SOIL CHEMISTRY DAT	TABASE												The second
2921 - Chartered Land		outh	Eur	opean C	ouncil	Decisio	n 2003/3	3/EC	RESULTS				
Quarter				Waste	Acceptan	ce Criteri	a (WAC)		Company	Minerex	Minerex	Minerex	Minerex
			1				of waste a	it	ID Entered	MO 05/10/2017	MO 05/10/2017	MO 05/10/2017	MO 05/10/2017
AAV				la		ssificatio	ns:		ID Checked	JC 06/10/2017	JC 06/10/2017	JC 06/10/2017	JC 06/10/2017
Min	Prex				- Non-H	Inert łazardous			Lab Ref No.	2921-028-COC4-G	2921-028-COC3-A	2921-028-COC3-B	2921-028-COC4-F
166	CICA		EYAMDI ES			rardous			Date Point ID	22/09/2017	22/09/2017 BH2	20/09/2017 BH2	22/09/2017 BH5
Environi	mental Lir	nited	For a value of	of 3 for TOC,	this means	that the iner	t limit is 3 and	d above this	Description	GRAVEL (Natural	GRAVEL (Made	GRAVEL (Made	GRAVEL (Made
Parameter / substance	Medium analysed		Cat. A	of pH if the ph	is <6 the v Cat. B NON- HAZ (or Stable Non- Reactive) Cat. E1	vaste is clas	Cat. C HAZARD OUS		(BS5930)	Ground) - with clay staining.	Ground) - with cobbles (25%). Non-Naturals = <15%	Ground) - with clay and cobbles. CONCRETE layer Non-Naturals = <15%	Ground) - with clay matrix and occasional gravelly lenses. Non-Naturals = <15% GRAVEL (Natural Ground) - with clay and occasional gravelly lenses.
	- Soil - Leachate (L/S10) - Gas - Water	nits	Cat D2	8	Cat. E2	8	Cat. F3	Cat. G	Sample ID	BH5-SS5	BH2-SS2	BH2-CompSS6	BH5-SS4
ESCALABORA DE S	- vvatos	5	5	IF.	2	JF.	5	IF.	Jampie ib	B110-000	BH2-332	Briz-Compase	B110-334
HAZWASTE TOOL ON LINE	To all	TENAC	147 OF 04		Tay of Ca		17-05-03*			No. How 47 DE DA	No. 11-2 47 05 01	Harriston 42 OF CCC	Henrydows 17 OF COS
Classification (Haz or Non-Haz) Asbestos Contamination (Fibres or	Soil	EWC	17-05-04		17-05-04		>0.001%	Gen 196		Non-Haz 17-05-04	Non-Haz 17-05-04	Hazardous 17-05-03*	Hazardous 17-05-03*
Asbestos Containing materials	Soil	%	<0.001% <0.1%	The Paris	<0.001%		20.1%	ACMs		None	None	None	None
Depth	mbGL (or	~			District.		Parameter St.	(MAXIME)		7.0-7.6	0.4-1.4	0.4-1.9	2.6-5.9
WAC ANALYSIS (Total pollutant of	content) (TPC)			75 E 30		Tres sally d							
Total Organic Carbon (TOC)	Soil	%		3		5.0		6		0.21	1 26	0.39	0.54
Loss on Ignition (LOI)	Soil	%					3	10		1.370	5.18	2.27	2.58
BTEX	Soil	mg/kg		6						<0.024	< 0.024	<0.024	<0.024
PCB 7	Soil	mg/kg		1.0						<0.021	< 0.021	< 0.021	< 0.021
Mineral Oil	Soil	mg/kg		500						100	158	66.50	909
PAH - Total (6) PAHs - Total (16)	Soil	mg/kg		2 (Note 1) 100 (Note 1)		_		4		0.052	8.66	1.71	0.04
PAHs - Total (16) PAH - Total (17)	Soil	mg/kg mg/kg		100 (hote 1)	_	1				0.131 <0.318	15.60	2.92	1.43
pH pH	Soil	pH units		TOO (Moss 1)		<6		>11.5		8.800	11.40	11.50	8.72
WAC ANALYSIS (10:1 Leachate)	1000	lan. mare				1-0		1000		0.000	11.40	A.L.W.	0.72
Mercury	US10 Leachate	mg/kg	0.01		0.2	1	2				<0.0001	<0.0001	< 0.0001
Antimony	L/S10 Leachate	mg/kg	0.06		0.7		5				0.02	0.02	0.01
Arsenic	L/S10 Leachate	mg/kg	0.5		2		25				0.01	0.01	0.01
Barium	L/S10 Leachate	mg/kg	20		100		300				0.25	0.25	0.19
Cadmium	L/S10 Leachate	mg/kg	0:04		1		5				<0.0008	<0.0008	<0.0008
Chromium	L/S10 Leachate	mg/kg	0.5	1	10		70				0.068	0.07	<0.01
Copper	L/S10 Leachate	mg/kg	2		50	1	100				0.062	0.06	<0.003
Lead Molybdenum	L/S10 Leachate	mg/kg mg/kg	0.5		10	-	30	+			<0.002	0.002	0.002
Nickel	L/S10 Leachate	mg/kg	0.4		10		40				0.02	0.02	<0.004
Selenium	L/S10 Leachate	mg/kg	0.1	-	0.5		7	1			0.01	0.02	0.01
Zinc	L/S10 Leachate	mg/kg	4		50		200				<0.01	<0.01	<0.01
Chloride	L/S10 Leachate	mg/kg	800		15000		25000				<20	<20	<20
Fluoride	L/S10 Leachate	mg/kg	10		150		500				<5	<5	<5
Sulphate	L/S10 Leachate	mg/kg	1000	1	20000 60000		50000 100000				621	570	135
TDS - (Solids - total dissolved) Phenol Index	L/S10 Leachate	mg/kg	4000	-	60000		100000	1			4100	3640	714
Phenol Index Dissolved Organic Carbon (DOC)	L/S10 Leachate	mg/kg	500		800	-	1000				<0.16	<0.16	<0.16
Limitoryani Criganic Carpon (LCCC)	L'o io Leacnate	mg/kg	-600		Paris.		1000				P-30	7-50	L-20
General Comments:							War (I	ste Categor European Cour	y according to WAC cell Decision 2003/33/EC)	(Cat. A)	NON-HAZ (Cat. B)	HAZARDOUS (Cat. C)	HAZARDOUS (Cat C)
Note 1: There is no specified li Council Decision Ref: 2003/33/ PAHs "Member States to set lin prescribed in Waste Licence fo	EC, rather it state mit value" i.e. will l	s for be							Comments	classified as Non-Haz through haz-tool, and Inert according to WAC reference limits.	The material has been classified as Non-Haz through haz-tool, and Non-Haz according to WAC reference limits.	The material has been classified as Hazardous through Haz-tool Haz WAC limits listed under Council Decision	The material has been classified as Hazardous through Haz-tool but meets Non-Haz WAC limits listed under Coun-
							Disposal rout	es / Outlets	for waste subsoils	The material can be accepted at any facility which accepts Inert material.	The material can be accepted at any facility which accepts Non-Haz material.	The material is suitable for disposal at any facility that accepts Haz waste soil.	The material is suitable for disposal at any facilit that accepts Haz waste soil.

**Certificates of Analysis** 



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

170923-22

2921-028 COC1-A

Chartered Land - Heuston South Quarter

426617

We received 1 sample on Friday September 22, 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

ALS Environmental is part of ALS Life Sciences Limited. 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: 170923-22 Client Referent Location: Chartered Land - Heuston Order Number

Client Reference: 2921-028 COC1-A

Report Number: Superseded Report: 426617

# **Received Sample Overview**

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16234821	2921-BH1-Comp-SS6		0.30 - 1.70	20/09/2017

Maximum Sample/Coolbox Temperature (°C):

14.2

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:

170923-22 Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC1-A

Report Number: Superseded Report:

Results Legend					_
X Test	Lab Sar	mple No(s)			16234821
No Determination Possible					
	Cus	stomer			2921-BH1-Comp-SS 6
	Sample	Reference			1-Comp 6
Sample Types - S - Soil/Solid					SS
UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate	AGS F	Reference			
PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent	Dep	oth (m)			0.30 - 1.70
TS - Treated Sewage US - Untreated Sewage Recreational Water			250		
- Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas	Cor	ntainer	250g Amber Jar (ALE210)	400g Tub (ALE214)	(ALE215)
OTH - Other	Samp	ole Type	S	S	co
Anions by Kone (w)	All	NDPs: 0 Tests: 1		X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1		х	
Boron Water Soluble	All	NDPs: 0 Tests: 1	X		
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	
olved Organic/Inorganic	All	NDPs: 0 Tests: 1		х	
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 1	Х		
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 1	X		
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	X		
Mercury Dissolved	All	NDPs: 0 Tests: 1		X	
als by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 1		X	

# **CERTIFICATE OF ANALYSIS**



SDG: 170923-22 Client Reference: 2921-028 COC1-A Report Number: 426617
Location: Chartered Land - Heuston Order Number: Superseded Report:

(ALS) Location:	Chart	ered Land - Heusto	n Ord	er Nu	mber
Results Legend					16
X Test	Lab Sa	mple No(s)			16234821
No Determination Possible					
	Cus	0			
	Sample	Reference			2921-BH1-Comp-SS 6
Sample Types - S - Soil/Solid					SS
UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate	AGS F	Reference			
PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage	Dep	pth (m)			0.30 - 1.70
RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas	Con	ntainer	250g Amber Jar (ALE210)	400g Tub (ALE214)	60g VOC (ALE215)
OTH - Other	Samı	ole Type	S	S	S
Metals in solid samples by OES	All	NDPs: 0 Tests: 1	Х		
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	Х		
рН	All	NDPs: 0 Tests: 1	X		
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1	X		
Phenols 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		X	
Total Organic Carbon	All	NDPs: 0 Tests: 1	Х		
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:

170923-22

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC1-A

Report Number: Superseded Report:

426617

# Sample Descriptions

#### **Grain Sizes**

very fine <0.	063mm fine	0.063mm - 0.1mm	medium 0.1r	nm - 2mm	coarse	2mm - 10m	very coars	se >1
Lab Sample No(s)	Customer Sample Re	f. Depth (m)	Colour	Description	n Incl	usions	Inclusions 2	
16234821	2921-BH1-Comp-SS6	0.30 - 1.70	Dark Brown	Loamy Sand	S	ones	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:

170923-22 Client Referenc Chartered Land - Heuston Order Number: Client Reference:

2921-028 COC1-A

Report Number: Superseded Report:

Results Legend	C	Customer Sample Ref.	2921-BH1-Comp-S			
# ISO17025 accredited.			S6			
M mCERTS accredited. aq Aqueous / settled sample.						
diss.filt Dissolved / filtered sample.		Depth (m) Sample Type	0.30 - 1.70			
tot.unfilt Total / unfiltered sample.  * Subcontracted test.		Date Sampled	Unspecified Solid (UNS) 20/09/2017			
" % recovery of the surrogate stands	ard to	Sampled Time	-			
check the efficiency of the method results of individual compounds w	1. The	Date Received	22/09/2017			
samples aren't corrected for the re		SDG Ref	170923-22			
(F) Trigger breach confirmed		Lab Sample No.(s)	16234821			
1-5&+§@ Sample deviation (see appendix)		AGS Reference				
Component	LOD/Units	Method				
Moisture Content Ratio (% of as	%	PM024	11			
received sample)	,,,,,					
		711010	4.04			
Loss on ignition	<0.7 %	TM018	4.61			
Mineral oil >C10-C40	<1 mg/kg	TM061	137			
	3.55 850					
Mineral Oil Surrogate %	%	TM061	95.2			
	70	TWOOT	90.E			
recovery**						
Phenol	< 0.01	TM062 (S)	< 0.01			
	mg/kg					
Organic Carbon, Total	<0.2 %	TM132	1.43			
organio darbon, rotal	J.E 70	11102	1.40			la la
A CLASSIC COLUMN CONTRACTOR CONTR						
Sulphur, Total	<0.02 %	TM132	0.152			100
Sulphate, Total potential	<0.06 %	TM132	0.456			
Parameter and Pa			31.123			
-11	4 -1111 0	714400	0.00			
pH	1 pH Units	TM133	8.89			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6			
			-37.5			
Cyanide, Total	<1 mg/kg	TM153	<1			
Cyanide, Free	<1 mg/kg	TM153	<1			
DOD00	-0 1	T14400	-0			
PCB congener 28	<3 µg/kg	TM168	<3			
PCB congener 52	<3 µg/kg	TM168	<3			
	100					
DOD 404	-2 1	T14400	-2			
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 130	~5 µg/kg	1101100	-3			
PCB congener 153	<3 µg/kg	TM168	<3			
PCB congener 180	<3 µg/kg	TM168	<3			
. 12 sengensi 100	-o pg/ng					
0 1111111111111		99110		-		
Sum of detected PCB 7	<21 µg/kg	TM168	<21			
Congeners						
Antimony	<0.6 mg/kg	TM181	<0.6			
Name 25504			4.3.3			
Amonio	40.0 1	T34404	0.45			
Arsenic	<0.6 mg/kg	TM181	9.45			
Barium	<0.6 mg/kg	TM181	61.6			
Cadmium	<0.02	TM181	0.886			
Sustained in the sustai		IMIOI	0.000			
0	mg/kg		~ 00			
Chromium	<0.9 mg/kg	TM181	8.13			
Copper	<1.4 mg/kg	TM181	18.2			
90						
	-4000	Titto	47000			
lenn	<1000	TM181	17800			
Iron	mg/kg					
	40 7 mallin	TM181	16.2			
	<u. kg<="" mg="" td=""><td></td><td></td><td></td><td></td><td></td></u.>					
	<0.7 mg/kg					
Lead		TM404	EDO			
Lead	<0.13	TM181	588			
Lead Manganese	<0.13 mg/kg		07,000			
Lead Manganese	<0.13	TM181 TM181	588 0.547			
Lead Manganese	<0.13 mg/kg <0.14		07,000			
Lead Manganese Mercury	<0.13 mg/kg <0.14 mg/kg	TM181	0.547			
Lead Manganese Mercury	<0.13 mg/kg <0.14	TM181	07,000			
Iron  Lead  Manganese  Mercury  Molybdenum  Nickel	<0.13 mg/kg <0.14 mg/kg	TM181	0.547			



SDG: 17092 Location: Charte

170923-22 Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC1-A

Report Number: Superseded Report:

