oundwater & Surface Water Sampling Analysis Results

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

Attention: Daniel Hayden

CERTIFICATE OF ANALYSIS

 Date:
 17 September 2018

 Customer:
 D_FTIM_DUB

 Sample Delivery Group (SDG):
 180907-68

 Your Reference:
 P1444

 Location:
 Cartron Big

 Report No:
 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 ALSCLife Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Approved By:

Sonia McWhan
Operations Manager







FIEICATE OF ANALYSIS

 SDG:
 180907-68
 Client Reference:

 Location:
 Cartron Big
 Order Number:

P1444 Report Number: Z1162 Superseded Report: 472688

Validated

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 -

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

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.

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



CERTIFICATE OF ANALYSIS

ALS	

SDG: P1444 180907-68 Client Reference: Report Number: 472688 Location: Cartron Big Order Number: Z1162 Superseded Report: Results Legend 18279837 18279858 18279808 18279819 18279849 Lab Sample No(s) X Test No Determination Possible Ballymulvey Cartron SW1 Cartron SW2 Cartron SW3 Cartron SW4 Customer Sample Reference Ġ Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate 0.00-0.00-PR - Process Water 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 SA - Saline Water Depth (m) - 0.00 - 0.00 TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water 250ml BOD (ALE212) 1lplastic (ALE221) 1lplastic (ALE221) 1lplastic (ALE221) (ALE204) 250ml BOD (ALE212) NaOH (ALE245) HNO3 Filtered (ALE204) 250ml BOD (ALE212) NaOH (ALE245) NaOH (ALE245) HNO3 Filtered (ALE204) 250ml BOD (ALE212) lplastic (ALE221) HNO3 Filtered (ALE204) 250ml BOD (ALE212) NaOH (ALE245) lplastic (ALE221) HNO3 Filtered (ALE204) DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other WS Sample Type WS WS WS WS WS WS WS Alkalinity as CaCO3 All NDPs: 0 Tests: 5 X X X Χ Anions by Kone (w) All NDPs: 0 dioi Tests: 5 ت پېچى X Χ Χ Χ BOD True Total All NDPs: 0 Tests: 5 X Х Х Χ COD Unfiltered All NDPs: 0 Tests: 5 X Χ X X Cvanide Comp/Free/Total/Thiocvanate All NDPs: 0 Tests: 5 X Χ Χ Χ Dissolved Metals by ICP-MS All NDPs: 0 Tests: 5 X Х X X Х

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SDG:180907-68Client Reference:P1444Report Number:472688Location:Cartron BigOrder Number:Z1162Superseded Report:

Results Legend # ISO17025 accredited.		Customer Sample Ref.	Ballymulvey - G	Cartron SW1	Cartron SW2	Cartron SW3	Cartron SW4]
M mCERTS accredited. aq Aqueous / settled sample.		5						
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	0.00 - 0.00 Surface Water (SW)	0.00 - 0.00 Surface Water (SW)	0.00 - 0.00 Surface Water (SW)	0.00 - 0.00 Surface Water (SW)	0.00 - 0.00 Surface Water (SW)	
* Subcontracted test.		Date Sampled	06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018	
check the efficiency of the method.	The	Sample Time Date Received	07/09/2018	07/09/2018	07/09/2018	07/09/2018	07/09/2018	
results of individual compounds wi samples aren't corrected for the rec		SDG Ref	180907-68	180907-68	180907-68	180907-68	180907-68	
(F) Trigger breach confirmed 1-5&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	18279808	18279819	18279837	18279849	18279858	
Component	LOD/Units	Method						
Alkalinity, Total as CaCO3	<2 mg/l	TM043	322	293	290	286	302	
BOD, unfiltered	<1 mg/l	TM045	<1	# <1	# <1	# <1	* <1	
Bob, unintored	*i ilig/i	11040	* #	• #	♦ #	♦ #	♦ #	
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	1.24	
		=======================================	#	#	#	#	#	
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	
Gadman (disc.iit)		111102	#	#	#	#	#	
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	
0 11 7 11	0.05 "	71,1007	#	#	#	#	#	
Cyanide, Total	<0.05 mg/l	TM227	<0.05	<0.05	<0.05	<0.05	<0.05	
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SDG: 180907-68 Client Reference: P1444 Report Number: 472688
Location: Cartron Big Order Number: Z1162 Superseded Report:

Table of Results - Appendix

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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



 SDG:
 180907-68
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 Location:
 Cartron Big
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 Z1162
 Superseded Report:

Test Completion Dates

	_			p. 0 c. 0 .	
Lab Sample No(s)	18279808	18279819	18279837	18279849	18279858
Customer Sample Ref.	Ballymulvey - G	Cartron SW1	Cartron SW2	Cartron SW3	Cartron SW4
AGS Ref.					
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Туре	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Alkalinity as CaCO3	14-Sep-2018	14-Sep-2018	14-Sep-2018	13-Sep-2018	13-Sep-2018
Anions by Kone (w)	17-Sep-2018	17-Sep-2018	17-Sep-2018	08-Sep-2018	08-Sep-2018
BOD True Total	17-Sep-2018	17-Sep-2018	17-Sep-2018	17-Sep-2018	17-Sep-2018
COD Unfiltered	17-Sep-2018	16-Sep-2018	17-Sep-2018	17-Sep-2018	17-Sep-2018
Cyanide Comp/Free/Total/Thiocyanate	14-Sep-2018	13-Sep-2018	14-Sep-2018	14-Sep-2018	14-Sep-2018
Dissolved Metals by ICP-MS	14-Sep-2018	14-Sep-2018	14-Sep-2018	14-Sep-2018	14-Sep-2018





180907-68 472688 SDG: P1444 Client Reference: Report Number: Superseded Report: Cartron Big 71162 Location: Order Number:

Appendix

General

- 1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.
- 2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
- 3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.
- 4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
- 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 received.
- 10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals total metals must be requested separately.

 11. Results relate only to the items tested.
- 12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected
- 13. Surrogate recoveries Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. 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
- 15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
- 16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).
- Stones/debris are not routinely removed. We always endeavour to take a 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, clav 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						
I	~ 3. K	Deviation from method						
ş	N. CO.	Holding time exceeded before sample received						
2	5	Samples exceeded holding time before presevation was performed						
	§	Sampled on date not provided						
I	•	Sample holding time exceeded in laboratory						
I	@	Sample holding time exceeded due to sampled on date						
	&	Sample Holding Time exceeded - Late arrival of instructions.						

Asbestos

Identification of Asbestos in Bulk Materials & Soils

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

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

Asbe stos Type	Common Name
Chrysof le	White Asbests
Amosite	Brow n Asbestos
Cro 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.

15:48:03 17/09/2018 Modification Date: 17/09/2018 EPA Export 06-10-2021:02:43:50



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

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

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

Attention: Daniel Hayden

CERTIFICATE OF ANALYSIS

 Date:
 16 October 2018

 Customer:
 D_FTIM_DUB

 Sample Delivery Group (SDG):
 181009-28

 Your Reference:
 P1444

 Location:
 Ballymulvey

 Report No:
 476976

We received 5 samples on Tuesday October 09, 2018 and 5 of these samples were scheduled for analysis which was completed on Tuesday October 16, 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 ALSCLife Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Approved By:

Sonia McWhan
Operations Manager







P1444 476976 Client Reference: Report Number: Z1162 Superseded Report: Order Number:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18487193	BH5		0.00 - 0.00	08/10/2018
18487204	BH6		0.00 - 0.00	08/10/2018
18487168	GW01		0.00 - 0.00	08/10/2018
18487176	GW02		0.00 - 0.00	08/10/2018
18487186	GW03		0.00 - 0.00	08/10/2018

Maximum Sample/Coolbox Temperature (°C):

ISO5667-3 Water quality - Sampling - Part3 -

SDG:

Location:

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

181009-28

Ballymulvey

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

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



SDG: P1444 181009-28 Client Reference: Report Number: 476976 Location: Ballymulvey Order Number: Z1162 Superseded Report: Results Legend 18487193 18487204 18487176 18487168 Lab Sample No(s) X Test No Determination Possible Customer GW01 GW02 BH5 Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water 0.00-0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 SA - Saline Water Depth (m) TE - Trade Effluent - 0.00 TS - Treated Sewage US - Untreated Sewage RE - Recreational Water HNO3 Filtered (ALE204) H2SO4 (ALE244) 0.5l glass bottle (ALE227) 1 lplastic (ALE221) H2SO4 (ALE244) H2SO4 (ALE244) 1lplastic (ALE221) 0.5l glass bottle (ALE227) 1lplastic (ALE221) Ilplastic (ALE221) NaOH (ALE245) HNO3 Filtered (ALE204) NaOH (ALE245) NaOH (ALE245) HNO3 Filtered (ALE204) DW - Drinking Water Non-regulatory Vial (ALE297) Vial (ALE297) 250ml BOD (ALE212) 250ml BOD (ALE212) UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other GW GW GW Sample Type GW \mathbb{H} E Е H ᇤ Е H H Ε Е Е \mathbb{H} H H Alkalinity as CaCO3 All NDPs: 0 Tests: 5 X X Χ X Ammoniacal Nitrogen All NDPs: 0 Tests: 5 X X Χ Dil Anions by Kone (w) All NDPs: 0 Tests: 5 Х Х Х Х oring BOD True Total ΔII NDPs: 0 Tests: 2 X Χ COD Unfiltered All NDPs: 0 Tests: 2 Χ Х Coliforms (W) All NDPs: 0 Tests: 3 Χ Х Conductivity (at 20 deg.C) All NDPs: 0 Tests: 5 Χ Χ Χ Χ Cyanide Comp/Free/Total/Thiocyanate All NDPs: 0 Tests: 5 X Χ Х Dissolved Metals by ICP-MS All NDPs: 0 Tests: 5 X X Χ Dissolved Oxygen by Probe All NDPs: 0 Tests: 5 Х Х X X Fluoride All NDPs: 0 Tests: 5 Χ Х Х Х Mercury Dissolved All NDPs: 0 Tests: 5 X X X Mineral Oil C10-40 Aqueous (W) All NDPs: 0 Tests: 2 Χ Х Nitrite by Kone (w) All NDPs: 0 Tests: 2 Χ X All Organotins in Aqueous Samples NDPs: 0 Tests: 2 X X

			18487176				1848/186
			GW02				GW03
			0.00 - 0.00				0.00 - 0.00
	H2SO4 (ALE244)	HNO3 Filtered GW (ALE204)	0.00 - 0.00 NaOH (ALE245)	1lplastic (ALE221) GW	H2SO4 (ALE244) GW	HNO3 Filtered (ALE204)	0.00 - 0.00 NaOH (ALE245) GW
Į	GW	GW	GW	GW	GW	GW	GW
				X			
	Х				X		
				X			
				Х			
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			X				X
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CERTIFICATE OF ANALYSIS

