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BALLYMULVEY HISTORIC LANDFILL - H0296-01

RESPONSE TO REQUEST FOR INFORMATION

Prepared for: Longford County Council

AN LONGFORT CONNECTED
Longford County Council
Comhairle Chontae An Longfoirt
People · Place · Opportunity

Date: November 2022

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Abstract: Fehily Timoney and Company (FT) on behalf of Longford County Council (LCC) submitted an application to the Environmental Protection Agency (EPA) for a certificate of authorisation (CoA) for the Ballymulvey Historic Landfill. The EPA determined the application did not comply with Regulation 7(2) of the Waste Management (Certification of Historic Unlicenced Waste Disposal and Recovery Activity) Regulations, 2008. The EPA requested that Longford County Council (LCC), in accordance with Regulation 7(4) supply the information listed in Appendix 1. This report provides responses to the queries raised.

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1. INTRODUCTION

1.1 Introduction

Fehily Timoney and Company (FT) on behalf of Longford County Council (LCC) submitted an application to the Environmental Protection Agency (EPA) for a Certificate of Authorisation (CoA) for the Ballymulvey Historic Landfill.

The EPA reviewed the CoA application and determined the application did not comply with Regulation 7(2) of the Waste Management (Certification of Historic Unlicenced Waste Disposal and Recovery Activity) Regulations, 2008.

The EPA requested that LCC, in accordance with Regulation 7(4) supply the information listed in Appendix 1.

This report provides responses to the queries raised.

2. REQUEST FOR INFORMATION

This section outlines the 13 no. items requested by the EPA and the responses to respective items.

2.1 Item 1

2.1.1 Request for Information

Section B.1 of the Application Form indicates that the site lies on 'unregistered land with PRAI but owned by Longford County Council'. Clarify if ownership of the site will be registered with the PRAI.

2.1.2 Response

Ballymulvey Historic Landfill lies on unregistered lands. Longford County Council intend to regularise the site ownership. A letter prepared by E. C. Gearty & Co. solicitors confirming this intent is included as Appendix 2 to this response.

2.2 Item 2

2.2.1 Request for Information

Provide a letter from the Qualified Body to the Qualified Person, as required under Section 2.3 of the EPA Code of Practice – Environmental Risk Assessment for Unregulated Waste Disposal Sites.

2.2.2 Response

A letter from the Qualified Body (Engineers Ireland) to the Qualified Person (James O'Neill) confirming the Qualified Person has been assessed as a person who is qualified, trained and experienced to the standard set out in Section 2.3 of Code of Practice: Environmental Risk Assessment for Unregulated Waste Disposal Sites (EPA, 2007) is included in Appendix 3.

2.3 Item 3

2.3.1 Request for Information

Section 1.2 of the Non-Technical Summary states that the operation at the landfill ceased following a High Court Order. Provide a copy of the High Court Order.

2.3.2 Response

A copy of the High Court Order is provided in Appendix 4 of this document.

2.4 Item 4

2.4.1 Request for Information

The site boundary shown in Figure 1 'Site Location Plan' of the Tier 1 Risk Assessment and Figure 2.1 titled 'Site Location Plan and Aerial View' of the Tier 2 Assessment differ. State the reason for the differences in the site boundary and submit, or refer to, a Figure that shows the correct site boundary.

2.4.2 Response

Figure 1 'Site Location Plan' of the Tier 1 Assessment showed a provisional boundary of the site, the definitive site boundary was confirmed during the Tier 2 Assessment. Figure 2.1 titled 'Site Location Plan and Aerial View' of the Tier 2 Assessment, included for clarity as Appendix 5 of this report, shows the correct site boundary.

2.5 Item 5

2.5.1 Request for Information

State what waste was deposited in the area referred to as 'area of special precautions; area shaded to be protected to ensure that this area is not disturbed or exposed by any proposed works', as shown in Figure 2 'Site Layout Plan' of the Tier 1 Assessment.

2.5.2 Response

The waste deposited in this area is described as asbestos containing material (ACM) originated from Lanesborough Power Station, as per Section 2.2 of the Tier 1 Assessment, Appendix I of the Tier 2 Assessment. Further details on the ACM management can be found in Section 1.6 of the Tier 3 Assessment.

2.6 Item 6

2.6.1 Request for Information

It is noted that the most recent surface water monitoring was carried out on 6th September 2018 and 26th September 2018 at two locations SW-C and SW-G, which are downstream of the landfill, as shown in Figure 4.3 'Surface Water Monitoring' of the Tier 2 Assessment. It is also noted that no monitoring was carried out at other surface water monitoring points shown in Figure 4.3, due to being dry on the monitoring dates. It is therefore considered that the monitoring carried out in 2018 may not be reflective of the potential impact of the landfill on surface waters.

Accordingly, repeat surface water monitoring at locations SW-A, SW-B, SW-C, SW-E, SW-G, SW-I, SW-H and SW-M. Please include the monitoring locations in the Drawing required under point 13.

2.6.2 Response

Additional surface water monitoring has been carried out on the 11th May and 6th July 2022 at the locations SWB, SWC, SWD, SWF, SWG, SWH, SWI and SWM.

A summary of the results from both monitoring events is outlined in Table 2.1, only parameters that were above the limit of detection are included. Associated laboratory reports are presented in Appendix 6.

Table 2.1: 2022 Surface Water Sampling Results

Test	Units	AA-EQS2 Inland surface waters3	MAC-EQS4 Inland surface waters3	SWB - Downstream		SWC - Downstream		SWD - Upstream	SWF - Downstream		SWG - Downstream	
				11/05/2022	06/07/2022	11/05/2022	06/07/2022	11/05/2022	11/05/2022	06/07/2022	11/05/2022	06/07/2022
Inorganics												
Oxygen, dissolved	mg/l			8.54	9.51	9.32	10.5	9.84	9.11	7.64	11.2	10.9
pH	pH Units			8.21	7.35	7.67	7.5	8.14	7.95	7.88	8.24	8.33
Phosphate (Ortho as PO4)	mg/l			<0.05	0.459	<0.05	<0.05	<0.05	<0.05	0.056	<0.05	<0.05
Sulphate	mg/l			<2	<2	50.3	42.5	33.3	28.5	30.1	14.3	15.8
Chloride	mg/l			127	138	92.2	108	107	91	88.2	17	15.7
COD, unfiltered	mg/l			59.9	80.7	44.8	68.8	71.8	57.5	68.8	14.4	19.9
Ammoniacal Nitrogen as N (low level)	mg/l	0.065	0.14	0.0542	0.0802	0.0725	0.76	0.0566	0.0601	0.129	0.0356	0.036
Total Oxidised Nitrogen as NO3	mg/l			0.74	<0.3	5.98	4.96	<0.3	0.339	<0.3	5.81	5.41
Conductivity @ 20 deg.C	mS/cm			0.87	0.936	0.948	1	0.92	0.897	0.915	0.574	0.633
BOD, unfiltered	mg/l			<1	2.78	<1	2.76	<1	3.52	2.52	<1	<1
Alkalinity, Total as CaCO3	mg/l			335	350	410	455	410	415	425	325	375
Suspended solids, Total	mg/l			<6	18.6	28	13.9	22.9	9.2	24.4	6.5	2.95
Filtered (Dissolved) Metals												
Arsenic (diss.filt)	µg/l	25		1.62	6.67	0.807	1.55	0.826	0.855	1.15	0.621	0.753
Boron (diss.filt)	µg/l			108	164	67.7	129	84.9	71.2	104	<10	<10
Chromium (diss.filt)	µg/l	4.7	32	<1	<1	<1	7.04	<1	<1	<1	<1	<1
Copper (diss.filt)	µg/l	30		0.461	0.825	<0.3	<0.3	0.54	0.373	0.54	0.57	2.64
Manganese (diss.filt)	µg/l			54.5	1650	4	1590	29.8	46.8	163	11.7	<3
Nickel (diss.filt)	µg/l	4	34	1.66	1.93	1.78	2.57	2.15	2.57	3.19	0.959	0.977
Zinc (diss.filt)	µg/l	100		2.85	4.42	3.8	1.72	1.95	1.28	2.1	1.66	3.36
Sodium (Dis.Filt)	mg/l			75.8	76.7	56.1	59.8	64.7	54.8	48.5	8.83	8.24
Magnesium (Dis.Filt)	mg/l			20.1	20.4	21.7	20.3	20.9	18.8	16.5	11	10.5
Potassium (Dis.Filt)	mg/l			14.8	16	10	9.67	10.1	8.66	9.5	2.11	2.44
Calcium (Dis.Filt)	mg/l			102	110	154	157	137	147	151	132	136
Iron (Dis.Filt)	mg/l			0.314	0.751	0.0778	0.212	0.133	0.152	0.0516	0.0559	0.039
Unfiltered (Total) Metals												
Phosphorus (tot.unfilt)	µg/l			48	128	34.6	52	40.8	44.9	149	26.1	26.2
Semi-Volatile Organic Compounds (SVOCs)												
4-Methylphenol (aq)	µg/l			<1	<1	<1	<1	<1	<1	8.77	<1	<1
Phenol (aq)	µg/l	8	46	<1	<1	<1	<1	<1	<1	2.2	<1	<1
Miscellaneous Organics												
Dinitro-o-cresol	µg/l			<0.1	<0.1	<0.1	0.164	<0.1	<0.1	<0.1	<0.1	<0.1
Clopyralid	µg/l			<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.0678	<0.04
2,4-Dichlorophenoxyacetic acid	µg/l			<0.05	<0.05	<0.05	<0.05	0.526	<0.05	<0.05	<0.05	<0.05

Notes:

1. Environmental Quality Standard (EQS) as per European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I No. 272 of 2009). Refers to Annual-Average (AA) EQS for relevant parameters.
2. Maximum Admissible Concentration (MAC), as classified by European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I No. 272 of 2009).

* Items shaded in orange are in exceedance of the 2009 AA-EQS Regulations.
* Items shaded in blue are in exceedance of the 2009 MAC-EQS Regulations.

Test	Units	AA-EQS2 Inland surface waters3	MAC-EQS4 Inland surface waters3	SWH - Downstream		SWI - Downstream		SWM - Downstream	
				11/05/2022	06/07/2022	11/05/2022	06/07/2022	11/05/2022	06/07/2022
Inorganics									
Oxygen, dissolved	mg/l			10.9	11.4	10.7	12.7	6.79	9.81
pH	pH Units			8.45	8.34	8.61	8.35	7.74	7.43
Phosphate (Ortho as PO4)	mg/l			<0.05	0.054	<0.05	0.05	<0.05	<0.05
Sulphate	mg/l			19.3	19.8	20.3	20.4	<2	<2
Chloride	mg/l			16.5	15.4	15.6	14.8	29.2	29.7
COD, unfiltered	mg/l			17.5	28.4	18.2	24.4	73.8	69.7
Ammoniacal Nitrogen as N (low level)	mg/l	0.065	0.14	0.0981	0.0369	0.0465	0.0348	0.573	0.0872
Total Oxidised Nitrogen as NO3	mg/l			4.69	2.9	3.55	2.03	<0.3	<0.3
Conductivity @ 20 deg.C	mS/cm			0.5	0.495	0.438	0.457	0.65	0.616
BOD, unfiltered	mg/l			<1	<1	<1	<1	11.2	<1
Alkalinity, Total as CaCO3	mg/l			270	275	230	245	365	340
Suspended solids, Total	mg/l			2.3	<2	<2	2.3	49.2	3.65
Filtered (Dissolved) Metals									
Arsenic (diss.filt)	µg/l	25		0.571	0.719	0.638	0.595	<0.5	0.589
Boron (diss.filt)	µg/l			<10	<10	<10	<10	<10	19.8
Chromium (diss.filt)	µg/l	4.7	32	<1	<1	<1	<1	<1	2.77
Copper (diss.filt)	µg/l	30		0.813	0.892	0.763	0.916	<0.3	<0.3
Manganese (diss.filt)	µg/l			9.42	<3	5.28	<3	314	128
Nickel (diss.filt)	µg/l	4	34	1.45	1.65	1.83	1.93	0.406	<0.4
Zinc (diss.filt)	µg/l	100		2.08	3.04	2.75	3.45	4.01	1.85
Sodium (Dis.Filt)	mg/l			8.4	7.9	7.95	7.47	15.5	14.3
Magnesium (Dis.Filt)	mg/l			8.52	7.57	7.49	6.55	12.3	10.6
Potassium (Dis.Filt)	mg/l			1.96	2.04	2.06	1.86	4.93	3.37
Calcium (Dis.Filt)	mg/l			105	105	92	92.7	129	122
Iron (Dis.Filt)	mg/l			0.0549	0.049	0.0416	0.0526	0.819	0.5
Unfiltered (Total) Metals									
Phosphorus (tot.unfilt)	µg/l			33.7	47.1	26.9	37.4	150	<20
Semi-Volatile Organic Compounds (SVOCs)									
4-Methylphenol (aq)	µg/l			<1	<1	<1	<1	<2	<2
Phenol (aq)	µg/l	8	46	<1	<1	<1	<1	<2	<2
Miscellaneous Organics									
Dinitro-o-cresol	µg/l			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Clopyralid	µg/l			<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
2,4-Dichlorophenoxyacetic acid	µg/l			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Notes:

3. Environmental Quality Standard (EQS) as per European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I No. 272 of 2009). Refers to Annual-Average (AA) EQS for relevant parameters.
4. Maximum Admissible Concentration (MAC), as classified by European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I No. 272 of 2009).

* Items shaded in orange are in exceedance of the 2009 AA-EQS Regulations.

* Items shaded in blue are in exceedance of the 2009 MAC-EQS Regulations.

Results of the additional surface water monitoring events from 2022 show exceedances for Ammoniacal Nitrogen and Chromium only.

Ammonia has exceeded both AA and MAC-EQS threshold values for 7 no. samples, both upstream and downstream of the site. The ammonia levels at these concentrations (0.0725 to 0.760 mg/l) could mean the waste body is impacting the surface water quality but it could also be influenced by the peat present in the region.

Chromium exceeded the AA-EQS threshold value at location SW-C in the July monitoring event. Elevated Chromium concentration in surface water is considered to be an indication of impact from the waste body.

2.7 Item 7

2.7.1 Request for Information

It is noted that the most recent groundwater monitoring was carried out on 26th September 2018 and 8th October 2018 at three monitoring boreholes BH1, BH2 and BH3 (also referred to by the applicant as boreholes GW01, GW02 and GW03), as shown in Figure 4.1 'Groundwater Flow' of the Tier 2 Assessment. Considering the locations of the three cells with waste, as shown in Figure F061-01 'Existing Site Survey' of the Tier 1 Assessment, and the direction of groundwater flow towards the south/south-west, it is considered that the monitoring locations BH3 may not be fully representative of groundwater downgradient of the waste body. Accordingly, please install an additional borehole, BH4, outside the waste body between Cell No. 2 and the south-western site boundary and out up-to-date groundwater monitoring in BH1, BH2, BH3 and BH4. Include the monitoring locations on the Drawing required under Point 13. Additionally, include a log for the new borehole.

2.7.2 Response

Additional site investigations works were completed in August/September 2020 by Priority Geotechnical Ltd. and September 2022 by Causeway Geotechnical Ltd.

The following works were completed in 2020:

- Installation of three boreholes by rotary drilling, GW4, GW5 and GW6 (groundwater wells); and
- Three number falling head borehole permeability tests.

The following works were completed in 2022:

- Installation of two boreholes by rotary drilling, GW7/BH4 (groundwater well) and LH1/BH5A (leachate well); and
- Standpipe installation in the two new boreholes.

A full copy of the 2020 and 2022 geotechnical reports, including the borehole logs, can be found in Appendix 7 of this report.

Additional groundwater monitoring events have been carried out in 2021 and 2022 at the locations BH1(GW01), BH2(GW02), BH3(GW03), GW7/BH4, GW4, GW5 and GW6.

GW7/BH4 and GW5 were only monitored during the October 2022 event.

- R3 - 15/06/2021
- R4 - 15/09/2021
- R5 - 27/10/2021
- R6 - 17/02/2022
- R7 - 11/05/2022
- R8 - 06/07/2022
- R9 - 05/10/2022

A summary of the results from all seven monitoring events is outlined in Table 2.2, only parameters that were above the threshold values are included. The laboratory reports are presented in Appendix 8.

Table 2.2: 2022 Groundwater Sampling Results

Test	Units	OTV[1]	IGV[2]	BH1(GW01)							BH2(GW02)							BH3(GW03)						
				Upgradient							Upgradient							Downgradient						
				R3	R4	R5	R6	R7	R8	R9	R3	R4	R5	R6	R7	R8	R9	R3	R4	R5	R6	R7	R8	R9
Inorganics																								
Chloride	mg/l	187.5	30	22	19.4	20.3	20	15.5	14.7	13.6	29.5	27.7	27.9	22.7	24	25.5	29.3	162	139	80.9	102	163	63.6	129
Ammoniacal Nitrogen as N (low level)	mg/l	0.065	0.15	0.053	0.057	0.065	0.102	0.0859	0.396	0.177	1.51	1.4	1.48	0.667	1.33	2.08	1.47	15.2	18.3	4.72	7.5	19.4	3.65	23.9
Alkalinity, Total as CaCO3	mg/l		200	424	405	397	430	415	405	400	3060	1740	1140	530	679	545	1160	449	580	508	561	650	425	595
Filtered (Dissolved) Metals																								
Arsenic (diss.filt)	µg/l	7.5	10	<0.5	<0.5	-	0.563	-	<0.5	<0.5	1.7	1.57	-	1.17	-	97.5	1.14	0.789	0.655	-	0.965	-	1.09	2.96
Boron (diss.filt)	µg/l	750	1000	<10	13.5	-	70.7	-	20.8	16.6	22.6	24.6	-	25.2	-	241	25.7	<10	14.2	-	88.6	-	107	91
Chromium (diss.filt)	µg/l	37.5	30	<1	<1	-	2.13	-	<1	<1	<1	<1	-	<1	-	1.02	<1	<1	<1	-	2.22	-	<1	<1
Manganese (diss.filt)	µg/l		50	85.3	26.2	-	65.6	-	293	9.25	928	786	-	700	-	1000	624	1630	1150	-	548	-	358	577
Nickel (diss.filt)	µg/l	15	20	2.91	3.71	-	5.3	-	13.4	5.1	4.28	5.7	-	4.78	-	6.31	7.99	4.77	6.02	-	4.39	-	4.69	3.26
Zinc (diss.filt)	µg/l	75	100	3.5	1.52	-	9.56	-	9.78	11.8	7.86	11.7	-	9.26	-	17.9	23.4	6.31	10.2	-	6.69	-	7.43	19.4
Sodium (Dis.Filt)	mg/l	150	150	7.51	7.33	-	9.02	-	7.57	7.69	15	14	-	14.3	-	13	16.8	71.3	75.5	-	65.8	-	44.2	82.5
Magnesium (Dis.Filt)	mg/l		50	14	12.6	-	18.7	-	12.6	12.7	8.9	8.52	-	9.18	-	8.49	8.95	11.5	14.9	-	28	-	25.3	28.2
Potassium (Dis.Filt)	mg/l		5	9.64	9.57	-	8.75	-	9.53	9.52	2.54	2.41	-	2.92	-	4.16	3.94	6.06	10.2	-	20.3	-	19.5	24
Calcium (Dis.Filt)	mg/l		200	151	139	-	166	-	150	145	198	187	-	202	-	197	201	222	194	-	165	-	133	177
Iron (Dis.Filt)	mg/l		0.2	<0.019	<0.019	-	<0.019	-	<0.019	<0.019	1.09	0.0356	-	0.0277	-	29.2	0.0688	0.644	0.0485	-	0.0446	-	0.424	0.305
Semi-Volatile Organic Compounds (SVOCs)																								
bis(2-Ethylhexyl) phthalate (aq)	µg/l	6	8	<8	<20	<8	<2	<2	<2	<2	<16	<20	<20	<2	<4	<4	<8	<2	<4	<2	<2	<2	<2	<2
Volatile Organic Compounds (VOCs)																								
Benzene	µg/l	0.75	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	µg/l	525	10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	µg/l		1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	µg/l		10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
m,p-Xylene	µg/l		10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Naphthalene	µg/l	0.075	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Combined Pesticides / Herbicides																								
Simazine	µg/l	0.075	1	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.1	<0.01	<0.02	<0.02	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Miscellaneous Organics																								
Mecoprop	µg/l	0.75	10	<0.08	<0.2	<0.08	<0.04	<0.04	<0.04	<0.4	<0.08	<0.2	<0.08	<0.04	<0.2	<0.2	<0.4	<0.04	0.0452	<0.04	<0.04	<0.04	0.0902	0.12

Notes:

1. OTV-Overall threshold value, European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010) as amended in 2011, 2012, 2016.
2. IGV-Interim Guideline Values, from EPA, Towards Setting Guideline Values for the Protection of Groundwater in Ireland, 2003.

* Items shaded in orange are in exceedance of the Drinking Water Regulations
* Items shaded in blue are in exceedance of the EPA IGV Standards

Test	Units	OTV[1]	IGV[2]	GW7/BH4	GW4							GW5	GW6						
				Downgradient	Upgradient							Downgradient	Downgradient						
				R9	R3	R4	R5	R6	R7	R8	R9	R9	R3	R4	R5	R6	R7	R8	R9
Inorganics																			
Chloride	mg/l	187.5	30	1030	18.2	19.9	17.4	15.7	14.3	13	14	35.9	18.8	26.1	24.2	27.9	60.4	32.6	21.1
Ammoniacal Nitrogen as N (low level)	mg/l	0.065	0.15	513	0.715	0.67	0.704	0.911	0.904	1.68	1.22	0.171	2.19	0.358	0.724	0.039	0.0511	0.163	1.73
Alkalinity, Total as CaCO3	mg/l		200	2940	325	426	437	447	445	445	445	755	289	325	334	397	430	375	365
Filtered (Dissolved) Metals																			
Arsenic (diss.filt)	µg/l	7.5	10	5.32	1.08	1.03	-	0.938	-	1.41	1.16	0.508	1.7	0.913	-	<0.5	-	0.564	1.06
Boron (diss.filt)	µg/l	750	1000	1490	18.3	23.6	-	13.6	-	24.2	17.8	57.3	<10	14.6	-	<10	-	12.3	15.7
Chromium (diss.filt)	µg/l	37.5	30	7.97	<1	<1	-	1.14	-	<1	<1	<1	<1	<1	-	1.91	-	<1	<1
Manganese (diss.filt)	µg/l		50	656	963	905	-	1910	-	1860	1950	<3	323	52.6	-	7.62	-	56.7	562
Nickel (diss.filt)	µg/l	15	20	37.6	3.05	5.56	-	5.5	-	3.89	4.24	1.11	2.98	4.92	-	3.55	-	2.37	4.17
Zinc (diss.filt)	µg/l	75	100	80.7	29	27.5	-	24.4	-	17.9	21.2	12	36.3	14.9	-	15	-	9.65	21
Sodium (Dis.Filt)	mg/l	150	150	693	10.6	10.4	-	8.35	-	7.89	7.64	27.5	15	17.1	-	18.6	-	21.3	17.6
Magnesium (Dis.Filt)	mg/l		50	102	19.2	18.8	-	17.2	-	16.5	16.2	13.3	11.6	10.3	-	5.69	-	8.53	9.98
Potassium (Dis.Filt)	mg/l		5	182	3.61	3.75	-	3.51	-	3.42	3.42	2.48	2.28	1.91	-	0.717	-	1.28	1.77
Calcium (Dis.Filt)	mg/l		200	154	134	131	-	154	-	153	151	84.4	109	112	-	157	-	130	116
Iron (Dis.Filt)	mg/l		0.2	0.64	<0.019	<0.019	-	<0.019	-	<0.019	<0.019	<0.019	0.0292	<0.019	-	<0.019	-	<0.019	<0.019
Semi-Volatile Organic Compounds (SVOCs)																			
bis(2-Ethylhexyl) phthalate (aq)	µg/l	6	8	<20	<2	<4	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2
Volatile Organic Compounds (VOCs)																			
Benzene	µg/l	0.75	1	2.29	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	µg/l	525	10	1.59	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	µg/l		1	3.36	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	µg/l		10	2.29	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
m,p-Xylene	µg/l		10	43.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Naphthalene	µg/l	0.075	1	2.04	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Combined Pesticides / Herbicides																			
Simazine	µg/l	0.075	1	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.02
Miscellaneous Organics																			
Mecoprop	µg/l	0.75	10	2.29	<0.08	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.2	<0.08	<0.04	<0.08	<0.04	<0.04	<0.04	<0.04

Notes:

1. OTV-Overall threshold value, European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010) as amended in 2011, 2012, 2016.
2. IGV-Interim Guideline Values, from EPA, Towards Setting Guideline Values for the Protection of Groundwater in Ireland, 2003.
3. UG = upgradient, DG=downgradient, IW = in waste, CG=cross-gradient.
4. GW01-S (shallow) refers to GW01, GW01-D (deep) refers to well GW02 (See Causeway 2020 site investigation report Appendix 7).

* Items shaded in orange are in exceedance of the Drinking Water Regulations.

* Items shaded in blue are in exceedance of the EPA IGV Standards.

The results of the groundwater monitoring from all monitoring wells have reported a number of exceedances of the OTV and IGV threshold values.

Chloride concentrations exceeding the threshold values can be found only in downgradient boreholes, BH3, GW7/BH4, GW5 and GW6, which is considered to be an indication of impact from the leachate plume migrating beyond the landfill boundary.

Samples recovered from all monitoring wells reported ammonia concentrations that exceed the threshold values in at least one of the 7 no. monitoring events, ranging from 0.0859 mg/l to 513 mg/l. The ammonia concentrations at upgradient boreholes GW4, BH1 (GW01) and BH2 (GW02) could indicate contamination from the waste body, slurry spreading or from nearby septic tanks. The highest ammonia concentrations of 23.9 mg/l recorded at BH3 (GW03) and 513 mg/l at GW7/BH4 is 400 and 1000 times the groundwater threshold value. At this concentration it is probable to consider that the waste body is impacting water quality and indicates a leachate plume is potentially migrating beyond the landfill boundary. Further south (downgradient) at GW5 and GW6, the ammonia levels drop to 0.039 mg/l to 2.19 mg/l.

The peat strata underlying the waste body may also be influencing high levels of ammonia detected in the groundwater.

Elevated alkalinity ($CaCO_3$) is consistent across all sampling locations and monitoring events since 2018. The alkaline groundwater quality in the range 289 mg/l to 3060 mg/l is up to 15 times the IGV threshold value. The alkaline groundwater quality detected at each monitoring borehole is considered to be a factor of the local bedrock hydrochemistry.

Elevated arsenic concentration exceeding the OTV quality standard is reported at monitoring well BH2 only, in R6 (July/2022). The detected concentration of 97.5 µg/l (0.0975) mg/l at upgradient borehole is considered to be an indication of impact from the leachate plume migrating beyond the landfill boundary.

Significantly elevated manganese concentrations exceeding the IGV threshold limit value of 50 µg/l are reported at all monitoring wells in different monitoring events. Similar concentrations between upgradient and downgradient boreholes can be seen with the results reported for manganese, ranging from 52.6 µg/l to 1950 µg/l across all monitoring wells with the highest concentration reported in upgradient borehole GW4. Review of the Tier 1 and Tier 2 Assessments show similar concentrations and trends reported for manganese which suggest that these are background levels within the local bedrock hydrochemistry.

Iron concentrations were detected within the range 0.305 mg/l to 29.2 mg/l across BH2 to GW7/BH4, with the highest concentration reported in upgradient borehole BH2.

Elevated potassium concentrations ranging from 6.06 mg/l at BH3 to 182 mg/l at GW7/BH4 were also detected in samples collected from monitoring well BH1 upgradient. The potassium concentrations exceed the IGV standard of 5 mg/l and are considered to be representative of impact from the waste body.

A number of parameters that relate to leachate components have exceeded both OTV and IGV threshold values in GW7/BH4, which is located immediately downgradient of the waste body, showing that leachate migration is impacting the groundwater quality locally.

2.8 Item 8

2.8.1 Request for Information

It is noted that the most recent gas monitoring was carried out on 25th September 1018 and 8th October 2018 at the three boreholes BH1, BH2 and BH3 (also referred to by the applicants as boreholes GW01, GW02 and GW03) and two boreholes within the waste body BH5 and BH6, as shown in Figure 3.1 'Site Investigation Location Plan' of the Tier 2 Assessment. Accordingly, carry out up-to-date gas monitoring in accordance with the EPA Landfill Manuals – Landfill Monitoring. Please note, as per Section 7.5.2 of EPA Landfill Manual – Landfill Monitoring, that for gas monitoring purposes within the waste body, leachate monitoring boreholes are inappropriate and, where appropriate, groundwater monitoring boreholes may be used for gas monitoring.

2.8.2 Response

Additional site investigations works were completed in August/September 2020 by Priority Geotechnical Ltda. and in September 2022 by Causeway Geotechnical Ltd.

The following works were completed in 2020:

- Installation of three boreholes by rotary drilling, GW4, GW5 and GW6 (groundwater wells); and
- Three number falling head borehole permeability tests.

The following works were completed in 2022:

- Installation of two boreholes by rotary drilling, GW7/BH4 (groundwater well) and LH1/BH5A (leachate well); and
- Standpipe installation in the two new boreholes.

A full copy of the 2020 and 2022 geotechnical reports, including the borehole logs, can be found in Appendix 7 of this report.

Additional landfill gas monitoring has been carried out on the 10th November 2022 at the locations BH1, BH2, BH3, GW7/BH4 and BH5A. The results from are outlined in Table 2.3:

Table 2.3: Perimeter Gas Monitoring Results – November 2022

Sample Station	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Atmospheric Pressure (mbar)	Staff Member	Weather
BH1 (GW01)	0.1	0.1	21.4	999	Gary Lawlor	Cloudy, dry, Wind N-NE, 14°C - 16°C
BH2 (GW02)	0.0	0.1	21.4	999		
BH3 (GW03)	0.1	0.1	21.6	998		
BH4 (GW7)	0.7	0.6	20.9	998		

Table 2.4: Landfill Footprint Gas Monitoring Results – November 2022

Sample Station	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Atmospheric Pressure (mbar)	Staff Member	Weather
BH5A (LH1)	63.9	30.4	1.5	998	Gary Lawlor	Cloudy, dry, Wind N-NE, 14°C - 16°C

Concentrations of both CO_2 and CH_4 at all perimeter boreholes BH1 to BH4 (GW01 to GW03 and GW7) were below the threshold values set by the CoP.

Results from BH5A show the production of landfill gas continues within the waste body.

2.9 Item 9

2.9.1 Request for Information

Figure 5.1 'The Conceptual Site Model' of the Tier 2 Assessment indicated that industrial waste was deposited at the landfill. State the nature of this waste.

2.9.2 Response

Evidence suggests predominantly municipal waste was deposited at the landfill. ACM containing C&D waste was deposited in a particular area as discussed in response to Item 5. Additionally, fly ash from the local peat burning power plant has been used for capping and profiling the site in the late 1990's. No evidence of the deposition of industrial waste at the landfill was found and has been reported in error.

The Conceptual Site Model has been corrected and can be found in Appendix 9 of this report.

2.10 Item 10

2.10.1 Request for Information

Referring to Drawing No. BLS-01 of the Tier 1 Assessment, provide the following information:

(i) State whether the network of stone filled gas trenches, which are marked in thick black lines in the drawing, have been installed.

(ii) State whether the six passive vents (Vents 1 to 6), as shown in Drawing No. BLS-01 or the four vents (Vents 1 to 4), as shown in Figure 2 'Site Layout Plan' of the Tier 1 Assessment have been connected to the said gas trenches and are operational. If connected, submit a new drawing showing the location of the actual gas management infrastructure installed.

2.10.2 Response to Item 10 (i)

The Site Development Drawings were prepared between 1997 and 2001 and have been included for historical context and information only.

Evidence of stone filled trenches is described in the Site Walkover Checklist in Tier 1 Assessment, however it is not possible to confirm definitively that all trenches shown have all been installed accordingly in accordance with the historic drawings.

2.10.3 Response to Item 10 (ii)

The Site Development Drawings were prepared between 1997 and 2001 and have been included for historical context and information only.

Several apparent gas vent locations have been identified on site during site walkovers. It should be noted that the site is extensively overgrown therefore all six locations have not been identified.

No definitive information is available on their connection or otherwise with the gas trenches.

2.11 Item 11

2.11.1 Request for Information

It is noted that the location of borehole BH6 differs on Figure 2 'Site Layout Plan' of the Tier 1 Assessment and Figure 3.1 'Site Investigation Location Plan' of the Tier 2 Assessment. Clarify which Drawing/Figure shows the correct location of borehole BH6 and confirm that this BH6 location correlates with the leachate monitoring results summarised in Tables 4.4 and 4.5 of the Tier 2 Assessment.

2.11.2 Response

Figure 3.1 'Site Investigation Location Plan' of the Tier 2 Assessment shows the correct location and it correlates with the leachate monitoring results summarised in Tables 4.4 and 4.5 of the same report.

2.12 Item 12

2.12.1 Request for Information

State the type of waste encountered in the trial pit TP01 and in the leachate monitoring boreholes BH5 and BH6 installed within the waste body and whether the encountered waste is representative of the entire waste body. Include the logs for boreholes BH5 and BH6. Additionally, state the maximum depth of waste and how it was established.

2.12.2 Response

The purpose of TP01 was to assess the depth and permeability of the existing capping material only. It did not go below the waste material.

Additional site investigations works were completed in 27th and the 28th of September 2022 by Causeway Geotechnical Ltd. in support of this RFI response, BH5 has been reinstated and its log (LH1) describe the made ground as landfill with fragments of plastic, paper and household waste, as per Appendix 7 of this report.

Boreholes BH5 and BH6 have been installed between 1997 and 2001, no logs or information is available regarding their installation.

The maximum depth of waste of 8.5m BGL has been confirmed by the additional site investigation works, as per BH5/LH1 logs. The depth of 8.5m BGL agrees with the ground levels described in the historic site development drawings (Appendix II of the Tier 2 Assessment).

2.13 Item 13

2.13.1 Request for Information

Provide one Drawing showing all of the following elements interpolated:

(i) The entire site boundary in red;

(ii) The waste body boundary, in a different colour than red, showing the extent of the areas where waste was deposited;

(iii) The water cut-off perimeter drains and other on-site land water drains, the off-site land water drains and any other waterbodies. Each land water drain and waterbody should be shown in blue and be annotated. Please also include arrows showing water flow direction in each land drain and waterbody;

(iv) All leachate, groundwater, gas and surface water monitoring locations; and

(v) The brown oval feature located east of the monitoring location SW-A, as shown in Figure 4.3, and a label identifying this feature.

2.13.2 Response

Please see Appendix 10.

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APPENDIX 1

Regulation 7 Notice

Mr. Bernard Shea,
Environmental Section,
Longford County Council,
Great Water Street,
Longford, N39 NH56

31st March 2022 Reg. No. H0296-01

Re: Ballymulvey Historic Landfill – Notice in accordance with Regulation 7(4) of the Waste Management (Certification of Historic Unlicenced Waste Disposal and Recovery Activity) Regulations, 2008

Dear Mr. Shea,

I am to refer to the above referenced application for a certificate of authorisation in relation to the above referenced historic landfill.

Having examined the foregoing, I am to advise that the Agency is of the view that the application does not comply with Regulation 7(2) of the Waste Management (Certification of Historic Unlicenced Waste Disposal and Recovery Activity) Regulations, 2008.

You are therefore requested in accordance with Regulation 7(4) of the Regulations, to take steps to supply the information detailed below:

REGULATION 7(2) COMPLIANCE REQUIREMENTS

1. **Section B.1 of the Application Form indicates that the site lies on 'unregistered land with PRAI** but **owned by Longford County Council'**. Clarify if ownership of the site will be registered with the PRAI.
2. Provide a letter from the Qualified Body to the Qualified Person, as required under Section 2.3 of the EPA Code of Practice – Environmental Risk Assessment for Unregulated Waste Disposal Sites.
3. Section 1.2 of the Non-Technical Summary states that the operation at the landfill ceased following a High Court Order. Provide a copy of the High Court Order.
4. **The site boundary shown in Figure 1 '***Site Location Plan***' of the Tier 1 Risk Assessment and Figure** 2.1 **titled '***Site Location Plan and Aerial View***' of the** Tier 2 Assessment differ. State the reason for the differences in the site boundary and submit, or refer to, a Figure that shows the correct site boundary.
5. State what waste was deposited in the area referred to as '*area of special precautions; area shaded to be protected to ensure that this area is not disturbed or exposed by any proposed works*', as **shown in Figure 2 'Site Layout Plan' of the Tier 1 Assessment.**

6. It is noted that the most recent surface water monitoring was carried out on 6th September 2018 and 26th September 2018 at two locations SW-C and SW-G, which are downstream of the landfill, as shown in Figure 4.3 'Surface Water Monitoring' of the Tier 2 Assessment. It is also noted that no monitoring was carried out at other surface water monitoring points shown in Figure 4.3, due to being dry on the monitoring dates. It is therefore considered that the monitoring carried out in 2018 may not be reflective of the potential impact of the landfill on surface waters. Accordingly, repeat surface water monitoring at locations SW-A, SW-B, SW-C, SW-E, SW-G, SW-I, SW-H and SW-M. Please include the monitoring locations in the Drawing required under Point 13.

7. It is noted that the most recent groundwater monitoring was carried out on 26th September 2018 and 8th October 2018 at three monitoring boreholes BH1, BH2 and BH3 (also referred to by the applicant as boreholes GW01, GW02 and GW03), as shown in Figure 4.1 'Groundwater Flow' of the Tier 2 Assessment. Considering the locations of the three cells with waste, as shown in Figure F061-01 'Existing Site Survey' of the Tier 1 Assessment, and the direction of groundwater flow towards the south/ south-west, it is considered that the monitoring location BH3 may not be fully representative of groundwater downgradient of the waste body. Accordingly, please install an additional borehole, BH4, outside the waste body between Cell No. 2 and the south-western site boundary and carry out up-to-date groundwater monitoring in BH1, BH2, BH3 and BH4. Include the monitoring locations on the Drawing required under Point 13. Additionally, include a log for the new borehole.

8. It is noted that the most recent gas monitoring was carried out on 25th September 2018 and 8th October 2018 at three boreholes BH1, BH2 and BH3 (also referred to by the applicant as boreholes GW01, GW02 and GW03) and two boreholes within the waste body BH5 and BH6, as shown in Figure 3.1 'Site Investigation Location Plan' of the Tier 2 Assessment. Accordingly, carry out up-to-date gas monitoring in accordance with the EPA Landfill Manuals – Landfill Monitoring. Please note, as per Section 7.5.2 of EPA Landfill Manuals - Landfill Monitoring, that for gas monitoring purposes within the waste body, leachate monitoring boreholes are inappropriate and, where appropriate, groundwater monitoring boreholes may be used for gas monitoring.

9. Figure 5.1 'The Conceptual Site Model' of the Tier 2 Assessment indicates that industrial waste was deposited at the landfill. State the nature of this waste.

10. Referring to Drawing No. BLS-01 of the Tier 1 Assessment, provide the following information:

    (i) State whether the network of stone filled gas trenches, which are marked in thick black lines in the drawing, have been installed.

    (ii) State whether the six passive vents (Vents 1 to 6), as shown in Drawing No. BLS-01 or the four vents (Vents 1 to 4), as shown in Figure 2 'Site Layout Plan' of the Tier 1 Assessment have been connected to the said gas trenches and are operational. If connected, submit a new drawing showing the location of the actual gas management infrastructure installed.

11. It is noted that the location of borehole BH6 differs on Figure 2 'Site Layout Plan' of the Tier 1 Assessment and Figure 3.1 'Site Investigation Location Plan' of the Tier 2 Assessment. Clarify which Drawing/Figure shows the correct location of borehole BH6 and confirm that this BH6 location correlates with the leachate monitoring results summarised in Tables 4.4 and 4.5 of the Tier 2 Assessment.

12. State the type of waste encountered in the trial pit TP01 and in the leachate monitoring boreholes BH5 and BH6 installed within the waste body and whether the encountered waste is representative of the entire waste body. Include the logs for boreholes BH5 and BH6. Additionally, state the maximum depth of waste and how it was established.

13. Provide one Drawing showing all of the following elements interpolated:

    (i) the entire site boundary in red;

    (ii) the waste body boundary, in a different colour than red, showing the extent of the areas where waste was deposited;

(iii) the water cut-off perimeter drains and other on-site land water drains, the off-site land water drains and any other waterbodies. Each land water drain and waterbody should be shown in blue and be annotated. Please also include arrows showing water flow direction in each land drain and waterbody;

(iv) all leachate, groundwater, gas and surface water monitoring locations; and

(v) the brown oval feature located east of the monitoring location SW-A, as shown in Figure 4.3, and a label identifying this feature.

Your reply to this notice should include a **revised Non-technical Summary**, which reflects the information you supply in compliance with the notice, insofar as that information impinges on the non-technical summary.

In the case where any drawings already submitted are subject to revision consequent on this request, a revised drawing should be prepared in each case. It is not sufficient to annotate the original drawing with a textual correction. The revision status, such as revised drawing number and/or revision date should be clearly stated. Also, where such revised drawings are submitted, provide a list of drawing titles, drawing numbers and revision status, which correlates the revised drawings with the superseded versions.

Please supply the requested information within ***eight weeks*** of the date of this notice. Please note that during COVID-19 there are new arrangements in place for the receipt of all correspondence in relation to applications for Certificates of Authorisation. Accordingly, any correspondence in respect of the above referenced application should be sent to the Agency via file transfer by emailing historiclandfillapplications@epa.ie, quoting the Register Number H0296-01. **The EPA doesn't accept** files to be transferred using any file share application other than MS One Drive. Each file should be in a searchable .pdf format and a size not exceeding 10MB.

Please also note, post COVID-19, you may be contacted to submit the hard copies and CD-ROMs for the submitted electronic correspondence.

Yours sincerely,

Ewa Babiarczyk
Inspector
Circular Economy Programme
Office of Environmental Sustainability

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APPENDIX 2

Solicitors' Letter

E. C. Gearty & Co.
Solicitors

Francis L. Gearty, Solicitor - Sandra J. Carroll, B.B.L.S
Lorcan D. Gearty, B.A., L.L.B. - Lisa Duffy B. Corp. Law

4/5 Church Street,
Longford, Co. Longford,
N39 D5HO.

Tel: 043 3346312
Fax: 043 3347017
Email: cgearty@ecgearty.ie
DX 29015

My Ref: **LAB 15377/L** *Your Ref:* *Date:* **29 September 2022**

Mr. Bernard Shea
Senior Executive Engineer
Environment Section
Longford County Council

Re: Property - Ballymulvey Landfill Site, Ballymahon, Co. Longford

Dear Bernard,

I confirm that I am presently working on regularising the title to above mentioned property for Longford County Council.

Papers have been sent to counsel on the matter and preliminary advices have been received stating that an application for registration of the property should be made to the Property Registration Authority in the first instance. Counsel is currently drafting the application. Should the Property Registration Authority refuse to register on foot of this application, the refusal would be appealed to the Circuit Court and counsel would similarly be engaged for this.

Yours sincerely,

Lorcan Gearty
EC Gearty & Co.

Encl.

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APPENDIX 3

Letter from the Qualified Body to the Qualified Person

Engineers Ireland
22 Clyde Road
Ballsbridge
Dublin 4
(D04 R3N2)

T: +353 1 665 1300
E: info@engineersireland.ie

Sent via email only to: james.oneill@ftco.ie

9 November 2022

Re: Register of Chartered Engineers for Historic Landfill Register accordance with Section 2.3 of Code of Practice: Environmental Risk Assessment for Unregulated Waste Disposal Sites (EPA, 2007)

To Whom it May Concern,

This letter confirms that Mr James O'Neill is a member of Engineers Ireland in good standing.

Engineers Ireland confirms that Mr O'Neill has been assessed as a person who is qualified, trained and experienced to the standard set out in Section 2.3 of Code of Practice: Environmental Risk Assessment for Unregulated Waste Disposal Sites (EPA, 2007).

Damien Owens
Director General

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APPENDIX 4

High Court Order

THE HIGH COURT ON CIRCUIT

MIDLAND CIRCUIT COUNTY OF LONGF

BETWEEN

SEVERAL

Plaintiff

AND

THE COUNTY COUNCIL OF THE COUNTY OF LONGFORD

Defendants

CONSENT

Tormey & Company,
Solicitors,
Castle Street,
Athlone.

97c/1-11.

THE HIGH COURT ON CIRCUIT

WESTERN CIRCUIT

COUNTY OF LONGFORD

BETWEEN

TOM DELANEY AND ANNE DELANEY

AND

OTHERS AS IN SCHEDULE

Plaintiffs

AND

THE COUNTY COUNCIL OF THE COUNTY OF LONGFORD.

Defendants

BEFORE HIS HONOUR MR JUSTICE BLANEY AT LONGFORD
ON THE 6TH OF OCTOBER, 1992.

The Defendants having appealed the Order of Judge Matthew Deery of the 4th May, 1992 by Notice of Appeal dated the 6th May, 1992 WHEREUPON the same coming on for hearing on this day in the presence of Counsel for the Plaintiffs and Counsel for the Defendants and UPON READING the Consent herein dated the 6th October, 1992 signed by Counsel for the Plaintiffs, Edward Walsh B.L., and Counsel for the Defendants Esmonde Keane B.L., IT IS HEREBY ORDERED that the said Consent be received and filed and be deemed to be part of this Order.

CONSENT

The action is settled on the following terms:-

1. That the Defendants, its servants or agents, as and from the 1st day of January, 1995, be and are hereby enjoined and restrained from using its property the subject matter of the proceedings herein situate at Ballymulvey, Ballymahon in the County of Longford, as a public dump or tiphead.

2. That the Defendants, its servants or agents, as and from the 6th day of October, 1992 shall be permitted to dump or to allow the dumping of at Ballymulvey, Ballymahon in the County of Longford non-toxic domestic waste, non toxic commercial waste and non toxic industrial waste only and shall not be permitted to dispose or allow the disposal of offal, farm waste, dead animals or parts thereof, asbestos, oils, lubricants, toxic wastes.

3. That the Defendants, its servants or agents carry out amelioration works in accordance with Schedule A annexed hereto which works are to commence immediately and to be completed not later than the 1st January, 1995.

4. That the Defendants, its servants or agents carry out rehabilitation works in accordance with Schedule B annexed hereto which works are to be completed not later than the 1st January, 1998.