1000	Results Legend		2 1 2 1 2 1				
#	ISO17025 accredited.		Customer Sample Ref.	2921-BH1-Comp-S S6			
M	mCERTS accredited. Aqueous / settled sample.			30			
	Dissolved / filtered sample.		Depth (m)	0.30 - 1.70			
tot.unfilt	Total / unfiltered sample.		Sample Type	Unspecified Solid (UNS)			
	Subcontracted test.		Date Sampled	20/09/2017			
	% recovery of the surrogate stand check the efficiency of the method	ard to	Sampled Time				
	results of individual compounds w	rithin	Date Received	22/09/2017			
	samples aren't corrected for the re		SDG Ref	170923-22			
(F)	Trigger breach confirmed		Lab Sample No.(s)	16234821			
	Sample deviation (see appendix)		AGS Reference				
Compor	nent	LOD/Units	Method				
Seleniun	1	<1 mg/kg	TM181	<1			
			1				
Zinc		<1.9 mg/kg	TM181	65			
Sulphate	Total	<48 mg/kg	TM221	724			
Odipilate	, rotal	-40 mg/kg	IIIIZZI	124			
Sulphide	, Oxidisable	<0.03 %	TM221	0.384			
Doron u	ater soluble	<1 mg/kg	TM222	<1			
boron, w	ater soluble	<1 mg/kg	TIVIZZZ	<1			
_							
		-					
			_				
					*		
			_				
		-					
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-							

# **CERTIFICATE OF ANALYSIS**



SDG: Location:

170923-22 Client Referenc Chartered Land - Heuston Order Number: Client Reference:

2921-028 COC1-A

Report Number: Superseded Report:

March   Marc	PAH by GCMS Results Legend	C	ustomer Sample Ref.	2921-BH1-Comp-S		
The constraint of the constr	M mCERTS accredited.					
*** The control of th	aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.					
### Supplemental Composition of the English Processor of the English Pr	tot.unfilt Total / unfiltered sample.  * Subcontracted test.					
	** % recovery of the surrogate stand	dard to	Sampled Time			
19	results of individual compounds	within				
Component   CODUMITS   Method   Fig.   Contents   Fig.   Contents   Fig.   Contents   Fig.	<ul><li>(F) Trigger breach confirmed</li></ul>		Lab Sample No.(s)	16234821		
laphthelene-d10 % recovery**         %         TM218         97.2           ceresphthene-d10 % recovery**         %         TM218         88.2           scovery**         %         TM218         81.7           hhysene-d12 % recovery**         %         TM218         85.4           laphthelene         <9 µg/kg         TM218         88.8           laphthelene         <9 µg/kg         TM218         15.2           ceresphthylene         <12 µg/kg         TM218         <12           ceresphthylene         <12 µg/kg         TM218         <12           ceresphthylene         <10 µg/kg         TM218         <12           lucrenthylene         <10 µg/kg         TM218         <10           veresphthylene         <10 µg/kg         TM218         <10           veresphthylene         <10 µg/kg         TM218         <10           veresphthylene         <15 µg/kg         TM218         <10           veresphthylene         <16 µg/kg         TM218         <16           vibraciene         <16 µg/kg         TM218         <16           vibraciene         <15 µg/kg         TM218         <16           vyrene         <15 µg/kg         TM218         <17 <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>						
TM218 88.2  TM218 88.2  TM218 88.2  TM218 81.7  TM218 88.8  TM218 TM218 88.8  TM218 TM218 TM218  TM218 TM218 TM218  TM2				97.2		
Scovery   S						
TM218   81.7   Strysene-d12% recovery**   % TM218   85.4   S8.8   S8.		%	TM218	88.2		
htysene-d12 % recovery**		%	TM218	81.7		
TM218 88.8 15.2 17M218 1						
Asphthalene	Chrysene-d12 % recovery**	%	TM218	85.4		
Cenaphthylene   <12 μg/kg   TM218   <12	Perylene-d12 % recovery**	%	TM218	88.8		
Cenaphthylene   <12 μg/kg   TM218   <12	Nanhthalana	<q td="" valka<=""><td>TM249</td><td>15.2</td><td></td><td></td></q>	TM249	15.2		
Cenaphthene   <6 μg/kg   TM218   <8	rapittialene	-a have	I IVIZ 10	10.2		
The continue	Acenaphthylene	<12 µg/kg	TM218	<12		
Second   S	Acenaphthene	<8 un/kn	TM218	<8		
Phenanthrene       <15 μg/kg						
Anthracene	Fluorene	<10 µg/kg	TM218	<10		
Anthracene   <16 μg/kg   TM218   <16	Phenanthrene	<15 µg/kg	TM218	70.1		
Fluoranthene	Anthrono	200	T11040	-40		
Syrene	Anthracene	<16 µg/kg	TM218	<16		
Senz(a)anthracene < 14 μg/kg TM218 70.9  Chrysene <10 μg/kg TM218 43.2  Senzo(b)fluoranthene <15 μg/kg TM218 65.5  Senzo(k)fluoranthene <14 μg/kg TM218 27.3  Senzo(a)pyrene <15 μg/kg TM218 58.3  senzo(a)pyrene <15 μg/kg TM218 34.3  Senzo(a)pyrene <18 μg/kg TM218 34.3  Sibenzo(a,h)anthracene <23 μg/kg TM218 <23  Senzo(g,h,i)perylene <24 μg/kg TM218 46.8  Senzo(g,h,i)perylene <24 μg/kg TM218 <200  Senzo(g,h,i)perylene <200 μg/kg TM218 <200  Senzo(g,h,i)perylene <200 μg/kg TM218 568	Fluoranthene	<17 µg/kg	TM218	71.5		
Senz(a)anthracene <14 μg/kg TM218 70.9  Chrysene <10 μg/kg TM218 43.2  Senzo(b)fluoranthene <15 μg/kg TM218 65.5  Senzo(k)fluoranthene <14 μg/kg TM218 27.3  Senzo(a)pyrene <15 μg/kg TM218 58.3  senzo(a)pyrene <15 μg/kg TM218 34.3  Senzo(a)pyrene <18 μg/kg TM218 34.3  Sibenzo(a,h)anthracene <23 μg/kg TM218 <23  Senzo(g,h,i)perylene <24 μg/kg TM218 46.8  Senzo(g,h,i)perylene <24 μg/kg TM218 <200  PAH, Total Detected USEPA 16 <118 μg/kg TM218 568	Pyrene	<15 µa/ka	TM218	64.7		
Chrysene       <10 μg/kg       TM218       43.2         Benzo(b)fluoranthene       <15 μg/kg				1-17-5		
Benzo(b)fluoranthene       <15 μg/kg	Benz(a)anthracene	<14 µg/kg	TM218	70.9		
Senzo(k)fluoranthene <14 μg/kg TM218 27.3  Senzo(a)pyrene <15 μg/kg TM218 58.3  ndeno(1,2,3-cd)pyrene <18 μg/kg TM218 34.3  Dibenzo(a,h)anthracene <23 μg/kg TM218 <23  Senzo(g,h,i)perylene <24 μg/kg TM218 46.8  Coronene <200 μg/kg TM218 <200  PAH, Total Detected USEPA 16 <118 μg/kg TM218 568	Chrysene	<10 µg/kg	TM218	43.2		
Senzo(k)fluoranthene <14 μg/kg TM218 27.3  Senzo(a)pyrene <15 μg/kg TM218 58.3  ndeno(1,2,3-cd)pyrene <18 μg/kg TM218 34.3  Dibenzo(a,h)anthracene <23 μg/kg TM218 <23  Senzo(g,h,i)perylene <24 μg/kg TM218 46.8  Coronene <200 μg/kg TM218 <200  PAH, Total Detected USEPA 16 <118 μg/kg TM218 568	Benzo(b)fluoranthene	<15 µa/ka	TM218	65.5	-	
Senzo(a)pyrene <15 μg/kg TM218 58.3  Indeno(1,2,3-cd)pyrene <18 μg/kg TM218 34.3  Dibenzo(a,h)anthracene <23 μg/kg TM218 <23  Senzo(g,h,i)perylene <24 μg/kg TM218 46.8  Coronene <200 μg/kg TM218 <200  PAH, Total Detected USEPA 16 <118 μg/kg TM218 568  PAH, Total Detected USEPA 16 <318 μg/kg TM218 568	2.8	6.00 (0.00)				
Machine   Companies   Compa	Benzo(k)fluoranthene	<14 µg/kg	TM218	27.3		
Meno(1,2,3-cd)pyrene   <18 μg/kg   TM218   34.3	Benzo(a)pyrene	<15 µg/kg	TM218	58.3		
Oibenzo(a,h)anthracene   <23 μg/kg   TM218   <23     Genzo(g,h,i)perylene   <24 μg/kg   TM218   46.8     Coronene   <200 μg/kg   TM218   <200     PAH, Total Detected USEPA 16   <318 μg/kg   TM218   568     PAH, Total Detected USEPA 16   <318 μg/kg   TM218   568     Coronene   <200 μg/kg   TM218     Coronene   <200 μg/kg   T	2.00	800 080				
Senzo(g,h,i)perylene       <24 μg/kg	indeno(1,2,3-cd)pyrene	<18 µg/kg	1M218	34.3		
Coronene <200 μg/kg TM218 <200  PAH, Total Detected USEPA 16 <118 μg/kg TM218 568  PAH, Total Detected USEPA 16 <318 μg/kg TM218 568	Dibenzo(a,h)anthracene	<23 µg/kg	TM218	<23		
Coronene <200 μg/kg TM218 <200  PAH, Total Detected USEPA 16 <118 μg/kg TM218 568  PAH, Total Detected USEPA 16 <318 μg/kg TM218 568	Benzo(a h i)pervlene	<24 µn/kg	TM218	46.8		
PAH, Total Detected USEPA 16 <118 μg/kg TM218 568  PAH, Total Detected USEPA 16 <318 μg/kg TM218 568	Server(A'''''') bei Jueire			100000		
PAH, Total Detected USEPA 16 <318 μg/kg TM218 568	Coronene	<200 µg/kg	TM218	<200		
PAH, Total Detected USEPA 16 <318 μg/kg TM218 568	PAH, Total Detected USEPA 16	<118 µg/kg	TM218	568		
	DAH Total Detected LICEDA 40	210	TMONO	500		
	+ Coronene	<318 µg/kg	1M218	508		

# **CERTIFICATE OF ANALYSIS**

SDG: Location:

170923-22 Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC1-A

Report Number: Superseded Report:

Results Legend	C	ustomer Sample Ref.	2921-BH1-Comp-S				
# ISO17025 accredited.			S6				
M mCERTS accredited.							
aq Aqueous / settled sample.		Depth (m)	0.30 - 1.70				
diss.filt Dissolved / filtered sample. ot.unfilt Total / unfiltered sample.		Sample Type	Unspecified Solid (UNS)				
* Subcontracted test.		Date Sampled	20/09/2017				
** % recovery of the surrogate stand	iard to	Sampled Time	20/09/2017				
check the efficiency of the metho			00/00/0047				
results of individual compounds		Date Received	22/09/2017				
samples aren't corrected for the r		SDG Ref	170923-22				
(F) Trigger breach confirmed	100 (10025)	Lab Sample No.(s)	16234821				
1-5&+§@ Sample deviation (see appendix)		AGS Reference					
Component	LOD/Units	Method					
SOURCE IN THE SECOND CONTRACTOR		Method					
GRO Surrogate % recovery**	%	TM089	12	-			
					100		
GRO TOT (Moisture Corrected)	<44 µg/kg	TM089	<44				
2000 00 00 00 00 00 00 00 00 00 00 00 00							
Methyl tertiary butyl ether	<5 µg/kg	TM089	<5				
(MTBE)							
Panana	-40	TMOOO	<10				
Benzene	<10 µg/kg	TM089	<10				
Toluene	<2 µg/kg	TM089	<2			Ì	
Toluelle	~z µg/kg	110003	~2				
Ethylbenzene	<3 µg/kg	TM089	<3				
and the state of t	-o pg/ng	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	-0				
1							
Xylene	<6 µg/kg	TM089	<6				
€	13.3	10.000000	902				
	-						
o-Xylene	<3 µg/kg	TM089	<3				
	, 5.5						
22 (10.0 10.0 21.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	ALC: 200		000				
sum of detected mpo xylene by	<9 µg/kg	TM089	<9				
GC							
	.0.4	THIRDS					
sum of detected BTEX by GC	<24 µg/kg	TM089	<24				
	11.000.1100						
All-1-1	-40	T14000	-40				
Aliphatics >C5-C6	<10 µg/kg	TM089	<10				
Aliphatics >C6-C8	<10 µg/kg	TM089	<10				
Aliphatics > Co-Co	10 pg/kg	110003	~10				
Aliphatics >C8-C10	<10 µg/kg	TM089	<10				
/ Imprication - Go G To	To pgring	1111000	-10				
Aliphatics >C10-C12	<10 µg/kg	TM089	<10				
, imprication of the original	To pains	1111000	, ,				
Aliphatics >C12-C16	<100 µg/kg	TM173	717				
. O. # 0.002004001. / 1.51/1.75.0 T (1.51/1.		1,000,000,000					
Aliphatics >C16-C21	<100 µg/kg	TM173	1880				
Aliphatics >C21-C35	<100 µg/kg	TM173	40800				
All-1-4 > 025 044	-100 ···- //···	T14470	40700				
Aliphatics >C35-C44	<100 µg/kg	TM173	40700				
Aliphatian > C12 C14	<100	TM4472	0.4100				
l Aliphatics >C12-C44	<100 µg/kg	TM173	84100				
Allers							
Aromatics >EC5-EC7	<10 µg/kg	TM089	<10				
,	- 10 pg/kg	11000	~10				
Aromatics >EC7-EC8	<10 µg/kg	TM089	<10				
	6.0.0		S-EARNE				
0.00			and the second				
Aromatics >EC8-EC10	<10 µg/kg	TM089	<10				
		- Carlotte					
V-12-12-12-12-12-12-12-12-12-12-12-12-12-			7.0				
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10				
	1,000,000	-					
Assembling SEO40 EO40	×400 . "	T14470	<100				
Aromatics >EC12-EC16	<100 µg/kg	TM173	< 100				
Aromatics >EC16-EC21	<100 ua/ka	TM173	1640				
Alonduo -EO 10-EOZ1	<100 µg/kg	11/11/3	1040				
Aromatics >EC21-EC35	<100 µg/kg	TM173	44400				
	. oo pg/ng		10/11/20				
Aromatics >EC35-EC44	<100 µg/kg	TM173	66100				
	Paring I		2,2,2,2,2,2				
The Spannerson	1,127,124		Transfers				
Aromatics >EC40-EC44	<100 µg/kg	TM173	39800				
			y-1000				
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	112000				
	105 "	73.4470	400000				
Total Aliphatics & Aromatics	<100 µg/kg	TM173	196000				
>C5-C44							
10							
0.5							