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SDG: P1444 181009-28 Client Reference: Report Number: 476976 Location: Ballymulvey Order Number: Z1162 Superseded Report: **Results Legend** 18487193 18487176 18487204 18487168 Lab Sample No(s) X Test No Determination Possible Customer GW01 GW02 BH5 BH6 Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water 0.00 - 0.00 0.00-0.00 - 0.00 0.00 - 0.00 SA - Saline Water Depth (m) TE - Trade Effluent 0.00 TS - Treated Sewage US - Untreated Sewage RE - Recreational Water HNO3 Filtered (ALE204) H2SO4 (ALE244) 0.5l glass bottle (ALE227) 1lplastic (ALE221) 0.5l glass bottle (ALE227) H2SO4 (ALE244) 1 lplastic (ALE221) 1lplastic (ALE221) H2SO4 (ALE244) NaOH (ALE245) 1lplastic (ALE221) HNO3 Filtered (ALE204) NaOH (ALE245) DW - Drinking Water Non-regulatory NaOH (ALE245) Vial (ALE297) 250ml BOD (ALE212) 250ml BOD (ALE212) Vial (ALE297) NO3 Filtered UNL - Unspecified Liquid (ALE204) SL - Sludge Container G - Gas OTH - Other GW Sample Type GW GW GW GW H E ᇤ Е Е Ε \mathbb{H} Е Е Ε Ε Ε Е Е Pesticides (Suite I) by GCMS All NDPs: 0 Х X Pesticides (Suite II) by GCMS All NDPs: 0 Tests: 2 Х Х Pesticides (Suite III) by GCMS All NDPs: 0 Tests: 2 Χ Х pH Value All NDPs: 0 10 Tests: 5 Х Х Х All Phosphate by Kone (w) NDPs: 0 Tests: 2 Χ X Silicon Dissolved by ICP-OES All NDPs: 0 Tests: 2 X X SVOC MS (W) - Aqueous All NDPs: 0 Tests: 2 X X Total Organic and Inorganic Carbon All NDPs: 0 Tests: 5 Х X Χ VOC MS (W) All NDPs: 0 Tests: 2

X

X

Х				GW	H2SO4 (ALE244) GW			
				GW	HNO3 Filtered (ALE204)			
				GW	NaOH (ALE245)	0.00 - 0.00	GW02	18487176
		X		GW	1lplastic (ALE221) GW			
X				GW	H2SO4 (ALE244)			
				GW	HNO3 Filtered (ALE204)			
				GW	0.00 - 0.00 NaOH (ALE245) GW	0.00 - 0.00	GW03	18487186

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SDG: 181009-28 Location: Ballymulvey

Client Reference: P1
Order Number: Z1

P1444 Z1162

Report Number: Superseded Report:

Results Legend # ISO17025 accredited. M mCERTS accredited.	C	ustomer Sample Ref.	BH5	BH6	GW01	GW02	GW03	
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	
tot.unfilt Total / unfiltered sample. * Subcontracted test.		Sample Type Date Sampled	Land Leachate (LE) 08/10/2018	Land Leachate (LE) 08/10/2018	Ground Water (GW) 08/10/2018	Ground Water (GW) 08/10/2018	Ground Water (GW) 08/10/2018	
** % recovery of the surrogate stand		Sample Time						
check the efficiency of the method results of individual compounds w		Date Received	09/10/2018	09/10/2018	09/10/2018	09/10/2018	09/10/2018	
samples aren't corrected for the re (F) Trigger breach confirmed		SDG Ref Lab Sample No.(s)	181009-28 18487193	181009-28 18487204	181009-28 18487168	181009-28 18487176	181009-28 18487186	
1-5&+§@ Sample deviation (see appendix)		AGS Reference						
Component	LOD/Units	Method						
Coliforms, Total*	CFU/100ml	SUB			1640	141000	13400	
Alkalinity, Total as CaCO3	<2 mg/l	TM043	3630 #	984 #	653 #	414 #	521 #	
BOD, unfiltered	<1 mg/l	TM045	14.1 #	6.15 #				
Oxygen, dissolved	<0.3 mg/l	TM046	7.01	7.63	8.57	8.86	8.46	
Organic Carbon, Total	<3 mg/l	TM090	87.7	12.8	15.1 #	15.8 #	28.8	
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	469	66.2	3.99 #	2.56 #	9.87	
Fluoride	<0.5 mg/l	TM104	<0.5	<0.5	<0.5	<0.5	<0.5	
COD, unfiltered	<7 mg/l	TM107	332	45	#	#	#	
Conductivity @ 20 deg.C	<0.005	TM120	8.18	1.84	0.96	0.783	1.2	
Antimony (diss.filt)	mS/cm <1 µg/l	TM152	<1 #	# <1	#	#	#	
Arsenic (diss.filt)	<0.5 μg/l	TM152	3.3	2.1	4.72 2	52.3	13.4	
Barium (diss.filt)	<0.2 μg/l	TM152	382	#	4.72 et 4	#	#	
Beryllium (diss.filt)	<0.1 µg/l	TM152	<0.1	<0.1	~			
, , ,		TM152	1420	JIT W	57.1	32.8	33	
Boron (diss.filt)	<10 µg/l		#	ecit399 et 1204	#	#	#	
Cadmium (diss.filt)	<0.08 µg/l	TM152			0.178 #	<0.08	<0.08	
Chromium (diss.filt)	<1 µg/l	TM152	12.7	≪ <1 #	<1 #	1.26 #	<1 #	
Cobalt (diss.filt)	<0.5 µg/l	TM152	3.43 ent of	1.57 #				
Copper (diss.filt)	<0.3 µg/l	TM152	< 0.3 #	<0.3 #	3.54 #	1.35 #	0.967 #	
Lead (diss.filt)	<0.2 µg/l	TM152	0.249 #	0.233 #	5.06 #	2.14 #	0.325 #	
Manganese (diss.filt)	<3 µg/l	TM152	348 #	444 #	1500 #	1260 #	617 #	
Molybdenum (diss.filt)	<3 µg/l	TM152	<3 #	<3 #				
Nickel (diss.filt)	<0.4 µg/l	TM152	8.52 #	1.76 #	8.07 #	6.34 #	2.91 #	
Phosphorus (diss.filt)	<10 µg/l	TM152	1890 #	561 #	254 #	69.5 #	130 #	
Selenium (diss.filt)	<1 µg/l	TM152	<1 #	<1 #	"	"	"	
Tellurium (diss.filt)	<2 µg/l	TM152	<2	<2				
Thallium (diss.filt)	<2 µg/l	TM152	<2 #	<2 #				
Titanium (diss.filt)	<1 µg/l	TM152	64.9	27.5				
Uranium (diss.filt)	<0.5 µg/l	TM152	<0.5	<0.5				
Vanadium (diss.filt)	<1 µg/l	TM152	2.98	<1 #				
Zinc (diss.filt)	<1 µg/l	TM152	18.5	4.05	15.1	10.3	4.63	
Tin (Diss.Filt)	<1 µg/l	TM152	2.75	<1	#	#	#	
Silver (diss.filt)	<0.5 µg/l	TM152	<0.5	<0.5				
Sodium (Dis.Filt)	<0.076 mg/l	TM152	667	92.8	13.9	13.2	64.2	
1	I .		#	. #	#	#	#	I

CERTIFICATE OF ANALYSIS



SDG: 181009-28 Location: Ballymulvey Client Reference: Order Number: P1444 Z1162 Report Number: Superseded Report:

Parella Lancad		vetemes Comple Def						
Results Legend # ISO17025 accredited.	C	ustomer Sample Ref.	BH5	BH6	GW01	GW02	GW03	
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	0.00 - 0.00 Land Leachate (LE)	0.00 - 0.00 Land Leachate (LE)	0.00 - 0.00 Ground Water (GW)	0.00 - 0.00 Ground Water (GW)	0.00 - 0.00 Ground Water (GW)	
* Subcontracted test. ** % recovery of the surrogate standa	ard 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)	181009-28 18487193	181009-28 18487204	181009-28 18487168	181009-28 18487176	181009-28 18487186	
(F) Trigger breach confirmed 1-5&+§@ Sample deviation (see appendix)		AGS Reference	10 101 100	10.07201	10107100	10.107.170	10.107.100	
Component Magnesium (Die Filt)	LOD/Units	Method	240	AC F	45.0	7.00	40.2	
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	210 #	46.5 #	15.9 #	7.88 #	19.3 #	
Potassium (Dis.Filt)	<0.2 mg/l	TM152	145	51.1	7.14	3.42	14.4	
(= 12.11.11)		"""	#	#	#	#	#	
Calcium (Dis.Filt)	<0.2 mg/l	TM152	222	177	201	188	189	
			#	#	#	#	#	
Iron (Dis.Filt)	<0.019 mg/l	TM152	17	12.4	9.08	7.97	2.36	
Minaral ail > O40 O40 (aa)	4400 //	TM470	200	# #	#	#	#	
Mineral oil >C10 C40 (aq)	<100 µg/l	TM172	320	<100				
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01	0.0382	0.0135	<0.01	
, (====,	J	"""	#	#	#	#	#	
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184	<0.05	<0.05				
Chloride	<2 mg/l	TM184	1180	90.1	24	35.5	132	
Nitrito on N	-0.0450	T14404	20 04F0	-0.0450	#	#	#	
Nitrite as N	<0.0152 mg/l	TM184	<0.0152	<0.0152				
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184	0.101	0.122	0.52	<0.1	<0.1	
Total Oxidiood Willogon do W	-o.r mg/r	"""	0.101	0.122	15#	#	#	
Sulphate (soluble) as S	<1 mg/l	TM184	<1	<1	6.8376	10.1	3.9	
						#	#	
Cyanide, Total	<0.05 mg/l	TM227	<0.05	<0.05	on 20.05	<0.05	<0.05	
			#	#	#	#	#	
Cyanide, Free	<0.05 mg/l	TM227	<0.05 #	<0.05 phirodiff	ř			
pH	<1 pH Units	TM256	7.53	:1014 55	7.42	7.58	7.12	
P'''	T pri onito	1111200	#	get Milet #	#	#	#	
Silicon (diss.filt)	<0.05 mg/l	TM284	9.93	itight 9.5				
			Ć.	N VIII				
Dibutyl tin	<5 ng/l	TM328	<15	<10				
Talk and the	44 //	TM200	is the					
Tributyl tin	<1 ng/l	TM328	<3 consent or	<2				
Tetrabutyl tin	<2 ng/l	TM328	6	<4				
			-					
Triphenyl tin	<1 ng/l	TM328	<3	<2				
Surrogate	%	TM328	66.9	94.3				
Trifluralin	<0.01 µg/l	TM343	<0.01	<0.01				
Timurum	-0.01 µg/l	I WIU-FU	~ 0.01	\U.U.I				
alpha-HCH	<0.01 µg/l	TM343	<0.01	<0.01				
gamma-HCH (Lindane)	<0.01 µg/l	TM343	<0.01	<0.01				
Hantachlar	-0.04 "	TN40.40	-0.04	-0.04				
Heptachlor	<0.01 µg/l	TM343	<0.01	<0.01				
Aldrin	<0.01 µg/l	TM343	<0.01	<0.01				
	5.5. Pg/		5.5.					l
beta-HCH	<0.01 µg/l	TM343	<0.01	<0.01				
Isodrin	<0.01 µg/l	TM343	<0.01	<0.01				
Hontachlar anavida	<0.01 µg/l	TM343	<0.01	<0.01				
Heptachlor epoxide	~υ.υ ι μg/l	1 IVI 343	\U.U1	\U.U1				
o,p'-DDE	<0.01 µg/l	TM343	<0.01	<0.01				
·	1.3.							
Endosulphan I	<0.01 µg/l	TM343	<0.01	<0.01				
		1						
trans-Chlordane	<0.01 µg/l	TM343	<0.01	<0.01				
cis-Chlordane	<0.01 µg/l	TM343	<0.01	<0.01				
GIS-CHIOLUGHE	~υ.υ ι μg/l	1 IVI 343	\U.U1	\U.U1				
		_		<u> </u>				

CERTIFICATE OF ANALYSIS



SDG: 181009-28 Ballymulvey Location:

Client Reference: Order Number:

P1444 Z1162 Report Number: Superseded Report:

