FEHILY TIMONEY
30 YEARS

CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE & PLANNING

KILKENNY HISTORIC LANDFILLS

TIER 3 RISK ASSESSMENT
HISTORIC LANDFILL AT OLDCOURT, CO. KILKENNY

Prepared for: Kilkenny County Council

Date: August 2020

J5 Plaza, North Park Business Park,
North Road, Dublin 11, D11 PXT0, Ireland

T: +353 1 658 3500 | E: info@ftco.ie

CORK | DUBLIN | CARLOW

www.fehilytimoney.ie

TIER 3 RISK ASSESSMENT
HISTORIC LANDFILL AT OLDCOURT, CO. KILKENNY

User is responsible for Checking the Revision Status of This Document

Rev. No.	Description of Changes	Prepared by:	Checked by:	Approved by:	Date:
00	For Client comment	BF/EOC	JON	BG	26.08.2020

Client: Kilkenny County Council

Keywords: Environmental Risk Assessment, site investigation, waste, leachate, remediation.

Abstract: This report presents the findings of a Tier 3 risk assessment carried out on the Oldcourt Historic Landfill site, Co. Kilkenny, prepared in accordance with the EPA Code of Practice for unregulated landfill sites. The Tier 3 risk assessment was conducted following recommendations made in an earlier Tier 2 risk assessment.

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF FIGURES

Page

LIST OF TABLES

1. INTRODUCTION

1.1 Overview

Fehily Timoney and Company (FT) was appointed by Kilkenny County Council to carry out and prepare a Tier 3 risk assessment for Oldcourt Historical landfill located east of the town of Inistioge, Co. Kilkenny. This Tier 3 makes reference to the:

- Tier 1 Risk Assessment, Kilkenny County Council.
- Tier 2 Risk Assessment and Site investigation , Fehily Timoney and Company, 2019.

All FT risk assessments were carried out in accordance with the Environmental Protection Agency (EPA) Code of practice (CoP) - Environmental Risk Assessment for Unregulated Waste Disposal Sites guidance document.

1.2 Tier 1 Risk Classification

Kilkenny County Council initially prepared a Tier 1 risk assessment. This risk assessment determined that the site was a **medium (Class B) risk** to the receiving environment. Applying the EPA risk assessment tool as per the EPA CoP for Unregulated Waste Disposal Sites, yielded risk scores of 50% for source-pathway-receptors (SPR) linkage SPR8. All other SPR linkages were calculated to be of low risk. A summary of the risks is presented below in Table 1-1.

Table 1-1 normalised scores for Tier 1 assessment have been provided for reference purposes to reflect records as per the current (2020) EPA Section 22 register.

Table 1-1: Tier 1 SPR Linkages

SPR No.	Linkage	Normalised Score	Justification
Leachate migration through combined groundwater and surface water pathways			
SPR1	Leachate => surface water	30%	Groundwater vulnerability was identified as being 'Extreme'. The site is underlain by a 'Locally Important Aquifer – Bedrock which is moderately productive in local zones'. The River Barrow and River Nore Special Area of Conservation (SAC) is located adjacent to south-eastern site boundary. There is a direct connection between the site and the Woodstock Park stream.
SPR2	Leachate => SWDTE	20%	Aquifer and bedrock present a groundwater pathway.
Leachate migration through groundwater pathway			
SPR3	Leachate => human presence	25%	Residential dwelling greater than 50m but less than 250m from the waste body. It is unlikely that this dwelling would be exposed to any subsurface leachate.

SPR No.	Linkage	Normalised Score	Justification
SPR4	Leachate => GWDTE	16.67%	The nearest groundwater source protection zone (SPZ) is located greater than 1 km away from the site boundary.
SPR5	Leachate => Aquifer	15%	Locally Important Aquifer – Bedrock that is moderately productive in local zones.
SPR6	Leachate => Public Supply	0%	The nearest groundwater protection zone (outer source protection area) is located greater than 1 km away from the site boundary with no karst aquifer present.
SPR7	Leachate => SWDTE	25%	The Woodstock Park stream crosses the site from east to south-west.
Leachate migration through surface water pathway			
SPR8	Leachate => Surface Water	50%	There is a direct connection between the landfill site and the Woodstock Park stream surface water receptor, which crosses the site.
SPR9	Leachate => SWDTE	33.33%	There is a direct surface water pathway from the site to surface water receptors. The nearest SAC/pNHA (River Nore) is located greater than 50m but less than 250m of the waste body.
Landfill gas migration pathway (lateral & vertical)			
SPR10	Landfill Gas => Human Presence	33.33%	The historic landfill is located within forestry with the groundwater vulnerability described as 'Extreme' and the aquifer as 'Locally Important'.
SPR11	Landfill Gas => Human Presence	30%	The historic landfill is located within forestry with the nearest residential dwelling located greater than 50 m but less than 150 m from the waste body.

1.3 Tier 2 Site investigation

Fehily Timoney and Company (FT) was appointed by Kilkenny County Council to prepare a Tier 2 environmental risk assessment report on the Oldcourt historical landfill, located at Inistioge, Co. Kilkenny.

Oldcourt site investigation included the following elements:

- 2 No. machine excavated trial pits (TP04, TP05)
- 3 No. hand dug trial pits (TP01, TP02, TP03)
- 2 No. boreholes by light percussion methods for window sampling
- Factual reporting

The Tier 2 site investigations confirmed that the historic landfill typically contained fragments plastic bottles, glass bottles, plastic bags, pieces of steel, clothing and plastic fibre straps deposited to the eastern side of the site where the area of flatter ground is located which covers an area approximately 0.14 hectares.

Made ground comprising waste was found to depths of 1.6m and 3.0m in machine dug trial pits and depths of 2.0m and 3.0m in window sample boreholes.

1.4 Tier 2 Risk Classification and Tier 2 SPRs

The Tier 2 site investigation risk assessment concluded that the risk rating of the site was Low (Class C). The highest single risk rating for the site was calculated to be 25% for source-pathway-receptor (SPR) Linkage 8, which referred to leachate migration through a surface water pathway to a surface water receptor. The SPR linkages examined in the Tier 2 are discussed in Table 1.2..

Table 1-2: Tier 2 Selected SPR Linkages

SPR No.	Linkage	Normalised Score	Justification
Leachate migration through combined groundwater and surface water pathways			
SPR1	Leachate => surface water	18%	Groundwater vulnerability was identified as being 'Extreme' and site is underlain by a 'Locally Important Aquifer – Bedrock which is moderately productive in local zones'. The River Barrow and River Nore Special Area of Conservation (SAC) is located adjacent to southeastern site boundary. There is a direct connection between the site and the Woodstock Park stream. Surface water monitoring was conducted at upstream and downstream locations on the Woodstock Park stream as part of the Tier 2 site investigation. Surface water monitoring did not demonstrate deterioration in water quality between upstream and downstream monitoring locations besides BOD, therefore indicating that the landfill is not having a deleterious effect on the Woodstock Park stream and connected rivers, as the nearest surface water receptors.
SPR2	Leachate => SWDTE	12%	Aquifer and bedrock present a groundwater pathway however, the surface water monitoring did not demonstrate any deterioration in surface water quality.
Leachate migration through groundwater pathway			
SPR3	Leachate => human presence	10%	Residential dwelling greater than 50m but less than 250m from the waste body. It is unlikely that this dwelling would be exposed to any subsurface leachate. House drinking water is supplied via mains water supply.
SPR4	Leachate => GWDTE	10%	The nearest groundwater source protection zone (SPZ) is located greater than 1 km away from the site boundary.
SPR5	Leachate => Aquifer	9%	Locally Important Aquifer – Bedrock that is moderately productive in local zones.
SPR6	Leachate => Public Supply	0%	The nearest groundwater protection zone (outer source protection area) is located greater than 1 km away from the site boundary with no karst aquifer present.

SPR No.	Linkage	Normalised Score	Justification
SPR7	Leachate => SWDTE	16%	The Woodstock Park stream crosses the site from east to south-west. Surface water monitoring did not indicate any deterioration other than BOD in surface quality attributable to the presence of waste at the historical landfill.
Leachate migration through surface water pathway			
SPR8	Leachate => Surface Water	25%	There is a direct connection between the landfill site and the Woodstock Park stream surface water receptor, which crosses the site. Surface water monitoring did not demonstrate any deterioration other than BOD in water quality between upstream and downstream monitoring locations therefore indicating that the landfill is not having a deleterious effect on the Woodstock Park stream, as the nearest surface water receptor.
SPR9	Leachate => SWDTE	17%	There is a direct surface water pathway from the site to surface water receptors. The nearest SAC/pNHA (River Nore) is located greater than 50m but less than 250m of the waste body. Surface water monitoring did not demonstrate any deterioration in water quality other than BOD between upstream and downstream monitoring locations.
Landfill gas migration pathway (lateral & vertical)			
SPR10	Landfill Gas => Human Presence	10%	The historic landfill is located within forestry with the groundwater vulnerability described as 'Extreme' and the aquifer as 'Locally Important'. No visual or olfactory evidence of putrescible/biodegradable waste was noted by CGLs supervising Geologist during the site investigation.
SPR11	Landfill Gas => Human Presence	0%	The historic landfill is located within forestry with the nearest residential dwelling located greater than 50 m but less than 150 m from the waste body. No visual or olfactory evidence of putrescible/biodegradable waste was noted by CGLs supervising Geologist during the site investigation.

1.4.1 Leachate migration through surface water pathways (SPR8)

Leachate migration poses a low risk to the adjacent surface water stream, the Woodstock Park stream. Surface water monitoring was conducted at two locations on the Woodstock Park stream upstream and downstream of the historic landfill. The monitoring results did not present concentrations above the relevant surface water quality thresholds apart from BOD downstream on the first round.

Although leachate wasn't observed within the Woodstock Park Stream directly and the outcome of surface water monitoring doesn't suggest the site is actively causing a deterioration in water quality downstream of the site there is still a potential pathway for leachate to migrate to the river.

The Tier 2 assessment recommended that additional surface water monitoring be conducted prior to a Certificate of Authorisation (CoA) application. This Tier 3 has been prepared for the purpose examining the findings of additional surface water monitoring and to inform appropriate site remediation measures.

2. TIER 3 QUANTITATIVE RISK ASSESSMENT SCOPE OF WORKS

2.1 Tier 3 Overview

A Tier 3 assessment includes some form of quantitative risk assessment either as a Generic Quantitative Risk Assessment (GQRA) or as a Detailed Quantitative Risk Assessment (DQRA).

This Tier 3 assessment report applies a GQRA to further assess the risk to surface waters and further examines the Tier 2 (see Table 1-2) linkages in relation to the SPR8 Leachate migration through surface water pathway resulting in a risk rating score of 25%.

As part of the Tier 3 assessment, a further review of the Tier 2 site investigations and environment risk assessments was conducted.

The 2018 site investigation findings and the subsequent 2019 Tier 2 assessment concluded that the Oldcourt site presents a **low risk**. The Tier 2 report recommended additional surface water monitoring be conducted at upstream and downstream locations on the Woodstock park Stream prior to the Certificate of Authorisation (CoA) application. This Tier 3 assessment included an analysis and interpretation of those additional rounds of monitoring to confirm the findings of the Tier assessment and confirm the potential risk of the site to the Woodstock Park Stream.

Based on the outcomes of the GQRA suitable remediation measures are presented in Section 5 of this report.

2.2 Generic Quantitative Risk Assessment

The generic quantitative risk assessment addressed the risk SPR8 Leachate migration through surface water pathway to surface water receptors (SPR8).

The GQRA rely on information gathered as part of the Tier 2 investigations and additional surface water monitoring conducted in 2020. Relevant environmental characteristics considered in evaluating the site and carrying out this Tier 3 investigation are discussed below.

