WATERFORD COUNTY COUNCIL

COMHAIRLE CHONTAE PHORTLAIRGE

ANNUAL ENVIRONMENTAL REPORT 2009

BALLYNAMUCK WASTE DISPOSAL SITE

BALLYNAMUCK MIDDLE

DUNGARVAN CO. WATERFORD

Waste Licence Register No. W0032-2

Report Compiled by;
Mr David Regan, Facility Manager, Dungarvan Landfill
Mr Paul Carroll, Executive Scientific Officer, Adamstown Laboratory

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Introduction

Waterford County Council was granted a Waste Licence (Ref 32-1) by the Environmental Protection Agency on the 29th November 2002 for the continued acceptance of municipal waste within the existing footprint of the Dungarvan Landfill Facility at Ballynamuck Middle, Dungarvan Co. Waterford. The landfill ceased to accept waste on the 30th June 2003. This licence was updated by Waste Licence (Ref 32-2) which included permission for a Transfer Station and Composting facilities. This is the seventh Annual Environmental Report for the Facility and includes the monitoring period 1st January 2009 – 31st December 2009. The report has been prepared in accordance with Condition 11.7 and Schedule G of the Waste Licence.

1. Reporting Period

This is the seventh Annual Environmental Report for the Dungarvan Waste Disposal Site, which covers the period 1st January 2009 to 31st December 2009.

2. Waste Activities carried out at the Facility

Part 1 of the Waste Licence details the activities authorised by the licence:

Waste Management Act 1996: Third Schedule

Class 4. **Surface impoundment, including placement of liquid or sludge discards in to pits, ponds or lagoons:**

This activity is limited to the storage of leachate generated within the facility in a lined leachate lagoon and the storage of surface water runoff in surface water retention (s) ponds

Class 13. **Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned was produced:**

This activity is limited to the storage of rejected waste in the waste Inspection and Quarantine area and the Construction and Demolition Recovery Area prior to the removal of such waste off site for the disposal at an appropriate facility

Waste Management Act, 1996, Fourth Schedule

Class 2. **Recycling or reclamation of organic substances, which are not used as solvents (including composting and other biological transformation processes):**

This activity is limited to recycling of organic waste including cardboard and paper at the civic waste facility only and the acceptance and storage of waste oils in appropriate containers at the civic waste facility prior to removal offsite.

Class 3. **Recycling or reclamation of metals and metal compounds:**

This activity is limited to the acceptance of white goods within a designated Metal Recovery Area, the acceptance and storage of beverage cans in the appropriate containers at the civic waste facility prior to removal offsite.

Class 4. **Recycling or reclamation of other inorganic materials:**

This activity is limited to the acceptance and storage in appropriate containers of glass bottles, batteries and fluorescent tubes and the recovery of inert waste at the facility for use in site development and restoration works.

Class 9. **Use of any waste principally as a fuel or other means to generate energy**

Class 11. **Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule:**

This activity is limited to the use of suitable inert waste in site development and restoration works.

Class 13. **Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than the temporary storage, pending collection, on the premises where such waste is produced:**

This activity is limited to the storage of wastes within designated areas and receptacles prior to recovery offsite and the storage of inert waste prior to restoration of the facility.

3. Quantity and Composition of Waste received, disposed of and removed during the reporting period and each year previous

The quantity and composition of waste received, disposed of and removed for the reporting period 1st January 2009 – 31st December 2009 is attached in Appendix A.

4. Methods of deposition of inert waste for restoration

Inert waste is brought on site in dumper trucks where it is tipped in the relevant areas that needed temporary capping. Acceptance criteria are as outlined in Schedule F of the Waste Licence. An excavator then levels the inert waste. Some minor adjustments to the landfill cap were required during the reporting period which resulted in approximately 40 tonnes of clay being brought on site in 2009.

5.0 Environmental Monitoring

Introduction

Dungarvan landfill is located in County Waterford approximately 2km north west of Dungarvan off the N25 road on the southern edge of the Colligan River. The total area of the landfill site is approximately 6.5 hectares, and has been in operation since 1968. The landfill closed on 30th June 2003, but still acts as a transfer station for recyclable material.

Monitoring of surface waters, groundwater's and leachate and landfill gas was carried out in accordance with the waste licence, conditions 8. EPA and Waterford County Council staff carried out sampling and field measurements. Analysis was carried out at EPA Laboratories, Waterford County Council Laboratory and Euro environmental Laboratory. The ecological survey was carried out by Limosa Scientific.

Sampling sites are as set out in Table 1 and attached Drawing, DUN-EIS-003.