Part									
Section Sect	M mCERTS accredited.	C	Customer Sample Ref.	BH5	BH6	GW01	GW02	GW03	
Personal	diss.filt Dissolved / filtered sample.								
Description of the control of the	* Subcontracted test.								
Component	check the efficiency of the method.	. The							
Technology Tec				181009-28	181009-28	181009-28	181009-28	181009-28	
Component Code Co	(F) Trigger breach confirmed	·		18487193	18487204	18487168	18487176	18487186	
Debton		LOD/Units							
20-00-(10E)	p,p'-DDE	<0.01 µg/l	TM343	<0.01	<0.01				
Edite	Dieldrin	<0.01 µg/l	TM343	<0.01	<0.01				
Proposition	o,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.01	<0.01				
Proceduration Proceduratio	Endrin	<0.01 µg/l	TM343	<0.01	<0.01				
Endosulphan II	o,p'-DDT	<0.01 µg/l	TM343	<0.01	<0.01				
Part	p,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.01	<0.01				
Parkethosychiler 4-001 µp1 1M343 4-0.01	Endosulphan II	<0.02 µg/l	TM343	<0.02	<0.02				
Endosulphane Sulphate	p,p'-DDT	<0.01 µg/l	TM343	<0.01	<0.01				
Mevinphos	p,p'-Methoxychlor	<0.01 µg/l	TM343	<0.01					
Mevinphos	Endosulphan Sulphate	<0.02 µg/l	TM343	<0.02	<0.02	, 115°.			
Mevinphos	Permethrin I	<0.01 µg/l	TM343	<0.01	<0.01	other			
Mevinphos	Permethrin II	<0.01 µg/l	TM343	<0.01	<0.01	only are			
Mevinphos 4.00 pgl 1M344 4.001	Dichlorvos	<0.01 µg/l	TM344	<0.01	<0.01 purioditi	200			
Heachirobenzene	Mevinphos	<0.01 µg/l	TM344	<0.01	₹ 9.01 <i>∞</i>				
Diazinon	Tecnazene	<0.01 µg/l	TM344	<0.01	K Vite				
Intalate 4.0.0 μg/l 1M344 4.0.01 4.0.	Hexachlorobenzene	<0.01 µg/l	TM344	<0.01	<0.01				
Intalate 4.0.0 μg/l 1M344 4.0.01 4.0.	Diazinon	<0.01 µg/l	TM344	<0.01 sent	<0.01				
Simazine <0.01 µg/l TM344 0.184 <0.01	Triallate	<0.01 µg/l	TM344	<0.01	<0.01				
Disulfoton 4.0.1 μg/l TM344 4.0.01 4.	Atrazine	<0.01 µg/l	TM344	<0.01	<0.01				
Propetamphos <0.01 μg/l	Simazine	<0.01 µg/l	TM344	0.184	<0.01				
Chlorpyriphos-methyl < 0.01 µg/l TM344 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01<	Disulfoton	<0.01 µg/l	TM344	<0.01	<0.01				
Dimethoate < 0.01 μg/l TM344 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 <t< td=""><td>Propetamphos</td><td></td><td>TM344</td><td><0.01</td><td><0.01</td><td></td><td></td><td></td><td></td></t<>	Propetamphos		TM344	<0.01	<0.01				
Pirimiphos-methyl < 0.01 μg/l TM344 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	Chlorpyriphos-methyl	<0.01 μg/l		<0.01	<0.01				
Chlorpyriphos < 0.01 μg/l TM344 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 <	Dimethoate	<0.01 μg/l			<0.01				
Methyl Parathion < 0.01 µg/l TM344 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	Pirimiphos-methyl								
Malathion < 0.01 µg/l TM344 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	Chlorpyriphos	<0.01 µg/l	TM344	<0.01	<0.01				
Fenthion < 0.01 μg/l TM344 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	Methyl Parathion	<0.01 µg/l	TM344	<0.01	<0.01				
Fenitrothion < 0.01 μg/l TM344 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 <	Malathion	<0.01 µg/l	TM344	<0.01	<0.01				
Triadimefon <0.01 μg/l TM344 <0.01 <0.01	Fenthion	<0.01 µg/l	TM344	<0.01	<0.01				
	Fenitrothion		TM344	<0.01	<0.01				
Pendimethalin <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:181009-28Client Reference:P1444Report Number:476976Location:BallymulveyOrder Number:Z1162Superseded Report:

Results Legend		Customer Sample Ref.	BH5	BH6	GW01	GW02	GW03	
# ISO17025 accredited. M mCERTS accredited.		·	5.1.0	5.10	0	5.1.02	0.1.30	
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m) Sample Type	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	
tot.unfilt Total / unfiltered sample. * Subcontracted test.		Date Sampled	Land Leachate (LE) 08/10/2018	Land Leachate (LE) 08/10/2018	Ground Water (GW) 08/10/2018	Ground Water (GW) 08/10/2018	Ground Water (GW) 08/10/2018	
** % recovery of the surrogate stands check the efficiency of the method	. The	Sample Time Date Received	09/10/2018	09/10/2018	09/10/2018	09/10/2018	09/10/2018	
results of individual compounds w samples aren't corrected for the re		SDG Ref	181009-28	181009-28	181009-28	181009-28	181009-28	
(F) Trigger breach confirmed 1-5&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	18487193	18487204	18487168	18487176	18487186	
Component	LOD/Units	Method						
Parathion	<0.01 µg/l		<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	only, any other use.			
Chlorothalonil	<0.01 µg/l	TM345	<0.01	<0.01	other			
Etrimphos	<0.01 µg/l	TM345	<0.01	<0.01	only and			
				Duryo di	25			
				getion ner i				
			€ ⁽	<0.01 <p><0.01</p> <0.01 www.energer.com/ </td <td></td> <td></td> <td></td> <td></td>				
			્ હે	'96,				
			Consentor					
L								

181009-28 Ballymulvey P1444 Z1162 Report Number: Superseded Report: SDG: Client Reference: 476976 Order Number: Location:

SVOC MS (W) - Aqueous							
Results Legend # ISO17025 accredited.		Customer Sample Ref.	BH5	BH6]
M mCERTS accredited. aq Aqueous / settled sample.							
diss.filt Dissolved / filtered sample.		Depth (m) Sample Type	0.00 - 0.00 Land Leachate (LE)	0.00 - 0.00 Land Leachate (LE)			
tot.unfilt Total / unfiltered sample. * Subcontracted test.		Date Sampled	08/10/2018	08/10/2018			
** % recovery of the surrogate standa check the efficiency of the method.		Sample Time	09/10/2018	09/10/2018			
results of individual compounds with samples aren't corrected for the re-	ithin	Date Received SDG Ref	181009-28	181009-28			
(F) Trigger breach confirmed	covery	Lab Sample No.(s)	18487193	18487204			
1-5&+§@ Sample deviation (see appendix) Component	LOD/Units	AGS Reference Method					
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<1	<1			
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1			
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1			
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1			
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1			
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1			
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<1	<1			
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<1	<1			
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1			
2,6-Dinitrotoluene (aq)	<1 μg/l	TM176	<1	<1			
2-Chloronaphthalene (aq)	<1 μg/l	TM176	<1	<1	ly of other use.		
2-Chlorophenol (aq)	<1 μg/l	TM176	<1	<1	only and other		
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1 205.	or correction of the correctio		
2-Methylphenol (aq)	<1 µg/l	TM176	<1	of Dury Tedur			
2-Nitroaniline (aq)	<1 μg/l	TM176	<1	aspection ner			
2-Nitrophenol (aq)	<1 μg/l	TM176	<1	<1 politically control of the contro			
3-Nitroaniline (aq)	<1 μg/l	TM176		<1			
			<1 Salt of	<1			
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<1	<1			
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176					
4-Chloroaniline (aq)	<1 µg/l	TM176	<1	<1			
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<1	<1			
4-Methylphenol (aq)	<1 µg/l	TM176	<1	<1			
4-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1			
4-Nitrophenol (aq)	<1 µg/l	TM176	<1	<1			
Azobenzene (aq)	<1 µg/l	TM176	<1	<1			
Acenaphthylene (aq)	<1 µg/l	TM176	<1	<1			
Acenaphthene (aq)	<1 µg/l	TM176	<1	<1			
Anthracene (aq)	<1 µg/l	TM176	<1	<1			
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<1	<1			
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<1	<1			
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<2	<2			
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	<1			
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<1	<1			

CERTIFICATE OF ANALYSIS



P1444 Z1162 SDG: Report Number: Superseded Report: 181009-28 Client Reference: 476976 Ballymulvey Order Number: Location:

SVOC MS (W) - Aqueous								
Results Legend # ISO17025 accredited.		Customer Sample Ref.	BH5	BH6				
M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test.		Depth (m) Sample Type Date Sampled	0.00 - 0.00 Land Leachate (LE) 08/10/2018	0.00 - 0.00 Land Leachate (LE) 08/10/2018				
** % recovery of the surrogate stands check the efficiency of the method results of individual compounds w samples aren't corrected for the re	. The ithin	Sample Time Date Received SDG Ref	09/10/2018 181009-28	09/10/2018 181009-28				
(F) Trigger breach confirmed 1-5&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	18487193	18487204				
Component	LOD/Units	Method	.4	.4				
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176	<1	<1				
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<1	<1				
Benzo(a)pyrene (aq)	<1 µg/l	TM176	<1	<1				
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176	<1	<1				
Carbazole (aq)	<1 µg/l	TM176	<1	<1				
Chrysene (aq)	<1 µg/l	TM176	<1	<1				
Dibenzofuran (aq)	<1 µg/l	TM176	<1	<1				
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<1	<1				
Diethyl phthalate (aq)	<1 µg/l	TM176	<1	<1				
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176	<1	<1	Tuse.			
Dimethyl phthalate (aq)	<1 µg/l	TM176	<1	<1	only and other reco			
n-Dioctyl phthalate (aq)	<5 µg/l	TM176	<5	<5 _&	only air.			
Fluoranthene (aq)	<1 µg/l	TM176	<1	1 12 13	2 ~			
Fluorene (aq)	<1 µg/l	TM176	<1	ectioner				
Hexachlorobenzene (aq)	<1 µg/l	TM176	<1 �	itisott <1				
Hexachlorobutadiene (aq)	<1 µg/l	TM176	<1	oV				
Pentachlorophenol (aq)	<1 µg/l	TM176	<1 CORPORT OF	<1				
Phenol (aq)	<1 µg/l	TM176		<1				
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176	<1	<1				
Hexachloroethane (aq)	<1 µg/l	TM176	<1	<1				
Nitrobenzene (aq)	<1 µg/l	TM176	<1	<1				
Naphthalene (aq)	<1 µg/l	TM176	<1	<1				
Isophorone (aq)	<1 µg/l	TM176	<1	<1				
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176	<1	<1				
Phenanthrene (aq)	<1 µg/l	TM176	<1	<1				
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176	<1	<1				
Pyrene (aq)	<1 µg/l	TM176	<1	<1				

ALS

SDG:181009-28Client Reference:P1444Report Number:476976Location:BallymulveyOrder Number:Z1162Superseded Report:

Section	(ALS) Education		Banymarray	0.00	i italiibei. 2	102	· ·	
Part	VOC MS (W)							
Section Content			Customer Sample Ref.	BH5	BH6			
Section Sect			B # ()					
Secure methods Secure Se	diss.filt Dissolved / filtered sample.							
Commontation Comm	* Subcontracted test.	adard to						
Components	check the efficiency of the meth-	od. The		09/10/2018	09/10/2018			
Table of Part Table of Par	samples aren't corrected for the							
Companies)	Lab Sample No.(s) AGS Reference	10407 193	10407204			
Tournementary 1	Component		Method					
District State Section Section	Dibromofluoromethane**	%	TM208	103	103			
District of Control Age Co	Toluene-d8**	%	TM208	100	101			
Chipmonshame	4-Bromofluorobenzene**	%	TM208	96.4	95.4			
Chlorostellane	Dichlorodifluoromethane	<1 µg/l	TM208		I			
The comments	Chloromethane	<1 µg/l	TM208	<1	<1			
Biomonethane	Vinyl chloride	<1 µg/l	TM208	<1	186			
Chlorestrates	Bromomethane	<1 µg/l	TM208	<1	<1			
1.1 Dichloropethere	Chloroethane	<1 µg/l	TM208		I			
Miles	Trichlorofluoromethane				#			
Miles				#	<1 #	1150.		
Miles	Carbon disulphide			#	<1 #	other		
Miles	Dichloromethane			#	<3 #	only an,		
Security Security	(MTBE)			#	<1 purpos.	ęec .		
Security Security	·			#	ecitante #			
2.2-Dichloropropane				<1 #	\$ '. is #			
The content of the				<u>⊊u</u> '	#			
Chloroform				Conser				
Time				#	#			
1,1-Dichloropropene				#	#			
Carbontetrachloride				#	#			
1,2-Dichloroethane				#	#			
Benzene				#	#			
# # # # # # # # # # # # # # # # # # #	Benzene			#	#			
1,2-Dichloropropane	Trichloroethene		TM208	#				
Dibromomethane <1 μg/l	1,2-Dichloropropane		TM208	<1	<1			
Bromodichloromethane <1 μg/l	Dibromomethane	<1 µg/l	TM208	<1	<1			
cis-1,3-Dichloropropene <1 μg/l	Bromodichloromethane	<1 µg/l	TM208	<1	<1			
Toluene < 1 μg/l TM208 1.37 # 1.48 # # # # Tm208 1.37 # 1.48 # # Tm208	cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1			
trans-1,3-Dichloropropene <1 μg/l TM208 <1	Toluene	<1 µg/l	TM208	1.37	1.48			
1,1,2-Trichloroethane <1 μg/l TM208 <1	trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1			
1,3-Dichloropropane <1 μg/l TM208 <1 <1	1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1			
	1,3-Dichloropropane	<1 µg/l	TM208	<1	<1			

CERTIFICATE OF ANALYSIS



 SDG:
 181009-28
 Client Reference:
 P1444
 Report Number:
 476976

 Location:
 Ballymulvey
 Order Number:
 Z1162
 Superseded Report:

VOC MS (W)							
Results Legend # ISO17025 accredited.		Customer Sample Ref.	BH5	BH6			
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 standa		Date Sampled Sample Time	08/10/2018	08/10/2018			
check the efficiency of the method. results of individual compounds wi	ithin	Date Received	09/10/2018 181009-28	09/10/2018 181009-28			
samples aren't corrected for the red (F) Trigger breach confirmed	covery	SDG Ref Lab Sample No.(s)	18487193	18487204			
1-5&+§@ Sample deviation (see appendix) Component	LOD/Units	AGS Reference Method					
Tetrachloroethene	<1 µg/l	TM208	<1 #	<1 #			
Dibromochloromethane	<1 µg/l	TM208	<1 #	<1 #			
1,2-Dibromoethane	<1 µg/l	TM208	<1 #	<1 #			
Chlorobenzene	<1 µg/l	TM208	2.64 #	<1 #			
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1 #	<1 #			
Ethylbenzene	<1 µg/l	TM208	1.09	<1 #			
m,p-Xylene	<1 µg/l	TM208	6.06	<1 #			
o-Xylene	<1 µg/l	TM208	1.95	<1 #			
Styrene	<1 µg/l	TM208	<1 #	<1 #			
Bromoform	<1 µg/l	TM208	<1 #	<1 #	, 11 ⁵ E.		
Isopropylbenzene	<1 µg/l	TM208	<1 #	<1 #	other		
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1 #	<1 #	offy and		
1,2,3-Trichloropropane	<1 µg/l	TM208	<1 #	<1 rpingosi	e ^e		
Bromobenzene	<1 µg/l	TM208	<1 #	ection the			
Propylbenzene	<1 µg/l	TM208	1.07	ithe file <1 #			
2-Chlorotoluene	<1 µg/l	TM208	<1	♂ <1 #			
1,3,5-Trimethylbenzene	<1 µg/l	TM208	1.94 sent #	<1 #			
4-Chlorotoluene	<1 µg/l	TM208	<1 #				
tert-Butylbenzene	<1 µg/l	TM208	<1 #	<1 #			
1,2,4-Trimethylbenzene	<1 µg/l	TM208	9.68 #	<1 #			
sec-Butylbenzene	<1 µg/l	TM208	<1 #	<1 #			
4-iso-Propyltoluene	<1 µg/l	TM208	<1 #	<1 #			
1,3-Dichlorobenzene	<1 µg/l	TM208	<1 #	<1 #			
1,4-Dichlorobenzene	<1 µg/l	TM208	1.86	<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	4.26 #	<1 #			
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1 #	<1 #			

CERTIFICATE OF ANALYSIS



SDG: Report Number: Superseded Report: 181009-28 Client Reference: P1444 476976 Ballymulvey Order Number: Z1162 Location:

OC MS (W)								
Results Legend # ISO17025 accredited.	(Customer Sample Ref.	BH5	BH6				
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	ard to	Date Sampled Sample Time	08/10/2018	08/10/2018				
check the efficiency of the method results of individual compounds v	i. The	Date Received	09/10/2018	09/10/2018				
samples aren't corrected for the re		SDG Ref Lab Sample No.(s)	181009-28 18487193	181009-28 18487204				
(F) Trigger breach confirmed 1-5&+\$@ Sample deviation (see appendix)	LOD/Units	AGS Reference						
1,3,5-Trichlorobenzene	<1 µg/l	Method TM208	<1	<1				
	10							
					odily and other use.			
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					of sylik			
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Report Number: Superseded Report: SDG: 181009-28 Client Reference: P1444 476976 Ballymulvey Order Number: Z1162 Location:

Table of Results - Appendix

Market Alberta	D. C	Book Book
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 (Pasily 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 Determination of Selected Pesticides (Suite I) in Liquids by GCMS
TM284		att ^o die ^e
TM328		a five div
TM343	EPA 8270D - Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of Selected Pesticides (Suite I) in Liquids by GCMS The property of Selected Pesticides (Suite II) by GCMS
TM344	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	The immination 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.

NA = not applicable.

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





SDG: 181009-28 Client Reference: P1444 Report Number: 476976
Location: Ballymulvey Order Number: Z1162 Superseded Report:

Test Completion Dates

Customer Sample Ref. AGS Ref. Depth De			163	ot Colli	pietioi	Date
AGS Ref. Depth Type Land Leachate Land Leachate Ground Water Ground	Lab Sample No(s)	18487193	18487204	18487168	18487176	18487186
Depth Type	Customer Sample Ref.	BH5	BH6	GW01	GW02	GW03
Depth Type Depth	AGS Ref.					
Land Leachate Land Leachate Ground Water Alkalinity as CaCO3 16-Oct-2018 15-Oct-2018 16-Oct-2018 11-Oct-2018 11-Oct-20		0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
Alkalinity as CaCO3	•					
Ammoniacal Nitrogen 15-Oct-2018 11-Oct-2018 11-Oct-201						
Anions by Kone (w) 15-Oct-2018 11-Oct-2018	· · · · · · · · · · · · · · · · · · ·					15-Oct-2018
BOD True Total	<u> </u>					15-Oct-2018
COD Unfiltered	* * * * * * * * * * * * * * * * * * * *			15-Oct-2018	15-Oct-2018	15-Oct-2018
Coliforms (W) 11-Oct-2018 12-Oct-2018 12-Oct-2018 12-Oct-2018 12-Oct-2018 12-Oct-2018 12-Oct-2018 11-Oct-2018						
Conductivity (at 20 deg.C) 11-Oct-2018 12-Oct-2018 12-Oct-2018 12-Oct-2018 12-Oct-2018 12-Oct-2018 12-Oct-2018 10-Oct-2018 11-Oct-2018 11-Oct-	COD Unfiltered	12-Oct-2018	11-Oct-2018			
Cyanide Comp/Free/Total/Thiocyanate 11-Oct-2018 12-Oct-2018 12-Oct-2018 12-Oct-2018 12-Oct-2018 12-Oct-2018 12-Oct-2018 10-Oct-2018 10-Oct-2018 10-Oct-2018 10-Oct-2018 10-Oct-2018 10-Oct-2018 10-Oct-2018 10-Oct-2018 11-Oct-2018 11-Oct-2018 <t< td=""><td>Coliforms (W)</td><td></td><td></td><td></td><td></td><td>11-Oct-2018</td></t<>	Coliforms (W)					11-Oct-2018
12-Oct-2018	Conductivity (at 20 deg.C)	11-Oct-2018	11-Oct-2018	11-Oct-2018	11-Oct-2018	11-Oct-2018
Dissolved Oxygen by Probe 10-Oct-2018 16-Oct-2018 16-Oct-2018 16-Oct-2018 11-Oct-2018 12-Oct-2018 12-Oct-2	Cyanide Comp/Free/Total/Thiocyanate					11-Oct-2018
Fluoride	Dissolved Metals by ICP-MS	12-Oct-2018	12-Oct-2018	12-Oct-2018	12-Oct-2018	12-Oct-2018
Mercury Dissolved 11-Oct-2018	**	10-Oct-2018	10-Oct-2018	10-Oct-2018		10-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 16-Oct-2018 16-Oct-2018 Ph Value 12-Oct-2018 12-Oct-2018 12-Oct-2018 Phosphate by Kone (w) 15-Oct-2018 15-Oct-2018 12-Oct-2018	Fluoride	16-Oct-2018	16-Oct-2018	16-Oct-2018	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 16-Oct-2018 16-Oct-2018 Pesticides (Suite III) by GCMS 16-Oct-2018 12-Oct-2018 PH Value 12-Oct-2018 12-Oct-2018 12-Oct-2018 Phosphate by Kone (w) 15-Oct-2018 15-Oct-2018 15-Oct-2018	Mercury Dissolved	11-Oct-2018	11-Oct-2018	11-Oct-2018	11-Oct-2018	11-Oct-2018
Organotins in Aqueous Samples 12-Oct-2018 12-Oct-2018 Pesticides (Suite II) by GCMS 15-Oct-2018 15-Oct-2018 Pesticides (Suite III) by GCMS 15-Oct-2018 15-Oct-2018 Pesticides (Suite III) by GCMS 16-Oct-2018 16-Oct-2018 PH Value 12-Oct-2018 12-Oct-2018 12-Oct-2018 Phosphate by Kone (w) 15-Oct-2018 15-Oct-2018 12-Oct-2018	Mineral Oil C10-40 Aqueous (W)	16-Oct-2018	16-Oct-2018			
Pesticides (Suite II) by GCMS 15-Oct-2018 15-Oct-2018 Pesticides (Suite III) by GCMS 15-Oct-2018 15-Oct-2018 Pesticides (Suite III) by GCMS 16-Oct-2018 16-Oct-2018 pH Value 12-Oct-2018 12-Oct-2018 12-Oct-2018 Phosphate by Kone (w) 15-Oct-2018 15-Oct-2018 15-Oct-2018	Nitrite by Kone (w)	15-Oct-2018	15-Oct-2018			
Pesticides (Suite III) by GCMS 15-Oct-2018 15-Oct-2018 Pesticides (Suite III) by GCMS 16-Oct-2018 16-Oct-2018 pH Value 12-Oct-2018 12-Oct-2018 12-Oct-2018 Phosphate by Kone (w) 15-Oct-2018 15-Oct-2018 15-Oct-2018	Organotins in Aqueous Samples	12-Oct-2018	12-Oct-2018			
Pesticides (Suite III) by GCMS 16-Oct-2018 16-Oct-2018 12-Oct-2018 12-	Pesticides (Suite I) by GCMS	15-Oct-2018	15-Oct-2018			
pH Value 12-Oct-2018	Pesticides (Suite II) by GCMS	15-Oct-2018	15-Oct-2018			
Phosphate by Kone (w) 15-Oct-2018 15-Oct-2018	Pesticides (Suite III) by GCMS	16-Oct-2018	16-Oct-2018			
	pH Value	12-Oct-2018	12-Oct-2018	12-Oct-2018	12-Oct-2018	12-Oct-2018
Silicon Dissolved by ICP-OES 10-Oct-2018 10-Oct-2018 12-Oct-2018 12-Oct-2018 10-Oct-2018 1	Phosphate by Kone (w)	15-Oct-2018	15-Oct-2018			
12-Oct-2018 12-Oct-2018 10-Oct-2018	Silicon Dissolved by ICP-OES	10-Oct-2018	10-Oct-2018			
Total Organic and Inorganic Carbon 10-Oct-2018 11-Oct-2018 10-Oct-2018 10-Oct-	SVOC MS (W) - Aqueous	12-Oct-2018	12-Oct-2018			
VOC MS (W) 11-Oct-2018 11-Oct-2018 11-Oct-2018 11-Oct-2018 11-Oct-2018 Consent of convitation or first or	Total Organic and Inorganic Carbon	10-Oct-2018	11-Oct-2018	10-Oct-2018	10-Oct-2018	10-Oct-2018
Consent of copyright owner technical for any	VOC MS (W)	11-Oct-2018	11-Oct-2018			dille
Conac			ċ	For its get	on purposes of	a de la companya de l
			Course	,		

