

Validated

SDG: Location:

170923-73 Chartered Land - Heuston Order Number:

Client Reference:

2921-028 COC3-B

Report Number: Superseded Report:

Inert Waste

Landfill

426770

Stable

Non-reactive

Hazardous Waste

in Non-

Hazardous

Waste Landfill

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS REF: BS EN 12457/2

Chartered Land - Heuston South Qi Client Reference Site Location Mass Sample taken (kg) 0.097 8.34 Natural Moisture Content (%) Mass of dry sample (kg) 0.090 92.3 Dry Matter Content (%)

Particle Size <4mm >95%

Landfill Waste Acceptance Case Criteria Limits SDG 170923-73

Lab Sample Number(s) 16240556 Sampled Date 20-Sep-2017 2921-BH2-Comp-SS6 Customer Sample Ref.

0.30 - 2.00Depth (m)

		the second secon		Landfill	
Solid Waste Analysis	Result				
Organic Carbon (%)	0.386		3	5	6
Loss on Ignition (%)	2.27			-	10
Sum of BTEX (mg/kg)	<0.024		6		-
Sum of 7 PCBs (mg/kg)	<0.021		1		-
Mineral Oil (mg/kg)	66.5		500		-
PAH Sum of 17 (mg/kg)	(2)		-		
pH (pH Units)	11.5			>6	
ANC to pH 6 (mol/kg)				-	-
ANC to pH 4 (mol/kg)	-		-		-

Eluate Analysis	C ₂ Conc ⁿ in	10:1 eluate (mg/l)	A2 10:1 con	ec ⁿ leached (mg/kg)	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Limit of Detection Result				,9
Arsenic	0.00145	<0.0005	0.0145	<0.005	0.5	2	25
Barium	0.0254	<0.0002	0.254	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.00654	<0.001	0.0654	<0.01	0.5	10	70
Copper	0.00608	< 0.0003	0.0608	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.00244	< 0.0005	0.0244	<0.005	0.5	10	30
Nickel	0.00162	<0.0004	0.0162	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
nony	0.00157	<0.0001	0.0157	<0.001	0.06	0.7	5
anium	0.00164	<0.0005	0.0164	<0.005	0.1	0.5	7
Zinc	< 0.001	<0.001	<0.01	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	57	<2	570	<20	1000	20000	50000
Total Dissolved Solids	364	<5	3640	<50	4000	60000	10000
Total Monohydric Phenols (W)	< 0.016	< 0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	<3	<3	<30	<30	500	800	1000

Leach Test Information

Date Prepared 27-Sep-2017 pH (pH Units) 11.46 Conductivity (µS/cm) 623.00 Temperature (°C) 19.80 Volume Leachant (Litres) 0.892

.d Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation Mcerts Certification does not apply to leachates

04/10/2017 13:00:28



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Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample 1	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis	Jampie	Jorreotea
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step		
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition		
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material		
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC		
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)		
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water		
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser		
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water		
TM132	In - house Method	ELTRA CS800 Operators Guide		
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter		
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser		
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils		
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone		
TM218	Determination of PAH by GCMS Microwave extraction	Spectrophotometric Analysers The determination of PAH in soil samples by microwave extraction and GC-MS		
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer		
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).





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170923-73 Client Reference Chartered Land - Heuston Order Number: Client Reference:

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Test Completion Dates

Lab Sample No	o(s) 16240556
Customer Sample F	Ref. 2921-BH2-Comp-S S6
AGS F	Ref.
De	pth 0.30 - 2.00
Ty	/pe Soil/Solid (S
Anions by Kone (w)	29-Sep-2017
Asbestos ID in Solid Samples	03-Oct-2017
Boron Water Soluble	28-Sep-2017
CEN 10:1 Leachate (1 Stage)	27-Sep-2017
CEN Readings	28-Sep-2017
Cyanide Comp/Free/Total/Thiocyanate	29-Sep-2017
Dissolved Metals by ICP-MS	29-Sep-2017
Dissolved Organic/Inorganic Carbon	29-Sep-2017
EPH CWG (Aliphatic) GC (S)	28-Sep-2017
EPH CWG (Aromatic) GC (S)	28-Sep-2017
Fluoride	29-Sep-2017
GRO by GC-FID (S)	27-Sep-2017
Hexavalent Chromium (s)	29-Sep-2017
s on Ignition in soils	04-Oct-2017
ıry Dissolved	29-Sep-2017
cals by iCap-OES Dissolved (W)	29-Sep-2017
Metals in solid samples by OES	29-Sep-2017
Mineral Oil	29-Sep-2017
PAH by GCMS	29-Sep-2017
PCBs by GCMS	28-Sep-2017
PH	27-Sep-2017
Phenols by HPLC (S)	28-Sep-2017
Phenols by HPLC (W)	29-Sep-2017
Sample description	26-Sep-2017
Total Dissolved Solids	28-Sep-2017
Total Organic Carbon	28-Sep-2017
Total Sulphate	29-Sep-2017
Total Sulphur	28-Sep-2017
TPH CWG GC (S)	28-Sep-2017





SDG: Location: 170923-73

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Chromatogram

Analysis: EPH CWG (Aliphatic) GC (S)

Sample No : Sample ID : 16251489

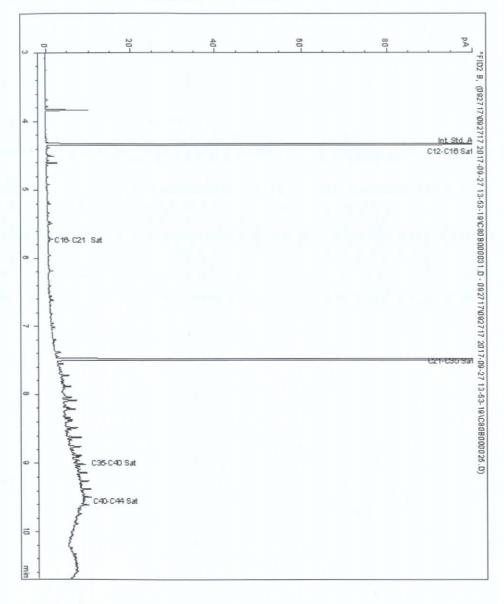
2921-BH2-Comp-SS6

Depth: 0.30 - 2.00

Alcontrol/Geochem Analytical Services Speciated TPH - SATS (C12 - C40)

Sample Identity: 15212360-Date Acquired : 27/09/17 23:18:12

Units : ppb Dilution Multiplier : 1.010







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2921-028 COC3-B

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426770

Chromatogram

Analysis: EPH CWG (Aromatic) GC (S)

Sample No : Sample ID :

16251489 2921-BH2-Comp-SS6 Depth: 0.30 - 2.00

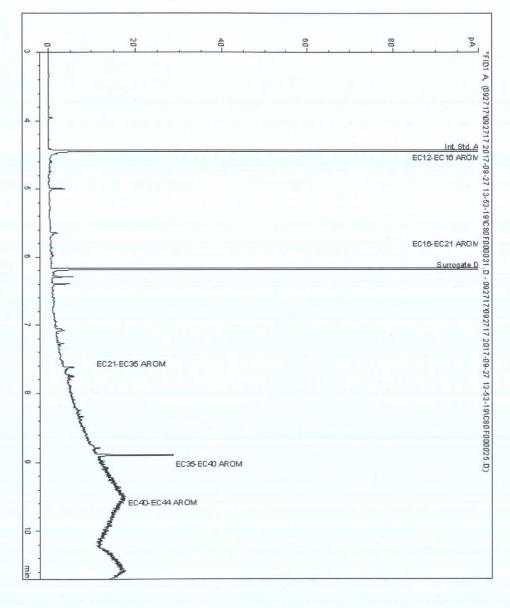
Speciated TPH - AROMS (C12 - C44)

Sample Identity: 15212361-Date Acquired : 27/09/17 23:18:12

Units : ppb

Dilution

CF : 1 Multiplier : 1.010







SDG: Location: 170923-73

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-B

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426770

Chromatogram

Analysis: Mineral Oil

Sample No : Sample ID :

16256300

2921-BH2-Comp-SS6

Depth: 0.30 - 2.00

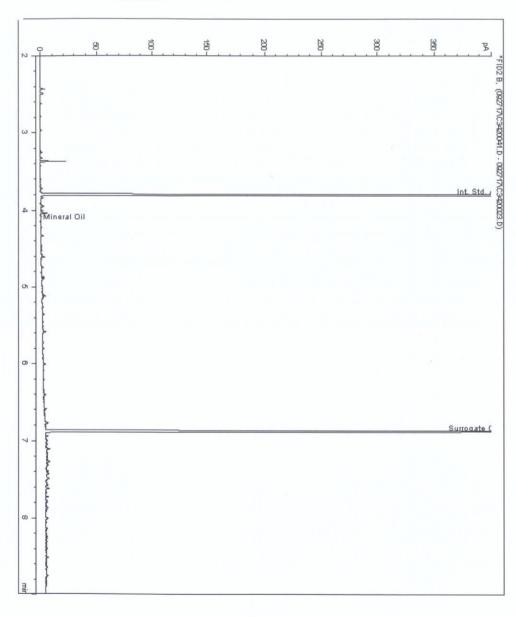
Mineral Oil Range Organics (ClO - C40)

15212363-28/09/17 16:05:24 PM mg/kg 0.000

Sample Identity Date Acquired Units Sample Multiplier Dilution









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2921-028 COC3-B

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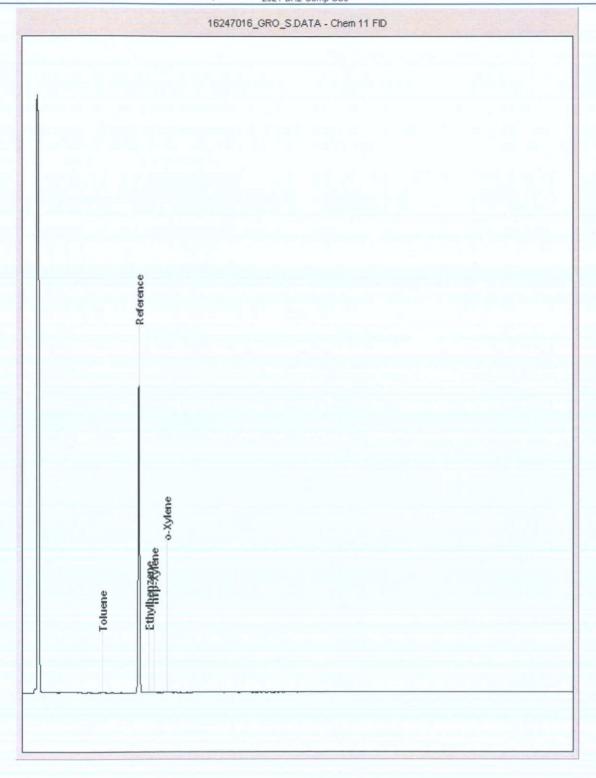
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : Sample ID :

16247016 2921-BH2-Comp-SS6

Depth: 0.30 - 2.00





SDG: Location: 170923-73 Client Reference: rtered Land - Heuston South Qua Order Number:

2921-028 COC3-B

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Appendix

General

- Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.
- 2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
- 3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.
- 4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
- 5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
- 6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.
- 7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.
- 8. If appropriate preserved bottles are not received preservation will take place on receipt However, the integrity of the data may be compromised.
- 9. NDP No determination possible due to insufficient/unsuitable sample
- 10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals total metals must be requested separately.
- 11. Results relate only to the items tested
- 12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.
- 13. Surrogate recoveries Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.
- 14. Product analyses Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
- 15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
- 16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).
- 17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
- 18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
- 19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
- 20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

- 21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
- 22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
- 23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.
- 24. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

If a sample is classed as deviated then the associated results may be compromised

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before presevation was performed
§	Sampled on date not provided
	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy an central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysofile	White Asbests
Amosite	Brown Asbests
Cro d dollte	Blue Asbe stos
Fibrous Adinolite	
Ribious Anthophyllite	
Fibrous Tremplife	

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Minerex Environmental Taney hall Eglinton Terrace Dundrum Dublin Dublin 14

Attention: Sven Klinkenbergh

Unit 7-8 Hawarden Business Park Manor Road (off Manor Lane) Hawarden Deeside CH5 3US

Tel: (01244) 528700 Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date:

Customer:

Sample Delivery Group (SDG):

Your Reference: Location:

Report No:

04 October 2017 D_MINEREX_DUB

170923-71

2921-028 COC3-C

Chartered Land - Heuston South Quarter

426769

We received 1 sample on Saturday September 23, 2017 and 1 of these samples were scheduled for analysis which was completed on Wednesday October 04, 2017. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Approved By

Sonia McWhan
Operations Manager







Validated

SDG: Location: 170923-71

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-C

Report Number: Superseded Report:

426769

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16240471	2921-BH2-SS5		2.00 - 4.00	20/09/2017

Maximum Sample/Coolbox Temperature (°C):

16.6

ISO5667-3 Water quality - Sampling - Part3 - During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of $(5\pm3)^{\circ}$ C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.



Results Legend					
X Test	Test Lab Sample No				104-20
No Determination Possible					_
	0				787
	100	stomer			787 I-DHZ-000
	Sample	Reference			
Comple Tuese					5
Sample Types - S - Soil/Solid			-		
UNS - Unspecified Solid					
GW - Ground Water SW - Surface Water	AGS	Reference			
LE - Land Leachate					
PL - Prepared Leachate PR - Process Water					
SA - Saline Water	Do	nth (m)			2.00
TE - Trade Effluent TS - Treated Sewage	De	pth (m)			
US - Untreated Sewage			_		
- Recreational Water			2508	4 0	- 0
- Drinking Water Non-regulatory INL - Unspecified Liquid	Co	ntainer	250g Amber Jar (ALE210)	400g Tub (ALE214)	(ALE215)
SL - Sludge	30		ber J.	Tub (14)	215)
G - Gas OTH - Other			Br		
	Sam	ple Type	co	S	O
Anions by Kone (w)	All	NDPs: 0			
		Tests: 1		Х	
Asbestos ID in Solid Samples	All	NDPs: 0			
	7	Tests: 1			
				Х	
Boron Water Soluble	All	NDPs: 0 Tests: 1			
		16363. 1	Х		
CEN Readings	All	NDPs: 0			
		Tests: 1		X	
Overside	A.U.			^	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1			
			X		
Dissolved Metals by ICP-MS	All	NDPs: 0			
		Tests: 1		X	
olved Organic/Inorganic	A.II			^	
∠rbon	All	NDPs: 0 Tests: 1			
				Х	
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0			
		Tests: 1	Х		
EDIT 01410 (4(1-) 0.0 (0)			^		
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 1			
		10010.	X		
Fluoride	All	NDPs: 0			
		Tests: 1		v	
				X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			
		10313.1			X
Hexavalent Chromium (s)	All	NDPs: 0			
		Tests: 1	v		
			X		
Loss on Ignition in soils	All	NDPs: 0 Tests: 1			
		10313.1	Х		
Mercury Dissolved	All	NDPs: 0			
		Tests: 1		v	
				X	
als by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 1			
		rests. 1		X	

CERTIFICATE OF ANALYSIS



(ALS) Location:	Chartered Land - Heuston Order Number:						
Results Legend					_		
X Test	Lab Sa			16240471			
No Determination Possible					471		
Sample Types -		Customer Sample Reference			2921-BH2-SS5		
S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate	AGS	Reference					
PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage	De	epth (m)			2.00 - 4.00		
OS - Officeated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas	Co	ontainer	250g Amber Jar (ALE210)	400g Tub (ALE214)	60g VOC (ALE215)		
OTH - Other	Sam	ple Type	S	co	S		
Metals in solid samples by OES	All	NDPs: 0					
		Tests: 1	х				
Mineral Oil	All	NDPs: 0 Tests: 1	Х				
PAH by GCMS	All	NDPs: 0 Tests: 1	Х				
PCBs by GCMS	All	NDPs: 0 Tests: 1	Х				
рН	All	NDPs: 0 Tests: 1	Х				
Phenois by HPLC (S)	All	NDPs: 0 Tests: 1	x				
Phenois by HPLC (W)	All	NDPs: 0 Tests: 1		X			
Sample description	All	NDPs: 0 Tests: 1	Х				
Total Dissolved Solids	All	NDPs: 0 Tests: 1		Х			
Total Organic Carbon	All	NDPs: 0 Tests: 1	Х				
Total Sulphate	All	NDPs: 0 Tests: 1	Х				
Total Sulphur	All	NDPs: 0 Tests: 1	Х				
TPH CWG GC (S)	All	NDPs: 0 Tests: 1	X				



