

CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING



Soil Sampling Analysis Results





Fehily Timoney 3rd Floor North Park Offices North Park Business Park North Road Dublin Dublin 11

Attention: Daniel Hayden

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: 12 August 2018 D_FTIM_DUB 180804-62 P1444 Cartron Big 468044

We received 1 sample on Saturday August 04, 2018 and 1 of these samples were scheduled for analysis which was completed on Sunday August 12, 2018. 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 Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Approved By:

<u>Sonia McWhan</u> Operations Manager



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

P1444

468044

Report Number: Superseded Report:

180804-62

Client Reference: Order Number:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18060638	TP11		0.90 - 0.90	03/08/2018

Maximum Sample/Coolbox Temperature (°C) : ISO5667-3 Water quality - Sampling - Part3 -

13.6 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.

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

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



Cartron Big

		C	ERT	IFIC	ATE (OF ANALYSI	IS			
SDG:	180804-62 Cartron Big				erence:	P1444		Report Number: Superseded Report:	468044	
(ALS) Location:	Cartron Big		Ora	er Nur	nber:			Superseded Report.		
Results Legend X Test N No Determination Possible	Lab Sample N	No(s)			18060638					
	Custome Sample Refer				TP11					
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate	AGS Refere	nce								
PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage	Depth (m)			0.90 - 0.90					
RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Containe	r	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)					
	Sample Ty	ре	S		s S					
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1		x						
Anions by Kone (w)	All	NDPs: 0 Tests: 1	x							
CEN Readings	All	NDPs: 0 Tests: 1	x							
Coronene	All	NDPs: 0 Tests: 1		x						
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	x							
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	x							
Loss on Ignition in soils	All	NDPs: 0 Tests: 1	x							
Mercury Dissolved	All	NDPs: 0 Tests: 1 NDPs: 0		x						
Mineral Oil	All	NDPs: 0 Tests: 1 NDPs: 0	x							
PAH 16 & 17 Calc	All	Tests: 1		x						
PAH by GCMS	All	Tests: 1 NDPs: 0		x						
PCBs by GCMS	All	Tests: 1 NDPs: 0		x						
рН	All	Tests: 1 NDPs: 0		x						
Phenols by HPLC (W)	All	Tests: 1 NDPs: 0		x						
		Tests: 1	x							

SDG: Location:	180804-62 Cartron Big			nt Ref er Nu	erence nber:	P1444	Report Number: Superseded Report:	468
Results Legend X Test N O Determination Possible	Lab Sample	No(s)			18060638			
Sample Types -	Custome Sample Refe				TP11			
S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate	AGS Refere	nce						
PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage	Depth (m	1)			0.90 - 0.90			
BE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Containe	r	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)			
	Sample Ty	ре	S	S	S			
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				
VOC MS (S)	All	NDPs: 0 Tests: 1			x			



180804-62

Cartron Big

CERTIFICATE OF ANALYSIS

Validated

>10mm

468044

P1444 Client Reference:

Report Number: Superseded Report:

Sample Descriptions

Grain Sizes very fine <0.063mm fine 0.063mm - 0.1mm medium 2mm - 10mm very coarse 0.1mm - 2mm coarse Lab Sample No(c) Customer Sample Pet Donth (m) The alternation of D - ... - - -

Eab Sample No(3)	customer Sample Ken	Deptil (III)	Colour	Description	Inclusions	Inclusions 2
18060638	TP11	0.90 - 0.90	Dark Brown	Silt Loam	Stones	Vegetation

Order Number:

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.

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



SDG: Location:		80804-62 Cartron Big		Client Reference: Order Number:	P1444	Report Number Superseded Report	
		.9				· · · ·	
Results Legend # ISO17025 accredited.	Cu	stomer Sample Ref.	TP11				
M mCERTS accredited.							
diss.filt Dissolved / filtered sample.		Depth (m)	0.90 - 0.90				
tot.unfilt Total / unfiltered sample. * Subcontracted test.		Sample Type Date Sampled	Soil/Solid (S) 03/08/2018				
** % recovery of the surrogate stands check the efficiency of the method		Sample Time					
results of individual compounds w	ithin	Date Received SDG Ref	04/08/2018 180804-62				
samples aren't corrected for the re (F) Trigger breach confirmed	covery	Lab Sample No.(s)	18060638				
1-5&+§@ Sample deviation (see appendix)		AGS Reference					
Component	LOD/Units	Method	40				
Moisture Content Ratio (% of as received sample)	%	PM024	18				
Loss on ignition	<0.7 %	TM018	3.58				
				м			
Mineral oil >C10-C40	<1 mg/kg	TM061	50.3				
Mineral Oil Surrogate %	%	TM061	75.1				
recovery**							
Organic Carbon, Total	<0.2 %	TM132	0.948				
nH	1 pH Units	TM133	7.86	M			
рН	i pri Units	111133	00.1	м			
PCB congener 28	<3 µg/kg	TM168	<3	141			
	o have	INTOO	-0	м			
PCB congener 52	<3 µg/kg	TM168	<3				
	~ ~3'''S		Ŭ	м			
PCB congener 101	<3 µg/kg	TM168	<3				
				м			
PCB congener 118	<3 µg/kg	TM168	<3				
				м			
PCB congener 138	<3 µg/kg	TM168	<3				
				М			
PCB congener 153	<3 µg/kg	TM168	<3				
				М			
PCB congener 180	<3 µg/kg	TM168	<3				
				М			
Sum of detected PCB 7	<21 µg/kg	TM168	<21				
Congeners							
ANC @ pH 4	< 0.03	TM182	0.555				
	mol/kg	T1400	0.0704				
ANC @ pH 6	<0.03 mol/kg	TM182	0.0721				
PAH Total 17 (inc Coronene)	<10 mg/kg	TM410	<10				
Moisture Corrected	< to thig/kg	1101410	<10				
Coronene	<200 µg/kg	TM410	<200				
Outonene	~200 µg/kg	1101410	~200				
		I T					
		├ ──┤					
		├					

	SDG:		180804-62		t Reference: P1		Report Numb	er: 468044	
	LS Location:	(Cartron Big		r Number:	····	Superseded Re	port: 400044	
PAH h	by GCMS								
	Results Legend	Ci	ustomer Sample Ref.	TP11					
tot.unfilt * **	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Subcontracted test. % recovery of the surrogate stand: check the efficiency of the method results of individual compounds w samples aren't corrected for the re Trigger breach confirmed Sample deviation (see appendix)	. The rithin	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference Method	0.90 - 0.90 Soil/Solid (S) 03/08/2018 04/08/2018 180604-62 18060638					
WAC	ment	mg/kg	TM218	10					
-		3.3							
					I				

SDG: Location:	1 (80804-62 Cartron Big		Reference: P1444 Number:	rt Number: 46804 seded Report:	4
		Juli on Big	Order		 	
OC MS (S) Results Legend	Cu	stomer Sample Ref.	TP11			
# 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 stand	ard to	Depth (m) Sample Type Date Sampled Sample Time	0.90 - 0.90 Soil/Solid (S) 03/08/2018			
check the efficiency of the method results of individual compounds v	vithin	Date Received	04/08/2018 180804-62			
samples aren't corrected for the re (F) Trigger breach confirmed	ecovery	SDG Ref Lab Sample No.(s)	18060638			
1-5&+§@ Sample deviation (see appendix)		AGS Reference				
Component Dibromofluoromethane**	LOD/Units %	Method TM116	102			
Toluene-d8**	%	TM116	92		 	
4-Bromofluorobenzene**	%	TM116	79.5		 	
Methyl Tertiary Butyl Ether	⁷⁶ <10 μg/kg	TM116	<10		 	
			М		 	
Benzene	<9 µg/kg	TM116	<9 M			
Toluene	<7 µg/kg	TM116	<7 M		 	
Ethylbenzene	<4 µg/kg	TM116	<4 M		 	
p/m-Xylene	<10 µg/kg	TM116	<10 #			
o-Xylene	<10 µg/kg	TM116	<10 M		 	
					 	1

SDG:	180804-62	Client Refer			port Number:	468044	
(ALS) Location:	Cartron Big	Order Numb			perseded Report:		
		IU.I SINGLE					
NAC ANALYTICAL RES	ULTS					REF : BS	EN 12457
Client Reference			Site Location		Cartro	on Big	
Mass Sample taken (kg)	0.110		Natural Moistur	. ,	22		
Mass of dry sample (kg)	0.090		Dry Matter Con	tent (%)	82		
Particle Size <4mm	>95%						
Case					Landf	ill Waste Acce	
SDG	180804-62			_		Criteria Limits	i
_ab Sample Number(s)	18060638						
Sampled Date	03-Aug-2018					Stable Non-reactive	
Customer Sample Ref.	TP11				Inert Waste	Hazardous Waste	Hazardous
Depth (m)	0.90 - 0.90				Landfill	in Non- Hazardous	Waste Landfil
Solid Waste Analysis	Result					Landfill	
otal Organic Carbon (%)	0.948				3	5	6
oss on Ignition (%)	3.58				-	-	10
Sum of BTEX (mg/kg)	- <0.021				-	-	-
Sum of 7 PCBs (mg/kg) /lineral Oil (mg/kg)	<0.021 50.3				1 500	-	-
AH Sum of 17 (mg/kg)	<10				100	-	-
H (pH Units)	7.86				-	>6	-
NC to pH 6 (mol/kg)	0.0721				-	-	-
ANC to pH 4 (mol/kg)	0.555		1		-		
Eluate Analysis		.0:1 eluate (mg/l)	712	r ⁿ leached (mg/kg)		es for compliance lea 3S EN 12457-3 at L/S	
Arsenic	0.00214	Limit of Detection <0.0005	Result 0.0214	Limit of Detection <0.005	0.5	2	25
Barium	0.0655	<0.0003	0.655	<0.003	20	100	300
Cadmium	<0.00008	<0.0002	< 0.0008	<0.002	0.04	1	5
Chromium	<0.001	<0.001	< 0.01	<0.01	0.5	10	70
Copper	0.0034	<0.0003	0.034	<0.003	2	50	100
Aercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.0106	<0.003	0.106	<0.03	0.5	10	30
Nickel	0.00177	<0.0004	0.0177	<0.004	0.4	10	40
ead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	0.00258	10.001	0.0050			0.7	5
		<0.001	0.0258	<0.01	0.06	0.7	
Selenium	<0.001	<0.001	<0.0258	<0.01 <0.01	0.06 0.1	0.7	7
linc	<0.001 <0.001 <2	<0.001	<0.01	<0.01	0.1	0.5	7
Selenium Zinc Chloride Fluoride	<0.001 <0.001 <2 <0.5	<0.001 <0.001 <2 <0.5	<0.01 <0.01 <20 <5	<0.01 <0.01 <20 <5	0.1 4 800 10	0.5 50 15000 150	7 200 25000 500
tinc Chloride Iluoride Sulphate (soluble)	<0.001 <0.001 <2 <0.5 7.6	<0.001 <0.001 <2 <0.5 <2	<0.01 <0.01 <20 <5 76	<0.01 <0.01 <20 <5 <20	0.1 4 800 10 1000	0.5 50 15000 150 20000	7 200 25000 500 50000
tinc Chloride Fluoride Sulphate (soluble) Fotal Dissolved Solids	<0.001 <0.001 <2 <0.5 7.6 172	<0.001 <0.001 <2 <0.5 <2 <2 <5	<0.01 <0.01 <20 <5 76 1720	<0.01 <0.01 <20 <5 <20 <5 <20 <50	0.1 4 800 10 1000 4000	0.5 50 15000 150	7 200 25000 500
inc Chloride Sulphate (soluble) Total Dissolved Solids Total Monohydric Phenols (W)	<0.001 <0.001 <2 <0.5 7.6 172 <0.016	<0.001 <0.001 <2 <0.5 <2 <5 <0.016	<0.01 <0.01 <20 <5 76 1720 <0.16	<0.01 <0.01 <20 <5 <20 <50 <50 <0.16	0.1 4 800 10 1000 4000 1	0.5 50 15000 150 20000 60000 -	7 200 25000 500 50000 100000 -
Zinc Chloride Fluoride Sulphate (soluble) Total Dissolved Solids Total Monohydric Phenols (W)	<0.001 <0.001 <2 <0.5 7.6 172	<0.001 <0.001 <2 <0.5 <2 <2 <5	<0.01 <0.01 <20 <5 76 1720	<0.01 <0.01 <20 <5 <20 <5 <20 <50	0.1 4 800 10 1000 4000	0.5 50 15000 150 20000	7 200 25000 500 50000
tinc Chloride Sulphate (soluble) Total Dissolved Solids Total Monohydric Phenols (W) Dissolved Organic Carbon	<0.001 <0.001 <2 <0.5 7.6 172 <0.016 5.87	<0.001 <0.001 <2 <0.5 <2 <5 <0.016	<0.01 <0.01 <20 <5 76 1720 <0.16	<0.01 <0.01 <20 <5 <20 <50 <50 <0.16	0.1 4 800 10 1000 4000 1	0.5 50 15000 150 20000 60000 -	7 200 25000 500 50000 100000 -
Zinc Chloride Fluoride Sulphate (soluble) Fotal Dissolved Solids Fotal Monohydric Phenols (W) Dissolved Organic Carbon	<pre><0.001 <0.001 <2 <0.5 7.6 172 <0.016 5.87 </pre>	<0.001 <0.001 <2 <0.5 <2 <5 <0.016	<0.01 <0.01 <20 <5 76 1720 <0.16	<0.01 <0.01 <20 <5 <20 <50 <50 <0.16	0.1 4 800 10 1000 4000 1	0.5 50 15000 150 20000 60000 -	7 200 25000 500 50000 100000 -
Zinc Chloride Fluoride Sulphate (soluble) Total Dissolved Solids Total Monohydric Phenols (W) Dissolved Organic Carbon	 <0.001 <0.001 <2 <0.5 7.6 172 <0.016 5.87 	<0.001 <0.001 <2 <0.5 <2 <5 <0.016	<0.01 <0.01 <20 <5 76 1720 <0.16	<0.01 <0.01 <20 <5 <20 <50 <50 <0.16	0.1 4 800 10 1000 4000 1	0.5 50 15000 150 20000 60000 -	7 200 25000 500 50000 100000 -
Zinc Chloride Fluoride Sulphate (soluble) Total Dissolved Solids Total Monohydric Phenols (W) Dissolved Organic Carbon Dissolved Organic Carbon Dissolved H (pH Units)	<pre><0.001 <0.001 <2 <0.5 7.6 172 <0.016 5.87 </pre>	<0.001 <0.001 <2 <0.5 <2 <5 <0.016	<0.01 <0.01 <20 <5 76 1720 <0.16	<0.01 <0.01 <20 <5 <20 <50 <50 <0.16	0.1 4 800 10 1000 4000 1	0.5 50 15000 150 20000 60000 -	7 200 25000 500 50000 100000 -

Validated

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

12/08/2018 16:16:34



P1444

468044



SDG:

180804-62 Cartron Big

Client Reference: Order Number:

Report Number: Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
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
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
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
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
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
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
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	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS

NA = not applicable.

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

P1444

Report Number: Superseded Report:

468044

Validated



Anions by Kone (w) 09-Aug-2018 CEN 10:1 Leachate (1 Stage) 07-Aug-2018 CEN Readings 08-Aug-2018 Coronene 09-Aug-2018 Dissolved Metals by ICP-MS 10-Aug-2018 Dissolved Organic/Inorganic Carbon 10-Aug-2018 Fluoride 10-Aug-2018 Loss on Ignition in soils 10-Aug-2018 Mineral Oil 10-Aug-2018 PAH 16 & 17 Calc 09-Aug-2018 PAH by GCMS 09-Aug-2018 pH 07-Aug-2018 Sample description 06-Aug-2018 PAL 16 & 17 Calc 09-Aug-2018 PAH by GCMS 09-Aug-2018 pH 07-Aug-2018 pLanols by HPLC (W) 10-Aug-2018 Sample description 06-Aug-2018 Total Dis	Lab Sample No(s)	18060638
Depth Type 0.90 - 0.90 Soil/Solid (S) ANC at pH4 and ANC at pH 6 08-Aug-2018 Anions by Kone (w) 09-Aug-2018 CEN 10:1 Leachate (1 Stage) 07-Aug-2018 CEN Readings 08-Aug-2018 Coronene 09-Aug-2018 Dissolved Metals by ICP-MS 10-Aug-2018 Dissolved Organic/Inorganic Carbon 10-Aug-2018 Fluoride 10-Aug-2018 Mineral Oil 10-Aug-2018 PAH by GCMS 09-Aug-2018 PAH by GCMS 09-Aug-2018 PhH by GCMS 09-Aug-2018 Phenols by HPLC (W) 10-Aug-2018 Sample description 06-Aug-2018 Total Dissolved Solids 09-Aug-2018	Customer Sample Ref.	TP11
Type Soil/Solid (S) ANC at pH4 and ANC at pH 6 08-Aug-2018 Anions by Kone (w) 09-Aug-2018 CEN 10:1 Leachate (1 Stage) 07-Aug-2018 CEN Readings 08-Aug-2018 Coronene 09-Aug-2018 Dissolved Metals by ICP-MS 10-Aug-2018 Dissolved Organic/Inorganic Carbon 10-Aug-2018 Fluoride 10-Aug-2018 Mercury Dissolved 10-Aug-2018 PAH 16 & 17 Calc 09-Aug-2018 PAH by GCMS 09-Aug-2018 Phenols by HPLC (W) 09-Aug-2018 Sample description 06-Aug-2018 Sample description 06-Aug-2018 Total Dissolved Solids 09-Aug-2018	AGS Ref.	
ANC at pH4 and ANC at pH 6 08-Aug-2018 Anions by Kone (w) 09-Aug-2018 CEN 10:1 Leachate (1 Stage) 07-Aug-2018 CEN 10:1 Leachate (1 Stage) 07-Aug-2018 Cen Readings 08-Aug-2018 Dissolved Metals by ICP-MS 10-Aug-2018 Dissolved Organic/Inorganic Carbon 10-Aug-2018 Fluoride 10-Aug-2018 Mineral Oil 10-Aug-2018 PAH 16 & 17 Calc 09-Aug-2018 PAH by GCMS 09-Aug-2018 pH 07-Aug-2018 pH 07-Aug-2018 Sample description 09-Aug-2018 pAt 16 & 17 Calc 09-Aug-2018 pAt by GCMS 09-Aug-2018 pH 07-Aug-2018 pLensols by HPLC (W) 10-Aug-2018 Sample description 06-Aug-2018	Depth	0.90 - 0.90
Anions by Kone (w) 09-Aug-2018 CEN 10:1 Leachate (1 Stage) 07-Aug-2018 CEN Readings 08-Aug-2018 Coronene 09-Aug-2018 Dissolved Metals by ICP-MS 10-Aug-2018 Dissolved Organic/Inorganic Carbon 10-Aug-2018 Fluoride 10-Aug-2018 Loss on Ignition in soils 10-Aug-2018 Mineral Oil 10-Aug-2018 PAH 16 & 17 Calc 09-Aug-2018 PAH by GCMS 09-Aug-2018 pH 07-Aug-2018 Sample description 06-Aug-2018 PAL 16 & 17 Calc 09-Aug-2018 PAH by GCMS 09-Aug-2018 pH 07-Aug-2018 pLanols by HPLC (W) 10-Aug-2018 Sample description 06-Aug-2018 Total Dis	Туре	Soil/Solid (S)
CEN 10:1 Leachate (1 Stage) 07-Aug-2018 CEN Readings 08-Aug-2018 Coronene 09-Aug-2018 Dissolved Metals by ICP-MS 10-Aug-2018 Dissolved Organic/Inorganic Carbon 10-Aug-2018 Fluoride 10-Aug-2018 Loss on Ignition in soils 10-Aug-2018 Mineral Oil 10-Aug-2018 PAH 16 & 17 Calc 09-Aug-2018 PAH by GCMS 09-Aug-2018 pH 07-Aug-2018 Sample description 06-Aug-2018 Total Dissolved 09-Aug-2018 Total Dissolved Solids 09-Aug-2018 Total Organic Carbon 10-Aug-2018	ANC at pH4 and ANC at pH 6	08-Aug-2018
CEN Readings 08-Aug-2018 Coronene 09-Aug-2018 Dissolved Metals by ICP-MS 10-Aug-2018 Dissolved Organic/Inorganic Carbon 10-Aug-2018 Fluoride 10-Aug-2018 Loss on Ignition in soils 10-Aug-2018 Mineral Oil 10-Aug-2018 PAH 16 & 17 Calc 09-Aug-2018 PAH by GCMS 09-Aug-2018 PH 07-Aug-2018 PH 07-Aug-2018 PAT 16 & 17 Calc 09-Aug-2018 PAB by GCMS 08-Aug-2018 PH 07-Aug-2018 PH 07-Aug-2018 Phanols by HPLC (W) 10-Aug-2018 Sample description 06-Aug-2018 Total Dissolved Solids 09-Aug-2018 Total Organic Carbon 12-Aug-2018	Anions by Kone (w)	09-Aug-2018
Ocronene 09-Aug-2018 Dissolved Metals by ICP-MS 10-Aug-2018 Dissolved Organic/Inorganic Carbon 10-Aug-2018 Fluoride 10-Aug-2018 Loss on Ignition in soils 10-Aug-2018 Mercury Dissolved 10-Aug-2018 Mineral Oil 10-Aug-2018 PAH 16 & 17 Calc 09-Aug-2018 PAH by GCMS 09-Aug-2018 PCBs by GCMS 08-Aug-2018 Phenols by HPLC (W) 10-Aug-2018 Sample description 06-Aug-2018 Total Dissolved Solids 09-Aug-2018 Total Organic Carbon 12-Aug-2018	CEN 10:1 Leachate (1 Stage)	07-Aug-2018
Dissolved Metals by ICP-MS 10-Aug-2018 Dissolved Organic/Inorganic Carbon 10-Aug-2018 Fluoride 10-Aug-2018 Loss on Ignition in soils 10-Aug-2018 Mercury Dissolved 10-Aug-2018 Mineral Oil 10-Aug-2018 PAH 16 & 17 Calc 09-Aug-2018 PAB by GCMS 09-Aug-2018 PCBs by GCMS 08-Aug-2018 PH 07-Aug-2018 Phenols by HPLC (W) 10-Aug-2018 Sample description 06-Aug-2018 Total Dissolved Solids 09-Aug-2018 Total Organic Carbon 12-Aug-2018	CEN Readings	08-Aug-2018
Dissolved Organic/Inorganic Carbon 10-Aug-2018 Fluoride 10-Aug-2018 Loss on Ignition in soils 10-Aug-2018 Mercury Dissolved 10-Aug-2018 Mineral Oil 10-Aug-2018 PAH 16 & 17 Calc 09-Aug-2018 PAB by GCMS 09-Aug-2018 PCBs by GCMS 08-Aug-2018 PH 07-Aug-2018 Sample description 06-Aug-2018 Total Dissolved Solids 09-Aug-2018 Total Organic Carbon 12-Aug-2018	Coronene	09-Aug-2018
Fluoride 10-Aug-2018 Loss on Ignition in soils 10-Aug-2018 Mercury Dissolved 10-Aug-2018 Mineral Oil 10-Aug-2018 PAH 16 & 17 Calc 09-Aug-2018 PAH by GCMS 09-Aug-2018 PCBs by GCMS 08-Aug-2018 PH 07-Aug-2018 PH 07-Aug-2018 Phenols by HPLC (W) 10-Aug-2018 Sample description 06-Aug-2018 Total Dissolved Solids 09-Aug-2018 Total Organic Carbon 12-Aug-2018	Dissolved Metals by ICP-MS	10-Aug-2018
Instruction Interface Loss on Ignition in soils 10-Aug-2018 Mercury Dissolved 10-Aug-2018 Mineral Oil 10-Aug-2018 PAH 16 & 17 Calc 09-Aug-2018 PAH by GCMS 09-Aug-2018 PCBs by GCMS 08-Aug-2018 pH 07-Aug-2018 Sample description 06-Aug-2018 Total Dissolved Solids 09-Aug-2018 Total Organic Carbon 12-Aug-2018	Dissolved Organic/Inorganic Carbon	10-Aug-2018
Mercury Dissolved 10-Aug-2018 Mineral Oil 10-Aug-2018 PAH 16 & 17 Calc 09-Aug-2018 PAH by GCMS 09-Aug-2018 PCBs by GCMS 08-Aug-2018 pH 07-Aug-2018 PH 07-Aug-2018 Sample description 06-Aug-2018 Total Dissolved Solids 09-Aug-2018 Total Organic Carbon 12-Aug-2018	Fluoride	10-Aug-2018
Mineral Oil 10-Aug-2018 PAH 16 & 17 Calc 09-Aug-2018 PAH by GCMS 09-Aug-2018 PCBs by GCMS 08-Aug-2018 pH 07-Aug-2018 PHenols by HPLC (W) 10-Aug-2018 Sample description 06-Aug-2018 Total Dissolved Solids 09-Aug-2018 Total Organic Carbon 12-Aug-2018	Loss on Ignition in soils	10-Aug-2018
Name No Fing 2016 PAH 16 & 17 Calc 09-Aug-2018 PAH by GCMS 09-Aug-2018 PCBs by GCMS 08-Aug-2018 pH 07-Aug-2018 PHenols by HPLC (W) 10-Aug-2018 Sample description 06-Aug-2018 Total Dissolved Solids 09-Aug-2018 Total Organic Carbon 12-Aug-2018	Mercury Dissolved	10-Aug-2018
PAH by GCMS 09-Aug-2018 PCBs by GCMS 08-Aug-2018 pH 07-Aug-2018 pH 07-Aug-2018 Sample description 06-Aug-2018 Total Dissolved Solids 09-Aug-2018 Total Organic Carbon 12-Aug-2018	Mineral Oil	10-Aug-2018
PCBs by GCMS 08-Aug-2018 pH 07-Aug-2018 Phenols by HPLC (W) 10-Aug-2018 Sample description 06-Aug-2018 Total Dissolved Solids 09-Aug-2018 Total Organic Carbon 12-Aug-2018	PAH 16 & 17 Calc	09-Aug-2018
pH 07-Aug-2018 Phenols by HPLC (W) 10-Aug-2018 Sample description 06-Aug-2018 Total Dissolved Solids 09-Aug-2018 Total Organic Carbon 12-Aug-2018	PAH by GCMS	09-Aug-2018
Phenols by HPLC (W) 10-Aug-2018 Sample description 06-Aug-2018 Total Dissolved Solids 09-Aug-2018 Total Organic Carbon 12-Aug-2018	PCBs by GCMS	08-Aug-2018
Sample description 06-Aug-2018 Total Dissolved Solids 09-Aug-2018 Total Organic Carbon 12-Aug-2018	рН	07-Aug-2018
Total Dissolved Solids 09-Aug-2018 Total Organic Carbon 12-Aug-2018	Phenols by HPLC (W)	10-Aug-2018
Total Organic Carbon 12-Aug-2018	Sample description	06-Aug-2018
· · · · ·	Total Dissolved Solids	09-Aug-2018
VOC MS (S) 09-Aug-2018	Total Organic Carbon	12-Aug-2018
	VOC MS (S)	09-Aug-2018