Validated

SDG: 170923-22 Client Reference: 2921-028 COC1-A Report Number: 426617
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-Comp-SS 6 0.30 - 1.70 MISC_SOLID 20/09/2017 00:00:00 25/09/2017 13:15:21 170923-22 16234821 TM048	02/10/17	Eva Guerra	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



Case

SDG

#### CERTIFICATE OF ANALYSIS

Validated

SDG: 170923-22 Client Reference: Location: Chartered Land - Heuston Order Number:

170923-22

2921-028 COC1-A

Report Number: Superseded Report:

500

426617

Landfill Waste Acceptance Criteria Limits

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

LTS		REF : BS EN 12457/2
	Site Location	Chartered Land - Heuston South Qu
0.101	Natural Moisture Content (%)	12.4
0.090	Dry Matter Content (%)	89
>95%		
	0.101 0.090	0.101 Site Location Natural Moisture Content (%) Dry Matter Content (%)

Lab Sample Number(s) 16234821 Stable Sampled Date 20-Sep-2017 Non-reactive Customer Sample Ref. 2921-BH1-Comp-SS6 Inert Waste Hazardous Hazardous Waste Landfill Waste Landfill in Non-Depth (m) 0.30 - 1.70Hazardous Landfill Result Solid Waste Analysis Organic Carbon (%) 1.43 Loss on Ignition (%) 4.61 Sum of BTEX (mg/kg) < 0.024 6 1

 Organic Carbon (%)
 1.43

 Loss on Ignition (%)
 4.61

 Sum of BTEX (mg/kg)
 <0.024</td>

 Sum of 7 PCBs (mg/kg)
 <0.021</td>

 Mineral Oil (mg/kg)
 137

 PAH Sum of 17 (mg/kg)

 pH (pH Units)
 8.89

 ANC to pH 6 (mol/kg)

 ANC to pH 4 (mol/kg)

Eluate Analysis	C <sub>2</sub> Conc <sup>n</sup> in	10:1 eluate (mg/l)	A2 10:1 con	ic <sup>n</sup> leached (mg/kg)		es for compliance le	
	Result	Limit of Detection	Result	Limit of Detection		211 22 137 3 41 27	5 20 1/ Ng
Arsenic	0.00192	<0.0005	0.0192	<0.005	0.5	2	25
Barium	0.00462	<0.0002	0.0462	<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	0.0012	< 0.0003	0.012	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.00994	< 0.0005	0.0994	<0.005	0.5	10	30
Nickel	0.00074	<0.0004	0.0074	<0.004	0.4	10	40
Lead	0.0151	<0.0002	0.151	<0.002	0.5	10	50
nony	0.00108	<0.0001	0.0108	<0.001	0.06	0.7	5
- Jenium	0.00332	<0.0005	0.0332	<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)	21.2	<2	212	<20	1000	20000	50000
Total Dissolved Solids	70.6	<5	706	<50	4000	60000	100000
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	26-Sep-2017
pH (pH Units)	9.51
Conductivity (µS/cm)	87.40
Temperature (°C)	18.00
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

03/10/2017 13:03:04





SDG: Location:

170923-22 Client Reference: Chartered Land - Heuston Order Number: 2921-028 COC1-A

Report Number: Superseded Report: 426617

# **Table of Results - Appendix**

Method No	Reference	Description	Wet/Dry Sample 1	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis	Gampie	301120124
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 PhenoIs in Waters and Leachates by HPLC		

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: 170923-22

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC1-A

Report Number: Superseded Report:

426617

# **Test Completion Dates**

Lab Sample No(s)	16234821
Customer Sample Ref.	2921-BH1-Comp-S S6
AGS Ref.	
Depth	0.30 - 1.70
Туре	Unspecified Sc
Anions by Kone (w)	28-Sep-2017
Asbestos ID in Solid Samples	02-Oct-2017
Boron Water Soluble	28-Sep-2017
CEN 10:1 Leachate (1 Stage)	26-Sep-2017
CEN Readings	27-Sep-2017
Cyanide Comp/Free/Total/Thiocyanate	28-Sep-2017
Dissolved Metals by ICP-MS	28-Sep-2017
Dissolved Organic/Inorganic Carbon	28-Sep-2017
EPH CWG (Aliphatic) GC (S)	27-Sep-2017
EPH CWG (Aromatic) GC (S)	27-Sep-2017
Fluoride	27-Sep-2017
GRO by GC-FID (S)	29-Sep-2017
Hexavalent Chromium (s)	27-Sep-2017
on Ignition in soils	03-Oct-2017
ary Dissolved	28-Sep-2017
etals by iCap-OES Dissolved (W)	28-Sep-2017
Metals in solid samples by OES	28-Sep-2017
Mineral Oil	28-Sep-2017
PAH by GCMS	27-Sep-2017
PCBs by GCMS	28-Sep-2017
pH	26-Sep-2017
Phenois by HPLC (S)	28-Sep-2017
Phenols by HPLC (W)	28-Sep-2017
Sample description	25-Sep-2017
Total Dissolved Solids	28-Sep-2017
Total Organic Carbon	28-Sep-2017
Total Sulphate	28-Sep-2017
Total Sulphur	28-Sep-2017
TPH CWG GC (S)	29-Sep-2017

### CERTIFICATE OF ANALYSIS



SDG: Location: 170923-22

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC1-A

Report Number: Superseded Report:

426617

# Chromatogram

Analysis: EPH CWG (Aliphatic) GC (S)

Sample No : Sample ID : 16246318

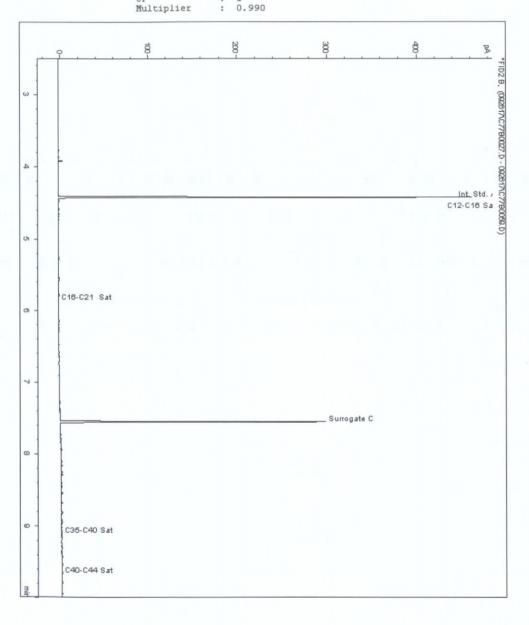
2921-BH1-Comp-SS6

Depth: 0.30 - 1.70

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

Sample Identity: 15209236-Date Acquired : 9/26/2017 6:59:41 PM Units : ppb

Dilution CF Multiplier





SDG: Location: 170923-22

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC1-A

Report Number: Superseded Report:

426617

Chromatogram

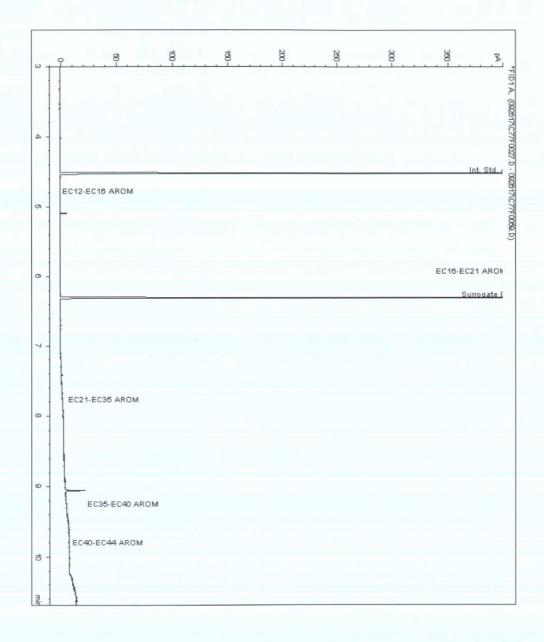
Analysis: EPH CWG (Aromatic) GC (S)

Sample No: Sample ID :

16246318 2921-BH1-Comp-SS6 Depth: 0.30 - 1.70

Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 15209237-Date Acquired : 9/26/2017 6:59:41 PM Units : ppb Dilution:



### **CERTIFICATE OF ANALYSIS**



SDG: Location: 170923-22

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC1-A

Report Number: Superseded Report:

426617

# Chromatogram

Analysis: Mineral Oil

Sample No : Sample ID:

16251042

2921-BH1-Comp-SS6

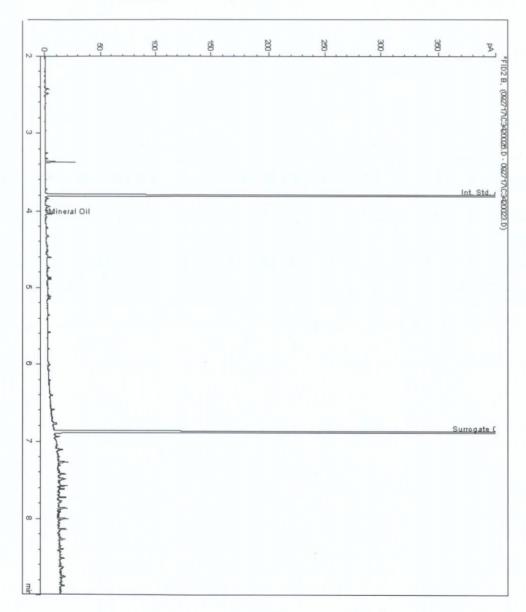
Depth: 0.30 - 1.70

Mineral Oil Range Organics ( ClO - C40 )

Sample Identity Date Acquired Units Sample Multiplier

15209239-28/09/17 11:00:09 PM mq/kq 0.000







Validated

SDG: Location: 170923-22

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC1-A

Report Number: Superseded Report:

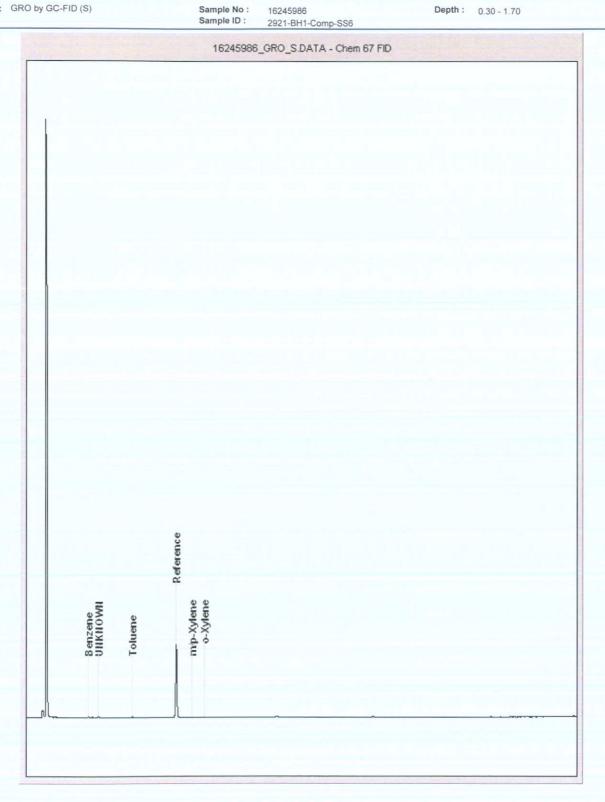
426617

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : Sample ID :

Depth: 0.30 - 1.70



SDG: Location:

170923-22 Client Reference: rtered Land - Heuston South Que Order Number:

2921-028 COC1-A

Report Number: Superseded Report: 426617

# 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
- 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).
- 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

- 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
ž	Sample Holding Time exceeded - Late arrival of instructions.

#### Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of aspestos 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 Asbests
Amosite	BrownAsbests
Cro d dolite	Blue Asbe stos
Fibrous Actinolite	
Rib to us. Anthop hyll ite	
Fibrous Tremplife	

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:

Report No:

Sample Delivery Group (SDG):

Your Reference: Location:

03 October 2017 D\_MINEREX\_DUB 170922-108 2921-028 COC1-B Chartered Land 426616

We received 1 sample on Friday September 22, 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



Validated

SDG: Location:

170922-108 Chartered Land Client Reference: Order Number:

2921-028 COC1-B

Report Number: Superseded Report:

426616

# **Received Sample Overview**

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16234820	2921-BH1-SS4		1.70 - 4.00	20/09/2017

Maximum Sample/Coolbox Temperature (°C):

14.2

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: 170922-108 Client Reference: 2921-028 COC1-B Report Number: 426616
Location: Chartered Land Order Number: Superseded Report:

Results Legend					16
X Test	Lab Sar	15234820			
No Determination Possible					
	100000000000000000000000000000000000000	tomer Reference			2921-0011-004
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate	AGS R	Reference			
PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage	Dep	oth (m)			1.70 - 4.00
IIS - Untreated Sewage - Recreational Water - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas	Cor	ntainer	250g Amber Jar (ALE210)	400g Tub (ALE214)	(ALE215)
OTH - Other	Samp	le Type	S	S	U
Anions by Kone (w)	All	NDPs: 0 Tests: 1		х	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1		х	
Boron Water Soluble	All	NDPs: 0 Tests: 1	X		
CEN Readings	All	NDPs: 0 Tests: 1	^_	X	
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	All	NDPs: 0 Tests: 1		X	
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 1	X		
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 1	X		
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	X		
Mercury Dissolved	All	NDPs: 0 Tests: 1		Х	
als by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 1		X	



 SDG:
 170922-108
 Client Reference:
 2921-028 COC1-B
 Report Number:
 426616

 Location:
 Chartered Land
 Order Number:
 Superseded Report:

(ALS) Location:	Cha	Chartered Land				
Results Legend		Lab Sample No(s)				
X Test	Lab Sa					
No Determination Possible					16234820	
		ustomer e Reference				
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	epth (m)			1.70 - 4.00	
RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas	Co	ontainer	250g Amber Jar (ALE210)	400g Tub (ALE214)	(ALE215)	
OTH - Other	Sam	Sample Type			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	X			
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		Х		
Sample description	All	NDPs: 0 Tests: 1	X			
Total Dissolved Solids	All	NDPs: 0 Tests: 1		X		
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:

170922-108 Chartered Land Client Reference: Order Number: 2921-028 COC1-B

Report Number: Superseded Report: 426616

# **Sample Descriptions**

#### **Grain Sizes**

very fine <0.0	063mm fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 1	10mm very	coarse
Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colo	ur Descrip	tion	Inclusions	Inclusions 2	2
16234820	2921-BH1-SS4	1.70 - 4.00	Blac	k 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: 1709 Location: Char

