APPENDIX 1

Tier 1 Report

See Separate Volume

Tier 1 Environmental Risk Assessment

For

Unlicensed Landfill
Dysert, Kilrush

Assessment carried out by:
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Patricia O'Brien
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Environment Section
Clare County Council

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1. Introduction

1.1 Objective

The objective of this investigation was to undertake a Tier 1 Risk Assessment in accordance with the Code of Practice for Environmental Risk Assessment of Unregulated Waste Disposal Sites, EPA, 2007 (EPA CoP, 2007). The Tier 1 Risk Assessment is an initial screening process that allows for the prioritisation of sites into high, moderate and low risk, so that resources can be allocated to the investigation of higher risk sites. The risk assessment also enables the source-pathway-receptor (SPR) linkages to be examined for each site.

The Risk Assessment comprised the following:

- Desk study, including aquifer classification maps, aerial photographs, Ordnance Survey Ireland (OSI) maps, archived records.
- Site inspection including walkover survey.
- Development of conceptual site model showing SPR linkages.
- Risk screening as described in EPA Code of Practice.

2. Desk Study

2.1 Information Sources

The following sources of information were consulted as part of the desk study:

- Archived records held by Clare County Council.
- OSI 6" maps and 5 and 50k maps.
- GSI and EPA online maps.
- Ordinance Survey Ireland aerial photographs, 1996, 2002 and 2006.
- NPWS.
- Interviews with current and retired Council staff.

2.2 Site Location and Walkover Survey Observations.

Kilrush landfill is located on a 2.6 Ha site in the townland of Dysert, Kilrush. The site is owned by Clare County Council. The lands are fenced off and are currently idle. Lands to the south, east and west are agricultural. The site is bordered to the immediate north by marshy land and to the south and east by road. The nearest house is 360m from the waste body, to the northeast. The lands slope very gently from south to north and east to west. The groundwater vulnerability rating is "high" with areas of extreme vulnerability. The aquifer category is Li.

The site walkover survey revealed substantial areas of exposed waste throughout the site; with the western side slope being worst affected. The walkover survey checklist is attached in appendix I. Site photographs are also included in appendix I.

2.3 Surface Water Features

A drain runs in a northerly direction along the western site boundary. The drain flows towards marshy ground to the immediate north but the exact route is not known; the ground was impassable due to high water level at the time of the site visit. The drainage from this marshy area is believed to flow into a stream (stream A), which runs in a westerly direction approximately 110m to the north of the site. There is a second stream (stream B) 220m to the south of the site, but there is no surface water connection between the landfill and this stream.

2.4 Historical Site Use and Waste Disposal Activities.

The landfill opened in either 1987 or 1981-1982 (exact opening date is unclear from the archived records). It closed in 1992. The waste type accepted was mainly municipal waste but because of the rural location of the site, it is likely that some agricultural waste was also deposited here. The annual tonnage of waste deposited was estimated at 5,570 tonnes (from information supplied from CCC for An Foras Forbatha report, 1986).

3. Risk Assessment

The Tier 1 Risk Assessment was run for the site following the procedure described in EPA CoP, 2007. The procedure is not described here because a full and detailed description is available in the EPA document.

Scores were obtained for each of the total of eleven possible SPR linkages based on the nature of the source, the existence of receptors within defined distances from the source and the pathways available between the source and receptors. The scoring system is specified in the CoP.

The three highest individual linkage scores obtained from the Risk Assessment for Kilrush Landfill are summarised in table 1 below. Detailed results are provided in appendix II.

Table 1: Highest Linkage Scores for Kilrush Landfill.

SPR Number	Normalised Score %	Risk Classification*	Description of Linkage
8	47	Moderate Risk (Class B)	Leachate migration through surface water.
1	28	Lowest Risk (Class C)	Leachate migration through combined groundwater and surface water pathways
7	23	Lowest Risk (Class C)	Leachate migration through groundwater to a surface water body.
Final Risk Classification:		**Moderate Risk (Class B)**	

** from EPA Code of Practice For Unregulated Waste Disposal Sites.*

As can be seen from table 1 above, Kilrush landfill is assigned to Class B (moderate risk); due to the SPR linkage of leachate migration through surface water to a surface water body (the western boundary drain is believed to flow eventually into a first order stream to the north of the site). This was the only SPR linkage score in the moderate risk category. All other scores were low risk (i.e. normalised score of <40).

When the risk assessment was repeated using the EPA online methodology, the resultant classification was initially Class C (lowest risk). This was due to differences in inputted data in relation to distance to the nearest surface water body. However, Clare County Council can confirm from the site visit that the distance to the nearest surface water body (first order stream) is approximately 110m. The EPA assessment was repeated using the corrected distance and similar results were obtained to the in-house assessment. A copy of the online risk assessment is included in appendix IIb.

4.0 Follow-up Investigation

Findings of the Tier 1 risk assessment are tentative only, and must be confirmed by field investigations. A follow-up site visit was made in November 2008 to assess surface water quality in the vicinity of the site. Subsurface gas levels were also measured.

4.1 Landfill Gas

Impact searcher bars were used to measure gas levels at 0.5m to 1m depths at suitable locations on the site. It was only possible to measure at four locations due to ground conditions. No methane was detected at any location. CO_2 levels were low, ranging from

0 to 2.8%v/v. Detailed results are attached in Appendix III. Sample locations are shown on a map attached in appendix III.

4.2 Surface Water Quality.

Surface water samples were collected from three locations in the vicinity of the landfill site, as follows:

- SW1, from the drain which flows north along the western site boundary.
- SW2, from the stream to the north of the site (stream A), at a location upstream of any surface water connection between the stream and the landfill.
- SW3, from stream A, downstream of the landfill.

Sample locations are shown on the drawing attached in appendix III.

Sample results are summarised below in Table 2, with detailed results included in Appendix III:

Table 2: Surface Water Monitoring Results, Kilrush Landfill Area.

Parameter	units	SW1 (d/s)	SW2 (u/s)	SW3 (d/s)	Parameter	units	SW1 (d/s)	SW2 (u/s)	SW3 (d/s)
TON	ppm	<0.3	<0.3	<0.3	Nickel	ppb	5	2	3
Total 16 EPA PAH's	ppt	<10	<10	<10	Selenium	ppb	<1	<1	<1
Total phenol	ppm	0.02	<0.01	0.01	Zinc	ppb	27	11	14
Mercury	ppb	<0.05	<0.05	<0.05	TOC	ppm	19	32	31
Arsenic	ppb	<1	<1	<1	Sulphate	ppm	10	5	5
Boron	ppb	94	<3	<3	pH	-	7.02	6.77	6.96
Cadmium	ppb	<0.4	<0.4	<0.4	Total Cyanide	ppm	<0.05	<0.05	<0.05
Chromium	ppb	<1	<1	<1	Free Cyanide	ppm	<0.01	<0.01	<0.01
Chromium VI	ppb	<0.03	<0.03	<0.03	Sulphide	ppm	<0.01	<0.01	<0.01
Copper	ppb	4	<1	<1	Thio-cyanate	ppm	<0.2	<0.2	<0.2
Lead	ppb	<1	<1	<1	Ammonia	ppm	1.8	7.9	0.5

As can be seen from the table, satisfactory results were obtained for all parameters with little or no difference between upstream and downstream water quality except for parameters ammonia, boron, copper and zinc. Ammonia levels were slightly elevated on the drain (1.8ppm) and also on stream A, upstream of the site (7.9ppm). The drain ammonia level is not significantly elevated and is lower than the ammonia level in the upstream surface water sample. The drain boron level was 94ppb compared to <3ppb in both upstream and downstream surface water samples. However the boron level in the drain is not particularly elevated; the drinking water MAC for boron is 1000ppb. Copper and zinc levels in the drain sample were also slightly elevated above surface water stream levels but results were below proposed environmental quality standards[1] for these parameters.

Results of this survey indicate that the landfill is not impacting to any significant extent on surface waters in the area. However the exposed waste on the site must be addressed in order to minimise the risk of future surface water contamination.

Conclusions

1. Results of the tier 1 risk assessment for the unlicensed landfill at Kilrush indicate that the landfill is a class B (moderate risk) site. This is based on the contamination pathway of leachate migration via surface water to a surface water body.
2. Results of follow-up investigations indicate that the surface water downstream of the site is uncontaminated.
3. There is a considerable amount of exposed waste around this site. The worst area appears to be the side slope on the western perimeter beside the drain. While the surface water monitoring results indicate that the impact of this exposed waste may be visual only, the waste should be covered as soon as possible in order to minimise the risk of future surface water (and groundwater) contamination. Kilrush landfill should be prioritised for this remedial action.
4. Gas levels across the site were very low with no methane detected. However only four locations could be monitored as the ground was heavily waterlogged.

Note 1: Surface Water EQS's taken from draft EC Environmental Objectives (Surface Waters) Regulations, 2008

Appendix I

Site Walkover Survey Checklist and Site Photographs

Appendix II

Risk Assessment Results and Conceptual Site Model

Appendix III

Results of Follow-Up Site Investigations for Surface Water and Landfill Gas

Appendix IIIa

LANDFILL GAS MONITORING FORM

Site Name: Kilrush Landfill		Site Address: Dysert, Kilrush, County Clare National Grid Reference:
Site Status: Closed unlicensed landfill		Date: 12/11/08
Instrument Used: Gas Data LMSxi		Date Next Calibration: Aug 09
Monitoring Personnel: Maeve Ryan/Patricia O'Brien/Michael McDermott	Weather. Variable, wet	Atmospheric Pressure:

Results

Sample Station Number	Borehole/ spike/ other	Survey Depth (m)	CH_4 %v/v	CO_2 %v/v	O_2 %v/v	Comments
1	spike	All 0.5-1m	0	0	21.0	
2	spike		0	0.7	19.9	
3	spike		0	2.8	17.0	
4	spike		0	1.2	18.7	Ground is too wet for any further sampling. Risk of damage to analyser by drawing water through sample line
5	spike					
6	spike					
7	spike					
8	spike					
9	spike					
10	spike					
11	spike					
12	spike					
13	spike					
14	spike					
15	spike					
16	spike					
17	spike					
18	spike					
19	spike					
20	spike					
21	spike					
22	spike					
23	spike					

APPENDIX 2

Ecology Report

See Separate Volume

BIOLOGICAL ASSESSMENT OF SURFACE WATER QUALITY IN THE VICINITY OF THE CLOSED LANDFILL AT DYSERT, KILRUSH, COUNTY CLARE

October 2015

DRAFT REPORT PREPARED FOR CLARE COUNTY COUNCIL

by

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1 INTRODUCTION

Conservation Services, Ecological & Environmental Consultants have been commissioned by Clare County Council to carry out biological sampling and water quality assessment of surface waters in the vicinity of the closed landfill at Dysert, Kilrush, County Clare. Sampling was carried out on 19th October 2015.

2 METHODOLOGY

2.1 SITE SELECTION

Sampling was carried out at four locations (See Maps 1 & 2). Site locations were recorded using a GPS.

Site Code	Grid Reference
1	R 02877 54694
2	R 02649 55030
3	R 02652 55033
4	R 02645 55035

2.2 HABITAT ASSESSMENT

Habitat assessment was carried out at each of the stream/river sites selected for invertebrate/water quality assessment. These sites were assessed in terms of:

- Stream width and depth
- Substrate type, listing substrate fractions in order of dominance, i.e. large rocks, cobble, gravel, sand, mud etc.
- Flow type, listing percentage of riffle, glide and pool in the sampling area
- Instream vegetation, listing plant species occurring and their percentage coverage of the stream bottom at the sampling site
- Dominant bankside vegetation, listing the main species overhanging the stream

- Estimated summer cover by bankside vegetation, giving percentage shade of the sampling site

- Rating of the site as habitat for trout adult, nursery and spawning on a scale of Poor/Fair/Good/Very Good/Excellent. This rating assesses the physical suitability of the habitat; the presence/absence/density of salmonids at the site will also depend on present and historical water quality and accessibility of the site to fish.

2.3 INVERTEBRATE SAMPLING AND WATER QUALITY ASSESSMENT

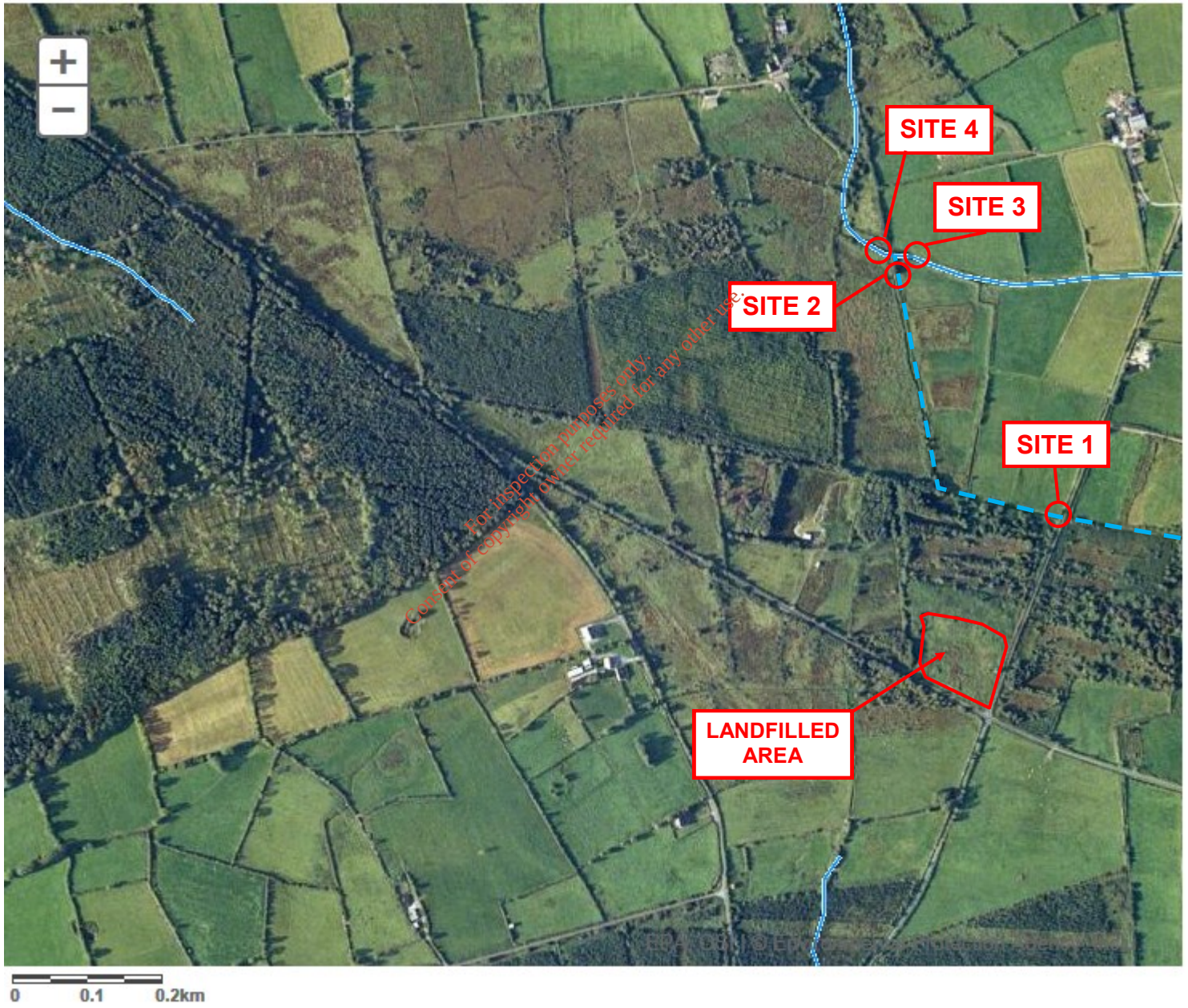
At each site a five-minute kick and stone wash sample was taken (ISO 7828:1985) using standard methodology employed by EPA. Each sample was retained in a large plastic bag at the sampling site. Sample processing and preservation was carried out under laboratory conditions within 24 hours of sampling. Mud was removed from each sample by sieving under running water through a 500µ sieve. Sieved samples were then live sorted for 30 minutes in a white plastic sorting tray under a bench lamp (ISO 5667-3:1994) and if necessary using a magnifying lens. Macroinvertebrates were stored in 70% alcohol. Preserved invertebrates were identified to the level required for the EPA Q-rating method (Clabby *et al,* 2001) using high-power and low-power binocular microscopes when necessary. The preserved samples were archived for future examination or verification. Based on the relative abundance of indicator species, a biotic index (Q-rating) was determined for each site in accordance with the biological assessment procedure used by the Environmental Protection Agency (Statutory Instruments No. 258 of 1998) and more detailed unpublished methodology (McGarrigle, Clabby and Lucey pers. comm.). Based on the relative abundance of indicator species, a biotic index (Q-rating) was determined for each site in accordance with the biological assessment procedure used by the Environmental Protection Agency

(McGarrigle *et al*, 2002) and S.I. No. 258 of 1998 (Phosphorus Regulations), and more detailed unpublished methodology (McGarrigle, Clabby and Lucey pers. comm.) The EPA Q-rating method is primarily designed to reflect levels of organic pollution and eutrophication by determining the relative abundance of indicator taxa.

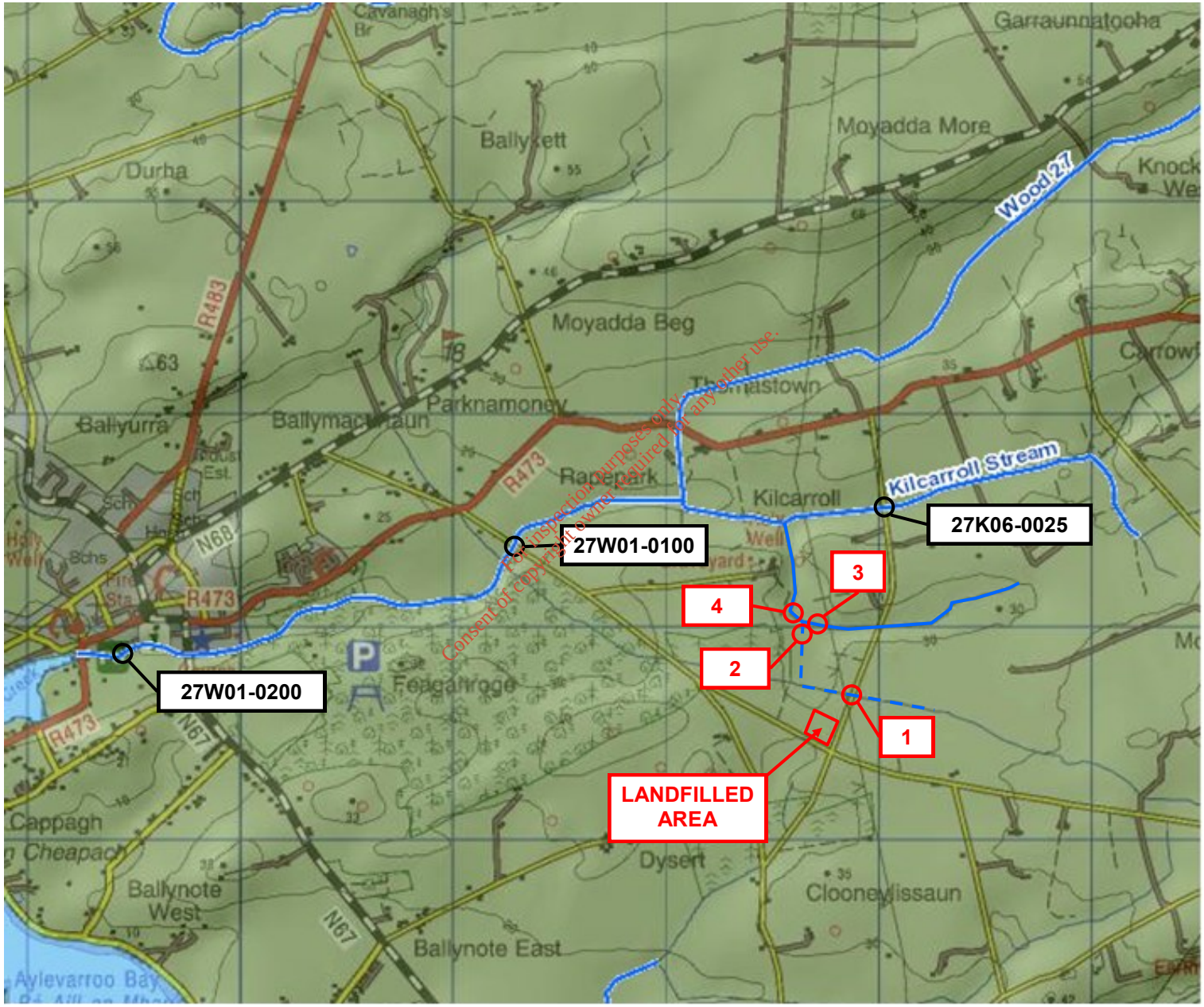
Biotic Index	**Water Framework Directive Ecological Status**	**Quality Status**
Q5	High	Unpolluted Waters
Q4-5	High	
Q4	Good	
Q3-4	Moderate	Slightly Polluted Waters
Q3	Poor	Moderately Polluted Waters
Q2-3	Poor	
Q2	Bad	Seriously Polluted Waters
Q1-2	Bad	
Q1	Bad	

MAP 1 LOCATION OF BIOLOGICAL ASSESSMENT SITES

Locations shown are approximate; for exact locations, see Grid References in text



MAP 2 LOCATION OF CS (RED) AND EPA (BLACK) BIOLOGICAL ASSESSMENT SITES



3 RESULTS

Habitat assessment for all sites, including site photographs, is tabulated in Appendix 1.

3.1 SITE 1

The abundance of invertebrate indicators recorded at Site 1 are tabulated below and merit a Q-rating of 3 indicating moderately polluted conditions and poor ecological status.

INDICATOR GROUP	TAXON	NUMBER
Group A - Pollution Sensitive	None recorded	
Group B - Less Pollution Sensitive	*Leuctra sp.*	14
	Sericostoma personatum	1
	Silo sp.	1
Group C - Pollution Tolerant	*Potamopyrgus antipodarum*	6
	Gammarus duebeni	26
	Baetis rhodani	1
	Hydropsyche sp.	14
	Rhyacophila sp.	1
	Wormaldia sp.	1
	Velia sp.	1
	Chironomidae (excl. *Chironomus* sp.)	4
	Pediciidae	1
	Dytiscidae	1
	Elmidae	5
	Scirtidae	1
Group D - Very Pollution Tolerant	Erpobdellidae	2
	Lymnaea peregra	1
	Pisidium sp.	1
Group E - Most Pollution Tolerant	*Chironomus sp.*	1
Not assigned to an indicator group	Lumbricidae	1

3.2 SITE 2

The abundance of invertebrate indicators recorded at Site 2 are tabulated below and merit a Q-rating of 2-3 indicating moderately polluted conditions and poor ecological status.

INDICATOR GROUP	TAXON	NUMBER
Group A - Pollution Sensitive	None Recorded	
Group B - Less Pollution Sensitive	Limnephilidae	1
Group C - Pollution Tolerant	*Potamopyrgus antipodarum*	18
	Gammarus duebeni	102
	Baetis rhodani	1
	Hydropsyche sp.	6
	Plectrocnemia sp.	1
	Rhyacophila sp.	2
	Ceratopogonidae	1
	Chironomidae (excl. *Chironomus* sp.)	2
	Simuliidae	38
	Dytiscidae	3
	Elmidae	2
Group D - Very Pollution Tolerant	Erpobdellidae	3
	Glossiphonia complanata	2
	Lymnaea peregra	2
	Asellus aquaticus	104
Group E - Most Pollution Tolerant	None recorded	
Not assigned to an indicator group	Lumbricidae	1

3.3 SITE 3

The abundance of invertebrate indicators recorded at Site 3 are tabulated below and merit a Q-rating of 2 indicating seriously polluted conditions and bad ecological status.

INDICATOR GROUP	TAXON	NUMBER
Group A - Pollution Sensitive	None Recorded	
Group B - Less Pollution Sensitive	None recorded	
Group C - Pollution Tolerant	*Plectrocnemia sp.*	1
	Ceratopogonidae	1
	Chironomidae (excl. *Chironomus* sp.)	3
	Dytiscidae	3
Group D - Very Pollution Tolerant	Erpobdellidae	3
	Glossiphonia complanata	2
	Sphaeriidae	c.600
	Asellus aquaticus	45
Group E - Most Pollution Tolerant	Tubificidae	22
	Chironomus sp.	6

3.4 SITE 4

The abundance of invertebrate indicators recorded at Site 4 are tabulated below and merit a Q-rating of 2-3 indicating moderately polluted conditions and poor ecological status.

INDICATOR GROUP	TAXON	NUMBER
Group A - Pollution Sensitive	None Recorded	
Group B - Less Pollution Sensitive	*Agapetus sp.*	1
Group C - Pollution Tolerant	*Ancylus fluviatilis*	2
	Potamopyrgus antipodarum	35
	Gammarus duebeni	22
	Hydracarina	3
	Baetis rhodani	3
	Hydropsyche sp.	2
	Ceratopogonidae	2
	Chironomidae (excl. *Chironomus* sp.)	3
	Simuliidae	9
	Elmidae	1
Group D - Very Pollution Tolerant	Erpobdellidae	2
	Glossiphonia complanata	2
	Sphaeriidae	3
	Asellus aquaticus	60
Group E - Most Pollution Tolerant	Tubificidae	1
	Chironomus sp.	1

4 DISCUSSION/CONCLUSIONS

Q-ratings from the present survey and EPA Q-ratings on the Kilcarroll River and Wood River are shown on Map 3.

The watercourse located c.150m to the north of the landfill flows in an east to west direction for c.250m downstream of the road. It then flows north for a distance of c.250m to join a small tributary of the Kilcarroll Stream, which flows to the Kilcarroll Stream c.500m further north.

Determining the drainage from the closed landfill did not form part of the present assessment; however if the drainage is in a northerly direction, it is possible that the reduction in Q-rating from Q3 at Site 1 to Q2-3 at Site 2 may be due to drainage from the landfill.

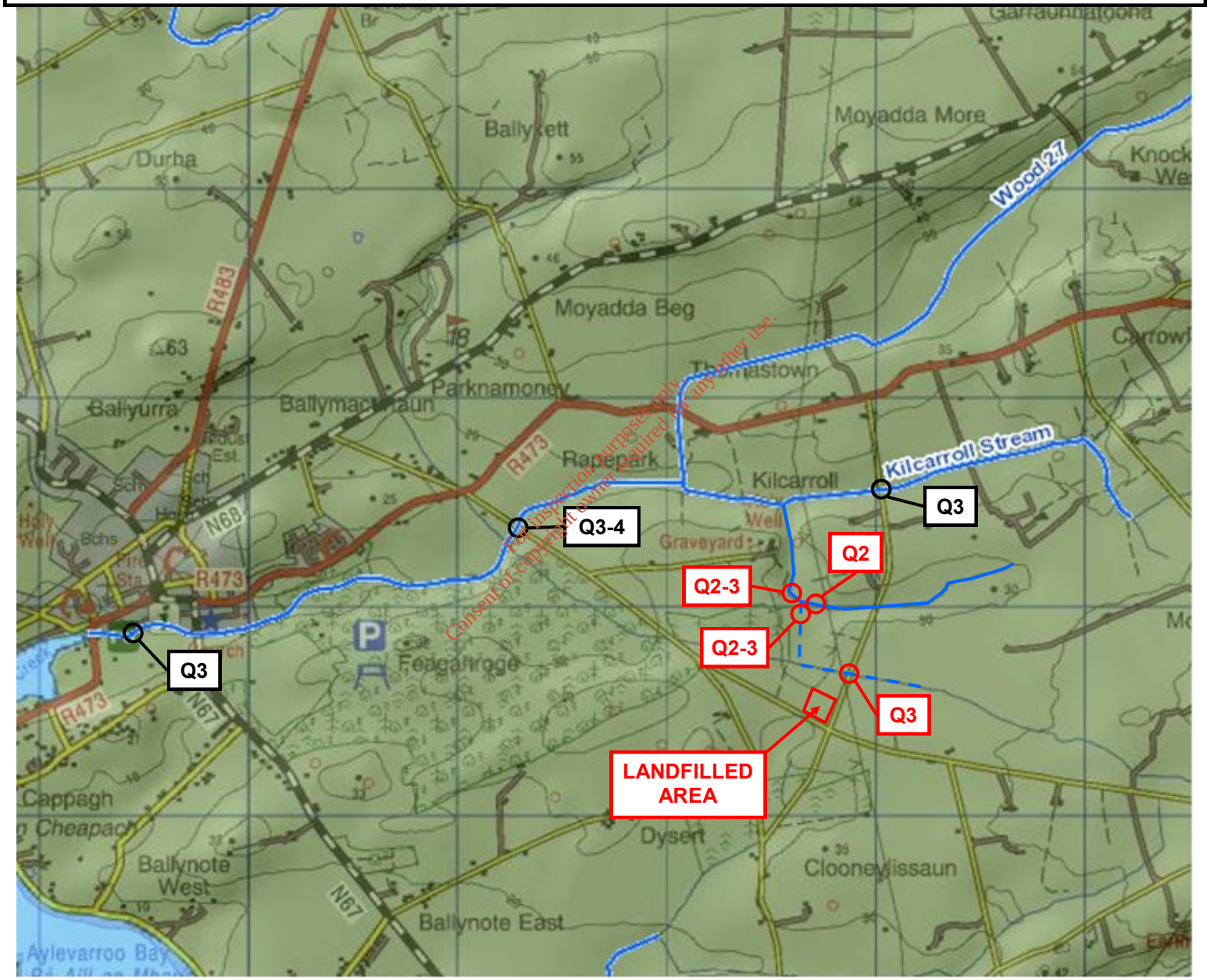
It is notable that the watercourse flowing from the vicinity of the landfill joins an EPA and O.S. mapped tributary of the Kilcarroll Stream (which is smaller than the landfill watercourse). This tributary has a rating of Q2 upstream of the confluence, and is therefore significantly more polluted than the landfill watercourse. The stream downstream of the confluence is Q2-3.

Q-ratings at the three sites monitored by EPA on the Kilcarroll Stream and Wood River in 2013 are shown on Map 3. Unfortunately EPA have not sampled the Wood River upstream of its confluence with the Kilcarroll Stream since 2005, so it is not possible to determine whether the Kilcarroll Stream contributes to the slightly polluted Q3-4 status at EPA Site 27W01-0100.

Water quality deteriorates from Q3-4 at Site 27W01-0100 to Q3 at Site 27W01-0200. The landfill cannot in any way contribute to this decline if it can be established that the drainage from the landfill is exclusively to the watercourse to its north. In this drainage scenario, at worst the landfill may make some contribution to the slightly polluted status (Q3-4) in the Wood River at Site W01-0100. As the Kilcarroll Stream has a Q3 rating before any potential input from

the landfill, it is also possible that the landfill has no significant impact on the biological water quality of the Wood River.

MAP 3 Q-RATINGS AT CS BIOLOGICAL ASSESSMENT SITES IN 2015 (RED) AND AT EPA BIOLOGICAL ASSESSMENT SITES IN 2013 (BLACK)



5 REFERENCES

Conservation Services (2014) Biological monitoring of surface water quality in the vicinity of Ballyduff Beg Waste Management Facility, County Clare. Report to Clare County Council.

McGarrigle, M.L. *et al* (2002) *Water Quality in Ireland 1998-2000*. Environmental Protection Agency.

APPENDIX 1

HABITAT ASSESSMENT AT STREAM/RIVER SAMPLING SITES

Site Code	Site 1
Site Location	Immediately downstream of road crossing
Grid Reference	R02877 54694
Site Photograph	
Width (m)	4
Depth (cm)	5 – 25
Substrate (order of dominance)	Mud, Sand, Cobble, Large Rocks
Flow Type	Riffle 25% Glide 75%
Instream Vegetation	None
Dominant Bankside Vegetation	Bramble, Hawthorn, Bracken, Grass.
Estimated Summer Cover of Stream by Bankside Vegetation	10%
Trout Adult Habitat	Poor – Fair
Trout Nursery Habitat	Poor – Fair
Trout Spawning Habitat	None - Poor

Site Code	Site 2
Site Location	Immediately upstream of confluence with tributary of Kilcarroll River
Grid Reference	R02649 55030
Site Photograph	
Width (m)	1
Depth (cm)	10
Substrate (order of dominance)	Cobble, Gravel, Mud.
Flow Type	Riffle 10% Glide 90%
Instream Vegetation	*Callitriche* sp. 20%
Dominant Bankside Vegetation	Gorse, Rushes, Grass.
Estimated Summer Cover of Stream by Bankside Vegetation	20%
Trout Adult Habitat	None
Trout Nursery Habitat	Poor - Fair
Trout Spawning Habitat	Poor

Site Code	Site 3
Site Location	Tributary of Kilcarroll River immediately upstream of confluence with landfill watercourse
Grid Reference	R02652 55033
Site Photograph	
Width (m)	1
Depth (cm)	25
Substrate (order of dominance)	Mud
Flow Type	Slow Glide 100%
Instream Vegetation	*Agrostis* sp. 15%
Dominant Bankside Vegetation	Bramble, Blackthorn
Estimated Summer Cover of Stream by Bankside Vegetation	35%
Trout Adult Habitat	None
Trout Nursery Habitat	None
Trout Spawning Habitat	None

Site Code	Site 4
Site Location	Immediately downstream of confluence of landfill watercourse with Tributary of Kilcarroll Stream.
Grid Reference	R02645 55035
Site Photograph	
Width (m)	1
Depth (cm)	12
Substrate (order of dominance)	Mud, Gravel, Cobble
Flow Type	Riffle 35% Glide 65%
Instream Vegetation	*Callitriche* sp. <1% *Glyceria* sp. 5%
Dominant Bankside Vegetation	Bramble, Willow, Bracken
Estimated Summer Cover of Stream by Bankside Vegetation	40%
Trout Adult Habitat	None- Poor
Trout Nursery Habitat	Poor – Fair
Trout Spawning Habitat	Poor

APPENDIX 2

EPA BIOLOGICAL WATER QUALITY ASSESSMENT DATA FOR WOOD RIVER AND KILCARROLL STREAM 1988 – 2013

River and Code: **KILCARROL STREAM** **27K06**

Tributary of: 27W01 WOOD OS Catchment No: 158

OS Grid Ref of confluence:

Date(s) Surveyed: 31/12/1988, 31/12/1991, 31/12/1997, 20/9/2000, 27/9/2001, 5/10/2005, 6/9/2007, 6/9/2011, 3/10/2013

Previously reported as part of the Wood 27W01

	Biological Quality Ratings (Q Values)								
Station Nos.	**1988**	**1991**	**1997**	**2000**	**2001**	**2005**	**2007**	**2011**	**2013**
0020	3	2-3	-	-	-	-	-	-	-
0025	-	-	2	2-3	3	3	3	3	3
0030	3	1-2	-	-	-	-	-	-	-

Assessment: This tributary of the Wood (qv) was again unsatisfactory in October 2013. .

Station No.	***Station Location***	***National X***	***Grid Ref. Y***	***Discovery Series No.***	***County Code***
0020	Bridge S. of Carrowfree	0	0	0	CE
0025	Br NE Kilcarroll	103020	155552	64	CE
0030	Bridge N.W. of Kilcarroll	0	0	0	CE

River and Code: **WOOD** **27W01**

Tributary of: Sea - Shannon Estuary OS Catchment No: 155

OS Grid Ref of confluence: Q 991 546

Date(s) Surveyed: 31/12/1971, 31/12/1975, 31/12/1979, 31/12/1980, 31/12/1985, 31/12/1988, 31/12/1991, 31/12/1997, 20/9/2000, 21/9/2000, 26/9/2001, 27/9/2001, 5/10/2005, 6/10/2005, 6/9/2007, 6/9/2011, 2/10/2013, 3/10/2013

	Biological Quality Ratings (Q Values)													
Station Nos.	**1971**	**1975**	**1979**	**1980**	**1985**	**1988**	**1991**	**1997**	**2000**	**2001**	**2005**	**2007**	**2011**	**2013**
0080	-	-	-	-	-	3	3	3	3	3	4	-	-	-
0100	-	4	4-5	3	3-4	3	3	3	3	3	3	3	3	3-4
0200	1	1	4	3-4	3	3-4	3	3	4	3-4	4	3	4	3

Assessment: Station 0100 located near a closed landfill continues to be seriously marred by bad rubbish dumping over the bridge. The lower site in Kilrush lacked any sensitive macroinvertebrates in early October 2013 reversing the improvement noted in 2011.