Validated

SDG: Location:

170923-71 Client Reference Chartered Land - Heuston Order Number: Client Reference: 2921-028 COC3-C

Report Number: Superseded Report:

426769

Sample Descriptions

Grain Sizes

very fine <0.0	63mm fine	0.063mm - 0.1mm	medium 0.1m	ım - 2mm C	oarse 2mm - 1	10mm very coarse	>10m
Lab Sample No(s)	Customer Sample Ref	Depth (m)	Colour	Description	Inclusions	Inclusions 2	
16240471	2921-BH2-SS5	2.00 - 4.00	Dark Brown	Stone/Soil	Stones	None	

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

er coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

DCC PLAN NO:4610/22 RECEIVED: 04/08/2022

CERTIFICATE OF ANALYSIS



Results Legend # ISO17025 accredited.		Customer Sample Ref.	2921-BH2-SS5	
M mCERTS accredited.				
diss.filt Dissolved / filtered sample.		Depth (m)	2.00 - 4.00	
tot.unfilt Total / unfiltered sample. * Subcontracted test		Sample Type	Soil/Solid (S) 20/09/2017	
** % recovery of the surrogate stands	ard to	Date Sampled Sampled Time	2010912011	
check the efficiency of the method results of individual compounds w	. The	Date Received	23/09/2017	
samples aren't corrected for the re		SDG Ref	170923-71	
(F) Trigger breach confirmed	313,010-0	Lab Sample No.(s)	16240471	
1-5&+§@ Sample deviation (see appendix)	100011	AGS Reference		
Component	LOD/Units			
Moisture Content Ratio (% of as received sample)	%	PM024	6.1	
Loss on ignition	<0.7 %	TM018	0.856	
Mineral oil >C10-C40	<1 mg/kg	TM061	11.2	
Mineral Oil Surrogate % recovery**	%	TM061	86.7	
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	
Organic Carbon, Total	<0.2 %	TM132	0.622	
Sulphur, Total	<0.02 %	TM132	0.0361	_
Sulphate, Total potential	<0.06 %	TM132	0.108	¥
рН	1 pH Units	TM133	9.38	
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	
Cyanide, Total	<1 mg/kg	TM153	<1 #	
Cyanide, Free	<1 mg/kg	TM153	<1 #	
PCB congener 28	<3 µg/kg	TM168	<3 #	
PCB congener 52	<3 µg/kg	TM168	<3 #	
PCB congener 101	<3 µg/kg	TM168	<3	
PCB congener 118	<3 µg/kg	TM168	<3 #	
PCB congener 138	<3 µg/kg	TM168	<3 #	
PCB congener 153	<3 µg/kg	TM168	<3 #	
PCB congener 180	<3 µg/kg	TM168	<3 #	
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168	<21	
Antimony	<0.6 mg/kg		<0.6	
Arsenic	<0.6 mg/kg	TM181	2.28	
Barium	<0.6 mg/kg	TM181	10.1	
Cadmium	<0.02 mg/kg	TM181	0.547 #	
Chromium	<0.9 mg/kg		6.46 #	
Copper	<1.4 mg/kg		4.06 #	
Iron	<1000 mg/kg	TM181	3950 #	
Lead	<0.7 mg/kg		3.47	
Manganese	<0.13 mg/kg	TM181	256 #	
Mercury	<0.14 mg/kg	TM181	0.318	
Molybdenum	<0.1 mg/kg		0.777	NATURE NATURE
Nickel	<0.2 mg/kg	TM181	8.71	



Validated

# IS	Results Legend O17025 accredited.	C	Customer Sample Ref.	2921-BH2-SS5			
M m	CERTS accredited.						
A ps	queous / settled sample.		Donth (m)	202 402			
diss.filt D	issolved / filtered sample. otal / unfiltered sample.		Depth (m) Sample Type	2.00 - 4.00 Soll/Solid (S)			
* S	ubcontracted test.		Date Sampled	20/09/2017			
** %	recovery of the surrogate standa	ard to	Sampled Time				
ch	heck the efficiency of the method	The	Date Received	23/09/2017			
	sults of individual compounds warples aren't corrected for the re		SDG Ref	170923-71			
(F) Tr	rigger breach confirmed	covery	Lab Sample No.(s)	16240471			
1-58+5@ S	ample deviation (see appendix)		AGS Reference				
Compone	ent	LOD/Units	Method				
Selenium		<1 mg/kg	TM181	<1			
		20.2			#		
		40.0	7711101	10.4	"		
Zinc		<1.9 mg/kg	TM181	18.1			
					#		
Sulphate,	Total	<48 mg/kg	TM221	123			
ouipilate,	Total	-40 mg/kg	TIVIZZI	120	vo.		
					#		
Sulphide, (Oxidisable	< 0.03 %	TM221	0.108			
		100000000000000000000000000000000000000					
Boron, wat	ter soluble	<1 mg/kg	TM222	<1			
					#		
					#		
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CERTIFICATE OF ANALYSIS



AH by GCMS						
# ISO17025 accredited. M mCERTS accredited.		Customer Sample Ref.	2921-BH2-SS5			
aq Aqueous / settled sample. diss.fiit Dissolved / filtered sample. ot.unfit Total / unfiltered sample.		Depth (m) Sample Type	2.00 - 4.00 Soil/Solid (S)			
Subcontracted test. **	tard to	Date Sampled Sampled Time	20/09/2017		h 1	
check the efficiency of the method	d. The	Date Received	23/09/2017			
results of individual compounds v samples aren't corrected for the re	ecovery	SDG Ref Lab Sample No.(s)	170923-71 16240471			
(F) Trigger breach confirmed I-5&+§@ Sample deviation (see appendix)		AGS Reference				
Component	LOD/Units	Method				
Naphthalene-d8 % recovery**	%	TM218	93.3			
Acenaphthene-d10 % recovery**	%	TM218	89.8			
Phenanthrene-d10 % recovery**	%	TM218	89.4			
Chrysene-d12 % recovery**	%	TM218	89.8			
Perylene-d12 % recovery**	%	TM218	87.9			
Naphthalene	<9 µg/kg	TM218	<9 #	1 1		
Acenaphthylene	<12 µg/kg	TM218	<12			
Acenaphthene	<8 µg/kg	TM218	<8 #			
Fluorene	<10 µg/kg	TM218	<10 #			
Phenanthrene	<15 µg/kg	TM218	<15			
Anthracene	<16 µg/kg	TM218	<16			
Fluoranthene	<17 µg/kg	TM218	<17			
Pyrene	<15 µg/kg	TM218	<15			
Benz(a)anthracene	<14 µg/kg	TM218	<14			
Chrysene	<10 µg/kg	TM218	<10 #			
Benzo(b)fluoranthene	<15 µg/kg	TM218	<15 #			
Benzo(k)fluoranthene	<14 µg/kg	TM218	<14			
Benzo(a)pyrene	<15 µg/kg	TM218	<15			
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218	<18			
Dibenzo(a,h)anthracene	<23 µg/kg	TM218	<23 #			
Benzo(g,h,i)perylene	<24 µg/kg	TM218	<24			
Coronene	<200 µg/kg	TM218	<200			
PAH, Total Detected USEPA 16	<118 µg/kg	TM218	<118			
PAH, Total Detected USEPA 16 + Coronene	<318 µg/kg	TM218	<318			
- ALVINIA						
				- , 1 11		





SDG: 170923-71 Client Reference: 2921-028 COC3-C Location: Chartered Land - Heuston Order Number:

Report Number: Superseded Report:

port Number: 426769

Aliphatics >C12-C16	TM173 TM173 TM173 TM173	<3 #	# # # # # #	Sali/Salid (S) 20/08/2017 23/09/2017 170923-71 170243-71 16240471 78 <44 # <5 # <10 # 2.13 # <3 # <6 # <3 # <9 <24 <10 <10 <10 <10 <10 <10
Aquecus / settled sample.	Sample Type Date Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sample No.(a) AGS Reference Method TM089 TM073 TM173 TM173 TM173	Soli/Solid (S) 20/09/2017 23/09/2017 1709/23-71 1709/23-71 16240471 78 < 44 # <5 # <10 # 2.13 # <6 # <3 # <9 <24 <10 <10 <10 <10 <10	# # # # # #	Sali/Salid (S) 20/08/2017 23/09/2017 170923-71 170243-71 16240471 78 <44 # <5 # <10 # 2.13 # <3 # <6 # <3 # <9 <24 <10 <10 <10 <10 <10 <10
Dissolved / Hitrerd sample. Total content of the content of t	Sample Type Date Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sample No.(a) AGS Reference Method TM089 TM073 TM173 TM173 TM173	Soli/Solid (S) 20/09/2017 23/09/2017 17/09/2017 17/09/23-71 16/240471 78 < 44 # < 5 # < 10 # 2.13 # < 6 # < 3 # < 9 < 24 < 10 < 10 < 10 < 10 < 10	# # # # # #	Sali/Salid (S) 20/08/2017 23/09/2017 170923-71 170243-71 16240471 78 <44 # <5 # <10 # 2.13 # <3 # <6 # <3 # <9 <24 <10 <10 <10 <10 <10 <10
Total / unfiltered sample.	Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(a) AGS Reference Method TM089 TM173 TM173 TM173 TM173 TM173	20/09/2017 23/09/2017 17/0923-71 16240471 78 <44 # <5 # <10 # 2.13 # <6 # <3 # <9 <24 <10 <10 <10 <10	# # # # # #	2009/2017 23/09/2017 170923-71 16240471 78 <44 # <5 # <10 # 2.13 # <6 # <3 # <9 <24 <10 <10 <10 <10 <10
% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)	Sampled Time	23/09/2017 17/09/23-71 16240471 78 <444 # <5 # <10 # 2.13 # <6 # <3 # <9 <24 <10 <10 <10 <10	# # # # #	23/09/2017 17/0923-71 16240471 78 <444 # <5 # <10 # 2.13 # <3 # <6 # <3 # <9 <24 <10 <10 <10 <10 <10
check the efficiency of the method. The results of Individual compounds within samples aren't corrected for the recovery Trigger breach confirmed samples deviation (see appendix) SRO Surrogate % recovery**	Date Received SDG Ref Lab Sample No.(a) AGS Reference Method TM089	170923-71 16240471 78 <44 # <5 # <10 # 2.13 # <6 # <3 # <9 <24 <10 <10 <10 <10	# # # # #	170923-71 16240471 78 <44 # <5 # <10 # 2.13 # <6 # <3 # <9 <24 <10 <10 <10 <10 <10
results of Individual compounds within samples aren't corrected for the recovery 17/5gper breach confirmed Sample deviation (see appendix) Component LOD/Units GRO Surrogate % recovery** % GRO TOT (Moisture Corrected) <44 µg/kg Methyl tertiary butyl ether <5 µg/kg Methyl tertiary butyl ether <5 µg/kg Genzene <10 µg/kg Ethylbenzene <3 µg/kg Ethylbenzene <3 µg/kg Ethylbenzene <3 µg/kg Ethylbenzene <4 µg/k	Date Received SDG Ref Lab Sample No.(a) AGS Reference Method TM089	170923-71 16240471 78 <44 # <5 # <10 # 2.13 # <6 # <3 # <9 <24 <10 <10 <10 <10	# # # # #	170923-71 16240471 78 <44 # <5 # <10 # 2.13 # <6 # <3 # <9 <24 <10 <10 <10 <10 <10
Samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)	SDG Ref Lab Sample No.(a) AGS Reference Method TM089 TM173 TM173 TM173 TM173	170923-71 16240471 78 <44 # <5 # <10 # 2.13 # <6 # <3 # <9 <24 <10 <10 <10 <10	# # # # #	170923-71 16240471 78 <44 # <5 # <10 # 2.13 # <6 # <3 # <9 <24 <10 <10 <10 <10 <10
Trigger breach confirmed Sample deviation (see appendix)	Lab Sample No.(s) AGS Reference Method TM089 TM173 TM173 TM173 TM173 TM173	78 <44 # <5 # <10 2.13 # <6 # <9 <24 <10 <10 <10 <10	# # # # #	78 <44 # <5 # <10 # 2.13 # <3 # <6 # <3 # <9 <24 <10 <10 <10 <10 <10
Sample deviation (see appendix) Component COD/Units	AGS Reference Method TM089 TM173 TM173 TM173 TM173 TM173	78 <44 # <5 # 213 43 46 43 49 <24 <10 <10 <10 <10	# # # # #	78 <44 # <5 # <10 # 2.13 # <6 # <3 # <9 <24 <10 <10 <10 <10
Component LOD/Units GRO Surrogate % recovery** % GRO TOT (Moisture Corrected) <44 μg/kg	Method TM089 TM173 TM173 TM173 TM173 TM173 TM173	<44 # <5 # <10 # 2.13 # <3 # <6 # <3 # <9 <24 <10 <10 <10 <10	# # # # #	<44 # <5 # <10 # 2.13 # <3 # <6 # <3 # <9 <24 <10 <10 <10 <10 <10 <
GRO Surrogate % recovery** % GRO TOT (Moisture Corrected) <44 μg/kg Methyl tertiary butyl ether (MTBE) <5 μg/kg Benzene <10 μg/kg Toluene <2 μg/kg Ethylbenzene <3 μg/kg Xylene <6 μg/kg o-Xylene <3 μg/kg sum of detected mpo xylene by GC <9 μg/kg sum of detected BTEX by GC <24 μg/kg Aliphatics >C5-C6 <10 μg/kg Aliphatics >C6-C8 <10 μg/kg Aliphatics >C10-C12 <10 μg/kg Aliphatics >C10-C12 <10 μg/kg Aliphatics >C12-C16 <100 μg/kg Aliphatics >C21-C35 <100 μg/kg Aliphatics >C35-C44 <100 μg/kg Aromatics >EC5-EC7 <10 μg/kg Aromatics >EC7-EC8 <10 μg/kg Aromatics >EC8-EC10 <10 μg/kg Aromatics >EC12-EC16 <10 μg/kg	TM089 TM173 TM173 TM173 TM173 TM173	<44 # <5 # <10 # 2.13 # <3 # <6 # <3 # <9 <24 <10 <10 <10 <10	# # # # #	<44 # <5 # <10 # 2.13 # <3 # <6 # <3 # <9 <24 <10 <10 <10 <10 <10 <
GRO Surrogate % recovery** % GRO TOT (Moisture Corrected) <44 μg/kg	TM089 TM173 TM173 TM173 TM173 TM173	<44 # <5 # <10 # 2.13 # <3 # <6 # <3 # <9 <24 <10 <10 <10 <10	# # # # #	<44 # <5 # <10 # 2.13 # <3 # <6 # <3 # <9 <24 <10 <10 <10 <10 <10 <
Methyl tertiary butyl ether (MTBE) <5 μg/kg	TM089 TM173 TM173 TM173 TM173 TM173	<pre> </pre> <pre> </pre> <pre> <10 # 2.13 # <3 # <6 # <3 # <9 <24 <10 <10 <10 <10 </pre>	# # # # #	# <5 # <10 # 2.13 # <3 # <6 # <3 # <9 <24 <10 <10 <10 <10 <10 <10
Methyl tertiary butyl ether MTBE) <5 μg/kg	TM089 TM173 TM173 TM173 TM173 TM173	<pre> </pre> <pre> </pre> <pre> <10 # 2.13 # <3 # <6 # <3 # <9 <24 <10 <10 <10 <10 </pre>	# # # # #	# <5 # <10 # 2.13 # <3 # <6 # <3 # <9 <24 <10 <10 <10 <10 <10 <10
MTBE Senzene	TM089 TM173 TM173 TM173 TM173 TM173	<5 # <10 # 2.13 # <3 # <6 # <3 # <9 <24 <10 <10 <10 <10	# # # # #	<5 # <10 # 2.13 # <3 # <6 # <3 # <9 <24 <10 <10 <10 <10 <10 <10 <10 <10
(MTBE) <10 μg/kg	TM089 TM173 TM173 TM173 TM173 TM173	<10 # 2.13 # 2.13 # <6 # <7	# # # #	# <10 # 2.13 # <3 # <6 # <3 # <9 *24 *10 *10 *10 *10 *10 *10 *10 *10 *10 *10
Senzene <10 μg/kg	TM089 TM173 TM173 TM173 TM173 TM173	<10 # 2.13 # <3 # <6 # <3 # <9 <24 <10 <10 <10 <10	# # # #	<10 # 2.13 # <3 # <6 # <3 # <9 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10
Toluene <2 μg/kg Xylene <6 μg/kg Xylene <6 μg/kg Sum of detected mpo xylene by GC Sum of detected BTEX by GC <24 μg/kg Aliphatics > C5-C6 <10 μg/kg Aliphatics > C6-C8 <10 μg/kg Aliphatics > C10-C12 <10 μg/kg Aliphatics > C10-C12 <10 μg/kg Aliphatics > C10-C12 <10 μg/kg Aliphatics > C10-C14 <100 μg/kg Aliphatics > C10-C21 <100 μg/kg Aliphatics > C10-C24 <100 μg/kg Aromatics > EC5-EC7 <10 μg/kg Aromatics > EC7-EC8 <10 μg/kg Aromatics > EC8-EC10 <10 μg/kg Aromatics > EC10-EC12 <10 μg/kg Aromatics > EC10-EC12 <10 μg/kg Aromatics > EC12-EC16 <100 μg/kg Aromatics > EC12	TM089 TM173 TM173 TM173 TM173 TM173	2.13 # <3 # <6 # <3 # <9 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 * <10 * <10 * <10 * <10 * <10 * <10 * <10 * <10 * <10 * <10 *	#	# 2.13 # <3 # <6 # <9 <24 <10 <10 <10 <10
Coluene C2 μg/kg C3 μg/kg C4 μg/kg C5 μg/kg C5 μg/kg C6 μg/kg C5 μg/kg	TM089 TM173 TM173 TM173 TM173 TM173	2.13 # <3 # <6 # <3 # <9 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 * <10 * <10 * <10 * <10 * <10 * <10 * <10 * <10 * <10 * <10 *	#	# 2.13 # <3 # <6 # <9 <24 <10 <10 <10 <10
State	TM089 TM173 TM173 TM173 TM173 TM173	2.13 # <3 # <6 # <3 # <9 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 * <10 * <10 * <10 * <10 * <10 * <10 * <10 * <10 * <10 * <10 *	#	2.13 # <3 # <6 # <3 # <9 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 ** <10 * <10 * <10 * <10 * <10 * <1
Xylene	TM089 TM173 TM173 TM173 TM173 TM173	<pre> </pre> <pre> <3</pre>	#	# <3 # <6 # <3 # <9 <24 <10 <10 <10
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Xylene	TM089 TM089 TM089 TM089 TM089 TM089 TM089 TM089 TM089 TM173 TM173 TM173 TM173 TM173	<3 # <6 # <3 # <9 <24 <10 <10 <10 <10	#	<3 # <6 # <3 # <9 <24 <10 <10 <10 <10 <10 <10 <10 <10
Xylene	TM089 TM089 TM089 TM089 TM089 TM089 TM089 TM089 TM089 TM173 TM173 TM173 TM173 TM173	<3 # <6 # <3 # <9 <24 <10 <10 <10 <10	#	<3 # <6 # <3 # <9 <24 <10 <10 <10 <10 <10 <10 <10 <10
Xylene	TM089 TM089 TM089 TM089 TM089 TM089 TM089 TM089 TM089 TM173 TM173 TM173 TM173 TM173	<pre># <6 # <3 # <9 <24 <10 <10 <10</pre>	#	# <6 # <3 # <9 <24 <10 <10 <10
December 23 μg/kg Sum of detected mpo xylene by GC Sum of detected BTEX by GC Aliphatics >C5-C6 Aliphatics >C6-C8 Aliphatics >C8-C10 Aliphatics >C10-C12 Aliphatics >C10-C12 Aliphatics >C10-C12 Aliphatics >C10-C12 Aliphatics >C10-C12 Aliphatics >C10-C14 Aliphatics >C10-C21 Aliphatics >C10-C21 Aliphatics >C10-C21 Aliphatics >C10-C21 Aliphatics >C10-C21 Aliphatics >C10-C21 Aliphatics >C100 μg/kg Aliphatics >C15-C44 Aliphatics >C100 μg/kg Aromatics >EC5-EC7 Aromatics >EC5-EC7 Aromatics >EC6-EC10 Aromatics >EC10-EC12 Aromatics >EC10-EC12 Aromatics >EC12-EC16	TM089 TM089 TM089 TM089 TM089 TM089 TM089 TM173 TM173 TM173 TM173 TM173	<6 # <3 # <9 <24 <10 <10 <10 <10	#	<6 # <3 # <9 <24 <10 <10 <10
December 23 μg/kg Sum of detected mpo xylene by GC Sum of detected BTEX by GC Aliphatics >C5-C6 Aliphatics >C6-C8 Aliphatics >C8-C10 Aliphatics >C10-C12 Aliphatics >C10-C12 Aliphatics >C10-C12 Aliphatics >C10-C12 Aliphatics >C10-C12 Aliphatics >C10-C14 Aliphatics >C10-C21 Aliphatics >C10-C21 Aliphatics >C10-C21 Aliphatics >C10-C21 Aliphatics >C10-C21 Aliphatics >C10-C21 Aliphatics >C100 μg/kg Aliphatics >C15-C44 Aliphatics >C100 μg/kg Aromatics >EC5-EC7 Aromatics >EC5-EC7 Aromatics >EC6-EC10 Aromatics >EC10-EC12 Aromatics >EC10-EC12 Aromatics >EC12-EC16	TM089 TM089 TM089 TM089 TM089 TM089 TM089 TM173 TM173 TM173 TM173 TM173	<6 # <3 # <9 <24 <10 <10 <10 <10	#	<6 # <3 # <9 <24 <10 <10 <10
December 23 μg/kg Sum of detected mpo xylene by GC Sum of detected BTEX by GC Aliphatics >C5-C6 Aliphatics >C6-C8 Aliphatics >C8-C10 Aliphatics >C10-C12 Aliphatics >C10-C12 Aliphatics >C10-C12 Aliphatics >C10-C12 Aliphatics >C10-C12 Aliphatics >C10-C14 Aliphatics >C10-C21 Aliphatics >C10-C21 Aliphatics >C10-C21 Aliphatics >C10-C21 Aliphatics >C10-C21 Aliphatics >C10-C21 Aliphatics >C100 μg/kg Aliphatics >C15-C44 Aliphatics >C100 μg/kg Aromatics >EC5-EC7 Aromatics >EC5-EC7 Aromatics >EC6-EC10 Aromatics >EC10-EC12 Aromatics >EC10-EC12 Aromatics >EC12-EC16	TM089 TM089 TM089 TM089 TM089 TM089 TM089 TM173 TM173 TM173 TM173 TM173	<pre></pre>		# <3 # <9 <24 <10 <10 <10 <10
Sum of detected mpo xylene by GC	TM089 TM089 TM089 TM089 TM089 TM089 TM089 TM173 TM173 TM173 TM173 TM173	<3 # <9 <24 <10 <10 <10 <10		<3 # <9 <24 <10 <10 <10 <10
Sum of detected mpo xylene by 3C Sum of detected BTEX by GC Sum of	TM089 TM089 TM089 TM089 TM089 TM089 TM089 TM173 TM173 TM173 TM173 TM173	<3 # <9 <24 <10 <10 <10 <10		<3 # <9 <24 <10 <10 <10 <10
Sum of detected mpo xylene by 3C Sum of detected BTEX by GC Sum of	TM089 TM089 TM089 TM089 TM089 TM089 TM089 TM173 TM173 TM173 TM173 TM173	<9 <24 <10 <10 <10 <10	#	# <9 *24 *10 *10 *10 *10 *10 *10 *10 *10 *10 *10
GC sum of detected BTEX by GC <24 μg/kg	TM089 TM089 TM089 TM089 TM089 TM173 TM173 TM173 TM173 TM173	<9 <24 <10 <10 <10 <10	#	<9 <24 <10 <10 <10 <10
GC sum of detected BTEX by GC <24 μg/kg	TM089 TM089 TM089 TM089 TM089 TM173 TM173 TM173 TM173 TM173	<9 <24 <10 <10 <10 <10		<9 <24 <10 <10 <10 <10
Signar	TM089 TM089 TM089 TM089 TM089 TM173 TM173 TM173 TM173 TM173	<24 <10 <10 <10 <10		<24 <10 <10 <10 <10 <10
sum of detected BTEX by GC <24 μg/kg	TM089 TM089 TM089 TM089 TM173 TM173 TM173 TM173 TM173	<10 <10 <10 <10		<10 <10 <10 <10
sum of detected BTEX by GC <24 μg/kg	TM089 TM089 TM089 TM089 TM173 TM173 TM173 TM173 TM173	<10 <10 <10 <10		<10 <10 <10 <10
Aliphatics >C5-C6	TM089 TM089 TM089 TM089 TM173 TM173 TM173 TM173 TM173	<10 <10 <10 <10		<10 <10 <10 <10
Aliphatics >C6-C8	TM089 TM089 TM089 TM173 TM173 TM173 TM173 TM173	<10 <10 <10		<10 <10 <10
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Aliphatics > C6-C8	TM089 TM173 TM173 TM173 TM173 TM173 TM173	<10		<10
Aliphatics >C8-C10	TM089 TM173 TM173 TM173 TM173 TM173 TM173	<10		<10
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Aliphatics > C10-C12	TM173 TM173 TM173 TM173 TM173			
Aliphatics >C12-C16	TM173 TM173 TM173 TM173 TM173			
Aliphatics >C12-C16	TM173 TM173 TM173 TM173 TM173			
Aliphatics >C16-C21 <100 μg/kg Aliphatics >C21-C35 <100 μg/kg Aliphatics >C35-C44 <100 μg/kg I Aliphatics >C12-C44 <100 μg/kg Aromatics >EC5-EC7 <10 μg/kg Aromatics >EC7-EC8 <10 μg/kg Aromatics >EC8-EC10 <10 μg/kg Aromatics >EC10-EC12 <10 μg/kg	TM173 TM173 TM173 TM173	<100		<100
Aliphatics >C16-C21 <100 μg/kg Aliphatics >C21-C35 <100 μg/kg Aliphatics >C35-C44 <100 μg/kg I Aliphatics >C12-C44 <100 μg/kg Aromatics >EC5-EC7 <10 μg/kg Aromatics >EC7-EC8 <10 μg/kg Aromatics >EC8-EC10 <10 μg/kg Aromatics >EC10-EC12 <10 μg/kg	TM173 TM173 TM173 TM173	<100		<100
Aliphatics >C16-C21 <100 μg/kg Aliphatics >C21-C35 <100 μg/kg Aliphatics >C35-C44 <100 μg/kg I Aliphatics >C12-C44 <100 μg/kg Aromatics >EC5-EC7 <10 μg/kg Aromatics >EC7-EC8 <10 μg/kg Aromatics >EC8-EC10 <10 μg/kg Aromatics >EC10-EC12 <10 μg/kg	TM173 TM173 TM173 TM173	<100		<100
Aliphatics >C16-C21 <100 μg/kg Aliphatics >C21-C35 <100 μg/kg Aliphatics >C35-C44 <100 μg/kg I Aliphatics >C12-C44 <100 μg/kg Aromatics >EC5-EC7 <10 μg/kg Aromatics >EC7-EC8 <10 μg/kg Aromatics >EC8-EC10 <10 μg/kg Aromatics >EC10-EC12 <10 μg/kg	TM173 TM173 TM173 TM173			
Aliphatics >C21-C35	TM173 TM173 TM173			
Aliphatics >C21-C35	TM173 TM173 TM173	1000		
Aliphatics >C35-C44	TM173	<100		<100
Aliphatics >C35-C44	TM173			
Aliphatics >C35-C44	TM173			
Aliphatics > C12-C44	TM173	551		
Aliphatics > C12-C44	TM173			551
Aliphatics > C12-C44	TM173			551
Aromatics >EC5-EC7 <10 μg/kg Aromatics >EC7-EC8 <10 μg/kg Aromatics >EC8-EC10 <10 μg/kg Aromatics >EC10-EC12 <10 μg/kg Aromatics >EC10-EC12 <10 μg/kg		<100		
Aromatics >EC5-EC7 <10 μg/kg Aromatics >EC7-EC8 <10 μg/kg Aromatics >EC8-EC10 <10 μg/kg Aromatics >EC10-EC12 <10 μg/kg Aromatics >EC10-EC12 <10 μg/kg				551 <100
Aromatics >EC5-EC7 <10 μg/kg Aromatics >EC7-EC8 <10 μg/kg Aromatics >EC8-EC10 <10 μg/kg Aromatics >EC10-EC12 <10 μg/kg Aromatics >EC10-EC12 <10 μg/kg				
Aromatics >EC5-EC7 <10 μg/kg Aromatics >EC7-EC8 <10 μg/kg Aromatics >EC8-EC10 <10 μg/kg Aromatics >EC10-EC12 <10 μg/kg Aromatics >EC10-EC12 <10 μg/kg		551		<100
Aromatics >EC7-EC8 <10 μg/kg Aromatics >EC8-EC10 <10 μg/kg Aromatics >EC10-EC12 <10 μg/kg Aromatics >EC12-EC16 <100 μg/kg				
Aromatics >EC7-EC8 <10 μg/kg Aromatics >EC8-EC10 <10 μg/kg Aromatics >EC10-EC12 <10 μg/kg Aromatics >EC12-EC16 <100 μg/kg	TIMOOO	-40		<100
Aromatics >EC8-EC10 <10 μg/kg Aromatics >EC10-EC12 <10 μg/kg Aromatics >EC12-EC16 <100 μg/kg	TM089	<1U		<100 551
Aromatics >EC8-EC10 <10 μg/kg Aromatics >EC10-EC12 <10 μg/kg Aromatics >EC12-EC16 <100 μg/kg				<100
Aromatics >EC8-EC10 <10 μg/kg Aromatics >EC10-EC12 <10 μg/kg Aromatics >EC12-EC16 <100 μg/kg	TNAOOO	-40		<100 551
Aromatics >EC10-EC12 <10 μg/kg Aromatics >EC12-EC16 <100 μg/kg	TM089	<10		<100 551 <10
Aromatics >EC10-EC12 <10 μg/kg Aromatics >EC12-EC16 <100 μg/kg				<100 551
Aromatics >EC10-EC12 <10 μg/kg Aromatics >EC12-EC16 <100 μg/kg	TAMOOO	-40		<100 551 <10
Aromatics >EC10-EC12 <10 μg/kg Aromatics >EC12-EC16 <100 μg/kg	TM089	<10		<100 551 <10 <10
Aromatics >EC12-EC16 <100 μg/kg				<100 551 <10
Aromatics >EC12-EC16 <100 μg/kg	T14000	-40		<100 551 <10 <10
	TM089	<10		<100 551 <10 <10 <10
				<100 551 <10 <10
	T1470	007		<100 551 <10 <10 <10
Aromatics >EC16-EC21 <100 µg/kg	TM173			<100 551 <10 <10 <10 <10 <10
Aromatics >EC16-EC21 <100 μg/kg		237		<100 551 <10 <10 <10
Aromatics >EC16-EC21 <100 µg/kg	714470	23/		<100 551 <10 <10 <10 <10 <10
	TM173			<100 551 <10 <10 <10 <10 <20 237
		133		<100 551 <10 <10 <10 <10 <20 237
U - F004 F005	T14470			<100 551 <10 <10 <10 <10 <20 237
romatics >EC21-EC35 <100 µg/kg	TM173	133		<100 551 <10 <10 <10 <10 <10 237 133
				<100 551 <10 <10 <10 <10 <10 237 133
	73.4470	133		<100 551 <10 <10 <10 <10 <10 237 133
romatics >EC35-EC44 <100 µg/kg	TM173	133		<100 551 <10 <10 <10 <10 <10 <10 <10 <10 <10 <37 <10 <37 <100
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	71477	133		<100 551 <10 <10 <10 <10 <10 <10 <10 <10 <10 <37 <10 <37 <100
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		133		<100 551 <10 <10 <10 <10 <10 237 133 <100 <100
		133 <100 <100		<100 551 <10 <10 <10 <10 <10 237 133 <100 <100
fotal Aromatics >EC12-EC44 <100 μg/kg		133 <100 <100 <100		<100 551 <10 <10 <10 <10 237 133 <100 <100 <100 <
	TM173	133 <100 <100		<100 551 <10 <10 <10 <10 237 133 <100 <100 <100 <
	TM173	133 <100 <100 <100		<100 551 <10 <10 <10 <10 237 133 <100 <100 <100 <
Fotal Aliphatics & Aromatics <100 µg/kg	(A. 10 Con	133 <100 <100 <100 371		<100 551 <10 <10 <10 <10 237 133 <100 <100 <100 <100 371
C5-C44	(A. 10 Con	133 <100 <100 <100		<100 551 <10 <10 <10 <10 237 133 <100 <100 <100 <100 371
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	(A. 10 Con	133 <100 <100 <100 371		<100 551 <10 <10 <10 <10 237 133 <100 <100 <100 <100 371
	(A. 10 Con	133 <100 <100 <100 371		<100 551 <10 <10 <10 <10 237 133 <100 <100 <100 <100 371
TM TM TM TM TM TM TM	M173	<100		<100
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C21-C35 <100 μg/kg C35-C44 <100 μg/kg cics >C12-C44 <100 μg/kg EC5-EC7 <10 μg/kg EC7-EC8 <10 μg/kg EC8-EC10 <10 μg/kg EC10-EC12 <10 μg/kg	TM173 TM173 TM173	<100		<100
atics >C21-C35	TM173 TM173 TM173	<100		<100
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iphatics >C21-C35	TM173 TM173 TM173			
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Iliphatics > C21-C35	TM173 TM173 TM173			
Iliphatics > C16-C21	TM173 TM173 TM173 TM173			
Aliphatics >C16-C21 <100 µg/kg Aliphatics >C21-C35 <100 µg/kg Aliphatics >C35-C44 <100 µg/kg I Aliphatics >C12-C44 <100 µg/kg Aromatics >EC5-EC7 <10 µg/kg Aromatics >EC7-EC8 <10 µg/kg Aromatics >EC8-EC10 <10 µg/kg Aromatics >EC10-EC12 <10 µg/kg Aromatics >EC10-EC12 <10 µg/kg	TM173 TM173 TM173 TM173	<100		<100
Aliphatics > C16-C21	TM173 TM173 TM173 TM173	<100		<100
Aliphatics >C16-C21 <100 μg/kg Aliphatics >C21-C35 <100 μg/kg Aliphatics >C35-C44 <100 μg/kg I Aliphatics >C12-C44 <100 μg/kg Aromatics >EC5-EC7 <10 μg/kg Aromatics >EC7-EC8 <10 μg/kg Aromatics >EC8-EC10 <10 μg/kg Aromatics >EC10-EC12 <10 μg/kg	TM173 TM173 TM173 TM173	<100		<100
Aliphatics >C16-C21	TM173 TM173 TM173 TM173	<100		<100
Aliphatics >C12-C16	TM173 TM173 TM173 TM173	<100		<100
Aliphatics >C12-C16	TM173 TM173 TM173 TM173 TM173			
Aliphatics >C12-C16	TM173 TM173 TM173 TM173 TM173			
Aliphatics >C12-C16	TM173 TM173 TM173 TM173 TM173			
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Aliphatics >C12-C16	TM173 TM173 TM173 TM173 TM173			
Aliphatics > C10-C12	TM173 TM173 TM173 TM173 TM173			
Aliphatics > C10-C12	TM089 TM173 TM173 TM173 TM173 TM173	<10		<10
Aliphatics > C10-C12	TM173 TM173 TM173 TM173 TM173			
Aliphatics > C12-C16	TM173 TM173 TM173 TM173 TM173			
Aliphatics > C10-C12	TM173 TM173 TM173 TM173 TM173			
Aliphatics > C10-C12	TM173 TM173 TM173 TM173 TM173			
Aliphatics >C10-C12	TM089 TM173 TM173 TM173 TM173 TM173			
Aliphatics >C10-C12	TM089 TM173 TM173 TM173 TM173 TM173	<10		<10
Aliphatics >C10-C12	TM089 TM173 TM173 TM173 TM173 TM173	<10		<10
Aliphatics >C10-C12	TM089 TM173 TM173 TM173 TM173 TM173	<10		<10