Test Completion Dates

	SDG:	180804-62	Client Reference:	P1444	Report Number:	468044
ALE	Location:	Cartron Big	Order Number:		Superseded Report:	
(ALS)						

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 sumples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

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

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt . However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. Surrogate recoveries - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. 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-lsopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

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

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

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

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

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
Chrysof le	White Asbestos
Amosite	Brow n Asbestos
Cro ci dolite	Blue Asbe stos
Fibrous Actinolite	
Fib to us Anthop hyll ite	-
Fibrous Tremol ite	-

Visual Estimation Of Fibre Content

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

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

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



Fehily Timoney 3rd Floor North Park Offices North Park Business Park North Road Dublin Dublin 11

Attention: Daniel Hayden

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: 13 August 2018 D_FTIM_DUB 180803-55 P1444 Cartron Big 468081

We received 4 samples on Friday August 03, 2018 and 4 of these samples were scheduled for analysis which was completed on Monday August 13, 2018. 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 Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Approved By:

<u>Sonia McWhan</u> Operations Manager



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

 SDG:
 180803-55
 Client Reference:
 P1444
 Report Number:
 468081

 Location:
 Cartron Big
 Order Number:
 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18053550	TP1		1.80 - 1.80	31/07/2018
18053555	TP3		2.50 - 2.50	31/07/2018
18053560	TP4		1.20 - 1.20	31/07/2018
18053565	TP5		1.80 - 1.80	31/07/2018

Maximum Sample/Coolbox Temperature (°C) : ISO5667-3 Water quality - Sampling - Part3 - 19.8

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.

Validated

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of $(5\pm3)^{\circ}$ C.

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

		С	ERT	IFIC	CAT	ΕO	F A	NAL	_YS	IS					
SDG: Location:	180803-55 Cartron Big				ierenc mber:		P144	44						Numb led Re	
Results Legend X Test N No Determination Possible	Lab Sample	No(s)			18053550			18053555			18053560			18053565	
Sample Types -	Custome Sample Refe				TP1			TP3			TP4			TP5	
S - Soil/Solid JNS - Unspecified Solid GW - Ground Water GW - Surface Water .E - Land Leachate	AGS Refere	ence													
PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage JS - Untreated Sewage	Depth (n	n)			1.80 - 1.80			2.50 - 2.50			1.20 - 1.20			1.80 - 1.80	
RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Containe	ər	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	
	Sample Ty	/pe	S	S	S	S	S	S	S	S	ა	S	S	S	
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 4		X			X			x			X		
Anions by Kone (w)	All	NDPs: 0 Tests: 4	X			X			X			X			
CEN Readings	All	NDPs: 0 Tests: 4	x			x			x			x			
Coronene	All	NDPs: 0 Tests: 4		x			x			x			x		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 4	x			X			X			X			
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 4	x			x			x			x			
Fluoride	All	NDPs: 0 Tests: 4	x			X			X			x			
Loss on Ignition in soils	All	NDPs: 0 Tests: 4		x			x			x			x		
Mercury Dissolved	All	NDPs: 0 Tests: 4	x			x			x			x			
Mineral Oil	All	NDPs: 0 Tests: 4		x			x			x			x		
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 4		x			x			x			x		
PAH by GCMS	All	NDPs: 0 Tests: 4		x			x			x			x		
PCBs by GCMS	All	NDPs: 0 Tests: 4		x			x			x			x		
рН	All	NDPs: 0 Tests: 4		x			x			x			x		
Phenols by HPLC (W)	All	NDPs: 0 Tests: 4	x			X			X			X			

			С	ERI	TIFIC	CAT	ΕO	FA	NAI	_YS	IS					[Va
ALS	SDG: Location:	180803-55 Cartron Big			nt Re er Nu			P14	44						Numbe ded Rep	46808	31
Results Legend X Test N No Dete Possible	rmination	Lab Sample	No(s)			18053550			18053555			18053560			18053565		
Sample Types -	e	Custome Sample Refe				TP1			TP3			TP4			TP5		
S - Soil/Solid UNS - Unspecified 3 GW - Ground Water SW - Surface Water LE - Land Leachater	r r ;	AGS Refere	ence														
LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage		Depth (m	1)			1.80 - 1.80			2.50 - 2.50			1.20 - 1.20			1.80 - 1.80		
RE - Recreational V DW - Drinking Water I UNL - Unspecified I SL - Sludge G - Gas OTH - Other	Vater Non-regulatory	Containe	r	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)		
		Sample Ty	ре	S	ა	S	ა	S	ა	ა	S	ა	ა	ა	S		
Sample description		All	NDPs: 0 Tests: 4		x			x			x			x			
Total Dissolved Solids		All	NDPs: 0 Tests: 4	x			X			x			X				
Total Organic Carbon		All	NDPs: 0 Tests: 4		x			x			x			x			
VOC MS (S)		All	NDPs: 0 Tests: 4			X			X			x			x		

Sample Descriptions

P1444

468081

Validated

>10mm



180803-55 Cartron Big Client Reference: Order Number: Report Number: Superseded Report:

Grain Sizes

very fine <0	.063mm fine 0.0	63mm - 0.1mm m	edium 0.1mm	n - 2mm coai	r se 2mm - 1	0mm very coars
Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
18053550	TP1	1.80 - 1.80	Black	Sludge	Stones	None
18053555	TP3	2.50 - 2.50	Black	Loamy Sand	Vegetation	Oil/Petroleum
18053560	TP4	1.20 - 1.20	Dark Brown	Loamy Sand	Stones	Vegetation
18053565	TP5	1.80 - 1.80	Dark Brown	Loamy Sand	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.

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



SDG:

180803-55

CERTIFICATE OF ANALYSIS

Client Reference:

P1444

Report Number:

Validated

468081

Cartron Big Order Number: Superseded Report: Location: Customer Sample Ref. Results Leg ISO17025 accredited. TP1 TP3 TP4 TP5 mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. aq diss.filt Depth (m) 1.80 - 1.80 2.50 - 2.50 1.20 - 1.20 1.80 - 1.80 Soil/Solid (S) 31/07/2018 Soil/Solid (S) 31/07/2018 Soil/Solid (S) Sample Type Soil/Solid (S tot.unfilt 31/07/2018 31/07/2018 Subcontracted test. Date Sample Subcontracted test.
 % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed
 1-5&+§@ Sample deviation (see appendix) Sample Tim . 03/08/2018 . 03/08/2018 . 03/08/2018 . 03/08/2018 Date Receive 180803-55 18053550 180803-55 180803-55 180803-55 SDG Re 18053555 18053560 18053565 Lab Sample No.(s) AGS Reference LOD/Units Component Method Moisture Content Ratio (% of as 35 44 PM024 56 50 % received sample) <0.7 % TM018 15.7 18.9 36.7 22.4 Loss on ignition # Μ Μ Μ Mineral oil >C10-C40 <1 mg/kg TM061 898 1080 1160 2390 Mineral Oil Surrogate % % TM061 76.4 80.7 77.8 71.4 recovery** Organic Carbon, Total <0.2 % TM132 4.13 7.08 10.7 7.17 # Μ Μ Μ pН 1 pH Units TM133 8.68 7.02 7.77 7.67 # М М М PCB congener 28 TM168 <15 <3 <3 <15 <3 µg/kg # Μ М Μ PCB congener 52 TM168 <15 <3 <3 <15 <3 µg/kg # Μ Μ М PCB congener 101 TM168 <3 <3 <3 µg/kg <15 <15 # Μ Μ М PCB congener 118 TM168 <3 µg/kg <15 <3 <3 <15 # Μ М Μ PCB congener 138 TM168 <15 <3 <3 <15 <3 µg/kg # Μ М Μ PCB congener 153 TM168 <3 µg/kg <15 <3 <3 <15 # Μ М Μ PCB congener 180 <3 µg/kg TM168 <15 <3 <3 <15 # М М М Sum of detected PCB 7 <21 µg/kg TM168 <105 <21 <21 <105 Congeners ANC @ pH 4 <0.03 TM182 2.01 1.57 1.3 0.837 mol/kg ANC @ pH 6 < 0.03 TM182 0.235 0.0936 0.154 0.192 mol/kg TM410 <10 PAH Total 17 (inc Coronene) <10 mg/kg <10 <10 <10 Moisture Corrected Coronene <200 µg/kg TM410 <200 <200 <200 <200

SDG:	1808	03-55		t Reference: P14		Report Numbe	er: 468081	
ALS Location:	Cartr	on Big		r Number:		Superseded Rep	oort:	
PAH by GCMS	Custome	r Samula Daf	75/	770	701			
Results Legend # 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 stand check the efficiency of the method samples aren't corrected for the registria of individual compounds vis samples aren't corrected for the ref. (F) Trigger breach confirmed 1-58-5@ Sample deviation (see appendix)	lard to I d. The C within C scovery Lab 4	Depth (m) 1.8 Sample Type Soil Date Sampled 31/ Sample Time late Received 03/ SDG Ref 18/ Sample No.(s) 18/ 38 Reference	TP1 30 - 1.80 /Solid (S) 107/2018 108/2018 0803-55 1053550	TP3 2.50 - 2.50 Soil/Solid (S) 31/07/2018 03/08/2018 180803-55 18053555	TP4 1.20 - 1.20 Soli/Solid (S) 31/07/2018 03/08/2018 18/08/3-55 18/05/3560	TP5 1.80 - 1.80 Soil/Solid (S) 31/07/2018 03/08/2018 180080-55 18053565		
Component WAC		Method TM218	10	10	10	10		

Validated

SDG:	1	180803-55		t Reference: P1	444	Report Number:	468081
(ALS) Location:	(Cartron Big		r Number:		Superseded Report:	
/OC MS (S)							
Results Legend ISO17025 accredited. M mCERTS accredited. aq Aqueous / sottied sample. diss.filt Dissolved / filtered sample. Subcontracted test. * % recovery of the surrogate stan check the efficiency of the methor results of individual compounds samples aren't corrected for the	dard to d. The within	ustomer Sample Ref. Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref	TP1 1.80 - 1.80 Soiil/Solid (S) 31/07/2018 03/08/2018 180603-55	TP3 2.50 - 2.50 Soil/Solid (S) 31/07/2018 	TP4 1.20 - 1.20 Soil/Solid (S) 31/07/2018 03/08/2018 180803-55	TP5 1.80 - 1.80 Soli/Solid (S) 31/07/2018 03/08/2018 180803-55	
(F) Trigger breach confirmed 1-5&+§@ Sample deviation (see appendix)		Lab Sample No.(s)	18053550	18053555	18053560	18053565	
Component	LOD/Units	AGS Reference Method					
Dibromofluoromethane**	%	TM116	102	105	102	99.7	
Toluene-d8**	%	TM116	98.2	96.1	95.6	96.1	
4-Bromofluorobenzene**	%	TM116	95.4	95.1	86.4	91.7	
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<100 #	<100 M	<100 M	<100 M	
Benzene	<9 µg/kg	TM116	<90 #	<90 M	<90 M	<90 M	
Toluene	<7 µg/kg	TM116	<70 #	<70 M	<70 M	<70 M	
Ethylbenzene	<4 µg/kg	TM116	117 #	<40 M	<40 M	<40 M	
p/m-Xylene	<10 µg/kg	TM116	<100 #	<100 #	<100 #	<100 #	
o-Xylene	<10 µg/kg	TM116	<100 #	<100 M	<100 M	<100 M	
	1						

Location: Carl WAC ANALYTICAL RESULTS Client Reference Mass Sample taken (kg) 0.7 Mass of dry sample (kg) 0.6 Particle Size <4mm >9 Case 5 SDG 18 Lab Sample Number(s) 18 Sampled Date 31 Customer Sample Ref. TF	138 090 95% 80803-55 8053550 1-Jul-2018 P1 80 - 1.80 Result 4.13 15.7 - <0.105 898 <10 8.68			Su CHATE TEST e Content (%)	port Number: perseded Report: Cartro 53.8 65 Landfi Inert Waste Landfill	468081 REF : BS I on Big fill Waste Accep Criteria Limits Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	otance
WAC ANALYTICAL RESULTS Client Reference Mass Sample taken (kg) 0.7 Mass of dry sample (kg) 0.6 Particle Size <4mm >9 Case 5DG 18 Sampled Date 31 Customer Sample Ref. TF Depth (m) 1.8 Solid Waste Analysis 5 Fotal Organic Carbon (%) 5 Sum of BTEX (mg/kg) 5 Sum of 7 PCBs (mg/kg) 5 Wineral Oil (mg/kg) 5 PAH Sum of 17 (mg/kg) 5 OH (pH Units) 5 NC to pH 6 (mol/kg) 5	CEN / 138 090 95% 80803-55 8053550 1-Jul-2018 P1 80 - 1.80 Result 4.13 15.7 - <0.105 898 <10 8.68	10:1 SINGLE	STAGE LEAC Site Location Natural Moistur	e Content (%)	53.8 65 Landf	fill Waste Accep Criteria Limits Stable Non-reactive Hazardous Waste in Non- Hazardous	Dtance
Client Reference Mass Sample taken (kg) 0.1 Mass of dry sample (kg) 0.0 Particle Size <4mm >9 Case 30 SDG 18 Lab Sample Number(s) 18 Sampled Date 31 Customer Sample Ref. TF Depth (m) 1.8 Solid Waste Analysis 50 otal Organic Carbon (%) 50 um of BTEX (mg/kg) 10 um of 17 PCBs (mg/kg) 10 H Sum of 17 (mg/kg) 11 H Sum of 17 (mg/kg) 14 H Units) NC to pH 6 (mol/kg)	090 95% 80803-55 8053550 1-Jul-2018 P1 80 - 1.80 Result 4.13 15.7 - <0.105 898 <10 8.68		Natural Moistur		53.8 65 Landf	fill Waste Accep Criteria Limits Stable Non-reactive Hazardous Waste in Non- Hazardous	Dtance
Mass Sample taken (kg) 0.7 Mass of dry sample (kg) 0.0 Particle Size <4mm	090 95% 80803-55 8053550 1-Jul-2018 P1 80 - 1.80 Result 4.13 15.7 - <0.105 898 <10 8.68		Natural Moistur		53.8 65 Landf	fill Waste Accep Criteria Limits Stable Non-reactive Hazardous Waste in Non- Hazardous	Hazardous
Mass of dry sample (kg) 0.0 Particle Size <4mm	090 95% 80803-55 8053550 1-Jul-2018 P1 80 - 1.80 Result 4.13 15.7 - <0.105 898 <10 8.68				53.8 65 Landf	fill Waste Accep Criteria Limits Stable Non-reactive Hazardous Waste in Non- Hazardous	Hazardous
Mass of dry sample (kg) 0.0 Particle Size <4mm	090 95% 80803-55 8053550 1-Jul-2018 P1 80 - 1.80 Result 4.13 15.7 - <0.105 898 <10 8.68				65 Landf	Stable Non-reactive Hazardous Waste in Non- Hazardous	Hazardous
Particle Size <4mm	95% 80803-55 8053550 1-Jul-2018 P1 80 - 1.80 Result 4.13 15.7 - <0.105 898 <10 8.68				Landf Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous	Hazardous
Case SDG 18 Lab Sample Number(s) 18 Sampled Date 31 Customer Sample Ref. TF Depth (m) 1.8 Solid Waste Analysis Solid Waste Analysis Solid Organic Carbon (%) Loss on Ignition (%) Sum of BTEX (mg/kg) Sum of 7 PCBs (mg/kg) Mineral Oil (mg/kg) AH Sum of 17 (mg/kg) H (pH Units) LNC to pH 6 (mol/kg)	80803-55 8053550 1-Jul-2018 P1 80 - 1.80 Result 4.13 15.7 - <0.105 898 <10 8.68		•		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous	Hazardous
SDG 18 Lab Sample Number(s) 18 Sampled Date 31 Customer Sample Ref. TF Depth (m) 1.8 Solid Waste Analysis 1.8 Solid Vaste Analysis 1.8 Solid Vaste Analysis 1.8 Solid Organic Carbon (%) 1.8 oss on Ignition (%) 1.8 Bum of BTEX (mg/kg) 1.8 Mineral Oil (mg/kg) 1.8 AH Sum of 17 (mg/kg) 1.4 H (pH Units) 1.4 NC to pH 6 (mol/kg) 1.8	8053550 1-Jul-2018 P1 80 - 1.80 Result 4.13 15.7 - <0.105 898 <10 8.68		1		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous	Hazardous
Lab Sample Number(s) 18 Sampled Date 31 Customer Sample Ref. TF Depth (m) 1.8 Solid Waste Analysis 1.8 Fotal Organic Carbon (%) 1.8 Soss on Ignition (%) 1.8 Sum of BTEX (mg/kg) 1.8 Juneral Oil (mg/kg) 1.4 YAH Sum of 17 (mg/k	8053550 1-Jul-2018 P1 80 - 1.80 Result 4.13 15.7 - <0.105 898 <10 8.68		•		Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous	Hazardous
Sampled Date 31 Customer Sample Ref. TF Depth (m) 1.8 Solid Waste Analysis 1.8 Solid Organic Carbon (%) 1.8 oss on Ignition (%) 1.8 Sum of BTEX (mg/kg) 1.8 Mineral Oil (mg/kg) 1.8 PAH Sum of 17 (mg/kg) 1.4 H (pH Units) 1.4	1-Jul-2018 P1 80 - 1.80 Result 4.13 15.7 - <0.105 898 <10 8.68		1		Landfill	Non-reactive Hazardous Waste in Non- Hazardous	
Customer Sample Ref. TF Depth (m) 1.8 Solid Waste Analysis 1.8 Total Organic Carbon (%) 1.8 Soss on Ignition (%) 1.8 Sum of BTEX (mg/kg) 1.8 Juneral Oil (mg/kg) 1.8 PAH Sum of 17 (mg/kg) 1.8 Where the the the the the the the the the th	P1 80 - 1.80 Result 4.13 15.7 - <0.105 898 <10 8.68				Landfill	Non-reactive Hazardous Waste in Non- Hazardous	
Depth (m) 1.8 Solid Waste Analysis 5 Total Organic Carbon (%) 5 Soss on Ignition (%) 5 Sum of BTEX (mg/kg) 5 Sum of 7 PCBs (mg/kg) 5 All Sum of 17 (mg/kg) 5 PAH Sum of 17 (mg/kg) 5 H (pH Units) 5 NNC to pH 6 (mol/kg) 5	80 - 1.80 Result 4.13 15.7 - <0.105 898 <10 8.68				Landfill	Hazardous Waste in Non- Hazardous	
Depth (m) 1.8 Solid Waste Analysis Fotal Organic Carbon (%) Loss on Ignition (%) Sum of BTEX (mg/kg) Sum of 7 PCBs (mg/kg) Vineral Oil (mg/kg) PAH Sum of 17 (mg/kg) H (pH Units) NNC to pH 6 (mol/kg)	Result 4.13 15.7 - <0.105 898 <10 8.68					Hazardous	waste Landfil
Total Organic Carbon (%) Loss on Ignition (%) Sum of BTEX (mg/kg) Sum of 7 PCBs (mg/kg) Vineral Oil (mg/kg) PAH Sum of 17 (mg/kg) DH (pH Units) ANC to pH 6 (mol/kg)	4.13 15.7 - <0.105 898 <10 8.68				3	Landfill	
Total Organic Carbon (%) Loss on Ignition (%) Sum of BTEX (mg/kg) Sum of 7 PCBs (mg/kg) Vineral Oil (mg/kg) PAH Sum of 17 (mg/kg) DH (pH Units) ANC to pH 6 (mol/kg)	4.13 15.7 - <0.105 898 <10 8.68				3		
oss on Ignition (%) Gum of BTEX (mg/kg) Gum of 7 PCBs (mg/kg) Mineral Oil (mg/kg) PAH Sum of 17 (mg/kg) H (pH Units) INC to pH 6 (mol/kg)	15.7 - <0.105 898 <10 8.68				3		
Sum of BTEX (mg/kg) Sum of 7 PCBs (mg/kg) Alineral Oil (mg/kg) PAH Sum of 17 (mg/kg) H (pH Units) INC to pH 6 (mol/kg)	<0.105 898 <10 8.68					-	6
Sum of 7 PCBs (mg/kg) /lineral Oil (mg/kg) PAH Sum of 17 (mg/kg) OH (pH Units) ANC to pH 6 (mol/kg)	<0.105 898 <10 8.68				-	-	- 10
PAH Sum of 17 (mg/kg) H (pH Units) NNC to pH 6 (mol/kg)	<10 8.68				1	-	-
H (pH Units) NC to pH 6 (mol/kg)	8.68				500	-	-
NC to pH 6 (mol/kg)					100	-	-
	0.235				-	>6 -	-
	2.01				-	-	-
Eluate Analysis	C ₂ Conc ⁿ in 1	0:1 eluate (mg/l)	A2 10:1 conc	ⁿ leached (mg/kg)		ies for compliance lea 3S EN 12457-3 at L/S	
Arapia	Result 0.0371	Limit of Detection	Result 0.371	Limit of Detection <0.005	0.5	2	25
Arsenic Barium	0.0371	<0.0005 <0.0002	0.244	<0.003	0.5 20	100	25 300
Cadmium	0.000431	<0.0002	0.00431	<0.002	0.04	1	5
Chromium	0.541	<0.001	5.41	<0.01	0.5	10	70
Copper	0.0213	< 0.0003	0.213	< 0.003	2	50	100
Aercury Dissolved (CVAF)	0.0000295	< 0.00001	0.000295	<0.0001	0.01	0.2	2
Nolybdenum	0.0284	<0.003	0.284	< 0.03	0.5	10	30
lickel	0.0617	<0.0004	0.617	<0.004	0.4	10	40
ead	0.016	<0.0002	0.16	<0.002	0.5	10	50
Antimony	0.00387	<0.001	0.0387	<0.01	0.06	0.7	5
Selenium	0.00184	<0.001	0.0184	<0.01	0.1	0.5	7
linc	0.048	<0.001	0.48	<0.01	4	50	200
Chloride	010	<10	8120	<100	800	15000	05000
	812				000	10000	25000
luoride	812 0.604	<0.5	6.04	<5	10	15000	25000 500
Fluoride Sulphate (soluble)		<0.5 <10	6.04 <100	<5 <100			
Sulphate (soluble)	0.604				10	150	500
ulphate (soluble)	0.604 <10	<10	<100	<100	10 1000	150 20000	500 50000