5. That the Defendants do pay the Plaintiffs' costs of the hearing in the Circuit Court and the High Court including reserved costs in all cases as set out in Schedule C annexed hereto numbering 1 to 10 inclusive. The said costs to be taxed in default of agreement on a Solicitor and Client basis, and on the basis that the said proceedings were heard together as one composite set of proceedings with provision for one instructions fee and one set of Brief fees for such composite proceedings together with outlay in all of the proceedings, the Court having certified for Senior Counsel in the Circuit Court and the High Court proceedings.

That the proceedings entitled the Circuit Court Midland Circuit - County of Longford - Between Patrick Delaney, Mary Delaney and James Delaney Plaintiffs and The County Council of the County of Longford Defendants (record number 19/87) be struck out with no Order as to costs.

7. That the proceedings as set out in Schedule D annexed hereto and numbered 1 to 13 inclusive be struck out by consent with an Order for taxation of the Plaintiffs' costs incurred up to the 6th day of October, 1992 be taxed in default of agreement on a Solicitor/Client basis.

8. Liberty to apply to the Circuit Court.

9. That no award for damages be made to any of the Plaintiffs in any of the Proceedings.

BY THE COURT

COUNTY REGISTRAR

SCHEDULE A

1 Adequate security of the site as a whole, by means of a fence or wide cut-off drain so as to prevent unauthorised access to the tipping area, lagoon or other parts of the landfill when the entrance is closed.

2 Provision of a secure controlled entrance in order to prevent unauthorised access at all times.

3 Identification and control of all wastes arriving on site.

4 Elimination of the practice of letting leachate accumulate in a lagoon on the site.

5 Imposition of strict control over the quantities of liquid wastes accepted at the site, so as to reduce the rate of infiltration and leachate production.

6 Operation of the landfill site on the "cell" system with only one cell being "open" or active at any one time, and compaction and covering of the refuse with soil or other suitable material after each day's tipping.

7 Capping and grading of each completed cell surface with clay or other suitable impermeable material so as to prevent the penetration of surface water into the landfilled refuse.

8 If the monitoring programme specified in 14 below should show any evidence or indication that polluting matter is being discharged to surface or ground water from the landfill operation to an extent that it gives rise to significant contamination then the leachate must be managed and treated (either on-site or off-site) to an appropriate standard suitable for discharge.

9 Installation of a system to vent or otherwise prevent the build up of methane gas in the landfill mass.

10 Control and elimination of on-site fires, including training of site personnel in fire fighting and the provision of appropriate fire-fighting equipment.

11 Site personnel to receive training in identifying and dealing with suspect or unacceptable wastes with clear instructions regarding refusal.

12 Implementation of an extensive landscaping programme around the site, with the aim of restoring visual and environmental amenity as far as may be achievable.

13 Implementation of a programme to reduce and eventually eliminate vermin from the site.

14 Implementation of a comprehensive programme of air and water quality monitoring in and around the site, including the establishment and inspection of dust gauges and regular sampling and analysis of surface and groundwater (from boreholes and local domestic wells); and this monitoring programme to be carried out monthly, initially; and then quarterly if no evidence of significant contamination persists; dust measurements to be made only if there is a reported dust problem; results of all monitoring to be made available to the public.

15 Improvement of the surface and margins of the road.

SCHEDULE B

1 Closure and on-going rehabilitation of the site to begin on the 1st of January, 1993, and to be completed by 1st January, 1995; final restoration (including capping) to be completed by 1st January, 1998.

2 Closure and rehabilitation to be carried out according to a site management, operation and rehabilitation plan and schedule which will be prepared by Malachi Cullen and Partners. The Longford County Council to submit this plan to the residents for their examination by 31st December, 1992; and in this consultation process the imput and concerns of the residents to be taken into account as far as practicable; and the County Council will use their best endeavours to meet the concerns of the residents.

3 The site rehabilitation plan to provide a clear and detailed, illustrated account of how the site will, after closure, be integrated into the surrounding landscape.

4 Contouring of the entire site and covering with an adequate layer of impervious material such as clay or marl so as to shed rainfall and reduce the ingress of water to the waste.

5 Continuing monitoring of the site on a less frequent basis, declining to annually if no detrimental effects or contamination is evidenced.

6 All monitoring results to be made available to the public and the representative of the local residents.

contamination, the County Council is to take responsibility for the management of leachate, for its containment and (if necessary) for its removal and/or treatment.

8 Installation of a system to vent or otherwise prevent the build up of methane gas in the landfill mass.

9 The site of asbestos burial to be clearly marked, it being noted that one site is to be identified by Laurence Burke, Clonard, Ballymahon and that the second site has been identified by the Defendants and these two areas to be strictly off limits for any mechanised or pedestrian traffic, works, excavations, or any other interference or disturbance of any nature whatsoever, other than all necessary rehabilitation works to be carried out under the terms of this Consent.

10 Monitoring of surface water and ground water within and adjacent to the site until all significant traces of contamination by leachate have ceased.

11 Ensuring that the site is secure and access is not possible until capping has been completed and the site has been made safe.

12 Landscaping the perimeter of the site and seeding the domed cap with suitable vegetative cover, e.g., a grass and clover mixture, which will have the effect of further reducing infiltration by rainfall and will improve the appearance of the closed site.

SCHEDULE C

	RECORD NUMBER	TITLE
1.	E15/92	James & Mary Delaney v The County Council of the County of Longford.
2.	E16/92	Michael Breheny v The County Council of the County of Longford.
3.	E17/92	William & Nora Byrne v The County Council of the County of Longford.
4.	E18/92	Mary Casey v The County Council of the County of Longford.
5.	E19/92	Padraig & Patricia Delaney v The County Council of the County of Longford.
6.	E20/92	Tom & Anne Delaney v The County Council of the County of Longford.
7.	E21/92	Sean Delaney v The County Council of the County of Longford.
8.	E22/92	Seamus Keegan v The County Council of the County of Longford.
9.	E23/92	Tom McCormack v The County Council of the County of Longford.
10.	E24/92	The County Council of the County of Longford v Albert Coffey & Caroline Coffey & Patrick Fallon.

SCHEDULE D

	RECORD NO.	TITLE
1.	E43/92	Sean & Annette Burke v The County Council of the County of Longford.
2.	E42/92	Pat & Margaret Lloyd v The County Council of the County of Longford.
3.	E44/92	Edward & P.J. Walsh v The County Council of the County of Longford.
4.	E41/92	Edward, Bridget & Elizabety Nestor v The County Council of the County of Longford.
5.	E30/92	Larry & Nancy Burke v The County Council of the County of Longford.
6.	E31/92	Albert & Caroline Coffey v The County Council of the County of Longford.
7.	E32/92	William & Kathleen Kavanagh v The County Council of the County of Longford.
8.	E39/92	Joe Walsh v The County Council of the County of Longford.
9.	E34/92	Michael & Marian Higgins v The County Council of the County of Longford.
10.	E35/92	John & Mary Clancy v The County Council of the County of Longford.
11.	E37/92	Anna Kavanagh v The County Council of the County of Longford.

12. E36/92 — Des & Mary Byrne v The County Council of the County of Longford.

13. E40/92 — Peter & Angela Hoare v The County Council of the County of Longford.

0097c/1

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ENVIRONMENTAL SCIENCE
& PLANNING

APPENDIX 5

Site Location Plan and Aerial View

Map Path: R:\Map Production\2018\P1444\Workspace\Ballymulvey Historic Landfill\P1444_Fig2-1_SiteLocation_A3.mxd

Legend

Site Boundary

Kilometers
0 0.5 1 2

Figure Title	Site Location Plan and Aerial View
Figure No.	2.1
Project	Historical Landfills: Ballymulvey
Client	Longford County Council
Scale	1:50,000
Page Size	A3
Revision	A
Date	29/08/2018

Consultants in Engineering and Environmental Sciences

www.fehilytimoney.ie

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CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE
& PLANNING

APPENDIX 6

Surface Water Sampling Laboratory Results

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 of report Generation:	23 May 2022
Customer:	Fehily Timoney
Sample Delivery Group (SDG):	220513-164
Your Reference:	P1444
Location:	Ballymulvey Landfill
Report No:	647597
Order Number:	Z2871

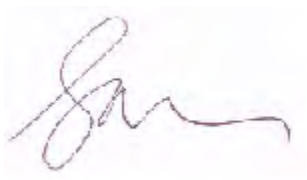
We received 8 samples on Friday May 13, 2022 and 8 of these samples were scheduled for analysis which was completed on Monday May 23, 2022. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
26277288	SWB		0.00 - 0.00	11/05/2022
26277297	SWC		0.00 - 0.00	11/05/2022
26277307	SWD		0.00 - 0.00	11/05/2022
26277317	SWF		0.00 - 0.00	11/05/2022
26277326	SWG		0.00 - 0.00	11/05/2022
26277341	SWH		0.00 - 0.00	11/05/2022
26277374	SWI		0.00 - 0.00	11/05/2022
26277355	SWM		0.00 - 0.00	11/05/2022

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

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

- X — Test
- N — No Determination Possible

Sample Types -

- S - Soil/Solid
- UNS - Unspecified Solid
- GW - Ground Water
- SW - Surface Water
- LE - Land Leachate
- PL - Prepared Leachate
- PR - Process Water
- SA - Saline Water
- TE - Trade Effluent
- TS - Treated Sewage
- US - Untreated Sewage
- RE - Recreational Water
- DW - Drinking Water Non-regulatory
- UNL - Unspecified Liquid
- SL - Sludge
- G - Gas
- OTH - Other

Lab Sample No(s)			26277288							26277297							26277307				
Customer Sample Reference			SWB							SWC							SWD				
AGS Reference																					
Depth (m)			0.00 - 0.00							0.00 - 0.00							0.00 - 0.00				
Container			0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)
Sample Type			SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 8	X							X							X				
Alkalinity as CaCO3	All	NDPs: 0 Tests: 8			X							X							X		
Ammonium Low	All	NDPs: 0 Tests: 8				X							X							X	
Anions by Kone (w)	All	NDPs: 0 Tests: 8			X							X							X		
BOD True Total	All	NDPs: 0 Tests: 8		X							X							X			
COD Unfiltered	All	NDPs: 0 Tests: 8		X							X							X			
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 8						X							X						
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 8			X							X							X		
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 8			X							X							X		
Fluoride	All	NDPs: 0 Tests: 8			X							X							X		
Mercury Dissolved	All	NDPs: 0 Tests: 8			X							X							X		
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 8	X							X							X				
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 8	X							X							X				
pH Value	All	NDPs: 0 Tests: 8			X							X							X		
Phosphate by Kone (w)	All	NDPs: 0 Tests: 8			X							X							X		

26277341	SWH		0.00 - 0.00	HNO3 Unfiltered (ALE204)	SW																
				H2SO4 (ALE244)	SW				X												
				500ml Plastic (ALE208)	SW		X			X					X	X	X	X			X	X
				250ml BOD (ALE212)	SW						X	X										
				0.5l glass bottle (ALE227)	SW	X														X	X	
26277326	SWG		0.00 - 0.00	Vial (ALE297)	SW																
				NaOH (ALE245)	SW								X								
				HNO3 Unfiltered (ALE204)	SW																
				H2SO4 (ALE244)	SW				X												
				500ml Plastic (ALE208)	SW		X			X					X	X	X	X			X	X
				250ml BOD (ALE212)	SW						X	X										
				0.5l glass bottle (ALE227)	SW	X														X	X	
26277317	SWF		0.00 - 0.00	Vial (ALE297)	SW																
				NaOH (ALE245)	SW								X								
				HNO3 Unfiltered (ALE204)	SW																
				H2SO4 (ALE244)	SW				X												
				500ml Plastic (ALE208)	SW		X			X					X	X	X	X			X	X
				250ml BOD (ALE212)	SW						X	X										
				0.5l glass bottle (ALE227)	SW	X														X	X	
26277307	SWD		0.00 - 0.00	Vial (ALE297)	SW																
				NaOH (ALE245)	SW								X								

Validated

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)									26277288							26277297							26277307		
Customer Sample Reference									SWB							SWC							SWD		
AGS Reference																									
Depth (m)									0.00 - 0.00							0.00 - 0.00							0.00 - 0.00		
Container									0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)
Sample Type									SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
Suspended Solids	All	NDPs: 0 Tests: 8									X							X							X		
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 8							X							X							X				
Total Metals by ICP-MS	All	NDPs: 0 Tests: 8											X							X							X
VOC MS (W)	All	NDPs: 0 Tests: 8													X							X					

26277341	SWH		0.00 - 0.00	HNO3 Unfiltered (ALE204)	SW						X		
				H2SO4 (ALE244)	SW								
				500ml Plastic (ALE208)	SW		X						
				250ml BOD (ALE212)	SW								
				0.5l glass bottle (ALE227)	SW				X				
26277326	SWG		0.00 - 0.00	Vial (ALE297)	SW								X
				NaOH (ALE245)	SW								
				HNO3 Unfiltered (ALE204)	SW						X		
				H2SO4 (ALE244)	SW								
				500ml Plastic (ALE208)	SW		X						
				250ml BOD (ALE212)	SW								
				0.5l glass bottle (ALE227)	SW				X				
26277317	SWF		0.00 - 0.00	Vial (ALE297)	SW								X
				NaOH (ALE245)	SW								
				HNO3 Unfiltered (ALE204)	SW						X		
				H2SO4 (ALE244)	SW								
				500ml Plastic (ALE208)	SW		X						
				250ml BOD (ALE212)	SW								
				0.5l glass bottle (ALE227)	SW				X				
26277307	SWD		0.00 - 0.00	Vial (ALE297)	SW								X
				NaOH (ALE245)	SW								

Validated

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			26277341					26277374								26277355			
Customer Sample Reference			SWH					SWI								SWM			
AGS Reference																			
Depth (m)			0.00 - 0.00					0.00 - 0.00								0.00 - 0.00			
Container			NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	
Sample Type			SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 8			X							X							
Alkalinity as CaCO3	All	NDPs: 0 Tests: 8					X							X					
Ammonium Low	All	NDPs: 0 Tests: 8						X							X				
Anions by Kone (w)	All	NDPs: 0 Tests: 8					X							X					
BOD True Total	All	NDPs: 0 Tests: 8				X							X						
COD Unfiltered	All	NDPs: 0 Tests: 8				X							X						
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 8	X							X							X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 8					X							X					
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 8					X							X					
Fluoride	All	NDPs: 0 Tests: 8					X							X					
Mercury Dissolved	All	NDPs: 0 Tests: 8					X							X					
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 8			X							X							
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 8			X							X							
pH Value	All	NDPs: 0 Tests: 8					X							X					
Phosphate by Kone (w)	All	NDPs: 0 Tests: 8					X							X					

Validated

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			26277341								26277374								26277355
Customer Sample Reference			SWH								SWI								SWM
AGS Reference																			
Depth (m)			0.00 - 0.00								0.00 - 0.00								0.00 - 0.00
Container			NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)
Sample Type			SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
Suspended Solids	All	NDPs: 0 Tests: 8					X							X					
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 8			X							X							
Total Metals by ICP-MS	All	NDPs: 0 Tests: 8							X							X			
VOC MS (W)	All	NDPs: 0 Tests: 8		X							X								X

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+$@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SWB	SWC	SWD	SWF	SWG	SWH
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
			Date Sampled	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022
			Sample Time	.	.	.	.	.	.
			Date Received	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022
			SDG Ref	220513-164	220513-164	220513-164	220513-164	220513-164	220513-164
			Lab Sample No.(s)	26277288	26277297	26277307	26277317	26277326	26277341
			AGS Reference						
Suspended solids, Total	<2 mg/l	TM022		<6 #	28 #	22.9 #	9.2 #	6.5 #	2.3 #
Alkalinity, Total as CaCO3	<2 mg/l	TM043		335 #	410 #	410 #	415 #	325 #	270 #
BOD, unfiltered	<1 mg/l	TM045		<1 #	<1 #	<1 #	3.52 #	<1 #	<1 #
Oxygen, dissolved	<0.3 mg/l	TM046		8.54	9.32	9.84	9.11	11.2	10.9
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099		0.0542 #	0.0725 #	0.0566 #	0.0601 #	0.0356 #	0.0981 #
Fluoride	<0.5 mg/l	TM104		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
COD, unfiltered	<7 mg/l	TM107		59.9 #	44.8 #	71.8 #	57.5 #	14.4 #	17.5 #
Arsenic (diss.filt)	<0.5 µg/l	TM152		1.62 2 #	0.807 2 #	0.826 2 #	0.855 2 #	0.621 2 #	0.571 2 #
Boron (diss.filt)	<10 µg/l	TM152		108 2 #	67.7 2 #	84.9 2 #	71.2 2 #	<10 2 #	<10 2 #
Cadmium (diss.filt)	<0.08 µg/l	TM152		<0.08 2 #	<0.08 2 #	<0.08 2 #	<0.08 2 #	<0.08 2 #	<0.08 2 #
Chromium (diss.filt)	<1 µg/l	TM152		<1 2 #	<1 2 #	<1 2 #	<1 2 #	<1 2 #	<1 2 #
Copper (diss.filt)	<0.3 µg/l	TM152		0.461 2 #	<0.3 2 #	0.54 2 #	0.373 2 #	0.57 2 #	0.813 2 #
Lead (diss.filt)	<0.2 µg/l	TM152		<0.2 2 #	<0.2 2 #	<0.2 2 #	<0.2 2 #	<0.2 2 #	<0.2 2 #
Manganese (diss.filt)	<3 µg/l	TM152		54.5 2 #	4 2 #	29.8 2 #	46.8 2 #	11.7 2 #	9.42 2 #
Phosphorus (tot.unfilt)	<20 µg/l	TM152		48 #	34.6 #	40.8 #	44.9 #	26.1 #	33.7 #
Nickel (diss.filt)	<0.4 µg/l	TM152		1.66 2 #	1.78 2 #	2.15 2 #	2.57 2 #	0.959 2 #	1.45 2 #
Zinc (diss.filt)	<1 µg/l	TM152		2.85 2 #	3.8 2 #	1.95 2 #	1.28 2 #	1.66 2 #	2.08 2 #
Sodium (Dis.Filt)	<0.076 mg/l	TM152		75.8 2 #	56.1 2 #	64.7 2 #	54.8 2 #	8.83 2 #	8.4 2 #
Magnesium (Dis.Filt)	<0.036 mg/l	TM152		20.1 2 #	21.7 2 #	20.9 2 #	18.8 2 #	11 2 #	8.52 2 #
Potassium (Dis.Filt)	<0.2 mg/l	TM152		14.8 2 #	10 2 #	10.1 2 #	8.66 2 #	2.11 2 #	1.96 2 #
Calcium (Dis.Filt)	<0.2 mg/l	TM152		102 2 #	154 2 #	137 2 #	147 2 #	132 2 #	105 2 #
Iron (Dis.Filt)	<0.019 mg/l	TM152		0.314 2 #	0.0778 2 #	0.133 2 #	0.152 2 #	0.0559 2 #	0.0549 2 #
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 2	<0.01 2	<0.01 2	<0.01 2	<0.01 2	<0.01 2
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
Sulphate	<2 mg/l	TM184		<2 #	50.3 #	33.3 #	28.5 #	14.3 #	19.3 #
Chloride	<2 mg/l	TM184		127 #	92.2 #	107 #	91 #	17 #	16.5 #
Total Oxidised Nitrogen as NO3	<0.3 mg/l	TM184		0.74 #	5.98 #	<0.3 #	0.339 #	5.81 #	4.69 #
Cyanide, Total	<0.05 mg/l	TM227		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
pH	<1 pH Units	TM256		8.21 #	7.67 #	8.14 #	7.95 #	8.24 #	8.45 #
Conductivity @ 20 deg.C	<0.02 mS/cm	TM256		0.87 #	0.948 #	0.92 #	0.897 #	0.574 #	0.5 #
Trifluralin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
alpha-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
gamma-HCH (Lindane)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Results Legend	Customer Sample Ref.	SWB	SWC	SWD	SWF	SWG	SWH
# ISO17025 accredited.							
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	0.00 - 0.00
diss.filt Dissolved / filtered sample.	Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
tot.unfilt Total / unfiltered sample.	Date Sampled	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022
* Subcontracted - refer to subcontractor report for accreditation status.	Sample Time	.	.	.	.	.	.
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Date Received	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022
(F) Trigger breach confirmed	SDG Ref	220513-164	220513-164	220513-164	220513-164	220513-164	220513-164
1-4+§@ Sample deviation (see appendix)	Lab Sample No.(s)	26277288	26277297	26277307	26277317	26277326	26277341
	AGS Reference						

Component	LOD/Units	Method					
Heptachlor	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aldrin	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
beta-HCH	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Isodrin	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
delta-HCH	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
Heptachlor epoxide	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
o,p'-DDE	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan I	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
trans-Chlordane	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
cis-Chlordane	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
p,p'-DDE	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dieldrin	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
o,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endrin	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
o,p'-DDT	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
p,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan II	<0.02 µg/l	TM343	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
p,p'-DDT	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
o,p'-Methoxychlor	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
p,p'-Methoxychlor	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
Endosulphan Sulphate	<0.02 µg/l	TM343	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Permethrin I	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Permethrin II	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Hexachlorobutadiene	<0.01 µg/l	TM344	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dichlorvos	<0.01 µg/l	TM344	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dichlobenil	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mevinphos	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tecnazene	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hexachlorobenzene	<0.01 µg/l	TM344	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Demeton-S-methyl	<0.01 µg/l	TM344	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SWB	SWC	SWD	SWF	SWG	SWH
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
			Date Sampled	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022
			Sample Time	.	.	.	.	.	.
			Date Received	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022
			SDG Ref	220513-164	220513-164	220513-164	220513-164	220513-164	220513-164
			Lab Sample No.(s)	26277288	26277297	26277307	26277317	26277326	26277341
			AGS Reference						
Phorate	<0.01 µg/l	TM344		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Diazinon	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Triallate	<0.01 µg/l	TM344		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Atrazine	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Simazine	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Disulfoton	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
Propetamphos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chlorpyriphos-methyl	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dimethoate	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pirimiphos-methyl	<0.01 µg/l	TM344		<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
Methyl Parathion	<0.01 µg/l	TM344		<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
Fenthion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fenitrothion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Triadimefon	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pendimethalin	<0.01 µg/l	TM344		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Parathion	<0.01 µg/l	TM344		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Chlorfenvinphos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
trans-Chlordane	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
cis-Chlordane	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Carbophenothion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Triazophos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phosalone	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Azinphos methyl	<0.02 µg/l	TM344		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Azinphos ethyl	<0.02 µg/l	TM344		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dinitro-o-cresol	<0.1 µg/l	TM411		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Clopyralid	<0.04 µg/l	TM411		<0.04	<0.04	<0.04	<0.04	0.0678	<0.04
MCPA	<0.05 µg/l	TM411		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Mecoprop	<0.04 µg/l	TM411		<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Dicamba	<0.04 µg/l	TM411		<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
MCPB	<0.05 µg/l	TM411		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SWB	SWC	SWD	SWF	SWG	SWH
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
			Date Sampled	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022
			Sample Time	.	.	.	.	.	.
			Date Received	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022
			SDG Ref	220513-164	220513-164	220513-164	220513-164	220513-164	220513-164
			Lab Sample No.(s)	26277288	26277297	26277307	26277317	26277326	26277341
			AGS Reference						
2,4-DB	<0.1 µg/l	TM411		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorprop	<0.1 µg/l	TM411		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Triclopyr	<0.05 µg/l	TM411		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fenoprop (Silvex)	<0.1 µg/l	TM411		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.05	<0.05	0.526	<0.05	<0.05	<0.05
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromoxynil	<0.04 µg/l	TM411		<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Benazolin	<0.04 µg/l	TM411		<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Ioxynil	<0.05 µg/l	TM411		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Pentachlorophenol	<0.04 µg/l	TM411		<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Fluoroxypyr	<0.1 µg/l	TM411		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Validated

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SWI	SWM				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Surface Water (SW)	Surface Water (SW)				
			Date Sampled	11/05/2022	11/05/2022				
			Sample Time	.	.				
			Date Received	13/05/2022	13/05/2022				
			SDG Ref	220513-164	220513-164				
			Lab Sample No.(s)	26277374	26277355				
			AGS Reference						
Suspended solids, Total	<2 mg/l	TM022		<2 #	49.2 #				
Alkalinity, Total as CaCO3	<2 mg/l	TM043		230 #	365 #				
BOD, unfiltered	<1 mg/l	TM045		<1 #	11.2 #				
Oxygen, dissolved	<0.3 mg/l	TM046		10.7	6.79				
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099		0.0465 #	0.573 #				
Fluoride	<0.5 mg/l	TM104		<0.5	<0.5				
COD, unfiltered	<7 mg/l	TM107		18.2 #	73.8 #				
Arsenic (diss.filt)	<0.5 µg/l	TM152		0.638 2 #	<0.5 2 #				
Boron (diss.filt)	<10 µg/l	TM152		<10 2 #	<10 2 #				
Cadmium (diss.filt)	<0.08 µg/l	TM152		<0.08 2 #	<0.08 2 #				
Chromium (diss.filt)	<1 µg/l	TM152		<1 2 #	<1 2 #				
Copper (diss.filt)	<0.3 µg/l	TM152		0.763 2 #	<0.3 2 #				
Lead (diss.filt)	<0.2 µg/l	TM152		<0.2 2 #	<0.2 2 #				
Manganese (diss.filt)	<3 µg/l	TM152		5.28 2 #	314 2 #				
Phosphorus (tot.unfilt)	<20 µg/l	TM152		26.9 #	150 #				
Nickel (diss.filt)	<0.4 µg/l	TM152		1.83 2 #	0.406 2 #				
Zinc (diss.filt)	<1 µg/l	TM152		2.75 2 #	4.01 2 #				
Sodium (Dis.Filt)	<0.076 mg/l	TM152		7.95 2 #	15.5 2 #				
Magnesium (Dis.Filt)	<0.036 mg/l	TM152		7.49 2 #	12.3 2 #				
Potassium (Dis.Filt)	<0.2 mg/l	TM152		2.06 2 #	4.93 2 #				
Calcium (Dis.Filt)	<0.2 mg/l	TM152		92 2 #	129 2 #				
Iron (Dis.Filt)	<0.019 mg/l	TM152		0.0416 2 #	0.819 2 #				
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 2	<0.01 2				
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184		<0.05 #	<0.05 #				
Sulphate	<2 mg/l	TM184		20.3 #	<2 #				
Chloride	<2 mg/l	TM184		15.6 #	29.2 #				
Total Oxidised Nitrogen as NO3	<0.3 mg/l	TM184		3.55 #	<0.3 #				
Cyanide, Total	<0.05 mg/l	TM227		<0.05	<0.05				
pH	<1 pH Units	TM256		8.61 #	7.74 #				
Conductivity @ 20 deg.C	<0.02 mS/cm	TM256		0.438 #	0.65 #				
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				

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

		Customer Sample Ref.	SWI	SWM				
		Depth (m)	0.00 - 0.00	0.00 - 0.00				
		Sample Type	Surface Water (SW)	Surface Water (SW)				
		Date Sampled	11/05/2022	11/05/2022				
		Sample Time	.	.				
		Date Received	13/05/2022	13/05/2022				
		SDG Ref	220513-164	220513-164				
		Lab Sample No.(s)	26277374	26277355				
		AGS Reference						
Component	**LOD/Units**	**Method**						
Heptachlor	<0.01 µg/l	TM343	<0.01	<0.01				
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				
delta-HCH	<0.01 µg/l	TM343	<0.02	<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				
trans-Chlordane	<0.01 µg/l	TM343	<0.01	<0.01				
cis-Chlordane	<0.01 µg/l	TM343	<0.01	<0.01				
p,p'-DDE	<0.01 µg/l	TM343	<0.01	<0.01				
Dieldrin	<0.01 µg/l	TM343	<0.01	<0.01				
o,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.01	<0.01				
Endrin	<0.01 µg/l	TM343	<0.01	<0.01				
o,p'-DDT	<0.01 µg/l	TM343	<0.02	<0.01				
p,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.01	<0.01				
Endosulphan II	<0.02 µg/l	TM343	<0.02	<0.02				
p,p'-DDT	<0.01 µg/l	TM343	<0.02	<0.01				
o,p'-Methoxychlor	<0.01 µg/l	TM343	<0.02	<0.01				
p,p'-Methoxychlor	<0.01 µg/l	TM343	<0.02	<0.01				
Endosulphan Sulphate	<0.02 µg/l	TM343	<0.02	<0.02				
Permethrin I	<0.01 µg/l	TM343	<0.01	<0.01				
Permethrin II	<0.01 µg/l	TM343	<0.01	<0.01				
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344	<0.03	<0.03				
Hexachlorobutadiene	<0.01 µg/l	TM344	<0.04	<0.04				
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344	<0.02	<0.02				
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344	<0.02	<0.02				
Dichlorvos	<0.01 µg/l	TM344	<0.02	<0.02				
Dichlobenil	<0.01 µg/l	TM344	<0.01	<0.01				
Mevinphos	<0.01 µg/l	TM344	<0.01	<0.01				
Tecnazene	<0.01 µg/l	TM344	<0.01	<0.01				
Hexachlorobenzene	<0.01 µg/l	TM344	<0.02	<0.02				
Demeton-S-methyl	<0.01 µg/l	TM344	<0.02	<0.02				

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Customer Sample Ref.	SWI	SWM				
Depth (m)	0.00 - 0.00	0.00 - 0.00				
Sample Type	Surface Water (SW)	Surface Water (SW)				
Date Sampled	11/05/2022	11/05/2022				
Sample Time	.	.				
Date Received	13/05/2022	13/05/2022				
SDG Ref	220513-164	220513-164				
Lab Sample No.(s)	26277374	26277355				
AGS Reference						

Component	LOD/Units	Method						
Phorate	<0.01 µg/l	TM344	<0.02	<0.02				
Diazinon	<0.01 µg/l	TM344	<0.01	<0.01				
Triallate	<0.01 µg/l	TM344	<0.02	<0.02				
Atrazine	<0.01 µg/l	TM344	<0.01	<0.01				
Simazine	<0.01 µg/l	TM344	<0.01	<0.01				
Disulfoton	<0.01 µg/l	TM344	<0.02	<0.02				
Propetamphos	<0.01 µg/l	TM344	<0.01	<0.01				
Chlorpyriphos-methyl	<0.01 µg/l	TM344	<0.01	<0.01				
Dimethoate	<0.01 µg/l	TM344	<0.01	<0.01				
Pirimiphos-methyl	<0.01 µg/l	TM344	<0.01	<0.01				
Chlorpyriphos	<0.01 µg/l	TM344	<0.01	<0.01				
Methyl Parathion	<0.01 µg/l	TM344	<0.01	<0.01				
Malathion	<0.01 µg/l	TM344	<0.01	<0.01				
Fenthion	<0.01 µg/l	TM344	<0.01	<0.01				
Fenitrothion	<0.01 µg/l	TM344	<0.01	<0.01				
Triadimefon	<0.01 µg/l	TM344	<0.01	<0.01				
Pendimethalin	<0.01 µg/l	TM344	<0.02	<0.02				
Parathion	<0.01 µg/l	TM344	<0.02	<0.02				
Chlorfenvinphos	<0.01 µg/l	TM344	<0.01	<0.01				
trans-Chlordane	<0.01 µg/l	TM344	<0.01	<0.01				
cis-Chlordane	<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				
Dinitro-o-cresol	<0.1 µg/l	TM411	<0.1	<0.1				
Clopyralid	<0.04 µg/l	TM411	<0.04	<0.04				
MCPA	<0.05 µg/l	TM411	<0.05	<0.05				
Mecoprop	<0.04 µg/l	TM411	<0.04	<0.04				
Dicamba	<0.04 µg/l	TM411	<0.04	<0.04				
MCPB	<0.05 µg/l	TM411	<0.05	<0.05				

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SWI	SWM				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Surface Water (SW)	Surface Water (SW)				
			Date Sampled	11/05/2022	11/05/2022				
			Sample Time	.	.				
			Date Received	13/05/2022	13/05/2022				
			SDG Ref	220513-164	220513-164				
			Lab Sample No.(s)	26277374	26277355				
			AGS Reference						
2,4-DB	<0.1 µg/l	TM411		<0.1	<0.1				
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411		<0.05	<0.05				
Dichlorprop	<0.1 µg/l	TM411		<0.1	<0.1				
Triclopyr	<0.05 µg/l	TM411		<0.05	<0.05				
Fenoprop (Silvex)	<0.1 µg/l	TM411		<0.1	<0.1				
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.05	<0.05				
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.05	<0.05				
Bromoxynil	<0.04 µg/l	TM411		<0.04	<0.04				
Benazolin	<0.04 µg/l	TM411		<0.04	<0.04				
Ioxynil	<0.05 µg/l	TM411		<0.05	<0.05				
Pentachlorophenol	<0.04 µg/l	TM411		<0.04	<0.04				
Fluoroxypyr	<0.1 µg/l	TM411		<0.1	<0.1				

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

SVOC MS (W) - Aqueous

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+$@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SWB	SWC	SWD	SWF	SWG	SWH
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
			Date Sampled	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022
			Sample Time	.	.	.	.	.	.
			Date Received	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022
			SDG Ref	220513-164	220513-164	220513-164	220513-164	220513-164	220513-164
			Lab Sample No.(s)	26277288	26277297	26277307	26277317	26277326	26277341
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2-Chlorophenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2-Methylphenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2-Nitroaniline (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2-Nitrophenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-Methylphenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-Nitroaniline (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Azobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Acenaphthylene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Acenaphthene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Anthracene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2 #	<2 #	<2 #	<2 #	<2 #	<2 #
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

SVOC MS (W) - Aqueous

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SWB	SWC	SWD	SWF	SWG	SWH
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
			Date Sampled	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022
			Sample Time	.	.	.	.	.	.
			Date Received	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022
			SDG Ref	220513-164	220513-164	220513-164	220513-164	220513-164	220513-164
			Lab Sample No.(s)	26277288	26277297	26277307	26277317	26277326	26277341
			AGS Reference						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Carbazole (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chrysene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibenzofuran (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Diethyl phthalate (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5 #	<5 #	<5 #	<5 #	<5 #	<5 #
Fluoranthene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Fluorene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Phenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Hexachloroethane (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Nitrobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Naphthalene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Isophorone (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Phenanthrene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Pyrene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

SVOC MS (W) - Aqueous

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+$@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SWI	SWM				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Surface Water (SW)	Surface Water (SW)				
			Date Sampled	11/05/2022	11/05/2022				
			Sample Time	.	.				
			Date Received	13/05/2022	13/05/2022				
			SDG Ref	220513-164	220513-164				
			Lab Sample No.(s)	26277374	26277355				
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #				
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #				
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #				
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #				
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1 #	<2 #				
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1 #	<2 #				
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1 #	<2 #				
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1 #	<2 #				
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1 #	<2 #				
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1 #	<2 #				
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1 #	<2 #				
2-Chlorophenol (aq)	<1 µg/l	TM176		<1 #	<2 #				
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1 #	<2 #				
2-Methylphenol (aq)	<1 µg/l	TM176		<1 #	<2 #				
2-Nitroaniline (aq)	<1 µg/l	TM176		<1 #	<2 #				
2-Nitrophenol (aq)	<1 µg/l	TM176		<1 #	<2 #				
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<2				
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1 #	<2 #				
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1 #	<2 #				
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<2				
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1 #	<2 #				
4-Methylphenol (aq)	<1 µg/l	TM176		<1 #	<2 #				
4-Nitroaniline (aq)	<1 µg/l	TM176		<1 #	<2 #				
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<2				
Azobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #				
Acenaphthylene (aq)	<1 µg/l	TM176		<1 #	<2 #				
Acenaphthene (aq)	<1 µg/l	TM176		<1 #	<2 #				
Anthracene (aq)	<1 µg/l	TM176		<1 #	<2 #				
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1 #	<2 #				
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1 #	<2 #				
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2 #	<4 #				
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1 #	<2 #				
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1 #	<2 #				

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

SVOC MS (W) - Aqueous

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SWI	SWM				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Surface Water (SW)	Surface Water (SW)				
			Date Sampled	11/05/2022	11/05/2022				
			Sample Time	.	.				
			Date Received	13/05/2022	13/05/2022				
			SDG Ref	220513-164	220513-164				
			Lab Sample No.(s)	26277374	26277355				
			AGS Reference						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1 #	<2 #				
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1 #	<2 #				
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1 #	<2 #				
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1 #	<2 #				
Carbazole (aq)	<1 µg/l	TM176		<1 #	<2 #				
Chrysene (aq)	<1 µg/l	TM176		<1 #	<2 #				
Dibenzofuran (aq)	<1 µg/l	TM176		<1 #	<2 #				
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1 #	<2 #				
Diethyl phthalate (aq)	<1 µg/l	TM176		<1 #	<2 #				
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1 #	<2 #				
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1 #	<2 #				
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5 #	<10 #				
Fluoranthene (aq)	<1 µg/l	TM176		<1 #	<2 #				
Fluorene (aq)	<1 µg/l	TM176		<1 #	<2 #				
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #				
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1 #	<2 #				
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<2				
Phenol (aq)	<1 µg/l	TM176		<1	<2				
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1 #	<2 #				
Hexachloroethane (aq)	<1 µg/l	TM176		<1 #	<2 #				
Nitrobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #				
Naphthalene (aq)	<1 µg/l	TM176		<1 #	<2 #				
Isophorone (aq)	<1 µg/l	TM176		<1 #	<2 #				
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<2				
Phenanthrene (aq)	<1 µg/l	TM176		<1 #	<2 #				
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1 #	<2 #				
Pyrene (aq)	<1 µg/l	TM176		<1 #	<2 #				

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

VOC MS (W)

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+$@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SWB	SWC	SWD	SWF	SWG	SWH
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
			Date Sampled	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022
			Sample Time	.	.	.	.	.	.
			Date Received	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022
			SDG Ref	220513-164	220513-164	220513-164	220513-164	220513-164	220513-164
			Lab Sample No.(s)	26277288	26277297	26277307	26277317	26277326	26277341
			AGS Reference						
Dibromofluoromethane**	%	TM208		111	110	117	109	111	111
Toluene-d8**	%	TM208		101	104	101	99.5	98.9	99.8
4-Bromofluorobenzene**	%	TM208		96.3	97.5	97.6	99.1	97.2	97.6
Dichlorodifluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Vinyl chloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Trichlorofluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Carbon disulphide	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dichloromethane	<3 µg/l	TM208		<3 #	<3 #	<3 #	<3 #	<3 #	<3 #
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2,2-Dichloropropane	<1 µg/l	TM208		<1	<1	<1	<1	<1	<1
Bromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloroform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Carbontetrachloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Benzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Trichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromodichloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Toluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

VOC MS (W)

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SWB	SWC	SWD	SWF	SWG	SWH
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
			Date Sampled	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022
			Sample Time	.	.	.	.	.	.
			Date Received	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022
			SDG Ref	220513-164	220513-164	220513-164	220513-164	220513-164	220513-164
			Lab Sample No.(s)	26277288	26277297	26277307	26277317	26277326	26277341
			AGS Reference						
Tetrachloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromoethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Ethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
m,p-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
o-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Styrene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromoform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Isopropylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,3-Trichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Propylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,4-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
sec-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-iso-Propyltoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,4-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
n-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208		<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Hexachlorobutadiene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Naphthalene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,3-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trichlorobenzene	<1 µg/l	TM208		<1	<1	<1	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

VOC MS (W)

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+$@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SWI	SWM				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Surface Water (SW)	Surface Water (SW)				
			Date Sampled	11/05/2022	11/05/2022				
			Sample Time	.	.				
			Date Received	13/05/2022	13/05/2022				
			SDG Ref	220513-164	220513-164				
			Lab Sample No.(s)	26277374	26277355				
			AGS Reference						
Dibromofluoromethane**	%	TM208		109	108				
Toluene-d8**	%	TM208		98.1	101				
4-Bromofluorobenzene**	%	TM208		99.3	97.1				
Dichlorodifluoromethane	<1 µg/l	TM208		<1 #	<1 #				
Chloromethane	<1 µg/l	TM208		<1 #	<1 #				
Vinyl chloride	<1 µg/l	TM208		<1 #	<1 #				
Bromomethane	<1 µg/l	TM208		<1 #	<1 #				
Chloroethane	<1 µg/l	TM208		<1 #	<1 #				
Trichlorofluoromethane	<1 µg/l	TM208		<1 #	<1 #				
1,1-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #				
Carbon disulphide	<1 µg/l	TM208		<1 #	<1 #				
Dichloromethane	<3 µg/l	TM208		<3 #	<3 #				
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 #	<1 #				
trans-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #				
1,1-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #				
cis-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #				
2,2-Dichloropropane	<1 µg/l	TM208		<1	<1				
Bromochloromethane	<1 µg/l	TM208		<1 #	<1 #				
Chloroform	<1 µg/l	TM208		<1 #	<1 #				
1,1,1-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #				
1,1-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #				
Carbontetrachloride	<1 µg/l	TM208		<1 #	<1 #				
1,2-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #				
Benzene	<1 µg/l	TM208		<1 #	<1 #				
Trichloroethene	<1 µg/l	TM208		<1 #	<1 #				
1,2-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #				
Dibromomethane	<1 µg/l	TM208		<1 #	<1 #				
Bromodichloromethane	<1 µg/l	TM208		<1 #	<1 #				
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #				
Toluene	<1 µg/l	TM208		<1 #	<1 #				
trans-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #				
1,1,2-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #				
1,3-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #				

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

VOC MS (W)

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Customer Sample Ref.	SWI	SWM				
Depth (m)	0.00 - 0.00	0.00 - 0.00				
Sample Type	Surface Water (SW)	Surface Water (SW)				
Date Sampled	11/05/2022	11/05/2022				
Sample Time	.	.				
Date Received	13/05/2022	13/05/2022				
SDG Ref	220513-164	220513-164				
Lab Sample No.(s)	26277374	26277355				
AGS Reference						

Component	LOD/Units	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	<1 #	<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	<1 #	<1 #				
o-Xylene	<1 µg/l	TM208	<1 #	<1 #				
Styrene	<1 µg/l	TM208	<1 #	<1 #				
Bromoform	<1 µg/l	TM208	<1 #	<1 #				
Isopropylbenzene	<1 µg/l	TM208	<1 #	<1 #				
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1 #	<1 #				
1,2,3-Trichloropropane	<1 µg/l	TM208	<1 #	<1 #				
Bromobenzene	<1 µg/l	TM208	<1 #	<1 #				
Propylbenzene	<1 µg/l	TM208	<1 #	<1 #				
2-Chlorotoluene	<1 µg/l	TM208	<1 #	<1 #				
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1 #	<1 #				
4-Chlorotoluene	<1 µg/l	TM208	<1 #	<1 #				
tert-Butylbenzene	<1 µg/l	TM208	<1 #	<1 #				
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1 #	<1 #				
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 #				
1,3,5-Trichlorobenzene	<1 µg/l	TM208	<1	<1				

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
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
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
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
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, Standard Methods for the examination of waters and wastewaters 20th Edition, PHA, Washington DC, USA. ISBN 0-87553-235-7 and The Determination of Alkalinity and Acidity in water HMSO, 1981, ISBN 0 11 751601 5.	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM343	EPA 8270D - Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of Selected Pesticides (Suite I) in Liquids by GCMS
TM344	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite II) by GCMS
TM411	Acid_Herbs_GCMS	Acid Herbs in Water by GCMS

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden.

CERTIFICATE OF ANALYSIS

SDG: 220513-164 **Report Number:** 647597 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Test Completion Dates

Lab Sample No(s)	26277288	26277297	26277307	26277317	26277326	26277341	26277374	26277355
Customer Sample Ref.	SWB	SWC	SWD	SWF	SWG	SWH	SWI	SWM
AGS Ref.								
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Acid Herbicides by GCMS	23-May-2022	23-May-2022	23-May-2022	23-May-2022	23-May-2022	23-May-2022	23-May-2022	23-May-2022
Alkalinity as CaCO3	18-May-2022	18-May-2022	18-May-2022	18-May-2022	18-May-2022	18-May-2022	18-May-2022	18-May-2022
Ammonium Low	18-May-2022	17-May-2022	17-May-2022	17-May-2022	18-May-2022	17-May-2022	17-May-2022	18-May-2022
Anions by Kone (w)	17-May-2022	17-May-2022	17-May-2022	17-May-2022	17-May-2022	17-May-2022	17-May-2022	17-May-2022
BOD True Total	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022
COD Unfiltered	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022
Cyanide Comp/Free/Total/Thiocyanate	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022
Dissolved Metals by ICP-MS	18-May-2022	17-May-2022	18-May-2022	17-May-2022	18-May-2022	17-May-2022	17-May-2022	18-May-2022
Dissolved Oxygen by Probe	15-May-2022	15-May-2022	15-May-2022	15-May-2022	15-May-2022	15-May-2022	15-May-2022	15-May-2022
Fluoride	20-May-2022	20-May-2022	20-May-2022	20-May-2022	20-May-2022	20-May-2022	20-May-2022	20-May-2022
Mercury Dissolved	18-May-2022	18-May-2022	18-May-2022	18-May-2022	18-May-2022	18-May-2022	18-May-2022	18-May-2022
Pesticides (Suite I) by GCMS	20-May-2022	20-May-2022	20-May-2022	20-May-2022	19-May-2022	19-May-2022	19-May-2022	20-May-2022
Pesticides (Suite II) by GCMS	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022
pH Value	18-May-2022	18-May-2022	18-May-2022	18-May-2022	18-May-2022	18-May-2022	18-May-2022	18-May-2022
Phosphate by Kone (w)	14-May-2022	14-May-2022	14-May-2022	14-May-2022	14-May-2022	14-May-2022	14-May-2022	14-May-2022
Suspended Solids	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022
SVOC MS (W) - Aqueous	19-May-2022	19-May-2022	20-May-2022	20-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022
Total Metals by ICP-MS	19-May-2022	18-May-2022	18-May-2022	18-May-2022	19-May-2022	18-May-2022	18-May-2022	19-May-2022
VOC MS (W)	21-May-2022	21-May-2022	21-May-2022	21-May-2022	21-May-2022	21-May-2022	21-May-2022	21-May-2022

Appendix

1. Results are expressed on a dry weight basis (dried at 35ºC) 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. 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.

3. 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.

4. 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.

5. 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.

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

7. Results relate only to the items tested.

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

9. **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.

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

11. 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.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

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

14. 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.

15. 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.

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

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **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.

19. **Sample Deviations**

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

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Matrix interference**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**
§	**Sampled on date not provided**

20. **Asbestos**

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 (2021), 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.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials andd soils 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 (2021).