170922-108 Chartered Land Client Reference: Order Number: 2921-028 COC1-B

Report Number: Superseded Report:

Results Legend		Customer Sample Ref.	2921-BH1-SS4			
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m) Sample Type	1.70 - 4.00 Unspecified Solid (UNS)			
ot.unfilt Total / unfiltered sample.  * Subcontracted test.  * % recovery of the surrogate stand check the efficiency of the metho	d. The	Date Sampled Sampled Time Date Received	20/09/2017			
results of individual compounds samples aren't corrected for the results of the r	recovery	SDG Ref Lab Sample No.(s) AGS Reference	170922-108 16234820			
Component	LOD/Units	Method	1 1			
Moisture Content Ratio (% of as received sample)	%	PM024	9.3			
Loss on ignition	<0.7 %	TM018	1.7			
Mineral oil >C10-C40	<1 mg/kg	TM061	33.1			
Mineral Oil Surrogate % recovery**	%	TM061	88.2			
Phenol	<0.01 mg/kg	TM062 (S)	<0.01			
Organic Carbon, Total	<0.2 %	TM132	0.291			
Sulphur, Total	<0.02 %	TM132	0.254			
Sulphate, Total potential	<0.06 %	TM132	0.762		3	
рН	1 pH Units	TM133	8.71			
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	TM181	<0.6			
Arsenic	<0.6 mg/kg	TM181	7.44			
Barium	<0.6 mg/kg	TM181	59.2			
Cadmium	<0.02 mg/kg	TM181	1.13			
Chromium	<0.9 mg/kg	TM181	7.29			
Copper	<1.4 mg/kg	TM181	13.4			
Iron	<1000 mg/kg	TM181	13800			
Lead	<0.7 mg/kg	TM181	14.5			
Manganese	<0.13 mg/kg	TM181	882			
Mercury	<0.14 mg/kg	TM181	0.39			
Molybdenum	<0.1 mg/kg	TM181	1.68			
Nickel	<0.2 mg/kg	TM181	23.6			



Validated

SDG: Location: 170922-108 Chartered Land Client Reference: Order Number: 2921-028 COC1-B

Report Number: Superseded Report:

Results Legend	XIII SINKE	Customer Sample Ref.	2921-BH1-SS4				
# ISO17025 accredited.		ootomer oample Ker.	Z8Z1-BH1-SS4				
M mCERTS accredited.							
aq Aqueous / settled sample. ss.filt Dissolved / filtered sample.		Depth (m)	1.70 - 4.00				
unfilt Total / unfiltered sample.		Sample Type	Unspecified Solid (UNS)				
<ul> <li>Subcontracted test.</li> </ul>	900	Date Sampled	20/09/2017				
** % recovery of the surrogate standa	rd to	Sampled Time					
check the efficiency of the method. results of individual compounds wi	thin	Date Received	22/09/2017				
samples aren't corrected for the rec	covery	SDG Ref	170922-108 16234820				
(F) Trigger breach confirmed 5&+§@ Sample deviation (see appendix)		Lab Sample No.(s)	10234020				
	1.00//1.16	AGS Reference					
omponent	LOD/Units	Method					
elenium	<1 mg/kg	TM181	1.16				
nc	<1.9 mg/kg	TM181	59.1				
ulphate, Total	<48 mg/kg	TM221	628				
uipriate, rotai	140 mg/kg	TIVIZZI	020				
			72-1-2-2-2				
ulphide, Oxidisable	<0.03 %	TM221	0.699				
oron, water soluble	<1 mg/kg	TM222	<1				
	3 3						
		+ +				-	
						1.	
		1					
			T				
-							
				-	-		

### **CERTIFICATE OF ANALYSIS**



 SDG:
 170922-108

 Location:
 Chartered Land

108 Client Reference: ed Land Order Number: 2921-028 COC1-B

Report Number: Superseded Report:

1997   1997	PAH by GCMS Results Legend	0	Customer Sample Ref.	2921-BH1-SS4			
Section   Component   Compon	# ISO17025 accredited.			2021-0111-004			
	aq Aqueous / settled sample.		D45 (-1				
*** But the control of the control o	diss.filt Dissolved / filtered sample.						
"" Surveyory of the number of control of the n	ot.unfilt Total / unfiltered sample.						
Comparison of the members of the m	** % recovery of the surrogate stand	dard to		20/03/2017			
Secretary   Secr	check the efficiency of the metho	d. The		22/09/2017			
18	results of individual compounds samples aren't corrected for the r	within	SDG Ref				
Component   LODUINIS   Method	<ul><li>(F) Trigger breach confirmed</li></ul>			16234820			
Naphthalene-d10 % recovery**		_					
Aconspithlene-410 % recovery"		LOD/Units	Method				
Phenanthrene-d10 % recovery**	Naphthalene-d8 % recovery**	%	TM218	128			
Phonanthrene-d10 % recovery**			711010				
Phenanthrene-d10 % recovery**	A STATE OF THE STA	%	1M218	117			
Chrysene-d12 % recovery**							
Penylene-d12 % recovery**         %         TM218         110           Najhrihalene         <9 μg/kg	Phenanthrene-d10 % recovery**	%	TM218	113			
Penylene-d12 % recovery**         %         TM218         110           Najhrihalene         <9 μg/kg							
Perylene-d12 % recovery**  % TM218  110  Acenaphthylene  <12 μg/kg  TM218  <12  Acenaphthylene  <12 μg/kg  TM218  <12  Acenaphthylene  <10 μg/kg  TM218  <10  Phenanthrene  <16 μg/kg  TM218  <15  Anthracene  <16 μg/kg  TM218  <16  Fluoranthene  <17 μg/kg  TM218  <17  Pyrene  <15 μg/kg  TM218  <17  Pyrene  <15 μg/kg  TM218  <17  Pyrene  <15 μg/kg  TM218  <15  Benzo(g)anthracene  <14 μg/kg  TM218  <15  Benzo(b)fluoranthene  <19 μg/kg  TM218  21 2  Benzo(k)fluoranthene  <15 μg/kg  TM218  23 9  Benzo(k)fluoranthene  <14 μg/kg  TM218  <15  Benzo(k)fluoranthene  <15 μg/kg  TM218  23 9  Benzo(k)fluoranthene  <15 μg/kg  TM218  <15  Benzo(k)fluoranthene  <15 μg/kg  TM218  23 9  Benzo(k)fluoranthene  <15 μg/kg  TM218  32 9  Benzo(k)fluoranthene  <15 μg/kg  TM218  31 7  TM218  32 9  Benzo(k)fluoranthene  <15 μg/kg  TM218  32 9  Benzo(k)fluoranthene  <15 μg/kg  TM218  31 7  Coronene  <20 μg/kg  TM218  31 7  Coronene  <20 μg/kg  TM218  31 7  Coronene  <20 μg/kg  TM218  <210  Dehected USEPA 16  <118 μg/kg  TM218  <210  PAH, Total Detected USEPA 16  <118 μg/kg  TM218  <216  TM218  T	Chrysene-d12 % recovery**	%	TM218	111			
Acenaphthylene							
Acenaphthylene	Perviene-d12 % recovery**	%	TM218	110			
Acenaphthylene			100				
Acenaphthylene	Nanhthalene	eQ ualla	TM210	<b>~</b> 0			
Acensphthene	rapriliació	-э µg/кд	1 W Z 10	79			
Acensphthene	A Lib. 1-		90.00.0	- 12			
Fluorene	Acenaphthylene	<12 µg/kg	TM218	<12			1
Fluorene							
Fluorene	Acenaphthene	<8 µg/kg	TM218	<8			
Phenanthrene         <15 μg/kg	8						
Phenanthrene         <15 μg/kg	Fluorene	<10 µg/kg	TM218	<10			
Anthracene <16 μg/kg TM218 <16		i o Haina					
Anthracene <16 μg/kg TM218 <16	Phononthrone	/4E	TRADAD	-4E			
Fluoranthene	rnelidiitiilelië	~15 µg/кg	I IVIZ I Ö	<10			
Fluoranthene							
Pyrene       <15 μg/kg	Anthracene	<16 µg/kg	TM218	<16			
Pyrene       <15 μg/kg							
Benz(a)anthracene         <14 µg/kg	Fluoranthene	<17 µg/kg	TM218	<17			
Benz(a)anthracene         <14 µg/kg		135.00					
Benz(a)anthracene         <14 µg/kg	Pyrene	<15 µa/ka	TM218	<15			
Chrysene < 10 μg/kg TM218 21.2							
Chrysene < 10 μg/kg TM218 21.2  Benzo(b)fluoranthene <15 μg/kg TM218 23.9  Benzo(k)fluoranthene <14 μg/kg TM218 18.9  Benzo(a)pyrene <15 μg/kg TM218 <15  Indeno(1,2,3-cd)pyrene <18 μg/kg TM218 27.1  Dibenzo(a,h)anthracene <23 μg/kg TM218 32.9  Benzo(g,h,i)perylene <24 μg/kg TM218 31.7  Coronene <200 μg/kg TM218 <200  PAH, Total Detected USEPA 16 <118 μg/kg TM218 <318	Ronz/a)anthracono	<14 ualka	TM219	<14			
Benzo(b)fluoranthene       <15 μg/kg	Deliz(a)antinacene	~14 µg/kg	1101210	~14			
Benzo(b)fluoranthene       <15 μg/kg	0.	10 0	711010	212			
Benzo(k)fluoranthene       <14 μg/kg	Chrysene	<10 µg/kg	TM218	21.2			
Benzo(k)fluoranthene       <14 μg/kg							
Benzo(a)pyrene       <15 μg/kg	Benzo(b)fluoranthene	<15 µg/kg	TM218	23.9			
Benzo(a)pyrene       <15 μg/kg							
Indeno(1,2,3-cd)pyrene <18 μg/kg TM218 27.1  Dibenzo(a,h)anthracene <23 μg/kg TM218 32.9  Benzo(g,h,i)perylene <24 μg/kg TM218 31.7  Coronene <200 μg/kg TM218 <200  PAH, Total Detected USEPA 16 <118 μg/kg TM218 156  PAH, Total Detected USEPA 16 <318 μg/kg TM218 <318	Benzo(k)fluoranthene	<14 µg/kg	TM218	18.9			
Indeno(1,2,3-cd)pyrene <18 μg/kg TM218 27.1  Dibenzo(a,h)anthracene <23 μg/kg TM218 32.9  Benzo(g,h,i)perylene <24 μg/kg TM218 31.7  Coronene <200 μg/kg TM218 <200  PAH, Total Detected USEPA 16 <118 μg/kg TM218 156  PAH, Total Detected USEPA 16 <318 μg/kg TM218 <318							
Indeno(1,2,3-cd)pyrene <18 μg/kg TM218 27.1  Dibenzo(a,h)anthracene <23 μg/kg TM218 32.9  Benzo(g,h,i)perylene <24 μg/kg TM218 31.7  Coronene <200 μg/kg TM218 <200  PAH, Total Detected USEPA 16 <118 μg/kg TM218 156  PAH, Total Detected USEPA 16 <318 μg/kg TM218 <318	Benzo(a)pyrene	<15 µg/kg	TM218	<15			
Dibenzo(a,h)anthracene <23 μg/kg TM218 32.9  Benzo(g,h,i)perylene <24 μg/kg TM218 31.7  Coronene <200 μg/kg TM218 <200  PAH, Total Detected USEPA 16 <118 μg/kg TM218 156  PAH, Total Detected USEPA 16 <318 μg/kg TM218 <318	1 11 1	- 25.19					
Dibenzo(a,h)anthracene <23 μg/kg TM218 32.9  Benzo(g,h,i)perylene <24 μg/kg TM218 31.7  Coronene <200 μg/kg TM218 <200  PAH, Total Detected USEPA 16 <118 μg/kg TM218 156  PAH, Total Detected USEPA 16 <318 μg/kg TM218 <318	Indeno(1.2.3.cd\nyrans	<18 malka	TMO19	27.1			
Benzo(g,h,i)perylene       <24 μg/kg	mound 1,2,0-ou)pyrene	- 10 µg/кд	1101210	27.1			
Benzo(g,h,i)perylene       <24 μg/kg	Dihaana/a b) - it	.00 -	T11045	20.0			
Coronene <200 μg/kg TM218 <200  PAH, Total Detected USEPA 16 <118 μg/kg TM218 156  PAH, Total Detected USEPA 16 <318 μg/kg TM218 <318	Dibenzo(a,h)anthracene	<23 µg/kg	TM218	32.9			
Coronene <200 μg/kg TM218 <200  PAH, Total Detected USEPA 16 <118 μg/kg TM218 156  PAH, Total Detected USEPA 16 <318 μg/kg TM218 <318	And the second second						
Coronene <200 μg/kg TM218 <200  PAH, Total Detected USEPA 16 <118 μg/kg TM218 156  PAH, Total Detected USEPA 16 <318 μg/kg TM218 <318	Benzo(g,h,i)perylene	<24 µg/kg	TM218	31.7			
PAH, Total Detected USEPA 16		1110000					
PAH, Total Detected USEPA 16	Coronene	<200 µg/kg	TM218	<200			
PAH, Total Detected USEPA 16 <318 µg/kg TM218 <318		-3-3		75TE-61			
PAH, Total Detected USEPA 16 <318 µg/kg TM218 <318	PAH Total Detected LISEPA 16	<118 μα/ka	TM218	156			
		TTO PS/NS	11412.10	100			
	DALL Total Detected LICEDA 40	210	THOSE	-040			
		<318 µg/kg	1M218	<318			
	+ Coronene	-					
		_					
						İ	



 SDG:
 170922-108
 Client Reference:
 2921-028 COC1-B
 Report Number:
 426616

 Location:
 Chartered Land
 Order Number:
 Superseded Report:

TPH CWG (S) Results Legend	C	Customer Sample Ref.	2921-BH1-SS4	T		
# ISO17025 accredited.  M mCERTS accredited.		***************************************	227 011 001			
aq Aqueous / settled sample.		Depth (m)	1.70 - 4.00			
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Sample Type	Unspecified Solid (UNS)			
<ul> <li>Subcontracted test.</li> </ul>		Date Sampled	20/09/2017			
** % recovery of the surrogate stan check the efficiency of the metho	od. The	Sampled Time	00.000.0047			
results of individual compounds	within	Date Received SDG Ref	22/09/2017 170922-108			
samples aren't corrected for the (F) Trigger breach confirmed	recovery	Lab Sample No.(s)	16234820			
1-5&+§@ Sample deviation (see appendix)		AGS Reference				
Component	LOD/Units	Method				
GRO Surrogate % recovery**	%	TM089	22			
GRO TOT (Moisture Corrected)	<44 µg/kg	TM089	-44			
GRO TOT (Moisture Corrected)	144 pg/kg	110009	<44			
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089	<5			
Benzene	<10 µg/kg	TM089	<10			
Toluene	<2 µg/kg	TM089	2.2			
Ethylbenzene	<3 µg/kg	TM089	<3			
Xylene	<6 µg/kg	TM089	<6			
o-Xylene	<3 µg/kg	TM089	<3	- 19		 
sum of detected mpo xylene by GC	<9 µg/kg	TM089	<9			
sum of detected BTEX by GC	<24 µg/kg	TM089	<24		 	
Aliphatics >C5-C6	<10 µg/kg	TM089	<10			
Aliphatics >C6-C8	<10 µg/kg	TM089	<10			
Aliphatics >C8-C10	<10 µg/kg	TM089	<10			
Aliphatics >C10-C12	<10 µg/kg	TM089	<10			
Aliphatics >C12-C16	<100 µg/kg	TM173	<100			
Aliphatics >C16-C21	<100 µg/kg	TM173	<100			
Aliphatics >C21-C35	<100 µg/kg	TM173	<100			
Aliphatics >C35-C44	<100 µg/kg	TM173	<100			
l Aliphatics >C12-C44	<100 µg/kg	TM173	<100			
Aromatics >EC5-EC7	<10 µg/kg	TM089	<10			
Aromatics >EC7-EC8	<10 µg/kg	TM089	<10			
Aromatics >EC8-EC10	<10 µg/kg	TM089	<10			
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10			
Aromatics >EC12-EC16	<100 µg/kg	TM173	<100			
Aromatics >EC16-EC21	<100 µg/kg	TM173	<100			
Aromatics >EC21-EC35	<100 µg/kg	TM173	<100			
Aromatics >EC35-EC44	<100 µg/kg	TM173	<100		_	
Aromatics >EC40-EC44	<100 µg/kg	TM173	<100			
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	<100			
Total Aliphatics & Aromatics	<100 µg/kg	TM173	<100			
>C5-C44	100 pg/kg		100			

# **CERTIFICATE OF ANALYSIS**



SDG: 170922-108 Location: Chartered Land Client Reference: Order Number: 2921-028 COC1-B

Report Number: Superseded Report: 426616

# **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-SS4 1.70 - 4.00 MISC_SOLID 20/09/2017 00:00:00 25/09/2017 13:10:29 170922-108 16234820 TM048	02/10/17	Eva Guerra		Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



Validated

SDG: 170922-108 Location: Chartered Land Client Reference: Order Number:

2921-028 COC1-B

Report Number: Superseded Report:

426616

	CEN	10:1 SINGLE	STAGE LEA	CHATE TEST					
CEN ANALYTICAL RESU	JLTS					REF : BS	EN 12457/		
Client Reference  Mass Sample taken (kg)  0.100				re Content (%)	Chartered Land 10.3				
Mass of dry sample (kg) Particle Size <4mm	0.090 >95%		Dry Matter Co	itent (%)	90.7				
Case					Land	Ifill Waste Acce	otance		
SDG	170922-108					Criteria Limits			
Lab Sample Number(s)	16234820						CONTRACTOR OF THE PARTY OF THE		
Sampled Date	20-Sep-2017					Stable			
Customer Sample Ref.	2921-BH1-SS4				Inert Waste	Non-reactive Hazardous Waste	Hazardous		
Depth (m)	1.70 - 4.00				Landfill	in Non- Hazardous	Waste Landfill		
Solid Waste Analysis	Result					Landfill			
Organic Carbon (%)	0.291				3	5	6		
Loss on Ignition (%)	1.7						10		
Sum of BTEX (mg/kg)	<0.024				6	-	-		
Sum of 7 PCBs (mg/kg)	<0.021	Drr Di.			1	-	1-2		
Mineral Oil (mg/kg)	33.1	RECTILAN	Nn. 1. 410		500	-	-		
PAH Sum of 17 (mg/kg) pH (pH Units)	8.71	DCC PLAN RECEIVED:	0/ 7010/	22		>6			
ANC to pH 6 (mol/kg)	-		04/08/20	22		-	_		
ANC to pH 4 (mol/kg)	-			44	-				
Eluate Analysis	C <sub>2</sub> Conc <sup>n</sup> in 1	LO:1 eluate (mg/l)	A2 10:1 con	A2 10:1 conc <sup>n</sup> leached (mg/kg)		Limit values for compliance leaching test			
Eludio Analysis	Result	Limit of Detection	Result	Limit of Detection			N 12457-3 at L/S 10 I/kg		
Arsenic	0.000517	<0.0005	0.00517	<0.005	0.5	2	25		
Barium	0.034	<0.0002	0.34	<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	0.000432	<0.0003	0.00432	<0.003	2	50	100		
Mercury Dissolved (CVAF)	0.000036	<0.00001	0.00036	<0.0001	0.01	0.2	2		
Molybdenum	0.00765	<0.0005	0.0765	<0.005	0.5	10	30		
Nickel	<0.0004	<0.0004	<0.004	<0.004	0.4	10	40		
l ead	0.00024	<0.0002	0.0024	<0.002	0.5	10	50		
nony	0.000681	<0.0001	0.00681	<0.001	0.06	0.7	5		
Jenium	0.00493	<0.0005	0.0493	<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)	21.2	<2	212	<20	1000	20000	50000		
Total Dissolved Solids	82.8	<5	828	<50	4000	60000	100000		
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**

26-Sep-2017
8.99
98.00
14.60
0.891

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

03/10/2017 13:01:42



Validated

SDG: Location: 170922-108 Chartered Land Client Reference: Order Number: 2921-028 COC1-B

Report Number: Superseded Report: 426616

# Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample 1	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis		
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 PhenoIs in Waters and Leachates by HPLC		

<sup>&</sup>lt;sup>1</sup> 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:

170922-108 Chartered Land Client Reference: Order Number: 2921-028 COC1-B

Report Number: Superseded Report: 426616

# **Test Completion Dates**

Lab Sample No(	s) 16234820
Customer Sample Re	of. 2921-BH1-SS4
AGS Re	
Dep	th 1.70 - 4.00
Тур	De Unspecified So
Anions by Kone (w)	28-Sep-2017
Asbestos ID in Solid Samples	02-Oct-2017
Boron Water Soluble	28-Sep-2017
CEN 10:1 Leachate (1 Stage)	26-Sep-2017
CEN Readings	27-Sep-2017
Cyanide Comp/Free/Total/Thiocyanate	28-Sep-2017
Dissolved Metals by ICP-MS	28-Sep-2017
Dissolved Organic/Inorganic Carbon	28-Sep-2017
EPH CWG (Aliphatic) GC (S)	27-Sep-2017
EPH CWG (Aromatic) GC (S)	27-Sep-2017
Fluoride	27-Sep-2017
GRO by GC-FID (S)	29-Sep-2017
Hexavalent Chromium (s)	27-Sep-2017
on Ignition in soils	03-Oct-2017
ry Dissolved	28-Sep-2017
.als by iCap-OES Dissolved (W)	28-Sep-2017
Metals in solid samples by OES	28-Sep-2017
Mineral Oil	28-Sep-2017
PAH by GCMS	27-Sep-2017
PCBs by GCMS	28-Sep-2017
pH	26-Sep-2017
Phenois by HPLC (S)	27-Sep-2017
Phenois by HPLC (W)	28-Sep-2017
Sample description	25-Sep-2017
Total Dissolved Solids	28-Sep-2017
Total Organic Carbon	28-Sep-2017
Total Sulphate	28-Sep-2017
Total Sulphur	28-Sep-2017
TPH CWG GC (S)	29-Sep-2017

### **CERTIFICATE OF ANALYSIS**



SDG: Location:

170922-108 Chartered Land Client Reference: Order Number:

2921-028 COC1-B

Report Number: Superseded Report:

426616

Chromatogram

Analysis: EPH CWG (Aliphatic) GC (S)

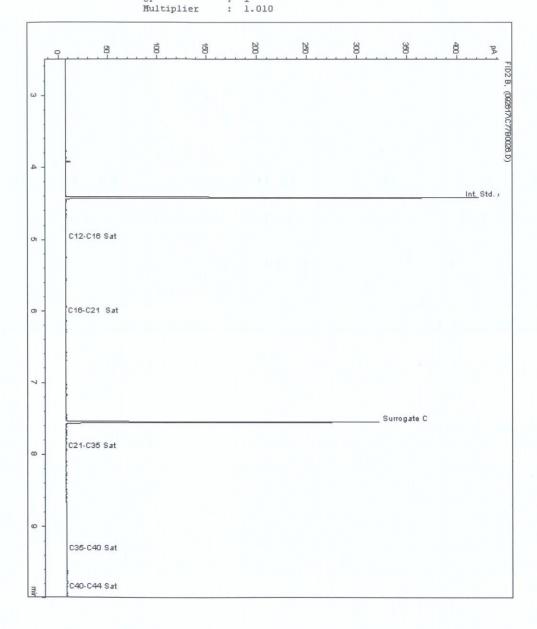
Sample No : Sample ID :

16246183 2921-BH1-SS4 Depth: 1.70 - 4.00

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

Sample Identity: 15209170-Date Acquired : 9/26/2017 6:39:33 PM Units : ppb

Dilution CF Multiplier





Validated

SDG: Location: 170922-108 Chartered Land

Client Reference: Order Number:

2921-028 COC1-B

Report Number: Superseded Report:

426616

Chromatogram

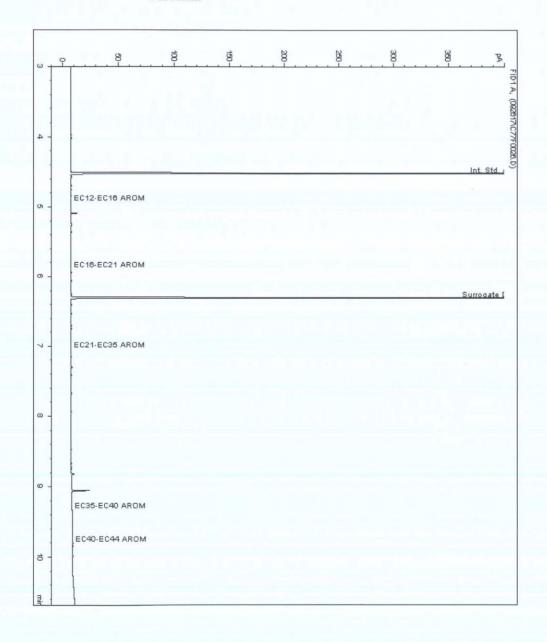
Analysis: EPH CWG (Aromatic) GC (S)

Sample No : Sample ID :

16246183 2921-BH1-SS4 Depth: 1.70 - 4.00

Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 15209171-Date Acquired : 9/26/2017 6:39:33 PM Units : ppb Dilution:







SDG: Location:

170922-108 Chartered Land Client Reference: Order Number:

2921-028 COC1-B

Report Number: Superseded Report:

426616

Chromatogram

Analysis: Mineral Oil

Sample No: Sample ID:

16251485 2921-BH1-SS4 Depth: 1.70 - 4.00

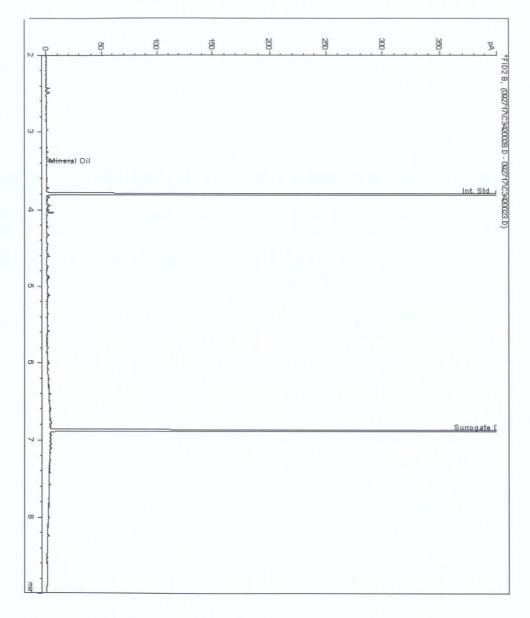
Mineral Oil Range Organics ( C10 - C40 )

: 15209173-: 28/09/17 11:34:31 PM : mq/kq : 0.000

Sample Identity Date Acquired Units Sample Multiplier









Validated

SDG: Location: 170922-108 Chartered Land

Client Reference: Order Number:

2921-028 COC1-B

Report Number: Superseded Report:

426616

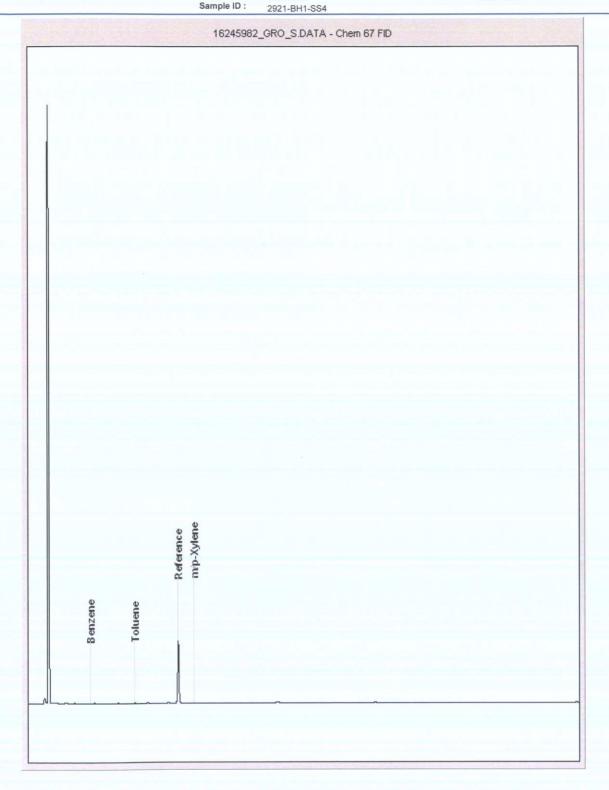
# Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : Sample ID :

16245982

Depth: 1.70 - 4.00



SDG Location:

170922-108 Chartered Land Client Reference: Order Number:

2921-028 COC1-B

Report Number: Superseded Report: 426616

# 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
- 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, 2,5 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).
- 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.