SDG: Location: WAC ANALYTICAL RESU Client Reference Mass Sample taken (kg) Mass of dry sample (kg) Particle Size <4mm Case SDG Lab Sample Number(s) Sampled Date Customer Sample Ref. Depth (m)	ULTS 0.161 0.090 >95% 180803-55 18053555 31-Jul-2018			Su CHATE TEST e Content (%)	port Number: perseded Report: Cartro 78.6 56		EN 12457/
WAC ANALYTICAL RESU Client Reference Mass Sample taken (kg) Mass of dry sample (kg) Particle Size <4mm Case SDG Lab Sample Number(s) Sampled Date Customer Sample Ref.	CEN JLTS 0.161 0.090 >95% 180803-55 18053555 31-Jul-2018	10:1 SINGLE	STAGE LEAC Site Location Natural Moisture	CHATE TEST	Cartro 78.6 56	n Big	EN 12457/
Client Reference Mass Sample taken (kg) Mass of dry sample (kg) Particle Size <4mm Case SDG Lab Sample Number(s) Sampled Date Customer Sample Ref.	0.161 0.090 >95% 180803-55 18053555 31-Jul-2018		Natural Moisture		78.6 56	n Big	EN 12457/
Mass Sample taken (kg) Mass of dry sample (kg) Particle Size <4mm Case SDG Lab Sample Number(s) Sampled Date Customer Sample Ref.	0.090 >95% 180803-55 18053555 31-Jul-2018		Natural Moisture		78.6 56		
Mass of dry sample (kg) Particle Size <4mm Case SDG Lab Sample Number(s) Sampled Date Customer Sample Ref.	0.090 >95% 180803-55 18053555 31-Jul-2018				56		
Particle Size <4mm Case SDG Lab Sample Number(s) Sampled Date Customer Sample Ref.	>95% 180803-55 18053555 31-Jul-2018		Dry Matter Cont	ent (%)			
Case SDG Lab Sample Number(s) Sampled Date Customer Sample Ref.	180803-55 18053555 31-Jul-2018				Landf		
SDG Lab Sample Number(s) Sampled Date Customer Sample Ref.	18053555 31-Jul-2018				Landf		
Lab Sample Number(s) Sampled Date Customer Sample Ref.	18053555 31-Jul-2018				Lana	ill Waste Accep	otance
Sampled Date Customer Sample Ref.	31-Jul-2018					Criteria Limits	
Customer Sample Ref.							
Customer Sample Ref.						Stable	
-	TP3				Inert Waste	Non-reactive Hazardous Waste	Hazardous
	2.50 - 2.50				Landfill	in Non- Hazardous	Waste Landfill
Solid Waste Analysis	Result					Landfill	
Total Organic Carbon (%)	7.08		I		3	5	6
Loss on Ignition (%)	18.9				-	-	10
Sum of BTEX (mg/kg)	-				-	-	-
Sum of 7 PCBs (mg/kg)	<0.021				1	-	-
/lineral Oil (mg/kg) PAH Sum of 17 (mg/kg)	1080 <10				500 100	-	-
bH (pH Units)	7.02				-	>6	-
NC to pH 6 (mol/kg)	0.0936				-	-	-
ANC to pH 4 (mol/kg)	1.57				-	-	-
Eluate Analysis	C ₂ Conc ⁿ in 1	.0:1 eluate (mg/l)	A2 10:1 conc ¹	ⁿ leached (mg/kg)		es for compliance lea S EN 12457-3 at L/S	
• ·	Result	Limit of Detection	Result	Limit of Detection	0.5		05
Arsenic	0.00665	< 0.0005	0.0665	< 0.005	0.5	2	25
Barium	0.0657	< 0.0002	0.657	< 0.002	20	100	300
	<0.0008	< 0.0008	<0.0008	< 0.0008	0.04	1	5 70
Chromium	< 0.001	<0.001	< 0.01	< 0.01	0.5	10	
Copper //ercury Dissolved (CVAF)	<0.0003	<0.0003 <0.00001	<0.003 <0.0001	<0.003 <0.0001	0.01	50 0.2	100 2
Molybdenum	0.0546	<0.0001	0.546	<0.0001	0.01	10	
	0.00134	< 0.0004	0.0134	-0.00			
NICKEI				<0.004			30 40
vickel ead				<0.004 <0.002	0.4	10	40
ead	<0.0002	<0.0002	<0.002	<0.002	0.4 0.5	10 10	40 50
.ead Antimony	<0.0002 0.00192	<0.0002 <0.001	<0.002 0.0192	<0.002 <0.01	0.4 0.5 0.06	10 10 0.7	40 50 5
	<0.0002	<0.0002	<0.002	<0.002	0.4 0.5	10 10	40 50
.ead Antimony Selenium Zinc	<0.0002 0.00192 <0.001	<0.0002 <0.001 <0.001	<0.002 0.0192 <0.01	<0.002 <0.01 <0.01	0.4 0.5 0.06 0.1	10 10 0.7 0.5	40 50 5 7
ead Antimony Selenium Zinc Chloride	 <0.0002 0.00192 <0.001 <0.001 	<0.0002 <0.001 <0.001 <0.001	<0.002 0.0192 <0.01 <0.01	<0.002 <0.01 <0.01 <0.01	0.4 0.5 0.06 0.1 4	10 10 0.7 0.5 50	40 50 5 7 200
ead Antimony Selenium Zinc Chloride Fluoride	 <0.0002 0.00192 <0.001 <0.001 4.7 	<0.0002 <0.001 <0.001 <0.001 <2	<0.002 0.0192 <0.01 <0.01 47	<0.002 <0.01 <0.01 <0.01 <20	0.4 0.5 0.06 0.1 4 800	10 10 0.7 0.5 50 15000	40 50 5 7 200 25000
.ead Antimony Selenium	<0.0002 0.00192 <0.001 <0.001 4.7 <0.5	<0.0002 <0.001 <0.001 <0.001 <2 <0.5	<0.002 0.0192 <0.01 <0.01 47 <5	<0.002 <0.01 <0.01 <0.01 <20 <5	0.4 0.5 0.06 0.1 4 800 10	10 10 0.7 0.5 50 15000 150	40 50 5 7 200 25000 500
ead Antimony Selenium Zinc Chloride Fluoride Sulphate (soluble)	 <0.0002 0.00192 <0.001 <0.001 <0.001 4.7 <0.5 44.1 	<0.0002 <0.001 <0.001 <0.001 <2 <0.5 <2	<0.002 0.0192 <0.01 <0.01 47 <5 441	<0.002 <0.01 <0.01 <0.01 <20 <5 <20	0.4 0.5 0.06 0.1 4 800 10 1000	10 10 0.7 0.5 50 15000 150 20000	40 50 7 200 25000 500 5000

SDG: Location:	180803-55 Cartron Big						
		Client Refer Order Numb			eport Number: perseded Report:	468081	
		10:1 SINGLE					
NAC ANALYTICAL RES	ULTS					REF : BS	EN 12457
Client Reference			Site Location		Cartro	on Big	
Mass Sample taken (kg)	0.205		Natural Moistur	e Content (%)	127		
Mass of dry sample (kg)	0.090		Dry Matter Con		44		
Particle Size <4mm	>95%		-				
Case					Land	fill Waste Acce	otance
SDG	180803-55					Criteria Limits	
_ab Sample Number(s)	18053560						
Sampled Date	31-Jul-2018					Stable	
Customer Sample Ref.	TP4				Inert Waste	Non-reactive Hazardous Waste	Hazardous
Depth (m)	1.20 - 1.20				Landfill	in Non- Hazardous	Waste Landfil
Solid Waste Analysis	Result					Landfill	
-	10.7		I		3	5	6
otal Organic Carbon (%) oss on Ignition (%)	36.7				-	-	10
Sum of BTEX (mg/kg)	-				-	-	-
um of 7 PCBs (mg/kg)	<0.021				1	-	-
lineral Oil (mg/kg)	1160				500	-	-
AH Sum of 17 (mg/kg) H (pH Units)	<10				100 -	>6	-
NC to pH 6 (mol/kg)	0.154				-	-	-
NC to pH 4 (mol/kg)	1.3				-	-	-
Eluate Analysis	C ₂ Conc ⁿ in :	L0:1 eluate (mg/l)	A2 10:1 cond	c ⁿ leached (mg/kg)		es for compliance lea SS EN 12457-3 at L/S	
Eluate Analysis	C2 Conc ⁿ in : Result	LO:1 eluate (mg/l)	A2 10:1 cond Result	ⁿ leached (mg/kg)		es for compliance lea 3S EN 12457-3 at L/S	
vrsenic	Result 0.00705	Limit of Detection <0.0005	Result 0.0705	Limit of Detection <0.005	using l	3S EN 12457-3 at L/S	10 l/kg 25
arsenic	Result 0.00705 0.0935	Limit of Detection <0.0005 <0.0002	Result 0.0705 0.935	Limit of Detection <0.005 <0.002	using I 0.5 20	3S EN 12457-3 at L/S 2 100	10 l/kg 25 300
arsenic Iarium Cadmium	Result 0.00705 0.0935 <0.00008	Limit of Detection <0.0005 <0.0002 <0.0008	Result 0.0705 0.935 <0.0008	Limit of Detection <0.005 <0.002 <0.0008	using I 0.5 20 0.04	2 100 100	10 l/kg 25 300 5
arsenic Iarium Iadmium Chromium	Result 0.00705 0.0935 <0.00008	Limit of Detection <0.0005 <0.0002 <0.00008 <0.001	Result 0.0705 0.935 <0.0008	Limit of Detection <0.005 <0.002 <0.0008 <0.01	using I 0.5 20 0.04 0.5	35 EN 12457-3 at L/S 2 100 1 10	10 l/kg 25 300 5 70
vrsenic Barium Dadmium Chromium Copper	Result 0.00705 0.0935 <0.00008	Limit of Detection <0.0005 <0.0002 <0.0008 <0.001 <0.0003	Result 0.0705 0.935 <0.0008	Limit of Detection <0.005 <0.002 <0.0008 <0.01 <0.003	using I 0.5 20 0.04 0.5 2	35 EN 12457-3 at L/S 2 100 1 10 50	10 l/kg 25 300 5 70 100
Arsenic Barium Cadmium Chromium Copper Mercury Dissolved (CVAF)	Result 0.00705 0.0935 <0.00008	Limit of Detection <0.0005 <0.0002 <0.0008 <0.001 <0.0003 <0.00001	Result 0.0705 0.935 <0.0008	Limit of Detection <0.005 <0.002 <0.0008 <0.01 <0.003 <0.0001	using I 0.5 20 0.04 0.5 2 0.01	35 EN 12457-3 at L/S 2 100 1 10 50 0.2	10 l/kg 25 300 5 70 100 2
Arsenic Barium Cadmium Chromium Copper Mercury Dissolved (CVAF) Molybdenum	Result 0.00705 0.0935 <0.00008	Limit of Detection <0.0005 <0.0002 <0.0008 <0.001 <0.0003 <0.00001 <0.0003	Result 0.0705 0.935 <0.0008	Limit of Detection <0.005 <0.002 <0.0008 <0.01 <0.003 <0.0001 <0.03	using I 0.5 20 0.04 0.5 2 0.01 0.5	2 100 1 10 50 0.2 10	10 l/kg 25 300 5 70 100 2 30
Arsenic Barium Cadmium Chromium Copper Mercury Dissolved (CVAF) Molybdenum lickel	Result 0.00705 0.0935 <0.00008	Limit of Detection <0.0005 <0.0002 <0.0008 <0.001 <0.0003 <0.00001 <0.003 <0.003 <0.003	Result 0.0705 0.935 <0.0008	Limit of Detection <0.005 <0.002 <0.0008 <0.01 <0.003 <0.0001 <0.03 <0.03 <0.004	using I 0.5 20 0.04 0.5 2 0.01 0.5 0.4	35 EN 12457-3 at L/S 2 100 1 10 50 0.2 10 10 10	10 l/kg 25 300 5 70 100 2 30 40
Arsenic Barium Cadmium Chromium Copper Mercury Dissolved (CVAF) Molybdenum lickel ead	Result 0.00705 0.0935 <0.00008	Limit of Detection <0.0005 <0.0002 <0.0008 <0.001 <0.0003 <0.0001 <0.003 <0.0004 <0.0002	Result 0.0705 0.935 <0.0008	Limit of Detection <0.005 <0.002 <0.008 <0.01 <0.003 <0.0001 <0.03 <0.004 <0.002	using I 0.5 20 0.04 0.5 2 0.01 0.5 0.4 0.5	35 EN 12457-3 at L/S 2 100 1 10 50 0.2 10 10 10 10 10	10 l/kg 25 300 5 70 100 2 30 40 50
Arsenic Barium Cadmium Chromium Copper Mercury Dissolved (CVAF) Molybdenum Jickel ead antimony	Result 0.00705 0.0935 <0.0008	Limit of Detection <0.0005 <0.0002 <0.0008 <0.001 <0.0003 <0.0001 <0.0003 <0.0004 <0.0002 <0.001	Result 0.0705 0.935 <0.0008	Limit of Detection <0.005 <0.002 <0.008 <0.01 <0.003 <0.0001 <0.03 <0.004 <0.002 <0.01	using I 0.5 20 0.04 0.5 2 0.01 0.5 0.4 0.5 0.06	35 EN 12457-3 at L/S 2 100 1 10 50 0.2 10 10 10 10 0.7	10 l/kg 25 300 5 70 100 2 30 40 50 5
Arsenic aarium Sadmium Schromium Schromium Arcury Dissolved (CVAF) Molybdenum Iickel ead antimony ielenium	Result 0.00705 0.0935 <0.00008	Limit of Detection <0.0005 <0.0002 <0.0008 <0.001 <0.0003 <0.0001 <0.003 <0.0004 <0.0002	Result 0.0705 0.935 <0.0008	Limit of Detection <0.005 <0.002 <0.008 <0.01 <0.003 <0.0001 <0.03 <0.004 <0.002	using I 0.5 20 0.04 0.5 2 0.01 0.5 0.4 0.5	35 EN 12457-3 at L/S 2 100 1 10 50 0.2 10 10 10 10 10	10 l/kg 25 300 5 70 100 2 30 40 50
Arsenic larium cadmium chromium chromium copper Mercury Dissolved (CVAF) Molybdenum lickel ead untimony ielenium inc	Result 0.00705 0.0935 <0.0008	Limit of Detection <0.0005 <0.0002 <0.0008 <0.001 <0.0003 <0.0001 <0.0003 <0.0004 <0.0004 <0.0002 <0.001 <0.001	Result 0.0705 0.935 <0.0008	Limit of Detection <0.005 <0.002 <0.0008 <0.01 <0.003 <0.0001 <0.03 <0.004 <0.002 <0.01 <0.01 <0.01	using I 0.5 20 0.04 0.5 2 0.01 0.5 0.4 0.5 0.06 0.1	35 EN 12457-3 at L/S 2 100 1 10 50 0.2 10 10 10 10 0.7 0.5	10 l/kg 25 300 5 70 100 2 30 40 50 5 7 7
Arsenic aarium Sadmium Schromium Schromium Aercury Dissolved (CVAF) Aercury Dissolved (CVAF) Aer	Result 0.00705 0.0935 <0.0008	Limit of Detection <0.0005 <0.0002 <0.0008 <0.001 <0.0003 <0.0001 <0.003 <0.0004 <0.0002 <0.001 <0.001 <0.001 <0.001	Result 0.0705 0.935 <0.0008	Limit of Detection <0.005 <0.002 <0.008 <0.01 <0.003 <0.001 <0.03 <0.004 <0.002 <0.01 <0.01 <0.01 <0.01 	using I 0.5 20 0.04 0.5 2 0.01 0.5 0.4 0.5 0.06 0.1 4	35 EN 12457-3 at L/S 2 100 1 10 50 0.2 10 10 10 10 10 0.7 0.5 50	10 l/kg 25 300 5 70 100 2 30 40 50 5 7 200
Arsenic Barium Cadmium Chromium Copper Mercury Dissolved (CVAF)	Result 0.00705 0.0935 <0.0008	Limit of Detection <0.0005 <0.0002 <0.0008 <0.001 <0.0003 <0.0001 <0.003 <0.0004 <0.0002 <0.001 <0.001 <0.001 <2	Result 0.0705 0.935 <0.0008	Limit of Detection <0.005 <0.002 <0.008 <0.01 <0.003 <0.001 <0.03 <0.004 <0.002 <0.01 <0.01 <0.01 <20 	using I 0.5 20 0.04 0.5 2 0.01 0.5 0.4 0.5 0.06 0.1 4 800	35 EN 12457-3 at L/S 2 100 1 10 50 0.2 10 10 10 10 0.7 0.5 50 15000	10 l/kg 25 300 5 70 100 2 30 40 50 5 7 200 25000
Arsenic larium Cadmium Chromium Copper Aercury Dissolved (CVAF) Aolybdenum lickel ead antimony selenium inc Chloride luoride	Result 0.00705 0.0935 <0.00008	Limit of Detection <0.0005 <0.0002 <0.0008 <0.0001 <0.0003 <0.0001 <0.0004 <0.0002 <0.0004 <0.0002 <0.001 <0.001 <2 <0.5	Result 0.0705 0.935 <0.0008	Limit of Detection <0.005 <0.002 <0.008 <0.01 <0.003 <0.001 <0.03 <0.004 <0.002 <0.01 <0.01 <20 <5 	using I 0.5 20 0.04 0.5 2 0.01 0.5 0.4 0.5 0.06 0.1 4 800 10	35 EN 12457-3 at L/S 2 100 1 10 50 0.2 10 10 10 10 10 0.7 0.5 50 15000 150	10 l/kg 25 300 5 70 100 2 30 40 50 5 7 200 25000 500
rsenic arium admium hromium opper lercury Dissolved (CVAF) lolybdenum ickel ead ntimony elenium inc hloride luoride ulphate (soluble)	Result 0.00705 0.0935 <0.0008	Limit of Detection <0.0005 <0.0002 <0.0008 <0.0001 <0.0003 <0.0001 <0.0004 <0.0002 <0.001 <0.001 <0.001 <2 <0.001 <2 <0.5 <2	Result 0.0705 0.935 <0.0008	Limit of Detection <0.005	using I 0.5 20 0.04 0.5 2 0.01 0.5 0.4 0.5 0.06 0.1 4 800 10 1000	2 100 1 10 10 50 0.2 10 10 10 10 10 10 10 10 50 50 50 15000 150 20000	10 l/kg 25 300 5 70 100 2 30 40 50 5 7 200 25000 500 500