Station No.	***Station Location***	***National X***	***Grid Ref. Y***	***Discovery Series No.***	***County Code***
0080	Br E. of Ballykett Fair Grn	102054	155879	64	CE
0100	Bridge 1.5 km u/s Kilrush	101233	155298	64	CE
0200	Kilrush: 100 m u/s West Br	99358	154859	63	CE

APPENDIX 3

Tier 2 Report

See Separate Volume

Clare County Council
Pilot Project on Risk Assessment on Closed Landfill sites

Exploratory Investigation on Kilrush Landfill
(Class B rated site from Tier 1 investigation)

(Exploratory investigation undertaken by Tracey Duffy, Mary Burke, Patrick Mullane, Karen Foley, Cathal Brodie)
(Level Survey by Brendan O'Flanagan, Colm Byrne)

(Report prepared by Mary Bruke, Tracey Duffy, Cathal Brodie.)

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3. Objective of Tier 2 investigation

The objective of this exploratory investigation was to provide a Tier 2 investigation, using the methodology recommended in the EPA matrix (see Appendix A). This work should enable the Local Authority to provide a completed risk assessment for the closed landfill site at Dysert, Kilrush, as required for the Tier 2 investigation, and further develop the conceptual site model (CSM) for Kilrush landfill. A full Tier 2 investigation needs to provide sufficient information to quantify the risks associated with the site, and (if necessary) determine an appropriate level of essential and technical measures to appropriately manage the risks identified.

2. Site Description

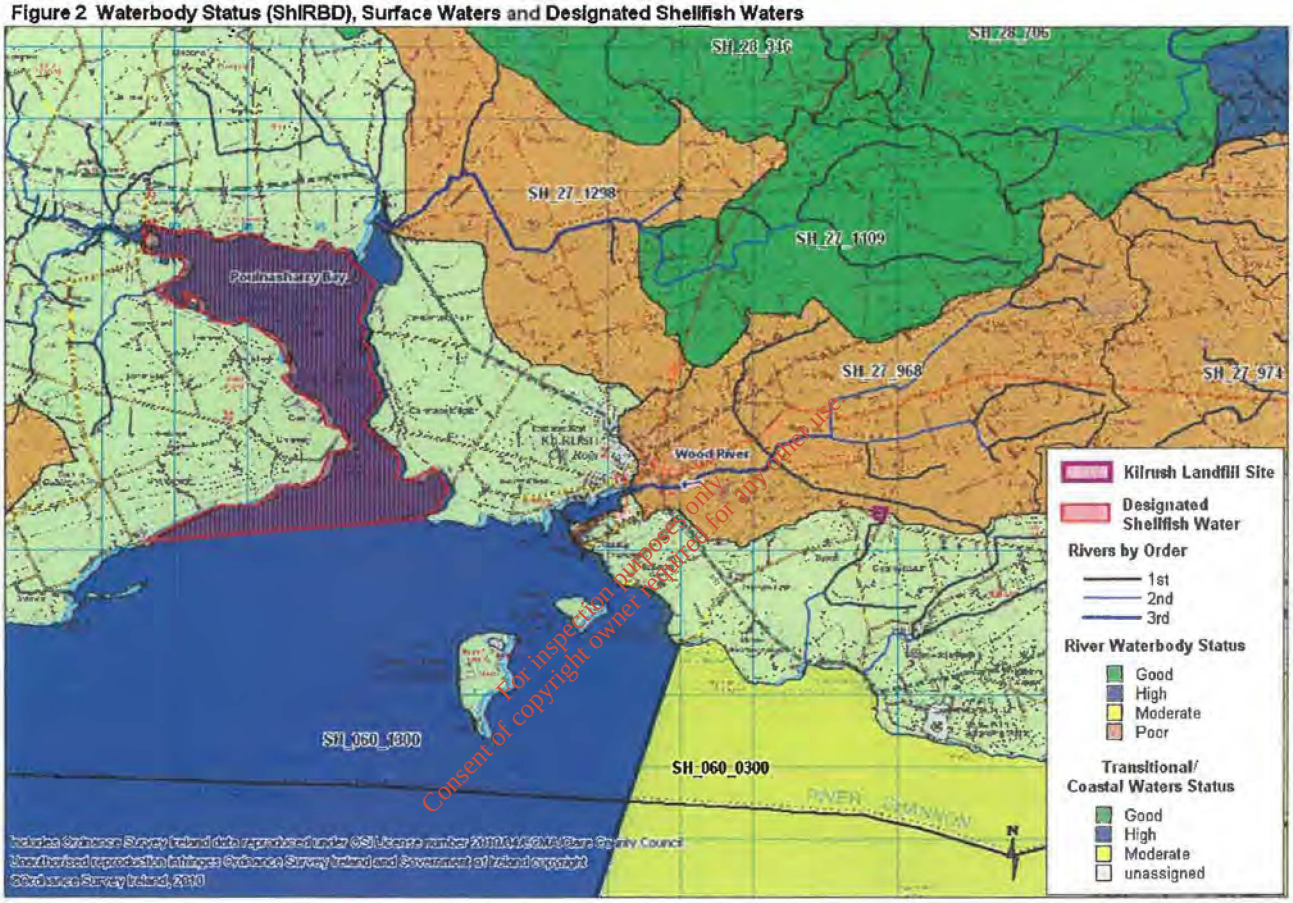
Figure 1 Location of Kilrush Landfill Site - County Clare

Kilrush landfill site is located on a 1.9 Ha site approximately 2.5 kilometres due south east of Kilrush town, in the townland of Dysert, off the R473 Kilrush-Kilmurry McMahon Road. The site is owned by Clare County Council. The lands are fenced off and are thinly covered with vegetation, which includes grass, rushes and some trees. The landfill site area is slightly elevated above the natural ground level, but the local topography slopes from south to north, and the landfilled area integrates with this topography to the extent that the landfill site does not appear as a disturbance in the natural topography. The site is bounded on two sides by a public road (southern and eastern sides) and by cut over bogland on the other two sides (western and northern sides). The adjacent road network is

well traversed and there is low density housing development in the Dysert area. The nearest house is 130m south of the site, having been constructed since the Tier 1 investigation was undertaken. In this regard, we recommend a planning search should be added to the Tier 1 investigation to address the risk rating for closed landfill sites, and to ensure the adequacy of scoping of investigative works for Tier 2 investigation from the earliest stages. The land slopes from south to north. Based on the initial exploratory work, the entire area of the site used for landfilling.

3. Shannon River Basin Management Plan

Figure 2 Waterbody Status (ShIRBD), Surface Waters and Designated Shellfish Waters



This plan was formally adopted in June 2010, and all investigations on activities likely to impact on surface water or groundwater quality must reference the water quality status assigned by the River Basin Management Plan. In this regard, the Plan divides the site into two areas, with the majority of the site being in the catchment of the River Wood water body (SH_27_968) and status defined as "Poor" by reason of macroinvertebrates. Clare County Council have commenced investigations in the catchment of the Wood River in accordance with the requirements of the Shannon River Basin Management Plan. An additional feature of the Wood river catchment is its inclusion in the catchment of the Poulnasherry Bay area, which was designated as a Shellfish waters under the European Communities (Quality of Shellfish Waters) Regulations 2009 (SI 55 of 2009). The southern end of the site, adjacent to the site entrance, does not appear to be included in the SH_27_968 catchment. The area is not included in any river water body delineation, and its status is not prescribed in the Shannon River Basin Management Plan. This is likely to be due to poor boundary definition for the water body, as the observations on site suggest the drainage of the site and the environs or the site is towards the Wood River (located due north of the site). The

entire area outfalls to the coastal waterbody named 'Mouth of Shannon SH_060_1300' which is designated as "high" in status under the Plan. In any event, this area lies within the South Clare/Shannon Estuary Water Management Unit. It is noted however, that the status of these transitional waters is derived rather than defined by analysis. An in depth study of transitional waters is due for completion in late 2010 (by the Marine Institute) and updates on status will be provided in 2011. For all intents and purposes, the landfill site is taken to be in the catchment of the Wood Water body, which is required to achieve improved status by 2015.

4. Tier 1 Assessment summary

Kilrush landfill site was rated as a Class B (medium risk) site in the Tier 1 Risk Assessment, which was undertaken in accordance with the Code of Practice for Environmental Risk Assessment of Unregulated Waste Disposal Sites, EPA, 2007 (EPA CoP, 2007). The Tier 1 Risk assessment for the Kilrush site concluded that based on the potential for leachate migration from the landfill site through surface water to a surface water body, the site was classified as a "moderate risk". This assessment used some limited monitoring of surface water in the area, which showed there was a limited impact on a first order surface water stream located approximately 100m due south of the landfill.

5. Scoping the Tier 2 Exploratory Site Investigation

This scoping exercise was based on the approach provided for the Tier 2 risk assessment methodology (set out in Chapter 5 of the EPA CoP, 2007 and the matrix entitled *COP Preliminary and Exploratory Investigations for all Unregulated Waste Disposal Sites*.

The exercise also took account of

- Accessibility throughout the site to assess site area, waste depth and uniformity
- Vegetation status of the site,
- Ready availability of investigation techniques,
- Their probative value and flexibility (on site) in the time allowed for the works.
- Details presented in the Tier 1 investigation

During the course of the on site works for the Tier 2 investigation, it was noted that there was a dwelling house constructed at 130m due South of the landfill site. Based on this finding, we now recommend a planning search should be included in the scoping of Tier 2 investigations to address potential house construction in the area. This could lead to a re-assessment of the risk designation for the site. It is important to emphasise that the confirmation of risk classification can only follow a full risk screening exercise based on the information yielded in the full Tier 2 assessment.

It was concluded that trial holes presented the best (and safest) approach to site investigation, using an appropriate sized track machine capable of providing holes to depth 5m. This would enable an assessment be undertaken to address the questions posed in Section 5.2.1 of the EPA Code of Practice document. The main areas being addressed included the following:

- Scoping waste type, age and depth across the site
- Depth and composition of capping layers
- Leachate monitoring
- Sub soil assessment for thickness and permeability
- Water table level
- Potential for discharges to surface waters
- Potential for discharges to groundwater
- Some limited assessment of groundwater flow direction
- Collection of sufficient data to determine the SPR linkages and determine appropriate remediation requirements

6. Exploratory Site investigation

The exploratory site investigation was undertaken on August 30th 2010. There was no rain on the day, or in the week preceeding the investigation. There was no ponding evident on lands in the area, and the drains at the boundary of the site (eastern and northern) were dry. Five persons (excluding the digger driver) were deployed at the site throughout the day to provide for in tandem sampling of surface waters (including examination of streams for suitability for SSRS assessment. SSRS assessment was not feasible with the streams inspected), trial hole observation (capping, soil layers, waste type, depth and age and waste deposition area and water table levels), leachate sampling, and, assessment of wells in the area. An additional team of two staff undertook a site level survey during the Tier 2 investigation

Safety considerations were also taken into account to ensure two persons were deployed at all locations on and adjacent to the landfill.

6.1 Physical Observations

Plate1. View of land area within the site, indicating typical exposed waste on site

Plate2. General over view of site, showing eastern boundary fence

Figure 3 Corrine Layer - Land type/use at Kilrush Landfill and surrounding areas

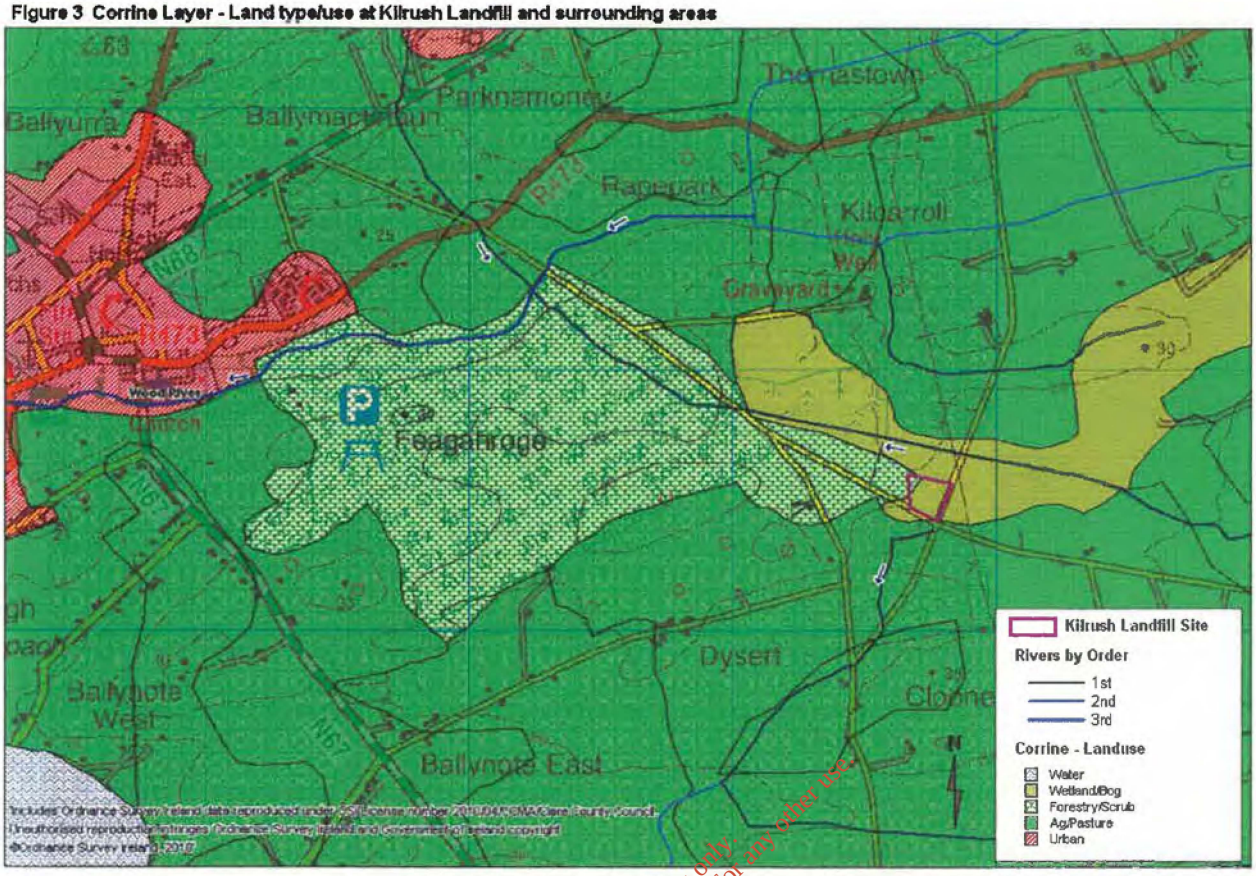


Figure 3 -1 Aerial Photo of Kilrush Landfill site showing surrounding land

- The landfill site is securely fenced off and difficult to access from the adjacent lands by reason of heavy vegetation growth, ditches and insecure footing with cut over bog in adjacent lands to the northern and eastern sides of the site.
- Adjacent lands, not in the ownership of Clare County Council, are in agricultural use to the north and west of the site. Approx. 140m to the west is a deer farm however there is little activity here at present. Cattle were observed in land approx. 330m to the west of the site. Land immediately to the north of the site is covered in scrub and quite difficult to access. A first order surface water borders this area flowing in a westerly direction and joins the Wood River. Land to the north and west of this stream is used for agriculture with land drainage pipework observed with discharge to the first order stream. Figure 3 and 3-1 shows the corrine layer for general land type/use and an aerial photo (2007) respectively.
- The site was readily accessible with grass growth, rushes and briars being the main vegetation
- The lands on site are elevated above the natural ground by reason of landfilling, but the ground does not present as an irregular topographic feature, due to the natural slope of surrounding lands in a north-south direction.
- The difference between the ground levels adjacent to the site and the area of the landfill was approximately 4m. This level difference appears to be consistent with waste depths as established using trial holes, described hereunder.
- During the digging of trial holes on site, and when the track machine moved across the site (initially) there was a characteristic landfill odour in the vicinity of the site. This did not linger, but was an incidental feature during various trial hole investigations, as described hereunder
- There was no ponding of water on the landfilled area, and the ditches adjacent to the site on the northern and eastern boundaries were dry.
- Waste was evident at the surface around most of the site areas, with various items of waste either projecting through the cover material, or were completely visible. See Plate 1 above. All exposed waste was inert, and presented a visual reduction in amenity, rather than any ongoing risk to the receiving environment

6.2 Local hydrology

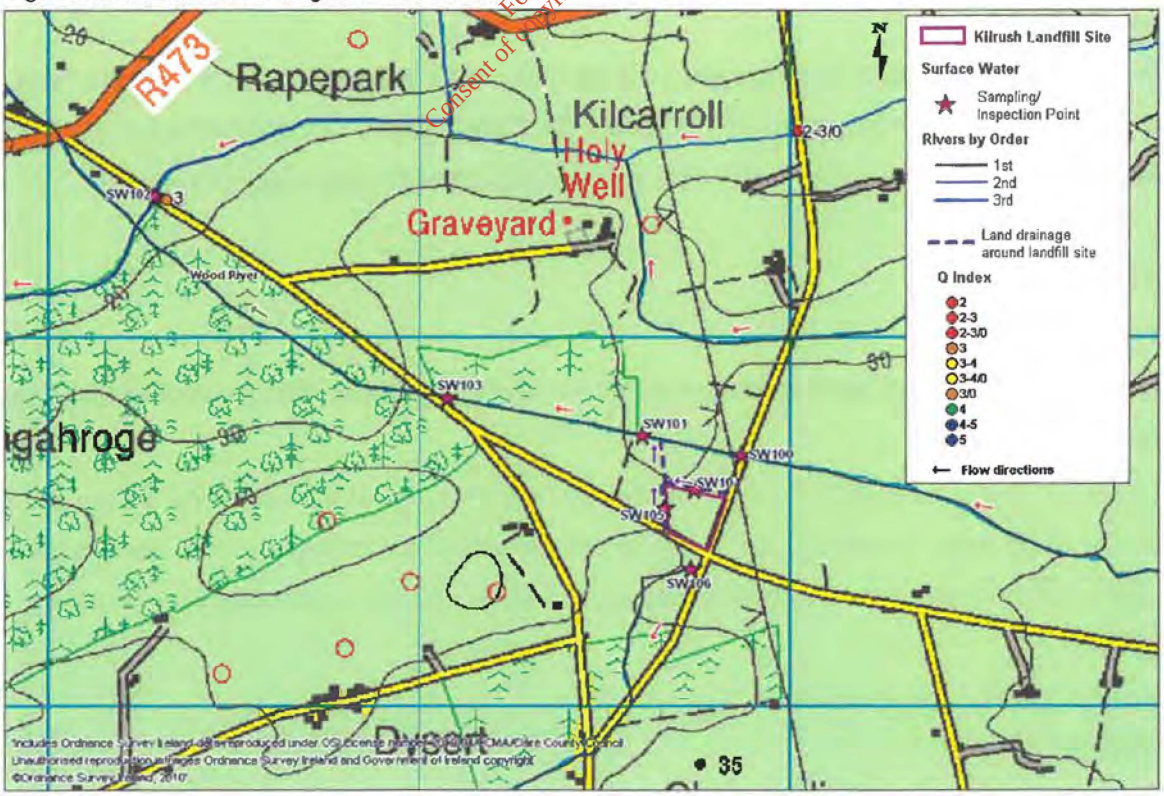
6.2.1 Surface water.

- A first order stream flows to the north of the site. Based on observations made during sampling, this drain may be contaminated.
- Taking account of topography and catchment delineation, the direction of movement of surface water and groundwater is likely to be towards the first order stream, flowing in a westerly direction towards the Wood River. Figure 4 below shows general hydrology features around the site and surrounding areas including:
- The Wood River
- Designated Shellfish Water at Poulnasharry Bay
- Shannon Estuary

Figure 4 Surface Water Features and Direction of Flows

- Details of all sampling locations at the landfill site are marked on the surface water and drainage map provided in Figure 5 below. Surface and storm water flow around the site is generally in northerly direction, towards the first order stream located at 110m due north of the site, these were dry during the Tier 2 investigation.

Figure 5 Surface Waters and Drainage around Kilrush Landfill



A surface water sampling program was designed to address the following areas:

- Compare upstream and downstream water quality, and determine whether significant impact has occurred
- Input further data in the Tier 1 linkage to quantify the risk to surface waters based on various indicator parameter concentrations
- Establish sites for future monitoring to assess future risk management measures
- Confirm the status of surface waters in the vicinity of the site, and the impact of the landfill site on these water bodies. Where possible analysis of nutrients and some anions (as defined in Table C.2 of the Landfill Manual-Tidy up reference) was undertaken by Clare County Council in the in-house laboratory. Metal and organic analysis was contracted to Alcontrol, with a standard turnaround time for results. The turnaround time requested is a consideration for costing of the work in this project, as speedy turn around times will be more expensive, and could reduce the number of sampling points.
- Water quality monitoring is undertaken on the Shannon Estuary by the Marine Institute. No data on this monitoring program was available to this investigation.

Surface water samples were collected from 3 locations in the vicinity of the landfill site, as were available, and are set out as follows – also see Figure 5 above:

Table 1 Surface Water Sampling/Investigation Locations

Location Name/Ref.	Date	Descriptor	Sampled
SW100 Lab Code: 10-1575	30/08/10	1st order stream, upstream of landfill site, flow from east to west direction, v slow movement however, pooling in channel at this location, channel very overgrown with grass prohibiting flow	Yes Full SW suite
SW101 Lab Code: 10-1576	30/08/10	Approx. 280m d/s of SW100 on same stream, d/s of drainage from landfill site, flow path is east to west, channel overgrown with vegetation, no flow, stagnant, odour detected when water disturbed for sampling.	Yes Full SW suite
SW102 Lab Code: 10-1580	30/08/10	Wood River, 3rd order stream, u/s of confluence with 1st order stream coming from east, normal flow, bed observed to be quite silted, vacuum tanker hose left by side of river, drainage coming from land immediate adjacent to east.	Yes Indicator suite
SW103	30/08/10	Approx. 540m d/s of SW101 on the 1st order stream coming from east direction, dry during inspection.	No - dry
SW104	30/08/10	Drainage investigated at the northern side of landfill site immediately adjacent, no drainage channel observed.	No – no drain present

SW105	30/08/10	Drainage investigated at the western side of landfill site immediately adjacent, dry during inspection. A sample was available here during the previous Tier 1 Investigations.	No - dry
SW106	30/08/10	Nearby drainage investigated to see typical drainage quality in the area, not in the same catchment as the landfill site, this drain is the rise of a 1st order stream flowing southwards (see Fig. 5 above), dry during inspection.	No -dry

Analytical data available for the samples taken on August 30th 2010 are summarised below in Table 2. Detailed results will be included in the final report.

Table 2 Surface Water Monitoring Results for samples taken 30/08/10 Kilrush Landfill				
Parameter	Units	SW100 Lab Code: 10-1575	SW101 Lab Code: 10-1576	SW102 Lab Code: 10-1580
Analysis Type	-	Full suite	Full suite	Indicator
Description	-	Overgrown with mainly grass in channel, flow observed coming from east but pooling at this location, adjacent land to north is grazing, field drain going to this stream further d/s, channel bank very overgrown – some difficulty in sampling, high bank. Land adjacent to the south all scrub/trees, very difficult access.	In amongst trees, area somewhat overgrown but accessible, land adjacent and to the north west of site is very wet – rushes/reeds, cattle have access to this land for grazing, land adjacent to the west is a deer farm but no deer observed – looks not to be in use at present but fencing is in place, water in stream stagnant, foul odour when disturbed for sampling, brown in colour	This is the Wood River, 3rd order stream, flowing from an east direction, westward. Sampled upstream from the confluence with the 1st order stream coming from the east (north of landfill). Normal flow in stream, bed observed to be quite silted, water clear in appearance in bottle.
Time sampled	-			
Appearance	-	Brownish in stream, clear in sample bottle, v little flow	Brownish in stream, clear in sample bottle, stagnant, odourous,	Clear, silted bed
Temperature	°C	13.7	12.7	31.1
Dissolved oxygen	mg/l	10.4	4.97	9.93
Dissolved oxygen	%	99.8	46.5	93.8
pH	Units	7.84	7.41	8.09
Conductivity	µS/cm	0.178	0.278	0.234
Ammoniacal Nitrogen	mg/l	0.352	1.59	0.289
BOD	mg/l	2	12	<2
COD	mg/l	54.5	310	36.2

Total Phosphorus	**mg/l**	143	449	
Ortho-phosphate	**mg/l**	0.175	<0.7	
Chloride	**mg/l**	30.3	<0.4	34.2
Sulphate	**mg/l**	<3	37.4	13.2
Metals[1]				
As - Arsenic	**ug/l**	1.47	1.41	
B - Boron	**ug/l**	17.9	36.9	
Cd - Cadmium	**ug/l**	<0.1	<0.1	
Cr - Chromium	**ug/l**	1.16	1.83	
Cu - Copper	**ug/l**	0.959	<0.85	
Pb - Lead	**ug/l**	0.165	0.531	
Mn - Manganese	**ug/l**	87.9	310	
Ni - Nickel	**ug/l**	1.16	1.89	
Se - Selemium	**ug/l**	0.705	0.963	
Zn - Zinc	**ug/l**	5.63	7.47	
Hg - Mercury	**ug/l**	<0.01	<0.01	
Cr – Chromium (unfilt)	**ug/l**	<3	<3	
Ca - Calcium	**mg/l**	13.2	35.3	
Fe - Iron	**mg/l**	1.08	1.39	
Mg - Magnesium	**mg/l**	4.04	6.23	
K - Potassium	**mg/l**	2.64	5.46	
Na - Sodium	**mg/l**	18.3	22.1	
Cyanide, Total	**mg/l**	<0.05	<0.05	

1: Metal analysis included the following:
Toxic metals: Dissolved-As, B, Cd, Cr, Cu, Pb, Mn, Ni, Se, Zn, Hg.
Alkaline and Iron metals: Dissolved-Ca, Fe, Mg, K, Na Unfiltered metals: Unfiltered-Cr, Phosphorus

6.2.2 Groundwater assessment

The potable water supply for the area in which the landfill is situated is the West Clare Regional Water Supply This is sourced in Doolough located in excess of 20km due North East of the site. The public supply pipe line for this area is shown (by green line) on the map provided in Appendix D. A survey of the 1 kilometer radius around the landfill site indicates one farm dwelling using a private well. This facility is located due North of the landfill site, at approx. 610m, and is marked on the Map in Appendix D (red symbol ◉). The analysis of water quality for the well as required under Table C.2 of the Landfill Manual is set out in Table 2.

6.3 Landfill gas

There is no evidence of reasonable cover being place on the waste deposited on the site. Assessment of landfill gas was undertaken using a searcher bar during the Tier 1 investigation. No methane was detected in this investigation.

7.0 Trial Holes

For the exploratory investigation, the use of trial holes or trenches were considered as the main approach to assess site capping, sub-soil depth as a geotechnical barrier, waste type, depth and age and waste deposition area, consistency of waste type, depth to water table and potential landfilling on bedrock or within the water table. This decision was based on time available to undertake the exploratory work, costs associated, and the level of information which would arise from the approach. This is consistent with the window sampling approach, outlined in the EPA COP matrix (See Appendix A). The locations of trial holes through the site,(Refer to Appendix B) and observations arising from trial hole inspections is presented in Appendix C. These observations include depth of capping material, sub- soil layers (if evident), waste type, waste depth , possible waste age in each trial hole, and identification of landfilling within the water table.

It was decided to undertake trial holes at 40 meter intervals along the length of the eastern and western sides of the site and through the middle of the site to explore the waste deposition area (including type and depth of waste), and provide suitable sampling opportunities to assess leachate composition throughout the site. This decision was also based on safety considerations and investigative value. The depth of waste established (between 4-5 metres) was likely to render trenches unstable for a sufficient time window to undertake adequate observations and samples, without giving rise to serious risk to persons. An additional factor considered was the potential surge of leachate run off arising from the disturbed areas. However, there was limited volumes of leachate noted, and the areas where most significant volumes were noted tended to be in the middle of the site, rather than at boundaries. This suggests that the perimeter areas have drained off the leachate generated over the intervening years since the closure of the site.

In addition to the trial holes, five scrape backs were carried out along the eastern parameter adjoining the road. These were shallow and only recorded the presence of waste, the depth or type of waste was not recorded. Their usefulness was in determining the outer extremity of the site. Waste was present in all scrape backs indicating that the site was landfilled right up to the fence adjoining the road on the eastern and southern boundary.

The following data was provided from the trial hole investigations:

- Waste was deposited over the whole site to an average depth of 3.5m .
- The estimated volume of waste deposited is 66,500m^3.
- The maximum depth of waste deposited, based on trial hole detail is 4.5 m
- Waste is deposited above the water table in the area of site, but there are perched tables of leachate and infiltrated storm water in the waste body on site.
- In general there is peat overburden above the bedrock, with waste deposited on peat throughout the site.
- The depth of overburden was not clearly established on site, but the presence of peat was evident at the base of every trial hole. GSI records indicate 3 to 5m depth of overburden in this area
- The time frame of waste deposition was difficult to establish, as the waste type appears to be mainly industrial and commercial waste, with little or no municipal waste evident in the trial holes. Waste age was derived from dates on packaging (where found). This suggests most of the waste was deposited between 1980 and 1993.
- No significant volumes of leachate were encountered in the trial holes 3, 4 located adjacent to the western and northern boundaries of the site
- Limited leachate volumes were noted in all other trial holes. This is likely to be due to inadequate capping, with infiltration of storm water through the waste, rather than significant leachate generation. Leachate samples were taken at trial holes 2, 8, 5, 7 and 9 and their analysis is presented in Appendix C.
- Soil samples were taken from trial holes 2, 5 and 7 and their analysis is presented in Appendix C
- It was not possible to define groundwater movement direction in the overburden, (and associated leachate movement). Topographic derivation of movement suggests the direction of flow is likely to be in a northerly or north westerly direction
- Based on observation of the level of the water table in the trial holes; the seeps of water into trial holes; and, the elevation of waste deposited above the natural ground level- it is likely that the leachate generated on site is slowly draining to surface waters by percolation through the waste area and by gravity flow
- Bedrock was not reached in any trial hole
- Odour of landfill gas was clearly evident at all Trial holes . This was linked to both disturbance of waste and to the weight of the track machine traversing the site.
- Some industrial waste was evident in the trial holes 1, 4 and 9. This was identified as probably coming from the Brodericks Furniture facility (upholstery materials and tapes) and ESB Moneypoint (cables). Construction and demolition waste was also mixed with other wastes on site.
- Some limited evidence of burning was noted in Trial hole 7.

Conclusion: The waste volume deposited on site is approximately 66,500 m^3. The waste is not in direct contact with bedrock or with groundwater. There is a natural geological boundary of peat below the waste volume. The waste type was mixed commercial waste and inert industrial waste. The waste deposited on site was not deemed to be hazardous and no observation of listed or hazardous substances in the leachate would suggest deposition of hazardous waste at the site.

8.0 Source-Pathway-Receptor linkages

At Tier 1 stage seven SPR linkages were identified. Only one, SPR 8, leachate to surface water via runoff or drainage, was catagorised as medium. The other six were categorised as being low. On inspection of the site for the Tier 2 assessment, a new dwelling was noted within 150m of the site. The SPR 10, migration of landfill gas via horizontal migration, was re calculated. The SPR 10 linkage remained in the low category.

8.1 SPR 8 linkage of leachate to Surface Water via Runoff or drainage.

Kilrush landfill was categorised as a Class B, medium risk site in the Tier 1 assessment because of the potential linkage between leachate generated on site discharging to surface water in the area. The down stream analysis of the surface water shows a number of parameters with elevated concentrations. In the absence of any other contaminating source, the elevated levels can be directly attributed to the interaction of leachate with surface water. The parameters showing elevated levels include, Ammonia, COD, Boron, Chromium, Manganese, Nickel, Selenium, Zinc, and Phosphorus. The concentrations in the surface water are significantly diluted compared with the raw leachate concentrations. Depending on the parameter, the dilution factor ranges from 5 fold to 20 fold. Taking the limits set in the *European Communities Environmental Objectives (Surface Waters) Regulations 2009*, several of the parameters are exceeded. However, the increase in concentrations in relation to upstream levels is generally low and in most cases only a small fraction. The exceptions would be for nutrients such as ammoniacal nitrogen, phosphorus and potassium. These parameters are increased by several fold.

For all samples, both leachate and surface water, organocarbons and organophosphate pesticides, triazine herbicides, and soluble volatile organocarbons were absent or below detectable limits. Volatile organocarbons were in all cases below detectable limits.

8.2 SPR 1 Groundwater to Surface water

SPR 3 Linkage to private wells.

SPR 5 Groundwater migration to aquifer.

SPR 7 Groundwater migration to surfacewater.

The groundwater vulnerability rating for the site is "High" and the aquifer category is Ll (generally productive in local zones). Sub soils mapped for the area indicates peats namely Aughty Cutover phase. These subsoils would

generally provide protection for the underlying aquifer. As there was no evidence of removal of sub soil during landfill it can be assumed that there is at least 3 to 5 meters (GSI classification) of peat subsoil between the waste deposit and the underlying bedrock (sandstone, mudstone, siltstone). This offers sufficient protection to the underlying aquifer. In all trial holes, peat was encountered at the base of the trial hole. Bedrock was not reached in any trial hole.

Based on the information arising from the trial hole assessment of the site, there is no direct discharge[1] of leachate to groundwater at the site. In addition, consideration of the presence of private wells within the 1 kilometre radius around the site indicates no impact of discharges from the site on well water quality. No further hydrogeological investigation is considered necessary for groundwater impacts.

An upgradient borewell found elevated levels of ammonia which are likely to be related to the onsite septic tank. No down gradient bore well was identified. There is public water supply serving the area.

8.3 SPR 10 & SPR 11 Vertical and horizontal movement of Landfill gas

There is no evidence of reasonable cover being in place on the waste deposited on the site. Assessment of landfill gas was undertaken using a searcher bar during the Tier 1 investigation. No methane was detected in this investigation.

9.0 Check list of questions from Section 5.2 of the EPA Manual for Medium Risk sites

Waste type and age across the site: Has been assessed

Depth of waste: Has been assessed

Depth and composition of capping: Has been assessed

Leachate monitoring: Has been undertaken

Sub-soil thickness and permeability: Has been assessed

Bedrock type: Has been assessed from GSI maps

Aquifer type and groundwater flow regime: Aquifer type assessed, flow regime estimated.

Establish groundwater trigger levels: Would appear to be based on Drinking Water MAC values

Location and hydrological setting of surface water drainage, including details of levels and flows; Assessed

Surface water classification: Has been assessed using Shannon River Basin Management Plan data

Ecological survey: Not required

Are the data that were used in the CSM and risk screening exercise valid and accurate? Yes

Is there a need for specialist input? Hydrogeologist and possible ecologist (as outlined above) No

Is there biodegradable or hazardous waste present? No

What is the potential for landfill gas migration? No

Is there a natural geological barrier in place? Yes

Is there possibility of direct discharge to groundwater? No

What is the degree of connectivity between surface water and groundwater? None

Are there impacts evident? Not significant

What remediation measures are required? Capping to prevent rainwater ingress.

Have any remediation measures been put in place and have they been effective. No

10.0 Conclusion.

The surface water analysis shows some contamination of the surface water network directly down stream of the landfill. A number of parameters are elevated with nutrients being the most significant. Pesticides and volatile organics were not present in any of the samples. The Wood River, to which the surface water eventually discharges has a Q 3 rating both up stream and down stream of the confluence. Refer to Appendix F. Studies indicate that agriculture is likely to be the biggest contributing factor to poor quality in the river. The landfill is not noticeable adding to the impact on the quality.

To minimise the leachate generation, which appears to be a direct result of rainfall percolating through the landfill, capping of the landfill will be required. It would appear that no other remediation measures are required.