2.3 Existing Geological, Hydrogeological and Hydrological Environment

As discussed in Section 1, the risk to adjacent surface waters was identified as the primary environmental risk associated with the site. The application of the EPA risk calculation and scoring methodology, as outlined in the EPA CoP, is reliant on understanding the geological and hydrogeological characteristics of the site and the surrounding environment. An accurate understanding and rating of the geological, hydrogeological and hydrological characteristics of the site and environment are directly linked to determining the primary source-pathway-receptor linkages and potential impacts/risks associated with the site. The Tier 2 site investigation and risk assessment provided a better understanding of the site and surrounding environs. Summary findings of the relevant environmental characteristics considered when evaluating the site and carrying out this Tier 3 investigation are discussed below.

The site is approximately 0.6 ha in size, overgrown with vegetation and trees located in a rural, primarily agricultural area in east Kilkenny.

The site is located 1 km from Inistioge town. Lands within 1 km of the site are primarily agricultural with scattered one-off housing. The quaternary map provided by GSI Online identifies the quaternary sediments at the site as 'Bedrock, outcrop or subcrop' and the soil underlying the site is defined as 'Shallow well drained mineral (Mainly acidic)'. During the trial pitting and window sampling excavations during the site investigation, the presence of sandy gravelly clay described in the driller's logs to a depth of approximately 3.80 m BGL at borehole BH01 and 3.0m BGL at BH02.

The bedrock beneath the site is founded on the Oldcourt Member Formation, described as 'Schists, garnet-quartzites (costicules)'. This formation consists of Psammites, semi-pelites and pelitic schists containing thin finely-garnetiferous quartzite bands (coticules). Bedrock was not encountered during the installation of the boreholes.

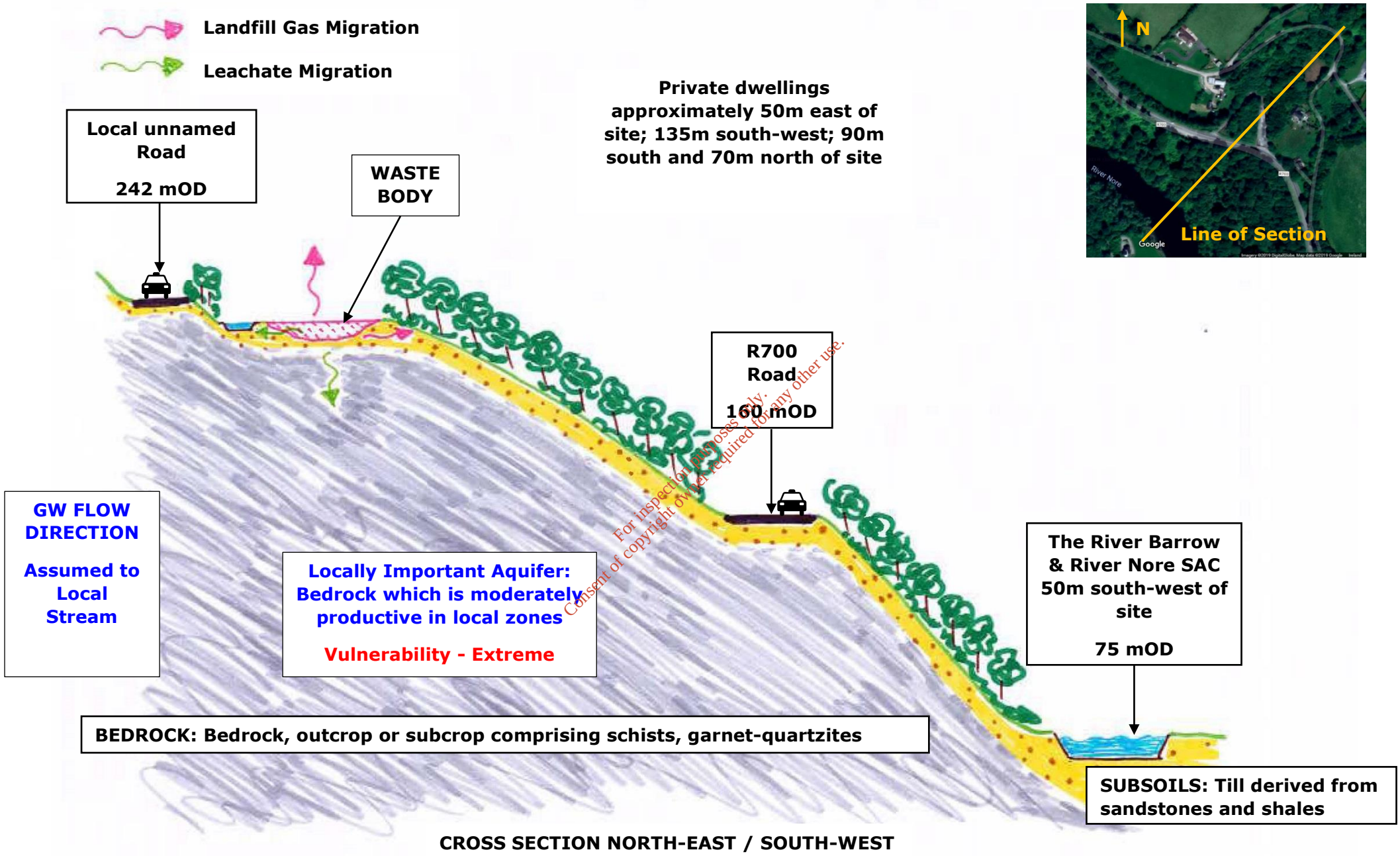
The underlying bedrock aquifer is a *'Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones'*. There are no Groundwater Drinking Water Protection Areas within the site boundaries according to GSI. The closest one, Thomastown PWS, is located approximately 4.40 km to the Northwest of the site.

The vulnerability of groundwater to contamination is classified as Extreme with areas of the site described as Rock at or near surface or karst. Much of the site consists of Made Ground with unknown subsoil permeability.

The site is located within the: Nore catchment (Hydrometric Area 15), Nore_SC_120 sub-catchment and Clodiagh_010 river sub-basin. The nearest surface water feature to the site is a stream (EPA Name: Woodstock Park) which crosses the site immediately and flows in a north-east to south-west direction eventually meeting the River Nore c.150 m downstream of the site. The Nore River is located approximately 150 m south-east of the site at its closest point. The Nore eventually discharges to River Barrow, which discharges to Waterford Harbour c. 30 km south of the site.

2.3.1 Conceptual Site Model (CSM)

A revised conceptual site model was prepared as part of the Tier 2 assessment and is included below for reference. The revised CSM illustrates the identified potential for migration of leachate from the site to the adjacent surface water stream, the Woodstock Park stream.



CROSS SECTION NORTH-EAST / SOUTH-WEST

FIGURE 3.1 OLDCOURT HISTORIC LANDFILL CONCEPTUAL SITE MODEL

CONSULTANTS IN ENGINEERING & ENVIRONMENTAL SCIENCES

FEHILY TIMONEY 30 YEARS

2.4 Impact of Leachate on Receiving Surface Waters

The potential impact of leachate emissions to the waterbody crossing the site was identified as being a primary risk associated with the site.

Surface water monitoring was conducted in 2018 at two locations upstream (SW1) and downstream (SW2) of the site. In accordance with Tier 2 recommendations, to further assess the potential impact of the landfill, if any, on downstream water quality, further surface water analysis was undertaken at both monitoring locations, SW1 and SW2, on three occasions, specifically the 13th May, 10th June and 30th June 2020.

The results of the surface water monitoring from SW1 and SW2 show 1 exceedance of the EQS (2009) guideline limit values for BOD for the first round out of four monitoring rounds. Results from the downstream (SW2) sampling locations detected a BOD concentration of 3.44 mg/l, greater than the upper, 95%ile guideline threshold of 2.6 mg/l on a single occasion.

All other parameters tested were found to be below the maximum allowable concentrations (MAC) and Environmental Quality Standard (EQS) guideline values.

A comparison of upstream of downstream samples results also demonstrates that the presence of waste is not having a deleterious effect on the quality of the Woodstock Park Stream, with no significant difference observed between monitoring locations, with the exception of BOD result from the September 2018 sample.

The results of all monitoring rounds for this site, including September 2018, are shown in Table 3-3. The complete laboratory reports with all results are presented in Appendix 1.

Table 3-1: Surface Water Sampling Results

Test	Units	EQS[1]	MAC[2]	27/09/2018		13/05/2020		10/06/2020		30/06/2020	
				SW1	SW2	SW1	SW2	SW1	SW2	SW1	SW2
Inorganics											
Ammoniacal Nitrogen as N	mg/l	0.065 (mean) 0.140 (95%ile)		<0.2	<0.2	-	-	-	-	-	-
Conductivity @ 20 deg.C	mS/cm			0.102	0.148	0.151	0.154	0.126	0.137	0.133	0.134
Fluoride	mg/l	0.5		-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Oxygen, dissolved	mg/l			11.7	11.6	10.1	10.6	9.36	9.71	10.9	12.6
pH	pH Units	6.0<pH<9.0		7.37	7.05	7.68	7.74	7.49	7.61	7.56	7.44
Phosphate (Ortho as PO4)	mg/l	≤0.035(mean) ≤0.075 (95%ile)			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/l			7.3	21.3	-	-	-	-	-	-
Chloride	mg/l			12.7	14.2	13.8	13.9	12.7	12.8	13.4	13.4
COD, unfiltered	mg/l			-	-	8.92	<7	<7	<7	<7	<7
Ammoniacal Nitrogen as N (low level)	mg/l	≤0.065 (mean) ≤0.140 (95%ile)		-	-	<0.01	0.0122	0.0182	0.0304	0.0181	0.034
Cyanide, Total	mg/l	0.01		-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BOD, unfiltered	mg/l	≤1.5 (mean) ≤2.6 (95%ile)		<1	3.44	<1	<1	<1	<1	<1	<1
Suspended solids, Total	mg/l			-	-	<9	2.6	3.45	2.3	<2	3.15
Sulphate (soluble) as S	mg/l			-	-	2.5	2.57	2.13	2.27	2.27	2.3
Filtered (Dissolved) Metals											
Mercury (diss.filt)	µg/l		0.07	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic (diss.filt)	µg/l	25		-	-	11.5	11.5	11.7	12.2	13.1	13.2
Cadmium (diss.filt)	µg/l	0.15	0.9	-	-	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Chromium (diss.filt)	µg/l	4.7	32	-	-	<1	<1	<1	<1	<1	<1
Copper (diss.filt)	µg/l	30		-	-	0.551	0.612	0.428	0.481	0.621	0.495
Lead (diss.filt)	µg/l	1.2	14	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Test	Units	EQS[1]	MAC[2]	27/09/2018		13/05/2020		10/06/2020		30/06/2020	
				SW1	SW2	SW1	SW2	SW1	SW2	SW1	SW2
Nickel (diss.filt)	µg/l	4	34	-	-	<0.4	<0.4	<0.4	<0.4	<0.4	0.436
Semi-Volatile Organic Compounds (SVOCs)											
1,2,4-Trichlorobenzene (aq)	µg/l	0.4	N/A	-	-	<2	<1	<1	<1	<1	<1
Anthracene (aq)	µg/l	0.1	0.1	-	-	<2	<1	<1	<1	<1	<1
bis(2-Ethylhexyl) phthalate (aq)	µg/l	1.3	N/A	-	-	<4	<2	<2	<2	<2	<2
Benzo(b)fluoranthene (aq)	µg/l		0.017	-	-	<2	<1	<1	<1	<1	<1
Benzo(k)fluoranthene (aq)	µg/l		0.017	-	-	<2	<1	<1	<1	<1	<1
Benzo(a)pyrene (aq)	µg/l	0.00017	0.27	-	-	<2	<1	<1	<1	<1	<1
Benzo(g,h,i)perylene (aq)	µg/l		0.0082	-	-	<2	<1	<1	<1	<1	<1
Diethyl phthalate (aq)	µg/l	1.3	N/A	-	-	<2	<1	<1	<1	<1	<1
Fluoranthene (aq)	µg/l	0.0063	0.12	-	-	<2	<1	<1	<1	<1	<1
Hexachlorobenzene (aq)	µg/l		0.05	-	-	<2	<1	<1	<1	<1	<1
Hexachlorobutadiene (aq)	µg/l		0.6	-	-	<2	<1	<1	<1	<1	<1
Pentachlorophenol (aq)	µg/l	0.4	1	-	-	<2	<1	<1	<1	<1	<1
Phenol (aq)	µg/l	8	46	-	-	<2	<1	<1	<1	<1	<1
Naphthalene (aq)	µg/l	2	130	-	-	<2	<1	<1	<1	<1	<1
Indeno(1,2,3-cd)pyrene (aq)	µg/l		N/A	-	-	<2	<1	<1	<1	<1	<1
Volatile Organic Compounds (VOCs)											
Dichloromethane	µg/l	20	N/A	-	-	<3	<3	<3	<3	<3	<3
Carbontetrachloride	µg/l	12	N/A	-	-	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/l	10	N/A	-	-	<1	<1	<1	<1	<1	<1
Benzene	µg/l	10	50	-	-	<1	<1	<1	<1	<1	<1
Toluene	µg/l	10		-	-	<1	<1	<1	<1	<1	<1
m,p-Xylene	µg/l	10		-	-	<1	<1	<1	<1	<1	<1
o-Xylene	µg/l	10		-	-	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	µg/l	0.4	N/A	-	-	<1	<1	<1	<1	<1	<1