itom Big Order Number: Supersoded Report: CEN 10:1 SINGLE STAGE LEACHATE TEST REF: BS EN 1 Result Site Location Cartron Big 180 Natural Moisture Content (%) 100 090 Dry Matter Content (%) 50 05% 50 50 055 50 50 055565 50 50 1-Juli-2018 5 5 P5 50 50 80-1.80 5 500 Result Stable Inert Waste Landfill 7.47 22.4 - - - - - - - 7.47 5 500 - 7.47 5 - - 7.47 5 - - 7.47 5 - - - 7.47 - - - - 7.47 - - - -			CERTIFICA	TE OF ANAL	YSIS					
CEN 10:1 SINGLE STAGE LEACHATE TEST REF : BS EN 1 Site Location Cartron Big 180 Natural Moisture Content (%) 100 090 Dry Matter Content (%) 50 05% Stable Stable Landfill Waste Acceptance Criteria Limits Stable Non-reactive Inert Waste 80-1.80 Stable Stable Stable Stable Stable Non-reactive Inert Waste Landfill Stable Non-reactive Inert Waste Landfill Stable Non-reactive Inert Waste Landfill Stable Non-reactive Hazardous Landfill Stable Non-reactive Hazardous Stable Non-reactive Hazardous Stable Non-reactive Hazardous Stable Non-reactive Hazardous Stable Non-reactive Hazardous Stable Non-reactive Hazardous Non-reactive Non-reactive Non-reactive Hazardous Stable Non-reactive Hazardous <t< th=""><th>SDG: Location:</th><th>180803-55 Cartron Big</th><th></th><th></th><th></th><th></th><th>468081</th><th></th></t<>	SDG: Location:	180803-55 Cartron Big					468081			
Site Location Cartron Big 180 Natural Moisture Content (%) 100 090 Dry Matter Content (%) 50 36% 50 50 Landfill Waste Acceptanc Criteria Limits 30803-55 50 305565 1-Jul-2018 P5 80 80<1.80 Stable Non-reactive Hazardous Waste Landfill Result 3 7.17 3 224 - - - - - 1 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - </th <th></th> <th></th> <th>10:1 SINGLE</th> <th>STAGE LEAC</th> <th>CHATE TEST</th> <th></th> <th></th> <th></th>			10:1 SINGLE	STAGE LEAC	CHATE TEST					
180 Natural Moisture Content (%) 100 090 Dry Matter Content (%) 50 35% Social Soc	VAC ANALYTICAL RESI	JLTS					REF : BS	EN 12457		
090 Dry Matter Content (%) 50 095% 50 30803-55 3053565 1-Jul-2018 Intert Waste P5 Stable 80 - 1.80 Intert Waste Result 3 7.17 22.4 - - <0.105	Client Reference			Site Location		Cartro	on Big			
30803-55 Stable Stable Non-reactive Hazardous Landfill Stable Non-reactive Hazardous Hazardous Landfill Landfill Landfill Landfill Landfill Landfill Landfill Linit values for compliance	Mass Sample taken (kg)	0.180		Natural Moistur	e Content (%)	100				
30803-55 3053565 1-Jul-2018 stable P5 80 - 1.80 Result 3 3 5 3 3 5 1 1/10/2018 P5 80 - 1.80 Result 3 3 5 1 1/1 1 3 3 5 3 3 5 3 3 5 1 1 3 3 5 1 1 1 1 1 1: colspan="2">1: colspan="2">1: colspan="2">1: colspan="2">1: colspan="2">1: colspan="2" 2. colspan= 2: colspan="2" <td <="" colspan="2" td=""><td>Mass of dry sample (kg)</td><td>0.090</td><td></td><td></td><td></td><td>50</td><td></td><td></td></td>	<td>Mass of dry sample (kg)</td> <td>0.090</td> <td></td> <td></td> <td></td> <td>50</td> <td></td> <td></td>		Mass of dry sample (kg)	0.090				50		
30803-55 3053565 1-Jul-2018 Stable Non-reactive Landfill Stable Non-reactive Landfill Non-reactive Landfill Har Wass 80-1.80	Particle Size <4mm	>95%		-	τ,					
30803-55 3053565 1-Jul-2018 Stable Non-reactive Landfill Stable Non-reactive Landfill Non-reactive Landfill Har Wass 80-1.80	Case					Land	fill Waste Acce	otance		
A-Jul-2018 Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill Stable Non-reactive Hazardous Landfill Hat waste in Non-Hazardous Landfill Hat waste in Non-Haza	SDG	180803-55					-			
ADDI-2016 Non-reactive Hazardous Waste In Non-Hazardous Landfill Non-reactive Hazardous Waste In Non-reactive Hazardous Waste In Non-reactive Hazardous Landfill Hazardous Waste In Non-reactive Hazardous Waste In Non-reactive Hazardous Landfill	_ab Sample Number(s)	18053565								
P5 Inert Waste Landfill Non-Factive Hazardous Landfill Hazardous Non-Factive Hazardous Landfill Hazardous Non-Factive Hazardous Landfill Hazardous Non-Factive Hazardous Landfill Hazardous Non-Factive Hazardous Landfill Hazardous Non-Factive Hazardous Landfill Hazardous Non-Factive Hazardous Landfill Hazardous Non-Factive Hazardous Landfill Hazardous Non- Hazardous Landfill Hazardous Landfill Hazardous Non- Hazardous Landfill Hazardous Landfill Hazard	Sampled Date	31-Jul-2018								
80 - 1.80 Landhil in Non-Hazardous Landfill Wasi 7.17 22.4 -	Customer Sample Ref.	TP5				Inert Waste		Hazardous		
Result 3 5 1 22.4 -	Depth (m)					Landfill	in Non-	Waste Landfi		
7.17 3 5 22.4 - - - <0.105		1.80 - 1.80								
22.4 - - - - - - - - - - - - - - - - - - - 1 - - - 1 - - - - - - - 100 - - 100 -<	Solid Waste Analysis	Result								
- - - - - - - - - - - - 1 - - 500 - - 500 - - 100 -<	otal Organic Carbon (%)	7.17				3	5	6		
- <0.105	oss on Ignition (%)	22.4						10		
2390 500 - <10	Sum of BTEX (mg/kg) Sum of 7 PCBs (mg/kg)	- <0.105						-		
7.67	lineral Oil (mg/kg)						-	-		
0.192	AH Sum of 17 (mg/kg)							-		
0.837 C2 Conc ⁿ in 10:1 eluate (mg/l) A 10:1 conc ⁿ leached (mg/kg) Limit of Detection Result Limit of Detection 0.00382 <0.0005	H (pH Units) NC to pH 6 (mol/kg)							-		
Result Limit of Detection Result Limit of Detection Result Limit of Detection 0.00382 <0.0005	NC to pH 4 (mol/kg)						-	-		
0.0249 <0.0002	Eluate Analysis	U 2								
<0.0008 <0.0008 <0.0008 <0.0008 0.04 1 <0.001	Arsenic							25		
<0.001 <0.001 <0.01 <0.01 0.5 10 <0.003	Barium							300		
<0.0003 <0.003 <0.003 <0.003 2 50 <0.0001	Cadmium							5 70		
<0.0001 <0.0001 <0.0001 <0.0001 0.01 0.2 0.0627 <0.003	Chromium Copper							100		
0.0627 <0.003 0.627 <0.03 0.5 10								2		
					-			30		
0.00287 <0.0004 0.0287 <0.004 0.4 10	•	0.00287	<0.0004			0.4		40		
<0.0002 <0.0002 <0.002 <0.002 0.5 10	ead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50		
0.00244 <0.001 0.0244 <0.01 0.06 0.7	Antimony	0.00244	<0.001	0.0244	<0.01	0.06	0.7	5		
0.00192 <0.001 0.0192 <0.01 0.1 0.5	Selenium	0.00192	<0.001	0.0192	<0.01	0.1	0.5	7		
		0.00264	<0.001	0.0264	<0.01	4	50	200		
		5.1	<2		<20	800	15000	25000		
5.1 <2 51 <20 800 15000 2										
5.1 <2 51 <20 800 15000 2 <0.5					-					
5.1 <2 51 <20 800 15000 2 <0.5					-			100000		
5.1 <2 51 <20 800 15000 2 <0.5	Dissolved Organic Carbon							- 1000		
<0.0002 <0.000 0.00244 <0.001 0.00192 <0.001	Mercury Dissolved (CVAF) Molybdenum Nickel Lead Antimony Selenium Zinc Chloride Fluoride Sulphate (soluble) Total Dissolved Solids	 <0.00001 0.0627 0.00287 <0.0002 0.00244 0.00192 0.00264 5.1 <0.5 314 	<0.000 <0.000 <0.000 <0.001 <0.001 <0.001 <0.001 <2 <0.5 <2)1 3 4 2 1	01 <0.0001 3 0.627 4 0.0287 2 <0.002	01 <0.0001 <0.0001 3 0.627 <0.03	01 <0.0001 <0.0001 0.01 3 0.627 <0.03	01 <0.0001 <0.0001 0.01 0.2 3 0.627 <0.03		
0.00244 <0.001 0.0244 <0.01 0.06 0.7		0.00244	<0.001	0.0244	<0.01	0.06	0.7	5		
	с	0.00264	<0.001	0.0264	<0.01	4	50	200		
0.00264 <0.001 0.0264 <0.01 4 50	lloride	5.1	<2	51	<20	800	15000	25000		
	uoride	<0.5	<0.5	<5	<5	10	150	500		
5.1 <2 51 <20 800 15000 2	ulphate (soluble)	314	<2	3140	<20	1000	20000	50000		
5.1 <2 51 <20 800 15000 2 <0.5		670	<5	6700	-	4000	60000	100000		
5.1 <2 51 <20 800 15000 2 <0.5	otal Monohydric Phenols (W)						-	-		
5.1 <2 51 <20 800 15000 2 <0.5	Issolved Organic Carbon	14.2	< 3	142	<30	500	800	1000		
5.1 <2 51 <20 800 15000 2 <0.5			I							
5.1 <2 51 <20 800 15000 2 <0.5	Date Prepared	06-Aug-2018								
5.1 <2 51 <20 800 15000 2 <0.5 <0.5 <5 <5 10 150 314 <2 3140 <20 1000 20000 5 670 <5 6700 <50 4000 60000 11 <0.016 <0.016 <0.16 <0.16 1 $ 14.2$ <3 142 <30 500 800 <0.00	Date Prepared H (pH Units)									
5.1 <2	Leach Test Information Date Prepared pH (pH Units) Conductivity (µS/cm) Temperature (°C)	7.96 869.00								



P1444

468081



SDG:

Client Reference: Order Number:

Report Number: Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
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
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
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
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
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
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
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	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS

NA = not applicable.

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



Client Reference: Order Number:

Report Number: Superseded Report:

Validated

468081

Test	Com	pletion	Dates

P1444

				protion
Lab Sample No(s)	18053550	18053555	18053560	18053565
Customer Sample Ref.	TP1	TP3	TP4	TP5
· · · ·				
AGS Ref.				
Depth	1.80 - 1.80	2.50 - 2.50	1.20 - 1.20	1.80 - 1.80
Туре	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
ANC at pH4 and ANC at pH 6	06-Aug-2018	06-Aug-2018	06-Aug-2018	06-Aug-2018
Anions by Kone (w)	09-Aug-2018	09-Aug-2018	10-Aug-2018	09-Aug-2018
CEN 10:1 Leachate (1 Stage)	06-Aug-2018	06-Aug-2018	06-Aug-2018	06-Aug-2018
CEN Readings	07-Aug-2018	07-Aug-2018	07-Aug-2018	07-Aug-2018
Coronene	08-Aug-2018	08-Aug-2018	08-Aug-2018	08-Aug-2018
Dissolved Metals by ICP-MS	09-Aug-2018	09-Aug-2018	09-Aug-2018	10-Aug-2018
Dissolved Organic/Inorganic Carbon	10-Aug-2018	09-Aug-2018	10-Aug-2018	09-Aug-2018
Fluoride	08-Aug-2018	08-Aug-2018	08-Aug-2018	08-Aug-2018
Loss on Ignition in soils	09-Aug-2018	09-Aug-2018	09-Aug-2018	09-Aug-2018
Mercury Dissolved	09-Aug-2018	09-Aug-2018	09-Aug-2018	09-Aug-2018
Mineral Oil	09-Aug-2018	10-Aug-2018	09-Aug-2018	10-Aug-2018
PAH 16 & 17 Calc	08-Aug-2018	13-Aug-2018	08-Aug-2018	13-Aug-2018
PAH by GCMS	08-Aug-2018	08-Aug-2018	08-Aug-2018	10-Aug-2018
PCBs by GCMS	09-Aug-2018	08-Aug-2018	08-Aug-2018	09-Aug-2018
рН	07-Aug-2018	07-Aug-2018	07-Aug-2018	07-Aug-2018
Phenols by HPLC (W)	10-Aug-2018	09-Aug-2018	09-Aug-2018	09-Aug-2018
Sample description	03-Aug-2018	03-Aug-2018	03-Aug-2018	03-Aug-2018
Total Dissolved Solids	08-Aug-2018	08-Aug-2018	08-Aug-2018	08-Aug-2018
Total Organic Carbon	12-Aug-2018	12-Aug-2018	12-Aug-2018	12-Aug-2018
VOC MS (S)	10-Aug-2018	10-Aug-2018	10-Aug-2018	10-Aug-2018

	SDG:	180803-55	Client Reference:	P1444	Report Number:	468081
ALE	Location:	Cartron Big	Order Number:		Superseded Report:	
(ALS)						

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 sumples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

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

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt . However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. Surrogate recoveries - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. 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-lsopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

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

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

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

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

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
Chrysof le	White Asbestos
Amosite	Brow n Asbestos
Cro ci dolite	Blue Asbe stos
Fibrous Actinolite	
Fib to us Anthop hyll ite	-
Fibrous Tremol ite	-

Visual Estimation Of Fibre Content

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

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

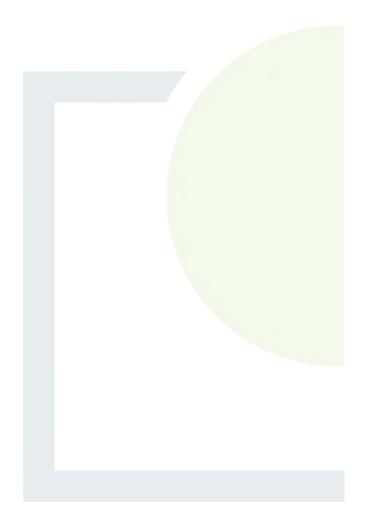
The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

APPENDIX 4

Groundwater and Surface Water Sampling Analysis Results





Fehily Timoney 3rd Floor North Park Offices North Park Business Park North Road Dublin Dublin 11

Attention: Daniel Hayden

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: 09 October 2018 D_FTIM_DUB 180927-86 P1444 Cartron Big 475903

We received 9 samples on Thursday September 27, 2018 and 9 of these samples were scheduled for analysis which was completed on Tuesday October 09, 2018. 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 Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Approved By:

<u>Sonia McWhan</u> Operations Manager



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

	SE
(ALS)	Lo

DG: 180927-86 P1444 475903 **Client Reference:** Report Number: Z1162 Superseded Report: ocation: Cartron Big Order Number:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18414731	GW01		0.00 - 0.00	26/09/2018
18414743	GW02		0.00 - 0.00	26/09/2018
18414752	GW03		0.00 - 0.00	26/09/2018
18414765	LH01		0.00 - 0.00	26/09/2018
18414784	LH02		0.00 - 0.00	26/09/2018
18414804	SW1		0.00 - 0.00	26/09/2018
18414814	SW2		0.00 - 0.00	26/09/2018
18414821	SW3		0.00 - 0.00	26/09/2018
18414830	SW4		0.00 - 0.00	26/09/2018

Maximum Sample/Coolbox Temperature (°C) :

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

15.8 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.

Validated

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

																				Vali	idated	1
ALS	SDG: Location:	180927-86 Cartron Big	С		nt Re	CAT ferend mber:	ce:	F Α P14 Z116	44	_YS	IS				Numb ded Re			4759	03			
Results Legend X Test	mination	Lab Sample I	No(s)					18414731					18414743					18414752				
Sample Types -		Custome Sample Refe	-					GW01					GW02					GW03				
S - Soil/Solid UNS - Unspecified S GW - Ground Water SW - Surface Water LE - Land Leachate		AGS Refere	nce																			
PL - Prepared Leach PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage)	Depth (m)					0.00 - 0.00					0.00 - 0.00					0.00 - 0.00				
RE - Recreational Wa DW - Drinking Water Na UNL - Unspecified Li SL - Sludge G - Gas OTH - Other	on-regulatory	Containe	r	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	1000ml glass bottle (ALE220)	250ml BOD (ALE212)	500ml Plastic (ALE208)	
		Sample Ty	ре	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	Ē	Ē	Ē	
Alkalinity as CaCO3		All	NDPs: 0 Tests: 5		x					x					x						x	
Ammoniacal Nitrogen		All	NDPs: 0 Tests: 9			x					X					X						
Anions by Kone (w)		All	NDPs: 0 Tests: 9		x					x					x						x	

184 14765

LHO1

0.00 - 0.00

H2SO4 (ALE244)

E E

Х

Х

Х

Х

Х

Х

Х

Х

Х

х

Х

Х

BOD True Filtered

COD Unfiltered

Coliforms (W)

Conductivity (at 20 deg.C)

Dissolved Metals by ICP-MS

Dissolved Oxygen by Probe

Fluoride

Mercury Dissolved

Nitrite by Kone (w)

Mineral Oil C10-40 Aqueous (W)

Organotins in Aqueous Samples

Cyanide Comp/Free/Total/Thiocyanate

All

NDPs: 0 Tests: 6

NDPs: 0 Tests: 2

NDPs: 0 Tests: 3

NDPs: 0 Tests: 9

NDPs: 0 Tests: 5

NDPs: 0 Tests: 9

NDPs: 0 Tests: 9

NDPs: 0 Tests: 5

NDPs: 0 Tests: 5

NDPs: 0 Tests: 2

NDPs: 0 Tests: 2

NDPs: 0

Tests: 2

Х

Х

Х

Х

Х

Х

Х

Х

Х

Х

Х

Х

Х

Х

Х

Х

Х

Х

		18414765								18414784					184 14804					184 148 14				18414821
		LHOT								LH02					SW1					SW2				SW3
		0.00 - 0.00								0.00 - 0.00					0.00 - 0.00					0.00 - 0.00				0.00 - 0.00
HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	1000ml glass bottle (ALE220)	(ALE212)	(ALE208)	HZSU4 (ALEZ44)	(ALE204)	HNO3 Filtered	NaOH (ALE245)	Vial (ALE297)	(ALE212)	(ALE208)	500ml Plastic	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	(ALE212)		500ml Plastic	H2SO4 (ALE244)	HNU3 Filtered (ALE204)	(ALE212)	250ml BOD	500ml Plastic (ALE208)	H2SO4 (ALE244)
Ē	Ē	F			; F	; F	i	Ē	Ē	Fi	SW	2	WS	WS	SW		ŝ	WS	SW	SW		WS	WS	SW
					X	X								X					X					X
					x							×	(x					x	
				X X							x					x					×			
	X				x							×	(x					x	
x	×							x	X						x					x				
					x							×	(x					x	
x					X			x																
			x																					
	x								x															
			X																					

		С	ERT	IFIC	:AT	ΕO	FΑ	ΝΔΙ	YS	IS									Vali	idated	ł
SDG: Location:	180927-86 Cartron Big		Clie	nt Rei er Nu	erend	ce:	P14 Z11	44						Numb ded Re			4759	03			
Results Legend X Test N No Determination	Lab Sample	No(s)					18414731					18414743					18414752				18414765
Possible	Custome Sample Refe						GW01					GW02					GW03				LH01
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate	AGS Refere	ence																			
PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage	Depth (n	1)					0.00 - 0.00					0.00 - 0.00					0.00 - 0.00				0.00 - 0.00
RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Containe	er	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	1000ml glass bottle (ALE220)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)
	Sample Ty	pe	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	Ē	Ē	Ē	Ē
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 2																x			
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 2																X			
Pesticides (Suite III) by GCMS	All	NDPs: 0 Tests: 2																X			
pH Value	All	NDPs: 0 Tests: 9		X					x					X						X	
Phosphate by Kone (w)	All	NDPs: 0 Tests: 2	-																	x	
Silicon Dissolved by ICP-OES	All	NDPs: 0 Tests: 2																			
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 2																X			
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 5			X					x					X						X

VOC MS (W)

All

Х

NDPs: 0 Tests: 2 Х

Х

Х

		18414765							18414784				184 14804				18414814			18414821
		LH01							LH02				SW1				SW2			SW3
		0.00 - 0.00							0.00 - 0.00				0.00 - 0.00				0.00 - 0.00			0.00 - 0.00
HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	1000ml glass bottle (ALE220)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)
Ē	Ē	E	Ē	Ē	Ē	E	Ē	Ē	E	SW	SW	WS	WS	SM	WS	SM	WS	SM	WS	WS
			x																	
			X																	
			x																	
					X						X				X				v	
											×				×				x	
					X															
x							x													
			x																	
						X														
		Х							Х											

SDG: Location:	180927-86 Cartron Big				feren mber:		P144 Z116	475
Results Legend X Test N No Determination	Lab Sample	e No(s)	18414821				184 14830	
Possible Sample Types -	Custom Sample Refe		SW3				SW4	
S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate	AGS Refer	ence						
PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage	Depth (ı	m)	0.00 - 0.00				0.00 - 0.00	
RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Contain	er	HNO3 Filtered (ALE204)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	
	Sample T	уре	WS	SM	WS	SM	WS	
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 9				X		
Anions by Kone (w)	All	NDPs: 0 Tests: 9			x			
BOD True Filtered	All	NDPs: 0 Tests: 6		x				
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 9			x			
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 9	x				x	
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 9			x			
pH Value	All	NDPs: 0 Tests: 9			X			



Validated **CERTIFICATE OF ANALYSIS** SDG: 180927-86 P1444 **Client Reference:** Report Number: 475903 Location: Cartron Big Order Number: Z1162 Superseded Report: Customer Sample Ref. Results Lege ISO17025 accredited. GW01 GW02 GW03 LH01 LH02 SW1 ISO17025 accredited.
 M mCERTS accredited.
 M mCERTS accredited sample.
 diss.fit Dissolved / fittered sample.
 tot.unfit Total / unfittered sample.
 * Subcontracted test.
 * % recovery of the surrogate standard to
 check the efficiency of the method. The
 results of individual compounds within
 samples aren't corracted for the recovery
 (F) Trigger breach confirmed
 1-58+§@ Sample deviation (see appendix) Depth (m) 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 Sample Type Date Sampled Ground Water (GW) 26/09/2018 Ground Water (GW) 26/09/2018 Ground Water (GW) 26/09/2018 Land Leachate (LE) 26/09/2018 Land Leachate (LE) 26/09/2018 Surface Water (SW) 26/09/2018 Sample Time . 27/09/2018 . 27/09/2018 . 27/09/2018 . 27/09/2018 . 27/09/2018 . 27/09/2018 Date Received 180927-86 18414731 180927-86 18414743 180927-86 18414752 180927-86 18414765 180927-86 18414784 180927-86 18414804 SDG Ref Lab Sample No.(s) AGS Reference Component LOD/Units Method Coliforms, Total* 921 1610 2180 CFU/100ml SUB Alkalinity, Total as CaCO3 TM043 415 473 942 1680 9500 <2 mg/l # # # # # BOD, filtered TM045 35 <1 mg/l >1310 <1 Oxygen, dissolved <0.3 mg/l TM046 9.02 8.69 7.5 4.35 0.35 12.6 Or An Flu СС Со

						1						
Organic Carbon, Total	<3 mg/l	TM090	<3	3.98	#	18.9	#	55.9		6400		
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	0.401	" 0.423 #	#	29.3	#	223	+	3080	<0.2	#
Fluoride	<0.5 mg/l	TM104	<0.5	<i>""</i> <0.5	#	<0.5	#	<0.5	╡	<2.5		π
COD, unfiltered	<7 mg/l	TM107		#	#		#	178	#	19800 #		
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	0.74	0.711	щ	0.902	ц.	4.38		47.6	0.6	
Antimony (diss.filt)	<1 µg/l	TM152		#	#		#	<1	#	# <6		#
Arsenic (diss.filt)	<0.5 µg/l	TM152	2.86	1.98		3.15		4.3		33		
Barium (diss.filt)	<0.2 µg/l	TM152		#	#		#	651	#	# 675		
Beryllium (diss.filt)	<0.1 µg/l	TM152					+	<0.1	#	# <0.6		
Boron (diss.filt)	<10 µg/l	TM152	83.7	12.5		214		644	#	# 164		
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08	# <0.08	#	0.0828	#	<0.08	#	#		
Chromium (diss.filt)	<1 µg/l	TM152	<1	# <1	#	<1	#	2.1	#	# 150		
Cobalt (diss.filt)	<0.5 µg/l	TM152		#	#		#	8.82	#	# 26.2		
Copper (diss.filt)	<0.3 µg/l	TM152	0.858	<0.3		7.67	+	1.16	#	# <1.8		
Lead (diss.filt)	<0.2 µg/l	TM152	<0.2	# <0.2	#	<0.2	#	0.377	#	# 1.46	<u> </u>	
Manganese (diss.filt)	<3 µg/l	TM152		# 398	#	157	#	958	#	# 2300		
Molybdenum (diss.filt)	<3 µg/l	TM152		#	#		#	<3	#	=======================================		
Nickel (diss.filt)	<0.4 µg/l	TM152	16.8	3.31		36.5	+	29.8	#	132		
. ,		TM152		# 10.3	#	31.6	#	484	#	# 12400		
Phosphorus (diss.filt)	<10 µg/l			#	#	31.0	#		#	#		
Selenium (diss.filt)	<1 µg/l	TM152						<1	#	<6 #		
Tellurium (diss.filt)	<2 µg/l	TM152						<2		<12		
Thallium (diss.filt)	<2 µg/l	TM152						<2	#	<12 #		
Titanium (diss.filt)	<1 µg/l	TM152						17.9	#	222 #		
Uranium (diss.filt)	<0.5 µg/l	TM152						0.93	#	7.96 #		
Vanadium (diss.filt)	<1 µg/l	TM152						<1	#	15.9 #		
Zinc (diss.filt)	<1 µg/l	TM152	4.65	3.18	#	19.9	#	8.41	#	46.4 #		
Tin (Diss.Filt)	<1 µg/l	TM152						1.35	#	38.9 #		
Silver (diss.filt)	<0.5 µg/l	TM152					+	<0.5	#	<3 #		
Sodium (Dis.Filt)	<0.076 mg/l	TM152	18.8	#	#	166	#	329	#		15.3	#
12:21:36 09/10/2018			ļ	Fage 8	#		#		#	#	<u> </u>	#



