

Eve O'Sullivan

Subject: FW: Mullagh historical Landfill
Attachments: Report Oct. 2019.pdf

From: Brona Keating <bkeating@cavancoco.ie>
Sent: 17 October 2019 15:40
To: Ewa Babiarczyk <E.Babiarczyk@epa.ie>
Subject: Mullagh historical Landfill

Hi Ewa,

Attached please find the most recent results for the Mullagh historical Landfill. Please note that Landfill Gas analysis is being carried out at Kingscourt landfill tomorrow and the results will be issued next week. I will follow up with my colleague Sean on your outstanding queries.

Best Regards

Bróna Keating
Cavan County Council

Waste Management Section,
Farnham St, Cavan
☎: 049 4327658 | 087-1759687
✉: bkeating@cavancoco.ie |
Web: www.cavancoco.ie |



Comhairle Contae an Chabháin
Cavan County Council

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Cavan County Council
Farnham Street, Cavan

**Bi-annual Water Monitoring Survey –
Mullagh Historical Landfill**

Report Date:

4th October 2019



KD Environmental Ltd.

1 Swiftbrook Glen, Virginia, Co. Cavan

Report No 2019/72/01

1.0 Introduction

KD Environmental Ltd. was commissioned by Bróna Keating, Waste Management Section, Cavan County Council, to perform bi-annual sampling and analysis of surfacewaters and groundwaters at Mullagh Historical Landfill in County Cavan. The landfill has ceased to operate for many years and is fully decommissioned. However biannual surfacewater monitoring on a minor stream that runs adjacent to the site is performed at four locations. Groundwater monitoring at three locations upstream, immediately adjacent and downstream of the decommissioned landfill is also performed biannually. A monitoring map identifying sampling locations accompanies this report as Appendix 1. Tables 3 and 4 of this report provides external laboratory analysis results; full laboratory test reports from Chemtest and Fitz Scientific are included as Appendix 2 of this report. All sampling was performed on 24th September 2019 by David Kelly BSc. MSc. of KD Environmental Ltd. In-situ monitoring was also performed by David Kelly.

2.0 Groundwater In situ Analysis

Parameter	Unit	GW1	GW2	GW3
Temperature	C	13.4	14.8	13.8
Well Depth	m	4.0	5.0	6.0
Water Level	m	0.0	0.0	0.0
pH	pH	6.77	7.01	6.79
Conductivity	uS/cm	624	564	549
Dissolved Solids	ppm	313	284	276
Suspended Solids	N/A	Low	Low	Low
Colour	N/A	Slight	Slight	Slight
Odour	N/A	Slight	Slight	No foul

Table 1: In-situ Groundwater Results

3.0 Stormwater In-situ Analysis

Parameter	Unit	SW1	SW2	SW3	SW4
Temperature	C	17.7	17.0	17.3	16.7
Dissolved Oxygen	mg/L	5.46	4.79	4.27	6.38
Dissolved Oxygen	%	56.6	49.6	43.9	65.3
pH	pH	6.92	6.83	6.72	6.67
Conductivity	uS/cm	209	200	192	141
Dissolved Solids	ppm	105	99	96	71
Flow Rate	N/A	Slow	Slow	Slow	Slow
Colour	N/A	Slight Orange	Slight Orange	Slight Brown	Orange
Odour	N/A	None	None	None	None

Table 2: In-situ Stormwater Results

4.0 Laboratory Microbiological Analysis Results

Sample ID	Unit	Total Coliforms	E. Coli
GW1	Cfu/100ml	<10	<10
GW2	Cfu/100ml	60	10
GW3	Cfu/100ml	110	<10
SW1	Cfu/100ml	840	330
SW2	Cfu/100ml	720	270
SW3	Cfu/100ml	470	180
SW4	Cfu/100ml	2700	1500

Table 3: Microbiological Results

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5.0 Laboratory Chemical Analysis Results