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

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
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.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

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

Attention: Daniel Hayden

CERTIFICATE OF ANALYSIS

Date of report Generation:	21 July 2022
Customer:	Fehily Timoney
Sample Delivery Group (SDG):	220711-29
Your Reference:	P1444
Location:	Ballymulvey Landfill
Report No:	655088
Order Number:	Z3180

We received 7 samples on Monday July 11, 2022 and 7 of these samples were scheduled for analysis which was completed on Thursday July 21, 2022. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager

1291

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
26569387	SWB		0.00 - 0.00	06/07/2022
26569398	SWC		0.00 - 0.00	06/07/2022
26569407	SWF		0.00 - 0.00	06/07/2022
26569418	SWG		0.00 - 0.00	06/07/2022
26569428	SWH		0.00 - 0.00	06/07/2022
26569448	SWI		0.00 - 0.00	06/07/2022
26569437	SWM		0.00 - 0.00	06/07/2022

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

Validated

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
			26569387	SWB		0.00 - 0.00	0.5l glass bottle (ALE227)	SW
							250ml BOD (ALE212)	SW
							500ml Plastic (ALE208)	SW
							H2SO4 (ALE244)	SW
							HNO3 Unfiltered (ALE204)	SW
							NaOH (ALE245)	SW
							Vial (ALE297)	SW
			26569398	SWC		0.00 - 0.00	0.5l glass bottle (ALE227)	SW
							250ml BOD (ALE212)	SW
							500ml Plastic (ALE208)	SW
							H2SO4 (ALE244)	SW
							HNO3 Unfiltered (ALE204)	SW
							NaOH (ALE245)	SW
							Vial (ALE297)	SW
			26569407	SWF		0.00 - 0.00	0.5l glass bottle (ALE227)	SW
							250ml BOD (ALE212)	SW
							500ml Plastic (ALE208)	SW
							H2SO4 (ALE244)	SW
							HNO3 Unfiltered (ALE204)	SW
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 7	X					
							X	
Alkalinity as CaCO3	All	NDPs: 0 Tests: 7						
							X	
								X
Ammonium Low	All	NDPs: 0 Tests: 7						
				X				
							X	
								X
Anions by Kone (w)	All	NDPs: 0 Tests: 7						
							X	
								X
BOD True Total	All	NDPs: 0 Tests: 7						
				X				
							X	
								X
COD Unfiltered	All	NDPs: 0 Tests: 7						
				X				
							X	
								X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 7						
						X		
								X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 7						
							X	
								X
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 7						
							X	
								X
Fluoride	All	NDPs: 0 Tests: 7						
							X	
								X
Mercury Dissolved	All	NDPs: 0 Tests: 7						
							X	
								X
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 7	X					
							X	
								X
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 7	X					
							X	
								X
pH Value	All	NDPs: 0 Tests: 7						
							X	
								X
Phosphate by Kone (w)	All	NDPs: 0 Tests: 7						
							X	
								X

26569448	SWI		0.00 - 0.00	HNO3 Unfiltered (ALE204)	SW																
				H2SO4 (ALE244)	SW			X													
				500ml Plastic (ALE208)	SW		X		X				X	X	X	X			X		X
				250ml BOD (ALE212)	SW					X	X										
				0.5l glass bottle (ALE227)	SW	X												X	X		
26569428	SWH		0.00 - 0.00	Vial (ALE297)	SW																
				NaOH (ALE245)	SW							X									
				HNO3 Unfiltered (ALE204)	SW																
				H2SO4 (ALE244)	SW			X													
				500ml Plastic (ALE208)	SW		X		X				X	X	X	X			X		X
				250ml BOD (ALE212)	SW					X	X										
				0.5l glass bottle (ALE227)	SW	X												X	X		
26569418	SWG		0.00 - 0.00	Vial (ALE297)	SW																
				NaOH (ALE245)	SW							X									
				HNO3 Unfiltered (ALE204)	SW																
				H2SO4 (ALE244)	SW			X													
				500ml Plastic (ALE208)	SW		X		X				X	X	X	X			X		X
				250ml BOD (ALE212)	SW					X	X										
				0.5l glass bottle (ALE227)	SW	X												X	X		
26569407	SWF		0.00 - 0.00	Vial (ALE297)	SW																
				NaOH (ALE245)	SW							X									

Validated

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
			26569387	SWB		0.00 - 0.00	0.5l glass bottle (ALE227)	SW
							250ml BOD (ALE212)	SW
							500ml Plastic (ALE208)	SW
							H2SO4 (ALE244)	SW
							HNO3 Unfiltered (ALE204)	SW
							NaOH (ALE245)	SW
							Vial (ALE297)	SW
			26569398	SWC		0.00 - 0.00	0.5l glass bottle (ALE227)	SW
							250ml BOD (ALE212)	SW
							500ml Plastic (ALE208)	SW
							H2SO4 (ALE244)	SW
							HNO3 Unfiltered (ALE204)	SW
							NaOH (ALE245)	SW
							Vial (ALE297)	SW
			26569407	SWF		0.00 - 0.00	0.5l glass bottle (ALE227)	SW
							250ml BOD (ALE212)	SW
							500ml Plastic (ALE208)	SW
							H2SO4 (ALE244)	SW
							HNO3 Unfiltered (ALE204)	SW
Suspended Solids	All	NDPs: 0 Tests: 7						
				X				
				X				
				X				
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 7						
			X					
			X					
			X					
Total Metals by ICP-MS	All	NDPs: 0 Tests: 7						
			X					
								X
VOC MS (W)	All	NDPs: 0 Tests: 7						
			X					
								X

26569448	SWI		0.00 - 0.00	HNO3 Unfiltered (ALE204)	SW		
				H2SO4 (ALE244)	SW		
				500ml Plastic (ALE208)	SW	X	X
				250ml BOD (ALE212)	SW		
				0.5l glass bottle (ALE227)	SW	X	X
26569428	SWH		0.00 - 0.00	Vial (ALE297)	SW	X	X
				NaOH (ALE245)	SW		
				HNO3 Unfiltered (ALE204)	SW	X	X
				H2SO4 (ALE244)	SW		
				500ml Plastic (ALE208)	SW	X	X
				250ml BOD (ALE212)	SW		
				0.5l glass bottle (ALE227)	SW	X	X
26569418	SWG		0.00 - 0.00	Vial (ALE297)	SW	X	X
				NaOH (ALE245)	SW		
				HNO3 Unfiltered (ALE204)	SW	X	X
				H2SO4 (ALE244)	SW		
				500ml Plastic (ALE208)	SW	X	X
				250ml BOD (ALE212)	SW		
				0.5l glass bottle (ALE227)	SW	X	X
26569407	SWF		0.00 - 0.00	Vial (ALE297)	SW	X	X
				NaOH (ALE245)	SW		

Validated

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			26569448									26569437
Customer Sample Reference			SWI									SWM
AGS Reference												
Depth (m)			0.00 - 0.00									0.00 - 0.00
Container			NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)
Sample Type			SW	SW	SW	SW	SW	SW	SW	SW	SW
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 7			X						
Alkalinity as CaCO3	All	NDPs: 0 Tests: 7					X				
Ammonium Low	All	NDPs: 0 Tests: 7						X			
Anions by Kone (w)	All	NDPs: 0 Tests: 7					X				
BOD True Total	All	NDPs: 0 Tests: 7				X					
COD Unfiltered	All	NDPs: 0 Tests: 7				X					
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 7	X							X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 7					X				
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 7					X				
Fluoride	All	NDPs: 0 Tests: 7					X				
Mercury Dissolved	All	NDPs: 0 Tests: 7					X				
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 7			X						
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 7			X						
pH Value	All	NDPs: 0 Tests: 7					X				
Phosphate by Kone (w)	All	NDPs: 0 Tests: 7					X				

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			26569448								26569437
Customer Sample Reference			SWI								SWM
AGS Reference											
Depth (m)			0.00 - 0.00								0.00 - 0.00
Container			NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)
Sample Type			SW	SW	SW	SW	SW	SW	SW	SW	SW
Suspended Solids	All	NDPs: 0 Tests: 7					X				
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 7			X						
Total Metals by ICP-MS	All	NDPs: 0 Tests: 7							X		
VOC MS (W)	All	NDPs: 0 Tests: 7		X							X

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SWB	SWC	SWF	SWG	SWH	SWI
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
			Date Sampled	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022
			Sample Time	-	-	-	-	-	-
			Date Received	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022
			SDG Ref	220711-29	220711-29	220711-29	220711-29	220711-29	220711-29
			Lab Sample No.(s)	26569387	26569398	26569407	26569418	26569428	26569448
			AGS Reference						
Suspended solids, Total	<2 mg/l	TM022		18.6 #	13.9 #	24.4 #	2.95 #	<2 #	2.3 #
Alkalinity, Total as CaCO3	<2 mg/l	TM043		350 #	455 #	425 #	375 #	275 #	245 #
BOD, unfiltered	<1 mg/l	TM045		2.78 @ #	2.76 @ #	2.52 @ #	<1 @ #	<1 @ #	<1 @ #
Oxygen, dissolved	<0.3 mg/l	TM046		9.51	10.5	7.64	10.9	11.4	12.7
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099		0.0802 #	0.76 #	0.129 #	0.036 #	0.0369 #	0.0348 #
Fluoride	<0.5 mg/l	TM104		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
COD, unfiltered	<7 mg/l	TM107		80.7 #	68.8 #	68.8 #	19.9 #	28.4 #	24.4 #
Arsenic (diss.filt)	<0.5 µg/l	TM152		6.67 2 #	1.55 2 #	1.15 2 #	0.753 2 #	0.719 2 #	0.595 2 #
Boron (diss.filt)	<10 µg/l	TM152		164 2 #	129 2 #	104 2 #	<10 2 #	<10 2 #	<10 2 #
Cadmium (diss.filt)	<0.08 µg/l	TM152		<0.08 2 #	<0.08 2 #	<0.08 2 #	<0.08 2 #	<0.08 2 #	<0.08 2 #
Chromium (diss.filt)	<1 µg/l	TM152		<1 2 #	7.04 2 #	<1 2 #	<1 2 #	<1 2 #	<1 2 #
Copper (diss.filt)	<0.3 µg/l	TM152		0.825 2 #	<0.3 2 #	0.54 2 #	2.64 2 #	0.892 2 #	0.916 2 #
Lead (diss.filt)	<0.2 µg/l	TM152		<0.2 2 #	<0.2 2 #	<0.2 2 #	<0.2 2 #	<0.2 2 #	<0.2 2 #
Manganese (diss.filt)	<3 µg/l	TM152		1650 2 #	1590 2 #	163 2 #	<3 2 #	<3 2 #	<3 2 #
Phosphorus (tot.unfilt)	<20 µg/l	TM152		128 #	52 #	149 #	26.2 #	47.1 #	37.4 #
Nickel (diss.filt)	<0.4 µg/l	TM152		1.93 2 #	2.57 2 #	3.19 2 #	0.977 2 #	1.65 2 #	1.93 2 #
Zinc (diss.filt)	<1 µg/l	TM152		4.42 2 #	1.72 2 #	2.1 2 #	3.36 2 #	3.04 2 #	3.45 2 #
Sodium (Dis.Filt)	<0.076 mg/l	TM152		76.7 2 #	59.8 2 #	48.5 2 #	8.24 2 #	7.9 2 #	7.47 2 #
Magnesium (Dis.Filt)	<0.036 mg/l	TM152		20.4 2 #	20.3 2 #	16.5 2 #	10.5 2 #	7.57 2 #	6.55 2 #
Potassium (Dis.Filt)	<0.2 mg/l	TM152		16 2 #	9.67 2 #	9.5 2 #	2.44 2 #	2.04 2 #	1.86 2 #
Calcium (Dis.Filt)	<0.2 mg/l	TM152		110 2 #	157 2 #	151 2 #	136 2 #	105 2 #	92.7 2 #
Iron (Dis.Filt)	<0.019 mg/l	TM152		0.751 2 #	0.212 2 #	0.0516 2 #	0.039 2 #	0.049 2 #	0.0526 2 #
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 2	<0.01 2	<0.01 2	<0.01 2	<0.01 2	<0.01 2
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184		0.459 #	<0.05 #	0.056 #	<0.05 #	0.054 #	0.05 #
Sulphate	<2 mg/l	TM184		<2 #	42.5 #	30.1 #	15.8 #	19.8 #	20.4 #
Chloride	<2 mg/l	TM184		138 #	108 #	88.2 #	15.7 #	15.4 #	14.8 #
Total Oxidised Nitrogen as NO3	<0.3 mg/l	TM184		<0.3 #	4.96 #	<0.3 #	5.41 #	2.9 #	2.03 #
Cyanide, Total	<0.05 mg/l	TM227		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
pH	<1 pH Units	TM256		7.35 #	7.5 #	7.88 #	8.33 #	8.34 #	8.35 #
Conductivity @ 20 deg.C	<0.02 mS/cm	TM256		0.936 #	1 #	0.915 #	0.633 #	0.495 #	0.457 #
Trifluralin	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.01	<0.01	<0.01
alpha-HCH	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.01	<0.01	<0.01
gamma-HCH (Lindane)	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.01	<0.01	<0.01

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SWB	SWC	SWF	SWG	SWH	SWI
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
			Date Sampled	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022
			Sample Time	.	.	.	.	.	.
			Date Received	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022
			SDG Ref	220711-29	220711-29	220711-29	220711-29	220711-29	220711-29
			Lab Sample No.(s)	26569387	26569398	26569407	26569418	26569428	26569448
			AGS Reference						
Heptachlor	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.01	<0.01	<0.01
Aldrin	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.01	<0.01	<0.01
beta-HCH	<0.01 µg/l	TM343		<0.04	<0.04	<0.04	<0.02	<0.02	<0.02
Isodrin	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.01	<0.01	<0.01
delta-HCH	<0.01 µg/l	TM343		<0.04	<0.04	<0.04	<0.02	<0.02	<0.02
Heptachlor epoxide	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.01	<0.01	<0.01
o,p'-DDE	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.01	<0.01	<0.01
Endosulphan I	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.01	<0.01	<0.01
trans-Chlordane	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.01	<0.01	<0.01
cis-Chlordane	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.01	<0.01	<0.01
p,p'-DDE	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.01	<0.01	<0.01
Dieldrin	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.01	<0.01	<0.01
o,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.01	<0.01	<0.01
Endrin	<0.01 µg/l	TM343		<0.04	<0.04	<0.04	<0.02	<0.02	<0.02
o,p'-DDT	<0.01 µg/l	TM343		<0.04	<0.04	<0.04	<0.02	<0.02	<0.02
p,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.01	<0.01	<0.01
Endosulphan II	<0.02 µg/l	TM343		<0.04	<0.04	<0.04	<0.02	<0.02	<0.02
p,p'-DDT	<0.01 µg/l	TM343		<0.04	<0.04	<0.04	<0.02	<0.02	<0.02
o,p'-Methoxychlor	<0.01 µg/l	TM343		<0.04	<0.04	<0.04	<0.02	<0.02	<0.02
p,p'-Methoxychlor	<0.01 µg/l	TM343		<0.04	<0.04	<0.04	<0.02	<0.02	<0.02
Endosulphan Sulphate	<0.02 µg/l	TM343		<0.08	<0.08	<0.08	<0.04	<0.04	<0.04
Permethrin I	<0.01 µg/l	TM343		<0.04	<0.04	<0.04	<0.02	<0.02	<0.02
Permethrin II	<0.01 µg/l	TM343		<0.04	<0.04	<0.04	<0.02	<0.02	<0.02
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.02	<0.01	<0.02
Hexachlorobutadiene	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.05	<0.01	<0.05
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Dichlorvos	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Dichlobenil	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Mevinphos	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Tecnazene	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Hexachlorobenzene	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Demeton-S-methyl	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SWB	SWC	SWF	SWG	SWH	SWI
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
			Date Sampled	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022
			Sample Time	.	.	.	.	.	.
			Date Received	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022
			SDG Ref	220711-29	220711-29	220711-29	220711-29	220711-29	220711-29
			Lab Sample No.(s)	26569387	26569398	26569407	26569418	26569428	26569448
			AGS Reference						
Phorate	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Diazinon	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Triallate	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Atrazine	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Simazine	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Disulfoton	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Propetamphos	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Chlorpyriphos-methyl	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Dimethoate	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Pirimiphos-methyl	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Chlorpyriphos	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Methyl Parathion	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Malathion	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Fenthion	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Fenitrothion	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Triadimefon	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Pendimethalin	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Parathion	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Chlorfenvinphos	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
trans-Chlordane	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
cis-Chlordane	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Ethion	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Carbophenothion	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Triazophos	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Phosalone	<0.01 µg/l	TM344		<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
Azinphos methyl	<0.02 µg/l	TM344		<0.08	<0.04	<0.08	<0.02	<0.04	<0.02
Azinphos ethyl	<0.02 µg/l	TM344		<0.04	<0.02	<0.04	<0.02	<0.02	<0.02
Dinitro-o-cresol	<0.1 µg/l	TM411		<0.1	0.164	<0.1	<0.1	<0.1	<0.1
Clopyralid	<0.04 µg/l	TM411		<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
MCPA	<0.05 µg/l	TM411		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Mecoprop	<0.04 µg/l	TM411		<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Dicamba	<0.04 µg/l	TM411		<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
MCPB	<0.05 µg/l	TM411		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SWB	SWC	SWF	SWG	SWH	SWI
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
			Date Sampled	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022
			Sample Time	.	.	.	.	.	.
			Date Received	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022
			SDG Ref	220711-29	220711-29	220711-29	220711-29	220711-29	220711-29
			Lab Sample No.(s)	26569387	26569398	26569407	26569418	26569428	26569448
			AGS Reference						
2,4-DB	<0.1 µg/l	TM411		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorprop	<0.1 µg/l	TM411		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Triclopyr	<0.05 µg/l	TM411		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fenoprop (Silvex)	<0.1 µg/l	TM411		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromoxynil	<0.04 µg/l	TM411		<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Benazolin	<0.04 µg/l	TM411		<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Ioxynil	<0.05 µg/l	TM411		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Pentachlorophenol	<0.04 µg/l	TM411		<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Fluoroxypyr	<0.1 µg/l	TM411		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend
- # ISO17025 accredited.
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- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
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- 1-4+§@ Sample deviation (see appendix)

		Customer Sample Ref.	SWM					
		Depth (m)	0.00 - 0.00					
		Sample Type	Surface Water (SW)					
		Date Sampled	06/07/2022					
		Sample Time	-					
		Date Received	11/07/2022					
		SDG Ref	220711-29					
		Lab Sample No.(s)	26569437					
		AGS Reference						
Component	**LOD/Units**	**Method**						
Suspended solids, Total	<2 mg/l	TM022	3.65 #					
Alkalinity, Total as CaCO3	<2 mg/l	TM043	340 #					
BOD, unfiltered	<1 mg/l	TM045	<1 @ #					
Oxygen, dissolved	<0.3 mg/l	TM046	9.81					
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099	0.0872 #					
Fluoride	<0.5 mg/l	TM104	<0.5					
COD, unfiltered	<7 mg/l	TM107	69.7 #					
Arsenic (diss.filt)	<0.5 µg/l	TM152	0.589 2 #					
Boron (diss.filt)	<10 µg/l	TM152	19.8 2 #					
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08 2 #					
Chromium (diss.filt)	<1 µg/l	TM152	2.77 2 #					
Copper (diss.filt)	<0.3 µg/l	TM152	<0.3 2 #					
Lead (diss.filt)	<0.2 µg/l	TM152	<0.2 2 #					
Manganese (diss.filt)	<3 µg/l	TM152	128 2 #					
Phosphorus (tot.unfilt)	<20 µg/l	TM152	<20 #					
Nickel (diss.filt)	<0.4 µg/l	TM152	<0.4 2 #					
Zinc (diss.filt)	<1 µg/l	TM152	1.85 2 #					
Sodium (Dis.Filt)	<0.076 mg/l	TM152	14.3 2 #					
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	10.6 2 #					
Potassium (Dis.Filt)	<0.2 mg/l	TM152	3.37 2 #					
Calcium (Dis.Filt)	<0.2 mg/l	TM152	122 2 #					
Iron (Dis.Filt)	<0.019 mg/l	TM152	0.5 2 #					
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01 2					
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184	<0.05 #					
Sulphate	<2 mg/l	TM184	<2 #					
Chloride	<2 mg/l	TM184	29.7 #					
Total Oxidised Nitrogen as NO3	<0.3 mg/l	TM184	<0.3 #					
Cyanide, Total	<0.05 mg/l	TM227	<0.05					
pH	<1 pH Units	TM256	7.43 #					
Conductivity @ 20 deg.C	<0.02 mS/cm	TM256	0.616 #					
Trifluralin	<0.01 µg/l	TM343	<0.02					
alpha-HCH	<0.01 µg/l	TM343	<0.02					
gamma-HCH (Lindane)	<0.01 µg/l	TM343	<0.02					

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

		Customer Sample Ref.	SWM
		Depth (m)	0.00 - 0.00
		Sample Type	Surface Water (SW)
		Date Sampled	06/07/2022
		Sample Time	.
		Date Received	11/07/2022
		SDG Ref	220711-29
		Lab Sample No.(s)	26569437
		AGS Reference	
Component	**LOD/Units**	**Method**	
Heptachlor	<0.01 µg/l	TM343	<0.02
Aldrin	<0.01 µg/l	TM343	<0.02
beta-HCH	<0.01 µg/l	TM343	<0.04
Isodrin	<0.01 µg/l	TM343	<0.02
delta-HCH	<0.01 µg/l	TM343	<0.04
Heptachlor epoxide	<0.01 µg/l	TM343	<0.02
o,p'-DDE	<0.01 µg/l	TM343	<0.02
Endosulphan I	<0.01 µg/l	TM343	<0.02
trans-Chlordane	<0.01 µg/l	TM343	<0.02
cis-Chlordane	<0.01 µg/l	TM343	<0.02
p,p'-DDE	<0.01 µg/l	TM343	<0.02
Dieldrin	<0.01 µg/l	TM343	<0.02
o,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.02
Endrin	<0.01 µg/l	TM343	<0.04
o,p'-DDT	<0.01 µg/l	TM343	<0.04
p,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.02
Endosulphan II	<0.02 µg/l	TM343	<0.04
p,p'-DDT	<0.01 µg/l	TM343	<0.04
o,p'-Methoxychlor	<0.01 µg/l	TM343	<0.04
p,p'-Methoxychlor	<0.01 µg/l	TM343	<0.04
Endosulphan Sulphate	<0.02 µg/l	TM343	<0.08
Permethrin I	<0.01 µg/l	TM343	<0.04
Permethrin II	<0.01 µg/l	TM343	<0.04
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344	<0.04
Hexachlorobutadiene	<0.01 µg/l	TM344	<0.1
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344	<0.01
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344	<0.01
Dichlorvos	<0.01 µg/l	TM344	<0.01
Dichlobenil	<0.01 µg/l	TM344	<0.01
Mevinphos	<0.01 µg/l	TM344	<0.01
Tecnazene	<0.01 µg/l	TM344	<0.01
Hexachlorobenzene	<0.01 µg/l	TM344	<0.01
Demeton-S-methyl	<0.01 µg/l	TM344	<0.01

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Customer Sample Ref.	SWM
Depth (m)	0.00 - 0.00
Sample Type	Surface Water (SW)
Date Sampled	06/07/2022
Sample Time	.
Date Received	11/07/2022
SDG Ref	220711-29
Lab Sample No.(s)	26569437
AGS Reference	

Component	LOD/Units	Method	
Phorate	<0.01 µg/l	TM344	<0.01
Diazinon	<0.01 µg/l	TM344	<0.01
Triallate	<0.01 µg/l	TM344	<0.01
Atrazine	<0.01 µg/l	TM344	<0.01
Simazine	<0.01 µg/l	TM344	<0.01
Disulfoton	<0.01 µg/l	TM344	<0.01
Propetamphos	<0.01 µg/l	TM344	<0.01
Chlorpyriphos-methyl	<0.01 µg/l	TM344	<0.01
Dimethoate	<0.01 µg/l	TM344	<0.01
Pirimiphos-methyl	<0.01 µg/l	TM344	<0.01
Chlorpyriphos	<0.01 µg/l	TM344	<0.01
Methyl Parathion	<0.01 µg/l	TM344	<0.01
Malathion	<0.01 µg/l	TM344	<0.01
Fenthion	<0.01 µg/l	TM344	<0.01
Fenitrothion	<0.01 µg/l	TM344	<0.01
Triadimefon	<0.01 µg/l	TM344	<0.01
Pendimethalin	<0.01 µg/l	TM344	<0.01
Parathion	<0.01 µg/l	TM344	<0.01
Chlorfenvinphos	<0.01 µg/l	TM344	<0.01
trans-Chlordane	<0.01 µg/l	TM344	<0.01
cis-Chlordane	<0.01 µg/l	TM344	<0.01
Ethion	<0.01 µg/l	TM344	<0.01
Carbophenothion	<0.01 µg/l	TM344	<0.01
Triazophos	<0.01 µg/l	TM344	<0.01
Phosalone	<0.01 µg/l	TM344	<0.01
Azinphos methyl	<0.02 µg/l	TM344	<0.02
Azinphos ethyl	<0.02 µg/l	TM344	<0.02
Dinitro-o-cresol	<0.1 µg/l	TM411	<0.1
Clopyralid	<0.04 µg/l	TM411	<0.04
MCPA	<0.05 µg/l	TM411	<0.05
Mecoprop	<0.04 µg/l	TM411	<0.04
Dicamba	<0.04 µg/l	TM411	<0.04
MCPB	<0.05 µg/l	TM411	<0.05

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			SWM	0.00 - 0.00	Surface Water (SW)	06/07/2022	.	11/07/2022	220711-29	26569437	
2,4-DB	<0.1 µg/l	TM411	<0.1								
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411	<0.05								
Dichlorprop	<0.1 µg/l	TM411	<0.1								
Triclopyr	<0.05 µg/l	TM411	<0.05								
Fenoprop (Silvex)	<0.1 µg/l	TM411	<0.1								
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411	<0.05								
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411	<0.05								
Bromoxynil	<0.04 µg/l	TM411	<0.04								
Benazolin	<0.04 µg/l	TM411	<0.04								
Ioxynil	<0.05 µg/l	TM411	<0.05								
Pentachlorophenol	<0.04 µg/l	TM411	<0.04								
Fluoroxypyr	<0.1 µg/l	TM411	<0.1								

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

SVOC MS (W) - Aqueous

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SWB	SWC	SWF	SWG	SWH	SWI
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
			Date Sampled	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022
			Sample Time	-	-	-	-	-	-
			Date Received	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022
			SDG Ref	220711-29	220711-29	220711-29	220711-29	220711-29	220711-29
			Lab Sample No.(s)	26569387	26569398	26569407	26569418	26569428	26569448
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2-Chlorophenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2-Methylphenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2-Nitroaniline (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2-Nitrophenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-Methylphenol (aq)	<1 µg/l	TM176		<1 #	<1 #	8.77 #	<1 #	<1 #	<1 #
4-Nitroaniline (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Azobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Acenaphthylene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Acenaphthene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Anthracene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2 #	<2 #	<2 #	<2 #	<2 #	<2 #
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

SVOC MS (W) - Aqueous

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SWB	SWC	SWF	SWG	SWH	SWI
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
			Date Sampled	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022
			Sample Time	.	.	.	.	.	.
			Date Received	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022
			SDG Ref	220711-29	220711-29	220711-29	220711-29	220711-29	220711-29
			Lab Sample No.(s)	26569387	26569398	26569407	26569418	26569428	26569448
			AGS Reference						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Carbazole (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chrysene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibenzofuran (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Diethyl phthalate (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5 #	<5 #	<5 #	<5 #	<5 #	<5 #
Fluoranthene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Fluorene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Phenol (aq)	<1 µg/l	TM176		<1	<1	2.2	<1	<1	<1
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Hexachloroethane (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Nitrobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Naphthalene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Isophorone (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Phenanthrene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Pyrene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

SVOC MS (W) - Aqueous

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			SWM	0.00 - 0.00	Surface Water (SW)	06/07/2022	-	11/07/2022	220711-29	26569437	
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<2 #								
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<2 #								
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<2 #								
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<2 #								
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<2 #								
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<2 #								
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<2 #								
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<2 #								
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<2 #								
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<2 #								
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<2 #								
2-Chlorophenol (aq)	<1 µg/l	TM176	<2 #								
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<2 #								
2-Methylphenol (aq)	<1 µg/l	TM176	<2 #								
2-Nitroaniline (aq)	<1 µg/l	TM176	<2 #								
2-Nitrophenol (aq)	<1 µg/l	TM176	<2 #								
3-Nitroaniline (aq)	<1 µg/l	TM176	<2								
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<2 #								
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<2 #								
4-Chloroaniline (aq)	<1 µg/l	TM176	<2								
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<2 #								
4-Methylphenol (aq)	<1 µg/l	TM176	<2 #								
4-Nitroaniline (aq)	<1 µg/l	TM176	<2 #								
4-Nitrophenol (aq)	<1 µg/l	TM176	<2								
Azobenzene (aq)	<1 µg/l	TM176	<2 #								
Acenaphthylene (aq)	<1 µg/l	TM176	<2 #								
Acenaphthene (aq)	<1 µg/l	TM176	<2 #								
Anthracene (aq)	<1 µg/l	TM176	<2 #								
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<2 #								
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<2 #								
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<4 #								
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<2 #								
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<2 #								

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

SVOC MS (W) - Aqueous

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Customer Sample Ref.	SWM
Depth (m)	0.00 - 0.00
Sample Type	Surface Water (SW)
Date Sampled	06/07/2022
Sample Time	.
Date Received	11/07/2022
SDG Ref	220711-29
Lab Sample No.(s)	26569437
AGS Reference	

Component	LOD/Units	Method	
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176	<2 #
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<2 #
Benzo(a)pyrene (aq)	<1 µg/l	TM176	<2 #
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176	<2 #
Carbazole (aq)	<1 µg/l	TM176	<2 #
Chrysene (aq)	<1 µg/l	TM176	<2 #
Dibenzofuran (aq)	<1 µg/l	TM176	<2 #
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<2 #
Diethyl phthalate (aq)	<1 µg/l	TM176	<2 #
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176	<2 #
Dimethyl phthalate (aq)	<1 µg/l	TM176	<2 #
n-Dioctyl phthalate (aq)	<5 µg/l	TM176	<10 #
Fluoranthene (aq)	<1 µg/l	TM176	<2 #
Fluorene (aq)	<1 µg/l	TM176	<2 #
Hexachlorobenzene (aq)	<1 µg/l	TM176	<2 #
Hexachlorobutadiene (aq)	<1 µg/l	TM176	<2 #
Pentachlorophenol (aq)	<1 µg/l	TM176	<2
Phenol (aq)	<1 µg/l	TM176	<2
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176	<2 #
Hexachloroethane (aq)	<1 µg/l	TM176	<2 #
Nitrobenzene (aq)	<1 µg/l	TM176	<2 #
Naphthalene (aq)	<1 µg/l	TM176	<2 #
Isophorone (aq)	<1 µg/l	TM176	<2 #
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176	<2
Phenanthrene (aq)	<1 µg/l	TM176	<2 #
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176	<2 #
Pyrene (aq)	<1 µg/l	TM176	<2 #

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

VOC MS (W)

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SWB	SWC	SWF	SWG	SWH	SWI
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
			Date Sampled	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022
			Sample Time	-	-	-	-	-	-
			Date Received	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022
			SDG Ref	220711-29	220711-29	220711-29	220711-29	220711-29	220711-29
			Lab Sample No.(s)	26569387	26569398	26569407	26569418	26569428	26569448
			AGS Reference						
Dibromofluoromethane**	%	TM208		121	126	117	115	116	119
Toluene-d8**	%	TM208		102	98.1	97.6	101	100	99
4-Bromofluorobenzene**	%	TM208		93.7	96.9	93.6	93	96.7	96.8
Dichlorodifluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Vinyl chloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Trichlorofluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Carbon disulphide	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dichloromethane	<3 µg/l	TM208		<5.5 #	<5.5 #	<5 #	<6 #	<6 #	<6 #
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2,2-Dichloropropane	<1 µg/l	TM208		<1	<1	<1	<1	<1	<1
Bromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloroform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Carbontetrachloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Benzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Trichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromodichloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Toluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

VOC MS (W)

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SWB	SWC	SWF	SWG	SWH	SWI
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
			Date Sampled	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022
			Sample Time	.	.	.	.	.	.
			Date Received	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022
			SDG Ref	220711-29	220711-29	220711-29	220711-29	220711-29	220711-29
			Lab Sample No.(s)	26569387	26569398	26569407	26569418	26569428	26569448
			AGS Reference						
Tetrachloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromoethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Ethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
m,p-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
o-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Styrene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromoform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Isopropylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,3-Trichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Propylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,4-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
sec-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-iso-Propyltoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,4-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
n-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208		<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Hexachlorobutadiene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Naphthalene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,3-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trichlorobenzene	<1 µg/l	TM208		<1	<1	<1	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

VOC MS (W)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Customer Sample Ref.	SWM
Depth (m)	0.00 - 0.00
Sample Type	Surface Water (SW)
Date Sampled	06/07/2022
Sample Time	-
Date Received	11/07/2022
SDG Ref	220711-29
Lab Sample No.(s)	26569437
AGS Reference	

Component	LOD/Units	Method	
Dibromofluoromethane**	%	TM208	122
Toluene-d8**	%	TM208	99.7
4-Bromofluorobenzene**	%	TM208	96.3
Dichlorodifluoromethane	<1 µg/l	TM208	<1 #
Chloromethane	<1 µg/l	TM208	<1 #
Vinyl chloride	<1 µg/l	TM208	<1 #
Bromomethane	<1 µg/l	TM208	<1 #
Chloroethane	<1 µg/l	TM208	<1 #
Trichlorofluoromethane	<1 µg/l	TM208	<1 #
1,1-Dichloroethene	<1 µg/l	TM208	<1 #
Carbon disulphide	<1 µg/l	TM208	<1 #
Dichloromethane	<3 µg/l	TM208	<5.5 #
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1 #
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1 #
1,1-Dichloroethane	<1 µg/l	TM208	<1 #
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1 #
2,2-Dichloropropane	<1 µg/l	TM208	<1
Bromochloromethane	<1 µg/l	TM208	<1 #
Chloroform	<1 µg/l	TM208	<1 #
1,1,1-Trichloroethane	<1 µg/l	TM208	<1 #
1,1-Dichloropropene	<1 µg/l	TM208	<1 #
Carbontetrachloride	<1 µg/l	TM208	<1 #
1,2-Dichloroethane	<1 µg/l	TM208	<1 #
Benzene	<1 µg/l	TM208	<1 #
Trichloroethene	<1 µg/l	TM208	<1 #
1,2-Dichloropropane	<1 µg/l	TM208	<1 #
Dibromomethane	<1 µg/l	TM208	<1 #
Bromodichloromethane	<1 µg/l	TM208	<1 #
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1 #
Toluene	<1 µg/l	TM208	<1 #
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1 #
1,1,2-Trichloroethane	<1 µg/l	TM208	<1 #
1,3-Dichloropropane	<1 µg/l	TM208	<1 #

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

VOC MS (W)

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

	Customer Sample Ref.		SWM
	Depth (m)		0.00 - 0.00
	Sample Type		Surface Water (SW)
	Date Sampled		06/07/2022
	Sample Time		.
	Date Received		11/07/2022
	SDG Ref		220711-29
	Lab Sample No.(s)		26569437
	AGS Reference		
Component	**LOD/Units**	**Method**	
Tetrachloroethene	<1 µg/l	TM208	<1 #
Dibromochloromethane	<1 µg/l	TM208	<1 #
1,2-Dibromoethane	<1 µg/l	TM208	<1 #
Chlorobenzene	<1 µg/l	TM208	<1 #
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1 #
Ethylbenzene	<1 µg/l	TM208	<1 #
m,p-Xylene	<1 µg/l	TM208	<1 #
o-Xylene	<1 µg/l	TM208	<1 #
Styrene	<1 µg/l	TM208	<1 #
Bromoform	<1 µg/l	TM208	<1 #
Isopropylbenzene	<1 µg/l	TM208	<1 #
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1 #
1,2,3-Trichloropropane	<1 µg/l	TM208	<1 #
Bromobenzene	<1 µg/l	TM208	<1 #
Propylbenzene	<1 µg/l	TM208	<1 #
2-Chlorotoluene	<1 µg/l	TM208	<1 #
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1 #
4-Chlorotoluene	<1 µg/l	TM208	<1 #
tert-Butylbenzene	<1 µg/l	TM208	<1 #
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1 #
sec-Butylbenzene	<1 µg/l	TM208	<1 #
4-iso-Propyltoluene	<1 µg/l	TM208	<1 #
1,3-Dichlorobenzene	<1 µg/l	TM208	<1 #
1,4-Dichlorobenzene	<1 µg/l	TM208	<1 #
n-Butylbenzene	<1 µg/l	TM208	<1 #
1,2-Dichlorobenzene	<1 µg/l	TM208	<1 #
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1 #
Hexachlorobutadiene	<1 µg/l	TM208	<1 #
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1 #
Naphthalene	<1 µg/l	TM208	<1 #
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1 #
1,3,5-Trichlorobenzene	<1 µg/l	TM208	<1

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
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
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
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
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, Standard Methods for the examination of waters and wastewaters 20th Edition, PHA, Washington DC, USA. ISBN 0-87553-235-7 and The Determination of Alkalinity and Acidity in water HMSO, 1981, ISBN 0 11 751601 5.	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM343	EPA 8270D - Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of Selected Pesticides (Suite I) in Liquids by GCMS
TM344	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite II) by GCMS
TM411	Acid_Herbs_GCMS	Acid Herbs in Water by GCMS

NA = not applicable.

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

CERTIFICATE OF ANALYSIS

SDG: 220711-29 **Report Number:** 655088 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Test Completion Dates

Lab Sample No(s)	26569387	26569398	26569407	26569418	26569428	26569448	26569437
Customer Sample Ref.	SWB	SWC	SWF	SWG	SWH	SWI	SWM
AGS Ref.							
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Acid Herbicides by GCMS	17-Jul-2022	17-Jul-2022	17-Jul-2022	17-Jul-2022	17-Jul-2022	17-Jul-2022	17-Jul-2022
Alkalinity as CaCO3	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022
Ammonium Low	18-Jul-2022	15-Jul-2022	15-Jul-2022	18-Jul-2022	18-Jul-2022	18-Jul-2022	15-Jul-2022
Anions by Kone (w)	18-Jul-2022	18-Jul-2022	18-Jul-2022	13-Jul-2022	13-Jul-2022	14-Jul-2022	18-Jul-2022
BOD True Total	18-Jul-2022	19-Jul-2022	19-Jul-2022	18-Jul-2022	18-Jul-2022	18-Jul-2022	19-Jul-2022
COD Unfiltered	16-Jul-2022	16-Jul-2022	16-Jul-2022	18-Jul-2022	16-Jul-2022	16-Jul-2022	16-Jul-2022
Cyanide Comp/Free/Total/Thiocyanate	16-Jul-2022	16-Jul-2022	16-Jul-2022	16-Jul-2022	16-Jul-2022	16-Jul-2022	16-Jul-2022
Dissolved Metals by ICP-MS	21-Jul-2022	21-Jul-2022	21-Jul-2022	20-Jul-2022	20-Jul-2022	20-Jul-2022	21-Jul-2022
Dissolved Oxygen by Probe	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022
Fluoride	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022
Mercury Dissolved	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022
Pesticides (Suite I) by GCMS	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022
Pesticides (Suite II) by GCMS	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022
pH Value	15-Jul-2022	15-Jul-2022	15-Jul-2022	14-Jul-2022	15-Jul-2022	14-Jul-2022	15-Jul-2022
Phosphate by Kone (w)	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022
Suspended Solids	18-Jul-2022	18-Jul-2022	18-Jul-2022	18-Jul-2022	18-Jul-2022	18-Jul-2022	19-Jul-2022
SVOC MS (W) - Aqueous	15-Jul-2022	15-Jul-2022	15-Jul-2022	15-Jul-2022	15-Jul-2022	15-Jul-2022	15-Jul-2022
Total Metals by ICP-MS	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022
VOC MS (W)	20-Jul-2022	20-Jul-2022	20-Jul-2022	20-Jul-2022	20-Jul-2022	20-Jul-2022	20-Jul-2022

SDG:	220711-29	**Report Number:**	655088	**Superseded Report:**	
Client Ref:	P1444	**Location:**	Ballymulvey Landfill		

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) 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. 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.

3. 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.

4. 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.

5. 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.

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

7. Results relate only to the items tested.

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

9. **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.

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

11. 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.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

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

14. 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.

15. 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.

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

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **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.

19. **Sample Deviations**

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

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Matrix interference**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**
§	**Sampled on date not provided**

20. **Asbestos**

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 (2021), 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.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials andd soils 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 (2021).

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.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
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.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

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

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

FEHILY TIMONEY

CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE
& PLANNING

APPENDIX 7

Geotechnical Reports – November 2020 and October 2022

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LONGFORD LANDFILLS

BALLYMULVEY

GROUND INVESTIGATION

REPORT No. P20083_BM_Rp_D01

Priority Geotechnical Ltd.

REPORT CONTROL SHEET

Client	Longford County Council				
Engineer Representative	Fehily Timoney				
Project Name	Longford Landfills- Ground Investigation				
Document Name	Longford Landfills- Ballymulvey Ground Investigation- Report				
Project Number	P20083_BM				
This Report Comprises of	TOC	No. of Volume	No. of Appendices	Drawings	Electronic data
	1	1	1	1	*.dwg, *.pdf

Revision	Status	Author(s)	Approved By	Issue Date
D01	Draft	SR	GH	04/11/2020

TABLE OF CONTENTS

A) Introduction

A.1) Scope of Works

Priority Geotechnical Ltd. was instructed by Fehily Timoney to undertake a direct intrusive ground investigation at Ballymulvey Landfill, Longford, Co. Longford.

The direct intrusive works consisted of boreholes and in-situ permeability determination of ground conditions. The site is shown in Figure A.1 below.

Figure A.1 Background map showing site and works location.

A.2) Objectives

The objectives of the works were as follows:

- to provide a means of monitoring the efficacy of proposed remediation measures

A.3) Site Topography

Site topography consists of a mostly grassy field. The perimeter of the site is comprised of densely vegetated ditches on the west, north and east sides of the site, while a metal fence with some vegetation makes up the southern perimeter. The site is flanked by a road to the north.

A.4) Coordinate System and Datum

All coordinates are given in Irish Transverse Mercator (ITM). All elevations are given in metres Ordnance Datum Malin (OD Malin). The locations are shown on the exploratory layout plans presented in **APPENDIX B.**

Location ID	Easting	Northing	Ground Level (mOD)	Final Depth (m bgl)	Date Start (DD/MM/YYYY)
RCGW04BM	617293.4	758182.2	55.35	12.5	02/09/2020
RCGW05BM	616877.5	757868	53.79	12.5	01/09/2020
RCGW06BM	616798.6	757759.6	54.31	12.5	31/08/2020

A.5) Acronyms

bgl – below ground level
ITM – Irish Transverse Mercator
OD Malin – metres above Ordnance Datum Malin
PGL – Priority Geotechnical Ltd.

A.6) Site Geology

According to the GSI 100k Geology Map (Sheet 12) the study area is underlain by the Waulsortian Limestones (WA) Formation, described as Massive Unbedded Lime-Mudstones. To the southeast of the survey area lies the Ballysteen Formation, described as fossiliferous

and argillaceous limestones with shale. These two formations are divided by a northeast-southwest fault.

According to the Quaternary Soils Map most of the study area is underlain by “Till derived from Carboniferous Sandstones cherts”. Peat deposits are shown to the North east of the site with minor pockets of “Gravels derived from Limestones” also mapped in the area.

All above mapping is available for free viewing on the Geological Survey of Ireland website at *https://www.gsi.ie/en-ie/Pages/default.aspx.*

B) Intrusive, direct investigation fieldworks

This direct investigation fieldworks were undertaken between the 31st August and the 2nd September, 2020 under the supervision of PGL, Engineering Geologist(s) in accordance with Eurocode 7- Geotechnical Design Part 2, ground investigation and testing (BS EN 1997-2: 2007) and the relevant British Standards (BS 5930 (2015) Code of Practice for Site Investigation and BS 1377, Method of Tests for Soil for Civil Engineering Purposes, *in situ* Tests Parts 1 to 9). Details of the plant and equipment used are detailed on the relevant exploratory records, attached herein.

B.1.i) Boreholes

Three (3) number rotary boreholes were bored to depth 12.5m below existing ground level using PGL's Soilmec PSM rotary rig. The records are presented in **APPENDIX A**.

Location	Depth (m bgl)	Date (dd/mm/yyyy)
RCGW04BM	12.5	02/09/2020
RCGW05BM	12.5	01/09/2020
RCGW06BM	12.5	31/08/2020

B.2) In-Situ Testing

Three (3) number falling head borehole permeability tests were carried out. The data from the testing was presented accompanying the relevant exploratory permeability test records in **APPENDIX A**.

B.3) Lab Testing

Under the scope of works no laboratory testing was required.

B.4) Ground and Groundwater Conditions

The full details of the ground conditions encountered are provided for on the exploratory records accompanying this report. The records provide descriptions, in accordance with BS 5930 (2015) and Eurocode 7, Geotechnical Investigation and Testing, Identification and classification of soils, Part 1, Identification and description (EN ISO 14688-1: 2002),–

Identification and Classification of Soil, Part 2: Classification Principles (EN ISO 14688-2:2004) and Identification and Classification of Rock, Part 1: Identification & Description (EN ISO 14689-1:2004) of the materials encountered, in situ testing and details of the samples taken, together with any observations made during the ground investigation.

Groundwater was recorded when encountered during boring over a period of 20 minutes, noting any changes that may occur. Groundwater levels were also monitored at start and end of drilling shifts.

It should be noted that the normal rate of boring may not permit the recording of equilibrium groundwater levels for any one groundwater water strike where casing may exclude low volume flows as the borehole progresses. The normal duration over which a trial excavation remains open may not allow for low volume flow to ingress in cohesive deposits. Groundwater conditions observed in the borings and the excavations, are those appertaining to the period of the investigation. Groundwater levels may be subject to diurnal, seasonal and climatic variations and can also be affected by drainage conditions, tidal variations etc.

Three (3) groundwater monitoring installations were constructed upon request of the engineer. The groundwater regime should be assessed from standpipe well installations, where available. A summary of groundwater is presented below.

Location	Depth Strike (m bgl)	Remarks	Standpipe (Y/N)
RCGW04BM	0.7	-	Y
RCGW05BM	-	None encountered.	Y
RCGW06BM	-	None encountered.	Y

Location	Depth Top (m bgl)	Depth Base (m bgl)	Diameter (mm)	Pipe Type
RCGW04BM	0.0	5.0	50	PLAIN
RCGW04BM	5.0	12.5	50	SLOTTED
RCGW05BM	0.0	2.5	50	PLAIN
RCGW05BM	2.5	12.5	50	SLOTTED
RCGW06BM	0.0	9.5	50	PLAIN
RCGW06BM	9.5	12.5	50	SLOTTED

Exploratory holes were backfilled upon instruction from the engineer. Backfill details are shown graphically on the exploratory logs accompanying this factual report.