Results Legend		Customer Sample Ref.	GW01	GW02	GW03	LH01	LH02	SW1
# ISO17025 accredited. M mCERTS accredited.								
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m) Sample Type	0.00 - 0.00 Ground Water (GW)	0.00 - 0.00 Ground Water (GW)	0.00 - 0.00 Ground Water (GW)	0.00 - 0.00 Land Leachate (LE)	0.00 - 0.00 Land Leachate (LE)	0.00 - 0.00 Surface Water (SW)
tot.unfilt Total / unfiltered sample. * Subcontracted test.		Date Sampled	26/09/2018	26/09/2018	26/09/2018	26/09/2018	26/09/2018	26/09/2018
** % recovery of the surrogate stand check the efficiency of the method	i. The	Sample Time Date Received	. 27/09/2018	. 27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
results of individual compounds v samples aren't corrected for the re		SDG Ref	180927-86	180927-86	180927-86	180927-86	180927-86	180927-86
(F) Trigger breach confirmed 1-5&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	18414731	18414743	18414752	18414765	18414784	18414804
Component	LOD/Units	s Method						
Magnesium (Dis.Filt)	<0.036 mg	/I TM152	30.6	10.5	57.8	58.9	95.5	
Potassium (Dis.Filt)	<0.2 mg/l	TM152	6.05	# 1.65	# 33.1	# 82.4	#	3.17
	-0.2 mg/i	TWITE	#	#	#	02.4 #	#	#
Calcium (Dis.Filt)	<0.2 mg/l	TM152	114	160	174	188	303	
			#	#	#	#	#	
Iron (Dis.Filt)	<0.019 mg	/I TM152	0.0277	<0.019	<0.019	34.7	23.4	
Mineral oil >C10 C40 (aq)	<100 µg/l	TM172	#	#	#	# 1310	#	
	100 µg/i	111172				1010	121	
Mercury (diss.filt)	<0.01 µg/	1 TM183	<0.01	<0.01	<0.01	<0.01	<0.01	
			#	#	#	#	#	
Phosphate (Ortho as PO4)	<0.05 mg/	/I TM184				<0.05	30.7	
Sulphata	<0"	TM404	32	26.9	124)E E	130	32.3
Sulphate	<2 mg/l	TM184	32 #	26.9	124 #	25.5	150	32.3 #
Chloride	<2 mg/l	TM184	15.1	24	66.3	613	14500	27.3
	<u>,</u>		#	#	#			#
Nitrite as N	<0.0152	TM184				<0.0152	<0.0152	
	mg/l		0.550	0.1	0.444		0.405	
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184	0.556 #	<0.1 #	0.114 #	<0.1	0.125	
Cyanide, Total	<0.05 mg/	/I TM227	<0.05	<0.05	<0.05	<0.05	<0.05	
	elee ing		#	#	#	#	#	
Cyanide, Free	<0.05 mg/	/I TM227				<0.05	<0.05	
						#	#	
рН	<1 pH Unit	ts TM256	7.6	7.27	7.37	7.14	7.52	8.08
Silicon (diss.filt)	<0.05 mg/	/I TM284	#	#	#	# 13.2	#	#
	<0.03 mg/	1 11/12/04				15.2	5.75	
Dibutyl tin	<5 ng/l	TM328				<5	<5	
Tributyl tin	<1 ng/l	TM328				<1	<1	
Tetrabutyl tin	<2 ng/l	TM328				<2	<2	
	~2 lig/i	1101320				~2	~2	
Triphenyl tin	<1 ng/l	TM328				<1	<1	
Surrogate	%	TM328				80.2	61.3	
Trifluralin	<0.01 µg/	1 TM343				<0.02	<0.02	
IIIIuidiii	<0.01 μg/	1 110345				∼ 0.02	~0.02	
alpha-HCH	<0.01 µg/	1 TM343				<0.02	<0.02	
gamma-HCH (Lindane)	<0.01 µg/	1 TM343				<0.02	<0.02	
Heptachlor	<0.01 µg/	1 TM343				<0.03	<0.03	
Ποριαστιιοι	~0.01 µg/	1 11/043				NU.UO	<u>\0.05</u>	
Aldrin	<0.01 µg/	1 TM343				<0.03	<0.03	
beta-HCH	<0.01 µg/	1 TM343				<0.01	<0.01	
Isodrin	20.04	1 TM343				<0.02	<0.02	
ISUUIII	<0.01 µg/	1 11/1043				≤ 0.02	NU.UZ	
Heptachlor epoxide	<0.01 µg/	1 TM343				<0.02	<0.02	
o,p'-DDE	<0.01 µg/	1 TM343				<0.02	<0.02	
Endoquinhor	Z0.04 ··· /	1 TM343				<0.02	<0.02	
Endosulphan I	<0.01 µg/	1 11/1043				≤ 0.02	NU.UZ	
trans-Chlordane	<0.01 µg/	1 TM343				<0.02	<0.02	
cis-Chlordane	<0.01 µg/	'I TM343				<0.02	<0.02	
	1							



_

SDG: Location:		180927-86 Cartron Big	Clien	t Reference:	P1444 Z1162	Report Numb Superseded Re		
		54.1.011 2.9	<u> </u>					
Results Legend # ISO17025 accredited. M mCERTS accredited.	Cu	ustomer Sample Ref.	GW01	GW02	GW03	LH01	LH02	SW1
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test. ** % recovery of the surrogate stand check the efficiency of the methoo results of individual compounds w samples aren't corrected for the re	d. The within	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref	0.00 - 0.00 Ground Water (GW) 26/09/2018 27/09/2018 180927-86	0.00 - 0.00 Ground Water (GW) 26/09/2018	0.00 - 0.00 Ground Water (GW) 26/09/2018 	0.00 - 0.00 Land Leachate (LE) 26/09/2018 27/09/2018 180927-86	0.00 - 0.00 Land Leachate (LE) 26/09/2018 27/09/2018 180927-86	0.00 - 0.00 Surface Water (SW) 26/09/2018 27/09/2018 180927-86
(F) Trigger breach confirmed 1-5&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	18414731	18414743	18414752	18414765	18414784	18414804
Component p,p'-DDE	LOD/Units <0.01 μg/l	Method TM343				<0.02	<0.02	
Dieldrin	<0.01 µg/l	TM343				<0.02	<0.02	
o,p'-DDD (TDE)	<0.01 µg/l	TM343				<0.02	<0.02	
Endrin	<0.01 µg/l	TM343				<0.02	<0.02	
o,p'-DDT	<0.01 µg/l	TM343				<0.04	<0.04	
p,p'-DDD (TDE)	<0.01 µg/l	TM343				<0.02	<0.02	
Endosulphan II	<0.02 µg/l	TM343				<0.04	<0.04	
p,p'-DDT	<0.01 µg/l	TM343				<0.04	<0.04	
p,p'-Methoxychlor	<0.01 µg/l	TM343				<0.04	<0.04	
Endosulphan Sulphate	<0.02 µg/l	TM343				<0.02	<0.02	
Permethrin I	<0.01 µg/l	TM343				<0.01	<0.01	
Permethrin II	<0.01 µg/l	TM343				<0.01	<0.01	
Dichlorvos	<0.01 µg/l	TM344				<0.01	<0.01	
Mevinphos	<0.01 µg/l	TM344				<0.01	<0.01	
Tecnazene	<0.01 µg/l	TM344				<0.01	<0.01	
Hexachlorobenzene	<0.01 µg/l	TM344				<0.01	<0.01	
Diazinon	<0.01 µg/l	TM344				<0.01	<0.01	
Triallate	<0.01 µg/l	TM344				<0.01	<0.01	
Atrazine	<0.01 µg/l	TM344				<0.01	<0.01	
Simazine	<0.01 µg/l	TM344				<0.01	<0.01	
Disulfoton	<0.01 µg/l	TM344				<0.01	<0.01	
Propetamphos	<0.01 µg/l	TM344				<0.01	<0.01	
Chlorpyriphos-methyl	<0.01 µg/l	TM344				<0.01	<0.01	
Dimethoate	<0.01 µg/l	TM344				<0.01	<0.01	
Pirimiphos-methyl	<0.01 µg/l	TM344				<0.01	<0.01	
Chlorpyriphos	<0.01 µg/l	TM344				<0.01	<0.01	
Methyl Parathion	<0.01 µg/l	TM344				<0.01	<0.01	
Malathion	<0.01 µg/l	TM344				<0.01	<0.01	
Fenthion	<0.01 µg/l	TM344				<0.01	<0.01	
Fenitrothion	<0.01 µg/l	TM344				<0.01	<0.01	
Triadimefon	<0.01 µg/l	TM344				<0.01	<0.01	
Pendimethalin	<0.01 µg/l	TM344				<0.01	<0.01	

SDG:								
ALS Location		180927-86 Cartron Big			444 162	Report Numb Superseded Re		
					_			
Results Legend # ISO17025 accredited. M mCERTS accredited.		Customer Sample Ref.	GW01	GW02	GW03	LH01	LH02	SW1
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
ot.unfilt Total / unfiltered sample. * Subcontracted test. ** % recovery of the surrogate star	ndard to	Sample Type Date Sampled Sample Time	Ground Water (GW) 26/09/2018	Ground Water (GW) 26/09/2018	Ground Water (GW) 26/09/2018	Land Leachate (LE) 26/09/2018	Land Leachate (LE) 26/09/2018	Surface Water (SW) 26/09/2018
check the efficiency of the meth results of individual compounds	od. The s within	Date Received SDG Ref	27/09/2018 180927-86	27/09/2018 180927-86	27/09/2018 180927-86	27/09/2018 180927-86	27/09/2018 180927-86	27/09/2018 180927-86
(F) Trigger breach confirmed -5&+§@ Sample deviation (see appendix		Lab Sample No.(s)	18414731	18414743	18414752	18414765	18414784	18414804
Component	LOD/Units	AGS Reference Method						
Parathion	<0.01 µg/l	TM344				<0.01	<0.01	
Chlorfenvinphos	<0.01 µg/l	TM344				<0.01	<0.01	
thion	<0.01 µg/l	TM344				<0.01	<0.01	
Carbophenothion	<0.01 µg/l	TM344				<0.01	<0.01	
riazophos	<0.01 µg/l	TM344				<0.01	<0.01	
Phosalone	<0.01 µg/l	TM344				<0.01	<0.01	
zinphos methyl	<0.02 µg/l	TM344				<0.02	<0.02	
zinphos ethyl	<0.02 µg/l	TM344				<0.02	<0.02	
Quintozene (PCNB)	<0.01 µg/l	TM345				<0.01	<0.01	
elodrin	<0.01 µg/l	TM345				<0.01	<0.01	
Chlorothalonil	<0.01 µg/l	TM345				<0.01	<0.01	
trimphos	<0.01 µg/l	TM345				<0.01	<0.01	
	_							
	+							
		+						

Validated **CERTIFICATE OF ANALYSIS** SDG: 180927-86 P1444 **Client Reference:** Report Number: 475903 Location: Cartron Big Order Number: Z1162 Superseded Report: Customer Sample Ref. Results Leg ISO17025 accredited. SW2 SW3 SW4 mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. м aq diss.filt tot.unfilt Depth (m) 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 Surface Water (SW) 26/09/2018 Surface Water (SW) 26/09/2018 Surface Water (SW) 26/09/2018 Sample Type tot.unfit Total / unfittered sample. Subcontracted test. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-5&+§@ Sample deviation (see appendix) Date Sample Sample Time . 27/09/2018 . 27/09/2018 . 27/09/2018 Date Received 180927-86 18414814 180927-86 18414821 SDG Re 180927-86 18414830 Lab Sample No.(s) AGS Reference LOD/Units Component Method BOD, filtered TM045 <1 <1 <1 <1 mg/l TM046 12.1 11.9 9.69 Oxygen, dissolved <0.3 mg/l 0.842 TM099 Ammoniacal Nitrogen as N <0.2 mg/l <0.2 < 0.2 # # # Conductivity @ 20 deg.C < 0.005 TM120 0.613 0.605 0.615 mS/cm # # # Sodium (Dis.Filt) <0.076 mg/l TM152 16 20 19.4 # # # Potassium (Dis.Filt) <0.2 mg/l TM152 3.14 3.16 3.43 # # # Sulphate <2 mg/l TM184 31.9 32 32.1 # # # Chloride <2 mg/l TM184 27.4 27.4 29.7 # # # pН <1 pH Units TM256 8.17 8.24 8.05 # # #

		-			

Validated

_

SDG: Location:		180927-86 Cartron Big		it Reference: r Number:	P1444 Z1162	Report Number: Superseded Report:	475903
(ALS) Location: SVOC MS (W) - Aqueou		ourron big			21102		
Results Legend # ISO17025 accredited.		ustomer Sample Ref.	LH01	LH02			
M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. totunfilt Total / unfiltered sample. Subcontracted test. * Subcontracted test. * hereovery of the surrogate stand check the efficiency of the methoo	d. The	Depth (m) Sample Type Date Sampled Sample Time Date Received	0.00 - 0.00 Land Leachate (LE) 26/09/2018 27/09/2018	0.00 - 0.00 Land Leachate (LE) 26/09/2018 27/09/2018			
results of individual compounds v samples aren't corrected for the re	vithin ecovery	SDG Ref	180927-86	180927-86 18414784			
(F) Trigger breach confirmed 1-5&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	16414705	10414704			
Component 1,2,4-Trichlorobenzene (aq)	LOD/Units <1 µg/l	Method TM176	<1	<800			
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<800			
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<800			
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<800			
2,4,5-Trichlorophenol (aq)		TM176	<1	<800			
	<1 µg/l						
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<800			
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<1	<800			
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<1	<800			
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<800			
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<800			
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<1	<800			
2-Chlorophenol (aq)	<1 µg/l	TM176	<1	<800			
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1	<800			
2-Methylphenol (aq)	<1 µg/l	TM176	<1	<800			
2-Nitroaniline (aq)	<1 µg/l	TM176	<1	<800			
2-Nitrophenol (aq)	<1 µg/l	TM176	<1	<800			
3-Nitroaniline (aq)	<1 µg/l	TM176	<1	<800			
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<1	<800			
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<1	<800			
4-Chloroaniline (aq)	<1 µg/l	TM176	<1	<800			
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<1	<800			
4-Methylphenol (aq)	<1 µg/l	TM176	<1	11400			
4-Nitroaniline (aq)	<1 µg/l	TM176	<1	<800			
4-Nitrophenol (aq)	<1 µg/l	TM176	<1	<800			
Azobenzene (aq)	<1 µg/l	TM176	<1	<800			
Acenaphthylene (aq)	<1 µg/l	TM176	<1	<800			
Acenaphthene (aq)	<1 µg/l	TM176	<1	<800			
Anthracene (aq)	<1 µg/l	TM176	<1	<800			
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<1	<800			
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<1	<800			
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	13.9	<1600			
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	<800			
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<1	<800		I	I

CERTIFICATE OF ANALYSIS

				FICATE OF A	
SDG: Location:		80927-86 Cartron Big		t Reference: P14 r Number: Z11	
VOC MS (W) - Aqueou					
Results Legend # ISO17025 accredited.		ustomer Sample Ref.	LH01	LH02	
M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	0.00 - 0.00 Land Leachate (LE)	0.00 - 0.00 Land Leachate (LE)	
* Subcontracted test. ** % recovery of the surrogate stand		Date Sampled Sample Time	26/09/2018	26/09/2018	
check the efficiency of the method results of individual compounds w	vithin	Date Received SDG Ref	27/09/2018 180927-86	27/09/2018 180927-86	
samples aren't corrected for the re (F) Trigger breach confirmed 1-5&+§@ Sample deviation (see appendix)	ecovery	Lab Sample No.(s)	18414765	18414784	
Component	LOD/Units	AGS Reference Method			
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176	<1	<800	
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<1	<800	
Benzo(a)pyrene (aq)	<1 µg/l	TM176	<1	<800	
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176	<1	<800	
Carbazole (aq)	<1 µg/l	TM176	<1	<800	
Chrysene (aq)	<1 µg/l	TM176	<1	<800	
Dibenzofuran (aq)	<1 µg/l	TM176	<1	<800	
n-Dibutyl phthalate (aq)	<1 µg/l	TM176 TM176	<1	<800	
Dietry prinalia (aq) Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176	<1	<800	
Dimethyl phthalate (aq)	<1 µg/l	TM176	<1	<800	
n-Dioctyl phthalate (aq)	<5 µg/l	TM176	<5	<4000	
Fluoranthene (aq)	<1 µg/l	TM176	<1	<800	
Fluorene (aq)	<1 µg/l	TM176	<1	<800	
Hexachlorobenzene (aq)	<1 µg/l	TM176	<1	<800	
Hexachlorobutadiene (aq)	<1 µg/l	TM176	<1	<800	
Pentachlorophenol (aq)	<1 µg/l	TM176	<1	<800	
Phenol (aq)	<1 µg/l	TM176	<1	11200	
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176	<1	<800	
Hexachloroethane (aq) Nitrobenzene (aq)	<1 µg/l	TM176 TM176	<1	<800	
Nitrobenzene (aq)	<1 μg/l <1 μg/l	TM176	<1	<800	
Isophorone (aq)	<1 µg/l	TM176	<1	<800	
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176	<1	<800	
Phenanthrene (aq)	<1 µg/l	TM176	<1	<800	
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176	<1	<800	
Pyrene (aq)	<1 µg/l	TM176	<1	<800	

_

SDG: Location	1:	180927-86 Cartron Big		t Reference: r Number:	P144 Z116	475903
OC MS (W)				-		
Results Legend # ISO17025 accredited.		Customer Sample Ref.	LH01	LH02		
M mCERTS accredited. aq Aqueous / settled sample.		Donth (m)	0.00	0.00, 0.00		
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	0.00 - 0.00 Land Leachate (LE)	0.00 - 0.00 Land Leachate (LE	E)	
* Subcontracted test. ** % recovery of the surrogate sta	andard to	Date Sampled	26/09/2018	26/09/2018		
check the efficiency of the met	hod. The	Sample Time Date Received	. 27/09/2018	27/09/2018		
results of individual compound samples aren't corrected for th	ls within e recovery	SDG Ref	180927-86	180927-86		
(F) Trigger breach confirmed 1-5&+\$@ Sample deviation (see appendi	x)	Lab Sample No.(s) AGS Reference	18414765	18414784		
Component	LOD/Units					
Dibromofluoromethane**	%	TM208	101	94.7		
Toluene-d8**	%	TM208	99.5	100		
4-Bromofluorobenzene**	%	TM208	96	91.4	+	
Dichlorodifluoromethane	<1 µg/l	TM208	13.2	18.2		
Chloromethane	<1 µg/l	TM208	# <1	<1	#	
Vinyl chloride	<1 µg/l	TM208	# <1	<1	#	
Bromomethane	<1 µg/l	TM208	# <1	<1	#	
Chloroethane	<1 µg/l	TM208	2.11	<1	#	
Trichlorofluoromethane	<1 µg/l	TM208	* <1	<1	#	
1,1-Dichloroethene	<1 µg/l	TM208	# <1	<1	#	
Carbon disulphide	<1 µg/l	TM208	# <1	<1	#	
Dichloromethane	<3 µg/l	TM208	* <3 #	<3	#	
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	# <1 #	<1	#	
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1 #	<1	#	
1,1-Dichloroethane	<1 µg/l	TM208	<1 #	<1	#	
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1 #	7.07	#	
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1		
Bromochloromethane	<1 µg/l	TM208	<1 #	<1	#	
Chloroform	<1 µg/l	TM208	<1 #	<1	#	
1,1,1-Trichloroethane	<1 µg/l	TM208	<1 #		#	
1,1-Dichloropropene	<1 µg/l	TM208 TM208	<1 #	<1 <1	#	
	<1 µg/l		#		#	
1,2-Dichloroethane	<1 µg/l	TM208	<1 # 2.5	<1 4.3	#	
Benzene	<1 µg/l	TM208 TM208	2.5 #	2.04	#	
1,2-Dichloropropane	<1 µg/l	TM200	<1 *1	<1	#	
Dibromomethane	<1 µg/l	TM200	<1 #		#	
Bromodichloromethane	<1 µg/l	TM200	<1 #	<1	#	
cis-1,3-Dichloropropene	<1 µg/l	TM200	<1 #	<1	#	
Toluene	<1 µg/l	TM208	<1 #		#	
trans-1,3-Dichloropropene	<1 µg/l	TM208	- #	<1	#	
1,1,2-Trichloroethane	<1 µg/l	TM208	<1 #		#	
1,3-Dichloropropane	<1 µg/l	TM208		· <1	#	
2:21:36 09/10/2018	· ۳۵''		#	, i	#	

SDG: Location:		180927-86 Cartron Big		t Reference: r Number:	P1444 Z1162	Report Number: Superseded Report:	475903	
			Urde	i Number:	21102	eaporosaea neport.		
OC MS (W) Results Legend	c	ustomer Sample Ref.	LH01	LH02	_	 		
Kosuits Legend Kosuits Legend Kosuits Legend Kosuits Legend M mCERTS accredited. A queous / settled sample. diss.filt Dissolved / filtered sample. Subcontracted test. Subcontracted test.		Depth (m) Sample Type Date Sampled	LHU1 0.00 - 0.00 Land Leachate (LE) 26/09/2018	0.00 - 0.00 Land Leachate (LE 26/09/2018	E)			
 ** % recovery of the surrogate stancheck the efficiency of the methoresults of individual compounds samples aren't corrected for the r (F) Trigger breach confirmed 	d. The within	Sample Time Date Received SDG Ref Lab Sample No.(s)	20/09/2018 27/09/2018 180927-86 18414765	27/09/2018 27/09/2018 180927-86 18414784				
1-5&+§@ Sample deviation (see appendix) Component	LOD/Units	AGS Reference Method						
Tetrachloroethene	<1 µg/l	TM208	<1 #	4.98	#			
Dibromochloromethane	<1 µg/l	TM208	<1 #	<1	#			
1,2-Dibromoethane	<1 µg/l	TM208	<1 #	<1	#			
Chlorobenzene	<1 µg/l	TM208	1.92 #	1.4	#	 		
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1 #	<1	#	 		
Ethylbenzene	<1 µg/l	TM208	2.28	3.67	1#			
m,p-Xylene	<1 µg/l	TM208	8.52 #	8.58	#	 		
o-Xylene	<1 µg/l	TM208	2.81 #	3.1	#			
Styrene	<1 µg/l	TM208	<1 #	<1	#			
Bromoform	<1 µg/l	TM208	<1 #	<1	#			
Isopropylbenzene	<1 µg/l	TM208	2.62 #	<1	#			
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1 #	<1	#			
1,2,3-Trichloropropane	<1 µg/l	TM208	<1 #	<1	#			
Bromobenzene	<1 µg/l	TM208	<1 #	<1	#			
Propylbenzene	<1 µg/l	TM208	<1 #	<1	#			
2-Chlorotoluene	<1 µg/l	TM208	<1 #	<1	#	 		
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1 #	<1	#			
4-Chlorotoluene	<1 µg/l	TM208	<1 #	<1	#	 		
tert-Butylbenzene	<1 µg/l	TM208	<1 #	<1	#			
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1 #	1.77	#			
sec-Butylbenzene	<1 µg/l	TM208	<1 #	<1	#			
4-iso-Propyltoluene	<1 µg/l	TM208	<1 #	4.48	#			
1,3-Dichlorobenzene	<1 µg/l	TM208	<1 #	<1	#			
1,4-Dichlorobenzene	<1 µg/l	TM208	<1 #	<1	#			
n-Butylbenzene	<1 µg/l	TM208	<1 #	<1	#			
1,2-Dichlorobenzene	<1 µg/l	TM208	<1 #	1.57	#			
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	<1				
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1 #	<1	#			
Hexachlorobutadiene	<1 µg/l	TM208	<1 #	<1	#			
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1 #	<1	#			
Naphthalene	<1 µg/l	TM208	<1 #	3.58	1#			
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1 #	<1	#			

ALS

_

	CERTIFICATE OF ANALYSIS							
	SDG:	4 ¹	180927-86		nt Reference:	P1444 Z1162	Report Number: Superseded Report:	475903
(A	LS Loca	tion:	Cartron Big	Orde	er Number:	21102	Superseded Report.	
	NS (W)		Customer Sample Ref.	11104	11100	_		
aq	Results Legend ISO17025 accredited. mCERTS accredited. Aqueous / settled sample.		Customer Sample Ref. Depth (m)	LH01 0.00 - 0.00	LH02 0.00 - 0.00			
tot.unfilt * **	Dissolved / filtered sample Total / unfiltered sample. Subcontracted test. % recovery of the surroga	te standard to	Sample Type Date Sampled Sample Time	Land Leachate (LE) 26/09/2018	Land Leachate (LE) 26/09/2018			
(F)	check the efficiency of the results of individual comp samples aren't corrected f Trigger breach confirmed	ounds within for the recovery	Date Received SDG Ref Lab Sample No.(s)	27/09/2018 180927-86 18414765	27/09/2018 180927-86 18414784			
1-5&+§@ Compo	Sample deviation (see app nent	bendix) LOD/Un	AGS Reference					
	ichlorobenzene	<1 µg		<1	<1			
						_		
						_		
						_		
						_		
						_		
						_		
						_		
						_		
						_		
						_		
						_		
						_		
						_		
						_		

Report Number: Superseded Report: Validated

475903

ALS

SDG:

Location:

180927-86 Cartron Big

Table of Results - Appendix

Method No	Reference	Description
SUB		Subcontracted Test
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
TM045	MEWAM BOD5 2nd Ed.HMSO 1988 / Method 5210B, AWWA/APHA, 20th Ed., 1999; SCA Blue Book 130	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids
TM046	Method 4500G, AWWA/APHA, 20th Ed., 1999	Measurement of Dissolved Oxygen by Oxygen Meter
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
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
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS
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
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM284		
TM328		
TM343	EPA 8270D - Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of Selected Pesticides (Suite I) in Liquids by GCMS
TM344	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite II) by GCMS
TM345	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite III) by GCMS

NA = not applicable.