Appendix A

Analysis Report by Alcontrol

ALcontrol Laboratories

Unit 18A
Rosemount Business Park
Ballycoolin
Dublin 11
Tel : (0035) 3188 29893

Clare County Council
Information Age Park Ennis
Gort Road
Ennis
County Clare

Attention: Cathal Brodie

CERTIFICATE OF ANALYSIS

Date:	16 September 2010		
Customer:	D_CLARE_ENS-11		
Sample Delivery Group (SDG):	100901-78	**Report No.:**	97011
Your Reference:	Kilrush Landfill		
Location:	Kilrush Landfill		

We received 13 samples on Wednesday September 01, 2010 and 13 of these samples were scheduled for analysis which was completed on (tba). 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.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Iain Swinton
Operations Director - Land UK & Ireland

1291
GROUP

Validated

ALcontrol Laboratories Analytical Services

SDG:	100901-78	**Customer:**	Clare County Council
Job:	D_CLARE_ENS-11	**Attention:**	Cathal Brodie
Client Reference:	Kilrush Landfill	**Order No.:**	400228482
Location:	Kilrush Landfill	**Report No:**	97011

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
2029502	10-1573			30/08/2010
2029589	10-1573			30/08/2010
2029600	10-1574			30/08/2010
2029756	10-1575			30/08/2010
2029825	10-1576			30/08/2010
2029875	10-1577			30/08/2010
2029884	10-1577			30/08/2010
2029894	10-1578			30/08/2010
2029903	10-1578			30/08/2010
2029914	10-1579			30/08/2010
2029923	10-1580			30/08/2010
2029933	10-1581			30/08/2010
2055225	10-1602			30/08/2010

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

Validated

ALcontrol Laboratories Analytical Services

SDG:	100901-78	**Customer:**	Clare County Council
Job:	D_CLARE_ENS-11	**Attention:**	Cathal Brodie
Client Reference:	Kilrush Landfill	**Order No.:**	400228482
Location:	Kilrush Landfill	**Report No:**	97011

LIQUID

Results Legend

X Test

N No Determination Possible

Lab Sample No(s)			2029502	2029600	2029756	2029635	2029975	2029894	2029914	2029923	2029933
Customer Sample Ref.			10-1573	10-1574	10-1575	10-1576	10-1577	10-1578	10-1579	10-1580	10-1581
AGS Ref.											
Depth (m)											
Container			1l glass bottle (D)	1plastic	60g VOC Dublin	H2SO4 (Dublin)	Plastic NaOH (D)	1l glass bottle (D)	1plastic	60g VOC Dublin	H2SO4 (Dublin)	Plastic NaOH (D)	1l glass bottle (D)	1plastic	60g VOC Dublin	H2SO4 (Dublin)	Plastic NaOH (D)	2l plastic	H2SO4 (Dublin)	1plastic	H2SO4 (Dublin)	2l plastic	H2SO4 (Dublin)	2l plastic	H2SO4 (Dublin)	2l plastic	H2SO4 (Dublin)
Alkalinity Filtered as CaCO3	All	NDPs: 0 Tests: 4		X					X				X				X										
Ammonium	All	NDPs: 0 Tests: 9				X					X				X				X		X		X		X		X
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 0																									
Anions by ion Chromatography	All	NDPs: 0 Tests: 1														X											
Anions by Kone (w)	All	NDPs: 0 Tests: 8		X					X				X						X		X		X		X		X
CEN 2:1 Readings	All	NDPs: 0 Tests: 0																									
CEN Readings	All	NDPs: 0 Tests: 0																									
COD Unfiltered	All	NDPs: 0 Tests: 9		X					X				X			X			X	X	X	X	X	X	X	X	X
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 9		X					X				X			X			X	X	X	X	X	X	X	X	X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 4					X				X				X				X								
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 4		X					X				X			X											
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 0																									

Validated

ALcontrol Laboratories Analytical Services

SDG:	100901-78	**Customer:**	Clare County Council
Job:	D_CLARE_ENS-11	**Attention:**	Cathal Brodie
Client Reference:	Kilrush Landfill	**Order No.:**	400228482
Location:	Kilrush Landfill	**Report No:**	97011

LIQUID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	2029902	2029920	2029756	2029925	2029875	2029894	2029914	2029923	2029933
			Customer Sample Ref.	10-1573	10-1574	10-1575	10-1576	10-1577	10-1578	10-1579	10-1580	10-1581
			AGS Ref.									
			Depth (m)									
			Container	1l glass bottle (D)	1plastic	60g VOC Dublin	H2SO4 (Dublin)	Plastic NaOH (D)	1l glass bottle (D)	1plastic	60g VOC Dublin	H2SO4 (Dublin)	Plastic NaOH (D)	1l glass bottle (D)	1plastic	60g VOC Dublin	H2SO4 (Dublin)	Plastic NaOH (D)	2l plastic	H2SO4 (Dublin)	1plastic	H2SO4 (Dublin)	2l plastic	H2SO4 (Dublin)	2l plastic	H2SO4 (Dublin)	2l plastic	H2SO4 (Dublin)
Fluoride	All	NDPs: 0 Tests: 3			X				X				X													
GRO by GC-FID (S)	All	NDPs: 0 Tests: 0																								
Loss on Ignition in soils	All	NDPs: 0 Tests: 0																								
Mercury Dissolved	All	NDPs: 0 Tests: 4	X					X				X				X										
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 9		X					X				X				X			X	X	X	X	X	X	X
Mineral Oil	All	NDPs: 0 Tests: 0																								
OC, OP Pesticides and Triazine Herb	All	NDPs: 0 Tests: 4	X					X				X				X										
PAH Value of soil	All	NDPs: 0 Tests: 0																								
PCBs by GCMS	All	NDPs: 0 Tests: 0																								
pH	All	NDPs: 0 Tests: 0																								
pH Value	All	NDPs: 0 Tests: 9		X					X				X				X			X	X	X	X	X	X	X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 0																								

Validated

ALcontrol Laboratories Analytical Services

SDG:	100901-78	**Customer:**	Clare County Council
Job:	D_CLARE_ENS-11	**Attention:**	Cathal Brodie
Client Reference:	Kilrush Landfill	**Order No.:**	400228482
Location:	Kilrush Landfill	**Report No:**	97011

LIQUID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	2029902	2029900	2029795	2029825	2029675	2029684	2029914	2029923	2029933
			Customer Sample Ref.	10-1573	10-1574	10-1575	10-1576	10-1577	10-1578	10-1579	10-1580	10-1581
			AGS Ref.									
			Depth (m)									
			Container	1l glass bottle (D)	1litre plastic	60g VOC Dublin	H2SO4 (Dublin)	Plastic NaOH (D)	1l glass bottle (D)	1litre plastic	60g VOC Dublin	H2SO4 (Dublin)	Plastic NaOH (D)	1l glass bottle (D)	1litre plastic	60g VOC Dublin	H2SO4 (Dublin)	Plastic NaOH (D)	1l glass bottle (D)	1litre plastic	60g VOC Dublin	H2SO4 (Dublin)	Plastic NaOH (D)	1l glass bottle (D)	1litre plastic	60g VOC Dublin	H2SO4 (Dublin)	Plastic NaOH (D)	2l plastic	H2SO4 (Dublin)	1litre plastic	H2SO4 (Dublin)	2l plastic	H2SO4 (Dublin)	2l plastic	H2SO4 (Dublin)	2l plastic	H2SO4 (Dublin)
Sample description	All	NDPs: 0 Tests: 0																																		
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 4		X					X				X				X																		
Total Dissolved Solids	All	NDPs: 0 Tests: 0																																		
Total Dissolved Solids (Grav)	All	NDPs: 0 Tests: 0																																		
Total Metals by ICP-MS	All	NDPs: 0 Tests: 4			X					X				X				X																		
Total Organic Carbon	All	NDPs: 0 Tests: 0																																		
VOC MS (W)	All	NDPs: 0 Tests: 4				X					X				X				X																	

Validated

ALcontrol Laboratories Analytical Services

SDG:	100901-78	**Customer:**	Clare County Council
Job:	D_CLARE_ENS-11	**Attention:**	Cathal Brodie
Client Reference:	Kilrush Landfill	**Order No.:**	400228482
Location:	Kilrush Landfill	**Report No:**	97011

SOLID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	2029569	2029604	2029603	2055225
			Customer Sample Ref.	10-1573	10-1577	10-1578	10-1602
			AGS Ref.				
			Depth (m)				
			Container	JAR (D) / Kone Cup / Tube for ICP-MS	JAR (D) / Kone Cup	JAR (D) / Kone Cup / BAG	Kone Cup / Tube for ICP-MS
Alkalinity Filtered as CaCO3	All	NDPs: 0 Tests: 0					
Ammonium	All	NDPs: 0 Tests: 0					
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 4	X	X	X	X	
Anions by Ion Chromatography	All	NDPs: 0 Tests: 4	X	X	X	X	
Anions by Kone (w)	All	NDPs: 6 Tests: 0	N N N	N N	N	
CEN 2:1 Readings	All	NDPs: 3 Tests: 0	N	N		N
CEN Readings	All	NDPs: 3 Tests: 1	N	N	N	X	
COD Unfiltered	All	NDPs: 0 Tests: 0					
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 0					
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 0					
Dissolved Metals by ICP-MS	All	NDPs: 6 Tests: 4	X N N N	X	X N N	X	N
Dissolved Organic/Inorganic Carbon	All	NDPs: 6 Tests: 3	X N N N	X	X N N		N

Validated

ALcontrol Laboratories Analytical Services

SDG:	100901-78	**Customer:**	Clare County Council
Job:	D_CLARE_ENS-11	**Attention:**	Cathal Brodie
Client Reference:	Kilrush Landfill	**Order No.:**	400228482
Location:	Kilrush Landfill	**Report No:**	97011

SOLID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	2029569	2029884	2029903	2033225
			Customer Sample Ref.	10-1573	10-1577	10-1578	10-1602
			AGS Ref.				
			Depth (m)				
			Container	JAR (D) / Kone Cap / Tube for ICP MS	JAR (D) / Kone Cap	JAR (D) / Kone Cap / BAG	Kone Cap / Tube for ICP MS
Fluoride	All	NDPs: 6 Tests: 0		N N N	N	N N	N
GRO by GC-FID (S)	All	NDPs: 0 Tests: 4		X	X	X X	X
Loss on Ignition in soils	All	NDPs: 0 Tests: 4		X	X	X X	X
Mercury Dissolved	All	NDPs: 6 Tests: 4		N N N X	N X	N N X X	N
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 0					
Mineral Oil	All	NDPs: 0 Tests: 4		X	X	X X	X
OC, OP Pesticides and Triazine Herb	All	NDPs: 0 Tests: 0					
PAH Value of soil	All	NDPs: 0 Tests: 4		X	X	X X	X
PCBs by GCMS	All	NDPs: 0 Tests: 4		X	X	X X	X
pH	All	NDPs: 0 Tests: 4		X	X	X X	X
pH Value	All	NDPs: 0 Tests: 0					
Phenols by HPLC (W)	All	NDPs: 6 Tests: 4		N N N X	N X	N N X X	N

Validated

ALcontrol Laboratories Analytical Services

SDG:	100901-78	**Customer:**	Clare County Council
Job:	D_CLARE_ENS-11	**Attention:**	Cathal Brodie
Client Reference:	Kilrush Landfill	**Order No.:**	400228482
Location:	Kilrush Landfill	**Report No:**	97011

SOLID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	2029589	2029884	2029903	2029225
			Customer Sample Ref.	10-1573	10-1577	10-1578	10-1602
			AGS Ref.				
			Depth (m)				
			Container	JAR (D) / Kone Cap / Tube for ICP-MS	JAR (D) / Kone Cap / JAR (D) / Kone Cap / BAG / Kone Cap / Tube for ICP-MS		
Sample description	All	NDPs: 0 Tests: 4		X	X	X	X
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 0					
Total Dissolved Solids	All	NDPs: 4 Tests: 0		N	N N	N	N
Total Dissolved Solids (Grav)	All	NDPs: 3 Tests: 4		N X	N X	N X	X
Total Metals by ICP-MS	All	NDPs: 0 Tests: 0					
Total Organic Carbon	All	NDPs: 0 Tests: 4		X	X	X	X
VOC MS (W)	All	NDPs: 0 Tests: 0					

Validated

ALcontrol Laboratories Analytical Services

SDG:	100901-78	**Customer:**	Clare County Council
Job:	D_CLARE_ENS-11	**Attention:**	Cathal Brodie
Client Reference:	Kilrush Landfill	**Order No.:**	400228482
Location:	Kilrush Landfill	**Report No:**	97011

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
2029589	10-1573		Dark Brown	Peat	0.063 - 0.1 mm	Vegetation	None
2029884	10-1577		Dark Brown	Peat	<0.063 mm	Vegetation	None
2029903	10-1578		Dark Brown	Peat	<0.063 mm	Vegetation	None
2055225	10-1602		Dark Brown	Silt Loam	0.063 - 0.1 mm	Vegetation	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

ALcontrol Laboratories Analytical Services

SDG:	100901-78	**Customer:**	Clare County Council
Job:	D_CLARE_ENS-11	**Attention:**	Cathal Brodie
Client Reference:	Kilrush Landfill	**Order No.:**	400228482
Location:	Kilrush Landfill	**Report No:**	97011

Test Completion Dates

Lab Sample No(s)	2029502	2029589	2029600	2029756	2029825	2029875	2029884	2029894	2029903	2029914
Customer Sample Ref.	10-1573	10-1573	10-1574	10-1575	10-1576	10-1577	10-1577	10-1578	10-1578	10-1579
AGS Ref.										
Depth										
Type	LIQUID	SOLID	LIQUID	LIQUID	LIQUID	LIQUID	SOLID	LIQUID	SOLID	LIQUID
Alkalinity Filtered as CaCO3	08/09/2010		08/09/2010	08/09/2010	08/09/2010					
Ammonium	03/09/2010		03/09/2010	03/09/2010	03/09/2010	03/09/2010		03/09/2010		03/09/2010
ANC at pH4 and ANC at pH 6		06/09/2010					06/09/2010		06/09/2010	
Anions by Ion Chromatography		08/09/2010			07/09/2010		08/09/2010		08/09/2010	
Anions by Kone (w)	02/09/2010		02/09/2010	02/09/2010		02/09/2010		02/09/2010		02/09/2010
COD Unfiltered	02/09/2010		02/09/2010	02/09/2010	02/09/2010	02/09/2010		02/09/2010		02/09/2010
Conductivity (at 20 deg.C)	03/09/2010		03/09/2010	03/09/2010	03/09/2010	03/09/2010		03/09/2010		03/09/2010
Cyanide Comp/Free/Total/Thiocyanate	02/09/2010		02/09/2010	02/09/2010	02/09/2010					
Dissolved Metals by ICP-MS	03/09/2010	07/09/2010	03/09/2010	02/09/2010	03/09/2010		07/09/2010		07/09/2010	
Dissolved Organic/Inorganic Carbon		06/09/2010					06/09/2010		06/09/2010	
Fluoride	03/09/2010		03/09/2010	03/09/2010						
GRO by GC-FID (S)		10/09/2010					14/09/2010		10/09/2010	
Loss on Ignition in soils		07/09/2010					07/09/2010		07/09/2010	
Mercury Dissolved	07/09/2010	08/09/2010	07/09/2010	07/09/2010	07/09/2010		08/09/2010		08/09/2010	
Metals by ICap-OES Dissolved (W)	03/09/2010		03/09/2010	03/09/2010	03/09/2010	03/09/2010		03/09/2010		03/09/2010
Mineral Oil		06/09/2010					06/09/2010		06/09/2010	
NRA Leachate		03/09/2010					03/09/2010		03/09/2010	
OC, OP Pesticides and Triazine Herb	10/09/2010		07/09/2010	07/09/2010	10/09/2010					
PAH Value of soil		06/09/2010					06/09/2010		06/09/2010	
PCBs by GCMS		06/09/2010					06/09/2010		06/09/2010	
pH		07/09/2010					07/09/2010		07/09/2010	
pH Value	03/09/2010		02/09/2010	02/09/2010	02/09/2010	10/09/2010		02/09/2010		03/09/2010
Phenols by HPLC (W)		07/09/2010					07/09/2010		07/09/2010	
Sample description		02/09/2010					02/09/2010		02/09/2010	
SVOC MS (W) - Aqueous	07/09/2010		13/09/2010	13/09/2010	07/09/2010					
Total Dissolved Solids (Grav)		09/09/2010					09/09/2010		09/09/2010	
Total Metals by ICP-MS	03/09/2010		03/09/2010	03/09/2010	03/09/2010					
Total Organic Carbon		03/09/2010					03/09/2010		03/09/2010	
VOC MS (W)	03/09/2010		03/09/2010	03/09/2010	03/09/2010					

Lab Sample No(s)	2029923	2029933	2053225
Customer Sample Ref.	10-1580	10-1581	10-1582
AGS Ref.			
Depth			
Type	LIQUID	LIQUID	SOLID
Ammonium	03/09/2010	03/09/2010	
ANC at pH4 and ANC at pH 6			10/09/2010
Anions by Ion Chromatography			10/09/2010
Anions by Kone (w)	03/09/2010	02/09/2010	
CEN 10:1 Leachate (1 Stage)			08/09/2010
CEN Readings			09/09/2010
COD Unfiltered	03/09/2010	02/09/2010	
Conductivity (at 20 deg.C)	03/09/2010	03/09/2010	
Dissolved Metals by ICP-MS			13/09/2010
Dissolved Organic/Inorganic Carbon			10/09/2010
GRO by GC-FID (S)			16/09/2010
Loss on Ignition in soils			10/09/2010
Mercury Dissolved			13/09/2010
Metals by ICap-OES Dissolved (W)	03/09/2010	03/09/2010	
Mineral Oil			13/09/2010
PAH Value of soil			10/09/2010
PCBs by GCMS			11/09/2010
pH			08/09/2010
pH Value	03/09/2010	03/09/2010	
Phenols by HPLC (W)			13/09/2010
Sample description			08/09/2010
Total Dissolved Solids (Grav)			14/09/2010
Total Organic Carbon			10/09/2010

Validated

ALcontrol Laboratories Analytical Services

SDG	100901-78	**Customer:**	Clare County Council
Job:	D_CLARE_ENS-11	**Attention:**	Cathal Brodie
Client Reference:	Kilrush Landfill	**Order No.:**	400228482
Location:	Kilrush Landfill	**Report No:**	97011

Results Legend

#	ISO17026 accredited.
M	mCERTS 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 the individual compounds within the samples are not corrected for this recovery.

Customer Sample Ref.	10-1573	10-1574	10-1575	10-1576	10-1577	10-1578
Depth (m)						
Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Date Sampled	30/08/2010	30/08/2010	30/08/2010	30/08/2010	30/08/2010	30/08/2010
Date Received	01/09/2010	01/09/2010	01/09/2010	01/09/2010	01/09/2010	01/09/2010
SDG Ref	100901-78	100901-78	100901-78	100901-78	100901-78	100901-78
Lab Sample No.(s)	2029502	2029600	2029756	2029825	2029875	2029894
AGS Reference						

Component	LOD/Units	Method											
Alkalinity,Total as CaCO3 (diss.filt)	<2 mg/l	TM043	865		450		45		55				
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	30.8	#	18.9	#	0.352	#	1.59	#	36.9	#	93.3 #
Fluoride	<0.5 mg/l	TM104	<0.5	#	<0.5	#	<0.5	#					
COD, unfiltered	<7 mg/l	TM107	434	#	71.6	#	54.5	#	310	#	154	#	171 #
Conductivity @ 20 deg.C	<0.014 mS/cm	TM120	2.35	#	1.08	#	0.178	#	0.278	#	1.56	#	2.46 #
Arsenic (diss.filt)	<0.12 µg/l	TM152	9.07	#	2.83	#	1.47	#	1.41	#			
Boron (diss.filt)	<9.4 µg/l	TM152	690	#	203	#	17.9	#	36.9	#			
Cadmium (diss.filt)	<0.1 µg/l	TM152	<0.1	#	<0.1	#	<0.1	#	<0.1	#			
Chromium (diss.filt)	<0.22 µg/l	TM152	27.4	#	15.1	#	1.16	#	1.83	#			
Copper (diss.filt)	<0.85 µg/l	TM152	<0.85	#	<0.85	#	0.959	#	<0.85	#			
Lead (diss.filt)	<0.02 µg/l	TM152	0.102	#	0.042	#	0.165	#	0.531	#			
Manganese (diss.filt)	<0.04 µg/l	TM152	1810	#	1170	#	87.9	#	310	#			
Nickel (diss.filt)	<0.15 µg/l	TM152	12.4	#	4.29	#	1.16	#	1.09	#			
Selenium (diss.filt)	<0.39 µg/l	TM152	13.4	#	2.06	#	0.705	#	0.963	#			
Zinc (diss.filt)	<0.41 µg/l	TM152	50.3	#	6.82	#	5.63	#	7.47	#			
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	#	<0.01	#	<0.01	#	<0.01	#			
Sulphate	<3 mg/l	TM184	<3	#	<3	#	<3	#			<3	#	<3 #
Chloride	<2 mg/l	TM184	145	#	36.7	#	30.3	#			81.4	#	137 #
Phosphate (ortho) as PO4	<0.05 mg/l	TM184	<0.05	#	<0.05	#	0.175	#					
Chromium (tot.unfilt)	<3 µg/l	TM191	7.03	#	4.57	#	<3	#	<3	#			
Phosphorus (tot.unfilt)	<20 µg/l	TM191	304	#	97.7	#	143	#	449	#			
Chloride	<0.07 mg/l	TM226							25.1	#			
Fluoride	<0.04 mg/l	TM226							<0.4	#			
Phospate (ortho) as PO4	<0.14 mg/l	TM226							<0.7	#			
Sulphate	<0.1 mg/l	TM226							37.4	#			
Cyanide, Total	<0.05 mg/l	TM227	<0.05	#	<0.05	#	<0.05	#	<0.05	#			
Calcium (diss.filt)	<0.012 mg/l	TM228	343		202		13.2		35.3				
Sodium (diss.filt)	<0.076 mg/l	TM228	108		27.7		18.3		22.1		62.8		101
Magnesium (diss.filt)	<0.036 mg/l	TM228	72.1		26.5		4.04		6.23				
Potassium (diss.filt)	<2.335 mg/l	TM228	88		24.8		2.64		5.46		55.6		111
Iron (diss.filt)	<0.019 mg/l	TM228	1.67		15		1.08		1.39				
pH	<1 pH Units	TM256	8.41	#	7.75	#	7.84	#	7.41	#	7.66	#	7.85 #

Validated

ALcontrol Laboratories Analytical Services

SDG	100901-78	**Customer:**	Clare County Council
Job:	D_CLARE_ENS-11	**Attention:**	Cathal Brodie
Client Reference:	Kilrush Landfill	**Order No.:**	400228482
Location:	Kilrush Landfill	**Report No:**	97011

OC, OP Pesticides and Triazine Herb

Results Legend	
#	ISO17025 accredited.
M	mCERTS 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 the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	10-1573	10-1574	10-1575	10-1576		
			Depth (m)						
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
			Date Sampled	30/08/2010	30/08/2010	30/08/2010	30/08/2010		
			Date Received	01/09/2010	01/09/2010	01/09/2010	01/09/2010		
			SDG Ref	100901-78	100901-78	100901-78	100901-78		
			Lab Sample No.(s)	2029502	2029600	2029758	2029825		
			AGS Reference						
Atrazine	<1 µg/l	TM231		<1	<1	<1	<1		
Simazine	<1 µg/l	TM231		<1	<1	<1	<1		
Tecnazene	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
Hexachlorobenzene	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
Trifluralin	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
Quintozene (PCNB)	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
Triallate	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
Heptachlor	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
Aldrin	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
Chlorothalonil	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
Telodrin	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
Isodrin	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
Heptachlor epoxide	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
Triadimefon	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
Pendimethalin	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
o,p-DDE	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
Endosulphan I	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
Trans-chlordane	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
cis-Chlordane	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
p,p-DDE	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
Dieldrin	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
o,p-TDE (DDD)	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
Endrin	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
o,p-DDT	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
p,p-TDE (DDD)	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
Endosulphan II	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
p,p-DDT	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
o,p-Methoxychlor	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
p,p-Methoxychlor	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
Endosulphan sulphate	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
Permethrin I	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		
Permethrin II	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01		

Validated

ALcontrol Laboratories Analytical Services

SDG	100901-78	**Customer:**	Clare County Council
Job:	D_CLARE_ENS-11	**Attention:**	Cathal Brodie
Client Reference:	Kilrush Landfill	**Order No.:**	400228482
Location:	Kilrush Landfill	**Report No:**	97011

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 test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	10-1573	10-1574	10-1575	10-1576
			Depth (m)				
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	30/08/2010	30/08/2010	30/08/2010	30/08/2010
			Date Received	01/09/2010	01/09/2010	01/09/2010	01/09/2010
			SDG Ref	100901-78	100901-78	100901-78	100901-78
			Lab Sample No.(s)	2028502	2029600	2029758	2029825
			AGS Reference				
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<2	<1	<1	<2
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<2	<1	<1	<2
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<2	<1	<1	<2
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<2	<1	<1	<2
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
2-Chlorophenol (aq)	<1 µg/l	TM176		<2	<1	<1	<2
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
2-Methylphenol (aq)	<1 µg/l	TM176		<2	<1	<1	<2
2-Nitroaniline (aq)	<1 µg/l	TM176		<2	<1	<1	<2
2-Nitrophenol (aq)	<1 µg/l	TM176		<2	<1	<1	<2
3-Nitroaniline (aq)	<1 µg/l	TM176		<2	<1	<1	<2
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<2	<1	<1	<2
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<2	<1	<1	<2
4-Chloroaniline (aq)	<1 µg/l	TM176		<2	<1	<1	<2
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<2	<1	<1	<2
4-Methylphenol (aq)	<1 µg/l	TM176		<2	<1	<1	<2
4-Nitrophenol (aq)	<1 µg/l	TM176		<2	<1	<1	<2
4-Nitroaniline (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Azobenzene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Acenaphthylene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Acenaphthene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Anthracene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<2	<1	<1	<2
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<2	<1	<1	<2
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<20	<2	<2	<4
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Carbazole (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Chrysene (aq)	<1 µg/l	TM176		<2	<1	<1	<2

Validated

ALcontrol Laboratories Analytical Services

SDG	100901-78	**Customer:**	Clare County Council
Job:	D_CLARE_ENS-11	**Attention:**	Cathal Brodie
Client Reference:	Kilrush Landfill	**Order No.:**	400228482
Location:	Kilrush Landfill	**Report No:**	97011

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 test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	10-1573	10-1574	10-1575	10-1576
			Depth (m)				
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	30/08/2010	30/08/2010	30/08/2010	30/08/2010
			Date Received	01/09/2010	01/09/2010	01/09/2010	01/09/2010
			SDG Ref	100901-78	100901-78	100901-78	100901-78
			Lab Sample No.(s)	2029502	2029600	2029756	2029825
			AGS Reference				
Dibenzofuran (aq)	<1 µg/l	TM176		<2	<1	<1	<2
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Diethyl phthalate (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Dimethyl phthalate (aq)	<1 µg/l	TM176		<2	<1	<1	<2
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<10	<5	<5	<10
Fluoranthene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Fluorene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Hexachlorobenzene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Pentachlorophenol (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Phenol (aq)	<1 µg/l	TM176		<2	<1	<1	<2
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Hexachloroethane (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Nitrobenzene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Naphthalene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Isophorone (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Phenanthrene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<2	<1	<1	<2
Pyrene (aq)	<1 µg/l	TM176		<2	<1	<1	<2

Validated

ALcontrol Laboratories Analytical Services

SDG	100901-78	**Customer:**	Clare County Council
Job:	D_CLARE_ENS-11	**Attention:**	Cathal Brodie
Client Reference:	Kilrush Landfill	**Order No.:**	400228482
Location:	Kilrush Landfill	**Report No:**	97011

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 test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Customer Sample Ref.	10-1573	10-1574	10-1575	10-1576
Depth (m)				
Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Date Sampled	30/08/2010	30/08/2010	30/08/2010	30/08/2010
Date Received	01/09/2010	01/09/2010	01/09/2010	01/09/2010
SDG Ref	100901-78	100901-78	100901-78	100901-78
Lab Sample No.(s)	2029502	2029600	2029756	2029825
AGS Reference				

Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM208	107		110		109		108	
Toluene-d8**	%	TM208	99.1		100		99.1		98.4	
4-Bromofluorobenzene**	%	TM208	97		97.9		99.1		97.6	
Dichlorodifluoromethane	<7 µg/l	TM208	<7	#	<7	#	<7	#	<7	#
Chloromethane	<9 µg/l	TM208	<9	#	<9	#	<9	#	<9	#
Vinyl chloride	<1.2 µg/l	TM208	<1.2	#	<1.2	#	<1.2	#	<1.2	#
Bromomethane	<2 µg/l	TM208	<2	#	<2	#	<2	#	<2	#
Chloroethane	<2.5 µg/l	TM208	7.23	#	<2.5	#	<2.5	#	<2.5	#
Trichlorofluoromethane	<1.3 µg/l	TM208	<1.3	#	<1.3	#	<1.3	#	<1.3	#
1,1-Dichloroethene	<1.2 µg/l	TM208	<1.2	#	<1.2	#	<1.2	#	<1.2	#
Carbon disulphide	<1.3 µg/l	TM208	<1.3	#	<1.3	#	<1.3	#	<1.3	#
Dichloromethane	<3.7 µg/l	TM208	<3.7	#	<3.7	#	<3.7	#	<3.7	#
Methyl tertiary butyl ether (MTBE)	<1.6 µg/l	TM208	<1.6	#	<1.6	#	<1.6	#	<1.6	#
trans-1,2-Dichloroethene	<1.9 µg/l	TM208	<1.9	#	<1.9	#	<1.9	#	<1.9	#
1,1-Dichloroethane	<1.2 µg/l	TM208	<1.2	#	<1.2	#	<1.2	#	<1.2	#
cis-1,2-Dichloroethene	<2.3 µg/l	TM208	<2.3	#	<2.3	#	<2.3	#	<2.3	#
2,2-Dichloropropane	<3.8 µg/l	TM208	<3.8	#	<3.8	#	<3.8	#	<3.8	#
Bromochloromethane	<1.9 µg/l	TM208	<1.9	#	<1.9	#	<1.9	#	<1.9	#
Chloroform	<1.8 µg/l	TM208	<1.8	#	<1.8	#	<1.8	#	<1.8	#
1,1,1-Trichloroethane	<1.3 µg/l	TM208	<1.3	#	<1.3	#	<1.3	#	<1.3	#
1,1-Dichloropropene	<1.3 µg/l	TM208	<1.3	#	<1.3	#	<1.3	#	<1.3	#
Carbontetrachloride	<1.4 µg/l	TM208	<1.4	#	<1.4	#	<1.4	#	<1.4	#
1,2-Dichloroethane	<3.3 µg/l	TM208	<3.3		<3.3		<3.3		<3.3	
Benzene	<1.3 µg/l	TM208	<1.3	#	<1.3	#	<1.3	#	<1.3	#
Trichloroethene	<2.5 µg/l	TM208	<2.5	#	<2.5	#	<2.5	#	<2.5	#
1,2-Dichloropropane	<3 µg/l	TM208	<3	#	<3	#	<3	#	<3	#
Dibromomethane	<2.7 µg/l	TM208	<2.7	#	<2.7	#	<2.7	#	<2.7	#
Bromodichloromethane	<0.9 µg/l	TM208	<0.9	#	<0.9	#	<0.9	#	<0.9	#
cis-1,3-Dichloropropene	<1.9 µg/l	TM208	<1.9	#	<1.9	#	<1.9	#	<1.9	#
Toluene	<1.4 µg/l	TM208	<1.4	#	<1.4	#	<1.4	#	<1.4	#
trans-1,3-Dichloropropene	<3.5 µg/l	TM208	<3.5	#	<3.5	#	<3.5	#	<3.5	#
1,1,2-Trichloroethane	<2.2 µg/l	TM208	<2.2	#	<2.2	#	<2.2	#	<2.2	#
1,3-Dichloropropane	<2.2 µg/l	TM208	<2.2	#	<2.2	#	<2.2	#	<2.2	#
Tetrachloroethene	<1.5 µg/l	TM208	<1.5	#	<1.5	#	<1.5	#	<1.5	#
Dibromochloromethane	<1.7 µg/l	TM208	<1.7	#	<1.7	#	<1.7	#	<1.7	#
1,2-Dibromoethane	<2.3 µg/l	TM208	<2.3	#	<2.3	#	<2.3	#	<2.3	#
Chlorobenzene	<3.5 µg/l	TM208	<3.5	#	<3.5	#	<3.5	#	<3.5	#
1,1,1,2-Tetrachloroethane	<1.3 µg/l	TM208	<1.3	#	<1.3	#	<1.3	#	<1.3	#
Ethylbenzene	<2.5 µg/l	TM208	<2.5	#	<2.5	#	<2.5	#	<2.5	#

Validated

ALcontrol Laboratories Analytical Services

SDG	100901-78	**Customer:**	Clare County Council
Job:	D_CLARE_ENS-11	**Attention:**	Cathal Brodie
Client Reference:	Kilrush Landfill	**Order No.:**	400228482
Location:	Kilrush Landfill	**Report No:**	97011

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 test.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Customer Sample Ref.	10-1573	10-1574	10-1575	10-1576
Depth (m)				
Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Date Sampled	30/08/2010	30/08/2010	30/08/2010	30/08/2010
Date Received	01/09/2010	01/09/2010	01/09/2010	01/09/2010
SDG Ref	100901-78	100901-78	100901-78	100901-78
Lab Sample No.(s)	2029502	2029600	2029756	2029825
AGS Reference				

Component	LOD/Units	Method							
m,p-Xylene	<2.5 µg/l	TM208	<2.5	#	<2.5	#	<2.5	#	<2.5 #
o-Xylene	<1.7 µg/l	TM208	<1.7	#	<1.7	#	<1.7	#	<1.7 #
Styrene	<1.2 µg/l	TM208	<1.2	#	<1.2	#	<1.2	#	<1.2 #
Bromoform	<3 µg/l	TM208	<3	#	<3	#	<3	#	<3 #
Isopropylbenzene	<1.4 µg/l	TM208	<1.4	#	<1.4	#	<1.4	#	<1.4 #
1,1,2,2-Tetrachloroethane	<5.2 µg/l	TM208	<5.2		<5.2		<5.2		<5.2
1,2,3-Trichloropropane	<7.8 µg/l	TM208	<7.8	#	<7.8	#	<7.8	#	<7.8 #
Bromobenzene	<2 µg/l	TM208	<2	#	<2	#	<2	#	<2 #
Propylbenzene	<2.6 µg/l	TM208	<2.6	#	<2.6	#	<2.6	#	<2.6 #
2-Chlorotoluene	<1.9 µg/l	TM208	<1.9	#	<1.9	#	<1.9	#	<1.9 #
1,3,5-Trimethylbenzene	<1.8 µg/l	TM208	<1.8	#	<1.8	#	<1.8	#	<1.8 #
4-Chlorotoluene	<1.9 µg/l	TM208	<1.9	#	<1.9	#	<1.9	#	<1.9 #
tert-Butylbenzene	<2 µg/l	TM208	<2	#	<2	#	<2	#	<2 #
1,2,4-Trimethylbenzene	<1.7 µg/l	TM208	<1.7	#	2.43	#	<1.7	#	<1.7 #
sec-Butylbenzene	<1.7 µg/l	TM208	<1.7	#	<1.7	#	<1.7	#	<1.7 #
4-iso-Propyltoluene	<2.6 µg/l	TM208	<2.6	#	<2.6	#	<2.6	#	<2.6 #
1,3-Dichlorobenzene	<2.2 µg/l	TM208	<2.2	#	<2.2	#	<2.2	#	<2.2 #
1,4-Dichlorobenzene	<2.7 µg/l	TM208	<2.7	#	<2.7	#	<2.7	#	<2.7 #
n-Butylbenzene	<2 µg/l	TM208	<2	#	<2	#	<2	#	<2 #
1,2-Dichlorobenzene	<3.7 µg/l	TM208	<3.7		<3.7		<3.7		<3.7
1,2-Dibromo-3-chloropropane	<9.8 µg/l	TM208	<9.8		<9.8		<9.8		<9.8
1,2,4-Trichlorobenzene	<2.3 µg/l	TM208	<2.3	#	<2.3	#	<2.3	#	<2.3 #
Hexachlorobutadiene	<2.5 µg/l	TM208	<2.5	#	<2.5	#	<2.5	#	<2.5 #
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1 #
Naphthalene	<3.5 µg/l	TM208	<3.5	#	<3.5	#	<3.5	#	<3.5 #
1,2,3-Trichlorobenzene	<3.1 µg/l	TM208	<3.1	#	<3.1	#	<3.1	#	<3.1 #
1,3,5-Trichlorobenzene	<10 µg/l	TM208	<10		<10		<10		<10

Validated

ALcontrol Laboratories Analytical Services

SDG	100901-78	**Customer:**	Clare County Council
Job:	D_CLARE_ENS-11	**Attention:**	Cathal Brodie
Client Reference:	Kilrush Landfill	**Order No.:**	400228482
Location:	Kilrush Landfill	**Report No:**	97011

Results Legend	
#	ISO17025 accredited.
M	mCERTS 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 the individual compounds within the samples are not corrected for this recovery.