Test	Units	EQS[1]	MAC[2]	27/09/2018		13/05/2020		10/06/2020		30/06/2020	
				SW1	SW2	SW1	SW2	SW1	SW2	SW1	SW2
Hexachlorobutadiene	µg/l		0.6	-	-	<1	<1	<1	<1	<1	<1
Naphthalene	µg/l	2	130	-	-	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene	µg/l	0.4	N/A	-	-	<1	<1	<1	<1	<1	<1
1,3,5-Trichlorobenzene	µg/l	0.4	N/A	-	-	<1	<1	<1	<1	<1	<1
Combined Pesticides / Herbicides											
Pentachlorobenzene	µg/l	0.007	N/A	-	-	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Trifluralin	µg/l	0.03	N/A	-	-	<0.02	<0.02	<0.02	<0.02	<0.01	<0.01
Alachlor	µg/l	0.3	0.7	-	-	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor	µg/l	0.0000002	0.0003	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aldrin	µg/l	sum = 0.01	N/A	-	-	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01
Terbutryn	µg/l	0.065	0.34	-	-	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Isodrin	µg/l	sum = 0.01	N/A	-	-	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01
Heptachlor epoxide	µg/l	0.0000002	0.0003	-	-	<0.02	<0.02	<0.02	<0.02	<0.01	<0.01
Endosulphan I	µg/l	0.005	0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,3,5-Trichlorobenzene	µg/l	0.4	N/A	-	-	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Dieldrin	µg/l	sum = 0.01	N/A	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hexachlorobutadiene	µg/l		0.6	-	-	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,4-Trichlorobenzene	µg/l	0.4	N/A	-	-	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Endrin	µg/l	sum = 0.01	N/A	-	-	<0.01	<0.01	<0.02	<0.02	<0.01	<0.01
1,2,3-Trichlorobenzene	µg/l	0.4	N/A	-	-	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Dichlorvos	µg/l	0.0006	0.0007	-	-	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan II	µg/l	0.005	0.01	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
p,p'-DDT	µg/l	0.01	N/A	-	-	<0.01	<0.01	<0.02	<0.02	<0.02	<0.03
Hexachlorobenzene	µg/l		0.05	-	-	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan Sulphate	µg/l	0.005	0.01	-	-	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02
Diazinon	µg/l	0.01	0.02	-	-	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01

Test	Units	EQS[1]	MAC[2]	27/09/2018		13/05/2020		10/06/2020		30/06/2020	
				SW1	SW2	SW1	SW2	SW1	SW2	SW1	SW2
Triallate	µg/l	670	670	-	-	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Atrazine	µg/l	0.6	2	-	-	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Simazine	µg/l	1	4	-	-	<0.02	<0.01	<0.01	<0.01	<0.01	0.0149
Chlorpyriphos-methyl	µg/l	0.03	0.1	-	-	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Dimethoate	µg/l	0.8	4	-	-	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Chlorpyriphos	µg/l	0.03	0.1	-	-	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Chlorfenvinphos	µg/l	0.1	0.3	-		<0.02	<0.01	<0.01	<0.01	<0.01	<0.01

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). Refers to Annual-Average (AA).

* Items shaded in **bold** are in exceedance of the European Communities MACs
** Items shaded in **orange** are in exceedance of the 2009 EQS Regulations

3. CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

This Tier 3 assessment:

- Reviewed the findings of the Tier 1 risk assessment.
- Reviewed the findings of the Tier 2 site investigation and risk assessment.
- Applied a GQRA and reviewed additional surface water monitoring results and compared them to relevant surface water quality standards in order to determine the impact of the deposited waste on the quality of the Woodstock Park Stream.
- Confirmed the site to be a Low Risk (Class C), with the highest risk identified at the site is the potential for migration of leachate from the site to the adjacent Woodstock Park stream. However, the waste has been identified as inert hence the risk of leachate migration to the stream is low.

3.2 Recommendations

Based on the site investigation results of the initial Tier 2 assessment and the further monitoring undertaken the Tier 3 assessment confirmed the site to be classified as a Low Risk. For a low-risk site, the CoP indicates that these sites are not considered to pose a significant risk to the environment or human health. It is therefore recommended that this site can proceed with a Certificate of Authorisation application.

Further details regarding the proposed monitoring are discussed in Section 4.

4. REMEDIAL ACTION PLAN

4.1 Remediation Plan

The primary objective of the proposed remediation will be to confirm the waste body is no longer affecting the local surface waters via leachate migration

4.1.1 Leachate migration through surface water pathways (SPR8)

The Tier 2 assessment determined that the site presented only a low risk to the environment, with respect to all SPR linkages with the highest calculated score for the site being 25%, referring to SPR8.

Three additional rounds of surface water monitoring on the Woodstock Park Stream conducted in 2020, indicated that the waste is not causing deleterious effect on surface water quality of the stream. This confirms the determination that the risk associated with the site is low. As such, no physical remediation or engineering works are required.

Proposed measures are limited to routine surface water monitoring on the Woodstock Park Stream

4.1.2 Proposed Surface Water Monitoring Regime

The EPA Landfill Monitoring landfill manual outlines recommended, minimum monitoring requirements for ground and surface waters. These parameters are shown in Table 5-1 below and are as presented in Table C.2 of the EPA's *Landfill Manuals - Landfill Monitoring, 2nd Edition (2003).*

It is recommended that surface water monitoring be conducted annually at locations on the Woodstock Park Stream, upstream and downstream of the site in accordance with parameters listed in Table 4-1:

Table 4-1: Parameters for Monitoring of Surface Water

Monitoring Parameter[1]	Frequency	Surface Water	Location
Temperature	Annual	✓	SW1 SW2
Dissolved Oxygen		✓	
pH		✓	
Electrical Conductivity		✓	
Total suspended solids		✓	
Total dissolved solids		✓	
Ammonia (as N)		✓	
Total oxidized nitrogen (as N)		✓	
Total organic carbon		✓	

[1] Tables D.1 and D.2 of the EPA Landfill Monitoring manual recommend guideline minimum reporting values for parameters.

Monitoring Parameter[1]	Frequency	Surface Water	Location
Biochemical Oxygen Demand		✓	
Chemical Oxygen Demand		✓	
Metals[2]		✓	
Total Alkalinity (as $CaCO_3$)		✓	
Sulphate		✓	
Chloride		✓	
Molybdate Reactive Phosphorous		✓	
Cyanide (Total)		✓	
Fluoride		✓	

[2] Metals for analysis should include: calcium, magnesium, sodium, potassium, iron, manganese, cadmium, chromium (total), copper, nickel, lead, zinc, arsenic, boron and mercury.

FEHILY TIMONEY
30 YEARS

CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE & PLANNING

APPENDIX 1

Surface Water Sampling Analysis 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:	26 October 2018
Customer:	D_FTIM_DUB
Sample Delivery Group (SDG):	180929-57
Your Reference:	P1723
Location:	Oldcourt
Report No:	478763

This report has been revised and directly supersedes 475845 in its entirety.

We received 2 samples on Saturday September 29, 2018 and 2 of these samples were scheduled for analysis which was completed on Monday October 08, 2018. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

Approved By:

Sonia McWhan
Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	180929-57	**Client Reference:**	P1723	**Report Number:**	478763
Location:	Oldcourt	**Order Number:**	Z1238	**Superseded Report:**	475845

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18429303	sw1		0.00 - 0.00	27/09/2018
18429310	sw2		0.00 - 0.00	27/09/2018

Maximum Sample/Coolbox Temperature (°C) : 12.2

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

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

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

Validated

CERTIFICATE OF ANALYSIS

SDG:	180929-57	**Client Reference:**	P1723	**Report Number:**	478763
Location:	Oldcourt	**Order Number:**	Z1238	**Superseded Report:**	475845

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)									18429303								18429310		
Customer Sample Reference									sw1								sw2		
AGS Reference																			
Depth (m)									0.00 - 0.00								0.00 - 0.00		
Container									250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)			
Sample Type									SW	SW	SW	SW	SW	SW	SW	SW			
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 2									X				X				
Anions by Kone (w)	All	NDPs: 0 Tests: 2								X				X					
BOD True Total	All	NDPs: 0 Tests: 2							X				X						
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 2								X				X					
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2										X						X	
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 2								X				X					
pH Value	All	NDPs: 0 Tests: 2								X				X					

Validated

CERTIFICATE OF ANALYSIS

SDG: 180929-57 **Client Reference:** P1723 **Report Number:** 478763
Location: Oldcourt **Order Number:** Z1238 **Superseded Report:** 475845

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	sw1	sw2			
			Depth (m)	0.00 - 0.00	0.00 - 0.00			
			Sample Type	Surface Water (SW)	Surface Water (SW)			
			Date Sampled	27/09/2018	27/09/2018			
			Sample Time	.	.			
			Date Received	29/09/2018	29/09/2018			
			SDG Ref	180929-57	180929-57			
			Lab Sample No.(s)	18429303	18429310			
			AGS Reference					
BOD, unfiltered	<1 mg/l	TM045		<1 #	3.44 #			
Oxygen, dissolved	<0.3 mg/l	TM046		11.7	11.6			
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099		<0.2 #	<0.2 #			
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		0.102 #	0.148 #			
Sodium (Dis.Filt)	<0.076 mg/l	TM152		8.36 #	8.52 #			
Potassium (Dis.Filt)	<0.2 mg/l	TM152		0.464 #	0.841 #			
Sulphate	<2 mg/l	TM184		7.3 #	21.3 #			
Chloride	<2 mg/l	TM184		12.7 #	14.2 #			
pH	<1 pH Units	TM256		7.37 #	7.05 #			

CERTIFICATE OF ANALYSIS

SDG:	180929-57	**Client Reference:**	P1723	**Report Number:**	478763
Location:	Oldcourt	**Order Number:**	Z1238	**Superseded Report:**	475845

CERTIFICATE OF ANALYSIS

SDG:	180929-57	**Client Reference:**	P1723	**Report Number:**	478763
Location:	Oldcourt	**Order Number:**	Z1238	**Superseded Report:**	475845

Table of Results - Appendix

Method No	Reference	Description
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
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
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
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

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:	180929-57	**Client Reference:**	P1723	**Report Number:**	478763
Location:	Oldcourt	**Order Number:**	Z1238	**Superseded Report:**	475845

Test Completion Dates

Lab Sample No(s)	18429303	18429310
Customer Sample Ref.	sw1	sw2
AGS Ref.		
Depth	0.00 - 0.00	0.00 - 0.00
Type	Surface Water	Surface Water
Ammoniacal Nitrogen	05-Oct-2018	05-Oct-2018
Anions by Kone (w)	08-Oct-2018	08-Oct-2018
BOD True Total	04-Oct-2018	04-Oct-2018
Conductivity (at 20 deg.C)	05-Oct-2018	05-Oct-2018
Dissolved Metals by ICP-MS	08-Oct-2018	08-Oct-2018
Dissolved Oxygen by Probe	01-Oct-2018	01-Oct-2018
pH Value	04-Oct-2018	04-Oct-2018

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. Samples will be run in duplicate upon request, but an additional charge may be incurred

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

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

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

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

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

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

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

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

11. Results relate only to the items tested.

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

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

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

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

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

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

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

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

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

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

Sample Deviations

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

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

Asbestos

Identification of Asbestos in Bulk Materials & Soils

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

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

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.

