/2018	[NT]	[NT]	[NT]	[NT]	01/03/2018	[NT]
Date analysed	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	81	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	81	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	79	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	81	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	81	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	81	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	82	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	106	[NT]	[NT]	[NT]	[NT]	94	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			01/03/2018	[NT]	[NT]	[NT]	[NT]	01/03/2018	[NT]
Date analysed	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	129	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	111	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	129	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	111	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
Surrogate o-Terphenyl	%		Org-003	94	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			01/03/2018	[NT]	[NT]	[NT]	[NT]	01/03/2018	[NT]
Date analysed	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	81	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	125	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	[NT]	[NT]	99	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	86	[NT]	[NT]	[NT]	[NT]	127	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			01/03/2018	[NT]	[NT]	[NT]	[NT]	01/03/2018	[NT]
Date analysed	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	117	[NT]
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	87	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	81	[NT]
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	77	[NT]
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	124	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-005	109	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			01/03/2018	[NT]	[NT]	[NT]	[NT]	01/03/2018	[NT]
Date analysed	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Dimethoate	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Fenitrothion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Malathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Parathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	117	[NT]
Ronnel	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	115	[NT]
Surrogate TCMX	%		Org-008	109	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			01/03/2018	[NT]	[NT]	[NT]	[NT]	01/03/2018	[NT]
Date analysed	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCLMX	%		Org-006	109	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date prepared	-			01/03/2018	5	01/03/2018	01/03/2018		01/03/2018	[NT]
Date analysed	-			02/03/2018	5	02/03/2018	02/03/2018		02/03/2018	[NT]
Arsenic	mg/kg	4	Metals-020	<4	5	41	33	22	101	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	5	<0.4	<0.4	0	94	[NT]
Chromium	mg/kg	1	Metals-020	<1	5	5	8	46	100	[NT]
Copper	mg/kg	1	Metals-020	<1	5	24	33	32	103	[NT]
Lead	mg/kg	1	Metals-020	<1	5	100	130	26	97	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	5	0.9	1	11	102	[NT]
Nickel	mg/kg	1	Metals-020	<1	5	4	5	22	100	[NT]
Zinc	mg/kg	1	Metals-020	<1	5	170	180	6	95	[NT]

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date prepared	-			01/03/2018	[NT]	[NT]	[NT]	[NT]	01/03/2018	[NT]
Date analysed	-			01/03/2018	[NT]	[NT]	[NT]	[NT]	01/03/2018	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	[NT]	[NT]	105	[NT]

QUALITY CONTROL: PFAs in Soils Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date prepared	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
Date analysed	-			04/03/2018	[NT]	[NT]	[NT]	[NT]	04/03/2018	[NT]
Perfluorohexanesulfonic acid	µg/kg	0.1	Org-035D	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-035D	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-035D	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
6:2 FTS	µg/kg	0.1	Org-035D	<0.1	[NT]	[NT]	[NT]	[NT]	93	[NT]
8:2 FTS	µg/kg	0.1	Org-035D	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Surrogate $^{13}C_8$ PFOS	%		Org-035D	99	[NT]	[NT]	[NT]	[NT]	87	[NT]
Surrogate $^{13}C_2$ PFOA	%		Org-035D_2	97	[NT]	[NT]	[NT]	[NT]	90	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			01/03/2018	1	01/03/2018	01/03/2018		01/03/2018	[NT]
Date analysed	-			01/03/2018	1	01/03/2018	01/03/2018		01/03/2018	[NT]
TRH C_6 - C_9	µg/L	10	Org-016	<10	1	57	<10	140	111	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-016	<10	1	130	<10	171	111	[NT]
Benzene	µg/L	1	Org-016	<1	1	<1	<1	0	111	[NT]
Toluene	µg/L	1	Org-016	<1	1	<1	<1	0	108	[NT]
Ethylbenzene	µg/L	1	Org-016	<1	1	2	<1	67	114	[NT]
m+p-xylene	µg/L	2	Org-016	<2	1	11	<2	138	111	[NT]
o-xylene	µg/L	1	Org-016	<1	1	6	<1	143	108	[NT]
Naphthalene	µg/L	1	Org-013	<1	1	2	<1	67	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-016	101	1	101	102	1	112	[NT]
Surrogate toluene-d8	%		Org-016	95	1	95	95	0	96	[NT]
Surrogate 4-BFB	%		Org-016	95	1	97	97	0	95	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			01/03/2018	1	01/03/2018	01/03/2018		01/03/2018	[NT]
Date analysed	-			01/03/2018	1	01/03/2018	01/03/2018		01/03/2018	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-003	<50	1	<50	<50	0	130	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-003	<100	1	<100	<100	0	128	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-003	<100	1	<100	<100	0	100	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-003	<50	1	<50	<50	0	130	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-003	<100	1	<100	<100	0	128	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-003	<100	1	<100	<100	0	100	[NT]
Surrogate o-Terphenyl	%		Org-003	89	1	90	79	13	106	[NT]

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			01/03/2018	1	01/03/2018	01/03/2018		01/03/2018	[NT]
Date analysed	-			01/03/2018	1	01/03/2018	01/03/2018		01/03/2018	[NT]
Naphthalene	µg/L	1	Org-012	<1	1	<1	<1	0	78	[NT]
Acenaphthylene	µg/L	1	Org-012	<1	1	<1	<1	0	[NT]	[NT]
Acenaphthene	µg/L	1	Org-012	<1	1	<1	<1	0	[NT]	[NT]
Fluorene	µg/L	1	Org-012	<1	1	<1	<1	0	75	[NT]
Phenanthrene	µg/L	1	Org-012	<1	1	<1	<1	0	84	[NT]
Anthracene	µg/L	1	Org-012	<1	1	<1	<1	0	[NT]	[NT]
Fluoranthene	µg/L	1	Org-012	<1	1	<1	<1	0	76	[NT]
Pyrene	µg/L	1	Org-012	<1	1	<1	<1	0	77	[NT]
Benzo(a)anthracene	µg/L	1	Org-012	<1	1	<1	<1	0	[NT]	[NT]
Chrysene	µg/L	1	Org-012	<1	1	<1	<1	0	87	[NT]
Benzo(b,j+k)fluoranthene	µg/L	2	Org-012	<2	1	<2	<2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	1	Org-012	<1	1	<1	<1	0	97	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012	<1	1	<1	<1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	1	Org-012	<1	1	<1	<1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	1	Org-012	<1	1	<1	<1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	99	1	113	135	18	86	[NT]

QUALITY CONTROL: OCP in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			01/03/2018	1	01/03/2018	01/03/2018		01/03/2018	[NT]
Date analysed	-			02/03/2018	1	02/03/2018	02/03/2018		02/03/2018	[NT]
HCB	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
alpha-BHC	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	98	[NT]
gamma-BHC	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
beta-BHC	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	92	[NT]
Heptachlor	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	98	[NT]
delta-BHC	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Aldrin	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	97	[NT]
Heptachlor Epoxide	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	100	[NT]
gamma-Chlordane	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
alpha-Chlordane	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Endosulfan I	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
pp-DDE	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	106	[NT]
Dieldrin	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	112	[NT]
Endrin	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	101	[NT]
pp-DDD	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	106	[NT]
Endosulfan II	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
pp-DDT	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Endrin Aldehyde	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	110	[NT]
Methoxychlor	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	70	1	85	71	18	80	[NT]

QUALITY CONTROL: OP Pesticides in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			01/03/2018	1	01/03/2018	01/03/2018		01/03/2018	[NT]
Date analysed	-			02/03/2018	1	02/03/2018	02/03/2018		02/03/2018	[NT]
Azinphos-methyl (Guthion)	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Bromophos ethyl	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Chlorpyriphos	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	98	[NT]
Chlorpyriphos-methyl	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Diazinon	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Dichlorovos	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	92	[NT]
Dimethoate	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Ethion	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	110	[NT]
Fenitrothion	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	106	[NT]
Malathion	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	99	[NT]
Parathion	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	104	[NT]
Ronnel	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	111	[NT]
Surrogate TCMX	%		Org-008	70	1	85	71	18	74	[NT]

QUALITY CONTROL: PCBs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			01/03/2018	1	01/03/2018	01/03/2018		01/03/2018	[NT]
Date analysed	-			02/03/2018	1	02/03/2018	02/03/2018		02/03/2018	[NT]
Aroclor 1016	µg/L	2	Org-006	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1221	µg/L	2	Org-006	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1232	µg/L	2	Org-006	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1242	µg/L	2	Org-006	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1248	µg/L	2	Org-006	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1254	µg/L	2	Org-006	<2	1	<2	<2	0	101	[NT]
Aroclor 1260	µg/L	2	Org-006	<2	1	<2	<2	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	70	1	85	71	18	74	[NT]

QUALITY CONTROL: Metals in Water - Dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date digested	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
Date analysed	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
Arsenic - Dissolved	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	111	[NT]
Cadmium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	116	[NT]
Chromium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	113	[NT]
Copper - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	108	[NT]
Lead - Dissolved	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	115	[NT]
Mercury - Dissolved	mg/L	0.0005	Metals-021	<0.0005	[NT]	[NT]	[NT]	[NT]	98	[NT]
Nickel - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	119	[NT]
Zinc - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	115	[NT]

QUALITY CONTROL: Total Phenolics in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			01/03/2018	[NT]	[NT]	[NT]	[NT]	01/03/2018	[NT]
Date analysed	-			01/03/2018	[NT]	[NT]	[NT]	[NT]	01/03/2018	[NT]
Total Phenolics (as Phenol)	mg/L	0.05	Inorg-031	<0.05	[NT]	[NT]	[NT]	[NT]	105	[NT]

QUALITY CONTROL: PFAS in Waters Short					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date prepared	-			06/03/2018	[NT]	[NT]	[NT]	[NT]	06/03/2018	[NT]
Date analysed	-			06/03/2018	[NT]	[NT]	[NT]	[NT]	06/03/2018	[NT]
Perfluorohexanesulfonic acid - PFHxS	μg/L	0.01	Org-035E	<0.01	[NT]	[NT]	[NT]	[NT]	99	[NT]
Perfluorooctanesulfonic acid PFOS	μg/L	0.01	Org-035E	<0.01	[NT]	[NT]	[NT]	[NT]	97	[NT]
Perfluorooctanoic acid PFOA	μg/L	0.01	Org-035E	<0.01	[NT]	[NT]	[NT]	[NT]	113	[NT]
6:2 FTS	μg/L	0.01	Org-035E	<0.01	[NT]	[NT]	[NT]	[NT]	117	[NT]
8:2 FTS	μg/L	0.01	Org-035E	<0.01	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate $^{13}C_8$ PFOS	%		Org-035E	92	[NT]	[NT]	[NT]	[NT]	89	[NT]
Surrogate $^{13}C_2$ PFOA	%		Org-035E_2	98	[NT]	[NT]	[NT]	[NT]	101	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

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.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

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 batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

vTRH(C6-C10)/BTEXN in Water - The RPD for duplicate results is accepted due to the non homogenous nature of the sample.

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment
Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.
This is reported outside our scope of NATA accreditation.

Aileen Hie

From: Darren Hanvey <darren.hanvey@consultingearth.com.au>
Sent: Friday, 9 March 2018 3:25 PM
To: Ken Nguyen; SydneyMailbox
Cc: tristan.goodbody@consultingearth.com.au; Bowen Ren
Subject: CES180204, Additional Analyses

Ken, can you please perform the following TCLP testing on these samples (already at Envirolab) on a 48 hour turnaround;

Can you please issue results by Tuesday COB.

Sample ID	Batch	TCLP
BH3_0.3-0.6	186116	Metals
BH2_0.3-0.6	186116	PAHs, Lead
BH1_0.4-0.8	186212	PAHs, Lead
BH4_0.3-0.8	186295	Metals
BH6_0.3-0.8	186376	Metals, PAHs
BH5_0.3-0.9	186376	Metals
BH7_0.3-0.9	186376	PAHs, Metals
BH8_0.3-0.9	186376	PAHs, Metals, PFAS
BH9_0.3-0.9	186376	PAHs, Metals
BH10_0.3-0.9	186597	PAHs
BH11_0.3-0.7	186597	PAHs, Metals

5

ELS: 186212-A
Rec: 9/3/18
TAT: 2 DAYS

Can you also please perform the following analyses (Samples at Envirolab):

- Batch 186597, Envirolab Sample ID 4, CES Sample ID BH11-Nat_1.3-1.6, PAHs, Metals

All results reported by Tuesday COB (48 hour analyses).

Thanks,

Darren Hanvey
Principal Geo-Environmental Engineer
Certified Practitioner – Site Assessment and Management

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12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 186212-A

Client Details

Client	Consulting Earth Scientists Pty Ltd
Attention	Tristan Goodbody, Darren Hanvey
Address	Suite 3, Level 1, 55 Grandview Street, Pymble, NSW, 2073

Sample Details

Your Reference	**CES180204**
Number of Samples	1 Water, 5 Soil
Date samples received	28/02/2018
Date completed instructions received	09/03/2018

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.

Report Details

Date results requested by	13/03/2018
Date of Issue	13/03/2018

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

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

Results Approved By
Jeremy Faircloth, Organics Supervisor
Long Pham, Team Leader, Metals

Authorised By

David Springer, General Manager

PAHs in TCLP (USEPA 1311)		
Our Reference		186212-A-5
Your Reference	UNITS	BH1
Depth		0.4-0.8
Type of sample		Soil
Date extracted	-	12/03/2018
Date analysed	-	12/03/2018
Naphthalene in TCLP	mg/L	<0.001
Acenaphthylene in TCLP	mg/L	<0.001
Acenaphthene in TCLP	mg/L	<0.001
Fluorene in TCLP	mg/L	<0.001
Phenanthrene in TCLP	mg/L	<0.001
Anthracene in TCLP	mg/L	<0.001
Fluoranthene in TCLP	mg/L	<0.001
Pyrene in TCLP	mg/L	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001
Chrysene in TCLP	mg/L	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001
Total +ve PAH's	mg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	104

Metals in TCLP USEPA1311		
Our Reference	UNITS	186212-A-5
Your Reference		BH1
Depth		0.4-0.8
Type of sample		Soil
Date extracted	-	12/03/2018
Date analysed	-	12/03/2018
pH of soil for fluid# determ.	pH units	8.4
pH of soil TCLP (after HCl)	pH units	1.9
Extraction fluid used	-	1
pH of final Leachate	pH units	5.1
Lead in TCLP	mg/L	0.04

Method ID	Methodology Summary
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-012	Leachates are extracted with Dichloromethane and analysed by GC-MS.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Date analysed	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	87	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	90	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	90	[NT]
Anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	93	[NT]
Pyrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	95	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	96	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	93	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	96	[NT]	[NT]	[NT]	[NT]	118	[NT]

QUALITY CONTROL: Metals in TCLP USEPA1311						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Date analysed	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	[NT]	[NT]	111	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

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.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	

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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 batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

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Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

CHAIN OF CUSTODY - Client

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19778

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Adelaide Lab - Envirolab Services
7 Palmerton Road Windsor Gardens, SA 5087
Ph 0406 350 706 / adelaide@envirolab.com.au

Client: Consulting Earth Scientists
Contact Person: Miles Thompson
Project Mgr: Darren Harvey
Sampler: M.T
Address:
Phone: **Mob:** 0497018918
Fax:
Email: Miles.thompson@consultingearth.com.au

Client Project Name / Number / Site etc (ie report title): CES180204
PO No.:
Envirolab Quote No. :
Date results required:
Or choose: standard / same day / 1 day / 2 day / 3 day
Note: Inform lab in advance if urgent turnaround is required - surcharges apply
Lab comments:

Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Combo 8	PFAS	TRH/BTEX	NEPM Asbestos	VHC	Comments: Provide as much information about the sample as you can
1	R1			Water	X	X				
2,3	TB/TS						X			
4	QAQC 1			Soil	X					
–	QAQC 2				X					Forward to ALS
5	BH1(0.4-0.8)m				X	X		X	X	
6	BH2(1.2-1.5)m				X					

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 186212
Date Received: 28/2/18
Time Received: 17:45
Received by: MT
Temp: Cool/Ambient 6.0
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished by (company): CES
Print Name: Bhagaban Acharya
Date & Time: 28/02/2018
Signature: [signature]

Received by (company): ELS
Print Name: MT
Date & Time: 28/2/18 17:45
Signature:

Lab use only:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: 6.0 **(if applicable)**
Transported by: Hand delivered / courier

White - Lab copy / Blue - Client copy / Pink - Retain in Book   Page No:

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CHAIN OF CUSTODY - Client

19779

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Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
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Perth Lab - MPL Laboratories
16-18 Hayden Crt Myaree, WA 6154
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Adelaide Lab - Envirolab Services
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Ph 0406 350 706 / adelaide@envirolab.com.au

Client: CES
Contact Person: Bhagaban Acharya
Project Mgr: Darren Hawley
Sampler: BA
Address:

Phone: **Mob:** 0486686356
Fax:
Email: bhagaban.acharya@consultingearth.com.au

Client Project Name / Number / Site etc (ie report title): CES180204 - SGH
PO No.:
Envirolab Quote No. :
Date results required:
Or choose: standard / same day / 1 day / 2 day / 3 day
Note: Inform lab in advance if urgent turnaround is required - surcharges apply
Lab comments:

Sample information					Tests Required			Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Combo-8	pH / CEC	NEPM Asbestos	Provide as much information about the sample as you can
1	BH4 (0.3-0.8)m		01/03/18	Soil	X		X	
2	BH4 (1.2-1.5)m		01/03/18	Soil		+		

Job No: 186295
Date Received: 010318
Time Received: 1715
Received by: EW
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished by (company): CES
Print Name: Bhagaban Acharya
Date & Time: 01/03/2018 5:30PM
Signature:

Received by (company): ELS
Print Name: Ellen W
Date & Time: 010318. 17:15.
Signature:

Lab use only:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: **(if applicable)**
Transported by: Hand delivered / courier

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Page No:

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CERTIFICATE OF ANALYSIS 186295

Client Details

Client	Consulting Earth Scientists Pty Ltd
Attention	Bhagaban Acharya, Darren Hanvey
Address	Suite 3, Level 1, 55 Grandview Street, Pymble, NSW, 2073

Sample Details

Your Reference	**CES180204-SGH**
Number of Samples	2 soil
Date samples received	01/03/2018
Date completed instructions received	01/03/2018

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	08/03/2018
Date of Issue	08/03/2018

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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Paul Ching
Authorised by Asbestos Approved Signatory: Paul Ching

Results Approved By
Diego Bigolin, Team Leader, Inorganics
Jeremy Faircloth, Organics Supervisor
Long Pham, Team Leader, Metals
Paul Ching, Senior Analyst
Priya Samarawickrama, Senior Chemist
Steven Luong, Senior Chemist

Authorised By

David Springer, General Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		186295-1
Your Reference	UNITS	BH4
Depth		0.3-0.8
Date Sampled		01/03/18
Type of sample		soil
Date extracted	-	01/03/2018
Date analysed	-	02/03/2018
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	92

svTRH (C10-C40) in Soil		
Our Reference		186295-1
Your Reference	UNITS	BH4
Depth		0.3-0.8
Date Sampled		01/03/18
Type of sample		soil
Date extracted	-	02/03/2018
Date analysed	-	03/03/2018
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	72

PAHs in Soil		
Our Reference		186295-1
Your Reference	UNITS	BH4
Depth		0.3-0.8
Date Sampled		01/03/18
Type of sample		soil
Date extracted	-	02/03/2018
Date analysed	-	02/03/2018
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	0.5
Anthracene	mg/kg	0.2
Fluoranthene	mg/kg	0.9
Pyrene	mg/kg	0.8
Benzo(a)anthracene	mg/kg	0.4
Chrysene	mg/kg	0.5
Benzo(b,j+k)fluoranthene	mg/kg	0.7
Benzo(a)pyrene	mg/kg	0.4
Indeno(1,2,3-c,d)pyrene	mg/kg	0.3
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	0.2
Total +ve PAH's	mg/kg	4.7
Benzo(a)pyrene TEQ calc (zero)	mg/kg	0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	0.6
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.6
Surrogate p-Terphenyl-d14	%	86

Organochlorine Pesticides in soil		
Our Reference		186295-1
Your Reference	UNITS	BH4
Depth		0.3-0.8
Date Sampled		01/03/18
Type of sample		soil
Date extracted	-	02/03/2018
Date analysed	-	02/03/2018
HCB	mg/kg	<0.1
alpha-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	82

Organophosphorus Pesticides		
Our Reference		186295-1
Your Reference	UNITS	BH4
Depth		0.3-0.8
Date Sampled		01/03/18
Type of sample		soil
Date extracted	-	02/03/2018
Date analysed	-	02/03/2018
Azinphos-methyl (Guthion)	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Dichlorvos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Ethion	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Parathion	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Surrogate TCMX	%	82

PCBs in Soil		
Our Reference		186295-1
Your Reference	UNITS	BH4
Depth		0.3-0.8
Date Sampled		01/03/18
Type of sample		soil
Date extracted	-	02/03/2018
Date analysed	-	02/03/2018
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate TCLMX	%	82

Acid Extractable metals in soil		
Our Reference		186295-1
Your Reference	UNITS	BH4
Depth		0.3-0.8
Date Sampled		01/03/18
Type of sample		soil
Date prepared	-	02/03/2018
Date analysed	-	02/03/2018
Arsenic	mg/kg	52
Cadmium	mg/kg	0.5
Chromium	mg/kg	6
Copper	mg/kg	18
Lead	mg/kg	190
Mercury	mg/kg	0.9
Nickel	mg/kg	4
Zinc	mg/kg	410

Misc Soil - Inorg		
Our Reference		186295-1
Your Reference	UNITS	BH4
Depth		0.3-0.8
Date Sampled		01/03/18
Type of sample		soil
Date prepared	-	02/03/2018
Date analysed	-	02/03/2018
Total Phenolics (as Phenol)	mg/kg	<5

Misc Inorg - Soil		
Our Reference		186295-2
Your Reference	UNITS	BH4
Depth		1.2-1.5
Date Sampled		01/03/18
Type of sample		soil
Date prepared	-	03/03/2018
Date analysed	-	03/03/2018
pH 1:5 soil:water	pH Units	7.8

CEC		
Our Reference		186295-2
Your Reference	UNITS	BH4
Depth		1.2-1.5
Date Sampled		01/03/18
Type of sample		soil
Date prepared	-	02/03/2018
Date analysed	-	02/03/2018
Exchangeable Ca	meq/100g	3.4
Exchangeable K	meq/100g	0.3
Exchangeable Mg	meq/100g	0.35
Exchangeable Na	meq/100g	<0.1
Cation Exchange Capacity	meq/100g	4.1

Moisture		
Our Reference		186295-1
Your Reference	UNITS	BH4
Depth		0.3-0.8
Date Sampled		01/03/18
Type of sample		soil
Date prepared	-	02/03/2018
Date analysed	-	05/03/2018
Moisture	%	11

Asbestos ID - soils NEPM - ASB-001		
Our Reference		186295-1
Your Reference	UNITS	BH4
Depth		0.3-0.8
Date Sampled		01/03/18
Type of sample		soil
Date analysed	-	07/03/2018
Sample mass tested	g	1,007.93
Sample Description	-	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected
Trace Analysis	-	No asbestos detected
Total Asbestos#1	g/kg	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected
ACM >7mm Estimation*	g	–
FA and AF Estimation*	g	–
ACM >7mm Estimation*	%(w/w)	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.