 GRAVEL Backfill to installation/ borehole	 ARISINGS Backfill
 uPVC slotted pipe	 BENTONITE Backfill to installation

APPENDIX A: EXPLORATORY LOGS

Location ID
RCGW04BM
RCGW05BM
RCGW06BM

Project Id:	P20083	Title:	Site Plan
Project Title:	Longford Landfills	Scale:	1:3000
Location:	Co. Longford	Engineer:	Fehily Timoney & Co.
Client:	Longford County Council	Contractor:	PGL

pgl priority geotechnical

Legend Key

- Locations By Type - Empty
- Locations By Type - RO

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Drilled By	Borehole No.
AK	**RCGW04BM**
Logged By	Sheet 1 of 2

Project Name:	Longford Landfills	**Project No.** P20083	**Co-ords:**	617293E - 758182N	**Hole Type** RO
Location:	Co. Longford		**Level:**	55.35 m OD	**Scale** 1:50
Client:	Longford County Council		**Date:**	02/09/2020 - 02/09/2020	

Well Backfill	Water Strike (m bgl)	Sample and In Situ Testing: Depth (m bgl)	Type	Results	Depth (m bgl)	Level (mOD)	Legend	Stratum Description
	▼							Open hole boring. Driller described: Peat & Boulders.
					3.10	52.25		Open hole boring. Driller described: Sand.
					5.10	50.25		Open hole boring. Driller described: Limestone bedrock.

Groundwater:

Struck (m bgl)	Rose to (m bgl)	After (mins)	Sealed (m bgl)	Comment
0.70				

Hole Information:

Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)
12.50	102	131

Equipment: Soilmech PSM

Chiselling Details:

Top (m)	Base (m)	Duration (hh:mm)	Tool

Remarks:

Borehole terminated at 12.50m, required depth. 50mm standpipe installed. Depth response zone from 5.00m to 12.50m. Permeability test done at 6.40m.

Shift Data:

GW (m bgl)	Shift	Depth (m bgl)	Remarks
	02/09/2020 08:00	0.00	Start of shift.
0.7	02/09/2020 18:00	12.50	End of borehole.

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Project Name:	Longford Landfills	**Project No.** P20083	**Co-ords:**	617293E - 758182N	**Hole Type** RO
Location:	Co. Longford		**Level:**	55.35 m OD	**Scale** 1:50
Client:	Longford County Council		**Date:**	02/09/2020 - 02/09/2020	

Well Backfill	Water Strike (m bgl)	Sample and In Situ Testing: Depth (m bgl)	Type	Results	Depth (m bgl)	Level (mOD)	Legend	Stratum Description
								Open hole boring. Driller described: Limestone bedrock.
					12.50	42.85		End of Borehole at 12.500m

10 11 12 13 14 15 16 17 18

Groundwater:

Struck (m bgl)	Rose to (m bgl)	After (mins)	Sealed (m bgl)	Comment
0.70				

Hole Information:

Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)
12.50	102	131

Equipment: Soilmech PSM

Chiselling Details:

Top (m)	Base (m)	Duration (hh:mm)	Tool

Remarks:

Borehole terminated at 12.50m, required depth. 50mm standpipe installed. Depth response zone from 5.00m to 12.50m. Permeability test done at 6.40m.

Shift Data:

GW (m bgl)	Shift	Depth (m bgl)	Remarks
	02/09/2020 08:00	0.00	Start of shift.
0.7	02/09/2020 18:00	12.50	End of borehole.

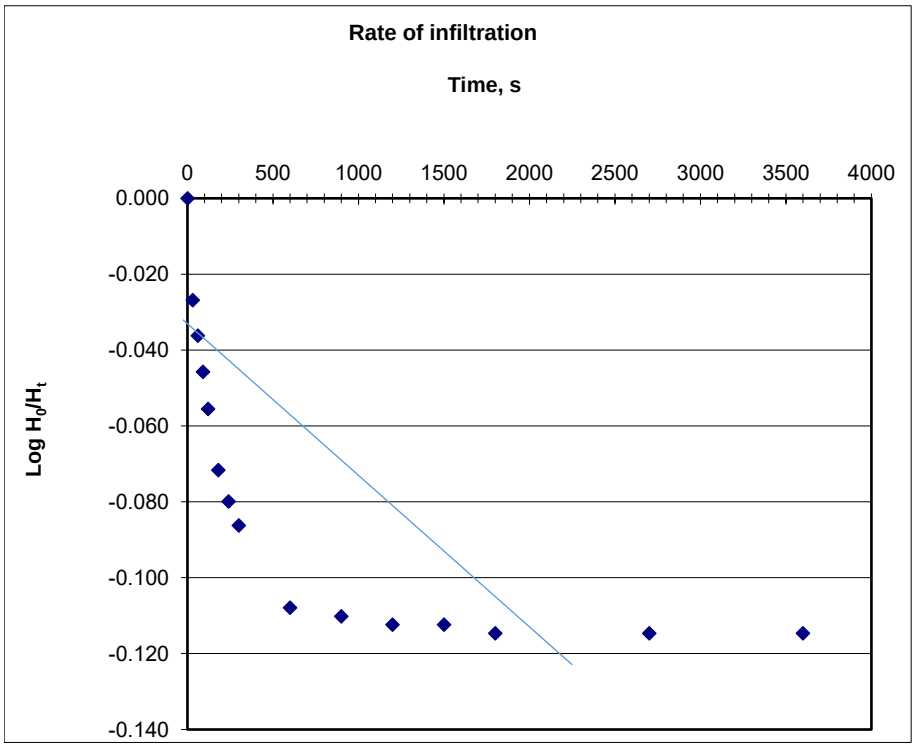
P20083 Falling head permeability test

Location	**Longford Landfills**			
BH ID	**RCGW04**		H_w / H_o	**2.50**
Test	**1**			
Casing diameter	**102**	mm		
Casing depth	**5.1**	m		
Borehole depth	**6.4**	m		
Groundwater level	**2.50**	m bgl		
Date	**02/09/2020**			
Strata				

Min	Sec	depth, m bgl	vol, cu.m	H_t	log H_0/H_t
0	0	0.000	0.00000	2.500	0.000
0.5	30	0.150	0.03000	2.350	-0.027
1	60	0.200	0.05000	2.300	-0.036
1.5	90	0.250	0.06000	2.250	-0.046
2	120	0.300	0.08000	2.200	-0.056
3	180	0.380	0.10000	2.120	-0.072
4	240	0.420	0.12000	2.080	-0.080
5	300	0.450	0.13000	2.050	-0.086
10	600	0.550	0.21000	1.950	-0.108
15	900	0.560	0.34000	1.940	-0.110
20	1200	0.570	0.51000	1.930	-0.112
25	1500	0.570	0.62000	1.930	-0.112
30	1800	0.580	0.80000	1.920	-0.115
45	2700	0.580	0.83000	1.920	-0.115
60	3600	0.580	1.01000	1.920	-0.115

k_{mean} **2.94E-07** ms^{-1}

$k_H = k_V$



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Drilled By	Borehole No.
AK	**RCGW05BM**
Logged By	Sheet 1 of 2

Project Name:	Longford Landfills	**Project No.** P20083	**Co-ords:**	616877E - 757868N	**Hole Type** RO
Location:	Co. Longford		**Level:**	53.79 m OD	**Scale** 1:50
Client:	Longford County Council		**Date:**	01/09/2020 - 01/09/2020	

Well Backfill	Water Strike (m bgl)	Sample and In Situ Testing: Depth (m bgl)	Type	Results	Depth (m bgl)	Level (mOD)	Legend	Stratum Description
								Open hole boring. Driller described: Gravelly Topsoil.
					1.00	52.78		Open hole boring. Driller described: Sandy Gravel.
					2.50	51.28		Open hole boring. Driller described: Limestone bedrock.

Groundwater:

Struck (m bgl)	Rose to (m bgl)	After (mins)	Sealed (m bgl)	Comment
				None encountered.

Hole Information:

Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)
12.50	102	131

Equipment: Soilmech PSM

Chiselling Details:

Top (m)	Base (m)	Duration (hh:mm)	Tool

Remarks:

Borehole terminated at 12.50m bgl, required depth. 50mm standpipe installed. Depth response zone from 2.50m to 12.50m. Permeability test done at 12.50m.

Shift Data:

GW (m bgl)	Shift	Depth (m bgl)	Remarks
	01/09/2020 08:00	0.00	Start of shift.
Dry	01/09/2020 18:00	12.50	End of borehole.

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Drilled By	Borehole No.
AK	**RCGW05BM**
Logged By	Sheet 2 of 2

Project Name:	Longford Landfills	**Project No.** P20083	**Co-ords:**	616877E - 757868N	**Hole Type** RO
Location:	Co. Longford		**Level:**	53.79 m OD	**Scale** 1:50
Client:	Longford County Council		**Date:**	01/09/2020 - 01/09/2020	

Well Backfill	Water Strike (m bgl)	Sample and In Situ Testing: Depth (m bgl)	Type	Results	Depth (m bgl)	Level (mOD)	Legend	Stratum Description
								Open hole boring. Driller described: Limestone bedrock.
					12.50	41.28		End of Borehole at 12.500m

10 11 12 13 14 15 16 17 18

Groundwater:

Struck (m bgl)	Rose to (m bgl)	After (mins)	Sealed (m bgl)	Comment
				None encountered.

Hole Information:

Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)
12.50	102	131

Equipment: Soilmech PSM

Chiselling Details:

Top (m)	Base (m)	Duration (hh:mm)	Tool

Remarks:

Borehole terminated at 12.50m bgl, required depth. 50mm standpipe installed. Depth response zone from 2.50m to 12.50m. Permeability test done at 12.50m.

Shift Data:

GW (m bgl)	Shift	Depth (m bgl)	Remarks
	01/09/2020 08:00	0.00	Start of shift.
Dry	01/09/2020 18:00	12.50	End of borehole.

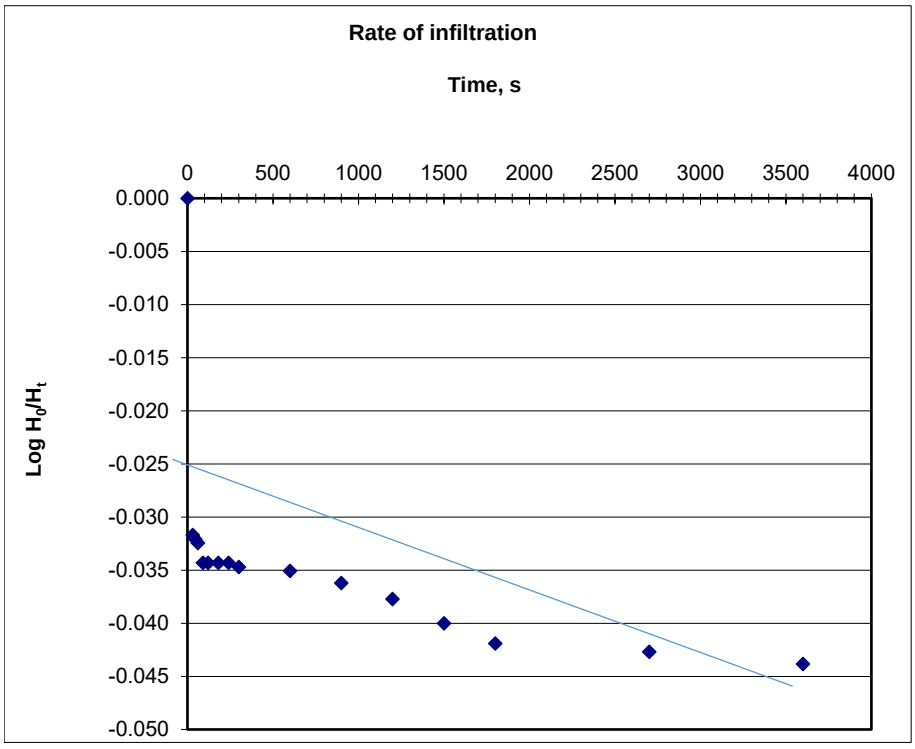
P20083 Falling head permeability test

Location	**Longford Landfills**		
BH ID	**RCGW05**	H_w / H_o	**12.50**
Test	**1**		
Casing diameter	**102** mm		
Casing depth	**4** m		
Borehole depth	**12.5** m		
Groundwater level	**12.50** m bgl		
Date	**01/09/2020**		

Min	Sec	depth, m bgl	vol, cu.m	H_t	log H_0/H_t
0	0	0.000	0.00000	12.500	0.000
0.5	30	0.880	0.03000	11.620	-0.032
	45	0.890	0.03000	11.610	-0.032
1	60	0.900	0.05000	11.600	-0.032
1.5	90	0.950	0.06000	11.550	-0.034
2	120	0.950	0.08000	11.550	-0.034
3	180	0.950	0.10000	11.550	-0.034
4	240	0.950	0.12000	11.550	-0.034
5	300	0.960	0.13000	11.540	-0.035
10	600	0.970	0.21000	11.530	-0.035
15	900	1.000	0.34000	11.500	-0.036
20	1200	1.040	0.51000	11.460	-0.038
25	1500	1.100	0.62000	11.400	-0.040
30	1800	1.150	0.80000	11.350	-0.042
45	2700	1.170	0.83000	11.330	-0.043
60	3600	1.200	1.01000	11.300	-0.044

k_{mean} **1.12E-07** ms^{-1}

$k_H = k_V$



Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Drilled By	Borehole No.
AK	**RCGW06BM**
Logged By	Sheet 1 of 2

Project Name:	Longford Landfills	**Project No.** P20083	**Co-ords:**	616799E - 757760N	**Hole Type** RO
Location:	Co. Longford		**Level:**	54.31 m OD	**Scale** 1:50
Client:	Longford County Council		**Date:**	31/08/2020 - 31/08/2020	

Well Backfill	Water Strike (m bgl)	Sample and In Situ Testing: Depth (m bgl)	Type	Results	Depth (m bgl)	Level (mOD)	Legend	Stratum Description
								Open hole boring. Driller described: GRAVEL.
					1.00	53.31		Open hole boring. Driller described: Sandy Gravel.
					4.00	50.31		Open hole boring. Driller described: Clayey Gravel.

Groundwater:

Struck (m bgl)	Rose to (m bgl)	After (mins)	Sealed (m bgl)	Comment

Hole Information:

Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)
12.50	102	131

Equipment: Soilmech PSM

Chiselling Details:

Top (m)	Base (m)	Duration (hh:mm)	Tool

Remarks:

Borehole terminated at 12.50m bgl, required depth. 50mm standpipe installed. Depth response zone from 9.50m to 12.50m. Permeability test done at 12.50m bgl.

Shift Data:

GW (m bgl)	Shift	Depth (m bgl)	Remarks
	31/08/2020 08:00	0.00	Start of shift.
0.8	31/08/2020 18:00	12.50	End of borehole.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Drilled By	Borehole No.
AK	**RCGW06BM**
Logged By	Sheet 2 of 2

Project Name:	Longford Landfills	**Project No.** P20083	**Co-ords:**	616799E - 757760N	**Hole Type** RO
Location:	Co. Longford		**Level:**	54.31 m OD	**Scale** 1:50
Client:	Longford County Council		**Date:**	31/08/2020 - 31/08/2020	

Well Backfill	Water Strike (m bgl)	Sample and In Situ Testing: Depth (m bgl)	Type	Results	Depth (m bgl)	Level (mOD)	Legend	Stratum Description
								Open hole boring. Driller described: Clayey Gravel.
					11.50	42.81		Open hole boring. Driller described: Very weathered Limestone.
					12.50	41.81		End of Borehole at 12.500m

Groundwater:

Struck (m bgl)	Rose to (m bgl)	After (mins)	Sealed (m bgl)	Comment

Hole Information:

Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)
12.50	102	131

Equipment: Soilmech PSM

Chiselling Details:

Top (m)	Base (m)	Duration (hh:mm)	Tool

Remarks:

Borehole terminated at 12.50m bgl, required depth. 50mm standpipe installed. Depth response zone from 9.50m to 12.50m. Permeability test done at 12.50m bgl.

Shift Data:

GW (m bgl)	Shift	Depth (m bgl)	Remarks
	31/08/2020 08:00	0.00	Start of shift.
0.8	31/08/2020 18:00	12.50	End of borehole.

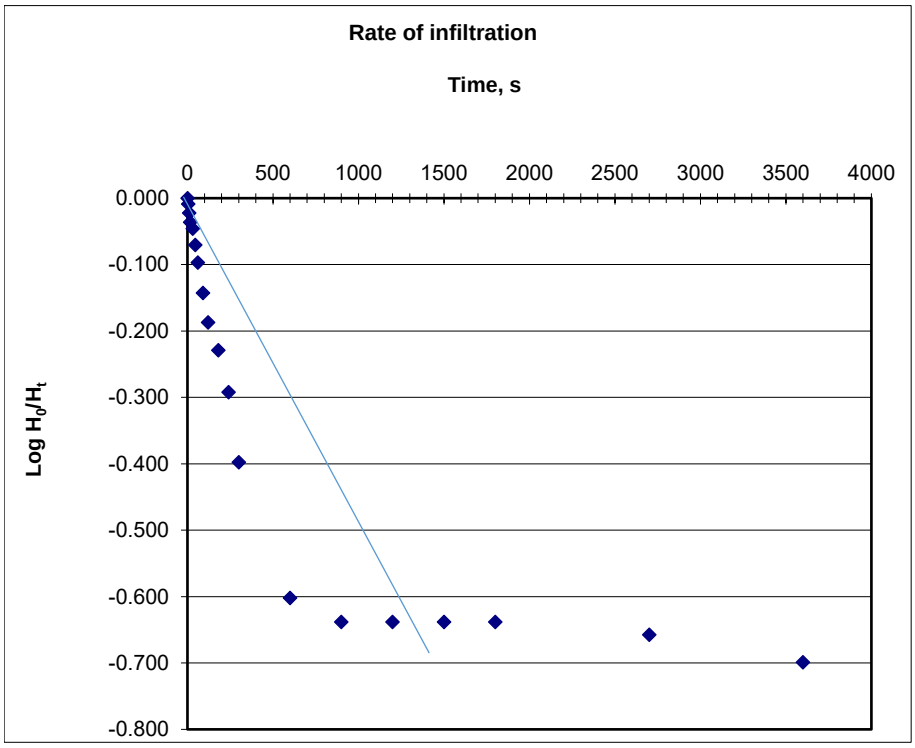
P20083 Falling head permeability test

Location	**Longford Landfills**			
BH ID	**RCGW06**		H_w / H_o	**1.00**
Test	**1**			
Casing diameter	**102**	mm		
Casing depth	**5.5**	m		
Borehole depth	**12.5**	m		
Groundwater level	**1.00**	m bgl		
Date	**31/08/2020**			

Min	Sec	depth, m bgl	vol, cu.m	H_t	log H_0/H_t
0	0	0.000	0.00000	1.000	0.000
	5	0.020	0.00016	0.980	-0.009
	10	0.050	0.00041	0.950	-0.022
	15	0.080	0.00065	0.920	-0.036
0.5	30	0.100	0.03000	0.900	-0.046
0.75	45	0.150	0.03000	0.850	-0.071
1	60	0.200	0.05000	0.800	-0.097
1.5	90	0.280	0.06000	0.720	-0.143
2	120	0.350	0.08000	0.650	-0.187
3	180	0.410	0.10000	0.590	-0.229
4	240	0.490	0.12000	0.510	-0.292
5	300	0.600	0.13000	0.400	-0.398
10	600	0.750	0.21000	0.250	-0.602
15	900	0.770	0.34000	0.230	-0.638
20	1200	0.770	0.51000	0.230	-0.638
25	1500	0.770	0.62000	0.230	-0.638
30	1800	0.770	0.80000	0.230	-0.638
45	2700	0.780	0.83000	0.220	-0.658
60	3600	0.800	1.01000	0.200	-0.699

k_{mean} **1.79E-06** ms^{-1}

$k_H = k_V$



Ballymulvey – Ground Investigation

Client:	Longford County Council
Client's Representative:	Fehily Timoney and Company
Report No.:	22-0980
Date:	October 2022
Status:	Final for Issue

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Registered in Northern Ireland. Company Number: NI610766
Approved: ISO 9001 • ISO 14001 • OHSAS 18001

CONTENTS

APPENDICES

Document Control Sheet

Report No.:		22-0980			
Project Title:		Ballymulvey			
Client:		Longford County Council			
Client's Representative:		Fehily Timoney and Company			
Revision:	A00	**Status:**	Final for Issue	**Issue Date:**	18th October 2022
Prepared by:		**Reviewed by:**		**Approved by:**	
					
Rachel White B.A. (Mod.) Geoscience		Sean Ross BSc MSc MIEI PGeo		Darren O'Mahony BSc MSc MIEI EurGeol PGeo	

The works were conducted in accordance with:

British Standards Institute (2015) BS 5930:2015+A1:2020, Code of practice for ground investigations.

BS EN 1997-2: 2007: Eurocode 7 - Geotechnical design - Part 2 Ground investigation and testing.

Geotechnical Society of Ireland (2016), Specification & Related Documents for Ground Investigation in Ireland

METHODS OF DESCRIBING SOILS AND ROCKS

Soil and rock descriptions are based on the guidance in BS5930:2015+A1:2020, The Code of Practice for Ground Investigation.

Abbreviations used on exploratory hole logs	
U	Nominal 100mm diameter undisturbed open tube sample (thick walled sampler).
UT	Nominal 100mm diameter undisturbed open tube sample (thin walled sampler).
P	Nominal 100mm diameter undisturbed piston sample.
B	Bulk disturbed sample.
LB	Large bulk disturbed sample.
D	Small disturbed sample.
C	Core sub-sample (displayed in the Field Records column on the logs).
L	Liner sample from dynamic sampled borehole.
W	Water sample.
ES / EW	Soil sample for environmental testing / Water sample for environmental testing.
SPT (s)	Standard penetration test using a split spoon sampler (small disturbed sample obtained).
SPT (c)	Standard penetration test using 60 degree solid cone.
(x,x/x,x,x,x)	Blows per increment during the standard penetration test. The initial two values relate to the seating drive (150mm) and the remaining four to the 75mm increments of the test length.
(Y for Z/ Y for Z)	Incomplete standard penetration test where the full test length was not achieved. The blows 'X' represent the total blows for the given seating or test length 'Z' (mm).
N=X	SPT blow count 'N' given by the summation of the blows 'X' required to drive the full test length (300mm).
HVP / HVR	In situ hand vane test result (HVP) and vane test residual result (HVR). Results presented in kPa.
V VR	Shear vane test (borehole). Shear strength stated in kPa. V: undisturbed vane shear strength VR: remoulded vane shear strength
Soil consistency description	In cohesive soils, where samples are disturbed and there are no suitable laboratory tests, N values may be used to indicate consistency on borehole logs – a median relationship of Nx5=Cu is used (as set out in Stroud & Butler 1975).
dd-mm-yyyy	Date at the end and start of shifts, shown at the relevant borehole depth. Corresponding casing and water depths shown in the adjacent columns.
▽	Water strike: initial depth of strike.
▼	Water strike: depth water rose to.
Abbreviations relating to rock core – reference Clause 36.4.4 of BS 5930: 2015+A1:2020	
TCR (%)	Total Core Recovery: Ratio of rock/soil core recovered (both solid and non-intact) to the total length of core run.
SCR (%)	Solid Core Recovery: Ratio of solid core to the total length of core run. Solid core has a full diameter, uninterrupted by natural discontinuities, but not necessarily a full circumference and is measured along the core axis between natural fractures.
RQD (%)	Rock Quality Designation: Ratio of total length of solid core pieces greater than 100mm to the total length of core run.
FI	Fracture Index: Number of natural discontinuities per metre over an indicated length of core of similar intensity of fracturing.
NI	Non Intact: Used where the rock material was recovered fragmented, for example as fine to coarse gravel size particles.
AZCL	Assessed zone of core loss: The estimated depth range where core was not recovered.
DIF	Drilling induced fracture: A fracture of non-geological origin brought about by the rock coring.
(xxx/xxx/xxx)	Spacing between discontinuities (minimum/average/maximum) measured in millimetres.

Ballymulvey

1 AUTHORITY

On the instructions of Fehily Timoney and Company, ("the Client's Representative"), acting on the behalf of Longford County Council ("the Client"), a ground investigation was undertaken at the above location to investigate the current state of the existing landfill.

This report details the work carried out on site; it contains a description of the site and the works undertaken and the exploratory hole logs.

All information given in this report is based upon the ground conditions encountered during the ground investigation works. However, there may be conditions at the site that have not been taken into account, such as unpredictable soil strata, contaminant concentrations, and water conditions between or below exploratory holes. It should be noted that groundwater levels usually vary due to seasonal and/or other effects and may at times differ to those recorded during the investigation. No responsibility can be taken for conditions not encountered through the scope of work commissioned, for example between exploratory hole points, or beneath the termination depths achieved.

This report was prepared by Causeway Geotech Ltd for the use of the Client and the Client's Representative in response to a particular set of instructions. Any other parties using the information contained in this report do so at their own risk and any duty of care to those parties is excluded.

2 SCOPE

The extent of the investigation, as instructed by the Client's Representative, included boreholes, groundwater monitoring and the preparation of a factual report on the findings.

3 DESCRIPTION OF SITE

As shown on the site location plan in Appendix A, the works were conducted on the site of Ballymulvey Historical Landfill, located in the Ballymulvey, County Longfordt. The site is bordered by Newcastle Road to the north and agricultural land to the east, south and west.

Elevations vary across the site, with a rise in elevation towards the north.

4 SITE OPERATIONS

4.1 Summary of site works

Site operations, which were conducted between the 27th and the 28th of September 2022, comprised:

- two boreholes by rotary drilling; and
- a standpipe installation in two boreholes

The exploratory holes were located as instructed by the Client's Representative, as shown on the exploratory hole location plan in Appendix A.

4.2 Boreholes

Two boreholes (GW07 and LH01) were put to their completion by rotary drilling techniques only. The boreholes were completed using a Comacchio 205 tracked drilling rig.

Symmetrix-cased full hole rotary percussive drilling techniques were employed to advance the boreholes to their scheduled depths.

Appendix B presents the borehole logs.

4.3 Standpipe installations

A groundwater monitoring standpipe was installed in boreholes GW07 and LH01.

Details of the installations, including the depth range of the response zone, are provided in Appendix B on the individual borehole logs.

Wattera tubing was installed in each borehole to allow for future groundwater and leachate sampling.

Fencing was installed around the headworks at each location.

4.4 Surveying

The as-built exploratory hole positions were surveyed following completion of site operations by a Site Engineer from Causeway Geotech. Surveying was carried out using a Trimble R10 GPS system employing VRS and real time kinetic (RTK) techniques.

The plan coordinates (Irish Transverse Mercator) and ground elevation (mOD Malin) at each location are recorded on the individual exploratory hole logs. The exploratory hole location plan presented in Appendix A shows these as-built positions.

4.5 Groundwater monitoring

Following completion of site works, groundwater monitoring was conducted over one round. Groundwater monitoring was carried out using a water interface probe.

Details of groundwater monitoring are presented in Section 6.3.

5 GROUND CONDITIONS

5.1 General geology of the area

Published geological mapping indicate the superficial deposits underlying the site comprise cut over raised peat. These deposits are underlain by massive, unbedded limestones of the Waulsortian Limestones Formation.

5.2 Ground types encountered during investigation of the site

A summary of the ground types encountered in the exploratory holes is listed below, in approximate stratigraphic order:

- **Topsoil:** encountered typically in 200mm thickness across the site.
- **Made Ground (landfill):** landfill was encountered to a depth of 8.60m in LH01.
- **Made Ground (fill):** gravelly sand with fragments of concrete, plastic and paper was encountered to a depth of 2.50m in GW07.
- **Recent deposits (peat):** spongey fibrous peat encountered in GW07 beneath made ground.
- **Fluvioglacial deposits:** medium dense silty sands and gravels encountered beneath landfill in LH01 and beneath made ground in GW07.

5.3 Groundwater

Details of the individual groundwater strikes, along with any relative changes in levels as works proceeded, are presented on the exploratory hole logs for each location.

Groundwater strikes were encountered during rotary drilling as seen in Table 1 below.

Table 1. Groundwater strikes encountered during the ground investigations

Location	Depth (mbgl)	Comments
GW07	5.40	Rose from 5.40m to 5.15m over 20 minutes
LH01	7.10	Rose from 7.10m to 6.80m over 20 minutes

It should be noted that the casing used in supporting the borehole walls during drilling may have sealed out additional groundwater strikes and the possibility of encountering groundwater during excavation works should not be ruled out.

Subsequent groundwater monitoring of the standpipe installations recorded water levels as shown in Table 2.

Table 2. Groundwater monitoring

Date	Water level (mbgl)	
	GW07	LH01
14/10/2022	2.25	5.70

Continued monitoring of the two installed standpipes will give an indication of the seasonal variation in groundwater level.

6 REFERENCES

Geotechnical Society of Ireland (2016), Specification & Related Documents for Ground Investigation in Ireland.

IS EN 1997-2: 2007: Eurocode 7 - Geotechnical design - Part 2 Ground investigation and testing. National Standards Authority of Ireland.

BS 5930: 2015+A1:2020: Code of practice for ground investigations. British Standards Institution.

BS EN ISO 14688-1:2018: Geotechnical investigation and testing. Identification and classification of soil. Part 1 Identification and description.

BS EN ISO 14688-2:2018: Geotechnical investigation and testing. Identification and classification of soil. Part 2 Principles for a classification.

BS 1377: 1990: Methods of test for soils for civil engineering purposes. British Standards Institution.

CAUSEWAY GEOTECH

APPENDIX A

SITE AND EXPLORATORY HOLE LOCATION PLANS

Project No.:	22-0980	**Client:**	Longford County Council
Project Name:	Ballymulvey	**Client's Representative:**	Fehily Timoney and Company

Legend Key

Title:

Site Location Plan

Last Revised:	**Scale:**
17/10/2022	1:10000

CAUSEWAY GEOTECH

Project No.:	22-0980	**Client:**	Longford County Council
Project Name:	Ballymulvey	**Client's Representative:**	Fehily Timoney and Company

Legend Key

Locations By Type - RO

Title:

Exploratory Hole Location Plan

Last Revised:	**Scale:**
17/10/2022	1:1000

CAUSEWAY GEOTECH

APPENDIX B

BOREHOLE LOGS

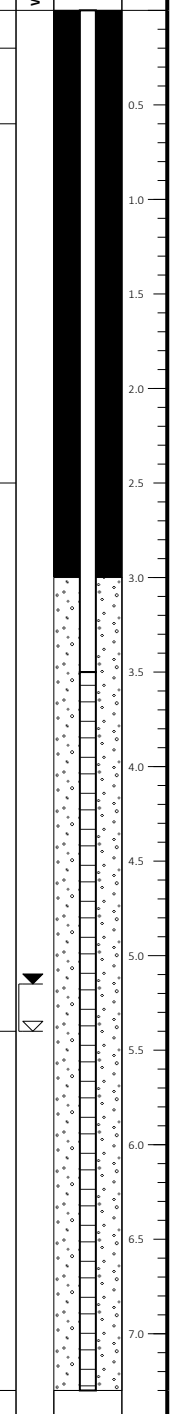
CAUSEWAY GEOTECH

Project No.	Project Name:	Borehole ID
22-0980	Ballymulvey	GW07
	Client: Longford County Council	
	Client's Rep: Fehily Timoney and Company	

Method	Plant Used	Top (m)	Base (m)	Coordinates
Rotary Percussion	Comacchio 205	0.00	10.00	617086.14 E 757952.10 N

Final Depth:	Start Date:	Driller:	Sheet 1 of 2
10.00 m	28/09/2022	JA	Scale: 1:40
Elevation: 55.97 mOD	**End Date:** 28/09/2022	**Logger:** SR	FINAL

Depth (m)	Sample / Tests	Field Records	Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description
					55.77	0.20		TOPSOIL
								MADE GROUND: Light brownish grey sandy GRAVEL. (Driller's description)
					55.37	0.60		MADE GROUND: Dark brownish grey sandy clayey GRAVEL with fragments of concrete and plastic. (Driller's description)
					53.47	2.50		Spongy brownish fibrous PEAT with very fine rootlets (<0.5mm). (Driller's description)
		Large water strike at 5.40m.			50.57	5.40		Brownish grey slightly silty sandy GRAVEL. (Driller's description)



Water Strikes

Struck at (m)	Casing to (m)	Time (min)	Rose to (m)
5.40	5.40	20	5.15

Casing Details

To (m)	Diam (mm)
10.00	150

Water Added

From (m)	To (m)

Remarks

Hand dug inspection pit excavated to 1.20m.

Core Barrel	Flush Type	Termination Reason	Last Updated
	Air	Terminated at scheduled depth.	18/10/2022

AGS

CAUSEWAY GEOTECH

Project No.	Project Name:	Borehole ID
22-0980	Ballymulvey	GW07
	Client: Longford County Council	
	Client's Rep: Fehily Timoney and Company	

Method	Plant Used	Top (m)	Base (m)	Coordinates	Final Depth:	Start Date:	Driller:	Sheet 2 of 2
Rotary Percussion	Comacchio 205	0.00	10.00	617086.14 E 757952.10 N	10.00 m	28/09/2022	JA	Scale: 1:40
					Elevation: 55.97 mOD	End Date: 28/09/2022	Logger: SR	FINAL

Depth (m)	Sample / Tests	Field Records	Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description	Water	Backfill
					48.07	7.90		Brownish grey slightly silty sandy GRAVEL. (Driller's description)		
								Dark reddish brown sandy silty GRAVEL. (Driller's description)		
10.00		28-09-2022	10.0	5.40	45.97	10.00		End of Borehole at 10.00m		

7.5 8.0 8.5 9.0 9.5 10.0 10.5 11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5

Water Strikes

Struck at (m)	Casing to (m)	Time (min)	Rose to (m)
5.40	5.40	20	5.15

Casing Details

To (m)	Diam (mm)
10.00	150

Water Added

From (m)	To (m)

Remarks

Hand dug inspection pit excavated to 1.20m.

Core Barrel	Flush Type	Termination Reason	Last Updated
	Air	Terminated at scheduled depth.	18/10/2022

AGS

CAUSEWAY GEOTECH

Project No.	Project Name:	Borehole ID
22-0980	Ballymulvey	LH01
	Client: Longford County Council	
	Client's Rep: Fehily Timoney and Company	

Method	Plant Used	Top (m)	Base (m)	Coordinates
Rotary Percussion	Comacchio 205	0.00	10.00	617144.55 E 758004.88 N

Final Depth:	Start Date:	Driller:	Sheet 1 of 2
10.00 m	27/09/2022	JA	Scale: 1:40
Elevation: 62.12 mOD	**End Date:** 27/09/2022	**Logger:** SR	FINAL

Depth (m)	Sample / Tests	Field Records	Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description
					61.92	0.20		TOPSOIL
								MADE GROUND: Greyish brown sandy subangular GRAVEL with high cobble content and landfill material. (Driller's description)
					61.52	0.60		MADE GROUND: Grey slightly gravelly fine to coarse SAND with landfill material. (Driller's description)
					57.92	4.20		MADE GROUND: LANDFILL with fragments of plastic, paper, household waste. (Driller's description)
		Large water strike at 7.10m						

Water

Backfill

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0

Water Strikes

Struck at (m)	Casing to (m)	Time (min)	Rose to (m)
7.10	7.10	20	6.80

Casing Details

To (m)	Diam (mm)
10.00	150

Water Added

From (m)	To (m)

Remarks

Hand dug inspection pit excavated to 1.20m.

Core Barrel	Flush Type	Termination Reason	Last Updated
	Air	Terminated at scheduled depth.	18/10/2022

AGS

CAUSEWAY GEOTECH

Project No.	Project Name:	Borehole ID
22-0980	Ballymulvey	LH01
	Client: Longford County Council	
	Client's Rep: Fehily Timoney and Company	

Method	Plant Used	Top (m)	Base (m)	Coordinates	Final Depth:	Start Date:	Driller:	Sheet 2 of 2
Rotary Percussion	Comacchio 205	0.00	10.00	617144.55 E 758004.88 N	10.00 m	27/09/2022	JA	Scale: 1:40
					Elevation: 62.12 mOD	End Date: 27/09/2022	Logger: SR	FINAL

Depth (m)	Sample / Tests	Field Records	Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description	Water	Backfill
					53.52	8.60		MADE GROUND: LANDFILL with fragments of plastic, paper, household waste. (Driller's description)		
					52.52	9.60		Medium dense dark grey sandy silty GRAVEL. (Driller's description)		
10.00		27-09-2022	10.0	7.10	52.12	10.00		Spongy dark brown black fibrous PEAT. (Driller's description)		
								End of Borehole at 10.00m		

7.5 8.0 8.5 9.0 9.5 10.0 10.5 11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5

Water Strikes

Struck at (m)	Casing to (m)	Time (min)	Rose to (m)
7.10	7.10	20	6.80

Casing Details

To (m)	Diam (mm)
10.00	150

Water Added

From (m)	To (m)

Remarks

Hand dug inspection pit excavated to 1.20m.

Core Barrel	Flush Type	Termination Reason	Last Updated
	Air	Terminated at scheduled depth.	18/10/2022

AGS

CAUSEWAY GEOTECH

APPENDIX C

SITE PHOTOGRAPHS

GW07

LH01

FEHILY TIMONEY

CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE
& PLANNING

APPENDIX 8

Groundwater Sampling Laboratory Results

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 of report Generation:	29 June 2021
Customer:	Fehily Timoney
Sample Delivery Group (SDG):	210618-168
Your Reference:	P1444
Location:	Ballymulvey Landfill
Report No:	603730

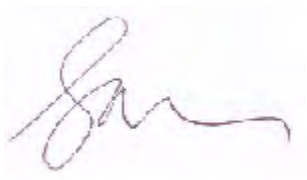
We received 6 samples on Friday June 18, 2021 and 6 of these samples were scheduled for analysis which was completed on Tuesday June 29, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	210618-168	**Client Reference:**	P1444	**Report Number:**	603730
Location:	Ballymulvey Landfill	**Order Number:**	Z2759	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24474611	BH1		0.00 - 0.00	15/06/2021
24474621	BH2		0.00 - 0.00	15/06/2021
24474630	BH3		0.00 - 0.00	15/06/2021
24474640	BH5		0.00 - 0.00	15/06/2021
24474653	GW4		0.00 - 0.00	15/06/2021
24474663	GW6		0.00 - 0.00	15/06/2021

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

Validated

CERTIFICATE OF ANALYSIS

SDG:	210618-168	**Client Reference:**	P1444	**Report Number:**	603730
Location:	Ballymulvey Landfill	**Order Number:**	Z2759	**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			2447611						2447621						2447630						2447640	
Customer Sample Reference			BH1						BH2						BH3						BH5	
AGS Reference																						
Depth (m)			0.00 - 0.00						0.00 - 0.00						0.00 - 0.00						0.00 - 0.00	
Container			0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	
Sample Type			GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 6	X						X						X						X	
Alkalinity as CaCO3	All	NDPs: 0 Tests: 6		X						X						X						
Ammonium Low	All	NDPs: 0 Tests: 6			X						X						X					
Anions by Kone (w)	All	NDPs: 0 Tests: 6		X						X						X						
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 6		X						X						X						
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 6					X						X							X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 6		X						X						X						
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 6		X						X						X						
Fluoride	All	NDPs: 0 Tests: 6	X						X						X						X	
Mercury Dissolved	All	NDPs: 0 Tests: 6		X						X						X						
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 6	X						X						X						X	
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 6	X						X						X						X	
pH Value	All	NDPs: 0 Tests: 6		X						X						X						
Phosphate by Kone (w)	All	NDPs: 0 Tests: 6		X						X						X						
Suspended Solids	All	NDPs: 0 Tests: 6		X						X						X						

24474663	GW6		0.00 - 0.00	Vial (ALE297)	GW																	
				NaOH (ALE245)	GW							x										
				HNO3 Unfiltered (ALE204)	GW																	
				H2SO4 (ALE244)	GW			x														
				500ml Plastic (ALE208)	GW		x		x	x		x	x		x			x	x	x		
				0.5l glass bottle (ALE227)	GW	x								x		x	x					
24474653	GW4		0.00 - 0.00	Vial (ALE297)	GW																	
				NaOH (ALE245)	GW							x										
				HNO3 Unfiltered (ALE204)	GW																	
				H2SO4 (ALE244)	GW			x														
				500ml Plastic (ALE208)	GW		x		x	x		x	x		x			x	x	x		
				0.5l glass bottle (ALE227)	GW	x								x		x	x					
24474640	BH5		0.00 - 0.00	Vial (ALE297)	GW																	
				NaOH (ALE245)	GW							x										
				HNO3 Unfiltered (ALE204)	GW																	
				H2SO4 (ALE244)	GW			x														
				500ml Plastic (ALE208)	GW		x		x	x		x	x		x			x	x	x		

Validated

CERTIFICATE OF ANALYSIS

SDG:	210618-168	**Client Reference:**	P1444	**Report Number:**	603730
Location:	Ballymulvey Landfill	**Order Number:**	Z2759	**Superseded Report:**	

Results Legend

- X — Test
- N — No Determination Possible

Sample Types -

- S - Soil/Solid
- UNS - Unspecified Solid
- GW - Ground Water
- SW - Surface Water
- LE - Land Leachate
- PL - Prepared Leachate
- PR - Process Water
- SA - Saline Water
- TE - Trade Effluent
- TS - Treated Sewage
- US - Untreated Sewage
- RE - Recreational Water
- DW - Drinking Water Non-regulatory
- UNL - Unspecified Liquid
- SL - Sludge
- G - Gas
- OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	SVOC MS (W) - Aqueous	Total Metals by ICP-MS	VOC MS (W)
24474611	BH1		0.00 - 0.00	0.5l glass bottle (ALE227)	GW	X		
				500ml Plastic (ALE208)	GW			
				H2SO4 (ALE244)	GW			
				HNO3 Unfiltered (ALE204)	GW		X	
				NaOH (ALE245)	GW			
				Vial (ALE297)	GW			X
24474621	BH2		0.00 - 0.00	0.5l glass bottle (ALE227)	GW	X		
				500ml Plastic (ALE208)	GW			
				H2SO4 (ALE244)	GW			
				HNO3 Unfiltered (ALE204)	GW		X	
				NaOH (ALE245)	GW			
				Vial (ALE297)	GW			X
24474630	BH3		0.00 - 0.00	0.5l glass bottle (ALE227)	GW	X		
				500ml Plastic (ALE208)	GW			
				H2SO4 (ALE244)	GW			
				HNO3 Unfiltered (ALE204)	GW		X	
				NaOH (ALE245)	GW			
				Vial (ALE297)	GW			X
24474640	BH5		0.00 - 0.00	0.5l glass bottle (ALE227)	GW	X		

Test		
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 6
Total Metals by ICP-MS	All	NDPs: 0 Tests: 6
VOC MS (W)	All	NDPs: 0 Tests: 6

24474663	GW6		0.00 - 0.00	Vial (ALE297)	GW						X
				NaOH (ALE245)	GW						
				HNO3 Unfiltered (ALE204)	GW				X		
				H2SO4 (ALE244)	GW						
				500ml Plastic (ALE208)	GW						
				0.5l glass bottle (ALE227)	GW		X				
24474653	GW4		0.00 - 0.00	Vial (ALE297)	GW						X
				NaOH (ALE245)	GW						
				HNO3 Unfiltered (ALE204)	GW				X		
				H2SO4 (ALE244)	GW						
				500ml Plastic (ALE208)	GW						
				0.5l glass bottle (ALE227)	GW		X				
24474640	BH5		0.00 - 0.00	Vial (ALE297)	GW						X
				NaOH (ALE245)	GW						
				HNO3 Unfiltered (ALE204)	GW				X		
				H2SO4 (ALE244)	GW						
				500ml Plastic (ALE208)	GW						

Validated

CERTIFICATE OF ANALYSIS

SDG:	210618-168	**Client Reference:**	P1444	**Report Number:**	603730
Location:	Ballymulvey Landfill	**Order Number:**	Z2759	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	15/06/2021	15/06/2021	15/06/2021	15/06/2021	15/06/2021	15/06/2021
			Sample Time	.	.	.	.	.	.
			Date Received	18/06/2021	18/06/2021	18/06/2021	18/06/2021	18/06/2021	18/06/2021
			SDG Ref	210618-168	210618-168	210618-168	210618-168	210618-168	210618-168
			Lab Sample No.(s)	24474611	24474621	24474630	24474640	24474653	24474663
			AGS Reference						
Suspended solids, Total	<2 mg/l	TM022		569 #	3830 #	88 #	165 #	116 #	134 #
Alkalinity, Total as CaCO3	<2 mg/l	TM043		424 #	3060 #	449 #	2430 #	325 #	289 #
Oxygen, dissolved	<0.3 mg/l	TM046		9.34	8.68	8.33	7.57	9.16	8.25
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099		0.053 #	1.51 #	15.2 #	177 #	0.715 #	2.19 #
Fluoride	<0.5 mg/l	TM104		<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #
Conductivity @ 20 deg.C	<0.02 mS/cm	TM120		0.681 #	0.752 #	1.24 #	4.77 #	0.556 #	0.511 #
Arsenic (diss.filt)	<0.5 µg/l	TM152		<0.5 2 #	1.7 2 #	0.789 2 #	<0.5 2 #	1.08 2 #	1.7 2 #
Boron (diss.filt)	<10 µg/l	TM152		<10 2 #	22.6 2 #	<10 2 #	<10 2 #	18.3 2 #	<10 2 #
Cadmium (diss.filt)	<0.08 µg/l	TM152		<0.08 2 #	<0.08 2 #	<0.08 2 #	<0.08 2 #	<0.08 2 #	<0.08 2 #
Chromium (diss.filt)	<1 µg/l	TM152		<1 2 #	<1 2 #	<1 2 #	<1 2 #	<1 2 #	<1 2 #
Copper (diss.filt)	<0.3 µg/l	TM152		2.92 2 #	<0.3 2 #	<0.3 2 #	<0.3 2 #	0.547 2 #	0.9 2 #
Lead (diss.filt)	<0.2 µg/l	TM152		<0.2 2 #	<0.2 2 #	<0.2 2 #	<0.2 2 #	<0.2 2 #	<0.2 2 #
Manganese (diss.filt)	<3 µg/l	TM152		85.3 2 #	928 2 #	1630 2 #	3.47 2 #	963 2 #	323 2 #
Phosphorus (tot.unfilt)	<20 µg/l	TM152		656 #	4130 #	81.3 #	2860 #	278 #	186 #
Nickel (diss.filt)	<0.4 µg/l	TM152		2.91 2 #	4.28 2 #	4.77 2 #	<0.4 2 #	3.05 2 #	2.98 2 #
Zinc (diss.filt)	<1 µg/l	TM152		3.5 2 #	7.86 2 #	6.31 2 #	<1 2 #	29 2 #	36.3 2 #
Sodium (Dis.Filt)	<0.076 mg/l	TM152		7.51 2 #	15 2 #	71.3 2 #	3.56 2 #	10.6 2 #	15 2 #
Magnesium (Dis.Filt)	<0.036 mg/l	TM152		14 2 #	8.9 2 #	11.5 2 #	1.8 2 #	19.2 2 #	11.6 2 #
Potassium (Dis.Filt)	<0.2 mg/l	TM152		9.64 2 #	2.54 2 #	6.06 2 #	0.768 2 #	3.61 2 #	2.28 2 #
Calcium (Dis.Filt)	<0.2 mg/l	TM152		151 2 #	198 2 #	222 2 #	1.79 2 #	134 2 #	109 2 #
Iron (Dis.Filt)	<0.019 mg/l	TM152		<0.019 2 #	1.09 2 #	0.644 2 #	<0.019 2 #	<0.019 2 #	0.0292 2 #
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 2 #	0.0169 2 #	0.0191 2 #	<0.01 2 #	<0.01 2 #	<0.01 2 #
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
Sulphate	<2 mg/l	TM184		24 #	25.4 #	16 #	<2 #	<2 #	<2 #
Chloride	<2 mg/l	TM184		22 #	29.5 #	162 #	614 #	18.2 #	18.8 #
Total Oxidised Nitrogen as NO3	<0.3 mg/l	TM184		22.3 #	<0.3 #	<0.3 #	2.3 #	0.707 #	4.25 #
Cyanide, Total	<0.05 mg/l	TM227		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
pH	<1 pH Units	TM256		7.75 #	7.43 #	7.64 #	7.45 #	7.83 #	7.84 #
Trifluralin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.1	<0.01	<0.01
alpha-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.1	<0.01	<0.01
gamma-HCH (Lindane)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.1	<0.01	<0.01
Heptachlor	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.1	<0.01	<0.01
Aldrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.1	<0.01	<0.01