Customer Sample Ref.	10-1579	10-1580	10-1581
Depth (m)			
Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Date Sampled	30/08/2010	30/08/2010	30/08/2010
Date Received	01/09/2010	01/09/2010	01/09/2010
SDG Ref	100901-78	100901-78	100901-78
Lab Sample No.(s)	2029914	2029923	2029933
AGS Reference			

Component	LOD/Units	Method			
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	29.9 #	0.289 #	0.629 #
COD, unfiltered	<7 mg/l	TM107	80.7 #	36.2 #	<7 #
Conductivity @ 20 deg.C	<0.014 mS/cm	TM120	1.36 #	0.234 #	0.376 #
Sulphate	<3 mg/l	TM184	6.3 #	12.2 #	13.2 #
Chloride	<2 mg/l	TM184	56.6 #	34.2 #	40.3 #
Sodium (diss.filt)	<0.076 mg/l	TM228	33.3	21.2	30.7
Potassium (diss.filt)	<2.335 mg/l	TM228	32.2	<2.34	<2.34
pH	<1 pH Units	TM256	8.14 #	8.09 #	8.56 #

Validated

ALcontrol Laboratories Analytical Services

SDG	100901-78	**Customer:**	Clare County Council
Job:	D_CLARE_ENS-11	**Attention:**	Cathal Brodie
Client Reference:	Kilrush Landfill	**Order No.:**	400228482
Location:	Kilrush Landfill	**Report No:**	97011

Results Legend	
#	ISO17025 accredited.
M	mCERTS 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 the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	10-1573	10-1577	10-1578	10-1602
			Depth (m)				
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	30/08/2010	30/08/2010	30/08/2010	30/08/2010
			Date Received	01/09/2010	01/09/2010	01/09/2010	01/09/2010
			SDG Ref	100901-78	100901-78	100901-78	100901-78
			Lab Sample No.(s)	2029589	2029884	2029903	2055225
			AGS Reference				
Moisture	%	PM114		83.1	78.6	77	81.5
Moisture content ratio	%	PM114		490	368	335	440
Dry matter content ratio	%	PM114		16.9	21.4	23	18.5
Loss on ignition	<0.7 %	TM018		31.3 #	95.5 #	93.1 #	82.4 M
Dissolved solids, Total (gravimetric) NRA leach	<40 mg/l	TM021		153	278	291	
Mineral oil >C10-C40	<1 mg/kg	TM061		657 #	209 #	317 #	313 #
Carbon, Organic (diss.filt) NRA leach	<3 mg/l	TM090		52.5	61.6	86.6	
Organic Carbon, Total	<0.2 %	TM132		14.8 #	43.9 #	48.4 #	39.9 #
pH	1 pH Units	TM133		6.09 #	5.72 #	6.78 #	6.77 M
Antimony (diss.filt) NRA leach	<0.16 µg/l	TM152		0.338	1.9	0.991	
Arsenic (diss.filt) NRA leach	<0.12 µg/l	TM152		25.2	10.1	6.94	
Barium (diss.filt) NRA leach	<0.03 µg/l	TM152		1.07	7.47	6.34	
Cadmium (diss.filt) NRA leach	<0.1 µg/l	TM152		<0.1	<0.1	<0.1	
Chromium (diss.filt) NRA leach	<0.22 µg/l	TM152		0.646	3.68	3.39	
Copper (diss.filt) NRA leach	<0.85 µg/l	TM152		<0.85	3.37	8.67	
Lead (diss.filt) NRA leach	<0.02 µg/l	TM152		1.66	4.94	11.9	
Molybdenum (diss.filt) NRA leach	<0.24 µg/l	TM152		0.902	3.55	4.98	
Nickel (diss.filt) NRA leach	<0.15 µg/l	TM152		1.19	3.4	2.52	
Selenium (diss.filt) NRA leach	<0.39 µg/l	TM152		1.07	1.58	1.31	
Zinc (diss.filt) NRA leach	<0.41 µg/l	TM152		0.92	9.8	13.2	
PCB congener 28	<3 µg/kg	TM168		16.4 #	<6 #	<6 #	<3 M
PCB congener 52	<3 µg/kg	TM168		<3 #	<6 #	<6 #	<3 M
PCB congener 101	<3 µg/kg	TM168		<3 #	<6 #	<6 #	<3 M
PCB congener 118	<3 µg/kg	TM168		<3 #	<6 #	<6 #	<3 M
PCB congener 138	<3 µg/kg	TM168		<3 #	<6 #	<6 #	<3 M
PCB congener 153	<3 µg/kg	TM168		<3 #	<6 #	<6 #	<3 M
PCB congener 180	<3 µg/kg	TM168		<3 #	<6 #	<6 #	<3 M
PCBs, Total ICES 7	<3 µg/kg	TM168		16.4	<6	<6	<3
ANC @ pH 4	<0.03 mol/kg	TM182		0.204 #	0.104 #	0.238 #	0.336 #
ANC @ pH 6	<0.03 mol/kg	TM182		0.0631 #	<0.03 #	0.0313 #	0.0639 #
Mercury (diss.filt) NRA leach	<0.01 µg/l	TM183		<0.01	<0.01	<0.01	
Polyaromatic hydrocarbons, Total 17	<10 mg/kg	TM213		<10	<10	<10	<10
Chloride NRA leach	<0.07 mg/l	TM226		23.5	21.5	10.3	
Fluoride NRA leach	<0.04 mg/l	TM226		<0.4	<0.4	<0.4	
Sulphate NRA leach	<0.1 mg/l	TM226		2.08	37.9	20.6	
Phenols, Total monohydric NRA leach	<0.015 mg/l	TM259		<0.015	<0.015	<0.015	

Validated

ALcontrol Laboratories Analytical Services

SDG	100901-78	**Customer:**	Clare County Council
Job:	D_CLARE_ENS-11	**Attention:**	Cathal Brodie
Client Reference:	Kilrush Landfill	**Order No.:**	400228482
Location:	Kilrush Landfill	**Report No:**	97011

GRO by GC-FID (S)

Results Legend
- # ISO17025 accredited.
- M mCERTS 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 the individual compounds within the samples are not corrected for this recovery.

Customer Sample Ref.	10-1573	10-1577	10-1578	10-1602
Depth (m)				
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	30/08/2010	30/08/2010	30/08/2010	30/08/2010
Date Received	01/09/2010	01/09/2010	01/09/2010	01/09/2010
SDG Ref	100901-78	100901-78	100901-78	100901-78
Lab Sample No.(s)	2029589	2029884	2029903	2055225
AGS Reference				

Component	LOD/Units	Method				
GRO Surrogate % recovery**	%	TM089	55	21	35	45
Benzene	<10 µg/kg	TM089	<10 #	<10 #	<10 #	
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089				<10 #
Benzene	<10 µg/kg	TM089				<20 M
Toluene	<2 µg/kg	TM089	8 #	<2 #	7.4 #	
Toluene	<2 µg/kg	TM089				<4 M
Ethylbenzene	<3 µg/kg	TM089	<3 #	<3 #	29.6 #	<6 M
m,p-Xylene	<6 µg/kg	TM089				<12 M
m,p-Xylene	<6 µg/kg	TM089	<6 #	<6 #	<6 #	
o-Xylene	<3 µg/kg	TM089				<6 M
o-Xylene	<3 µg/kg	TM089	<3 #	<3 #	<3 #	
m,p,o-Xylene	<10 µg/kg	TM089	<10 #	<10 #	<10 #	
BTEX, Total	<10 µg/kg	TM089	<10 #	<10 #	37 #	
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089	<5 #	<5 #	<5 #	

ALcontrol Laboratories Analytical Services

ALcontrol Laboratories

CEN 10:1 ONE STAGE BATCH TEST

REF-CEN12457-3

Client Reference	Kilrush Landfill	**Client Location**	Kilrush Landfill
Mass Sample taken (kg)	0.486	**Moisture Content Ratio (%)**	440
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	18.5
Particle Size <4mm	>95%		

Case				
SDG	100901-78			
Lab Sample Number(s)	2055225			
Sampled Date	30-Aug-2010			
Customer Sample Ref.	10-1602			
Depth (m)				

Solid Waste Analysis	**Result**			
Total Organic Carbon (%)	39.9	-	-	-
Loss on Ignition (%)	82.4	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	<0.003	-	-	-
Mineral Oil (mg/kg)	313	-	-	-
PAH Sum of 17 (mg/kg)	<10.0	-	-	-
pH (pH Units)	6.77	-	-	-
ANC to pH 6 (mol/kg)	0.0639	-	-	-
ANC to pH 4 (mol/kg)	0.336	-	-	-

Eluate Analysis	**C_2 Conc^n in 10:1 eluate (mg/l)**		**A_2 10:1 conc^n leached (mg/kg)**		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Arsenic	0.00844	<0.00012	0.0844	<0.0012	-	-	-
Barium	0.0168	<0.00003	0.168	<0.0003	-	-	-
Cadmium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Chromium	0.00384	<0.00022	0.0384	<0.0022	-	-	-
Copper	0.0108	<0.00085	0.108	<0.0085	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Molybdenum	0.00395	<0.00024	0.0395	<0.0024	-	-	-
Nickel	0.00694	<0.00015	0.0694	<0.0015	-	-	-
Lead	0.0111	<0.00002	0.111	<0.0002	-	-	-
Antimony	0.00165	<0.00016	0.0165	<0.0016	-	-	-
Selenium	0.00763	<0.00039	0.0763	<0.0039	-	-	-
Zinc	0.018	<0.00041	0.18	<0.0041	-	-	-
Chloride	-	-	-	-	-	-	-
Fluoride	-	-	-	-	-	-	-
Sulphate (soluble)	-	-	-	-	-	-	-
Total Dissolved Solids	-	-	-	-	-	-	-
Total Monohydric Phenols (W)	<0.015	<0.015	<0.15	<0.15	-	-	-
Dissolved Organic Carbon	200	<6	2000	<60	-	-	-

Leach Test Information

Date Prepared	08-Sep-2010
pH (pH Units)	7.45
Conductivity (µS/cm)	1,010.00
Temperature (°C)	21.80
Volume Leachant (Litres)	0.504
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

Mcerts Certification does not apply to leachates

ALcontrol Laboratories Analytical Services

CEN 10:1 ONE STAGE BATCH TEST

ALcontrol Laboratories

REF-CEN12457-3

Client Reference	Kilrush Landfill	**Client Location**	Kilrush Landfill
Mass Sample taken (kg)	0.486	**Moisture Content Ratio (%)**	440
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	18.5
Particle Size <4mm	>95%		

Case				
SDG	100901-78			
Lab Sample Number(s)	2055225			
Sampled Date	30-Aug-2010			
Customer Sample Ref.	10-1602			
Depth (m)				

Solid Waste Analysis	**Result**			
Total Organic Carbon (%)	39.9	-	-	-
Loss on Ignition (%)	82.4	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	<0.003	-	-	-
Mineral Oil (mg/kg)	313	-	-	-
PAH Sum of 17 (mg/kg)	<10.0	-	-	-
pH (pH Units)	6.77	-	-	-
ANC to pH 6 (mol/kg)	0.0639	-	-	-
ANC to pH 4 (mol/kg)	0.336	-	-	-

Eluate Analysis	**C_2 Conc^n in 10:1 eluate (mg/l)**		**A_2 10:1 conc^n leached (mg/kg)**		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Chloride (W)	122	<0.7	1220	<7	-	-	-
Fluoride (W)	<0.4	<0.4	<4	<4	-	-	-
Sulphate (W)	114	<4	1140	<10	-	-	-
Total Dissolved Solids (Grav)	838	<40	8380	<400	-	-	-

Leach Test Information

Date Prepared	08-Sep-2010
pH (pH Units)	7.45
Conductivity (µS/cm)	1,010.00
Temperature (°C)	21.80
Volume Leachant (Litres)	0.504
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

Mcerts Certification does not apply to leachates

16/09/2010, 11:30:57

Table of Results - Appendix

SDG Number : 100901-78 **Client :** D_CLARE_ENS **Client Ref :** Kilrush Landfill

REPORT KEY

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10-7

NDP	No Determination Possible	#	ISO 17025 Accredited	*	Subcontracted Test	M	MCERTS Accredited
NFD	No Fibres Detected	PFD	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM023	Leaching test method for the Assessment of Contaminated Land: Interim NRA Guidance. National Rivers Authority R & D note 301. (1994).	Leaching Procedure for NRA Leachates		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
PM114		Leaching Procedure for CEN Two Stage BatchTest 2:1/8:1 Cumulative		
PM114		Leaching Procedure for CEN Two Stage BatchTest 2:1/8:1 Cumulative		
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step		
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step		
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition		
TM021	Method 2540C, AWWA/APHA, 20th Ed., 1999	Determination of total dissolved solids in waters by gravimetry.		
TM021	Method 2540C, AWWA/APHA, 20th Ed., 1999	Determination of total dissolved solids in waters by gravimetry.		
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples		
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)		
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water		
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water		
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser		
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser		
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		
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water		
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water		
TM132	In - house Method	ELTRA CS800 Operators Guide		
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils		
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS		
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils		
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		
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		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM191	Standard Methods for the examination of waters and wastewaters 16th Edition, ALPHA, Washington DC, USA. ISBN 0-87553-131-8.	Determination of Unfiltered Metals in Water Matrices by ICP-MS		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM213	In-house Method	Rapid Determination of PAHs by GC-FID		
TM226	In-House Method	Determination of Anions in Waters using Ion Chromatography		
TM226	In-House Method	Determination of Anions in Waters using Ion Chromatography		
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		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		

ALcontrol Laboratories Analytical Services

ALcontrol Laboratories

Table of Results - Appendix

SDG Number : 100901-78 **Client :** D_CLARE_ENS **Client Ref :** Kilrush Landfill

REPORT KEY

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10-7

NDP	No Determination Possible	#	ISO 17025 Accredited	*	Subcontracted Test	M	MCERTS Accredited
NFD	No Fibres Detected	PFD	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM231	Agilent 6890 Gas Chromatograph system using an Agilent 5973 Mass Selective Detector (MSD)	Determination of Organochlorine and Organophosphorus Pesticides and Triazine Herbicides by GCMS		
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		
TM259				
TM259				

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

Notification of NDPs (No determination possible)

SDG Number	100901-78	**Location**	Kilrush Landfill
Client	D_CLARE_ENS	**Order No.**	400228482
Client Reference	Kilrush Landfill	**Report No.**	57439-3
Attention	Cathal Brodie	**Date Received**	01/09/2010 14:16:07

Sample No	Customer Sample Ref.	Depth (m)	Test	Comment
2029589	10-1573		Anions by Kone (w)	Sample unsuitable for analysis
2029589	10-1573		Dissolved Metals by ICP-MS	Sample unsuitable for analysis
2029589	10-1573		Dissolved Organic/Inorganic Carbon	Sample unsuitable for analysis
2029589	10-1573		Fluoride	Sample unsuitable for analysis
2029589	10-1573		Mercury Dissolved	Sample unsuitable for analysis
2029589	10-1573		Phenols by HPLC (W)	Sample unsuitable for analysis
2029589	10-1573		Total Dissolved Solids	Sample unsuitable for analysis
2029884	10-1577		Anions by Kone (w)	Sample unsuitable for analysis
2029884	10-1577		CEN 2:1 Leachate (2 Stage)	Sample unsuitable for analysis
2029884	10-1577		CEN 2:1 Readings	Sample unsuitable for analysis
2029884	10-1577		Dissolved Metals by ICP-MS	Sample unsuitable for analysis
2029884	10-1577		Dissolved Organic/Inorganic Carbon	Sample unsuitable for analysis
2029884	10-1577		Fluoride	Sample unsuitable for analysis
2029884	10-1577		Mercury Dissolved	Sample unsuitable for analysis
2029884	10-1577		Phenols by HPLC (W)	Sample unsuitable for analysis
2029884	10-1577		Total Dissolved Solids	Sample unsuitable for analysis
2029903	10-1578		Anions by Kone (w)	Sample unsuitable for analysis
2029903	10-1578		CEN 2:1 Leachate (2 Stage)	Sample unsuitable for analysis
2029903	10-1578		CEN 2:1 Readings	Sample unsuitable for analysis
2029903	10-1578		Dissolved Organic/Inorganic Carbon	Sample unsuitable for analysis
2029903	10-1578		Fluoride	Sample unsuitable for analysis
2029903	10-1578		Mercury Dissolved	Sample unsuitable for analysis
2029903	10-1578		Phenols by HPLC (W)	Sample unsuitable for analysis
2029903	10-1578		Total Dissolved Solids	Sample unsuitable for analysis
2029903	10-1578		Dissolved Metals by ICP-MS	UNSUITABLE FOR ANALYSIS'
2029589	10-1573		Anions by Kone (w)	Insufficient Sample
2029589	10-1573		CEN 10:1 Leachate (1 Stage)	Insufficient Sample
2029589	10-1573		CEN Readings	Insufficient Sample
2029589	10-1573		Dissolved Metals by ICP-MS	Insufficient Sample
2029589	10-1573		Dissolved Organic/Inorganic Carbon	Insufficient Sample
2029589	10-1573		Fluoride	Insufficient Sample
2029589	10-1573		Mercury Dissolved	Insufficient Sample
2029589	10-1573		Phenols by HPLC (W)	Insufficient Sample
2029589	10-1573		Total Dissolved Solids (Grav)	Insufficient Sample
2029884	10-1577		Anions by Kone (w)	Insufficient Sample
2029884	10-1577		CEN 10:1 Leachate (1 Stage)	Insufficient Sample
2029884	10-1577		CEN Readings	Insufficient Sample
2029884	10-1577		Dissolved Metals by ICP-MS	Insufficient Sample
2029884	10-1577		Dissolved Organic/Inorganic Carbon	Insufficient Sample
2029884	10-1577		Fluoride	Insufficient Sample
2029884	10-1577		Mercury Dissolved	Insufficient Sample
2029884	10-1577		Phenols by HPLC (W)	Insufficient Sample
2029884	10-1577		Total Dissolved Solids (Grav)	Insufficient Sample
2029903	10-1578		Anions by Kone (w)	Insufficient Sample

SDG Number	100901-78	**Location**	Kilrush Landfill
Client	D_CLARE_ENS	**Order No.**	400228482
Client Reference	Kilrush Landfill	**Report No.**	57439-3
Attention	Cathal Brodie	**Date Received**	01/09/2010 14:16:07

Sample No	Customer Sample Ref.	Depth (m)	Test	Comment
2029903	10-1578		CEN 10:1 Leachate (1 Stage)	Insufficient Sample
2029903	10-1578		CEN Readings	Insufficient Sample
2029903	10-1578		Dissolved Metals by ICP-MS	Insufficient Sample
2029903	10-1578		Dissolved Organic/Inorganic Carbon	Insufficient Sample
2029903	10-1578		Fluoride	Insufficient Sample
2029903	10-1578		Mercury Dissolved	Insufficient Sample
2029903	10-1578		Phenols by HPLC (W)	Insufficient Sample
2029903	10-1578		Total Dissolved Solids (Grav)	Insufficient Sample
2055225	10-1602		Anions by Kone (w)	unsuitable for analysis'
2055225	10-1602		CEN 2:1 Leachate (2 Stage)	unsuitable for analysis'
2055225	10-1602		CEN 2:1 Readings	unsuitable for analysis'
2055225	10-1602		Dissolved Metals by ICP-MS	unsuitable for analysis'
2055225	10-1602		Dissolved Organic/Inorganic Carbon	unsuitable for analysis'
2055225	10-1602		Fluoride	unsuitable for analysis'
2055225	10-1602		Mercury Dissolved	unsuitable for analysis'
2055225	10-1602		Phenols by HPLC (W)	unsuitable for analysis'
2055225	10-1602		Total Dissolved Solids	unsuitable for analysis'

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH_4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS 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 both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos 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. ALcontrol Laboratories 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 screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
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. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. Results relate only to the items tested
13. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 – 130 %.
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 14).
17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
18. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
19. 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 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.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
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 C4 – C10 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.

Last updated 1 April 2010

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKE	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM	LIQUID/LIQUID SHAKE	GC MS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GC FID

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

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 MDHS 100.

The identification of asbestos containing materials 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.

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

Sample code references:

10-1573 Trial Hole 2

10-1574 Trial Hole 8

10-1575 Surface water upstream

10-1576 Surface water downstream

10-1577 Trial Hole 5

10-1578 Trial Hole 7

10-1579 Trial Hole 9

10-1580 Surface water, Wood River.

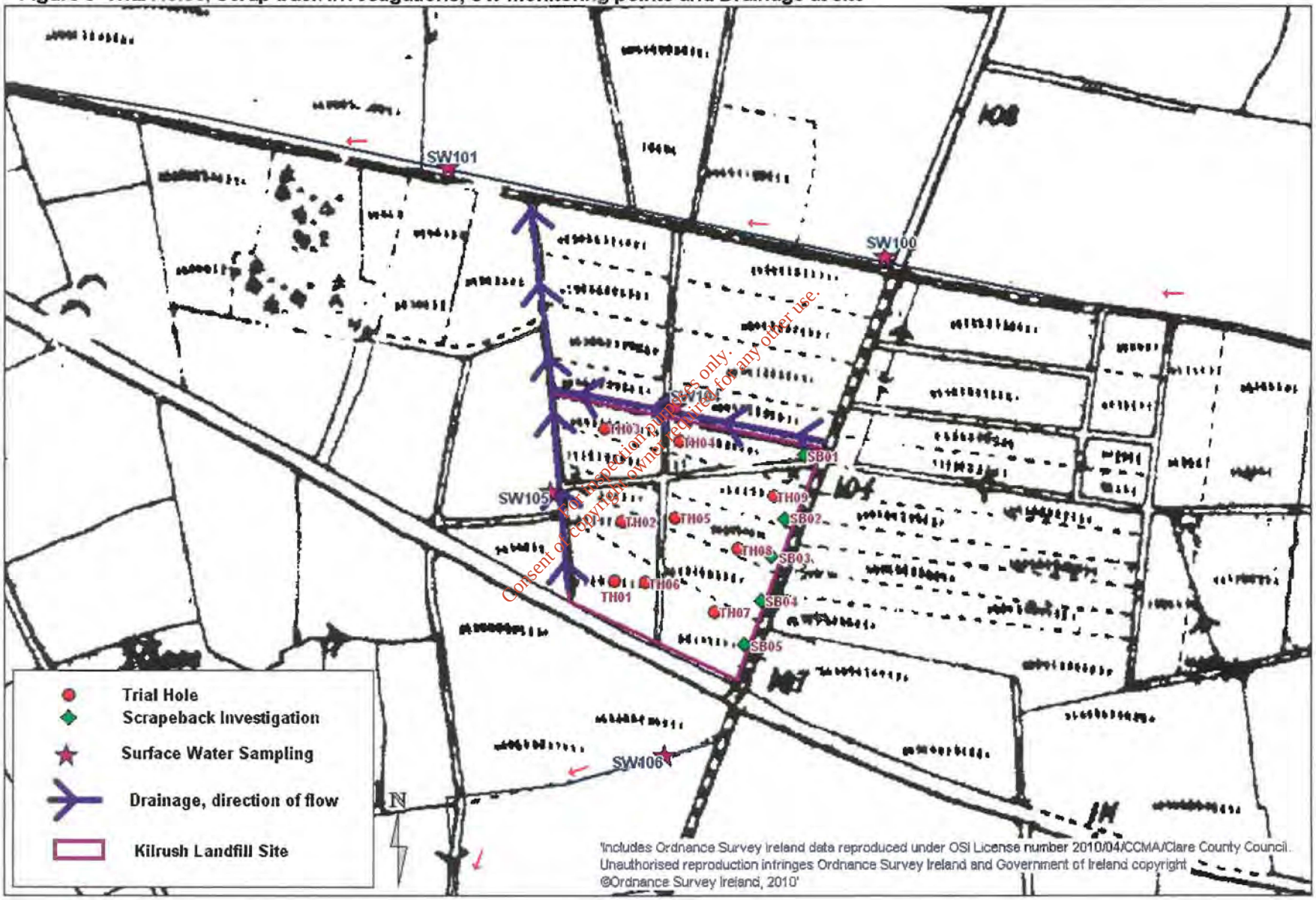
10-1581 up gradient bore well.

10-1602 Soil sample from Trial holes 2, 5 & 7, mixed.

Appendix B

Site map with location of Trial Holes

Figure 6 Trial Holes, Scrap-back investigations, SW monitoring points and Drainage at site



Appendix C

Observation logs of Trial Holes at Kilrush site

Trial hole profiles.

Trial Hole Number	**1**
GPS coordinates	E102702; N154483
Odour	Landfill gas odour from machine vibration.
Depth to bedrock	None encountered
Capping composition	Building rubble to 400mm
Waste type	Plastic, cable casings, bottles
Subsoil depth and composition	Peat at 3.0m
Leachate	Present at 1.4m
Water table	Perched at 1.4
Groundwater flow direction	NE to SW
Samples taken.	None

Trial Hole Number	**2**
GPS coordinates	E102706; N154520
Odour	Landfill gas on breaking the ground
Depth to bedrock	None encountered.
Capping composition	Minimal, waste at ground level.
Waste type	Cable casings, plastic(90%), domestic. Dates BB May 1991 & August 1992.
Subsoil depth and composition	Peat at 4.3m
Leachate	Present at different levels
Water table	Water ingress at 1.0m
Groundwater flow direction	W to E
Samples taken.	Subsoil, leachate-full suite.

Trial Hole Number	**3**
GPS coordinates	E102696; N154577
Odour	Landfill gas on breaking the ground
Depth to bedrock	None encountered.
Capping composition	100mm
Waste type	Municipal 100%. Very dry. BB date Feb & June 1993
Subsoil depth and composition	Peat 4.5m. Level with adjoining land.
Leachate	None present
Water table	Not encountered
Groundwater flow direction	N/A
Samples taken.	

Trial Hole Number	4
GPS coordinates	E102742; N154569
Odour	Slight odour
Depth to bedrock	None encountered.
Capping composition	None
Waste type	Farm plastic, some municipal. Very black maybe evidence of burning. Dumper tyre and some car parts. BB date July 1990.
Subsoil depth and composition	Peat at 4.0m. Level with adjoining land.
Leachate	None
Water table	Water ingress at 2.8m and seepage from 1m.
Groundwater flow direction	Unclear.
Samples taken.	

Trial Hole Number	5
GPS coordinates	E102739; N154522
Odour	Landfill gas odour.
Depth to bedrock	None encountered.
Capping composition	100mm of topsoil
Waste type	Very low municipal content. Plastic and mixed rubble.
Subsoil depth and composition	Peat at 3.7m
Leachate	Sampled at 1.6m
Water table	Water ingress at 1.5m from all sides.
Groundwater flow direction	All directions.
Samples taken.	Leachate (Indicator), peat, and water flow at gravel seam.

Trial Hole Number	6
GPS coordinates	E102721; N154480
Odour	Landfill gas odour.
Depth to bedrock	None encountered.
Capping composition	250mm of topsoil and gravel.
Waste type	Municipal with high plastic content. Newspaper dated August 1982 from near bottom of hole.
Subsoil depth and composition	Peat at 3.7m
Leachate	Present
Water table	Water ingress at 2m
Groundwater flow direction	Multiple flows from east direction.
Samples taken.	No samples

Trial Hole Number	7
GPS coordinates	E102764; N154464
Odour	Landfill gas odour.
Depth to bedrock	None encountered.
Capping composition	200mm of topsoil and gravel.
Waste type	90% building rubble, plastic, black bags and cables. Some evidence of burning.
Subsoil depth and composition	Peat at 3.7m
Leachate	Leachate at 1.4m
Water table	Water ingress at 1.4
Groundwater flow direction	From all sides.
Samples taken.	Leachate indicator.

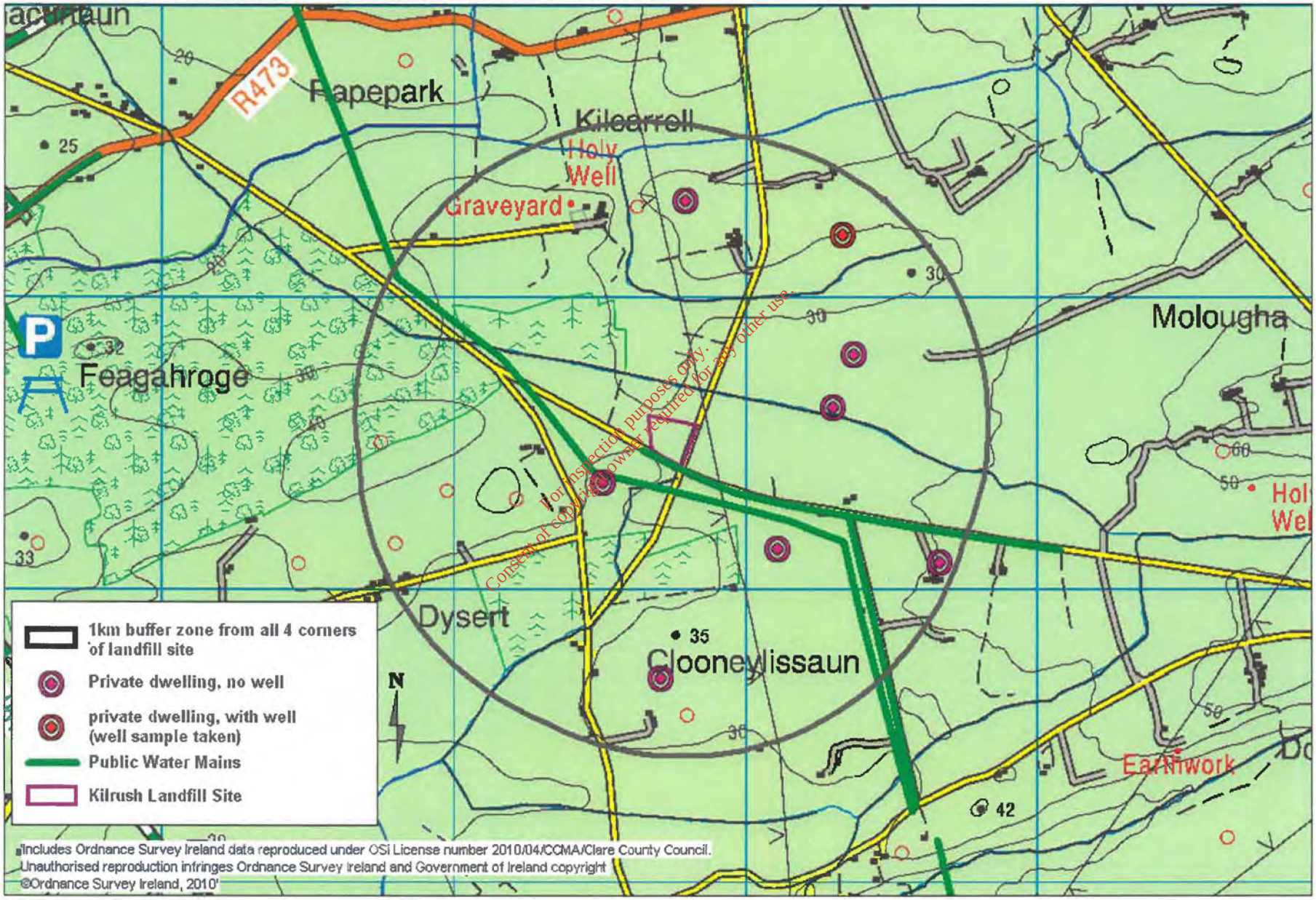
Trial Hole Number	8
GPS coordinates	E102778; N154503
Odour	Landfill gas odour.
Depth to bedrock	None encountered.
Capping composition	None
Waste type	Plastic 90%
Subsoil depth and composition	Peat at 4.0m
Leachate	Ponding at 2.3m
Water table	Water at 2.3m
Groundwater flow direction	All directions.
Samples taken.	

Trial Hole Number	9
GPS coordinates	E102800; N154536``
Odour	Landfill gas odour.
Depth to bedrock	None encountered.
Capping composition	None
Waste type	100% commercial/industrial. No house hold waste. Some furniture making cloth and plastic. Very dry and very loose. Metal cased IBC.
Subsoil depth and composition	Peat at 1.9, level with adjoining land
Leachate	None
Water table	Not encountered. Level with base of dry surface water drain
Groundwater flow direction	N/A
Samples taken.	

Appendix D

Site location map, with 1 kilometre radius around landfill site, and public water supply

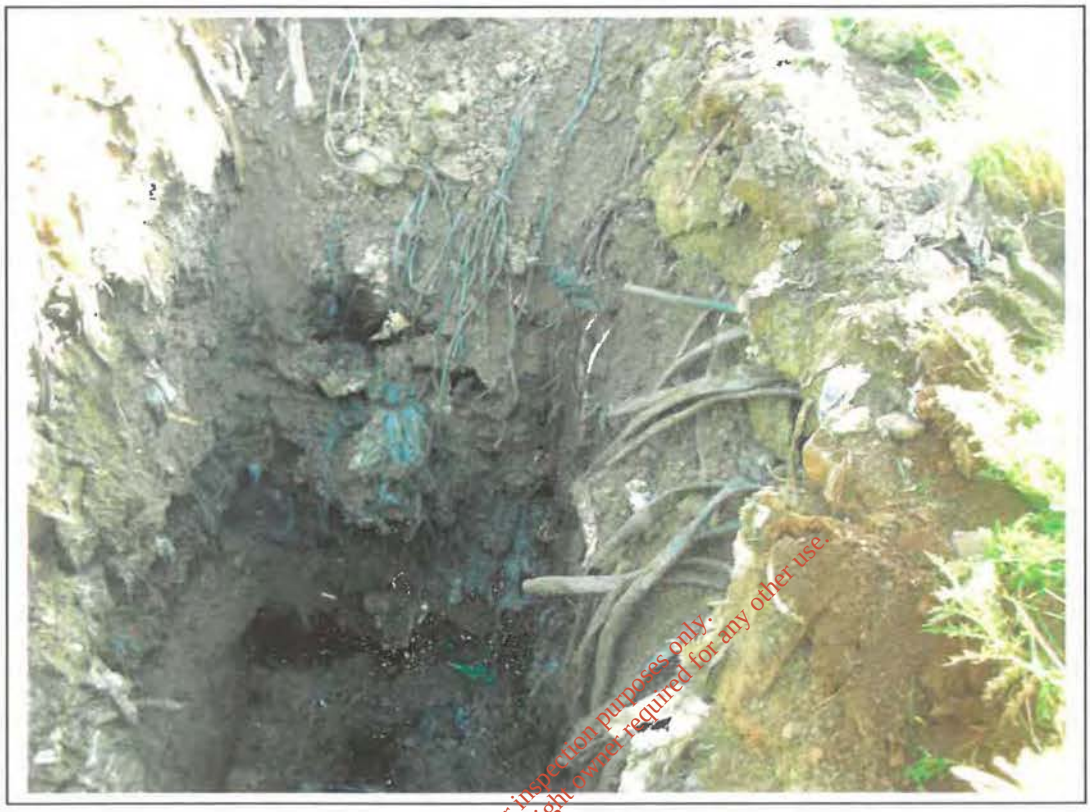
Figure 7 Private Houses, Mains Water Supply and 1km Buffer from site



Appendix E.

Trial Hole Photos.