Method ID	Methodology Summary
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing 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. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
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. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			01/03/2018	[NT]	[NT]	[NT]	[NT]	01/03/2018	[NT]
Date analysed	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	84	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	84	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	83	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	86	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	83	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	83	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	84	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	94	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
Date analysed	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	102	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	87	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	102	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	87	[NT]
Surrogate o-Terphenyl	%		Org-003	93	[NT]	[NT]	[NT]	[NT]	78	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
Date analysed	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	[NT]	[NT]	98	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	98	[NT]	[NT]	[NT]	[NT]	121	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
Date analysed	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	87	[NT]
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	83	[NT]
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	85	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	87	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	87	[NT]
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	76	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-005	91	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
Date analysed	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Dimethoate	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Fenitrothion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Malathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	76	[NT]
Parathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Ronnel	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Surrogate TCMX	%		Org-008	91	[NT]	[NT]	[NT]	[NT]	75	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
Date analysed	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCLMX	%		Org-006	91	[NT]	[NT]	[NT]	[NT]	75	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
Date analysed	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	111	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	101	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
Date analysed	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: Misc Inorg - Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			03/03/2018	[NT]	[NT]	[NT]	[NT]	03/03/2018	[NT]
Date analysed	-			03/03/2018	[NT]	[NT]	[NT]	[NT]	03/03/2018	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			02/03/2018	2	02/03/2018	02/03/2018		02/03/2018	[NT]
Date analysed	-			02/03/2018	2	02/03/2018	02/03/2018		02/03/2018	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-009	<0.1	2	3.4	3.2	6	105	[NT]
Exchangeable K	meq/100g	0.1	Metals-009	<0.1	2	0.3	0.3	0	114	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-009	<0.1	2	0.35	0.33	6	107	[NT]
Exchangeable Na	meq/100g	0.1	Metals-009	<0.1	2	<0.1	<0.1	0	111	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

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.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

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 batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.
This is reported outside our scope of NATA accreditation.

Aileen Hie

From: Darren Hanvey <darren.hanvey@consultingearth.com.au>
Sent: Friday, 9 March 2018 3:25 PM
To: Ken Nguyen; SydneyMailbox
Cc: tristan.goodbody@consultingearth.com.au; Bowen Ren
Subject: CES180204, Additional Analyses

Ken, can you please perform the following TCLP testing on these samples (already at Envirolab) on a 48 hour turnaround;

Can you please issue results by Tuesday COB.

Sample ID	Batch	TCLP
BH3_0.3-0.6	186116	Metals
BH2_0.3-0.6	186116	PAHs, Lead
BH1_0.4-0.8	186212	PAHs, Lead
BH4_0.3-0.8	186295	Metals
BH6_0.3-0.8	186376	Metals, PAHs
BH5_0.3-0.9	186376	Metals
BH7_0.3-0.9	186376	PAHs, Metals
BH8_0.3-0.9	186376	PAHs, Metals, PFAS
BH9_0.3-0.9	186376	PAHs, Metals
BH10_0.3-0.9	186597	PAHs
BH11_0.3-0.7	186597	PAHs, Metals

1

ELS: 186295-A
Rec: 9/3/18
TAT: 2DAYS

Can you also please perform the following analyses (Samples at Envirolab):

- Batch 186597, Envirolab Sample ID 4, CES Sample ID BH11-Nat_1.3-1.6, PAHs, Metals

All results reported by Tuesday COB (48 hour analyses).

Thanks,

Darren Hanvey
Principal Geo-Environmental Engineer
Certified Practitioner – Site Assessment and Management

CONSULTING
EARTH
SCIENTISTS

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www.envirolab.com.au

CERTIFICATE OF ANALYSIS 186295-A

Client Details

Client	Consulting Earth Scientists Pty Ltd
Attention	Tristan Goodbody, Darren Hanvey
Address	Suite 3, Level 1, 55 Grandview Street, Pymble, NSW, 2073

Sample Details

Your Reference	**CES180204-SGH**
Number of Samples	2 soil
Date samples received	01/03/2018
Date completed instructions received	09/03/2018

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.

Report Details

Date results requested by	13/03/2018
Date of Issue	13/03/2018

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Results Approved By
Long Pham, Team Leader, Metals

Authorised By

David Springer, General Manager

Metals in TCLP USEPA1311		
Our Reference		186295-A-1
Your Reference	UNITS	BH4
Depth		0.3-0.8
Date Sampled		01/03/18
Type of sample		soil
Date extracted	-	12/03/2018
Date analysed	-	12/03/2018
pH of soil for fluid# determ.	pH units	8.6
pH of soil TCLP (after HCl)	pH units	1.9
Extraction fluid used	-	1
pH of final Leachate	pH units	5.0
Arsenic in TCLP	mg/L	0.3
Cadmium in TCLP	mg/L	<0.01
Chromium in TCLP	mg/L	<0.01
Copper in TCLP	mg/L	<0.01
Lead in TCLP	mg/L	0.04
Mercury in TCLP	mg/L	<0.0005
Nickel in TCLP	mg/L	<0.02
Zinc in TCLP	mg/L	2.5

Method ID	Methodology Summary
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.

QUALITY CONTROL: Metals in TCLP USEPA1311					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Date analysed	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Arsenic in TCLP	mg/L	0.05	Metals-020 ICP-AES	<0.05	[NT]	[NT]	[NT]	[NT]	111	[NT]
Cadmium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	110	[NT]
Chromium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	110	[NT]
Copper in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	113	[NT]
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	[NT]	[NT]	111	[NT]
Mercury in TCLP	mg/L	0.0005	Metals-021 CV-AAS	<0.0005	[NT]	[NT]	[NT]	[NT]	93	[NT]
Nickel in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	[NT]	[NT]	110	[NT]
Zinc in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	[NT]	[NT]	108	[NT]

Result Definitions

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NA	Test not required
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PQL	Practical Quantitation Limit
<	Less than
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RPD	Relative Percent Difference
LCS	Laboratory Control Sample
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NR	Not Reported

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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.
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Laboratory Acceptance Criteria

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When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

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12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 186376

Client Details

Client	Consulting Earth Scientists Pty Ltd
Attention	Bhagaban Acharya, Darren Hanvey, Samuel Inameti
Address	Suite 3, Level 1, 55 Grandview Street, Pymble, NSW, 2073

Sample Details

Your Reference	**CES120204-SCH**
Number of Samples	10 Soil, 2 Water
Date samples received	02/03/2018
Date completed instructions received	02/03/2018

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	08/03/2018
Date of Issue	08/03/2018

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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Paul Ching
Authorised by Asbestos Approved Signatory: Paul Ching

Results Approved By
Diego Bigolin, Team Leader, Inorganics
Dragana Tomas, Senior Chemist
Jeremy Faircloth, Organics Supervisor
Long Pham, Team Leader, Metals
Paul Ching, Senior Analyst
Phalak Inthakesone, Organics Development Manager, Sydney
Steven Luong, Senior Chemist

Authorised By

David Springer, General Manager

VHC's in soil			
Our Reference		186376-3	186376-5
Your Reference	UNITS	BH5 - Fill	BH7 - Fill
Depth		0.3-0.9	0.3-0.9
Date Sampled		02/03/2018	02/03/2018
Type of sample		Soil	Soil
Date extracted	-	05/03/2018	05/03/2018
Date analysed	-	06/03/2018	06/03/2018
Dichlorodifluoromethane	mg/kg	<1	<1
Chloromethane	mg/kg	<1	<1
Vinyl Chloride	mg/kg	<1	<1
Bromomethane	mg/kg	<1	<1
Chloroethane	mg/kg	<1	<1
Trichlorofluoromethane	mg/kg	<1	<1
1,1-Dichloroethene	mg/kg	<1	<1
trans-1,2-dichloroethene	mg/kg	<1	<1
1,1-dichloroethane	mg/kg	<1	<1
cis-1,2-dichloroethene	mg/kg	<1	<1
bromochloromethane	mg/kg	<1	<1
chloroform	mg/kg	<1	<1
2,2-dichloropropane	mg/kg	<1	<1
1,2-dichloroethane	mg/kg	<1	<1
1,1,1-trichloroethane	mg/kg	<1	<1
1,1-dichloropropene	mg/kg	<1	<1
carbon tetrachloride	mg/kg	<1	<1
dibromomethane	mg/kg	<1	<1
1,2-dichloropropane	mg/kg	<1	<1
trichloroethene	mg/kg	<1	<1
bromodichloromethane	mg/kg	<1	<1
trans-1,3-dichloropropene	mg/kg	<1	<1
cis-1,3-dichloropropene	mg/kg	<1	<1
1,1,2-trichloroethane	mg/kg	<1	<1
1,3-dichloropropane	mg/kg	<1	<1
dibromochloromethane	mg/kg	<1	<1
1,2-dibromoethane	mg/kg	<1	<1
tetrachloroethene	mg/kg	<1	<1
1,1,1,2-tetrachloroethane	mg/kg	<1	<1
chlorobenzene	mg/kg	<1	<1
bromoform	mg/kg	<1	<1
1,1,2,2-tetrachloroethane	mg/kg	<1	<1
1,2,3-trichloropropane	mg/kg	<1	<1
bromobenzene	mg/kg	<1	<1

VHC's in soil			
Our Reference		186376-3	186376-5
Your Reference	UNITS	BH5 - Fill	BH7 - Fill
Depth		0.3-0.9	0.3-0.9
Date Sampled		02/03/2018	02/03/2018
Type of sample		Soil	Soil
2-chlorotoluene	mg/kg	<1	<1
4-chlorotoluene	mg/kg	<1	<1
1,3-dichlorobenzene	mg/kg	<1	<1
1,4-dichlorobenzene	mg/kg	<1	<1
1,2-dichlorobenzene	mg/kg	<1	<1
1,2-dibromo-3-chloropropane	mg/kg	<1	<1
1,2,4-trichlorobenzene	mg/kg	<1	<1
hexachlorobutadiene	mg/kg	<1	<1
1,2,3-trichlorobenzene	mg/kg	<1	<1
Surrogate Dibromofluorometha	%	108	110
Surrogate aaa-Trifluorotoluene	%	81	83
Surrogate Toluene-d_8	%	99	99
Surrogate 4-Bromofluorobenzene	%	95	91

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		186376-1	186376-3	186376-5	186376-7	186376-9
Your Reference	UNITS	BH6 - Fill	BH5 - Fill	BH7 - Fill	BH8 - Fill	BH9 - Fill
Depth		0.3-0.8	0.3-0.9	0.3-0.9	0.3-0.9	0.3-0.9
Date Sampled		02/03/2018	02/03/2018	02/03/2018	02/03/2018	02/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Date analysed	-	05/03/2018	06/03/2018	06/03/2018	05/03/2018	05/03/2018
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	85	<1	<1	5	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	87	81	83	89	87

svTRH (C10-C40) in Soil						
Our Reference		186376-1	186376-3	186376-5	186376-7	186376-9
Your Reference	UNITS	BH6 - Fill	BH5 - Fill	BH7 - Fill	BH8 - Fill	BH9 - Fill
Depth		0.3-0.8	0.3-0.9	0.3-0.9	0.3-0.9	0.3-0.9
Date Sampled		02/03/2018	02/03/2018	02/03/2018	02/03/2018	02/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Date analysed	-	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
TRH C_{10} - C_{14}	mg/kg	150	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	1,000	<100	450	240	<100
TRH C_{29} - C_{36}	mg/kg	360	<100	260	160	<100
TRH >C_{10} -C_{16}	mg/kg	270	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	190	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	1,200	<100	640	360	<100
TRH >C_{34} -C_{40}	mg/kg	140	<100	200	120	<100
Total +ve TRH (>C10-C40)	mg/kg	1,600	<50	830	480	<50
Surrogate o-Terphenyl	%	#	75	84	78	77

PAHs in Soil						
Our Reference		186376-1	186376-3	186376-5	186376-7	186376-9
Your Reference	UNITS	BH6 - Fill	BH5 - Fill	BH7 - Fill	BH8 - Fill	BH9 - Fill
Depth		0.3-0.8	0.3-0.9	0.3-0.9	0.3-0.9	0.3-0.9
Date Sampled		02/03/2018	02/03/2018	02/03/2018	02/03/2018	02/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Date analysed	-	05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Naphthalene	mg/kg	200	0.2	0.8	4.0	0.4
Acenaphthylene	mg/kg	58	0.2	2.8	2.0	0.7
Acenaphthene	mg/kg	18	<0.1	0.5	<0.1	0.1
Fluorene	mg/kg	94	0.1	3.2	0.3	0.5
Phenanthrene	mg/kg	360	1.1	22	5.2	4.3
Anthracene	mg/kg	92	0.3	6.4	1.8	1.3
Fluoranthene	mg/kg	250	1.2	24	14	6.2
Pyrene	mg/kg	250	1.1	22	15	6.3
Benzo(a)anthracene	mg/kg	110	0.6	12	8.0	3.3
Chrysene	mg/kg	98	0.5	8.6	6.7	2.6
Benzo(b,j+k)fluoranthene	mg/kg	130	0.8	15	10	4.5
Benzo(a)pyrene	mg/kg	98	0.5	10	7.0	3.0
Indeno(1,2,3-c,d)pyrene	mg/kg	37	0.2	4.1	2.8	1.3
Dibenzo(a,h)anthracene	mg/kg	12	<0.1	1.4	1	0.5
Benzo(g,h,i)perylene	mg/kg	47	0.2	4.9	3.5	1.5
Total +ve PAH's	mg/kg	1,900	7.0	140	81	36
Benzo(a)pyrene TEQ calc (zero)	mg/kg	140	0.6	15	10	4.4
Benzo(a)pyrene TEQ calc(half)	mg/kg	140	0.7	15	10	4.4
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	140	0.7	15	10	4.4
Surrogate p-Terphenyl-d14	%	118	97	102	97	101

Organochlorine Pesticides in soil						
Our Reference		186376-1	186376-3	186376-5	186376-7	186376-9
Your Reference	UNITS	BH6 - Fill	BH5 - Fill	BH7 - Fill	BH8 - Fill	BH9 - Fill
Depth		0.3-0.8	0.3-0.9	0.3-0.9	0.3-0.9	0.3-0.9
Date Sampled		02/03/2018	02/03/2018	02/03/2018	02/03/2018	02/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Date analysed	-	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
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	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
Heptachlor	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
Aldrin	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
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-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
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	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
Endosulfan Sulphate	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
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	67	83	78	77	80

Organophosphorus Pesticides						
Our Reference	UNITS	186376-1	186376-3	186376-5	186376-7	186376-9
Your Reference		BH6 - Fill	BH5 - Fill	BH7 - Fill	BH8 - Fill	BH9 - Fill
Depth		0.3-0.8	0.3-0.9	0.3-0.9	0.3-0.9	0.3-0.9
Date Sampled		02/03/2018	02/03/2018	02/03/2018	02/03/2018	02/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Date analysed	-	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	67	83	78	77	80

PCBs in Soil						
Our Reference		186376-1	186376-3	186376-5	186376-7	186376-9
Your Reference	UNITS	BH6 - Fill	BH5 - Fill	BH7 - Fill	BH8 - Fill	BH9 - Fill
Depth		0.3-0.8	0.3-0.9	0.3-0.9	0.3-0.9	0.3-0.9
Date Sampled		02/03/2018	02/03/2018	02/03/2018	02/03/2018	02/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Date analysed	-	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Aroclor 1016	mg/kg	<1	<0.1	<0.5	<0.5	<0.1
Aroclor 1221	mg/kg	<1	<0.1	<0.5	<0.5	<0.1
Aroclor 1232	mg/kg	<1	<0.1	<0.5	<0.5	<0.1
Aroclor 1242	mg/kg	<1	<0.1	<0.5	<0.5	<0.1
Aroclor 1248	mg/kg	<1	<0.1	<0.5	<0.5	<0.1
Aroclor 1254	mg/kg	<1	<0.1	<0.5	<0.5	<0.1
Aroclor 1260	mg/kg	<1	<0.1	<0.5	<0.5	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<1	<0.1	<0.5	<0.5	<0.1
Surrogate TCLMX	%	67	83	78	77	80

Acid Extractable metals in soil						
Our Reference		186376-1	186376-3	186376-5	186376-7	186376-9
Your Reference	UNITS	BH6 - Fill	BH5 - Fill	BH7 - Fill	BH8 - Fill	BH9 - Fill
Depth		0.3-0.8	0.3-0.9	0.3-0.9	0.3-0.9	0.3-0.9
Date Sampled		02/03/2018	02/03/2018	02/03/2018	02/03/2018	02/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Date analysed	-	07/03/2018	07/03/2018	07/03/2018	07/03/2018	07/03/2018
Arsenic	mg/kg	6	10	5	7	8
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	11	12	13	10	12
Copper	mg/kg	150	750	90	73	84
Lead	mg/kg	330	220	170	660	240
Mercury	mg/kg	0.5	1.5	0.5	0.5	1.1
Nickel	mg/kg	4	5	8	17	8
Zinc	mg/kg	150	340	330	160	240

Misc Soil - Inorg						
Our Reference		186376-1	186376-3	186376-5	186376-7	186376-9
Your Reference	UNITS	BH6 - Fill	BH5 - Fill	BH7 - Fill	BH8 - Fill	BH9 - Fill
Depth		0.3-0.8	0.3-0.9	0.3-0.9	0.3-0.9	0.3-0.9
Date Sampled		02/03/2018	02/03/2018	02/03/2018	02/03/2018	02/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Date analysed	-	05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Moisture						
Our Reference		186376-1	186376-3	186376-5	186376-7	186376-9
Your Reference	UNITS	BH6 - Fill	BH5 - Fill	BH7 - Fill	BH8 - Fill	BH9 - Fill
Depth		0.3-0.8	0.3-0.9	0.3-0.9	0.3-0.9	0.3-0.9
Date Sampled		02/03/2018	02/03/2018	02/03/2018	02/03/2018	02/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Date analysed	-	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Moisture	%	15	18	17	12	16

PFAs in Soils Short						
Our Reference		186376-1	186376-3	186376-5	186376-7	186376-9
Your Reference	UNITS	BH6 - Fill	BH5 - Fill	BH7 - Fill	BH8 - Fill	BH9 - Fill
Depth		0.3-0.8	0.3-0.9	0.3-0.9	0.3-0.9	0.3-0.9
Date Sampled		02/03/2018	02/03/2018	02/03/2018	02/03/2018	02/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Date analysed	-	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Perfluorohexanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	<0.1	<0.1	<0.1	0.2	<0.1
Perfluorooctanoic acid PFOA	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
6:2 FTS	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
8:2 FTS	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate $^{13}C_8$ PFOS	%	108	93	98	91	91
Surrogate $^{13}C_2$ PFOA	%	80	89	80	80	92

Asbestos ID - soils NEPM - ASB-001						
Our Reference		186376-1	186376-3	186376-5	186376-7	186376-9
Your Reference	UNITS	BH6 - Fill	BH5 - Fill	BH7 - Fill	BH8 - Fill	BH9 - Fill
Depth		0.3-0.8	0.3-0.9	0.3-0.9	0.3-0.9	0.3-0.9
Date Sampled		02/03/2018	02/03/2018	02/03/2018	02/03/2018	02/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	08/03/2018	08/03/2018	08/03/2018	08/03/2018	08/03/2018
Sample mass tested	g	909.85	1,122.91	1,185.08	1,290.67	704.73
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

vTRH(C6-C10)/BTEXN in Water			
Our Reference		186376-11	186376-12
Your Reference	UNITS	TB	TS
Depth		-	-
Date Sampled		02/03/2018	02/03/2018
Type of sample		Water	Water
Date extracted	-	05/03/2018	05/03/2018
Date analysed	-	05/03/2018	05/03/2018
TRH C_6 - C_9	µg/L	<10	[NA]
TRH C_6 - C_{10}	µg/L	<10	[NA]
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	[NA]
Benzene	µg/L	<1	87%
Toluene	µg/L	<1	92%
Ethylbenzene	µg/L	<1	96%
m+p-xylene	µg/L	<2	94%
o-xylene	µg/L	<1	96%
Naphthalene	µg/L	<1	[NA]
Surrogate Dibromofluoromethane	%	98	99
Surrogate toluene-d8	%	97	100
Surrogate 4-BFB	%	96	100

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.

Method ID	Methodology Summary
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing 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. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
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. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

Method ID	Methodology Summary
Org-035D	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are NOT corrected for Surrogates (mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample - also known as Extracted Internal Standards) UNLESS contractually requested. Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.
Org-035D_2	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are NOT corrected for Surrogates (mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample - also known as Extracted Internal Standards) UNLESS contractually requested. Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: VHC's in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			05/03/2018	[NT]	[NT]	[NT]	[NT]	05/03/2018	[NT]
Date analysed	-			06/03/2018	[NT]	[NT]	[NT]	[NT]	06/03/2018	[NT]
Dichlorodifluoromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]
cis-1,2-dichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromochloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
chloroform	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
2,2-dichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
1,1,1-trichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
1,1-dichloropropene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
carbon tetrachloride	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
dibromomethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
trichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
bromodichloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
trans-1,3-dichloropropene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
dibromochloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	81	[NT]
1,2-dibromoethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
tetrachloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	71	[NT]
1,1,1,2-tetrachloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
chlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromoform	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: VHC's in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
hexachlorobutadiene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluorometha	%		Org-014	122	[NT]	[NT]	[NT]	[NT]	106	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-014	93	[NT]	[NT]	[NT]	[NT]	89	[NT]
Surrogate Toluene-d_8	%		Org-014	114	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-014	94	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			05/03/2018	1	05/03/2018	05/03/2018		05/03/2018	[NT]
Date analysed	-			06/03/2018	1	05/03/2018	05/03/2018		06/03/2018	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	1	<25	<25	0	95	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	1	<25	<25	0	95	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	88	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	94	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	95	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	99	[NT]
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	92	[NT]
naphthalene	mg/kg	1	Org-014	<1	1	85	160	61	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	93	1	87	85	2	89	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			06/03/2018	1	05/03/2018	05/03/2018		06/03/2018	[NT]
Date analysed	-			06/03/2018	1	06/03/2018	06/03/2018		06/03/2018	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	1	150	66	78	110	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	1	1000	390	88	96	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	1	360	150	82	92	[NT]
TRH $>C_{10}$ -C_{16}	mg/kg	50	Org-003	<50	1	270	110	84	110	[NT]
TRH $>C_{16}$ -C_{34}	mg/kg	100	Org-003	<100	1	1200	470	87	96	[NT]
TRH $>C_{34}$ -C_{40}	mg/kg	100	Org-003	<100	1	140	<100	33	92	[NT]
Surrogate o-Terphenyl	%		Org-003	76	1	#	83		80	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			05/03/2018	1	05/03/2018	05/03/2018		05/03/2018	[NT]
Date analysed	-			05/03/2018	1	05/03/2018	05/03/2018		05/03/2018	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	200	28	151	93	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	1	58	7.9	152	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	1	18	1.8	164	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	1	94	10	162	93	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	360	45	156	94	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	1	92	11	157	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	1	250	29	158	91	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	1	250	29	158	96	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	110	12	161	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	98	11	160	101	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	130	15	159	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	98	11	160	100	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	1	37	4.0	161	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	1	12	1.1	166	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	1	47	5.3	159	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	93	1	118	118	0	121	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			05/03/2018	1	05/03/2018	05/03/2018		05/03/2018	[NT]
Date analysed	-			06/03/2018	1	06/03/2018	06/03/2018		06/03/2018	[NT]
HCB	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	82	[NT]
gamma-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	82	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	80	[NT]
delta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	82	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	85	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	93	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	97	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	87	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	94	[NT]
Endosulfan II	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	70	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	90	1	67	75	11	105	[NT]

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			05/03/2018	1	05/03/2018	05/03/2018		05/03/2018	[NT]
Date analysed	-			06/03/2018	1	06/03/2018	06/03/2018		06/03/2018	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	98	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	96	[NT]
Dimethoate	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	113	[NT]
Fenitrothion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	111	[NT]
Malathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	88	[NT]
Parathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	114	[NT]
Ronnel	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	113	[NT]
Surrogate TCMX	%		Org-008	90	1	67	75	11	87	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			05/03/2018	1	05/03/2018	05/03/2018		05/03/2018	[NT]
Date analysed	-			06/03/2018	1	06/03/2018	06/03/2018		06/03/2018	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<1	<1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<1	<1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<1	<1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<1	<1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<1	<1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<1	<1	0	112	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<1	<1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	90	1	67	75	11	87	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			05/03/2018	1	05/03/2018	05/03/2018		05/03/2018	[NT]
Date analysed	-			07/03/2018	1	07/03/2018	07/03/2018		07/03/2018	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	6	4	40	115	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	107	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	11	8	32	113	[NT]
Copper	mg/kg	1	Metals-020	<1	1	150	120	22	113	[NT]
Lead	mg/kg	1	Metals-020	<1	1	330	300	10	111	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	0.5	0.5	0	96	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	4	4	0	113	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	150	150	0	109	[NT]

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			05/03/2018	1	05/03/2018	05/03/2018		05/03/2018	[NT]
Date analysed	-			05/03/2018	1	05/03/2018	05/03/2018		05/03/2018	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	102	[NT]

QUALITY CONTROL: PFAs in Soils Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			06/03/3018	1	06/03/2018	06/03/2018		06/03/3018	[NT]
Date analysed	-			06/03/2018	1	06/03/2018	06/03/2018		06/03/2018	[NT]
Perfluorohexanesulfonic acid	µg/kg	0.1	Org-035D	<0.1	1	<0.1	<0.1	0	94	[NT]
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-035D	<0.1	1	<0.1	<0.1	0	94	[NT]
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-035D	<0.1	1	<0.1	<0.1	0	97	[NT]
6:2 FTS	µg/kg	0.1	Org-035D	<0.1	1	<0.1	<0.1	0	81	[NT]
8:2 FTS	µg/kg	0.1	Org-035D	<0.1	1	<0.1	<0.1	0	107	[NT]
Surrogate $^{13}C_8$ PFOS	%		Org-035D	93	1	108	99	9	92	[NT]
Surrogate $^{13}C_2$ PFOA	%		Org-035D_2	93	1	80	75	6	97	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			05/03/2018	[NT]	[NT]	[NT]	[NT]	05/03/2018	[NT]
Date analysed	-			05/03/2018	[NT]	[NT]	[NT]	[NT]	05/03/2018	[NT]
TRH C_6 - C_9	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	118	[NT]
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	119	[NT]
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	119	[NT]
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	119	[NT]
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-016	102	[NT]	[NT]	[NT]	[NT]	103	[NT]
Surrogate toluene-d8	%		Org-016	96	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate 4-BFB	%		Org-016	95	[NT]	[NT]	[NT]	[NT]	99	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

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.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

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 batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

svTRH (C10-C40) in Soil - Percent recovery is not possible to report as the high concentration of analytes in the sample/s have caused interference.
The RPD for duplicate results is accepted due to the non homogenous nature of sample 1.