Surface water stations	Groundwater station	Leachate station	Gas monitoring station	Noise	Dust
SW1*, SW2*, EPA station 280, EPA station 300 Also - Annual biological survey	GW1*, GW2a, RC3a, RC4*, RC6a, RC7*, RC8*	L1, L2a, L3*, L4* L5a, L6*, Leachate tank	L1*, L2a, L3*, L4*, L5a, L6, RC1*, RC3, RC4*, RC6, RC7, RC8, GW1*, GW2a	B1*, B2*, B3*, B4*, NSL1*	B1, B2, B3, B4, D1

Table 1: Monitoring locations, Dungarvan Landfill

*Baseline results available for these sites

Baseline Monitoring

One of the purposes of compliance monitoring is to determine if there has been a release of contaminants to the environmental media, and to demonstrate compliance with landfill licence conditions. ***Baseline monitoring*** is monitoring which serves as a reference point to which later monitoring results are compared. While there is no data available preceding the landfill, for the purpose of this report, water quality results obtained during 2001 will be used as baseline monitoring data. Two new groundwater monitoring boreholes (RC7 and RC8) were installed since 2001, and results of tests carried out in 2002 at these sites are used as baseline. Noise measurements taken during the 1998 survey will also be used as comparison with this 2009 study.

5.1 SURFACE WATER.

5.1.1 Introduction

Sampling was carried out by EPA and Waterford County Council personnel at sites SW1, SW2, EPA site 300, EPA Site 280 and the landfill lagoon, as per attached map. Analysis was carried out at EPA Laboratories in Kilkenny and Dublin.

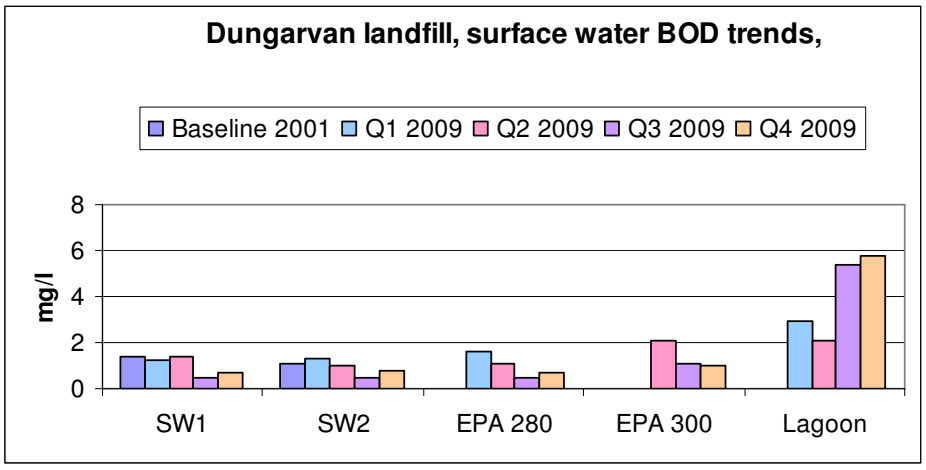
Sampling site EPA 300, at Ballyneety Bridge downstream of the landfill site, is subject to saline intrusion from Dungarvan Estuary. There are difficulties involved in monitoring surface water pollution from landfills adjacent to estuaries, as the salinity of the samples can interfere with many of the tests, (*ammonia, COD, arsenic, copper*). Additionally, many of the ions, which are considered indicators of leachate contamination, are also major components of sea/brackish water, *(chloride, sulphate, sodium, magnesium, calcium, boron).*

5.1.2 Results – see table 5.1.1 to 5.1.4 below.

River water quality was satisfactory. The lagoon had somewhat elevated levels of BOD, which may be related to algal and plant activity in this enclosed pond.

Key Parameter – BOD

The BOD test is a measure of the amount of oxygen consumed by microorganisms in breaking down organic matter in water. Respiration by phytoplankton or their decay, can also lead to oxygen depletion during the BOD test resulting in a high BOD value. Surface waters supporting fish life should have a BOD value < 4 mg/l BOD.



Discussion

BOD levels were low at river sites throughout the year and slightly elevated in the lagoon.