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: Gary Lawlor

CERTIFICATE OF ANALYSIS

Date of report Generation:	22 May 2020
Customer:	Fehily Timoney
Sample Delivery Group (SDG):	200516-40
Your Reference:	P20-015
Location:	Oldcourt Landfill
Report No:	553007

We received 2 samples on Saturday May 16, 2020 and 2 of these samples were scheduled for analysis which was completed on Friday May 22, 2020. 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:	200516-40	**Client Reference:**	P20-015	**Report Number:**	553007
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22157384	SW1		0.00 - 0.00	13/05/2020
22157398	SW2		0.00 - 0.00	13/05/2020

Maximum Sample/Coolbox Temperature (°C) : **6.8**

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

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

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

CERTIFICATE OF ANALYSIS

SDG:	200516-40	**Client Reference:**	P20-015	**Report Number:**	553007
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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)								22157384								22157398
Customer Sample Reference								SW1								SW2
AGS Reference																
Depth (m)								0.00 - 0.00								0.00 - 0.00
Container								250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)
Sample Type								SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 2							X					X						
Ammonium Low	All	NDPs: 0 Tests: 2								X							X			
Anions by Kone (w)	All	NDPs: 0 Tests: 2							X					X						
BOD True Total	All	NDPs: 0 Tests: 2						X							X					
COD Unfiltered	All	NDPs: 0 Tests: 2						X							X					
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 2							X							X				
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2										X							X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2									X							X		
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 2							X							X				
Fluoride	All	NDPs: 0 Tests: 2							X							X				
Mercury Dissolved	All	NDPs: 0 Tests: 2									X							X		
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 2							X							X				
PCB Congeners - Aqueous (W)	All	NDPs: 0 Tests: 2							X							X				
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 2							X					X						
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 2							X					X						

CERTIFICATE OF ANALYSIS

SDG:	200516-40	**Client Reference:**	P20-015	**Report Number:**	553007
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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)								2215738 4								2215739 8
Customer Sample Reference								SW1								SW2
AGS Reference																
Depth (m)								0.00 - 0.00								0.00 - 0.00
Container								250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)
Sample Type								SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
Pesticides (Suite III) by GCMS	All	NDPs: 0 Tests: 2							X					X						
pH Value	All	NDPs: 0 Tests: 2							X							X				
Phosphate by Kone (w)	All	NDPs: 0 Tests: 2							X					X						
Suspended Solids	All	NDPs: 0 Tests: 2							X							X				
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 2							X					X						
VOC MS (W)	All	NDPs: 0 Tests: 2						X												X

CERTIFICATE OF ANALYSIS

SDG:	200516-40	**Client Reference:**	P20-015	**Report Number:**	553007
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2			
			Depth (m)	0.00 - 0.00	0.00 - 0.00			
			Sample Type	Surface Water (SW)	Surface Water (SW)			
			Date Sampled	13/05/2020	13/05/2020			
			Sample Time	.	.			
			Date Received	16/05/2020	16/05/2020			
			SDG Ref	200516-40	200516-40			
			Lab Sample No.(s)	22157384	22157398			
			AGS Reference					
Suspended solids, Total	<2 mg/l	TM022		<9 #	2.6 #			
BOD, unfiltered	<1 mg/l	TM045		<1 #	<1 #			
Oxygen, dissolved	<0.3 mg/l	TM046		10.1	10.6			
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099		<0.01 #	0.0122 #			
Fluoride	<0.5 mg/l	TM104		<0.5	<0.5			
COD, unfiltered	<7 mg/l	TM107		8.92 #	<7 #			
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		0.151 #	0.154 #			
Arsenic (diss.filt)	<0.5 µg/l	TM152		11.5 #	11.5 #			
Barium (diss.filt)	<0.2 µg/l	TM152		4.08 #	3.75 #			
Boron (diss.filt)	<10 µg/l	TM152		14.2 #	13.2 #			
Cadmium (diss.filt)	<0.08 µg/l	TM152		<0.08 #	<0.08 #			
Chromium (diss.filt)	<1 µg/l	TM152		<1 #	<1 #			
Copper (diss.filt)	<0.3 µg/l	TM152		0.551 #	0.612 #			
Lead (diss.filt)	<0.2 µg/l	TM152		<0.2 #	<0.2 #			
Manganese (diss.filt)	<3 µg/l	TM152		<3 #	<3 #			
Nickel (diss.filt)	<0.4 µg/l	TM152		<0.4 #	<0.4 #			
Phosphorus (diss.filt)	<10 µg/l	TM152		<10 #	<10 #			
Selenium (diss.filt)	<1 µg/l	TM152		<1 #	<1 #			
Thallium (diss.filt)	<2 µg/l	TM152		<2 #	<2 #			
Zinc (diss.filt)	<1 µg/l	TM152		5.95 #	4.76 #			
Sodium (Dis.Filt)	<0.076 mg/l	TM152		8.41 #	8.47 #			
Magnesium (Dis.Filt)	<0.036 mg/l	TM152		4.5 #	4.46 #			
Potassium (Dis.Filt)	<0.2 mg/l	TM152		1.01 #	1.08 #			
Calcium (Dis.Filt)	<0.2 mg/l	TM152		17.1 #	17.4 #			
Iron (Dis.Filt)	<0.019 mg/l	TM152		<0.019 #	<0.019 #			
Mineral oil >C10 C40 (aq)	<100 µg/l	TM172		<200	<100			
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01	<0.01			
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184		<0.05 #	<0.05 #			
Chloride	<2 mg/l	TM184		13.8 #	13.9 #			
Sulphate (soluble) as S	<1 mg/l	TM184		2.5 #	2.57 #			
PCB congener 28	<0.015 µg/l	TM197		<0.03	<0.015			
PCB congener 52	<0.015 µg/l	TM197		<0.03	<0.015			
PCB congener 101	<0.015 µg/l	TM197		<0.03	<0.015			

CERTIFICATE OF ANALYSIS

SDG:	200516-40	**Client Reference:**	P20-015	**Report Number:**	553007
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Surface Water (SW)	Surface Water (SW)				
			Date Sampled	13/05/2020	13/05/2020				
			Sample Time	.	.				
			Date Received	16/05/2020	16/05/2020				
			SDG Ref	200516-40	200516-40				
			Lab Sample No.(s)	22157384	22157398				
			AGS Reference						
PCB congener 118	<0.015 µg/l	TM197		<0.03	<0.015				
PCB congener 138	<0.015 µg/l	TM197		<0.03	<0.015				
PCB congener 153	<0.015 µg/l	TM197		<0.03	<0.015				
PCB congener 180	<0.015 µg/l	TM197		<0.03	<0.015				
Sum of detected EC7 PCB's	<0.105 µg/l	TM197		<0.21	<0.105				
Cyanide, Total	<0.05 mg/l	TM227		<0.05	<0.05				
pH	<1 pH Units	TM256		7.68 #	7.74 #				
Trifluralin	<0.01 µg/l	TM343		<0.02	<0.02				
alpha-HCH	<0.01 µg/l	TM343		<0.01	<0.01				
gamma-HCH (Lindane)	<0.01 µg/l	TM343		<0.01	<0.01				
Heptachlor	<0.01 µg/l	TM343		<0.01	<0.01				
Aldrin	<0.01 µg/l	TM343		<0.02	<0.02				
beta-HCH	<0.01 µg/l	TM343		<0.01	<0.01				
Isodrin	<0.01 µg/l	TM343		<0.02	<0.02				
delta-HCH	<0.01 µg/l	TM343		<0.01	<0.01				
Heptachlor epoxide	<0.01 µg/l	TM343		<0.02	<0.02				
o,p'-DDE	<0.01 µg/l	TM343		<0.02	<0.02				
Endosulphan I	<0.01 µg/l	TM343		<0.01	<0.01				
trans-Chlordane	<0.01 µg/l	TM343		<0.02	<0.02				
cis-Chlordane	<0.01 µg/l	TM343		<0.02	<0.02				
p,p'-DDE	<0.01 µg/l	TM343		<0.02	<0.02				
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		<0.01	<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		<0.01	<0.01				
o,p'-Methoxychlor	<0.01 µg/l	TM343		<0.01	<0.01				
p,p'-Methoxychlor	<0.01 µg/l	TM343		<0.02	<0.02				
Endosulphan Sulphate	<0.02 µg/l	TM343		<0.04	<0.04				
Permethrin I	<0.01 µg/l	TM343		<0.01	<0.01				
Permethrin II	<0.01 µg/l	TM343		<0.01	<0.01				

CERTIFICATE OF ANALYSIS

SDG:	200516-40	**Client Reference:**	P20-015	**Report Number:**	553007
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Surface Water (SW)	Surface Water (SW)				
			Date Sampled	13/05/2020	13/05/2020				
			Sample Time	.	.				
			Date Received	16/05/2020	16/05/2020				
			SDG Ref	200516-40	200516-40				
			Lab Sample No.(s)	22157384	22157398				
			AGS Reference						
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344		<0.02	<0.01				
Hexachlorobutadiene	<0.01 µg/l	TM344		<0.02	<0.01				
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344		<0.02	<0.01				
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344		<0.02	<0.01				
Dichlorvos	<0.01 µg/l	TM344		<0.02	<0.01				
Dichlobenil	<0.01 µg/l	TM344		<0.02	<0.01				
Mevinphos	<0.01 µg/l	TM344		<0.02	<0.01				
Tecnazene	<0.01 µg/l	TM344		<0.02	<0.01				
Hexachlorobenzene	<0.01 µg/l	TM344		<0.02	<0.01				
Demeton-S-methyl	<0.01 µg/l	TM344		<0.02	<0.01				
Phorate	<0.01 µg/l	TM344		<0.02	<0.01				
Diazinon	<0.01 µg/l	TM344		<0.02	<0.01				
Triallate	<0.01 µg/l	TM344		<0.02	<0.01				
Atrazine	<0.01 µg/l	TM344		<0.02	<0.01				
Simazine	<0.01 µg/l	TM344		<0.02	<0.01				
Disulfoton	<0.01 µg/l	TM344		<0.02	<0.01				
Propetamphos	<0.01 µg/l	TM344		<0.02	<0.01				
Chlorpyriphos-methyl	<0.01 µg/l	TM344		<0.02	<0.01				
Dimethoate	<0.01 µg/l	TM344		<0.02	<0.01				
Pirimiphos-methyl	<0.01 µg/l	TM344		<0.02	<0.01				
Chlorpyriphos	<0.01 µg/l	TM344		<0.02	<0.01				
Methyl Parathion	<0.01 µg/l	TM344		<0.02	<0.01				
Malathion	<0.01 µg/l	TM344		<0.02	<0.01				
Fenthion	<0.01 µg/l	TM344		<0.02	<0.01				
Fenitrothion	<0.01 µg/l	TM344		<0.02	<0.01				
Triadimefon	<0.01 µg/l	TM344		<0.02	<0.01				
Pendimethalin	<0.01 µg/l	TM344		<0.02	<0.01				
Parathion	<0.01 µg/l	TM344		<0.02	<0.01				
Chlorfenvinphos	<0.01 µg/l	TM344		<0.02	<0.01				
trans-Chlordane	<0.01 µg/l	TM344		<0.02	<0.01				
cis-Chlordane	<0.01 µg/l	TM344		<0.02	<0.01				
Ethion	<0.01 µg/l	TM344		<0.02	<0.01				
Carbophenothion	<0.01 µg/l	TM344		<0.02	<0.01				

CERTIFICATE OF ANALYSIS

SDG:	200516-40	**Client Reference:**	P20-015	**Report Number:**	553007
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+§@	Sample deviation (see appendix)