PAHs in Soil - The RPD for duplicate results is accepted due to the non homogenous nature of sample 1.

vTRH(C6-C10)/BTEXN in Soil - The RPD for duplicate results is accepted due to the non homogenous nature of sample 1.

PCBs in Soil (sample 1,1d,5,7) - PQL has been raised due to interference from analytes(other than those being tested) in the sample/s.

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment
Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.
This is reported outside our scope of NATA accreditation.

Asbestos: Excessive sample volume was provided for asbestos analysis. A portion of the supplied sample was sub-sampled according to Envirolab procedures. We cannot guarantee that this
sub-sample is indicative of the entire sample. Envirolab recommends supplying 500mL
of sample in it's own container.

Aileen Hie

From:	Darren Hanvey <darren.hanvey@consultingearth.com.au>
Sent:	Tuesday, 6 March 2018 3:33 PM
To:	Aileen Hie; bhagaban.acharya@consultingearth.com.au; samuel.inameti@consultingearth.com.au
Subject:	RE: Sample Receipt for 186376 CES120204-SCH

Aileen, can you also schedule the following for results due by Thursday 8 March 2018 COB

8

- Batch 186376, Envirolab sample 8, BH8-Nat 1.2-1.5 – Combo 8.

Thanks,

ELS: 186376-A
Rec: 6/3/18
TAT: 2 days

Darren Hanvey
Principal Geo-Environmental Engineer
Certified Practitioner – Site Assessment and Management

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Tel: +61 2 8569 2200 Fax: +61 2 9983 0582 M: +61 499 071 665

ABN 67 151 524 757

From: Aileen Hie <AHie@envirolab.com.au>
Sent: Friday, 2 March 2018 6:20 PM
To: bhagaban.acharya@consultingearth.com.au; darren.hanvey@consultingearth.com.au; samuel.inameti@consultingearth.com.au
Subject: Sample Receipt for 186376 CES120204-SCH

Please refer to attached for:
a copy of the COC/paperwork received from you
a copy of our Sample Receipt Advice (SRA)
Please open and read the SRA as it contains important information.
Please let the lab know immediately if there are any issues.

Results will be available by 6.30pm on the date indicated.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 186376-A

Client Details

Client	Consulting Earth Scientists Pty Ltd
Attention	Bhagaban Acharya, Darren Hanvey, Samuel Inameti
Address	Suite 3, Level 1, 55 Grandview Street, Pymble, NSW, 2073

Sample Details

Your Reference	**CES120204-SCH**
Number of Samples	Additional tests, 1 sample
Date samples received	02/03/2018
Date completed instructions received	06/03/2018

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	08/03/2018
Date of Issue	08/03/2018

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

Results Approved By
Long Pham, Team Leader, Metals
Priya Samarawickrama, Senior Chemist
Steven Luong, Senior Chemist

Authorised By

David Springer, General Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		186376-A-8
Your Reference	UNITS	BH8 - Nat
Depth		1.2-1.5
Date Sampled		02/03/2018
Type of sample		Soil
Date extracted	-	07/03/2018
Date analysed	-	07/03/2018
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	90

svTRH (C10-C40) in Soil		
Our Reference		186376-A-8
Your Reference	UNITS	BH8 - Nat
Depth		1.2-1.5
Date Sampled		02/03/2018
Type of sample		Soil
Date extracted	-	07/03/2018
Date analysed	-	08/03/2018
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
TRH $>C_{10}$ -C_{16}	mg/kg	<50
TRH $>C_{10}$ - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH $>C_{16}$ -C_{34}	mg/kg	<100
TRH $>C_{34}$ -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	96

PAHs in Soil		
Our Reference		186376-A-8
Your Reference	UNITS	BH8 - Nat
Depth		1.2-1.5
Date Sampled		02/03/2018
Type of sample		Soil
Date extracted	-	07/03/2018
Date analysed	-	07/03/2018
Naphthalene	mg/kg	0.3
Acenaphthylene	mg/kg	0.4
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	0.2
Phenanthrene	mg/kg	2.0
Anthracene	mg/kg	0.8
Fluoranthene	mg/kg	3.1
Pyrene	mg/kg	3.0
Benzo(a)anthracene	mg/kg	1.7
Chrysene	mg/kg	1.4
Benzo(b,j+k)fluoranthene	mg/kg	2.5
Benzo(a)pyrene	mg/kg	1.8
Indeno(1,2,3-c,d)pyrene	mg/kg	0.8
Dibenzo(a,h)anthracene	mg/kg	0.3
Benzo(g,h,i)perylene	mg/kg	1
Total +ve PAH's	mg/kg	19
Benzo(a)pyrene TEQ calc (zero)	mg/kg	2.6
Benzo(a)pyrene TEQ calc(half)	mg/kg	2.6
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	2.6
Surrogate p-Terphenyl-d14	%	89

Organochlorine Pesticides in soil		
Our Reference		186376-A-8
Your Reference	UNITS	BH8 - Nat
Depth		1.2-1.5
Date Sampled		02/03/2018
Type of sample		Soil
Date extracted	-	07/03/2018
Date analysed	-	07/03/2018
HCB	mg/kg	<0.1
alpha-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	79

Organophosphorus Pesticides		
Our Reference		186376-A-8
Your Reference	UNITS	BH8 - Nat
Depth		1.2-1.5
Date Sampled		02/03/2018
Type of sample		Soil
Date extracted	-	07/03/2018
Date analysed	-	07/03/2018
Azinphos-methyl (Guthion)	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Dichlorvos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Ethion	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Parathion	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Surrogate TCMX	%	79

PCBs in Soil		
Our Reference		186376-A-8
Your Reference	UNITS	BH8 - Nat
Depth		1.2-1.5
Date Sampled		02/03/2018
Type of sample		Soil
Date extracted	-	07/03/2018
Date analysed	-	07/03/2018
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate TCLMX	%	79

Acid Extractable metals in soil		
Our Reference		186376-A-8
Your Reference	UNITS	BH8 - Nat
Depth		1.2-1.5
Date Sampled		02/03/2018
Type of sample		Soil
Date prepared	-	07/03/2018
Date analysed	-	08/03/2018
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	3
Copper	mg/kg	8
Lead	mg/kg	39
Mercury	mg/kg	0.3
Nickel	mg/kg	3
Zinc	mg/kg	47

Misc Soil - Inorg		
Our Reference		186376-A-8
Your Reference	UNITS	BH8 - Nat
Depth		1.2-1.5
Date Sampled		02/03/2018
Type of sample		Soil
Date prepared	-	07/03/2018
Date analysed	-	07/03/2018
Total Phenolics (as Phenol)	mg/kg	<5

Moisture		
Our Reference		186376-A-8
Your Reference	UNITS	BH8 - Nat
Depth		1.2-1.5
Date Sampled		02/03/2018
Type of sample		Soil
Date prepared	-	07/03/2018
Date analysed	-	08/03/2018
Moisture	%	13

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.

Method ID	Methodology Summary
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing 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. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
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. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			07/03/2018	8	07/03/2018	07/03/2018		07/03/2018	[NT]
Date analysed	-			07/03/2018	8	07/03/2018	07/03/2018		07/03/2018	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	8	<25	<25	0	91	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	8	<25	<25	0	91	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	8	<0.2	<0.2	0	85	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	8	<0.5	<0.5	0	91	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	8	<1	<1	0	92	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	8	<2	<2	0	93	[NT]
o-Xylene	mg/kg	1	Org-016	<1	8	<1	<1	0	92	[NT]
naphthalene	mg/kg	1	Org-014	<1	8	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	95	8	90	89	1	93	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			07/03/2018	8	07/03/2018	07/03/2018		07/03/2018	[NT]
Date analysed	-			08/03/2018	8	08/03/2018	08/03/2018		08/03/2018	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	8	<50	<50	0	74	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	8	<100	<100	0	76	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	8	<100	<100	0	92	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	8	<50	<50	0	74	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	8	<100	<100	0	76	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	8	<100	<100	0	92	[NT]
Surrogate o-Terphenyl	%		Org-003	93	8	96	93	3	103	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			07/03/2018	8	07/03/2018	07/03/2018		07/03/2018	[NT]
Date analysed	-			07/03/2018	8	07/03/2018	07/03/2018		07/03/2018	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	8	0.3	0.2	40	88	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	8	0.4	0.2	67	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	8	0.2	0.2	0	88	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	8	2.0	1.2	50	90	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	8	0.8	0.4	67	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	8	3.1	1.8	53	90	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	8	3.0	1.9	45	94	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	8	1.7	1	52	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	8	1.4	0.8	55	97	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	8	2.5	1	86	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	8	1.8	0.98	59	96	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	8	0.8	0.4	67	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	8	0.3	0.1	100	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	8	1	0.5	67	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	96	8	89	91	2	111	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			07/03/2018	8	07/03/2018	07/03/2018		07/03/2018	[NT]
Date analysed	-			07/03/2018	8	07/03/2018	07/03/2018		07/03/2018	[NT]
HCB	mg/kg	0.1	Org-005	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	8	<0.1	<0.1	0	84	[NT]
gamma-BHC	mg/kg	0.1	Org-005	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	8	<0.1	<0.1	0	81	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	8	<0.1	<0.1	0	75	[NT]
delta-BHC	mg/kg	0.1	Org-005	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	8	<0.1	<0.1	0	81	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	8	<0.1	<0.1	0	84	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	8	<0.1	<0.1	0	91	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	8	<0.1	<0.1	0	95	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	8	<0.1	<0.1	0	84	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	8	<0.1	<0.1	0	95	[NT]
Endosulfan II	mg/kg	0.1	Org-005	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	8	<0.1	<0.1	0	82	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	87	8	79	78	1	99	[NT]

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			07/03/2018	8	07/03/2018	07/03/2018		07/03/2018	[NT]
Date analysed	-			07/03/2018	8	07/03/2018	07/03/2018		07/03/2018	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	8	<0.1	<0.1	0	88	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	8	<0.1	<0.1	0	96	[NT]
Dimethoate	mg/kg	0.1	Org-008	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	8	<0.1	<0.1	0	92	[NT]
Fenitrothion	mg/kg	0.1	Org-008	<0.1	8	<0.1	<0.1	0	106	[NT]
Malathion	mg/kg	0.1	Org-008	<0.1	8	<0.1	<0.1	0	93	[NT]
Parathion	mg/kg	0.1	Org-008	<0.1	8	<0.1	<0.1	0	114	[NT]
Ronnel	mg/kg	0.1	Org-008	<0.1	8	<0.1	<0.1	0	100	[NT]
Surrogate TCMX	%		Org-008	87	8	79	78	1	80	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			07/03/2018	8	07/03/2018	07/03/2018		07/03/2018	[NT]
Date analysed	-			07/03/2018	8	07/03/2018	07/03/2018		07/03/2018	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	8	<0.1	<0.1	0	99	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	8	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	87	8	79	78	1	80	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			07/03/2018	8	07/03/2018	07/03/2018		07/03/2018	[NT]
Date analysed	-			08/03/2018	8	08/03/2018	08/03/2018		08/03/2018	[NT]
Arsenic	mg/kg	4	Metals-020	<4	8	<4	<4	0	119	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	8	<0.4	<0.4	0	111	[NT]
Chromium	mg/kg	1	Metals-020	<1	8	3	3	0	117	[NT]
Copper	mg/kg	1	Metals-020	<1	8	8	10	22	117	[NT]
Lead	mg/kg	1	Metals-020	<1	8	39	42	7	115	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	8	0.3	0.4	29	108	[NT]
Nickel	mg/kg	1	Metals-020	<1	8	3	3	0	117	[NT]
Zinc	mg/kg	1	Metals-020	<1	8	47	48	2	113	[NT]

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			07/03/2018	[NT]	[NT]	[NT]	[NT]	07/03/2018	[NT]
Date analysed	-			07/03/2018	[NT]	[NT]	[NT]	[NT]	07/03/2018	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	[NT]	[NT]	100	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

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.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

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 batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

PAHs in Soil - The RPD for duplicate results is accepted due to the non homogenous nature of sample 8.

Aileen Hie

From:	Darren Hanvey <darren.hanvey@consultingearth.com.au>
Sent:	Friday, 9 March 2018 3:25 PM
To:	Ken Nguyen; SydneyMailbox
Cc:	tristan.goodbody@consultingearth.com.au; Bowen Ren
Subject:	CES180204, Additional Analyses

Ken, can you please perform the following TCLP testing on these samples (already at Envirolab) on a 48 hour turnaround;

Can you please issue results by Tuesday COB.

Sample ID	Batch	TCLP	
BH3_0.3-0.6	186116	Metals	
BH2_0.3-0.6	186116	PAHs, Lead	
BH1_0.4-0.8	186212	PAHs, Lead	
BH4_0.3-0.8	186295	Metals	
BH6_0.3-0.8	186376	Metals, PAHs	1
BH5_0.3-0.9	186376	Metals	3
BH7_0.3-0.9	186376	PAHs, Metals	5
BH8_0.3-0.9	186376	PAHs, Metals, PFAS	7
BH9_0.3-0.9	186376	PAHs, Metals	9
BH10_0.3-0.9	186597	PAHs	
BH11_0.3-0.7	186597	PAHs, Metals	

ELS: 186376-B
Rec: 9/3/18
TAT: 2 DAYS
Attz

Can you also please perform the following analyses (Samples at Envirolab):

- Batch 186597, Envirolab Sample ID 4, CES Sample ID BH11-Nat_1.3-1.6, PAHs, Metals

All results reported by Tuesday COB (48 hour analyses).

Thanks,

Darren Hanvey
Principal Geo-Environmental Engineer
Certified Practitioner – Site Assessment and Management

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EARTH
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ABN 67 151 524 757

Aileen Hie

From: Darren Hanvey <darren.hanvey@consultingearth.com.au>
Sent: Friday, 9 March 2018 11:14 AM
To: Ken Nguyen; SydneyMailbox
Cc: tristan.goodbody@consultingearth.com.au; Bowen Ren
Subject: RE: Results for Registration 186376 CES180204-SCH

Hi Ken, for this Batch 186376 (CES180204-SGC), can you please also do the following analyses to be reported Tuesday COB (48 hour analyses):

- Envirolab Sample 2, CES sample BH6-Nat_1.2-1.5: Combo 3
- Envirolab Sample 4, CES sample BH5-Nat_1.2-1.5: Metals 8
- Envirolab Sample 6, CES sample BH7-Nat_1.2-1.5: PAHs, Metals 8
- Envirolab Sample 8, CES sample BH8-Nat_1.2-1.5: PAHs
- Envirolab Sample 10, CES sample BH9-Nat_1.2-1.5: PAHs

Regards,

Darren Hanvey
Principal Geo-Environmental Engineer
Certified Practitioner – Site Assessment and Management

186376-B

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ABN 67 151 524 757

From: Ken Nguyen <KNguyen@envirolab.com.au>
Sent: Thursday, 8 March 2018 2:55 PM
To: bhagaban.acharya@consultingearth.com.au; darren.hanvey@consultingearth.com.au; samuel.inameti@consultingearth.com.au; kay.lowe@consultingearth.com.au
Subject: Results for Registration 186376 CES120204-SCH

Please refer to attached for:
a copy of the Certificate of Analysis
a copy of the COC/paperwork received from you

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 186376-B

Client Details

Client	Consulting Earth Scientists Pty Ltd
Attention	Tristan Goodbody, Darren Hanvey
Address	Suite 3, Level 1, 55 Grandview Street, Pymble, NSW, 2073

Sample Details

Your Reference	**CES120204-SCH**
Number of Samples	10 Soil, 2 Water
Date samples received	02/03/2018
Date completed instructions received	09/03/2018

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.

Report Details

Date results requested by	13/03/2018
Date of Issue	13/03/2018

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Results Approved By
Jeremy Faircloth, Organics Supervisor
Leon Ow, Chemist
Long Pham, Team Leader, Metals
Phalak Inthakesone, Organics Development Manager, Sydney
Steven Luong, Senior Chemist

Authorised By

David Springer, General Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		186376-B-2
Your Reference	UNITS	BH6 - Nat
Depth		1.2-1.5
Date Sampled		02/03/2018
Type of sample		Soil
Date extracted	-	12/03/2018
Date analysed	-	12/03/2018
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	106

svTRH (C10-C40) in Soil		
Our Reference		186376-B-2
Your Reference	UNITS	BH6 - Nat
Depth		1.2-1.5
Date Sampled		02/03/2018
Type of sample		Soil
Date extracted	-	12/03/2018
Date analysed	-	13/03/2018
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	80

PAHs in Soil					
Our Reference		186376-B-2	186376-B-6	186376-B-8	186376-B-10
Your Reference	UNITS	BH6 - Nat	BH7 - Nat	BH8 - Nat	BH9 - Nat
Depth		1.2-1.5	1.2-1.5	1.2-1.5	1.2-1.5
Date Sampled		02/03/2018	02/03/2018	02/03/2018	02/03/2018
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	12/03/2018	12/03/2018	12/03/2018	12/03/2018
Date analysed	-	12/03/2018	12/03/2018	12/03/2018	12/03/2018
Naphthalene	mg/kg	0.6	<0.1	0.2	<0.1
Acenaphthylene	mg/kg	0.2	<0.1	0.2	0.2
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	0.1	<0.1
Phenanthrene	mg/kg	0.4	<0.1	1.1	0.6
Anthracene	mg/kg	0.2	<0.1	0.4	0.2
Fluoranthene	mg/kg	1.1	<0.1	1.5	1.2
Pyrene	mg/kg	1.2	<0.1	1.5	1.3
Benzo(a)anthracene	mg/kg	0.9	<0.1	0.8	0.7
Chrysene	mg/kg	0.8	<0.1	0.7	0.7
Benzo(b,j+k)fluoranthene	mg/kg	1	<0.2	0.8	0.8
Benzo(a)pyrene	mg/kg	1.0	<0.05	0.76	0.73
Indeno(1,2,3-c,d)pyrene	mg/kg	0.6	<0.1	0.4	0.4
Dibenzo(a,h)anthracene	mg/kg	0.2	<0.1	0.1	0.1
Benzo(g,h,i)perylene	mg/kg	0.8	<0.1	0.5	0.5
Total +ve PAH's	mg/kg	9.0	<0.05	9.1	7.5
Benzo(a)pyrene TEQ calc (zero)	mg/kg	1.4	<0.5	1.1	1.1
Benzo(a)pyrene TEQ calc(half)	mg/kg	1.4	<0.5	1.1	1.1
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	1.4	<0.5	1.1	1.1
Surrogate p-Terphenyl-d14	%	107	110	111	111

Acid Extractable metals in soil				
Our Reference		186376-B-2	186376-B-4	186376-B-6
Your Reference	UNITS	BH6 - Nat	BH5 - Nat	BH7 - Nat
Depth		1.2-1.5	1.2-1.5	1.2-1.5
Date Sampled		02/03/2018	02/03/2018	02/03/2018
Type of sample		Soil	Soil	Soil
Date prepared	-	12/03/2018	12/03/2018	12/03/2018
Date analysed	-	12/03/2018	12/03/2018	12/03/2018
Arsenic	mg/kg	4	<4	8
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	10	5	4
Copper	mg/kg	110	10	8
Lead	mg/kg	120	54	39
Mercury	mg/kg	1	0.3	0.2
Nickel	mg/kg	22	1	6
Zinc	mg/kg	140	24	27

Moisture						
Our Reference		186376-B-2	186376-B-4	186376-B-6	186376-B-8	186376-B-10
Your Reference	UNITS	BH6 - Nat	BH5 - Nat	BH7 - Nat	BH8 - Nat	BH9 - Nat
Depth		1.2-1.5	1.2-1.5	1.2-1.5	1.2-1.5	1.2-1.5
Date Sampled		02/03/2018	02/03/2018	02/03/2018	02/03/2018	02/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/03/2018	12/03/2018	12/03/2018	12/03/2018	12/03/2018
Date analysed	-	13/03/2018	13/03/2018	13/03/2018	13/03/2018	13/03/2018
Moisture	%	11	15	9.2	12	15

Metals in TCLP USEPA1311						
Our Reference		186376-B-1	186376-B-3	186376-B-5	186376-B-7	186376-B-9
Your Reference	UNITS	BH6 - Fill	BH5 - Fill	BH7 - Fill	BH8 - Fill	BH9 - Fill
Depth		0.3-0.8	0.3-0.9	0.3-0.9	0.3-0.9	0.3-0.9
Date Sampled		02/03/2018	02/03/2018	02/03/2018	02/03/2018	02/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/03/2018	13/03/2018	13/03/2018	13/03/2018	13/03/2018
Date analysed	-	13/03/2018	13/03/2018	13/03/2018	13/03/2018	13/03/2018
pH of soil for fluid# determ.	pH units	9.2	9.1	8.9	8.7	9.3
pH of soil TCLP (after HCl)	pH units	2.0	1.9	1.8	1.8	1.8
Extraction fluid used	-	1	1	1	1	1
pH of final Leachate	pH units	5.6	5.9	5.1	5.1	5.1
Arsenic in TCLP	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium in TCLP	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium in TCLP	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Copper in TCLP	mg/L	0.1	0.04	0.04	0.04	0.01
Lead in TCLP	mg/L	0.50	0.2	0.04	0.34	0.04
Mercury in TCLP	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel in TCLP	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Zinc in TCLP	mg/L	0.5	0.6	0.9	1.1	1.0

PFAS in TCLP Short		
Our Reference		186376-B-7
Your Reference	UNITS	BH8 - Fill
Depth		0.3-0.9
Date Sampled		02/03/2018
Type of sample		Soil
Date prepared	-	12/03/2018
Date analysed	-	12/03/2018
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01
6:2 FTS	µg/L	<0.01
8:2 FTS	µg/L	<0.01
Surrogate $^{13}C_8$ PFOS	%	98
Surrogate $^{13}C_2$ PFOA	%	98

PAHs in TCLP (USEPA 1311)					
Our Reference		186376-B-1	186376-B-5	186376-B-7	186376-B-9
Your Reference	UNITS	BH6 - Fill	BH7 - Fill	BH8 - Fill	BH9 - Fill
Depth		0.3-0.8	0.3-0.9	0.3-0.9	0.3-0.9
Date Sampled		02/03/2018	02/03/2018	02/03/2018	02/03/2018
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	12/03/2018	12/03/2018	12/03/2018	12/03/2018
Date analysed	-	13/03/2018	13/03/2018	13/03/2018	13/03/2018
Naphthalene in TCLP	mg/L	1.1	0.021	0.001	0.001
Acenaphthylene in TCLP	mg/L	0.11	0.002	<0.001	<0.001
Acenaphthene in TCLP	mg/L	0.028	<0.001	<0.001	<0.001
Fluorene in TCLP	mg/L	0.086	0.003	<0.001	<0.001
Phenanthrene in TCLP	mg/L	0.12	0.007	0.001	<0.001
Anthracene in TCLP	mg/L	0.020	0.001	<0.001	<0.001
Fluoranthene in TCLP	mg/L	0.017	0.001	<0.001	<0.001
Pyrene in TCLP	mg/L	0.014	<0.001	<0.001	<0.001
Benzo(a)anthracene in TCLP	mg/L	0.002	<0.001	<0.001	<0.001
Chrysene in TCLP	mg/L	0.002	<0.001	<0.001	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002	<0.002	<0.002	<0.002
Benzo(a)pyrene in TCLP	mg/L	0.001	<0.001	<0.001	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Total +ve PAH's	mg/L	1.5	0.036	0.0020	0.001
Surrogate p-Terphenyl-d14	%	101	106	112	96

Method ID	Methodology Summary
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-012	Leachates are extracted with Dichloromethane and analysed by GC-MS.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.