Trial Hole 1



Trial Hole 1

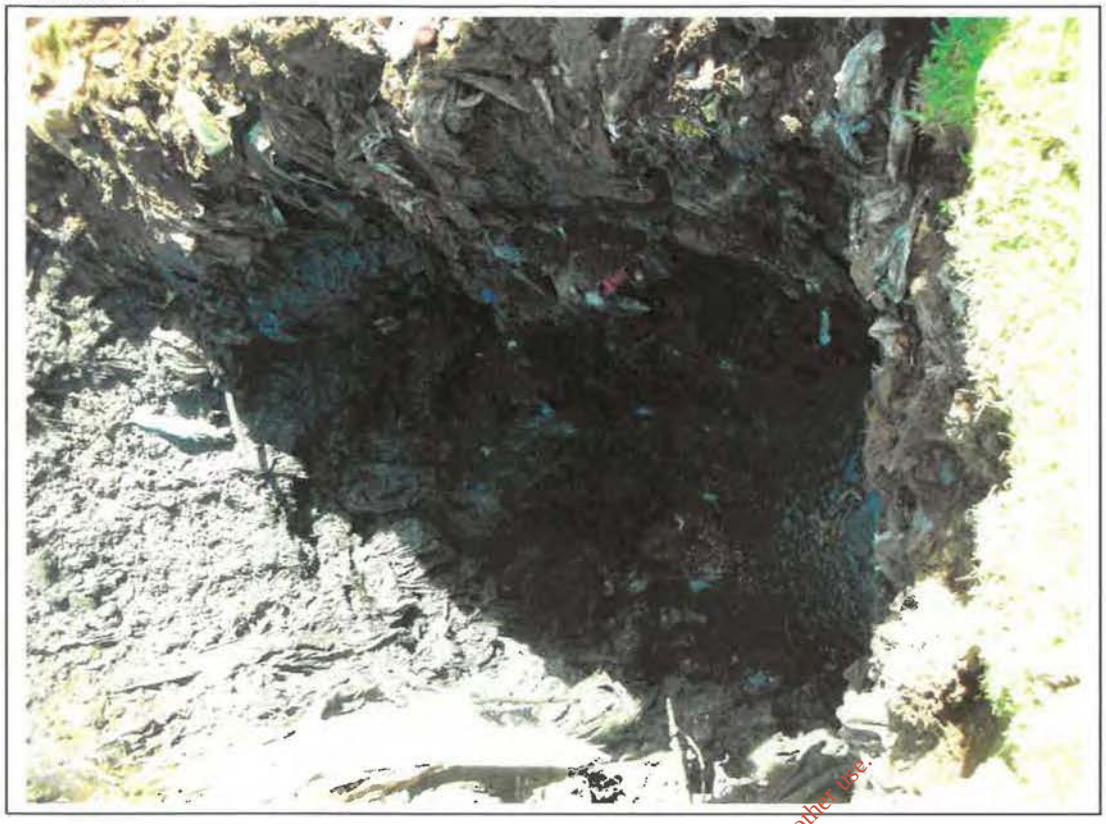
Trial Hole 3

Trial hole 3

Trial hole 4

Trial Hole 4

Trial Hole 5



Trial hole 6

Trial Hole 6

Trial Hole 7

Trial hole 9 upholstry material

Trial hole 9, upholstery material

Appendix F
Map of Wood River Monitoring Points.

Figure 8 Q Data for Wood River

Wood River Q Data.

River Water Quality data, baseline to 2009

1998 - 2003 EPA monitoring results
2005 - 2007 Clare County Council monitoring results (biological monitoring carried out by Conservation Services (CS))

obs - obselete site, not monitored by EPA

silted - siltation observed
t - tentative result due to conditions e.g. channel works, saline influenced

												ClareCoCo - Conservation Services			
River Name	**Code**	**St. No.**	**Station Location**	**1998-2000**	**2001-2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2004**	**2005**	**2006**	**2007**
WOOD	27W01	25	Br NE Kilcarroll	2-3	3		3		3			2	2-3/0	2-3/0	2-3/0
WOOD	27W01	80	Br E. of Ballykett Fair Grn	3	3		4					3	3	3	3 silted
WOOD	27W01	100	Bridge 1.5 km u/s Kilrush	3	3		3		3			3	3	3	3 silted
WOOD	27W01	200	Kilrush: 100 m u/s West Br	4	3-4		4		3			3	3	3	3

APPENDIX 4

Surface Water Laboratory Results

See Separate Volume

City Analysts Limited,
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Dublin 4.

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Fax: (01) 613 6008

Email:
reports@cityanalysts.ie

www.cityanalysts.ie

Customer

Tim McMahon

Clare County Council
Aras Contae an Chláir
New Road
Ennis
Co. Clare

Certificate Of Analysis

Job Number: 20-76447
Issue Number: 1
Report Date: 15 July 2020

Site: Not Applicable
PO Number: 400420003
Date Samples Received: 13/05/2020

Please find attached the results for the samples received at our laboratory on 13/05/2020.

Should you have any queries regarding the report or require any further services, we would be happy to discuss your requirements. For additional information about the company please log-on to our website at the above address.

Thank you for choosing City Analysts Limited. We look forward to assisting you again.

Authorised By: Shane Reynolds
Laboratory Manager

Authorised Date: 15 July 2020

Notes are not INAB accredited

Results relate only to the items tested.
Information on methods of analysis and uncertainty of measurement is available on request.
Any opinions or interpretations indicated are outside the scope of our INAB accreditation.
This test report shall not be reproduced except in full or with written approval of City Analysts Limited.

City Analysts Limited
Environmental Laboratories

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Ringsend,
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Certificate Of Analysis

Customer

Tim McMahon

Clare County Council
Aras Contae an Chláir
New Road
Ennis
Co. Clare

Report Reference: 20-76447

Report Version: 1

Site: Not Applicable

Sample Description: 20-0628

Sample Type: Surface

Lab Reference Number: 507720

Date of Sampling: 13/05/2020

Time of Sampling: 00:00

Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D3000#	14/05/2020	Alkalinity CaCO3	42.620	mg/l	-
D/D3000#	14/05/2020	Ammonia as N	0.010	mg/l	-
S/S1003#	13/05/2020	BOD5	< 2	mg/l O2	-
D/D3000#	14/05/2020	Chloride	40.037	mg/l	-
S/S1009#	13/05/2020	COD	50	mg/l O2	-
S/S3011#	13/05/2020	Conductivity @ 20°C	168.0	uS/cm @20°C	-
*	-	Dissolved Methane	< 0.050	mg/l	-
S/S1003#	13/05/2020	Dissolved Oxygen	9.43	mg/l O2	-
D/D3015#	19/05/2020	Fluoride	< 0.1	mg/l	-
DEAFULT*U	-	Total Cyanide High	< 10.0000	ug/L	-
EW188#*	-	Nickel-Dissolved	2.2	ug/l	-
EW188#*	-	Copper-Dissolved	0.008	mg/l	-
EW188#*	-	Sodium-Dissolved	20.1	mg/l	-
EW188#*	-	Arsenic-Dissolved	< 0.2	ug/L	-
EW188#*	-	Calcium-Dissolved	15.6	mg/l	-
EW188#*	-	Manganese-Dissolved	< 1.0	ug/l	-
EW188#*	-	Magnesium-Dissolved	5.0	mg/l	-
EW188#*	-	Zinc-Dissolved	5.9	ug/l	-

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

Note:
PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water samples.
For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely.
NAC & ATC - No abnormal change and acceptable to customers.
TVC - Total viable count
Site D = Analysed at City Analysts Dublin. Site S = Analysed at City Analysts Shannon

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Report Reference: 20-76447

Report Version: 1

Site: Not Applicable

Sample Description: 20-0628

Sample Type: Surface

Lab Reference Number: 507720

Date of Sampling: 13/05/2020

Time of Sampling: 00:00

Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
EW188#*	-	Chromium-Dissolved	< 1.0	ug/l	-
EW188#*	-	Cadmium-Dissolved	< 0.1	ug/l	-
EW188#*	-	Lead-Dissolved	0.4	ug/l	-
EW188#*	-	Potassium-Dissolved	1.7	mg/l	-
EW188#*	-	Mercury-Dissolved	0.03	ug/l	-
EW188#*	-	Iron-Dissolved	1900	ug/l	-
EW188#*	-	Boron-Dissolved	0.04	mg/l	-
S/S1041#	13/05/2020	PH	7.50	pH Unit	-
S/D3000#	14/05/2020	Phosphorus, Total as P	< 0.200	mg/l	-
D/D3000#	14/05/2020	Sulphate	< 20.000	mg/l	-
S/S	13/05/2020	Total Dissolved Solids	98.000	mg/l	-
S/S	14/05/2020	Temperature	12.8	℃	-
S/S3224	18/05/2020	Total Organic Carbon	20.880	mg/l	-
D/D3000#	14/05/2020	TON as N	< 2.000	mg/l	-
S/S1049#	15/05/2020	Total Suspended Solids	4	mg/l	-
S/S1201#	13/05/2020	Coliforms	816.4	MPN/100ml	-
S/S1201#	13/05/2020	E.coli	24.1	MPN/100ml	-
S/S3221#	13/05/2020	Faecal Coliforms	31	cfu/100ml	-

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

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

Report Reference: 20-76447

Report Version: 1

Site: Not Applicable

Sample Description: 20-0628

Sample Type: Surface

Lab Reference Number: 507720

Date of Sampling: 13/05/2020

Time of Sampling: 00:00

Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
SVOC					
*	-	1-2-4-Trichlorobenzene	< 1.00	ug/l	-
*	-	1,2-Dichlorobenzene	< 1.00	ug/l	-
*	-	1-3-Dichlorobenzene	< 1.00	ug/l	-
*	-	1-4-Dichlorobenzene	< 1.00	ug/l	-
*	-	2 4 5-Trichlorophenol	< 1.00	ug/l	-
*	-	2,4,6-Trichlorophenol	< 1.00	ug/l	-
*	-	2-4-Dichlorophenol	< 1.00	ug/l	-
*	-	2,4-Dimethylphenol	< 1.00	ug/l	-
*	-	2-4-Dinitrotoluene	< 1.00	ug/l	-
*	-	2-6-Dinitrotoluene	< 1.00	ug/l	-
*	-	2-Chloronaphthalene	< 1.00	ug/l	-
*	-	2-Chlorophenol	< 1.00	ug/l	-
*	-	2-Methynaphthalene	< 1.00	ug/l	-
*	-	2-Methylphenol	< 1.00	ug/l	-
*	-	2-Nitroaniline	< 1.00	ug/l	-
*	-	2-Nitrophenol	< 1.00	ug/l	-
*	-	3-Nitroaniline	< 1.00	ug/l	-

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

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

Customer

Tim McMahon

Clare County Council
Aras Contae an Chláir
New Road
Ennis
Co. Clare

Report Reference: 20-76447

Report Version: 1

Site: Not Applicable

Sample Description: 20-0628

Sample Type: Surface

Lab Reference Number: 507720

Date of Sampling: 13/05/2020

Time of Sampling: 00:00

Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
*	-	4-Bromophenyl phenyl ether	< 1.00	ug/l	-
*	-	4-Chloro-3-methylphenol	< 1.00	ug/l	-
*	-	4-Chloroaniline	< 1.00	ug/l	-
*	-	4-Chlorophenyl phenyl ether	< 1.00	ug/l	-
*	-	4-Methylphenol	< 1.00	ug/l	-
*	-	4-Nitrophenol	< 1.00	ug/l	-
*	-	4-Nitroaniline	< 1.00	ug/l	-
*	-	Azobenzene	< 1.00	ug/l	-
*	-	Acenaphthene	< 1.00	ug/l	-
*	-	Acenaphthylene	< 1.00	ug/l	-
*	-	Anthracene	< 1.00	ug/l	-
*	-	Bis(2-chloroethyl)ether	< 1.00	ug/l	-
*	-	Bis(2-chloroethoxy)methane	< 1.00	ug/l	-
*	-	Bis(2-ethylhexyl)phthalate	< 2.00	ug/l	-
*	-	Benzo(a)anthracene	< 1.00	ug/l	-
*	-	Butyl benzyl phthalate	< 1.00	ug/l	-
*	-	Benzo(b)fluoranthene	< 1.00	ug/l	-
*	-	Benzo(k)fluoranthene	< 1.00	ug/l	-

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*	-	Benzo(a)pyrlene	< 1.00	ug/l	-
*	-	Benzo(ghi)perylene	< 1.00	ug/l	-
*	-	Carbazole	< 1.00	ug/l	-
*	-	Chrysene	< 1.00	ug/l	-
*	-	Dibenzofuran	< 1.00	ug/l	-
*	-	n-Dibutyl phthalate	< 1.00	ug/l	-
*	-	Diethyl phthalate	< 1.00	ug/l	-
*	-	Dibenzo(a,h)anthracene	< 1.00	ug/l	-
*	-	Dimethyl phthalate	< 1.00	ug/l	-
*	-	n-Dioctyl phthalate	< 5.00	ug/l	-
*	-	Fluoranthene	< 1.00	ug/l	-
*	-	Fluorene	< 1.00	ug/l	-
*	-	Hexachlorobenzene	< 1.00	ug/l	-
*	-	Hexachlorobutadiene	< 1.00	ug/l	-
*	-	Pentachlorophenol	< 1.00	ug/l	-
*	-	Phenol	< 1.00	ug/l	-
*	-	N-Nitrosodi-n-propylamine	< 1.00	ug/l	-
*	-	Hexachloroethane	< 1.00	ug/l	-

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Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
*	-	Napthalene	< 1.00	ug/l	-
*	-	Napthalene	< 1.00	ug/l	-
*	-	Isophorone	< 1.00	ug/l	-
*	-	Hexachlorocyclopentadiene	< 1.00	ug/l	-
*	-	Phenanthrene	< 1.00	ug/l	-
*	-	Indeno(1,2,3-c,d) pyrene	< 1.00	ug/l	-
*	-	Pyrene	< 1.00	ug/l	-
VOC Full Suite					
EO025#*	-	1,1,1,2-tetrachloroethane	< 2.0	ug/L	-
EO025#*	-	1,1,1-trichloroethane	< 0.5	ug/L	-
EO025#*	-	1,1,2,2-tetrachloroethane	< 0.5	ug/L	-
EO025#*	-	1,1,2-trichloroethane	< 0.5	ug/L	-
EO025#*	-	1,1-dichloroethane	< 0.5	ug/L	-
EO025#*	-	1,2 dicloroethane	< 0.1	ug/L	-
EO025#*	-	1,2,3-trichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2,3-trichloropropane	< 2.0	ug/L	-
EO025#*	-	1,2,4-trichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2,4-trimethylbenzene	< 0.5	ug/L	-

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EO025#*	-	1,2-dibromo-3-chloropropane	< 2.0	ug/L	-
EO025#*	-	1,2-dibromoethane	< 0.5	ug/L	-
EO025#*	-	1,2-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2-dichloropropane	< 0.5	ug/L	-
EO025#*	-	1,3,5-trimethylbenzene	< 0.5	ug/L	-
EO025#*	-	1,3-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	13 Dichloropropene,trans	< 2.0	ug/L	-
EO025#*	-	1,3-dichloropropane	< 0.5	ug/L	-
EO025#*	-	1,4-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	11 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	11 Dichloropropene	< 0.5	ug/L	-
EO025#*	-	13 Dichloropropene,cis	< 2.0	ug/L	-
EO025#*	-	1-Chlorobutane	< 0.5	ug/L	-
EO025*	-	2,2-dichloropropane	< 0.5	ug/L	-
EO025*	-	2-Butanone	< 5.0	ug/L	-
EO025#*	-	2-chlorotoluene	< 0.5	ug/L	-
EO025#*	-	2-Hexanone	< 1.0	ug/L	-
EO025#*	-	2-Propenenitrile/Acrylonitrile	< 2.0	ug/L	-

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Sample Type: Surface

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Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
EO025#*	-	4-chlorotoluene	< 0.5	ug/L	-
EO025*	-	Acetone	< 2.0	ug/L	-
EO025#*	-	Benzene	< 0.1	ug/L	-
EO025#*	-	Bromobenzene	< 0.5	ug/L	-
EO025#*	-	Bromochloromethane	< 0.5	ug/L	-
EO025#*	-	Bromodichloromethane	< 2.0	ug/L	-
EO025#*	-	Bromoform	< 1.0	ug/L	-
EO025#*	-	Bromomethane	< 0.5	ug/L	-
EO025#*	-	Carbon Disulphide	< 0.5	ug/L	-
EO025#*	-	Carbon Tetrachloride	< 0.5	ug/L	-
EO025#*	-	Chlormethyl Cyanide/Chloroacetonitrile	< 0.5	ug/L	-
EO025#*	-	Chlorobenzene	< 0.5	ug/L	-
EO025#*	-	Chloroform	< 1.0	ug/L	-
EO025*	-	Chloromethane	< 0.5	ug/L	-
EO025#*	-	cis-12 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	Dibromochloromethane	< 1.0	ug/L	-
EO025#*	-	Dibromomethane	< 0.5	ug/L	-
EO025*	-	Dichlorodifluoromethane	< 10	ug/L	-

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Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
EO025#*	-	Dichloromethane	< 5.0	ug/L	-
EO025*	-	Ethyl Chloride/Chloroethane	< 0.5	ug/L	-
EO025#*	-	Ethyl Ether/Diethyl Ether	< 0.5	ug/L	-
EO025#*	-	Ethyl Methacrylate	< 2.0	ug/L	-
EO025#*	-	Ethylbenzene	< 0.5	ug/L	-
EO025#*	-	Hexachlorobutadiene	< 0.5	ug/L	-
EO025#*	-	Hexachloroethane	< 5.0	ug/L	-
EO025#*	-	Iodomethane/Methyl Iodide	< 0.5	ug/L	-
EO025#*	-	Isopropylbenzene	< 0.5	ug/L	-
EO025*	-	Methacrylonitrile	< 5.0	ug/L	-
EO025#*	-	Methyl Acrylate	< 0.5	ug/L	-
EO025#*	-	Methyl Methacrylate	< 0.5	ug/L	-
EO025#*	-	MIBK/4 Methyl 2 Pentanone	< 2.0	ug/L	-
EO025#*	-	MtBE	< 0.5	ug/L	-
EO025#*	-	N Butyl Benzene	< 0.5	ug/L	-
EO025*	-	Naphthalene	< 2.0	ug/L	-
EO025*	-	Nitrobenzene	< 0.5	ug/L	-
EO025#*	-	P Isopropyltoluene	< 0.5	ug/L	-

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EO025*	-	Propanenitrile	< 10	ug/L	-
EO025#*	-	Propylbenzene	< 0.5	ug/L	-
EO025#*	-	sec-butylbenzene	< 0.5	ug/L	-
EO025#*	-	Styrene	< 2.0	ug/L	-
EO025#*	-	Tert Butyl Benzene	< 0.5	ug/L	-
EO025#*	-	Tetrachloroethene	< 0.1	ug/L	-
EO025#*	-	Tetrahydrofuran	< 5.0	ug/L	-
EO025#*	-	Toluene	< 0.5	ug/L	-
EO025*	-	Trans 14 Dichloro 2 Butene, tran	< 2.0	ug/L	-
EO025#*	-	Trans-1,2 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	Trichloroethene	< 0.1	ug/L	-
EO025*	-	Trichloromonofluoromethane	< 0.5	ug/L	-
EO025*	-	Vinyl Chloride	< 0.5	ug/L	-
EO025#*	-	Xylene -o	< 0.5	ug/L	-
EO025#*	-	Xylene P&M	< 0.5	ug/L	-
EO025*	-	Epichlorohydrin	< 0.1	ug/L	-

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Report Reference: 20-76447

Report Version: 1

Site: Not Applicable

Sample Description: 20-0629

Sample Type: Surface

Lab Reference Number: 507721

Date of Sampling: 13/05/2020

Time of Sampling: 00:00

Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D3000#	14/05/2020	Alkalinity CaCO3	40.804	mg/l	-
D/D3000#	14/05/2020	Ammonia as N	0.041	mg/l	-
S/S1003#	13/05/2020	BOD5	< 2	mg/l O2	-
D/D3000#	14/05/2020	Chloride	40.018	mg/l	-
S/S1009#	13/05/2020	COD	52	mg/l O2	-
S/S3011#	13/05/2020	Conductivity @ 20°C	171.0	uS/cm @20°C	-
*	-	Dissolved Methane	< 0.050	mg/l	-
S/S1003#	13/05/2020	Dissolved Oxygen	9.53	mg/l O2	-
D/D3015#	19/05/2020	Fluoride	< 0.1	mg/l	-
DEAFULT*U	-	Total Cyanide High	< 10.0000	ug/L	-
EW188#*	-	Boron-Dissolved	0.03	mg/l	-
EW188#*	-	Iron-Dissolved	1800	ug/l	-
EW188#*	-	Potassium-Dissolved	1.7	mg/l	-
EW188#*	-	Sodium-Dissolved	20.1	mg/l	-
EW188#*	-	Mercury-Dissolved	0.07	ug/l	-
EW188#*	-	Manganese-Dissolved	250	ug/l	-
EW188#*	-	Chromium-Dissolved	< 1.0	ug/l	-
EW188#*	-	Magnesium-Dissolved	5.2	mg/l	-

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EW188#*	-	Nickel-Dissolved	0.8	ug/l	-
EW188#*	-	Zinc-Dissolved	9.3	ug/l	-
EW188#*	-	Calcium-Dissolved	16.6	mg/l	-
EW188#*	-	Arsenic-Dissolved	1.2	ug/L	-
EW188#*	-	Copper-Dissolved	0.008	mg/l	-
EW188#*	-	Cadmium-Dissolved	< 0.1	ug/l	-
EW188#*	-	Lead-Dissolved	0.4	ug/l	-
S/S1041#	13/05/2020	PH	7.36	pH Unit	-
S/D3000#	14/05/2020	Phosphorus, Total as P	< 0.200	mg/l	-
D/D3000#	14/05/2020	Sulphate	< 20.000	mg/l	-
S/S	13/05/2020	Total Dissolved Solids	100.000	mg/l	-
S/S	14/05/2020	Temperature	13.2	℃	-
S/S3224	18/05/2020	Total Organic Carbon	22.660	mg/l	-
D/D3000#	14/05/2020	TON as N	< 2.000	mg/l	-
S/S1049#	15/05/2020	Total Suspended Solids	30	mg/l	-
S/S1201#	13/05/2020	Coliforms	1046.2	MPN/100ml	-
S/S1201#	13/05/2020	E.coli	13.4	MPN/100ml	-
S/S3221#	13/05/2020	Faecal Coliforms	21	cfu/100ml	-

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Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
SVOC					
*	-	1-2-4-Trichlorobenzene	< 1.00	ug/l	-
*	-	1,2-Dichlorobenzene	< 1.00	ug/l	-
*	-	1-3-Dichlorobenzene	< 1.00	ug/l	-
*	-	1-4-Dichlorobenzene	< 1.00	ug/l	-
*	-	2 4 5-Trichlorophenol	< 1.00	ug/l	-
*	-	2,4,6-Trichlorophenol	< 1.00	ug/l	-
*	-	2-4-Dichlorophenol	< 1.00	ug/l	-
*	-	2,4-Dimethylphenol	< 1.00	ug/l	-
*	-	2-4-Dinitrotoluene	< 1.00	ug/l	-
*	-	2-6-Dinitrotoluene	< 1.00	ug/l	-
*	-	2-Chloronaphthalene	< 1.00	ug/l	-
*	-	2-Chlorophenol	< 1.00	ug/l	-
*	-	2-Methynaphthalene	< 1.00	ug/l	-
*	-	2-Methylphenol	< 1.00	ug/l	-
*	-	2-Nitroaniline	< 1.00	ug/l	-
*	-	2-Nitrophenol	< 1.00	ug/l	-
*	-	3-Nitroaniline	< 1.00	ug/l	-

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Customer

Tim McMahon

Clare County Council
Aras Contae an Chláir
New Road
Ennis
Co. Clare

Report Reference: 20-76447

Report Version: 1

Site: Not Applicable

Sample Description: 20-0629

Sample Type: Surface

Lab Reference Number: 507721

Date of Sampling: 13/05/2020

Time of Sampling: 00:00

Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
*	-	4-Bromophenyl phenyl ether	< 1.00	ug/l	-
*	-	4-Chloro-3-methylphenol	< 1.00	ug/l	-
*	-	4-Chloroaniline	< 1.00	ug/l	-
*	-	4-Chlorophenyl phenyl ether	< 1.00	ug/l	-
*	-	4-Methylphenol	< 1.00	ug/l	-
*	-	4-Nitrophenol	< 1.00	ug/l	-
*	-	4-Nitroaniline	< 1.00	ug/l	-
*	-	Azobenzene	< 1.00	ug/l	-
*	-	Acenaphthene	< 1.00	ug/l	-
*	-	Acenaphthylene	< 1.00	ug/l	-
*	-	Anthracene	< 1.00	ug/l	-
*	-	Bis(2-chloroethyl)ether	< 1.00	ug/l	-
*	-	Bis(2-chloroethoxy)methane	< 1.00	ug/l	-
*	-	Bis(2-ethylhexyl)phthalate	< 2.00	ug/l	-
*	-	Benzo(a)anthracene	< 1.00	ug/l	-
*	-	Butyl benzyl phthalate	< 1.00	ug/l	-
*	-	Benzo(b)fluoranthene	< 1.00	ug/l	-
*	-	Benzo(k)fluoranthene	< 1.00	ug/l	-

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Sample Type: Surface

Lab Reference Number: 507721

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Time of Sampling: 00:00

Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
*	-	Benzo(a)pyrlene	< 1.00	ug/l	-
*	-	Benzo(ghi)perylene	< 1.00	ug/l	-
*	-	Carbazole	< 1.00	ug/l	-
*	-	Chrysene	< 1.00	ug/l	-
*	-	Dibenzofuran	< 1.00	ug/l	-
*	-	n-Dibutyl phthalate	< 1.00	ug/l	-
*	-	Diethyl phthalate	< 1.00	ug/l	-
*	-	Dibenzo(a,h)anthracene	< 1.00	ug/l	-
*	-	Dimethyl phthalate	< 1.00	ug/l	-
*	-	n-Dioctyl phthalate	< 5.00	ug/l	-
*	-	Fluoranthene	< 1.00	ug/l	-
*	-	Fluorene	< 1.00	ug/l	-
*	-	Hexachlorobenzene	< 1.00	ug/l	-
*	-	Hexachlorobutadiene	< 1.00	ug/l	-
*	-	Pentachlorophenol	< 1.00	ug/l	-
*	-	Phenol	< 1.00	ug/l	-
*	-	N-Nitrosodi-n-propylamine	< 1.00	ug/l	-
*	-	Hexachloroethane	< 1.00	ug/l	-

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Sample Type: Surface

Lab Reference Number: 507721

Date of Sampling: 13/05/2020

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Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
*	-	Napthalene	< 1.00	ug/l	-
*	-	Napthalene	< 1.00	ug/l	-
*	-	Isophorone	< 1.00	ug/l	-
*	-	Hexachlorocyclopentadiene	< 1.00	ug/l	-
*	-	Phenanthrene	< 1.00	ug/l	-
*	-	Indeno(1,2,3-c,d) pyrene	< 1.00	ug/l	-
*	-	Pyrene	< 1.00	ug/l	-
VOC Full Suite					
EO025#*	-	1,1,1,2-tetrachloroethane	< 2.0	ug/L	-
EO025#*	-	1,1,1-trichloroethane	< 0.5	ug/L	-
EO025#*	-	1,1,2,2-tetrachloroethane	< 0.5	ug/L	-
EO025#*	-	1,1,2-trichloroethane	< 0.5	ug/L	-
EO025#*	-	1,1-dichloroethane	< 0.5	ug/L	-
EO025#*	-	1,2 dicloroethane	< 0.1	ug/L	-
EO025#*	-	1,2,3-trichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2,3-trichloropropane	< 2.0	ug/L	-
EO025#*	-	1,2,4-trichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2,4-trimethylbenzene	< 0.5	ug/L	-

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Lab Reference Number: 507721

Date of Sampling: 13/05/2020

Time of Sampling: 00:00

Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
EO025#*	-	1,2-dibromo-3-chloropropane	< 2.0	ug/L	-
EO025#*	-	1,2-dibromoethane	< 0.5	ug/L	-
EO025#*	-	1,2-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2-dichloropropane	< 0.5	ug/L	-
EO025#*	-	1,3,5-trimethylbenzene	< 0.5	ug/L	-
EO025#*	-	1,3-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	13 Dichloropropene,trans	< 2.0	ug/L	-
EO025#*	-	1,3-dichloropropane	< 0.5	ug/L	-
EO025#*	-	1,4-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	11 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	11 Dichloropropene	< 0.5	ug/L	-
EO025#*	-	13 Dichloropropene,cis	< 2.0	ug/L	-
EO025#*	-	1-Chlorobutane	< 0.5	ug/L	-
EO025*	-	2,2-dichloropropane	< 0.5	ug/L	-
EO025*	-	2-Butanone	< 5.0	ug/L	-
EO025#*	-	2-chlorotoluene	< 0.5	ug/L	-
EO025#*	-	2-Hexanone	< 1.0	ug/L	-
EO025#*	-	2-Propenenitrile/Acrylonitrile	< 2.0	ug/L	-

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Sample Type: Surface

Lab Reference Number: 507721

Date of Sampling: 13/05/2020

Time of Sampling: 00:00

Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
EO025#*	-	4-chlorotoluene	< 0.5	ug/L	-
EO025*	-	Acetone	< 2.0	ug/L	-
EO025#*	-	Benzene	< 0.1	ug/L	-
EO025#*	-	Bromobenzene	< 0.5	ug/L	-
EO025#*	-	Bromochloromethane	< 0.5	ug/L	-
EO025#*	-	Bromodichloromethane	< 2.0	ug/L	-
EO025#*	-	Bromoform	< 1.0	ug/L	-
EO025#*	-	Bromomethane	< 0.5	ug/L	-
EO025#*	-	Carbon Disulphide	< 0.5	ug/L	-
EO025#*	-	Carbon Tetrachloride	< 0.5	ug/L	-
EO025#*	-	Chlormethyl Cyanide/Chloroacetonitrile	< 0.5	ug/L	-
EO025#*	-	Chlorobenzene	< 0.5	ug/L	-
EO025#*	-	Chloroform	< 1.0	ug/L	-
EO025*	-	Chloromethane	< 0.5	ug/L	-
EO025#*	-	cis-12 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	Dibromochloromethane	< 1.0	ug/L	-
EO025#*	-	Dibromomethane	< 0.5	ug/L	-
EO025*	-	Dichlorodifluoromethane	< 10	ug/L	-

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Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
EO025#*	-	Dichloromethane	< 5.0	ug/L	-
EO025*	-	Ethyl Chloride/Chloroethane	< 0.5	ug/L	-
EO025#*	-	Ethyl Ether/Diethyl Ether	< 0.5	ug/L	-
EO025#*	-	Ethyl Methacrylate	< 2.0	ug/L	-
EO025#*	-	Ethylbenzene	< 0.5	ug/L	-
EO025#*	-	Hexachlorobutadiene	< 0.5	ug/L	-
EO025#*	-	Hexachloroethane	< 5.0	ug/L	-
EO025#*	-	Iodomethane/Methyl Iodide	< 0.5	ug/L	-
EO025#*	-	Isopropylbenzene	< 0.5	ug/L	-
EO025*	-	Methacrylonitrile	< 5.0	ug/L	-
EO025#*	-	Methyl Acrylate	< 0.5	ug/L	-
EO025#*	-	Methyl Methacrylate	< 0.5	ug/L	-
EO025#*	-	MIBK/4 Methyl 2 Pentanone	< 2.0	ug/L	-
EO025#*	-	MtBE	< 0.5	ug/L	-
EO025#*	-	N Butyl Benzene	< 0.5	ug/L	-
EO025*	-	Naphthalene	< 2.0	ug/L	-
EO025*	-	Nitrobenzene	< 0.5	ug/L	-
EO025#*	-	P Isopropyltoluene	< 0.5	ug/L	-

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Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
EO025*	-	Propanenitrile	< 10	ug/L	-
EO025#*	-	Propylbenzene	< 0.5	ug/L	-
EO025#*	-	sec-butylbenzene	< 0.5	ug/L	-
EO025#*	-	Styrene	< 2.0	ug/L	-
EO025#*	-	Tert Butyl Benzene	< 0.5	ug/L	-
EO025#*	-	Tetrachloroethene	< 0.1	ug/L	-
EO025#*	-	Tetrahydrofuran	< 5.0	ug/L	-
EO025#*	-	Toluene	< 0.5	ug/L	-
EO025*	-	Trans 14 Dichloro 2 Butene, tran	< 2.0	ug/L	-
EO025#*	-	Trans-1,2 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	Trichloroethene	< 0.1	ug/L	-
EO025*	-	Trichloromonofluoromethane	< 0.5	ug/L	-
EO025*	-	Vinyl Chloride	< 0.5	ug/L	-
EO025#*	-	Xylene -o	< 0.5	ug/L	-
EO025#*	-	Xylene P&M	< 0.5	ug/L	-
EO025*	-	Epichlorohydrin	< 0.1	ug/L	-

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Report Reference: 20-76447

Report Version: 1

Site: Not Applicable

Sample Description: 20-0630

Sample Type: Surface

Lab Reference Number: 507722

Date of Sampling: 13/05/2020

Time of Sampling: 00:00

Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D3000#	14/05/2020	Alkalinity CaCO3	53.573	mg/l	-
D/D3000#	14/05/2020	Ammonia as N	0.088	mg/l	-
S/S1003#	13/05/2020	BOD5	< 2	mg/l O2	-
D/D3000#	14/05/2020	Chloride	37.280	mg/l	-
S/S1009#	13/05/2020	COD	31	mg/l O2	-
S/S3011#	13/05/2020	Conductivity @ 20°C	198.0	uS/cm @20°C	-
*	-	Dissolved Methane	< 0.050	mg/l	-
S/S1003#	13/05/2020	Dissolved Oxygen	9.38	mg/l O2	-
D/D3015#	19/05/2020	Fluoride	0.1	mg/l	-
DEAFULT*U	-	Total Cyanide High	< 10.0000	ug/L	-
EW188#*	-	Magnesium-Dissolved	5.7	mg/l	-
EW188#*	-	Calcium-Dissolved	20.7	mg/l	-
EW188#*	-	Lead-Dissolved	0.4	ug/l	-
EW188#*	-	Nickel-Dissolved	2.0	ug/l	-
EW188#*	-	Copper-Dissolved	< 0.003	mg/l	-
EW188#*	-	Boron-Dissolved	0.03	mg/l	-
EW188#*	-	Zinc-Dissolved	5.9	ug/l	-
EW188#*	-	Cadmium-Dissolved	< 0.1	ug/l	-

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Sample Description: 20-0630

Sample Type: Surface

Lab Reference Number: 507722

Date of Sampling: 13/05/2020

Time of Sampling: 00:00

Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
EW188#*	-	Potassium-Dissolved	2.5	mg/l	-
EW188#*	-	Chromium-Dissolved	< 1.0	ug/l	-
EW188#*	-	Iron-Dissolved	1800	ug/l	-
EW188#*	-	Manganese-Dissolved	36.0	ug/l	-
EW188#*	-	Sodium-Dissolved	19.9	mg/l	-
EW188#*	-	Mercury-Dissolved	< 0.02	ug/l	-
EW188#*	-	Arsenic-Dissolved	< 0.2	ug/L	-
S/S1041#	13/05/2020	PH	7.62	pH Unit	-
S/D3000#	14/05/2020	Phosphorus, Total as P	< 0.200	mg/l	-
D/D3000#	14/05/2020	Sulphate	< 20.000	mg/l	-
S/S	13/05/2020	Total Dissolved Solids	116.000	mg/l	-
S/S	14/05/2020	Temperature	12.5	℃	-
S/S3224#	18/05/2020	Total Organic Carbon	13.060	mg/l	-
D/D3000#	14/05/2020	TON as N	< 2.000	mg/l	-
S/S1049#	15/05/2020	Total Suspended Solids	8	mg/l	-
S/S1201#	13/05/2020	Coliforms	2419.6	MPN/100ml	-
S/S1201#	13/05/2020	E.coli	1413.6	MPN/100ml	-
S/S3221#	14/05/2020	Faecal Coliforms	850	cfu/100ml	-