14:36:27 16/10/2018

476976 SDG: 181009-28 P1444 Client Reference: Report Number: Superseded Report: 71162 Location: Ballymulvey Order Number:

Appendix

General

- 1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.
- 2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
- 3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.
- 4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
- 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 received.
- 10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals total metals must be requested separately.

 11. Results relate only to the items tested.
- 12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected
- 13. Surrogate recoveries Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. 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
- 15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
- 16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).
- Stones/debris are not routinely removed. We always endeavour to take a 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, clav 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
I	~ 3. K	Deviation from method
ş	N. CO.	Holding time exceeded before sample received
2	5	Samples exceeded holding time before presevation was performed
	§	Sampled on date not provided
I	•	Sample holding time exceeded in laboratory
I	@	Sample holding time exceeded due to sampled on date
	&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

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

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

Asbe stos Type	Common Name		
Chrysof le	White Asbests		
Amosite	Brown Asbestos		
Cro 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.

14:36:56 16/10/2018 Modification Date: 16/10/2018 EPA Export 06-10-2021:02:43:50



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

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

Attention: Daniel Hayden

CERTIFICATE OF ANALYSIS

 Date:
 08 October 2018

 Customer:
 D_FTIM_DUB

 Sample Delivery Group (SDG):
 180927-85

 Your Reference:
 P1444

 Location:
 Ballymulvey

 Report No:
 475704

We received 7 samples on Thursday September 27, 2018 and 7 of these samples were scheduled for analysis which was completed on Monday October 08, 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 ALSCLife Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Approved By:

Sonia McWhan
Operations Manager







Validated

180927-85 Client Reference:
Ballymulvey Order Number:

P1444 Report Number: Z1162 Superseded Report: 475704

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18414647	BH1		0.00 - 0.00	26/09/2018
18414656	BH2		0.00 - 0.00	26/09/2018
18414665	ВН3		0.00 - 0.00	26/09/2018
18414673	BH5		0.00 - 0.00	26/09/2018
18414681	BH6		0.00 - 0.00	26/09/2018
18414699	SW-C		0.00 - 0.00	26/09/2018
18414691	SW-G		0.00 - 0.00	26/09/2018

Maximum Sample/Coolbox Temperature (°C):

ISO5667-3 Water quality - Sampling - Part3 -

SDG:

Location:

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.

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



SDG: P1444 180927-85 Client Reference: Report Number: 475704 Location: Ballymulvey Order Number: Z1162 Superseded Report: Results Legend 184 14656 84 18414673 18414647 Lab Sample No(s) X Test 14665 No Determination Possible Customer 뫄 Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water 0.00 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 SA - Saline Water Depth (m) - 0.00 TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water 1000ml glass bottle (ALE220) H2SO4 (ALE244) H2SO4 (ALE244) H2SO4 (ALE244) NaOH (ALE245) HNO3 Filtered (ALE204) NaOH (ALE245) H2SO4 (ALE244) NaOH (ALE245) HNO3 Filtered (ALE204) 500ml Plastic (ALE208) 250ml BOD (ALE212) 500ml Plastic (ALE208) 250ml BOD (ALE212) HNO3 Filtered (ALE204) 500ml Plastic (ALE208) 250ml BOD (ALE212) 500ml Plastic (ALE208) DW - Drinking Water Non-regulatory 250ml BOD (ALE212) UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other GW GW GW Sample Type GW GW GW GW GΜ GW GW GW GW G۷ GW G۷ Е E Ε H Alkalinity as CaCO3 All NDPs: 0 Tests: 3 X X Ammoniacal Nitrogen All NDPs: 0 Tests: 7 Χ Χ Χ Χ Anions by Kone (w) All NDPs: 0 Tests: 7 Х Х Х Х BOD True Total ΔII NDPs: 0 Tests: 4 Х COD Unfiltered All NDPs: 0 Tests: 2 X Coliforms (W) All NDPs: 0 Tests: 3 X X Х Conductivity (at 20 deg.C) All NDPs: 0 Tests: 7 Χ Х Χ X Cyanide Comp/Free/Total/Thiocyanate All NDPs: 0 Tests: 5 Х Х Χ Dissolved Metals by ICP-MS All NDPs: 0 Tests: 7 X X X Dissolved Oxygen by Probe All NDPs: 0 Tests: 7 Х Х Х Х Fluoride All NDPs: 0 Tests: 5 Χ Х Х Х Mercury Dissolved All NDPs: 0 Tests: 5 Χ X Χ Mineral Oil C10-40 Aqueous (W) All NDPs: 0 Tests: 2 Χ Nitrite by Kone (w) All NDPs: 0 Tests: 2 All Organotins in Aqueous Samples NDPs: 0 Tests: 2 X

		18414673							18414681				18414699				18414691	
		BH5							ВН6				SW-C				SW-G	
		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)	
듄	F	F	Fi	듀	Fi	듀	F	Fi	F	WS	WS	WS	WS	WS	WS	WS	WS	
					X	X					X	X		ins	esikol Arti	X Purp	Ses of Guired	dy. any other use
				x						X		, M.S	ont of	O. A. L.	10			
												C						
	Х				X			X			X				X			
X							X						X				X	
					X						X				X			
					X													
х							X											
			X															
	Х		X					X										

CERTIFICATE OF ANALYSIS

A	13

SDG: P1444 180927-85 Client Reference: Report Number: 475704 Location: Ballymulvey Order Number: Z1162 Superseded Report: **Results Legend** 184 18414673 18414647 18414656 Lab Sample No(s) X Test 14665 No Determination Possible Customer 뫄 BH2 BH3 BH5 Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate 0.00-PR - Process Water 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 SA - Saline Water Depth (m) TE - Trade Effluent - 0.00 TS - Treated Sewage US - Untreated Sewage RE - Recreational Water 500ml Plastic
(ALE208)
250ml BOD
(ALE212)
1000ml glass bottle
(ALE220) H2SO4 (ALE244) H2SO4 (ALE244) H2SO4 (ALE244) NaOH (ALE245) H2SO4 (ALE244) NaOH (ALE245) 500ml Plastic (ALE208) 250ml BOD (ALE212) HNO3 Filtered (ALE204) 500ml Plastic (ALE208) 250ml BOD (ALE212) HNO3 Filtered (ALE204) NaOH (ALE245) 500ml Plastic (ALE208) 250ml BOD (ALE212) HNO3 Filtered (ALE204) DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other Sample Type GW Е GW H Е Е Pesticides (Suite I) by GCMS All NDPs: 0 Х Pesticides (Suite II) by GCMS All NDPs: 0 Tests: 2 Χ Pesticides (Suite III) by GCMS All NDPs: 0 Tests: 2 Х pH Value All NDPs: 0 Tests: 7 Χ Х Х All Phosphate by Kone (w) NDPs: 0 Tests: 2 Х Silicon Dissolved by ICP-OES All NDPs: 0 Tests: 2 SVOC MS (W) - Aqueous All NDPs: 0 Tests: 2 Χ Total Organic and Inorganic Carbon All NDPs: 0 Tests: 5 Х Х Χ Х VOC MS (W) All NDPs: 0 Tests: 2

		18414673							18414681				18414699				18414691	
		BH5							ВН6				SW-C				SW-G	
		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)	(ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	(ALE212)	(ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	250ml BOD (ALE212)	,	4	HNO3 Filtered (ALE204)	
듄	듄	듄	H	H	F	<u> </u>	F	Æ	H	V	SW SW	WS	WS	WS	WS	WS	SW	
X		X	x		x	X	X		X		x	Consi	F's	s inst	ection State	Part Part Part Part Part Part Part Part	odite of the second	M'. any other use.



SDG:180927-85Client Reference:P1444Report Number:475704Location:BallymulveyOrder Number:Z1162Superseded Report:

Results Legend		Customer Sample Ref.	BH1	BH2	BH3	BH5	BH6	SW-C
# 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)	SW-C 0.00 - 0.00 Surface Water (SW)
tot.unfilt Total / unfiltered sample. * Subcontracted test. ** % recovery of the surrogate stands check the efficiency of the method	. The	Date Sample Time Date Received	26/09/2018 27/09/2018	26/09/2018 27/09/2018	26/09/2018 27/09/2018	26/09/2018 27/09/2018	26/09/2018 27/09/2018	26/09/2018 27/09/2018
results of individual compounds w samples aren't corrected for the re (F) Trigger breach confirmed 1-58+§@ Sample deviation (see appendix)	covery	SDG Ref Lab Sample No.(s) AGS Reference	180927-85 18414647	180927-85 18414656	180927-85 18414665	180927-85 18414673	180927-85 18414681	180927-85 18414699
Component Coliforms, Total*	CFU/100m		6050	17200	13000000			
Alkalinity, Total as CaCO3	<2 mg/l	TM043	465 #	373 #	695 #			
BOD, unfiltered	<1 mg/l	TM045	π	"	#	28.2	<2.5	<1 #
Oxygen, dissolved	<0.3 mg/l	TM046	8.56	8.68	4.92	3.18	6	11.2
Organic Carbon, Total	<3 mg/l	TM090	12.1	14.2	29.1	85.6	13.7	
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	2.75	3.55	11.1 #	449	58.2	<0.2
Fluoride	<0.5 mg/l	TM104	<0.5 #	<0.5 #	<0.5 #	<0.5	<0.5	
COD, unfiltered	<7 mg/l	TM107	"	"		677 #	42.3 #	
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	0.9	0.728	1.25	7.84	1.74	2.08
Antimony (diss.filt)	<1 µg/l	TM152	,,	"	, 115°E.	<1	<1	
Arsenic (diss.filt)	<0.5 µg/l	TM152	2.26	18.4	20.4	3.52 #	1.69	
Barium (diss.filt)	<0.2 µg/l	TM152	"		213, 210,	287 #	357 #	
Beryllium (diss.filt)	<0.1 µg/l	TM152		authose	20	<0.1 #	<0.1 #	
Boron (diss.filt)	<10 µg/l	TM152	53.7	phtponi #	60.4	1350 #	348 #	
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08	# #	<0.08	<0.08	<0.08	
Chromium (diss.filt)	<1 µg/l	TM152	<1	o₹ <1 #	<1 #	11.2	<1 #	
Cobalt (diss.filt)	<0.5 µg/l	TM152	Consent			3.33 #	1.36 #	
Copper (diss.filt)	<0.3 µg/l	TM152	1.6	0.425 #	<0.3	<0.3	<0.3	
Lead (diss.filt)	<0.2 µg/l	TM152	<0.2 #	<0.2 #	<0.2	<0.2	<0.2 #	
Manganese (diss.filt)	<3 µg/l	TM152	903 #	808 #	591 #	356 #	427 #	
Molybdenum (diss.filt)	<3 µg/l	TM152				<3 #	<3 #	
Nickel (diss.filt)	<0.4 µg/l	TM152	4.33 #	7.56 #	4.41 #	7.26 #	1.31 #	
Phosphorus (diss.filt)	<10 µg/l	TM152	34.6 #	22.9 #	83.1 #	812 #	565 #	
Selenium (diss.filt)	<1 µg/l	TM152				<1 #	<1 #	
Tellurium (diss.filt)	<2 µg/l	TM152				<2	<2	
Thallium (diss.filt)	<2 μg/l	TM152				<2 #	<2 #	
Titanium (diss.filt)	<1 µg/l	TM152				11.8 #	11.7 #	
Uranium (diss.filt)	<0.5 µg/l	TM152				<0.5 #	<0.5 #	
Vanadium (diss.filt)	<1 µg/l	TM152				2.02	<1 #	
Zinc (diss.filt)	<1 µg/l	TM152	4.09 #	3.45 #	6.52 #	2.07 #	2.33 #	
Tin (Diss.Filt)	<1 µg/l	TM152				1.3 #	<1 #	
Silver (diss.filt)	<0.5 µg/l	TM152				<0.5 #	<0.5 #	
Sodium (Dis.Filt)	<0.076 mg/	TM152	16.4 #	13.9 #	76.8 #	698 #	85.5 #	136 #
12-41-27 00/10/2010	•	_			-			•