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



Silicon Dissolved by ICP-OES

Total Organic and Inorganic Carbon

01-Oct-2018

01-Oct-2018

SVOC MS (W) - Aqueous

VOC MS (W)

CERTIFICATE OF ANALYSIS

ALS	SDG: Location:	180927-86 Cartron Big	Client Reference: Order Number:	P1444 Z1162	Report Number: Superseded Report:	475903
			Test Comple	tion Date	es	

lest completion Dates									
Lab Sample No(s)	18414731	18414743	18414752	18414765	18414784	18414804	18414814	18414821	18414830
Customer Sample Ref.	GW01	GW02	GW03	LH01	LH02	SW1	SW2	SW3	SW4
•									
AGS Ref.									
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Туре	Ground Water	Ground Water	Ground Water	Land Leachate	Land Leachate	Surface Water	Surface Water	Surface Water	Surface Water
Alkalinity as CaCO3	04-Oct-2018	05-Oct-2018	05-Oct-2018	04-Oct-2018	05-Oct-2018				
Ammoniacal Nitrogen	04-Oct-2018	04-Oct-2018	04-Oct-2018	04-Oct-2018	04-Oct-2018	05-Oct-2018	05-Oct-2018	05-Oct-2018	05-Oct-2018
Anions by Kone (w)	05-Oct-2018	05-Oct-2018	05-Oct-2018	05-Oct-2018	05-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018
BOD True Filtered				03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018
COD Unfiltered				04-Oct-2018	04-Oct-2018				
Coliforms (W)	05-Oct-2018	05-Oct-2018	05-Oct-2018						
Conductivity (at 20 deg.C)	03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018
Cyanide Comp/Free/Total/Thiocyanate	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018				
Dissolved Metals by ICP-MS	05-Oct-2018	04-Oct-2018	04-Oct-2018	05-Oct-2018	09-Oct-2018	08-Oct-2018	08-Oct-2018	08-Oct-2018	08-Oct-2018
Dissolved Oxygen by Probe	01-Oct-2018	01-Oct-2018	01-Oct-2018	01-Oct-2018	01-Oct-2018	01-Oct-2018	01-Oct-2018	01-Oct-2018	01-Oct-2018
Fluoride	04-Oct-2018	04-Oct-2018	04-Oct-2018	04-Oct-2018	04-Oct-2018				
Mercury Dissolved	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018				
Mineral Oil C10-40 Aqueous (W)				02-Oct-2018	02-Oct-2018				
Nitrite by Kone (w)				05-Oct-2018	05-Oct-2018				
Organotins in Aqueous Samples				04-Oct-2018	04-Oct-2018				
Pesticides (Suite I) by GCMS				04-Oct-2018	04-Oct-2018				
Pesticides (Suite II) by GCMS				05-Oct-2018	05-Oct-2018				
Pesticides (Suite III) by GCMS				03-Oct-2018	03-Oct-2018				
pH Value	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018
Phosphate by Kone (w)				05-Oct-2018	05-Oct-2018				

02-Oct-2018

04-Oct-2018

03-Oct-2018

01-Oct-2018

05-Oct-2018

04-Oct-2018

05-Oct-2018

02-Oct-2018

05-Oct-2018





DETAILED IN SCOPE REG NO. 138

City Analysts Limited, Pigeon House Road, Ringsend, Dublin 4.

Tel: (01) 613 6003 Fax: (01) 613 6008

Email: reports@cityanalysts.ie

www.cityanalysts.ie

Customer

Customer Services ALS Environmental Ltd Hawarden Business Park Manor Land Hawarden, Deeside UK **CH5 3US**

Certificate Of Analysis

18-47798 Job Number: **Issue Number:** 2 5 October 2018 **Report Date:**

Reason for re-issuing report: Edited invoice to split job. SR

Site: 180927-86 PO Number: Not Supplied Date Samples Received: 27/09/2018

Please find attached the results for the samples received at our laboratory on 27/09/2018.

Should you have any queries regarding the report or require any further services, we would be happy to discuss your requirements. For additional information about the company please log-on to our website at the above address.

Thank you for choosing City Analysts Limited. We look forward to assisting you again.

Authorised By:

Shane Reynolds Laboratory Manager

2 October 2018 Authorised Date:

Notes:

Results relate only to the items tested. Information on methods of analysis and performance characteristics is available on request. Any opinions or interpretations indicated are outside the scope of our INAB accreditation. This test report shall not be reproduced except in full or with written approval of City Analysts Limited.

Page 1 of 4

Template: 1146 Revision: 018





Tel: (01) 613 6003 Fax: (01) 613 6008

DETAILED IN SCOPE REG NO. 138

Report Reference: 18-47798

Report Version: 2

Email: reports@cityanalysts.ie

www.cityanalysts.ie

Certificate Of Analysis Customer **Customer Services** ALS Environmental Ltd Hawarden Business Park Manor Land Hawarden, Deeside

Site: 180927-86 Cartron GW1 Sample Description: Sample Type: Ground

Lab Reference Number: 412662

UK CH5 3US

Date of Sampling:	27/09/2018
Date Sample Received:	27/09/2018

Site / Method Ref.	Analysis Parameter Start Date		Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/09/2018	Coliforms	920.8	MPN/100ml	

= INAB Accredited, U = UKAS Accredited, * = Subcontracted

Note:

PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water

samples. For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely.

NAC & ATC - No abnormal change and acceptable to customers. TVC - Total viable count

Site D = Analysed at City Analysts Dublin. Site S = Analysed at City Analysts Shannon

Page 2 of 4





Tel: (01) 613 6003 Fax: (01) 613 6008

DETAILED IN SCOPE REG NO. 138

Report Reference: 18-47798

Report Version: 2

Email: reports@cityanalysts.ie

www.cityanalysts.ie

Certificate Of Analysis Customer **Customer Services** ALS Environmental Ltd Hawarden Business Park Manor Land

Hawarden, Deeside UK CH5 3US

Site: 180927-86 Cartron GW2 Sample Description: Sample Type: Ground

Lab Reference Number: 412663

Date of Sampling:	27/09/2018
Date Sample Received:	27/09/2018

Site / Method Ref.	Analysis Parameter Start Date		Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/09/2018	Coliforms	1610.0	MPN/100ml	ŝ

= INAB Accredited, U = UKAS Accredited, * = Subcontracted

Note:

PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water samples.

For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely.

NAC & ATC - No abnormal change and acceptable to customers. TVC - Total viable count

Site D = Analysed at City Analysts Dublin. Site S = Analysed at City Analysts Shannon

Page 3 of 4





Tel: (01) 613 6003 Fax: (01) 613 6008

DETAILED IN SCOPE REG NO. 138

Report Reference: 18-47798

Report Version: 2

Email: reports@cityanalysts.ie

www.cityanalysts.ie

Certificate Of Analysis Customer **Customer Services** ALS Environmental Ltd Hawarden Business Park Manor Land Hawarden, Deeside

Site: 180927-86 Cartron GW3 Sample Description: Sample Type: Ground

412664 Lab Reference Number:

UK CH5 3US

Date of Sampling:	27/09/2018
Date Sample Received:	27/09/2018

Site / Method Ref.	Analysis Parameter Start Date		Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/09/2018	Coliforms	2180.0	MPN/100ml	ŝ

= INAB Accredited, U = UKAS Accredited, * = Subcontracted

Note:

PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water samples.

For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely.

NAC & ATC - No abnormal change and acceptable to customers. TVC - Total viable count

Site D = Analysed at City Analysts Dublin. Site S = Analysed at City Analysts Shannon

Page 4 of 4

ALS	SDG: Location:	180927-86 Cartron Big	Client Reference: Order Number:	P1444 Z1162	Report Number: Superseded Report:	475903
(ALS)						

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 sumples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

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

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt . However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. Surrogate recoveries - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. 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-lsopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

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

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

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

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

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
Chrysof le	White Asbestos
Amosite	Brow n Asbestos
Cro ci dolite	Blue Asbe stos
Fibrous Actinolite	
Fib to us Anthop hyll ite	-
Fibrous Tremol ite	-

Visual Estimation Of Fibre Content

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

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

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



Fehily Timoney 3rd Floor North Park Offices North Park Business Park North Road Dublin Dublin 11

Attention: Daniel Hayden

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: 17 October 2018 D_FTIM_DUB 181009-33 P1444 Cartron Big 477260

We received 5 samples on Tuesday October 09, 2018 and 5 of these samples were scheduled for analysis which was completed on Wednesday October 17, 2018. 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 Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Approved By:

<u>Sonia McWhan</u> Operations Manager



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

SDG:
Location:

	SDG:	181009-33	Client Reference:	P1444	Report Number: 477260
(ALS)	Location:	Cartron Big	Order Number:	Z1162	Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18487365	GW01		0.00 - 0.00	08/10/2018
18487373	GW02		0.00 - 0.00	08/10/2018
18487380	GW03		0.00 - 0.00	08/10/2018
18487390	LH01		0.00 - 0.00	08/10/2018
18487400	LH02		0.00 - 0.00	08/10/2018

Maximum Sample/Coolbox Temperature (°C) : ISO5667-3 Water quality - Sampling - Part3 - 10

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.

Validated

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of $(5\pm3)^{\circ}$ C.

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

		SDG:	181009-33	С		IFIC nt Ref		E O	P14	44	_YS	IS				Numb			4772	60	Vali	idated	
(AI	LS)	ocation:	Cartron Big		Ord	er Nu	mber	:	Z11	62				Su	perse	ded Re	port:						
Results X	Legend Test No Determ	ination	Lab Sample I	No(s)					18487365					18487373					18487380				18487390
Sample	Possible		Custome Sample Refe						GW01					GW02					GW03				LH01
S - Soil/S UNS - Un GW - Gro SW - Sur LE - Land			AGS Refere	nce																			
PR - Proc SA - Salir TE - Trad TS - Trea	cess Water		Depth (m)		_			0.00 - 0.00					0.00 - 0.00					0.00 - 0.00				0.00 - 0.00
RE - Rec DW - Drin	reational Wat king Water Nor specified Liq ge	er -regulatory	Containe	r	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)
			Sample Ty	ре	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	E	Ē	Ē	Ē
Alkalinity as	CaCO3		All	NDPs: 0 Tests: 5		x					X					X						x	
Ammoniaca	l Nitrogen		All	NDPs: 0 Tests: 5			X					X					X						X
Anions by K	one (w)		All	NDPs: 0 Tests: 5		X					X					X						X	
BOD True T	otal		All	NDPs: 0																			

Х

Х

Х

Х

Х

Х

Х

Х

Х

Х

Х

Х

Х

Х

Tests: 2

NDPs: 0 Tests: 2

NDPs: 0 Tests: 3

NDPs: 0 Tests: 5

NDPs: 0 Tests: 2

NDPs: 0 Tests: 2

NDPs: 0 Tests: 2 Х

Х

Х

Х

All

Х

Х

Х

Х

Х

х

Х

Х

Х

Х

COD Unfiltered

Coliforms (W)

Conductivity (at 20 deg.C)

Dissolved Metals by ICP-MS

Dissolved Oxygen by Probe

Fluoride

Mercury Dissolved

Nitrite by Kone (w)

Mineral Oil C10-40 Aqueous (W)

Organotins in Aqueous Samples

Cyanide Comp/Free/Total/Thiocyanate

		18487390							18487400
		LH01							LH02
		0.00 - 0.00							0.00 - 0.00
HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5I glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	0.00 - 0.00 Vial (ALE297)
Ē	Ē	Ē	Ē	Ē	Ē	Ē	Ē	Ē	Ē
					X				
					^				
						X			
					x				
				X					
				^					
				х					
					X				
					^				
	x							x	
x							x		
					X				
					X				
x							x		
			х						
	X							x	
			х						

																			Vali	idated	
		С	ERT	IFIC	CAT	E O	FΑ	NAI	YS	S											
SDG: Location:	181009-33 Cartron Big			nt Ref er Nur			P14 Z110							lumb led Re			4772	60			
Results Legend X Test N No Determination	Lab Sample	No(s)					18487365					18487373			·		18487380				18487390
Possible Sample Types -	Custome Sample Refe	-					GW01					GW02					GW03				LH01
S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate	AGS Refere	nce																			
PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage	Depth (m)					0.00 - 0.00					0.00 - 0.00					0.00 - 0.00				0.00 - 0.00
RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Containe	r	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)
	Sample Ty	ре	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	Ē	Ē	Ē	Ē
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 2																		x	
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 2																		X	
Pesticides (Suite III) by GCMS	All	NDPs: 0 Tests: 2																		x	

Х

Х

Х

Х

Х

pH Value

Phosphate by Kone (w)

Silicon Dissolved by ICP-OES

SVOC MS (W) - Aqueous

VOC MS (W)

Total Organic and Inorganic Carbon

All

All

All

All

All

All

NDPs: 0 Tests: 5

NDPs: 0 Tests: 2

NDPs: 0 Tests: 2

NDPs: 0 Tests: 2

NDPs: 0 Tests: 5

NDPs: 0 Tests: 2

Х

Х

Х

Х

Х

Х

			x						Ē	HNO3 Filtered (ALE204)			
						 			Ē	NaOH (ALE245)			
x									Ē	Vial (ALE297)	0.00 - 0.00	LH01	18487390
									Ē	0.5l glass bottle (ALE227)			
									Ē	250ml BOD (ALE212)			
		x		x	x	X	X	x	Ē	500ml Plastic (ALE208)			
	x								Ē	H2SO4 (ALE244)			
			x						Ē	HNO3 Filtered (ALE204)			
									Ē	NaOH (ALE245)			
x									Ē	Vial (ALE297)	0.00 - 0.00	LH02	18487400



 m historius decletations aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. totumfilt Total / unfiltered sample. Subcontracted test. * % recovery of the surrogate stacheck the efficiency of the metiresults of individual compound samples aren't corrected for the (F) Trigger breach confirmed 1-58-§@ Sample deviation (see appendix) 	hod. The Is within e recovery	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Ground Water (GW) 08/10/2018 09/10/2018 181009-33 18487365	0.00 - 0.00 Ground Water (GW) 08/10/2018 09/10/2018 181009-33 18487373	0.00 - 0.00 Ground Water (GW) 08/10/2018 09/10/2018 181009-33 18487380	0.00 - 0.00 Land Leachate (LE) 08/10/2018 09/10/2018 181009-33 18487390	0.00 - 0.00 Land Leachate (LE) 08/10/2018 09/10/2018 181009-33 18487400	
Component Coliforms, Total*	LOD/Units CFU/100ml	Method	19700	7680	1990			
Comornis, rotar	CF0/100111	306	19700	7000	1990			
Alkalinity, Total as CaCO3	<2 mg/l	TM043	410 #	630 #	895 #	1520 #	15200 #	
BOD, unfiltered	<1 mg/l	TM045				7.89	>4990 #	
Oxygen, dissolved	<0.3 mg/l	TM046	6.93	7.76	6.02	6.07	1.05	
Organic Carbon, Total	<3 mg/l	TM090	<3 #	4.46 #	22.2 #	44.1	9960	
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2 #	<0.2	43.5	203	5170	
Fluoride	<0.5 mg/l	TM104	<0.5	<0.5	<0.5	<0.5	4.2	
COD, unfiltered	<7 mg/l	TM107				181 #	32300 #	
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	0.781 #	0.695	1.69 #	3.7 #	72.4 #	
Antimony (diss.filt)	<1 µg/l	TM152				<1	<6	
Arsenic (diss.filt)	<0.5 µg/l	TM152	4.57	1.52 #	7.9	4.96	<3 #	
Barium (diss.filt)	<0.2 µg/l	TM152	TT IT	TTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTT			4.23 #	
Beryllium (diss.filt)	<0.1 µg/l	TM152						
Boron (diss.filt)	<10 µg/l	TM152	58.2	16.8	204 #	750 #		
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08	<0.08	<0.08 #	0.175 #		
Chromium (diss.filt)	<1 µg/l	TM152	<1 #	<1 #	1.7 #	4.72 #		
Cobalt (diss.filt)	<0.5 µg/l	TM152				9.48 #	<3 #	
Copper (diss.filt)	<0.3 µg/l	TM152	2.69	<0.3	5.96	4.44 #	<1.8 #	
Lead (diss.filt)	<0.2 µg/l	TM152	4.21 #	<0.2	1.36 #		<1.2 #	
Manganese (diss.filt)	<3 µg/l	TM152	122 #	404 #	989 #	 1400 #	<18 #	
Molybdenum (diss.filt)	<3 µg/l	TM152				<3 #	<18 #	
Nickel (diss.filt)	<0.4 µg/l	TM152	11.3	2.9	34.3 #	25.7 #	<2.4 #	
Phosphorus (diss.filt)	<10 µg/l	TM152	72.5	<10	31.1 #	808 #	<60 #	
Selenium (diss.filt)	<1 µg/l	TM152				<1 #	<6 #	
Tellurium (diss.filt)	<2 µg/l	TM152				<2	<12	
Thallium (diss.filt)	<2 µg/l	TM152				<2 #	<12 #	
Titanium (diss.filt)	<1 µg/l	TM152				51.9 #	43.9 #	
Uranium (diss.filt)	<0.5 µg/l	TM152				0.939 #	<3 #	
Vanadium (diss.filt)	<1 µg/l	TM152				2.28 #	" <6 #	
Zinc (diss.filt)	<1 µg/l	TM152	23.7 #	2.67	30.4 #	98.2 #	" <6 #	
Tin (Diss.Filt)	<1 µg/l	TM152	TT IT		"	3.98 #		
Silver (diss.filt)	<0.5 µg/l	TM152						
Sodium (Dis.Filt)	<0.076 mg/l	TM152	13.9	8.24	39.4	256 #		I
15:43:27 17/10/2018			#		#	#	#	L



Results Legend		Customer Sample Ref.	CW01	CW02	CW/02	1 401	1 402	
# ISO17025 accredited.		Customer Sample Rei.	GW01	GW02	GW03	LH01	LH02	
M mCERTS accredited. aq Aqueous / settled sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Land Leachate (LE)	Land Leachate (LE)	
* Subcontracted test. ** % recovery of the surrogate standa	ird to	Date Sampled Sample Time	08/10/2018	08/10/2018	08/10/2018	08/10/2018	08/10/2018	
check the efficiency of the method. results of individual compounds wi	The	Date Received	09/10/2018	09/10/2018	09/10/2018	09/10/2018	09/10/2018	
samples aren't corrected for the red		SDG Ref Lab Sample No.(s)	181009-33 18487365	181009-33 18487373	181009-33 18487380	181009-33 18487390	181009-33 18487400	
1-5&+§@ Sample deviation (see appendix)		AGS Reference						
Component	LOD/Units	1	20.5	9.59	52.3	60.6	0.421	
Magnesium (Dis.Filt)	<0.036 mg	/I TM152	32.5 #	9.59	52.3	60.6 #	0.431 #	
Potassium (Dis.Filt)	<0.2 mg/l	TM152	3.56	π 0.936	35.4	π 78.6	2.08	
	0.2 mg/		#	#	#	#	=	
Calcium (Dis.Filt)	<0.2 mg/l	TM152	179	165	246	213	<1.2	
			#	#	#	#	#	
Iron (Dis.Filt)	<0.019 mg	/I TM152	0.963	0.054	2.31	37.4	0.128	
			#	#	#	#	#	
Mineral oil >C10 C40 (aq)	<100 µg/l	I TM172				<100	<100	
Mercury (diss.filt)	<0.01 µg/	1 TM183	<0.01	<0.01	<0.01	0.0231	<0.01	
	<0.01 μg/		~0.01 #	<0.01 #	~0.01 #	0.0231	<0.01 #	
Phosphate (Ortho as PO4)	<0.05 mg/	/I TM184				<0.05	32.9	
···· (· · · · · · · /								
Chloride	<2 mg/l	TM184	11.2	26.3	44.8	453	24700	
			#	#	#			
Nitrite as N	<0.0152	TM184				<0.0152	<0.0152	
	mg/l							
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184	<0.1	0.144	<0.1	<0.1	1.24	
Culphoto (coluble) co. C	<1 mg/l	TN4104	6.73	# 10.4	# 34	9.23	<10	
Sulphate (soluble) as S	<1 mg/l	TM184	6.73 #	10.4	34 #	9.23	<10	
Cyanide, Total	<0.05 mg/	/I TM227	<0.05	π <0.05	<0.05	<0.05	<0.05	
o jamao, rotai	0.00 mg		#	#	#	#	#	
Cyanide, Free	<0.05 mg/	/I TM227				<0.05	<0.05	
	_					#	#	
рН	<1 pH Unit	ts TM256	7.24	7.31	7.03	7.18	7.79	
			#	#	#	#	#	
Silicon (diss.filt)	<0.05 mg/	/I TM284				11.5	2.64	
Dibutyl tin	<5 ng/l	TM328				<15	<30	
	<0 lig/i	110020				\$15	-50	
Tributyl tin	<1 ng/l	TM328				<3	<6	
	Ĵ							
Tetrabutyl tin	<2 ng/l	TM328				<6	<12	
Triphenyl tin	<1 ng/l	TM328				<3	<6	
O	%	TM200				00.0	74.4	
Surrogate	70	TM328				92.3	71.1	
Trifluralin	<0.01 µg/	1 TM343				<0.1	<0.01	
	0.0 i µ9/							
alpha-HCH	<0.01 µg/	1 TM343				<0.1	<0.01	
gamma-HCH (Lindane)	<0.01 µg/	1 TM343				<0.1	<0.01	
						<u>^</u>		
Heptachlor	<0.01 µg/	1 TM343				<0.1	<0.01	
Aldrin	<0.01 µg/	1 TM343				<0.1	<0.01	
/ 941111	~v.v1 µg/	1 11VIJ4J				<u></u> \U.1	NU.U I	
beta-HCH	<0.01 µg/	1 TM343				<0.1	<0.01	
Isodrin	<0.01 µg/	1 TM343				<0.1	<0.01	
Heptachlor epoxide	<0.01 µg/	" TM343				<0.1	<0.01	
	Z0 04 ··· /	1 TM343				-0.4	-0.01	
o,p'-DDE	<0.01 µg/	1 11/1343				<0.1	<0.01	
Endosulphan I	<0.01 µg/	1 TM343				<0.1	<0.01	
·	0.0 i µ9/							
trans-Chlordane	<0.01 µg/	1 TM343				<0.1	<0.01	
cis-Chlordane	<0.01 µg/	'I TM343				<0.1	<0.01	