Customer Sample Ref.		SW1	SW2	
Depth (m)		0.00 - 0.00	0.00 - 0.00	
Sample Type		Surface Water (SW)	Surface Water (SW)	
Date Sampled		13/05/2020	13/05/2020	
Sample Time		.	.	
Date Received		16/05/2020	16/05/2020	
SDG Ref		200516-40	200516-40	
Lab Sample No.(s)		22157384	22157398	
AGS Reference				
Component	**LOD/Units**	**Method**		
Triazophos	<0.01 µg/l	TM344	<0.02	<0.01
Phosalone	<0.01 µg/l	TM344	<0.02	<0.01
Azinphos methyl	<0.02 µg/l	TM344	<0.08	<0.04
Azinphos ethyl	<0.02 µg/l	TM344	<0.04	<0.02
Etridiazole	<0.01 µg/l	TM345	<0.02	<0.01
Pentachlorobenzene	<0.01 µg/l	TM345	<0.02	<0.01
Tributylphosphate	<0.01 µg/l	TM345	<0.02	<0.01
Propachlor	<0.01 µg/l	TM345	<0.02	<0.01
Quintozene (PCNB)	<0.01 µg/l	TM345	<0.02	<0.01
Omethoate	<0.01 µg/l	TM345	<0.04	<0.02
Propazine	<0.01 µg/l	TM345	<0.02	<0.01
Propyzamide	<0.01 µg/l	TM345	<0.02	<0.01
Alachlor	<0.01 µg/l	TM345	<0.02	<0.01
Prometryn	<0.01 µg/l	TM345	<0.02	<0.01
Telodrin	<0.01 µg/l	TM345	<0.02	<0.01
Terbutryn	<0.01 µg/l	TM345	<0.02	<0.01
Chlorothalonil	<0.01 µg/l	TM345	<0.02	<0.01
Etrimphos	<0.01 µg/l	TM345	<0.02	<0.01
Metazachlor	<0.01 µg/l	TM345	<0.02	<0.01
Cyanazine	<0.01 µg/l	TM345	<0.02	<0.01
Trietazine	<0.01 µg/l	TM345	<0.02	<0.01
Coumaphos	<0.01 µg/l	TM345	<0.02	<0.01
Phosphamidon I	<0.01 µg/l	TM345	<0.04	<0.02
Phosphamidon II	<0.01 µg/l	TM345	<0.02	<0.01
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
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

15:40:11 22/05/2020

CERTIFICATE OF ANALYSIS

SDG:	200516-40	**Client Reference:**	P20-015	**Report Number:**	553007
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Surface Water (SW)	Surface Water (SW)				
			Date Sampled	13/05/2020	13/05/2020				
			Sample Time	.	.				
			Date Received	16/05/2020	16/05/2020				
			SDG Ref	200516-40	200516-40				
			Lab Sample No.(s)	22157384	22157398				
			AGS Reference						
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:	200516-40	**Client Reference:**	P20-015	**Report Number:**	553007
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2
			Depth (m)	0.00 - 0.00	0.00 - 0.00
			Sample Type	Surface Water (SW)	Surface Water (SW)
			Date Sampled	13/05/2020	13/05/2020
			Sample Time	.	.
			Date Received	16/05/2020	16/05/2020
			SDG Ref	200516-40	200516-40
			Lab Sample No.(s)	22157384	22157398
			AGS Reference		
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<2 #	<1 #
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<2 #	<1 #
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<2 #	<1 #
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<2 #	<1 #
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<2 #	<1 #
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<2 #	<1 #
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<2 #	<1 #
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<2 #	<1 #
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<2 #	<1 #
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<2 #	<1 #
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<2 #	<1 #
2-Chlorophenol (aq)	<1 µg/l	TM176		<2 #	<1 #
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<2 #	<1 #
2-Methylphenol (aq)	<1 µg/l	TM176		<2 #	<1 #
2-Nitroaniline (aq)	<1 µg/l	TM176		<2 #	<1 #
2-Nitrophenol (aq)	<1 µg/l	TM176		<2 #	<1 #
3-Nitroaniline (aq)	<1 µg/l	TM176		<2 #	<1 #
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<2 #	<1 #
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<2 #	<1 #
4-Chloroaniline (aq)	<1 µg/l	TM176		<2	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<2 #	<1 #
4-Methylphenol (aq)	<1 µg/l	TM176		<2 #	<1 #
4-Nitroaniline (aq)	<1 µg/l	TM176		<2 #	<1 #
4-Nitrophenol (aq)	<1 µg/l	TM176		<2	<1
Azobenzene (aq)	<1 µg/l	TM176		<2 #	<1 #
Acenaphthylene (aq)	<1 µg/l	TM176		<2 #	<1 #
Acenaphthene (aq)	<1 µg/l	TM176		<2 #	<1 #
Anthracene (aq)	<1 µg/l	TM176		<2 #	<1 #
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<2 #	<1 #
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<2 #	<1 #
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<4 #	<2 #
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<2 #	<1 #
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<2 #	<1 #

CERTIFICATE OF ANALYSIS

SDG:	200516-40	**Client Reference:**	P20-015	**Report Number:**	553007
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2
			Depth (m)	0.00 - 0.00	0.00 - 0.00
			Sample Type	Surface Water (SW)	Surface Water (SW)
			Date Sampled	13/05/2020	13/05/2020
			Sample Time	.	.
			Date Received	16/05/2020	16/05/2020
			SDG Ref	200516-40	200516-40
			Lab Sample No.(s)	22157384	22157398
			AGS Reference		
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<2 #	<1 #
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<2 #	<1 #
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<2 #	<1 #
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<2 #	<1 #
Carbazole (aq)	<1 µg/l	TM176		<2 #	<1 #
Chrysene (aq)	<1 µg/l	TM176		<2 #	<1 #
Dibenzofuran (aq)	<1 µg/l	TM176		<2 #	<1 #
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<2 #	<1 #
Diethyl phthalate (aq)	<1 µg/l	TM176		<2 #	<1 #
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<2 #	<1 #
Dimethyl phthalate (aq)	<1 µg/l	TM176		<2 #	<1 #
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<10 #	<5 #
Fluoranthene (aq)	<1 µg/l	TM176		<2 #	<1 #
Fluorene (aq)	<1 µg/l	TM176		<2 #	<1 #
Hexachlorobenzene (aq)	<1 µg/l	TM176		<2 #	<1 #
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<2 #	<1 #
Pentachlorophenol (aq)	<1 µg/l	TM176		<2	<1
Phenol (aq)	<1 µg/l	TM176		<2	<1
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<2 #	<1 #
Hexachloroethane (aq)	<1 µg/l	TM176		<2 #	<1 #
Nitrobenzene (aq)	<1 µg/l	TM176		<2 #	<1 #
Naphthalene (aq)	<1 µg/l	TM176		<2 #	<1 #
Isophorone (aq)	<1 µg/l	TM176		<2 #	<1 #
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<2	<1
Phenanthrene (aq)	<1 µg/l	TM176		<2 #	<1 #
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<2 #	<1 #
Pyrene (aq)	<1 µg/l	TM176		<2 #	<1 #

CERTIFICATE OF ANALYSIS

SDG:	200516-40	**Client Reference:**	P20-015	**Report Number:**	553007
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2			
			Depth (m)	0.00 - 0.00	0.00 - 0.00			
			Sample Type	Surface Water (SW)	Surface Water (SW)			
			Date Sampled	13/05/2020	13/05/2020			
			Sample Time	.	.			
			Date Received	16/05/2020	16/05/2020			
			SDG Ref	200516-40	200516-40			
			Lab Sample No.(s)	22157384	22157398			
			AGS Reference					
Dibromofluoromethane**	%	TM208		109	109			
Toluene-d8**	%	TM208		104	103			
4-Bromofluorobenzene**	%	TM208		105	104			
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:	200516-40	**Client Reference:**	P20-015	**Report Number:**	553007
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2
			Depth (m)	0.00 - 0.00	0.00 - 0.00
			Sample Type	Surface Water (SW)	Surface Water (SW)
			Date Sampled	13/05/2020	13/05/2020
			Sample Time	.	.
			Date Received	16/05/2020	16/05/2020
			SDG Ref	200516-40	200516-40
			Lab Sample No.(s)	22157384	22157398
			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

CERTIFICATE OF ANALYSIS

SDG:	200516-40	**Client Reference:**	P20-015	**Report Number:**	553007
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**Superseded Report:**	

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
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
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM197	Modified: US EPA Method 8082.EA Method 174 and 5109631	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Waters
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
TM345	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite III) 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:	200516-40	**Client Reference:**	P20-015	**Report Number:**	553007
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	22157384	22157398
Customer Sample Ref.	SW1	SW2
AGS Ref.		
Depth	0.00 - 0.00	0.00 - 0.00
Type	Surface Water	Surface Water
Acid Herbicides by GCMS	20-May-2020	20-May-2020
Ammonium Low	19-May-2020	19-May-2020
Anions by Kone (w)	18-May-2020	18-May-2020
BOD True Total	21-May-2020	21-May-2020
COD Unfiltered	18-May-2020	18-May-2020
Conductivity (at 20 deg.C)	20-May-2020	20-May-2020
Cyanide Comp/Free/Total/Thiocyanate	19-May-2020	19-May-2020
Dissolved Metals by ICP-MS	21-May-2020	21-May-2020
Dissolved Oxygen by Probe	20-May-2020	20-May-2020
Fluoride	18-May-2020	18-May-2020
Mercury Dissolved	18-May-2020	18-May-2020
Mineral Oil C10-40 Aqueous (W)	22-May-2020	22-May-2020
PCB Congeners - Aqueous (W)	22-May-2020	22-May-2020
Pesticides (Suite I) by GCMS	21-May-2020	21-May-2020
Pesticides (Suite II) by GCMS	21-May-2020	21-May-2020
Pesticides (Suite III) by GCMS	21-May-2020	21-May-2020
pH Value	19-May-2020	19-May-2020
Phosphate by Kone (w)	18-May-2020	18-May-2020
Suspended Solids	21-May-2020	21-May-2020
SVOC MS (W) - Aqueous	19-May-2020	19-May-2020
VOC MS (W)	18-May-2020	18-May-2020

SDG:	200516-40	**Client Reference:**	P20-015	**Report Number:**	553007
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**Superseded Report:**	

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**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**

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

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: Gary Lawlor

CERTIFICATE OF ANALYSIS

Date of report Generation:	23 June 2020
Customer:	Fehily Timoney
Sample Delivery Group (SDG):	200611-49
Your Reference:	P20-015
Location:	Oldcourt Landfill
Report No:	556352

We received 2 samples on Thursday June 11, 2020 and 2 of these samples were scheduled for analysis which was completed on Tuesday June 23, 2020. 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:	200611-49	**Client Reference:**	P20-015	**Report Number:**	556352
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22287256	SW1		0.00 - 0.00	10/06/2020
22287270	SW2		0.00 - 0.00	10/06/2020

Maximum Sample/Coolbox Temperature (°C) : **10.0**

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

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

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

Validated

CERTIFICATE OF ANALYSIS

SDG:	200611-49	**Client Reference:**	P20-015	**Report Number:**	556352
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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)											22287256									22287270
Customer Sample Reference											SW1									SW2
AGS Reference																				
Depth (m)											0.00 - 0.00									0.00 - 0.00
Container											0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)
Sample Type											SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 2									X							X						
Ammonium Low	All	NDPs: 0 Tests: 2												X							X			
Anions by Kone (w)	All	NDPs: 0 Tests: 2									X							X						
BOD True Total	All	NDPs: 0 Tests: 2										X							X					
COD Unfiltered	All	NDPs: 0 Tests: 2										X							X					
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 2											X							X				
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2														X							X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2													X							X		
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 2											X							X				
Fluoride	All	NDPs: 0 Tests: 2											X							X				
Mercury Dissolved	All	NDPs: 0 Tests: 2													X							X		
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 2											X							X				
PCB Congeners - Aqueous (W)	All	NDPs: 0 Tests: 2											X							X				
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 2									X							X						
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 2									X							X						