Table 5.1.1 Dungarvan landfill surface water monitoring 18/2/2009

Test	SW 1	SW 2	SW 280	SW 300	Pond L6	Drinking Water Standards (SI 278 2007)	Bathing Water Standards (SI 155 1992)	Estuarine Water Standards (DOELG 2001)	Comments	Environmental significance
BOD mg/l O2	1.2	1.3	1.6		2.9				BOD satisfactory in river, somewhat elevated in lagoon.	None
Dissolved Oxygen % Sat	108	109	108		116	-	70 - 120 95% compliance	70 - 130 (Brackish) 80-120 (Saline)	DO satisfactory	None
Suspended Solids mg/l	<6	<6	<6		13				SS satisfactory	None
Temperature ℃	8	8.1	8		7.6	25			Temperature normal	None

Sampling date 18/2/09
SW 300 not sampled due to difficult access and tidal conditions

Table 5.1.2 Surface water quality Dungarvan landfill 18/5/2009

Test	SW 1	SW 2	SW 280	SW 300	Pond L6	Drinking Water Standards (SI 278 2007)	Bathing Water Standards (SI 155 1992)	Estuarine Water Standards (DOELG 2001)	Comments	Environmental significance
BOD mg/l O2	1.4	1	1.1	2.1	2.1				BOD satisfactory	None
COD	15	30	23	37	24				COD satisfactory	None
Dissolved Oxygen % Sat	100	100	101	103	71	-	70 - 120 95% compliance	70 - 130 (Brackish) 80-120 (Saline)	DO slightly low in lagoon, typical of static pond, otherwise satisfactory	None
Suspended Solids mg/l	46	7	<6	36	32				SS generally satisfactory.	None

Sampling date 18/5/09

Table 5.1.3 Surface water quality Dungarvan landfill 10/9/09

	SW1	SW2	SW280	SW300	Lagoon	Drinking Water Standards (SI 278 2007)	Bathing Water Standards (SI 155 1992)	Estuarine Water Standards (DOELG 2001)	Comments	Environmental significance
Temperature deg C	12	12	12	12.2	17.2					
Dissolved Oxygen %	105	106	107	104	134		70 - 120 95% compliance	70 - 130 (Brackish) 80-120 (Saline)	DO satisfactory	None
BOD mg/l	<0.5	0.5	0.5	1.1	5.4	-			BOD satisfactory	None
Suspended solids mg/l	<5	<5	<5	<5	8				SS satisfactory.	None

Sampled 10/9/09

Table 5.1.4 Dungarvan landfill surface water monitoring 30/11/09

	SW1	SW2	SW280	SW300	Lagoon	Drinking Water	Bathing Water	Estuarine Water	Comments	Environmental significance
Temperature deg C	6.6	6.5	6.4	5.7	5.1					
Dissolved Oxygen %	97	97	97	97	91		70 - 120 95%	70 - 130 (Brackish)	DO satisfactory	None
BOD mg/l	0.7	0.8	0.7	1	5.8				BOD satisfactory	None
Suspended solids mg/l	<5	<5	<5	<5	5				SS satisfactory.	None

Sampled 30/11/09

5.2 Groundwater

5.2.1 INTRODUCTION

Sites GW1, GW2a, RC3a, RC4, RC6a, RC7 and RC8 were sampled during 2009. RC1 is no longer in place.

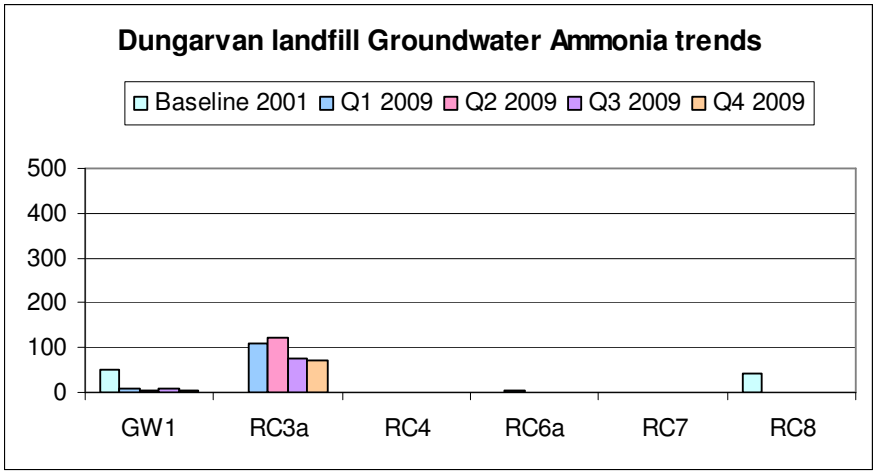
RC4 (south west of site) and RC7 (east of site) are outside the waste deposit area.

All the other ground water stations are within the site boundary, either within or immediately adjacent to waste deposit areas. Ground-water flow through the site has previously been described as south to north.

5.2.2 RESULTS

Results for 2009 are presented on tables 5.2.1 to 5.2.4 below, and appendices. High ammonia levels were detected at sites GW1, RC3a, RC6a and RC8, within the landfill site. Metals levels were generally low, although high iron levels were detected at GW1 and RC3a. Trace organics were not detected in groundwaters. Intermittently high conductivity levels detected at site RC7, outside the landfill boundary, and at RC8 indicate likely saline intrusion from the estuary.