CERTIFICATE OF ANALYSIS



SDG: 180927-85 Location: Ballymulvey

Client Reference: Order Number: P1444 Z1162 Report Number: Superseded Report:

M mCER aq Aquec diss.filt Dissol tot.unfilt Total / * Subco	Results Legend 7025 accredited. RTS accredited. ous / settled sample. olved / filtered sample. / unfiltered sample.		ustomer Sample Ref.	BH1	BH2	BH3	BH5	BH6	SW-C
diss.filt Dissolution.unfilt Total /	olved / filtered sample.								
tot.unfilt Total /			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
	ontracted test.		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
,0.000	covery of the surrogate standard	d to	Sample Time						
result	k the efficiency of the method. I ts of individual compounds with	hin	Date Received SDG Ref	27/09/2018 180927-85	27/09/2018 180927-85	27/09/2018 180927-85	27/09/2018 180927-85	27/09/2018 180927-85	27/09/2018 180927-85
(F) Trigge	oles aren't corrected for the reco per breach confirmed	overy	Lab Sample No.(s)	18414647	18414656	18414665	18414673	18414681	18414699
1-5&+§@ Sample Component	ple deviation (see appendix)	LOD/Units	AGS Reference Method						
Magnesium (E		<0.036 mg/l	TM152	14.7	6.71	23.6	220	42	
, ,	, , ,			#	#	#	#	#	
Potassium (Di	Dis.Filt)	<0.2 mg/l	TM152	7.45	4.06	22.1	160	49.6	14.1
				#	#	#	#	#	#
Calcium (Dis.l	.Filt)	<0.2 mg/l	TM152	167	151	164	231	168	
Jane (Die Eile)		40.040 //	TMACO	# 4.0	4.70	4 00	# 11.2	#	
Iron (Dis.Filt)		<0.019 mg/l	TM152	4.2	1.79 #	1.06 #	11.2	10.3 #	
Mineral oil >C	C10 C40 (ag)	<100 µg/l	TM172	п	"	π	778	174	
	3.0 3.0 (44)	.00 pg.							
Mercury (diss.	s.filt)	<0.01 µg/l	TM183	<0.01	<0.01	<0.01	<0.01	<0.01	
				#	#	#	#	#	
Phosphate (O	Ortho as PO4)	<0.05 mg/l	TM184				<0.05	<0.05	
Outst. 1		۰,0 "	T1404	07.4	00.4	20.0	.0	.^	050
Sulphate		<2 mg/l	TM184	27.1 #	23.1	22.6 #	<2	<2	652 #
Chloride		<2 mg/l	TM184	25.6	34.7	140	1080	74.1	249
Onionae		-2 mg/i	1101104	25.0	34.7	#		/7.1	249 #
Nitrite as N		<0.0152	TM184	<u>"</u>		<0 the time.	<0.0152	<0.0152	
		mg/l				, 115°C			
Total Oxidised	d Nitrogen as N	<0.1 mg/l	TM184	1.17	<0.1	<0.the	<0.1	<0.1	
				#	#	#			
Cyanide, Tota	al	<0.05 mg/l	TM227	<0.05	<0.05	on 20.05	<0.05	<0.05	
Cyanida Eraa	•	<0.05 mg/l	TM227	#		.0	*	4 <0.05	
Cyanide, Free	e	<0.05 mg/i	I IVIZZI		Purpolit edit	r	<0.05 #	<0.05 #	
pН		<1 pH Units	TM256	7.15	: 10 1 of	7.04	7.29	7.13	7.55
F				#	Dectrapie #	#	#	#	#
Silicon (diss.fi	filt)	<0.05 mg/l	TM284		THE CHE #		10.5	9.5	
				Ŷ(N ITE				
Dibutyl tin		<5 ng/l	TM328	, de	Ox		11.5	<5	
Teiler stud tim		-1 na/l	TM200	Consentor			<1	<1	
Tributyl tin		<1 ng/l	TM328	A CHISCA			<u> </u>	<u> </u>	
Tetrabutyl tin		<2 ng/l	TM328				<2	<2	
		3	'						
Triphenyl tin		<1 ng/l	TM328				<1	<1	
Surrogate		%	TM328				59.7	90.9	
Trifluralin		<0.01 µg/l	TM343				<0.02	<0.02	
miliuralin		<0.01 μg/I	1101343				<0.02	<0.02	
alpha-HCH		<0.01 µg/l	TM343				<0.02	<0.02	
gamma-HCH	(Lindane)	<0.01 µg/l	TM343				<0.02	<0.02	
Heptachlor		<0.01 µg/l	TM343				<0.03	<0.03	
Aldrin		ZO 04 · · - //	TMOAO				~n no	>0 00	
Aldrin		<0.01 µg/l	TM343				<0.03	<0.03	
beta-HCH		<0.01 µg/l	TM343				<0.01	<0.01	
		' ra''						2.0.	
Isodrin		<0.01 µg/l	TM343				<0.02	<0.02	
Heptachlor ep	poxide	<0.01 µg/l	TM343				<0.02	<0.02	
0 m² DDE		ZO O4 "	T14040				-0.00	-0.00	
o,p'-DDE		<0.01 µg/l	TM343				<0.02	<0.02	
Endosulphan	1	<0.01 µg/l	TM343				<0.02	<0.02	
	•	υ.υ ι μ g/ι					· · · · · · ·	-0.02	
trans-Chlorda	ane	<0.01 µg/l	TM343				<0.02	<0.02	
cis-Chlordane	e	<0.01 µg/l	TM343				<0.02	<0.02	

475704

CERTIFICATE OF ANALYSIS



 SDG:
 180927-85
 Client Reference:
 P1444
 Report Number:

 Location:
 Ballymulvey
 Order Number:
 Z1162
 Superseded Report:

Part	Results Legend		Customer Sample Ref.	DUI	DUD	DUS	DUE	DITE	CWC
Part	# ISO17025 accredited.		oustonier sample Kei.	BH1	BH2	BH3	BH5	BH6	SW-C
Serve Part Serv	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	0.00 - 0.00
Section Compose Comp	tot.unfilt Total / unfiltered sample.		Sample Type	Ground Water (GW)			Land Leachate (LE)		Surface Water (SW)
Composition	** % recovery of the surrogate standa	ard to		26/09/2018	26/09/2018	26/09/2018	26/09/2018	26/09/2018	26/09/2018
Part	results of individual compounds w	ithin							
Companies Comp	(F) Trigger breach confirmed	covery	Lab Sample No.(s)						
Pacific Paci		I OD/Unite							
Profession Pro	\		-				<0.02	<0.02	
Profession Pro									
Management Man	Dieldrin	<0.01 µg/l	TM343				<0.02	<0.02	
Part	o,p'-DDD (TDE)	<0.01 µg/l	TM343				<0.02	<0.02	
Part	Endrin	<0.01 µg/l	TM343				<0.02	<0.02	
Color Colo	o,p'-DDT	<0.01 µg/l	TM343				<0.04	<0.04	
Part	p,p'-DDD (TDE)	<0.01 µg/l	TM343				0.0354	<0.02	
Parenthrin	Endosulphan II	<0.02 µg/l	TM343				<0.04	<0.04	
Endosulptans Sulptable 402 µgl 71543	p,p'-DDT	<0.01 µg/l	TM343				<0.04	<0.04	
Displace	p,p'-Methoxychlor	<0.01 µg/l	TM343				<0.04	<0.04	
Displace	Endosulphan Sulphate	<0.02 µg/l	TM343			æ.	<0.02	<0.02	
Displace	Permethrin I	<0.01 µg/l	TM343			other	<0.01	<0.01	
Displace	Permethrin II	<0.01 µg/l	TM343		چ	Only and	<0.01	<0.01	
Displace	Dichlorvos	<0.01 µg/l	TM344		aurogui	2	<0.01	<0.01	
Displace	Mevinphos	<0.01 µg/l	TM344		action let ree,		<0.01	<0.01	
Displace	Tecnazene	<0.01 µg/l	TM344	<u>^</u>	titispet of		<0.01	<0.01	
Displace	Hexachlorobenzene	<0.01 µg/l	TM344	\$ (\$)	OR,		<0.01	<0.01	
Atrazine 4.01 µg/l TM344 Massine 4.01 µg/l 4.01	Diazinon	<0.01 µg/l	TM344	* Misent C			<0.01	<0.01	
Simazine COD 1 µg/l TM344 Code	Triallate	<0.01 µg/l	TM344				<0.01	<0.01	
Disulfoton Co 1 μg/l TM344 Co 1	Atrazine	<0.01 µg/l	TM344				<0.01	<0.01	
Propetamphos < 0.01 μg/l TM344 < 0.01 μg/l	Simazine	<0.01 µg/l	TM344				<0.01	<0.01	
Chlorpyriphos-methyl 40.01 µg/l TM344 Chlorpyriphos-methyl <0.01 µg/l TM344 Chlorpyriphos-methyl <0.01 µg/l	Disulfoton	<0.01 µg/l	TM344				<0.01	<0.01	
Dimethoate CO.01 μg/l TM344 CM CM CM CO.01 CM	Propetamphos	<0.01 µg/l	TM344				<0.01	<0.01	
Primiphos-methyl < 0.01 µg/l TM344 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 <th< td=""><td>Chlorpyriphos-methyl</td><td><0.01 µg/l</td><td>TM344</td><td></td><td></td><td></td><td><0.01</td><td><0.01</td><td></td></th<>	Chlorpyriphos-methyl	<0.01 µg/l	TM344				<0.01	<0.01	
Chlorpyriphos < 0.01 μg/l TM344 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01<	Dimethoate	<0.01 µg/l	TM344				<0.01	<0.01	
Methyl Parathion < 0.01 μg/l TM344 < 0.01 μg/l < 0.	Pirimiphos-methyl	<0.01 µg/l	TM344				<0.01	<0.01	
Malathion <	Chlorpyriphos	<0.01 µg/l	TM344				<0.01	<0.01	
Fenthion < Image: Control of the policy of	Methyl Parathion	<0.01 µg/l	TM344				<0.01	<0.01	
Fenitrothion <0.01 μg/l TM344 <0.01 μg/l	Malathion	<0.01 µg/l	TM344				<0.01	<0.01	
Triadimefon <0.01 μg/l TM344	Fenthion	<0.01 µg/l	TM344				<0.01	<0.01	
	Fenitrothion	<0.01 µg/l	TM344				<0.01	<0.01	
Pendimethalin <0.01 μg/l TM344 <0.01 <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:180927-85Client Reference:P1444Report Number:475704Location:BallymulveyOrder Number:Z1162Superseded Report:

March Application Applic	Results Legend		Customer Sample Ref.	BH1	BH2	BH3	BH5	BH6	SW-C
Component Control Co									
Sample Type Corus Weer (GW) Corus Weer (GW				0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	
New New York of the surroget standard to lock the feeling of the entition of	tot.unfilt Total / unfiltered sample.								
Carbophenothic Carb		ard to		26/09/2018	26/09/2018	26/09/2018	26/09/2018	26/09/2018	26/09/2018
State Stat							27/09/2018		
ASS Inference ASS Inference Component Componen	samples aren't corrected for the re-								
Component	(F) Trigger breach confirmed 1-5&+\$@ Sample deviation (see appendix)			10414047	10414000	10414000	10414073	10414001	10414099
Parathion <0.01 µg/l		LOD/Units							
Ethion		1					<0.01	<0.01	
Carbophenothion <0.01 μg/l TM344 <0.01 μg/l <0.02 μg/l <0.01	Chlorfenvinphos	<0.01 µg/l	TM344				<0.01	<0.01	
Triazophos <.0.01 μg/l TM344 <.0.01 <.0.01 <.0.01 Phosalone <.0.01 μg/l	Ethion	<0.01 µg/l	TM344				<0.01	<0.01	
Phosalone <0.01 μg/l TM344 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.02 <0.02 <0.02 <0.02 <0.02 <0.02 <0.02 <0.02 <0.02 <0.02 <0.02 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01	Carbophenothion	<0.01 µg/l	TM344				<0.01	<0.01	
Azinphos methyl < 0.02 µg/l TM344 < 0.02 < 0.02 < 0.02 Azinphos ethyl < 0.02 µg/l	Triazophos	<0.01 µg/l	TM344				<0.01	<0.01	
Azinphos ethyl <0.02 μg/l	Phosalone	<0.01 µg/l	TM344				<0.01	<0.01	
Quintozene (PCNB) < 0.01 μg/l	Azinphos methyl	<0.02 µg/l	TM344				<0.02	<0.02	
Telodrin	Azinphos ethyl						<0.02	<0.02	
Titodam	Quintozene (PCNB)						<0.01		
Chorontaloni	Telodrin					, 115e.	<0.01		
Elimphos	Chlorothalonil	<0.01 µg/l	TM345			other	<0.01	<0.01	
Consent of the control of the contro	Etrimphos	<0.01 µg/l	TM345		ي	only air.	<0.01	<0.01	
					Purpoliti	e e			
					gection nert				
				¢.	Kinst Jit C				
				x of 's	os,				
				Consent					

CERTIFICATE OF ANALYSIS



SDG:180927-85Client Reference:P1444Report Number:475704Location:BallymulveyOrder Number:Z1162Superseded Report:

Results Legend # ISO17025 accredited.	Cı	ıstomer Sample Ref.	SW-G			 	
M mCERTS accredited. aq Aqueous / settled sample.							
diss.filt Dissolved / filtered sample.		Depth (m) Sample Type	0.00 - 0.00 Surface Water (SW)				
tot.unfilt Total / unfiltered sample. * Subcontracted test.		Date Sampled	Surface Water (SW) 26/09/2018				
** % recovery of the surrogate standar check the efficiency of the method.	rd to The	Sample Time					
results of individual compounds with samples aren't corrected for the received for the rece	hin	Date Received SDG Ref	27/09/2018 180927-85				
(F) Trigger breach confirmed	overy	Lab Sample No.(s)	18414691				
1-5&+§@ Sample deviation (see appendix) Component	LOD/Units	AGS Reference Method					
BOD, unfiltered	<1 mg/l	TM045	<1 #				
Oxygen, dissolved	<0.3 mg/l	TM046	13				
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2				
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	0.648				
Sodium (Dis.Filt)	<0.076 mg/l	TM152	12.6 #				
Potassium (Dis.Filt)	<0.2 mg/l	TM152	3.59 #				
Sulphate	<2 mg/l	TM184	43.5				
Chloride	<2 mg/l	TM184	22.9				
pH	<1 pH Units	TM256	8.06 #			 	
					odist and other use.		
					other		
				<u>و</u>	ारिश वर्षाः भूशं वर्षाः		
				outpos	e c		
				s its petitor during the during t			
			\$ (Tinskit C			
			8	े%,			
			consent of s				

ALS

SDG:180927-85Client Reference:P1444Report Number:475704Location:BallymulveyOrder Number:Z1162Superseded Report:

Part	SVOC MS (W) - Aqueous	S						
	Results Legend # ISO17025 accredited.		Customer Sample Ref.	BH5	BH6			
	M mCERTS accredited.							
Processor Proc	diss.filt Dissolved / filtered sample.							
Companies Comp								
Section Company Comp	oubcontracted toot.	ard to		26/09/2018	26/09/2018			
Component Comp	check the efficiency of the method.	. The		27/09/2018	27/09/2018			
Marchen Marc								
Componence Com	(F) Trigger breach confirmed			18414673	18414681			
12.4 Enteroberance log 14 up TM 178 14 15 15 15 15 15 15 15		LODULE						
12.20/strochesson (a)				-14	-4			
1.3 Dicto browner leg	1,2,4-111011010Defizerie (aq)	~1 μg/1	1101170	<u> </u>	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			
1.4 Entirectoranceme (mg)	1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1			
2.4.5-frokroophered (eq)	1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1			
2.4. First Instruction (ng)	1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1			
24-Dictorophenol (eq)	2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1			
2.4-Drintroplurero (eq)	2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1			
2-Dintroblene (a)		<1 µg/l	TM176	<1	<1			
Sephintoplane (eq)								
2-Methylphana (aq)								
2-Methylphana (aq)					<1	Jige.		
2-Methylphana (aq)					<1	13 other		
2-Methylphana (aq)					<1	only air.		
3-Nitroanline (aq)				<1	<1 purpor	2		
3-Nitroanline (aq)				<1	spection per ,			
3-Nitroanline (aq)				<1	King dit <1			
4-chloro-3-methylphenol (aq)	. , , , ,				Ĭ			
4-Chloro-3-methylphenol (aq)				Conser				
4-Chlorophiline (aq)				·				
4-Chlorophenylphenylether (aq)								
4-Methylphenol (aq)								
4-Nitrophenol (aq)								
4-Nitrophenol (aq)								
Azobenzene (aq) <1 μg/l								
Acenaphthylene (aq)								
Acenaphthene (aq) <1 μg/l								
Anthracene (aq) <1 μg/l								
bis(2-Chloroethyl)ether (aq) <1 μg/l TM176 <1 <1 bis(2-Chloroethoxy)methane (aq) TM176 <1 <1 bis(2-Ethylhexyl) phthalate (aq) <2 μg/l TM176 14.2 <2 Butylbenzyl phthalate (aq) <1 μg/l TM176 <1 <1								
bis(2-Chloroethoxy)methane (aq)								
(aq) bis(2-Ethylhexyl) phthalate (aq) <2 μg/l								
Butylbenzyl phthalate (aq) <1 µg/l TM176 <1 <1	(aq)				<2			
	Benzo(a)anthracene (aq)			<1	<1		<u> </u>	

CERTIFICATE OF ANALYSIS



180927-85 Ballymulvey Report Number: Superseded Report: SDG: Client Reference: P1444 475704 Order Number: Z1162 Location:

SVOC MS (W) - Aqueous	3						
Results Legend		ustomer Sample Ref.	BH5	BH6			
# ISO17025 accredited. M mCERTS accredited.							
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00			
tot.unfilt Total / unfiltered sample. * Subcontracted test.		Sample Type Date Sampled	Land Leachate (LE) 26/09/2018	Land Leachate (LE) 26/09/2018			
** % recovery of the surrogate standa check the efficiency of the method.	rd to	Sample Time					
results of individual compounds w	ithin	Date Received SDG Ref	27/09/2018 180927-85	27/09/2018 180927-85			
samples aren't corrected for the re-	covery	Lab Sample No.(s)	18414673	18414681			
1-5&+§@ Sample deviation (see appendix) Component	LOD/Units	AGS Reference Method					
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176	<1	<1			
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<1	<1			
D ()	.4 //	T14470	.4	.4			
Benzo(a)pyrene (aq)	<1 µg/l	TM176	<1	<1			
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176	<1	<1			
201120(3511,17)por 310110 (447)	. 123		·	·			
Carbazole (aq)	<1 µg/l	TM176	<1	<1			
Chrysene (aq)	<1 µg/l	TM176	<1	<1			
Dibenzofuran (aq)	<1 µg/l	TM176	<1	<1			
Discrizoraran (aq)	~1 μg/1	1101170	-1	`'			
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<1	<1			
7. "	, ,						
Diethyl phthalate (aq)	<1 µg/l	TM176	<1	<1			
5" (1) " ()	4 "	T14470		,			
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176	<1	<1	offy, and other rise.		
Dimethyl phthalate (aq)	<1 µg/l	TM176	<1	<1	net it		
Dimenyi pinnanate (aq)	11 µg/1	TIWITTO	*1	`'	i solit		
n-Dioctyl phthalate (aq)	<5 µg/l	TM176	<5	<5	Mill die		
					afor		
Fluoranthene (aq)	<1 µg/l	TM176	<1		Ø.		
FI ()	.4 //	T14470	-4	<1 purple qui			
Fluorene (aq)	<1 µg/l	TM176	<1	oction ner			
Hexachlorobenzene (aq)	<1 µg/l	TM176	<1	Thirtelli (1)			
(-4)	1.3		₽ G	K Vile			
Hexachlorobutadiene (aq)	<1 µg/l	TM176	<1	्रे <1			
			tol.				
Pentachlorophenol (aq)	<1 µg/l	TM176	<1 consent or	<1			
Phonol (ag)	<1 ug/l	TM176	<1	<1			
Phenol (aq)	<1 µg/l	TM176	~1				
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176	<1	<1			
Hexachloroethane (aq)	<1 µg/l	TM176	<1	<1			
Nitrohannana (as)	-1ll	TM176	<1	<1			
Nitrobenzene (aq)	<1 µg/l	TIWITO	~1	``			
Naphthalene (aq)	<1 µg/l	TM176	<1	<1			
Isophorone (aq)	<1 µg/l	TM176	<1	<1			
	.4 0	T14470	-4	.4			
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176	<1	<1			
Phenanthrene (aq)	<1 µg/l	TM176	<1	<1			
(%4)	. 43,,						
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176	<1	<1			
Pyrene (aq)	<1 µg/l	TM176	<1	<1			
		+					
					-	-	

ALS

 SDG:
 180927-85
 Client Reference:
 P1444
 Report Number:
 475704

 Location:
 Ballymulvey
 Order Number:
 Z1162
 Superseded Report:

(ALS) Location:		Ballymulvey	Orde	r Number: Z1	162	Superseded Re	eport:	
VOC MS (W)								
Results Legend # ISO17025 accredited.	(Customer Sample Ref.	BH5	BH6				
M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test.		Depth (m) Sample Type Date Sampled	0.00 - 0.00 Land Leachate (LE) 26/09/2018	0.00 - 0.00 Land Leachate (LE) 26/09/2018				
** % recovery of the surrogate stand check the efficiency of the method results of individual compounds w samples aren't corrected for the re (F) Trigger breach confirmed	i. The vithin	Sample Time Date Received SDG Ref Lab Sample No.(s)	27/09/2018 180927-85 18414673	27/09/2018 180927-85 18414681				
1-5&+§@ Sample deviation (see appendix)	LOD#Inite	AGS Reference						
Component Dibromofluoromethane**	LOD/Units %	Method TM208	106	103				
Toluene-d8**	%	TM208	97.7	99.8				
4-Bromofluorobenzene**	%	TM208	95.3	97.3				
Dichlorodifluoromethane	<1 µg/l	TM208	<1 #	<1 #				
Chloromethane	<1 µg/l	TM208	<1 #	<1 #				
Vinyl chloride	<1 µg/l	TM208	<1 #	92.1 #				
Bromomethane	<1 µg/l	TM208	<1 #	<1 #				
Chloroethane	<1 µg/l	TM208	<1 #	<1 #				
Trichlorofluoromethane	<1 µg/l	TM208	<1 #	<1 #				
1,1-Dichloroethene	<1 µg/l	TM208	<1 #	<1 #	7115g.			
Carbon disulphide	<1 µg/l	TM208	<1 #	<1 #	1 20°			
Dichloromethane	<3 µg/l	TM208	<3 #	<3 #	offs air.			
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1 #	<1 purposition #	şe ⁰			
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1 #	cito alex				
1,1-Dichloroethane	<1 µg/l	TM208	<1 _#	insper on #				
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1 (su	46.5 #				
2,2-Dichloropropane	<1 µg/l	TM208	<1 consent	<1				
Bromochloromethane	<1 µg/l	TM208	¥ #	<1 #				
Chloroform	<1 µg/l	TM208	<1 #	<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 #				
1,2-Dichloroethane	<1 µg/l	TM208	<1 #	<1 #				
Benzene	<1 µg/l	TM208	1.51 #	<1 #				
Trichloroethene	<1 µg/l	TM208	<1 #	<1 #				
1,2-Dichloropropane	<1 µg/l	TM208	<1 #	<1 #				
Dibromomethane	<1 µg/l	TM208	<1 #	<1 #				
Bromodichloromethane	<1 µg/l	TM208	<1 #	<1 #				
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1 #	<1 #				
Toluene	<1 µg/l	TM208	1.42	1.02				
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1 #	<1 #				
1,1,2-Trichloroethane	<1 µg/l	TM208	<1 #	<1 #				
1,3-Dichloropropane	<1 µg/l	TM208	<1 "	<1 #			•	

CERTIFICATE OF ANALYSIS



180927-85 Ballymulvey P1444 Z1162 SDG: Report Number: Superseded Report: Client Reference: 475704 Order Number: Location:

VOC MS (W)							
Results Legend # ISO17025 accredited.		Customer Sample Ref.	BH5	BH6			
M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test.		Depth (m) Sample Type	0.00 - 0.00 Land Leachate (LE) 26/09/2018	0.00 - 0.00 Land Leachate (LE) 26/09/2018			
** % recovery of the surrogate stands check the efficiency of the method results of individual compounds w samples aren't corrected for the re	. The ithin	Date Sampled Sample Time Date Received SDG Ref	27/09/2018 180927-85	27/09/2018 180927-85			
(F) Trigger breach confirmed 1-5&+\$@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	18414673	18414681			
Tetrachloroethene	LOD/Units <1 µg/l	Method TM208	<1 #	<1 #			
Dibromochloromethane	<1 µg/l	TM208	<1 #	<1 #			
1,2-Dibromoethane	<1 µg/l	TM208	<1 #	<1 #			
Chlorobenzene	<1 µg/l	TM208	3.51 #	<1 #			
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1 #	<1 #			
Ethylbenzene	<1 µg/l	TM208	1 #	<1 #			
m,p-Xylene	<1 µg/l	TM208	5.51 #	<1 #			
o-Xylene	<1 µg/l	TM208	1.52 #	<1 #			
Styrene	<1 µg/l	TM208	<1 #	<1 #			
Bromoform	<1 µg/l	TM208	<1 #	<1 #	at 115°.		
Isopropylbenzene	<1 µg/l	TM208	<1 #	<1 #	ony, any other bed for any		
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1 #	<1	off or a		
1,2,3-Trichloropropane	<1 µg/l	TM208	<1 #	Oll Cl			
Bromobenzene	<1 µg/l	TM208 TM208	<1 # 1.07	ecited let #			
Propylbenzene 2 Chloratelypes	<1 µg/l	TM208	<1	108 c1 #			
2-Chlorotoluene	<1 µg/l	TM208	ð¥`	**************************************			
1,3,5-Trimethylbenzene 4-Chlorotoluene	<1 µg/l	TM208	1.79 consent #	<1 **			
tert-Butylbenzene	<1 µg/l <1 µg/l	TM208	<1 <1	<1 #			
1,2,4-Trimethylbenzene	<1 μg/l	TM208	7.13	*1 <1			
sec-Butylbenzene	<1 μg/l	TM208	**************************************	**************************************			
4-iso-Propyltoluene	<1 μg/l	TM208	<1	**************************************			
1,3-Dichlorobenzene	<1 μg/l	TM208	<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	# <1			
1,2,3-Trichlorobenzene	<1 μg/l	TM208	# <1	# <1			
			#	#			

CERTIFICATE OF ANALYSIS



180927-85 Ballymulvey Report Number: Superseded Report: SDG: Client Reference: P1444 475704 Order Number: Z1162 Location:

VOC MS	(W)							
	Results Legend		Customer Sample Ref.	BH5	BH6			
	17025 accredited. ERTS accredited.			Bilo	Dillo			
aq Aqı	ueous / settled sample. solved / filtered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00			
tot.unfilt Tota	al / unfiltered sample.		Sample Type Date Sampled	Land Leachate (LE) 26/09/2018	Land Leachate (LE) 26/09/2018			
** % r	ecovery of the surrogate standa	rd to	Sample Time					
res	ck the efficiency of the method. ults of individual compounds wi	thin	Date Received SDG Ref	27/09/2018 180927-85	27/09/2018 180927-85			
(F) Trig	nples aren't corrected for the rec ager breach confirmed	Lovery	Lab Sample No.(s)	18414673	18414681			
Componer	nple deviation (see appendix)	LOD/Units	AGS Reference Method					
1,3,5-Trichlo		<1 µg/l	TM208	<1	<1			
						only, any other use.		
						thei		
						4. 43 or		
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Report Number: Superseded Report: SDG: 180927-85 Client Reference: P1444 475704 Ballymulvey Z1162 Location: Order Number:

Table of Results - Appendix

		r 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 Determination of Selected Pesticides (Suite I) in Liquids by GCMS
TM284		ngo ijrev
TM328		"Lin teda
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)	Victormination 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 Dawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS



 SDG:
 180927-85
 Client Reference:
 P1444
 Report Number:
 475704

 Location:
 Ballymulvey
 Order Number:
 Z1162
 Superseded Report:

Test Completion Dates

		163	t Oom	pietioi	i Date.	3	
Lab Sample No(s)	18414647	18414656	18414665	18414673	18414681	18414699	18414691
Customer Sample Ref.	BH1	BH2	BH3	BH5	BH6	SW-C	SW-G
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
Туре	Ground Water	Ground Water	Ground Water	Land Leachate	Land Leachate	Surface Water	Surface Water
Alkalinity as CaCO3	05-Oct-2018	05-Oct-2018	05-Oct-2018				
Ammoniacal Nitrogen	05-Oct-2018	05-Oct-2018	04-Oct-2018	04-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
BOD True Total				03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018
COD Unfiltered				04-Oct-2018	03-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
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	05-Oct-2018	05-Oct-2018	05-Oct-2018	05-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
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)				03-Oct-2018	03-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	01-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018
Phosphate by Kone (w)				02-Oct-2018	02-Oct-2018		
Silicon Dissolved by ICP-OES				04-Oct-2018	04-Oct-2018		
SVOC MS (W) - Aqueous				05-Oct-2018	03-Oct-2018	్థ.	
Total Organic and Inorganic Carbon	01-Oct-2018	01-Oct-2018	01-Oct-2018	02-Oct-2018	02-Oct-2018	O	
VOC MS (W)				03-Oct-2018	03-Oct-2018		

O2-Oct-2018 O2-Oct O18 O2-Oct O18 O2-Oct O18 O2-Oct O18 O3-Oct O18 O3-Oct O18 O2-Oct O18





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Customer

CH5 3US

Customer Services ALS Environmental Ltd Hawarden Business Park Manor Land Hawarden, Deeside UK

Certificate Of Analysis

18-47445 Job Number:

2 Issue Number:

5 October 2018 Report Date:

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

Site: 180927-85 PO Number: Not Supplied

Date Samples Received: 27/09/2018

For inspection buttors outs, and other use. 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: **Authorised Date:** 2 October 2018

> Shane Reynolds Laboratory Manager

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.

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Certificate Of Analysis

Customer

CH5 3US

Customer Services ALS Environmental Ltd Hawarden Business Park Manor Land Hawarden, Deeside UK

Report Reference: 18-47445

Report Version: 2

Site: 180927-85

Date of Sampling: 27/09/2018 Sample Description: Ballymulvey BH1 Sample Type: Ground Date Sample Received: 27/09/2018

Lab Reference Number: 412665

Site / Method Ref.	Analysis Start Date	Parameter	He sult	Units	PV Value (Drinking Water Only)
D/D1201#	27/09/2018	Coliforms	D' - COEO O	MPN/100ml	9
		Consent of copyright owner require			

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

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





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Certificate Of Analysis

Customer

CH5 3US

Customer Services ALS Environmental Ltd Hawarden Business Park Manor Land Hawarden, Deeside UK

Report Reference: 18-47445

Report Version: 2

Site: 180927-85

Date of Sampling: 27/09/2018 Sample Description: Ballymulvey BH2 Sample Type: Ground Date Sample Received: 27/09/2018

Lab Reference Number: 412666

Site / Method Ref.	Analysis Start Date	Parameter	other Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/09/2018	Coliforms	17000 0	MPN/100ml	9
		Consent of copyright convincer require			

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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





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Certificate Of Analysis

Customer

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

Report Reference: 18-47445

Report Version: 2

Site: 180927-85

Date of Sampling: 27/09/2018 Sample Description: Ballymulvey BH3 Sample Type: Ground Date Sample Received: 27/09/2018

Lab Reference Number: 412667

Site / Method Ref.	Analysis Start Date	Parameter	Al and office Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/09/2018	Coliforms	12007000 0	MPN/100ml	â
		Consent of conviring to owner require			

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

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



180927-85 475704 SDG: P1444 Client Reference: Report Number: Superseded Report: 71162 Location: Ballymulvey Order Number:

Appendix

General

- 1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.
- 2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
- 3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.
- 4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
- 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 received.
- 10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals total metals must be requested separately.

 11. Results relate only to the items tested.
- 12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected
- 13. Surrogate recoveries Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. 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
- 15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
- 16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).
- Stones/debris are not routinely removed. We always endeavour to take a 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, clav 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.

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

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy 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 Asbests
Amosite	Brown Asbestos
Cro 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.

12:42:10 08/10/2018 Modification Date: 08/10/2018 EPA Export 06-10-2021:02:43:51