Method ID	Methodology Summary
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing 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. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
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. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
Org-035	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are NOT corrected for Surrogates (mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample - also known as Extracted Internal Standards) UNLESS contractually requested. Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.
Org-035E	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are NOT corrected for Surrogates (mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample - also known as Extracted Internal Standards) UNLESS contractually requested. Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

Method ID	Methodology Summary
Org-035E_2	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are NOT corrected for Surrogates (mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample - also known as Extracted Internal Standards) UNLESS contractually requested. Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Date analysed	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	92	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	92	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	82	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	90	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	96	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	109	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Date analysed	-			13/03/2018	[NT]	[NT]	[NT]	[NT]	13/03/2018	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	90	[NT]
TRH >C_{10}-C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH >C_{16}-C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH >C_{34}-C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	90	[NT]
Surrogate o-Terphenyl	%		Org-003	85	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Date analysed	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	117	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	[NT]	[NT]	113	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	114	[NT]	[NT]	[NT]	[NT]	116	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Date analysed	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	113	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	107	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	85	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]

QUALITY CONTROL: Metals in TCLP USEPA1311					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			13/03/2018	[NT]	[NT]	[NT]	[NT]	13/03/2018	[NT]
Date analysed	-			13/03/2018	[NT]	[NT]	[NT]	[NT]	13/03/2018	[NT]
Arsenic in TCLP	mg/L	0.05	Metals-020 ICP-AES	<0.05	[NT]	[NT]	[NT]	[NT]	104	[NT]
Cadmium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	96	[NT]
Chromium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	100	[NT]
Copper in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	111	[NT]
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	[NT]	[NT]	99	[NT]
Mercury in TCLP	mg/L	0.0005	Metals-021 CV-AAS	<0.0005	[NT]	[NT]	[NT]	[NT]	97	[NT]
Nickel in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	[NT]	[NT]	99	[NT]
Zinc in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	[NT]	[NT]	97	[NT]

QUALITY CONTROL: PFAS in TCLP Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date prepared	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Date analysed	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-035	<0.01	[NT]	[NT]	[NT]	[NT]	121	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-035	<0.01	[NT]	[NT]	[NT]	[NT]	99	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-035	<0.01	[NT]	[NT]	[NT]	[NT]	129	[NT]
6:2 FTS	µg/L	0.01	Org-035	<0.01	[NT]	[NT]	[NT]	[NT]	131	[NT]
8:2 FTS	µg/L	0.01	Org-035	<0.01	[NT]	[NT]	[NT]	[NT]	111	[NT]
Surrogate $^{13}C_8$ PFOS	%		Org-035E	107	[NT]	[NT]	[NT]	[NT]	93	[NT]
Surrogate $^{13}C_2$ PFOA	%		Org-035E_2	100	[NT]	[NT]	[NT]	[NT]	94	[NT]

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)					Duplicate					Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Date analysed	-			13/03/2018	[NT]	[NT]	[NT]	[NT]	13/03/2018	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	81	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	91	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	92	[NT]
Anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	89	[NT]
Pyrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	89	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	97	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	100	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	115	[NT]	[NT]	[NT]	[NT]	105	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

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.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

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 batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

CHAIN OF CUSTODY - Client

19780

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Client: CES
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Email: bhagaban.acharya@consultingearth.com.au

Client Project Name / Number / Site etc (ie report title):
PO No.: CES 120204 - SCH
Envirolab Quote No. :
Date results required:

Or choose: standard / same day / 1 day / 2 day / 3 day
Note: Inform lab in advance if urgent turnaround is required - surcharges apply

Lab comments:

Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Combo 8	NEPM Asbestos	VHC	TRH/BTEX	PFAS											Comments: Provide as much information about the sample as you can
1	BH6 - Fill	0.3-0.8	02/03/18	Soil	X	X			X											
2	BH6 - Nat	1.2-1.5	//	Soil																ON HOLD
3	BH5 - Fill	0.3-0.9	//	"	X	X	X		X											
4	BH5 - Nat	1.2-1.5	//	//																ON HOLD
5	BH7 - Fill	0.3-0.9	//	//	X	X	X		X											
6	BH7 - Nat	1.2-1.5	//	//																ON HOLD
7	BH8 - Fill	0.3-0.9	//	//	X	X			X											
8	BH8 - Nat	1.2-1.5	//	//																ON HOLD
9	BH9 - Fill	0.3-0.9	//	//	X	X			X											
10	BH9 - Nat	1.2-1.5	//	//																ON HOLD
11	TB	-	//	//				X												
12	TS	-	//	//				X												

Envirolab Services
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 186376
Date Received: 2/3/18
Time Received: 15:00
Received by: AB
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished by (company): CES
Print Name: A. Bhagaban.
Date & Time: 02 MARCH 2018
Signature: Bhagaban

Received by (company): ELS.
Print Name: Ellen Wy.
Date & Time: 020318. 1425
Signature: AB

Lab use only:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: (if applicable)
Transported by: Hand delivered / courier

White - Lab copy / Blue - Client copy / Pink - Retain in Book

Page No:

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CERTIFICATE OF ANALYSIS 186497

Client Details

Client	Consulting Earth Scientists Pty Ltd
Attention	Bhagaban Acharya, Darren Hanvey, Samuel Inameti
Address	Suite 3, Level 1, 55 Grandview Street, Pymble, NSW, 2073

Sample Details

Your Reference	**CES180204-SGC**
Number of Samples	7 Water
Date samples received	05/03/2018
Date completed instructions received	05/03/2018

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.

Report Details

Date results requested by	08/03/2018
Date of Issue	08/03/2018

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Results Approved By

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Long Pham, Team Leader, Metals
Phalak Inthakesone, Organics Development Manager, Sydney
Priya Samarawickrama, Senior Chemist
Steven Luong, Senior Chemist

Authorised By

David Springer, General Manager

VHC's in water						
Our Reference		186497-1	186497-2	186497-3	186497-4	186497-5
Your Reference	UNITS	BH01	BH04	BH03	QAQC 1	RIN
Date Sampled		05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Date analysed	-	07/03/2018	07/03/2018	07/03/2018	07/03/2018	07/03/2018
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1
Chloroform	µg/L	2	7	4	7	<1
2,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	<1	<1
Bromoform	µg/L	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1	<1	<1

VHC's in water						
Our Reference	UNITS	186497-1	186497-2	186497-3	186497-4	186497-5
Your Reference		BH01	BH04	BH03	QAQC 1	RIN
Date Sampled		05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Type of sample		Water	Water	Water	Water	Water
4-chlorotoluene	µg/L	<1	<1	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	102	125	124	112	100
Surrogate toluene-d8	%	98	111	110	88	98
Surrogate 4-BFB	%	97	107	92	105	91

vTRH(C6-C10)/BTEXN in Water						
Our Reference		186497-1	186497-2	186497-3	186497-4	186497-5
Your Reference	UNITS	BH01	BH04	BH03	QAQC 1	RIN
Date Sampled		05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	07/03/2018	07/03/2018	07/03/2018	07/03/2018	07/03/2018
Date analysed	-	07/03/2018	07/03/2018	07/03/2018	07/03/2018	07/03/2018
TRH C_6 - C_9	µg/L	19	210	<10	200	<10
TRH C_6 - C_{10}	µg/L	46	450	<10	440	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	33	320	<10	310	<10
Benzene	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	7	<1	7	<1
m+p-xylene	µg/L	8	84	<2	82	<2
o-xylene	µg/L	5	40	<1	39	<1
Naphthalene	µg/L	<1	4	<1	4	<1
Surrogate Dibromofluoromethane	%	102	125	124	112	100
Surrogate toluene-d8	%	98	111	110	88	98
Surrogate 4-BFB	%	97	107	92	105	91

vTRH(C6-C10)/BTEXN in Water			
Our Reference		186497-6	186497-7
Your Reference	UNITS	TB	TS
Date Sampled		05/03/2018	05/03/2018
Type of sample		Water	Water
Date extracted	-	07/03/2018	06/03/2018
Date analysed	-	07/03/2018	06/03/2018
TRH C_6 - C_9	µg/L	<10	[NA]
TRH C_6 - C_{10}	µg/L	<10	[NA]
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	[NA]
Benzene	µg/L	<1	96%
Toluene	µg/L	<1	100%
Ethylbenzene	µg/L	<1	101%
m+p-xylene	µg/L	<2	105%
o-xylene	µg/L	<1	105%
Naphthalene	µg/L	<1	[NA]
Surrogate Dibromofluoromethane	%	101	100
Surrogate toluene-d8	%	97	101
Surrogate 4-BFB	%	91	102

svTRH (C10-C40) in Water						
Our Reference		186497-1	186497-2	186497-3	186497-4	186497-5
Your Reference	UNITS	BH01	BH04	BH03	QAQC 1	RIN
Date Sampled		05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Date analysed	-	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
TRH C_{10} - C_{14}	µg/L	150	270	<50	410	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100	<100
TRH >C_{10} - C_{16}	µg/L	120	170	<50	260	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	120	170	<50	250	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	88	72	81	70	80

PAHs in Water						
Our Reference		186497-1	186497-2	186497-3	186497-4	186497-5
Your Reference	UNITS	BH01	BH04	BH03	QAQC 1	RIN
Date Sampled		05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Date analysed	-	07/03/2018	07/03/2018	07/03/2018	07/03/2018	07/03/2018
Naphthalene	µg/L	<1	3	<1	4	<1
Acenaphthylene	µg/L	<1	<1	<1	<1	<1
Acenaphthene	µg/L	<1	<1	<1	<1	<1
Fluorene	µg/L	<1	<1	<1	<1	<1
Phenanthrene	µg/L	<1	<1	<1	<1	<1
Anthracene	µg/L	<1	<1	<1	<1	<1
Fluoranthene	µg/L	<1	<1	<1	2	<1
Pyrene	µg/L	<1	<1	<1	2	<1
Benzo(a)anthracene	µg/L	<1	<1	<1	<1	<1
Chrysene	µg/L	<1	<1	<1	<1	<1
Benzo(b,j+k)fluoranthene	µg/L	<2	<2	<2	<2	<2
Benzo(a)pyrene	µg/L	<1	<1	<1	1	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1	<1	<1	<1	<1
Dibenzo(a,h)anthracene	µg/L	<1	<1	<1	<1	<1
Benzo(g,h,i)perylene	µg/L	<1	<1	<1	<1	<1
Benzo(a)pyrene TEQ	µg/L	<5	<5	<5	<5	<5
Total +ve PAH's	µg/L	NIL (+)VE	3.4	NIL (+)VE	8.6	NIL (+)VE
Surrogate p-Terphenyl-d14	%	125	87	116	107	124

OCP in water						
Our Reference		186497-1	186497-2	186497-3	186497-4	186497-5
Your Reference	UNITS	BH01	BH04	BH03	QAQC 1	RIN
Date Sampled		05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Date analysed	-	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
HCB	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
alpha-BHC	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
gamma-BHC	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
beta-BHC	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Heptachlor	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
delta-BHC	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Aldrin	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Heptachlor Epoxide	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
gamma-Chlordane	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
alpha-Chlordane	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Endosulfan I	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
pp-DDE	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Dieldrin	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
pp-DDD	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Endosulfan II	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
pp-DDT	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin Aldehyde	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Endosulfan Sulphate	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Methoxychlor	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Surrogate TCMX	%	73	119	82	70	83

OP Pesticides in water						
Our Reference		186497-1	186497-2	186497-3	186497-4	186497-5
Your Reference	UNITS	BH01	BH04	BH03	QAQC 1	RIN
Date Sampled		05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Date analysed	-	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Azinphos-methyl (Guthion)	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos ethyl	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyriphos	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyriphos-methyl	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Diazinon	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Dichlorovos	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Ethion	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Fenitrothion	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Ronnel	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Surrogate TCMX	%	73	119	82	70	83

PCBs in Water						
Our Reference		186497-1	186497-2	186497-3	186497-4	186497-5
Your Reference	UNITS	BH01	BH04	BH03	QAQC 1	RIN
Date Sampled		05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Date analysed	-	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Aroclor 1016	µg/L	<2	<2	<2	<2	<2
Aroclor 1221	µg/L	<2	<2	<2	<2	<2
Aroclor 1232	µg/L	<2	<2	<2	<2	<2
Aroclor 1242	µg/L	<2	<2	<2	<2	<2
Aroclor 1248	µg/L	<2	<2	<2	<2	<2
Aroclor 1254	µg/L	<2	<2	<2	<2	<2
Aroclor 1260	µg/L	<2	<2	<2	<2	<2
Surrogate TCLMX	%	73	119	82	70	83

Total Phenolics in Water						
Our Reference		186497-1	186497-2	186497-3	186497-4	186497-5
Your Reference	UNITS	BH01	BH04	BH03	QAQC 1	RIN
Date Sampled		05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	07/03/2018	07/03/2018	07/03/2018	07/03/2018	07/03/2018
Date analysed	-	07/03/2018	07/03/2018	07/03/2018	07/03/2018	07/03/2018
Total Phenolics (as Phenol)	mg/L	0.07	0.09	<0.05	0.1	<0.05

HM in water - dissolved						
Our Reference		186497-1	186497-2	186497-3	186497-4	186497-5
Your Reference	UNITS	BH01	BH04	BH03	QAQC 1	RIN
Date Sampled		05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	07/03/2018	07/03/2018	07/03/2018	07/03/2018	07/03/2018
Date analysed	-	07/03/2018	07/03/2018	07/03/2018	07/03/2018	07/03/2018
Arsenic-Dissolved	μg/L	<1	<1	<1	<1	<1
Cadmium-Dissolved	μg/L	0.1	<0.1	0.2	<0.1	<0.1
Chromium-Dissolved	μg/L	<1	<1	<1	<1	<1
Copper-Dissolved	μg/L	<1	<1	<1	<1	<1
Lead-Dissolved	μg/L	<1	<1	<1	<1	<1
Mercury-Dissolved	μg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	μg/L	10	3	2	3	<1
Zinc-Dissolved	μg/L	41	3	85	<1	<1

Miscellaneous Inorganics				
Our Reference		186497-1	186497-2	186497-3
Your Reference	UNITS	BH01	BH04	BH03
Date Sampled		05/03/2018	05/03/2018	05/03/2018
Type of sample		Water	Water	Water
Date prepared	-	06/03/2018	06/03/2018	06/03/2018
Date analysed	-	06/03/2018	06/03/2018	06/03/2018
Chloride, Cl	mg/L	490	44	33
Sulphate, SO4	mg/L	84	95	67

PFAS in Water Short Trace						
Our Reference		186497-1	186497-2	186497-3	186497-4	186497-5
Your Reference	UNITS	BH01	BH04	BH03	QAQC 1	RIN
Date Sampled		05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	07/03/2018	07/03/2018	07/03/2018	07/03/2018	07/03/2018
Date analysed	-	08/03/2018	08/03/2018	08/03/2018	08/03/2018	08/03/2018
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.001	0.0078	0.018	0.0084	<0.0002
Perfluorooctanesulfonic acid PFOS	µg/L	0.001	0.0054	0.036	0.0059	<0.0002
Perfluorooctanoic acid PFOA	µg/L	0.001	0.0028	0.010	0.0033	<0.0002
6:2 FTS	µg/L	<0.0004	0.001	0.0005	0.001	<0.0004
8:2 FTS	µg/L	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Surrogate $^{13}C_8$ PFOS	%	108	103	105	99	98
Surrogate $^{13}C_2$ PFOA	%	87	77	93	85	110

Method ID	Methodology Summary
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Alternatively determined by colourimetry/turbidity using Discrete Analyer.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
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. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-035	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are NOT corrected for Surrogates (mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample - also known as Extracted Internal Standards) UNLESS contractually requested. Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

Method ID	Methodology Summary
Org-035E	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are NOT corrected for Surrogates (mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample - also known as Extracted Internal Standards) UNLESS contractually requested. Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.
Org-035E_2	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are NOT corrected for Surrogates (mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample - also known as Extracted Internal Standards) UNLESS contractually requested. Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: VHC's in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			06/03/2018	1	06/03/2018	07/03/2018		06/03/2018	[NT]
Date analysed	-			07/03/2018	1	07/03/2018	07/03/2018		07/03/2018	[NT]
Dichlorodifluoromethane	µg/L	10	Org-013	<10	1	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-013	<10	1	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-013	<10	1	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-013	<10	1	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-013	<10	1	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-013	<10	1	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-013	<1	1	<1	<1	0	105	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-013	<1	1	2	2	0	103	[NT]
2,2-dichloropropane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-013	<1	1	<1	<1	0	101	[NT]
1,1,1-trichloroethane	µg/L	1	Org-013	<1	1	<1	<1	0	105	[NT]
1,1-dichloropropene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Dibromomethane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-013	<1	1	<1	<1	0	130	[NT]
Bromodichloromethane	µg/L	1	Org-013	<1	1	<1	<1	0	107	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-013	<1	1	<1	<1	0	102	[NT]
1,2-dibromoethane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-013	<1	1	<1	<1	0	100	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Bromoform	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VHC's in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-013	109	1	102	78	27	109	[NT]
Surrogate toluene-d8	%		Org-013	98	1	98	98	0	98	[NT]
Surrogate 4-BFB	%		Org-013	92	1	97	95	2	102	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			07/03/2018	1	07/03/2018	07/03/2018		07/03/2018	[NT]
Date analysed	-			07/03/2018	1	07/03/2018	07/03/2018		07/03/2018	[NT]
TRH C_6 - C_9	µg/L	10	Org-016	<10	1	19	23	19	97	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-016	<10	1	46	53	14	97	[NT]
Benzene	µg/L	1	Org-016	<1	1	<1	<1	0	100	[NT]
Toluene	µg/L	1	Org-016	<1	1	<1	<1	0	96	[NT]
Ethylbenzene	µg/L	1	Org-016	<1	1	<1	<1	0	94	[NT]
m+p-xylene	µg/L	2	Org-016	<2	1	8	8	0	98	[NT]
o-xylene	µg/L	1	Org-016	<1	1	5	5	0	101	[NT]
Naphthalene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-016	109	1	102	78	27	109	[NT]
Surrogate toluene-d8	%		Org-016	98	1	98	98	0	98	[NT]
Surrogate 4-BFB	%		Org-016	92	1	97	95	2	102	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	186497-2
Date extracted	-			06/03/2018	1	06/03/2018	06/03/2018		06/03/2018	06/03/2018
Date analysed	-			06/03/2018	1	06/03/2018	06/03/2018		06/03/2018	06/03/2018
TRH C_{10} - C_{14}	µg/L	50	Org-003	<50	1	150	81	60	76	92
TRH C_{15} - C_{28}	µg/L	100	Org-003	<100	1	<100	<100	0	89	95
TRH C_{29} - C_{36}	µg/L	100	Org-003	<100	1	<100	<100	0	93	93
TRH >C_{10} - C_{16}	µg/L	50	Org-003	<50	1	120	66	58	76	92
TRH >C_{16} - C_{34}	µg/L	100	Org-003	<100	1	<100	<100	0	89	95
TRH >C_{34} - C_{40}	µg/L	100	Org-003	<100	1	<100	<100	0	93	93
Surrogate o-Terphenyl	%		Org-003	71	1	88	66	29	78	72

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	186497-2
Date extracted	-			06/03/2018	1	06/03/2018	06/03/2018		06/03/2018	06/03/2018
Date analysed	-			07/03/2018	1	07/03/2018	07/03/2018		07/03/2018	07/03/2018
Naphthalene	µg/L	1	Org-012	<1	1	<1	<1	0	75	68
Acenaphthylene	µg/L	1	Org-012	<1	1	<1	<1	0	[NT]	[NT]
Acenaphthene	µg/L	1	Org-012	<1	1	<1	<1	0	[NT]	[NT]
Fluorene	µg/L	1	Org-012	<1	1	<1	<1	0	76	73
Phenanthrene	µg/L	1	Org-012	<1	1	<1	<1	0	79	68
Anthracene	µg/L	1	Org-012	<1	1	<1	<1	0	[NT]	[NT]
Fluoranthene	µg/L	1	Org-012	<1	1	<1	<1	0	96	76
Pyrene	µg/L	1	Org-012	<1	1	<1	<1	0	102	81
Benzo(a)anthracene	µg/L	1	Org-012	<1	1	<1	<1	0	[NT]	[NT]
Chrysene	µg/L	1	Org-012	<1	1	<1	<1	0	79	71
Benzo(b,j+k)fluoranthene	µg/L	2	Org-012	<2	1	<2	<2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	1	Org-012	<1	1	<1	<1	0	86	78
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012	<1	1	<1	<1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	1	Org-012	<1	1	<1	<1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	1	Org-012	<1	1	<1	<1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	101	1	125	112	11	117	97

QUALITY CONTROL: OCP in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	186497-2
Date extracted	-			06/03/2018	1	06/03/2018	06/03/2018		06/03/2018	06/03/2018
Date analysed	-			06/03/2018	1	06/03/2018	06/03/2018		06/03/2018	06/03/2018
HCB	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
alpha-BHC	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	80	78
gamma-BHC	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
beta-BHC	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	75	78
Heptachlor	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	78	77
delta-BHC	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Aldrin	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	75	75
Heptachlor Epoxide	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	77	78
gamma-Chlordane	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
alpha-Chlordane	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Endosulfan I	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
pp-DDE	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	80	79
Dieldrin	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	85	85
Endrin	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	77	78
pp-DDD	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	82	81
Endosulfan II	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
pp-DDT	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Endrin Aldehyde	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	84	85
Methoxychlor	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	103	1	73	97	28	113	110

QUALITY CONTROL: OP Pesticides in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	186497-3
Date extracted	-			06/03/2018	1	06/03/2018	06/03/2018		06/03/2018	06/03/2018
Date analysed	-			06/03/2018	1	06/03/2018	06/03/2018		06/03/2018	06/03/2018
Azinphos-methyl (Guthion)	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Bromophos ethyl	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Chlorpyriphos	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	90	101
Chlorpyriphos-methyl	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Diazinon	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Dichlorovos	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	79	79
Dimethoate	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Ethion	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	95	108
Fenitrothion	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	110	105
Malathion	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	91	102
Parathion	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	108	105
Ronnel	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	102	115
Surrogate TCMX	%		Org-008	103	1	73	97	28	119	77