Validated

CERTIFICATE OF ANALYSIS

SDG:	200611-49	**Client Reference:**	P20-015	**Report Number:**	556352
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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)																		22287256	22287270
Customer Sample Reference																		SW1	SW2
AGS Reference																			
Depth (m)																		0.00 - 0.00	0.00 - 0.00
Container																		0.5l glass bottle (ALE227)	0.5l glass bottle (ALE227)
																		250ml BOD (ALE212)	250ml BOD (ALE212)
																		500ml Plastic (ALE208)	500ml Plastic (ALE208)
																		H2SO4 (ALE244)	H2SO4 (ALE244)
																		HNO3 Filtered (ALE204)	HNO3 Filtered (ALE204)
																		NaOH (ALE245)	NaOH (ALE245)
																		Vial (ALE297)	Vial (ALE297)
Sample Type																		SW	SW
Pesticides (Suite III) by GCMS	All	NDPs: 0 Tests: 2																X	X
pH Value	All	NDPs: 0 Tests: 2																X	X
Phosphate by Kone (w)	All	NDPs: 0 Tests: 2																X	X
Suspended Solids	All	NDPs: 0 Tests: 2																X	X
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 2																X	X
VOC MS (W)	All	NDPs: 0 Tests: 2																X	X

CERTIFICATE OF ANALYSIS

SDG:	200611-49	**Client Reference:**	P20-015	**Report Number:**	556352
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2			
			Depth (m)	0.00 - 0.00	0.00 - 0.00			
			Sample Type	Surface Water (SW)	Surface Water (SW)			
			Date Sampled	10/06/2020	10/06/2020			
			Sample Time	.	.			
			Date Received	11/06/2020	11/06/2020			
			SDG Ref	200611-49	200611-49			
			Lab Sample No.(s)	22287256	22287270			
			AGS Reference					
Suspended solids, Total	<2 mg/l	TM022		3.45 #	2.3 #			
BOD, unfiltered	<1 mg/l	TM045		<1 #	<1 #			
Oxygen, dissolved	<0.3 mg/l	TM046		9.36	9.71			
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099		0.0182 #	0.0304 #			
Fluoride	<0.5 mg/l	TM104		<0.5	<0.5			
COD, unfiltered	<7 mg/l	TM107		<7 #	<7 #			
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		0.126 #	0.137 #			
Arsenic (diss.filt)	<0.5 µg/l	TM152		11.7 #	12.2 #			
Barium (diss.filt)	<0.2 µg/l	TM152		3.86 #	3.73 #			
Boron (diss.filt)	<10 µg/l	TM152		<10 #	<10 #			
Cadmium (diss.filt)	<0.08 µg/l	TM152		<0.08 #	<0.08 #			
Chromium (diss.filt)	<1 µg/l	TM152		<1 #	<1 #			
Copper (diss.filt)	<0.3 µg/l	TM152		0.428 #	0.481 #			
Lead (diss.filt)	<0.2 µg/l	TM152		<0.2 #	<0.2 #			
Manganese (diss.filt)	<3 µg/l	TM152		4.32 #	<3 #			
Nickel (diss.filt)	<0.4 µg/l	TM152		<0.4 #	<0.4 #			
Phosphorus (diss.filt)	<10 µg/l	TM152		16.6 #	18.2 #			
Selenium (diss.filt)	<1 µg/l	TM152		<1 #	<1 #			
Thallium (diss.filt)	<2 µg/l	TM152		<2 #	<2 #			
Zinc (diss.filt)	<1 µg/l	TM152		4.78 #	5.15 #			
Sodium (Dis.Filt)	<0.076 mg/l	TM152		7.87 #	8.11 #			
Magnesium (Dis.Filt)	<0.036 mg/l	TM152		3.41 #	3.54 #			
Potassium (Dis.Filt)	<0.2 mg/l	TM152		0.854 #	0.93 #			
Calcium (Dis.Filt)	<0.2 mg/l	TM152		12.7 #	14 #			
Iron (Dis.Filt)	<0.019 mg/l	TM152		<0.019 #	<0.019 #			
Mineral oil >C10 C40 (aq)	<100 µg/l	TM172		<100	<100			
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01	<0.01			
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184		<0.05 #	<0.05 #			
Chloride	<2 mg/l	TM184		12.7 #	12.8 #			
Sulphate (soluble) as S	<1 mg/l	TM184		2.13 #	2.27 #			
PCB congener 28	<0.015 µg/l	TM197		<0.015	<0.015			
PCB congener 52	<0.015 µg/l	TM197		<0.015	<0.015			
PCB congener 101	<0.015 µg/l	TM197		<0.015	<0.015			

CERTIFICATE OF ANALYSIS

SDG:	200611-49	**Client Reference:**	P20-015	**Report Number:**	556352
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Surface Water (SW)	Surface Water (SW)				
			Date Sampled	10/06/2020	10/06/2020				
			Sample Time	.	.				
			Date Received	11/06/2020	11/06/2020				
			SDG Ref	200611-49	200611-49				
			Lab Sample No.(s)	22287256	22287270				
			AGS Reference						
PCB congener 118	<0.015 µg/l	TM197		<0.015	<0.015				
PCB congener 138	<0.015 µg/l	TM197		<0.015	<0.015				
PCB congener 153	<0.015 µg/l	TM197		<0.015	<0.015				
PCB congener 180	<0.015 µg/l	TM197		<0.015	<0.015				
Sum of detected EC7 PCB's	<0.105 µg/l	TM197		<0.105	<0.105				
Cyanide, Total	<0.05 mg/l	TM227		<0.05	<0.05				
pH	<1 pH Units	TM256		7.49 #	7.61 #				
Trifluralin	<0.01 µg/l	TM343		<0.02	<0.02				
alpha-HCH	<0.01 µg/l	TM343		<0.02	<0.02				
gamma-HCH (Lindane)	<0.01 µg/l	TM343		<0.01	<0.01				
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	<0.02				
Heptachlor epoxide	<0.01 µg/l	TM343		<0.02	<0.02				
o,p'-DDE	<0.01 µg/l	TM343		<0.02	<0.02				
Endosulphan I	<0.01 µg/l	TM343		<0.01	<0.01				
trans-Chlordane	<0.01 µg/l	TM343		<0.02	<0.02				
cis-Chlordane	<0.01 µg/l	TM343		<0.02	<0.02				
p,p'-DDE	<0.01 µg/l	TM343		<0.02	<0.02				
Dieldrin	<0.01 µg/l	TM343		<0.01	<0.01				
o,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.02	<0.02				
Endrin	<0.01 µg/l	TM343		<0.02	<0.02				
o,p'-DDT	<0.01 µg/l	TM343		<0.02	<0.02				
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	<0.02				
o,p'-Methoxychlor	<0.01 µg/l	TM343		<0.04	<0.04				
p,p'-Methoxychlor	<0.01 µg/l	TM343		<0.06	<0.06				
Endosulphan Sulphate	<0.02 µg/l	TM343		<0.02	<0.02				
Permethrin I	<0.01 µg/l	TM343		<0.02	<0.02				
Permethrin II	<0.01 µg/l	TM343		<0.01	<0.01				

CERTIFICATE OF ANALYSIS

SDG:	200611-49	**Client Reference:**	P20-015	**Report Number:**	556352
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Surface Water (SW)	Surface Water (SW)				
			Date Sampled	10/06/2020	10/06/2020				
			Sample Time	.	.				
			Date Received	11/06/2020	11/06/2020				
			SDG Ref	200611-49	200611-49				
			Lab Sample No.(s)	22287256	22287270				
			AGS Reference						
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01				
Hexachlorobutadiene	<0.01 µg/l	TM344		<0.01	<0.01				
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01				
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01				
Dichlorvos	<0.01 µg/l	TM344		<0.01	<0.01				
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		<0.01	<0.01				
Demeton-S-methyl	<0.01 µg/l	TM344		<0.01	<0.01				
Phorate	<0.01 µg/l	TM344		<0.01	<0.01				
Diazinon	<0.01 µg/l	TM344		<0.01	<0.01				
Triallate	<0.01 µg/l	TM344		<0.01	<0.01				
Atrazine	<0.01 µg/l	TM344		<0.01	<0.01				
Simazine	<0.01 µg/l	TM344		<0.01	<0.01				
Disulfoton	<0.01 µg/l	TM344		<0.01	<0.01				
Propetamphos	<0.01 µg/l	TM344		<0.01	<0.01				
Chlorpyriphos-methyl	<0.01 µg/l	TM344		<0.01	<0.01				
Dimethoate	<0.01 µg/l	TM344		<0.01	<0.01				
Pirimiphos-methyl	<0.01 µg/l	TM344		<0.01	<0.01				
Chlorpyriphos	<0.01 µg/l	TM344		<0.01	<0.01				
Methyl Parathion	<0.01 µg/l	TM344		<0.01	<0.01				
Malathion	<0.01 µg/l	TM344		<0.01	<0.01				
Fenthion	<0.01 µg/l	TM344		<0.01	<0.01				
Fenitrothion	<0.01 µg/l	TM344		<0.01	<0.01				
Triadimefon	<0.01 µg/l	TM344		<0.01	<0.01				
Pendimethalin	<0.01 µg/l	TM344		<0.01	<0.01				
Parathion	<0.01 µg/l	TM344		<0.01	<0.01				
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				

CERTIFICATE OF ANALYSIS

SDG:	200611-49	**Client Reference:**	P20-015	**Report Number:**	556352
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Surface Water (SW)	Surface Water (SW)				
			Date Sampled	10/06/2020	10/06/2020				
			Sample Time	.	.				
			Date Received	11/06/2020	11/06/2020				
			SDG Ref	200611-49	200611-49				
			Lab Sample No.(s)	22287256	22287270				
			AGS Reference						
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				
Etridiazole	<0.01 µg/l	TM345		<0.01	<0.01				
Pentachlorobenzene	<0.01 µg/l	TM345		<0.01	<0.01				
Propachlor	<0.01 µg/l	TM345		<0.01	<0.01				
Quintozene (PCNB)	<0.01 µg/l	TM345		<0.01	<0.01				
Omethoate	<0.01 µg/l	TM345		<0.01	<0.01				
Propazine	<0.01 µg/l	TM345		<0.01	<0.01				
Propyzamide	<0.01 µg/l	TM345		<0.01	<0.01				
Alachlor	<0.01 µg/l	TM345		<0.01	<0.01				
Prometryn	<0.01 µg/l	TM345		<0.01	<0.01				
Telodrin	<0.01 µg/l	TM345		<0.01	<0.01				
Terbutryn	<0.01 µg/l	TM345		<0.01	<0.01				
Chlorothalonil	<0.01 µg/l	TM345		<0.01	<0.01				
Etrimphos	<0.01 µg/l	TM345		<0.01	<0.01				
Metazachlor	<0.01 µg/l	TM345		<0.01	<0.01				
Cyanazine	<0.01 µg/l	TM345		<0.01	<0.01				
Trietazine	<0.01 µg/l	TM345		<0.01	<0.01				
Coumaphos	<0.01 µg/l	TM345		<0.01	<0.01				
Phosphamidon I	<0.01 µg/l	TM345		<0.01	<0.01				
Phosphamidon II	<0.01 µg/l	TM345		<0.01	<0.01				
Dinitro-o-cresol	<0.1 µg/l	TM411		<0.2	<0.2				
Clopyralid	<0.04 µg/l	TM411		<0.08	<0.08				
MCPA	<0.05 µg/l	TM411		<0.1	<0.1				
Mecoprop	<0.04 µg/l	TM411		<0.08	<0.08				
Dicamba	<0.04 µg/l	TM411		<0.08	<0.08				
MCPB	<0.05 µg/l	TM411		<0.1	<0.1				
2,4-DB	<0.1 µg/l	TM411		<0.2	<0.2				
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411		<0.1	<0.1				
Dichlorprop	<0.1 µg/l	TM411		<0.2	<0.2				
Triclopyr	<0.05 µg/l	TM411		<0.1	<0.1				

