

Client Reference: E29353KM, Dolls Point

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	LCS-7	93%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	101	[NT]	[NT]	LCS-7	107%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organochlorine Pesticides in soil						Base II Duplicate II %RPD		
Date extracted	-			10/05/2016	[NT]	[NT]	LCS-7	10/05/2016
Date analysed	-			12/05/2016	[NT]	[NT]	LCS-7	12/05/2016
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	99%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	116%
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	87%
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	84%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	88%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	78%
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	96%
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	96%
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	79%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	68%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%		Org-005	101	[NT]	[NT]	LCS-7	115%

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Organophosphorus Pesticides						Base II Duplicate II %RPD		
Date extracted	-			10/05/2016	[NT]	[NT]	LCS-7	10/05/2016
Date analysed	-			12/05/2016	[NT]	[NT]	LCS-7	12/05/2016
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NR]	[NR]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NR]	[NR]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-7	93%
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NR]	[NR]
Diazinon	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NR]	[NR]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-7	79%
Dimethoate	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-7	92%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-7	103%
Malathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-7	75%
Parathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-7	92%
Ronnel	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-7	115%
Surrogate TCMX	%		Org-008	101	[NT]	[NT]	LCS-7	96%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PCBs in Soil						Base II Duplicate II %RPD		
Date extracted	-			10/05/2016	[NT]	[NT]	LCS-7	10/05/2016
Date analysed	-			12/05/2016	[NT]	[NT]	LCS-7	12/05/2016
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	LCS-7	110%
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%		Org-006	101	[NT]	[NT]	LCS-7	95%

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QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Date prepared	-			10/05/2016	[NT]	[NT]	LCS-7	10/05/2016
Date analysed	-			10/05/2016	[NT]	[NT]	LCS-7	10/05/2016
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	LCS-7	103%
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	LCS-7	97%
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	LCS-7	99%
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	LCS-7	100%
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	LCS-7	98%
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	LCS-7	84%
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	LCS-7	94%
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	LCS-7	98%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
sPOCAS						Base II Duplicate II %RPD		
Date prepared	-			10/05/2016	146263-6	10/05/2016 10/05/2016	LCS-1	10/05/2016
Date analysed	-			10/05/2016	146263-6	10/05/2016 10/05/2016	LCS-1	10/05/2016
pH _{kd}	pH units		Inorg-064	[NT]	146263-6	9.1 9.1 RPD: 0	LCS-1	103%
TAA pH 6.5	moles H ⁺ /t	5	Inorg-064	<5	146263-6	<5 <5	LCS-1	85%
s-TAA pH 6.5	% w/w S	0.01	Inorg-064	<0.01	146263-6	<0.01 <0.01	[NR]	[NR]
pH _{ox}	pH units		Inorg-064	[NT]	146263-6	7.5 7.1 RPD: 5	LCS-1	100%
TPA pH 6.5	moles H ⁺ /t	5	Inorg-064	<5	146263-6	<5 <5	LCS-1	114%
s-TPA pH 6.5	% w/w S	0.01	Inorg-064	<0.01	146263-6	<0.01 <0.01	[NR]	[NR]
TSA pH 6.5	moles H ⁺ /t	5	Inorg-064	<5	146263-6	<5 <5	[NR]	[NR]
s-TSA pH 6.5	% w/w S	0.01	Inorg-064	<0.01	146263-6	<0.01 <0.01	[NR]	[NR]
ANCE	% CaCO ₃	0.05	Inorg-064	<0.05	146263-6	0.44 0.31 RPD: 35	[NR]	[NR]
a-ANCE	moles H ⁺ /t	5	Inorg-064	<5	146263-6	87 62 RPD: 34	[NR]	[NR]
s-ANCE	% w/w S	0.05	Inorg-064	<0.05	146263-6	0.14 0.10 RPD: 33	[NR]	[NR]
SKCl	% w/w S	0.005	Inorg-064	<0.005	146263-6	0.02 0.02 RPD: 0	[NR]	[NR]
SP	% w/w	0.005	Inorg-064	<0.005	146263-6	0.24 0.25 RPD: 4	[NR]	[NR]
SPOS	% w/w	0.005	Inorg-064	<0.005	146263-6	0.21 0.23 RPD: 9	[NR]	[NR]
a-SPOS	moles H ⁺ /t	5	Inorg-064	<5	146263-6	130 140 RPD: 7	[NR]	[NR]
CaKCl	% w/w	0.005	Inorg-064	<0.005	146263-6	0.21 0.22 RPD: 5	[NR]	[NR]
CaP	% w/w	0.005	Inorg-064	<0.005	146263-6	0.61 0.58 RPD: 5	[NR]	[NR]
CaA	% w/w	0.005	Inorg-064	<0.005	146263-6	0.39 0.37 RPD: 5	[NR]	[NR]