QUALITY CONTROL: PCBs in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	186497-3
Date extracted	-			06/03/2018	1	06/03/2018	06/03/2018		06/03/2018	06/03/2018
Date analysed	-			06/03/2018	1	06/03/2018	06/03/2018		06/03/2018	06/03/2018
Aroclor 1016	µg/L	2	Org-006	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1221	µg/L	2	Org-006	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1232	µg/L	2	Org-006	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1242	µg/L	2	Org-006	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1248	µg/L	2	Org-006	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1254	µg/L	2	Org-006	<2	1	<2	<2	0	98	101
Aroclor 1260	µg/L	2	Org-006	<2	1	<2	<2	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	103	1	73	97	28	119	77

QUALITY CONTROL: Total Phenolics in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			07/03/2018	1	07/03/2018	07/03/2018		07/03/2018	[NT]
Date analysed	-			07/03/2018	1	07/03/2018	07/03/2018		07/03/2018	[NT]
Total Phenolics (as Phenol)	mg/L	0.05	Inorg-031	<0.05	1	0.07	0.06	15	96	[NT]

QUALITY CONTROL: HM in water - dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			07/03/2018	[NT]	[NT]	[NT]	[NT]	07/03/2018	[NT]
Date analysed	-			07/03/2018	[NT]	[NT]	[NT]	[NT]	07/03/2018	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	94	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			06/03/2018	[NT]	[NT]	[NT]	[NT]	06/03/2018	[NT]
Date analysed	-			06/03/2018	[NT]	[NT]	[NT]	[NT]	06/03/2018	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: PFAS in Water Short Trace						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			07/03/2018	[NT]	[NT]	[NT]	[NT]	07/03/2018	[NT]
Date analysed	-			08/03/2018	[NT]	[NT]	[NT]	[NT]	08/03/2018	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.0002	Org-035	<0.0002	[NT]	[NT]	[NT]	[NT]	108	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.0002	Org-035	<0.0002	[NT]	[NT]	[NT]	[NT]	114	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.0002	Org-035	<0.0002	[NT]	[NT]	[NT]	[NT]	100	[NT]
6:2 FTS	µg/L	0.0004	Org-035	<0.0004	[NT]	[NT]	[NT]	[NT]	125	[NT]
8:2 FTS	µg/L	0.0004	Org-035	<0.0004	[NT]	[NT]	[NT]	[NT]	124	[NT]
Surrogate $^{13}C_8$ PFOS	%		Org-035E	104	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate $^{13}C_2$ PFOA	%		Org-035E_2	113	[NT]	[NT]	[NT]	[NT]	98	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

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.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

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 batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

CHAIN OF CUSTODY - Client

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Client: Consulting Earth Scientists
Contact Person: Samuel Inameti
Project Mgr: D. Hanvey
Sampler: S. Inameti/B. Acharya
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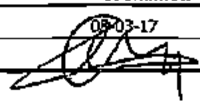
Client Project Name / Number / Site etc (ie report title): CES180204-SGC
PO No.:
Envirolab Quote No. :
Date results required: 3 Days TAT
Or choose: 3 day (8 March 2018) -
Note: Inform lab in advance if urgent turnaround is required - surcharges apply
Additional report format: esdat / equis /
Lab Comments:

Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	PFAS_WTR_Short	Combo 8	Sulphate	Chloride	VHC	TRH / BTEX	Comments: Provide as much information about the sample as you can
1 1	BH01		05-Mar	Water	x	x	x	x	x		
2 2	BH04		05-Mar	Water	x	x	x	x	x		
3 3	BH03		05-Mar	Water	x	x	x	x	x		
4 4	QAQC 1		05-Mar	Water	x	x			x		split into QAQC1 & QAQC2
— 5	~~QAQC 2~~		05-Mar	Water	x	x			x		Send to ALS
5 6	RIN		05-Mar	Water	x	x			x		
6 7	TB		05-Mar	Water						x	
7 8	TS		05-Mar							x	

Relinquished by (Company): CES
Print Name: S. Inameti
Date & Time: 05-03-17
Signature: 

Received by (Company): EL
Print Name: 117
Date & Time: 5/3/18 18:30
Signature:

Lab Use Only
Job number: 186497
Temperature: 14.2
Cooling: Ice / Ice pack / None
Security seal: Intact / Broken / None
TAT Req - SAME day / 1 / 2 / 3 / 4 / STD

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CERTIFICATE OF ANALYSIS 186597

Client Details

Client	Consulting Earth Scientists Pty Ltd
Attention	Bhagaban Acharya, Darren Hanvey
Address	Suite 3, Level 1, 55 Grandview Street, Pymble, NSW, 2073

Sample Details

Your Reference	**CES180204-SGS**
Number of Samples	4 Soil
Date samples received	06/03/2018
Date completed instructions received	06/03/2018

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	08/03/2018
Date of Issue	08/03/2018

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Asbestos Approved By

Analysed by Asbestos Approved Identifier: Paul Ching

Authorised by Asbestos Approved Signatory: Paul Ching

Results Approved By

Jeremy Faircloth, Organics Supervisor

Long Pham, Team Leader, Metals

Paul Ching, Senior Analyst

Priya Samarawickrama, Senior Chemist

Steven Luong, Senior Chemist

Authorised By

David Springer, General Manager

VHC's in soil			
Our Reference		186597-3	186597-4
Your Reference	UNITS	BH11 - Fill	BH11 - Nat
Depth		0.3-0.7m	1.3-1.6m
Date Sampled		06/03/18	06/03/18
Type of sample		Soil	Soil
Date extracted	-	07/03/2018	07/03/2018
Date analysed	-	07/03/2018	07/03/2018
Dichlorodifluoromethane	mg/kg	<1	<1
Chloromethane	mg/kg	<1	<1
Vinyl Chloride	mg/kg	<1	<1
Bromomethane	mg/kg	<1	<1
Chloroethane	mg/kg	<1	<1
Trichlorofluoromethane	mg/kg	<1	<1
1,1-Dichloroethene	mg/kg	<1	<1
trans-1,2-dichloroethene	mg/kg	<1	<1
1,1-dichloroethane	mg/kg	<1	<1
cis-1,2-dichloroethene	mg/kg	<1	<1
bromochloromethane	mg/kg	<1	<1
chloroform	mg/kg	<1	<1
2,2-dichloropropane	mg/kg	<1	<1
1,2-dichloroethane	mg/kg	<1	<1
1,1,1-trichloroethane	mg/kg	<1	<1
1,1-dichloropropene	mg/kg	<1	<1
carbon tetrachloride	mg/kg	<1	<1
dibromomethane	mg/kg	<1	<1
1,2-dichloropropane	mg/kg	<1	<1
trichloroethene	mg/kg	<1	<1
bromodichloromethane	mg/kg	<1	<1
trans-1,3-dichloropropene	mg/kg	<1	<1
cis-1,3-dichloropropene	mg/kg	<1	<1
1,1,2-trichloroethane	mg/kg	<1	<1
1,3-dichloropropane	mg/kg	<1	<1
dibromochloromethane	mg/kg	<1	<1
1,2-dibromoethane	mg/kg	<1	<1
tetrachloroethene	mg/kg	<1	<1
1,1,1,2-tetrachloroethane	mg/kg	<1	<1
chlorobenzene	mg/kg	<1	<1
bromoform	mg/kg	<1	<1
1,1,2,2-tetrachloroethane	mg/kg	<1	<1
1,2,3-trichloropropane	mg/kg	<1	<1
bromobenzene	mg/kg	<1	<1

VHC's in soil			
Our Reference		186597-3	186597-4
Your Reference	UNITS	BH11 - Fill	BH11 - Nat
Depth		0.3-0.7m	1.3-1.6m
Date Sampled		06/03/18	06/03/18
Type of sample		Soil	Soil
2-chlorotoluene	mg/kg	<1	<1
4-chlorotoluene	mg/kg	<1	<1
1,3-dichlorobenzene	mg/kg	<1	<1
1,4-dichlorobenzene	mg/kg	<1	<1
1,2-dichlorobenzene	mg/kg	<1	<1
1,2-dibromo-3-chloropropane	mg/kg	<1	<1
1,2,4-trichlorobenzene	mg/kg	<1	<1
hexachlorobutadiene	mg/kg	<1	<1
1,2,3-trichlorobenzene	mg/kg	<1	<1
Surrogate Dibromofluorometha	%	103	111
Surrogate aaa-Trifluorotoluene	%	91	92
Surrogate Toluene-d_8	%	97	98
Surrogate 4-Bromofluorobenzene	%	91	91

vTRH(C6-C10)/BTEXN in Soil				
Our Reference		186597-1	186597-2	186597-3
Your Reference	UNITS	BH10 - Fill	BH10 - Nat	BH11 - Fill
Depth		0.3-0.9m	1.2-1.5m	0.3-0.7m
Date Sampled		06/03/18	06/03/18	06/03/18
Type of sample		Soil	Soil	Soil
Date extracted	-	07/03/2018	07/03/2018	07/03/2018
Date analysed	-	07/03/2018	07/03/2018	07/03/2018
TRH C_6 - C_9	mg/kg	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	90	93	91

svTRH (C10-C40) in Soil				
Our Reference		186597-1	186597-2	186597-3
Your Reference	UNITS	BH10 - Fill	BH10 - Nat	BH11 - Fill
Depth		0.3-0.9m	1.2-1.5m	0.3-0.7m
Date Sampled		06/03/18	06/03/18	06/03/18
Type of sample		Soil	Soil	Soil
Date extracted	-	07/03/2018	07/03/2018	07/03/2018
Date analysed	-	08/03/2018	08/03/2018	08/03/2018
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	970	<100	390
TRH C_{29} - C_{36}	mg/kg	800	<100	410
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	1,600	<100	690
TRH >C_{34} -C_{40}	mg/kg	390	<100	190
Total +ve TRH (>C10-C40)	mg/kg	2,000	<50	880
Surrogate o-Terphenyl	%	#	89	121

PAHs in Soil				
Our Reference		186597-1	186597-2	186597-3
Your Reference	UNITS	BH10 - Fill	BH10 - Nat	BH11 - Fill
Depth		0.3-0.9m	1.2-1.5m	0.3-0.7m
Date Sampled		06/03/18	06/03/18	06/03/18
Type of sample		Soil	Soil	Soil
Date extracted	-	07/03/2018	07/03/2018	07/03/2018
Date analysed	-	07/03/2018	07/03/2018	07/03/2018
Naphthalene	mg/kg	2.3	<0.1	0.4
Acenaphthylene	mg/kg	2.8	<0.1	1.7
Acenaphthene	mg/kg	<1	<0.1	<0.1
Fluorene	mg/kg	2.9	<0.1	0.2
Phenanthrene	mg/kg	28	<0.1	7.8
Anthracene	mg/kg	12	<0.1	2.4
Fluoranthene	mg/kg	61	<0.1	16
Pyrene	mg/kg	61	<0.1	17
Benzo(a)anthracene	mg/kg	28	<0.1	8.7
Chrysene	mg/kg	32	<0.1	8.0
Benzo(b,j+k)fluoranthene	mg/kg	53	<0.2	15
Benzo(a)pyrene	mg/kg	37	<0.05	2.7
Indeno(1,2,3-c,d)pyrene	mg/kg	35	<0.1	6.0
Dibenzo(a,h)anthracene	mg/kg	6.3	<0.1	0.5
Benzo(g,h,i)perylene	mg/kg	35	<0.1	8.8
Total +ve PAH's	mg/kg	400	<0.05	95
Benzo(a)pyrene TEQ calc (zero)	mg/kg	56	<0.5	6.3
Benzo(a)pyrene TEQ calc(half)	mg/kg	56	<0.5	6.3
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	56	<0.5	6.3
Surrogate p-Terphenyl-d14	%	110	92	92

Organochlorine Pesticides in soil				
Our Reference		186597-1	186597-2	186597-3
Your Reference	UNITS	BH10 - Fill	BH10 - Nat	BH11 - Fill
Depth		0.3-0.9m	1.2-1.5m	0.3-0.7m
Date Sampled		06/03/18	06/03/18	06/03/18
Type of sample		Soil	Soil	Soil
Date extracted	-	07/03/2018	07/03/2018	07/03/2018
Date analysed	-	07/03/2018	07/03/2018	07/03/2018
HCB	mg/kg	<1	<0.1	<0.1
alpha-BHC	mg/kg	<1	<0.1	<0.1
gamma-BHC	mg/kg	<1	<0.1	<0.1
beta-BHC	mg/kg	<1	<0.1	<0.1
Heptachlor	mg/kg	<1	<0.1	<0.1
delta-BHC	mg/kg	<1	<0.1	<0.1
Aldrin	mg/kg	<1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<1	<0.1	<0.1
gamma-Chlordane	mg/kg	<1	<0.1	<0.1
alpha-chlordane	mg/kg	<1	<0.1	<0.1
Endosulfan I	mg/kg	<1	<0.1	<0.1
pp-DDE	mg/kg	<1	<0.1	<0.1
Dieldrin	mg/kg	<1	<0.1	<0.1
Endrin	mg/kg	<1	<0.1	<0.1
pp-DDD	mg/kg	<1	<0.1	<0.1
Endosulfan II	mg/kg	<1	<0.1	<0.1
pp-DDT	mg/kg	<1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<1	<0.1	<0.1
Methoxychlor	mg/kg	<1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<1	<0.1	<0.1
Surrogate TCMX	%	80	84	73

Organophosphorus Pesticides				
Our Reference		186597-1	186597-2	186597-3
Your Reference	UNITS	BH10 - Fill	BH10 - Nat	BH11 - Fill
Depth		0.3-0.9m	1.2-1.5m	0.3-0.7m
Date Sampled		06/03/18	06/03/18	06/03/18
Type of sample		Soil	Soil	Soil
Date extracted	-	07/03/2018	07/03/2018	07/03/2018
Date analysed	-	07/03/2018	07/03/2018	07/03/2018
Azinphos-methyl (Guthion)	mg/kg	<1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<1	<0.1	<0.1
Chlorpyriphos	mg/kg	<1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<1	<0.1	<0.1
Diazinon	mg/kg	<1	<0.1	<0.1
Dichlorvos	mg/kg	<1	<0.1	<0.1
Dimethoate	mg/kg	<1	<0.1	<0.1
Ethion	mg/kg	<1	<0.1	<0.1
Fenitrothion	mg/kg	<1	<0.1	<0.1
Malathion	mg/kg	<1	<0.1	<0.1
Parathion	mg/kg	<1	<0.1	<0.1
Ronnel	mg/kg	<1	<0.1	<0.1
Surrogate TCMX	%	80	84	73

PCBs in Soil				
Our Reference		186597-1	186597-2	186597-3
Your Reference	UNITS	BH10 - Fill	BH10 - Nat	BH11 - Fill
Depth		0.3-0.9m	1.2-1.5m	0.3-0.7m
Date Sampled		06/03/18	06/03/18	06/03/18
Type of sample		Soil	Soil	Soil
Date extracted	-	07/03/2018	07/03/2018	07/03/2018
Date analysed	-	07/03/2018	07/03/2018	07/03/2018
Aroclor 1016	mg/kg	<1	<0.1	<0.5
Aroclor 1221	mg/kg	<1	<0.1	<0.5
Aroclor 1232	mg/kg	<1	<0.1	<0.5
Aroclor 1242	mg/kg	<1	<0.1	<0.5
Aroclor 1248	mg/kg	<1	<0.1	<0.5
Aroclor 1254	mg/kg	<1	<0.1	<0.5
Aroclor 1260	mg/kg	<1	<0.1	<0.5
Total +ve PCBs (1016-1260)	mg/kg	<1	<0.1	<0.5
Surrogate TCLMX	%	80	84	73

Acid Extractable metals in soil				
Our Reference		186597-1	186597-2	186597-3
Your Reference	UNITS	BH10 - Fill	BH10 - Nat	BH11 - Fill
Depth		0.3-0.9m	1.2-1.5m	0.3-0.7m
Date Sampled		06/03/18	06/03/18	06/03/18
Type of sample		Soil	Soil	Soil
Date prepared	-	07/03/2018	07/03/2018	07/03/2018
Date analysed	-	08/03/2018	08/03/2018	08/03/2018
Arsenic	mg/kg	<4	<4	490
Cadmium	mg/kg	<0.4	<0.4	0.7
Chromium	mg/kg	6	<1	12
Copper	mg/kg	47	<1	60
Lead	mg/kg	89	1	280
Mercury	mg/kg	0.3	<0.1	0.9
Nickel	mg/kg	6	<1	8
Zinc	mg/kg	110	9	500

Misc Soil - Inorg				
Our Reference		186597-1	186597-2	186597-3
Your Reference	UNITS	BH10 - Fill	BH10 - Nat	BH11 - Fill
Depth		0.3-0.9m	1.2-1.5m	0.3-0.7m
Date Sampled		06/03/18	06/03/18	06/03/18
Type of sample		Soil	Soil	Soil
Date prepared	-	07/03/2018	07/03/2018	07/03/2018
Date analysed	-	07/03/2018	07/03/2018	07/03/2018
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5

Moisture					
Our Reference		186597-1	186597-2	186597-3	186597-4
Your Reference	UNITS	BH10 - Fill	BH10 - Nat	BH11 - Fill	BH11 - Nat
Depth		0.3-0.9m	1.2-1.5m	0.3-0.7m	1.3-1.6m
Date Sampled		06/03/18	06/03/18	06/03/18	06/03/18
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	07/03/2018	07/03/2018	07/03/2018	07/03/2018
Date analysed	-	08/03/2018	08/03/2018	08/03/2018	08/03/2018
Moisture	%	12	5.7	12	15

Asbestos ID - soils NEPM - ASB-001			
Our Reference		186597-1	186597-3
Your Reference	UNITS	BH10 - Fill	BH11 - Fill
Depth		0.3-0.9m	0.3-0.7m
Date Sampled		06/03/18	06/03/18
Type of sample		Soil	Soil
Date analysed	-	08/03/2018	08/03/2018
Sample mass tested	g	1,588.3	1,041.99
Sample Description	-	Brown sandy soil & rocks	Brown sandy soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected
Trace Analysis	-	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–
FA and AF Estimation*	g	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.

Method ID	Methodology Summary
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing 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. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
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. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: VHC's in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	186597-3
Date extracted	-			07/03/2018	3	07/03/2018	07/03/2018		07/03/2018	07/03/2018
Date analysed	-			07/03/2018	3	07/03/2018	07/03/2018		07/03/2018	07/03/2018
Dichlorodifluoromethane	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
Chloromethane	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
Bromomethane	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
Chloroethane	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
1,1-Dichloroethene	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	mg/kg	1	Org-014	<1	3	<1	<1	0	91	70
cis-1,2-dichloroethene	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
bromochloromethane	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
chloroform	mg/kg	1	Org-014	<1	3	<1	<1	0	92	72
2,2-dichloropropane	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	mg/kg	1	Org-014	<1	3	<1	<1	0	95	92
1,1,1-trichloroethane	mg/kg	1	Org-014	<1	3	<1	<1	0	94	92
1,1-dichloropropene	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
carbon tetrachloride	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
dibromomethane	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
trichloroethene	mg/kg	1	Org-014	<1	3	<1	<1	0	81	78
bromodichloromethane	mg/kg	1	Org-014	<1	3	<1	<1	0	101	99
trans-1,3-dichloropropene	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
1,3-dichloropropane	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
dibromochloromethane	mg/kg	1	Org-014	<1	3	<1	<1	0	102	101
1,2-dibromoethane	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
tetrachloroethene	mg/kg	1	Org-014	<1	3	<1	<1	0	94	91
1,1,1,2-tetrachloroethane	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
chlorobenzene	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
bromoform	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
bromobenzene	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
2-chlorotoluene	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
4-chlorotoluene	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VHC's in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	186597-3
1,2-dibromo-3-chloropropane	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
hexachlorobutadiene	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluorometha	%		Org-014	126	3	103	88	16	111	90
Surrogate aaa-Trifluorotoluene	%		Org-014	103	3	91	93	2	95	90
Surrogate Toluene-d_8	%		Org-014	113	3	97	96	1	97	97
Surrogate 4-Bromofluorobenzene	%		Org-014	91	3	91	91	0	85	99

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	186597-3
Date extracted	-			07/03/2018	1	07/03/2018	07/03/2018		07/03/2018	07/03/2018
Date analysed	-			07/03/2018	1	07/03/2018	07/03/2018		07/03/2018	07/03/2018
TRH C_6 - C_9	mg/kg	25	Org-016	<25	1	<25	<25	0	85	90
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	1	<25	<25	0	85	90
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	87	84
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	90	86
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	85	88
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	81	95
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	78	88
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	103	1	90	86	5	95	90

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	186597-3
Date extracted	-			07/03/2018	1	07/03/2018	07/03/2018		07/03/2018	07/03/2018
Date analysed	-			08/03/2018	1	08/03/2018	08/03/2018		08/03/2018	08/03/2018
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	1	<50	<50	0	74	77
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	1	970	1200	21	76	#
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	1	800	1100	32	92	#
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	1	<50	<50	0	74	77
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	1	1600	2000	22	76	#
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	1	390	570	38	92	#
Surrogate o-Terphenyl	%		Org-003	93	1	#	#		103	121

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	186597-3
Date extracted	-			07/03/2018	1	07/03/2018	07/03/2018		07/03/2018	07/03/2018
Date analysed	-			07/03/2018	1	07/03/2018	07/03/2018		07/03/2018	07/03/2018
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	2.3	2.1	9	88	73
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	1	2.8	3.6	25	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	1	<1	<1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	1	2.9	2.3	23	88	89
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	28	25	11	90	#
Anthracene	mg/kg	0.1	Org-012	<0.1	1	12	10	18	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	1	61	70	14	90	#
Pyrene	mg/kg	0.1	Org-012	<0.1	1	61	80	27	94	#
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	28	35	22	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	32	39	20	97	#
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	53	63	17	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	37	44	17	96	#
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	1	35	42	18	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	1	6.3	7.4	16	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	1	35	43	21	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	96	1	110	88	22	111	101

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	186597-3
Date extracted	-			07/03/2018	1	07/03/2018	07/03/2018		07/03/2018	07/03/2018
Date analysed	-			07/03/2018	1	07/03/2018	07/03/2018		07/03/2018	07/03/2018
HCB	mg/kg	0.1	Org-005	<0.1	1	<1	<1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	1	<1	<1	0	84	78
gamma-BHC	mg/kg	0.1	Org-005	<0.1	1	<1	<1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	1	<1	<1	0	81	91
Heptachlor	mg/kg	0.1	Org-005	<0.1	1	<1	<1	0	75	74
delta-BHC	mg/kg	0.1	Org-005	<0.1	1	<1	<1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	1	<1	<1	0	81	83
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	1	<1	<1	0	84	85
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	1	<1	<1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	1	<1	<1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	1	<1	<1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	1	<1	<1	0	91	91
Dieldrin	mg/kg	0.1	Org-005	<0.1	1	<1	<1	0	95	102
Endrin	mg/kg	0.1	Org-005	<0.1	1	<1	<1	0	84	89
pp-DDD	mg/kg	0.1	Org-005	<0.1	1	<1	<1	0	95	100
Endosulfan II	mg/kg	0.1	Org-005	<0.1	1	<1	<1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	1	<1	<1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	1	<1	<1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	1	<1	<1	0	82	88
Methoxychlor	mg/kg	0.1	Org-005	<0.1	1	<1	<1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	87	1	80	70	13	99	99

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	186597-3
Date extracted	-			07/03/2018	1	07/03/2018	07/03/2018		07/03/2018	07/03/2018
Date analysed	-			07/03/2018	1	07/03/2018	07/03/2018		07/03/2018	07/03/2018
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	1	<1	<1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	1	<1	<1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	1	<1	<1	0	88	102
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	1	<1	<1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	1	<1	<1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	1	<1	<1	0	96	86
Dimethoate	mg/kg	0.1	Org-008	<0.1	1	<1	<1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	1	<1	<1	0	92	95
Fenitrothion	mg/kg	0.1	Org-008	<0.1	1	<1	<1	0	106	105
Malathion	mg/kg	0.1	Org-008	<0.1	1	<1	<1	0	93	107
Parathion	mg/kg	0.1	Org-008	<0.1	1	<1	<1	0	114	106
Ronnel	mg/kg	0.1	Org-008	<0.1	1	<1	<1	0	100	98
Surrogate TCMX	%		Org-008	87	1	80	70	13	80	82

QUALITY CONTROL: PCBs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	186597-3
Date extracted	-			07/03/2018	1	07/03/2018	07/03/2018		07/03/2018	07/03/2018
Date analysed	-			07/03/2018	1	07/03/2018	07/03/2018		07/03/2018	07/03/2018
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<1	<1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<1	<1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<1	<1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<1	<1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<1	<1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<1	<1	0	99	116
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<1	<1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	87	1	80	70	13	80	82

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	186597-3
Date prepared	-			07/03/2018	1	07/03/2018	07/03/2018		07/03/2018	07/03/2018
Date analysed	-			08/03/2018	1	08/03/2018	08/03/2018		08/03/2018	08/03/2018
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	119	#
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	111	99
Chromium	mg/kg	1	Metals-020	<1	1	6	5	18	117	100
Copper	mg/kg	1	Metals-020	<1	1	47	48	2	117	107
Lead	mg/kg	1	Metals-020	<1	1	89	100	12	115	105
Mercury	mg/kg	0.1	Metals-021	<0.1	1	0.3	0.4	29	108	107
Nickel	mg/kg	1	Metals-020	<1	1	6	5	18	117	101
Zinc	mg/kg	1	Metals-020	<1	1	110	130	17	113	#

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			07/03/2018	[NT]	[NT]	[NT]	[NT]	07/03/2018	[NT]
Date analysed	-			07/03/2018	[NT]	[NT]	[NT]	[NT]	07/03/2018	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	[NT]	[NT]	100	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

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.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

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 batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

PAHs in Soil - PQL has been raised due to the high concentration of analytes in sample 1, resulting in the sample requiring dilution.
Percent recovery is not possible to report for the matrix spike as the high concentration of analytes in sample 3 have caused interference.