Results Legend	Cı	ustomer Sample Ref.	GW01	GW02	GW03	LH01	LH02	
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 standd check the efficiency of the method results of individual compounds w	. The	Depth (m) Sample Type Date Sampled Sample Time Date Received	0.00 - 0.00 Ground Water (GW) 08/10/2018 09/10/2018	0.00 - 0.00 Ground Water (GW) 08/10/2018 - 09/10/2018	0.00 - 0.00 Ground Water (GW) 08/10/2018 09/10/2018	0.00 - 0.00 Land Leachate (LE) 08/10/2018 09/10/2018	0.00 - 0.00 Land Leachate (LE) 08/10/2018 09/10/2018	
samples aren't corrected for the re (F) Trigger breach confirmed		SDG Ref Lab Sample No.(s)	181009-33 18487365	181009-33 18487373	181009-33 18487380	181009-33 18487390	181009-33 18487400	
1-5&+§@ Sample deviation (see appendix)	LOD/Units	AGS Reference Method						
p,p'-DDE	<0.01 µg/l	TM343				<0.1	<0.01	
Dieldrin	<0.01 µg/l	TM343				<0.1	<0.01	
o,p'-DDD (TDE)	<0.01 µg/l	TM343				<0.1	0.0399	
Endrin	<0.01 µg/l	TM343				<0.1	<0.01	
o,p'-DDT	<0.01 µg/l	TM343				<0.1	<0.01	
p,p'-DDD (TDE)	<0.01 µg/l	TM343				<0.1	<0.01	
Endosulphan II	<0.02 µg/l	TM343				<0.2	<0.02	
p,p'-DDT	<0.01 µg/l	TM343				<0.1	<0.01	
p,p'-Methoxychlor	<0.01 µg/l	TM343				<0.1	<0.01	
Endosulphan Sulphate	<0.02 µg/l	TM343				<0.2	<0.02	
Permethrin I	<0.01 µg/l	TM343				<0.1	<0.01	
Permethrin II	<0.01 µg/l	TM343				<0.1	<0.01	
Dichlorvos	<0.01 µg/l	TM344				<0.01	<0.01	
Mevinphos	<0.01 µg/l	TM344				<0.01	<0.01	
Tecnazene	<0.01 µg/l	TM344				<0.01	<0.01	
Hexachlorobenzene	<0.01 µg/l	TM344				<0.01	<0.01	
Diazinon	<0.01 µg/l	TM344				<0.01	<0.01	
Triallate	<0.01 µg/l	TM344				<0.01	<0.01	
Atrazine	<0.01 µg/l	TM344				<0.01	<0.01	
Simazine	<0.01 µg/l	TM344				<0.01	<0.01	
Disulfoton	<0.01 µg/l	TM344				<0.01	<0.01	
Propetamphos	<0.01 µg/l	TM344				<0.01	<0.01	
Chlorpyriphos-methyl	<0.01 µg/l	TM344				<0.01	<0.01	
Dimethoate	<0.01 µg/l	TM344				<0.01	<0.01	
Pirimiphos-methyl	<0.01 µg/l	TM344				<0.01	<0.01	
Chlorpyriphos	<0.01 µg/l	TM344				<0.01	<0.01	
Methyl Parathion	<0.01 µg/l	TM344				<0.01	<0.01	
Malathion	<0.01 µg/l	TM344				<0.01	<0.01	
Fenthion	<0.01 µg/l	TM344				<0.01	<0.01	
Fenitrothion	<0.01 µg/l	TM344				<0.01	<0.01	
Triadimefon	<0.01 µg/l	TM344				<0.01	<0.01	
Pendimethalin	<0.01 µg/l	TM344				<0.01	<0.01	



CERTIFICATE OF ANALYSIS

_

SDG: Location:	1	81009-33 Cartron Big	Clien	t Reference:	P1444 Z1162	Report Num Superseded Re	per: 477260	
		Santon Big	<u> </u>		21102			
Results Legend # ISO17025 accredited. M mCERTS accredited.	Cu	ustomer Sample Ref.	GW01	GW02	GW03	LH01	LH02	
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test. * % recovery of the surrogate stand check the efficiency of the method results of individual compounds w samples aren't corrected for the re	1. The vithin	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s)	0.00 - 0.00 Ground Water (GW) 08/10/2018 09/10/2018 181009-33 18487365	0.00 - 0.00 Ground Water (GW) 08/10/2018 09/10/2018 181009-33 18487373	0.00 - 0.00 Ground Water (GW) 08/10/2018 09/10/2018 181009-33 18487380	0.00 - 0.00 Land Leachate (LE) 08/10/2018 - 09/10/2018 181009-33 18487390	0.00 - 0.00 Land Leachate (LE) 08/10/2018 	
1-5&+§@ Sample deviation (see appendix) Component	LOD/Units	AGS Reference Method						
Parathion	<0.01 µg/l	TM344				<0.01	<0.01	
Chlorfenvinphos	<0.01 µg/l	TM344				<0.01	<0.01	
Ethion	<0.01 µg/l	TM344				<0.01	<0.01	
Carbophenothion	<0.01 µg/l	TM344				<0.01	<0.01	
Triazophos	<0.01 µg/l	TM344				<0.01	<0.01	
Phosalone	<0.01 µg/l	TM344				<0.01	<0.01	
Azinphos methyl	<0.02 µg/l	TM344				<0.02	<0.02	
Azinphos ethyl	<0.02 µg/l	TM344				<0.02	<0.02	
Quintozene (PCNB)	<0.01 µg/l	TM345				<0.01	<0.01	
Telodrin	<0.01 µg/l	TM345				<0.01	<0.01	
Chlorothalonil	<0.01 µg/l	TM345				<0.01	<0.01	
Etrimphos	<0.01 µg/l	TM345				<0.01	<0.01	
		· · · · · · · · · · · · · · · · · · ·				!	I I	

SDG:	11	81009-33	CERT		P1444	Report Number:	477260
ALS Location:		artron Big			Z1162	Superseded Report:	477200
VOC MS (W) - Aqueou	s						
Results Legend # ISO17025 accredited.		stomer Sample Ref.	LH01	LH02			
M mCERTS accredited. aq Aqueous / settled sample.		D II ()					
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	0.00 - 0.00 Land Leachate (LE)	0.00 - 0.00 Land Leachate (LE)			
* Subcontracted test. ** % recovery of the surrogate stands	ard to	Date Sampled Sample Time	08/10/2018	08/10/2018			
check the efficiency of the method results of individual compounds w	l. The	Date Received	09/10/2018	09/10/2018			
samples aren't corrected for the re	covery	SDG Ref	181009-33 18487390	181009-33 18487400			
(F) Trigger breach confirmed 1-5&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	10401030	10401400			
Component	LOD/Units	Method			_		
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<1	<1000			
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1000			
	1 49/1		- 1	1000			
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1000			
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1000			
045T'H + H)		T1470	.4	.1000			
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1000			
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1000			
_, .,	· . MA		- 1	1000			
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<1	<1000			
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<1	<1000			
					_		
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1000			
2,6-Dinitrotoluene (aq)	<1	TM176	<1	<1000	_		
2,6-Dinitrotoluene (aq)	<1 µg/l	11/11/0	<1	<1000			
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<1	<1000			
			·				
2-Chlorophenol (aq)	<1 µg/l	TM176	<1	<1000			
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1	<1000			
2-Methylphenol (aq)	<1 µg/l	TM176	<1	<1000			
2-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1000			
	si µg/i	TWIT70		\$1000			
2-Nitrophenol (aq)	<1 µg/l	TM176	<1	<1000			
3-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1000			
					_		
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<1	<1000			
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<1	<1000			
	si µg/i	TWIT70		\$1000			
4-Chloroaniline (aq)	<1 µg/l	TM176	<1	<1000			
	P.0*						
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<1	<1000			
4-Methylphenol (aq)	<1 µg/l	TM176	<1	14000			
6 N PC - 2 - 2		Th (170		1000			
I-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1000			
I-Nitrophenol (aq)	<1 µg/l	TM176	<1	<1000			
	~		1	51000			
Azobenzene (aq)	<1 µg/l	TM176	<1	<1000			
. "							
Acenaphthylene (aq)	<1 µg/l	TM176	<1	<1000			
					_		
cenaphthene (aq)	<1 µg/l	TM176	<1	<1000			
(nthroppone (ac)	المريد الم	TM476	-1	-1000			
Anthracene (aq)	<1 µg/l	TM176	<1	<1000			
is(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<1	<1000			
ad a consistent and a c	*' P9/I		- 1	-1000			
bis(2-Chloroethoxy)methane	<1 µg/l	TM176	<1	<1000			
(aq)							
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	4.92	<2000			
					_		
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	<1000			
		Th // TO		1000		I	
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<1	<1000			

CERTIFICATE OF ANALYSIS

			CERT	IFICATE OF A	ANALYSIS	5	
SDG: Location:		81009-33 Cartron Big			444 162	Report Number: Superseded Report:	477260
VOC MS (W) - Aqueou		Suitt of Big	0100				
Results Legend # ISO17025 accredited.		ustomer Sample Ref.	LH01	LH02			
M mCERTS accredited. aq Aqueous / settled sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00			
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test.		Sample Type Date Sampled	Land Leachate (LE) 08/10/2018	Land Leachate (LE) 08/10/2018			
** % recovery of the surrogate stand check the efficiency of the method	d. The	Sample Time Date Received					
results of individual compounds v samples aren't corrected for the n	within	SDG Ref	181009-33	181009-33			
(F) Trigger breach confirmed 1-5&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	18487390	18487400			
Component Benzo(b)fluoranthene (aq)	LOD/Units <1 µg/l	Method TM176	<1	<1000			
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<1	<1000			
Benzo(a)pyrene (aq)	<1 µg/l	TM176	<1	<1000			
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176	<1	<1000			
Carbazole (aq)	<1 µg/l	TM176	<1	<1000			
Chrysene (aq)	<1 µg/l	TM176	<1	<1000			
Dibenzofuran (aq)	<1 µg/l	TM176	<1	<1000			
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<1	<1000			
Diethyl phthalate (aq)	<1 µg/l	TM176	<1	<1000			
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176	<1	<1000			
Dimethyl phthalate (aq)	<1 µg/l	TM176	<1	<1000			
n-Dioctyl phthalate (aq)	<5 µg/l	TM176	<5	<5000			
Fluoranthene (aq)	<1 µg/l	TM176	<1	<1000			
Fluorene (aq)	<1 µg/l	TM176	<1	<1000			
Hexachlorobenzene (aq)	<1 µg/l	TM176	<1	<1000			
Hexachlorobutadiene (aq)	<1 µg/l	TM176	<1	<1000			
Pentachlorophenol (aq)	<1 µg/l	TM176	<1	<1000			
Phenol (aq)	<1 µg/l	TM176	<1	12800			
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176	<1	<1000			
Hexachloroethane (aq)	<1 µg/l	TM176	<1	<1000			
Nitrobenzene (aq)	<1 µg/l	TM176	<1	<1000			
Naphthalene (aq)	<1 µg/l	TM176	<1	<1000			
Isophorone (aq)	<1 µg/l	TM176	<1	<1000			
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176	<1	<1000			
Phenanthrene (aq)	<1 µg/l	TM176	<1	<1000			
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176	<1	<1000			
Pyrene (aq)	<1 µg/l	TM176	<1	<1000			

_

(ALS) Location:		181009-33 Cartron Big		t Reference: r Number:	P144 Z116	477260
OC MS (W)						
Results Legend # ISO17025 accredited.	C	ustomer Sample Ref.	LH01	LH02		
M mCERTS accredited. aq Aqueous / settled sample. diss.fit Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test. ** % recovery of the surrogate stand.	ard to	Depth (m) Sample Type Date Sampled Sample Time	0.00 - 0.00 Land Leachate (LE) 08/10/2018	0.00 - 0.00 Land Leachate (LE) 08/10/2018)	
check the efficiency of the method results of individual compounds w samples aren't corrected for the re	. The ithin	Date Received SDG Ref	09/10/2018 181009-33	09/10/2018 181009-33		
 (F) Trigger breach confirmed -5&+§@ Sample deviation (see appendix) 		Lab Sample No.(s) AGS Reference	18487390	18487400		
Component	LOD/Units	Method				
Dibromofluoromethane**	%	TM208	113	98.6		
Foluene-d8**	%	TM208	100	104		
1-Bromofluorobenzene**	%	TM208	97.7	94.9		
Dichlorodifluoromethane	<1 µg/l	TM208	<1 #	18.9	#	
Chloromethane	<1 µg/l	TM208	<1 #	<1	#	
/inyl chloride	<1 µg/l	TM208	<1 #	<1	#	
Bromomethane	<1 µg/l	TM208	<1 #	<1	#	
Chloroethane	<1 µg/l	TM208	1.56 #	<1	#	
Trichlorofluoromethane	<1 µg/l	TM208		<1	#	
1,1-Dichloroethene	<1 µg/l	TM208		<1	#	
Carbon disulphide	<1 µg/l	TM208		<1	#	
Dichloromethane	<3 µg/l	TM208		<3	#	
Methyl tertiary butyl ether MTBE)	<1 µg/l	TM208		<1	#	
rans-1,2-Dichloroethene	<1 µg/l	TM208		<1	#	
1,1-Dichloroethane	<1 µg/l	TM208		<1	#	
cis-1,2-Dichloroethene	<1 µg/l	TM208		7.98	#	
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1		
Bromochloromethane	<1 µg/l	TM208	<1 #	<1	#	
Chloroform	<1 µg/l	TM208		<1	#	
1,1,1-Trichloroethane	<1 µg/l	TM208	<1 #	<1	#	
1,1-Dichloropropene	<1 µg/l	TM208	<1 #	<1	#	
Carbontetrachloride	<1 µg/l	TM208		<1	#	
1,2-Dichloroethane	<1 µg/l	TM208		<1	#	
Benzene	<1 µg/l	TM208	1.8 #	3.3	#	
Trichloroethene	<1 µg/l	TM208		1.24	#	
1,2-Dichloropropane	<1 µg/l	TM208		<1	#	
Dibromomethane	<1 µg/l	TM208		<1	#	
Bromodichloromethane	<1 µg/l	TM208		<1	#	
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1	#	
Toluene	<1 µg/l	TM208		13.3	#	
rans-1,3-Dichloropropene	<1 µg/l	TM208	* <1 #	<1	#	
1,1,2-Trichloroethane	<1 µg/l	TM208	# <1 #	<1	#	
	1		<1 *	<1	#	

SDG: Location:				t Reference: P1444 r Number: Z1162		Report Number: Superseded Report:	Report Number: 477260 Superseded Report:		
OC MS (W)		ouriton big	Oraci		21102				
Results Legend	C	ustomer Sample Ref.	LH01	LH02					
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.fit Dissolved / filtered sample. tot.unfit Total / unfiltered sample. * Subcontracted test. * % recovery of the surrogate stanc check the efficiency of the metho results of individual compounds version.	d. The	Depth (m) Sample Type Date Sampled Sample Time Date Received	0.00 - 0.00 Land Leachate (LE) 08/10/2018 09/10/2018	0.00 - 0.00 Land Leachate (LE) 08/10/2018 09/10/2018					
samples aren't corrected for the r (F) Trigger breach confirmed		SDG Ref Lab Sample No.(s)	181009-33 18487390	181009-33 18487400					
1-5&+§@ Sample deviation (see appendix) Component	LOD/Units	AGS Reference Method							
Tetrachloroethene	<1 µg/l	TM208	<1 #	3.14	#				
Dibromochloromethane	<1 µg/l	TM208	<1 #	<1	#				
1,2-Dibromoethane	<1 µg/l	TM208	<1 #	<1	#				
Chlorobenzene	<1 µg/l	TM208	1.13 #	<1	#				
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1 #	<1	#				
Ethylbenzene	<1 µg/l	TM208	1.17 #	2.66	#				
m,p-Xylene	<1 µg/l	TM208	2.78 #	5.23	#				
o-Xylene	<1 µg/l	TM208	2.07 #	2.65	#				
Styrene	<1 µg/l	TM208	<1 #	<1	#				
Bromoform	<1 µg/l	TM208	<1 #	<1	#				
Isopropylbenzene	<1 µg/l	TM208	1.52 #	<1	#				
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1 #	<1	#				
1,2,3-Trichloropropane	<1 µg/l	TM208	<1 #	<1	#				
Bromobenzene	<1 µg/l	TM208	<1 #	<1	#				
Propylbenzene	<1 µg/l	TM208	<1 #	<1	#				
2-Chlorotoluene	<1 µg/l	TM208	<1 #	<1	#				
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1 #	<1	#				
4-Chlorotoluene	<1 µg/l	TM208	<1 #	<1	#				
tert-Butylbenzene	<1 µg/l	TM208	<1 #	<1	#				
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1 #	1.2	#				
sec-Butylbenzene	<1 µg/l	TM208	<1 #	<1	#				
4-iso-Propyltoluene	<1 µg/l	TM208	<1 #	3.2	#				
1,3-Dichlorobenzene	<1 µg/l	TM208	<1 #	<1	#				
1,4-Dichlorobenzene	<1 µg/l	TM208	<1 #	<1	#				
n-Butylbenzene	<1 µg/l	TM208	<1 #	<1	#				
1,2-Dichlorobenzene	<1 µg/l	TM208	<1 #	<1	#				
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	<1	_				
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1 #	<1	#				
Hexachlorobutadiene	<1 µg/l	TM208	<1 #	<1	#				
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1 #	<1	#				
Naphthalene	<1 µg/l	TM208	<1 #	2.64	#				
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1 #	<1	#				

ALS

_

SDG:	1	81009-33			P1444	Report Num Superseded R	ber: 477260	
ALS Location:		Cartron Big	Orde	r Number:	Z1162	Superseded R	eport.	
VOC MS (W)								
Results Legend # ISO17025 accredited.	Cu	stomer Sample Ref.	LH01	LH02				
M mCERTS accredited. aq Aqueous / settled sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00				
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Sample Type	Land Leachate (LE)	Land Leachate (LE)				
* Subcontracted test. ** % recovery of the surrogate stands	ard to	Date Sampled Sample Time	08/10/2018	08/10/2018				
check the efficiency of the method results of individual compounds w	vithin	Date Received SDG Ref	09/10/2018 181009-33	09/10/2018 181009-33				
samples aren't corrected for the re (F) Trigger breach confirmed	covery	Lab Sample No.(s)	18487390	18487400				
1-5&+§@ Sample deviation (see appendix) Component	LOD/Units	AGS Reference Method						
1,3,5-Trichlorobenzene	<1 µg/l	TM208	<1	<1				
					_			
					_			
					_			
					_			
					_			
					_			
					_			
					_			
							+	
							+	
L								·

Report Number: Superseded Report:



181009-33 Cartron Big

Table of Results - Appendix

Method No	Reference	Description
SUB		Subcontracted Test
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
TM045	MEWAM BOD5 2nd Ed.HMSO 1988 / Method 5210B, AWWA/APHA, 20th Ed., 1999; SCA Blue Book 130	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids
TM046	Method 4500G, AWWA/APHA, 20th Ed., 1999	Measurement of Dissolved Oxygen by Oxygen Meter
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
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
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS
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
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM284		
TM328		
TM343	EPA 8270D - Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of Selected Pesticides (Suite I) in Liquids by GCMS
TM344	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite II) by GCMS
TM345	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite III) by GCMS

NA = not applicable.

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

477260



477260

Report Number: Superseded Report:

SDG: Location:

Client Reference: Order Number:

Test Completion Dates

P1444

Z1162

Lab Sample No(s) 18487365 18487373 18487380 18487390 1848							
Lab Sample No(s)					18487400		
Customer Sample Ref.	GW01	GW02	GW03	LH01	LH02		
AGS Ref.							
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
Туре	Ground Water	Ground Water	Ground Water	Land Leachate	Land Leachate		
Alkalinity as CaCO3	15-Oct-2018	15-Oct-2018	15-Oct-2018	15-Oct-2018	16-Oct-2018		
Ammoniacal Nitrogen	15-Oct-2018	15-Oct-2018	15-Oct-2018	15-Oct-2018	15-Oct-2018		
Anions by Kone (w)	15-Oct-2018	15-Oct-2018	15-Oct-2018	15-Oct-2018	15-Oct-2018		
BOD True Total				15-Oct-2018	14-Oct-2018		
COD Unfiltered				12-Oct-2018	12-Oct-2018		
Coliforms (W)	11-Oct-2018	11-Oct-2018	11-Oct-2018				
Conductivity (at 20 deg.C)	11-Oct-2018	11-Oct-2018	11-Oct-2018	11-Oct-2018	11-Oct-2018		
Cyanide Comp/Free/Total/Thiocyanate	12-Oct-2018	12-Oct-2018	12-Oct-2018	12-Oct-2018	12-Oct-2018		
Dissolved Metals by ICP-MS	12-Oct-2018	12-Oct-2018	12-Oct-2018	12-Oct-2018	12-Oct-2018		
Dissolved Oxygen by Probe	10-Oct-2018	10-Oct-2018	10-Oct-2018	12-Oct-2018	10-Oct-2018		
Fluoride	16-Oct-2018	16-Oct-2018	16-Oct-2018	16-Oct-2018	16-Oct-2018		
Mercury Dissolved	12-Oct-2018	11-Oct-2018	11-Oct-2018	11-Oct-2018	12-Oct-2018		
Mineral Oil C10-40 Aqueous (W)				16-Oct-2018	16-Oct-2018		
Nitrite by Kone (w)				15-Oct-2018	15-Oct-2018		
Organotins in Aqueous Samples				12-Oct-2018	12-Oct-2018		
Pesticides (Suite I) by GCMS				15-Oct-2018	15-Oct-2018		
Pesticides (Suite II) by GCMS				15-Oct-2018	15-Oct-2018		
Pesticides (Suite III) by GCMS				17-Oct-2018	16-Oct-2018		
pH Value	15-Oct-2018	15-Oct-2018	15-Oct-2018	12-Oct-2018	15-Oct-2018		
Phosphate by Kone (w)				15-Oct-2018	15-Oct-2018		
Silicon Dissolved by ICP-OES				16-Oct-2018	16-Oct-2018		
SVOC MS (W) - Aqueous				15-Oct-2018	12-Oct-2018		
Total Organic and Inorganic Carbon	11-Oct-2018	10-Oct-2018	12-Oct-2018	12-Oct-2018	11-Oct-2018		
VOC MS (W)				11-Oct-2018	11-Oct-2018		





Tel: (01) 613 6003 Fax: (01) 613 6008

DETAILED IN SCOPE REG NO. 138

Email: reports@cityanalysts.ie

www.cityanalysts.ie

Customer

Customer Services ALS Life Sciences Hawarden Business Park Manor Lane Hawarden, Deeside UK **CH5 3US**

Certificate Of Analysis

18-47924 Job Number: **Issue Number:** 1 **Report Date:** 11 October 2018

Site: Cartron Big 181009-33 PO Number: Date Samples Received: 09/10/2018

Please find attached the results for the samples received at our laboratory on 09/10/2018.