CERTIFICATE OF ANALYSIS

SDG:	210618-168	**Client Reference:**	P1444	**Report Number:**	603730
Location:	Ballymulvey Landfill	**Order Number:**	Z2759	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	15/06/2021	15/06/2021	15/06/2021	15/06/2021	15/06/2021	15/06/2021
			Sample Time	.	.	.	.	.	.
			Date Received	18/06/2021	18/06/2021	18/06/2021	18/06/2021	18/06/2021	18/06/2021
			SDG Ref	210618-168	210618-168	210618-168	210618-168	210618-168	210618-168
			Lab Sample No.(s)	24474611	24474621	24474630	24474640	24474653	24474663
			AGS Reference						
beta-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.1	<0.01	<0.01
Isodrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.1	<0.01	<0.01
delta-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.1	<0.01	<0.01
Heptachlor epoxide	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.1	<0.01	<0.01
o,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.1	<0.01	<0.01
Endosulphan I	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.1	<0.01	<0.01
trans-Chlordane	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.1	<0.01	<0.01
cis-Chlordane	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.1	<0.01	<0.01
p,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.1	<0.01	<0.01
Dieldrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.1	<0.01	<0.01
o,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.1	<0.01	<0.01
Endrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.2	<0.01	<0.01
o,p'-DDT	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.2	<0.02	<0.02
p,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	0.961	<0.01	<0.01
Endosulphan II	<0.02 µg/l	TM343		<0.02	<0.02	<0.02	<0.2	<0.02	<0.02
p,p'-DDT	<0.01 µg/l	TM343		<0.03	<0.03	<0.03	<0.3	<0.03	<0.03
o,p'-Methoxychlor	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.2	<0.02	<0.02
p,p'-Methoxychlor	<0.01 µg/l	TM343		<0.03	<0.03	<0.03	<0.4	<0.03	<0.03
Endosulphan Sulphate	<0.02 µg/l	TM343		<0.02	<0.02	<0.02	<0.2	<0.02	<0.02
Permethrin I	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.1	<0.01	<0.01
Permethrin II	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.1	<0.01	<0.01
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Hexachlorobutadiene	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.14	0.0524	<0.01
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Dichlorvos	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Dichlobenil	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Mevinphos	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Tecnazene	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Hexachlorobenzene	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Demeton-S-methyl	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Phorate	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Diazinon	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01

Validated

CERTIFICATE OF ANALYSIS

SDG:	210618-168	**Client Reference:**	P1444	**Report Number:**	603730
Location:	Ballymulvey Landfill	**Order Number:**	Z2759	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	15/06/2021	15/06/2021	15/06/2021	15/06/2021	15/06/2021	15/06/2021
			Sample Time	.	.	.	.	.	.
			Date Received	18/06/2021	18/06/2021	18/06/2021	18/06/2021	18/06/2021	18/06/2021
			SDG Ref	210618-168	210618-168	210618-168	210618-168	210618-168	210618-168
			Lab Sample No.(s)	24474611	24474621	24474630	24474640	24474653	24474663
			AGS Reference						
Triallate	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Atrazine	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Simazine	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Disulfoton	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Propetamphos	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Chlorpyriphos-methyl	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Dimethoate	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Pirimiphos-methyl	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Chlorpyriphos	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Methyl Parathion	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Malathion	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Fenthion	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Fenitrothion	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Triadimefon	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Pendimethalin	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Parathion	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Chlorfenvinphos	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
trans-Chlordane	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
cis-Chlordane	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Ethion	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Carbophenothion	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Triazophos	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Phosalone	<0.01 µg/l	TM344		<0.01	<0.05	<0.01	<0.02	<0.01	<0.01
Azinphos methyl	<0.02 µg/l	TM344		<0.02	<0.1	<0.02	<0.04	<0.02	<0.02
Azinphos ethyl	<0.02 µg/l	TM344		<0.02	<0.1	<0.02	<0.04	<0.02	<0.02
Dinitro-o-cresol	<0.1 µg/l	TM411		<0.2	<0.2	<0.2	<0.4	<0.4	<0.2
Clopyralid	<0.04 µg/l	TM411		<0.08	<0.08	<0.04	0.266	<0.08	<0.08
MCPA	<0.05 µg/l	TM411		<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
Mecoprop	<0.04 µg/l	TM411		<0.08	<0.08	<0.04	0.706	<0.08	<0.08
Dicamba	<0.04 µg/l	TM411		<0.08	<0.08	<0.04	<0.08	<0.08	<0.08
MCPB	<0.05 µg/l	TM411		<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
2,4-DB	<0.1 µg/l	TM411		<0.2	<0.2	<0.1	<0.2	<0.2	<0.2
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411		<0.1	<0.1	<0.05	<0.1	<0.1	<0.1

Validated

CERTIFICATE OF ANALYSIS

SDG:	210618-168	**Client Reference:**	P1444	**Report Number:**	603730
Location:	Ballymulvey Landfill	**Order Number:**	Z2759	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	15/06/2021	15/06/2021	15/06/2021	15/06/2021	15/06/2021	15/06/2021
			Sample Time	.	.	.	.	.	.
			Date Received	18/06/2021	18/06/2021	18/06/2021	18/06/2021	18/06/2021	18/06/2021
			SDG Ref	210618-168	210618-168	210618-168	210618-168	210618-168	210618-168
			Lab Sample No.(s)	24474611	24474621	24474630	24474640	24474653	24474663
			AGS Reference						
Dichlorprop	<0.1 µg/l	TM411		<0.2	<0.2	<0.1	<0.2	<0.2	<0.2
Triclopyr	<0.05 µg/l	TM411		<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
Fenoprop (Silvex)	<0.1 µg/l	TM411		<0.2	<0.2	<0.1	<0.2	<0.2	<0.2
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
Bromoxynil	<0.04 µg/l	TM411		<0.08	<0.08	<0.04	<0.08	<0.08	<0.08
Benazolin	<0.04 µg/l	TM411		<0.08	<0.08	<0.04	<0.08	<0.08	<0.08
Ioxynil	<0.05 µg/l	TM411		<0.2	<0.2	<0.1	<0.2	<0.2	<0.2
Pentachlorophenol	<0.04 µg/l	TM411		<0.08	<0.08	<0.04	<0.08	<0.08	<0.08
Fluoroxypyr	<0.1 µg/l	TM411		<0.2	<0.2	<0.1	<0.2	<0.2	<0.2

Validated

CERTIFICATE OF ANALYSIS

SDG:	210618-168	**Client Reference:**	P1444	**Report Number:**	603730
Location:	Ballymulvey Landfill	**Order Number:**	Z2759	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	15/06/2021	15/06/2021	15/06/2021	15/06/2021	15/06/2021	15/06/2021
			Sample Time	.	.	.	.	.	.
			Date Received	18/06/2021	18/06/2021	18/06/2021	18/06/2021	18/06/2021	18/06/2021
			SDG Ref	210618-168	210618-168	210618-168	210618-168	210618-168	210618-168
			Lab Sample No.(s)	24474611	24474621	24474630	24474640	24474653	24474663
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
2-Chlorophenol (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
2-Methylphenol (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
2-Nitroaniline (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
2-Nitrophenol (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
3-Nitroaniline (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
4-Chloroaniline (aq)	<1 µg/l	TM176		<4	<8	<1	<10	<1	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
4-Methylphenol (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
4-Nitroaniline (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
4-Nitrophenol (aq)	<1 µg/l	TM176		<4	<8	<1	<10	<1	<1
Azobenzene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Acenaphthylene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Acenaphthene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Anthracene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<8 #	<16 #	<2 #	30.3 #	<2 #	<2 #
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #

CERTIFICATE OF ANALYSIS

SDG:	210618-168	**Client Reference:**	P1444	**Report Number:**	603730
Location:	Ballymulvey Landfill	**Order Number:**	Z2759	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	15/06/2021	15/06/2021	15/06/2021	15/06/2021	15/06/2021	15/06/2021
			Sample Time	.	.	.	.	.	.
			Date Received	18/06/2021	18/06/2021	18/06/2021	18/06/2021	18/06/2021	18/06/2021
			SDG Ref	210618-168	210618-168	210618-168	210618-168	210618-168	210618-168
			Lab Sample No.(s)	24474611	24474621	24474630	24474640	24474653	24474663
			AGS Reference						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Carbazole (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Chrysene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Dibenzofuran (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Diethyl phthalate (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Dimethyl phthalate (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<20 #	<40 #	<5 #	<50 #	<5 #	<5 #
Fluoranthene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Fluorene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Hexachlorobenzene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Pentachlorophenol (aq)	<1 µg/l	TM176		<4	<8	<1	<10	<1	<1
Phenol (aq)	<1 µg/l	TM176		<4	<8	<1	<10	<1	<1
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Hexachloroethane (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Nitrobenzene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Naphthalene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Isophorone (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<4	<8	<1	<10	<1	<1
Phenanthrene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #
Pyrene (aq)	<1 µg/l	TM176		<4 #	<8 #	<1 #	<10 #	<1 #	<1 #

CERTIFICATE OF ANALYSIS

SDG:	210618-168	**Client Reference:**	P1444	**Report Number:**	603730
Location:	Ballymulvey Landfill	**Order Number:**	Z2759	**Superseded Report:**	

VOC MS (W)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	15/06/2021	15/06/2021	15/06/2021	15/06/2021	15/06/2021	15/06/2021
			Sample Time	.	.	.	.	.	.
			Date Received	18/06/2021	18/06/2021	18/06/2021	18/06/2021	18/06/2021	18/06/2021
			SDG Ref	210618-168	210618-168	210618-168	210618-168	210618-168	210618-168
			Lab Sample No.(s)	24474611	24474621	24474630	24474640	24474653	24474663
			AGS Reference						
Dibromofluoromethane**	%	TM208		111	115	110	114	109	108
Toluene-d8**	%	TM208		98.6	98.8	99	98.3	98.7	97.4
4-Bromofluorobenzene**	%	TM208		100	100	99.4	99.5	101	100
Dichlorodifluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Vinyl chloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Trichlorofluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Carbon disulphide	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dichloromethane	<3 µg/l	TM208		<3 #	<3 #	<3 #	<3 #	<3 #	<3 #
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2,2-Dichloropropane	<1 µg/l	TM208		<1	<1	<1	<1	<1	<1
Bromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloroform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Carbontetrachloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Benzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Trichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromodichloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Toluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #

CERTIFICATE OF ANALYSIS

SDG:	210618-168	**Client Reference:**	P1444	**Report Number:**	603730
Location:	Ballymulvey Landfill	**Order Number:**	Z2759	**Superseded Report:**	

VOC MS (W)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	15/06/2021	15/06/2021	15/06/2021	15/06/2021	15/06/2021	15/06/2021
			Sample Time	.	.	.	.	.	.
			Date Received	18/06/2021	18/06/2021	18/06/2021	18/06/2021	18/06/2021	18/06/2021
			SDG Ref	210618-168	210618-168	210618-168	210618-168	210618-168	210618-168
			Lab Sample No.(s)	24474611	24474621	24474630	24474640	24474653	24474663
			AGS Reference						
Tetrachloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromoethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	2.05 #	<1 #	<1 #
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Ethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
m,p-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	2.71 #	<1 #	<1 #
o-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	1.28 #	<1 #	<1 #
Styrene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromoform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Isopropylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,3-Trichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Propylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,4-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	4.53 #	<1 #	<1 #
sec-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-iso-Propyltoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,4-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	1.36 #	2.38 #	<1 #	<1 #
n-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208		<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Hexachlorobutadiene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Naphthalene	<1 µg/l	TM208		<1 #	<1 #	<1 #	2.82 #	<1 #	<1 #
1,2,3-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trichlorobenzene	<1 µg/l	TM208		<1	<1	<1	<1	<1	<1

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
TM046	Method 4500G, AWWA/APHA, 20th Ed., 1999	Measurement of Dissolved Oxygen by Oxygen Meter
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
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
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
TM343	EPA 8270D - Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of Selected Pesticides (Suite I) in Liquids by GCMS
TM344	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite II) by GCMS
TM411	Acid_Herbs_GCMS	Acid Herbs in Water by GCMS

NA = not applicable.

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

CERTIFICATE OF ANALYSIS

SDG:	210618-168	**Client Reference:**	P1444	**Report Number:**	603730
Location:	Ballymulvey Landfill	**Order Number:**	Z2759	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	24474611	24474621	24474630	24474640	24474653	24474663
Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
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
Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Acid Herbicides by GCMS	29-Jun-2021	29-Jun-2021	29-Jun-2021	29-Jun-2021	29-Jun-2021	29-Jun-2021
Alkalinity as CaCO3	23-Jun-2021	23-Jun-2021	23-Jun-2021	23-Jun-2021	23-Jun-2021	23-Jun-2021
Ammonium Low	24-Jun-2021	24-Jun-2021	24-Jun-2021	24-Jun-2021	24-Jun-2021	24-Jun-2021
Anions by Kone (w)	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021
Conductivity (at 20 deg.C)	22-Jun-2021	23-Jun-2021	22-Jun-2021	22-Jun-2021	23-Jun-2021	23-Jun-2021
Cyanide Comp/Free/Total/Thiocyanate	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021
Dissolved Metals by ICP-MS	24-Jun-2021	22-Jun-2021	24-Jun-2021	22-Jun-2021	24-Jun-2021	24-Jun-2021
Dissolved Oxygen by Probe	20-Jun-2021	20-Jun-2021	20-Jun-2021	20-Jun-2021	20-Jun-2021	20-Jun-2021
Fluoride	23-Jun-2021	23-Jun-2021	23-Jun-2021	23-Jun-2021	23-Jun-2021	23-Jun-2021
Mercury Dissolved	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021
Pesticides (Suite I) by GCMS	25-Jun-2021	25-Jun-2021	25-Jun-2021	25-Jun-2021	25-Jun-2021	25-Jun-2021
Pesticides (Suite II) by GCMS	25-Jun-2021	24-Jun-2021	24-Jun-2021	24-Jun-2021	24-Jun-2021	24-Jun-2021
pH Value	21-Jun-2021	21-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	21-Jun-2021
Phosphate by Kone (w)	21-Jun-2021	21-Jun-2021	21-Jun-2021	21-Jun-2021	21-Jun-2021	21-Jun-2021
Suspended Solids	19-Jun-2021	21-Jun-2021	19-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021
SVOC MS (W) - Aqueous	23-Jun-2021	23-Jun-2021	23-Jun-2021	23-Jun-2021	23-Jun-2021	23-Jun-2021
Total Metals by ICP-MS	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021
VOC MS (W)	21-Jun-2021	21-Jun-2021	21-Jun-2021	21-Jun-2021	21-Jun-2021	21-Jun-2021

Appendix General

1. Results are expressed on a dry weight basis (dried at 35ºC) 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. 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.

3. 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.

4. 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.

5. 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.

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

7. Results relate only to the items tested.

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

9. **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.

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

11. 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.

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

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

14. 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.

15. 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.

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

17. **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.

18. **Sample Deviations**

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

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Matrix interference**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**
§	**Sampled on date not provided**

19. **Asbestos**

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.

Identification of Asbestos in Bulk Materials & Soils

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

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

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
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.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.
Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2017).*

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.

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 of report Generation:	27 September 2021
Customer:	Fehily Timoney
Sample Delivery Group (SDG):	210920-13
Your Reference:	P1444
Location:	Ballymulvey
Report No:	614787
Order Number:	Z2871

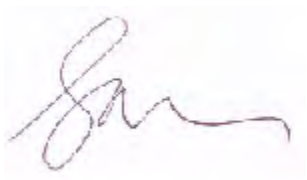
We received 6 samples on Monday September 20, 2021 and 6 of these samples were scheduled for analysis which was completed on Monday September 27, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG: 210920-13 **Report Number:** 614787 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
25006095	BH1		0.00 - 0.00	15/09/2021
25006080	BH2		0.00 - 0.00	15/09/2021
25006070	BH3		0.00 - 0.00	15/09/2021
25006055	BH5		0.00 - 0.00	15/09/2021
25006045	GW4		0.00 - 0.00	15/09/2021
25006029	GW6		0.00 - 0.00	15/09/2021

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

Validated

CERTIFICATE OF ANALYSIS

SDG: 210920-13 **Report Number:** 614787 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
			25006095	BH1		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
							500ml Plastic (ALE208)	GW
							H2SO4 (ALE244)	GW
							HNO3 Unfiltered (ALE204)	GW
							NaOH (ALE245)	GW
							Vial (ALE297)	GW
			25006080	BH2		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
							500ml Plastic (ALE208)	GW
							H2SO4 (ALE244)	GW
							HNO3 Unfiltered (ALE204)	GW
							NaOH (ALE245)	GW
							Vial (ALE297)	GW
			25006070	BH3		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
							500ml Plastic (ALE208)	GW
							H2SO4 (ALE244)	GW
							HNO3 Unfiltered (ALE204)	GW
							NaOH (ALE245)	GW
							Vial (ALE297)	GW
			25006055	BH5		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 6	X				X	
							X	
Alkalinity as CaCO3	All	NDPs: 0 Tests: 6		X				X
				X				X
Ammonium Low	All	NDPs: 0 Tests: 6			X			
					X			X
Anions by Kone (w)	All	NDPs: 0 Tests: 6		X				X
				X				X
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 6		X				X
				X				X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 6				X		
						X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 6		X				X
				X				X
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 6		X				X
				X				X
Fluoride	All	NDPs: 0 Tests: 6		X				X
				X				X
Mercury Dissolved	All	NDPs: 0 Tests: 6		X				X
				X				X
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 6	X				X	
							X	
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 6	X				X	
							X	
pH Value	All	NDPs: 0 Tests: 6		X				X
				X				X
Phosphate by Kone (w)	All	NDPs: 0 Tests: 6		X				X
				X				X
Suspended Solids	All	NDPs: 0 Tests: 6		X				X
				X				X

25006029	GW6		0.00 - 0.00	Vial (ALE297)	GW																	
				NaOH (ALE245)	GW							x										
				HNO3 Unfiltered (ALE204)	GW																	
				H2SO4 (ALE244)	GW			x														
				500ml Plastic (ALE208)	GW		x		x	x		x	x	x	x				x	x	x	
				0.5l glass bottle (ALE227)	GW	x												x	x				
25006045	GW4		0.00 - 0.00	Vial (ALE297)	GW																	
				NaOH (ALE245)	GW							x										
				HNO3 Unfiltered (ALE204)	GW																	
				H2SO4 (ALE244)	GW			x														
				500ml Plastic (ALE208)	GW				x	x		x	x	x	x				x	x	x	
				0.5l glass bottle (ALE227)	GW	x	x											x	x				
25006055	BH5		0.00 - 0.00	Vial (ALE297)	GW																	
				NaOH (ALE245)	GW							x										
				HNO3 Unfiltered (ALE204)	GW																	
				H2SO4 (ALE244)	GW			x														
				500ml Plastic (ALE208)	GW		x		x	x		x	x	x	x				x	x	x	

Validated

CERTIFICATE OF ANALYSIS

SDG: 210920-13 **Report Number:** 614787 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)								25006095							25006080							25006070			25006055
Customer Sample Reference								BH1							BH2							BH3			BH5
AGS Reference																									
Depth (m)								0.00 - 0.00							0.00 - 0.00							0.00 - 0.00			0.00 - 0.00
Container								0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)
Sample Type								GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 6						X						X						X						X
Total Metals by ICP-MS	All	NDPs: 0 Tests: 6									X						X						X			
VOC MS (W)	All	NDPs: 0 Tests: 6							X						X						X				X	

25006029	GW6		0.00 - 0.00	Vial (ALE297)	GW	
				NaOH (ALE245)	GW	
				HNO3 Unfiltered (ALE204)	GW	X
				H2SO4 (ALE244)	GW	
				500ml Plastic (ALE208)	GW	
				0.5l glass bottle (ALE227)	GW	X
25006045	GW4		0.00 - 0.00	Vial (ALE297)	GW	X
				NaOH (ALE245)	GW	
				HNO3 Unfiltered (ALE204)	GW	X
				H2SO4 (ALE244)	GW	
				500ml Plastic (ALE208)	GW	
				0.5l glass bottle (ALE227)	GW	X
25006055	BH5		0.00 - 0.00	Vial (ALE297)	GW	X
				NaOH (ALE245)	GW	
				HNO3 Unfiltered (ALE204)	GW	X
				H2SO4 (ALE244)	GW	
				500ml Plastic (ALE208)	GW	

Validated

CERTIFICATE OF ANALYSIS

SDG: 210920-13 **Report Number:** 614787 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+$@ Sample deviation (see appendix)

Component	LOD/Units	Method	BH1	BH2	BH3	BH5	GW4	GW6
Customer Sample Ref.								
Depth (m)			0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Sample Type			Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
Date Sampled			15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021
Sample Time			.	.	.	.	.	.
Date Received			20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021
SDG Ref			210920-13	210920-13	210920-13	210920-13	210920-13	210920-13
Lab Sample No.(s)			25006095	25006080	25006070	25006055	25006045	25006029
AGS Reference								
Suspended solids, Total	<2 mg/l	TM022	521 #	3980 #	62.3 #	95.6 #	93.1 #	140 #
Alkalinity, Total as CaCO3	<2 mg/l	TM043	405 #	1740 #	580 #	3430 #	426 #	325 #
Oxygen, dissolved	<0.3 mg/l	TM046	6.06	6.65	5.07	4.81	7.88	6.77
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099	0.057 #	1.4 #	18.3 #	425 #	0.67 #	0.358 #
Fluoride	<0.5 mg/l	TM104	<0.5 #	<0.5 #	<0.5 #	0.798 #	<0.5 #	<0.5 #
Conductivity @ 20 deg.C	<0.02 mS/cm	TM120	0.708 #	0.882 #	1.3 #	7.28 #	0.711 #	0.614 #
Arsenic (diss.filt)	<0.5 µg/l	TM152	<0.5 2 #	1.57 2 #	0.655 2 #	2.15 2 #	1.03 2 #	0.913 2 #
Boron (diss.filt)	<10 µg/l	TM152	13.5 2 #	24.6 2 #	14.2 2 #	1690 2 #	23.6 2 #	14.6 2 #
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08 2 #	0.127 2 #	<0.08 2 #	<0.08 2 #	<0.08 2 #	<0.08 2 #
Chromium (diss.filt)	<1 µg/l	TM152	<1 2 #	<1 2 #	<1 2 #	8.77 2 #	<1 2 #	<1 2 #
Copper (diss.filt)	<0.3 µg/l	TM152	2.9 2 #	3.98 2 #	<0.3 2 #	<0.3 2 #	0.854 2 #	1.1 2 #
Lead (diss.filt)	<0.2 µg/l	TM152	<0.2 2 #	<0.2 2 #	<0.2 2 #	<0.2 2 #	<0.2 2 #	<0.2 2 #
Manganese (diss.filt)	<3 µg/l	TM152	26.2 2 #	786 2 #	1150 2 #	345 2 #	905 2 #	52.6 2 #
Phosphorus (tot.unfilt)	<20 µg/l	TM152	728 #	2380 #	99.4 #	2070 #	162 #	66 #
Nickel (diss.filt)	<0.4 µg/l	TM152	3.71 2 #	5.7 2 #	6.02 2 #	8.65 2 #	5.56 2 #	4.92 2 #
Zinc (diss.filt)	<1 µg/l	TM152	1.52 2 #	11.7 2 #	10.2 2 #	4.86 2 #	27.5 2 #	14.9 2 #
Sodium (Dis.Filt)	<0.076 mg/l	TM152	7.33 2 #	14 2 #	75.5 2 #	579 2 #	10.4 2 #	17.1 2 #
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	12.6 2 #	8.52 2 #	14.9 2 #	236 2 #	18.8 2 #	10.3 2 #
Potassium (Dis.Filt)	<0.2 mg/l	TM152	9.57 2 #	2.41 2 #	10.2 2 #	132 2 #	3.75 2 #	1.91 2 #
Calcium (Dis.Filt)	<0.2 mg/l	TM152	139 2 #	187 2 #	194 2 #	215 2 #	131 2 #	112 2 #
Iron (Dis.Filt)	<0.019 mg/l	TM152	<0.019 2 #	0.0356 2 #	0.0485 2 #	0.465 2 #	<0.019 2 #	<0.019 2 #
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01 2 #	<0.01 2 #	<0.01 2 #	<0.01 2 #	<0.01 2 #	<0.01 2 #
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184	<0.05 #	<0.05 #	<0.05 #	0.281 #	<0.05 #	<0.05 #
Sulphate	<2 mg/l	TM184	18.6 #	21.3 #	22.9 #	<2 #	<2 #	4.8 #
Chloride	<2 mg/l	TM184	19.4 #	27.7 #	139 #	885 #	19.9 #	26.1 #
Total Oxidised Nitrogen as NO3	<0.3 mg/l	TM184	12.7 #	0.508 #	3.8 #	0.397 #	1.13 #	14 #
Cyanide, Total	<0.05 mg/l	TM227	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
pH	<1 pH Units	TM256	7.14 #	6.81 #	6.82 #	7.06 #	7.34 #	7.26 #
Trifluralin	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
alpha-HCH	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
gamma-HCH (Lindane)	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aldrin	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

CERTIFICATE OF ANALYSIS

SDG: 210920-13 **Report Number:** 614787 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey

Results Legend	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
# ISO17025 accredited.							
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	0.00 - 0.00
diss.filt Dissolved / filtered sample.	Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
tot.unfilt Total / unfiltered sample.	Date Sampled	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021
* Subcontracted - refer to subcontractor report for accreditation status.	Sample Time	.	.	.	.	.	.
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Date Received	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021
(F) Trigger breach confirmed	SDG Ref	210920-13	210920-13	210920-13	210920-13	210920-13	210920-13
1-4+§@ Sample deviation (see appendix)	Lab Sample No.(s)	25006095	25006080	25006070	25006055	25006045	25006029
	AGS Reference						

Component	LOD/Units	Method					
beta-HCH	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Isodrin	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
delta-HCH	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor epoxide	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
o,p'-DDE	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan I	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
trans-Chlordane	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
cis-Chlordane	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
p,p'-DDE	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dieldrin	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
o,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endrin	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
o,p'-DDT	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
p,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan II	<0.02 µg/l	TM343	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
p,p'-DDT	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
o,p'-Methoxychlor	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
p,p'-Methoxychlor	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan Sulphate	<0.02 µg/l	TM343	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Permethrin I	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Permethrin II	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hexachlorobutadiene	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	0.11	<0.01	<0.01
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dichlorvos	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dichlobenil	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mevinphos	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tecnazene	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hexachlorobenzene	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demeton-S-methyl	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phorate	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Diazinon	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

CERTIFICATE OF ANALYSIS

SDG: 210920-13 **Report Number:** 614787 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey

Results Legend	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
# ISO17025 accredited.							
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	0.00 - 0.00
tot.unfilt Total / unfiltered sample.	Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
* Subcontracted - refer to subcontractor report for accreditation status.	Date Sampled	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Sample Time	.	.	.	.	.	.
(F) Trigger breach confirmed	Date Received	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021
1-4+§@ Sample deviation (see appendix)	SDG Ref	210920-13	210920-13	210920-13	210920-13	210920-13	210920-13
	Lab Sample No.(s)	25006095	25006080	25006070	25006055	25006045	25006029
	AGS Reference						

Component	LOD/Units	Method						
Triallate	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Atrazine	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Simazine	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Disulfoton	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Propetamphos	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chlorpyriphos-methyl	<0.01 µg/l	TM344	<0.02	<0.01	<0.01	<0.01	<0.02	<0.02
Dimethoate	<0.01 µg/l	TM344	<0.02	<0.01	<0.01	<0.01	<0.02	<0.02
Pirimiphos-methyl	<0.01 µg/l	TM344	<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
Methyl Parathion	<0.01 µg/l	TM344	<0.02	<0.01	<0.01	<0.01	<0.02	<0.02
Malathion	<0.01 µg/l	TM344	<0.02	<0.01	<0.01	<0.01	<0.02	<0.02
Fenthion	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fenitrothion	<0.01 µg/l	TM344	<0.02	<0.01	<0.01	<0.01	<0.02	<0.02
Triadimefon	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pendimethalin	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Parathion	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chlorfenvinphos	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
trans-Chlordane	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
cis-Chlordane	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethion	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Carbophenothion	<0.01 µg/l	TM344	<0.02	<0.01	<0.01	<0.01	<0.02	<0.02
Triazophos	<0.01 µg/l	TM344	<0.02	<0.01	<0.01	<0.01	<0.02	<0.02
Phosalone	<0.01 µg/l	TM344	<0.03	<0.02	<0.02	<0.02	<0.03	<0.03
Azinphos methyl	<0.02 µg/l	TM344	<0.2	<0.08	<0.08	<0.08	<0.2	<0.2
Azinphos ethyl	<0.02 µg/l	TM344	<0.06	<0.04	<0.04	<0.04	<0.06	<0.06
Dinitro-o-cresol	<0.1 µg/l	TM411	<0.5	<0.5	0.254	<0.1	0.177	<0.1
Clopyralid	<0.04 µg/l	TM411	<0.2	<0.2	<0.04	0.431	<0.04	<0.04
MCPA	<0.05 µg/l	TM411	<0.25	<0.25	<0.05	0.644	<0.05	<0.05
Mecoprop	<0.04 µg/l	TM411	<0.2	<0.2	0.0452	0.942	<0.04	<0.04
Dicamba	<0.04 µg/l	TM411	<0.2	<0.2	<0.04	<0.04	<0.04	<0.04
MCPB	<0.05 µg/l	TM411	<0.25	<0.25	<0.05	<0.05	<0.05	<0.05
2,4-DB	<0.1 µg/l	TM411	<0.5	<0.5	<0.1	<0.1	<0.1	<0.1
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411	<0.25	<0.25	<0.05	<0.05	<0.05	<0.05

CERTIFICATE OF ANALYSIS

SDG: 210920-13 **Report Number:** 614787 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021
			Sample Time	.	.	.	.	.	.
			Date Received	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021
			SDG Ref	210920-13	210920-13	210920-13	210920-13	210920-13	210920-13
			Lab Sample No.(s)	25006095	25006080	25006070	25006055	25006045	25006029
			AGS Reference						
Dichlorprop	<0.1 µg/l	TM411		<0.5	<0.5	<0.1	0.148	<0.1	<0.1
Triclopyr	<0.05 µg/l	TM411		<0.25	<0.25	<0.05	<0.05	<0.05	<0.05
Fenoprop (Silvex)	<0.1 µg/l	TM411		<0.5	<0.5	<0.1	<0.1	<0.1	<0.1
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.25	<0.25	<0.05	<0.05	<0.05	<0.05
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.25	<0.25	<0.05	<0.05	<0.05	<0.05
Bromoxynil	<0.04 µg/l	TM411		<0.2	<0.2	<0.04	<0.04	<0.04	<0.04
Benazolin	<0.04 µg/l	TM411		<0.2	<0.2	<0.04	<0.04	<0.04	<0.04
Ioxynil	<0.05 µg/l	TM411		<0.25	<0.25	<0.05	<0.05	<0.05	<0.05
Pentachlorophenol	<0.04 µg/l	TM411		<0.2	<0.2	<0.04	<0.04	<0.04	<0.04
Fluoroxypyr	<0.1 µg/l	TM411		<0.5	<0.5	<0.1	<0.1	<0.1	<0.1

Validated

CERTIFICATE OF ANALYSIS

SDG: 210920-13 **Report Number:** 614787 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey

SVOC MS (W) - Aqueous

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021
			Sample Time	.	.	.	.	.	.
			Date Received	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021
			SDG Ref	210920-13	210920-13	210920-13	210920-13	210920-13	210920-13
			Lab Sample No.(s)	25006095	25006080	25006070	25006055	25006045	25006029
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
2-Chlorophenol (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
2-Methylphenol (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
2-Nitroaniline (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
2-Nitrophenol (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
3-Nitroaniline (aq)	<1 µg/l	TM176		<10	<10	<2	<10	<2	<2
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
4-Chloroaniline (aq)	<1 µg/l	TM176		<10	<10	<2	<10	<2	<2
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
4-Methylphenol (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
4-Nitroaniline (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
4-Nitrophenol (aq)	<1 µg/l	TM176		<10	<10	<2	<10	<2	<2
Azobenzene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Acenaphthylene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Acenaphthene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Anthracene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<20 #	<20 #	<4 #	48.7 #	<4 #	<4 #
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #

CERTIFICATE OF ANALYSIS

SDG: 210920-13 **Report Number:** 614787 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey

SVOC MS (W) - Aqueous

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021
			Sample Time	.	.	.	.	.	.
			Date Received	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021
			SDG Ref	210920-13	210920-13	210920-13	210920-13	210920-13	210920-13
			Lab Sample No.(s)	25006095	25006080	25006070	25006055	25006045	25006029
			AGS Reference						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Carbazole (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Chrysene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Dibenzofuran (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Diethyl phthalate (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Dimethyl phthalate (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<50 #	<50 #	<10 #	<50 #	<10 #	<10 #
Fluoranthene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Fluorene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Hexachlorobenzene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Pentachlorophenol (aq)	<1 µg/l	TM176		<10	<10	<2	<10	<2	<2
Phenol (aq)	<1 µg/l	TM176		<10	<10	<2	<10	<2	<2
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Hexachloroethane (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Nitrobenzene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Naphthalene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Isophorone (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<10	<10	<2	<10	<2	<2
Phenanthrene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #
Pyrene (aq)	<1 µg/l	TM176		<10 #	<10 #	<2 #	<10 #	<2 #	<2 #

Validated

CERTIFICATE OF ANALYSIS

SDG: 210920-13 **Report Number:** 614787 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey

VOC MS (W)

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+$@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021
			Sample Time	.	.	.	.	.	.
			Date Received	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021
			SDG Ref	210920-13	210920-13	210920-13	210920-13	210920-13	210920-13
			Lab Sample No.(s)	25006095	25006080	25006070	25006055	25006045	25006029
			AGS Reference						
Dibromofluoromethane**	%	TM208		115	115	117	112	117	114
Toluene-d8**	%	TM208		102	102	101	95	102	101
4-Bromofluorobenzene**	%	TM208		103	103	104	91.2	103	102
Dichlorodifluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Vinyl chloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Trichlorofluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Carbon disulphide	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dichloromethane	<3 µg/l	TM208		<3 #	<3 #	<3 #	<3 #	<3 #	<3 #
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2,2-Dichloropropane	<1 µg/l	TM208		<1	<1	<1	<1	<1	<1
Bromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloroform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Carbontetrachloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Benzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	1.15 #	<1 #	<1 #
Trichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromodichloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Toluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #

Validated

CERTIFICATE OF ANALYSIS

SDG: 210920-13 **Report Number:** 614787 **Superseded Report:**

Client Ref.: P1444 **Location:** Ballymulvey

VOC MS (W)

Results Legend

- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021
			Sample Time	.	.	.	.	.	.
			Date Received	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021
			SDG Ref	210920-13	210920-13	210920-13	210920-13	210920-13	210920-13
			Lab Sample No.(s)	25006095	25006080	25006070	25006055	25006045	25006029
			AGS Reference						
Tetrachloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromoethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	1.96 #	<1 #	<1 #
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Ethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
m,p-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	4.03 #	<1 #	<1 #
o-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	1.97 #	<1 #	<1 #
Styrene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromoform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Isopropylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,3-Trichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Propylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	1.61 #	<1 #	<1 #
4-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,4-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	5.92 #	<1 #	<1 #
sec-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-iso-Propyltoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,4-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	1.22 #	1.83 #	<1 #	<1 #
n-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208		<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Hexachlorobutadiene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Naphthalene	<1 µg/l	TM208		<1 #	<1 #	<1 #	1.67 #	<1 #	<1 #
1,2,3-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trichlorobenzene	<1 µg/l	TM208		<1	<1	<1	<1	<1	<1

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
TM046	Method 4500G, AWWA/APHA, 20th Ed., 1999	Measurement of Dissolved Oxygen by Oxygen Meter
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
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
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
TM343	EPA 8270D - Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of Selected Pesticides (Suite I) in Liquids by GCMS
TM344	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite II) by GCMS
TM411	Acid_Herbs_GCMS	Acid Herbs in Water by GCMS

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden.

CERTIFICATE OF ANALYSIS

SDG: 210920-13 **Report Number:** 614787 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey

Test Completion Dates

Lab Sample No(s)	25006095	25006080	25006070	25006055	25006045	25006029
Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
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
Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Acid Herbicides by GCMS	24-Sep-2021	24-Sep-2021	24-Sep-2021	24-Sep-2021	24-Sep-2021	24-Sep-2021
Alkalinity as CaCO3	22-Sep-2021	27-Sep-2021	22-Sep-2021	22-Sep-2021	27-Sep-2021	22-Sep-2021
Ammonium Low	23-Sep-2021	23-Sep-2021	23-Sep-2021	23-Sep-2021	23-Sep-2021	23-Sep-2021
Anions by Kone (w)	23-Sep-2021	23-Sep-2021	23-Sep-2021	24-Sep-2021	23-Sep-2021	23-Sep-2021
Conductivity (at 20 deg.C)	20-Sep-2021	20-Sep-2021	20-Sep-2021	20-Sep-2021	20-Sep-2021	20-Sep-2021
Cyanide Comp/Free/Total/Thiocyanate	22-Sep-2021	22-Sep-2021	22-Sep-2021	22-Sep-2021	22-Sep-2021	22-Sep-2021
Dissolved Metals by ICP-MS	25-Sep-2021	25-Sep-2021	25-Sep-2021	27-Sep-2021	25-Sep-2021	25-Sep-2021
Dissolved Oxygen by Probe	21-Sep-2021	21-Sep-2021	21-Sep-2021	21-Sep-2021	21-Sep-2021	21-Sep-2021
Fluoride	21-Sep-2021	21-Sep-2021	21-Sep-2021	21-Sep-2021	21-Sep-2021	21-Sep-2021
Mercury Dissolved	23-Sep-2021	23-Sep-2021	23-Sep-2021	23-Sep-2021	23-Sep-2021	23-Sep-2021
Pesticides (Suite I) by GCMS	27-Sep-2021	27-Sep-2021	27-Sep-2021	27-Sep-2021	27-Sep-2021	27-Sep-2021
Pesticides (Suite II) by GCMS	23-Sep-2021	23-Sep-2021	23-Sep-2021	23-Sep-2021	23-Sep-2021	23-Sep-2021
pH Value	21-Sep-2021	21-Sep-2021	21-Sep-2021	21-Sep-2021	21-Sep-2021	21-Sep-2021
Phosphate by Kone (w)	21-Sep-2021	21-Sep-2021	21-Sep-2021	21-Sep-2021	21-Sep-2021	21-Sep-2021
Suspended Solids	21-Sep-2021	21-Sep-2021	21-Sep-2021	21-Sep-2021	21-Sep-2021	21-Sep-2021
SVOC MS (W) - Aqueous	23-Sep-2021	23-Sep-2021	22-Sep-2021	23-Sep-2021	23-Sep-2021	22-Sep-2021
Total Metals by ICP-MS	22-Sep-2021	22-Sep-2021	22-Sep-2021	22-Sep-2021	22-Sep-2021	22-Sep-2021
VOC MS (W)	27-Sep-2021	27-Sep-2021	27-Sep-2021	27-Sep-2021	27-Sep-2021	27-Sep-2021

Appendix General

1. Results are expressed on a dry weight basis (dried at 35ºC) 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. 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.

3. 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.

4. 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.

5. 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.

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

7. Results relate only to the items tested.

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

9. **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.

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

11. 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.

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

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

14. 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.

15. 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.

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

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **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.

19. **Sample Deviations**

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

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Matrix interference**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**
§	**Sampled on date not provided**

20. **Asbestos**

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.