Key Parameter – Ammonia



Results for 2009 were similar to baseline monitoring. The boreholes, RC4 and RC7, outside the landfilling area, consistently had relatively low ammonia.

5.2.3 DISCUSSION

Ammonia was elevated at sites GW1, RC3a, RC6a, and RC8. In general, RC4 and RC7, outside the landfill area, had relatively low *ammonia*. RC7 had a high ionic content at times, possibly indicating brackish water intrusion.

Heavy metals and organics were not detected or else present in low concentrations.

The results of groundwater monitoring are in line with results from previous rounds of testing... The sites within and closely adjacent to the working area appear to be impacted by landfill leachate in terms of ammonia and iron concentration. Site RC4 at the south-western boundary had relatively good water quality. Site RC7, 200 metres east of the facility, and outside the landfill area, had generally satisfactory water quality and appeared to be unaffected by the landfill, though saline intrusion is evident.

Table 5.2.1 Dungarvan landfill groundwater monitoring February 2009

Test	GW 1	RC 3a	RC4	RC 6a	RC 7	RC 8	Drinking Water Standards (SI 278 2007)	Comments	Environmental significance
Ammonia mg/l N	10	110	0.011	2.6	0.007		0.23	Ammonia elevated at GW1 and RC3a	Depends on flow rate and path and available dilution. May contribute at times to ammonia at SW300
Chloride mg/l Cl	26	272	32	94	613		250	Elevated chloride at RC7. May be influenced by tidal infiltration.	None, as receiving environment is estuarine.
Conductivity µS/cm	2680	1424	688	1013	2530		1500	Elevated conductivity at GW1 and RC7. May be influenced by tidal infiltration at RC7.	None
Dissolved Oxygen % Sat	20	3.3	62	28	30			Quite low, reflecting reducing conditions in most boreholes	None
Iron ug/l	nm	2300	140	20000	390		200	Elevated at RC6a. Likely source is landfill leachate.	None, given distance from receiving surface waters and available dilution.
pH	7.4	6.8	7.4	7.3	7.5		7 to 9	normal	None
Temperature °C	12.4	11.4	11	11.4	11.2		25	results normal	None

Table 5.2.2. Groundwater quality Dungarvan landfill May 2009

Test	GW 1	GW 2a	RC 3a	RC4	RC 6a	RC 7	RC 8	Drinking Water Standards (SI 278 2007)	Comments	Environmental significance
Ammonia mg/l N	3.6		120	0.032	2	0.031		0.23	Ammonia elevated at RC3a	Depends on flow rate and path and available dilution. May contribute at times to ammonia at SW300
Chloride mg/l Cl	13		214	28	98	659		250	Elevated chloride at RC3a and RC7. May be influenced by tidal infiltration.	None, as receiving environment is estuarine.
Conductivity µS/cm	1156		2640	101	1006	2690		1500	Elevated conductivity at RC3a and RC7. May be influenced by tidal infiltration.	None
Dissolved Oxygen % Sat	18		21	60	26	22			Quite low, reflecting reducing conditions in most boreholes	None
E coli per 100 mls	nt		nt	nt	nt	nt			not tested	n/a
Iron ug/l	2000		<250	<250	<250	<250		200	Elevated at GW1.	None, given distance from receiving surface waters and available dilution.
pH	6.6		7.2	7.4	7.2	7.5		7 to 9	normal levels	None
Phenols mg/l	<0.002		<0.002	<0.002	<0.002	<0.002			not tested	n/a
Potassium ug/l	<5		7.3	<5	<5	<5			Potassium results broadly reflect salinity, also see chloride and conductivity.	None, as receiving environment is estuarine.
Sodium mg/l	<5		20	<5	6.2	<5			Sodium results broadly reflect salinity, also see chloride and conductivity	None, as receiving environment is estuarine.
Temperature °c	12.5		12.9	11.4	11.9	11.7		25	results normal	None
TOC mg/l C	nt		nt	nt	nt	nt			not tested	n/a
TON mg/l N	1.2		1.7	15	17	2.2			Relatively low levels	none
Total coliforms per 100 mls	nt		nt	nt	nt	nt			not tested	n/a