Validated

SDG: 170923-71 Client Reference: 2921-028 COC3-C Report Number: 426769
Location: Chartered Land - Heuston Order Number: Superseded Report:

Asbestos Identification - Soil

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	2921-BH2-SS5 2.00 - 4.00 SOLID 20/09/2017 00:00:00 27/09/2017 10:05:31 170923-71 16240471 TM048	03/10/17	Eva Guerra		Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



Case

SDG

Lab Sample Number(s)

Sampled Date

CERTIFICATE OF ANALYSIS

Validated

SDG: Location:

170923-71

Client Reference: Chartered Land - Heuston Order Number

2921-028 COC3-C

Report Number: Superseded Report:

426769

Stable

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS REF: BS EN 12457/2 Client Reference Site Location Chartered Land - Heuston South Qi Mass Sample taken (kg) 0.101 Natural Moisture Content (%) 12 89.3

Mass of dry sample (kg) 0.090 Dry Matter Content (%) Particle Size <4mm >95%

170923-71

16240471

20-Sep-2017

Landfill Waste Acceptance **Criteria Limits**

Non-reactive Inert Waste Hazardous Customer Sample Ref. 2921-BH2-SS5 Hazardous Waste Landfill Waste Landfill in Non-2.00 - 4.00 Depth (m) Hazardous Landfill Solid Waste Analysis Result 0.622 Organic Carbon (%) 0.856 < 0.024 6 < 0.021

Loss on Ignition (%) Sum of BTEX (mg/kg) Sum of 7 PCBs (mg/kg) Mineral Oil (mg/kg) 11.2 500 PAH Sum of 17 (mg/kg) 9.38 pH (pH Units) >6 ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg)

Eluate Analysis	C ₂ Conc ⁿ in	10:1 eluate (mg/l)	A2 10:1 con	A2 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection	asing bo			
Arsenic	0.00155	<0.0005	0.0155	<0.005	0.5	2	25	
Barium	0.00379	<0.0002	0.0379	<0.002	20	100	300	
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5	
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70	
Copper	< 0.0003	<0.0003	<0.003	<0.003	2	50	100	
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2	
Molybdenum	0.00656	<0.0005	0.0656	<0.005	0.5	10	30	
Nickel	<0.0004	<0.0004	<0.004	<0.004	0.4	10	40	
l ead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50	
nony	0.000383	<0.0001	0.00383	<0.001	0.06	0.7	5	
ienium	0.00103	<0.0005	0.0103	<0.005	0.1	0.5	7	
Zinc	<0.001	<0.001	<0.01	<0.01	4	50	200	
Chloride	<2	<2	<20	<20	800	15000	25000	
Fluoride	<0.5	<0.5	<5	<5	10	150	500	
Sulphate (soluble)	5.6	<2	56	<20	1000	20000	50000	
Total Dissolved Solids	42	<5	420	<50	4000	60000	10000	
Total Monohydric Phenols (W)	< 0.016	<0.016	<0.16	<0.16	1	-	-	
Dissolved Organic Carbon	<3	<3	<30	<30	500	800	1000	

Leach Test Information

Date Prepared	28-Sep-2017
pH (pH Units)	10.11
Conductivity (µS/cm)	55.60
Temperature (°C)	18.30
Volume Leachant (Litres)	0.889

Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation Mcerts Certification does not apply to leachates

04/10/2017 12:59:31



Validated

Location:

170923-71

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-C

Report Number: Superseded Report:

426769

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry	Surrogate
PM001		Preparation of Samples for Metals Analysis	Sample 1	Corrected
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step		
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition		
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material		
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC		
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)		
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water		
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser		
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water		
TM132	In - house Method	ELTRA CS800 Operators Guide		
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter		
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser		
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils		
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM218	Determination of PAH by GCMS Microwave extraction	The determination of PAH in soil samples by microwave extraction and GC-MS		
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer		
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).





SDG: Location:

170923-71 Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-C

Report Number: Superseded Report:

426769

Test Completion Dates

Lab Sample No(s	16240471
Customer Sample Re	F. 2921-BH2-SS5
AGS Re	f.
Dept	h 2.00 - 4.00
Тур	e Soil/Solid (S)
Anions by Kone (w)	29-Sep-2017
Asbestos ID in Solid Samples	03-Oct-2017
Boron Water Soluble	29-Sep-2017
CEN 10:1 Leachate (1 Stage)	28-Sep-2017
CEN Readings	29-Sep-2017
Cyanide Comp/Free/Total/Thiocyanate	29-Sep-2017
Dissolved Metals by ICP-MS	29-Sep-2017
Dissolved Organic/Inorganic Carbon	29-Sep-2017
EPH CWG (Aliphatic) GC (S)	29-Sep-2017
EPH CWG (Aromatic) GC (S)	29-Sep-2017
Fluoride	29-Sep-2017
GRO by GC-FID (S)	29-Sep-2017
Hexavalent Chromium (s)	29-Sep-2017
s on Ignition in soils	04-Oct-2017
ury Dissolved	29-Sep-2017
als by iCap-OES Dissolved (W)	29-Sep-2017
Metals in solid samples by OES	29-Sep-2017
Mineral Oil	29-Sep-2017
PAH by GCMS	29-Sep-2017
PCBs by GCMS	29-Sep-2017
pH	27-Sep-2017
Phenols by HPLC (S)	29-Sep-2017
PhenoIs by HPLC (W)	29-Sep-2017
Sample description	27-Sep-2017
Total Dissolved Solids	29-Sep-2017
Total Organic Carbon	29-Sep-2017
Total Sulphate	29-Sep-2017
Total Sulphur	28-Sep-2017
TPH CWG GC (S)	29-Sep-2017

CERTIFICATE OF ANALYSIS



SDG: Location: 170923-71

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-C

Report Number: Superseded Report:

426769

Chromatogram

Analysis: EPH CWG (Aliphatic) GC (S)

Sample No : Sample ID:

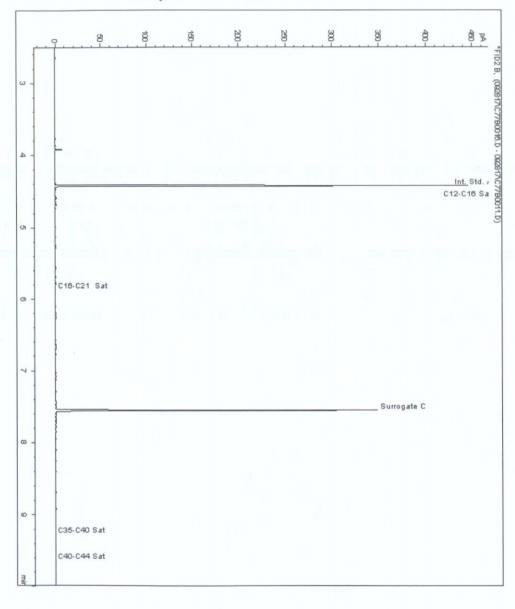
16256105 2921-BH2-SS5 Depth: 2.00 - 4.00

Alcontrol/Geochem Analytical Services Speciated TPH - SATS (C12 - C40)

Sample Identity: 15212314-Date Acquired : 9/28/2017 6:37:26 PM Units : ppb

Dilution CF Multiplier

0.970





Validated

SDG: Location: 170923-71

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-C

Report Number: Superseded Report:

426769

Chromatogram

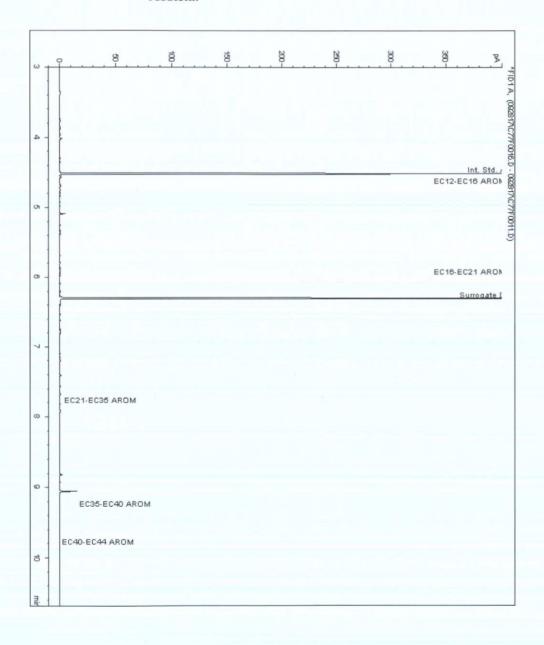
Analysis: EPH CWG (Aromatic) GC (S)

Sample No : 16256105 Sample ID: 2921-BH2-SS5 Depth: 2.00 - 4.00

Speciated TPH - AROM (C12 - C40)

Sample Identity: 15212315-Date Acquired : 9/28/2017 6:37:26 PM Units : ppb

Dilution:



CERTIFICATE OF ANALYSIS



SDG: Location: 170923-71

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-C

Report Number: Superseded Report:

426769

Chromatogram

Analysis: Mineral Oil

Sample No : Sample ID:

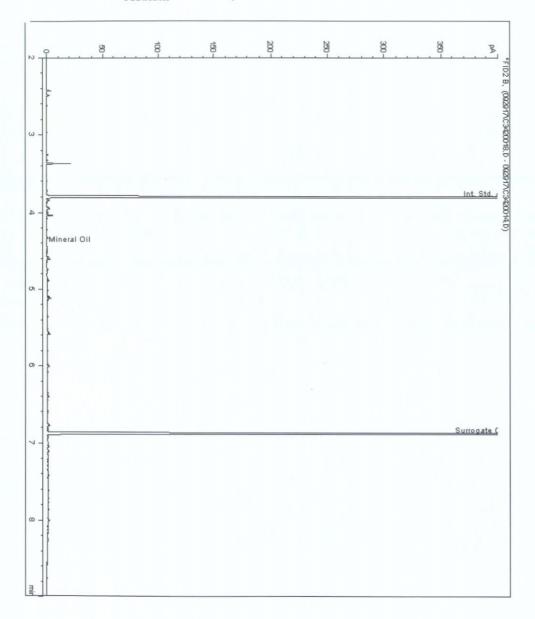
16265347 2921-BH2-SS5 Depth: 2.00 - 4.00

Mineral Oil Range Organics (ClO - C40)

: 15212317-: 29/09/17 12:08:57 PM : mq/kq : 0.000

Sample Identity Date Acquired Units Sample Multiplier

Dilution





Validated

SDG: Location: 170923-71

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-C

Report Number: Superseded Report:

426769

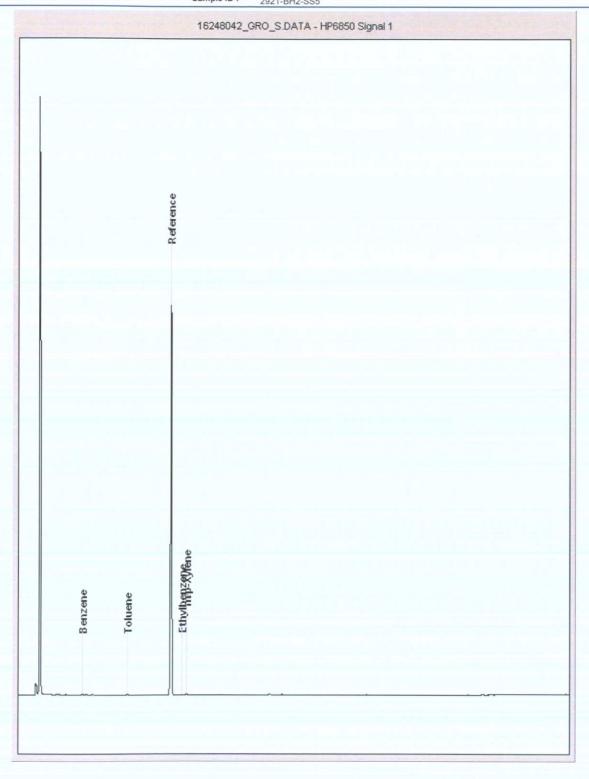
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : Sample ID :

16248042 2921-BH2-SS5

Depth: 2.00 - 4.00





SDG Location: 170923-71

Client Reference: rtered Land - Heuston South Qua Order Number:

2921-028 COC3-C

Report Number: Superseded Report: 426769

Appendix

General

- Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.
- 2. Samples will be run in duplicate upon request, but an additional charge may be incurred
- 3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.
- 4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
- 5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised
- 6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific ashestos fibre type is not found this will be reported as "Not detected". If no ashestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.
- 7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate
- 8. If appropriate preserved bottles are not received preservation will take place on receipt However, the integrity of the data may be compromised.
- 9. NDP No determination possible due to insufficient/unsuitable sample.
- 10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.
- 11. Results relate only to the items tested
- 12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content
- 13. Surrogate recoveries Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment . Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect
- 14. Product analyses Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
- 15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
- 16. Total of 5 speciated phenols by HPLC includes Phenol, 2.3.5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).
- 17. Stones/debris are not routinely removed. We always endeavour to take a <u>Visual Estimation Of Fibre Content</u> representative sub sample from the received sample.
- 18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
- 19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample
- 20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur

- 21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
- 22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
- 23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.
- 24. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected

Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before presevation was performed
ş	Sampled on date not provided
	Sample holding time exceeded in laboratory
0	Sample holding time exceeded due to sampled on date
ž.	Sample Holding Time exceeded - Late arrival of instructions.

Ashestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Aste stos Type	Common Name	
Chrysoll le	White Asbests	
Amosite	BrownAsbests	
Cro d dolite	Blue Asbe stos	
Fibrous Admolite		
Fibrous Anthophyllite	4	
Fibrous Tremolite		

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Minerex Environmental Taney hall Eglinton Terrace Dundrum Dublin Dublin 14

Attention: Michael Owens

Unit 7-8 Hawarden Business Park Manor Road (off Manor Lane) Hawarden Deeside CH5 3US

Tel: (01244) 528700 Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

04 October 2017

Date:

Customer:

Report No:

Your Reference: Location:

Sample Delivery Group (SDG):

D_MINEREX_DUB 170923-93 2921-028 COC3-D Chartered Land - Heuston South Quarter

We received 1 sample on Saturday September 23, 2017 and 1 of these samples were scheduled for analysis which was completed on Wednesday October 04, 2017. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Approved By

Sonia McWhan Operations Manager





Validated

SDG: Location:

170923-93

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-D

Report Number: Superseded Report:

426772

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16241161	2921-BH4-Comp-SS8		0.30 - 1.85	21/09/2017

Maximum Sample/Coolbox Temperature (°C):

16.4

ISO5667-3 Water quality - Sampling - Part3 - During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of $(5\pm3)^{\circ}$ C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.





Results Legend					16
X Test	Lab Samp	le No(s)			16241161
No Determination Possible					
					2921-BH4-Comp-SS
	Sample Re				8
	Sample Re	elerence			Com
Sample Types -					p-55
S - Soil/Solid					
UNS - Unspecified Solid GW - Ground Water	AGS Ref	erence			
SW - Surface Water LE - Land Leachate					
PL - Prepared Leachate					
PR - Process Water SA - Saline Water	Depth	(m)			
TE - Trade Effluent TS - Treated Sewage	Deptii	(111)			0.30 - 1.65
US - Untreated Sewage			N		
Recreational Water Drinking Water Non-regulatory			(AL	400 (AL	(AL
UNL - Unspecified Liquid SL - Sludge	Conta	iner	250g Amber Jar (ALE210)	g Tut E214	(ALE215)
G - Gas			Jar)	~ ~	`
OTH - Other	Sample	Туре	co	co	U
Anions by Kone (w)	All	NDPs: 0			
		Tests: 1		X	
Asbestos ID in Solid Samples	All	NDPs: 0			
		Tests: 1		X	
Boron Water Soluble	All	NDPs: 0			
		Tests: 1	X		
CEN Readings	All	NDPs: 0			
		Tests: 1		Х	
Cyanide	All	NDPs: 0			
Comp/Free/Total/Thiocyanate		Tests: 1	Х		
Dissolved Metals by ICP-MS	All	NDPs: 0			
		Tests: 1		X	
olved Organic/Inorganic	All	NDPs: 0		**	
arbon	-All	Tests: 1			
EDIT ON TO THE PARTY OF THE	All	2022		X	
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 1			
			Х		
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 1		x x	
		rests; 1	Х		
Fluoride	All	NDPs: 0			
		Tests: 1		Х	
GRO by GC-FID (S)	All	NDPs: 0			
, (-)		Tests: 1			X
Havavalant Characium (-)	All	NDD C			^
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1			
			Х		
Loss on Ignition in soils	All	NDPs: 0 Tests: 1			
		10010, 1	X		
Mercury Dissolved	All	NDPs: 0			
		Tests: 1		Х	
als by iCap-OES Dissolved (W)	All	NDPs: 0			
,		Tests: 1			

CERTIFICATE OF ANALYSIS



(ALS) Location:	Onai	tered Land - Heusto	oru	er Nu	iiibei	
Results Legend X Test No Determination	Lab Sa	Lab Sample No(s)				
Possible Sample Types -		Customer Sample Reference				
S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate	AGS	Reference			2921-BH4-Comp-SS 8	
PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage	De	epth (m)				
RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Studge G - Gas	Co	Container				
OTH - Other	Sam	co	S	co		
Metals in solid samples by OES	All	NDPs: 0 Tests: 1	X			
Mineral Oil	All	NDPs: 0 Tests: 1	X			
PAH by GCMS	All	NDPs: 0 Tests: 1	X			
PCBs by GCMS	All	NDPs: 0 Tests: 1	X			
рН	Ali	NDPs: 0 Tests: 1	X			
Phenois by HPLC (S)	All	NDPs: 0 Tests: 1	X			
Phenois by HPLC (W)	All	NDPs: 0 Tests: 1		Х		
Sample description	All	NDPs: 0 Tests: 1	X			
Total Dissolved Solids	All	NDPs: 0 Tests: 1		Х		
Total Organic Carbon	All	NDPs: 0 Tests: 1	X			
Total Sulphate	All	NDPs: 0 Tests: 1	X			
Total Sulphur	All	NDPs: 0 Tests: 1	Х			
TPH CWG GC (S)	All	NDPs: 0 Tests: 1	X			



Validated

SDG: Location:

170923-93

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-D

Report Number: Superseded Report:

426772

Sample Descriptions

Grain Sizes

very fine <0.0	63mm fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10r
Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colo	ur Descript	ion Incl	usions In	clusions 2	
16241161	2921-BH4-Comp-SS8	0.30 - 1.85	Gre	y Silt Loa	m St	ones	/egetation	

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

er coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



SDG: Location:

170923-93 Client Referenc Chartered Land - Heuston Order Number: Client Reference:

2921-028 COC3-D

Report Number: Superseded Report:

426772

Results Legend	C	ustomer Sample Ref.	2921-BH4-Comp-S				1
# ISO17025 accredited. M mCERTS accredited.			S8				
aq Aqueous / settled sample.		Depth (m)	0.30 - 1.85				
fiss.filt Dissolved / filtered sample.		Sample Type	Soil/Solid (S)				
ot.unfilt Total / unfiltered sample. * Subcontracted test.		Date Sampled	21/09/2017				
** % recovery of the surrogate stand		Sampled Time					
check the efficiency of the metho		Date Received	23/09/2017				
results of individual compounds of samples aren't corrected for the r		SDG Ref	170923-93				
(F) Trigger breach confirmed		Lab Sample No.(s)	16241161				
-5&+§@ Sample deviation (see appendix)		AGS Reference					
Component	LOD/Units	Method					
Moisture Content Ratio (% of as	%	PM024	13				
received sample)		1,					
	4 = 11	771010	4.00	_		_	
oss on ignition	<0.7 %	TM018	4.09				
				M			
Mineral oil >C10-C40	<1 mg/kg	TM061	13.9				
Mi1 Oil C1- N/	0/	TMOCA	00				
Mineral Oil Surrogate %	%	TM061	88				
recovery**							
Phenol	< 0.01	TM062 (S)	< 0.01				
	mg/kg			М			
Organic Carbon, Total	The state of the s	T84420	1.41				
organic Carbon, Total	<0.2 %	TM132	1.41				
				M			
Sulphur, Total	<0.02 %	TM132	0.0558				
Sulphate, Total potential	<0.06 %	TM132	0.167				
ouipridie, Total potential	50.00 /6	1101102	0.107				
	-			-			
H	1 pH Units	TM133	10.2				
				M			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6				
Janonium, mexavalent	-0.0 mg/kg	1101101	-0.0	,,			
20				#			_
Cyanide, Total	<1 mg/kg	TM153	<1				
				M			
Cyanide, Free	<1 mg/kg	TM153	<1		1		
,	, mg/ng		35.41	M			
202	-0 "	714/00		M			
PCB congener 28	<3 µg/kg	TM168	<3				
				M			
PCB congener 52	<3 µg/kg	TM168	<3				
	,,,,			M			
000 404	.0	TALLOS	-0	IVI			
PCB congener 101	<3 µg/kg	TM168	<3				
		1		M			
PCB congener 118	<3 µg/kg	TM168	<3				
				М			
DCB congence 120	2 //	TM168	<3				
PCB congener 138	<3 µg/kg	1W108	53				
				M			
PCB congener 153	<3 µg/kg	TM168	<3				
472				М			
PCB congener 180	2.100	TM168	<3				
Ob congener 100	<3 µg/kg	1W108	43				
				М			
Sum of detected PCB 7	<21 µg/kg	TM168	<21				
Congeners							
Antimony	<0.6 mg/kg	TM181	1.1				
Tituliotiy	-u.u mg/kg	TWITET	1.1				
and the second s		-		#	-		
Arsenic	<0.6 mg/kg	TM181	7.75				
				М			
Barium	<0.6 mg/kg	TM181	60				
esera(II)	J.O Hight		00				
			yourse.	#			_
Cadmium	<0.02	TM181	1.53				
	mg/kg			М			
Chromium	<0.9 mg/kg	TM181	7.9				
	J.O Highly	.mioi	1.3	M			
2		m11/2/	y 2°2°	M			
Copper	<1.4 mg/kg	TM181	18.9				
				M			
ron	<1000	TM181	15300				
100000	mg/kg		,0000	#			
		7714404	20.0	#			1
Lead	<0.7 mg/kg	TM181	22.6				
				M			
Manganese	< 0.13	TM181	640				
4.11	mg/kg	(1000000000)	17/570	M			
Mercury	<0.14	TM181	0.55	IAI			
vierculy		11/11/81	0.55				
	mg/kg			M			
Molybdenum	<0.1 mg/kg	TM181	3.37				
				#			
	<0.2 mg/kg						
Nickel	cl) 2 malka	TM181	28.4				



Validated

SDG: 170923-93 Client Reference: Location: Chartered Land - Heuston Order Number: 2921-028 COC3-D

Report Number: Superseded Report: 426772

	Results Legend	44/2-20	Customer Sample Ref.	2921-BH4-Comp-S					
M	ISO17025 accredited. mCERTS accredited.			S8					
aq diss filt	Aqueous / settled sample. Dissolved / filtered sample.		Depth (m)	0.30 - 1.85					
tot.unfilt	Total / unfiltered sample.		Sample Type	Soil/Solid (S)					
	Subcontracted test. % recovery of the surrogate standard	ard to	Date Sampled Sampled Time	21/09/2017					
	check the efficiency of the method results of individual compounds w	. The	Date Received	23/09/2017		_			
	samples aren't corrected for the re	covery	SDG Ref	170923-93 16241161					
(F) 1-5&+§@	Trigger breach confirmed Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	10241101					
Compo	nent	LOD/Unit							
Seleniun	n	<1 mg/k	g TM181	<1					1
					#				
Zinc		<1.9 mg/l	kg TM181	79.6					
					М				
Sulphate	e, Total	<48 mg/k	kg TM221	679					
					М				
Sulphide	e, Oxidisable	<0.03 %	6 TM221	0.0991					
Boron, w	vater soluble	<1 mg/k	g TM222	<1					
					М				
-									
1									
			1.				2		
								4	
-									
							1020		

CERTIFICATE OF ANALYSIS



PAH by GCMS Results Legend	C	Customer Sample Ref.	2921-BH4-Comp-S					
# ISO17025 accredited. M mCERTS accredited.			S8					
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.30 - 1.85					
tot.unfilt Total / unfiltered sample.		Sample Type	Soil/Solid (S)	-				
 Subcontracted test. recovery of the surrogate stand 	and to	Date Sampled	21/09/2017					
check the efficiency of the method	f. The	Sampled Time Date Received	23/09/2017					
results of individual compounds w		SDG Ref	170923-93					
samples aren't corrected for the re (F) Trigger breach confirmed	Covery	Lab Sample No.(s)	16241161					
1-5&+§@ Sample deviation (see appendix)		AGS Reference						
Component	LOD/Units	Method						
Naphthalene-d8 % recovery**	%	TM218	101					
Acenaphthene-d10 %	%	TM218	94.2					
	/0	1101210	34.2					
recovery**	0/	T14040	0.1.7					
Phenanthrene-d10 % recovery**	%	TM218	91.7					
Chrysene-d12 % recovery**	%	TM218	99.9					
Perylene-d12 % recovery**	%	TM218	99.9					
Naphthalene	<9 µg/kg	TM218	<9					
			M					
Acenaphthylene	<12 µg/kg	TM218	14.6					
Acenaphthene	<8 µg/kg	TM218	M					
noonaphalene	-o µg/kg	1191210	M					
Eluarana	<10	TNADAR	<10					
Fluorene	<10 µg/kg	TM218						
Phenanthrene	<15 µg/kg	TM218	30.1					
i nonanunciid	- то ружу	1 IVIZ 10	30.1					
Anthracene	<16 ma/ka	TM218	<16					
Anuitacene	<16 µg/kg	1M216						
Eluoranthono	247 . · · · · · · · ·	TNADAR	47.2					
Fluoranthene	<17 µg/kg	TM218	47.2 M					
Pyrene	<15 µg/kg	TM218	40.8					
1,010	- 10 pg/kg	I IVIZ 10	40.6 M					
Ronz/alanthrocono	e1A valle	TM218	25.4					
Benz(a)anthracene	<14 µg/kg	1W218						
			M					
Chrysene	<10 µg/kg	TM218	24.6					
			M					
Benzo(b)fluoranthene	<15 µg/kg	TM218	44.1					
			M					
Benzo(k)fluoranthene	<14 µg/kg	TM218	26.6					
			M					
Benzo(a)pyrene	<15 µg/kg	TM218	38					
			M					
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218	27.4					
-1.1-111.1.22	- maa		M					
Dibenzo(a,h)anthracene	<23 µg/kg	TM218	<23					
Discrizo(a,ii)animacene	-20 pg/kg	TIVIZIO						
Denze/a h ilpende	-24 · · - // ·	TMO40	M					
Benzo(g,h,i)perylene	<24 µg/kg	TM218	43.2					
Coronana	2000 11	THOSE	M			7		
Coronene	<200 µg/kg	TM218	<200					
DIV 7	212							
PAH, Total Detected USEPA 16	<118 µg/kg	TM218	362					
DALL TALIB	.010		1010.2					
PAH, Total Detected USEPA 16	<318 µg/kg	TM218	362					
+ Coronene								
					4			
					*		-	
					-			