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.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
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.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

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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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 of report Generation:	09 November 2021
Customer:	Fehily Timoney
Sample Delivery Group (SDG):	211101-26
Your Reference:	P1444
Location:	Ballymulvey Landfill
Report No:	620467
Order Number:	Z2871

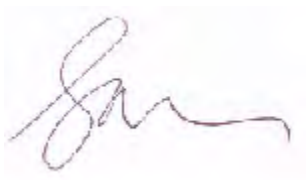
We received 6 samples on Monday November 01, 2021 and 6 of these samples were scheduled for analysis which was completed on Tuesday November 09, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG: 211101-26 **Report Number:** 620467 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
25253418	BH1		0.00 - 0.00	27/10/2021
25253410	BH2		0.00 - 0.00	27/10/2021
25253401	BH3		0.00 - 0.00	27/10/2021
25253391	BH5		0.00 - 0.00	27/10/2021
25253380	GW4		0.00 - 0.00	27/10/2021
25253370	GW6		0.00 - 0.00	27/10/2021

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

Validated

CERTIFICATE OF ANALYSIS

SDG: 211101-26 **Report Number:** 620467 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
			25253418	BH1		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
							500ml Plastic (ALE208)	GW
							H2SO4 (ALE244)	GW
							HNO3 Unfiltered (ALE204)	GW
							NaOH (ALE245)	GW
							Vial (ALE297)	GW
			25253410	BH2		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
							500ml Plastic (ALE208)	GW
							H2SO4 (ALE244)	GW
							HNO3 Unfiltered (ALE204)	GW
							NaOH (ALE245)	GW
							Vial (ALE297)	GW
			25253401	BH3		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
							500ml Plastic (ALE208)	GW
							H2SO4 (ALE244)	GW
							HNO3 Unfiltered (ALE204)	GW
							NaOH (ALE245)	GW
							Vial (ALE297)	GW
			25253391	BH5		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 6						
			X				X	
							X	
							X	
Alkalinity as CaCO3	All	NDPs: 0 Tests: 6						
				X				
							X	
							X	
Ammonium Low	All	NDPs: 0 Tests: 6						
					X			
							X	
							X	
Anions by Kone (w)	All	NDPs: 0 Tests: 6						
				X				
							X	
							X	
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 6						
				X				
							X	
							X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 6						
						X		
							X	
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 6						
				X				
							X	
							X	
Fluoride	All	NDPs: 0 Tests: 6						
				X				
							X	
							X	
Mercury Unfiltered	All	NDPs: 0 Tests: 6						
					X			
							X	
							X	
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 6						
			X				X	
							X	
							X	
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 6						
			X				X	
							X	
							X	
pH Value	All	NDPs: 0 Tests: 6						
				X				
							X	
							X	
Phosphate by Kone (w)	All	NDPs: 0 Tests: 6						
				X				
							X	
							X	
Suspended Solids	All	NDPs: 0 Tests: 6						
				X				
							X	
							X	
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 6						
			X				X	
							X	
							X	

25253370	GW6		0.00 - 0.00	Vial (ALE297)	GW																	
				NaOH (ALE245)	GW							x										
				HNO3 Unfiltered (ALE204)	GW										x							
				H2SO4 (ALE244)	GW				x													
				500ml Plastic (ALE208)	GW		x			x	x			x	x					x	x	x	
				0.5l glass bottle (ALE227)	GW	x											x		x				x
25253380	GW4		0.00 - 0.00	Vial (ALE297)	GW																	
				NaOH (ALE245)	GW							x										
				HNO3 Unfiltered (ALE204)	GW										x							
				H2SO4 (ALE244)	GW				x													
				500ml Plastic (ALE208)	GW		x			x	x			x	x					x	x	x	
				0.5l glass bottle (ALE227)	GW	x											x		x				x
25253391	BH5		0.00 - 0.00	Vial (ALE297)	GW																	
				NaOH (ALE245)	GW							x										
				HNO3 Unfiltered (ALE204)	GW										x							
				H2SO4 (ALE244)	GW				x													
				500ml Plastic (ALE208)	GW		x			x	x			x	x					x	x	x	

Validated

CERTIFICATE OF ANALYSIS

SDG: 211101-26 **Report Number:** 620467 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)							25253418						25253410						25253401			25253391
Customer Sample Reference							BH1						BH2						BH3			BH5
AGS Reference																						
Depth (m)							0.00 - 0.00						0.00 - 0.00						0.00 - 0.00			0.00 - 0.00
Container							0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)
Sample Type							GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
Total Metals by ICP-MS	All	NDPs: 0 Tests: 6								X						X						X			
VOC MS (W)	All	NDPs: 0 Tests: 6										X						X						X	

25253370	GW6		0.00 - 0.00	Vial (ALE297)	GW				
				NaOH (ALE245)	GW				
				HNO3 Unfiltered (ALE204)	GW		X		
				H2SO4 (ALE244)	GW				
				500ml Plastic (ALE208)	GW				
				0.5l glass bottle (ALE227)	GW				
25253380	GW4		0.00 - 0.00	Vial (ALE297)	GW			X	
				NaOH (ALE245)	GW				
				HNO3 Unfiltered (ALE204)	GW		X		
				H2SO4 (ALE244)	GW				
				500ml Plastic (ALE208)	GW				
				0.5l glass bottle (ALE227)	GW				
25253391	BH5		0.00 - 0.00	Vial (ALE297)	GW			X	
				NaOH (ALE245)	GW				
				HNO3 Unfiltered (ALE204)	GW		X		
				H2SO4 (ALE244)	GW				
				500ml Plastic (ALE208)	GW				

Validated

CERTIFICATE OF ANALYSIS

SDG: 211101-26 **Report Number:** 620467 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+$@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
			Sample Time	.	.	.	.	.	.
			Date Received	01/11/2021	01/11/2021	01/11/2021	01/11/2021	01/11/2021	01/11/2021
			SDG Ref	211101-26	211101-26	211101-26	211101-26	211101-26	211101-26
			Lab Sample No.(s)	25253418	25253410	25253401	25253391	25253380	25253370
			AGS Reference						
Suspended solids, Total	<2 mg/l	TM022		294 #	1690 #	51.4 #	227 #	53.7 #	137 #
Alkalinity, Total as CaCO3	<2 mg/l	TM043		397 #	1140 #	508 #	2960 #	437 #	334 #
Oxygen, dissolved	<0.3 mg/l	TM046		8.55	7.44	4.69	4.3	8.98	7.23
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099		0.065 #	1.48 #	4.72 #	284 #	0.704 #	0.724 #
Fluoride	<0.5 mg/l	TM104		<0.5 #	<0.5 #	<0.5 #	0.862 #	<0.5 #	<0.5 #
Conductivity @ 20 deg.C	<0.02 mS/cm	TM120		0.753 #	0.943 #	1.04 #	5.7 #	0.743 #	0.605 #
Arsenic (tot.unfilt)	<2 µg/l	TM152		7.65 #	48.7 #	<2 #	2.03 #	6.65 #	15.2 #
Boron (tot.unfilt)	<20 µg/l	TM152		21.3 #	<120 #	117 #	1730 #	21.3 #	<20 #
Cadmium (tot.unfilt)	<0.5 µg/l	TM152		1.82 #	3.31 #	<0.5 #	0.748 #	<0.5 #	<0.5 #
Chromium (tot.unfilt)	<3 µg/l	TM152		8.59 #	48.6 #	<3 #	11.4 #	<3 #	<3 #
Copper (tot.unfilt)	<1 µg/l	TM152		31.6 #	64 #	2.21 #	3.39 #	2.74 #	1.69 #
Lead (tot.unfilt)	<1 µg/l	TM152		34.7 #	91.9 #	1.23 #	2.17 #	3.04 #	3.18 #
Manganese (tot.unfilt)	<1 µg/l	TM152		5950 #	2260 #	591 #	497 #	1440 #	384 #
Nickel (tot.unfilt)	<1 µg/l	TM152		46.1 #	151 #	4.32 #	7.46 #	5.32 #	5.28 #
Phosphorus (tot.unfilt)	<20 µg/l	TM152		858 #	1790 #	127 #	2450 #	87.6 #	103 #
Zinc (tot.unfilt)	<5 µg/l	TM152		80 #	381 #	31.6 #	42.9 #	64.9 #	33.8 #
Sodium (Tot. Unfilt.)	<0.047 mg/l	TM152		8.42 #	14.5 #	60.6 #	410 #	10.6 #	20.5 #
Magnesium (Tot. Unfilt.)	<0.05 mg/l	TM152		17 #	36 #	34 #	245 #	20.1 #	10.8 #
Potassium (Tot. Unfilt.)	<0.2 mg/l	TM152		10.9 #	4.67 #	24.5 #	113 #	3.93 #	1.72 #
Calcium (Tot. Unfilt.)	<0.057 mg/l	TM152		190 #	739 #	166 #	248 #	145 #	132 #
Iron (Tot. Unfilt.)	<0.024 mg/l	TM152		15.8 #	59.9 #	4.22 #	16.5 #	2.79 #	2.93 #
Mercury (tot.unfilt)	<0.02 µg/l	TM183		0.0951 #	0.451 #	<0.02 #	0.0282 #	<0.02 #	<0.02 #
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184		<0.05 #	<0.05 #	<0.05 #	0.613 #	<0.05 #	<0.05 #
Sulphate	<2 mg/l	TM184		21.5 #	20.7 #	31.2 #	<2 #	<2 #	2.1 #
Chloride	<2 mg/l	TM184		20.3 #	27.9 #	80.9 #	644 #	17.4 #	24.2 #
Total Oxidised Nitrogen as NO3	<0.3 mg/l	TM184		7.39 #	<0.3 #	<0.3 #	0.784 #	4.02 #	9.52 #
Cyanide, Total	<0.05 mg/l	TM227		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
pH	<1 pH Units	TM256		7.24 #	6.88 #	7.07 #	7.08 #	7.45 #	7.53 #
Trifluralin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
alpha-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
gamma-HCH (Lindane)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aldrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

CERTIFICATE OF ANALYSIS

SDG: 211101-26 **Report Number:** 620467 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
			Sample Time	.	.	.	.	.	.
			Date Received	01/11/2021	01/11/2021	01/11/2021	01/11/2021	01/11/2021	01/11/2021
			SDG Ref	211101-26	211101-26	211101-26	211101-26	211101-26	211101-26
			Lab Sample No.(s)	25253418	25253410	25253401	25253391	25253380	25253370
			AGS Reference						
beta-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Isodrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
delta-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor epoxide	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
o,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan I	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
trans-Chlordane	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
cis-Chlordane	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
p,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dieldrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
o,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endrin	<0.01 µg/l	TM343		<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
o,p'-DDT	<0.01 µg/l	TM343		<0.03	<0.03	<0.01	<0.03	<0.03	<0.02
p,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.04	<0.01	<0.01
Endosulphan II	<0.02 µg/l	TM343		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
p,p'-DDT	<0.01 µg/l	TM343		<0.06	<0.06	<0.01	<0.06	<0.06	<0.03
o,p'-Methoxychlor	<0.01 µg/l	TM343		<0.03	<0.03	<0.01	<0.03	<0.03	<0.02
p,p'-Methoxychlor	<0.01 µg/l	TM343		<0.06	<0.06	<0.01	<0.06	<0.06	<0.03
Endosulphan Sulphate	<0.02 µg/l	TM343		<0.04	<0.04	<0.04	<0.04	<0.04	<0.08
Permethrin I	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Permethrin II	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344		<0.1	<0.2	<0.02	<0.2	<0.02	<0.02
Hexachlorobutadiene	<0.01 µg/l	TM344		<0.1	<0.2	<0.02	<0.2	<0.02	<0.02
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344		<0.1	<0.2	<0.02	<0.2	<0.02	<0.02
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344		<0.1	<0.2	<0.02	<0.2	<0.02	<0.01
Dichlorvos	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
Dichlobenil	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
Mevinphos	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
Tecnazene	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
Hexachlorobenzene	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.2	<0.01	<0.02
Demeton-S-methyl	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.02
Phorate	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
Diazinon	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01

CERTIFICATE OF ANALYSIS

SDG: 211101-26 **Report Number:** 620467 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
			Sample Time	.	.	.	.	.	.
			Date Received	01/11/2021	01/11/2021	01/11/2021	01/11/2021	01/11/2021	01/11/2021
			SDG Ref	211101-26	211101-26	211101-26	211101-26	211101-26	211101-26
			Lab Sample No.(s)	25253418	25253410	25253401	25253391	25253380	25253370
			AGS Reference						
Triallate	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
Atrazine	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
Simazine	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	0.61	<0.01	<0.01
Disulfoton	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.02
Propetamphos	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
Chlorpyriphos-methyl	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
Dimethoate	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
Pirimiphos-methyl	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.02
Chlorpyriphos	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
Methyl Parathion	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
Malathion	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
Fenthion	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.02
Fenitrothion	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
Triadimefon	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
Pendimethalin	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
Parathion	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
Chlorfenvinphos	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
trans-Chlordane	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.02
cis-Chlordane	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.02
Ethion	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
Carbophenothion	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
Triazophos	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.1	<0.01	<0.01
Phosalone	<0.01 µg/l	TM344		<0.1	<0.2	<0.01	<0.1	<0.01	<0.01
Azinphos methyl	<0.02 µg/l	TM344		<0.3	<0.6	<0.06	<0.4	<0.06	<0.02
Azinphos ethyl	<0.02 µg/l	TM344		<0.2	<0.4	<0.04	<0.2	<0.04	<0.02
Dinitro-o-cresol	<0.1 µg/l	TM411		<0.2	<0.2	0.199	<0.1	<0.1	<0.2
Clopyralid	<0.04 µg/l	TM411		<0.08	<0.08	<0.04	0.066	<0.04	<0.08
MCPA	<0.05 µg/l	TM411		<0.1	<0.1	<0.05	0.432	<0.05	<0.1
Mecoprop	<0.04 µg/l	TM411		<0.08	<0.08	<0.04	0.659	<0.04	<0.08
Dicamba	<0.04 µg/l	TM411		<0.08	<0.08	<0.04	<0.04	<0.04	<0.08
MCPB	<0.05 µg/l	TM411		<0.1	<0.1	<0.1	0.221	<0.05	<0.1
2,4-DB	<0.1 µg/l	TM411		<0.2	<0.2	<0.1	<0.1	<0.1	<0.2
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411		<0.1	<0.1	<0.05	<0.05	<0.05	<0.1

CERTIFICATE OF ANALYSIS

SDG: 211101-26 **Report Number:** 620467 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
			Sample Time	.	.	.	.	.	.
			Date Received	01/11/2021	01/11/2021	01/11/2021	01/11/2021	01/11/2021	01/11/2021
			SDG Ref	211101-26	211101-26	211101-26	211101-26	211101-26	211101-26
			Lab Sample No.(s)	25253418	25253410	25253401	25253391	25253380	25253370
			AGS Reference						
Dichlorprop	<0.1 µg/l	TM411		<0.2	<0.2	<0.1	<0.1	<0.1	<0.2
Triclopyr	<0.05 µg/l	TM411		<0.1	<0.1	<0.05	<0.05	<0.05	<0.1
Fenoprop (Silvex)	<0.1 µg/l	TM411		<0.2	<0.2	<0.1	<0.1	<0.1	<0.2
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.1	<0.1	<0.05	<0.05	<0.05	<0.1
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.1	<0.1	<0.05	<0.05	<0.05	<0.1
Bromoxynil	<0.04 µg/l	TM411		<0.08	<0.08	<0.04	<0.04	<0.04	<0.08
Benazolin	<0.04 µg/l	TM411		<0.08	<0.08	<0.04	0.72	<0.04	<0.08
Ioxynil	<0.05 µg/l	TM411		<0.1	<0.1	<0.05	<0.05	<0.05	<0.1
Pentachlorophenol	<0.04 µg/l	TM411		<0.08	<0.08	<0.04	<0.04	<0.04	<0.08
Fluoroxypyr	<0.1 µg/l	TM411		<0.2	<0.2	<0.1	<0.1	<0.1	<0.2

CERTIFICATE OF ANALYSIS

SDG: 211101-26 **Report Number:** 620467 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

SVOC MS (W) - Aqueous

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
			Sample Time	.	.	.	.	.	.
			Date Received	01/11/2021	01/11/2021	01/11/2021	01/11/2021	01/11/2021	01/11/2021
			SDG Ref	211101-26	211101-26	211101-26	211101-26	211101-26	211101-26
			Lab Sample No.(s)	25253418	25253410	25253401	25253391	25253380	25253370
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
2-Chlorophenol (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
2-Methylphenol (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
2-Nitroaniline (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
2-Nitrophenol (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
3-Nitroaniline (aq)	<1 µg/l	TM176		<4	<10	<1	<10	<1	<1
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
4-Chloroaniline (aq)	<1 µg/l	TM176		<4	<10	<1	<10	<1	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
4-Methylphenol (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
4-Nitroaniline (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
4-Nitrophenol (aq)	<1 µg/l	TM176		<4	<10	<1	<10	<1	<1
Azobenzene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Acenaphthylene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Acenaphthene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Anthracene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<8 #	<20 #	<2 #	24.2 #	<2 #	<2 @ #
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #

CERTIFICATE OF ANALYSIS

SDG: 211101-26 **Report Number:** 620467 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

SVOC MS (W) - Aqueous

Results Legend
- # ISO17025 accredited.
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- aq Aqueous / settled sample.
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- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
			Sample Time	.	.	.	.	.	.
			Date Received	01/11/2021	01/11/2021	01/11/2021	01/11/2021	01/11/2021	01/11/2021
			SDG Ref	211101-26	211101-26	211101-26	211101-26	211101-26	211101-26
			Lab Sample No.(s)	25253418	25253410	25253401	25253391	25253380	25253370
			AGS Reference						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Carbazole (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Chrysene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Dibenzofuran (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Diethyl phthalate (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Dimethyl phthalate (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<20 #	<50 #	<5 #	<50 #	<5 #	<5 @ #
Fluoranthene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Fluorene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Hexachlorobenzene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Pentachlorophenol (aq)	<1 µg/l	TM176		<4	<10	<1	<10	<1	<1
Phenol (aq)	<1 µg/l	TM176		<4	<10	<1	<10	<1	<1
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Hexachloroethane (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Nitrobenzene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Naphthalene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Isophorone (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<4	<10	<1	<10	<1	<1
Phenanthrene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #
Pyrene (aq)	<1 µg/l	TM176		<4 #	<10 #	<1 #	<10 #	<1 #	<1 @ #

CERTIFICATE OF ANALYSIS

SDG: 211101-26 **Report Number:** 620467 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

VOC MS (W)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
			Sample Time	.	.	.	.	.	.
			Date Received	01/11/2021	01/11/2021	01/11/2021	01/11/2021	01/11/2021	01/11/2021
			SDG Ref	211101-26	211101-26	211101-26	211101-26	211101-26	211101-26
			Lab Sample No.(s)	25253418	25253410	25253401	25253391	25253380	25253370
			AGS Reference						
Dibromofluoromethane**	%	TM208		111	112	116	116	113	115
Toluene-d8**	%	TM208		101	101	101	99.1	101	101
4-Bromofluorobenzene**	%	TM208		102	104	104	97.2	104	104
Dichlorodifluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Vinyl chloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Trichlorofluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Carbon disulphide	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dichloromethane	<3 µg/l	TM208		<3 #	<3 #	<3 #	<3 #	<3 #	<3 #
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2,2-Dichloropropane	<1 µg/l	TM208		<1	<1	<1	<1	<1	<1
Bromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloroform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Carbontetrachloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Benzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	1.02 #	<1 #	<1 #
Trichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromodichloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Toluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #

CERTIFICATE OF ANALYSIS

SDG: 211101-26 **Report Number:** 620467 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

VOC MS (W)

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
			Sample Time	.	.	.	.	.	.
			Date Received	01/11/2021	01/11/2021	01/11/2021	01/11/2021	01/11/2021	01/11/2021
			SDG Ref	211101-26	211101-26	211101-26	211101-26	211101-26	211101-26
			Lab Sample No.(s)	25253418	25253410	25253401	25253391	25253380	25253370
			AGS Reference						
Tetrachloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromoethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	2.19 #	<1 #	<1 #
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Ethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
m,p-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	3.18 #	<1 #	<1 #
o-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	1.3 #	<1 #	<1 #
Styrene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromoform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Isopropylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,3-Trichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Propylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,4-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	5.42 #	<1 #	<1 #
sec-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-iso-Propyltoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,4-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	1.99 #	<1 #	<1 #
n-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208		<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Hexachlorobutadiene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Naphthalene	<1 µg/l	TM208		<1 #	<1 #	<1 #	3.16 #	<1 #	<1 #
1,2,3-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trichlorobenzene	<1 µg/l	TM208		<1	<1	<1	<1	<1	<1

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
TM046	Method 4500G, AWWA/APHA, 20th Ed., 1999	Measurement of Dissolved Oxygen by Oxygen Meter
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
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
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
TM343	EPA 8270D - Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of Selected Pesticides (Suite I) in Liquids by GCMS
TM344	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite II) by GCMS
TM411	Acid_Herbs_GCMS	Acid Herbs in Water by GCMS

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden.

CERTIFICATE OF ANALYSIS

SDG: 211101-26 **Report Number:** 620467 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Test Completion Dates

Lab Sample No(s)	25253418	25253410	25253401	25253391	25253380	25253370
Customer Sample Ref.	BH1	BH2	BH3	BH5	GW4	GW6
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
Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Acid Herbicides by GCMS	08-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	08-Nov-2021	09-Nov-2021
Alkalinity as CaCO3	05-Nov-2021	04-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	04-Nov-2021
Ammonium Low	09-Nov-2021	05-Nov-2021	08-Nov-2021	08-Nov-2021	08-Nov-2021	08-Nov-2021
Anions by Kone (w)	08-Nov-2021	08-Nov-2021	08-Nov-2021	08-Nov-2021	08-Nov-2021	08-Nov-2021
Conductivity (at 20 deg.C)	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021
Cyanide Comp/Free/Total/Thiocyanate	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021
Dissolved Oxygen by Probe	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021
Fluoride	03-Nov-2021	03-Nov-2021	03-Nov-2021	03-Nov-2021	03-Nov-2021	03-Nov-2021
Mercury Unfiltered	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021
Pesticides (Suite I) by GCMS	05-Nov-2021	05-Nov-2021	04-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021
Pesticides (Suite II) by GCMS	05-Nov-2021	05-Nov-2021	05-Nov-2021	09-Nov-2021	05-Nov-2021	09-Nov-2021
pH Value	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021
Phosphate by Kone (w)	03-Nov-2021	03-Nov-2021	03-Nov-2021	03-Nov-2021	03-Nov-2021	03-Nov-2021
Suspended Solids	06-Nov-2021	05-Nov-2021	06-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021
SVOC MS (W) - Aqueous	08-Nov-2021	08-Nov-2021	08-Nov-2021	08-Nov-2021	08-Nov-2021	09-Nov-2021
Total Metals by ICP-MS	05-Nov-2021	05-Nov-2021	05-Nov-2021	08-Nov-2021	05-Nov-2021	05-Nov-2021
VOC MS (W)	08-Nov-2021	08-Nov-2021	08-Nov-2021	08-Nov-2021	08-Nov-2021	08-Nov-2021

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) 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. 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.

3. 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.

4. 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.

5. 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.

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

7. Results relate only to the items tested.

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

9. **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.

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

11. 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.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

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

14. 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.

15. 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.

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

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **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.

19. **Sample Deviations**

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

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Matrix interference**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**
§	**Sampled on date not provided**

20. **Asbestos**

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.

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.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
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.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

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.

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
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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 of report Generation:	04 March 2022
Customer:	Fehily Timoney
Sample Delivery Group (SDG):	220222-36
Your Reference:	P21-312
Location:	Ballymulvey Landfill
Report No:	636178
Order Number:	Z3180

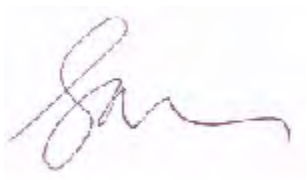
We received 5 samples on Tuesday February 22, 2022 and 5 of these samples were scheduled for analysis which was completed on Friday March 04, 2022. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG: 220222-36 **Report Number:** 636178 **Superseded Report:**
Client Ref.: P21-312 **Location:** Ballymulvey Landfill

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
25858250	BH1		0.00 - 0.00	17/02/2022
25858267	BH2		0.00 - 0.00	17/02/2022
25858276	BH3		0.00 - 0.00	17/02/2022
25858286	GW4		0.00 - 0.00	17/02/2022
25858298	GW6		0.00 - 0.00	17/02/2022

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

Validated

CERTIFICATE OF ANALYSIS

SDG: 220222-36 **Report Number:** 636178 **Superseded Report:**
Client Ref.: P21-312 **Location:** Ballymulvey Landfill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	25858250						25858267						25858276						25858286
			Customer Sample Reference	BH1						BH2						BH3						GW4
			AGS Reference																			
			Depth (m)	0.00 - 0.00						0.00 - 0.00						0.00 - 0.00						0.00 - 0.00
			Container	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)
			Sample Type	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 5		X						X						X						X
Alkalinity as CaCO3	All	NDPs: 0 Tests: 5		X						X						X						X
Ammonium Low	All	NDPs: 0 Tests: 5				X						X						X				
Anions by Kone (w)	All	NDPs: 0 Tests: 5			X						X						X					
BOD True Total	All	NDPs: 0 Tests: 5			X						X						X					
COD Unfiltered	All	NDPs: 0 Tests: 5		X						X						X						X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 5						X						X						X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 5		X						X						X						X
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 5			X						X						X					
Fluoride	All	NDPs: 0 Tests: 5			X						X						X					
Mercury Dissolved	All	NDPs: 0 Tests: 5		X						X						X						X
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 5		X						X						X						X
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 5		X						X						X						X
Phosphate by Kone (w)	All	NDPs: 0 Tests: 5			X						X						X					
Suspended Solids	All	NDPs: 0 Tests: 5			X						X						X					

25858298	GW6		0.00 - 0.00	Vial (ALE297)	GW																	
				NaOH (ALE245)	GW								X									
				HNO3 Unfiltered (ALE204)	GW																	
				H2SO4 (ALE244)	GW				X													
				500ml Plastic (ALE208)	GW					X		X					X		X				X		X
				0.5l glass bottle (ALE227)	GW		X		X					X		X				X		X		X		
25858286	GW4		0.00 - 0.00	Vial (ALE297)	GW																	
				NaOH (ALE245)	GW								X									
				HNO3 Unfiltered (ALE204)	GW																	
				H2SO4 (ALE244)	GW				X													
				500ml Plastic (ALE208)	GW					X		X					X		X				X		X

Validated

CERTIFICATE OF ANALYSIS

SDG: 220222-36 **Report Number:** 636178 **Superseded Report:**
Client Ref.: P21-312 **Location:** Ballymulvey Landfill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			25858250						25858267						25858276						25858286			
Customer Sample Reference			BH1						BH2						BH3						GW4			
AGS Reference																								
Depth (m)			0.00 - 0.00						0.00 - 0.00						0.00 - 0.00						0.00 - 0.00			
Container			0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)			
Sample Type			GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW			
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 5	X						X						X						X			
Total Metals by ICP-MS	All	NDPs: 0 Tests: 5				X						X						X						
VOC MS (W)	All	NDPs: 0 Tests: 5						X						X						X				

25858298	GW6		0.00 - 0.00	Vial (ALE297)	GW						X
				NaOH (ALE245)	GW						
				HNO3 Unfiltered (ALE204)	GW				X		
				H2SO4 (ALE244)	GW						
				500ml Plastic (ALE208)	GW						
				0.5l glass bottle (ALE227)	GW		X				
25858286	GW4		0.00 - 0.00	Vial (ALE297)	GW						X
				NaOH (ALE245)	GW						
				HNO3 Unfiltered (ALE204)	GW				X		
				H2SO4 (ALE244)	GW						
				500ml Plastic (ALE208)	GW						

CERTIFICATE OF ANALYSIS

SDG: 220222-36 **Report Number:** 636178 **Superseded Report:**
Client Ref.: P21-312 **Location:** Ballymulvey Landfill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+$@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	17/02/2022	17/02/2022	17/02/2022	17/02/2022	17/02/2022
			Sample Time	.	.	.	.	.
			Date Received	22/02/2022	22/02/2022	22/02/2022	22/02/2022	22/02/2022
			SDG Ref	220222-36	220222-36	220222-36	220222-36	220222-36
			Lab Sample No.(s)	25858250	25858267	25858276	25858286	25858298
			AGS Reference					
Suspended solids, Total	<2 mg/l	TM022		3.2 #	9.25 #	39 #	105 #	25 #
Alkalinity, Total as CaCO3	<2 mg/l	TM043		430 #	530 #	561 #	447 #	397 #
BOD, unfiltered	<1 mg/l	TM045		<1 @ #	<1 @ #	<1 @ #	<1 @ #	<1 @ #
Oxygen, dissolved	<0.3 mg/l	TM046		7.95	10.5	7.78	9.51	9.91
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099		0.102 #	0.667 #	7.5 #	0.911 #	0.039 #
Fluoride	<0.5 mg/l	TM104		<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #
COD, unfiltered	<7 mg/l	TM107		19.2 #	51.7 #	55.3 #	41.6 #	27.6 #
Arsenic (diss.filt)	<0.5 µg/l	TM152		0.563 2 #	1.17 2 #	0.965 2 #	0.938 2 #	<0.5 2 #
Boron (diss.filt)	<10 µg/l	TM152		70.7 2 #	25.2 2 #	88.6 2 #	13.6 2 #	<10 2 #
Cadmium (diss.filt)	<0.08 µg/l	TM152		<0.08 2 #	<0.08 2 #	<0.08 2 #	<0.08 2 #	<0.08 2 #
Chromium (diss.filt)	<1 µg/l	TM152		2.13 2 #	<1 2 #	2.22 2 #	1.14 2 #	1.91 2 #
Copper (diss.filt)	<0.3 µg/l	TM152		3.69 2 #	2.12 2 #	1.55 2 #	2.03 2 #	1.66 2 #
Lead (diss.filt)	<0.2 µg/l	TM152		<0.2 2 #	<0.2 2 #	<0.2 2 #	<0.2 2 #	<0.2 2 #
Manganese (diss.filt)	<3 µg/l	TM152		65.6 2 #	700 2 #	548 2 #	1910 2 #	7.62 2 #
Phosphorus (tot.unfilt)	<20 µg/l	TM152		49.5 #	270 #	232 #	130 #	58.9 #
Nickel (diss.filt)	<0.4 µg/l	TM152		5.3 2 #	4.78 2 #	4.39 2 #	5.5 2 #	3.55 2 #
Zinc (diss.filt)	<1 µg/l	TM152		9.56 2 #	9.26 2 #	6.69 2 #	24.4 2 #	15 2 #
Sodium (Dis.Filt)	<0.076 mg/l	TM152		9.02 2 #	14.3 2 #	65.8 2 #	8.35 2 #	18.6 2 #
Magnesium (Dis.Filt)	<0.036 mg/l	TM152		18.7 2 #	9.18 2 #	28 2 #	17.2 2 #	5.69 2 #
Potassium (Dis.Filt)	<0.2 mg/l	TM152		8.75 2 #	2.92 2 #	20.3 2 #	3.51 2 #	0.717 2 #
Calcium (Dis.Filt)	<0.2 mg/l	TM152		166 2 #	202 2 #	165 2 #	154 2 #	157 2 #
Iron (Dis.Filt)	<0.019 mg/l	TM152		<0.019 2 #	0.0277 2 #	0.0446 2 #	<0.019 2 #	<0.019 2 #
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 2 #	<0.01 2 #	<0.01 2 #	<0.01 2 #	<0.01 2 #
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
Sulphate	<2 mg/l	TM184		60.5 #	25.1 #	18.4 #	<2 #	10.3 #
Chloride	<2 mg/l	TM184		20 #	22.7 #	102 #	15.7 #	27.9 #
Total Oxidised Nitrogen as NO3	<0.3 mg/l	TM184		10.3 #	6.89 #	0.441 #	1.55 #	13.2 #
Cyanide, Total	<0.05 mg/l	TM227		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
Trifluralin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
alpha-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
gamma-HCH (Lindane)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
Aldrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01

CERTIFICATE OF ANALYSIS

SDG: 220222-36 **Report Number:** 636178 **Superseded Report:**
Client Ref.: P21-312 **Location:** Ballymulvey Landfill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6	
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	
			Date Sampled	17/02/2022	17/02/2022	17/02/2022	17/02/2022	17/02/2022	
			Sample Time	.	.	.	.	.	
			Date Received	22/02/2022	22/02/2022	22/02/2022	22/02/2022	22/02/2022	
			SDG Ref	220222-36	220222-36	220222-36	220222-36	220222-36	
			Lab Sample No.(s)	25858250	25858267	25858276	25858286	25858298	
			AGS Reference						
beta-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	
Isodrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	
delta-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	
Heptachlor epoxide	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	
o,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	
Endosulphan I	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	
trans-Chlordane	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	
cis-Chlordane	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	
p,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	
Dieldrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	
o,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	
Endrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	
o,p'-DDT	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	
p,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	
Endosulphan II	<0.02 µg/l	TM343		<0.02	<0.02	<0.02	<0.02	<0.02	
p,p'-DDT	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	
o,p'-Methoxychlor	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	
p,p'-Methoxychlor	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	
Endosulphan Sulphate	<0.02 µg/l	TM343		<0.02	<0.02	<0.02	<0.02	<0.02	
Permethrin I	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	
Permethrin II	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	
Hexachlorobutadiene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	
Dichlorvos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	
Dichlobenil	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	
Mevinphos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	
Tecnazene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	
Hexachlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	
Demeton-S-methyl	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	
Phorate	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	
Diazinon	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01	<0.01	

CERTIFICATE OF ANALYSIS

SDG: 220222-36 **Report Number:** 636178 **Superseded Report:**
Client Ref.: P21-312 **Location:** Ballymulvey Landfill

Results Legend	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6	
# ISO17025 accredited.							
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.	Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	
* Subcontracted - refer to subcontractor report for accreditation status.	Date Sampled	17/02/2022	17/02/2022	17/02/2022	17/02/2022	17/02/2022	
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Sample Time	.	.	.	.	.	
(F) Trigger breach confirmed	Date Received	22/02/2022	22/02/2022	22/02/2022	22/02/2022	22/02/2022	
1-4+§@ Sample deviation (see appendix)	SDG Ref	220222-36	220222-36	220222-36	220222-36	220222-36	
	Lab Sample No.(s)	25858250	25858267	25858276	25858286	25858298	
	AGS Reference						

Component	LOD/Units	Method						
Triallate	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	
Atrazine	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	
Simazine	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	
Disulfoton	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	
Propetamphos	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	
Chlorpyriphos-methyl	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	
Dimethoate	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	
Pirimiphos-methyl	<0.01 µg/l	TM344	<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	
Methyl Parathion	<0.01 µg/l	TM344	<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	
Fenthion	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	
Fenitrothion	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	
Triadimefon	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	
Pendimethalin	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	
Parathion	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	
Chlorfenvinphos	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	
trans-Chlordane	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	
cis-Chlordane	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	
Ethion	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	
Carbophenothion	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	
Triazophos	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	
Phosalone	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01	
Azinphos methyl	<0.02 µg/l	TM344	<0.02	<0.02	<0.02	<0.02	<0.02	
Azinphos ethyl	<0.02 µg/l	TM344	<0.02	<0.02	<0.02	<0.02	<0.02	
Dinitro-o-cresol	<0.1 µg/l	TM411	0.188	<0.1	0.136	0.392	<0.1	
Clopyralid	<0.04 µg/l	TM411	<0.04	<0.04	<0.04	<0.04	<0.04	
MCPA	<0.05 µg/l	TM411	<0.05	<0.05	<0.05	<0.05	<0.05	
Mecoprop	<0.04 µg/l	TM411	<0.04	<0.04	<0.04	<0.04	<0.04	
Dicamba	<0.04 µg/l	TM411	<0.04	<0.04	<0.04	<0.04	<0.04	
MCPB	<0.05 µg/l	TM411	<0.05	<0.05	<0.05	<0.05	<0.05	
2,4-DB	<0.1 µg/l	TM411	<0.1	<0.1	<0.1	<0.1	<0.1	
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411	<0.05	<0.05	<0.05	<0.05	<0.05	

CERTIFICATE OF ANALYSIS

SDG: 220222-36 **Report Number:** 636178 **Superseded Report:**
Client Ref.: P21-312 **Location:** Ballymulvey Landfill

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	17/02/2022	17/02/2022	17/02/2022	17/02/2022	17/02/2022
			Sample Time	.	.	.	.	.
			Date Received	22/02/2022	22/02/2022	22/02/2022	22/02/2022	22/02/2022
			SDG Ref	220222-36	220222-36	220222-36	220222-36	220222-36
			Lab Sample No.(s)	25858250	25858267	25858276	25858286	25858298
			AGS Reference					
Dichlorprop	<0.1 µg/l	TM411		<0.1	<0.1	<0.1	<0.1	<0.1
Triclopyr	<0.05 µg/l	TM411		<0.05	<0.05	<0.05	<0.05	<0.05
Fenoprop (Silvex)	<0.1 µg/l	TM411		<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.05	<0.05	<0.05	<0.05	<0.05
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.05	<0.05	<0.05	<0.05	<0.05
Bromoxynil	<0.04 µg/l	TM411		<0.04	<0.04	<0.04	<0.04	<0.04
Benazolin	<0.04 µg/l	TM411		<0.04	<0.04	<0.04	<0.04	<0.04
Ioxynil	<0.05 µg/l	TM411		<0.05	<0.05	<0.05	<0.05	<0.05
Pentachlorophenol	<0.04 µg/l	TM411		<0.04	<0.04	<0.04	<0.04	<0.04
Fluoroxypyr	<0.1 µg/l	TM411		<0.1	<0.1	<0.1	<0.1	<0.1

CERTIFICATE OF ANALYSIS

SDG: 220222-36 **Report Number:** 636178 **Superseded Report:**
Client Ref.: P21-312 **Location:** Ballymulvey Landfill

SVOC MS (W) - Aqueous

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+$@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	17/02/2022	17/02/2022	17/02/2022	17/02/2022	17/02/2022
			Sample Time	.	.	.	.	.
			Date Received	22/02/2022	22/02/2022	22/02/2022	22/02/2022	22/02/2022
			SDG Ref	220222-36	220222-36	220222-36	220222-36	220222-36
			Lab Sample No.(s)	25858250	25858267	25858276	25858286	25858298
			AGS Reference					
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
2-Chlorophenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
2-Methylphenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
2-Nitroaniline (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
2-Nitrophenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
4-Methylphenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
4-Nitroaniline (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1
Azobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
Acenaphthylene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
Acenaphthene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
Anthracene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2 #	<2 #	<2 #	<2 #	<2 #
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #

CERTIFICATE OF ANALYSIS

SDG: 220222-36 **Report Number:** 636178 **Superseded Report:**
Client Ref.: P21-312 **Location:** Ballymulvey Landfill

SVOC MS (W) - Aqueous

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6	
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	
			Date Sampled	17/02/2022	17/02/2022	17/02/2022	17/02/2022	17/02/2022	
			Sample Time	.	.	.	.	.	
			Date Received	22/02/2022	22/02/2022	22/02/2022	22/02/2022	22/02/2022	
			SDG Ref	220222-36	220222-36	220222-36	220222-36	220222-36	
			Lab Sample No.(s)	25858250	25858267	25858276	25858286	25858298	
			AGS Reference						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
Carbazole (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
Chrysene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
Dibenzofuran (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
Diethyl phthalate (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5 #	<5 #	<5 #	<5 #	<5 #	
Fluoranthene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
Fluorene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	
Phenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
Hexachloroethane (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
Nitrobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
Naphthalene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
Isophorone (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	
Phenanthrene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	
Pyrene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #	<1 #	

CERTIFICATE OF ANALYSIS

SDG: 220222-36 **Report Number:** 636178 **Superseded Report:**
Client Ref.: P21-312 **Location:** Ballymulvey Landfill

VOC MS (W)

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+$@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	17/02/2022	17/02/2022	17/02/2022	17/02/2022	17/02/2022
			Sample Time	.	.	.	.	.
			Date Received	22/02/2022	22/02/2022	22/02/2022	22/02/2022	22/02/2022
			SDG Ref	220222-36	220222-36	220222-36	220222-36	220222-36
			Lab Sample No.(s)	25858250	25858267	25858276	25858286	25858298
			AGS Reference					
Dibromofluoromethane**	%	TM208		111	114	108	111	115
Toluene-d8**	%	TM208		99.2	99.1	95.8	100	98.1
4-Bromofluorobenzene**	%	TM208		99.1	105	95.4	97.1	95.6
Dichlorodifluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Chloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Vinyl chloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Bromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Chloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Trichlorofluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Carbon disulphide	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Dichloromethane	<3 µg/l	TM208		<3 #	<3 #	<3 #	<3 #	<3 #
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
2,2-Dichloropropane	<1 µg/l	TM208		<1	<1	<1	<1	<1
Bromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Chloroform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Carbontetrachloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Benzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Trichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Dibromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Bromodichloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Toluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #

CERTIFICATE OF ANALYSIS

SDG: 220222-36 **Report Number:** 636178 **Superseded Report:**
Client Ref.: P21-312 **Location:** Ballymulvey Landfill

VOC MS (W)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
aq Aqueous / settled sample.
diss.filt Dissolved / filtered sample.
tot.unfilt Total / unfiltered sample.
* Subcontracted - refer to subcontractor report for accreditation status.
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F) Trigger breach confirmed
1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	17/02/2022	17/02/2022	17/02/2022	17/02/2022	17/02/2022
			Sample Time	.	.	.	.	.
			Date Received	22/02/2022	22/02/2022	22/02/2022	22/02/2022	22/02/2022
			SDG Ref	220222-36	220222-36	220222-36	220222-36	220222-36
			Lab Sample No.(s)	25858250	25858267	25858276	25858286	25858298
			AGS Reference					
Tetrachloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Dibromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromoethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Chlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Ethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
m,p-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
o-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Styrene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Bromoform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Isopropylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,2,3-Trichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Bromobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Propylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
2-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
4-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
tert-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,2,4-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
sec-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
4-iso-Propyltoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,4-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
n-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208		<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Hexachlorobutadiene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Naphthalene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,2,3-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trichlorobenzene	<1 µg/l	TM208		<1	<1	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG: 220222-36 **Report Number:** 636178 **Superseded Report:**
Client Ref.: P21-312 **Location:** Ballymulvey Landfill

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
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
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
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
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
TM343	EPA 8270D - Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of Selected Pesticides (Suite I) in Liquids by GCMS
TM344	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite II) by GCMS
TM411	Acid_Herbs_GCMS	Acid Herbs in Water by GCMS

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden.

CERTIFICATE OF ANALYSIS

SDG: 220222-36 **Report Number:** 636178 **Superseded Report:**
Client Ref.: P21-312 **Location:** Ballymulvey Landfill

Test Completion Dates

Lab Sample No(s)	25858250	25858267	25858276	25858286	25858298
Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
AGS Ref.					
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Acid Herbicides by GCMS	04-Mar-2022	04-Mar-2022	04-Mar-2022	04-Mar-2022	04-Mar-2022
Alkalinity as CaCO3	01-Mar-2022	01-Mar-2022	01-Mar-2022	01-Mar-2022	01-Mar-2022
Ammonium Low	28-Feb-2022	25-Feb-2022	25-Feb-2022	25-Feb-2022	25-Feb-2022
Anions by Kone (w)	01-Mar-2022	28-Feb-2022	28-Feb-2022	01-Mar-2022	01-Mar-2022
BOD True Total	28-Feb-2022	28-Feb-2022	27-Feb-2022	28-Feb-2022	28-Feb-2022
COD Unfiltered	01-Mar-2022	01-Mar-2022	01-Mar-2022	01-Mar-2022	01-Mar-2022
Cyanide Comp/Free/Total/Thiocyanate	24-Feb-2022	23-Feb-2022	23-Feb-2022	24-Feb-2022	24-Feb-2022
Dissolved Metals by ICP-MS	24-Feb-2022	24-Feb-2022	24-Feb-2022	24-Feb-2022	24-Feb-2022
Dissolved Oxygen by Probe	27-Feb-2022	27-Feb-2022	27-Feb-2022	27-Feb-2022	27-Feb-2022
Fluoride	26-Feb-2022	26-Feb-2022	26-Feb-2022	26-Feb-2022	26-Feb-2022
Mercury Dissolved	25-Feb-2022	25-Feb-2022	25-Feb-2022	25-Feb-2022	25-Feb-2022
Pesticides (Suite I) by GCMS	28-Feb-2022	28-Feb-2022	28-Feb-2022	28-Feb-2022	28-Feb-2022
Pesticides (Suite II) by GCMS	28-Feb-2022	28-Feb-2022	28-Feb-2022	28-Feb-2022	28-Feb-2022
Phosphate by Kone (w)	25-Feb-2022	25-Feb-2022	25-Feb-2022	25-Feb-2022	25-Feb-2022
Suspended Solids	27-Feb-2022	27-Feb-2022	27-Feb-2022	01-Mar-2022	27-Feb-2022
SVOC MS (W) - Aqueous	24-Feb-2022	24-Feb-2022	24-Feb-2022	24-Feb-2022	24-Feb-2022
Total Metals by ICP-MS	25-Feb-2022	23-Feb-2022	23-Feb-2022	25-Feb-2022	23-Feb-2022
VOC MS (W)	25-Feb-2022	25-Feb-2022	25-Feb-2022	25-Feb-2022	25-Feb-2022

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) 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. 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.

3. 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.

4. 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.

5. 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.

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

7. Results relate only to the items tested.

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

9. **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.

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

11. 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.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

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

14. 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.

15. 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.

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

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **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.

19. **Sample Deviations**

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

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Matrix interference**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**
§	**Sampled on date not provided**

20. **Asbestos**

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 (2021), 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.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials andd soils 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 (2021).

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

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
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.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

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.

Unit 7-8 Hawarden Business Park
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Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
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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 of report Generation:	23 May 2022
Customer:	Fehily Timoney
Sample Delivery Group (SDG):	220513-169
Your Reference:	P1444
Location:	Ballymulvey Landfill
Report No:	647608
Order Number:	Z2871

This report has been revised and directly supersedes 647516 in its entirety.

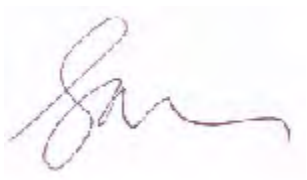
We received 5 samples on Friday May 13, 2022 and 5 of these samples were scheduled for analysis which was completed on Monday May 23, 2022. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG: 220513-169 **Report Number:** 647608 **Superseded Report:** 647516
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
26277516	BH1		0.00 - 0.00	11/05/2022
26277507	BH2		0.00 - 0.00	11/05/2022
26277498	BH3		0.00 - 0.00	11/05/2022
26277489	GW4		0.00 - 0.00	11/05/2022
26277481	GW6		0.00 - 0.00	11/05/2022

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

Validated

CERTIFICATE OF ANALYSIS

SDG: 220513-169 **Report Number:** 647608 **Superseded Report:** 647516
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)																			
			26277516						26277507						26277498						26277489	
			Customer Sample Reference																			
			BH1						BH2						BH3						GW4	
			AGS Reference																			
			Depth (m)																			
			0.00 - 0.00						0.00 - 0.00						0.00 - 0.00						0.00 - 0.00	
			Container	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	
			Sample Type	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 5		X						X						X						X
Alkalinity as CaCO3	All	NDPs: 0 Tests: 5			X						X						X					
Ammonium Low	All	NDPs: 0 Tests: 5				X						X						X				
Anions by Kone (w)	All	NDPs: 0 Tests: 5			X						X						X					
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 5						X						X						X		
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 5			X						X						X					
Fluoride	All	NDPs: 0 Tests: 5			X						X						X					
Mercury Unfiltered	All	NDPs: 0 Tests: 5					X						X						X			
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 5		X						X						X						X
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 5		X						X						X						X
pH Value	All	NDPs: 0 Tests: 5			X						X						X					
Phosphate by Kone (w)	All	NDPs: 0 Tests: 5			X						X						X					
Suspended Solids	All	NDPs: 0 Tests: 5			X						X						X					
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 5		X						X						X						X
Total Metals by ICP-MS	All	NDPs: 1 Tests: 5					X						X						N X			

26277481	GW6		0.00 - 0.00	Vial (ALE297)	GW																
				NaOH (ALE245)	GW						x										
				HNO3 Unfiltered (ALE204)	GW									x							x
				H2SO4 (ALE244)	GW			x													
				500ml Plastic (ALE208)	GW		x		x			x	x					x	x	x		
				0.5l glass bottle (ALE227)	GW	x									x	x				x		
26277489	GW4		0.00 - 0.00	Vial (ALE297)	GW																
				NaOH (ALE245)	GW						x										
				HNO3 Unfiltered (ALE204)	GW									x							x
				H2SO4 (ALE244)	GW			x													
				500ml Plastic (ALE208)	GW		x		x			x	x					x	x	x		

Validated

CERTIFICATE OF ANALYSIS

SDG: 220513-169 **Report Number:** 647608 **Superseded Report:** 647516

Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

X Test

N No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)							26277516							26277507							26277498				26277489
Customer Sample Reference							BH1							BH2							BH3				GW4
AGS Reference																									
Depth (m)							0.00 - 0.00							0.00 - 0.00							0.00 - 0.00				0.00 - 0.00
Container							0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)
Sample Type							GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
VOC MS (W)	All	NDPs: 0 Tests: 5										X						X						X	

26277481	GW6		0.00 - 0.00	Vial (ALE297)	GW		X
				NaOH (ALE245)	GW		
				HNO3 Unfiltered (ALE204)	GW		
				H2SO4 (ALE244)	GW		
				500ml Plastic (ALE208)	GW		
				0.5l glass bottle (ALE227)	GW		
26277489	GW4		0.00 - 0.00	Vial (ALE297)	GW		X
				NaOH (ALE245)	GW		
				HNO3 Unfiltered (ALE204)	GW		
				H2SO4 (ALE244)	GW		
				500ml Plastic (ALE208)	GW		

Validated

CERTIFICATE OF ANALYSIS

SDG: 220513-169 **Report Number:** 647608 **Superseded Report:** 647516

Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+$@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022
			Sample Time	.	.	.	.	.
			Date Received	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022
			SDG Ref	220513-169	220513-169	220513-169	220513-169	220513-169
			Lab Sample No.(s)	26277516	26277507	26277498	26277489	26277481
			AGS Reference					
Suspended solids, Total	<2 mg/l	TM022		43 #	727 #	45.1 #	50.8 #	483 #
Alkalinity, Total as CaCO3	<2 mg/l	TM043		415 #	679 #	650 #	445 #	430 #
Oxygen, dissolved	<0.3 mg/l	TM046		7.96	6.71	5.79	7.01	9.06
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099		0.0859 #	1.33 #	19.4 #	0.904 #	0.0511 #
Fluoride	<0.5 mg/l	TM104		<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #
Arsenic (tot.unfilt)	<2 µg/l	TM152		3.68 #	41.6 #	17.3 #	4.16 #	12 #
Boron (tot.unfilt)	<20 µg/l	TM152		<20 #	32.1 #	20.4 #	20.4 #	<20 #
Cadmium (tot.unfilt)	<0.5 µg/l	TM152		1.2 #	1.2 #	<0.5 #	<0.5 #	<0.5 #
Chromium (tot.unfilt)	<3 µg/l	TM152		4.79 #	19.5 #	<3 #	<3 #	4.14 #
Copper (tot.unfilt)	<1 µg/l	TM152		14.4 #	25 #	2.51 #	2.76 #	5.26 #
Lead (tot.unfilt)	<1 µg/l	TM152		9.5 #	35.7 #	1.7 #	3.99 #	6.08 #
Manganese (tot.unfilt)	<1 µg/l	TM152		5600 #	1500 #	765 #	3080 #	265 #
Nickel (tot.unfilt)	<1 µg/l	TM152		29 #	56.3 #	7.11 #	5.73 #	9.55 #
Phosphorus (tot.unfilt)	<20 µg/l	TM152		275 #	1020 #	171 #	83.9 #	144 #
Zinc (tot.unfilt)	<5 µg/l	TM152		45.4 #	139 #		34.9 #	46.3 #
Sodium (Tot. Unfilt.)	<0.047 mg/l	TM152		9.01 #	13.7 #	102 #	8.68 #	35.2 #
Magnesium (Tot. Unfilt.)	<0.05 mg/l	TM152		15.1 #	18.7 #	27.8 #	18.9 #	7.53 #
Potassium (Tot. Unfilt.)	<0.2 mg/l	TM152		10.2 #	3.95 #	21.9 #	3.81 #	1.25 #
Calcium (Tot. Unfilt.)	<0.057 mg/l	TM152		168 #	490 #	210 #	163 #	183 #
Iron (Tot. Unfilt.)	<0.024 mg/l	TM152		6.74 #	38.9 #	7.55 #	1.87 #	5.03 #
Mercury (tot.unfilt)	<0.02 µg/l	TM183		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
Sulphate	<2 mg/l	TM184		26.5 #	40.6 #	47.9 #	<2 #	19.4 #
Chloride	<2 mg/l	TM184		15.5 #	24 #	163 #	14.3 #	60.4 #
Total Oxidised Nitrogen as NO3	<0.3 mg/l	TM184		14.8 #	0.961 #	1.41 #	1.13 #	27.8 #
Cyanide, Total	<0.05 mg/l	TM227		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
pH	<1 pH Units	TM256		7.5 #	7.06 #	7.01 #	7.39 #	7.51 #
Conductivity @ 20 deg.C	<0.02 mS/cm	TM256		0.739 #	0.869 #	1.47 #	0.732 #	0.816 #
Trifluralin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
alpha-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
gamma-HCH (Lindane)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
Aldrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01

CERTIFICATE OF ANALYSIS

SDG: 220513-169 **Report Number:** 647608 **Superseded Report:** 647516
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022
			Sample Time	.	.	.	.	.
			Date Received	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022
			SDG Ref	220513-169	220513-169	220513-169	220513-169	220513-169
			Lab Sample No.(s)	26277516	26277507	26277498	26277489	26277481
			AGS Reference					
beta-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
Isodrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
delta-HCH	<0.01 µg/l	TM343		<0.02	<0.01	<0.01	<0.02	<0.01
Heptachlor epoxide	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
o,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan I	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
trans-Chlordane	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
cis-Chlordane	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
p,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
Dieldrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
o,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
Endrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
o,p'-DDT	<0.01 µg/l	TM343		<0.02	<0.01	<0.01	<0.02	<0.01
p,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan II	<0.02 µg/l	TM343		<0.02	<0.02	<0.02	<0.02	<0.02
p,p'-DDT	<0.01 µg/l	TM343		<0.02	<0.01	<0.01	<0.02	<0.01
o,p'-Methoxychlor	<0.01 µg/l	TM343		<0.02	<0.01	<0.01	<0.02	<0.01
p,p'-Methoxychlor	<0.01 µg/l	TM343		<0.02	<0.01	<0.01	<0.02	<0.01
Endosulphan Sulphate	<0.02 µg/l	TM343		<0.02	<0.02	<0.02	<0.02	<0.02
Permethrin I	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
Permethrin II	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344		<0.03	<0.06	<0.03	<0.03	<0.06
Hexachlorobutadiene	<0.01 µg/l	TM344		<0.04	<0.08	<0.04	<0.04	<0.08
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344		<0.02	<0.04	<0.02	<0.06	<0.04
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344		<0.02	<0.04	<0.02	<0.02	<0.04
Dichlorvos	<0.01 µg/l	TM344		<0.02	<0.04	<0.02	<0.02	<0.04
Dichlobenil	<0.01 µg/l	TM344		<0.02	<0.02	<0.01	<0.01	<0.02
Mevinphos	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02
Tecnazene	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02
Hexachlorobenzene	<0.01 µg/l	TM344		<0.02	<0.04	<0.02	<0.02	<0.04
Demeton-S-methyl	<0.01 µg/l	TM344		<0.02	<0.04	<0.02	<0.02	<0.04
Phorate	<0.01 µg/l	TM344		<0.02	<0.04	<0.02	<0.02	<0.04
Diazinon	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02

CERTIFICATE OF ANALYSIS

SDG: 220513-169 **Report Number:** 647608 **Superseded Report:** 647516
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022
			Sample Time	.	.	.	.	.
			Date Received	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022
			SDG Ref	220513-169	220513-169	220513-169	220513-169	220513-169
			Lab Sample No.(s)	26277516	26277507	26277498	26277489	26277481
			AGS Reference					
Triallate	<0.01 µg/l	TM344		<0.02	<0.04	<0.02	<0.02	<0.04
Atrazine	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02
Simazine	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02
Disulfoton	<0.01 µg/l	TM344		<0.02	<0.04	<0.02	<0.02	<0.04
Propetamphos	<0.01 µg/l	TM344		<0.01	<0.04	<0.01	<0.01	<0.02
Chlorpyriphos-methyl	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02
Dimethoate	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02
Pirimiphos-methyl	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02
Chlorpyriphos	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02
Methyl Parathion	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02
Malathion	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02
Fenthion	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02
Fenitrothion	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02
Triadimefon	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02
Pendimethalin	<0.01 µg/l	TM344		<0.02	<0.04	<0.02	<0.02	<0.04
Parathion	<0.01 µg/l	TM344		<0.02	<0.04	<0.02	<0.02	<0.04
Chlorfenvinphos	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02
trans-Chlordane	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02
cis-Chlordane	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02
Ethion	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02
Carbophenothion	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02
Triazophos	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02
Phosalone	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.02
Azinphos methyl	<0.02 µg/l	TM344		<0.02	<0.04	<0.02	<0.02	<0.04
Azinphos ethyl	<0.02 µg/l	TM344		<0.02	<0.04	<0.02	<0.02	<0.04
Dinitro-o-cresol	<0.1 µg/l	TM411		<0.1	<0.5	<0.1	<0.1	<0.1
Clopyralid	<0.04 µg/l	TM411		<0.04	<0.2	<0.04	<0.04	<0.04
MCPA	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.05	<0.05
Mecoprop	<0.04 µg/l	TM411		<0.04	<0.2	<0.04	<0.04	<0.04
Dicamba	<0.04 µg/l	TM411		<0.04	<0.2	<0.04	<0.04	<0.04
MCPB	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.05	<0.05
2,4-DB	<0.1 µg/l	TM411		<0.1	<0.5	<0.1	<0.1	<0.1
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.05	<0.05

CERTIFICATE OF ANALYSIS

SDG: 220513-169 **Report Number:** 647608 **Superseded Report:** 647516
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022
			Sample Time	.	.	.	.	.
			Date Received	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022
			SDG Ref	220513-169	220513-169	220513-169	220513-169	220513-169
			Lab Sample No.(s)	26277516	26277507	26277498	26277489	26277481
			AGS Reference					
Dichlorprop	<0.1 µg/l	TM411		<0.1	<0.5	<0.1	<0.1	<0.1
Triclopyr	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.05	<0.05
Fenoprop (Silvex)	<0.1 µg/l	TM411		<0.1	<0.5	<0.1	<0.1	<0.1
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.05	<0.05
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.05	<0.05
Bromoxynil	<0.04 µg/l	TM411		<0.04	<0.2	<0.04	<0.04	<0.04
Benazolin	<0.04 µg/l	TM411		<0.04	<0.2	<0.04	<0.04	<0.04
Ioxynil	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.05	<0.05
Pentachlorophenol	<0.04 µg/l	TM411		<0.04	<0.2	<0.04	<0.04	<0.04
Fluoroxypyr	<0.1 µg/l	TM411		<0.1	<0.5	<0.1	<0.1	<0.1

CERTIFICATE OF ANALYSIS

SDG: 220513-169 **Report Number:** 647608 **Superseded Report:** 647516
Client Ref.: P1444 **Location:** Ballymulvey Landfill

SVOC MS (W) - Aqueous

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+$@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022
			Sample Time	.	.	.	.	.
			Date Received	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022
			SDG Ref	220513-169	220513-169	220513-169	220513-169	220513-169
			Lab Sample No.(s)	26277516	26277507	26277498	26277489	26277481
			AGS Reference					
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2-Chlorophenol (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2-Methylphenol (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2-Nitroaniline (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2-Nitrophenol (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<2	<1	<1	<1
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<2	<1	<1	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
4-Methylphenol (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
4-Nitroaniline (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<2	<1	<1	<1
Azobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
Acenaphthylene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
Acenaphthene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
Anthracene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2 #	<4 #	<2 #	<2 #	<2 #
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #

CERTIFICATE OF ANALYSIS

SDG: 220513-169 **Report Number:** 647608 **Superseded Report:** 647516
Client Ref.: P1444 **Location:** Ballymulvey Landfill

SVOC MS (W) - Aqueous

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6	
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	
			Date Sampled	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022	
			Sample Time	.	.	.	.	.	
			Date Received	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022	
			SDG Ref	220513-169	220513-169	220513-169	220513-169	220513-169	
			Lab Sample No.(s)	26277516	26277507	26277498	26277489	26277481	
			AGS Reference						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Carbazole (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Chrysene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Dibenzofuran (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Diethyl phthalate (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5 #	<10 #	<5 #	<5 #	<5 #	
Fluoranthene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Fluorene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<2	<1	<1	<1	
Phenol (aq)	<1 µg/l	TM176		<1	<2	<1	<1	<1	
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Hexachloroethane (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Nitrobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Naphthalene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Isophorone (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<2	<1	<1	<1	
Phenanthrene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Pyrene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	

CERTIFICATE OF ANALYSIS

SDG: 220513-169 **Report Number:** 647608 **Superseded Report:** 647516
Client Ref.: P1444 **Location:** Ballymulvey Landfill

VOC MS (W)

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+$@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022
			Sample Time	.	.	.	.	.
			Date Received	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022
			SDG Ref	220513-169	220513-169	220513-169	220513-169	220513-169
			Lab Sample No.(s)	26277516	26277507	26277498	26277489	26277481
			AGS Reference					
Dibromofluoromethane**	%	TM208		119	111	114	110	115
Toluene-d8**	%	TM208		101	98.8	97.6	100	101
4-Bromofluorobenzene**	%	TM208		96.2	97.7	99	95.3	98.1
Dichlorodifluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Chloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Vinyl chloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Bromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Chloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Trichlorofluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Carbon disulphide	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Dichloromethane	<3 µg/l	TM208		<3 #	<3 #	<3 #	<3 #	<3 #
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
2,2-Dichloropropane	<1 µg/l	TM208		<1	<1	<1	<1	<1
Bromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Chloroform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Carbontetrachloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Benzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Trichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Dibromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Bromodichloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Toluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #

CERTIFICATE OF ANALYSIS

SDG: 220513-169 **Report Number:** 647608 **Superseded Report:** 647516

Client Ref.: P1444 **Location:** Ballymulvey Landfill

VOC MS (W)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022
			Sample Time	.	.	.	.	.
			Date Received	13/05/2022	13/05/2022	13/05/2022	13/05/2022	13/05/2022
			SDG Ref	220513-169	220513-169	220513-169	220513-169	220513-169
			Lab Sample No.(s)	26277516	26277507	26277498	26277489	26277481
			AGS Reference					
Tetrachloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Dibromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromoethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Chlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Ethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
m,p-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
o-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Styrene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Bromoform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Isopropylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,2,3-Trichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Bromobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Propylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
2-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
4-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
tert-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,2,4-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
sec-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
4-iso-Propyltoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,4-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
n-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208		<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Hexachlorobutadiene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Naphthalene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,2,3-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trichlorobenzene	<1 µg/l	TM208		<1	<1	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG: 220513-169 **Report Number:** 647608 **Superseded Report:** 647516
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Notification of NDPs (No determination possible)

Date Received : 13/05/2022 15:43:17

Sample No	Customer Sample Ref.	Depth (m)	Test	Comment
26277498	BH3	0.00 - 0.00	Total Metals by ICP-MS	Insufficient sample remaining for repeat analysis

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
TM046	Method 4500G, AWWA/APHA, 20th Ed., 1999	Measurement of Dissolved Oxygen by Oxygen Meter
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
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
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, Standard Methods for the examination of waters and wastewaters 20th Edition, PHA, Washington DC, USA. ISBN 0-87553-235-7 and The Determination of Alkalinity and Acidity in water HMSO, 1981, ISBN 0 11 751601 5.	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM343	EPA 8270D - Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of Selected Pesticides (Suite I) in Liquids by GCMS
TM344	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite II) by GCMS
TM411	Acid_Herbs_GCMS	Acid Herbs in Water by GCMS

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden.

CERTIFICATE OF ANALYSIS

SDG: 220513-169 **Report Number:** 647608 **Superseded Report:** 647516
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Test Completion Dates

Lab Sample No(s)	26277516	26277507	26277498	26277489	26277481
Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
AGS Ref.					
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Acid Herbicides by GCMS	23-May-2022	23-May-2022	23-May-2022	23-May-2022	23-May-2022
Alkalinity as CaCO3	18-May-2022	19-May-2022	18-May-2022	18-May-2022	18-May-2022
Ammonium Low	18-May-2022	18-May-2022	17-May-2022	18-May-2022	17-May-2022
Anions by Kone (w)	17-May-2022	17-May-2022	17-May-2022	17-May-2022	17-May-2022
Cyanide Comp/Free/Total/Thiocyanate	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022
Dissolved Oxygen by Probe	15-May-2022	15-May-2022	15-May-2022	15-May-2022	15-May-2022
Fluoride	20-May-2022	20-May-2022	20-May-2022	20-May-2022	20-May-2022
Mercury Unfiltered	23-May-2022	23-May-2022	23-May-2022	23-May-2022	23-May-2022
Pesticides (Suite I) by GCMS	19-May-2022	20-May-2022	20-May-2022	19-May-2022	20-May-2022
Pesticides (Suite II) by GCMS	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022
pH Value	18-May-2022	18-May-2022	18-May-2022	18-May-2022	18-May-2022
Phosphate by Kone (w)	14-May-2022	14-May-2022	14-May-2022	14-May-2022	14-May-2022
Suspended Solids	19-May-2022	19-May-2022	19-May-2022	19-May-2022	19-May-2022
SVOC MS (W) - Aqueous	19-May-2022	19-May-2022	20-May-2022	19-May-2022	20-May-2022
Total Metals by ICP-MS	19-May-2022	19-May-2022	20-May-2022	19-May-2022	23-May-2022
VOC MS (W)	21-May-2022	21-May-2022	21-May-2022	21-May-2022	21-May-2022

Appendix

1. Results are expressed on a dry weight basis (dried at 35ºC) 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. 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.

3. 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.

4. 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.

5. 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.

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

7. Results relate only to the items tested.

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

9. **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.

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

11. 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.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

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

14. 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.

15. 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.

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

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **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.

19. **Sample Deviations**

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

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Matrix interference**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**
§	**Sampled on date not provided**

20. **Asbestos**

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 (2021), 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.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials andd soils 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 (2021).

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

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
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.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

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.

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528777
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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 of report Generation:	21 July 2022
Customer:	Fehily Timoney
Sample Delivery Group (SDG):	220711-30
Your Reference:	P1444
Location:	Ballymulvey Landfill
Report No:	655089
Order Number:	Z3180

We received 5 samples on Monday July 11, 2022 and 5 of these samples were scheduled for analysis which was completed on Thursday July 21, 2022. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager

1291

CERTIFICATE OF ANALYSIS

SDG: 220711-30 **Report Number:** 655089 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
26569515	BH1		0.00 - 0.00	06/07/2022
26569507	BH2		0.00 - 0.00	06/07/2022
26569497	BH3		0.00 - 0.00	06/07/2022
26569487	GW4		0.00 - 0.00	06/07/2022
26569470	GW6		0.00 - 0.00	06/07/2022

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

Validated

CERTIFICATE OF ANALYSIS

SDG: 220711-30 **Report Number:** 655089 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
			26569515	BH1		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
							500ml Plastic (ALE208)	GW
							H2SO4 (ALE244)	GW
							HNO3 Unfiltered (ALE204)	GW
							NaOH (ALE245)	GW
							Vial (ALE297)	GW
			26569507	BH2		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
							500ml Plastic (ALE208)	GW
							H2SO4 (ALE244)	GW
							HNO3 Unfiltered (ALE204)	GW
							NaOH (ALE245)	GW
							Vial (ALE297)	GW
			26569497	BH3		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
							500ml Plastic (ALE208)	GW
							H2SO4 (ALE244)	GW
							HNO3 Unfiltered (ALE204)	GW
							NaOH (ALE245)	GW
							Vial (ALE297)	GW
			26569487	GW4		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 5	X					X						X					X
Alkalinity as CaCO3	All	NDPs: 0 Tests: 5		X					X						X				
Ammonium Low	All	NDPs: 0 Tests: 5			X					X						X			
Anions by Kone (w)	All	NDPs: 0 Tests: 5		X					X						X				
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 5					X						X					X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 5		X					X						X				
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 5		X					X						X				
Fluoride	All	NDPs: 0 Tests: 5		X					X						X				
Mercury Dissolved	All	NDPs: 0 Tests: 5		X					X						X				
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 5	X					X						X					X
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 5	X					X						X					X
pH Value	All	NDPs: 0 Tests: 5		X					X						X				
Phosphate by Kone (w)	All	NDPs: 0 Tests: 5		X					X						X				
Suspended Solids	All	NDPs: 0 Tests: 5		X					X						X				
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 5	X					X						X					X

26569470	GW6		0.00 - 0.00	Vial (ALE297)	GW															
				NaOH (ALE245)	GW					X										
				HNO3 Unfiltered (ALE204)	GW															
				H2SO4 (ALE244)	GW			X												
				500ml Plastic (ALE208)	GW		X		X		X	X	X	X			X	X	X	
				0.5l glass bottle (ALE227)	GW	X									X	X				X
26569487	GW4		0.00 - 0.00	Vial (ALE297)	GW															
				NaOH (ALE245)	GW					X										
				HNO3 Unfiltered (ALE204)	GW															
				H2SO4 (ALE244)	GW			X												
				500ml Plastic (ALE208)	GW		X		X		X	X	X	X			X	X	X	

Validated

CERTIFICATE OF ANALYSIS

SDG: 220711-30 **Report Number:** 655089 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
			26569515	BH1		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
							500ml Plastic (ALE208)	GW
							H2SO4 (ALE244)	GW
Total Metals by ICP-MS	All	NDPs: 0 Tests: 5					HNO3 Unfiltered (ALE204)	GW
							NaOH (ALE245)	GW
VOC MS (W)	All	NDPs: 0 Tests: 5					Vial (ALE297)	GW
			26569507	BH2		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
							500ml Plastic (ALE208)	GW
							H2SO4 (ALE244)	GW
Total Metals by ICP-MS	All	NDPs: 0 Tests: 5					HNO3 Unfiltered (ALE204)	GW
							NaOH (ALE245)	GW
VOC MS (W)	All	NDPs: 0 Tests: 5					Vial (ALE297)	GW
			26569497	BH3		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
							500ml Plastic (ALE208)	GW
							H2SO4 (ALE244)	GW
Total Metals by ICP-MS	All	NDPs: 0 Tests: 5					HNO3 Unfiltered (ALE204)	GW
							NaOH (ALE245)	GW
VOC MS (W)	All	NDPs: 0 Tests: 5					Vial (ALE297)	GW
			26569487	GW4		0.00 - 0.00	0.5l glass bottle (ALE227)	GW

26569470	GW6		0.00 - 0.00	Vial (ALE297)	GW				X
				NaOH (ALE245)	GW				
				HNO3 Unfiltered (ALE204)	GW		X		
				H2SO4 (ALE244)	GW				
				500ml Plastic (ALE208)	GW				
				0.5l glass bottle (ALE227)	GW				
26569487	GW4		0.00 - 0.00	Vial (ALE297)	GW				X
				NaOH (ALE245)	GW				
				HNO3 Unfiltered (ALE204)	GW		X		
				H2SO4 (ALE244)	GW				
				500ml Plastic (ALE208)	GW				

CERTIFICATE OF ANALYSIS

SDG: 220711-30 **Report Number:** 655089 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022
			Sample Time	-	-	-	-	-
			Date Received	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022
			SDG Ref	220711-30	220711-30	220711-30	220711-30	220711-30
			Lab Sample No.(s)	26569515	26569507	26569497	26569487	26569470
			AGS Reference					
Suspended solids, Total	<2 mg/l	TM022		53.8 #	911 #	19.3 #	42.7 #	164 #
Alkalinity, Total as CaCO3	<2 mg/l	TM043		405 #	545 #	425 #	445 #	375 #
Oxygen, dissolved	<0.3 mg/l	TM046		9.58	6.07	6.71	7.71	8.16
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099		0.396 #	2.08 #	3.65 #	1.68 #	0.163 #
Fluoride	<0.5 mg/l	TM104		<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #
Arsenic (diss.filt)	<0.5 µg/l	TM152		<0.5 2 #	97.5 2 #	1.09 2 #	1.41 2 #	0.564 2 #
Boron (diss.filt)	<10 µg/l	TM152		20.8 2 #	241 2 #	107 2 #	24.2 2 #	12.3 2 #
Cadmium (diss.filt)	<0.08 µg/l	TM152		0.504 2 #	<0.08 2 #	<0.08 2 #	<0.08 2 #	<0.08 2 #
Chromium (diss.filt)	<1 µg/l	TM152		<1 2 #	1.02 2 #	<1 2 #	<1 2 #	<1 2 #
Copper (diss.filt)	<0.3 µg/l	TM152		3.56 2 #	<0.3 2 #	0.532 2 #	0.931 2 #	0.651 2 #
Lead (diss.filt)	<0.2 µg/l	TM152		<0.2 2 #	<0.2 2 #	<0.2 2 #	<0.2 2 #	<0.2 2 #
Manganese (diss.filt)	<3 µg/l	TM152		293 2 #	1000 2 #	358 2 #	1860 2 #	56.7 2 #
Phosphorus (tot.unfilt)	<20 µg/l	TM152		337 #	1300 #	107 #	62.9 #	112 #
Nickel (diss.filt)	<0.4 µg/l	TM152		13.4 2 #	6.31 2 #	4.69 2 #	3.89 2 #	2.37 2 #
Zinc (diss.filt)	<1 µg/l	TM152		9.78 2 #	17.9 2 #	7.43 2 #	17.9 2 #	9.65 2 #
Sodium (Dis.Filt)	<0.076 mg/l	TM152		7.57 2 #	13 2 #	44.2 2 #	7.89 2 #	21.3 2 #
Magnesium (Dis.Filt)	<0.036 mg/l	TM152		12.6 2 #	8.49 2 #	25.3 2 #	16.5 2 #	8.53 2 #
Potassium (Dis.Filt)	<0.2 mg/l	TM152		9.53 2 #	4.16 2 #	19.5 2 #	3.42 2 #	1.28 2 #
Calcium (Dis.Filt)	<0.2 mg/l	TM152		150 2 #	197 2 #	133 2 #	153 2 #	130 2 #
Iron (Dis.Filt)	<0.019 mg/l	TM152		<0.019 2 #	29.2 2 #	0.424 2 #	<0.019 2 #	<0.019 2 #
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 2 #	<0.01 2 #	<0.01 2 #	<0.01 2 #	<0.01 2 #
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
Sulphate	<2 mg/l	TM184		26.2 #	39.3 #	44.9 #	<2 #	9.7 #
Chloride	<2 mg/l	TM184		14.7 #	25.5 #	63.6 #	13 #	32.6 #
Total Oxidised Nitrogen as NO3	<0.3 mg/l	TM184		10.6 #	<0.3 #	0.549 #	1.9 #	12.5 #
Cyanide, Total	<0.05 mg/l	TM227		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
pH	<1 pH Units	TM256		7.32 #	6.94 #	7.14 #	7.33 #	7.35 #
Conductivity @ 20 deg.C	<0.02 mS/cm	TM256		0.719 #	0.883 #	0.898 #	0.725 #	0.683 #
Trifluralin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
alpha-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
gamma-HCH (Lindane)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
Aldrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01

CERTIFICATE OF ANALYSIS

SDG: 220711-30 **Report Number:** 655089 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022
			Sample Time	.	.	.	.	.
			Date Received	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022
			SDG Ref	220711-30	220711-30	220711-30	220711-30	220711-30
			Lab Sample No.(s)	26569515	26569507	26569497	26569487	26569470
			AGS Reference					
beta-HCH	<0.01 µg/l	TM343		<0.02	<0.04	<0.02	<0.02	<0.02
Isodrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
delta-HCH	<0.01 µg/l	TM343		<0.02	<0.04	<0.02	<0.02	<0.02
Heptachlor epoxide	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
o,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan I	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
trans-Chlordane	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
cis-Chlordane	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
p,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
Dieldrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
o,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
Endrin	<0.01 µg/l	TM343		<0.02	<0.04	<0.02	<0.02	<0.02
o,p'-DDT	<0.01 µg/l	TM343		<0.02	<0.04	<0.02	<0.02	<0.02
p,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan II	<0.02 µg/l	TM343		<0.02	<0.02	<0.02	<0.02	<0.02
p,p'-DDT	<0.01 µg/l	TM343		<0.02	<0.04	<0.02	<0.02	<0.02
o,p'-Methoxychlor	<0.01 µg/l	TM343		<0.02	<0.04	<0.02	<0.02	<0.02
p,p'-Methoxychlor	<0.01 µg/l	TM343		<0.02	<0.04	<0.02	<0.02	<0.02
Endosulphan Sulphate	<0.02 µg/l	TM343		<0.04	<0.08	<0.04	<0.04	<0.04
Permethrin I	<0.01 µg/l	TM343		<0.02	<0.04	<0.02	<0.02	<0.02
Permethrin II	<0.01 µg/l	TM343		<0.02	<0.04	<0.02	<0.02	<0.02
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344		<0.04	<0.02	<0.04	<0.01	<0.01
Hexachlorobutadiene	<0.01 µg/l	TM344		<0.1	<0.02	<0.1	<0.01	<0.01
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	0.0878	<0.01
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Dichlorvos	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Dichlobenil	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Mevinphos	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Tecnazene	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Hexachlorobenzene	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Demeton-S-methyl	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Phorate	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Diazinon	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01

CERTIFICATE OF ANALYSIS

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- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022
			Sample Time	.	.	.	.	.
			Date Received	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022
			SDG Ref	220711-30	220711-30	220711-30	220711-30	220711-30
			Lab Sample No.(s)	26569515	26569507	26569497	26569487	26569470
			AGS Reference					
Triallate	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Atrazine	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Simazine	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Disulfoton	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Propetamphos	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Chlorpyriphos-methyl	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Dimethoate	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Pirimiphos-methyl	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Chlorpyriphos	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Methyl Parathion	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Malathion	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Fenthion	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Fenitrothion	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Triadimefon	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Pendimethalin	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Parathion	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Chlorfenvinphos	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
trans-Chlordane	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
cis-Chlordane	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Ethion	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Carbophenothion	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Triazophos	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Phosalone	<0.01 µg/l	TM344		<0.01	<0.02	<0.01	<0.01	<0.01
Azinphos methyl	<0.02 µg/l	TM344		<0.02	<0.08	<0.02	<0.02	<0.04
Azinphos ethyl	<0.02 µg/l	TM344		<0.02	<0.04	<0.02	<0.02	<0.02
Dinitro-o-cresol	<0.1 µg/l	TM411		<0.1	<0.5	<0.1	<0.1	<0.1
Clopyralid	<0.04 µg/l	TM411		<0.04	<0.2	<0.04	<0.04	<0.04
MCPA	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.05	<0.05
Mecoprop	<0.04 µg/l	TM411		<0.04	<0.2	0.0902	<0.04	<0.04
Dicamba	<0.04 µg/l	TM411		<0.04	<0.2	<0.04	<0.04	<0.04
MCPB	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.05	<0.05
2,4-DB	<0.1 µg/l	TM411		<0.1	<0.5	<0.1	<0.1	<0.1
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.05	<0.05

CERTIFICATE OF ANALYSIS

SDG: 220711-30 **Report Number:** 655089 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022
			Sample Time	.	.	.	.	.
			Date Received	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022
			SDG Ref	220711-30	220711-30	220711-30	220711-30	220711-30
			Lab Sample No.(s)	26569515	26569507	26569497	26569487	26569470
			AGS Reference					
Dichlorprop	<0.1 µg/l	TM411		<0.1	<0.5	<0.1	<0.1	<0.1
Triclopyr	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.05	<0.05
Fenoprop (Silvex)	<0.1 µg/l	TM411		<0.1	<0.5	<0.1	<0.1	<0.1
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.05	<0.05
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.05	<0.05
Bromoxynil	<0.04 µg/l	TM411		<0.04	<0.2	<0.04	<0.04	<0.04
Benazolin	<0.04 µg/l	TM411		<0.04	<0.2	<0.04	<0.04	<0.04
Ioxynil	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.05	<0.05
Pentachlorophenol	<0.04 µg/l	TM411		<0.04	<0.2	<0.04	<0.04	<0.04
Fluoroxypyr	<0.1 µg/l	TM411		<0.1	<0.5	<0.1	<0.1	<0.1

CERTIFICATE OF ANALYSIS

SDG: 220711-30 **Report Number:** 655089 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

SVOC MS (W) - Aqueous

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022
			Sample Time	-	-	-	-	-
			Date Received	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022
			SDG Ref	220711-30	220711-30	220711-30	220711-30	220711-30
			Lab Sample No.(s)	26569515	26569507	26569497	26569487	26569470
			AGS Reference					
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2-Chlorophenol (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2-Methylphenol (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2-Nitroaniline (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
2-Nitrophenol (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<2	<1	<1	<1
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<2	<1	<1	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
4-Methylphenol (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
4-Nitroaniline (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<2	<1	<1	<1
Azobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
Acenaphthylene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
Acenaphthene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
Anthracene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2 #	<4 #	<2 #	<2 #	<2 #
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #

CERTIFICATE OF ANALYSIS

SDG: 220711-30 **Report Number:** 655089 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

SVOC MS (W) - Aqueous

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6	
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	
			Date Sampled	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022	
			Sample Time	.	.	.	.	.	
			Date Received	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022	
			SDG Ref	220711-30	220711-30	220711-30	220711-30	220711-30	
			Lab Sample No.(s)	26569515	26569507	26569497	26569487	26569470	
			AGS Reference						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Carbazole (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Chrysene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Dibenzofuran (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Diethyl phthalate (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5 #	<10 #	<5 #	<5 #	<5 #	
Fluoranthene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Fluorene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<2	<1	<1	<1	
Phenol (aq)	<1 µg/l	TM176		<1	<2	<1	<1	<1	
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Hexachloroethane (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Nitrobenzene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Naphthalene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Isophorone (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<2	<1	<1	<1	
Phenanthrene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	
Pyrene (aq)	<1 µg/l	TM176		<1 #	<2 #	<1 #	<1 #	<1 #	

CERTIFICATE OF ANALYSIS

SDG: 220711-30 **Report Number:** 655089 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

VOC MS (W)

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022
			Sample Time	-	-	-	-	-
			Date Received	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022
			SDG Ref	220711-30	220711-30	220711-30	220711-30	220711-30
			Lab Sample No.(s)	26569515	26569507	26569497	26569487	26569470
			AGS Reference					
Dibromofluoromethane**	%	TM208		118	122	125	116	121
Toluene-d8**	%	TM208		100	102	98.8	98.5	100
4-Bromofluorobenzene**	%	TM208		93.8	96.7	94.8	93.8	95.5
Dichlorodifluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Chloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Vinyl chloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Bromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Chloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Trichlorofluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Carbon disulphide	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Dichloromethane	<3 µg/l	TM208		<6 #	<6 #	<5.5 #	<6 #	<5.5 #
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	1.36 #	<1 #
2,2-Dichloropropane	<1 µg/l	TM208		<1	<1	<1	<1	<1
Bromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Chloroform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Carbontetrachloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Benzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Trichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Dibromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Bromodichloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
Toluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #

CERTIFICATE OF ANALYSIS

SDG: 220711-30 **Report Number:** 655089 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

VOC MS (W)

Results Legend	Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6	
# ISO17025 accredited.							
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.	Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	
* Subcontracted - refer to subcontractor report for accreditation status.	Date Sampled	06/07/2022	06/07/2022	06/07/2022	06/07/2022	06/07/2022	
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Sample Time	.	.	.	.	.	
(F) Trigger breach confirmed	Date Received	11/07/2022	11/07/2022	11/07/2022	11/07/2022	11/07/2022	
1-4+§@ Sample deviation (see appendix)	SDG Ref	220711-30	220711-30	220711-30	220711-30	220711-30	
	Lab Sample No.(s)	26569515	26569507	26569497	26569487	26569470	
	AGS Reference						

Component	LOD/Units	Method									
Tetrachloroethene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
Dibromochloromethane	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
1,2-Dibromoethane	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
Chlorobenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
Ethylbenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
m,p-Xylene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
o-Xylene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
Styrene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
Bromoform	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
Isopropylbenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
Bromobenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
Propylbenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
2-Chlorotoluene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
4-Chlorotoluene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
tert-Butylbenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
sec-Butylbenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
4-iso-Propyltoluene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
n-Butylbenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1		<1		<1		<1		<1	
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
Hexachlorobutadiene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
Naphthalene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#	<1	#
1,3,5-Trichlorobenzene	<1 µg/l	TM208	<1		<1		<1		<1		<1	

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
TM046	Method 4500G, AWWA/APHA, 20th Ed., 1999	Measurement of Dissolved Oxygen by Oxygen Meter
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
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
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, Standard Methods for the examination of waters and wastewaters 20th Edition, PHA, Washington DC, USA. ISBN 0-87553-235-7 and The Determination of Alkalinity and Acidity in water HMSO, 1981, ISBN 0 11 751601 5.	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM343	EPA 8270D - Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of Selected Pesticides (Suite I) in Liquids by GCMS
TM344	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite II) by GCMS
TM411	Acid_Herbs_GCMS	Acid Herbs in Water by GCMS

NA = not applicable.

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

CERTIFICATE OF ANALYSIS

SDG: 220711-30 **Report Number:** 655089 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Test Completion Dates

Lab Sample No(s)	26569515	26569507	26569497	26569487	26569470
Customer Sample Ref.	BH1	BH2	BH3	GW4	GW6
AGS Ref.					
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Acid Herbicides by GCMS	17-Jul-2022	17-Jul-2022	17-Jul-2022	17-Jul-2022	17-Jul-2022
Alkalinity as CaCO3	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022
Ammonium Low	15-Jul-2022	15-Jul-2022	18-Jul-2022	15-Jul-2022	18-Jul-2022
Anions by Kone (w)	13-Jul-2022	15-Jul-2022	13-Jul-2022	13-Jul-2022	13-Jul-2022
Cyanide Comp/Free/Total/Thiocyanate	16-Jul-2022	16-Jul-2022	16-Jul-2022	16-Jul-2022	16-Jul-2022
Dissolved Metals by ICP-MS	21-Jul-2022	21-Jul-2022	20-Jul-2022	20-Jul-2022	21-Jul-2022
Dissolved Oxygen by Probe	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022
Fluoride	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022
Mercury Dissolved	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022
Pesticides (Suite I) by GCMS	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022
Pesticides (Suite II) by GCMS	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022
pH Value	15-Jul-2022	15-Jul-2022	14-Jul-2022	15-Jul-2022	14-Jul-2022
Phosphate by Kone (w)	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022
Suspended Solids	18-Jul-2022	19-Jul-2022	19-Jul-2022	18-Jul-2022	18-Jul-2022
SVOC MS (W) - Aqueous	15-Jul-2022	15-Jul-2022	15-Jul-2022	15-Jul-2022	15-Jul-2022
Total Metals by ICP-MS	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022	19-Jul-2022
VOC MS (W)	20-Jul-2022	20-Jul-2022	20-Jul-2022	20-Jul-2022	20-Jul-2022

SDG:	220711-30	**Report Number:**	655089	**Superseded Report:**	
Client Ref:	P1444	**Location:**	Ballymulvey Landfill		

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) 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. 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.

3. 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.

4. 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.

5. 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.

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

7. Results relate only to the items tested.

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

9. **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.

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

11. 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.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

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

14. 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.

15. 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.

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

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **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.

19. **Sample Deviations**

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

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Matrix interference**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**
§	**Sampled on date not provided**

20. **Asbestos**

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 (2021), 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.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials andd soils 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 (2021).

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.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
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.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

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.

Unit 7-8 Hawarden Business Park
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Hawarden
Deeside
CH5 3US
Tel: (01244) 528777
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 of report Generation:	25 October 2022
Customer:	Fehily Timoney
Sample Delivery Group (SDG):	221007-78
Your Reference:	P1444
Location:	Ballymulvey Landfill
Report No:	665902
Order Number:	Z3180

We received 8 samples on Friday October 07, 2022 and 8 of these samples were scheduled for analysis which was completed on Tuesday October 25, 2022. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager

1291

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
26983216	BH1		0.00 - 0.00	05/10/2022
26983199	BH2		0.00 - 0.00	05/10/2022
26983190	BH3		0.00 - 0.00	05/10/2022
26983224	BH4		0.00 - 0.00	05/10/2022
26983232	BH5A		0.00 - 0.00	05/10/2022
26983178	GW4		0.00 - 0.00	05/10/2022
26983241	GW5		0.00 - 0.00	05/10/2022
26983170	GW6		0.00 - 0.00	05/10/2022

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

Validated

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 8	26983216	BH1		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
Alkalinity as CaCO3	All	NDPs: 0 Tests: 8	26983216	BH1		0.00 - 0.00	500ml Plastic (ALE208)	GW
Ammonium Low	All	NDPs: 0 Tests: 8	26983216	BH1		0.00 - 0.00	H2SO4 (ALE244)	GW
Anions by Kone (w)	All	NDPs: 0 Tests: 8	26983216	BH1		0.00 - 0.00	500ml Plastic (ALE208)	GW
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 8	26983216	BH1		0.00 - 0.00	NaOH (ALE245)	GW
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 8	26983216	BH1		0.00 - 0.00	500ml Plastic (ALE208)	GW
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 8	26983216	BH1		0.00 - 0.00	500ml Plastic (ALE208)	GW
Fluoride	All	NDPs: 0 Tests: 8	26983216	BH1		0.00 - 0.00	500ml Plastic (ALE208)	GW
Mercury Dissolved	All	NDPs: 0 Tests: 8	26983216	BH1		0.00 - 0.00	500ml Plastic (ALE208)	GW
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 8	26983216	BH1		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 8	26983216	BH1		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
pH Value	All	NDPs: 0 Tests: 8	26983216	BH1		0.00 - 0.00	500ml Plastic (ALE208)	GW
Phosphate by Kone (w)	All	NDPs: 0 Tests: 8	26983216	BH1		0.00 - 0.00	500ml Plastic (ALE208)	GW
Suspended Solids	All	NDPs: 0 Tests: 8	26983216	BH1		0.00 - 0.00	500ml Plastic (ALE208)	GW
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 8	26983216	BH1		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 8	26983199	BH2		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
Alkalinity as CaCO3	All	NDPs: 0 Tests: 8	26983199	BH2		0.00 - 0.00	500ml Plastic (ALE208)	GW
Ammonium Low	All	NDPs: 0 Tests: 8	26983199	BH2		0.00 - 0.00	H2SO4 (ALE244)	GW
Anions by Kone (w)	All	NDPs: 0 Tests: 8	26983199	BH2		0.00 - 0.00	500ml Plastic (ALE208)	GW
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 8	26983199	BH2		0.00 - 0.00	NaOH (ALE245)	GW
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 8	26983199	BH2		0.00 - 0.00	500ml Plastic (ALE208)	GW
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 8	26983199	BH2		0.00 - 0.00	500ml Plastic (ALE208)	GW
Fluoride	All	NDPs: 0 Tests: 8	26983199	BH2		0.00 - 0.00	500ml Plastic (ALE208)	GW
Mercury Dissolved	All	NDPs: 0 Tests: 8	26983199	BH2		0.00 - 0.00	500ml Plastic (ALE208)	GW
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 8	26983199	BH2		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 8	26983199	BH2		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
pH Value	All	NDPs: 0 Tests: 8	26983199	BH2		0.00 - 0.00	500ml Plastic (ALE208)	GW
Phosphate by Kone (w)	All	NDPs: 0 Tests: 8	26983199	BH2		0.00 - 0.00	500ml Plastic (ALE208)	GW
Suspended Solids	All	NDPs: 0 Tests: 8	26983199	BH2		0.00 - 0.00	500ml Plastic (ALE208)	GW
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 8	26983199	BH2		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 8	26983190	BH3		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
Alkalinity as CaCO3	All	NDPs: 0 Tests: 8	26983190	BH3		0.00 - 0.00	500ml Plastic (ALE208)	GW
Ammonium Low	All	NDPs: 0 Tests: 8	26983190	BH3		0.00 - 0.00	H2SO4 (ALE244)	GW
Anions by Kone (w)	All	NDPs: 0 Tests: 8	26983190	BH3		0.00 - 0.00	500ml Plastic (ALE208)	GW
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 8	26983190	BH3		0.00 - 0.00	NaOH (ALE245)	GW
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 8	26983190	BH3		0.00 - 0.00	500ml Plastic (ALE208)	GW
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 8	26983190	BH3		0.00 - 0.00	500ml Plastic (ALE208)	GW
Fluoride	All	NDPs: 0 Tests: 8	26983190	BH3		0.00 - 0.00	500ml Plastic (ALE208)	GW
Mercury Dissolved	All	NDPs: 0 Tests: 8	26983190	BH3		0.00 - 0.00	500ml Plastic (ALE208)	GW
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 8	26983190	BH3		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 8	26983190	BH3		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
pH Value	All	NDPs: 0 Tests: 8	26983190	BH3		0.00 - 0.00	500ml Plastic (ALE208)	GW
Phosphate by Kone (w)	All	NDPs: 0 Tests: 8	26983190	BH3		0.00 - 0.00	500ml Plastic (ALE208)	GW
Suspended Solids	All	NDPs: 0 Tests: 8	26983190	BH3		0.00 - 0.00	500ml Plastic (ALE208)	GW
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 8	26983190	BH3		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 8	26983224	BH4		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
Alkalinity as CaCO3	All	NDPs: 0 Tests: 8	26983224	BH4		0.00 - 0.00	500ml Plastic (ALE208)	GW
Ammonium Low	All	NDPs: 0 Tests: 8	26983224	BH4		0.00 - 0.00	H2SO4 (ALE244)	GW
Anions by Kone (w)	All	NDPs: 0 Tests: 8	26983224	BH4		0.00 - 0.00	500ml Plastic (ALE208)	GW
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 8	26983224	BH4		0.00 - 0.00	NaOH (ALE245)	GW
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 8	26983224	BH4		0.00 - 0.00	500ml Plastic (ALE208)	GW
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 8	26983224	BH4		0.00 - 0.00	500ml Plastic (ALE208)	GW
Fluoride	All	NDPs: 0 Tests: 8	26983224	BH4		0.00 - 0.00	500ml Plastic (ALE208)	GW
Mercury Dissolved	All	NDPs: 0 Tests: 8	26983224	BH4		0.00 - 0.00	500ml Plastic (ALE208)	GW
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 8	26983224	BH4		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 8	26983224	BH4		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
pH Value	All	NDPs: 0 Tests: 8	26983224	BH4		0.00 - 0.00	500ml Plastic (ALE208)	GW
Phosphate by Kone (w)	All	NDPs: 0 Tests: 8	26983224	BH4		0.00 - 0.00	500ml Plastic (ALE208)	GW
Suspended Solids	All	NDPs: 0 Tests: 8	26983224	BH4		0.00 - 0.00	500ml Plastic (ALE208)	GW
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 8	26983224	BH4		0.00 - 0.00	0.5l glass bottle (ALE227)	GW

26983241	GW5		0.00 - 0.00	HNO3 Unfiltered (ALE204)	GW																	
				H2SO4 (ALE244)	GW				x													
				500ml Plastic (ALE208)	GW		x			x			x	x	x	x				x	x	x	
				0.5l glass bottle (ALE227)	GW	x											x		x				x
26983178	GW4		0.00 - 0.00	Vial (ALE297)	GW																	
				NaOH (ALE245)	GW						x											
				HNO3 Unfiltered (ALE204)	GW																	
				H2SO4 (ALE244)	GW				x													
				500ml Plastic (ALE208)	GW		x			x			x	x	x	x				x	x	x	
				0.5l glass bottle (ALE227)	GW	x											x		x				x
26983232	BH5A		0.00 - 0.00	Vial (ALE297)	GW																	
				NaOH (ALE245)	GW						x											
				HNO3 Unfiltered (ALE204)	GW																	
				H2SO4 (ALE244)	GW				x													
				500ml Plastic (ALE208)	GW		x			x			x	x	x	x				x	x	x	
				0.5l glass bottle (ALE227)	GW	x											x		x				x
26983224	BH4		0.00 - 0.00	Vial (ALE297)	GW																	
				NaOH (ALE245)	GW						x											
				HNO3 Unfiltered (ALE204)	GW																	
				H2SO4 (ALE244)	GW				x													
				500ml Plastic (ALE208)	GW		x			x			x	x	x	x				x	x	x	

Validated

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
			26983216	BH1		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
							500ml Plastic (ALE208)	GW
							H2SO4 (ALE244)	GW
							HNO3 Unfiltered (ALE204)	GW
							NaOH (ALE245)	GW
							Vial (ALE297)	GW
			26983199	BH2		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
							500ml Plastic (ALE208)	GW
							H2SO4 (ALE244)	GW
							HNO3 Unfiltered (ALE204)	GW
							NaOH (ALE245)	GW
							Vial (ALE297)	GW
			26983190	BH3		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
							500ml Plastic (ALE208)	GW
							H2SO4 (ALE244)	GW
							HNO3 Unfiltered (ALE204)	GW
							NaOH (ALE245)	GW
							Vial (ALE297)	GW
			26983224	BH4		0.00 - 0.00	0.5l glass bottle (ALE227)	GW
Total Metals by ICP-MS	All	NDPs: 0 Tests: 8						
				X				
				X				
VOC MS (W)	All	NDPs: 0 Tests: 8						
				X				
				X				