Sampled 18/5/09
GW2 damaged, RC8 dry -not sampled

Table 5.2.3. Groundwater quality Dungarvan landfill September 2009

	RC4	GW3a	GW1	RC6a	RC7	Drinking Water Standards (SI 278 2007)	Comments	Environmental significance
Depth of borehole	23.3	23	10.2	11.6	12.2			
Water level	16.5	14	4.1	8.2	11.4			
Temp deg C	10.5	11.8	11.4	10.7	9.9			
DO %	56	19	30	31	28		Quite low, reflecting reducing conditions in most boreholes	None
pH	7.2	7.1	6.6	7.2	7.4	7 to 9	normal	None
Conductivity us/cm	675	1922	1310	896	1328	1500	Elevated conductivity at GW1, GW3a and RC7. May be influenced by tidal infiltration at RC7.	None
Ammonia mg/l N	0.14	72	5.4	1.3	0.01	0.23	Ammonia elevated at GW3a	Depends on flow rate and path and available dilution. May contribute at times to ammonia at SW300
Chloride mg/l	29	143	16	67	219	250	Elevated chloride at RC7. May be influenced by tidal infiltration.	None, as receiving environment is estuarine.
TON mg/l	14	-0.5	-0.5	15	4.9		Relatively low nitrogen present	None, given distance from receiving surface waters and available dilution.
Iron ug/l	180	520	20000	110	130	200	Elevated at GW1. Likely source is landfill leachate.	None, given distance from receiving surface waters and available dilution.

Sampled 30/11/09 RC8 no tubing, GW2a dry

Table 5.2.4 Dungarvan landfill groundwater monitoring 30/11/09

	RC4	GW3a	GW1	RC6a	RC7	Drinking Water Standards (SI 278 2007)	Comments	Environmental significance
Depth of borehole	23.3	23	10.2	11.6	12.2			
Water level	16.5	14	4.1	8.2	11.4			
Temp deg C	10.5	11.8	11.4	10.7	9.9			
DO %	56	19	30	31	28		Quite low, reflecting reducing conditions in most boreholes	None
pH	7.2	7.1	6.6	7.2	7.4	7 to 9	normal	None
Conductivity us/cm	675	1922	1310	896	1328	1500	Elevated conductivity at GW1, GW3a and RC7. May be influenced by tidal infiltration at RC7.	None
Ammonia mg/l N	0.14	72	5.4	1.3	0.01	0.23	Ammonia elevated at GW3a	Depends on flow rate and path and available dilution. May contribute at times to ammonia at SW300
Chloride mg/l	29	143	16	67	219	250	Elevated chloride at RC7. May be influenced by tidal infiltration.	None, as receiving environment is estuarine.
TON mg/l	14	-0.5	-0.5	15	4.9		Relatively low nitrogen present	None, given distance from receiving surface waters and available dilution.
Iron ug/l	180	520	20000	110	130	200	Elevated at GW1. Likely source is landfill leachate.	None, given distance from receiving surface waters and available dilution.

Sampled 30/11/09 RC8 no tubing, GW2a dry

5.3 LEACHATE

5.3.1 INTRODUCTION

The leachate holding tank was sampled during 2009. No sampling was possible from leachate boreholes due to access difficulties due to capping and landfill remediation works.
Results of analysis are presented in table 5.3.1 to 5.3.2, below, and laboratory results appendices.
Values are compared with the median of typical landfill leachate, as published in the EPA document "*Landfill Operational Practices*" 1998.

5.3.2 RESULTS

COD was relatively high in Q4 in the leachate interception tank.

Key Parameter – COD

The COD test measures the organic matter in a sample that is amenable to chemical oxidation. The COD test is usually applied to polluted waters and waste-waters.

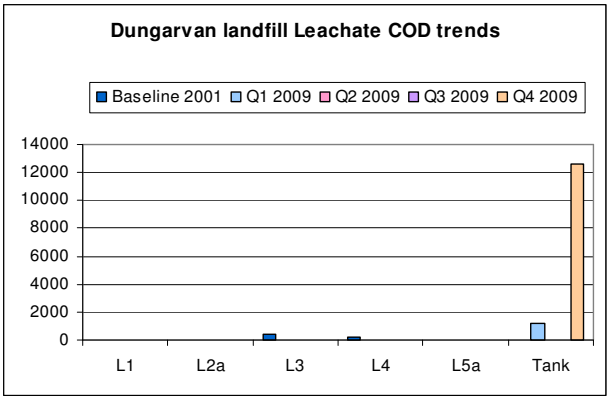


Figure 5.3.1 Leachate COD trends

An increase in COD occurred in the leachate manhole sample in the 1st and 4th quarters of 2009,

DISCUSSION

The increase in measured COD may be due to the general concentration of leachate due to drying of landfill infiltration due to capping. The contents of this tank are removed and treated off-site, as required. Continued monitoring will indicate any trends.