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Report Version: 1

Site: Not Applicable

Sample Description: 20-0630

Sample Type: Surface

Lab Reference Number: 507722

Date of Sampling: 13/05/2020

Time of Sampling: 00:00

Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
SVOC					
*	-	1-2-4-Trichlorobenzene	< 1.00	ug/l	-
*	-	1,2-Dichlorobenzene	< 1.00	ug/l	-
*	-	1-3-Dichlorobenzene	< 1.00	ug/l	-
*	-	1-4-Dichlorobenzene	< 1.00	ug/l	-
*	-	2 4 5-Trichlorophenol	< 1.00	ug/l	-
*	-	2,4,6-Trichlorophenol	< 1.00	ug/l	-
*	-	2-4-Dichlorophenol	< 1.00	ug/l	-
*	-	2,4-Dimethylphenol	< 1.00	ug/l	-
*	-	2-4-Dinitrotoluene	< 1.00	ug/l	-
*	-	2-6-Dinitrotoluene	< 1.00	ug/l	-
*	-	2-Chloronaphthalene	< 1.00	ug/l	-
*	-	2-Chlorophenol	< 1.00	ug/l	-
*	-	2-Methynaphthalene	< 1.00	ug/l	-
*	-	2-Methylphenol	< 1.00	ug/l	-
*	-	2-Nitroaniline	< 1.00	ug/l	-
*	-	2-Nitrophenol	< 1.00	ug/l	-
*	-	3-Nitroaniline	< 1.00	ug/l	-

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Certificate Of Analysis

Customer

Tim McMahon

Clare County Council
Aras Contae an Chláir
New Road
Ennis
Co. Clare

Report Reference: 20-76447

Report Version: 1

Site: Not Applicable

Sample Description: 20-0630

Sample Type: Surface

Lab Reference Number: 507722

Date of Sampling: 13/05/2020

Time of Sampling: 00:00

Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
*	-	4-Bromophenyl phenyl ether	< 1.00	ug/l	-
*	-	4-Chloro-3-methylphenol	< 1.00	ug/l	-
*	-	4-Chloroaniline	< 1.00	ug/l	-
*	-	4-Chlorophenyl phenyl ether	< 1.00	ug/l	-
*	-	4-Methylphenol	< 1.00	ug/l	-
*	-	4-Nitrophenol	< 1.00	ug/l	-
*	-	4-Nitroaniline	< 1.00	ug/l	-
*	-	Azobenzene	< 1.00	ug/l	-
*	-	Acenaphthene	< 1.00	ug/l	-
*	-	Acenaphthylene	< 1.00	ug/l	-
*	-	Anthracene	< 1.00	ug/l	-
*	-	Bis(2-chloroethyl)ether	< 1.00	ug/l	-
*	-	Bis(2-chloroethoxy)methane	< 1.00	ug/l	-
*	-	Bis(2-ethylhexyl)phthalate	< 2.00	ug/l	-
*	-	Benzo(a)anthracene	< 1.00	ug/l	-
*	-	Butyl benzyl phthalate	< 1.00	ug/l	-
*	-	Benzo(b)fluoranthene	< 1.00	ug/l	-
*	-	Benzo(k)fluoranthene	< 1.00	ug/l	-

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Report Version: 1

Site: Not Applicable

Sample Description: 20-0630

Sample Type: Surface

Lab Reference Number: 507722

Date of Sampling: 13/05/2020

Time of Sampling: 00:00

Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
*	-	Benzo(a)pyrlene	< 1.00	ug/l	-
*	-	Benzo(ghi)perylene	< 1.00	ug/l	-
*	-	Carbazole	< 1.00	ug/l	-
*	-	Chrysene	< 1.00	ug/l	-
*	-	Dibenzofuran	< 1.00	ug/l	-
*	-	n-Dibutyl phthalate	< 1.00	ug/l	-
*	-	Diethyl phthalate	< 1.00	ug/l	-
*	-	Dibenzo(a,h)anthracene	< 1.00	ug/l	-
*	-	Dimethyl phthalate	< 1.00	ug/l	-
*	-	n-Dioctyl phthalate	< 5.00	ug/l	-
*	-	Fluoranthene	< 1.00	ug/l	-
*	-	Fluorene	< 1.00	ug/l	-
*	-	Hexachlorobenzene	< 1.00	ug/l	-
*	-	Hexachlorobutadiene	< 1.00	ug/l	-
*	-	Pentachlorophenol	< 1.00	ug/l	-
*	-	Phenol	< 1.00	ug/l	-
*	-	N-Nitrosodi-n-propylamine	< 1.00	ug/l	-
*	-	Hexachloroethane	< 1.00	ug/l	-

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Report Version: 1

Site: Not Applicable

Sample Description: 20-0630

Sample Type: Surface

Lab Reference Number: 507722

Date of Sampling: 13/05/2020

Time of Sampling: 00:00

Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
*	-	Napthalene	< 1.00	ug/l	-
*	-	Napthalene	< 1.00	ug/l	-
*	-	Isophorone	< 1.00	ug/l	-
*	-	Hexachlorocyclopentadiene	< 1.00	ug/l	-
*	-	Phenanthrene	< 1.00	ug/l	-
*	-	Indeno(1,2,3-c,d) pyrene	< 1.00	ug/l	-
*	-	Pyrene	< 1.00	ug/l	-
VOC Full Suite					
EO025#*	-	1,1,1,2-tetrachloroethane	< 2.0	ug/L	-
EO025#*	-	1,1,1-trichloroethane	< 0.5	ug/L	-
EO025#*	-	1,1,2,2-tetrachloroethane	< 0.5	ug/L	-
EO025#*	-	1,1,2-trichloroethane	< 0.5	ug/L	-
EO025#*	-	1,1-dichloroethane	< 0.5	ug/L	-
EO025#*	-	1,2 dicloroethane	< 0.1	ug/L	-
EO025#*	-	1,2,3-trichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2,3-trichloropropane	< 2.0	ug/L	-
EO025#*	-	1,2,4-trichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2,4-trimethylbenzene	< 0.5	ug/L	-

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Report Version: 1

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Sample Description: 20-0630

Sample Type: Surface

Lab Reference Number: 507722

Date of Sampling: 13/05/2020

Time of Sampling: 00:00

Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
EO025#*	-	1,2-dibromo-3-chloropropane	< 2.0	ug/L	-
EO025#*	-	1,2-dibromoethane	< 0.5	ug/L	-
EO025#*	-	1,2-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2-dichloropropane	< 0.5	ug/L	-
EO025#*	-	1,3,5-trimethylbenzene	< 0.5	ug/L	-
EO025#*	-	1,3-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	13 Dichloropropene,trans	< 2.0	ug/L	-
EO025#*	-	1,3-dichloropropane	< 0.5	ug/L	-
EO025#*	-	1,4-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	11 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	11 Dichloropropene	< 0.5	ug/L	-
EO025#*	-	13 Dichloropropene,cis	< 2.0	ug/L	-
EO025#*	-	1-Chlorobutane	< 0.5	ug/L	-
EO025*	-	2,2-dichloropropane	< 0.5	ug/L	-
EO025*	-	2-Butanone	< 5.0	ug/L	-
EO025#*	-	2-chlorotoluene	< 0.5	ug/L	-
EO025#*	-	2-Hexanone	< 1.0	ug/L	-
EO025#*	-	2-Propenenitrile/Acrylonitrile	< 2.0	ug/L	-

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Report Version: 1

Site: Not Applicable

Sample Description: 20-0630

Sample Type: Surface

Lab Reference Number: 507722

Date of Sampling: 13/05/2020

Time of Sampling: 00:00

Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
EO025#*	-	4-chlorotoluene	< 0.5	ug/L	-
EO025*	-	Acetone	< 2.0	ug/L	-
EO025#*	-	Benzene	< 0.1	ug/L	-
EO025#*	-	Bromobenzene	< 0.5	ug/L	-
EO025#*	-	Bromochloromethane	< 0.5	ug/L	-
EO025#*	-	Bromodichloromethane	< 2.0	ug/L	-
EO025#*	-	Bromoform	< 1.0	ug/L	-
EO025#*	-	Bromomethane	< 0.5	ug/L	-
EO025#*	-	Carbon Disulphide	< 0.5	ug/L	-
EO025#*	-	Carbon Tetrachloride	< 0.5	ug/L	-
EO025#*	-	Chlormethyl Cyanide/Chloroacetonitrile	< 0.5	ug/L	-
EO025#*	-	Chlorobenzene	< 0.5	ug/L	-
EO025#*	-	Chloroform	< 1.0	ug/L	-
EO025*	-	Chloromethane	< 0.5	ug/L	-
EO025#*	-	cis-12 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	Dibromochloromethane	< 1.0	ug/L	-
EO025#*	-	Dibromomethane	< 0.5	ug/L	-
EO025*	-	Dichlorodifluoromethane	< 10	ug/L	-

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Report Version: 1

Site: Not Applicable

Sample Description: 20-0630

Sample Type: Surface

Lab Reference Number: 507722

Date of Sampling: 13/05/2020

Time of Sampling: 00:00

Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
EO025#*	-	Dichloromethane	< 5.0	ug/L	-
EO025*	-	Ethyl Chloride/Chloroethane	< 0.5	ug/L	-
EO025#*	-	Ethyl Ether/Diethyl Ether	< 0.5	ug/L	-
EO025#*	-	Ethyl Methacrylate	< 2.0	ug/L	-
EO025#*	-	Ethylbenzene	< 0.5	ug/L	-
EO025#*	-	Hexachlorobutadiene	< 0.5	ug/L	-
EO025#*	-	Hexachloroethane	< 5.0	ug/L	-
EO025#*	-	Iodomethane/Methyl Iodide	< 0.5	ug/L	-
EO025#*	-	Isopropylbenzene	< 0.5	ug/L	-
EO025*	-	Methacrylonitrile	< 5.0	ug/L	-
EO025#*	-	Methyl Acrylate	< 0.5	ug/L	-
EO025#*	-	Methyl Methacrylate	< 0.5	ug/L	-
EO025#*	-	MIBK/4 Methyl 2 Pentanone	< 2.0	ug/L	-
EO025#*	-	MtBE	< 0.5	ug/L	-
EO025#*	-	N Butyl Benzene	< 0.5	ug/L	-
EO025*	-	Naphthalene	< 2.0	ug/L	-
EO025*	-	Nitrobenzene	< 0.5	ug/L	-
EO025#*	-	P Isopropyltoluene	< 0.5	ug/L	-

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Sample Type: Surface

Lab Reference Number: 507722

Date of Sampling: 13/05/2020

Time of Sampling: 00:00

Date Sample Received: 13/05/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
EO025*	-	Propanenitrile	< 10	ug/L	-
EO025#*	-	Propylbenzene	< 0.5	ug/L	-
EO025#*	-	sec-butylbenzene	< 0.5	ug/L	-
EO025#*	-	Styrene	< 2.0	ug/L	-
EO025#*	-	Tert Butyl Benzene	< 0.5	ug/L	-
EO025#*	-	Tetrachloroethene	< 0.1	ug/L	-
EO025#*	-	Tetrahydrofuran	< 5.0	ug/L	-
EO025#*	-	Toluene	< 0.5	ug/L	-
EO025*	-	Trans 14 Dichloro 2 Butene, tran	< 2.0	ug/L	-
EO025#*	-	Trans-1,2 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	Trichloroethene	< 0.1	ug/L	-
EO025*	-	Trichloromonofluoromethane	< 0.5	ug/L	-
EO025*	-	Vinyl Chloride	< 0.5	ug/L	-
EO025#*	-	Xylene -o	< 0.5	ug/L	-
EO025#*	-	Xylene P&M	< 0.5	ug/L	-
EO025*	-	Epichlorohydrin	< 0.1	ug/L	-

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Report Reference: 20-76447

Report Version: 1

Raw Data

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Lab Reference Number:	Parameter	Result	Units	Site / Method Ref.
507720	Alkalinity CaCO3	42.61951	mg/l	D/D3000
507720	Ammonia as N	0.01028	mg/l	D/D3000
507720	BOD5	0.7800	mg/l O2	S/S1003
507720	Chloride	40.03658	mg/l	D/D3000
507720	COD	50.0000	mg/l O2	S/S1009
507720	Conductivity @ 20℃	168	uS/cm @20℃	S/S3011
507720	Dissolved Oxygen	9.43	mg/l O2	S/S1003
507720	Fluoride	0.0986	mg/l	D/D3015
507720	PH	7.50	pH Unit	S/S1041
507720	Phosphorus, Total as P	0.06000	mg/l	S/D3000
507720	Sulphate	2.48657	mg/l	D/D3000
507720	Total Dissolved Solids	98	mg/l	S/S
507720	Temperature	12.8	℃	S/S
507720	Total Organic Carbon	20.88	mg/l	S/S3224
507720	TON as N	0.1675	mg/l	D/D3000
507720	Total Suspended Solids	4.0000	mg/l	S/S1049
507720	Coliforms	816.4	MPN/100ml	S/S1201
507720	E.coli	24.1	MPN/100ml	S/S1201
507720	Faecal Coliforms	31	cfu/100ml	S/S3221
507721	Alkalinity CaCO3	40.80414	mg/l	D/D3000
507721	Ammonia as N	0.04122	mg/l	D/D3000
507721	BOD5	1.2300	mg/l O2	S/S1003
507721	Chloride	40.01838	mg/l	D/D3000
507721	COD	52.0000	mg/l O2	S/S1009
507721	Conductivity @ 20℃	171	uS/cm @20℃	S/S3011
507721	Dissolved Oxygen	9.53	mg/l O2	S/S1003
507721	Fluoride	0.0838	mg/l	D/D3015
507721	PH	7.36	pH Unit	S/S1041
507721	Phosphorus, Total as P	0.09400	mg/l	S/D3000
507721	Sulphate	4.8056	mg/l	D/D3000
507721	Total Dissolved Solids	100	mg/l	S/S
507721	Temperature	13.2	℃	S/S
507721	Total Organic Carbon	22.66	mg/l	S/S3224
507721	TON as N	0.18405	mg/l	D/D3000
507721	Total Suspended Solids	30.0000	mg/l	S/S1049
507721	Coliforms	1046.2	MPN/100ml	S/S1201
507721	E.coli	13.4	MPN/100ml	S/S1201

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Environmental Laboratories

Report Reference: 20-76447

Report Version: 1

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Lab Reference Number:	Parameter	Result	Units	Site / Method Ref.
507721	Faecal Coliforms	21	cfu/100ml	S/S3221
507722	Alkalinity CaCO3	53.57311	mg/l	D/D3000
507722	Ammonia as N	0.08841	mg/l	D/D3000
507722	BOD5	0.8300	mg/l O2	S/S1003
507722	Chloride	37.28028	mg/l	D/D3000
507722	COD	31.0000	mg/l O2	S/S1009
507722	Conductivity @ 20℃	198	uS/cm @20℃	S/S3011
507722	Dissolved Oxygen	9.38	mg/l O2	S/S1003
507722	Fluoride	0.123	mg/l	D/D3015
507722	PH	7.62	pH Unit	S/S1041
507722	Phosphorus, Total as P	0.06100	mg/l	S/D3000
507722	Sulphate	14.41139	mg/l	D/D3000
507722	Total Dissolved Solids	116	mg/l	S/S
507722	Temperature	12.5	℃	S/S
507722	Total Organic Carbon	13.06	mg/l	S/S3224
507722	TON as N	0.44916	mg/l	D/D3000
507722	Total Suspended Solids	8.0000	mg/l	S/S1049
507722	Coliforms	2419.6	MPN/100ml	S/S1201
507722	E.coli	1413.6	MPN/100ml	S/S1201
507722	Faecal Coliforms	850	cfu/100ml	S/S3221

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Certificate Of Analysis

Job Number: 20-78213
Issue Number: 1
Report Date: 29 July 2020

Site: Not Applicable
PO Number: 400422180
Date Samples Received: 11/06/2020

Please find attached the results for the samples received at our laboratory on 11/06/2020.

Should you have any queries regarding the report or require any further services, we would be happy to discuss your requirements. For additional information about the company please log-on to our website at the above address.

Thank you for choosing City Analysts Limited. We look forward to assisting you again.

Authorised By: Shane Reynolds
Laboratory Manager

Authorised Date: 29 July 2020

Notes are not INAB accredited

Results relate only to the items tested.
Information on methods of analysis and uncertainty of measurement is available on request.
Any opinions or interpretations indicated are outside the scope of our INAB accreditation.
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Co. Clare

Report Reference: 20-78213

Report Version: 1

Site: Not Applicable

Sample Description: 20-0739

Sample Type: Surface

Lab Reference Number: 513869

Date of Sampling: 11/06/2020

Date Sample Received: 11/06/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D3000#	15/06/2020	Alkalinity CaCO3	54.469	mg/l	-
D/D3000#	15/06/2020	Ammonia as N	0.033	mg/l	-
S/S1003#	11/06/2020	BOD5	< 2	mg/l O2	-
D/D3000#	15/06/2020	Chloride	41.708	mg/l	-
S/S1009#	11/06/2020	COD	47	mg/l O2	-
S/S3011#	11/06/2020	Conductivity @ 20°C	248.0	uS/cm @20°C	-
*	-	Dissolved Methane	< 0.050	mg/l	-
S/S1003#	11/06/2020	Dissolved Oxygen	9.77	mg/l O2	-
S/S1003#	11/06/2020	Dissolved Oxygen	101	%	-
D/D3015#	15/06/2020	Fluoride	< 0.1	mg/l	-
DEAFULT*U	-	Total Cyanide Low	< 0.7000	ug/L	-
EW188#*	-	Arsenic-Dissolved	0.8	ug/L	-
EW188#*	-	Boron-Dissolved	0.03	mg/l	-
EW188#*	-	Cadmium-Dissolved	< 0.1	ug/l	-
EW188#*	-	Calcium-Dissolved	19.6	mg/l	-
EW188#*	-	Chromium-Dissolved	< 1.0	ug/l	-
EW188#*	-	Copper-Dissolved	0.003	mg/l	-
EW188#*	-	Iron-Dissolved	570	ug/l	-

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EW188#*	-	Lead-Dissolved	< 0.3	ug/l	-
EW188#*	-	Manganese-Dissolved	160	ug/l	-
EW188#*	-	Mercury-Dissolved	0.02	ug/l	-
EW188#*	-	Nickel-Dissolved	1.8	ug/l	-
EW188#*	-	Sodium-Dissolved	25.6	mg/l	-
EW188#*	-	Zinc-Dissolved	2.0	ug/l	-
EW188#*	-	Potassium-Dissolved	< 0.2	mg/l	-
EW188#*	-	Magnesium-Dissolved	7.3	mg/l	-
S/S1041#	11/06/2020	PH	7.63	pH Unit	-
S/D3000#	12/06/2020	Phosphorus, Total as P	< 0.200	mg/l	-
D/D3000#	15/06/2020	Sulphate	< 20.000	mg/l	-
S/S	11/06/2020	Total Dissolved Solids	111.000	mg/l	-
S/S	11/06/2020	Temperature	17.9	℃	-
S/S3224#	13/06/2020	Total Organic Carbon	19.470	mg/l	-
D/D3000#	15/06/2020	TON as N	< 2.000	mg/l	-
S/S1049#	12/06/2020	Total Suspended Solids	3	mg/l	-
S/S1201#	11/06/2020	Coliforms	14136.0	MPN/100ml	-
S/S1201#	11/06/2020	E.coli	185.0	MPN/100ml	-

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S/S3221#	11/06/2020	Faecal Coliforms	230	cfu/100ml	-
SVOC					
*	-	1-2-4-Trichlorobenzene	< 1.00	ug/l	-
*	-	1,2-Dichlorobenzene	< 1.00	ug/l	-
*	-	1-3-Dichlorobenzene	< 1.00	ug/l	-
*	-	1-4-Dichlorobenzene	< 1.00	ug/l	-
*	-	2 4 5-Trichlorophenol	< 1.00	ug/l	-
*	-	2,4,6-Trichlorophenol	< 1.00	ug/l	-
*	-	2-4-Dichlorophenol	< 1.00	ug/l	-
*	-	2,4-Dimethylphenol	< 1.00	ug/l	-
*	-	2-4-Dinitrotoluene	< 1.00	ug/l	-
*	-	2-6-Dinitrotoluene	< 1.00	ug/l	-
*	-	2-Chloronaphthalene	< 1.00	ug/l	-
*	-	2-Chlorophenol	< 1.00	ug/l	-
*	-	2-Methynaphthalene	< 1.00	ug/l	-
*	-	2-Methylphenol	< 1.00	ug/l	-
*	-	2-Nitroaniline	< 1.00	ug/l	-
*	-	2-Nitrophenol	< 1.00	ug/l	-

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*	-	3-Nitroaniline	< 1.00	ug/l	-
*	-	4-Bromophenyl phenyl ether	< 1.00	ug/l	-
*	-	4-Chloro-3-methylphenol	< 1.00	ug/l	-
*	-	4-Chloroaniline	< 1.00	ug/l	-
*	-	4-Chlorophenyl phenyl ether	< 1.00	ug/l	-
*	-	4-Methylphenol	< 1.00	ug/l	-
*	-	4-Nitrophenol	< 1.00	ug/l	-
*	-	4-Nitroaniline	< 1.00	ug/l	-
*	-	Azobenzene	< 1.00	ug/l	-
*	-	Acenaphthene	< 1.00	ug/l	-
*	-	Acenaphthylene	< 1.00	ug/l	-
*	-	Anthracene	< 1.00	ug/l	-
*	-	Bis(2-chloroethyl)ether	< 1.00	ug/l	-
*	-	Bis(2-chloroethoxy)methane	< 1.00	ug/l	-
*	-	Bis(2-ethylhexyl)phthalate	< 2.00	ug/l	-
*	-	Benzo(a)anthracene	< 1.00	ug/l	-
*	-	Butyl benzyl phthalate	< 1.00	ug/l	-
*	-	Benzo(b)fluoranthene	< 1.00	ug/l	-

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*	-	Benzo(k)fluoranthene	< 1.00	ug/l	-
*	-	Benzo(a)pyrlene	< 1.00	ug/l	-
*	-	Benzo(ghi)perylene	< 1.00	ug/l	-
*	-	Carbazole	< 1.00	ug/l	-
*	-	Chrysene	< 1.00	ug/l	-
*	-	Dibenzofuran	< 1.00	ug/l	-
*	-	n-Dibutyl phthalate	< 1.00	ug/l	-
*	-	Diethyl phthalate	< 1.00	ug/l	-
*	-	Dibenzo(a,h)anthracene	< 1.00	ug/l	-
*	-	Dimethyl phthalate	< 1.00	ug/l	-
*	-	n-Dioctyl phthalate	< 5.00	ug/l	-
*	-	Fluoranthene	< 1.00	ug/l	-
*	-	Fluorene	< 1.00	ug/l	-
*	-	Hexachlorobenzene	< 1.00	ug/l	-
*	-	Hexachlorobutadiene	< 1.00	ug/l	-
*	-	Pentachlorophenol	< 1.00	ug/l	-
*	-	Phenol	< 1.00	ug/l	-
*	-	N-Nitrosodi-n-propylamine	< 1.00	ug/l	-

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*	-	Hexachloroethane	< 1.00	ug/l	-
*	-	Napthalene	< 1.00	ug/l	-
*	-	Napthalene	< 1.00	ug/l	-
*	-	Isophorone	< 1.00	ug/l	-
*	-	Hexachlorocyclopentadiene	< 1.00	ug/l	-
*	-	Phenanthrene	< 1.00	ug/l	-
*	-	Indeno(1,2,3-c,d) pyrene	< 1.00	ug/l	-
*	-	Pyrene	< 1.00	ug/l	-
VOC Full Suite					
EO025#*	-	1,1,1,2-tetrachloroethane	< 2.0	ug/L	-
EO025#*	-	1,1,1-trichloroethane	< 0.5	ug/L	-
EO025#*	-	1,1,2,2-tetrachloroethane	< 0.5	ug/L	-
EO025#*	-	1,1,2-trichloroethane	< 0.5	ug/L	-
EO025#*	-	1,1-dichloroethane	< 0.5	ug/L	-
EO025#*	-	1,2 dicloroethane	< 0.1	ug/L	-
EO025#*	-	1,2,3-trichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2,3-trichloropropane	< 2.0	ug/L	-
EO025#*	-	1,2,4-trichlorobenzene	< 0.5	ug/L	-

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EO025#*	-	1,2,4-trimethylbenzene	< 0.5	ug/L	-
EO025#*	-	1,2-dibromo-3-chloropropane	< 2.0	ug/L	-
EO025#*	-	1,2-dibromoethane	< 0.5	ug/L	-
EO025#*	-	1,2-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2-dichloropropane	< 0.5	ug/L	-
EO025#*	-	1,3,5-trimethylbenzene	< 0.5	ug/L	-
EO025#*	-	1,3-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	13 Dichloropropene,trans	< 2.0	ug/L	-
EO025#*	-	1,3-dichloropropane	< 0.5	ug/L	-
EO025#*	-	1,4-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	11 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	11 Dichloropropene	< 0.5	ug/L	-
EO025#*	-	13 Dichloropropene,cis	< 2.0	ug/L	-
EO025#*	-	1-Chlorobutane	< 0.5	ug/L	-
EO025*	-	2,2-dichloropropane	< 0.5	ug/L	-
EO025*	-	2-Butanone	< 5.0	ug/L	-
EO025#*	-	2-chlorotoluene	< 0.5	ug/L	-
EO025#*	-	2-Hexanone	< 1.0	ug/L	-

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EO025#*	-	2-Propenenitrile/Acrylonitrile	< 2.0	ug/L	-
EO025#*	-	4-chlorotoluene	< 0.5	ug/L	-
EO025*	-	Acetone	< 2.0	ug/L	-
EO025#*	-	Benzene	< 0.1	ug/L	-
EO025#*	-	Bromobenzene	< 0.5	ug/L	-
EO025#*	-	Bromochloromethane	< 0.5	ug/L	-
EO025#*	-	Bromodichloromethane	< 2.0	ug/L	-
EO025#*	-	Bromoform	< 1.0	ug/L	-
EO025#*	-	Bromomethane	< 0.5	ug/L	-
EO025#*	-	Carbon Disulphide	< 0.5	ug/L	-
EO025#*	-	Carbon Tetrachloride	< 0.5	ug/L	-
EO025#*	-	Chlormethyl Cyanide/Chloroacetonitrile	< 0.5	ug/L	-
EO025#*	-	Chlorobenzene	< 0.5	ug/L	-
EO025#*	-	Chloroform	< 1.0	ug/L	-
EO025*	-	Chloromethane	< 0.5	ug/L	-
EO025#*	-	cis-12 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	Dibromochloromethane	< 1.0	ug/L	-
EO025#*	-	Dibromomethane	< 0.5	ug/L	-

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EO025*	-	Dichlorodifluoromethane	< 10	ug/L	-
EO025#*	-	Dichloromethane	< 5.0	ug/L	-
EO025*	-	Ethyl Chloride/Chloroethane	< 0.5	ug/L	-
EO025#*	-	Ethyl Ether/Diethyl Ether	< 0.5	ug/L	-
EO025#*	-	Ethyl Methacrylate	< 2.0	ug/L	-
EO025#*	-	Ethylbenzene	< 0.5	ug/L	-
EO025#*	-	Hexachlorobutadiene	< 0.5	ug/L	-
EO025#*	-	Hexachloroethane	< 5.0	ug/L	-
EO025#*	-	Iodomethane/Methyl Iodide	< 0.5	ug/L	-
EO025#*	-	Isopropylbenzene	< 0.5	ug/L	-
EO025*	-	Methacrylonitrile	< 5.0	ug/L	-
EO025#*	-	Methyl Acrylate	< 0.5	ug/L	-
EO025#*	-	Methyl Methacrylate	< 0.5	ug/L	-
EO025#*	-	MIBK/4 Methyl 2 Pentanone	< 2.0	ug/L	-
EO025#*	-	MtBE	< 0.5	ug/L	-
EO025#*	-	N Butyl Benzene	< 0.5	ug/L	-
EO025*	-	Naphthalene	< 2.0	ug/L	-
EO025*	-	Nitrobenzene	< 0.5	ug/L	-

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EO025#*	-	P Isopropyltoluene	< 0.5	ug/L	-
EO025*	-	Propanenitrile	< 10	ug/L	-
EO025#*	-	Propylbenzene	< 0.5	ug/L	-
EO025#*	-	sec-butylbenzene	< 0.5	ug/L	-
EO025#*	-	Styrene	< 2.0	ug/L	-
EO025#*	-	Tert Butyl Benzene	< 0.5	ug/L	-
EO025#*	-	Tetrachloroethene	< 0.1	ug/L	-
EO025#*	-	Tetrahydrofuran	< 5.0	ug/L	-
EO025#*	-	Toluene	< 0.5	ug/L	-
EO025*	-	Trans 14 Dichloro 2 Butene, tran	< 2.0	ug/L	-
EO025#*	-	Trans-1,2 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	Trichloroethene	< 0.1	ug/L	-
EO025*	-	Trichloromonofluoromethane	< 0.5	ug/L	-
EO025*	-	Vinyl Chloride	< 0.5	ug/L	-
EO025#*	-	Xylene -o	< 0.5	ug/L	-
EO025#*	-	Xylene P&M	< 0.5	ug/L	-
EO025*	-	Epichlorohydrin	< 0.1	ug/L	-

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Certificate Of Analysis

Customer

Tim McMahon

Clare County Council
Aras Contae an Chláir
New Road
Ennis
Co. Clare

Report Reference: 20-78213

Report Version: 1

Site: Not Applicable

Sample Description: 20-0740

Sample Type: Surface

Lab Reference Number: 513870

Date of Sampling: 11/06/2020

Date Sample Received: 11/06/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D3000#	15/06/2020	Alkalinity CaCO3	53.483	mg/l	-
D/D3000#	15/06/2020	Ammonia as N	0.037	mg/l	-
S/S1003#	11/06/2020	BOD5	< 2	mg/l O2	-
D/D3000#	15/06/2020	Chloride	43.142	mg/l	-
S/S1009#	11/06/2020	COD	49	mg/l O2	-
S/S3011#	11/06/2020	Conductivity @ 20°C	248.0	uS/cm @20°C	-
*	-	Dissolved Methane	< 0.050	mg/l	-
S/S1003#	11/06/2020	Dissolved Oxygen	8.91	mg/l O2	-
S/S1003#	11/06/2020	Dissolved Oxygen	94	%	-
D/D3015#	15/06/2020	Fluoride	< 0.1	mg/l	-
DEAFULT*U	-	Total Cyanide Low	< 0.7000	ug/L	-
EW188#*	-	Arsenic-Dissolved	0.8	ug/L	-
EW188#*	-	Boron-Dissolved	0.03	mg/l	-
EW188#*	-	Cadmium-Dissolved	< 0.1	ug/l	-
EW188#*	-	Calcium-Dissolved	20.1	mg/l	-
EW188#*	-	Chromium-Dissolved	< 1.0	ug/l	-
EW188#*	-	Copper-Dissolved	< 0.003	mg/l	-
EW188#*	-	Iron-Dissolved	520	ug/l	-

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EW188#*	-	Lead-Dissolved	< 0.3	ug/l	-
EW188#*	-	Magnesium-Dissolved	7.3	mg/l	-
EW188#*	-	Manganese-Dissolved	110	ug/l	-
EW188#*	-	Mercury-Dissolved	0.02	ug/l	-
EW188#*	-	Nickel-Dissolved	2.0	ug/l	-
EW188#*	-	Sodium-Dissolved	25.9	mg/l	-
EW188#*	-	Zinc-Dissolved	4.0	ug/l	-
EW188#*	-	Potassium-Dissolved	1.4	mg/l	-
S/S1041#	11/06/2020	PH	7.46	pH Unit	-
S/D3000#	12/06/2020	Phosphorus, Total as P	< 0.200	mg/l	-
D/D3000#	15/06/2020	Sulphate	< 20.000	mg/l	-
S/S	11/06/2020	Total Dissolved Solids	120.000	mg/l	-
S/S	11/06/2020	Temperature	18.1	℃	-
S/S3224	13/06/2020	Total Organic Carbon	20.090	mg/l	-
D/D3000#	15/06/2020	TON as N	< 2.000	mg/l	-
S/S1049#	12/06/2020	Total Suspended Solids	2	mg/l	-
S/S1201#	11/06/2020	Coliforms	7500.0	MPN/100ml	-
S/S1201#	11/06/2020	E.coli	5200.0	MPN/100ml	-

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S/S3221#	11/06/2020	Faecal Coliforms	5500	cfu/100ml	-
SVOC					
*	-	1-2-4-Trichlorobenzene	< 1.00	ug/l	-
*	-	1,2-Dichlorobenzene	< 1.00	ug/l	-
*	-	1-3-Dichlorobenzene	< 1.00	ug/l	-
*	-	1-4-Dichlorobenzene	< 1.00	ug/l	-
*	-	2 4 5-Trichlorophenol	< 1.00	ug/l	-
*	-	2,4,6-Trichlorophenol	< 1.00	ug/l	-
*	-	2-4-Dichlorophenol	< 1.00	ug/l	-
*	-	2,4-Dimethylphenol	< 1.00	ug/l	-
*	-	2-4-Dinitrotoluene	< 1.00	ug/l	-
*	-	2-6-Dinitrotoluene	< 1.00	ug/l	-
*	-	2-Chloronaphthalene	< 1.00	ug/l	-
*	-	2-Chlorophenol	< 1.00	ug/l	-
*	-	2-Methynaphthalene	< 1.00	ug/l	-
*	-	2-Methylphenol	< 1.00	ug/l	-
*	-	2-Nitroaniline	< 1.00	ug/l	-
*	-	2-Nitrophenol	< 1.00	ug/l	-

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*	-	3-Nitroaniline	< 1.00	ug/l	-
*	-	4-Bromophenyl phenyl ether	< 1.00	ug/l	-
*	-	4-Chloro-3-methylphenol	< 1.00	ug/l	-
*	-	4-Chloroaniline	< 1.00	ug/l	-
*	-	4-Chlorophenyl phenyl ether	< 1.00	ug/l	-
*	-	4-Methylphenol	< 1.00	ug/l	-
*	-	4-Nitrophenol	< 1.00	ug/l	-
*	-	4-Nitroaniline	< 1.00	ug/l	-
*	-	Azobenzene	< 1.00	ug/l	-
*	-	Acenaphthene	< 1.00	ug/l	-
*	-	Acenaphthylene	< 1.00	ug/l	-
*	-	Anthracene	< 1.00	ug/l	-
*	-	Bis(2-chloroethyl)ether	< 1.00	ug/l	-
*	-	Bis(2-chloroethoxy)methane	< 1.00	ug/l	-
*	-	Bis(2-ethylhexyl)phthalate	< 2.00	ug/l	-
*	-	Benzo(a)anthracene	< 1.00	ug/l	-
*	-	Butyl benzyl phthalate	< 1.00	ug/l	-
*	-	Benzo(b)fluoranthene	< 1.00	ug/l	-

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*	-	Benzo(k)fluoranthene	< 1.00	ug/l	-
*	-	Benzo(a)pyrlene	< 1.00	ug/l	-
*	-	Benzo(ghi)perylene	< 1.00	ug/l	-
*	-	Carbazole	< 1.00	ug/l	-
*	-	Chrysene	< 1.00	ug/l	-
*	-	Dibenzofuran	< 1.00	ug/l	-
*	-	n-Dibutyl phthalate	< 1.00	ug/l	-
*	-	Diethyl phthalate	< 1.00	ug/l	-
*	-	Dibenzo(a,h)anthracene	< 1.00	ug/l	-
*	-	Dimethyl phthalate	< 1.00	ug/l	-
*	-	n-Dioctyl phthalate	< 5.00	ug/l	-
*	-	Fluoranthene	< 1.00	ug/l	-
*	-	Fluorene	< 1.00	ug/l	-
*	-	Hexachlorobenzene	< 1.00	ug/l	-
*	-	Hexachlorobutadiene	< 1.00	ug/l	-
*	-	Pentachlorophenol	< 1.00	ug/l	-
*	-	Phenol	< 1.00	ug/l	-
*	-	N-Nitrosodi-n-propylamine	< 1.00	ug/l	-