CERTIFICATE OF ANALYSIS

SDG:	200611-49	**Client Reference:**	P20-015	**Report Number:**	556352
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Surface Water (SW)	Surface Water (SW)				
			Date Sampled	10/06/2020	10/06/2020				
			Sample Time	.	.				
			Date Received	11/06/2020	11/06/2020				
			SDG Ref	200611-49	200611-49				
			Lab Sample No.(s)	22287256	22287270				
			AGS Reference						
Fenoprop (Silvex)	<0.1 µg/l	TM411		<0.2	<0.2				
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.1	<0.1				
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.1	<0.1				
Bromoxynil	<0.04 µg/l	TM411		<0.08	<0.08				
Benazolin	<0.04 µg/l	TM411		<0.08	<0.08				
Ioxynil	<0.05 µg/l	TM411		<0.1	<0.1				
Pentachlorophenol	<0.04 µg/l	TM411		<0.08	<0.08				
Fluoroxypyr	<0.1 µg/l	TM411		<0.2	<0.2				

CERTIFICATE OF ANALYSIS

SDG:	200611-49	**Client Reference:**	P20-015	**Report Number:**	556352
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2			
			Depth (m)	0.00 - 0.00	0.00 - 0.00			
			Sample Type	Surface Water (SW)	Surface Water (SW)			
			Date Sampled	10/06/2020	10/06/2020			
			Sample Time	.	.			
			Date Received	11/06/2020	11/06/2020			
			SDG Ref	200611-49	200611-49			
			Lab Sample No.(s)	22287256	22287270			
			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:	200611-49	**Client Reference:**	P20-015	**Report Number:**	556352
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2			
			Depth (m)	0.00 - 0.00	0.00 - 0.00			
			Sample Type	Surface Water (SW)	Surface Water (SW)			
			Date Sampled	10/06/2020	10/06/2020			
			Sample Time	.	.			
			Date Received	11/06/2020	11/06/2020			
			SDG Ref	200611-49	200611-49			
			Lab Sample No.(s)	22287256	22287270			
			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:	200611-49	**Client Reference:**	P20-015	**Report Number:**	556352
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Surface Water (SW)	Surface Water (SW)				
			Date Sampled	10/06/2020	10/06/2020				
			Sample Time	.	.				
			Date Received	11/06/2020	11/06/2020				
			SDG Ref	200611-49	200611-49				
			Lab Sample No.(s)	22287256	22287270				
			AGS Reference						
Dibromofluoromethane**	%	TM208		108	108				
Toluene-d8**	%	TM208		100	100				
4-Bromofluorobenzene**	%	TM208		100	102				
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:	200611-49	**Client Reference:**	P20-015	**Report Number:**	556352
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2			
			Depth (m)	0.00 - 0.00	0.00 - 0.00			
			Sample Type	Surface Water (SW)	Surface Water (SW)			
			Date Sampled	10/06/2020	10/06/2020			
			Sample Time	.	.			
			Date Received	11/06/2020	11/06/2020			
			SDG Ref	200611-49	200611-49			
			Lab Sample No.(s)	22287256	22287270			
			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			

CERTIFICATE OF ANALYSIS

SDG:	200611-49	**Client Reference:**	P20-015	**Report Number:**	556352
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**Superseded Report:**	

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
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
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM197	Modified: US EPA Method 8082.EA Method 174 and 5109631	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Waters
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
TM345	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite III) 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:	200611-49	**Client Reference:**	P20-015	**Report Number:**	556352
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	22287256	22287270
Customer Sample Ref.	SW1	SW2
AGS Ref.		
Depth	0.00 - 0.00	0.00 - 0.00
Type	Surface Water	Surface Water
Acid Herbicides by GCMS	23-Jun-2020	23-Jun-2020
Ammonium Low	19-Jun-2020	19-Jun-2020
Anions by Kone (w)	12-Jun-2020	12-Jun-2020
BOD True Total	17-Jun-2020	17-Jun-2020
COD Unfiltered	21-Jun-2020	21-Jun-2020
Conductivity (at 20 deg.C)	19-Jun-2020	19-Jun-2020
Cyanide Comp/Free/Total/Thiocyanate	16-Jun-2020	16-Jun-2020
Dissolved Metals by ICP-MS	19-Jun-2020	19-Jun-2020
Dissolved Oxygen by Probe	17-Jun-2020	17-Jun-2020
Fluoride	12-Jun-2020	12-Jun-2020
Mercury Dissolved	12-Jun-2020	12-Jun-2020
Mineral Oil C10-40 Aqueous (W)	19-Jun-2020	19-Jun-2020
PCB Congeners - Aqueous (W)	19-Jun-2020	19-Jun-2020
Pesticides (Suite I) by GCMS	18-Jun-2020	18-Jun-2020
Pesticides (Suite II) by GCMS	17-Jun-2020	17-Jun-2020
Pesticides (Suite III) by GCMS	17-Jun-2020	17-Jun-2020
pH Value	18-Jun-2020	18-Jun-2020
Phosphate by Kone (w)	12-Jun-2020	12-Jun-2020
Suspended Solids	22-Jun-2020	22-Jun-2020
SVOC MS (W) - Aqueous	16-Jun-2020	16-Jun-2020
VOC MS (W)	20-Jun-2020	20-Jun-2020

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**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**

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

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: Gary Lawlor

CERTIFICATE OF ANALYSIS

Date of report Generation:	10 July 2020
Customer:	Fehily Timoney
Sample Delivery Group (SDG):	200701-66
Your Reference:	P20-015
Location:	Oldcourt Landfill
Report No:	558449

We received 2 samples on Wednesday July 01, 2020 and 2 of these samples were scheduled for analysis which was completed on Thursday July 09, 2020. 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:	200701-66	**Client Reference:**	P20-015	**Report Number:**	558449
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22402719	SW1		0.00 - 0.00	30/06/2020
22402728	SW2		0.00 - 0.00	30/06/2020

Maximum Sample/Coolbox Temperature (°C) : **12.6**

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

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

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

Validated

CERTIFICATE OF ANALYSIS

SDG:	200701-66	**Client Reference:**	P20-015	**Report Number:**	558449
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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)			22402719							22402728						
Customer Sample Reference			SW1							SW2						
AGS Reference																
Depth (m)			0.00 - 0.00							0.00 - 0.00						
Container			0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)
Sample Type			SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 2	X							X						
Ammonium Low	All	NDPs: 0 Tests: 2				X							X			
Anions by Kone (w)	All	NDPs: 0 Tests: 2	X							X						
BOD True Total	All	NDPs: 0 Tests: 2		X							X					
COD Unfiltered	All	NDPs: 0 Tests: 2		X							X					
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 2			X							X				
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2						X							X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2					X							X		
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 2			X							X				
Fluoride	All	NDPs: 0 Tests: 2			X							X				
Mercury Dissolved	All	NDPs: 0 Tests: 2					X							X		
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 2			X							X				
PCB Congeners - Aqueous (W)	All	NDPs: 0 Tests: 2			X							X				
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 2	X							X						
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 2	X							X						

Validated

CERTIFICATE OF ANALYSIS

SDG:	200701-66	**Client Reference:**	P20-015	**Report Number:**	558449
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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)																		22402719	22402728
Customer Sample Reference																		SW1	SW2
AGS Reference																			
Depth (m)																		0.00 - 0.00	0.00 - 0.00
Container																		0.5l glass bottle (ALE227)	0.5l glass bottle (ALE227)
																		250ml BOD (ALE212)	250ml BOD (ALE212)
																		500ml Plastic (ALE208)	500ml Plastic (ALE208)
																		H2SO4 (ALE244)	H2SO4 (ALE244)
																		HNO3 Filtered (ALE204)	HNO3 Filtered (ALE204)
																		NaOH (ALE245)	NaOH (ALE245)
																		Vial (ALE297)	Vial (ALE297)
Sample Type																		SW	SW
Pesticides (Suite III) by GCMS	All	NDPs: 0 Tests: 2																X	X
pH Value	All	NDPs: 0 Tests: 2																X	X
Phosphate by Kone (w)	All	NDPs: 0 Tests: 2																X	X
Suspended Solids	All	NDPs: 0 Tests: 2																X	X
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 2																X	X
VOC MS (W)	All	NDPs: 0 Tests: 2																X	X

CERTIFICATE OF ANALYSIS

SDG:	200701-66	**Client Reference:**	P20-015	**Report Number:**	558449
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Surface Water (SW)	Surface Water (SW)				
			Date Sampled	30/06/2020	30/06/2020				
			Sample Time	.	.				
			Date Received	01/07/2020	01/07/2020				
			SDG Ref	200701-66	200701-66				
			Lab Sample No.(s)	22402719	22402728				
			AGS Reference						
Suspended solids, Total	<2 mg/l	TM022		<2 #	3.15 #				
BOD, unfiltered	<1 mg/l	TM045		<1 #	<1 #				
Oxygen, dissolved	<0.3 mg/l	TM046		10.9	12.6				
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099		0.0181 #	0.034 #				
Fluoride	<0.5 mg/l	TM104		<0.5	<0.5				
COD, unfiltered	<7 mg/l	TM107		<7 #	<7 #				
Conductivity @ 20 deg.C	<0.02 mS/cm	TM120		0.133 #	0.134 #				
Arsenic (diss.filt)	<0.5 µg/l	TM152		13.1 #	13.2 #				
Barium (diss.filt)	<0.2 µg/l	TM152		4.01 #	4.04 #				
Boron (diss.filt)	<10 µg/l	TM152		12.7 #	11.4 #				
Cadmium (diss.filt)	<0.08 µg/l	TM152		<0.08 #	<0.08 #				
Chromium (diss.filt)	<1 µg/l	TM152		<1 #	<1 #				
Copper (diss.filt)	<0.3 µg/l	TM152		0.621 #	0.495 #				
Lead (diss.filt)	<0.2 µg/l	TM152		<0.2 #	<0.2 #				
Manganese (diss.filt)	<3 µg/l	TM152		<3 #	<3 #				
Nickel (diss.filt)	<0.4 µg/l	TM152		<0.4 #	0.436 #				
Phosphorus (diss.filt)	<10 µg/l	TM152		16.2 #	15.5 #				
Selenium (diss.filt)	<1 µg/l	TM152		<1 #	<1 #				
Thallium (diss.filt)	<2 µg/l	TM152		<2 #	<2 #				
Zinc (diss.filt)	<1 µg/l	TM152		4.61 #	4.88 #				
Sodium (Dis.Filt)	<0.076 mg/l	TM152		8.52 #	8.43 #				
Magnesium (Dis.Filt)	<0.036 mg/l	TM152		3.86 #	3.86 #				
Potassium (Dis.Filt)	<0.2 mg/l	TM152		0.962 #	1.06 #				
Calcium (Dis.Filt)	<0.2 mg/l	TM152		14.8 #	15.3 #				
Iron (Dis.Filt)	<0.019 mg/l	TM152		<0.019 #	<0.019 #				
Mineral oil >C10 C40 (aq)	<100 µg/l	TM172		<100	<100				
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01	<0.01				
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184		<0.05 #	<0.05 #				
Chloride	<2 mg/l	TM184		13.4 #	13.4 #				
Sulphate (soluble) as S	<1 mg/l	TM184		2.27 #	2.3 #				
PCB congener 28	<0.015 µg/l	TM197		<0.015	<0.015				
PCB congener 52	<0.015 µg/l	TM197		<0.015	<0.015				
PCB congener 101	<0.015 µg/l	TM197		<0.015	<0.015				