Table 5.3.1 Leachate quality Dungarvan landfill, February 2009

Test	L1	L2A	L3	L4	L5a	Leachate Tank Inteceptor	Typical Leachate Analysis (EPA, 1997)	Comment	Environmental significance
BOD mg/l O_2						800	270	results lower than typical leachate	none, as leachate removed for off-site treatment
COD mg/l O_2						1202	954	results lower than typical leachate	none, as leachate removed for off-site treatment
Temperature °c						8		all results normal	none

Sampled 18/2/09

L1 missing, L2a damaged, L3 borehole damaged, L4 dry, L5 under water in reed bed

Table 5.3.2 Leachate Quality Dungarvan landfill, November 2009

Test	L1	L2A	L3	L4	L5a	Leachate Tank Inteceptor	GW2a	Typical Leachate Analysis (EPA, 1997)	Comment	Environmental significance
BOD mg/l O_2						>6000		270	result in line with typical leachate	none, given expected dilution in receiving waters
COD mg/l O_2						12580		954	result in line with typical leachate	none, given expected dilution in receiving waters
Conductivity µS/cm						4560		7180	result in line with typical leachate	none, given expected dilution in receiving waters, and estuarine environment
pH						6.1		7.1	pH quite low	none
Temperature °c						7.7			result normal	none

Sampled 30/11/09. L1, L2a, L3 damaged unable to sample, L4 dry, L5a borehole in reedbed, unable to sample.

5.4. Groundwater and Leachate Levels

5.4.1 Introduction

Groundwater and leachate levels are determined monthly, by dip meter, at boreholes GW1, RC3a, RC4, RC6a, RC7, RC8, L4, and L5a.

5.4.2 Results

Results of monitoring are presented in table 4.1.

Table 5.4.1 Dungarvan landfill leachate levels 2009

Date	Operator	GW 1	GW 2A	RC 3A	RC 4	RC 6A	L1	LT 2A	L3	L4	L5A	RC 7	RC 8
09/01/2009	DR	4.5	1.4	12.4	14.7	7.4	D	D	D	3.1	3.4	10.4	11
17/02/2009	DR	4.7	1.8	12.7	15.5	7.8	D	D	D	3.3	D	10.8	11.4
27/03/2009	DR	4.5	1.7	12.4	15.3	7.7	D	D	D	3.3	D	10.6	11.4
21/04/2009	DR	2.8	1.5	12.5	15.3	7.6	D	D	D	3.3	D	10.4	11.4
20/05/2009	DR	3	1.7	12.7	15.5	7.9	D	D	D	3.3	D	10.4	11.8
10/06/2009	DR	2.3	1.8	12.6	15.3	8	D	D	D	1.2	D	10.5	11.4
22/07/2009	DR	2.9	1.8	12.8	14.9	7.9	D	D	D	1.2	D	10.5	11.4
11/08/2009	DR	3	1.8	12.7	15.4	7.9	D	D	D	3.2	D	10.7	11.5
10/09/2009	DR	4.2	1.8	12.8	15.6	7.9	D	D	D	3.2	D	10.8	11.4
14/10/2009	DR	4.4	1.4	12.8	15.4	7.5	D	D	D	1	D	10.5	11.1
30/11/2009	DR	4.2	2.1	13.3	15.9	8.2	D	D	D	1.3	D	11	12
14/12/2009	DR	3.5	1.9	13.1	15.8	8	D	D	D	1.1	D	11	11.3

D=Damaged

5.4.3 Discussion

There was no detectable variation in levels over the monitoring period..

5.5 LANDFILL GASES

5.5.1 Introduction

Gases (mainly methane –65% and carbon dioxide – 35%) are given off by the biodegradation of organic matter within the landfill waste. The rate of gas generation is dependent on waste type, moisture content and age of waste. Gas is monitored weekly at the site building, and monthly at the groundwater and leachate boreholes. Results of gas monitoring are presented in tables 5.1 to 5.4 below.

5.5.2 Results

KEY PARAMETER –METHANE

Methane is a colourless, odourless gas generated by the biodegradation of organic matter. Landfill gas contains about 65% methane.