Acid Extractable Metals in Soil:
Percent recovery is not possible to report due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.
This is reported outside our scope of NATA accreditation.

Organochlorine Pesticides and OP in soil - PQL has been raised due to interference from analytes(other than those being tested) in sample 1.

PCBs in Soil - PQL has been raised due to interference from analytes (other than those being tested) in samples 1 and 3.

svTRH (C10-C40) in Soil (sample 1,1d) - # Percent recovery is not possible to report as the high concentration of analytes in the sample/s have caused interference.

Aileen Hie

From:	Darren Hanvey <darren.hanvey@consultingearth.com.au>
Sent:	Friday, 9 March 2018 3:25 PM
To:	Ken Nguyen; SydneyMailbox
Cc:	tristan.goodbody@consultingearth.com.au; Bowen Ren
Subject:	CES180204, Additional Analyses

Ken, can you please perform the following TCLP testing on these samples (already at Envirolab) on a 48 hour turnaround;

Can you please issue results by Tuesday COB.

Sample ID	Batch	TCLP	
BH3_0.3-0.6	186116	Metals	
BH2_0.3-0.6	186116	PAHs, Lead	
BH1_0.4-0.8	186212	PAHs, Lead	
BH4_0.3-0.8	186295	Metals	
BH6_0.3-0.8	186376	Metals, PAHs	
BH5_0.3-0.9	186376	Metals	
BH7_0.3-0.9	186376	PAHs, Metals	
BH8_0.3-0.9	186376	PAHs, Metals, PFAS	
BH9_0.3-0.9	186376	PAHs, Metals	
BH10_0.3-0.9	186597	PAHs	1
BH11_0.3-0.7	186597	PAHs, Metals	3

ELS: 186597-A
Rec: 9/3/18
TAT: 2 DAYS
Afz

Can you also please perform the following analyses (Samples at Envirolab):

- Batch 186597, Envirolab Sample ID 4, CES Sample ID BH11-Nat_1.3-1.6, PAHs, Metals

All results reported by Tuesday COB (48 hour analyses).

Thanks,

Darren Hanvey
Principal Geo-Environmental Engineer
Certified Practitioner – Site Assessment and Management

CONSULTING EARTH SCIENTISTS

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CERTIFICATE OF ANALYSIS 186597-A

Client Details	
Client	Consulting Earth Scientists Pty Ltd
Attention	Tristan Goodbody, Darren Hanvey
Address	Suite 3, Level 1, 55 Grandview Street, Pymble, NSW, 2073

Sample Details	
Your Reference	**CES180204-SGS**
Number of Samples	4 Soil
Date samples received	06/03/2018
Date completed instructions received	09/03/2018

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.

Report Details	
Date results requested by	13/03/2018
Date of Issue	13/03/2018

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Results Approved By
Jeremy Faircloth, Organics Supervisor
Long Pham, Team Leader, Metals

Authorised By

David Springer, General Manager

PAHs in Soil		
Our Reference		186597-A-4
Your Reference	UNITS	BH11 - Nat
Depth		1.3-1.6m
Date Sampled		06/03/18
Type of sample		Soil
Date extracted	-	12/03/2018
Date analysed	-	12/03/2018
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate p-Terphenyl-d14	%	113

Acid Extractable metals in soil		
Our Reference		186597-A-4
Your Reference	UNITS	BH11 - Nat
Depth		1.3-1.6m
Date Sampled		06/03/18
Type of sample		Soil
Date prepared	-	12/03/2018
Date analysed	-	12/03/2018
Arsenic	mg/kg	820
Cadmium	mg/kg	<0.4
Chromium	mg/kg	11
Copper	mg/kg	2
Lead	mg/kg	14
Mercury	mg/kg	<0.1
Nickel	mg/kg	1
Zinc	mg/kg	46

Metals in TCLP USEPA1311			
Our Reference		186597-A-1	186597-A-3
Your Reference	UNITS	BH10 - Fill	BH11 - Fill
Depth		0.3-0.9m	0.3-0.7m
Date Sampled		06/03/18	06/03/18
Type of sample		Soil	Soil
Date extracted	-	11/03/2018	12/03/2018
Date analysed	-	12/03/2018	12/03/2018
pH of soil for fluid# determ.	pH units	9.8	9.4
pH of soil TCLP (after HCl)	pH units	2.0	1.8
Extraction fluid used	-	1	1
pH of final Leachate	pH units	5.2	5.4
Arsenic in TCLP	mg/L	[NA]	2.8
Cadmium in TCLP	mg/L	[NA]	<0.01
Chromium in TCLP	mg/L	[NA]	<0.01
Copper in TCLP	mg/L	[NA]	0.05
Lead in TCLP	mg/L	[NA]	0.33
Mercury in TCLP	mg/L	[NA]	<0.0005
Nickel in TCLP	mg/L	[NA]	0.03
Zinc in TCLP	mg/L	[NA]	4.8

PAHs in TCLP (USEPA 1311)			
Our Reference		186597-A-1	186597-A-3
Your Reference	UNITS	BH10 - Fill	BH11 - Fill
Depth		0.3-0.9m	0.3-0.7m
Date Sampled		06/03/18	06/03/18
Type of sample		Soil	Soil
Date extracted	-	12/03/2018	12/03/2018
Date analysed	-	12/03/2018	12/03/2018
Naphthalene in TCLP	mg/L	<0.001	<0.001
Acenaphthylene in TCLP	mg/L	<0.001	<0.001
Acenaphthene in TCLP	mg/L	<0.001	<0.001
Fluorene in TCLP	mg/L	<0.001	<0.001
Phenanthrene in TCLP	mg/L	0.007	<0.001
Anthracene in TCLP	mg/L	0.002	<0.001
Fluoranthene in TCLP	mg/L	0.006	<0.001
Pyrene in TCLP	mg/L	0.005	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001	<0.001
Chrysene in TCLP	mg/L	<0.001	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001	<0.001
Total +ve PAH's	mg/L	0.020	NIL (+)VE
Surrogate p-Terphenyl-d14	%	101	79

Method ID	Methodology Summary
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004.
Metals-020	Determination of various metals by ICP-AES.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-012	Leachates are extracted with Dichloromethane and analysed by GC-MS.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. ‘EQ PQL’values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. ‘EQ zero’values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. ‘EQ half PQL’values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Date analysed	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	117	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	[NT]	[NT]	113	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	114	[NT]	[NT]	[NT]	[NT]	116	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			12/03/2018	4	12/03/2018	12/03/2018		12/03/2018	[NT]
Date analysed	-			12/03/2018	4	12/03/2018	12/03/2018		12/03/2018	[NT]
Arsenic	mg/kg	4	Metals-020	<4	4	820	770	6	117	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	4	<0.4	<0.4	0	110	[NT]
Chromium	mg/kg	1	Metals-020	<1	4	11	11	0	116	[NT]
Copper	mg/kg	1	Metals-020	<1	4	2	2	0	115	[NT]
Lead	mg/kg	1	Metals-020	<1	4	14	12	15	114	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	4	<0.1	<0.1	0	103	[NT]
Nickel	mg/kg	1	Metals-020	<1	4	1	2	67	113	[NT]
Zinc	mg/kg	1	Metals-020	<1	4	46	40	14	111	[NT]

QUALITY CONTROL: Metals in TCLP USEPA1311						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			12/03/2018	3	12/03/2018	12/03/2018		12/03/2018	[NT]
Date analysed	-			12/03/2018	3	12/03/2018	12/03/2018		12/03/2018	[NT]
Arsenic in TCLP	mg/L	0.05	Metals-020 ICP-AES	<0.05	3	2.8	2.8	0	111	[NT]
Cadmium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	3	<0.01	<0.01	0	110	[NT]
Chromium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	3	<0.01	<0.01	0	110	[NT]
Copper in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	3	0.05	0.05	0	113	[NT]
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	3	0.33	0.33	0	111	[NT]
Mercury in TCLP	mg/L	0.0005	Metals-021 CV-AAS	<0.0005	3	<0.0005	<0.0005	0	93	[NT]
Nickel in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	3	0.03	0.03	0	110	[NT]
Zinc in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	3	4.8	4.8	0	108	[NT]

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Date analysed	-			12/03/2018	[NT]	[NT]	[NT]	[NT]	12/03/2018	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	87	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	90	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	90	[NT]
Anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	93	[NT]
Pyrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	95	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	96	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	93	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	96	[NT]	[NT]	[NT]	[NT]	118	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

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.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

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 batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

CHAIN OF CUSTODY - Client

19781

ENVIROLAB GROUP - National Phone number 1300 42 43 44

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7 Palmerton Road Windsor Gardens, SA 5067
Ph 0406 350 706 / adelaide@envirolab.com.au

Client: CES
Contact Person: Bhagaban Acharya
Project Mgr: D. Hanvex
Sampler: Bhagaban Acharya
Address:

Phone: **Mob:**
Fax: Darren.Hanvex@consultingearth.com.au
Email: b.acharya@consultingearth.com.au

Client Project Name / Number / Site etc (ie report title):
PO No.: CES180204-SGS
Envirolab Quote No. :
Date results required: 8 March 2018 (Thursday COB)
Or choose: standard / same day / 1 day / 2 day / 3 day
Note: Inform lab in advance if urgent turnaround is required - surcharges apply
Lab comments:

Sample information					Tests Required				Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Combo 8	NEPM Asbestos	PFAS	VHC	Provide as much information about the sample as you can
1	BH10 - Fill	(0.3-0.9)m	6/3/18	Soil	X	X			
2	BH10 - Nat	(1.2-1.5)m	6/3/18	"	X				
3	BH11 - Fill	(0.3-0.7)m	6/3/18	"	X	X		X	
4	BH11 - Nat	(1.3-1.6)m	6/3/18	"				X	

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 186597
Date Received: 06.03.18
Time Received: 16:15
Received by: JE
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished by (company): CES
Print Name: Bhagaban Acharya
Date & Time: 06/03/18, 4:15PM
Signature: Bhagaban

Received by (company): ELS
Print Name: MT
Date & Time: 6/3/18 16:15
Signature:

Lab use only:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: 3.5°C **(if applicable)**
Transported by: Hand delivered / courier

White - Lab copy / Blue - Client copy / Pink - Retain in Book Page No:

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1806508**	Page	: 1 of 7
Client	: **CONSULTING EARTH SCIENTISTS**	Laboratory	: Environmental Division Sydney
Contact	: Mr Darren Hanvey	Contact	: Customer Services ES
Address	: Suite 3, Level 1 55-65 Grandview Street PYMBLE NSW, AUSTRALIA 2073	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 8569 2200	Telephone	: +61-2-8784 8555
Project	: CES180204	Date Samples Received	: 01-Mar-2018 04:50
Order number	: ----	Date Analysis Commenced	: 05-Mar-2018
C-O-C number	: 19778	Issue Date	: 09-Mar-2018 16:23
Sampler	: Miles Thompson		
Site	: ----		
Quote number	: SYBQ/521/16		
No. of samples received	: 1		
No. of samples analysed	: 1		

ilac-MRA NATA

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

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

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QAQC 2	----	----	----	----
			Client sampling date / time	28-Feb-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1806508-001	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**27.9**	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**3**	----	----	----	----
Copper	7440-50-8	5	mg/kg	**6**	----	----	----	----
Lead	7439-92-1	5	mg/kg	**23**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**2**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**19**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	**0.1**	----	----	----	----
EP035G: Total Phenol by Discrete Analyser								
Phenols (Total)	----	1	mg/kg	<1	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QAQC 2	----	----	----	----
			Client sampling date / time	28-Feb-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1806508-001	--------	--------	--------	--------
				Result	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued								
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	----	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	----	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	----	----	----	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	----	----	----	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	----	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	----	----	----	----
Malathion	121-75-5	0.05	mg/kg	<0.05	----	----	----	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	----	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	----	----	----	----
Parathion	56-38-2	0.2	mg/kg	<0.2	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	----	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	----	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	----	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	----	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	----	----	----	----
Ethion	563-12-2	0.05	mg/kg	<0.05	----	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	----	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QAQC 2	----	----	----	----
			Client sampling date / time	28-Feb-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1806508-001	--------	--------	--------	--------
				Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QAQC 2	----	----	----	----
			Client sampling date / time	28-Feb-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1806508-001	--------	--------	--------	--------
				Result	----	----	----	----
EP080: BTEXN - Continued								
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	----	----
^ Total Xylenes	----	0.5	mg/kg	<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	**95.7**	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**95.4**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**86.6**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**105**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**89.3**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**74.9**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**97.7**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	**85.3**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	**114**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**103**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	**119**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	**103**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

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

ENVIROLAB GROUP

CHAIN OF CUSTODY - Client

19778

ENVIROLAB GROUP - National Phone number 1300 42 43 44

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Client: Consulting Earth Scientists
Contact Person: Miles Thompson
Project Mgr: Darren Harvey
Sampler: M.T
Address:
Phone: **Mob:** 0497018918
Fax:
Email: Miles.Thompson@consultingearth.com.au

Client Project Name / Number / Site etc (ie report title): CES180204
PO No.:
Envirolab Quote No. :
Date results required:
Or choose: standard / same day / 1 day / 2 day / 3 day
Note: Inform lab in advance if urgent turnaround is required - surcharges apply
Lab comments:

Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Combo 8	PFAS	TRH/BTEX	NEPM Asbestos	UHC	Comments: Provide as much information about the sample as you can
1	R1			Water	X	X				
2,3	TB/TS						X			
4	QAQC1			Soil	X					
(1) –	QAQC 2				X					Forward to ALS
5	BH1(0.4-0.8)m				X	X		X	X	
6	BH2(1.2-1.5)m				X					

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

Job No: 186512
Date Received: 28/2/18
Time Received: 17:45
Received by: MT
Temp: Cool/Ambient 6.0
Cooling: Ice/Icepack
Security: Intact/Broken/None

Environmental Division
Sydney
Work Order Reference
ES1806508

Telephone : +61-2-8784 8555

Relinquished by (company): CES ELS
Print Name: Bhagaban Acharya Jack Emblen
Date & Time: 28/02/2018 01/03/18 12:35
Signature:

Received by (company): ELS
Print Name: MT
Date & Time: 28/2/18 17:45
Signature:

Lab use only:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: 6.0 **(if applicable)**
Transported by: Hand delivered / courier

Rec: Sos 1/3/18 1650 9.8c

White - Lab copy / Blue - Client copy / Pink - Retain in Book

Page No:

CERTIFICATE OF ANALYSIS

Work Order	: **ES1806886**	Page	: 1 of 9
Client	: **CONSULTING EARTH SCIENTISTS**	Laboratory	: Environmental Division Sydney
Contact	: Mr Darren Hanvey	Contact	: Customer Services ES
Address	: Suite 3, Level 1 55-65 Grandview Street PYMBLE NSW, AUSTRALIA 2073	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 8569 2200	Telephone	: +61-2-8784 8555
Project	: CES180204-SGC	Date Samples Received	: 06-Mar-2018 17:15
Order number	: ----	Date Analysis Commenced	: 07-Mar-2018
C-O-C number	: ----	Issue Date	: 09-Mar-2018 18:23
Sampler	: S. INAMETI/B.ACHARYA		
Site	: ----		
Quote number	: SYBQ/521/16		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini		Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

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

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EG035: Positive Hg result for ES1806886 #1 has been confirmed by reanalysis
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: **WATER**
(Matrix: **WATER**)

			Client sample ID	QAQC2	----	----	----	----
			Client sampling date / time	05-Mar-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1806886-001	--------	--------	--------	--------
				Result	----	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	**0.029**	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	**0.0013**	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	**0.442**	----	----	----	----
Copper	7440-50-8	0.001	mg/L	**0.499**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	**0.090**	----	----	----	----
Lead	7439-92-1	0.001	mg/L	**0.449**	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	**1.08**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	**0.0013**	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	1	µg/L	<1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.5	µg/L	<0.5	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	----	----	----	----
beta-BHC	319-85-7	0.5	µg/L	<0.5	----	----	----	----
gamma-BHC	58-89-9	0.5	µg/L	<0.5	----	----	----	----
delta-BHC	319-86-8	0.5	µg/L	<0.5	----	----	----	----
Heptachlor	76-44-8	0.5	µg/L	<0.5	----	----	----	----
Aldrin	309-00-2	0.5	µg/L	<0.5	----	----	----	----
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	----	----	----	----
trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	----	----	----	----
alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	----	----	----	----
cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	----	----	----	----
Dieldrin	60-57-1	0.5	µg/L	<0.5	----	----	----	----
4.4`-DDE	72-55-9	0.5	µg/L	<0.5	----	----	----	----
Endrin	72-20-8	0.5	µg/L	<0.5	----	----	----	----
beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	----	----	----	----
4.4`-DDD	72-54-8	0.5	µg/L	<0.5	----	----	----	----
Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	----	----	----	----
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	----	----	----	----
4.4`-DDT	50-29-3	2.0	µg/L	<2.0	----	----	----	----
Endrin ketone	53494-70-5	0.5	µg/L	<0.5	----	----	----	----
Methoxychlor	72-43-5	2.0	µg/L	<2.0	----	----	----	----
^ Total Chlordane (sum)	----	0.5	µg/L	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	QAQC2	----	----	----	----
			Client sampling date / time	05-Mar-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1806886-001	--------	--------	--------	--------
				Result	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued								
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/L	<0.5	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.5	µg/L	<0.5	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.5	µg/L	<0.5	----	----	----	----
Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	----	----	----	----
Monocrotophos	6923-22-4	2.0	µg/L	<2.0	----	----	----	----
Dimethoate	60-51-5	0.5	µg/L	<0.5	----	----	----	----
Diazinon	333-41-5	0.5	µg/L	<0.5	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	----	----	----	----
Parathion-methyl	298-00-0	2.0	µg/L	<2.0	----	----	----	----
Malathion	121-75-5	0.5	µg/L	<0.5	----	----	----	----
Fenthion	55-38-9	0.5	µg/L	<0.5	----	----	----	----
Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	----	----	----	----
Parathion	56-38-2	2.0	µg/L	<2.0	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	----	----	----	----
Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	----	----	----	----
Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	----	----	----	----
Fenamiphos	22224-92-6	0.5	µg/L	<0.5	----	----	----	----
Prothiofos	34643-46-4	0.5	µg/L	<0.5	----	----	----	----
Ethion	563-12-2	0.5	µg/L	<0.5	----	----	----	----
Carbophenothion	786-19-6	0.5	µg/L	<0.5	----	----	----	----
Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	----	----	----	----
EP074D: Fumigants								
2.2-Dichloropropane	594-20-7	5	µg/L	<5	----	----	----	----
1.2-Dichloropropane	78-87-5	5	µg/L	<5	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	----	----	----	----
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	----	----	----	----
Chloromethane	74-87-3	50	µg/L	<50	----	----	----	----
Vinyl chloride	75-01-4	50	µg/L	<50	----	----	----	----
Bromomethane	74-83-9	50	µg/L	<50	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	QAQC2	----	----	----	----
			Client sampling date / time	05-Mar-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1806886-001	--------	--------	--------	--------
				Result	----	----	----	----
EP074E: Halogenated Aliphatic Compounds - Continued								
Chloroethane	75-00-3	50	µg/L	<50	----	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L	<50	----	----	----	----
1.1-Dichloroethene	75-35-4	5	µg/L	<5	----	----	----	----
Iodomethane	74-88-4	5	µg/L	<5	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	----	----	----	----
1.1-Dichloroethane	75-34-3	5	µg/L	<5	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	----	----	----	----
1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	----	----	----	----
1.1-Dichloropropylene	563-58-6	5	µg/L	<5	----	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L	<5	----	----	----	----
1.2-Dichloroethane	107-06-2	5	µg/L	<5	----	----	----	----
Trichloroethene	79-01-6	5	µg/L	<5	----	----	----	----
Dibromomethane	74-95-3	5	µg/L	<5	----	----	----	----
1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	----	----	----	----
1.3-Dichloropropane	142-28-9	5	µg/L	<5	----	----	----	----
Tetrachloroethene	127-18-4	5	µg/L	<5	----	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	----	----	----	----
1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	----	----	----	----
Pentachloroethane	76-01-7	5	µg/L	<5	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	----	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L	<5	----	----	----	----
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	5	µg/L	<5	----	----	----	----
Bromobenzene	108-86-1	5	µg/L	<5	----	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L	<5	----	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L	<5	----	----	----	----
1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	----	----	----	----
1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	----	----	----	----
1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	QAQC2	----	----	----	----
			Client sampling date / time	05-Mar-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1806886-001	--------	--------	--------	--------
				Result	----	----	----	----
EP074G: Trihalomethanes								
Chloroform	67-66-3	5	µg/L	<5	----	----	----	----
Bromodichloromethane	75-27-4	5	µg/L	<5	----	----	----	----
Dibromochloromethane	124-48-1	5	µg/L	<5	----	----	----	----
Bromoform	75-25-2	5	µg/L	<5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	**160**	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	**120**	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	**120**	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	**400**	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	**290**	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	QAQC2	----	----	----	----
			Client sampling date / time	05-Mar-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1806886-001	--------	--------	--------	--------
				Result	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued								
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	**6**	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	**70**	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	**35**	----	----	----	----
^ Total Xylenes	----	2	µg/L	**105**	----	----	----	----
^ Sum of BTEX	----	1	µg/L	**111**	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	QAQC2	----	----	----	----
			Client sampling date / time	05-Mar-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1806886-001	--------	--------	--------	--------
				Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	----	----	----	----
EP231P: PFAS Sums								
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	1	%	**84.7**	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.5	%	**76.3**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.5	%	**67.1**	----	----	----	----
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	5	%	**88.4**	----	----	----	----
Toluene-D8	2037-26-5	5	%	**97.6**	----	----	----	----
4-Bromofluorobenzene	460-00-4	5	%	**99.3**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1.0	%	**19.6**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%	**48.5**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%	**62.7**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1.0	%	**61.4**	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%	**73.9**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%	**88.5**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**102**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**102**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**106**	----	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**104**	----	----	----	----
13C8-PFOA	----	0.02	%	**117**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	29	129
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	67	111
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	67	111
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	78	133
Toluene-D8	2037-26-5	79	129
4-Bromofluorobenzene	460-00-4	81	124
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	130
13C8-PFOA	----	60	130