CERTIFICATE OF ANALYSIS

ALS

PH CWG (S) Results Le		Customer Sample Ref.	2921-BH4-Comp-S			
# ISO17025 accredited M mCERTS accredited.	1.		S8			
aq Aqueous / settled sa		E 1/10/05				
diss.filt Dissolved / filtered s	ample.	Depth (m)	0.30 - 1.85			
tot.unfilt Total / unfiltered san		Sample Type	Soil/Solid (S)			
* Subcontracted test.		Date Sampled	21/09/2017			
** % recovery of the su check the efficiency		Sampled Time				
results of individual	compounds within	Date Received	23/09/2017			
	cted for the recovery	SDG Ref	170923-93			
(F) Trigger breach confi	rmed	Lab Sample No.(s)	16241161			
1-5&+§@ Sample deviation (se	ee appendix)	AGS Reference				
Component	LOD/Ur	nits Method				
AND A CONTRACT OF THE CONTRACT						
GRO Surrogate % recove	ery** %	TM089	52			
GRO TOT (Moisture Corr	ected) <44 µg	/kg TM089	78.2			
orto for (moistare con-	55.55) Tr pg	1111000				
Made displace but delegation	45	TM000				
Methyl tertiary butyl ether	<5 µg/	kg TM089	<5			
(MTBE)						
Benzene	<10 µg	/kg TM089	<10			
Toluene	<2 µg/	kg TM089	3.45			
Ethylhenzono	٠٥,	kg TM089	<3			
Ethylbenzene	<3 µg/	ng 1101009				
M. C.						
Xylene	<6 µg/	kg TM089	<6			
	To pg					
o-Xylene	<3 µg/	kg TM089	<3			
-	, ,					
array of data-to-d	an hu	T- 1000				
sum of detected mpo xyle	ene by <9 µg/	kg TM089	<9			
GC						
sum of detected BTEX by	GC <24 µg	/kg TM089	<24			
or actioned DTEADy	-24 pg	1111000		-		
Aliphatics >C5-C6	<10 µg	/kg TM089	<10			
CVM ANABOLE INC. SEVEN PRESI						
Aliphatics >C6-C8	<10 µg	/kg TM089	<10			
Aliphatics >C8-C10	<10 µg	/kg TM089	13.8			
Allphalics 200-010	10 pg	rky Tivioos	13.0			
Aliphatics >C10-C12	<10 µg	/kg TM089	23			
Aliphatics >C12-C16	<100 µg	g/kg TM173	<100			
Aliphatics >C16-C21	<100	g/kg TM173	<100			
Aliphalics >C10-C21	<100 µg	J/Kg TIVIT/3	<100			
Aliphatics >C21-C35	<100 µg	1/kg TM173	2930			
imprioritor out a coo	100 %	ing I iii i	2000			
Aliphatics >C35-C44	<100 µg	g/kg TM173	<100			
145 1 5 040 04	4.00	711170	2022			
I Aliphatics >C12-C44	4 <100 µg	g/kg TM173	2930			
1,2						
Aromatics >EC5-EC7	<10 µg	/kg TM089	<10			
o 100-L01	10 μg	1,44009	-10			
Aromatics >EC7-EC8	<10 µg	/kg TM089	<10			
	, ,	200			HILL THE STATE OF	
A	- 46	II T21000	40.4			
Aromatics >EC8-EC10	<10 µg	/kg TM089	10.4			
Aromatics >EC10-EC12	<10 µg	/kg TM089	15			
THOMISSING PLOTO-EUTZ	×10 μg	I I WIO GS	10			
Aromatics >EC12-EC16	<100 µg	g/kg TM173	<100			
	1	(600000)(1000)				
Aromatics >EC16-EC21	<100 µg	g/kg TM173	<100			
Aromatics >EC21-EC35	<100 µg	g/kg TM173	2620			
Alomatics /EUZ I-EU35	<100 h	and livilia	2020			
Aromatics >EC35-EC44	<100 µg	1/kg TM173	4280			
2000 2017	100 þý					
			V2000 WEND			
Aromatics >EC40-EC44	<100 µg	g/kg TM173	2490			
T-1-1 A F0/2 =	044	0. TH470	6000			
Total Aromatics >EC12-E	C44 <100 µg	g/kg TM173	6900			
Total Aliphatics & Aromati	ics <100 µg	g/kg TM173	9910			
	100 þ	ang Inilio	0010			
>C5-C44						



Validated

SDG: Location:

170923-93 Client Referenc Chartered Land - Heuston Order Number: Client Reference:

2921-028 COC3-D

Report Number: Superseded Report:

426772

Asbestos Identification - Soil

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	2921-BH4-Comp-SS 8 0.30 - 1.85 SOLID 21/09/2017 00:00:00 26/09/2017 13:01:20 170923-93 16241161 TM048	03/10/17	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected





 SDG:
 170923-93

 Location:
 Chartered La

170923-93 Client Reference: Chartered Land - Heuston Order Number: 2921-028 COC3-D

Report Number: Superseded Report: 426772

CEN 10:1 SINGLE STAGE LEACHATE TEST

	CEN	10:1 SINGLE	STAGE LEAG	CHATE TEST	Acres de la constitución de la c	A STATE OF THE STA	
CEN ANALYTICAL RESU	JLTS					REF : BS	EN 12457/2
Client Reference			Site Location		Char	ered Land - Heu	ston South C
Mass Sample taken (kg)	0.103		Natural Moistur	re Content (%)	14.9		
Mass of dry sample (kg)	0.090		Dry Matter Con		87		
Particle Size <4mm	>95%			(,,,			
Case			THE RESIDENCE OF THE PARTY OF T		Land	fill Waste Acce	otance
SDG	170923-93					Criteria Limits	
Lab Sample Number(s)	16241161					Total Control of the	The second second
Sampled Date	21-Sep-2017					Stable	
Customer Sample Ref.	2921-BH4-Cor	nn-SS8			Inert Waste	Non-reactive Hazardous Waste	Hazardous
Depth (m)	0.30 - 1.85	11p 000			Landfill	in Non- Hazardous	Waste Landfill
Solid Waste Analysis	Result					Landfill	
Organic Carbon (%)	1.41				3	5	6
Loss on Ignition (%)	4.09				-	-	10
Sum of BTEX (mg/kg)	<0.024				6	-	-
Sum of 7 PCBs (mg/kg)	<0.021				1		•
Mineral Oil (mg/kg) PAH Sum of 17 (mg/kg)	13.9				500		
pH (pH Units)	10.2				_	>6	
ANC to pH 6 (mol/kg)					-	-	-
ANC to pH 4 (mol/kg)							THE THE PARTY OF
Eluate Analysis	C ₂ Conc ⁿ in	10:1 eluate (mg/l)	A2 10:1 cond	c ⁿ leached (mg/kg)		ues for compliance lea BS EN 12457-3 at L/S	
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.0043	<0.0005	0.043	<0.005	0.5	2	25
Barium	0.00259	<0.0002	0.0259	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00467	<0.0003	0.0467	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.0128	<0.0005	0.128	<0.005	0.5	10	30
Nickel	0.00109	<0.0004	0.0109	<0.004	0.4	10	40
l ead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
nony	0.00143	<0.0001	0.0143	<0.001	0.06	0.7	5
.enium	0.00286	<0.0005	0.0286	<0.005	0.1	0.5	7
Zinc	<0.001	<0.001	<0.01	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	0.638	<0.5	6.38	<5	10	150	500
And the same of th					The second second	WELL THE LOCAL PROPERTY OF THE PARTY OF THE	THE RESERVE OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TW

Leach Test Information

Sulphate (soluble)

Total Dissolved Solids

Total Monohydric Phenols (W)

Dissolved Organic Carbon

Date Prepared	27-Sep-2017
pH (pH Units)	10.62
Conductivity (µS/cm)	137.00
Temperature (°C)	17.70
Volume Leachant (Litres)	0.887

Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation Mcerts Certification does not apply to leachates

19.9

86.7

< 0.016

<3

<2

<5

< 0.016

199

867

< 0.16

<30

<20

<50

<0.16

<30

1000

4000

500

04/10/2017 13:03:20

20000

60000

800



SDG: Location: 170923-93

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-D

Report Number: Superseded Report:

426772

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample '	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis	Sample	Corrected
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step		
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition		
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material		
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC		
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)		
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water		
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser		
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water		
TM132	In - house Method	ELTRA CS800 Operators Guide		
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter		
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser		
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils		
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM218	Determination of PAH by GCMS Microwave extraction	The determination of PAH in soil samples by microwave extraction and GC-MS		
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer		
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



Validated

SDG: Location:

170923-93

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-D

Report Number: Superseded Report:

426772

Test Completion Dates

Lab Sample No(s)	16241161
Customer Sample Ref.	2921-BH4-Comp-S S8
AGS Ref.	
Depth	0.30 - 1.85
Туре	Soil/Solid (S)
Anions by Kone (w)	29-Sep-2017
Asbestos ID in Solid Samples	03-Oct-2017
Boron Water Soluble	28-Sep-2017
CEN 10:1 Leachate (1 Stage)	27-Sep-2017
CEN Readings	28-Sep-2017
Cyanide Comp/Free/Total/Thiocyanate	29-Sep-2017
Dissolved Metals by ICP-MS	29-Sep-2017
Dissolved Organic/Inorganic Carbon	29-Sep-2017
EPH CWG (Aliphatic) GC (S)	28-Sep-2017
EPH CWG (Aromatic) GC (S)	28-Sep-2017
Fluoride	29-Sep-2017
GRO by GC-FID (S)	29-Sep-2017
Hexavalent Chromium (s)	28-Sep-2017
on Ignition in soils	04-Oct-2017
ry Dissolved	29-Sep-2017
as by iCap-OES Dissolved (W)	29-Sep-2017
Metals in solid samples by OES	02-Oct-2017
Mineral Oil	29-Sep-2017
PAH by GCMS	28-Sep-2017
PCBs by GCMS	28-Sep-2017
pH	27-Sep-2017
Phenols by HPLC (S)	29-Sep-2017
Phenols by HPLC (W)	29-Sep-2017
Sample description	26-Sep-2017
Total Dissolved Solids	28-Sep-2017
Total Organic Carbon	28-Sep-2017
Total Sulphate	29-Sep-2017
Total Sulphur	28-Sep-2017
TPH CWG GC (S)	29-Sep-2017

CERTIFICATE OF ANALYSIS



SDG: Location: 170923-93

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-D

Report Number: Superseded Report:

426772

Chromatogram

Analysis: EPH CWG (Aliphatic) GC (S)

Sample No : Sample ID : 16251274

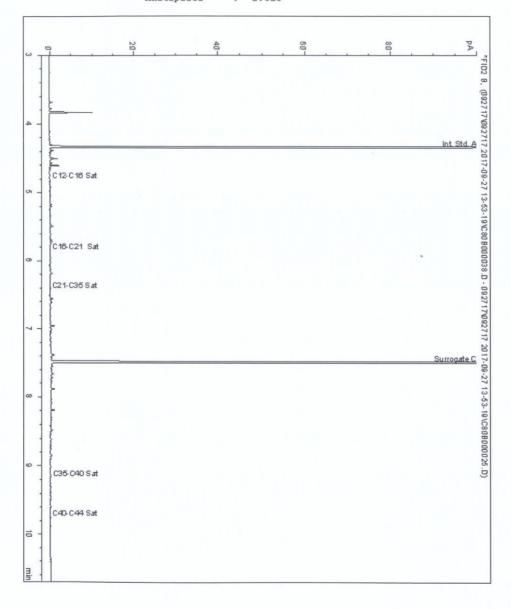
2921-BH4-Comp-SS8

Depth: 0.30 - 1.85

Alcontrol/Geochem Analytical Services Speciated TPH - SATS (C12 - C40)

Sample Identity: 15212868-Date Acquired : 28/09/17 01:07:18

Units ppb Dilution CF Multiplier 1.020







SDG: Location: 170923-93

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-D

Report Number: Superseded Report:

426772

Chromatogram

Analysis: EPH CWG (Aromatic) GC (S)

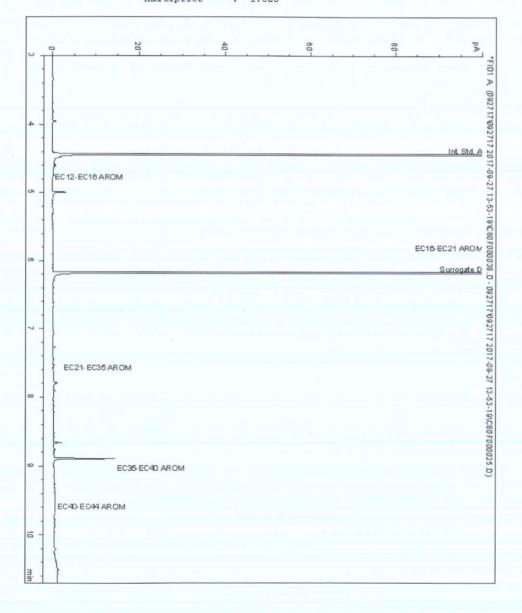
Sample No: 16251274 Sample ID: 2921-BH4-Comp-SS8 Depth: 0.30 - 1.85

Speciated TPH - AROMS (C12 - C44)

Sample Identity: 15212869-

Date Acquired : 28/09/17 01:07:18

Units : ppb Dilution CF 1 : 1.020 Multiplier :



CERTIFICATE OF ANALYSIS



SDG: Location: 170923-93

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-D

Report Number: Superseded Report:

426772

Chromatogram

Analysis: Mineral Oil

Sample No : Sample ID:

16256430

2921-BH4-Comp-SS8

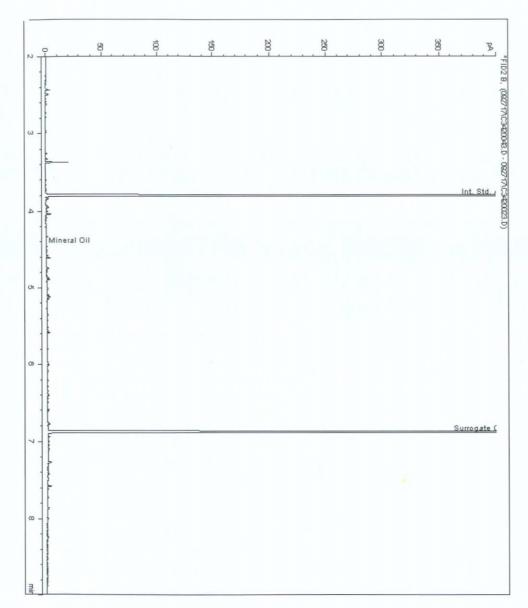
Depth: 0.30 - 1.85

Mineral Oil Range Organics (C10 - C40)

Sample Identity Date Acquired Units Sample Multiplier

15212871-28/09/17 17:23:25 PM mq/kq 0.000

Dilution





Validated

SDG: Location:

170923-93 Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-D

Report Number: Superseded Report:

426772

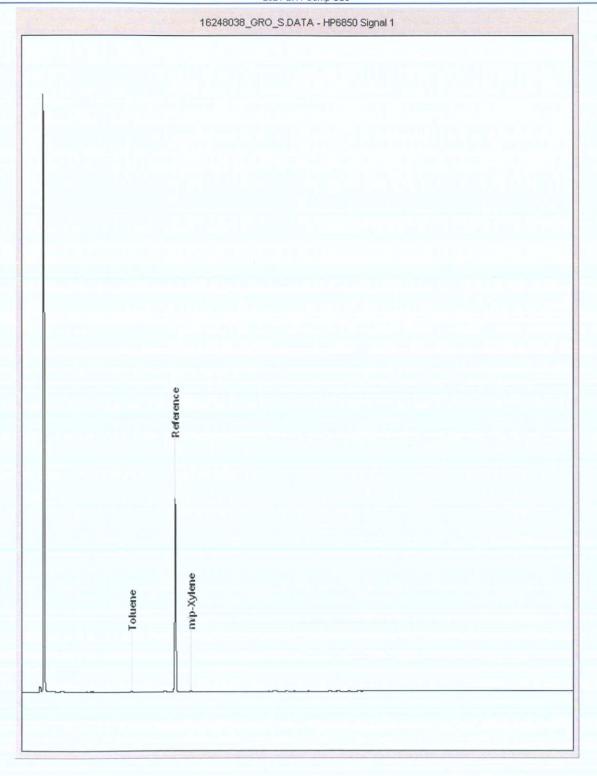
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : Sample ID :

16248038 2921-BH4-Comp-SS8

Depth: 0.30 - 1.85



SDG Location:

170923-93 Client Reference: rtered Land - Heuston South Qua Order Number:

2921-028 COC3-D

Report Number:

426772

Appendix

General

- 1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.
- 2. Samples will be run in duplicate upon request, but an additional charge may be incurred
- 3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.
- 4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
- 5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised
- 6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested
- 7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.
- 8. If appropriate preserved bottles are not received preservation will take place on receipt However, the integrity of the data may be compromised.
- 9. NDP No determination possible due to insufficient/unsuitable sample
- 10. Metals in water are performed on a filtered sample and therefore represent dissolved metals - total metals must be requested separately.
- 11. Results relate only to the items tested.
- 12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.
- 13. Surrogate recoveries Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect
- 14. Product analyses Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
- Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
- Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).
- Stones/debris are not routinely removed. We always endeavour to take a Visual Estimation Of Fibre Content representative sub sample from the received sample.
- 18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
- 19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample
- 20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

- 21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
- 22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
- 23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.
- 24. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected

Sample Deviations

If a sample is classed as deviated then the associated results may be compromised

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before presevation was performed
§	Sampled on date not provided
•	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy an central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005)

Aste stos Type	Common Name
Chrysotle	White Asbests
Amosite	BrownAsbests
Cro d dolite	Blue Asbe stos
Fibrous Actinolite	
Rb to us. Anthop hyllite	
Fibrous Tremolite	

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Minerex Environmental Taney hall Eglinton Terrace Dundrum Dublin Dublin 14

Attention: Sven Klinkenbergh

Unit 7-8 Hawarden Business Park Manor Road (off Manor Lane) Hawarden Deeside CH5 3US

Tel: (01244) 528700 Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date:

Customer:

Sample Delivery Group (SDG):

Your Reference:

Location:

Report No:

03 October 2017

D MINEREX DUB

170923-100

2921-028 COC3-E

Chartered Land - Heuston South Quarter

426613

We received 1 sample on Saturday September 23, 2017 and 1 of these samples were scheduled for analysis which was completed on Tuesday October 03, 2017. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Approved By:

Sonia McWhan
Operations Manager







CERTIFICATE OF ANALYSIS

170923-100 Client Reference: Chartered Land - Heuston S.Order Number: SDG: Location:

2921-028 COC3-E

Report Number: Superseded Report:

426613

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16241380	2921-BH4-SS3		0.80 - 0.90	21/09/2017

Maximum Sample/Coolbox Temperature (°C):

ISO5667-3 Water quality - Sampling - Part3 - During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

16.4

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS Client Reference: Order Number: 170923-100

X

2921-028 COC3-E

Report Number: Superseded Report:

Validated

426613

Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	
	Sample	е Туре	S
T- Prinking Water Non-regulatory - Unspecified Liquid - Sludge G - Gas OTH - Other	Conta	ainer	1kg TUB
PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage	Depti	n (m)	0.80 - 0.90
S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate	AGS Re	ference	
Sample Types -	Custo Sample R		2921-BH4-SS3
X Test No Determination Possible	Lab Samı	ple No(s)	16241380
Results Legend			

SDG:

CERTIFICATE OF ANALYSIS

170923-100 Client Reference: 2921-028 COC3-E Chartered Land - Heuston S/Order Number: SDG: Location:

Report Number: Superseded Report:

426613

Asbestos Identification - Solid Samples

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	2921-BH4-SS3 0.80 - 0.90 SOLID 21/09/2017 00:00:00 27/09/2017 08:47:44 170923-100 16241380 TM048	03/10/17	Eva Guerra	*	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



Validated

SDG: Location: 170923-100

Client Reference: Chartered Land - Heuston Sorder Number:

2921-028 COC3-E

Report Number: Superseded Report:

426613

Table of Results - Appendix

Method No	Reference	Description	urrogate
TM048	HSG 248, Asbestos: The analysts' guide for sampling,	Identification of Asbestos in Bulk Material	
	analysis and clearance procedures		

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS



SDG: 170923-100 Client Reference: 2921-028 COC3-E Report Number: 426613
Location: Chartered Land - Heuston SOrder Number: Superseded Report:

Test Completion Dates

Lab Sample No(s)	16241380
Customer Sample Ref.	
AGS Ref.	
Depth	0.80 - 0.90
Туре	Soil/Solid (S
Asbestos ID in Solid Samples	03-Oct-2017



SDG: Location:

170923-100 rtered Land - Heuston South Qua Order Number:

Client Reference:

2921-028 COC3-E

Report Number: Superseded Report: 426613

Appendix

General

- 1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the calculated, the volume of the leachate produced is measured and filtered for all tests. BRE method, VOC TICs and SVOC TICs
- 2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
- 3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.
- 4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
- 5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known record will be utilised.

then requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for Testing can be carried out on asbestos positive samples, but, due each fibre type found). to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

- 7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on
- 8. If appropriate preserved bottles are not received preservation will take place on receipt However, the integrity of the data may be compromised.
- 9. NDP No determination possible due to insufficient/unsuitable sample
- 10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.
- 11. Results relate only to the items tested.
- 12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

.rrogate recoveries - Surrogates are added to your sample to monitor recovery of est requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment . Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect

- 14. Product analyses Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
- 15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
- 16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).
- 17. Stones/debris are not routinely removed. We always endeavour to take a <u>Visual Estimation Of Fibre Content</u> representative sub sample from the received sample.
- 18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
- 19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample

For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

- We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
- 22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
- 23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds and for more definitive identification, volatiles by GCMS should be utilised.
- 24. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before presevation was performed
§	Sampled on date not provided
ř	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
8.	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Aste stos Type	Common Name
Chrysotle	White Asbestos
Amosite	Brown Asbestos
Cro d dolite	Blue Asbe stos
Fibrous Actinolite	
Fibrous Anthophyllite	
Fibrous Tremplite	

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation



Minerex Environmental Taney hall Eglinton Terrace Dundrum Dublin Dublin 14

Attention: Sven Klinkenbergh

Unit 7-8 Hawarden Business Park Manor Road (off Manor Lane) Hawarder Deesic CH5 3US

Tel: (01244) 528700 Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date:

Customer:

Sample Delivery Group (SDG):

Your Reference:

Location:

Report No:

04 October 2017

D MINEREX DUB

170923-99

2921-028 COC3-F

Chartered Land - Heuston South Quarter

426761

We received 1 sample on Saturday September 23, 2017 and 1 of these samples were scheduled for analysis which was completed on Wednesday October 04, 2017. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Approved By:

Sonia McWhan
Operations Manager





ALS Life Sciences Limited. Registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.



Validated

SDG: 170923-99 Client Reference: Location: Chartered Land - Heuston S/Order Number: 2921-028 COC3-F

Report Number: Superseded Report: 426761

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16241350	2921-BH4-SS5		1.70 - 1.80	21/09/2017

Maximum Sample/Coolbox Temperature (°C):

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

intaining

16.4

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS



SDG: 170923-99 Client Reference: 2921-028 COC3-F Report Number: 426761
Location: Chartered Land - Heuston Signature Number: Superseded Report:

Sample Type	co
Container	1kg TUB
Depth (m)	1.70 - 1.80
AGS Reference	
Customer Sample Reference	2921-BH4-SS5
Lab Sample No(s)	16241350
	Customer Sample Reference AGS Reference Depth (m) Container



Validated

SDG: 170923-99 Client Reference: 2921-028 COC3-F Report Number: 426761
Location: Chartered Land - Heuston SiOrder Number: Superseded Report:

Asbestos Identification - Solid Samples

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	2921-BH4-SS5 1.70 - 1.80 SOLID 21/09/2017 00:00:00 27/09/2017 08:51:32 170923-99 16241350 TM048	04/10/17	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

DCC PLAN NO:4610/ZZ RECEIVED: 04/08/2022



Validated

SDG: 170923-99 Client Reference: 2921-028 COC3-F Report Number: 426761 Location: Chartered Land - Heuston SOrder Number: Superseded Report:

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material		

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



Validated

SDG: Location:

170923-99 Client Reference: Chartered Land - Heuston Sorder Number:

2921-028 COC3-F

Report Number: Superseded Report:

426761

Test Completion Dates

Lab Sample No(s)	16241350
Customer Sample Ref.	2921-BH4-SS5
AGS Ref.	
Depth	1.70 - 1.80
Туре	Soil/Solid (S)
Asbestos ID in Solid Samples	04-Oct-2017



SDG Location: 170923-99

Client Reference: rtered Land - Heuston South Qua Order Number:

2921-028 COC3-F

Report Number: Superseded Report: 426761

Appendix

General

- 1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.
- 2. Samples will be run in duplicate upon request, but an additional charge may be incurred
- 3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.
- 4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
- 5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
- 6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.
- 7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate
- 8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
- 9. NDP No determination possible due to insufficient/unsuitable sample
- 10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately
- 11. Results relate only to the items tested.
- 12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.
- 13. Surrogate recoveries Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect
- 14. Product analyses Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
- 15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
- Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).
- 17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
- 18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
- 19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample
- 20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur

- 21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
- 22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
- 23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.
- 24. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected

Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before presevation was performed
§	Sampled on date not provided
	Sample holding time exceeded in laboratory
<u>a</u>	Sample holding time exceeded due to sampled on date
<u>&</u>	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Aste stos Type	Common Name
Chrysotie	White Asbestos
Amosite	Brown Asbests
Cro d dolite	Blue Asbe stos
Fibrous Actinolite	22
Ribio us Anthophyllite	10
Fibrous Tremplite	

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Minerex Environmental Taney hall Eglinton Terrace Dundrum Dublin

Attention: Sven Klinkenbergh

Unit 7-8 Hawarden Business Park Manor Road (off Manor Lane) Hawarden Deeside CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701 email: hawardencustomerservices@alsglobal.com Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date:

Customer:

Dublin 14

Sample Delivery Group (SDG):

Your Reference:

Location:

Report No:

04 October 2017

D MINEREX DUB

170923-97

2921-028 COC3-G

Chartered Land - Heuston South Quarter

426773

We received 1 sample on Saturday September 23, 2017 and 1 of these samples were scheduled for analysis which was completed on Wednesday October 04, 2017. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Approved By:

Sonia McWhan

Operations Manager









Validated

SDG: Location: 170923-97

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-G

Report Number: Superseded Report:

426773

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16241281	2921-BH1-SS3		0.60 - 1.30	20/09/2017

Maximum Sample/Coolbox Temperature (°C):

16.4

ISO5667-3 Water quality - Sampling - Part3 - During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of $(5\pm3)^{\circ}$ C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.



SDG: Location:

170923-97 Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-G

Report Number: Superseded Report:

426773

Results Legend					_
X Test	Lab San	nple No(s)			16241281
No Determination Possible					0
Sample Types -		tomer Reference			7871-0011-003
S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate	AGS R	eference			
PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage	Dep	oth (m)			0.00 - 1.00
- Recreational Water - Drinking Water Non-regulatory Unspecified Liquid SL - Sludge G - Gas	Con	tainer	250g Amber Jar (ALE210)	400g Tub (ALE214)	(ALE215)
OTH - Other	Sample Type			S	U
Anions by Kone (w)	All	NDPs: 0 Tests: 1		X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1		X	
Boron Water Soluble	All	NDPs: 0 Tests: 1	Х	^	
CEN Readings	All	NDPs: 0 Tests: 1		X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1	Х		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1		X	
iolved Organic/Inorganic arbon	All	NDPs: 0 Tests: 1		X	
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 1	Х		
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 1	Х		
Fluoride	All	NDPs: 0 Tests: 1		X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1	X		
Loss on Ignition in soils	All	NDPs: 0 Tests: 1	х		
Mercury Dissolved	All	NDPs: 0 Tests: 1		X	
als by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 1		X	

CERTIFICATE OF ANALYSIS



SDG: 170923-97 Client Reference: 2921-028 COC3-G Report Number: 426773
Location: Chartered Land - Heuston Order Number: Superseded Report:

Location:	Ondi	tered Land - Heusto	ii Oi di	CI INU	moci
Results Legend X Test No Determination	Lab Sa	mple No(s)			16241281
Possible		Customer Sample Reference			2921-BH1-SS3
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate	AGS	Reference			
PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage	De	pth (m)			
RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas	Co	ntainer	250g Amber Jar (ALE210)	400g Tub (ALE214)	60g VOC (ALE215)
OTH - Other	Sam	ple Type	co	S	S
Metals in solid samples by OES	All	NDPs: 0 Tests: 1	X		
Mineral Oil	All	NDPs: 0 Tests: 1	X		
PAH by GCMS	All	NDPs: 0 Tests: 1	X		
PCBs by GCMS	All	NDPs: 0 Tests: 1	X		
рН	All	NDPs: 0 Tests: 1	X		
Phenois by HPLC (S)	All	NDPs: 0 Tests: 1	X		
Phenois by HPLC (W)	All	NDPs: 0 Tests: 1		Х	
Sample description	All	NDPs: 0 Tests: 1	Х		
Total Dissolved Solids	All	NDPs: 0 Tests: 1		Х	
Total Organic Carbon	All	NDPs: 0 Tests: 1	х		
Total Sulphate	All	NDPs: 0 Tests: 1	х		
Total Sulphur	All	NDPs: 0 Tests: 1	X		
TPH CWG GC (S)	All	NDPs: 0 Tests: 1	X		



Validated

SDG: Location:

170923-97

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-G

Report Number: Superseded Report:

426773

Sample Descriptions

Grain Sizes

very fine <0.0	063mm fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 1	10mm very	coarse	>10
Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Descrip	tion I	nclusions	Inclusions	2	
16241281	2921-BH1-SS3	0.60 - 1.30	Dark Brov	vn Loamy S	and	Stones	Vegetation		

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

er coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS



SDG: Location: 170923-97

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-G

Report Number: Superseded Report:

426773

				-			
# ISO17025 accredite		Customer Sample Ref.	2921-BH1-SS3				
M mCERTS accredited	1.						
aq Aqueous / settled s		Depth (m)	0.60 - 1.30				
diss.filt Dissolved / filtered ot.unfilt Total / unfiltered sa	sample.	Sample Type	Soil/Solid (S)				
* Subcontracted test		Date Sampled	20/09/2017				
	urrogate standard to	Sampled Time					
check the efficiency	of the method. The compounds within	Date Received	23/09/2017				
	ected for the recovery	SDG Ref	170923-97				
(F) Trigger breach con		Lab Sample No.(s)	16241281				
1-58+5@ Sample deviation (e	ee appendix)	AGS Reference					
Component	LOD/Uni	ts Method					
			40				
Moisture Content Ratio (% of as %	PM024	16				
received sample)							
ose on ignition	<0.7 %	TM018	3.54				
Loss on ignition	30.1 /6	1141010	0.01				
				M			
Mineral oil >C10-C40	<1 mg/k	g TM061	92.8				
Mineral Oil Surrogate %	%	TM061	85				
recovery**							
	-0.04	TM000 (0)	< 0.01				
Phenol	<0.01	TM062 (S)	<0.01				
	mg/kg			M			
Organic Carbon, Total	<0.2 %	TM132	0.765				
J			(202)(202)	1.4			
2 6 Mar Marines (1942-1944)			10.1000	М			
Sulphur, Total	< 0.02 %	% TM132	0.116				
Outshale Traditions	-0.000	/ T14420	0.040				
Sulphate, Total potential	<0.06 9	% TM132	0.348				
pH	1 pH Un	its TM133	9.06				
Pi i	1 pri Oil	1111100	3.00				
				M			
Chromium, Hexavalent	<0.6 mg/	/kg TM151	< 0.6				
				#			
				#			
Cyanide, Total	<1 mg/k	kg TM153	<1				
				M			
Ouasida Fran	et mall	TM452	<1				
Cyanide, Free	<1 mg/k	kg TM153	<1				
				M			
PCB congener 28	<3 µg/k	g TM168	<3				
r ob oongoner zo	o par	9 1111100					
				М		-	
PCB congener 52	<3 µg/k	g TM168	<3				
· ·		*		M			
202 101		711100		191			
PCB congener 101	<3 µg/k	rg TM168	<3				
				M			
PCB congener 118	<3 µg/k	g TM168	<3				
1 Ob congener 110	-o pg/	ig initio					
				M			
PCB congener 138	<3 µg/l	kg TM168	<3				
				M			
DOD 450	-00	T14400	-0	141			
PCB congener 153	<3 µg/l	kg TM168	<3				
				M			
PCB congener 180	<3 µg/k	kg TM168	<3				
. Ju ourgener 100	-5 hg/r	3 111100					
				М			
Sum of detected PCB 7	<21 µg/	kg TM168	<21				
Congeners	10	9786					
		5 T11101	4.00				
Antimony	<0.6 mg	/kg TM181	1.03				
				#			
Arsenic	<0.6 mg	/kg TM181	9.86				
, συτιιο	-0.0 mg	111101	0.00				
				M			
Barium	<0.6 mg	/kg TM181	44.8				
				#			
Cadmium	<0.02	TM181	1.51	11			
Cadmium			1.51				
	mg/kg			M			
Chromium	<0.9 mg	/kg TM181	15.3				
and the second s	- July		13.0	11			
_				М			
Copper	<1.4 mg	/kg TM181	22.4				
				M			
Iron	<1000	TM181	20400	141			
IIVII			20400				
	mg/kg			#			
Lead	<0.7 mg		21.8				
	S. Hig		21.0	1.4			
				M			
Manganese	<0.13		1050				
	mg/kg			M			
Mercury	<0.14		0.522	.41			
watcuty			0.522				
	mg/kg			M			
Mahahaman	<0.1 mg	/kg TM181	3.53				
Molybaenum	10000000		2,000	#			
Molybdenum				**			
Molybdenum		B 751101					
Nickel	<0.2 mg	/kg TM181	38.3				



Validated

SDG: 170923-97 Client Reference: 2921-028 COC3-G Report Number: 426773
Location: Chartered Land - Heuston Order Number: Superseded Report:

# M	Results Legend	K US STATE	Customer Sample Ref.	2921-BH1-SS3		
	ISO17025 accredited.					
ag	mCERTS accredited. Aqueous / settled sample.					
diss.filt	Dissolved / filtered sample.		Depth (m)	0.60 - 1.30		
tot.unfilt	Total / unfiltered sample. Subcontracted test.		Sample Type	Soil/Solid (S)		
	Subcontracted test. % recovery of the surrogate standa	ard to	Date Sampled Sampled Time	20/09/2017		
	check the efficiency of the method	I. The	Date Received	23/09/2017		
	results of individual compounds w	rithin	SDG Ref	170923-97		
	samples aren't corrected for the re	covery	Lab Sample No.(s)	16241281		
1-5&+6/5	Trigger breach confirmed Sample deviation (see appendix)		AGS Reference			
		LOD/U-14				
Compor		LOD/Unit				
Selenium	1	<1 mg/kg	g TM181	1.03		
				#		
-		40 1	714404			
Zinc		<1.9 mg/k	kg TM181	90.4		
				M		
Sulphate	Total	<48 mg/k	g TM221	759		
Julphato	, 1000	To mg/i	19 1111221			
				M		
Sulphide	, Oxidisable	< 0.03 %	5 TM221	0.272		
_			711000			
Boron, w	ater soluble	<1 mg/kg	g TM222	<1		
				M		
-						

CERTIFICATE OF ANALYSIS



SDG: Location: 170923-97

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-G

Report Number: Superseded Report:

426773

Customer Sample Ref. ### ISO17025 accredited. ### MCERT'S accredited. ### Aquanous / settled sample. diss.filt blooved / filtered sample. Totu.unfilt Total / unfiltered sample
Aqueous / settled sample. Depth (m) 0.80 - 1.30
tot.unfilit Total / unfilitered sample. **Subcontracted test. **Wrecovery of the surrogate standard to check the efficiency of the method. The results of Individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Lab Sample deviation (see appendix) **Component LOD/Units Method Naphthalene-d8 % recovery** **TM218 94.1 **TM218 99.5
** Subcontracted test. *** Vercovery of the surrogate standard to check the efficiency of the method. The results of Individual compounds within samples arren't corrected for the recovery Trigger breach confirmed 1-5&-98 Sample deviation (see appendix) *** Modern Component *** LOD/Units Method Naphthalene-d8 % recovery** % TM218 102 Acenaphthene-d10 % recovery** % TM218 94.1 *** Subcontracted test.** Date Sample deviation (see appendix) *** TM218 94.1 *** TM218 90.5
Acenaphthene-d10 % recovery** Check the efficiency of the method. The results of individual compounds within SDG Ref Lab Sample No.(s) ASS Reference Lab Sample deviation (see appendix) ACS Reference TM218 TM218 102 Acenaphthene-d10 % recovery** Phenanthrene-d10 % recovery** Mathematical SDG Ref Lab Sample No.(s) ASS Reference TM218 TM218 102 TM218 94.1
results of Individual compounds within SDG Ref 170923-97 18241281 SDG Ref Lab Sample No.(s) 18241281 Sample deviation (see appendix) Method Method Method Method Method Method Method
samples aren't corrected for the recovery Figure breach confirmed 1-5&+9@ Sample deviation (see appendix) AGS Reference Component LOD/Units Method Naphthalene-d8 % recovery** % TM218 102 Acenaphthene-d10 % recovery*** Phenanthrene-d10 % recovery** % TM218 90.5
AGS Reference Component LOD/Units Method
Component LOD/Units Method Naphthalene-d8 % recovery** % TM218 102 Acenaphthene-d10 % recovery** % TM218 94.1 Phenanthrene-d10 % recovery** % TM218 90.5
Naphthalene-d8 % recovery** % TM218 102 Acenaphthene-d10 % recovery** % TM218 94.1 Phenanthrene-d10 % recovery** % TM218 90.5
Acenaphthene-d10 %
ecovery** Phenanthrene-d10 % recovery**
Phenanthrene-d10 % recovery**
Chrysene-d12 % recovery**
, , , , , , , , , , , , , , , , , , , ,
Produce MO Warranger M. W. Thousand
Perylene-d12 % recovery**
Naphthalene <9 μg/kg TM218 <9 M
Acenaphthylene <12 μg/kg TM218 <12
M
Acenaphthene < 8 μg/kg TM218 <8 M
Fluorene <10 μg/kg TM218 <10 M
Phenanthrene <15 μg/kg TM218 34.5
M Anthracene <16 μg/kg TM218 <16
M M
Fluoranthene <17 μg/kg TM218 42.2 M
Pyrene <15 μg/kg TM218 39 M
Benz(a)anthracene <14 µg/kg TM218 18.5
Chrysene <10 μg/kg TM218 18.5
Benzo(b)fluoranthene <15 μg/kg TM218 31.6
M Benzo(k)fluoranthene <14 μg/kg TM218 19.3
M
Benzo(a)pyrene <15 µg/kg TM218 28.1 M
Indeno(1,2,3-cd)pyrene <18 µg/kg TM218 <18 M
Dibenzo(a,h)anthracene <23 µg/kg TM218 <23
M Benzo(g,h,i)perylene <24 μg/kg TM218 <24
M Coronene <200 μg/kg TM218 <200
PAH, Total Detected USEPA 16 <118 μg/kg TM218 232
PAH, Total Detected USEPA 16 <318 μg/kg TM218 <318 + Coronene

CERTIFICATE OF ANALYSIS



SDG: Location:

170923-97 Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-G

Report Number: Superseded Report:

426773

Results Legend	C	ustomer Sample Ref.	2921-BH1-SS3			
# ISO17025 accredited.			EEE 110111-000			
M mCERTS accredited. aq Aqueous / settled sample.						
diss.filt Dissolved / filtered sample.		Depth (m)	0.60 - 1.30			
ot.unfilt Total / unfiltered sample.		Sample Type	Soil/Solid (S)			
 Subcontracted test. 		Date Sampled	20/09/2017			
** % recovery of the surrogate stand		Sampled Time				
check the efficiency of the metho results of individual compounds	d. The	Date Received	23/09/2017			
samples aren't corrected for the r		SDG Ref	170923-97			
(F) Trigger breach confirmed		Lab Sample No.(s)	16241281			
-5&+§@ Sample deviation (see appendix)		AGS Reference				
Component	LOD/Units	Method				
GRO Surrogate % recovery**	%	TM089	54			
GRO TOT (Moisture Corrected)	<44 µg/kg	TM089	<44			
			N			
Methyl tertiary butyl ether	<5 µg/kg	TM089	<5			
MTBE)						
Benzene	<10 µg/kg	TM089	<10			
			N			
Toluene	<2 µg/kg	TM089	5.95			
10100110	- Paring	TIMOGO				
		71.40.55	N			
Ethylbenzene	<3 µg/kg	TM089	<3			
			N			
Xylene	<6 µg/kg	TM089	<6			
	o Paula					
NV 18		71.000	N			
o-Xylene	<3 µg/kg	TM089	<3	2		
			N			
sum of detected mpo xylene by	<9 µg/kg	TM089	<9			
GC	v P3'''9		-			
	.01	T1 1000	-0.4			
sum of detected BTEX by GC	<24 µg/kg	TM089	<24			
Aliphatics >C5-C6	<10 µg/kg	TM089	<10			
		1,110,555	1.5			
	10	W11000	- 10			
Aliphatics >C6-C8	<10 µg/kg	TM089	<10			
Aliphatics >C8-C10	<10 µg/kg	TM089	<10			
			1000			
Vinhatine >C10 C12	240	TNADOD	<10			
Aliphatics >C10-C12	<10 µg/kg	TM089	<10			
		-	7.333.43			
Aliphatics >C12-C16	<100 µg/kg	TM173	2090			
Aliphatics >C16-C21	<100 µg/kg	TM173	6430			
mp. 10000 0 10 02 1	Too pging	111170	0100			
	100 0	W11100	77/00			
Aliphatics >C21-C35	<100 µg/kg	TM173	77400			
Aliphatics >C35-C44	<100 µg/kg	TM173	75600			
	1 2 3					
LAtinhatian a CAN CAA	1400 "	T14470	400000			
I Aliphatics >C12-C44	<100 µg/kg	TM173	162000			
Aromatics >EC5-EC7	<10 µg/kg	TM089	<10			
A	.10	T1 1000	-40			
Aromatics >EC7-EC8	<10 µg/kg	TM089	<10			
Aromatics >EC8-EC10	<10 µg/kg	TM089	<10			
		100000000000000000000000000000000000000	445			
Assembling SEC40 FO40	240	T\$4000	>10			
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10			
Aromatics >EC12-EC16	<100 µg/kg	TM173	202			
Aromatics >EC16-EC21	<100 µg/kg	TM173	3240			
TIONIGUES - LOTO-EOZT	- 100 µg/kg	11/11/3	3240			
NOT THE PROPERTY OF THE PROPER			21222			
Aromatics >EC21-EC35	<100 µg/kg	TM173	64200			
Aromatics >EC35-EC44	<100 µg/kg	TM173	105000			
2000 2017	, oo pging					
	100	7711170	50500			
Aromatics >EC40-EC44	<100 µg/kg	TM173	59900			
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	173000			
	noo pgring	133.73				
		773 1 4 770	201000			
Total Aliphatics & Aromatics	<100 µg/kg	TM173	334000			
C5-C44						
12						



Validated

SDG: 170923-97 Client Reference: 2921-028 COC3-G Report Number: 426773
Location: Chartered Land - Heuston Order Number: Superseded Report:

Asbestos Identification - Soil

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	2921-BH1-SS3 0.60 - 1.30 SOLID 20/09/2017 00:00:00 26/09/2017 12:59:37 170923-97 16241281 TM048	3/10/2017	Barbara Urbanek-Wals h		Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



Depth (m)

CERTIFICATE OF ANALYSIS

Validated

SDG: Location:

170923-97 Client Reference: Chartered Land - Heuston Order Number:

0.60 - 1.30

2921-028 COC3-G

Report Number: Superseded Report:

426773

in Non-

Hazardous

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESU	REF : BS EN 12457/2				
Client Reference		Site Location	Char	tered Land - He	uston South Qı
Mass Sample taken (kg)	0.107	Natural Moisture Content (%)	19		
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	84		
Particle Size <4mm	>95%				
Case			Land	Ifill Waste Acce	ptance
SDG 170923-97				Criteria Limits	
Lab Sample Number(s)	16241281				
Sampled Date	20-Sep-2017			Stable	
Customer Sample Ref.	2921-BH1-SS3		Inert Waste	Non-reactive Hazardous Waste	Hazardous
			Landfill	in Non-	Waste Landfill

			Landfill	
Solid Waste Analysis	Result			
Organic Carbon (%)	0.765	3	5	
Loss on Ignition (%)	3.54			
Sum of BTEX (mg/kg)	<0.024	6		
Sum of 7 PCBs (mg/kg)	<0.021	1		
Mineral Oil (mg/kg)	92.8	500		
PAH Sum of 17 (mg/kg)		-		
pH (pH Units)	9.06		>6	
ANC to pH 6 (mol/kg)				
ANC to pH 4 (mol/kg)				

Barium Cadmium Chromium	Result 0.00147 0.00472 <0.00008 <0.001	Limit of Detection <0.0005 <0.0002	Result 0.0147	Limit of Detection		S EN 12457-3 at L/S	J 20 17 119
Arsenic Barium Cadmium Chromium Copper	0.00472 <0.00008		0.0147	<0.005			
Cadmium Chromium	<0.00008	<0.0002		0.000	0.5	2	25
Chromium			0.0472	<0.002	20	100	300
	-0.001	<0.00008	<0.0008	<0.0008	0.04	1	5
Copper	~0.001	<0.001	<0.01	<0.01	0.5	10	70
	0.00243	< 0.0003	0.0243	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.0191	<0.0005	0.191	<0.005	0.5	10	30
Nickel	0.00134	<0.0004	0.0134	<0.004	0.4	10	40
Lead	0.000235	<0.0002	0.00235	<0.002	0.5	10	50
nony	0.00112	<0.0001	0.0112	<0.001	0.06	0.7	5
anium	0.00317	<0.0005	0.0317	<0.005	0.1	0.5	7
Zinc	0.00105	<0.001	0.0105	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	0.594	<0.5	5.94	<5	10	150	500
Sulphate (soluble)	34.4	<2	344	<20	1000	20000	50000
Total Dissolved Solids	92.4	<5	924	<50	4000	60000	10000
Total Monohydric Phenols (W)	< 0.016	<0.016	<0.16	<0.16	1		-
Dissolved Organic Carbon	<3	<3	<30	<30	500	800	1000

Leach Test Information

Date Prepared	27-Sep-2017			
pH (pH Units)	9.50			
Conductivity (µS/cm)	114.00			
Temperature (°C)	18.80			
Volume Leachant (Litres)	0.883			

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation Mcerts Certification does not apply to leachates

04/10/2017 13:04:17