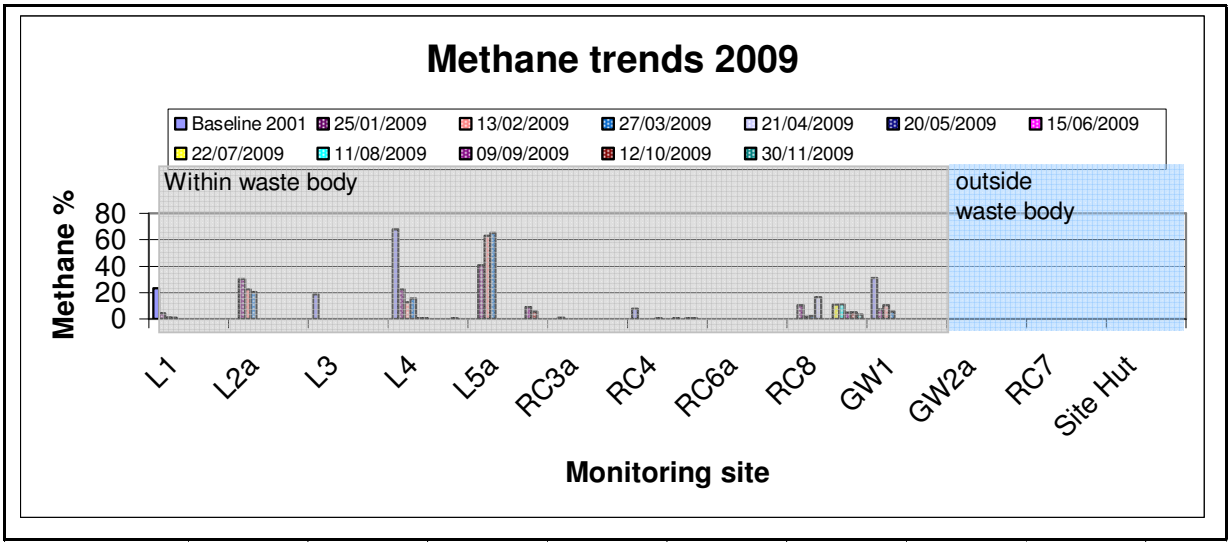


Figure 5.5.1 Methane trends 2009

Relatively high levels of methane were detected at most boreholes within the waste deposit area, indicating active decomposition of waste, in line with previous monitoring results. Methane levels detected at L3, L4, L5a, RC4 and GW1 were quite constant over the year and compared to baseline levels in 2001. .

No methane was detected in the site buildings or at monitoring points outside the landfill area.

Table 5.5.1: Dungarvan Landfill Gas monitoring Feb 2009

Week No	Date	Operator	Gas	Site Hut	GW 1	GW 2A	RC 3A	RC 4	RC 6A	LT 1	LT 2A	LT 3	LT 4	LT 5A	RC 7	RC 8
1	02/01/2009	TL	CH_4, CO_2, O_2 Air Pressure	0 0 18.0 1026												
2	09/01/2009	TL	CH_4, CO_2, O_2 Air Pressure	0 0 17.8 1026												
3	15/01/2009	TL	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 974												
4	25/01/2009	TL	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 1026	7.4 5.3 18.0 1026	0 0 20.9 1026	0.7 0.1 20.1 1026	0 0 20.9 1027	0 0 20.9 1027	4.4 1.5 19.6 1026	30.4 14.2 9.6 1027	Damaged	22.4 9.9 12.6 1027	40.5 27.4 5.5 1027	0 0 20.9 1027	10.2 8.5 18.6 1026
5	01/02/2009	TL	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 998												
6	04/02/2009	TL	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 988												
7	13/02/2009	TL	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 1027	10.3 7.6 14.4 1027	0 0 20.9 1026	0.0 0.0 20.9 1027	0.0 0.0 20.9 1027	0.0 0.0 20.9 1027	1.4 1.1 20.8 1026	22.7 11.4 12.2 1027	Damaged	12.6 8.3 14.9 1027	63.2 30.4 1.3 1026	0.0 0.0 20.9 1027	1.8 0.9 20.0 1026
8	19/02/2009	TL	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 1016												
9	28/02/2009	TL	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 1014												
10	03/03/2009	TL	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 998												
11	11/03/2009	TL	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 1010												
12	19/03/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 1001												
13	27/03/2009	TL	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 998	5.7 2.2 18.9 998	0 0 20.9 998	0.0 0.0 20.9 999	0.0 0 20.9 999	0 0 20.9 999	0.9 0.5 20.8 999	20.2 9.6 14.8 998	Damaged	15.5 7.8 16.3 998	65.5 31.1 1.2 998	0 0 20.9 998	2.0 0.6 20.4 1000