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 424 344

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Client: Consulting Earth Scientists
Contact Person: Samuel Inameti
Project Mgr: D. Hanvey
Sampler: S. Inameti/B. Acharya
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Phone: Mob: 0439 261 637
Email: samuel.inameti@consultingearth.com.au
darren.hanvey@consultingearth.com.au
b.acharya@consultingearth.com.au

Client Project Name / Number / Site etc (ie report title): CES180204-SGC
PO No.:
Envirolab Quote No. :
Date results required: 3 Days TAT
Or choose: 3 day (8 March 2018).
Note: Inform lab in advance if urgent turnaround is required - surcharges apply
Additional report format: esdat / equis /
Lab Comments:

Sample information					Tests Required						Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	PFAS_WTR_Short	Combo 8	Sulphate	Chloride	VHC	TRH / BTEX	Provide as much information about the sample as you can
1 1	BH01		05-Mar	Water	x	x	x	x	x		
2 2	BH04		05-Mar	Water	x	x	x	x	x		
3 3	BH03		05-Mar	Water	x	x	x	x	x		
4 4	QAQC 1		05-Mar	Water	x	x			x		split into QAQC1 + QAQC2
— 5	QAQC 2		05-Mar	Water	x	x			x		Send to ALS
5 6	RIN		05-Mar	Water	x	x			x		
6 7	TB		05-Mar	Water						x	
7 8	TS		05-Mar							x	

Environmental Division
Sydney
Work Order Reference
ES1806886
Telephone : + 61-2-8784 8555

TAT

Relinquished by (Company): CES	CES	Received by (Company): ELS
Print Name: Jack Emblen	S. Inameti	Print Name: [illegible]
Date & Time: 06.03.18 12:45	05.03.17	Date & Time: 5/3/18 18:30
Signature:		Signature:

Lab Use Only	
Job number: 186497	Cooling: Ice / Ice pack / None
Temperature: 14.2	Security seal: Intact / Broken / None
TAT Req - SAME day / 1 / 2 / 3 / 4 / STD	

Rec SGS Stephen 06/3/18 1715 [illegible]

Appendix H

Project: 9-11 Gibbons Street, Redfern
Client: St George Community Housing
CES Project Number: CES180204-SGC
Table H: QAQC

Parameter							Primary vs. Duplicate RPDs		Primary vs. Triplicate RPDs	
			Batch	186212	186212	ES1806508				
			Sample	BH1_0.4-0.8	BH1_QAQC1_0.4-0.8	BH1_QAQC2_0.4-0.8				
			Depth	0.4-0.8	0.4-0.8	0.4-0.8				
			Sample Date	28/02/2018	28/02/2018	28/02/2018	**Average**	**RPD**	**Average**	**RPD**
	Units	PQL 1	PQL 2	**Primary**	**Duplicate**	**Triplicate**				
TRH C_6 - C_9	mg/kg	25	10	<25	<25	<10	N/A	N/A	N/A	N/A
TRH C_6 - C_{10}	mg/kg	25	10	<25	<25	<10	N/A	N/A	N/A	N/A
TPHC_6-C_{10} less BTEX (F1)	mg/kg	25	10	<25	<25	<10	N/A	N/A	N/A	N/A
Benzene	mg/kg	0.2	0.2	<0.2	<0.2	<0.2	N/A	N/A	N/A	N/A
Toluene	mg/kg	0.5	0.5	<0.5	<0.5	<0.5	N/A	N/A	N/A	N/A
Ethylbenzene	mg/kg	1	0.5	<1	<1	<0.5	N/A	N/A	N/A	N/A
m+p-xylene	mg/kg	2	0.5	<1	<1	<0.5	N/A	N/A	N/A	N/A
o-Xylene	mg/kg	1	0.5	<1	<1	<0.5	N/A	N/A	N/A	N/A
Xylenes total	mg/kg	1	0.5	<1	<1	<0.5	N/A	N/A	N/A	N/A
naphthalene	mg/kg	1	1	<1	<1	<1	N/A	N/A	N/A	N/A
TRH C10 - C14	mg/kg	50	50	<50	<50	<50	N/A	N/A	N/A	N/A
TRH C15 - C28	mg/kg	100	100	<100	<100	<100	N/A	N/A	N/A	N/A
TRH C29 - C36	mg/kg	100	100	<100	<100	<100	N/A	N/A	N/A	N/A
TRH >C10-C16	mg/kg	50	50	<50	<50	<50	N/A	N/A	N/A	N/A
TRH >C10 - C16 less Naphthalene (F2)	mg/kg	50	50	<50	<50	<50	N/A	N/A	N/A	N/A
TRH >C16-C34	mg/kg	100	100	<100	<100	<100	N/A	N/A	N/A	N/A
TRH >C34-C40	mg/kg	100	100	<100	<100	<100	N/A	N/A	N/A	N/A
Naphthalene	mg/kg	0.1	0.5	<0.1	<0.1	<0.5	N/A	N/A	N/A	N/A
Acenaphthylene	mg/kg	0.1	0.5	<0.1	<0.1	<0.5	N/A	N/A	N/A	N/A
Acenaphthene	mg/kg	0.1	0.5	<0.1	<0.1	<0.5	N/A	N/A	N/A	N/A
Fluorene	mg/kg	0.1	0.5	<0.1	<0.1	<0.5	N/A	N/A	N/A	N/A
Phenanthrene	mg/kg	0.1	0.5	0.7	<0.1	<0.5	0.7	N/A	0.70	N/A
Anthracene	mg/kg	0.1	0.5	0.2	<0.1	<0.5	0.2	N/A	0.20	N/A
Fluoranthene	mg/kg	0.1	0.5	1.5	0.2	<0.5	0.85	**153%**	1.50	N/A
Pyrene	mg/kg	0.1	0.5	1.7	0.2	<0.5	0.95	**158%**	1.70	N/A
Benzo(a)anthracene	mg/kg	0.1	0.5	0.8	<0.1	<0.5	0.8	N/A	0.80	N/A
Chrysene	mg/kg	0.1	0.5	1.0	<0.1	<0.5	1	N/A	1.00	N/A
Benzo(b,j+k)fluoranthene	mg/kg	0.2	0.5	3.6	0.4	<0.5	2	**160%**	3.60	N/A
Benzo(a)pyrene	mg/kg	0.05	0.5	1.1	0.1	<0.5	0.6	**167%**	1.10	N/A
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	0.5	0.8	<0.1	<0.5	0.8	N/A	0.80	N/A
Dibenzo(a,h)anthracene	mg/kg	0.1	0.5	0.2	<0.1	<0.5	0.2	N/A	0.20	N/A
Benzo(g,h,i)perylene	mg/kg	0.1	0.5	0.9	<0.1	<0.5	0.9	N/A	0.90	N/A
Arsenic	mg/kg	4	5	41	7	5.0	24	**130%**	23.00	**117%**
Cadmium	mg/kg	0.4	1	0.4	0.4	1.0	0.4	0%	0.70	86%
Chromium	mg/kg	1	2	5	4	3.0	4.5	22%	4.00	50%
Copper	mg/kg	1	5	24	8	6.0	16	**100%**	15.00	**120%**
Lead	mg/kg	1	5	100	31	23.0	65.5	**105%**	61.50	**125%**
Mercury	mg/kg	0.1	0.1	0.9	0.2	0.1	0.55	**127%**	0.50	**160%**
Nickel	mg/kg	1	2	4	1	2.0	2.5	**120%**	3.00	67%
Zinc	mg/kg	1	5	170	28	19.0	99	**143%**	94.50	**160%**

RPD Control Limits:

§ 0 – 100% RPD (When the average concentration is 5 times the LOR/EQL)

§ 0 – 75% RPD (When the average concentration is 5 to 10 times the LOR/EQL)

§ 0 – 50% RPD (When the average concentration is > 10 times the LOR/EQL)

Appendix I

CONSULTING EARTH SCIENTISTS

GROUNDWATER FIELD DATA SHEET

Client:		**CES Project Code:**	CES120204-SGC
Project:	Groundwater Monitoring	**Location:**	Redfern
Sampler (s): S.I / B.A	**Signature(s):** B.A	**Project Manager:**	D. Hanvey
BH ID:	BH1	**Sample ID:**	BH1
Purging Date:	05-Mar-18	**Sampling Date:**	05-Mar-18

Well Status

Well damaged:	YES/NO	Well locked:	YES/NO
Cement footing damaged:	YES/NO	Cap on PVC casing:	YES/NO
Internal obstructions in casing:	YES/NO	Well ID visible:	YES/NO
Standing water, vegetation around monument:	YES/NO	Monument damaged:	YES/NO
Water between PVC and protective casing:	YES/NO	Odours from groundwater:	YES/NO

Comments:

Standing Water Level (SWL): 7.90 (mBTOC)
Well volume: (L)
Water level after purging: (mBTOC)
Water level at time of sampling: (mBTOC)
Volume of water purged: (L)
Well purged to dry?: YES/NO
Purging equipment: Pump / micro-Purging / Bailer / Foot valve
Sampling equipment: Pump / Bailer / Foot valve

Weather Conditions
Temperature 15-20 20-25 25-30 >30
Clear Partly cloudy Overcast
Calm Slight breeze Moderate Breeze Windy
Fine Showers Rain

Purging Details

Elapsed time (min)	SWL m BTOC	Cumulative volume (L)	DO (mg L^{-1})	EC (uS cm^{-1})	pH -	Eh (mV)	Temp. (°C)	Comments
16:46	–	–	1.46	1927	5.85	100	23.9	Odourless, slightly
+2	–	0.25	1.14	1825	5.88	91	23.8	turbid, Colourless
+4	–	0.50	1.10	1788	5.88	89	23.8	Sample taken

Groundwater field parameters at the end of purging to be marked "Field Measurements".

CONSULTING EARTH SCIENTISTS

GROUNDWATER FIELD DATA SHEET

Client:		**CES Project Code:**	CES120204-SGC
Project: Groundwater Monitoring		**Location:**	Redfern
Sampler (s): SI / A.B	**Signature(s):** SI	**Project Manager:**	D. Hanvey
BH ID: BH3		**Sample ID:**	BH3
Purging Date: 05-Mar-18		**Sampling Date:**	05-Mar-18

Well Status

Well damaged:	YES/NO	Well locked:	YES/NO
Cement footing damaged:	YES/NO	Cap on PVC casing:	YES/NO
Internal obstructions in casing:	YES/NO	Well ID visible:	YES/NO
Standing water, vegetation around monument:	YES/NO	Monument damaged:	YES/NO
Water between PVC and protective casing:	YES/NO	Odours from groundwater:	YES/NO

Comments:

Standing Water Level (SWL): 3.00 (mBTOC)
Well volume: (L)
Water level after purging: (mBTOC)
Water level at time of sampling: (mBTOC)
Volume of water purged: (L)
Well purged to dry?: YES/NO
Purging equipment: Pump / micro-Purging / Bailer / Foot valve
Sampling equipment: Pump / Bailer / Foot valve

Weather Conditions

Temperature 15-20	20-25	
25-30	≥30	
Clear	Partly cloudy	Overcast
Calm	Slight breeze	Moderate Breeze
Windy		
Fine	Showers	Rain

Purging Details

Elapsed time (min)	SWL m BTOC	Cumulative volume (L)	DO (mg L^{-1})	EC (uS cm^{-1})	pH -	Eh (mV)	Temp. (°C)	Comments
17.48	—	—	1.42	507	5.84	33	23.1	Pale brown,
+2	—	0.25	0.52	413	5.43	62	23.9	turbid, odorless
+4	—	0.50	0.30	405	4.89	100	24.3	
+6	—	0.75	0.26	409	4.95	103	24.5	sample taken
+8								

Groundwater field parameters at the end of purging to be marked "Field Measurements".

CONSULTING EARTH SCIENTISTS

GROUNDWATER FIELD DATA SHEET

Client:		**CES Project Code:**	CES120204-SGC
Project:	Groundwater Monitoring	**Location:**	Redfern
Sampler (s):	SI / AB **Signature(s):** SI	**Project Manager:**	D. Hanvey
BH ID:	BH4	**Sample ID:**	BH4
Purging Date:	05-Mar-18	**Sampling Date:**	05-Mar-18

Well Status

Well damaged:	YES/NO	Well locked:	YES/NO
Cement footing damaged:	YES/NO	Cap on PVC casing:	YES/NO
Internal obstructions in casing:	YES/NO	Well ID visible:	YES/NO
Standing water, vegetation around monument:	YES/NO	Monument damaged:	YES/NO
Water between PVC and protective casing:	YES/NO	Odours from groundwater:	YES/NO

Comments:

Standing Water Level (SWL): 1.32 (mBTOC)
Well volume: (L)
Water level after purging: (mBTOC)
Water level at time of sampling: (mBTOC)
Volume of water purged: (L)
Well purged to dry?: YES/NO
Purging equipment: Pump / micro-Purging / Bailer / Foot valve
Sampling equipment: Pump / Bailer / Foot valve

Weather Conditions
Temperature 15-20 | 20-25 | 25-30 | >30
Clear | Partly cloudy | Overcast
Calm | Slight breeze | Moderate Breeze
Windy
Fine | Showers | Rain

Purging Details

Elapsed time (min)	SWL m BTOC	Cumulative volume (L)	DO (mg L^{-1})	EC (uS cm^{-1})	pH -	Eh (mV)	Temp. (^0C)	Comments
17:21	—	—	1.63	619	6.76	35	23.5	Pale brown, odourless,
+2	—	0.25	0.72	588	6.81	26	24.4	turbid.
+4	—	0.50	1.32	592	7.03	10	24.6	
+6	—	0.75	3.07	1496	7.10	-16	24.7	
+8	—	1.00	4.00	1616	7.13	-29	24.7	
+10	—	1.25	4.16	1629	7.12	-31	24.7	Sample taken.

Groundwater field parameters at the end of purging to be marked "Field Measurements".

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RENTALS

Equipment Report – Micropurge Flow Cell

This unit has been performance checked as follows:

Operations Check		
☑ Clean / decon		

Date: 05/03/2018 Checked by: Jerry

Signed: [signature]

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum $20 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Received	Returned	Item
			Sample Pro Pump
☑	☐	☐	Flow Cell
☑	☐	☐	3-way valve
☑	☐	☐	Connecting tubes (3)
☐	☐	☐	Optional – cable
☐	☐	☐	
☐	☐	☐	

Processors Signature/ Initials [signature]

Quote Reference	CS008432	Condition on return
Customer Ref		
Equipment ID	EFC500-17	
Equipment serial no.		
Return Date	/ /	
Return Time		

RENTALS

Equipment Certification Report – TPS 90FLMV Water Quality Meter

This Water Quality Meter has been performance checked and calibrated as follows:

Sensor	Concentration	Span 1	Span 2	Traceability Lot #	Pass?
pH	pH 7.00 / pH 4.00	7.00 pH	4.00 pH	300765/312725	☑
Conductivity	12.88mS/cm	0.0 mS/cm	12.88 mS/cm	312392	☑
TDS	36 ppk	0.0 ppk	36.0 ppk	313394	☑
Dissolved Oxygen	Sodium Sulphite / Air	0.00 ~~ppm~~ in Sodium Sulphite	8.63 ppm Saturation in Air	5656 (SS) 306207 (DI)	☑

Check only

Redox (ORP) *	Electrode operability test	240mV +/- 10%	234 mV	306263 (A) 299343 (B)	☑

* This meter uses an Ag/AgCl ORP electrode. To convert readings to SHE (Standard Hydrogen Electrode), add 199mV to the mV reading.

☑ Battery Status 7.9V (min 7.2V)
☑ Electrical Safety Tag attached (AS/NZS 3760)

☑ Temperature 22.0 °C
☑ Electrodes Cleaned and checked

Tag No: 080652

Valid to: 29/04/2018

Date: 01/03/2018

Signed:

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum $30 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Returned	Item
☑	☐	90FLMV Unit. Ops check/Battery status: 7.9V
☑	☐	pH sensor with wetting cap, 5m
☑	☐	Conductivity/TDS/Temperature K=10 sensor, 5m
☑	☐	Dissolved oxygen YSI5739 sensor with wetting cap, 5m
☑	☐	Redox (ORP) sensor with wetting cap, 5m
☑	☐	Power supply 240V to 12V DC 200mA
☑	☐	Instruction Manual
☑	☐	Quick Guide
☑	☐	Syringe with storage solution for pH and ORP sensors
☑	☐	Carry Case
☑	☐	Check to confirm electrical safety (tag must be valid)

Date: 04/03/2018

Signed:

TFS Reference	CS008432	Return Date: / /	
Customer Reference		Return Time:	
Equipment ID	90FLMV SP	Condition on return:	
Equipment Serial No.	T3871		

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26/02/2018

PID Calibration Certificate

Instrument **PhoCheck Tiger**
Serial No. **T-108801**

airmet

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 ev			
Alarms	Beeper	✓	Low	High	TWA	STEL
	Settings	✓	50ppm	100ppm		
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		98ppm Isobutylene	NATA	SY137		95.9ppm

Calibrated by: Sarah Lian **Sarah Lian**

Calibration date: **26/02/2018**

Next calibration due: **28/03/2018**

Ground Penetrating Radar
Underground Tank Investigation
March 07, 2018

CLIENT	Consulting Earth Scientists Pty Ltd
CLIENT CONTACT	Darren Hanvey
JOB SITE	9/11 Gibbons Street
	Redfern, NSW
PROJECT ID #	GNX18062
ONSITE CONTACT	Bhagaban Acharya
SURVEY DATE	March 07, 2018
REPORT DATE	March 12, 2018
METHODS	Ground Penetrating Radar (GPR)

COMPILED BY

James Meintjes (BSc)
Geophysicist

REVIEWED BY

Mads Toft (MSc)
Senior Geophysicist

BACKGROUND & SPECIFICATIONS

Ground Penetrating Radar (GPR) was requested by Consulting Earth Scientists with the aim to locate and identify potential underground tanks within an urban industrial property. Subsurface investigation depths of interest were shallower than 3.5m depth.

The GPR survey aimed to provide site characterisation information and details which will contribute to existing site plans; thereby providing a safer working environment and detail for informed decision making.

MALA GPR Australia undertook a geophysical survey on March 07, 2018. The instrument selected for the survey was the MALA Easy Locator HDR Wide Range GPR. It contains both a 160Mhz and 670Mhz antenna.

SURVEY AREA & GROUND CONDITIONS

The area for investigation was throughout a small industrial property located at 9/11 Gibbons Street, Redfern NSW. The area was described as approximately 1500 square metres and contained three main areas, a North Building, carpark and South building.

Figure 1: Plan of the investigation area as provided by the client.

Site photos were provided prior to the commencement of the GPR data acquisition. These photos displayed the following for each area:

- Carpark; A relatively open and flat area with minimal obstacles. Suitable for methodical GPR data collection.
- North Building; included many small rooms that were cluttered with office furniture and council equipment. The area was not ideal for methodical GPR data collection.
- South Building; included a warehouse workshop area cluttered with plant and machinery as well as a small outside corridor with many material obstructions. The area was not ideal for methodical GPR data collection.

Upon arrival to site it was requested by MALA GPR that the areas were made suitable for methodical GPR data collection to ensure the majority of moveable items were set aside to allow for maximum floor area to be scanned. This was specifically directed at the North and South buildings.

Subsurface information of the carpark was provided verbally by the client. It was described as asphalt and slab thickness of approximately 250mm overlain by a layer of fill material which lay atop a clay layer around 1m deep. This information was obtained through on site boreholes. Subsurface information of the North and South building was unknown however a previous GPR survey was conducted which showed layers of steel reinforcing and potential anomalies relating to subsurface tanks.

INSTRUMENT DESCRIPTION

The instrument selected for the survey included the latest range of GPR technology available by MALA GPR Australia. The instrumentation is at the highest level of any Ground Penetrating Radar available. It deployed a 160Mhz/670Mhz dual frequency GPR antenna. The GPR antenna uses High Dynamic Range (HDR) technology which increases signal stacking (averaging) and reduces noise while attempting to increase signal resolution and depth penetration.

It was selected with aim to achieve depth penetration up to 5m and 1m (160MHz/670Mhz) to obtain both suitable depth penetration and data resolution for the requested 3.5m investigation depth. This 2D GPR method is a proven and widely used technique for subsurface tank location.

Figure 2: MALA Easy Locator HDR Wide Range GPR used for acquisition.

POSITIONING

An in built differential GPS (~1-3m horizontal accuracy) was used for the positioning of the carpark survey. A local grid (x,y) was also conducted in the carpark area. The North building used horizontal chainage for the GPR tracking with orange dots marked on the floor to outline start and end positions of the lines. The South building used horizontal chaining for the GPR tracking however markings were not made on the ground due to tenant requests. A rough mud map of GPR line collection was made in the South Building for profile relocation.

STAFFING The data acquisitioning was performed by Geophysicist James Meintjes of MALA GPR Australia. Data processing was performed by James Meintjes. Reporting was compiled by James Meintjes and reviewed by Geophysicist William Barber.

SCHEDULE OF EVENTS

Wednesday March 07; Data acquisition throughout entire site.

Thursday March 08; Data processing and interpretation.

Friday March 09-12; Geophysical report writing and delivery of report.

RESULTS AND DISCUSSION OF SURVEY Data was processed and interpreted within a MALA proprietary software package, ObjectMapper 2018. A soil velocity of 95m/µs was used in data processing, this is a soil velocity respective of concrete structures.

CARPARK:

Data coverage obtained from the carpark area is displayed in black lines below. Red markers indicate areas in which subsurface anomalies were recorded that may resemble subsurface tank features.

Figure 3: Plan view of the data coverage within the carpark area. Red markers indicate areas where anomalies were detected that may indicate tank like features.

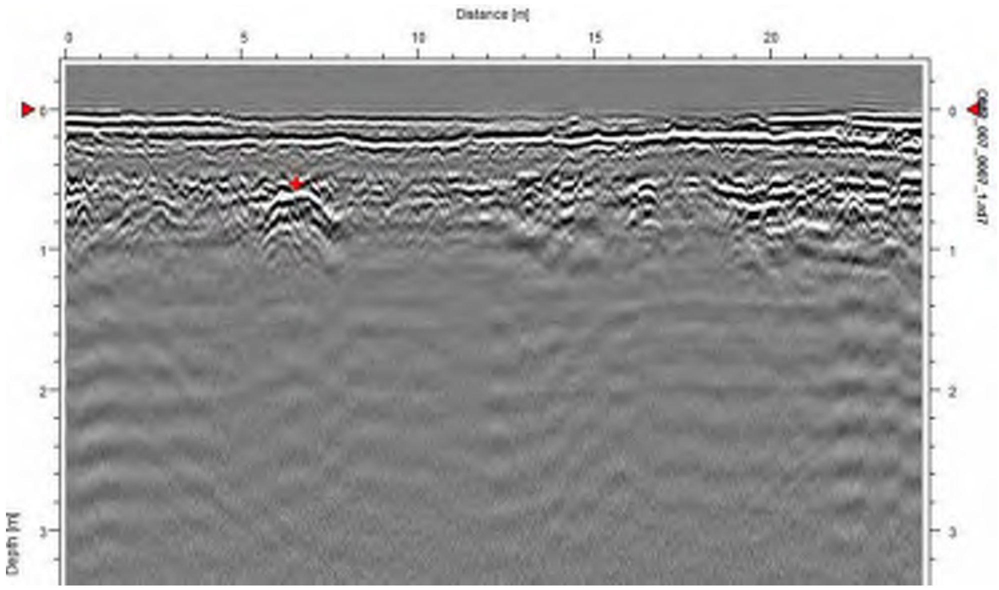

Figure 4: Red marker indicates strong anomaly at ~600mm depth.