CERTIFICATE OF ANALYSIS

SDG:	200701-66	**Client Reference:**	P20-015	**Report Number:**	558449
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Surface Water (SW)	Surface Water (SW)				
			Date Sampled	30/06/2020	30/06/2020				
			Sample Time	.	.				
			Date Received	01/07/2020	01/07/2020				
			SDG Ref	200701-66	200701-66				
			Lab Sample No.(s)	22402719	22402728				
			AGS Reference						
PCB congener 118	<0.015 µg/l	TM197		<0.015	<0.015				
PCB congener 138	<0.015 µg/l	TM197		<0.015	<0.015				
PCB congener 153	<0.015 µg/l	TM197		<0.015	<0.015				
PCB congener 180	<0.015 µg/l	TM197		<0.015	<0.015				
Sum of detected EC7 PCB's	<0.105 µg/l	TM197		<0.105	<0.105				
Cyanide, Total	<0.05 mg/l	TM227		<0.05	<0.05				
pH	<1 pH Units	TM256		7.56 #	7.44 #				
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				
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		<0.01	<0.01				
Heptachlor epoxide	<0.01 µg/l	TM343		<0.01	<0.01				
o,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01				
Endosulphan I	<0.01 µg/l	TM343		<0.01	<0.01				
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		<0.01	<0.02				
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	<0.03				
o,p'-Methoxychlor	<0.01 µg/l	TM343		<0.02	<0.02				
p,p'-Methoxychlor	<0.01 µg/l	TM343		<0.02	<0.03				
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				

CERTIFICATE OF ANALYSIS

SDG:	200701-66	**Client Reference:**	P20-015	**Report Number:**	558449
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Surface Water (SW)	Surface Water (SW)				
			Date Sampled	30/06/2020	30/06/2020				
			Sample Time	.	.				
			Date Received	01/07/2020	01/07/2020				
			SDG Ref	200701-66	200701-66				
			Lab Sample No.(s)	22402719	22402728				
			AGS Reference						
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01				
Hexachlorobutadiene	<0.01 µg/l	TM344		<0.01	<0.01				
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01				
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01				
Dichlorvos	<0.01 µg/l	TM344		<0.01	<0.01				
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		<0.01	<0.01				
Demeton-S-methyl	<0.01 µg/l	TM344		<0.01	<0.01				
Phorate	<0.01 µg/l	TM344		<0.01	<0.01				
Diazinon	<0.01 µg/l	TM344		<0.01	<0.01				
Triallate	<0.01 µg/l	TM344		<0.01	<0.01				
Atrazine	<0.01 µg/l	TM344		<0.01	<0.01				
Simazine	<0.01 µg/l	TM344		<0.01	0.0149				
Disulfoton	<0.01 µg/l	TM344		<0.01	<0.01				
Propetamphos	<0.01 µg/l	TM344		<0.01	<0.01				
Chlorpyriphos-methyl	<0.01 µg/l	TM344		<0.01	<0.01				
Dimethoate	<0.01 µg/l	TM344		<0.01	<0.01				
Pirimiphos-methyl	<0.01 µg/l	TM344		<0.01	<0.01				
Chlorpyriphos	<0.01 µg/l	TM344		<0.01	<0.01				
Methyl Parathion	<0.01 µg/l	TM344		<0.01	<0.01				
Malathion	<0.01 µg/l	TM344		<0.01	<0.01				
Fenthion	<0.01 µg/l	TM344		<0.01	<0.01				
Fenitrothion	<0.01 µg/l	TM344		<0.01	<0.01				
Triadimefon	<0.01 µg/l	TM344		<0.01	<0.01				
Pendimethalin	<0.01 µg/l	TM344		<0.01	<0.01				
Parathion	<0.01 µg/l	TM344		<0.01	<0.01				
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				

CERTIFICATE OF ANALYSIS

SDG:	200701-66	**Client Reference:**	P20-015	**Report Number:**	558449
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+§@	Sample deviation (see appendix)

		Customer Sample Ref.	SW1	SW2					
		Depth (m)	0.00 - 0.00	0.00 - 0.00					
		Sample Type	Surface Water (SW)	Surface Water (SW)					
		Date Sampled	30/06/2020	30/06/2020					
		Sample Time	.	.					
		Date Received	01/07/2020	01/07/2020					
		SDG Ref	200701-66	200701-66					
		Lab Sample No.(s)	22402719	22402728					
		AGS Reference							
Component	**LOD/Units**	**Method**							
Triazophos	<0.01 µg/l	TM344	<0.01	<0.01					
Phosalone	<0.01 µg/l	TM344	<0.02	<0.02					
Azinphos methyl	<0.02 µg/l	TM344	<0.04	<0.04					
Azinphos ethyl	<0.02 µg/l	TM344	<0.04	<0.04					
Etridiazole	<0.01 µg/l	TM345	<0.01	<0.01					
Pentachlorobenzene	<0.01 µg/l	TM345	<0.01	<0.01					
Propachlor	<0.01 µg/l	TM345	<0.01	<0.01					
Quintozene (PCNB)	<0.01 µg/l	TM345	<0.01	<0.01					
Omethoate	<0.01 µg/l	TM345	<0.01	<0.01					
Propazine	<0.01 µg/l	TM345	<0.01	<0.01					
Propyzamide	<0.01 µg/l	TM345	<0.01	<0.01					
Alachlor	<0.01 µg/l	TM345	<0.01	<0.01					
Prometryn	<0.01 µg/l	TM345	<0.01	<0.01					
Telodrin	<0.01 µg/l	TM345	<0.01	<0.01					
Terbutryn	<0.01 µg/l	TM345	<0.01	<0.01					
Chlorothalonil	<0.01 µg/l	TM345	<0.02	<0.02					
Etrimphos	<0.01 µg/l	TM345	<0.01	<0.01					
Metazachlor	<0.01 µg/l	TM345	<0.01	<0.01					
Cyanazine	<0.01 µg/l	TM345	<0.01	<0.01					
Trietazine	<0.01 µg/l	TM345	<0.01	<0.01					
Coumaphos	<0.01 µg/l	TM345	<0.01	<0.01					
Phosphamidon I	<0.01 µg/l	TM345	<0.01	<0.01					
Phosphamidon II	<0.01 µg/l	TM345	<0.01	<0.01					
Dinitro-o-cresol	<0.1 µg/l	TM411	<0.2	<0.1					
Clopyralid	<0.04 µg/l	TM411	<0.08	<0.04					
MCPA	<0.05 µg/l	TM411	<0.1	<0.05					
Mecoprop	<0.04 µg/l	TM411	<0.08	<0.04					
Dicamba	<0.04 µg/l	TM411	<0.08	<0.04					
MCPB	<0.05 µg/l	TM411	<0.1	<0.05					
2,4-DB	<0.1 µg/l	TM411	<0.2	<0.1					
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411	<0.1	<0.05					
Dichlorprop	<0.1 µg/l	TM411	<0.2	<0.1					
Triclopyr	<0.05 µg/l	TM411	<0.75	<0.75					

CERTIFICATE OF ANALYSIS

SDG:	200701-66	**Client Reference:**	P20-015	**Report Number:**	558449
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Surface Water (SW)	Surface Water (SW)				
			Date Sampled	30/06/2020	30/06/2020				
			Sample Time	.	.				
			Date Received	01/07/2020	01/07/2020				
			SDG Ref	200701-66	200701-66				
			Lab Sample No.(s)	22402719	22402728				
			AGS Reference						
Fenoprop (Silvex)	<0.1 µg/l	TM411		<0.2	<0.1				
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.1	<0.05				
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.1	<0.05				
Bromoxynil	<0.04 µg/l	TM411		<0.08	<0.04				
Benazolin	<0.04 µg/l	TM411		<0.08	<0.04				
Ioxynil	<0.05 µg/l	TM411		<0.1	<0.05				
Pentachlorophenol	<0.04 µg/l	TM411		<0.08	<0.04				
Fluoroxypyr	<0.1 µg/l	TM411		<0.2	<0.1				

CERTIFICATE OF ANALYSIS

SDG:	200701-66	**Client Reference:**	P20-015	**Report Number:**	558449
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Surface Water (SW)	Surface Water (SW)				
			Date Sampled	30/06/2020	30/06/2020				
			Sample Time	.	.				
			Date Received	01/07/2020	01/07/2020				
			SDG Ref	200701-66	200701-66				
			Lab Sample No.(s)	22402719	22402728				
			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:	200701-66	**Client Reference:**	P20-015	**Report Number:**	558449
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2			
			Depth (m)	0.00 - 0.00	0.00 - 0.00			
			Sample Type	Surface Water (SW)	Surface Water (SW)			
			Date Sampled	30/06/2020	30/06/2020			
			Sample Time	.	.			
			Date Received	01/07/2020	01/07/2020			
			SDG Ref	200701-66	200701-66			
			Lab Sample No.(s)	22402719	22402728			
			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:	200701-66	**Client Reference:**	P20-015	**Report Number:**	558449
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Surface Water (SW)	Surface Water (SW)				
			Date Sampled	30/06/2020	30/06/2020				
			Sample Time	.	.				
			Date Received	01/07/2020	01/07/2020				
			SDG Ref	200701-66	200701-66				
			Lab Sample No.(s)	22402719	22402728				
			AGS Reference						
Dibromofluoromethane**	%	TM208		110	111				
Toluene-d8**	%	TM208		101	99.8				
4-Bromofluorobenzene**	%	TM208		97.6	96.6				
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:	200701-66	**Client Reference:**	P20-015	**Report Number:**	558449
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2			
			Depth (m)	0.00 - 0.00	0.00 - 0.00			
			Sample Type	Surface Water (SW)	Surface Water (SW)			
			Date Sampled	30/06/2020	30/06/2020			
			Sample Time	.	.			
			Date Received	01/07/2020	01/07/2020			
			SDG Ref	200701-66	200701-66			
			Lab Sample No.(s)	22402719	22402728			
			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			

CERTIFICATE OF ANALYSIS

SDG:	200701-66	**Client Reference:**	P20-015	**Report Number:**	558449
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**Superseded Report:**	

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
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
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM197	Modified: US EPA Method 8082.EA Method 174 and 5109631	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Waters
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
TM345	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite III) 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:	200701-66	**Client Reference:**	P20-015	**Report Number:**	558449
Location:	Oldcourt Landfill	**Order Number:**	Z2085	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	22402719	22402728
Customer Sample Ref.	SW1	SW2
AGS Ref.		
Depth	0.00 - 0.00	0.00 - 0.00
Type	Surface Water	Surface Water
Acid Herbicides by GCMS	07-Jul-2020	07-Jul-2020
Ammonium Low	07-Jul-2020	07-Jul-2020
Anions by Kone (w)	02-Jul-2020	02-Jul-2020
BOD True Total	08-Jul-2020	08-Jul-2020
COD Unfiltered	05-Jul-2020	05-Jul-2020
Conductivity (at 20 deg.C)	03-Jul-2020	03-Jul-2020
Cyanide Comp/Free/Total/Thiocyanate	07-Jul-2020	07-Jul-2020
Dissolved Metals by ICP-MS	06-Jul-2020	06-Jul-2020
Dissolved Oxygen by Probe	03-Jul-2020	03-Jul-2020
Fluoride	03-Jul-2020	03-Jul-2020
Mercury Dissolved	02-Jul-2020	02-Jul-2020
Mineral Oil C10-40 Aqueous (W)	07-Jul-2020	07-Jul-2020
PCB Congeners - Aqueous (W)	08-Jul-2020	08-Jul-2020
Pesticides (Suite I) by GCMS	08-Jul-2020	07-Jul-2020
Pesticides (Suite II) by GCMS	07-Jul-2020	07-Jul-2020
Pesticides (Suite III) by GCMS	09-Jul-2020	09-Jul-2020
pH Value	02-Jul-2020	02-Jul-2020
Phosphate by Kone (w)	02-Jul-2020	02-Jul-2020
Suspended Solids	07-Jul-2020	07-Jul-2020
SVOC MS (W) - Aqueous	03-Jul-2020	05-Jul-2020
VOC MS (W)	06-Jul-2020	06-Jul-2020

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**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**

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

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.

FEHILY TIMONEY

30 YEARS

CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

www.fehilytimoney.ie

CORK OFFICE
Core House
Pouladuff Road,
Cork, T12 D773,
Ireland
+353 21 496 4133

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

Carlow Office
Unit 6, Bagenalstown Industrial Park, Royal Oak Road,
Muine Bheag
Co. Carlow, R21 XA00,
Ireland
+353 59 972 3800

HEALTH & SAFETY OHSAS 18001:2007 NSAI Certified

QUALITY ISO 9001:2015 NSAI Certified

ENVIRONMENT ISO 14001:2015 NSAI Certified