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QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
sPOCAS						Base Duplicate %RPD		
MgKCl	% w/w	0.005	Inorg-064	<0.005	146263-6	0.011 0.011 RPD: 0	[NR]	[NR]
MgP	% w/w	0.005	Inorg-064	<0.005	146263-6	0.026 0.026 RPD: 0	[NR]	[NR]
MgA	% w/w	0.005	Inorg-064	<0.005	146263-6	0.015 0.015 RPD: 0	[NR]	[NR]
SHCl	% w/w S	0.005	Inorg-064	<0.005	[NT]	[NT]	[NR]	[NR]
SNAS	% w/w S	0.005	Inorg-064	<0.005	[NT]	[NT]	[NR]	[NR]
a-SNAS	moles H ⁺ /t	5	Inorg-064	<5	[NT]	[NT]	[NR]	[NR]
s-SNAS	% w/w S	0.01	Inorg-064	<0.01	[NT]	[NT]	[NR]	[NR]
Fineness Factor	-	1.5	Inorg-064	<1.5	146263-6	1.5 1.5 RPD: 0	[NR]	[NR]
a-Net Acidity	moles H ⁺ /t	10	Inorg-064	<10	146263-6	<10 <10	[NR]	[NR]
Liming rate	kg CaCO ₃ /t	0.75	Inorg-064	<0.75	146263-6	<0.75 <0.75	[NR]	[NR]
a-Net Acidity without ANCE	moles H ⁺ /t	10	Inorg-064	<10	146263-6	130 140 RPD: 7	[NR]	[NR]
Liming rate without ANCE	kg CaCO ₃ /t	0.75	Inorg-064	<0.75	146263-6	10 11 RPD: 10	[NR]	[NR]

Report Comments:

Asbestos ID was analysed by Approved Identifier: Lulu Scott
Asbestos ID was authorised by Approved Signatory: Lulu Scott

INS: Insufficient sample for this test
NR: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

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

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

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

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

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

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in 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.

Aileen Hie

From: Rob Muller <RMuller@jkgroup.net.au>
Sent: Wednesday, 18 May 2016 5:10 PM
To: Aileen Hie
Subject: TCLP - batch #146263

Hi Aileen,

Could you please arrange for TCLP analysis of the following samples from batch #146263:

Sample location and depth	Lab ID	TCLP required
BH3 (0.4-0.5)	146263 - 4	Lead, benzo(a)pyrene
BH4 (0.0-0.1)	146263-5	Lead

Regards,

Rob Muller
Senior Environmental Scientist
RMuller@jkgroup.net.au
www.jkgroup.net.au



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146263 - A.
Due 25/5.

This email and any attachments are confidential and may be privileged in which case neither is intended to be waived. If you have received this message in error, please notify us and remove it from your system. It is your responsibility to check any attachments for viruses and defects before opening or sending them on. At the Company's discretion we may send a paper copy for confirmation. In the event of any discrepancy between paper and electronic versions the paper version is to take precedence.

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Envirolab Services Pty Ltd - Sydney | ABN 37 112 535 645

CERTIFICATE OF ANALYSIS

146263-A

Client:

Environmental Investigation Services
PO Box 976
North Ryde BC
NSW 1670

Attention: Rob Muller

Sample log in details:

Your Reference:	<u>E29353KM, Dolls Point</u>
No. of samples:	9 Soils
Date samples received / completed instructions received	9/5/2016 / 18/05/16

Analysis Details:

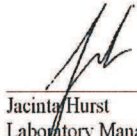
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.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

Report Details:

Date results requested by: / Issue Date:	25/05/16 / 23/05/16
Date of Preliminary Report:	Not Issued

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

Results Approved By:


Jacinta Hurst
Laboratory Manager

Envirolab Reference: 146263-A
Revision No: R 00



Metals in TCLP USEPA 1311			
Our Reference:	UNITS	146263-A-4	146263-A-5
Your Reference	-----	BH3	BH4
	-		
Depth	-----	0.4-0.5	0.0-0.1
Date Sampled		5/05/2016	2/05/2016
Type of sample		Soil	Soil
Date extracted	-	20/05/2016	20/05/2016
Date analysed	-	20/05/2016	20/05/2016
pH of soil for fluid# determ.	pH units	10.0	8.6
pH of soil TCLP (after HCl)	pH units	1.8	1.5
Extraction fluid used	-	1	1
pH of final Leachate	pH units	6.0	5.0
Lead in TCLP	mg/L	4.9	0.2

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PAHs in TCLP (USEPA 1311)		
Our Reference:	UNITS	146263-A-4
Your Reference	-----	BH3
Depth	-	0.4-0.5
Date Sampled	-----	5/05/2016
Type of sample		Soil
Date extracted	-	20/05/2016
Date analysed	-	20/05/2016
Benzo(a)pyrene in TCLP	mg/L	<0.001
Surrogate <i>p</i> -Terphenyl-d14	%	92

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Method ID	Methodology Summary
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004.
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP).
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.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
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.

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QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Metals in TCLP USEPA1311						Base II Duplicate II %RPD		
Date extracted	-			20/05/2016	146263-A-5	20/05/2016 20/05/2016	LCS-W1	20/05/2016
Date analysed	-			20/05/2016	146263-A-5	20/05/2016 20/05/2016	LCS-W1	20/05/2016
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	146263-A-5	0.2 0.2 RPD: 0	LCS-W1	95%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in TCLP (USEPA 1311)						Base II Duplicate II %RPD		
Date extracted	-			20/05/2016	[NT]	[NT]	LCS-W1	20/05/2016
Date analysed	-			20/05/2016	[NT]	[NT]	LCS-W1	20/05/2016
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	LCS-W1	90%
Surrogate p-Terphenyl-d14	%		Org-012	80	[NT]	[NT]	LCS-W1	85%