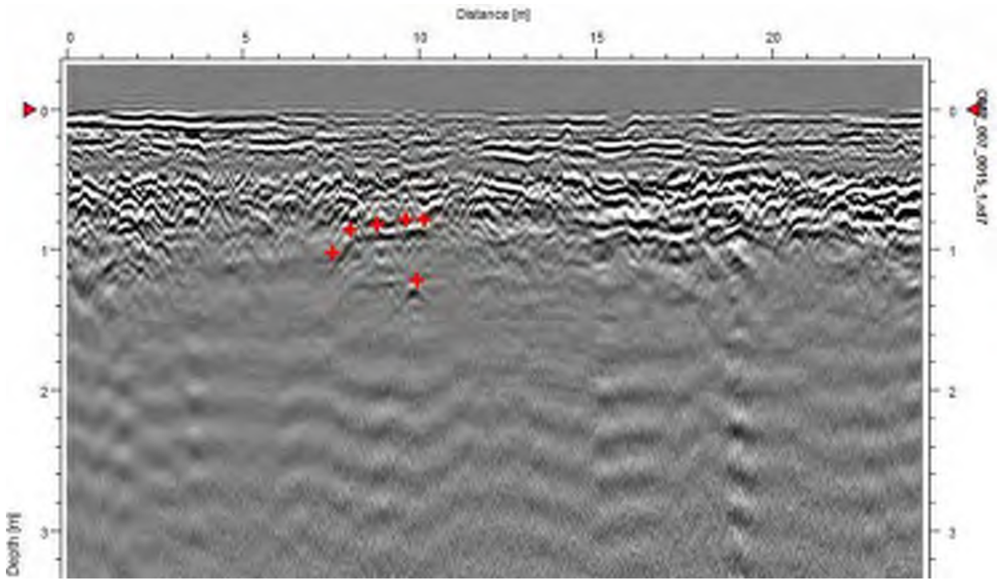

Figure 5: Red markers indicate subsurface anomalies at ~1m depth.

The radargrams above indicate subsurface anomalies that may represent tank-like features. Figure 4 displays a strong and wide hyperbola at ~600mm depth. Figure 5 displays a weak anomaly at ~1200mm depth with a horizon above it, dipping off to the left. These anomalies were detected on these profiles only and were not noted to occur on neighbouring GPR profiles. 1m GPR profile spacing was used in the carpark area.

160MHz data was processed and interpreted however data resolution was too poor to allow interpretation. Depth penetration from the 160Mhz did not exceed 2-3m.

NORTH BUILDING:

Figure 6: Three parallel lines conducted in the North building, Garage 1.

Figure 7: Three parallel lines conducted in the North building, Garage 2.

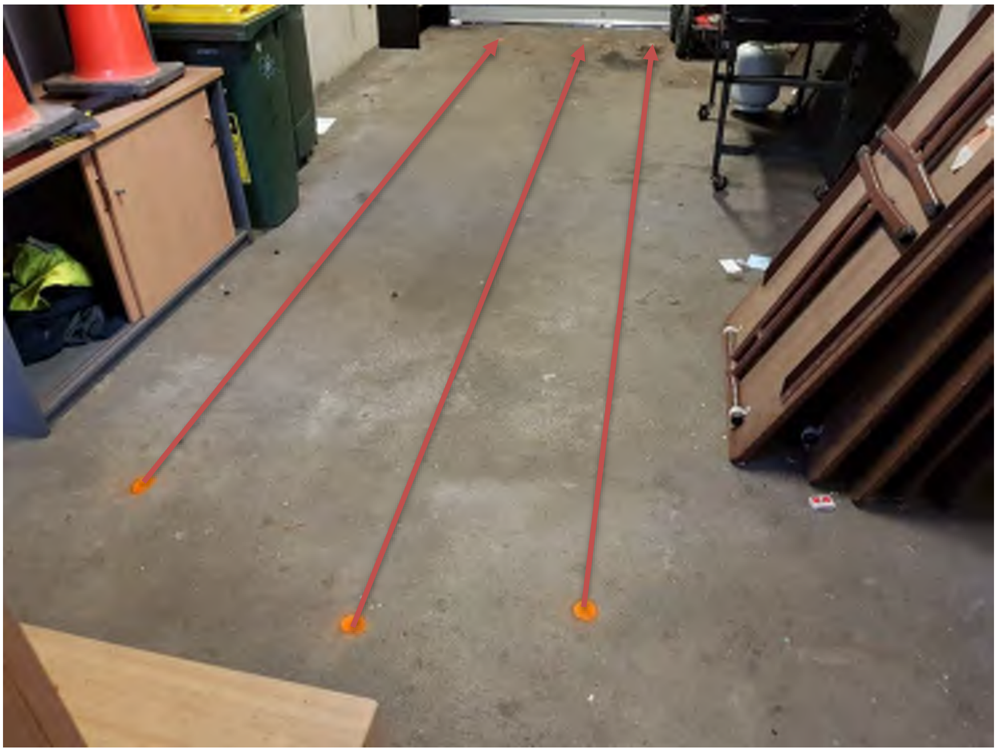

Figure 8: Three parallel lines conducted in the North building, Garage 3.

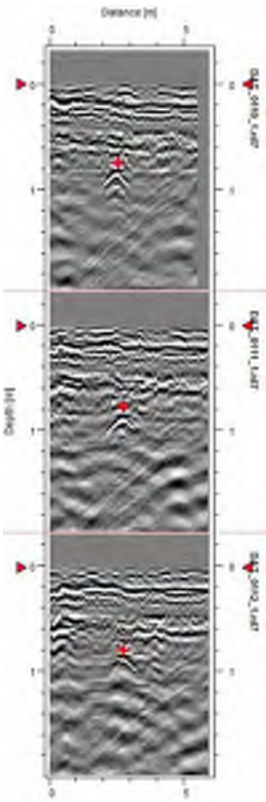

Figure 9: Radargrams showing anomaly (RED) occurring over neighbouring profiles.

Garage 3 displayed three strong anomalies at ~800mm depth that aligned over neighbouring GPR profiles. These most likely represent a subsurface utility due to the sharpness of the hyperbola response.

Figure 10: Line run through the doorways after Garage 2.

Figure 11: Two GPR lines run in room 4.

Figure 12: A third line run in Room 4.

Figure 13: One line run in Room 5.

Figure 14: A second line run in Room 5.

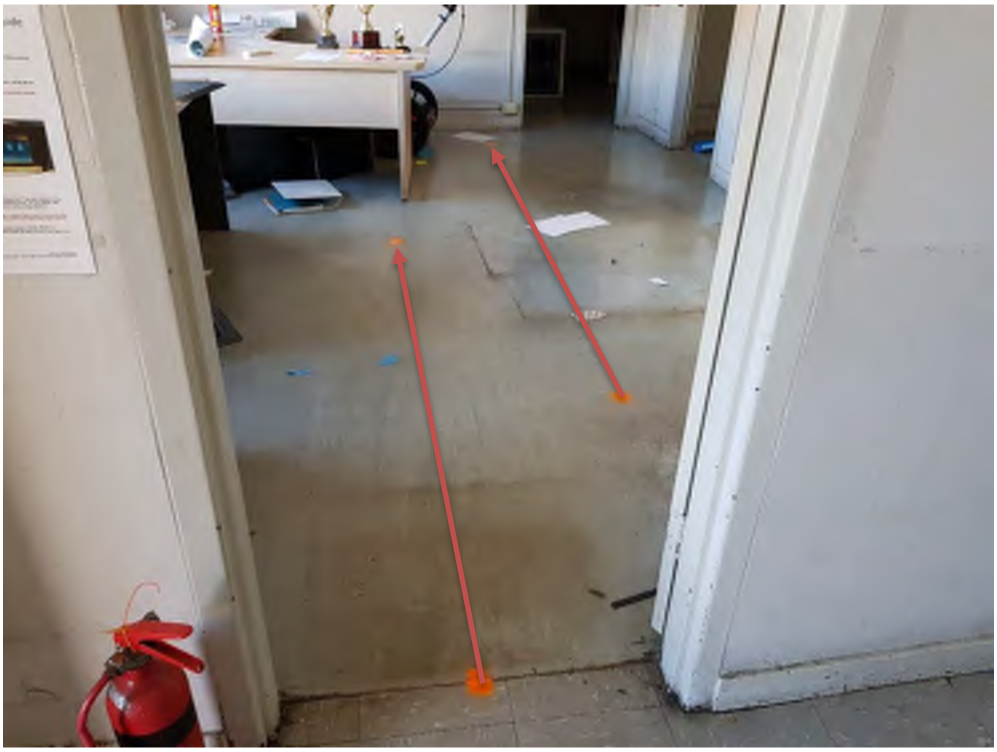

Figure 15: Two of three lines run in Room 6.

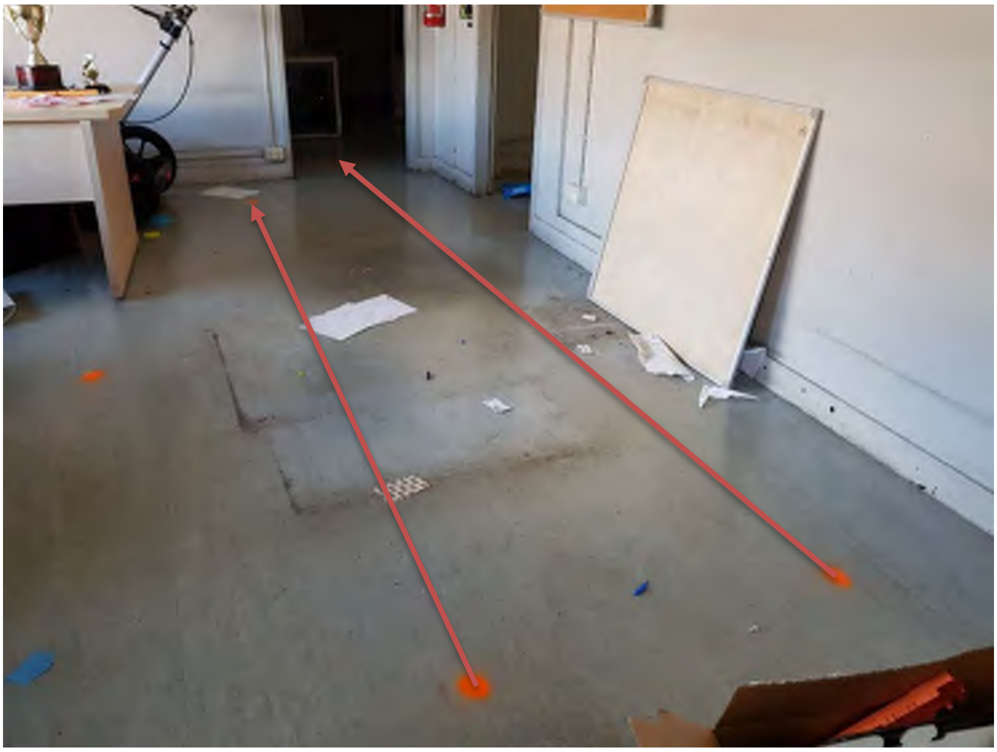

Figure 16: The second and third line run in Room 6.

Each area in the North building showed no visible data indicating subsurface tanks. All of the data displayed a layer of steel reinforcing. The only data of interest was that displayed in figure 8 & 9 collected from Garage 3. The anomalies most likely represent a subsurface utility. 670Mhz depth penetration was approximately 1m. 160Mhz data was processed and interpreted however resolution was too poor for interpretation.

SOUTH BUILDING:

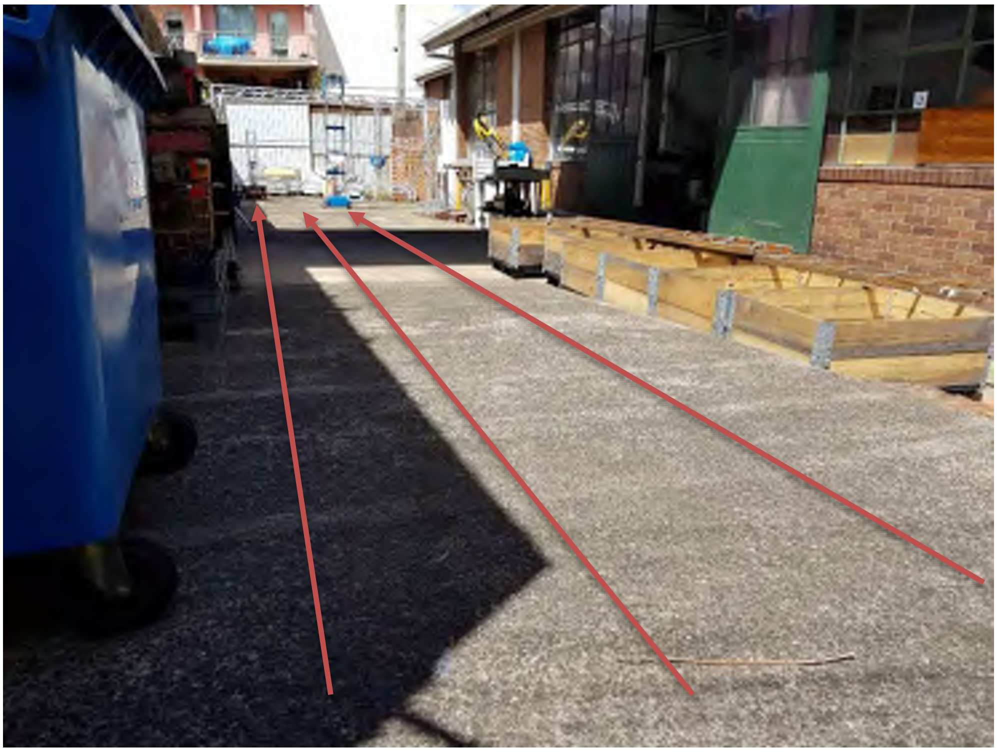

Figure 17: Three lines run down the ramp.

Figure 18: An additional two lines collected outside.

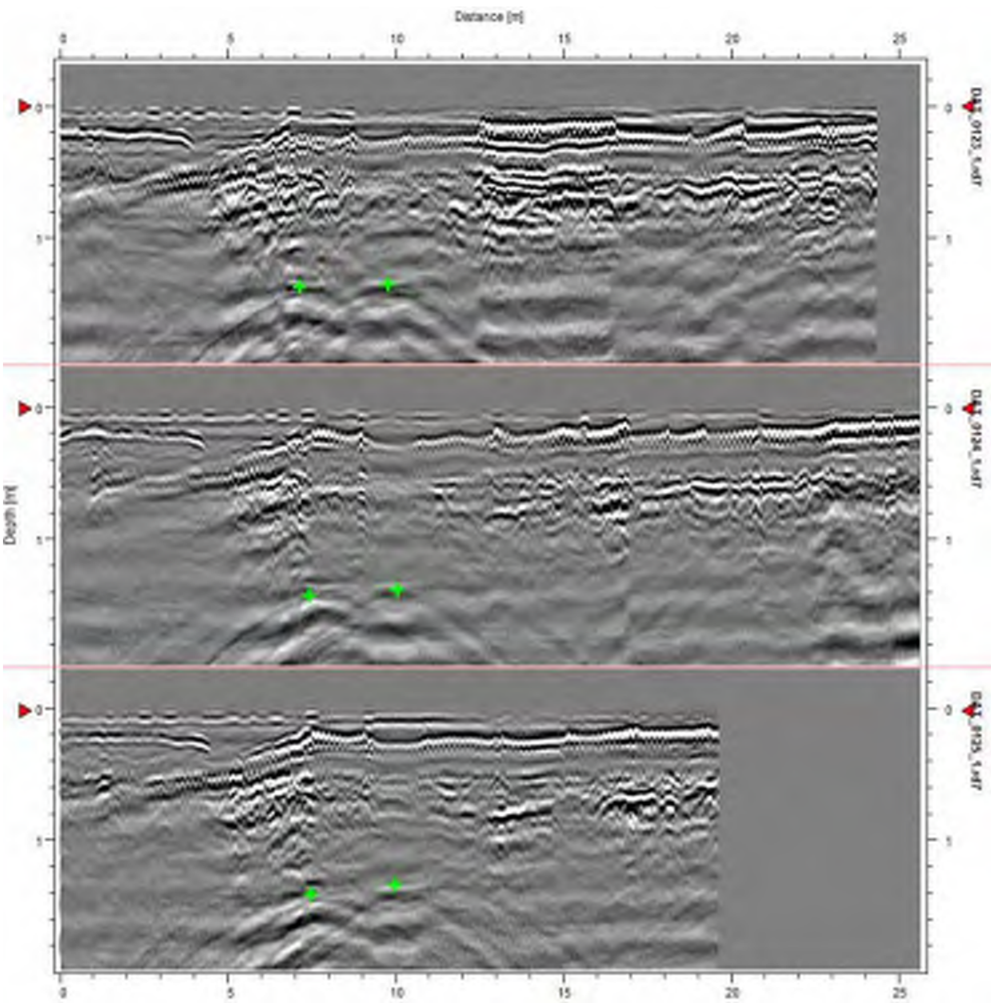

Figure 19: Three GPR profiles displaying anomalies marked in GREEN.

Figure 20: Overhead feature believed to create the anomalies shown in the dataset from figure 19.

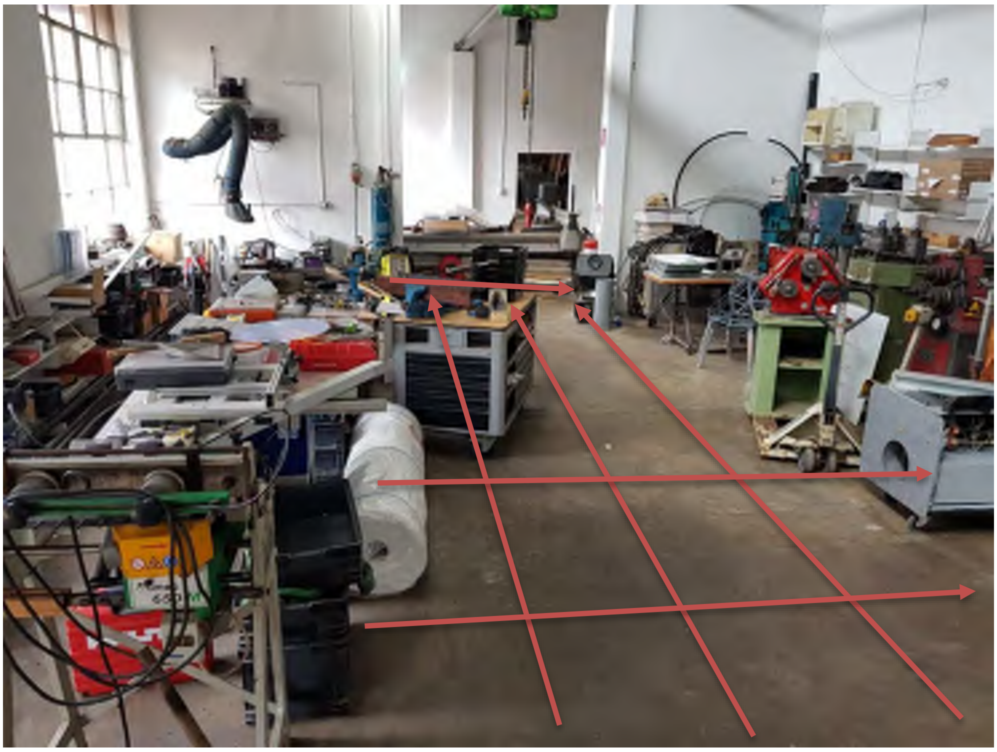

Figure 21: Inside the warehouse. Red lines indicate approximate GPR lines conducted.

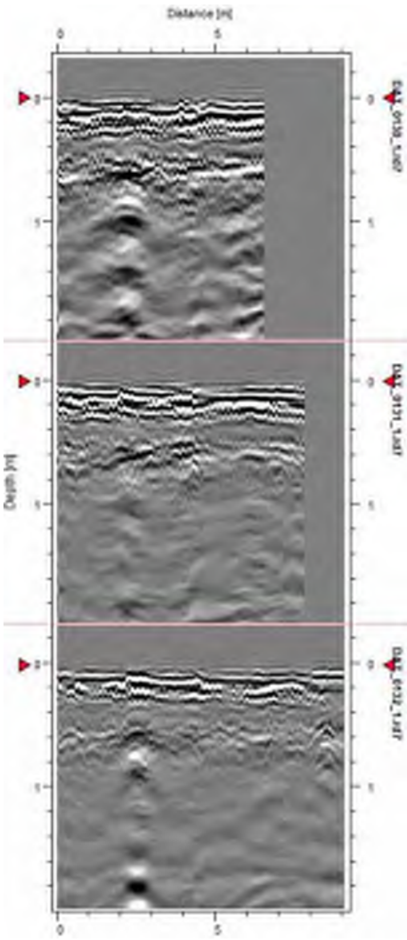

Figure 22: Three GPR profiles showing steel reinforcing and pavement layers.

Deep anomalies were detected (~1.4m deep) from the outside area (Figure 17). These anomalies are marked in Green in Figure 19. The anomalies have a very wide shape which can be an indication of an air reflection. During data processing, a tool known as 'migration' can assist to determine the soil velocity of the subsurface based on the response of the anomaly. It turns out that a soil velocity of approximately 300m/µs applies to the anomalies which in turn supports the theory of them being an air reflection. As the vertical depth from a GPR profile is dependant on the sol velocity, applying a soil velocity of 300m/µs (air) actually triples the depth scale and therefore sets the anomalies at ~4m depth. It was noted in the driveway area that an overhanging concrete slab containing metal rails was present (figure 20). It is believed that this overhead feature created the artefacts within the dataset.

No indications of tanks were evident from the dataset both inside or outside the South building. Data from the 160Mhz was of too low resolution to make any interpretation of the subsurface. It was noted that both the inside and outside areas had significant steel reinforcing within the slab (figure 22), potentially two layers. A lower frequency antenna such as the 160Mhz has trouple penetrating steel reinforced concrete slabs due to the signals longer wavelength.

The inside of the South Building had many obstructions which did not allow for a methodical data collection approach (figure 21). In order to achieve best results there should be an open and unobstructed area to collect data.

CONCLUSIONS

It can be concluded that from the dataset obtained, there is no evidence of subsurface tanks in the areas scanned in the North and South Buildings. Anomalies detected in this area appear to be steel reinforcing layers, concrete slab thicknesses as well as artefacts in the data such as above ground air reflections.

There were, however, anomalies that were detected in the car park area that could indicate subsurface features such as that of an underground tank. These two areas were outlined in Figure 3, 4 and 5. The anomalies detected relate towards unknown objects as no patterns can be obtained about the anomalies across neighbouring GPR profiles.

The area (South Building and North Building in particular) was not well prepared for a proper methodical GPR survey approach. It was requested that the area be cleaned of surface debris and obstructions to the best of the clients ability. Unfortunately this was not prepared for the GPR survey and therefore the GPR operator was limited towards collection which in turn does not aid interpretation. With GPR, the more data collected (in an orderly fashion), the simpler it is to interpret the data as transitions in profiles can be noted and neighbouring GPR profiles assist on interpreting single/linear anomalies.

RECOMMENDAT-IONS FOR FUTURE WORKS

- Use a mid-frequency (450Mhz) GPR antenna in specific areas of interest to further investigate anomalies already detected.
- Undergo further invasive investigations to correlate with GPR data. Special care should be taken in these investigations as the anomalies detected from GPR are unknown potential objects.

DELIVERABLES Along with this report the following can be delivered upon request:

- Any raw or processed data profiles.
- Relocation coordinates

DISCLAIMER It should be noted that the attached results are the result of an interpretation of the collected data. Whilst state-of-the-art instrumentation and qualified personnel have been utilised for this survey there are circumstances under which the interpreted result can differ from the actual sub surface strata.

The author accepts no responsibility for actions or decisions made on the basis of the presented result. The results are presented for the clients' review only and should not form the sole basis of any decision or action made in relation to this project.

This report has been prepared for the use of the client as listed on page 1 in accordance with general accepted consulting practice. No other warranty, expressed or implied, is made as to the professional advice included in this report.

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Whilst to the best of our knowledge, information contained in this report is accurate at the date of issue; conditions on the site can change in a limited time. This should be borne in mind if the report is used after a protracted delay. As with any form of non-destructive resting, our opinions of results do not apply, we rely solely on date collection and criteria conformance.

If it is found that the actual locations differ from the interpreted result the author should be contacted immediately.