		Mullagh GW1	Mullagh GW2	Mullagh GW3	Mullagh SW1	Mullagh SW2	Mullagh SW3	Mullagh SW4
Determinant	Units							
pH		8.6	8.5	8.6	8.7	8.6	8.6	9.0
Electrical Conductivity	µS/cm	880	610	570	240	200	190	190
Suspended Solids At 105C	mg/l	140	220	130	7.0	11	20	17
Total Dissolved Solids	mg/l	570	400	370				
Biochemical Oxygen Demand	mg O2/l				< 4.0	< 4.0	< 4.0	< 4.0
Chemical Oxygen Demand	mg O2/l				58	70	26	110
Dissolved Oxygen	mg O2/l	7.9	7.8	8.0	7.9	8.1	8.1	8.0
Alkalinity (Total)	mg/l	420	380	380				
Chloride	mg/l	16	17	20	23	24	22	18
Fluoride	mg/l	0.13	0.18	0.16				
Ammonia (Free) as N	mg/l	0.56	0.29	0.15				
Ammoniacal Nitrogen	mg/l	3.1	1.7	0.86	0.61	0.43	0.35	0.14
Nitrate as N	mg/l				< 0.50	< 0.50	< 0.50	< 0.50
Phosphorus (Total)	mg/l	0.025	< 0.020	0.05	0.093	0.057	0.037	0.030
Sulphate	mg/l	2.2	6.8	6.7	< 1.0	< 1.0	< 1.0	< 1.0
Total Oxidised Nitrogen	mg/l	< 0.20	< 0.20	0.97				
Cyanide (Total)	mg/l	< 0.050	< 0.050	< 0.050				
Nitrogen (Total)	mg/l				3.9	4.0	3.1	3.7
Calcium	mg/l	64	62	52	47	20	20	17
Potassium	mg/l	1.0	2.5	1.2	3.2	3.4	3.4	1.9
Magnesium	mg/l	9.3	15	26	9.7	3.2	3.2	4.2
Sodium	mg/l	11	23	11	11	10	9.6	8.5
Boron (Dissolved)	µg/l	< 20	28	35				
Cadmium (Dissolved)	µg/l	0.62	0.60	1.9				
Chromium (Dissolved)	µg/l	< 1.0	< 1.0	1.6				
Copper (Dissolved)	µg/l	1.6	1.8	3.8				
Iron (Dissolved)	µg/l	470	250	480				
Mercury (Dissolved)	µg/l	< 0.50	< 0.50	1.0				
Manganese (Dissolved)	µg/l	640	2500	910				
Lead (Dissolved)	µg/l	< 1.0	< 1.0	2.0				
Zinc (Dissolved)	µg/l	5.5	6.1	7.1				

		Mullagh GW1	Mullagh GW2	Mullagh GW3	Mullagh SW1	Mullagh SW2	Mullagh SW3	Mullagh SW4
Determinant	Units							
Boron (Total)	µg/l				33	32	29	26
Cadmium (Total)	µg/l				1.9	2.0	1.7	1.6
Chromium (Total)	µg/l				2.0	2.1	1.6	1.7
Copper (Total)	µg/l				5.7	5.8	5.1	5.0
Iron (Total)	µg/l				520	490	610	770
Mercury (Total)	µg/l				0.55	< 0.50	< 0.50	< 0.50
Manganese (Total)	µg/l				200	82	45	74
Lead (Total)	µg/l				1.7	1.9	1.5	2.2
Zinc (Total)	µg/l				7.0	8.6	8.8	10
Total Organic Carbon	mg/l	8.5	6.1	13				
Total Phenols	mg/l	< 0.030	< 0.030	< 0.030				

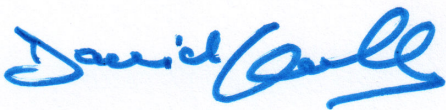
Table 4: Chemical Analysis Results

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6.0 Discussion of Results

It is important to note that there are a number of influences on the water quality in the vicinity other than the historical landfill at Mullagh. The area is one of low intensity dwellings with septic tanks in use for treatment of domestic waste water. Agriculture – predominantly cattle and sheep farming, is the dominant land use. The land spreading of animal waste is a common practice to improve the grass yield of grazing lands. At location SW3 and upstream of SW4, direct cattle access to the stream was noted. This adds organic load to the stream and results in a decrease in oxygen concentrations in waters. Microbiological analysis showed elevated counts for Total Coliforms and E. Coli (indicator of faecal presence) at SW4.