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Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
*	-	Hexachloroethane	< 1.00	ug/l	-
*	-	Napthalene	< 1.00	ug/l	-
*	-	Napthalene	< 1.00	ug/l	-
*	-	Isophorone	< 1.00	ug/l	-
*	-	Hexachlorocyclopentadiene	< 1.00	ug/l	-
*	-	Phenanthrene	< 1.00	ug/l	-
*	-	Indeno(1,2,3-c,d) pyrene	< 1.00	ug/l	-
*	-	Pyrene	< 1.00	ug/l	-
VOC Full Suite					
EO025#*	-	1,1,1,2-tetrachloroethane	< 2.0	ug/L	-
EO025#*	-	1,1,1-trichloroethane	< 0.5	ug/L	-
EO025#*	-	1,1,2,2-tetrachloroethane	< 0.5	ug/L	-
EO025#*	-	1,1,2-trichloroethane	< 0.5	ug/L	-
EO025#*	-	1,1-dichloroethane	< 0.5	ug/L	-
EO025#*	-	1,2 dicloroethane	< 0.1	ug/L	-
EO025#*	-	1,2,3-trichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2,3-trichloropropane	< 2.0	ug/L	-
EO025#*	-	1,2,4-trichlorobenzene	< 0.5	ug/L	-

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EO025#*	-	1,2,4-trimethylbenzene	< 0.5	ug/L	-
EO025#*	-	1,2-dibromo-3-chloropropane	< 2.0	ug/L	-
EO025#*	-	1,2-dibromoethane	< 0.5	ug/L	-
EO025#*	-	1,2-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2-dichloropropane	< 0.5	ug/L	-
EO025#*	-	1,3,5-trimethylbenzene	< 0.5	ug/L	-
EO025#*	-	1,3-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	13 Dichloropropene,trans	< 2.0	ug/L	-
EO025#*	-	1,3-dichloropropane	< 0.5	ug/L	-
EO025#*	-	1,4-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	11 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	11 Dichloropropene	< 0.5	ug/L	-
EO025#*	-	13 Dichloropropene,cis	< 2.0	ug/L	-
EO025#*	-	1-Chlorobutane	< 0.5	ug/L	-
EO025*	-	2,2-dichloropropane	< 0.5	ug/L	-
EO025*	-	2-Butanone	< 5.0	ug/L	-
EO025#*	-	2-chlorotoluene	< 0.5	ug/L	-
EO025#*	-	2-Hexanone	< 1.0	ug/L	-

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EO025#*	-	2-Propenenitrile/Acrylonitrile	< 2.0	ug/L	-
EO025#*	-	4-chlorotoluene	< 0.5	ug/L	-
EO025*	-	Acetone	< 2.0	ug/L	-
EO025#*	-	Benzene	< 0.1	ug/L	-
EO025#*	-	Bromobenzene	< 0.5	ug/L	-
EO025#*	-	Bromochloromethane	< 0.5	ug/L	-
EO025#*	-	Bromodichloromethane	< 2.0	ug/L	-
EO025#*	-	Bromoform	< 1.0	ug/L	-
EO025#*	-	Bromomethane	< 0.5	ug/L	-
EO025#*	-	Carbon Disulphide	< 0.5	ug/L	-
EO025#*	-	Carbon Tetrachloride	< 0.5	ug/L	-
EO025#*	-	Chlormethyl Cyanide/Chloroacetonitrile	< 0.5	ug/L	-
EO025#*	-	Chlorobenzene	< 0.5	ug/L	-
EO025#*	-	Chloroform	< 1.0	ug/L	-
EO025*	-	Chloromethane	< 0.5	ug/L	-
EO025#*	-	cis-12 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	Dibromochloromethane	< 1.0	ug/L	-
EO025#*	-	Dibromomethane	< 0.5	ug/L	-

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Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
EO025*	-	Dichlorodifluoromethane	< 10	ug/L	-
EO025#*	-	Dichloromethane	< 5.0	ug/L	-
EO025*	-	Ethyl Chloride/Chloroethane	< 0.5	ug/L	-
EO025#*	-	Ethyl Ether/Diethyl Ether	< 0.5	ug/L	-
EO025#*	-	Ethyl Methacrylate	< 2.0	ug/L	-
EO025#*	-	Ethylbenzene	< 0.5	ug/L	-
EO025#*	-	Hexachlorobutadiene	< 0.5	ug/L	-
EO025#*	-	Hexachloroethane	< 5.0	ug/L	-
EO025#*	-	Iodomethane/Methyl Iodide	< 0.5	ug/L	-
EO025#*	-	Isopropylbenzene	< 0.5	ug/L	-
EO025*	-	Methacrylonitrile	< 5.0	ug/L	-
EO025#*	-	Methyl Acrylate	< 0.5	ug/L	-
EO025#*	-	Methyl Methacrylate	< 0.5	ug/L	-
EO025#*	-	MIBK/4 Methyl 2 Pentanone	< 2.0	ug/L	-
EO025#*	-	MtBE	< 0.5	ug/L	-
EO025#*	-	N Butyl Benzene	< 0.5	ug/L	-
EO025*	-	Naphthalene	< 2.0	ug/L	-
EO025*	-	Nitrobenzene	< 0.5	ug/L	-

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EO025#*	-	P Isopropyltoluene	< 0.5	ug/L	-
EO025*	-	Propanenitrile	< 10	ug/L	-
EO025#*	-	Propylbenzene	< 0.5	ug/L	-
EO025#*	-	sec-butylbenzene	< 0.5	ug/L	-
EO025#*	-	Styrene	< 2.0	ug/L	-
EO025#*	-	Tert Butyl Benzene	< 0.5	ug/L	-
EO025#*	-	Tetrachloroethene	< 0.1	ug/L	-
EO025#*	-	Tetrahydrofuran	< 5.0	ug/L	-
EO025#*	-	Toluene	< 0.5	ug/L	-
EO025*	-	Trans 14 Dichloro 2 Butene, tran	< 2.0	ug/L	-
EO025#*	-	Trans-1,2 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	Trichloroethene	< 0.1	ug/L	-
EO025*	-	Trichloromonofluoromethane	< 0.5	ug/L	-
EO025*	-	Vinyl Chloride	< 0.5	ug/L	-
EO025#*	-	Xylene -o	< 0.5	ug/L	-
EO025#*	-	Xylene P&M	< 0.5	ug/L	-
EO025*	-	Epichlorohydrin	< 0.1	ug/L	-

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Tim McMahon

Clare County Council
Aras Contae an Chláir
New Road
Ennis
Co. Clare

Report Reference: 20-78213

Report Version: 1

Site: Not Applicable

Sample Description: 20-0741

Sample Type: Surface

Lab Reference Number: 513871

Date of Sampling: 11/06/2020

Date Sample Received: 11/06/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D3000#	15/06/2020	Alkalinity CaCO3	55.228	mg/l	-
D/D3000#	15/06/2020	Ammonia as N	0.023	mg/l	-
S/S1003#	11/06/2020	BOD5	< 2	mg/l O2	-
D/D3000#	15/06/2020	Chloride	39.635	mg/l	-
S/S1009#	11/06/2020	COD	30	mg/l O2	-
S/S3011#	11/06/2020	Conductivity @ 20°C	259.0	uS/cm @20°C	-
*	-	Dissolved Methane	< 0.050	mg/l	-
S/S1003#	11/06/2020	Dissolved Oxygen	9.50	mg/l O2	-
S/S1003#	11/06/2020	Dissolved Oxygen	101	%	-
D/D3015#	15/06/2020	Fluoride	0.1	mg/l	-
DEAFULT*U	-	Total Cyanide Low	< 0.7000	ug/L	-
EW188#*	-	Arsenic-Dissolved	0.5	ug/L	-
EW188#*	-	Boron-Dissolved	0.03	mg/l	-
EW188#*	-	Cadmium-Dissolved	< 0.1	ug/l	-
EW188#*	-	Calcium-Dissolved	20.7	mg/l	-
EW188#*	-	Chromium-Dissolved	< 1.0	ug/l	-
EW188#*	-	Iron-Dissolved	720	ug/l	-
EW188#*	-	Lead-Dissolved	< 0.3	ug/l	-

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EW188#*	-	Magnesium-Dissolved	7.5	mg/l	-
EW188#*	-	Manganese-Dissolved	8.0	ug/l	-
EW188#*	-	Mercury-Dissolved	< 0.02	ug/l	-
EW188#*	-	Nickel-Dissolved	1.7	ug/l	-
EW188#*	-	Sodium-Dissolved	26.3	mg/l	-
EW188#*	-	Zinc-Dissolved	1.6	ug/l	-
EW188#*	-	Potassium-Dissolved	2.4	mg/l	-
EW188#*	-	Copper-Dissolved	< 0.003	mg/l	-
S/S1041#	11/06/2020	PH	7.49	pH Unit	-
S/D3000#	12/06/2020	Phosphorus, Total as P	< 0.200	mg/l	-
D/D3000#	15/06/2020	Sulphate	< 20.000	mg/l	-
S/S	11/06/2020	Total Dissolved Solids	126.000	mg/l	-
S/S	11/06/2020	Temperature	18.0	℃	-
S/S3224#	13/06/2020	Total Organic Carbon	12.740	mg/l	-
D/D3000#	15/06/2020	TON as N	< 2.000	mg/l	-
S/S1049#	12/06/2020	Total Suspended Solids	3	mg/l	-
S/S1201#	11/06/2020	Coliforms	3100.0	MPN/100ml	-
S/S1201#	11/06/2020	E.coli	2000.0	MPN/100ml	-

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S/S3221#	11/06/2020	Faecal Coliforms	2200	cfu/100ml	-
SVOC					
*	-	1-2-4-Trichlorobenzene	< 1.00	ug/l	-
*	-	1,2-Dichlorobenzene	< 1.00	ug/l	-
*	-	1-3-Dichlorobenzene	< 1.00	ug/l	-
*	-	1-4-Dichlorobenzene	< 1.00	ug/l	-
*	-	2 4 5-Trichlorophenol	< 1.00	ug/l	-
*	-	2,4,6-Trichlorophenol	< 1.00	ug/l	-
*	-	2-4-Dichlorophenol	< 1.00	ug/l	-
*	-	2,4-Dimethylphenol	< 1.00	ug/l	-
*	-	2-4-Dinitrotoluene	< 1.00	ug/l	-
*	-	2-6-Dinitrotoluene	< 1.00	ug/l	-
*	-	2-Chloronaphthalene	< 1.00	ug/l	-
*	-	2-Chlorophenol	< 1.00	ug/l	-
*	-	2-Methynaphthalene	< 1.00	ug/l	-
*	-	2-Methylphenol	< 1.00	ug/l	-
*	-	2-Nitroaniline	< 1.00	ug/l	-
*	-	2-Nitrophenol	< 1.00	ug/l	-

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*	-	3-Nitroaniline	< 1.00	ug/l	-
*	-	4-Bromophenyl phenyl ether	< 1.00	ug/l	-
*	-	4-Chloro-3-methylphenol	< 1.00	ug/l	-
*	-	4-Chloroaniline	< 1.00	ug/l	-
*	-	4-Chlorophenyl phenyl ether	< 1.00	ug/l	-
*	-	4-Methylphenol	< 1.00	ug/l	-
*	-	4-Nitrophenol	< 1.00	ug/l	-
*	-	4-Nitroaniline	< 1.00	ug/l	-
*	-	Azobenzene	< 1.00	ug/l	-
*	-	Acenaphthene	< 1.00	ug/l	-
*	-	Acenaphthylene	< 1.00	ug/l	-
*	-	Anthracene	< 1.00	ug/l	-
*	-	Bis(2-chloroethyl)ether	< 1.00	ug/l	-
*	-	Bis(2-chloroethoxy)methane	< 1.00	ug/l	-
*	-	Bis(2-ethylhexyl)phthalate	< 2.00	ug/l	-
*	-	Benzo(a)anthracene	< 1.00	ug/l	-
*	-	Butyl benzyl phthalate	< 1.00	ug/l	-
*	-	Benzo(b)fluoranthene	< 1.00	ug/l	-

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*	-	Benzo(k)fluoranthene	< 1.00	ug/l	-
*	-	Benzo(a)pyrlene	< 1.00	ug/l	-
*	-	Benzo(ghi)perylene	< 1.00	ug/l	-
*	-	Carbazole	< 1.00	ug/l	-
*	-	Chrysene	< 1.00	ug/l	-
*	-	Dibenzofuran	< 1.00	ug/l	-
*	-	n-Dibutyl phthalate	< 1.00	ug/l	-
*	-	Diethyl phthalate	< 1.00	ug/l	-
*	-	Dibenzo(a,h)anthracene	< 1.00	ug/l	-
*	-	Dimethyl phthalate	< 1.00	ug/l	-
*	-	n-Dioctyl phthalate	< 5.00	ug/l	-
*	-	Fluoranthene	< 1.00	ug/l	-
*	-	Fluorene	< 1.00	ug/l	-
*	-	Hexachlorobenzene	< 1.00	ug/l	-
*	-	Hexachlorobutadiene	< 1.00	ug/l	-
*	-	Pentachlorophenol	< 1.00	ug/l	-
*	-	Phenol	< 1.00	ug/l	-
*	-	N-Nitrosodi-n-propylamine	< 1.00	ug/l	-

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*	-	Hexachloroethane	< 1.00	ug/l	-
*	-	Napthalene	< 1.00	ug/l	-
*	-	Napthalene	< 1.00	ug/l	-
*	-	Isophorone	< 1.00	ug/l	-
*	-	Hexachlorocyclopentadiene	< 1.00	ug/l	-
*	-	Phenanthrene	< 1.00	ug/l	-
*	-	Indeno(1,2,3-c,d) pyrene	< 1.00	ug/l	-
*	-	Pyrene	< 1.00	ug/l	-
VOC Full Suite					
EO025#*	-	1,1,1,2-tetrachloroethane	< 2.0	ug/L	-
EO025#*	-	1,1,1-trichloroethane	< 0.5	ug/L	-
EO025#*	-	1,1,2,2-tetrachloroethane	< 0.5	ug/L	-
EO025#*	-	1,1,2-trichloroethane	< 0.5	ug/L	-
EO025#*	-	1,1-dichloroethane	< 0.5	ug/L	-
EO025#*	-	1,2 dicloroethane	< 0.1	ug/L	-
EO025#*	-	1,2,3-trichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2,3-trichloropropane	< 2.0	ug/L	-
EO025#*	-	1,2,4-trichlorobenzene	< 0.5	ug/L	-

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EO025#*	-	1,2,4-trimethylbenzene	< 0.5	ug/L	-
EO025#*	-	1,2-dibromo-3-chloropropane	< 2.0	ug/L	-
EO025#*	-	1,2-dibromoethane	< 0.5	ug/L	-
EO025#*	-	1,2-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2-dichloropropane	< 0.5	ug/L	-
EO025#*	-	1,3,5-trimethylbenzene	< 0.5	ug/L	-
EO025#*	-	1,3-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	13 Dichloropropene,trans	< 2.0	ug/L	-
EO025#*	-	1,3-dichloropropane	< 0.5	ug/L	-
EO025#*	-	1,4-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	11 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	11 Dichloropropene	< 0.5	ug/L	-
EO025#*	-	13 Dichloropropene,cis	< 2.0	ug/L	-
EO025#*	-	1-Chlorobutane	< 0.5	ug/L	-
EO025*	-	2,2-dichloropropane	< 0.5	ug/L	-
EO025*	-	2-Butanone	< 5.0	ug/L	-
EO025#*	-	2-chlorotoluene	< 0.5	ug/L	-
EO025#*	-	2-Hexanone	< 1.0	ug/L	-

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EO025#*	-	2-Propenenitrile/Acrylonitrile	< 2.0	ug/L	-
EO025#*	-	4-chlorotoluene	< 0.5	ug/L	-
EO025*	-	Acetone	< 2.0	ug/L	-
EO025#*	-	Benzene	< 0.1	ug/L	-
EO025#*	-	Bromobenzene	< 0.5	ug/L	-
EO025#*	-	Bromochloromethane	< 0.5	ug/L	-
EO025#*	-	Bromodichloromethane	< 2.0	ug/L	-
EO025#*	-	Bromoform	< 1.0	ug/L	-
EO025#*	-	Bromomethane	< 0.5	ug/L	-
EO025#*	-	Carbon Disulphide	< 0.5	ug/L	-
EO025#*	-	Carbon Tetrachloride	< 0.5	ug/L	-
EO025#*	-	Chlormethyl Cyanide/Chloroacetonitrile	< 0.5	ug/L	-
EO025#*	-	Chlorobenzene	< 0.5	ug/L	-
EO025#*	-	Chloroform	< 1.0	ug/L	-
EO025*	-	Chloromethane	< 0.5	ug/L	-
EO025#*	-	cis-12 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	Dibromochloromethane	< 1.0	ug/L	-
EO025#*	-	Dibromomethane	< 0.5	ug/L	-

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Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
EO025*	-	Dichlorodifluoromethane	< 10	ug/L	-
EO025#*	-	Dichloromethane	< 5.0	ug/L	-
EO025*	-	Ethyl Chloride/Chloroethane	< 0.5	ug/L	-
EO025#*	-	Ethyl Ether/Diethyl Ether	< 0.5	ug/L	-
EO025#*	-	Ethyl Methacrylate	< 2.0	ug/L	-
EO025#*	-	Ethylbenzene	< 0.5	ug/L	-
EO025#*	-	Hexachlorobutadiene	< 0.5	ug/L	-
EO025#*	-	Hexachloroethane	< 5.0	ug/L	-
EO025#*	-	Iodomethane/Methyl Iodide	< 0.5	ug/L	-
EO025#*	-	Isopropylbenzene	< 0.5	ug/L	-
EO025*	-	Methacrylonitrile	< 5.0	ug/L	-
EO025#*	-	Methyl Acrylate	< 0.5	ug/L	-
EO025#*	-	Methyl Methacrylate	< 0.5	ug/L	-
EO025#*	-	MIBK/4 Methyl 2 Pentanone	< 2.0	ug/L	-
EO025#*	-	MtBE	< 0.5	ug/L	-
EO025#*	-	N Butyl Benzene	< 0.5	ug/L	-
EO025*	-	Naphthalene	< 2.0	ug/L	-
EO025*	-	Nitrobenzene	< 0.5	ug/L	-

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EO025#*	-	P Isopropyltoluene	< 0.5	ug/L	-
EO025*	-	Propanenitrile	< 10	ug/L	-
EO025#*	-	Propylbenzene	< 0.5	ug/L	-
EO025#*	-	sec-butylbenzene	< 0.5	ug/L	-
EO025#*	-	Styrene	< 2.0	ug/L	-
EO025#*	-	Tert Butyl Benzene	< 0.5	ug/L	-
EO025#*	-	Tetrachloroethene	< 0.1	ug/L	-
EO025#*	-	Tetrahydrofuran	< 5.0	ug/L	-
EO025#*	-	Toluene	< 0.5	ug/L	-
EO025*	-	Trans 14 Dichloro 2 Butene, tran	< 2.0	ug/L	-
EO025#*	-	Trans-1,2 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	Trichloroethene	< 0.1	ug/L	-
EO025*	-	Trichloromonofluoromethane	< 0.5	ug/L	-
EO025*	-	Vinyl Chloride	< 0.5	ug/L	-
EO025#*	-	Xylene -o	< 0.5	ug/L	-
EO025#*	-	Xylene P&M	< 0.5	ug/L	-
EO025*	-	Epichlorohydrin	< 0.1	ug/L	-

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Tim McMahon

Clare County Council
Aras Contae an Chláir
New Road
Ennis
Co. Clare

Report Reference: 20-78213

Report Version: 1

Site: Not Applicable

Sample Description: 20-0746

Sample Type: Surface

Lab Reference Number: 513872

Date of Sampling: 11/06/2020

Date Sample Received: 11/06/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D3000#	15/06/2020	Alkalinity CaCO3	56.444	mg/l	-
D/D3000#	15/06/2020	Ammonia as N	0.094	mg/l	-
S/S1003#	11/06/2020	BOD5	< 2	mg/l O2	-
D/D3000#	15/06/2020	Chloride	39.938	mg/l	-
S/S1009#	11/06/2020	COD	87	mg/l O2	-
S/S3011#	11/06/2020	Conductivity @ 20°C	270.0	uS/cm @20°C	-
*	-	Dissolved Methane	< 0.050	mg/l	-
S/S1003#	11/06/2020	Dissolved Oxygen	6.68	mg/l O2	-
S/S1003#	11/06/2020	Dissolved Oxygen	70	%	-
D/D3015#	15/06/2020	Fluoride	< 0.1	mg/l	-
DEAFULT*U	-	Total Cyanide Low	< 0.7000	ug/L	-
EW188#*	-	Arsenic-Dissolved	1.3	ug/L	-
EW188#*	-	Boron-Dissolved	0.03	mg/l	-
EW188#*	-	Cadmium-Dissolved	< 0.1	ug/l	-
EW188#*	-	Calcium-Dissolved	20.9	mg/l	-
EW188#*	-	Chromium-Dissolved	< 1.0	ug/l	-
EW188#*	-	Copper-Dissolved	< 0.003	mg/l	-
EW188#*	-	Iron-Dissolved	1100	ug/l	-

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EW188#*	-	Lead-Dissolved	< 0.3	ug/l	-
EW188#*	-	Magnesium-Dissolved	7.7	mg/l	-
EW188#*	-	Manganese-Dissolved	270	ug/l	-
EW188#*	-	Mercury-Dissolved	0.02	ug/l	-
EW188#*	-	Nickel-Dissolved	3.7	ug/l	-
EW188#*	-	Sodium-Dissolved	25.4	mg/l	-
EW188#*	-	Zinc-Dissolved	3.5	ug/l	-
EW188#*	-	Potassium-Dissolved	0.9	mg/l	-
S/S1041#	11/06/2020	PH	6.93	pH Unit	-
S/D3000#	12/06/2020	Phosphorus, Total as P	< 0.200	mg/l	-
D/D3000#	15/06/2020	Sulphate	< 20.000	mg/l	-
S/S	11/06/2020	Total Dissolved Solids	115.000	mg/l	-
S/S	11/06/2020	Temperature	17.8	℃	-
S/S3224	13/06/2020	Total Organic Carbon	34.330	mg/l	-
D/D3000#	15/06/2020	TON as N	< 2.000	mg/l	-
S/S1049#	12/06/2020	Total Suspended Solids	< 2	mg/l	-
S/S1201#	11/06/2020	Coliforms	5172.0	MPN/100ml	-
S/S1201#	11/06/2020	E.coli	20.0	MPN/100ml	-

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S/S3221#	11/06/2020	Faecal Coliforms	90	cfu/100ml	-
SVOC					
*	-	1-2-4-Trichlorobenzene	< 1.00	ug/l	-
*	-	1,2-Dichlorobenzene	< 1.00	ug/l	-
*	-	1-3-Dichlorobenzene	< 1.00	ug/l	-
*	-	1-4-Dichlorobenzene	< 1.00	ug/l	-
*	-	2 4 5-Trichlorophenol	< 1.00	ug/l	-
*	-	2,4,6-Trichlorophenol	< 1.00	ug/l	-
*	-	2-4-Dichlorophenol	< 1.00	ug/l	-
*	-	2,4-Dimethylphenol	< 1.00	ug/l	-
*	-	2-4-Dinitrotoluene	< 1.00	ug/l	-
*	-	2-6-Dinitrotoluene	< 1.00	ug/l	-
*	-	2-Chloronaphthalene	< 1.00	ug/l	-
*	-	2-Chlorophenol	< 1.00	ug/l	-
*	-	2-Methynaphthalene	< 1.00	ug/l	-
*	-	2-Methylphenol	< 1.00	ug/l	-
*	-	2-Nitroaniline	< 1.00	ug/l	-
*	-	2-Nitrophenol	< 1.00	ug/l	-

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*	-	3-Nitroaniline	< 1.00	ug/l	-
*	-	4-Bromophenyl phenyl ether	< 1.00	ug/l	-
*	-	4-Chloro-3-methylphenol	< 1.00	ug/l	-
*	-	4-Chloroaniline	< 1.00	ug/l	-
*	-	4-Chlorophenyl phenyl ether	< 1.00	ug/l	-
*	-	4-Methylphenol	< 1.00	ug/l	-
*	-	4-Nitrophenol	< 1.00	ug/l	-
*	-	4-Nitroaniline	< 1.00	ug/l	-
*	-	Azobenzene	< 1.00	ug/l	-
*	-	Acenaphthene	< 1.00	ug/l	-
*	-	Acenaphthylene	< 1.00	ug/l	-
*	-	Anthracene	< 1.00	ug/l	-
*	-	Bis(2-chloroethyl)ether	< 1.00	ug/l	-
*	-	Bis(2-chloroethoxy)methane	< 1.00	ug/l	-
*	-	Bis(2-ethylhexyl)phthalate	< 2.00	ug/l	-
*	-	Benzo(a)anthracene	< 1.00	ug/l	-
*	-	Butyl benzyl phthalate	< 1.00	ug/l	-
*	-	Benzo(b)fluoranthene	< 1.00	ug/l	-

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*	-	Benzo(k)fluoranthene	< 1.00	ug/l	-
*	-	Benzo(a)pyrlene	< 1.00	ug/l	-
*	-	Benzo(ghi)perylene	< 1.00	ug/l	-
*	-	Carbazole	< 1.00	ug/l	-
*	-	Chrysene	< 1.00	ug/l	-
*	-	Dibenzofuran	< 1.00	ug/l	-
*	-	n-Dibutyl phthalate	< 1.00	ug/l	-
*	-	Diethyl phthalate	< 1.00	ug/l	-
*	-	Dibenzo(a,h)anthracene	< 1.00	ug/l	-
*	-	Dimethyl phthalate	< 1.00	ug/l	-
*	-	n-Dioctyl phthalate	< 5.00	ug/l	-
*	-	Fluoranthene	< 1.00	ug/l	-
*	-	Fluorene	< 1.00	ug/l	-
*	-	Hexachlorobenzene	< 1.00	ug/l	-
*	-	Hexachlorobutadiene	< 1.00	ug/l	-
*	-	Pentachlorophenol	< 1.00	ug/l	-
*	-	Phenol	< 1.00	ug/l	-
*	-	N-Nitrosodi-n-propylamine	< 1.00	ug/l	-

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*	-	Hexachloroethane	< 1.00	ug/l	-
*	-	Napthalene	< 1.00	ug/l	-
*	-	Napthalene	< 1.00	ug/l	-
*	-	Isophorone	< 1.00	ug/l	-
*	-	Hexachlorocyclopentadiene	< 1.00	ug/l	-
*	-	Phenanthrene	< 1.00	ug/l	-
*	-	Indeno(1,2,3-c,d) pyrene	< 1.00	ug/l	-
*	-	Pyrene	< 1.00	ug/l	-
VOC Full Suite					
EO025#*	-	1,1,1,2-tetrachloroethane	< 2.0	ug/L	-
EO025#*	-	1,1,1-trichloroethane	< 0.5	ug/L	-
EO025#*	-	1,1,2,2-tetrachloroethane	< 0.5	ug/L	-
EO025#*	-	1,1,2-trichloroethane	< 0.5	ug/L	-
EO025#*	-	1,1-dichloroethane	< 0.5	ug/L	-
EO025#*	-	1,2 dicloroethane	< 0.1	ug/L	-
EO025#*	-	1,2,3-trichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2,3-trichloropropane	< 2.0	ug/L	-
EO025#*	-	1,2,4-trichlorobenzene	< 0.5	ug/L	-

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EO025#*	-	1,2,4-trimethylbenzene	< 0.5	ug/L	-
EO025#*	-	1,2-dibromo-3-chloropropane	< 2.0	ug/L	-
EO025#*	-	1,2-dibromoethane	< 0.5	ug/L	-
EO025#*	-	1,2-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2-dichloropropane	< 0.5	ug/L	-
EO025#*	-	1,3,5-trimethylbenzene	< 0.5	ug/L	-
EO025#*	-	1,3-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	13 Dichloropropene,trans	< 2.0	ug/L	-
EO025#*	-	1,3-dichloropropane	< 0.5	ug/L	-
EO025#*	-	1,4-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	11 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	11 Dichloropropene	< 0.5	ug/L	-
EO025#*	-	13 Dichloropropene,cis	< 2.0	ug/L	-
EO025#*	-	1-Chlorobutane	< 0.5	ug/L	-
EO025*	-	2,2-dichloropropane	< 0.5	ug/L	-
EO025*	-	2-Butanone	< 5.0	ug/L	-
EO025#*	-	2-chlorotoluene	< 0.5	ug/L	-
EO025#*	-	2-Hexanone	< 1.0	ug/L	-

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EO025#*	-	2-Propenenitrile/Acrylonitrile	< 2.0	ug/L	-
EO025#*	-	4-chlorotoluene	< 0.5	ug/L	-
EO025*	-	Acetone	< 2.0	ug/L	-
EO025#*	-	Benzene	< 0.1	ug/L	-
EO025#*	-	Bromobenzene	< 0.5	ug/L	-
EO025#*	-	Bromochloromethane	< 0.5	ug/L	-
EO025#*	-	Bromodichloromethane	< 2.0	ug/L	-
EO025#*	-	Bromoform	< 1.0	ug/L	-
EO025#*	-	Bromomethane	< 0.5	ug/L	-
EO025#*	-	Carbon Disulphide	< 0.5	ug/L	-
EO025#*	-	Carbon Tetrachloride	< 0.5	ug/L	-
EO025#*	-	Chlormethyl Cyanide/Chloroacetonitrile	< 0.5	ug/L	-
EO025#*	-	Chlorobenzene	< 0.5	ug/L	-
EO025#*	-	Chloroform	< 1.0	ug/L	-
EO025*	-	Chloromethane	< 0.5	ug/L	-
EO025#*	-	cis-12 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	Dibromochloromethane	< 1.0	ug/L	-
EO025#*	-	Dibromomethane	< 0.5	ug/L	-

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Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
EO025*	-	Dichlorodifluoromethane	< 10	ug/L	-
EO025#*	-	Dichloromethane	< 5.0	ug/L	-
EO025*	-	Ethyl Chloride/Chloroethane	< 0.5	ug/L	-
EO025#*	-	Ethyl Ether/Diethyl Ether	< 0.5	ug/L	-
EO025#*	-	Ethyl Methacrylate	< 2.0	ug/L	-
EO025#*	-	Ethylbenzene	< 0.5	ug/L	-
EO025#*	-	Hexachlorobutadiene	< 0.5	ug/L	-
EO025#*	-	Hexachloroethane	< 5.0	ug/L	-
EO025#*	-	Iodomethane/Methyl Iodide	< 0.5	ug/L	-
EO025#*	-	Isopropylbenzene	< 0.5	ug/L	-
EO025*	-	Methacrylonitrile	< 5.0	ug/L	-
EO025#*	-	Methyl Acrylate	< 0.5	ug/L	-
EO025#*	-	Methyl Methacrylate	< 0.5	ug/L	-
EO025#*	-	MIBK/4 Methyl 2 Pentanone	< 2.0	ug/L	-
EO025#*	-	MtBE	< 0.5	ug/L	-
EO025#*	-	N Butyl Benzene	< 0.5	ug/L	-
EO025*	-	Naphthalene	< 2.0	ug/L	-
EO025*	-	Nitrobenzene	< 0.5	ug/L	-

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EO025#*	-	P Isopropyltoluene	< 0.5	ug/L	-
EO025*	-	Propanenitrile	< 10	ug/L	-
EO025#*	-	Propylbenzene	< 0.5	ug/L	-
EO025#*	-	sec-butylbenzene	< 0.5	ug/L	-
EO025#*	-	Styrene	< 2.0	ug/L	-
EO025#*	-	Tert Butyl Benzene	< 0.5	ug/L	-
EO025#*	-	Tetrachloroethene	< 0.1	ug/L	-
EO025#*	-	Tetrahydrofuran	< 5.0	ug/L	-
EO025#*	-	Toluene	< 0.5	ug/L	-
EO025*	-	Trans 14 Dichloro 2 Butene, tran	< 2.0	ug/L	-
EO025#*	-	Trans-1,2 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	Trichloroethene	< 0.1	ug/L	-
EO025*	-	Trichloromonofluoromethane	< 0.5	ug/L	-
EO025*	-	Vinyl Chloride	< 0.5	ug/L	-
EO025#*	-	Xylene -o	< 0.5	ug/L	-
EO025#*	-	Xylene P&M	< 0.5	ug/L	-
EO025*	-	Epichlorohydrin	< 0.1	ug/L	-

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Customer

Tim McMahon

Clare County Council
Aras Contae an Chláir
New Road
Ennis
Co. Clare

Report Reference: 20-78213

Report Version: 1

Site: Not Applicable

Sample Description: 20-0747

Sample Type: Surface

Lab Reference Number: 513873

Date of Sampling: 11/06/2020

Date Sample Received: 11/06/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D3000#	15/06/2020	Alkalinity CaCO3	66.074	mg/l	-
D/D3000#	15/06/2020	Ammonia as N	0.034	mg/l	-
S/S1003#	11/06/2020	BOD5	< 2	mg/l O2	-
D/D3000#	15/06/2020	Chloride	38.909	mg/l	-
S/S1009#	11/06/2020	COD	40	mg/l O2	-
S/S3011#	11/06/2020	Conductivity @ 20°C	286.0	uS/cm @20°C	-
*	-	Dissolved Methane	< 0.050	mg/l	-
S/S1003#	11/06/2020	Dissolved Oxygen	9.84	mg/l O2	-
S/S1003#	11/06/2020	Dissolved Oxygen	103	%	-
D/D3015#	15/06/2020	Fluoride	< 0.1	mg/l	-
DEAFULT*U	-	Total Cyanide Low	< 0.7000	ug/L	-
EW188#*	-	Arsenic-Dissolved	0.8	ug/L	-
EW188#*	-	Boron-Dissolved	0.03	mg/l	-
EW188#*	-	Cadmium-Dissolved	< 0.1	ug/l	-
EW188#*	-	Calcium-Dissolved	22.8	mg/l	-
EW188#*	-	Chromium-Dissolved	< 1.0	ug/l	-
EW188#*	-	Copper-Dissolved	< 0.003	mg/l	-
EW188#*	-	Iron-Dissolved	1200	ug/l	-

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EW188#*	-	Lead-Dissolved	< 0.3	ug/l	-
EW188#*	-	Magnesium-Dissolved	9.1	mg/l	-
EW188#*	-	Manganese-Dissolved	76.0	ug/l	-
EW188#*	-	Mercury-Dissolved	< 0.02	ug/l	-
EW188#*	-	Nickel-Dissolved	3.1	ug/l	-
EW188#*	-	Sodium-Dissolved	25.5	mg/l	-
EW188#*	-	Zinc-Dissolved	2.2	ug/l	-
EW188#*	-	Potassium-Dissolved	3.1	mg/l	-
S/S1041#	11/06/2020	PH	7.56	pH Unit	-
S/D3000#	12/06/2020	Phosphorus, Total as P	< 0.200	mg/l	-
D/D3000#	15/06/2020	Sulphate	< 20.000	mg/l	-
S/S	11/06/2020	Total Dissolved Solids	134.000	mg/l	-
S/S	11/06/2020	Temperature	18.3	℃	-
S/S3224#	13/06/2020	Total Organic Carbon	17.060	mg/l	-
D/D3000#	15/06/2020	TON as N	< 2.000	mg/l	-
S/S1049#	12/06/2020	Total Suspended Solids	< 2	mg/l	-
S/S1201#	11/06/2020	Coliforms	9208.0	MPN/100ml	-
S/S1201#	11/06/2020	E.coli	3654.0	MPN/100ml	-

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S/S3221#	11/06/2020	Faecal Coliforms	4000	cfu/100ml	-
SVOC					
*	-	1-2-4-Trichlorobenzene	< 1.00	ug/l	-
*	-	1,2-Dichlorobenzene	< 1.00	ug/l	-
*	-	1-3-Dichlorobenzene	< 1.00	ug/l	-
*	-	1-4-Dichlorobenzene	< 1.00	ug/l	-
*	-	2 4 5-Trichlorophenol	< 1.00	ug/l	-
*	-	2,4,6-Trichlorophenol	< 1.00	ug/l	-
*	-	2-4-Dichlorophenol	< 1.00	ug/l	-
*	-	2,4-Dimethylphenol	< 1.00	ug/l	-
*	-	2-4-Dinitrotoluene	< 1.00	ug/l	-
*	-	2-6-Dinitrotoluene	< 1.00	ug/l	-
*	-	2-Chloronaphthalene	< 1.00	ug/l	-
*	-	2-Chlorophenol	< 1.00	ug/l	-
*	-	2-Methynaphthalene	< 1.00	ug/l	-
*	-	2-Methylphenol	< 1.00	ug/l	-
*	-	2-Nitroaniline	< 1.00	ug/l	-
*	-	2-Nitrophenol	< 1.00	ug/l	-