Should you have any queries regarding the report or require any further services, we would be happy to discuss your requirements. For additional information about the company please log-on to our website at the above address.

Thank you for choosing City Analysts Limited. We look forward to assisting you again.

Authorised By:

Deputy Quality Manager

Authorised Date: 11 October 2018

Caitlin Quinn

Notes:

Results relate only to the items tested. Information on methods of analysis and performance characteristics is available on request. Any opinions or interpretations indicated are outside the scope of our INAB accreditation. This test report shall not be reproduced except in full or with written approval of City Analysts Limited.

Page 1 of 4

Template: 1146 Revision: 018



Cartron Big **GW01**

Ground



City Analysts Limited, Pigeon House Road, Ringsend, Dublin 4.

Tel: (01) 613 6003 Fax: (01) 613 6008

DETAILED IN SCOPE REG NO. 138

Report Reference: 18-47924

Report Version: 1

Email: reports@cityanalysts.ie

www.cityanalysts.ie

Certificate Of Analysis

Customer

Site:

Customer Services ALS Life Sciences

Sample Description:

Sample Type:

Hawarden Business Park Manor Lane Hawarden, Deeside UK CH5 3US

> Date of Sampling: 09/10/2018 **Date Sample Received:** 09/10/2018

Lab Reference Number: 414098

Site / Analysis I Method Ref. Start Date		Parameter	Result	Units	PV Value (Drinking Water Only)	
D/D1201#	09/10/2018	Coliforms	19680.0	MPN/100ml	1003-01	

= INAB Accredited, U = UKAS Accredited, * = Subcontracted

Note: PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water

samples. For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely.

NAC & ATC - No abnormal change and acceptable to customers. TVC - Total viable count

Site D = Analysed at City Analysts Dublin. Site S = Analysed at City Analysts Shannon

Page 2 of 4





Report Reference: 18-47924

Report Version: 1

City Analysts Limited, Pigeon House Road, Ringsend, Dublin 4.

Tel: (01) 613 6003 Fax: (01) 613 6008

Email:

reports@cityanalysts.ie

www.cityanalysts.ie

Certificate Of Analysis

Customer

Customer Services ALS Life Sciences

Hawarden Business Park Manor Lane Hawarden, Deeside UK CH5 3US

Site:	Cartron Big
Sample Description:	GW02

Sample Type: Ground

Lab Reference Number: 414099

Date of Sampling:	09/10/2018
Date Sample Received:	09/10/2018

Site / Method Ref. Analysis Start Date Parameter D/D1201# 09/10/2018 Coliforms		Result	Units	PV Value (Drinking Water Only)	
D/D1201#	09/10/2018	Coliforms	7680.0	MPN/100ml	

= INAB Accredited, U = UKAS Accredited, * = Subcontracted

Note: PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water

For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely. NAC & ATC - No abnormal change and acceptable to customers. TVC - Total viable count

Site D = Analysed at City Analysts Dublin. Site S = Analysed at City Analysts Shannon

Page 3 of 4





City Analysts Limited, Pigeon House Road, Ringsend, Dublin 4.

Tel: (01) 613 6003 Fax: (01) 613 6008

Report Reference: 18-47924

Report Version: 1

Email: reports@cityanalysts.ie

www.cityanalysts.ie

Certificate Of Analysis

Customer

Customer Services ALS Life Sciences

Hawarden Business Park Manor Lane Hawarden, Deeside UK CH5 3US

Site:	Cartron Big		
Sample Description:	GW03	Date of Sampling:	09/10/2018
Sample Type: Ground		Date Sample Received:	09/10/2018
Lab Reference Number	er: 414100		

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	09/10/2018	Coliforms	1986.3	MPN/100ml	112312

= INAB Accredited, U = UKAS Accredited, * = Subcontracted

Note: PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water

For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely. NAC & ATC - No abnormal change and acceptable to customers. TVC - Total viable count

Site D = Analysed at City Analysts Dublin. Site S = Analysed at City Analysts Shannon

Page 4 of 4

ALS	SDG: Location:	181009-33 Cartron Big	Client Reference: Order Number:	P1444 Z1162	Report Number: Superseded Report:	477260
(ALS)						

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 sumples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

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

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt . However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. Surrogate recoveries - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. 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-lsopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

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

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

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

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

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).

Asbe stos Type	Common Name					
Chrysof le	White Asbestos					
Amosite	Brow n Asbestos					
Cio d dolite	Blue Asbe stos					
Fibrous Act nolite						
Fib to us Anthop hyll ite	-					
Fibrous Tremolite	-					

Visual Estimation Of Fibre Content

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

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

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



Fehily Timoney 3rd Floor North Park Offices North Park Business Park North Road Dublin Dublin 11

Attention: Daniel Hayden

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: 17 September 2018 D_FTIM_DUB 180907-68 P1444 Cartron Big 472688

We received 7 samples on Friday September 07, 2018 and 7 of these samples were scheduled for analysis which was completed on Monday September 17, 2018. 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 Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Approved By:

<u>Sonia McWhan</u> Operations Manager



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



Validated

ALS	SDG:	180907-68	Client Reference:	P1444	Report Number: 472688
	Location:	Cartron Big	Order Number:	Z1162	Superseded Report:
(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18279869	Ballymulvey BH5		0.00 - 0.00	06/09/2018
18279875	Ballymulvey BH6		0.00 - 0.00	06/09/2018
18279808	Ballymulvey - G		0.00 - 0.00	06/09/2018
18279819	Cartron SW1		0.00 - 0.00	06/09/2018
18279837	Cartron SW2		0.00 - 0.00	06/09/2018
18279849	Cartron SW3		0.00 - 0.00	06/09/2018
18279858	Cartron SW4		0.00 - 0.00	06/09/2018

Maximum Sample/Coolbox Temperature (°C) :

ISO5667-3 Water quality - Sampling - Part3 -

13.4

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

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

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

CERTIFICATE	OF	ANALYS	SIS

		С	ERT	IFIC	AT	ΕO	F A	NAL	YSI	IS								Validated									
SDG: Location:	180907-68 Cartron Big			nt Ref er Nur			P14 Z116							Numb ded Re			47268	38									
Results Legend X Test N No Determination	Results Legend Lab Sample No(s) No Determination Customer Sample Reference Sample Reference					18279808				18279819				18279837				18279849			18279858						
Sample Types -														Ballymulvey - G				Cartron SW1				Cartron SW2				Cartron SW3	
S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate	AGS Refere	nce																									
PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage	Depth (m)	0.00 - c.00		0.00 - 0.00			0.00 - 0.00				0.00 - 0.00			0.00		, , , , ,		0.00 - 0.00								
RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Container		1lplastic (ALE221)	250ml BOD (ALE212)	HNO3 Filtered (ALE204)	NaOH (ALE245)	1lplastic (ALE221)	250ml BOD (ALE212)	HNO3 Filtered (ALE204)	NaOH (ALE245)	1lplastic (ALE221)	250ml BOD (ALE212)	HNO3 Filtered (ALE204)	NaOH (ALE245)	1lplastic (ALE221)	250ml BOD (ALE212)	HNO3 Filtered (ALE204)	NaOH (ALE245)	1lplastic (ALE221)	250ml BOD (ALE212)	HNO3 Filtered (ALE204)						
	Sample Ty	ре	WS	WS	SM	WS	SM	SM	SM	SM	SW	WS	WS	WS	WS	WS	SM	SM	WS	SM	WS						
Alkalinity as CaCO3	All	NDPs: 0 Tests: 5	x				x				x				x				x								
Anions by Kone (w)	All	NDPs: 0 Tests: 5	x				x				x				x				x								
BOD True Total	All	NDPs: 0 Tests: 5		x				x				x				x				x							
COD Unfiltered	All	NDPs: 0 Tests: 5		x				x				x				x				x							
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 5				x				x				x				x									
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 5			x				x				x				x				x						

	l
18279858	
Cartron SW4	
0.00 - 0.00	
NaOH (ALE245)	
WS	
х	
X	
X	



Validated

Desults Levend		ustomor Sample Dof		0 / 01//	0 1 0110	0 1 01/0	0.1.0111	
Results Legend # ISO17025 accredited.		ustomer Sample Ref.	Ballymulvey - G	Cartron SW1	Cartron SW2	Cartron SW3	Cartron SW4	
M mCERTS accredited. aq Aqueous / settled sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	
* Subcontracted test. ** % recovery of the surrogate stands	ard to	Date Sampled Sample Time	06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018	
check the efficiency of the method results of individual compounds w	. The	Date Received	07/09/2018	07/09/2018	07/09/2018	07/09/2018	07/09/2018	
samples aren't corrected for the re (F) Trigger breach confirmed		SDG Ref Lab Sample No.(s)	180907-68 18279808	180907-68 18279819	180907-68 18279837	180907-68 18279849	180907-68 18279858	
1-5&+§@ Sample deviation (see appendix)		AGS Reference						
Component Alkalinity, Total as CaCO3	LOD/Units <2 mg/l	Method TM043	322	293	290	286	302	
, maining, rotal ao oao oo	2		#	=======================================	=======================================	#	#	
BOD, unfiltered	<1 mg/l	TM045	<1	<1	<1	<1	<1	
			♦ #	♦ #	♦ #	♦ #	♦ #	
COD, unfiltered	<7 mg/l	TM107	<7	12.8	24.4	<7	16.3	
Arsenic (diss.filt)	<0.5 µg/l	TM152	# 1.29	# 1.1	# 1.04	# 1.15	#	
	<0.0 μg/i	TWITSZ	1.25	#	1.04	#	#	
Boron (diss.filt)	<10 µg/l	TM152	12.7	16.6	21.1	18.4	25.8	
			#	#	#	#	#	
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08	<0.08	<0.08	<0.08	<0.08	
Calaium (Dia Filt)	<0.0 mm//	TM150	#	#	#	#	#	
Calcium (Dis.Filt)	<0.2 mg/l	TM152	115 #	113 #	111 #	109 #	109 #	
Chloride	<2 mg/l	TM184	20.2	# 25.1	25.6	25.9	32.8	
			#	#	#	#	#	
Cyanide, Total	<0.05 mg/l	TM227	<0.05	<0.05	<0.05	<0.05	<0.05	
		+ +						
		┥──┤						
		┥ ┥						
		+ +						
		<u> </u>						
	ļ	_ ↓						



SDG:

CERTIFICATE OF ANALYSIS

P1444

Z1162

Client Reference:

Order Number:

472688

Report Number: Superseded Report:

Validated

Table of Results - Appendix

		• •
Method No	Reference	Description
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
TM045	MEWAM BOD5 2nd Ed.HMSO 1988 / Method 5210B, AWWA/APHA, 20th Ed., 1999; SCA Blue Book 130	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate

NA = not applicable.

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

CERTIFICATE OF ANALYSIS P1444 Z1162

Client Reference:

Order Number:

			P.01.01	
18279808	18279819	18279837	18279849	18279858
Ballymulvey - G	Cartron SW1	Cartron SW2	Cartron SW3	Cartron SW4
0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
14-Sep-2018	14-Sep-2018	14-Sep-2018	13-Sep-2018	13-Sep-2018
17-Sep-2018	17-Sep-2018	17-Sep-2018	08-Sep-2018	08-Sep-2018
17-Sep-2018	17-Sep-2018	17-Sep-2018	17-Sep-2018	17-Sep-2018
17-Sep-2018	16-Sep-2018	17-Sep-2018	17-Sep-2018	17-Sep-2018
14-Sep-2018	13-Sep-2018	14-Sep-2018	14-Sep-2018	14-Sep-2018
14-Sep-2018	14-Sep-2018	14-Sep-2018	14-Sep-2018	14-Sep-2018
	Ballymulvey - G 0.00 - 0.00 Surface Water 14-Sep-2018 17-Sep-2018 17-Sep-2018 17-Sep-2018 14-Sep-2018	18279808 18279819 Baltymulvey-G Carton SW1 0.00-0.00 0.00-0.00 Surface Water Surface Water 14-Sep-2018 14-Sep-2018 17-Sep-2018 17-Sep-2018 17-Sep-2018 17-Sep-2018 17-Sep-2018 16-Sep-2018 14-Sep-2018 16-Sep-2018	18279808 18279819 18279837 Ballymulvey-G Cartron SW1 Cartron SW2 D D D 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 Surface Water Surface Water Surface Water 14-Sep-2018 14-Sep-2018 14-Sep-2018 17-Sep-2018 17-Sep-2018 17-Sep-2018 17-Sep-2018 17-Sep-2018 17-Sep-2018 17-Sep-2018 16-Sep-2018 17-Sep-2018 14-Sep-2018 13-Sep-2018 14-Sep-2018	Ballymulvey-G Cartron SW1 Cartron SW2 Cartron SW3 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 Surface Water Surface Water Surface Water Surface Water 14-Sep-2018 14-Sep-2018 14-Sep-2018 13-Sep-2018 17-Sep-2018 17-Sep-2018 17-Sep-2018 08-Sep-2018 17-Sep-2018 17-Sep-2018 17-Sep-2018 17-Sep-2018 17-Sep-2018 16-Sep-2018 17-Sep-2018 17-Sep-2018 14-Sep-2018 13-Sep-2018 14-Sep-2018 14-Sep-2018

Test Completion Dates

Report Number: Superseded Report: 472688



180907-68 Cartron Big

ALS	SDG: Location:	180907-68 Cartron Big	Client Reference: Order Number:	P1444 Z1162	Report Number: Superseded Report:	472688
(ALS)						

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 sumples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

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

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt . However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. Surrogate recoveries - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. 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-lsopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

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

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

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

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

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).

Asbe stos Type	Common Name
Chrysof le	White Asbestos
Amosite	Brow n Asbestos
Cio d dolite	Blue Asbe stos
Fibrous Act nolite	
Fib to us Anthop hyll ite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

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

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

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



CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING



Site Walkover Checklist & Photographs

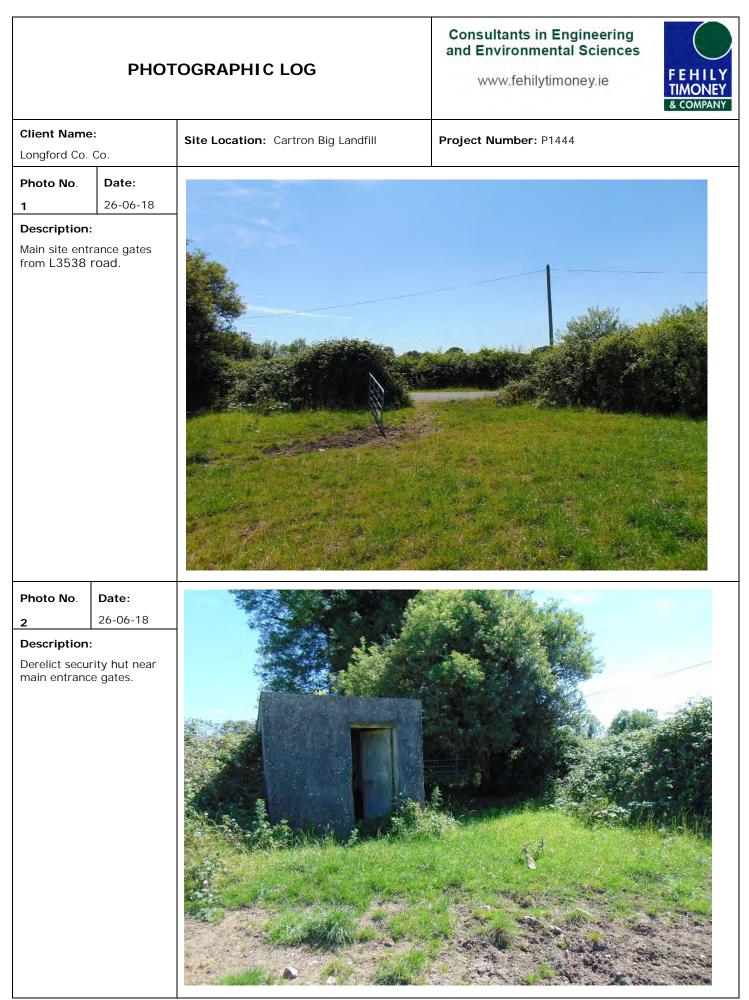


Cartron Big Walkover Survey Checklist – 26th June 2018

Information	Checked	Comment (include distances from site boundary)
1. What is the current land use?	\checkmark	The site is vegetated with grassland is currently under agricultural use.
2. What are the neighbouring land uses?	√	North: The L1071 road and an agricultural field bound the north of the site. South: Agricultural fields. East: Clooncoose Stream West: The L3538 road to N4 and agricultural fields.
3. What is the size of the site?	\checkmark	The site occupies approximately 4.0 hectares.
4. What is the topography?	\checkmark	The countryside surrounding the site is gently undulating. There is a gentle gradient across the site from southeast to the north/northwest toward the Clooncoose stream.
5. Are there potential receptors (if yes, give details)?	\checkmark	The Clooncoose stream forms the eastern site boundary, seepage of leachate into the stream was observed. There are houses within 200m of the site. Bedrock Aquifer is classified as a locally important aquifer which is moderately productive and highly to extremely vulnerable to contamination.
Houses	\checkmark	There are no houses within 200m of the site boundary.
Surface water features (if yes, distance and direction of flow)	\checkmark	The Clooncoose stream forms the eastern site boundary and flows from southeast to northwest.
Any wetland or protected areas	\checkmark	None.
Public water supplies	\checkmark	A public water supply borehole is located approximately 1 km to the east of the site.
Private wells	\checkmark	There are no private wells located with 1km of the site.
Services	\checkmark	None identified.
Other buildings	\checkmark	Two derelict buildings exist onsite. A small security/weighbridge hut and a derelict farm house.
Other	\checkmark	N/A
6. Are there any potential sources of contamination (if yes, give details)?	\checkmark	Leachate seepage from shallow waste body into the Clooncoose stream.

Information	Checked	Comment (include distances from site boundary)
Surface waste (if yes, what type?)	\checkmark	No
Surface ponding of leachate	\checkmark	The site is known for becoming waterlogged in many places, but no ponding was observed during this visit.
Leachate seepage	\checkmark	Possible leachate seepage into the Clooncoose stream was observed i.e. red oxide staining to stream bed at two locations
Landfill gas odours	\checkmark	No
7. Are there any outfalls to surface water? (If yes, are there discharges and what is the nature of discharge?)	√	Possible leachate seepage into the Clooncoose stream was observed i.e. red oxide staining to stream bed at two locations
8. Are there any signs of impact on the environment? (If yes, take photographic evidence)	\checkmark	See Photographic Log
Vegetation die off, bare ground	\checkmark	No
Leachate seepages	\checkmark	Red oxide staining to stream bed at two locations. See Photographic Log
Odours	\checkmark	No
Litter	\checkmark	No
Gas bubbling through water	\checkmark	No
Signs of settlement	\checkmark	Yes, signs of settlement and subsidence were evident, in particular close to the southern site boundary.
Subsidence, water logged areas	\checkmark	Within the site, localised subsidence has occurred where waste has settled over time. Areas prone to waterlogging across the site, mainly along the eastern site boundary.
Drainage or hydraulic issues	\checkmark	Evidence of localised areas of waterlogging and poor drainage.
Downstream water quality appears poorer than upstream water quality	\checkmark	Red oxide staining to stream bed at two locations
9. Are there any indications of remedial measures? (Provide details)	√	Surface water biological quality is monitored at the north-eastern site corner – Cartron Bridge – by the EPA and its status is classified as Good. It is also classified as Good at the next monitoring point 2.5 km downstream.
Capping	\checkmark	Yes, the waste body is reported to have been capped with bark, shale and a soil cap.

Information	Checked	Comment (include distances from site boundary)
Landfill gas collection	\checkmark	Yes, there are a series of landfill gas vents across the site which appear to be passive. There does not appear to be a landfill gas collection system in place.
Leachate collection	\checkmark	No.
10. Describe fences and security features (if any)	\checkmark	The eastern site boundary is formed by the Clooncoose stream, with brambles and small beech trees on the opposite bank. Along the northern site boundary with the L1071 the site boundary is formed by an open hedgerow of small trees and brambles with a drainage ditch running from west to east toward the Clooncoose stream. The western site boundary with the L3538 roadway is dense bramble, elder and hawthorn hedge. Access gates from the L3538 are padlocked. Along the southern site boundary is a 2 m chain link fence with concrete posts.
Any other relevant information?	\checkmark	No.



PHOTOGRAPHIC LOG			Consultants in Engineering and Environmental Sciences www.fehilytimoney.ie		
Client Name		Site Location: Cartron Big Landfill	Project Number: P1444		
Longford Co.					
Photo No. 3	Date: 26-06-18				
Description:	1				
Derelict buil along weste boundary ar to concrete hardstand a	rn nd near				
Photo No.	Date:				
4	26-06-18				
Description: View showin draining gra conditions p waterlogging the eastern the site.	ng poorly ssland rone to g along				

	PHOT	OGRAPHIC LOG	Consultants in Engineering and Environmental Sciences www.fehilytimoney.ie
Client Name Longford Co.		Site Location: Cartron Big Landfill	Project Number: P1444
Photo No. 5 Description View showin discoloratio Clooncoose near the ea portion of th (possible ex leachate se from the lan	ng n to the Stream stern he landfill vidence of epage		<image/>
Photo No. 6 Description Another vie discoloratio staining) to Clooncoose near the ea portion of th (possible ex leachate se from the lar	w n (red the Stream stern ne landfill vidence of epage		<image/>

PHOTOGRAPHIC LOG			Consultants in Engineering and Environmental Sciences www.fehilytimoney.ie
Client Name: Longford Co. Co.		Site Location: Cartron Big Landfill	Project Number: P1444
Photo No. 7 Description: View showir Clooncoose in north-eas corner of lat	ng area of Stream stern		
Photo No.	Date:		
8	26-06-18		
Existing gas venting system installed within landfill cap.			

Consultants in Engineering and Environmental Sciences

PHOTOGRAPHIC LOG

www.fehilytimoney.ie



Client Name: Longford Co. Co.

Site Location: Cartron Big Landfill

Project Number: P1444

g			
Photo No.	Date:		
9	26-06-18		
Description:			
View showing the discharge location of iron precipitate entering the Clooncoose Stream from the field north of the landfill. Possibly a preferential pathway to North-North East.			



Photo No. Date: 10 26-06-18

Description:

Evidence of land subsidence towards the southern site boundary





CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

www.fehilytimoney.ie



Core House

Ireland

Pouladuff Road,

Cork, T12 D773,

+353 21 496 4133

Oublin Office

J5 Plaza, North Park Business Park, North Road, Dublin 11, D11 PXT0, Ireland +353 1 658 3500



Unit 6, Bagenalstown Industrial Park, Royal Oak Road, Muine Bheag, Co. Carlow, R21 XW81, Ireland +353 59 972 3800





ENVIRONMENT ISO 14001:2015 NSAI Certified