Container with Headspace provided for volatiles analysis
Incorrect container received
Deviation from method
Holding time exceeded before sample received
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 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 Adinolite	
Rib to us. Anthop hyllite	
Fibrous Tremol lib	-

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 th 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

Website: www.alsenvironmental.co.uk

email: hawardencustomerservices@alsglobal.com

# **CERTIFICATE OF ANALYSIS**

Date:

Customer:

Sample Delivery Group (SDG):

Your Reference: Location:

Report No:

04 October 2017 D MINEREX DUB

170923-68

2921-028 COC3-A

Chartered Land - Heuston South Quarter

426768

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

Location:

170923-68

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-A

Report Number: Superseded Report:

426768

# **Received Sample Overview**

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16240404	2921-BH2-SS2		0.30 - 1.50	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±3)°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: 170923-68 Client Reference: 2921-028 COC3-A Report Number: 426768
Location: Chartered Land - Heuston Order Number: Superseded Report:

				-	
Lab S	ample No(s)			10240404	
C	ustomor			707	
				78C-7HG-1787	
				20	
4.00					
AGS	Reference				
				0.0	
De	epth (m)	0.50 - 1.50			
C	ontainer	250g Am (ALE	(ALE	(ALE215)	
	Jitainer	ber Jar 210)	Tub 214)	215)	
Sam	ple Type	S	S	C.	
All	NDPs: 0				
	16515. 1		X		
All	NDPs: 0 Tests: 1		X		
All	NDPs: 0 Tests: 1	~			
All	NDPs: 0 Tests: 1		X		
All	NDPs: 0 Tests: 1	X			
All	NDPs: 0				
	Tests: 1		X		
All	NDPs: 0 Tests: 1		Y		
All	NDPs: 0		^		
	Tests: 1	Х			
All	NDPs: 0 Tests: 1				
		X			
All	NDPs: 0 Tests: 1		X		
All	NDPs: 0 Tests: 1			v	
All	NDPs: 0 Tests: 1	X		X	
All	NDPs: 0 Tests: 1	X			
All	NDPs: 0 Tests: 1	^			
All	NDPs: 0		X		
	AGS  AGS  AII  AII  AII  AII  AII  AII	All NDPs: 0 Tests: 1   Customer   Sample Reference	Customer   Sample Reference   Customer   Sample Reference   Container   Con		

## **CERTIFICATE OF ANALYSIS**



SDG: 170923-68 Client Reference: 2921-028 COC3-A Report Number: 426768
Location: Chartered Land - Heuston Order Number: Superseded Report:

(ALS) Location:	Criar	tered Land - Heusto	Orue	er reur	mber	
Results Legend	l ab Sa	ample No(s)			162	
X Test  No Determination	Lab Sa	imple No(s)			6240404	
Possible  Sample Types -		Customer Sample Reference				
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)				
RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Studge G - Gas	Co	ontainer	250g Amber Jar (ALE210)	400g Tub (ALE214)	60g VOC (ALE215)	
OTH - Other	Sam	ple Type	S	S	co	
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	x			
рН	All	NDPs: 0 Tests: 1	X			
Phenois by HPLC (S)	All	NDPs: 0 Tests: 1	х			
Phenois by HPLC (W)	All	NDPs: 0 Tests: 1		X		
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	x			
TPH CWG GC (S)	All	NDPs: 0 Tests: 1	×			



Validated

SDG: Location:

170923-68

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-A

Report Number: Superseded Report:

426768

# **Sample Descriptions**

#### **Grain Sizes**

very fine <0.0	63mm fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10m
Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Descripti	on Inclu	sions Inc	lusions 2	
16240404	2921-BH2-SS2	0.30 - 1.50	Dark Brov	vn Stone/So	il Sto	nes	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.

426768

# **CERTIFICATE OF ANALYSIS**



SDG: 170923-68 Client Reference: 2921-028 COC3-A Report Number:
Location: Chartered Land - Heuston Order Number: Superseded Report:

	Results Legend		Customas Sample Bof	2004 1911 200	Т			
	ISO17025 accredited. mCERTS accredited.		Customer Sample Ref.	2921-BH2-SS2				100 100
aq	Aqueous / settled sample. Dissolved / filtered sample.		Depth (m)	0.30 - 1.50			1 1 1	
tot.unfilt	Total / unfiltered sample.		Sample Type	Soil/Solid (S)				
	Subcontracted test. % recovery of the surrogate stands	ard to	Date Sampled Sampled Time	20/09/2017				
	check the efficiency of the method	. The	Date Received	23/09/2017				
	results of individual compounds w samples aren't corrected for the re	rithin	SDG Ref	170923-68				
(F)	Trigger breach confirmed	3-300 m5;	Lab Sample No.(s)	16240404				
Compo	Sample deviation (see appendix)	LOD/Units	AGS Reference Method					
	Content Ratio (% of as	%	PM024	7.7				
	sample)							
Loss on	ignition	<0.7 %	TM018	5.18				
Mineral	oil >C10-C40	<1 mg/kg	TM061	158			la l	
Mineral recovery	Oil Surrogate %	%	TM061	84.9				
Phenol		<0.01 mg/kg	TM062 (S)	<0.01				
Organic	Carbon, Total	<0.2 %	TM132	1.26				
Sulphur	Total	<0.02 %	TM132	0.215				
Sulphate	e, Total potential	<0.06 %	TM132	0.645	,			
	, . Juli potential	1100000				_		
pH		1 pH Units		11.4				
Chromiu	m, Hexavalent	<0.6 mg/k	g TM151	<0.6				
Cyanide	, Total	<1 mg/kg	TM153	<1				
Cyanide	, Free	<1 mg/kg	TM153	<1				
PCB cor	ngener 28	<3 µg/kg	TM168	<3				
PCB co	ngener 52	<3 µg/kg	TM168	<3				
PCB co	ngener 101	<3 µg/kg	TM168	<3				
PCB co	ngener 118	<3 µg/kg	TM168	<3				
PCB co	ngener 138	<3 µg/kg	TM168	<3				
PCB co	ngener 153	<3 µg/kg	TM168	<3				
PCB co	ngener 180	<3 µg/kg	TM168	<3				
Sum of	detected PCB 7	<21 µg/kg	g TM168	<21	:			
Congen								
Antimor	у	<0.6 mg/k	g TM181	<0.6				
Arsenic		<0.6 mg/k	g TM181	6.54				
Barium		<0.6 mg/k	g TM181	128				
Cadmiu	m	<0.02 mg/kg	TM181	0.528				
Chromit	ım	<0.9 mg/k	g TM181	11.5				
Copper		<1.4 mg/k	g TM181	13.2	#			
Iron		<1000 mg/kg	TM181	10700				
Lead		<0.7 mg/kg	g TM181	21.9	‡			
Mangar	ese	<0.13	TM181	490	#			
Mari		mg/kg	771101		#			
Mercury		<0.14 mg/kg	TM181	0.558	<b>‡</b>			
Molybde	enum	<0.1 mg/k	g TM181	1.27	#			
Nickel		<0.2 mg/k	g TM181	21.3				
				-	<b>#</b>			



Validated

SDG: 170923-68 Client Reference: 2921-028 COC3-A Report Number: 426768
Location: Chartered Land - Heuston Order Number: Superseded Report:

Results Legend		Customer Sample Ref.	2921-BH2-SS2			
<ul> <li># ISO17025 accredited.</li> <li>M mCERTS accredited.</li> </ul>						
aq Aqueous / settled sample.  diss.filt Dissolved / filtered sample.		Depth (m)	0.30 - 1.50			
tot.unfilt Total / unfiltered sample.		Sample Type	Soil/Solid (S)			
<ul> <li>Subcontracted test.</li> <li>" recovery of the surrogate stand</li> </ul>	dard to	Date Sampled Sampled Time	20/09/2017			
check the efficiency of the metho results of individual compounds	d. The	Date Received	23/09/2017			
samples aren't corrected for the r	ecovery	SDG Ref	170923-68			
(F) Trigger breach confirmed 1-5&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	16240404			
Component	LOD/Units	Method				
Selenium	<1 mg/kg	TM181	<1			
				ŧ		
Zinc	<1.9 mg/kg	TM181	158			
Sulphate, Total	<48 mg/kg	TM221	4430	ŧ		
Sulphide, Oxidisable	<0.03 %	TM221	0.202			
Boron, water soluble	<1 mg/kg	TM222	<1			
				<u> </u>		
	-					2
			75 - 7			

# **CERTIFICATE OF ANALYSIS**



SDG: Location:

170923-68 Client Referenc Chartered Land - Heuston Order Number: Client Reference:

2921-028 COC3-A

Report Number: Superseded Report:

426768

PAH by GCMS Results Legend	Ci	ustomer Sample Ref.	2921-BH2-SS2			
# ISO17025 accredited.		2000 H 200 CO	200.000			
M mCERTS accredited. aq Aqueous / settled sample.						
aq Aqueous / settled sample.  diss.filt Dissolved / filtered sample.		Depth (m)	0.30 - 1.50			
ot.unfilt Total / unfiltered sample.		Sample Type	Soil/Solid (S)			
<ul> <li>Subcontracted test.</li> </ul>		Date Sampled	20/09/2017			
** % recovery of the surrogate stand		Sampled Time				
check the efficiency of the metho results of individual compounds of		Date Received	23/09/2017			
samples aren't corrected for the r	recovery	SDG Ref	170923-68			
<ul><li>(F) Trigger breach confirmed</li></ul>	8 9	Lab Sample No.(s)	16240404			
1-5&+§@ Sample deviation (see appendix)		AGS Reference				
Component	LOD/Units	Method				
	0/	TRACAG	404			
Naphthalene-d8 % recovery**	%	TM218	101			
Acenaphthene-d10 %	%	TM218	98.4			
recovery**						
Phenanthrene-d10 % recovery**	%	TM218	97			
Phenanthrene-d to % recovery	/0	110/210	91			
Chrysene-d12 % recovery**	%	TM218	99.9			
Perylene-d12 % recovery**	%	TM218	107			
r crytono d 12 /v rocovery	//	TIVETO	101			
Naphthalene	<9 µg/kg	TM218	37.6			
	- pging	1111210	# #			
Acenaphthylene	<12 µg/kg	TM218	56.4			
7	- Parria		#			
Acenaphthene	<8 µg/kg	TM218	37.6			
	- pging		37.0			
Elucrono	<10 . m/kg	TM210				
Fluorene	<10 µg/kg	TM218	53.7			
			±			
Phenanthrene	<15 µg/kg	TM218	919			
			#			
Anthracene	<16 µg/kg	TM218	381			
Altillacelle	то руку	1101210				
			#			
Fluoranthene	<17 µg/kg	TM218	3250			
	0.00		#			
Pyrene	<15 µg/kg	TM218	2530			
Tyrono	170 pg/ng	1111210				
Benz(a)anthracene	<14 µg/kg	TM218	1560			
	1000 000		#			
Chrysene	<10 µg/kg	TM218	1170			
om your	To pang	7,11,2,10				
			- f			
Benzo(b)fluoranthene	<15 µg/kg	TM218	1790			
			#			
Benzo(k)fluoranthene	<14 µg/kg	TM218	751			
DOTE O(N) THE OTHER THE	-14 pg/ng	TIMETO				
			#			
Benzo(a)pyrene	<15 µg/kg	TM218	1390			
	100.00		#			
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218	722			
madrio( 1,2,0°00)pyrene	то ружу	1101210				
			#			
Dibenzo(a,h)anthracene	<23 µg/kg	TM218	204			
	1000 200		#			
Benzo(g,h,i)perylene	<24 µg/kg	TM218	754			
Donzo(g,n,n)perylene	-24 µg/kg	11912 10				
			#			
Coronene	<200 µg/kg	TM218	<200			
PAH, Total Detected USEPA 16	<118 µg/kg	TM218	15600			
DALL Total Detected LIGERA 40	2040 0	THOLC	45000			
PAH, Total Detected USEPA 16	<318 µg/kg	TM218	15600			
+ Coronene						
	_					
	+					
						1



Validated

SDG: 170923-68 Client Reference: 2921-028 COC3-A Report Number: 426768
Location: Chartered Land - Heuston Order Number: Superseded Report:

# ISO17025 accredited.  M mCERTS accredited.  aq Aqueous / settled sample.  diss.filt Dissolved / filtered sample.  tot.unfilt Total / unfiltered sample.  * Subcontracted test.  * % recovery of the surrogate			
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.  * Subcontracted test.  ** % recovery of the surrogate			
<ul> <li>Subcontracted test.</li> <li>" recovery of the surrogate</li> </ul>		Depth (m)	0.30 - 1.50
10.1000.101) 01.1110.0011.000		Sample Type Date Sampled	Soil/Solid (S) 20/09/2017
check the efficiency of the n	ethod. The	Sampled Time Date Received	23/09/2017
results of individual compou samples aren't corrected for	inds within the recovery	SDG Ref	170923-68
<ul><li>(F) Trigger breach confirmed</li><li>-5&amp;+§@ Sample deviation (see appear</li></ul>	ndix)	Lab Sample No.(s) AGS Reference	16240404
Component	LOD/Units		
GRO Surrogate % recovery**	%	TM089	46
GRO TOT (Moisture Corrected)	<44 µg/kg	TM089	86.7
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089	<5 #
Benzene	<10 µg/kg	TM089	<10
Toluene	<2 µg/kg	TM089	3.25
Ethylbenzene	<3 µg/kg	TM089	<3
Xylene	<6 µg/kg	TM089	<6 *
o-Xylene	<3 µg/kg	TM089	. <3
sum of detected mpo xylene by	<9 µg/kg	TM089	<9
GC sum of detected BTEX by GC	<24 µg/kg	110000000000000000000000000000000000000	<24
Aliphatics >C5-C6	<10 µg/kg		<10
Aliphatics >C6-C8	<10 µg/kg		15.2
Aliphatics >C8-C10	<10 µg/kg	TM089	16.3
Aliphatics >C10-C12	<10 µg/kg	TM089	16.3
Aliphatics >C12-C16	<100 µg/kg	TM173	2940
Aliphatics >C16-C21	<100 µg/kg	TM173	12000
Aliphatics >C21-C35	<100 µg/kg	TM173	196000
Aliphatics >C35-C44	<100 µg/kg	TM173	172000
l Aliphatics >C12-C44	<100 µg/kg	TM173	383000
Aromatics >EC5-EC7	<10 µg/kg	TM089	<10
Aromatics >EC7-EC8	<10 µg/kg	TM089	<10
Aromatics >EC8-EC10	<10 µg/kg		17.3
Aromatics >EC10-EC12	<10 µg/kg		10.8
Aromatics >EC12-EC16	<100 µg/kg		1590
Aromatics >EC16-EC21	<100 µg/kg	111111111111111111111111111111111111111	9700
Aromatics >EC21-EC35	<100 µg/kg		205000
Aromatics >EC35-EC44	<100 µg/kg		232000
Aromatics >EC40-EC44	<100 µg/kg		106000
Total Aromatics >EC12-EC44	<100 µg/kg		448000
Total Aliphatics & Aromatics >C5-C44	<100 µg/kg	TM173	832000