Weather conditions may also greatly affect water quality. In times of heavy rain, parameters such as suspended solids, oxygen demand, ammonia and phosphate may increase due to increased land run-off and more turbulent water flows.



David Kelly BSc. MSc.

Technical Manager
KD Environmental Ltd

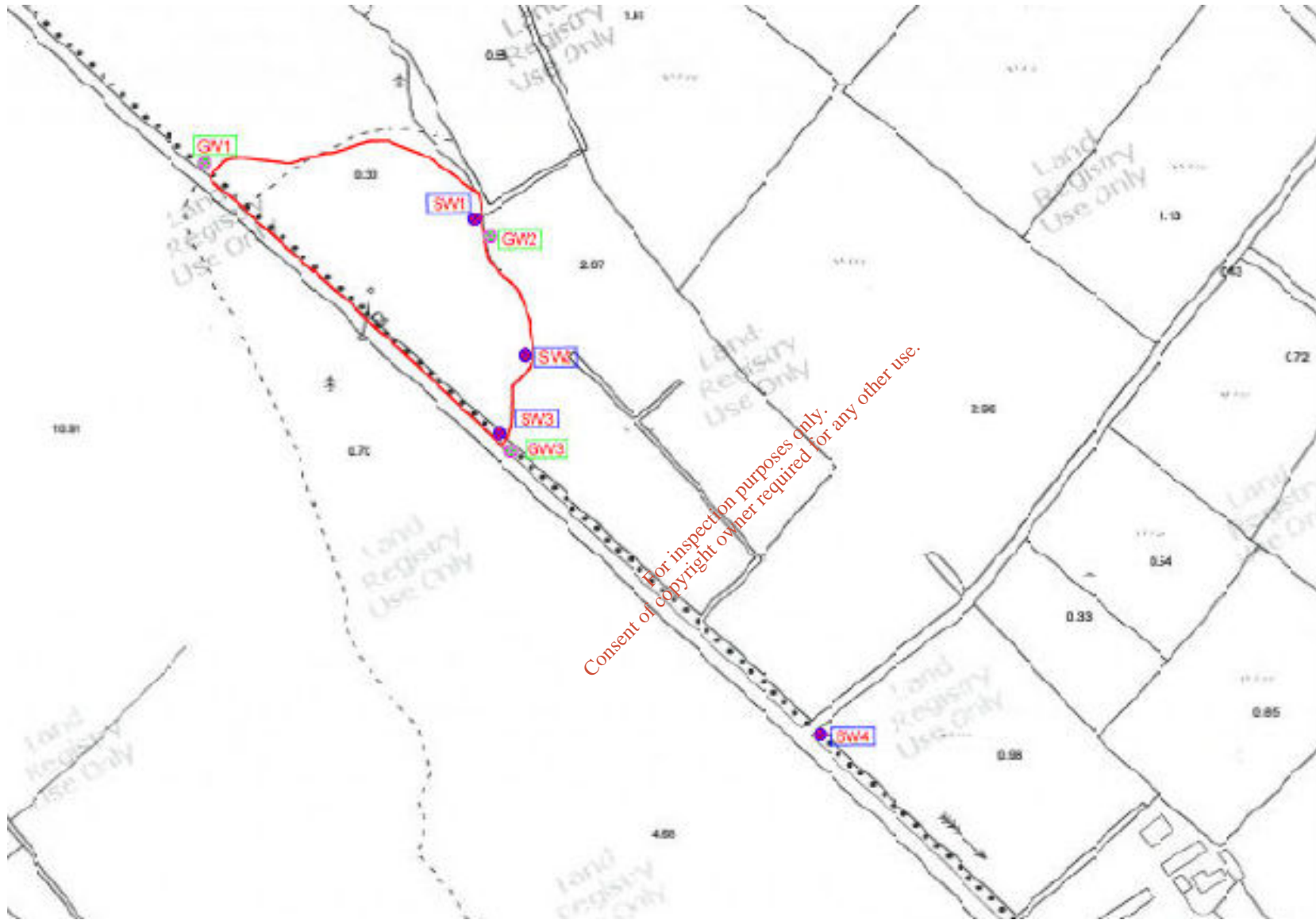
4th March 2019

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Appendix 1

Mullagh Historical Landfill – Water Monitoring Map

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Appendix 2

Mullagh Historical Landfill – Laboratory Certs of Analysis

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Final Report

Report No.: 19-32040-1

Initial Date of Issue: 01-Oct-2019

Client: KD Environmental

Client Address: 1 Swiftbrook Glen
Virginia
Virginia
County Cavan
Ireland

Contact(s): David Kelly

Project: Mullagh Lf Cavan Co. Co.

Quotation No.: Q19-15835


Order No.:

No. of Samples: 7

Turnaround (Wkdays): 5

Date Approved: 01-Oct-2019

Approved By:



Details: Robert Monk, Technical Manager

Date Received: 25-Sep-2019

Date Instructed: 25-Sep-2019

Results Due: 01-Oct-2019

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Results - Water

Client: KD Environmental	Chemtest Job No.:				19-32040	19-32040	19-32040	19-32040	19-32040	19-32040	19-32040
Quotation No.: Q19-15835	Chemtest Sample ID.:				894336	894337	894338	894339	894340	894341	894342
	Client Sample ID.:				Mullagh GW1	Mullagh GW2	Mullagh GW3	Mullagh SW1	Mullagh SW2	Mullagh SW3	Mullagh SW4
	Sample Type:				WATER	WATER	WATER	WATER	WATER	WATER	WATER
	Top Depth (m):				0.0	0.0	0.0				
	Bottom Depth (m):				4.0	5.0	6.0				
	Date Sampled (\$):				24-Sep-2019	24-Sep-2019	24-Sep-2019	24-Sep-2019	24-Sep-2019	24-Sep-2019	24-Sep-2019
Determinand	Accred.	SOP	Units	LOD							
pH	U	1010		N/A	8.6	8.5	8.6	8.7	8.6	8.6	9.0
Electrical Conductivity	U	1020	µS/cm	1.0	880	610	570	240	200	190	190
Suspended Solids At 105C	U	1030	mg/l	5.0	140	220	130	7.0	11	20	17
Total Dissolved Solids	N	1020	mg/l	1.0	570	400	370				
Biochemical Oxygen Demand	N	1090	mg O2/l	4.0				< 4.0	< 4.0	< 4.0	< 4.0
Chemical Oxygen Demand	U	1100	mg O2/l	10				58	70	26	110
Dissolved Oxygen	N	1150	mg O2/l	0.50	7.9	7.8	8.0	7.9	8.1	8.1	8.0
Alkalinity (Total)	U	1220	mg/l	10	420	380	380				
Chloride	U	1220	mg/l	1.0	16	17	20	23	24	22	18
Fluoride	U	1220	mg/l	0.050	0.13	0.18	0.16				
Ammonia (Free) as N	U	1220	mg/l	0.050	0.56	0.29	0.15				
Ammoniacal Nitrogen	U	1220	mg/l	0.050	3.1	1.7	0.86	0.61	0.43	0.35	0.14
Nitrate as N	U	1220	mg/l	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Phosphorus (Total)	N	1220	mg/l	0.020	0.025	< 0.020	0.057	0.093	0.057	0.037	0.030
Sulphate	U	1220	mg/l	1.0	2.2	6.8	6.7	< 1.0	< 1.0	< 1.0	< 1.0
Total Oxidised Nitrogen	U	1220	mg/l	0.20	< 0.20	< 0.20	0.97				
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050	0.050				
Nitrogen (Total)	N	1340	mg/l	1.0				3.9	4.0	3.1	3.7
Calcium	U	1415	mg/l	5.0	64	62	52	47	20	20	17
Potassium	U	1415	mg/l	0.50	1.0	2.5	1.2	3.2	3.4	3.4	1.9
Magnesium	U	1415	mg/l	0.50	9.3	15	26	9.7	3.2	3.2	4.2
Sodium	U	1415	mg/l	0.50	11	23	11	11	10	9.6	8.5
Boron (Dissolved)	U	1450	µg/l	20	< 20	28	35				
Cadmium (Dissolved)	U	1450	µg/l	0.080	0.62	0.60	1.9				
Chromium (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	1.6				
Copper (Dissolved)	U	1450	µg/l	1.0	1.6	1.8	3.8				
Iron (Dissolved)	N	1450	µg/l	20	470	250	480				
Mercury (Dissolved)	U	1450	µg/l	0.50	< 0.50	< 0.50	1.0				
Manganese (Dissolved)	U	1450	µg/l	1.0	640	2500	910				
Lead (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	2.0				
Zinc (Dissolved)	U	1450	µg/l	1.0	5.5	6.1	7.1				
Boron (Total)	N	1450	µg/l	20				33	32	29	26
Cadmium (Total)	N	1450	µg/l	0.080				1.9	2.0	1.7	1.6
Chromium (Total)	N	1450	µg/l	1.0				2.0	2.1	1.6	1.7
Copper (Total)	N	1450	µg/l	1.0				5.7	5.8	5.1	5.0
Iron (Total)	N	1450	µg/l	20				520	490	610	770
Mercury (Total)	N	1450	µg/l	0.50				0.55	< 0.50	< 0.50	< 0.50
Manganese (Total)	N	1450	µg/l	1.0				200	82	45	74
Lead (Total)	N	1450	µg/l	1.0				1.7	1.9	1.5	2.2

Results - Water

Client: KD Environmental	Chemtest Job No.:				19-32040	19-32040	19-32040	19-32040	19-32040	19-32040	19-32040
Quotation No.: Q19-15835	Chemtest Sample ID.:				894336	894337	894338	894339	894340	894341	894342
	Client Sample ID.:				Mullagh GW1	Mullagh GW2	Mullagh GW3	Mullagh SW1	Mullagh SW2	Mullagh SW3	Mullagh SW4
	Sample Type:				WATER	WATER	WATER	WATER	WATER	WATER	WATER
	Top Depth (m):				0.0	0.0	0.0				
	Bottom Depth (m):				4.0	5.0	6.0				
	Date Sampled (\$):				24-Sep-2019	24-Sep-2019	24-Sep-2019	24-Sep-2019	24-Sep-2019	24-Sep-2019	24-Sep-2019
Determinand	Accred.	SOP	Units	LOD							
Zinc (Total)	N	1450	µg/l	1.0				7.0	8.6	8.8	10
Total Organic Carbon	U	1610	mg/l	2.0	8.5	6.1	13				
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030				

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SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1030	Total Suspended Solids	Total suspended solids	Filtration of a mixed sample through a standard glass fibre filter and determination of the mass of residue retained dried at 105°C.
1090	Biochemical Oxygen Demand	Biochemical Oxygen demand (BOD)	Colorimetric determination of dissolved oxygen in seeded sample after 5 days incubation at 20°C.
1100	Chemical Oxygen Demand	Chemical Oxygen demand (COD)	Dichromate oxidation of organic matter in sample followed by colorimetric determination of residual Cr[VI].
1150	Dissolved Oxygen	Dissolved Oxygen (DO)	Electrometric determination (on site preferred), using oxygen sensitive membrane electrode.
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1340	Total Nitrogen in Waters	Total Nitrogen and organic Nitrogen	Persulphate digestion followed by colorimetry.
1415	Cations in Waters by ICP-MS	Sodium; Potassium; Calcium; Magnesium	Direct determination by inductively coupled plasma - mass spectrometry (ICP-MS).
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
- < "less than"
- > "greater than"
- \$ This information has been supplied by the client and can affect the integrity of test data.

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

A copy of this certificate is available on www.fitzsci.ie

Customer	David Kelly KD Environmental Ltd 1 Swiftbrok Glen Virginia Co Cavan	Lab Report Ref. No.	4315/051/01
Customer PO		Date of Receipt	24/09/2019
Customer Ref	Cavan Co Co GW1	Sampled On	24/09/2019
Ref 2	24/09/19 12:30	Date Testing Commenced	24/09/2019
Ref 3		Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
		Date of Report	26/09/2019
		Sample Type	Groundwater

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Coliforms (Total)	157	Filtration/Incubation	<10	cfu/100ml	
E. coli	157	Filtration/Incubation	<10	cfu/100ml	

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Signed : 
Aoife Harmon - Laboratory Supervisor

Date : 26/09/2019

Acc. : Accredited Parameters by ISO 17025:2005

PVL - Parametric Value Limit as per EU (Drinking water) Regulations (SI 122 2014)

For bacterial analysis a result of 0 means none detected in volume examined

All organic results are analysed as received and all results are corrected for dry weight at 104 C

Results shall not be reproduced, except in full, without the approval of Fitz Scientific

Results contained in this report relate only to the samples tested (P) : Presumptive Results

** : The test result for this parameter may be invalid as it has exceeded the recommended holding time (BS EN ISO 5667-3:2018)

A copy of this certificate is available on www.fitzsci.ie

Customer	David Kelly KD Environmental Ltd 1 Swiftbrock Glen Virginia Co Cavan	Lab Report Ref. No.	4315/051/02
Customer PO		Date of Receipt	24/09/2019
Customer Ref	Cavan Co Co GW2	Sampled On	24/09/2019
Ref 2	24/09/19 12:30	Date Testing Commenced	24/09/2019
Ref 3		Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
		Date of Report	26/09/2019
		Sample Type	Groundwater

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Coliforms (Total)	157	Filtration/Incubation	60	cfu/100ml	
E. coli	157	Filtration/Incubation	10	cfu/100ml	

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Signed : 
Aoife Harmon - Laboratory Supervisor

Date : 26/09/2019

Acc. : Accredited Parameters by ISO 17025:2005

PVL - Parametric Value Limit as per EU (Drinking water) Regulations (SI 122 2014)

For bacterial analysis a result of 0 means none detected in volume examined

All organic results are analysed as received and all results are corrected for dry weight at 104 C

Results shall not be reproduced, except in full, without the approval of Fitz Scientific

Results contained in this report relate only to the samples tested (P) : Presumptive Results

** : The test result for this parameter may be invalid as it has exceeded the recommended holding time (BS EN ISO 5667-3:2018)

A copy of this certificate is available on www.fitzsci.ie

Customer	David Kelly KD Environmental Ltd 1 Swiftbrock Glen Virginia Co Cavan	Lab Report Ref. No.	4315/051/03
Customer PO		Date of Receipt	24/09/2019
Customer Ref	Cavan Co Co GW3	Sampled On	24/09/2019
Ref 2	24/09/19 12:30	Date Testing Commenced	24/09/2019
Ref 3		Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
		Date of Report	26/09/2019
		Sample Type	Groundwater

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Coliforms (Total)	157	Filtration/Incubation	110	cfu/100ml	
E. coli	157	Filtration/Incubation	<10	cfu/100ml	

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Signed : 
Aoife Harmon - Laboratory Supervisor

Date : 26/09/2019

Acc. : Accredited Parameters by ISO 17025:2005

PVL - Parametric Value Limit as per EU (Drinking water) Regulations (SI 122 2014)

For bacterial analysis a result of 0 means none detected in volume examined

All organic results are analysed as received and all results are corrected for dry weight at 104 C

Results shall not be reproduced, except in full, without the approval of Fitz Scientific

Results contained in this report relate only to the samples tested (P) : Presumptive Results

** : The test result for this parameter may be invalid as it has exceeded the recommended holding time (BS EN ISO 5667-3:2018)

A copy of this certificate is available on www.fitzsci.ie

Customer	David Kelly KD Environmental Ltd 1 Swiftbrock Glen Virginia Co Cavan	Lab Report Ref. No.	4315/051/04
Customer PO		Date of Receipt	24/09/2019
Customer Ref	Cavan Co Co SW1	Sampled On	24/09/2019
Ref 2	24/09/19 12:30	Date Testing Commenced	24/09/2019
Ref 3		Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
		Date of Report	26/09/2019
		Sample Type	Surface Water

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Coliforms (Total)	157	Filtration/Incubation	840	cfu/100ml	
E. coli	157	Filtration/Incubation	330	cfu/100ml	

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Signed : 
Aoife Harmon - Laboratory Supervisor

Date : 26/09/2019

Acc. : Accredited Parameters by ISO 17025:2005

PVL - Parametric Value Limit as per EU (Drinking water) Regulations (SI 122 2014)

For bacterial analysis a result of 0 means none detected in volume examined

All organic results are analysed as received and all results are corrected for dry weight at 104 C

Results shall not be reproduced, except in full, without the approval of Fitz Scientific

Results contained in this report relate only to the samples tested (P) : Presumptive Results

** : The test result for this parameter may be invalid as it has exceeded the recommended holding time (BS EN ISO 5667-3:2018)

A copy of this certificate is available on www.fitzsci.ie

Customer	David Kelly KD Environmental Ltd 1 Swiftbrock Glen Virginia Co Cavan	Lab Report Ref. No.	4315/051/05
Customer PO		Date of Receipt	24/09/2019
Customer Ref	Cavan Co Co SW2	Sampled On	24/09/2019
Ref 2	24/09/19 12:30	Date Testing Commenced	24/09/2019
Ref 3		Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
		Date of Report	26/09/2019
		Sample Type	Surface Water

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Coliforms (Total)	157	Filtration/Incubation	720	cfu/100ml	
E. coli	157	Filtration/Incubation	270	cfu/100ml	

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Signed : 
Aoife Harmon - Laboratory Supervisor

Date : 26/09/2019

Acc. : Accredited Parameters by ISO 17025:2005

PVL - Parametric Value Limit as per EU (Drinking water) Regulations (SI 122 2014)

For bacterial analysis a result of 0 means none detected in volume examined

All organic results are analysed as received and all results are corrected for dry weight at 104 C

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Results contained in this report relate only to the samples tested (P) : Presumptive Results

** : The test result for this parameter may be invalid as it has exceeded the recommended holding time (BS EN ISO 5667-3:2018)

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Customer	David Kelly KD Environmental Ltd 1 Swiftbrock Glen Virginia Co Cavan	Lab Report Ref. No.	4315/051/06
Customer PO		Date of Receipt	24/09/2019
Customer Ref	Cavan Co Co SW3	Sampled On	24/09/2019
Ref 2	24/09/19 12:30	Date Testing Commenced	24/09/2019
Ref 3		Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
		Date of Report	26/09/2019
		Sample Type	Surface Water

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Coliforms (Total)	157	Filtration/Incubation	470	cfu/100ml	
E. coli	157	Filtration/Incubation	180	cfu/100ml	

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Date : 26/09/2019

Acc. : Accredited Parameters by ISO 17025:2005

PVL - Parametric Value Limit as per EU (Drinking water) Regulations (SI 122 2014)

For bacterial analysis a result of 0 means none detected in volume examined

All organic results are analysed as received and all results are corrected for dry weight at 104 C

Results shall not be reproduced, except in full, without the approval of Fitz Scientific

Results contained in this report relate only to the samples tested (P) : Presumptive Results

** : The test result for this parameter may be invalid as it has exceeded the recommended holding time (BS EN ISO 5667-3:2018)

A copy of this certificate is available on www.fitzsci.ie

Customer	David Kelly KD Environmental Ltd 1 Swiftbrock Glen Virginia Co Cavan	Lab Report Ref. No.	4315/051/07
Customer PO		Date of Receipt	24/09/2019
Customer Ref	Cavan Co Co SW4	Sampled On	24/09/2019
Ref 2	24/09/19 12:30	Date Testing Commenced	24/09/2019
Ref 3		Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
		Date of Report	26/09/2019
		Sample Type	Surface Water

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Coliforms (Total)	157	Filtration/Incubation	2700	cfu/100ml	
E. coli	157	Filtration/Incubation	1500	cfu/100ml	

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Signed : 
Aoife Harmon - Laboratory Supervisor

Date : 26/09/2019

Acc. : Accredited Parameters by ISO 17025:2005

PVL - Parametric Value Limit as per EU (Drinking water) Regulations (SI 122 2014)

For bacterial analysis a result of 0 means none detected in volume examined

All organic results are analysed as received and all results are corrected for dry weight at 104 C

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Results contained in this report relate only to the samples tested (P) : Presumptive Results

** : The test result for this parameter may be invalid as it has exceeded the recommended holding time (BS EN ISO 5667-3:2018)