26983241	GW5		0.00 - 0.00	HNO3 Unfiltered (ALE204)	GW		X		
				H2SO4 (ALE244)	GW				
				500ml Plastic (ALE208)	GW				
				0.5l glass bottle (ALE227)	GW				
26983178	GW4		0.00 - 0.00	Vial (ALE297)	GW				X
				NaOH (ALE245)	GW				
				HNO3 Unfiltered (ALE204)	GW		X		
				H2SO4 (ALE244)	GW				
				500ml Plastic (ALE208)	GW				
				0.5l glass bottle (ALE227)	GW				
26983232	BH5A		0.00 - 0.00	Vial (ALE297)	GW				X
				NaOH (ALE245)	GW				
				HNO3 Unfiltered (ALE204)	GW		X		
				H2SO4 (ALE244)	GW				
				500ml Plastic (ALE208)	GW				
				0.5l glass bottle (ALE227)	GW				
26983224	BH4		0.00 - 0.00	Vial (ALE297)	GW				X
				NaOH (ALE245)	GW				
				HNO3 Unfiltered (ALE204)	GW		X		
				H2SO4 (ALE244)	GW				
				500ml Plastic (ALE208)	GW				

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			26983241			26983170				
Customer Sample Reference			GW5			GW6				
AGS Reference										
Depth (m)			0.00 - 0.00			0.00 - 0.00				
Container			NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)
Sample Type			GW	GW	GW	GW	GW	GW	GW	GW
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 8			X					
Alkalinity as CaCO3	All	NDPs: 0 Tests: 8				X				
Ammonium Low	All	NDPs: 0 Tests: 8					X			
Anions by Kone (w)	All	NDPs: 0 Tests: 8				X				
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 8	X						X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 8				X				
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 8				X				
Fluoride	All	NDPs: 0 Tests: 8				X				
Mercury Dissolved	All	NDPs: 0 Tests: 8				X				
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 8			X					
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 8			X					
pH Value	All	NDPs: 0 Tests: 8				X				
Phosphate by Kone (w)	All	NDPs: 0 Tests: 8				X				
Suspended Solids	All	NDPs: 0 Tests: 8				X				
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 8			X					

Validated

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			26983241							26983170
Customer Sample Reference			GW5							GW6
AGS Reference										
Depth (m)			0.00 - 0.00							0.00 - 0.00
Container			NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)
Sample Type			GW	GW	GW	GW	GW	GW	GW	GW
Total Metals by ICP-MS	All	NDPs: 0 Tests: 8						X		
VOC MS (W)	All	NDPs: 0 Tests: 8		X						X

Validated

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH4	BH5A	GW4
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	05/10/2022	05/10/2022	05/10/2022	05/10/2022	05/10/2022	05/10/2022
			Sample Time	-	-	-	-	-	-
			Date Received	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022
			SDG Ref	221007-78	221007-78	221007-78	221007-78	221007-78	221007-78
			Lab Sample No.(s)	26983216	26983199	26983190	26983224	26983232	26983178
			AGS Reference						
Suspended solids, Total	<2 mg/l	TM022		246 #	2580 #	11.4 #	286 #	261 #	51.7 #
Alkalinity, Total as CaCO3	<2 mg/l	TM043		400 #	1160 #	595 #	2940 #	7020 #	445 #
Oxygen, dissolved	<0.3 mg/l	TM046		7.14	4.08	3.98	5.19	4.12	8.38
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099		0.177 #	1.47 #	23.9 #	513 #	1620 #	1.22 #
Fluoride	<0.5 mg/l	TM104		<0.5 #	<0.5 #	<0.5 #	<0.5 #	1.61 #	<0.5 #
Arsenic (diss.filt)	<0.5 µg/l	TM152		<0.5 2 #	1.14 2 #	2.96 2 #	5.32 2 #	13.4 2 #	1.16 2 #
Boron (diss.filt)	<10 µg/l	TM152		16.6 2 #	25.7 2 #	91 2 #	1490 2 #	1960 2 #	17.8 2 #
Cadmium (diss.filt)	<0.08 µg/l	TM152		<0.08 2 #	0.122 2 #	<0.08 2 #	<0.08 2 #	0.127 2 #	<0.08 2 #
Chromium (diss.filt)	<1 µg/l	TM152		<1 2 #	<1 2 #	<1 2 #	7.97 2 #	72.3 2 #	<1 2 #
Copper (diss.filt)	<0.3 µg/l	TM152		3.27 2 #	5.13 2 #	0.585 2 #	4.49 2 #	5.69 2 #	1.31 2 #
Lead (diss.filt)	<0.2 µg/l	TM152		<0.2 2 #	<0.2 2 #	<0.2 2 #	0.662 2 #	1.73 2 #	<0.2 2 #
Manganese (diss.filt)	<3 µg/l	TM152		9.25 2 #	624 2 #	577 2 #	656 2 #	174 2 #	1950 2 #
Phosphorus (tot.unfilt)	<20 µg/l	TM152		1040 #	870 #	125 #	1670 #	6730 #	65.1 #
Nickel (diss.filt)	<0.4 µg/l	TM152		5.1 2 #	7.99 2 #	3.26 2 #	37.6 2 #	77.7 2 #	4.24 2 #
Zinc (diss.filt)	<1 µg/l	TM152		11.8 2 #	23.4 2 #	19.4 2 #	80.7 2 #	73.2 2 #	21.2 2 #
Sodium (Dis.Filt)	<0.076 mg/l	TM152		7.69 2 #	16.8 2 #	82.5 2 #	693 2 #	2530 2 #	7.64 2 #
Magnesium (Dis.Filt)	<0.036 mg/l	TM152		12.7 2 #	8.95 2 #	28.2 2 #	102 2 #	190 2 #	16.2 2 #
Potassium (Dis.Filt)	<0.2 mg/l	TM152		9.52 2 #	3.94 2 #	24 2 #	182 2 #	503 2 #	3.42 2 #
Calcium (Dis.Filt)	<0.2 mg/l	TM152		145 2 #	201 2 #	177 2 #	154 2 #	77.5 2 #	151 2 #
Iron (Dis.Filt)	<0.019 mg/l	TM152		<0.019 2 #	0.0688 2 #	0.305 2 #	0.64 2 #	5.33 2 #	<0.019 2 #
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 2 #	<0.01 2 #	<0.01 2 #	<0.01 2 #	<0.1 2 #	<0.01 2 #
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184		<0.05 #	<0.05 #	<0.05 #	0.055 #	14.6 #	<0.05 #
Sulphate	<2 mg/l	TM184		23.8 #	38.4 #	36.8 #	<2 #	<2 #	<2 #
Chloride	<2 mg/l	TM184		13.6 #	29.3 #	129 #	1030 #	6840 #	14 #
Total Oxidised Nitrogen as NO3	<0.3 mg/l	TM184		7.61 #	0.694 #	1.88 #	0.518 #	0.672 #	1.49 #
Cyanide, Total	<0.05 mg/l	TM227		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
pH	<1 pH Units	TM256		7.37 #	7.31 #	7.25 #	7.17 #	7.56 #	7.54 #
Conductivity @ 20 deg.C	<0.02 mS/cm	TM256		0.697 #	0.869 #	1.24 #	6.66 #	24.5 #	0.712 #
Trifluralin	<0.01 µg/l	TM343		<0.05	<0.1	<0.01	<0.05	<0.5	<0.01
alpha-HCH	<0.01 µg/l	TM343		<0.05	<0.1	<0.01	<0.05	<0.5	<0.01
gamma-HCH (Lindane)	<0.01 µg/l	TM343		<0.05	<0.1	<0.01	<0.05	<0.5	<0.01
Heptachlor	<0.01 µg/l	TM343		<0.05	<0.1	<0.01	<0.05	<0.5	<0.02
Aldrin	<0.01 µg/l	TM343		<0.05	<0.1	<0.01	<0.05	<0.5	<0.01

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend								
#	ISO17025 accredited.	Customer Sample Ref.	BH1	BH2	BH3	BH4	BH5A	GW4
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	0.00 - 0.00
diss.filt	Dissolved / filtered sample.	Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
tot.unfilt	Total / unfiltered sample.	Date Sampled	05/10/2022	05/10/2022	05/10/2022	05/10/2022	05/10/2022	05/10/2022
*	Subcontracted - refer to subcontractor report for accreditation status.	Sample Time	.	.	.	.	.	.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Date Received	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022
(F)	Trigger breach confirmed	SDG Ref	221007-78	221007-78	221007-78	221007-78	221007-78	221007-78
1-4+§@	Sample deviation (see appendix)	Lab Sample No.(s)	26983216	26983199	26983190	26983224	26983232	26983178
		AGS Reference						

Component	LOD/Units	Method						
beta-HCH	<0.01 µg/l	TM343	<0.05	<0.1	<0.01	<0.05	<2.5	<0.01
Isodrin	<0.01 µg/l	TM343	<0.05	<0.1	<0.01	<0.05	<0.5	<0.01
delta-HCH	<0.01 µg/l	TM343	<0.05	<0.1	<0.01	<0.05	<0.5	<0.01
Heptachlor epoxide	<0.01 µg/l	TM343	<0.05	<0.1	<0.01	<0.05	<0.5	<0.01
o,p'-DDE	<0.01 µg/l	TM343	<0.05	<0.1	<0.01	<0.05	<0.5	<0.01
Endosulphan I	<0.01 µg/l	TM343	<0.05	<0.1	<0.01	<0.05	<0.5	<0.01
trans-Chlordane	<0.01 µg/l	TM343	<0.05	<0.1	<0.01	<0.06	<0.5	<0.01
cis-Chlordane	<0.01 µg/l	TM343	<0.05	<0.1	<0.01	<0.05	<0.5	<0.01
p,p'-DDE	<0.01 µg/l	TM343	<0.05	<0.1	<0.01	<0.05	<0.5	<0.01
Dieldrin	<0.01 µg/l	TM343	<0.05	<0.1	<0.01	<0.05	<0.5	<0.01
o,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.05	<0.1	<0.01	<0.05	<0.5	<0.01
Endrin	<0.01 µg/l	TM343	<0.05	<0.1	<0.01	<0.05	<0.5	<0.01
o,p'-DDT	<0.01 µg/l	TM343	<0.15	<0.3	<0.03	<0.15	<0.5	<0.05
p,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.05	<0.1	<0.01	<0.05	<0.5	<0.01
Endosulphan II	<0.02 µg/l	TM343	<0.1	<0.2	<0.02	<0.1	<1	<0.02
p,p'-DDT	<0.01 µg/l	TM343	<0.2	<0.4	<0.04	<0.2	<2.5	<0.1
o,p'-Methoxychlor	<0.01 µg/l	TM343	<0.15	<0.3	<0.03	<0.15	<1	<0.04
p,p'-Methoxychlor	<0.01 µg/l	TM343	<0.2	<0.4	<0.04	<0.2	<2.5	<0.08
Endosulphan Sulphate	<0.02 µg/l	TM343	<0.2	<0.4	<0.04	<0.2	<1	<0.04
Permethrin I	<0.01 µg/l	TM343	<0.05	<0.1	<0.01	<0.05	<0.5	<0.02
Permethrin II	<0.01 µg/l	TM343	<0.05	<0.1	<0.01	<0.05	<0.5	<0.02
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344	<0.1	<0.1	<0.01	<0.05	<0.2	<0.01
Hexachlorobutadiene	<0.01 µg/l	TM344	<0.1	<0.1	<0.01	<0.05	<0.2	<0.01
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344	<0.1	<0.1	<0.01	<0.05	<0.21	0.0453
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344	<0.1	<0.1	<0.01	0.0839	<0.2	<0.01
Dichlorvos	<0.01 µg/l	TM344	<0.05	<0.1	<0.01	<0.05	<0.1	<0.01
Dichlobenil	<0.01 µg/l	TM344	<0.05	<0.1	<0.01	<0.05	<0.1	<0.01
Mevinphos	<0.01 µg/l	TM344	<0.05	<0.1	<0.01	<0.05	<0.1	<0.01
Tecnazene	<0.01 µg/l	TM344	<0.05	<0.1	<0.01	<0.05	<0.1	<0.01
Hexachlorobenzene	<0.01 µg/l	TM344	<0.1	<0.1	<0.01	<0.05	<0.2	<0.01
Demeton-S-methyl	<0.01 µg/l	TM344	<0.05	<0.1	<0.01	<0.05	<0.1	<0.01
Phorate	<0.01 µg/l	TM344	<0.05	<0.1	<0.01	<0.05	<0.1	<0.01
Diazinon	<0.01 µg/l	TM344	<0.05	<0.1	<0.01	<0.05	<0.1	<0.01

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH4	BH5A	GW4
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	05/10/2022	05/10/2022	05/10/2022	05/10/2022	05/10/2022	05/10/2022
			Sample Time	.	.	.	.	.	.
			Date Received	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022
			SDG Ref	221007-78	221007-78	221007-78	221007-78	221007-78	221007-78
			Lab Sample No.(s)	26983216	26983199	26983190	26983224	26983232	26983178
			AGS Reference						
Triallate	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.05	<0.1	0.0111
Atrazine	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.05	<0.1	<0.01
Simazine	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.05	<0.1	<0.01
Disulfoton	<0.01 µg/l	TM344		<0.1	<0.1	<0.01	<0.05	<0.2	<0.01
Propetamphos	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.05	<0.1	<0.01
Chlorpyriphos-methyl	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.05	<0.1	<0.01
Dimethoate	<0.01 µg/l	TM344		<0.1	<0.1	<0.01	<0.05	<0.1	<0.01
Pirimiphos-methyl	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.05	<0.1	<0.01
Chlorpyriphos	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.05	<0.1	<0.01
Methyl Parathion	<0.01 µg/l	TM344		<0.1	<0.1	<0.01	<0.05	<0.1	<0.01
Malathion	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.05	<0.1	<0.01
Fenthion	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.05	<0.1	<0.01
Fenitrothion	<0.01 µg/l	TM344		<0.1	<0.1	<0.01	<0.05	<0.1	<0.01
Triadimefon	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.05	<0.1	<0.01
Pendimethalin	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.05	<0.1	<0.01
Parathion	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.05	<0.1	<0.01
Chlorfenvinphos	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.05	<0.1	<0.01
trans-Chlordane	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	0.11	<0.1	<0.01
cis-Chlordane	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	0.0706	<0.1	<0.01
Ethion	<0.01 µg/l	TM344		<0.05	<0.1	<0.01	<0.05	<0.1	<0.01
Carbophenothion	<0.01 µg/l	TM344		<0.1	<0.1	<0.01	<0.05	<0.1	<0.1
Triazophos	<0.01 µg/l	TM344		<0.1	<0.1	<0.01	<0.05	3.93	<0.1
Phosalone	<0.01 µg/l	TM344		<0.2	<0.1	<0.01	<0.05	<0.2	<0.1
Azinphos methyl	<0.02 µg/l	TM344		<4	<0.4	<0.04	<0.1	<1.4	<0.2
Azinphos ethyl	<0.02 µg/l	TM344		<0.3	<0.2	<0.02	<0.1	<0.4	<0.02
Dinitro-o-cresol	<0.1 µg/l	TM411		<1	<1	0.232	<1	1.89	0.329
Clopyralid	<0.04 µg/l	TM411		<1	<1	<0.1	<1	2.37	<0.1
MCPA	<0.05 µg/l	TM411		<0.5	<0.5	<0.05	0.91	7.06	<0.05
Mecoprop	<0.04 µg/l	TM411		<0.4	<0.4	0.12	2.29	3.79	<0.04
Dicamba	<0.04 µg/l	TM411		<0.4	<0.4	<0.04	<0.4	<0.4	<0.04
MCPB	<0.05 µg/l	TM411		<0.5	<0.5	<0.05	<0.5	4.94	<0.05
2,4-DB	<0.1 µg/l	TM411		<1	<1	<0.1	<1	<1	<0.1
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411		<0.5	<0.5	<0.05	<0.5	<0.5	<0.05

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH4	BH5A	GW4
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	05/10/2022	05/10/2022	05/10/2022	05/10/2022	05/10/2022	05/10/2022
			Sample Time	.	.	.	.	.	.
			Date Received	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022
			SDG Ref	221007-78	221007-78	221007-78	221007-78	221007-78	221007-78
			Lab Sample No.(s)	26983216	26983199	26983190	26983224	26983232	26983178
			AGS Reference						
Dichlorprop	<0.1 µg/l	TM411		<1	<1	<0.1	<1	2.63	<0.1
Triclopyr	<0.05 µg/l	TM411		<0.5	<0.5	<0.05	<0.5	<0.5	<0.05
Fenoprop (Silvex)	<0.1 µg/l	TM411		<1	<1	<0.1	<1	<1	<0.1
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.5	<0.5	<0.05	<0.5	<0.5	<0.05
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.5	<0.5	<0.05	<0.5	<0.5	<0.05
Bromoxynil	<0.04 µg/l	TM411		<0.4	<0.4	<0.04	<0.4	<0.4	<0.04
Benazolin	<0.04 µg/l	TM411		<0.4	<0.4	<0.04	<0.4	<0.4	<0.04
Ioxynil	<0.05 µg/l	TM411		<0.5	<0.5	<0.05	<0.5	<0.5	<0.05
Pentachlorophenol	<0.04 µg/l	TM411		<0.4	<0.4	<0.04	<0.4	<0.4	<0.04
Fluoroxypyr	<0.1 µg/l	TM411		<1	<1	<0.1	<1	<1	<0.1

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	GW5	GW6				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Ground Water (GW)	Ground Water (GW)				
			Date Sampled	05/10/2022	05/10/2022				
			Sample Time	-	-				
			Date Received	07/10/2022	07/10/2022				
			SDG Ref	221007-78	221007-78				
			Lab Sample No.(s)	26983241	26983170				
			AGS Reference						
Suspended solids, Total	<2 mg/l	TM022		742 #	155 #				
Alkalinity, Total as CaCO3	<2 mg/l	TM043		755 #	365 #				
Oxygen, dissolved	<0.3 mg/l	TM046		7.21	6.32				
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099		0.171 #	1.73 #				
Fluoride	<0.5 mg/l	TM104		<0.5 #	<0.5 #				
Arsenic (diss.filt)	<0.5 µg/l	TM152		0.508 2 #	1.06 2 #				
Boron (diss.filt)	<10 µg/l	TM152		57.3 2 #	15.7 2 #				
Cadmium (diss.filt)	<0.08 µg/l	TM152		<0.08 2 #	<0.08 2 #				
Chromium (diss.filt)	<1 µg/l	TM152		<1 2 #	<1 2 #				
Copper (diss.filt)	<0.3 µg/l	TM152		0.765 2 #	1.12 2 #				
Lead (diss.filt)	<0.2 µg/l	TM152		<0.2 2 #	<0.2 2 #				
Manganese (diss.filt)	<3 µg/l	TM152		<3 2 #	562 2 #				
Phosphorus (tot.unfilt)	<20 µg/l	TM152		207 #	96.9 #				
Nickel (diss.filt)	<0.4 µg/l	TM152		1.11 2 #	4.17 2 #				
Zinc (diss.filt)	<1 µg/l	TM152		12 2 #	21 2 #				
Sodium (Dis.Filt)	<0.076 mg/l	TM152		27.5 2 #	17.6 2 #				
Magnesium (Dis.Filt)	<0.036 mg/l	TM152		13.3 2 #	9.98 2 #				
Potassium (Dis.Filt)	<0.2 mg/l	TM152		2.48 2 #	1.77 2 #				
Calcium (Dis.Filt)	<0.2 mg/l	TM152		84.4 2 #	116 2 #				
Iron (Dis.Filt)	<0.019 mg/l	TM152		<0.019 2 #	<0.019 2 #				
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 2 #	<0.01 2 #				
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184		<0.05 #	<0.05 #				
Sulphate	<2 mg/l	TM184		54.3 #	3.9 #				
Chloride	<2 mg/l	TM184		35.9 #	21.1 #				
Total Oxidised Nitrogen as NO3	<0.3 mg/l	TM184		<0.3 #	3.02 #				
Cyanide, Total	<0.05 mg/l	TM227		<0.05 #	<0.05 #				
pH	<1 pH Units	TM256		7.89 #	7.9 #				
Conductivity @ 20 deg.C	<0.02 mS/cm	TM256		0.532 #	0.585 #				
Trifluralin	<0.01 µg/l	TM343		<0.05	<0.05				
alpha-HCH	<0.01 µg/l	TM343		<0.05	<0.05				
gamma-HCH (Lindane)	<0.01 µg/l	TM343		<0.05	<0.05				
Heptachlor	<0.01 µg/l	TM343		<0.1	<0.05				
Aldrin	<0.01 µg/l	TM343		<0.05	<0.05				

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	GW5	GW6				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Ground Water (GW)	Ground Water (GW)				
			Date Sampled	05/10/2022	05/10/2022				
			Sample Time	.	.				
			Date Received	07/10/2022	07/10/2022				
			SDG Ref	221007-78	221007-78				
			Lab Sample No.(s)	26983241	26983170				
			AGS Reference						
beta-HCH	<0.01 µg/l	TM343		<0.05	<0.25				
Isodrin	<0.01 µg/l	TM343		<0.05	<0.05				
delta-HCH	<0.01 µg/l	TM343		<0.05	<0.05				
Heptachlor epoxide	<0.01 µg/l	TM343		<0.05	<0.05				
o,p'-DDE	<0.01 µg/l	TM343		<0.05	<0.05				
Endosulphan I	<0.01 µg/l	TM343		<0.05	<0.05				
trans-Chlordane	<0.01 µg/l	TM343		<0.05	<0.05				
cis-Chlordane	<0.01 µg/l	TM343		<0.05	<0.05				
p,p'-DDE	<0.01 µg/l	TM343		<0.05	<0.05				
Dieldrin	<0.01 µg/l	TM343		<0.05	<0.05				
o,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.05	<0.05				
Endrin	<0.01 µg/l	TM343		<0.05	<0.05				
o,p'-DDT	<0.01 µg/l	TM343		<0.25	<0.05				
p,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.05	<0.05				
Endosulphan II	<0.02 µg/l	TM343		<0.1	<0.1				
p,p'-DDT	<0.01 µg/l	TM343		<0.5	<0.25				
o,p'-Methoxychlor	<0.01 µg/l	TM343		<0.2	<0.1				
p,p'-Methoxychlor	<0.01 µg/l	TM343		<0.4	<0.25				
Endosulphan Sulphate	<0.02 µg/l	TM343		<0.2	<0.1				
Permethrin I	<0.01 µg/l	TM343		<0.1	<0.05				
Permethrin II	<0.01 µg/l	TM343		<0.1	<0.05				
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344		<0.05	<0.02				
Hexachlorobutadiene	<0.01 µg/l	TM344		<0.05	<0.02				
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344		0.124	<0.02				
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344		<0.05	<0.02				
Dichlorvos	<0.01 µg/l	TM344		<0.05	<0.02				
Dichlobenil	<0.01 µg/l	TM344		<0.05	<0.02				
Mevinphos	<0.01 µg/l	TM344		<0.05	<0.02				
Tecnazene	<0.01 µg/l	TM344		<0.05	<0.02				
Hexachlorobenzene	<0.01 µg/l	TM344		<0.05	<0.02				
Demeton-S-methyl	<0.01 µg/l	TM344		<0.05	<0.02				
Phorate	<0.01 µg/l	TM344		<0.05	<0.02				
Diazinon	<0.01 µg/l	TM344		<0.05	<0.02				

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	GW5	GW6				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Ground Water (GW)	Ground Water (GW)				
			Date Sampled	05/10/2022	05/10/2022				
			Sample Time	.	.				
			Date Received	07/10/2022	07/10/2022				
			SDG Ref	221007-78	221007-78				
			Lab Sample No.(s)	26983241	26983170				
			AGS Reference						
Triallate	<0.01 µg/l	TM344		<0.05	<0.02				
Atrazine	<0.01 µg/l	TM344		<0.05	<0.02				
Simazine	<0.01 µg/l	TM344		<0.05	<0.02				
Disulfoton	<0.01 µg/l	TM344		<0.05	<0.02				
Propetamphos	<0.01 µg/l	TM344		<0.05	<0.02				
Chlorpyriphos-methyl	<0.01 µg/l	TM344		<0.05	<0.02				
Dimethoate	<0.01 µg/l	TM344		<0.05	<0.02				
Pirimiphos-methyl	<0.01 µg/l	TM344		<0.05	<0.02				
Chlorpyriphos	<0.01 µg/l	TM344		<0.05	<0.02				
Methyl Parathion	<0.01 µg/l	TM344		<0.05	<0.02				
Malathion	<0.01 µg/l	TM344		<0.05	<0.02				
Fenthion	<0.01 µg/l	TM344		<0.05	<0.02				
Fenitrothion	<0.01 µg/l	TM344		<0.05	<0.02				
Triadimefon	<0.01 µg/l	TM344		<0.05	<0.02				
Pendimethalin	<0.01 µg/l	TM344		<0.05	<0.02				
Parathion	<0.01 µg/l	TM344		<0.05	<0.02				
Chlorfenvinphos	<0.01 µg/l	TM344		<0.05	<0.02				
trans-Chlordane	<0.01 µg/l	TM344		<0.05	<0.02				
cis-Chlordane	<0.01 µg/l	TM344		<0.05	<0.02				
Ethion	<0.01 µg/l	TM344		<0.05	<0.02				
Carbophenothion	<0.01 µg/l	TM344		<0.05	<0.02				
Triazophos	<0.01 µg/l	TM344		<0.05	<0.02				
Phosalone	<0.01 µg/l	TM344		<0.05	<0.02				
Azinphos methyl	<0.02 µg/l	TM344		<0.2	<0.08				
Azinphos ethyl	<0.02 µg/l	TM344		<0.1	<0.04				
Dinitro-o-cresol	<0.1 µg/l	TM411		<0.5	<0.1				
Clopyralid	<0.04 µg/l	TM411		<0.5	<0.1				
MCPA	<0.05 µg/l	TM411		<0.25	<0.05				
Mecoprop	<0.04 µg/l	TM411		<0.2	<0.04				
Dicamba	<0.04 µg/l	TM411		<0.2	<0.04				
MCPB	<0.05 µg/l	TM411		<0.25	<0.05				
2,4-DB	<0.1 µg/l	TM411		<0.5	<0.1				
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411		<0.25	<0.05				

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	GW5	GW6				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Ground Water (GW)	Ground Water (GW)				
			Date Sampled	05/10/2022	05/10/2022				
			Sample Time	.	.				
			Date Received	07/10/2022	07/10/2022				
			SDG Ref	221007-78	221007-78				
			Lab Sample No.(s)	26983241	26983170				
			AGS Reference						
Dichlorprop	<0.1 µg/l	TM411		<0.5	<0.1				
Triclopyr	<0.05 µg/l	TM411		<0.25	<0.05				
Fenoprop (Silvex)	<0.1 µg/l	TM411		<0.5	<0.1				
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.25	<0.05				
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.25	<0.05				
Bromoxynil	<0.04 µg/l	TM411		<0.2	<0.04				
Benazolin	<0.04 µg/l	TM411		<0.2	<0.04				
Ioxynil	<0.05 µg/l	TM411		<0.25	<0.05				
Pentachlorophenol	<0.04 µg/l	TM411		<0.2	<0.04				
Fluoroxypyr	<0.1 µg/l	TM411		<0.5	<0.1				

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

SVOC MS (W) - Aqueous

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH4	BH5A	GW4
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	05/10/2022	05/10/2022	05/10/2022	05/10/2022	05/10/2022	05/10/2022
			Sample Time	-	-	-	-	-	-
			Date Received	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022
			SDG Ref	221007-78	221007-78	221007-78	221007-78	221007-78	221007-78
			Lab Sample No.(s)	26983216	26983199	26983190	26983224	26983232	26983178
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
2-Chlorophenol (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
2-Methylphenol (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	11.1 #	<1 #
2-Nitroaniline (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
2-Nitrophenol (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<4	<1	<10	<10	<1
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<4	<1	<10	<10	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
4-Methylphenol (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	164 #	<1 #
4-Nitroaniline (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<4	<1	<10	<10	<1
Azobenzene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Acenaphthylene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Acenaphthene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Anthracene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2 #	<8 #	<2 #	<20 #	28.4 #	<2 #
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

SVOC MS (W) - Aqueous

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH4	BH5A	GW4
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	05/10/2022	05/10/2022	05/10/2022	05/10/2022	05/10/2022	05/10/2022
			Sample Time	.	.	.	.	.	.
			Date Received	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022
			SDG Ref	221007-78	221007-78	221007-78	221007-78	221007-78	221007-78
			Lab Sample No.(s)	26983216	26983199	26983190	26983224	26983232	26983178
			AGS Reference						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Carbazole (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Chrysene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Dibenzofuran (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Diethyl phthalate (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5 #	<20 #	<5 #	<50 #	<50 #	<5 #
Fluoranthene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Fluorene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<4	<1	<10	<10	<1
Phenol (aq)	<1 µg/l	TM176		<1	<4	<1	<10	<10	<1
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Hexachloroethane (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Nitrobenzene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Naphthalene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Isophorone (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<4	<1	<10	<10	<1
Phenanthrene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #
Pyrene (aq)	<1 µg/l	TM176		<1 #	<4 #	<1 #	<10 #	<10 #	<1 #

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

SVOC MS (W) - Aqueous

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	GW5	GW6				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Ground Water (GW)	Ground Water (GW)				
			Date Sampled	05/10/2022	05/10/2022				
			Sample Time	-	-				
			Date Received	07/10/2022	07/10/2022				
			SDG Ref	221007-78	221007-78				
			Lab Sample No.(s)	26983241	26983170				
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #				
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #				
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #				
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #				
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1 #	<1 #				
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1 #	<1 #				
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1 #	<1 #				
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1 #	<1 #				
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1 #	<1 #				
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1 #	<1 #				
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1 #	<1 #				
2-Chlorophenol (aq)	<1 µg/l	TM176		<1 #	<1 #				
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1 #	<1 #				
2-Methylphenol (aq)	<1 µg/l	TM176		<1 #	<1 #				
2-Nitroaniline (aq)	<1 µg/l	TM176		<1 #	<1 #				
2-Nitrophenol (aq)	<1 µg/l	TM176		<1 #	<1 #				
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1				
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1 #	<1 #				
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1 #	<1 #				
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1				
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1 #	<1 #				
4-Methylphenol (aq)	<1 µg/l	TM176		<1 #	<1 #				
4-Nitroaniline (aq)	<1 µg/l	TM176		<1 #	<1 #				
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1				
Azobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #				
Acenaphthylene (aq)	<1 µg/l	TM176		<1 #	<1 #				
Acenaphthene (aq)	<1 µg/l	TM176		<1 #	<1 #				
Anthracene (aq)	<1 µg/l	TM176		<1 #	<1 #				
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1 #	<1 #				
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1 #	<1 #				
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2 #	<2 #				
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1 #	<1 #				
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1 #	<1 #				

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

SVOC MS (W) - Aqueous

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	GW5	GW6				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Ground Water (GW)	Ground Water (GW)				
			Date Sampled	05/10/2022	05/10/2022				
			Sample Time	.	.				
			Date Received	07/10/2022	07/10/2022				
			SDG Ref	221007-78	221007-78				
			Lab Sample No.(s)	26983241	26983170				
			AGS Reference						
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 #				
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1 #	<1 #				
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5 #	<5 #				
Fluoranthene (aq)	<1 µg/l	TM176		<1 #	<1 #				
Fluorene (aq)	<1 µg/l	TM176		<1 #	<1 #				
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #				
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1 #	<1 #				
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<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 #				

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

VOC MS (W)

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	BH1	BH2	BH3	BH4	BH5A	GW4
Customer Sample Ref.								
Depth (m)			0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Sample Type			Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
Date Sampled			05/10/2022	05/10/2022	05/10/2022	05/10/2022	05/10/2022	05/10/2022
Sample Time			-	-	-	-	-	-
Date Received			07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022
SDG Ref			221007-78	221007-78	221007-78	221007-78	221007-78	221007-78
Lab Sample No.(s)			26983216	26983199	26983190	26983224	26983232	26983178
AGS Reference								
Dibromofluoromethane**	%	TM208	120	119	115	122	112	116
Toluene-d8**	%	TM208	102	101	101	100	99.5	99.4
4-Bromofluorobenzene**	%	TM208	96.9	98.2	94.7	97.5	94.3	99.9
Dichlorodifluoromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Vinyl chloride	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromomethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Trichlorofluoromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Carbon disulphide	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dichloromethane	<3 µg/l	TM208	<4 #	<5 #	<6 #	<7 #	<5 #	<5 #
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	1.32 #	<1 #
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
Bromochloromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloroform	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1-Trichloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloropropene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Carbontetrachloride	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Benzene	<1 µg/l	TM208	<1 #	<1 #	<1 #	2.29 #	1.63 #	<1 #
Trichloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloropropane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromomethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromodichloromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Toluene	<1 µg/l	TM208	<1 #	<1 #	<1 #	1.59 #	22.8 #	<1 #
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2-Trichloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichloropropane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

VOC MS (W)

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH4	BH5A	GW4
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	05/10/2022	05/10/2022	05/10/2022	05/10/2022	05/10/2022	05/10/2022
			Sample Time	.	.	.	.	.	.
			Date Received	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022
			SDG Ref	221007-78	221007-78	221007-78	221007-78	221007-78	221007-78
			Lab Sample No.(s)	26983216	26983199	26983190	26983224	26983232	26983178
			AGS Reference						
Tetrachloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromoethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	3.36 #	<1 #	<1 #
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Ethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	2.29 #	18.2 #	<1 #
m,p-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	43.5 #	32 #	<1 #
o-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	3.23 #	8.77 #	<1 #
Styrene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromoform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Isopropylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,3-Trichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Propylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	1.41 #	1.17 #	<1 #
2-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	4.09 #	1.53 #	<1 #
4-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,4-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	15.2 #	5.91 #	<1 #
sec-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-iso-Propyltoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	8.03 #	<1 #
1,3-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,4-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	2.83 #	<1 #	<1 #
n-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208		<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Hexachlorobutadiene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Naphthalene	<1 µg/l	TM208		<1 #	<1 #	<1 #	2.04 #	7.23 #	<1 #
1,2,3-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trichlorobenzene	<1 µg/l	TM208		<1	<1	<1	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

VOC MS (W)

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	GW5	GW6				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Ground Water (GW)	Ground Water (GW)				
			Date Sampled	05/10/2022	05/10/2022				
			Sample Time	-	-				
			Date Received	07/10/2022	07/10/2022				
			SDG Ref	221007-78	221007-78				
			Lab Sample No.(s)	26983241	26983170				
			AGS Reference						
Dibromofluoromethane**	%	TM208		111	112				
Toluene-d8**	%	TM208		101	100				
4-Bromofluorobenzene**	%	TM208		96	95.9				
Dichlorodifluoromethane	<1 µg/l	TM208		<1 #	<1 #				
Chloromethane	<1 µg/l	TM208		<1 #	<1 #				
Vinyl chloride	<1 µg/l	TM208		<1 #	<1 #				
Bromomethane	<1 µg/l	TM208		<1 #	<1 #				
Chloroethane	<1 µg/l	TM208		<1 #	<1 #				
Trichlorofluoromethane	<1 µg/l	TM208		<1 #	<1 #				
1,1-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #				
Carbon disulphide	<1 µg/l	TM208		<1 #	<1 #				
Dichloromethane	<3 µg/l	TM208		<5 #	<5 #				
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 #	<1 #				
trans-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #				
1,1-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #				
cis-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #				
2,2-Dichloropropane	<1 µg/l	TM208		<1	<1				
Bromochloromethane	<1 µg/l	TM208		<1 #	<1 #				
Chloroform	<1 µg/l	TM208		<1 #	<1 #				
1,1,1-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #				
1,1-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #				
Carbontetrachloride	<1 µg/l	TM208		<1 #	<1 #				
1,2-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #				
Benzene	<1 µg/l	TM208		<1 #	<1 #				
Trichloroethene	<1 µg/l	TM208		<1 #	<1 #				
1,2-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #				
Dibromomethane	<1 µg/l	TM208		<1 #	<1 #				
Bromodichloromethane	<1 µg/l	TM208		<1 #	<1 #				
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #				
Toluene	<1 µg/l	TM208		<1 #	<1 #				
trans-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #				
1,1,2-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #				
1,3-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #				

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

VOC MS (W)

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	GW5	GW6				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Ground Water (GW)	Ground Water (GW)				
			Date Sampled	05/10/2022	05/10/2022				
			Sample Time	.	.				
			Date Received	07/10/2022	07/10/2022				
			SDG Ref	221007-78	221007-78				
			Lab Sample No.(s)	26983241	26983170				
			AGS Reference						
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		<1 #	<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		<1 #	<1 #				
o-Xylene	<1 µg/l	TM208		<1 #	<1 #				
Styrene	<1 µg/l	TM208		<1 #	<1 #				
Bromoform	<1 µg/l	TM208		<1 #	<1 #				
Isopropylbenzene	<1 µg/l	TM208		<1 #	<1 #				
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #				
1,2,3-Trichloropropane	<1 µg/l	TM208		<1 #	<1 #				
Bromobenzene	<1 µg/l	TM208		<1 #	<1 #				
Propylbenzene	<1 µg/l	TM208		<1 #	<1 #				
2-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #				
1,3,5-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #				
4-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #				
tert-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #				
1,2,4-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #				
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 #				
1,3,5-Trichlorobenzene	<1 µg/l	TM208		<1	<1				

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
TM046	Method 4500G, AWWA/APHA, 20th Ed., 1999	Measurement of Dissolved Oxygen by Oxygen Meter
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
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
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, Standard Methods for the examination of waters and wastewaters 20th Edition, PHA, Washington DC, USA. ISBN 0-87553-235-7 and The Determination of Alkalinity and Acidity in water HMSO, 1981, ISBN 0 11 751601 5.	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM343	EPA 8270D - Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of Selected Pesticides (Suite I) in Liquids by GCMS
TM344	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite II) by GCMS
TM411	Acid_Herbs_GCMS	Acid Herbs in Water by GCMS

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).

CERTIFICATE OF ANALYSIS

SDG: 221007-78 **Report Number:** 665902 **Superseded Report:**
Client Ref.: P1444 **Location:** Ballymulvey Landfill

Test Completion Dates

Lab Sample No(s)	26983216	26983199	26983190	26983224	26983232	26983178	26983241	26983170
Customer Sample Ref.	BH1	BH2	BH3	BH4	BH5A	GW4	GW5	GW6
AGS Ref.								
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Acid Herbicides by GCMS	14-Oct-2022	14-Oct-2022	14-Oct-2022	14-Oct-2022	14-Oct-2022	14-Oct-2022	14-Oct-2022	14-Oct-2022
Alkalinity as CaCO3	14-Oct-2022	12-Oct-2022	14-Oct-2022	14-Oct-2022	14-Oct-2022	14-Oct-2022	14-Oct-2022	14-Oct-2022
Ammonium Low	12-Oct-2022	11-Oct-2022	11-Oct-2022	10-Oct-2022	10-Oct-2022	11-Oct-2022	12-Oct-2022	11-Oct-2022
Anions by Kone (w)	14-Oct-2022	12-Oct-2022	12-Oct-2022	12-Oct-2022	12-Oct-2022	12-Oct-2022	12-Oct-2022	12-Oct-2022
Cyanide Comp/Free/Total/Thiocyanate	11-Oct-2022	11-Oct-2022	11-Oct-2022	11-Oct-2022	11-Oct-2022	11-Oct-2022	11-Oct-2022	11-Oct-2022
Dissolved Metals by ICP-MS	14-Oct-2022	14-Oct-2022	14-Oct-2022	17-Oct-2022	17-Oct-2022	14-Oct-2022	14-Oct-2022	14-Oct-2022
Dissolved Oxygen by Probe	08-Oct-2022	08-Oct-2022	08-Oct-2022	08-Oct-2022	08-Oct-2022	08-Oct-2022	08-Oct-2022	08-Oct-2022
Fluoride	10-Oct-2022	10-Oct-2022	10-Oct-2022	10-Oct-2022	10-Oct-2022	10-Oct-2022	10-Oct-2022	10-Oct-2022
Mercury Dissolved	13-Oct-2022	13-Oct-2022	13-Oct-2022	13-Oct-2022	13-Oct-2022	13-Oct-2022	13-Oct-2022	13-Oct-2022
Pesticides (Suite I) by GCMS	13-Oct-2022	13-Oct-2022	13-Oct-2022	13-Oct-2022	19-Oct-2022	13-Oct-2022	13-Oct-2022	19-Oct-2022
Pesticides (Suite II) by GCMS	14-Oct-2022	18-Oct-2022	18-Oct-2022	25-Oct-2022	18-Oct-2022	21-Oct-2022	18-Oct-2022	18-Oct-2022
pH Value	11-Oct-2022	11-Oct-2022	11-Oct-2022	11-Oct-2022	11-Oct-2022	11-Oct-2022	11-Oct-2022	11-Oct-2022
Phosphate by Kone (w)	08-Oct-2022	08-Oct-2022	08-Oct-2022	08-Oct-2022	08-Oct-2022	08-Oct-2022	08-Oct-2022	08-Oct-2022
Suspended Solids	12-Oct-2022	12-Oct-2022	08-Oct-2022	12-Oct-2022	12-Oct-2022	12-Oct-2022	12-Oct-2022	12-Oct-2022
SVOC MS (W) - Aqueous	12-Oct-2022	12-Oct-2022	12-Oct-2022	12-Oct-2022	13-Oct-2022	12-Oct-2022	12-Oct-2022	12-Oct-2022
Total Metals by ICP-MS	12-Oct-2022	12-Oct-2022	11-Oct-2022	12-Oct-2022	12-Oct-2022	12-Oct-2022	12-Oct-2022	12-Oct-2022
VOC MS (W)	12-Oct-2022	12-Oct-2022	12-Oct-2022	12-Oct-2022	12-Oct-2022	12-Oct-2022	12-Oct-2022	12-Oct-2022

SDG:	221007-78	**Report Number:**	665902	**Superseded Report:**	
Client Ref:	P1444	**Location:**	Ballymulvey Landfill		

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) 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. 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.

3. 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.

4. 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.

5. 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.

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

7. Results relate only to the items tested.

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

9. **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.

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

11. 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.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

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

14. 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.

15. 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.

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

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **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.

19. **Sample Deviations**

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

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Matrix interference**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**
§	**Sampled on date not provided**

20. **Asbestos**

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 (2021), 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.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials andd soils 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 (2021).

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.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
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.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

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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APPENDIX 9

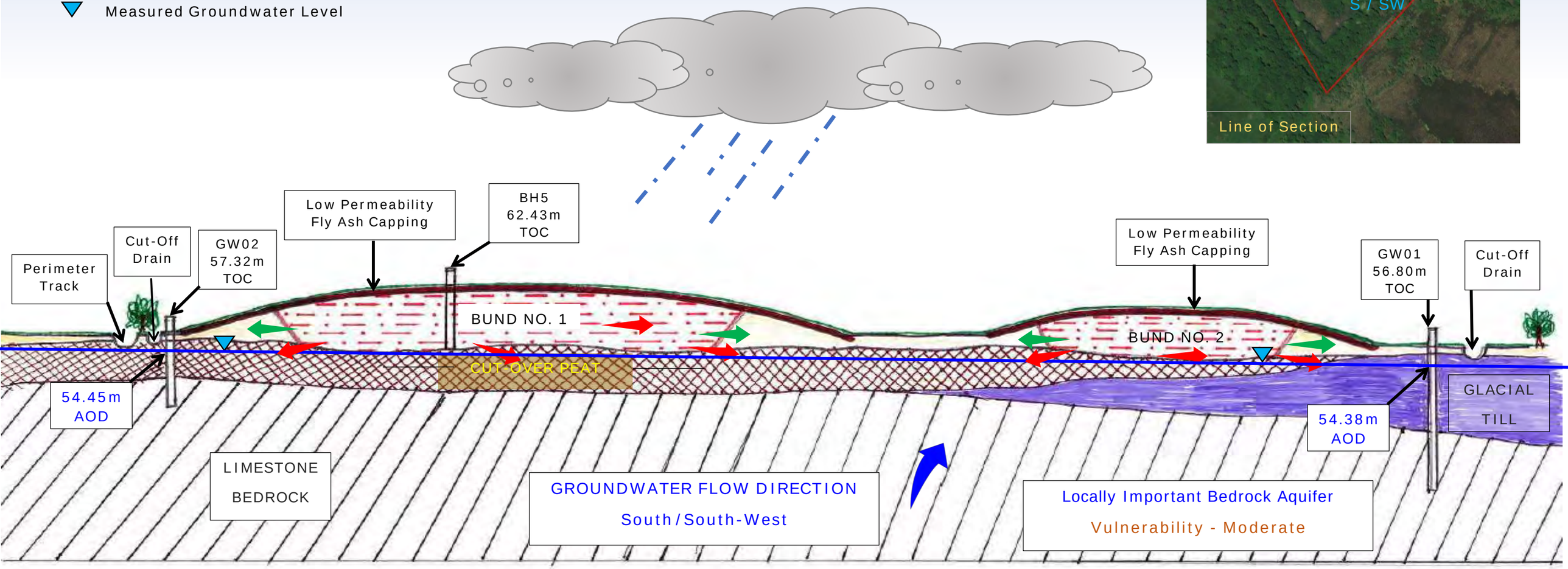
Conceptual Site Model

LANDFILL GAS

LEACHATE MIGRATION

Waste – Typically Municipal

Measured Groundwater Level



SE

NW

CROSS SECTION SOUTH-EAST / NORTH-WEST

FIGURE 5.1 BALLYMULVEY HISTORIC LANDFILL CONCEPTUAL SITE MODEL

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APPENDIX 10

Drawing Requested under
Point 13

Path: R:\Map Production\2022\P22-103\Workspaces\P22-103_Fig_xx_Site_Investigation_Location_Plan_A3.mxd

Legend

- Site Boundary
- Waste Boundary
- Peat Excavation Area
- Rivers
- Surface Water Drains
- Surface Water Monitoring Locations

Borehole Locations

Type

- Groundwater Well
- Leachate Well

N W E S

0 125 250 500 Meters

TITLE:	Ballymulvey Historic Landfill		
PROJECT:	Ballymulvey Historic Landfill - Regulation 7 RFI		
FIGURE NO:	-		
CLIENT:	Longford County Council		
SCALE:	1:5500	**REVISION:**	0
DATE:	22/11/2022	**PAGE SIZE:**	A3

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