Validated

SDG: 170923-68 Client Reference: 2921-028 COC3-A Report Number: 426768
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-SS2 0.30 - 1.50 SOLID 20/09/2017 00:00:00 27/09/2017 10:04:09 170923-68 16240404 TM048	03/10/17	Eva Guerra	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



Validated

SDG: Location: 170923-68

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-A

Report Number: Superseded Report:

426768

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

CEN ANALYTICAL RESU	II TS					REF · BS	EN 12457/2	
	, 210		0'4-1		Charl			
Client Reference	0.097		Site Location	0 4 4 (0/ )	Chartered Land - Heuston South Q			
Mass Sample taken (kg)			Natural Moistur		8.34			
Mass of dry sample (kg)					92.3			
Particle Size <4mm	>95%							
Case					Land	fill Waste Acce	otance	
SDG	170923-68					Criteria Limits		
Lab Sample Number(s)	16240404							
Sampled Date	20-Sep-2017					Stable		
Customer Sample Ref.	2921-BH2-SS2				Inert Waste	Non-reactive Hazardous Waste	Hazardous	
Depth (m)	0.30 - 1.50			*	Landfill	in Non-	Waste Landfill	
Deptii (iii)	0.00 - 1.00					Hazardous Landfill		
Solid Waste Analysis	Result							
Organic Carbon (%)	1.26				3	- 5	6	
Loss on Ignition (%)	5.18				-		10	
Sum of BTEX (mg/kg)	<0.024				6	-	-	
Sum of 7 PCBs (mg/kg)	<0.021				1		-	
Mineral Oil (mg/kg)	158				500			
PAH Sum of 17 (mg/kg) pH (pH Units)	11.4				1	>6		
ANC to pH 6 (mol/kg)	-				-		-	
ANC to pH 4 (mol/kg)					-	-		
Eluate Analysis	C <sub>2</sub> Conc <sup>n</sup> in 1	LO:1 eluate (mg/l)	A2 10:1 cone	c <sup>n</sup> 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				
Arsenic	0.000766	<0.0005	0.00766	<0.005	0.5	2	25	
Barium	0.025	<0.0002	0.25	<0.002	20	100	300	
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5	
Chromium	0.00677	<0.001	0.0677	<0.01	0.5	10	70	
Copper	0.00615	<0.0003	0.0615	<0.003	2	50	100	
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2	
Molybdenum	0.0023	<0.0005	0.023	<0.005	0.5	10	30	
Nickel	0.00176	<0.0004	0.0176	<0.004	0.4	10	40	
I ead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50	
nony	0.00179	<0.0001	0.0179	<0.001	0.06	0.7	5	
ənium	0.00146	<0.0005	0.0146	<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)	62.1	<2	621	<20	1000	20000	50000	
T. (B) 1 10 E)	2.20		1100	.50	4000	00000	400000	

## **Leach Test Information**

Total Dissolved Solids

Total Monohydric Phenols (W)

Dissolved Organic Carbon

Date Prepared 27-Sep-2017 pH (pH Units) 11.47 Conductivity (µS/cm) 614.00 Temperature (°C) 19.90 Volume Leachant (Litres) 0.892

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

410

<0.016

<3

<5

< 0.016

04/10/2017 12:58:25

800

4100

<0.16

<30

<50

<0.16

<30

4000

500



Validated

SDG: Location: 170923-68

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-A

Report Number: Superseded Report:

426768

# 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		

<sup>&</sup>lt;sup>1</sup> 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:

170923-68 Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-A

Report Number: Superseded Report:

426768

# **Test Completion Dates**

Lab Sample No(s)	16240404
Customer Sample Ref.	2921-BH2-SS2
AGS Ref.	
Depth	0.30 - 1.50
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)	27-Sep-2017
Hexavalent Chromium (s)	29-Sep-2017
on Ignition in soils	04-Oct-2017
ry Dissolved	29-Sep-2017
als by iCap-OES Dissolved (W)	29-Sep-2017
Metals in solid samples by OES	28-Sep-2017
Mineral Oil	29-Sep-2017
PAH by GCMS	29-Sep-2017
PCBs by GCMS	28-Sep-2017
pH	26-Sep-2017
Phenois by HPLC (S)	27-Sep-2017
Phenois by HPLC (W)	29-Sep-2017
Sample description	25-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

#### **CERTIFICATE OF ANALYSIS**



Location:

170923-68

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-A

Report Number: Superseded Report:

426768

# Chromatogram

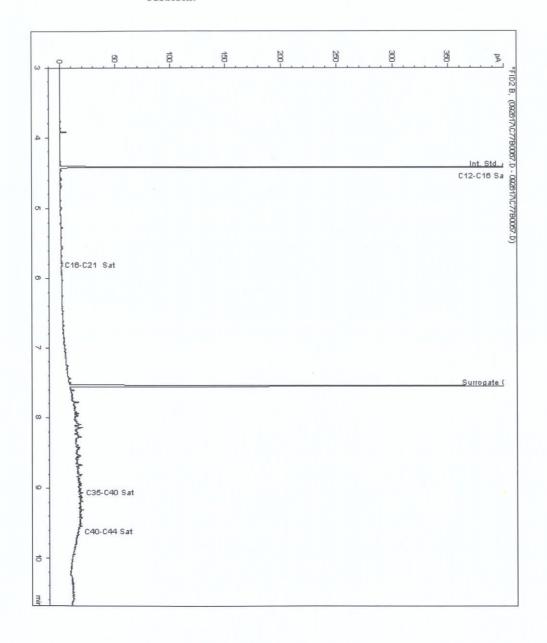
Analysis: EPH CWG (Aliphatic) GC (S)

Sample No : Sample ID:

16247224 2921-BH2-SS2 Depth: 0.30 - 1.50

Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 15211896-Date Acquired : 27/09/2017 19:08:45 PM Units : ppb Dilution:





Validated

SDG: Location: 170923-68

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-A

Report Number: Superseded Report:

426768

Chromatogram

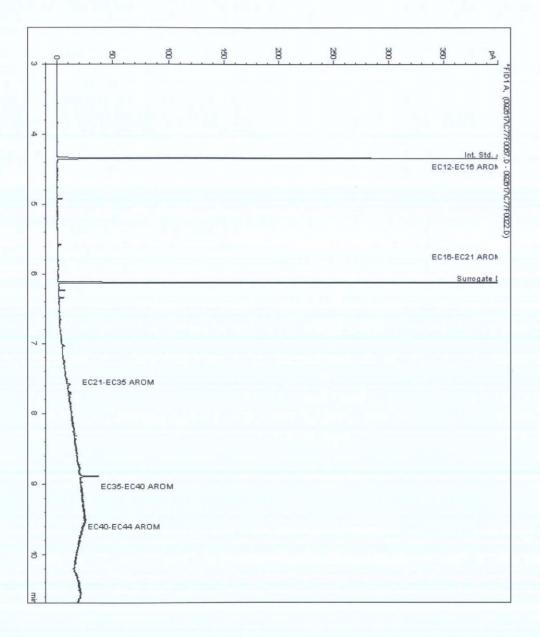
Analysis: EPH CWG (Aromatic) GC (S)

Sample No : Sample ID :

16247224 2921-BH2-SS2 Depth: 0.30 - 1.50

Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 15211897Date Acquired : 27/09/2017 19:08:45 PM
Units : ppb
Dilution:



### **CERTIFICATE OF ANALYSIS**



SDG: Location: 170923-68

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-A

Report Number: Superseded Report:

426768

# Chromatogram

Analysis: Mineral Oil

Sample No: Sample ID :

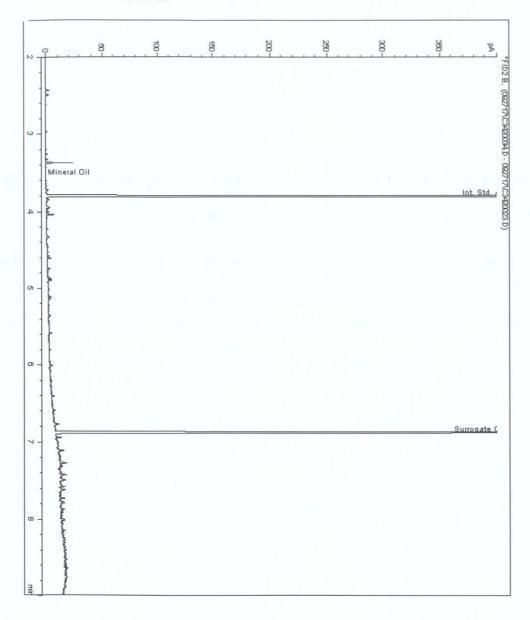
16251605 2921-BH2-SS2 Depth: 0.30 - 1.50

Mineral Oil Range Organics ( C10 - C40 )

15211899-28/09/17 13:37:27 PM mq/kq 0.000

Sample Identity Date Acquired Units Sample Multiplier

Dilution





Validated

SDG: Location:

170923-68 Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-A

Report Number: Superseded Report:

426768

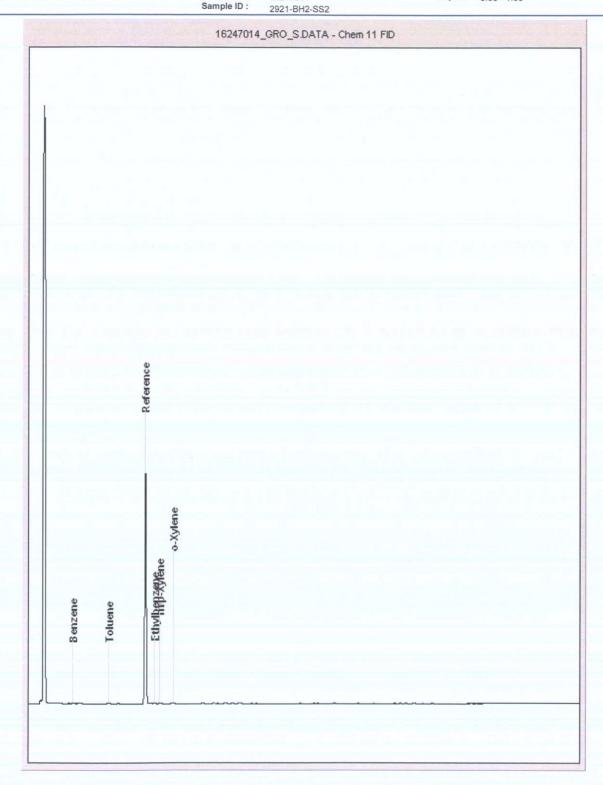
# Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : Sample ID :

16247014

Depth: 0.30 - 1.50





SDG Location:

170923-68 Client Reference: rtered Land - Heuston South Qua Order Number

2921-028 COC3-A

Report Number: Superseded Report: 426768

# Appendix

#### General

- 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
- 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 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.

- 1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except 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
9	Sample holding time exceeded due to sampled on date
ž	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).

Asbestos Type	Common Name
Chrysofile	WhiteAsbests
Amosite	Brown Asbests
Cro d dolite	Blue Asbe stos
Fibrous Act nolite	8
Fibro us Anthop hyll ite	-
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 th 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:

D MINEREX DUB 170923-73 2921-028 COC3-B

04 October 2017

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







SDG: Location:

170923-73

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-B

Report Number: Superseded Report:

426770

# **Received Sample Overview**

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16240556	2921-BH2-Comp-SS6		0.30 - 2.00	20/09/2017

Maximum Sample/Coolbox Temperature (°C):

16.0

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.



Validated

SDG: 170923-73 Client Reference: 2921-028 COC3-B Report Number: 426770
Location: Chartered Land - Heuston Order Number: Superseded Report:

Results Legend		19. 900			ē	
X Test	Lab San					
No Determination Possible						
					2921-BHZ-Comp-55	
		tomer			9 8HZ-0	
	Sample	Reference			Con	
0 1 7					o-du	
Sample Types - S - Soil/Solid			-		U	
UNS - Unspecified Solid						
GW - Ground Water SW - Surface Water	AGS R	eference				
LE - Land Leachate						
PL - Prepared Leachate PR - Process Water					C	
SA - Saline Water	Den	th (m)			0.30 - 2.00	
TE - Trade Effluent TS - Treated Sewage	БСР	()			2.00	
US - Untreated Sewage						
Recreational Water     Drinking Water Non-regulatory			250g (A	(A)	(A) (B)	
JINL - Unspecified Liquid	Con	tainer	250g Amber Jar (ALE210)	400g Tub (ALE214)	(ALE215)	
SL - Sludge G - Gas			o) O)	4 5	5)	
OTH - Other	Samp	le Type	S	S	U	
Anions by Kone (w)	All	NDPs: 0				
		Tests: 1		Х		
Asbestos ID in Solid Samples	All	NDPs: 0		- 202		
		Tests: 1		Х		
Boron Water Soluble	All	NDPs: 0		^		
Doron Mater Goldbio	7.11	Tests: 1				
05115			Х			
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		Х		
olved Organic/Inorganic	All	NDPs: 0		^		
.rbon	Δ"	Tests: 1				
				Х		
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0				
		Tests: 1	Х			
EPH CWG (Aromatic) GC (S)	All	NDPs: 0				
CONTROL AND CONTRO		Tests: 1	V			
			X			
Fluoride	All	NDPs: 0 Tests: 1				
		100.0.		Х		
GRO by GC-FID (S)	All	NDPs: 0				
		Tests: 1			Х	
Hexavalent Chromium (s)	All	NDPs: 0				
	7	Tests: 1				
			X			
Loss on Ignition in soils	All	NDPs: 0 Tests: 1				
		10515. 1	X			
Mercury Dissolved	All	NDPs: 0				
		Tests: 1		Х		
als by iCap-OES Dissolved (W)	All	NDPs: 0				
als by IOap-OES Dissolved (VV)	731	Tests: 1				
				Х		

426770

## **CERTIFICATE OF ANALYSIS**



SDG: 170923-73 Client Reference: 2921-028 COC3-B Report Number: Superseded Report:

(ALS) Location:	Char	tered Land - Heusto	Orae	er Nu	mber	
Results Legend					16240556	
X Test  No Determination	Lab Sa	Customer Sample Reference				
Possible  Sample Types -	1					
S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate	AGS	Reference		===11	2921-BH2-Comp-SS 6	
PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage	De	pth (m)				
US - Untreated Sewage 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	Sample Type			S	
Metals in solid samples by OES	All	NDPs: 0 Tests: 1	Х			
Mineral Oil	All	NDPs: 0 Tests: 1	X			
PAH by GCMS	All	NDPs: 0 Tests: 1	Х			
PCBs by GCMS	All	NDPs: 0 Tests: 1	X			
рН	All	NDPs: 0 Tests: 1	Х			
Phenois by HPLC (S)	All	NDPs: 0 Tests: 1	Х			
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	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	Х			



Validated

SDG:

SDG: 170923-73 Location: Chartered I

170923-73 Client Reference: Chartered Land - Heuston Order Number: 2921-028 COC3-B

Report Number: Superseded Report: 426770

# **Sample Descriptions**

#### **Grain Sizes**

very fine <0.0	63mm fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 1	.0mm very coa	arse >1
Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Col	our Descri	ption	Inclusions	Inclusions 2	1
16240556	2921-BH2-Comp-SS6	0.30 - 2.00	Gr	ey Stone	Soil	Stones	None	1

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 occurring 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: 170923-73

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-B

Report Number: Superseded Report:

426770

Results Legend		ustomer Sample Ref.	2021 BU2 C C	
# ISO17025 accredited.		ustomer sample Kel.	2921-BH2-Comp-S S6	
M mCERTS accredited.				
aq Aqueous / settled sample.  diss.filt Dissolved / filtered sample.		Depth (m)	0.30 - 2.00	
ot.unfilt Total / unfiltered sample.		Sample Type	Soil/Solid (S)	
<ul> <li>Subcontracted test.</li> </ul>		Date Sampled	20/09/2017	
" % recovery of the surrogate stand	ard to	Sampled Time		
check the efficiency of the method results of individual compounds v	i. The	Date Received	23/09/2017	
samples aren't corrected for the re		SDG Ref	170923-73	
(F) Trigger breach confirmed		Lab Sample No.(s)	16240556	
-5&+§@ Sample deviation (see appendix)		AGS Reference		
Component	LOD/Units	Method		
	%	DMODA	7.7	
Moisture Content Ratio (% of as	70	PM024	1.1	
received sample)				
Loss on ignition	<0.7 %	TM018	2.27	
Loss on ignition	-0.1 70	TIVIOTO		
Mineral oil >C10-C40	<1 mg/kg	TM061	66.5	
		,		
Mineral Oil Surrogate %	%	TM061	84.8	
recovery**				
Phenol	< 0.01	TM062 (S)	< 0.01	
	mg/kg		#	
Organic Carbon, Total	<0.2 %	TM132	0.386	
2			+	
	7272277			
Sulphur, Total	<0.02 %	TM132	0.124	
	.0.00.11	W11107	2.070	
Sulphate, Total potential	<0.06 %	TM132	0.372	
11	4 -1111-0	TALLOC	44.5	
H	1 pH Units	TM133	11.5	
			#	
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	
Zinomium, mozavaiciit	-U.U HIG/NG	INITOT		
			7	
Cyanide, Total	<1 mg/kg	TM153	<1	
yanide, rotai	- i ilig/kg	1101155		
			7	
Cyanide, Free	<1 mg/kg	TM153	<1	
yanida, i rac	Tinging	1101100		
			#	
PCB congener 28	<3 µg/kg	TM168	<3	
	- 1-3.13			
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	
			1	
OCB153	-2	T14400		
PCB congener 153	<3 µg/kg	TM168	<3	
CB congener 180	-2 110/20	TM4CO	<3	
ob congener 100	<3 µg/kg	TM168		
			#	
Sum of detected PCB 7	<21 µg/kg	TM168	<21	
	-z i pg/kg	1111100	-41	
Congeners				
Antimony	<0.6 mg/kg	TM181	< 0.6	
rsenic	<0.6 mg/kg	TM181	4.98	
		100,000,000		
		-		_
Barium	<0.6 mg/kg	TM181	38.8	
N. d1	-0.00	721101		
Cadmium	<0.02	TM181	0.552	
	mg/kg			
hromium		T34404		
Chromium	<0.9 mg/kg	TM181	6.26	
Copper	<1.4 mg/kg	TM181	9.2	
oppor	~1.4 mg/kg	10101		
on	<1000	TM181	5970	
OII.		10101		
	mg/kg			
ead	<0.7 mg/kg	TM181	15	
	J. mg/kg	1,11101		
			-	
Manganese	< 0.13	TM181	482	
3		1.11.101		
	mg/kg			
Mercury	< 0.14	TM181	0.451	
	mg/kg			
		Thanh	0.811	
folybdenum	<0.1 mg/ka	1M181	0.011	
folybdenum	<0.1 mg/kg	TM181		
Molybdenum	<0.1 mg/kg <0.2 mg/kg	TM181		

## CERTIFICATE OF ANALYSIS



SDG: 170923-73 Client Reference: 2921-028 COC3-B Report Number: 426770
Location: Chartered Land - Heuston Order Number: Superseded Report:

W 28	Results Legend		Customer Sample Ref.	2921-BH2-Comp-S			
# M	ISO17025 accredited. mCERTS accredited.			S6			
aq	Aqueous / settled sample.		Depth (m)	0.30 - 2.00			
	Dissolved / filtered sample. Total / unfiltered sample.		Sample Type	Soil/Solid (S)			
	Subcontracted test.		Date Sampled	20/09/2017			
	% recovery of the surrogate standa check the efficiency of the method		Sampled Time	22/20/2047			
	results of individual compounds w	rithin	Date Received SDG Ref	23/09/2017 170923-73			
	samples aren't corrected for the re Trigger breach confirmed	covery	Lab Sample No.(s)	16240556			
	Sample deviation (see appendix)		AGS Reference				
Compo	nent	LOD/Uni	its Method				
Seleniur	n	<1 mg/k	g TM181	<1			
Zinc		<1.9 mg/	/kg TM181	43.7			
				#			
Sulphate	e, Total	<48 mg/	kg TM221	1130			
Sulphide	e, Oxidisable	<0.03 %	% TM221	0.259			
Boron, w	vater soluble	<1 mg/k	g TM222	<1			
				#			
_							
*							
_							

# CERTIFICATE OF ANALYSIS



SDG: 170923-73 Client Reference: 2921-028 COC3-B Report Number: 426770
Location: Chartered Land - Heuston Order Number: Superseded Report:

PAH by GCMS Results Legend		Customer Sample Ref.	2921-BH2-Comp-S				
# ISO17025 accredited. M mCERTS accredited.			S6				
aq Aqueous / settled sample.		Don'th (m)					
fiss.filt Dissolved / filtered sample.		Depth (m) Sample Type	0.30 - 2.00				
ot.unfilt Total / unfiltered sample.		Date Sampled	Soil/Solid (S) 20/09/2017				
<ul> <li>Subcontracted test.</li> <li>% recovery of the surrogate stan</li> </ul>	dard to	Sampled Time	20/09/2017				
check the efficiency of the metho		Date Received	23/09/2017				
results of individual compounds	within	SDG Ref	170923-73				
samples aren't corrected for the	recovery	Lab Sample No.(s)	16240556				
(F) Trigger breach confirmed I-5&+§@ Sample deviation (see appendix)		AGS Reference	100 0000				
		THE RESERVE THE PERSON NAMED IN COLUMN 2 IS NOT THE OWNER.					
Component	LOD/Units	Method					
Naphthalene-d8 % recovery**	%	TM218	99.2				
	-						
Acenaphthene-d10 %	%	TM218	97.1				
recovery**							
Phenanthrene-d10 % recovery**	%	TM218	89.6				
Frienditilierie-u to % recovery	70	1191210	03.0				
Chrysene-d12 % recovery**	%	TM218	95.9				
	-		400				
Perylene-d12 % recovery**	%	TM218	103				
Naphthalene	<9 µg/kg	TM218	<9				
Top-Initiativity	- hand	11112.10					
	_		#				
Acenaphthylene	<12 µg/kg	TM218	<12				
			#				
A	-0 "	73.10.40			1		
Acenaphthene	<8 µg/kg	TM218	18.1				
			#				
Fluorene	<10 µg/kg	TM218	<10				
i morono	- TO pg/k	11112.10					
			#				
Phenanthrene	<15 µg/kg	g TM218	187				
			#				
A - II	40	T14040					
Anthracene	<16 µg/k	g TM218	58.4				
			#				
Fluoranthene	<17 µg/k	g TM218	367				
			#				
	_						
Pyrene	<15 µg/k	g TM218	368				
			#				
Benz(a)anthracene	<14 µg/k	g TM218	295				
Denz(a)antinacene	14 pg/k	9 1111210					
			#				
Chrysene	<10 µg/k	g TM218	241				
			#				
Danna (h.) Rosanathana	44E	g TM218	479				
Benzo(b)fluoranthene	<15 µg/k	g 1W210					
			#				
Benzo(k)fluoranthene	<14 µg/k	g TM218	166				
		3					
			#				
Benzo(a)pyrene	<15 µg/k	g TM218	332				
			#				
Indone(1.0.3 ad)nurana	-10 all	TM240	147				
Indeno(1,2,3-cd)pyrene	<18 µg/k	g TM218					
			#				
Dibenzo(a,h)anthracene	<23 µg/k	g TM218	43.1				
	- 10	v	#				
2 ( ) 2 (	.01	T11010					
Benzo(g,h,i)perylene	<24 µg/k	g TM218	217				
			#				
Coronene	<200 µg/l	kg TM218	<200				
	Loo pgr						
	-						
PAH, Total Detected USEPA 16	<118 µg/l	kg TM218	2920				
PAH, Total Detected USEPA 16	<318 µg/l	kg TM218	2920				
+ Coronene	υ.υ μg//	9 1111610	2020				
· Colonene	_						
	_						
	_	_					
	_					-	

## **CERTIFICATE OF ANALYSIS**



SDG: Location:

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

2921-028 COC3-B

Report Number: Superseded Report:

426770

PH CWG (S) Results Legend	Cu	ustomer Sample Ref.	2921-BH2-Comp-S				
# ISO17025 accredited.			S6				
M mCERTS accredited. ag Aqueous / settled sample.							
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.30 - 2.00				
ot.unfilt Total / unfiltered sample.		Sample Type	Soil/Solid (S)				
* Subcontracted test.		Date Sampled	20/09/2017				
** % recovery of the surrogate stand	lard to	Sampled Time	2010012011				
check the efficiency of the method	d. The	Date Received	23/09/2017				
results of individual compounds v	vithin	SDG Ref	170923-73				
samples aren't corrected for the re	ecovery		16240556				
(F) Trigger breach confirmed		Lab Sample No.(s)	10240000				
1-5&+§@ Sample deviation (see appendix)		AGS Reference					
Component	LOD/Units	Method					
GRO Surrogate % recovery**	%	TM089	51				
onto carrogato reserve,							
GRO TOT (Moisture Corrected)	<44 µg/kg	TM089	103				
one for (modulate contestes)			#		_		
		T14000				-	
Methyl tertiary butyl ether	<5 µg/kg	TM089	<5				
(MTBE)			#				
Benzene	<10 µg/kg	TM089	<10				
			#				
22 1 W/ 65:22 1							
Toluene	<2 µg/kg	TM089	3.25				
			#				
Ethylhonzono	20	TRACOC					
Ethylbenzene	<3 µg/kg	TM089	<3				
			#				
Yulong	es notice	TMORO	<6				
Xylene	<6 µg/kg	TM089					
			#				
o Yylene	<3 µg/kg	TM089	<3				
o-Xylene	>> µg/kg	LINIOOS					
			#				
sum of detected mpo xylene by	<9 µg/kg	TM089	<9				
	-a µg/kg	TIVIOUS	-5				
GC							
sum of detected BTEX by GC	<24 µg/kg	TM089	<24				
or actioned by Entry Co	T. Faula		Robati				
Aliphatics >C5-C6	<10 µg/kg	TM089	<10				
Aliphatics >C6-C8	<10 µg/kg	TM089	17.3				
	F53						
			A-16				
Aliphatics >C8-C10	<10 µg/kg	TM089	18.4				
value en la	100	14,000 mil (800)					
	_						
Aliphatics >C10-C12	<10 µg/kg	TM089	21.7				
	1000000						
			2722				
Aliphatics >C12-C16	<100 µg/kg	TM173	3160				
Aliabetias > C4C C24	<400 //wa	TM173	6860				
Aliphatics >C16-C21	<100 µg/kg	11/11/3	0000				
Aliphatics >C21-C35	<100 µg/kg	TM173	66200				
Aliphados - 021-000	Too pg/kg	11111111	00200				
Aliphatics >C35-C44	<100 µg/kg	TM173	82200				
inproduce of the	roo pging	1,11,11,0					
! Aliphatics >C12-C44	<100 µg/kg	TM173	158000				
Type Control of the C							
		-	1.100				
Aromatics >EC5-EC7	<10 µg/kg	TM089	<10		-		
Assessment NEOT FOR	240	TA4000	<10				
Aromatics >EC7-EC8	<10 µg/kg	TM089	~10				
Aromatics >EC8-EC10	<10 µg/kg	TM089	18.4				
Allomatics > EGG-EGTU	- 10 Hg/kg	1141003	15.7				
Aromatics >EC10-EC12	<10 µg/kg	TM089	15.2				
and the second s	- Pama						
			100000				
Aromatics >EC12-EC16	<100 µg/kg	TM173	941				
en e		Wildle Work	10000				
Aromatics >EC16-EC21	<100 µg/kg	TM173	5850				
	/** "	711175	70000				
Aromatics >EC21-EC35	<100 µg/kg	TM173	73300				
A	-400 . #	T14470	105000				
Aromatics >EC35-EC44	<100 µg/kg	TM173	125000				
Aromatics >EC40 EC44	<100	TM472	62600				
Aromatics >EC40-EC44	<100 µg/kg	TM173	02000				
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	205000				
Total Atomatics >EC12-EC44	~ 100 µg/kg	TIVITIO	200000				
Total Aliphatics & Aromatics	<100 µg/kg	TM173	363000				
	- 100 pg/kg		30000				
>C5-C44							
	-			-			



Validated

SDG: Location: 170923-73

Client Reference: Chartered Land - Heuston Order Number:

2921-028 COC3-B

Report Number: Superseded Report:

426770

# **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-Comp-SS 6 0.30 - 2.00 SOLID 20(09/2017 00:00:00 26/09/2017 13:21:29 170923-73 16240556 TM048	03/10/17	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected