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







P1444 472688 Client Reference: Report Number: Z1162 Superseded Report: Order Number: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
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 -

SDG:

Location:

During Transportation samples shall be stored in a cooling device capable of maintaining

180907-68

Cartron Big

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.

Validated

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SDG: P1444 180907-68 Client Reference: Report Number: 472688 Location: Cartron Big Order Number: Z1162 Superseded Report: Results Legend 18279837 18279858 18279808 18279819 18279849 Lab Sample No(s) X Test No Determination Possible Ballymulvey Cartron SW1 Cartron SW2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) HNO3 Filtered (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 Χ Х X X Х

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

Results Legend		Contamos Comolo Def			200	200		
# ISO17025 accredited. M mCERTS accredited.		Customer Sample Ref.	Ballymulvey - G	Cartron SW1	Cartron SW2	Cartron SW3	Cartron SW4	
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 Surface Water (SW) 06/09/2018					
** % recovery of the surrogate standa 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 18279808	180907-68 18279819	180907-68 18279837	180907-68 18279849	180907-68 18279858	
(F) Trigger breach confirmed 1-5&+\$@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	1027 0000	10270010	10270007	10270010	10270000	
Alkalinity, Total as CaCO3	LOD/Units <2 mg/l	Method TM043	322	293	290	286	302	
BOD, unfiltered	<1 mg/l	TM045	<1	<1	<1	<1	<1	
COD, unfiltered	<7 mg/l	TM107	◆ #	♦ # 12.8	♦ # 24.4	◆ #	♦ #	
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/	I TM152	<0.08	<0.08	<0.08	<0.08	<0.08	
Calcium (Dis.Filt)	<0.2 mg/l	TM152	115	113	# 111	109	109	
Chloride	<2 mg/l	TM184	20.2	25.1 25.1	# 25.6	# 25.9	32.8	
Cyanide, Total	<0.05 mg/	I 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

		• •
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
TM152 TM184	Method 3125B, AWWA/APHA, 20th Ed., 1999 EPA Methods 325.1 & 325.2, Standard methods for the examination of waters and	Analysis of Aqueous Samples by ICP-MS The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers

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
 Order Number:
 Z1162
 Superseded Report:

Test Completion Dates

				Piotioi	Date
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
ĺ	@	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 06-10-2021:02:46:25 Page 8 of 8



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				GWU3
			0.00 - 0.00				0.00 - 0.00
	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	0.00 - 0.00 NaOH (ALE245) GW	1lplastic (ALE221) GW	H2SO4 (ALE244)	HNO3 Filtered GW (ALE204)	NaOH (ALE245) GW
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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 E 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

X				GW	H2SO4 (ALE244)			
				GW	HNO3 Filtered (ALE204)			
				GW		0.00 - 0.00	GW02	18487176
		Х		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:181009-28Client Reference:P1444Report Number:476976Location:BallymulveyOrder Number:Z1162Superseded Report:

Results Legend # ISO17025 accredited.	Cu	ustomer Sample Ref.	BH5	BH6	GW01	GW02	GW03	
M mCERTS accredited. 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 standa 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 wi samples aren't corrected for the rec		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						
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 mS/cm	TM120	8.18	1.84 #	0.96 #	0.783 #	1.2 #	
Antimony (diss.filt)	<1 µg/l	TM152	<1	<1	12°C.			
Arsenic (diss.filt)	<0.5 µg/l	TM152	3.3	2.1	4.72 t	52.3 #	13.4 #	
Barium (diss.filt)	<0.2 µg/l	TM152	382	379	only and			
Beryllium (diss.filt)	<0.1 µg/l	TM152	<0.1	<0.1 post	20			
Boron (diss.filt)	<10 µg/l	TM152	1420	citi899 ret	57.1 #	32.8 #	33 #	
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08 #c	1158/1×0.08	0.178 #	<0.08 #	<0.08 #	
Chromium (diss.filt)	<1 µg/l	TM152	کیں ۲	ুন্ত <1 #	<1 #	1.26 #	<1 #	
Cobalt (diss.filt)	<0.5 µg/l	TM152	3.43 en #	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	

CERTIFICATE OF ANALYSIS



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

Results Legend # ISO17025 accredited.	O O	Customer 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	Land Leachate (LE)	Land Leachate (LE)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	
* Subcontracted test.		Date Sampled	08/10/2018	08/10/2018	08/10/2018	08/10/2018	08/10/2018	
** % recovery of the surrogate standa check the efficiency of the method.	rd to The	Sample Time Date Received	. 09/10/2018	09/10/2018	09/10/2018	09/10/2018	09/10/2018	
results of individual compounds wi samples aren't corrected for the rec		SDG Ref	181009-28	181009-28	181009-28	181009-28	181009-28	
(F) Trigger breach confirmed	Lovery	Lab Sample No.(s)	18487193	18487204	18487168	18487176	18487186	
1-5&+§@ Sample deviation (see appendix) Component	LOD/Units	AGS Reference Method						
Magnesium (Dis.Filt)	<0.036 mg/l	_	210	46.5	15.9	7.88	19.3	
Magnesium (Dis.i iit)	<0.030 mg/i	TIVITOL	ž10 #	#	15.5	7.00	19.5	
Potassium (Dis.Filt)	<0.2 mg/l	TM152	145	51.1	7.14	3.42	14.4	
i otassiam (bis.i iit)	₹0.2 mg/i	TIVITOL	145	#	/.I 4	5. 4 2	#	
Coloium (Dio Filt)	<0.2 mag/l	TM152	222		201	188	189	
Calcium (Dis.Filt)	<0.2 mg/l	1101152	222 #	177 #	201	100 #	109	
L (D: E30)	.0.040 #	T14450						
Iron (Dis.Filt)	<0.019 mg/l	TM152	17	12.4	9.08	7.97	2.36	
Minaral alla C40 C40 (an)	4100//	TM470	200	# #	#	#	#	
Mineral oil >C10 C40 (aq)	<100 µg/l	TM172	320	<100				
A4 (1) (10)	0.04 "	T14400	2.24	2.24	0.000	0.0405	2.24	
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01	0.0382	0.0135	<0.01	
			#	#	#	#	#	
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184	<0.05	<0.05				
		1						
Chloride	<2 mg/l	TM184	1180	90.1	24	35.5	132	
		1			#	#	#	
Nitrite as N	<0.0152	TM184	<0.0152	<0.0152				
	mg/l							
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184	0.101	0.122	0.52	<0.1	<0.1	
					0.52 15 ² #	#	#	
Sulphate (soluble) as S	<1 mg/l	TM184	<1	<1	6.830ex	10.1	3.9	
					#	#	#	
Cyanide, Total	<0.05 mg/l	TM227	<0.05	<0.05	officer 10<0.05 #	<0.05	<0.05	
		1 1	#	_#	#	#	#	
Cyanide, Free	<0.05 mg/l	TM227	< 0.05	<0.05 rolling	2			
	Ĭ	1 1	#	<0.05 pirpo				
pH	<1 pH Units	TM256	7.53	×7.744 of	7.42	7.58	7.12	
r		"	#	pecito #	#	#	#	
Silicon (diss.filt)	<0.05 mg/l	TM284	9 93	·105 11 95				
Cincon (discinity	0.00 mg//	201	5.50 •	K Title Co.				
Dibutyl tin	<5 ng/l	TM328	<15	<10				
Sibatyi tiri	-o ngn	1111020	× `	- 10				
Tributyl tin	<1 ng/l	TM328	<3 rept of	<2				
Tributyi tiri	~111g/i	1101020	OILSO	``				
Totrobutul tip	<2 na/l	TM328		<4				
Tetrabutyl tin	<2 ng/l	1101320	~0	\ 4				
Trials and the	44//	TMOOO	42	<2				
Triphenyl tin	<1 ng/l	TM328	<3	<2				
Curregate	0/	TMOOO	66.0	04.2				
Surrogate	%	TM328	66.9	94.3				
T '0 "	.0.04	71.10.75	2.24	224				
Trifluralin	<0.01 µg/l	TM343	<0.01	<0.01				
alpha-HCH	<0.01 µg/l	TM343	<0.01	<0.01				
gamma-HCH (Lindane)	<0.01 µg/l	TM343	<0.01	<0.01				
		1						
Heptachlor	<0.01 µg/l	TM343	<0.01	<0.01				
		1						
Aldrin	<0.01 µg/l	TM343	<0.01	<0.01				
beta-HCH	<0.01 µg/l	TM343	<0.01	<0.01				
Isodrin	<0.01 µg/l	TM343	<0.01	<0.01				
Heptachlor epoxide	<0.01 µg/l	TM343	<0.01	<0.01				
o,p'-DDE	<0.01 µg/l	TM343	<0.01	<0.01				
'								
Endosulphan I	<0.01 µg/l	TM343	<0.01	<0.01				
	۳9′′		****					
trans-Chlordane	<0.01 µg/l	TM343	<0.01	<0.01				
	mg/1							
cis-Chlordane	<0.01 µg/l	TM343	<0.01	<0.01				
	3.0. μg/i	1	·····	""				

CERTIFICATE OF ANALYSIS



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

Page	Results Legend		Customer Sample Ref.	BH5	BH6	GW01	GW02	GW03	i l
Section Continue	M mCERTS accredited.								
Decision Composed Composed	diss.filt Dissolved / filtered sample.								
Companies Comp	* Subcontracted test.	ird to	Date Sampled						
Minimum	results of individual compounds wi	ithin	Date Received						
Component	(F) Trigger breach confirmed	covery	Lab Sample No.(s)						
Decision	Component	LOD/Unit	s Method						
Ap 2000 (10E)	p,p'-DDE	<0.01 µg	/I TM343	<0.01	<0.01				
Entin	Dieldrin	<0.01 µg	/I TM343	<0.01	<0.01				
ODD TUSAS ODD TUSAS ODD	o,p'-DDD (TDE)	<0.01 µg	/I TM343	<0.01	<0.01				
p-000 (TDE)				<0.01	<0.01				
Entosuphen II									
p.p-DoT									
Permethrin	·								
Permethin									
Merinphos 4.01 μpl TM344 <0.01 4.001									
Merinphos 4.01 μpl TM344 <0.01 4.001					<0.02	ruse.			
Merinphos 4.01 μpl TM344 <0.01 4.001					<0.01	4. Adolher			
Merinphos 4.01 μpl TM344 <0.01 4.001	Permethrin II				<0.01	office are			
Mevinphos	Dichlorvos			<0.01	July dill	<i>y</i>			
Hexachlorobenzene	Mevinphos				Decito 10121				
Diazinon	Tecnazene			<0.01	Title 10.01				
Titallate <0.01 μg/l	Hexachlorobenzene			O.	<0.01				
Atrazine	Diazinon			<0.01 sett	<0.01				
Simazine < 0.01 µg/l TM344 0.184 < 0.01	Triallate								
Disulfoton 40.01 μg/l TM344 40.01 4		. •							
Propetamphos < 0.01 μg/l TM344 < 0.01 < 0.01 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>									
Chlorpyriphos-methyl	Disulfoton	<0.01 µg	/I 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>· ·</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	· ·								
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 < 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 <									
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	·								
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 <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>									
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									
Fenitrothion < 0.01 μg/l TM344 < 0.01 < 0.01 Triadimefon < 0.01 μg/l					<0.01				
Triadimefon <0.01 μg/l TM344 <0.01 <0.01									
	Fenitrothion	<0.01 µg		<0.01					
Pendimethalin <0.01 μg/l TM344 <0.01 <0.01	Triadimefon	<0.01 μg	/I TM344	<0.01	<0.01				
	Pendimethalin	<0.01 µg	/I TM344	<0.01	<0.01				

476976

CERTIFICATE OF ANALYSIS



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

 Location:
 Ballymulvey
 Order Number:
 Z1162
 Superseded Report:

Results Legend	С	Customer Sample Ref.	BH5	BH6	GW01	GW02	GW03	
# ISO17025 accredited. M mCERTS accredited.		·	Silo	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 standar 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 wit samples aren't corrected for the rec		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	TM344	<0.01	<0.01				
Chlorfenvinphos	<0.01 µg/l	TM344	<0.01	<0.01				
Ethion	<0.01 µg/l	TM344	<0.01	<0.01				
Carbophenothion	<0.01 µg/l	TM344	<0.01	<0.01				
Triazophos	<0.01 µg/l	TM344	<0.01	<0.01				
Phosalone	<0.01 µg/l	TM344	<0.01	<0.01				
Azinphos methyl	<0.02 µg/l	TM344	<0.02	<0.02				
Azinphos ethyl	<0.02 µg/l	TM344	<0.02	<0.02				
Quintozene (PCNB)	<0.01 µg/l	TM345	<0.01	<0.01				
Telodrin	<0.01 µg/l	TM345	<0.01	<0.01	only, any other use.			
Chlorothalonil	<0.01 µg/l	TM345	<0.01	<0.01	d. wother			
Etrimphos	<0.01 µg/l	TM345	<0.01	<0.01 💸	only air.			
				Dur equi	2°			
				gection ner t				
			Ŷ ⁽	<0.01 <p><0.01</p> <0.01 www.energet.com/ </td <td></td> <td></td> <td></td> <td></td>				
			, of G	or.				
			Consentor					

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

SVOC MS (W) - Aqueous	S						
Results Legend # ISO17025 accredited.		Customer Sample Ref.	BH5	BH6			
M mCERTS accredited.							
diss.filt Dissolved / filtered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00			
tot.unfilt Total / unfiltered sample. * Subcontracted test		Sample Type	Land Leachate (LE) 08/10/2018	Land Leachate (LE)			
* Subcontracted test. ** % recovery of the surrogate standa	ard to	Date Sampled Sample Time	08/10/2018	08/10/2018			
check the efficiency of the method.	. The	Date Received	09/10/2018	09/10/2018			
results of individual compounds wi samples aren't corrected for the re-		SDG Ref	181009-28	181009-28			
(F) Trigger breach confirmed		Lab Sample No.(s)	18487193	18487204			
1-5&+§@ Sample deviation (see appendix)	LOD/U-i	AGS Reference					
Component	LOD/Unit		-4	-4			
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		<1	<1			
2,4-Dichlorophenol (aq)	<1 µg/l		<1	<1			
2,4-Dimethylphenol (aq)	<1 µg/l		<1	<1			
2,4-Dinitrotoluene (aq)	<1 µg/l		<1	<1			
2,6-Dinitrotoluene (aq)	<1 µg/l		<1	<1	ार्थि क्षेत्र के जिल्हा हुई.		
2-Chloronaphthalene (aq)	<1 µg/l		<1	<1	14 13 other		
2-Chlorophenol (aq)	<1 µg/l		<1	<1	off of all		
2-Methylnaphthalene (aq)	<1 µg/l		<1	<1 purporti	o ⁻		
2-Methylphenol (aq)	<1 µg/l		<1	and children			
2-Nitrophenol (aq)	<1 µg/l <1 µg/l		<1 <1	<1 purpose is a pu			
3-Nitroaniline (aq)	<1 μg/l			<1			
4-Bromophenylphenylether (aq)			<1 constitution	<1			
4-Chloro-3-methylphenol (aq)	<1 µg/l <1 µg/l		<1	<1			
4-Chloroaniline (aq)	<1 μg/l		<1	<1			
4-Chlorophenylphenylether (aq)	- μg/l		<1	<1			
4-Methylphenol (aq)	- μg/l		<1	<1			
4-Nitroaniline (aq)	<1 μg/l		<1	<1			
4-Nitrophenol (aq)	<1 μg/l		<1	<1			
Azobenzene (aq)	<1 μg/l		<1	<1			
Acenaphthylene (aq)	<1 μg/l		<1	<1			
Acenaphthene (aq)	<1 μg/l		<1	<1			
Anthracene (aq)	<1 μg/l		<1	<1			
bis(2-Chloroethyl)ether (aq)	<1 μg/l		<1	<1			
bis(2-Chloroethoxy)methane	<1 μg/l		<1	<1			
(aq) bis(2-Ethylhexyl) phthalate (aq)	<2 μg/l		<2	<2			
Butylbenzyl phthalate (aq)	<2 μg/l		<1	<1			
Benzo(a)anthracene (aq)	<1 μg/l		<1	<1			
Bonzo(a)ananaoene (aq)	- 1 μg/I	TIWIT/U	~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.		Depth (m) Sample Type	0.00 - 0.00 Land Leachate (LE)	0.00 - 0.00 Land Leachate (LE)				
Subcontracted test. % recovery of the surrogate stands check the efficiency of the method results of individual compounds w	. The rithin	Date Sampled Sample Time Date Received SDG Ref	08/10/2018 09/10/2018 181009-28	08/10/2018 09/10/2018 181009-28				
samples aren't corrected for the re (F) Trigger breach confirmed 1-5&+§@ Sample deviation (see appendix) Component	LOD/Units	Lab Sample No.(s) AGS Reference	18487193	18487204				
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	115°.			
Dimethyl phthalate (aq)	<1 µg/l	TM176	<1	<1	other			
n-Dioctyl phthalate (aq)	<5 µg/l	TM176	<5	<5	only and other reco			
Fluoranthene (aq)	<1 µg/l	TM176	<1	THE STATE OF	z [©]			
Fluorene (aq)	<1 µg/l	TM176	<1	ectioner				
Hexachlorobenzene (aq)	<1 µg/l	TM176	<1	inspired <1				
Hexachlorobutadiene (aq)	<1 µg/l	TM176	<1	o₹ <1				
Pentachlorophenol (aq)	<1 µg/l	TM176	<1 CORPORT OF	<1				
Phenol (aq)	<1 µg/l	TM176	<1	<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				

181009-28 Ballymulvey P1444 Z1162 Report Number: Superseded Report: SDG: Client Reference: 476976 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.		Depth (m)	0.00 - 0.00	0.00 - 0.00			
tot.unfilt Total / unfiltered sample.		Sample Type	Land Leachate (LE)	Land Leachate (LE)			
* Subcontracted test. ** % recovery of the surrogate standa	ird to	Date Sampled Sample Time	08/10/2018	08/10/2018			
check the efficiency of the method.	The	Date Received	09/10/2018	09/10/2018			
results of individual compounds wi samples aren't corrected for the rec		SDG Ref	181009-28	181009-28			
(F) Trigger breach confirmed		Lab Sample No.(s)	18487193	18487204			
1-5&+§@ Sample deviation (see appendix) Component	LOD/Uni	AGS Reference ts Method					
Dibromofluoromethane**	%	TM208	103	103			
			122	101			
Toluene-d8**	%	TM208	100	101			
4-Bromofluorobenzene**	%	TM208	96.4	95.4			
Dichlorodifluoromethane	<1 µg/l	I TM208	<1 #	<1 #			
Chloromethane	<1 µg/l	I TM208	<1 #	<1 #			
Vinyl chloride	<1 µg/l	TM208	<1 #	186 #			
Bromomethane	<1 µg/l	TM208	<1 #	<1			
Chloroethane	<1 µg/l	TM208	<1 #	<1			
Trichlorofluoromethane	<1 µg/l	I TM208	<1 #	<1			
1,1-Dichloroethene	<1 µg/l	I TM208	<1 #	<1	Alige.		
Carbon disulphide	<1 µg/l	I TM208	<1 #	<1 #	othe,		
Dichloromethane	<3 µg/l	TM208	<3 #	<3 #	offer all.		
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1 #	<1 ,50',	20		
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1 #	. 2877 4 7			
1,1-Dichloroethane	<1 µg/l	I TM208	<1 #	I HE STATE OF THE			
cis-1,2-Dichloroethene	<1 µg/l	I TM208	<1	93.3			
2,2-Dichloropropane	<1 µg/l	TM208	<1 consent	<1			
Bromochloromethane	<1 µg/l	I TM208	¥ #	<1 #			
Chloroform	<1 µg/l		<1 #	<1 #			
1,1,1-Trichloroethane	<1 µg/l		<1 #	<1 #			
1,1-Dichloropropene	<1 µg/l	I TM208	<1 #	<1 #			
Carbontetrachloride	<1 µg/l	TM208	<1 #	<1 #			
1,2-Dichloroethane	<1 µg/l	TM208	<1 #	<1			
Benzene	<1 µg/l	TM208	1.33 #	<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	I TM208	<1 #	<1			
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1 #	<1			
Toluene	<1 µg/l	TM208	1.37 #	1.48			
trans-1,3-Dichloropropene	<1 µg/l	I TM208	<1 #	<1			
1,1,2-Trichloroethane	<1 µg/l	TM208	<1 #	<1			
1,3-Dichloropropane	<1 µg/l	TM208	<1 #	<1 #		 	



SDG: Report Number: Superseded Report: 181009-28 Client Reference: P1444 476976 Ballymulvey Order Number: Z1162 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.		Depth (m) Sample Type	0.00 - 0.00 Land Leachate (LE)	0.00 - 0.00 Land Leachate (LE)				
* Subcontracted test. ** % recovery of the surrogate stands	ard to	Date Sampled Sample Time	08/10/2018	08/10/2018				
check the efficiency of the method results of individual compounds w		Date Received	09/10/2018 181009-28	09/10/2018 181009-28				
samples aren't corrected for the re (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 #	715°.			
Isopropylbenzene	<1 µg/l	TM208	<1 #	<1 #	only and other use.			
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1 #	<1	official			
1,2,3-Trichloropropane	<1 µg/l	TM208	<1 #	<1 11/Pull	~			
Bromobenzene	<1 µg/l	TM208 TM208	<1 # 1.07	Titis and <1				
Propylbenzene 2-Chlorotoluene	<1 µg/l	TM208	<1	itistitis +				
1,3,5-Trimethylbenzene	<1 μg/l	TM208	₹	**************************************				
4-Chlorotoluene	<1 μg/l	TM208	1.94 sent #	*1 <1				
tert-Butylbenzene	<1 μg/l	TM208	<1 **					
1,2,4-Trimethylbenzene	<1 μg/l	TM208	9.68					
sec-Butylbenzene	<1 μg/l	TM208	# <1					
4-iso-Propyltoluene	<1 μg/l	TM208	<1 **	<1				
1,3-Dichlorobenzene	<1 μg/l	TM208	<1 #					
1,4-Dichlorobenzene	<1 μg/l	TM208	1.86					
n-Butylbenzene	<1 μg/l	TM208	<1	** <1				
1,2-Dichlorobenzene	<1 μg/l	TM208	- # <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:181009-28Client Reference:P1444Report Number:476976Location:BallymulveyOrder Number:Z1162Superseded Report:

VOC	OC MS (W)								
#	Results Legend ISO17025 accredited.		Customer Sample Ref.	BH5	BH6				
М	mCERTS accredited.								
aq diss.filt	Aqueous / settled sample. Dissolved / filtered sample.		Depth (m)		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				
**	% recovery of the surrogate standa check the efficiency of the method.	rd to	Sample Time						
	results of individual compounds wi	ithin	Date Received SDG Ref	09/10/2018 181009-28	09/10/2018 181009-28				
(F)	samples aren't corrected for the rec Trigger breach confirmed	covery	Lab Sample No.(s)	18487193	18487204				
1-5&+§@ Compo	Sample deviation (see appendix)	LOD/Un	AGS Reference its Method						
	ichlorobenzene	<1 µg/		<1	<1				
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Report Number: Superseded Report: SDG: 181009-28 Client Reference: P1444 476976 Ballymulvey Z1162 Location: Order Number:

Table of Results - Appendix

rable of Results - Appendix								
Method No	Reference	Description						
SUB		Subcontracted Test						
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples						
TM045	MEWAM BOD5 2nd Ed.HMSO 1988 / Method 5210B, AWWA/APHA, 20th Ed., 1999; SCA Blue Book 130	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids						
TM046	Method 4500G, AWWA/APHA, 20th Ed., 1999	Measurement of Dissolved Oxygen by Oxygen Meter						
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)						
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water						
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser						
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser						
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit						
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter						
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS						
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters						
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS						
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry						
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers						
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters						
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate						
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter Determination of Selected Pesticides (Suite I) in Liquids by GCMS						
TM284		a Posities						
TM328		"Lingh						
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).





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

 Location:
 Ballymulvey
 Order Number:
 Z1162
 Superseded Report:

Test Completion Dates

AGS Ref. Depth Type Alkalinity as CaCO3 Ammoniacal Nitrogen Anions by Kone (w) BDD True Total Colliforms (W) Conductivity (at 20 deg.C) Cyanide Comp/Free/Total/Thiocyanate Dissolved Metals by ICP-MS Dissolved Metals by ICP-MS Dissolved Oxygen by Probe Fluoride Mineral Oil C10-40 Aqueous (W) Nitrite by Kone (w) BDD True Total Corganotins in Aqueous Samples Pesticides (Suite II) by GCMS Pesticides (Suite III) by GCMS Pesticides (Suite III) by GCMS Pesticides (Suite III) by GCMS Person Ammonia Depth Depth Doub (0.00 - 0.00) Dissolved Metals by ICP-MS Dissol	- 0.00	GW03 00 0.00 - 0.00 ater Ground Water 18 15-Oct-2018 18 15-Oct-2018 18 11-Oct-2018 18 11-Oct-2018 18 11-Oct-2018 18 11-Oct-2018 18 12-Oct-2018 18 10-Oct-2018 18 16-Oct-2018
AGS Ref. Depth Type Land Leachate Land Leachate Ground Alkalinity as CaCO3 Ammoniacal Nitrogen Ammoniacal Nitrogen 15-Oct-2018 BDD True Total Coll Unfiltered 12-Oct-2018 11-Oct-2018	- 0.00	00 0.00 - 0.00 ater Ground Water 18 15-Oct-2018 18 15-Oct-2018 18 15-Oct-2018 18 11-Oct-2018 18 11-Oct-2018 18 11-Oct-2018 18 12-Oct-2018 18 10-Oct-2018 18 16-Oct-2018
Depth Type	Mater Ground Water 15-Oct-20 15-Oc	ater Ground Water 18 15-Oct-2018 18 15-Oct-2018 18 15-Oct-2018 18 11-Oct-2018
Depth Type	Mater Ground Water 15-Oct-20 15-Oc	ater Ground Water 18 15-Oct-2018 18 15-Oct-2018 18 15-Oct-2018 18 11-Oct-2018
Type	Mater Ground Water 15-Oct-20 15-Oc	18 11-Oct-2018 18 11-Oct-2018 18 15-Oct-2018 18 15-Oct-2018 18 11-Oct-2018 18 11-Oct-2018 18 11-Oct-2018 18 12-Oct-2018 18 12-Oct-2018 18 16-Oct-2018
Alkalinity as CaCO3	#:2018 15-Oct-20 #:2018 15-Oct-20 #:2018 15-Oct-20 #:2018 11-Oct-20 #:2018 11-Oct-20 #:2018 11-Oct-20 #:2018 11-Oct-20 #:2018 12-Oct-20 #:2018 10-Oct-20	18 15-Oct-2018 18 15-Oct-2018 18 15-Oct-2018 18 11-Oct-2018 18 11-Oct-2018 18 11-Oct-2018 18 12-Oct-2018 18 12-Oct-2018 18 10-Oct-2018 18 16-Oct-2018
Ammoniacal Nitrogen 15-Oct-2018 11-Oct-2018 11-Oct-201	#:2018 15-Oct-20 #:2018 15-Oct-20 #:2018 11-Oct-20 #:2018 11-Oct-20 #:2018 11-Oct-20 #:2018 12-Oct-20 #:2018 10-Oct-20	18 15-Oct-2018 18 15-Oct-2018 18 11-Oct-2018 18 11-Oct-2018 18 11-Oct-2018 18 12-Oct-2018 18 12-Oct-2018 18 16-Oct-2018
Anions by Kone (w) 15-Oct-2018 15-Oct-2018 15-Oct 2018 11-Oct 2018	#:2018 15-Oct-20 #:2018 11-Oct-20 #:2018 11-Oct-20 #:2018 11-Oct-20 #:2018 12-Oct-20 #:2018 10-Oct-20 #:2018 16-Oct-20	18 11-Oct-2018 18 11-Oct-2018 18 11-Oct-2018 18 11-Oct-2018 18 12-Oct-2018 18 10-Oct-2018 18 16-Oct-2018
BOD True Total	#:2018 11-Oct-20 #:2018 11-Oct-20 #:2018 11-Oct-20 #:2018 11-Oct-20 #:2018 12-Oct-20 #:2018 10-Oct-20	18 11-Oct-2018 18 11-Oct-2018 18 11-Oct-2018 18 12-Oct-2018 18 10-Oct-2018 18 16-Oct-2018
COD Unfiltered 12-Oct-2018 11-Oct-2018 Coliforms (W) 11-Oct-2018 11-Oct-2018 Conductivity (at 20 deg.C) 11-Oct-2018 11-Oct-2018 11-Oct-2018 Cyanide Comp/Free/Total/Thiocyanate 11-Oct-2018 11-Oct-2018 11-Oct-2018 Dissolved Metals by ICP-MS 12-Oct-2018 12-Oct-2018 12-Oct-2018 Dissolved Oxygen by Probe 10-Oct-2018 10-Oct-2018 10-Oct-2018 Fluoride 16-Oct-2018 16-Oct-2018 11-Oct-2018 11-Oct-2018 11-Oct-2018 11-Oct-2018 11-Oct-2018 11-Oct-2018 11-Oct-2018 Nort-2018 15-Oct-2018 Nort-2018 15-Oct-2018 15-Oct-2018 15-Oct-2018 15-Oct-2018 15-Oct-2018 15-Oct-2018 15-Oct-2018 15-Oct-2018 15-Oct-2018 16-Oct-2018	tt-2018 11-Oct-20 tt-2018 11-Oct-20 tt-2018 12-Oct-20 tt-2018 10-Oct-20 tt-2018 16-Oct-20	18 11-Oct-2018 18 11-Oct-2018 18 12-Oct-2018 18 10-Oct-2018 18 16-Oct-2018
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Conductivity (at 20 deg.C) 11-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 11-Oct-2018 11-Oct-	tt-2018 11-Oct-20 tt-2018 11-Oct-20 tt-2018 12-Oct-20 tt-2018 10-Oct-20 tt-2018 16-Oct-20	18 11-Oct-2018 18 11-Oct-2018 18 12-Oct-2018 18 10-Oct-2018 18 16-Oct-2018
Cyanide Comp/Free/Total/Thiocyanate 11-Oct-2018 11-Oct-2018 11-Oct-2018 11-Oct-2018 11-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 11-Oct-2018 11-Oct-2018 <t< td=""><td>tt-2018 11-Oct-20 tt-2018 12-Oct-20 tt-2018 10-Oct-20 tt-2018 16-Oct-20</td><td>18 11-Oct-2018 18 12-Oct-2018 18 10-Oct-2018 18 16-Oct-2018</td></t<>	tt-2018 11-Oct-20 tt-2018 12-Oct-20 tt-2018 10-Oct-20 tt-2018 16-Oct-20	18 11-Oct-2018 18 12-Oct-2018 18 10-Oct-2018 18 16-Oct-2018
Dissolved Metals by ICP-MS	tt-2018 12-Oct-20 tt-2018 10-Oct-20 tt-2018 16-Oct-20	18 12-Oct-2018 18 10-Oct-2018 18 16-Oct-2018
Dissolved Oxygen by Probe 10-Oct-2018 10-Oct-2018 10-Oct Fluoride 16-Oct-2018 16-Oct-2018 16-Oct Mercury Dissolved 11-Oct-2018 11-Oct-2018 11-Oct 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 Phosphate by Kone (w) 15-Oct-2018 15-Oct-2018	ct-2018 10-Oct-20 ct-2018 16-Oct-20	18 10-Oct-2018 18 16-Oct-2018
Fluoride	ct-2018 16-Oct-20	18 16-Oct-2018
Mercury Dissolved 11-Oct-2018 11-Oct-2018 11-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 II) 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		
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 II) 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 Phosphate by Kone (w) 15-Oct-2018 15-Oct-2018	:t-2018 11-Oct-20	
Nitrite by Kone (w) 15-Oct-2018 15-Oct-2018		18 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		
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		
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		
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		
pH Value 12-Oct-2018 12-Oct-2018 12-Oct-2018 Phosphate by Kone (w) 15-Oct-2018 15-Oct-2018		
Phosphate by Kone (w) 15-Oct-2018 15-Oct-2018		
	t-2018 12-Oct-20	18 12-Oct-2018
Silicon Dissolved by ICP-OES 10-Oct-2018 10-Oct-2018		
SVOC MS (W) - Aqueous 12-Oct-2018 12-Oct-2018 Total Organic and Inorganic Carbon 10-Oct-2018 11-Oct-2018 10-Oct-2018 VOC MS (W) 11-Oct-2018 11-Oct-2018 11-Oct-2018		
Total Organic and Inorganic Carbon		
VOC MS (W) 11-Oct-2018 11-Oct-2018	:t-2018 10-Oct-20	18 10-Oct-2018
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Ça co	itspection burgos	18 10-Oct-2018, South and all the state of t

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.

I	1	Container with Headspace provided for volatiles analysis
I	2	incorrect container received
I	A03.	Deviation from method
Ş	N. Con	Holding time exceeded before sample received
Ź	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
I	&	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.

14:36:56 16/10/2018 Modification Date: 16/10/2018 EPA Export 06-10-2021:02:46:26



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







P1444 475704 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
18414647	BH1		0.00 - 0.00	26/09/2018
18414656	BH2		0.00 - 0.00	26/09/2018
18414665	BH3		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.

180927-85

Ballymulvey

15.8

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

Validated

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



ALS

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	
		3 BH5							1 BH6				9 SW-C				1 SW-G	
		O1							63				0				G 	
		0.00							0.00				0.00				0.00	
		0.00 - 0.00							0.00 - 0.00				0.00 - 0.00				0.00 - 0.00	
HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	1000ml glass bottle (ALE220)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	
듀	Æ	F	F	E	Æ	Fi	듀	Fi	Fi	WS	WS	WS	WS	WS	WS	WS	WS	
				X	X	X				X	X	X	Fit of f	Tins of the	ecite of	X Purper	odine d	dy. any other use
					X						X	Con			X			
X	Х						X	X					X				X	
					X						X				X			
X					X		X											
	X		X					X										
			X															

CERTIFICATE OF ANALYSIS

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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									184 1468 1	2002						18414699						18414691		
		BH5									BHo	2 5						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)	(ALE212)	(ALE208)	500ml Plastic	H2SO4 (ALE244)	(ALE204)	HNO3 Filtered	NaOH (ALE245)	Viai (ALEZ97)	\ \(\)	250ml BOD (ALE212)	(ALE208)	500ml Plastic	H2SO4 (ALE244)	(ALE204)	ă	250ml BOD (ALE212)		500ml Plastic	H2SO4 (ALE244)	(ALE204)	Q		
Fi	듀	E	H	F	1	F	H		F	Æ	F	7	WS		WS	WS		WS	WS		WS	WS		WS		
X		х	x			×	X		×		X				×	Çan ^s	Ent	Ç.C	r inst	eciti X	Con	Durch Red Re		S ON THE CONTRACT OF THE CONTR	id. and other tise	5-



180927-85 Ballymulvey SDG: Client Reference: Order Number: Z1162 Location:

Report Number: Superseded Report: P1444 475704

Results Legend # ISO17025 accredited.	0	Customer Sample Ref.	BH1	BH2	BH3	BH5	BH6	SW-C
M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test. * % recovery of the surrogate standcheck the efficiency of the method results of individual compounds wamples aren't corrected for the ref. (F) Trigger breach confirmed	d. The within	Depth (m) Sample Type Date Sample Time Date Received SDG Ref Lab Sample No.(s)	0.00 - 0.00 Ground Water (GW) 26/09/2018 27/09/2018 180927-85 18414647	0.00 - 0.00 Ground Water (GW) 26/09/2018 27/09/2018 180927-85 18414656	0.00 - 0.00 Ground Water (GW) 26/09/2018 27/09/2018 18/0927-85 18414665	0.00 - 0.00 Land Leachate (LE) 26/09/2018 27/09/2018 180927-85 18414673	0.00 - 0.00 Land Leachate (LE) 26/09/2018 27/09/2018 180927-85 18414681	0.00 - 0.00 Surface Water (SW) 26/09/2018 27/09/2018 18/0927-85 18414699
1-5&+§@ Sample deviation (see appendix) Component	LOD/Units	AGS Reference Method						
Coliforms, Total*	CFU/100ml		6050	17200	13000000			
Alkalinity, Total as CaCO3	<2 mg/l	TM043	465 #	373 #	695 #			
BOD, unfiltered	<1 mg/l	TM045		, ,	, ,	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	T T
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	#	#	# _ 15 [©] .	<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	#	#	July au	287	# 357	
Beryllium (diss.filt)	<0.1 µg/l	TM152		Durpose.	iso to	<0.1	<0.1	
Boron (diss.filt)	<10 µg/l	TM152	53.7	20:5 05	60.4	1350	348	
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08	1115 11 0.08	<0.08	<0.08	<0.08	
Chromium (diss.filt)	<1 µg/l	TM152		o ⁽²⁾ <1	<1	11.2	<1	
Cobalt (diss.filt)	<0.5 µg/l	TM152	Collise III (#	#	#	3.33	1.36	
Copper (diss.filt)	<0.3 µg/l	TM152	7.6	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	
Tellurium (diss.filt)	<2 μg/l	TM152				# <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	
Sodium (Dis.Filt)	<0.076 mg/l		16.4	13.9	76.8	698	85.5	136
	5.57 6 mg/l	111102	10.4	#	70.0 #	#	65.5 #	#

CERTIFICATE OF ANALYSIS



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

Second Part Part	Results Legend	С	ustomer Sample Ref.	BH1	BH2	BH3	BH5	BH6	SW-C
Part	# ISO17025 accredited.	Ĭ	ustomer oampie Kei.	BHI	BHZ	внз	внэ	вно	SW-C
Second Continue	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
Compose Comp	tot.unfilt Total / unfiltered sample.			Ground Water (GW)	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
	results of individual compounds w	rithin							
Component Comp	(F) Trigger breach confirmed	covery							
Magnetim (Dis-Fife 4.000 mm) TM 1/2 14.7		LOD/Unite							
Parassam Baristo	-	1	1	14.7	6.71	23.6	220	42	
Company Comp	,	Ĭ		#	#	#	#	#	
Cacion (Classific)	Potassium (Dis.Filt)	<0.2 mg/l	TM152						
Marcal al Script	Coloium (Dia Filt)	<0.0 ma/l	TM4E0						#
More March March	Calcium (Dis.Filt)	<0.2 mg/i	1101132			· ·			
Mercan Chicago Chica	Iron (Dis.Filt)	<0.019 mg/l	TM152						
Marchy (1988 NI)				#	#	#			
Probable (Office as PC4)	Mineral oil >C10 C40 (aq)	<100 µg/l	TM172				778	174	
Probable (Office as PC4)	Mercury (dies filt)	<0.01.ug/l	TM183	<0.01	<0.01	<0.01	<0.01	<0.01	
Phosphale (Ciffo as PC4) 0.05 mg/l TM/94 27.1	wercary (diss.iiit)	νο.στ μg/ι	1101100						
Marke as N	Phosphate (Ortho as PO4)	<0.05 mg/l	TM184						
Marke as N									
Cliorde	Sulphate	<2 mg/l	TM184				<2	<2	
Minter as N	Chloride	c) mall	TM194				1080	7/1 1	
Note as N	Graonae	~2 mg/i	1101104			#		74.1	
Cyanide, Total 9,05 mg/l TM227 -0.05 mg/l -0.05 mg/	Nitrite as N	<0.0152	TM184			g)*	<0.0152	<0.0152	
Cyanide, Total 9,05 mg/l TM227 -0.05 mg/l -0.05 mg/						r USC			
Cyanide, Total 9,05 mg/l TM227 -0.05 mg/l -0.05 mg/	Total Oxidised Nitrogen as N	<0.1 mg/l	TM184			<0.10er	<0.1	<0.1	
Cyanide, Free < 0.05 mg/l TM227 Author/Leading < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.05 mg/l < 0.0	Cyanida Total	<0.05 mg/l	TM227		# <0.05	# # # #		<0.05	
Cyanide, Free Cyanide, Fre	Cyaniue, Total	<0.03 mg/i	TIVIZZI		V0.03	\$ \$ 0 × 0.05			
Silcon (alss fift)	Cyanide, Free	<0.05 mg/l	TM227		17001	-0			
Silcon (alss fift)					Pilifedir				
Dibutyl tin	рH	<1 pH Units	TM256	7.15	citolifer,	7.04			
Dibutyl tin	Silicon (dies filt)	<0.05 mg/l	TM28/I	#	TOTAL THE	#			#
Dibutyl tin	Silicon (diss.iiit)	10.05 mg/l	1101204	\$ (Kliteli		10.5	3.5	
Tributyl fin	Dibutyl tin	<5 ng/l	TM328				11.5	<5	
Triphenyl tin				<u> </u>					
Triphenyl tin	Tributyl tin	<1 ng/l	TM328	other			<1	<1	
Triphenyl tin <1 ng/l TM328 <1 ng/l <1 ng/l TM328 <1 ng/l <1 ng/l <td>Tetrabutyl tin</td> <td><2 ng/l</td> <td>TM328</td> <td>CO</td> <td></td> <td></td> <td><2</td> <td><2</td> <td></td>	Tetrabutyl tin	<2 ng/l	TM328	CO			<2	<2	
Surrogate % TM328 6 99.7 90.9 Trifluralin -0.01 µg/l TM343 -0.02 <0.02		g					_	_	
Trifluralin < 0.01 μg/l TM343 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.01 < 0.01 < 0.01 < 0.01 < 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 < 0.02 < 0.02 < 0.02 < 0.02 < 0	Triphenyl tin	<1 ng/l	TM328				<1	<1	
Trifluralin < 0.01 μg/l TM343 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.01 < 0.01 < 0.01 < 0.01 < 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 < 0.02 < 0.02 < 0.02 < 0.02 < 0		2/	T11000				50.7	22.2	
alpha-HCH	Surrogate	%	TM328				59.7	90.9	
alpha-HCH	Trifluralin	<0.01 µg/l	TM343				<0.02	<0.02	
gamma-HCH (Lindane) <0.01 µg/l TM343 <0.02 <0.02 <0.02 <0.02 Heptachlor Heptachlor <0.01 µg/l									
Heptachlor < 0.01 μg/l TM343 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 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 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.	alpha-HCH	<0.01 µg/l	TM343				<0.02	<0.02	
Heptachlor < 0.01 μg/l TM343 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 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 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.	gamma_HCH /Lindano)	<0.01	LVV3V3				<n no<="" td=""><td><0.02</td><td></td></n>	<0.02	
Aldrin < 0.01 μg/l TM343 < 0.01 μg/l TM343 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.01 < 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 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.	ganina-non (Linuane)	~υ.υ ι μg/l	1101343				\ U.UZ	\U.UZ	
beta-HCH < 0.01 μg/l TM343 < 0.01 < 0.01 < 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 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02	Heptachlor	<0.01 µg/l	TM343				<0.03	<0.03	
beta-HCH < 0.01 μg/l TM343 < 0.01 < 0.01 < 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 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02									
Isodrin < 0.01 μg/l TM343 < 0.02 < 0.02 < 0.02 Heptachlor epoxide < 0.01 μg/l	Aldrin	<0.01 µg/l	TM343				<0.03	<0.03	
Isodrin < 0.01 μg/l TM343 < 0.02 < 0.02 < 0.02 Heptachlor epoxide < 0.01 μg/l	beta-HCH	<0.01.110/	TM343				<0.01	<0.01	
Heptachlor epoxide < 0.01 μg/l TM343 < 0.02 < 0.02 < 0.02 o,p'-DDE < 0.01 μg/l	2000 11011	-0.01 μg/1	1111040				-0.01	-0.01	
c,p'-DDE <0.01 μg/l TM343 <0.02 <0.02 <0.02 Endosulphan I <0.01 μg/l	Isodrin	<0.01 µg/l	TM343				<0.02	<0.02	
c,p'-DDE <0.01 μg/l TM343 <0.02 <0.02 <0.02 Endosulphan I <0.01 μg/l									
Endosulphan I <0.01 μg/I TM343 <0.02 <0.02 <0.02 trans-Chlordane <0.01 μg/I	Heptachlor epoxide	<0.01 µg/l	TM343				<0.02	<0.02	
Endosulphan I <0.01 μg/I TM343 <0.02 <0.02 <0.02 trans-Chlordane <0.01 μg/I	o,p'-DDE	<0.01 ua/l	TM343				<0.02	<0.02	
trans-Chlordane <0.01 µg/l TM343 <0.02 <0.02 <0.02									
	Endosulphan I	<0.01 µg/l	TM343				<0.02	<0.02	
		.004 "	T11010				2.22	2.22	
cis-Chlordane <0.01 μg/l TM343 <0.02 <0.02	trans-Uniordane	<0.01 µg/l	1M343				<0.02	<0.02	
	cis-Chlordane	<0.01 µa/l	TM343				<0.02	<0.02	

CERTIFICATE OF ANALYSIS



180927-85 Ballymulvey SDG: Client Reference: P1444 Order Number: Location:

Z1162

Report Number: Superseded Report:

475704

Part									
Section Process Proc	M mCERTS accredited. aq Aqueous / settled sample.			BH1	BH2	BH3	BH5	BH6	SW-C
Section Sect	tot.unfilt Total / unfiltered sample.			Ground Water (GW)	Ground Water (GW)			Land Leachate (LE)	Surface Water (SW)
Part		ard to		26/09/2018	26/09/2018	26/09/2018	26/09/2018	26/09/2018	26/09/2018
Part			Date Received						
Content		covery							
Part	1-5&+§@ Sample deviation (see appendix)	L OD/II-it-	AGS Reference						
Characteristation							<0.02	<0.02	
Control Cont	Fir								
March Marc	Dieldrin	<0.01 µg/l	TM343				<0.02	<0.02	
Control	o,p'-DDD (TDE)	<0.01 µg/l	TM343				<0.02	<0.02	
Part	Endrin	<0.01 µg/l	TM343				<0.02	<0.02	
Part	o,p'-DDT		TM343				<0.04	<0.04	
App-DOT 100 kg TMASS 100 kg 100 kg<	p,p'-DDD (TDE)	<0.01 µg/l	TM343				0.0354	<0.02	
Permethrin	Endosulphan II	<0.02 µg/l	TM343				<0.04	<0.04	
Permethin	p,p'-DDT	<0.01 µg/l	TM343				<0.04	<0.04	
Diazinon	p,p'-Methoxychlor	<0.01 µg/l	TM343				<0.04	<0.04	
Diazinon	Endosulphan Sulphate	<0.02 µg/l	TM343			, USE.	<0.02	<0.02	
Diazinon	Permethrin I	<0.01 µg/l	TM343			other	<0.01	<0.01	
Diazinon	Permethrin II	<0.01 µg/l	TM343		, es	only at	<0.01	<0.01	
Diazinon	Dichlorvos	<0.01 µg/l	TM344		Dut 20 di	2	<0.01	<0.01	
Diazinon	Mevinphos	<0.01 µg/l	TM344		getion et l		<0.01	<0.01	
Diazinon	Tecnazene	<0.01 µg/l	TM344	€.	institut Kyright		<0.01	<0.01	
Diazinon	Hexachlorobenzene	<0.01 µg/l	TM344	, of	'06,		<0.01	<0.01	
Atrazine COD μg/l TM344 COD μg/l TM344 COD μg/l COD μg/l TM344 COD μg/l COD μg/l TM344 COD μg/l COD μg	Diazinon	<0.01 µg/l	TM344	Consent			<0.01	<0.01	
Simazine CO1 µg/l TM344 C	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	
Chlorypriphos-methyl 40.01 µg/l TM344 Methyl Parathion 40.01 µg/l 40.01 </td <td>Disulfoton</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>	Disulfoton	<0.01 µg/l	TM344				<0.01	<0.01	
Dimethoate COD1 μg/l TM344 COD1 μg/l TM344 COD1 μg/l <	Propetamphos	<0.01 µg/l	TM344				<0.01	<0.01	
Primiphos-methyl < 0.01 μg/l TM344 < 0.01 μg/l < 0.	Chlorpyriphos-methyl	<0.01 µg/l	TM344				<0.01	<0.01	
Chlorpyriphos < 0.01 μg/l TM344 < 0.01 μg/l	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 < 0.01 μg/l TM344	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 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 <td>Fenthion</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>	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	Triadimefon	<0.01 µg/l	TM344				<0.01	<0.01	
	Pendimethalin	<0.01 µg/l	TM344				<0.01	<0.01	

CERTIFICATE OF ANALYSIS



Results Legend # ISO17025 accredited.		Customer Sample Ref.	BH1	BH2	BH3	BH5	BH6	SW-C
M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test. ** % recovery of the surrogate stands check the efficiency of the method results of individual compounds w samples aren't corrected for the re (F) Tigger breach confirmed	. The ithin	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s)	0.00 - 0.00 Ground Water (GW) 26/09/2018 27/09/2018 180927-85 18414647	0.00 - 0.00 Ground Water (GW) 26/09/2018 27/09/2018 180927-85 18414656	0.00 - 0.00 Ground Water (GW) 26/09/2018 27/09/2018 180927-85 18414665	0.00 - 0.00 Land Leachate (LE) 26/09/2018 27/09/2018 180927-85 18414673	0.00 - 0.00 Land Leachate (LE) 26/09/2018 27/09/2018 180927-85 18414681	0.00 - 0.00 Surface Water (SW) 26/09/2018
1-5&+§@ Sample deviation (see appendix) Component	LOD/Unit	AGS Reference S Method						
Parathion	<0.01 µg					<0.01	<0.01	
Chlorfenvinphos	<0.01 µg	/I TM344				<0.01	<0.01	
Ethion	<0.01 µg	/I TM344				<0.01	<0.01	
Carbophenothion	<0.01 µg	/I TM344				<0.01	<0.01	
Triazophos	<0.01 µg	/I TM344				<0.01	<0.01	
Phosalone	<0.01 µg	/I TM344				<0.01	<0.01	
Azinphos methyl	<0.02 µg	/I TM344				<0.02	<0.02	
Azinphos ethyl	<0.02 µg	/I TM344				<0.02	<0.02	
Quintozene (PCNB)	<0.01 µg	/I TM345				<0.01	<0.01	
Telodrin	<0.01 µg	/I TM345			only and other tise.	<0.01	<0.01	
Chlorothalonil	<0.01 µg	/I TM345			other	<0.01	<0.01	
Etrimphos	<0.01 µg	/I TM345		ع	only and	<0.01	<0.01	
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				action & rees				
				rinsperda				
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CERTIFICATE OF ANALYSIS



Results Legend # ISO17025 accredited.	С	ustomer 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	26/09/2018				
** % recovery of the surrogate standar check the efficiency of the method.	rd to The	Sample Time					
results of individual compounds wit samples aren't corrected for the rec	thin	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 #				
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SVOC MS (W) - Aqueous							
Results Legend # ISO17025 accredited.	Cı	ıstomer Sample Ref.	BH5	BH6			
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.		Sample Type	Land Leachate (LE)	Land Leachate (LE)			
* Subcontracted test. ** % recovery of the surrogate standa	ard to	Date Sampled Sample Time	26/09/2018	26/09/2018			
check the efficiency of the method results of individual compounds w		Date Received	27/09/2018	27/09/2018			
samples aren't corrected for the re		SDG Ref	180927-85 18414673	180927-85 18414681			
(F) Trigger breach confirmed 1-5&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	10414073	10414001			
Component	LOD/Units	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			
(-4)	. 49.			· ·			
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1			
1,1 210111010201120110 (44)	. 49			·			
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1			
2,1,0 11101101011011011(44)	l Pg/	1		''			
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1			
2,4,0-Thenlorophenor (aq)	ν μ μ μ μ	1101170	- 1	`'			
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<1	<1			
2,4-Dictilorophenor (aq)	\	1101170	~1	`'			
2,4-Dimethylphenol (aq)	44//	TM176	-4	<1			
2,4-Dimethylphenol (aq)	<1 µg/l	TIVITO	<1	<u> </u>			
0.4 Dinitaretalisa a ()	44//	TM470	-4	-4			
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1			
0.C Disitantalisma ()	44 //	TM176	<1	<1			
2,6-Dinitrotoluene (aq)	<1 µg/l	TIVITO	<u> </u>	<u> </u>	್ದಲ.		
2 Chlorenouhtholone (ag)	<1 · · ~/l	TM176	<1	<1	2112		
2-Chloronaphthalene (aq)	<1 µg/l	TIVITO	<u> </u>	<u> </u>	other		
2 Chlorophonol (oc)	<1 · · ~/l	TM176	<1	<1	14.00		
2-Chlorophenol (aq)	<1 µg/l	TIVITA	~1	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	offst and other rise.		
O Mathedra a laterator (and	44 //	TM470	-4	11 05	370		
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1	1 IIP TI	۲		
O Mathedale and (an)	44//	TM176	<1	- 100 C			
2-Methylphenol (aq)	<1 µg/l	TIVITO	<u> </u>	ctioner			
2-Nitroaniline (aq)	<1 µg/l	TM176	<1	28 × 07			
2-IVIII Odrillili le (dq)	\	1101170	N	or of			
2-Nitrophenol (aq)	<1 µg/l	TM176	<1	20 <1			
2-Mill ophenor (aq)	ν μ μ μ μ	1101170	\$	10,			
3-Nitroaniline (aq)	<1 µg/l	TM176	<1 consent or	<1			
o renounime (uq)	1 49/1	1101170	-nser	`'			
4-Bromophenylphenylether (aq)	<1 ug/l	TM176	Q	<1			
4 Bromophenyiphenyiether (uq)	<1 µg/l	1101170	-1	`'			
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<1	<1			
1 chiefe e moutyphoner (aq)	l Pg/	1		''			
4-Chloroaniline (aq)	<1 µg/l	TM176	<1	<1			
1 critorouriiino (uq)	l Pg/	1		''			
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<1	<1			
(aq)	. 49			·			
4-Methylphenol (aq)	<1 µg/l	TM176	<1	<1			
7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7	""						
4-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1			
(-4)	. 49.						
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	<1 µg/l	TM176	<1	<1			
(aq)							
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	14.2	<2			
		<u> </u>				 <u> </u>	
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	<1			
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<1	<1			
	1	1		1			

CERTIFICATE OF ANALYSIS



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

SVOC MS (W) - Aqueous	S						
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			
Component Denve (h)fluerenthene (ex)	LOD/Units		<1	<1			
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176	< I	<u> </u>			
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	at lise.		
Dimethyl phthalate (aq)	<1 µg/l	TM176	<1	<1	only any other user		
n-Dioctyl phthalate (aq)	<5 µg/l	TM176	<5	<5 ©	office 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		insorties (1			
Hexachlorobutadiene (aq)	<1 µg/l	TM176	<1				
Pentachlorophenol (aq)	<1 µg/l	TM176	<1 CORPUTE 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

(ALS) LOCATION		Sanymarray		r Number.			
VOC MS (W)							
Results Legend # ISO17025 accredited.	Cı	ustomer Sample Ref.	BH5	BH6			
 M mCERTS accredited. aq Aqueous / settled sample. 							
diss.filt Dissolved / filtered sample.		Depth (m) Sample Type	0.00 - 0.00	0.00 - 0.00			
tot.unfilt Total / unfiltered sample. * Subcontracted test.		Date Sampled	Land Leachate (LE) 26/09/2018	Land Leachate (LE) 26/09/2018			
** % recovery of the surrogate star check the efficiency of the meth-		Sample Time					
results of individual compounds	within	Date Received	27/09/2018 180927-85	27/09/2018 180927-85			
samples aren't corrected for the (F) Trigger breach confirmed	recovery	SDG Ref Lab Sample No.(s)	18414673	18414681			
1-5&+§@ Sample deviation (see appendix)	AGS Reference					
Component	LOD/Units	Method					
Dibromofluoromethane**	%	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	Ø1*		
			#	#	1150		
Carbon disulphide	<1 µg/l	TM208	<1	<1	ony and other use.		
			#	#	OV		
Dichloromethane	<3 µg/l	TM208	<3	<3	ally all,		
			#	#	101		
Methyl tertiary butyl ether	<1 µg/l	TM208	<1	<1 00%	e ^C		
(MTBE)			#	On COM			
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1 1100 11 1100 11 1100 1100 1100 1100			
			#	ect with #			
1,1-Dichloroethane	<1 µg/l	TM208	<1	insper on #			
			<u>#</u> (K 1196 #			
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1 ',	46.5			
				#			
2,2-Dichloropropane	<1 µg/l	TM208	<1 consent	<1			
			COUR				
Bromochloromethane	<1 µg/l	TM208	X	<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			1
			#	#			
Benzene	<1 µg/l	TM208	1.51	<1			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			1
			#	. #			
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1 "	<1			
			#	#			
Toluene	<1 µg/l	TM208	1.42	1.02			1
			#	#			
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1			
			#	#			
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1 ,,,			1
			#	. #			
1,3-Dichloropropane	<1 µg/l	TM208	<1	<1			
			#	#	1		
2:41:37 08/10/2018							

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.	Cu	ustomer Sample Ref.	BH5	BH6			
M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test. ** % recovery of the surrogate stand	land to	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			
check the efficiency of the method results of individual compounds we samples aren't corrected for the refriger treatment confirmed 1-58+\$@ Sample deviation (see appendix)	d. The vithin	Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	27/09/2018 180927-85 18414673	27/09/2018 180927-85 18414681			
Component 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	, 115°C.		
Isopropylbenzene	<1 µg/l	TM208	<1 #	<1 #	other		
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1 #	<1	only any other use.		
1,2,3-Trichloropropane	<1 µg/l	TM208	<1 #	<1 reduit	200		
Bromobenzene	<1 µg/l	TM208	<1 #	acitellar,			
Propylbenzene	<1 µg/l	TM208	1.07	itished <1			
2-Chlorotoluene	<1 µg/l	TM208	<1	<1 #			
1,3,5-Trimethylbenzene	<1 µg/l	TM208	1.79 ent #	<1 #			
4-Chlorotoluene	<1 µg/l	TM208	<1 #	<1 #			
tert-Butylbenzene	<1 µg/l	TM208	<1 #	<1 #			
1,2,4-Trimethylbenzene	<1 µg/l	TM208	7.13 #	<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	<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			
			#	#			

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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 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 stands check the efficiency of the method	. The	Sample Time Date Received	27/09/2018	27/09/2018			
results of individual compounds w samples aren't corrected for the re		SDG Ref Lab Sample No.(s)	180927-85 18414673	180927-85 18414681			
(F) Trigger breach confirmed 1-5&+§@ Sample deviation (see appendix)	1.00///	AGS Reference					
Component 1,3,5-Trichlorobenzene	LOD/Units <1 µg/l	Method TM208	<1	<1			
					offy, and offet tise.		
					other		
					Out and		
				چې مې . م	Stor		
				Ditty Colin			
				ection per s			
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180927-85 Ballymulvey Report Number: Superseded Report: SDG: Client Reference: P1444 475704 Order Number: Z1162 Location:

Table of Results - Appendix

	Table of	
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		ato ite
TM328		a for feath
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 permination 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).

CERTIFICATE OF ANALYSIS



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

Test Completion Dates

Lab Sample No(s)							
Lab cample NO(3)	18414647	18414656	18414665	18414673	18414681	18414699	18414691
Customer Sample Ref.	BH1	BH2	ВН3	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
Туре		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	00 001 2010	00 000 2010	00 000 2010	03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018
COD Unfiltered				04-Oct-2018	03-Oct-2018	00 000 2010	00 00(2010
Coliforms (W)	05-Oct-2018	05-Oct-2018	05-Oct-2018	01 001 2010	00 00(2010		
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	00 000-2010	00 001-2010
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	01-001-2010	01-OCI-2016
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	04.0 + 0040	00.0.1.0040	00.0.1.0040	03-Oct-2018	03-Oct-2018	20.0.1.0040	00.0.1.0040
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	04 0-4 0040	04.0-+ 0040	04.0-+ 0040	05-Oct-2018	03-Oct-2018	eo.	
Total Organic and Inorganic Carbon	01-Oct-2018	01-Oct-2018	01-Oct-2018	02-Oct-2018	02-Oct-2018		
VOC MS (W)				03-Oct-2018	03-Oct-2018		
			For its get	02-Oct-2018 03-Oct-2018	Ed or		





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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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Template: 1146 Revision: 018 Page 1 of 4





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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 BH1 Sample Type: Ground Date Sample Received: 27/09/2018

Lab Reference Number: 412665

Site / Method Ref.	Analysis Start Date	Parameter	ad and office Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/09/2018	Coliforms	OTT A COED O	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





Report Reference: 18-47445

Report Version: 2

17220.0

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

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

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Water Only)

www.cityanalysts.ie

Certificate Of Analysis

Customer

Site:

Site /

Method Ref.

D/D1201#

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

180927-85

Sample Description:Ballymulvey BH2Date of Sampling:27/09/2018Sample Type:GroundDate Sample Received:27/09/2018

Consent of copyright owner require

Parameter

Lab Reference Number: 412666

Analysis

Start Date

27/09/2018

 Units	PV Value

MPN/100ml

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

Note:

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

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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	ad add Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/09/2018	Coliforms	10007000 0	MPN/100ml	<u> </u>
		Consent of copyright owner test			

= 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.

	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.

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