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*	-	3-Nitroaniline	< 1.00	ug/l	-
*	-	4-Bromophenyl phenyl ether	< 1.00	ug/l	-
*	-	4-Chloro-3-methylphenol	< 1.00	ug/l	-
*	-	4-Chloroaniline	< 1.00	ug/l	-
*	-	4-Chlorophenyl phenyl ether	< 1.00	ug/l	-
*	-	4-Methylphenol	< 1.00	ug/l	-
*	-	4-Nitrophenol	< 1.00	ug/l	-
*	-	4-Nitroaniline	< 1.00	ug/l	-
*	-	Azobenzene	< 1.00	ug/l	-
*	-	Acenaphthene	< 1.00	ug/l	-
*	-	Acenaphthylene	< 1.00	ug/l	-
*	-	Anthracene	< 1.00	ug/l	-
*	-	Bis(2-chloroethyl)ether	< 1.00	ug/l	-
*	-	Bis(2-chloroethoxy)methane	< 1.00	ug/l	-
*	-	Bis(2-ethylhexyl)phthalate	< 2.00	ug/l	-
*	-	Benzo(a)anthracene	< 1.00	ug/l	-
*	-	Butyl benzyl phthalate	< 1.00	ug/l	-
*	-	Benzo(b)fluoranthene	< 1.00	ug/l	-

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*	-	Benzo(k)fluoranthene	< 1.00	ug/l	-
*	-	Benzo(a)pyrlene	< 1.00	ug/l	-
*	-	Benzo(ghi)perylene	< 1.00	ug/l	-
*	-	Carbazole	< 1.00	ug/l	-
*	-	Chrysene	< 1.00	ug/l	-
*	-	Dibenzofuran	< 1.00	ug/l	-
*	-	n-Dibutyl phthalate	< 1.00	ug/l	-
*	-	Diethyl phthalate	< 1.00	ug/l	-
*	-	Dibenzo(a,h)anthracene	< 1.00	ug/l	-
*	-	Dimethyl phthalate	< 1.00	ug/l	-
*	-	n-Dioctyl phthalate	< 5.00	ug/l	-
*	-	Fluoranthene	< 1.00	ug/l	-
*	-	Fluorene	< 1.00	ug/l	-
*	-	Hexachlorobenzene	< 1.00	ug/l	-
*	-	Hexachlorobutadiene	< 1.00	ug/l	-
*	-	Pentachlorophenol	< 1.00	ug/l	-
*	-	Phenol	< 1.00	ug/l	-
*	-	N-Nitrosodi-n-propylamine	< 1.00	ug/l	-

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*	-	Hexachloroethane	< 1.00	ug/l	-
*	-	Napthalene	< 1.00	ug/l	-
*	-	Napthalene	< 1.00	ug/l	-
*	-	Isophorone	< 1.00	ug/l	-
*	-	Hexachlorocyclopentadiene	< 1.00	ug/l	-
*	-	Phenanthrene	< 1.00	ug/l	-
*	-	Indeno(1,2,3-c,d) pyrene	< 1.00	ug/l	-
*	-	Pyrene	< 1.00	ug/l	-
VOC Full Suite					
EO025#*	-	1,1,1,2-tetrachloroethane	< 2.0	ug/L	-
EO025#*	-	1,1,1-trichloroethane	< 0.5	ug/L	-
EO025#*	-	1,1,2,2-tetrachloroethane	< 0.5	ug/L	-
EO025#*	-	1,1,2-trichloroethane	< 0.5	ug/L	-
EO025#*	-	1,1-dichloroethane	< 0.5	ug/L	-
EO025#*	-	1,2 dicloroethane	< 0.1	ug/L	-
EO025#*	-	1,2,3-trichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2,3-trichloropropane	< 2.0	ug/L	-
EO025#*	-	1,2,4-trichlorobenzene	< 0.5	ug/L	-

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EO025#*	-	1,2,4-trimethylbenzene	< 0.5	ug/L	-
EO025#*	-	1,2-dibromo-3-chloropropane	< 2.0	ug/L	-
EO025#*	-	1,2-dibromoethane	< 0.5	ug/L	-
EO025#*	-	1,2-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2-dichloropropane	< 0.5	ug/L	-
EO025#*	-	1,3,5-trimethylbenzene	< 0.5	ug/L	-
EO025#*	-	1,3-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	13 Dichloropropene,trans	< 2.0	ug/L	-
EO025#*	-	1,3-dichloropropane	< 0.5	ug/L	-
EO025#*	-	1,4-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	11 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	11 Dichloropropene	< 0.5	ug/L	-
EO025#*	-	13 Dichloropropene,cis	< 2.0	ug/L	-
EO025#*	-	1-Chlorobutane	< 0.5	ug/L	-
EO025*	-	2,2-dichloropropane	< 0.5	ug/L	-
EO025*	-	2-Butanone	< 5.0	ug/L	-
EO025#*	-	2-chlorotoluene	< 0.5	ug/L	-
EO025#*	-	2-Hexanone	< 1.0	ug/L	-

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EO025#*	-	2-Propenenitrile/Acrylonitrile	< 2.0	ug/L	-
EO025#*	-	4-chlorotoluene	< 0.5	ug/L	-
EO025*	-	Acetone	< 2.0	ug/L	-
EO025#*	-	Benzene	< 0.1	ug/L	-
EO025#*	-	Bromobenzene	< 0.5	ug/L	-
EO025#*	-	Bromochloromethane	< 0.5	ug/L	-
EO025#*	-	Bromodichloromethane	< 2.0	ug/L	-
EO025#*	-	Bromoform	< 1.0	ug/L	-
EO025#*	-	Bromomethane	< 0.5	ug/L	-
EO025#*	-	Carbon Disulphide	< 0.5	ug/L	-
EO025#*	-	Carbon Tetrachloride	< 0.5	ug/L	-
EO025#*	-	Chlormethyl Cyanide/Chloroacetonitrile	< 0.5	ug/L	-
EO025#*	-	Chlorobenzene	< 0.5	ug/L	-
EO025#*	-	Chloroform	< 1.0	ug/L	-
EO025*	-	Chloromethane	< 0.5	ug/L	-
EO025#*	-	cis-12 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	Dibromochloromethane	< 1.0	ug/L	-
EO025#*	-	Dibromomethane	< 0.5	ug/L	-

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Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
EO025*	-	Dichlorodifluoromethane	< 10	ug/L	-
EO025#*	-	Dichloromethane	< 5.0	ug/L	-
EO025*	-	Ethyl Chloride/Chloroethane	< 0.5	ug/L	-
EO025#*	-	Ethyl Ether/Diethyl Ether	< 0.5	ug/L	-
EO025#*	-	Ethyl Methacrylate	< 2.0	ug/L	-
EO025#*	-	Ethylbenzene	< 0.5	ug/L	-
EO025#*	-	Hexachlorobutadiene	< 0.5	ug/L	-
EO025#*	-	Hexachloroethane	< 5.0	ug/L	-
EO025#*	-	Iodomethane/Methyl Iodide	< 0.5	ug/L	-
EO025#*	-	Isopropylbenzene	< 0.5	ug/L	-
EO025*	-	Methacrylonitrile	< 5.0	ug/L	-
EO025#*	-	Methyl Acrylate	< 0.5	ug/L	-
EO025#*	-	Methyl Methacrylate	< 0.5	ug/L	-
EO025#*	-	MIBK/4 Methyl 2 Pentanone	< 2.0	ug/L	-
EO025#*	-	MtBE	< 0.5	ug/L	-
EO025#*	-	N Butyl Benzene	< 0.5	ug/L	-
EO025*	-	Naphthalene	< 2.0	ug/L	-
EO025*	-	Nitrobenzene	< 0.5	ug/L	-

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EO025#*	-	P Isopropyltoluene	< 0.5	ug/L	-
EO025*	-	Propanenitrile	< 10	ug/L	-
EO025#*	-	Propylbenzene	< 0.5	ug/L	-
EO025#*	-	sec-butylbenzene	< 0.5	ug/L	-
EO025#*	-	Styrene	< 2.0	ug/L	-
EO025#*	-	Tert Butyl Benzene	< 0.5	ug/L	-
EO025#*	-	Tetrachloroethene	< 0.1	ug/L	-
EO025#*	-	Tetrahydrofuran	< 5.0	ug/L	-
EO025#*	-	Toluene	< 0.5	ug/L	-
EO025*	-	Trans 14 Dichloro 2 Butene, tran	< 2.0	ug/L	-
EO025#*	-	Trans-1,2 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	Trichloroethene	< 0.1	ug/L	-
EO025*	-	Trichloromonofluoromethane	< 0.5	ug/L	-
EO025*	-	Vinyl Chloride	< 0.5	ug/L	-
EO025#*	-	Xylene -o	< 0.5	ug/L	-
EO025#*	-	Xylene P&M	< 0.5	ug/L	-
EO025*	-	Epichlorohydrin	< 0.1	ug/L	-

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Customer

Tim McMahon

Clare County Council
Aras Contae an Chláir
New Road
Ennis
Co. Clare

Report Reference: 20-78213

Report Version: 1

Site: Not Applicable

Sample Description: 20-0748

Sample Type: Surface

Lab Reference Number: 513874

Date of Sampling: 11/06/2020

Date Sample Received: 11/06/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D3000#	15/06/2020	Alkalinity CaCO3	67.434	mg/l	-
D/D3000#	15/06/2020	Ammonia as N	0.036	mg/l	-
S/S1003#	11/06/2020	BOD5	< 2	mg/l O2	-
D/D3000#	15/06/2020	Chloride	39.223	mg/l	-
S/S1009#	11/06/2020	COD	22	mg/l O2	-
S/S3011#	11/06/2020	Conductivity @ 20°C	240.0	uS/cm @20°C	-
*	-	Dissolved Methane	< 0.050	mg/l	-
S/S1003#	11/06/2020	Dissolved Oxygen	9.86	mg/l O2	-
S/S1003#	11/06/2020	Dissolved Oxygen	104	%	-
D/D3015#	15/06/2020	Fluoride	0.2	mg/l	-
DEAFULT*U	-	Total Cyanide Low	< 0.7000	ug/L	-
EW188#*	-	Arsenic-Dissolved	0.4	ug/L	-
EW188#*	-	Boron-Dissolved	0.02	mg/l	-
EW188#*	-	Cadmium-Dissolved	< 0.1	ug/l	-
EW188#*	-	Calcium-Dissolved	14.7	mg/l	-
EW188#*	-	Chromium-Dissolved	< 1.0	ug/l	-
EW188#*	-	Copper-Dissolved	< 0.003	mg/l	-
EW188#*	-	Iron-Dissolved	670	ug/l	-

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EW188#*	-	Lead-Dissolved	< 0.3	ug/l	-
EW188#*	-	Magnesium-Dissolved	5.7	mg/l	-
EW188#*	-	Manganese-Dissolved	33.0	ug/l	-
EW188#*	-	Mercury-Dissolved	< 0.02	ug/l	-
EW188#*	-	Nickel-Dissolved	1.3	ug/l	-
EW188#*	-	Sodium-Dissolved	24.5	mg/l	-
EW188#*	-	Zinc-Dissolved	< 1.0	ug/l	-
EW188#*	-	Potassium-Dissolved	1.7	mg/l	-
S/S1041#	11/06/2020	PH	7.51	pH Unit	-
S/D3000#	12/06/2020	Phosphorus, Total as P	< 0.200	mg/l	-
D/D3000#	15/06/2020	Sulphate	< 20.000	mg/l	-
S/S	11/06/2020	Total Dissolved Solids	114.000	mg/l	-
S/S	11/06/2020	Temperature	17.5	℃	-
S/S3224#	13/06/2020	Total Organic Carbon	10.380	mg/l	-
D/D3000#	15/06/2020	TON as N	< 2.000	mg/l	-
S/S1049#	12/06/2020	Total Suspended Solids	2	mg/l	-
S/S1201#	11/06/2020	Coliforms	6300.0	MPN/100ml	-
S/S1201#	11/06/2020	E.coli	3100.0	MPN/100ml	-

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S/S3221#	11/06/2020	Faecal Coliforms	3600	cfu/100ml	-
SVOC					
*	-	1-2-4-Trichlorobenzene	< 1.00	ug/l	-
*	-	1,2-Dichlorobenzene	< 1.00	ug/l	-
*	-	1-3-Dichlorobenzene	< 1.00	ug/l	-
*	-	1-4-Dichlorobenzene	< 1.00	ug/l	-
*	-	2 4 5-Trichlorophenol	< 1.00	ug/l	-
*	-	2,4,6-Trichlorophenol	< 1.00	ug/l	-
*	-	2-4-Dichlorophenol	< 1.00	ug/l	-
*	-	2,4-Dimethylphenol	< 1.00	ug/l	-
*	-	2-4-Dinitrotoluene	< 1.00	ug/l	-
*	-	2-6-Dinitrotoluene	< 1.00	ug/l	-
*	-	2-Chloronaphthalene	< 1.00	ug/l	-
*	-	2-Chlorophenol	< 1.00	ug/l	-
*	-	2-Methynaphthalene	< 1.00	ug/l	-
*	-	2-Methylphenol	< 1.00	ug/l	-
*	-	2-Nitroaniline	< 1.00	ug/l	-
*	-	2-Nitrophenol	< 1.00	ug/l	-

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*	-	3-Nitroaniline	< 1.00	ug/l	-
*	-	4-Bromophenyl phenyl ether	< 1.00	ug/l	-
*	-	4-Chloro-3-methylphenol	< 1.00	ug/l	-
*	-	4-Chloroaniline	< 1.00	ug/l	-
*	-	4-Chlorophenyl phenyl ether	< 1.00	ug/l	-
*	-	4-Methylphenol	< 1.00	ug/l	-
*	-	4-Nitrophenol	< 1.00	ug/l	-
*	-	4-Nitroaniline	< 1.00	ug/l	-
*	-	Azobenzene	< 1.00	ug/l	-
*	-	Acenaphthene	< 1.00	ug/l	-
*	-	Acenaphthylene	< 1.00	ug/l	-
*	-	Anthracene	< 1.00	ug/l	-
*	-	Bis(2-chloroethyl)ether	< 1.00	ug/l	-
*	-	Bis(2-chloroethoxy)methane	< 1.00	ug/l	-
*	-	Bis(2-ethylhexyl)phthalate	< 2.00	ug/l	-
*	-	Benzo(a)anthracene	< 1.00	ug/l	-
*	-	Butyl benzyl phthalate	< 1.00	ug/l	-
*	-	Benzo(b)fluoranthene	< 1.00	ug/l	-

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*	-	Benzo(k)fluoranthene	< 1.00	ug/l	-
*	-	Benzo(a)pyrlene	< 1.00	ug/l	-
*	-	Benzo(ghi)perylene	< 1.00	ug/l	-
*	-	Carbazole	< 1.00	ug/l	-
*	-	Chrysene	< 1.00	ug/l	-
*	-	Dibenzofuran	< 1.00	ug/l	-
*	-	n-Dibutyl phthalate	< 1.00	ug/l	-
*	-	Diethyl phthalate	< 1.00	ug/l	-
*	-	Dibenzo(a,h)anthracene	< 1.00	ug/l	-
*	-	Dimethyl phthalate	< 1.00	ug/l	-
*	-	n-Dioctyl phthalate	< 5.00	ug/l	-
*	-	Fluoranthene	< 1.00	ug/l	-
*	-	Fluorene	< 1.00	ug/l	-
*	-	Hexachlorobenzene	< 1.00	ug/l	-
*	-	Hexachlorobutadiene	< 1.00	ug/l	-
*	-	Pentachlorophenol	< 1.00	ug/l	-
*	-	Phenol	< 1.00	ug/l	-
*	-	N-Nitrosodi-n-propylamine	< 1.00	ug/l	-

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Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
*	-	Hexachloroethane	< 1.00	ug/l	-
*	-	Napthalene	< 1.00	ug/l	-
*	-	Napthalene	< 1.00	ug/l	-
*	-	Isophorone	< 1.00	ug/l	-
*	-	Hexachlorocyclopentadiene	< 1.00	ug/l	-
*	-	Phenanthrene	< 1.00	ug/l	-
*	-	Indeno(1,2,3-c,d) pyrene	< 1.00	ug/l	-
*	-	Pyrene	< 1.00	ug/l	-
VOC Full Suite					
EO025#*	-	1,1,1,2-tetrachloroethane	< 2.0	ug/L	-
EO025#*	-	1,1,1-trichloroethane	< 0.5	ug/L	-
EO025#*	-	1,1,2,2-tetrachloroethane	< 0.5	ug/L	-
EO025#*	-	1,1,2-trichloroethane	< 0.5	ug/L	-
EO025#*	-	1,1-dichloroethane	< 0.5	ug/L	-
EO025#*	-	1,2 dicloroethane	< 0.1	ug/L	-
EO025#*	-	1,2,3-trichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2,3-trichloropropane	< 2.0	ug/L	-
EO025#*	-	1,2,4-trichlorobenzene	< 0.5	ug/L	-

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EO025#*	-	1,2,4-trimethylbenzene	< 0.5	ug/L	-
EO025#*	-	1,2-dibromo-3-chloropropane	< 2.0	ug/L	-
EO025#*	-	1,2-dibromoethane	< 0.5	ug/L	-
EO025#*	-	1,2-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	1,2-dichloropropane	< 0.5	ug/L	-
EO025#*	-	1,3,5-trimethylbenzene	< 0.5	ug/L	-
EO025#*	-	1,3-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	13 Dichloropropene,trans	< 2.0	ug/L	-
EO025#*	-	1,3-dichloropropane	< 0.5	ug/L	-
EO025#*	-	1,4-dichlorobenzene	< 0.5	ug/L	-
EO025#*	-	11 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	11 Dichloropropene	< 0.5	ug/L	-
EO025#*	-	13 Dichloropropene,cis	< 2.0	ug/L	-
EO025#*	-	1-Chlorobutane	< 0.5	ug/L	-
EO025*	-	2,2-dichloropropane	< 0.5	ug/L	-
EO025*	-	2-Butanone	< 5.0	ug/L	-
EO025#*	-	2-chlorotoluene	< 0.5	ug/L	-
EO025#*	-	2-Hexanone	< 1.0	ug/L	-

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EO025#*	-	2-Propenenitrile/Acrylonitrile	< 2.0	ug/L	-
EO025#*	-	4-chlorotoluene	< 0.5	ug/L	-
EO025*	-	Acetone	< 2.0	ug/L	-
EO025#*	-	Benzene	< 0.1	ug/L	-
EO025#*	-	Bromobenzene	< 0.5	ug/L	-
EO025#*	-	Bromochloromethane	< 0.5	ug/L	-
EO025#*	-	Bromodichloromethane	< 2.0	ug/L	-
EO025#*	-	Bromoform	< 1.0	ug/L	-
EO025#*	-	Bromomethane	< 0.5	ug/L	-
EO025#*	-	Carbon Disulphide	< 0.5	ug/L	-
EO025#*	-	Carbon Tetrachloride	< 0.5	ug/L	-
EO025#*	-	Chlormethyl Cyanide/Chloroacetonitrile	< 0.5	ug/L	-
EO025#*	-	Chlorobenzene	< 0.5	ug/L	-
EO025#*	-	Chloroform	< 1.0	ug/L	-
EO025*	-	Chloromethane	< 0.5	ug/L	-
EO025#*	-	cis-12 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	Dibromochloromethane	< 1.0	ug/L	-
EO025#*	-	Dibromomethane	< 0.5	ug/L	-

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Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
EO025*	-	Dichlorodifluoromethane	< 10	ug/L	-
EO025#*	-	Dichloromethane	< 5.0	ug/L	-
EO025*	-	Ethyl Chloride/Chloroethane	< 0.5	ug/L	-
EO025#*	-	Ethyl Ether/Diethyl Ether	< 0.5	ug/L	-
EO025#*	-	Ethyl Methacrylate	< 2.0	ug/L	-
EO025#*	-	Ethylbenzene	< 0.5	ug/L	-
EO025#*	-	Hexachlorobutadiene	< 0.5	ug/L	-
EO025#*	-	Hexachloroethane	< 5.0	ug/L	-
EO025#*	-	Iodomethane/Methyl Iodide	< 0.5	ug/L	-
EO025#*	-	Isopropylbenzene	< 0.5	ug/L	-
EO025*	-	Methacrylonitrile	< 5.0	ug/L	-
EO025#*	-	Methyl Acrylate	< 0.5	ug/L	-
EO025#*	-	Methyl Methacrylate	< 0.5	ug/L	-
EO025#*	-	MIBK/4 Methyl 2 Pentanone	< 2.0	ug/L	-
EO025#*	-	MtBE	< 0.5	ug/L	-
EO025#*	-	N Butyl Benzene	< 0.5	ug/L	-
EO025*	-	Naphthalene	< 2.0	ug/L	-
EO025*	-	Nitrobenzene	< 0.5	ug/L	-

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EO025#*	-	P Isopropyltoluene	< 0.5	ug/L	-
EO025*	-	Propanenitrile	< 10	ug/L	-
EO025#*	-	Propylbenzene	< 0.5	ug/L	-
EO025#*	-	sec-butylbenzene	< 0.5	ug/L	-
EO025#*	-	Styrene	< 2.0	ug/L	-
EO025#*	-	Tert Butyl Benzene	< 0.5	ug/L	-
EO025#*	-	Tetrachloroethene	< 0.1	ug/L	-
EO025#*	-	Tetrahydrofuran	< 5.0	ug/L	-
EO025#*	-	Toluene	< 0.5	ug/L	-
EO025*	-	Trans 14 Dichloro 2 Butene, tran	< 2.0	ug/L	-
EO025#*	-	Trans-1,2 Dichloroethene	< 0.5	ug/L	-
EO025#*	-	Trichloroethene	< 0.1	ug/L	-
EO025*	-	Trichloromonofluoromethane	< 0.5	ug/L	-
EO025*	-	Vinyl Chloride	< 0.5	ug/L	-
EO025#*	-	Xylene -o	< 0.5	ug/L	-
EO025#*	-	Xylene P&M	< 0.5	ug/L	-
EO025*	-	Epichlorohydrin	< 0.1	ug/L	-

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

Note:
PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water samples.
For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely.
NAC & ATC - No abnormal change and acceptable to customers.
TVC - Total viable count
Site D = Analysed at City Analysts Dublin. Site S = Analysed at City Analysts Shannon

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Environmental Laboratories

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Lab Reference Number:	Parameter	Result	Units	Site / Method Ref.
513869	Alkalinity CaCO3	54.4685	mg/l	D/D3000
513869	Ammonia as N	0.03308	mg/l	D/D3000
513869	BOD5	0.8100	mg/l O2	S/S1003
513869	Chloride	41.7079	mg/l	D/D3000
513869	COD	47.0000	mg/l O2	S/S1009
513869	Conductivity @ 20℃	248	uS/cm @20℃	S/S3011
513869	Dissolved Oxygen	9.77	mg/l O2	S/S1003
513869	Dissolved Oxygen	101.3	%	S/S1003
513869	Fluoride	0.0592	mg/l	D/D3015
513869	PH	7.63	pH Unit	S/S1041
513869	Phosphorus, Total as P	0.04200	mg/l	S/D3000
513869	Sulphate	0	mg/l	D/D3000
513869	Total Dissolved Solids	111	mg/l	S/S
513869	Temperature	17.9	℃	S/S
513869	Total Organic Carbon	19.47	mg/l	S/S3224
513869	TON as N	0.07366	mg/l	D/D3000
513869	Total Suspended Solids	3.0000	mg/l	S/S1049
513869	Coliforms	14136	MPN/100ml	S/S1201
513869	E.coli	185	MPN/100ml	S/S1201
513869	Faecal Coliforms	230	cfu/100ml	S/S3221
513870	Alkalinity CaCO3	53.4827	mg/l	D/D3000
513870	Ammonia as N	0.03741	mg/l	D/D3000
513870	BOD5	0.5600	mg/l O2	S/S1003
513870	Chloride	43.14168	mg/l	D/D3000
513870	COD	49.0000	mg/l O2	S/S1009
513870	Conductivity @ 20℃	248	uS/cm @20℃	S/S3011
513870	Dissolved Oxygen	8.91	mg/l O2	S/S1003
513870	Dissolved Oxygen	93.9	%	S/S1003
513870	Fluoride	0.0615	mg/l	D/D3015
513870	PH	7.46	pH Unit	S/S1041
513870	Phosphorus, Total as P	0.04400	mg/l	S/D3000
513870	Sulphate	0	mg/l	D/D3000
513870	Total Dissolved Solids	120	mg/l	S/S
513870	Temperature	18.1	℃	S/S
513870	Total Organic Carbon	20.09	mg/l	S/S3224
513870	TON as N	0.05322	mg/l	D/D3000
513870	Total Suspended Solids	2.0000	mg/l	S/S1049

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Lab Reference Number:	Parameter	Result	Units	Site / Method Ref.
513870	Coliforms	7500	MPN/100ml	S/S1201
513870	E.coli	5200	MPN/100ml	S/S1201
513870	Faecal Coliforms	5500	cfu/100ml	S/S3221
513871	Alkalinity CaCO3	55.22781	mg/l	D/D3000
513871	Ammonia as N	0.02285	mg/l	D/D3000
513871	BOD5	0.7000	mg/l O2	S/S1003
513871	Chloride	39.63469	mg/l	D/D3000
513871	COD	30.0000	mg/l O2	S/S1009
513871	Conductivity @ 20℃	259	uS/cm @20℃	S/S3011
513871	Dissolved Oxygen	9.50	mg/l O2	S/S1003
513871	Dissolved Oxygen	101.3	%	S/S1003
513871	Fluoride	0.107	mg/l	D/D3015
513871	PH	7.49	pH Unit	S/S1041
513871	Phosphorus, Total as P	0.045	mg/l	S/D3000
513871	Sulphate	15.77126	mg/l	D/D3000
513871	Total Dissolved Solids	126	mg/l	S/S
513871	Temperature	18.0	℃	S/S
513871	Total Organic Carbon	12.74	mg/l	S/S3224
513871	TON as N	0.33592	mg/l	D/D3000
513871	Total Suspended Solids	3.0000	mg/l	S/S1049
513871	Coliforms	3100	MPN/100ml	S/S1201
513871	E.coli	2000	MPN/100ml	S/S1201
513871	Faecal Coliforms	2200	cfu/100ml	S/S3221
513872	Alkalinity CaCO3	56.44375	mg/l	D/D3000
513872	Ammonia as N	0.09432	mg/l	D/D3000
513872	BOD5	0.6400	mg/l O2	S/S1003
513872	Chloride	39.93783	mg/l	D/D3000
513872	COD	87.0000	mg/l O2	S/S1009
513872	Conductivity @ 20℃	270	uS/cm @20℃	S/S3011
513872	Dissolved Oxygen	6.68	mg/l O2	S/S1003
513872	Dissolved Oxygen	69.7	%	S/S1003
513872	Fluoride	0.0770	mg/l	D/D3015
513872	PH	6.93	pH Unit	S/S1041
513872	Phosphorus, Total as P	0.12600	mg/l	S/D3000
513872	Sulphate	0	mg/l	D/D3000
513872	Total Dissolved Solids	115	mg/l	S/S
513872	Temperature	17.8	℃	S/S

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Lab Reference Number:	Parameter	Result	Units	Site / Method Ref.
513872	Total Organic Carbon	34.33	mg/l	S/S3224
513872	TON as N	0	mg/l	D/D3000
513872	Total Suspended Solids	1.0000	mg/l	S/S1049
513872	Coliforms	5172	MPN/100ml	S/S1201
513872	E.coli	20	MPN/100ml	S/S1201
513872	Faecal Coliforms	90	cfu/100ml	S/S3221
513873	Alkalinity CaCO3	66.07407	mg/l	D/D3000
513873	Ammonia as N	0.03422	mg/l	D/D3000
513873	BOD5	0.9600	mg/l O2	S/S1003
513873	Chloride	38.90887	mg/l	D/D3000
513873	COD	40.0000	mg/l O2	S/S1009
513873	Conductivity @ 20℃	286	uS/cm @20℃	S/S3011
513873	Dissolved Oxygen	9.84	mg/l O2	S/S1003
513873	Dissolved Oxygen	103.3	%	S/S1003
513873	Fluoride	0.0648	mg/l	D/D3015
513873	PH	7.56	pH Unit	S/S1041
513873	Phosphorus, Total as P	0.06700	mg/l	S/D3000
513873	Sulphate	13.13702	mg/l	D/D3000
513873	Total Dissolved Solids	134	mg/l	S/S
513873	Temperature	18.3	℃	S/S
513873	Total Organic Carbon	17.06	mg/l	S/S3224
513873	TON as N	0.27761	mg/l	D/D3000
513873	Total Suspended Solids	1.0000	mg/l	S/S1049
513873	Coliforms	9208	MPN/100ml	S/S1201
513873	E.coli	3654	MPN/100ml	S/S1201
513873	Faecal Coliforms	4000	cfu/100ml	S/S3221
513874	Alkalinity CaCO3	67.43362	mg/l	D/D3000
513874	Ammonia as N	0.03641	mg/l	D/D3000
513874	BOD5	0.4400	mg/l O2	S/S1003
513874	Chloride	39.2231	mg/l	D/D3000
513874	COD	22.0000	mg/l O2	S/S1009
513874	Conductivity @ 20℃	240	uS/cm @20℃	S/S3011
513874	Dissolved Oxygen	9.86	mg/l O2	S/S1003
513874	Dissolved Oxygen	104.1	%	S/S1003
513874	Fluoride	0.155	mg/l	D/D3015
513874	PH	7.51	pH Unit	S/S1041
513874	Phosphorus, Total as P	0.03000	mg/l	S/D3000

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Lab Reference Number:	Parameter	Result	Units	Site / Method Ref.
513874	Sulphate	13.26057	mg/l	D/D3000
513874	Total Dissolved Solids	114	mg/l	S/S
513874	Temperature	17.5	℃	S/S
513874	Total Organic Carbon	10.38	mg/l	S/S3224
513874	TON as N	0.26993	mg/l	D/D3000
513874	Total Suspended Solids	2.0000	mg/l	S/S1049
513874	Coliforms	6300	MPN/100ml	S/S1201
513874	E.coli	3100	MPN/100ml	S/S1201
513874	Faecal Coliforms	3600	cfu/100ml	S/S3221

APPENDIX 5

Tier 3 Risk Scores

See Separate Volume

Kilrush Closed Landfill

Table 1a LEACHATE: SOURCE/HAZARD SCORING MATRIX			
	Waste FOOTPRINT (ha)		
WASTE TYPE	≤ 1ha	> 1 ≤ 5 ha	> 5ha
C&D	0.5	1	1.5
Municipal	5	7	10
Industrial	5	7	10
Pre 1977 sites	1	2	3

1a =	7

Table 1b LANDFILL GAS: SOURCE/HAZARD SCORING MATRIX			
	Waste FOOTPRINT (ha)		
WASTE TYPE	≤ 1ha	> 1 ≤ 5 ha	> 5ha
C&D	0.5	0.75	1
Municipal	5	7	10
Industrial	3	5	7
Pre 1977 sites	0.5	0.75	1

1b =	7

Table 2a : LEACHATE MIGRATION: PATHWAYS	
GROUNDWATER VULNERABILITY (Vertical Pathway)	Points
Extreme Vulnerability	3
High Vulnerability	2
Moderate Vulnerability	1
Low Vulnerability	0.5
High - Low Vulnerability (use where vulnerability not on GIS)	2

2a =	2

Table 2b : LEACHATE MIGRATION: PATHWAYS	
GROUNDWATER FLOW REGIME (Horizontal Pathway)	Points
Karstified Groundwater Bodies (Rk)	5
Productive Fissured Bedrock Groundwater Bodies (Rf & Lm)	3
Gravel Groundwater Bodies (Rg and Lg)	2
Poorly Productive Bedrock Groundwater Bodies (Ll, Pl, Pu)	1

2b =	1

Table 2c : LEACHATE MIGRATION: PATHWAYS	
SURFACE WATER DRAINAGE (Surface water pathway)	**Points**
associated with the waste body and adjacent surface water	2
If no direct connection	0

2c =	**2**

Table 2d : LANDFILL GAS: PATHWAY	
LANDFILL GAS LATERAL MIGRATION POTENTIAL	**Points**
Sand and Gravel, Made ground, urban, karst	3
Bedrock	2
All other Tills (including limestone, sandstone etc - moderate	1.5
All Namurian or Irish Sea Tills (low permability)	1
Clay, Alluvium, Peat	1

2d =	**1**

able 2e : LANDFILL GAS: PATHWAY (assuming receptor located above sourc	
LANDFILL GAS LATERAL MIGRATION POTENTIAL	**Points**
Sand and Gravel, Made ground, urban, karst	5
Bedrock	3
All other Tills (including limestone, standstone etc - moderate	2
All Namurian or Irish Sea Tills (low permability)	1
Clay, Alluvium, Peat	1

2e =	**0**

Table 3a : LEACHAGE MIGRATION: *RECEPTORS*	
HUMAN PRESENCE (presence of a house indicates potential private wells)	**Points**
On or within 50m of the waste body	3
Greater than 50m but less than 250m	2
Greater than 250m but less than 1km from waste body	1
Greater than 1km of the waste body	0

3a =	**1**

Table 3b : LEACHAGE MIGRATION: RECEPTORS PROTECTED AREAS (SWDTE or GWDTE)	Points
Within 50m of waste body	3
Greater than 50m but less than 250m of the waste body	2
Greater than 250m but less than 1km from waste body	1
Greater than 1km of the waste body	0
Undesignated sites within 50m of waste body	1
Undesignated sites greater than 50m but less than 250m	0.5
Undesignated sites greater than 250m of the waste body	0

3b =	0

Table 3c : LEACHAGE MIGRATION: *RECEPTORS*	
AQUIFER CATEGORY (resource potential)	Points
Regionally Important Aquifers (Rk, Rf, Rg)	5
Locally Important Aquifers (LI, Lm, Lg)	3
Poor Aquifers (Pl, Pu)	1

3c =	3

Table 3d : LEACHAGE MIGRATION: *RECEPTORS*	
PUBLIC WATER SUPPLIES (Other than private wells)	Points
Within 100m of site boundary	**7**
for GW supplies	5
(SO) for GW supplies	3
Greater than 1km (karst aquifer)	3
Greater than 1km (no karst aquifer)	0

3d =	0

Table 3e : LEACHAGE MIGRATION: *RECEPTORS*	
SURFACE WATER BODIES	Points
Within 50m of site boundary	3
Greater than 50m but less than 250m	2
Greater than 250m but less than 1km	1
Greater than 1km	0

3e =	2

Table 3f : LEACHAGE MIGRATION: *RECEPTORS*	
HUMAN PRESENCE	**Points**
On site or within 50m of site boundary	5
Greater than 50m but less than 150m	3
Greater than 150m but less than 250m	1
Greater than 250m	0.5

3f =	**0.5**

Note: The table below represents the Tier 1 risk rating for this site. SPR 1 to 9 represent the leachate risk scores. SPR 10 & 11 represent Landfill Gas risks. The migration pathways are colour coded as follows:

Groundwater & Surface Water	Groundwater only	Surface water only	Lateral & Vertical

Calculator	SPR Values	Maximum Score	Linkages	Normalised Score
SPR 1 =	70	300	**Leachate => surface water**	**23%**
SPR 2 =	0	300	**Leachate => SWDTE**	**0%**
SPR 3 =	21	240	**Leachate => human presence**	**9%**
SPR 4 =	0	240	**Leachate => GWDTE**	**0%**
SPR 5 =	63	400	**Leachate => Aquifer**	**16%**
SPR 6 =	0	560	**Leachate => Surface Water**	**0%**
SPR 7 =	42	240	**Leachate => SWDTE**	**18%**
SPR 8 =	28	60	**Leachate => Surface Water**	**47%**
SPR 9 =	0	60	**Leachate => SWDTE**	**0%**
SPR 10 =	3.5	150	**Landfill Gas => Human Presence**	**2%**
SPR 11 =	0	250	**Landfill Gas => Human Presence**	**0%**

Risk Classification	Range of Risk Scores
Highest Risk (Class A)	**Greater than or equal to 70% for any individual SPR lingage**
Moderate Risk (Class B)	**Between 40-70% for any individual SPR linkage**
Lowest Risk (Class C)	**Less than or equal to 40% for any individual SPR linkage**

TIER 3 RATING	**Moderate**