Table 5.5.2: Dungarvan Landfill Gas monitoring June2009

Week No	Date	Operator	Gas	Site Hut	GW 1	GW 2A	RC 3A	RC 4	RC 6A	LT 1	LT 2A	LT 3	LT 4	LT 5A	RC 7	RC 8
14	07/04/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 1000												
15	14/04/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.6 1003												
16	21/04/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.0 1021	0 0 19.5 1024	0 0 19.7 1024	0 0 19.8 1024	0.5 0.1 19.5 1024	0 0 19.9 1024	Damaged	Damaged	Damaged	0 0 19.9 1026	Damaged	0 0 20.6 1024	16.3 5.1 14.7 1024
17	23/04/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 21.3 1014												
18	30/04/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.3 1003												
19	08/05/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 19.9 1009												
20	20/05/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 21.5 1010	0 0 17.9 1029	0 0 17.7 1029	0 0 17.9 1029	0 0 17.9 1029	0 0 17.9 1029	Damaged	Damaged	Damaged	0.3 0.2 17.7 1029	Damaged	0 0 17.8 1029	0 0 17.8 1029
21	26/05/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 21.6 1014												
22	28/02/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 1014												
23	09/06/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 21.4 1014												
24	15/06/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 21.3 1006	0 0 21.3 1006	0 0 21.2 1007	0 0 21.3 1007	0 0 21.2 1007	0 0 21.2 1007	Damaged	Damaged	Damaged	0.2 0 21.3 1007	Damaged	0 0 20.9 1007	0 0 20.8 1007
25	22/06/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 21.5 1012												
26	29/06/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 21.2 1007												
Week No	**Date**	**Operator**	**Gas**	**Site Hut**	**GW 1**	**GW 2A**	**RC 3A**	**RC 4**	**RC 6A**	**LT 1**	**LT 2A**	**LT 3**	**LT 4**	**LT 5A**	**RC 7**	**RC 8**

Table 5.5.3: Dungarvan Landfill Gas monitoring September 2009

Week No	Date	Operator	Gas	Site Hut	GW 1	GW 2A	RC 3A	RC 4	RC 6A	LT 1	LT 2A	LT 3	LT 4	LT 5A	RC 7	RC 8
27	08/07/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 21.2 1010												
28	16/07/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 1014												
29	22/07/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 21.5 990	0 0 21.1 990	0 0 21.3 990	0 0 21.2 990	0.4 0.1 20.9 990	0 0 21.4 990	Damaged	Damaged	Damaged	0 0 21.3 1026	Damaged	0 0 20.9 990	10.7 3.5 18.1 990
30	29/07/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 21.2 1004												
31	07/08/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 21.0 1004												
32	11/08/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.7 1017	0 0 20.8 1017	0 0 20.8 1017	0 0 20.9 1017	0.2 0.1 20.7 1017	0.2 0.1 20.6 1017	Damaged	Damaged	Damaged	0 0 20.9 1017	Damaged	0 0 21.0 1017	11.1 3.6 20.8 1017
33	17/08/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 1010												
34	24/08/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 998												
35	02/09/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 1014												
36	09/09/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 1034	0 0 21.0 1034	0 0 21.2 1034	0 0 21.1 1034	0.3 0.2 21.2 1034	0 0 20.9 1034	Damaged	Damaged	Damaged	0.2 0.1 20.9 1034	9.0 4.4 18.3 1034	0 0 20.6 1034	4.7 1.4 19.4 1034
37	14/09/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 21.3 1023												
38	22/09/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 21.2 1017												
39	29/09/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.4 1018												
Week No	**Date**	**Operator**	**Gas**	**Site Hut**	**GW 1**	**GW 2A**	**RC 3A**	**RC 4**	**RC 6A**	**LT 1**	**LT 2A**	**LT 3**	**LT 4**	**LT 5A**	**RC 7**	**RC 8**

Table 5.5.4: Dungarvan Landfill Gas monitoring November 2009

Week No	Date	Operator	Gas	Site Hut	GW 1	GW 2A	RC 3A	RC 4	RC 6A	LT 1	LT 2A	LT 3	LT 4	LT 5A	RC 7	RC 8
40	07/10/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 21.2 1008												
41	12/10/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 1025	0 0 20.9 1025	0 0 20.9 1025	0 0 20.9 1025	0.3 0.1 20.7 1025	0 0 20.9 1025	Damaged	Damaged	Damaged	0.3 0.1 20.6 1025	5.5 2.6 19.5 1025	0 0 20.9 1025	5.2 1.7 19.8 1025
42	15/10/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 1029												
43	21/10/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 980												
44	29/10/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 1009												
45	05/11/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 1013												
46	17/11/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 998												
47	23/11/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 1003												
48	30/11/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 21.9 985	0 0 21.9 985	0 0 21.9 985	0 0.1 21.8 985	0.2 0.1 21.7 985	0 0 21.7 985	Damaged	Damaged	Damaged	0 0.1 21.8 985	0.1 0.1 21.7 985	0 0 21.7 985	3.4 1.2 20.7 985
49	07/12/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 21.7 986												
50	14/12/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 21.3 1027												
51	22/12/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 20.9 984												
52	30/12/2009	DR	CH_4, CO_2, O_2 Air Pressure	0 0 21.2 984												
Week No	**Date**	**Operator**	**Gas**	**Site Hut**	**GW 1**	**GW 2A**	**RC 3A**	**RC 4**	**RC 6A**	**LT 1**	**LT 2A**	**LT 3**	**LT 4**	**LT 5A**	**RC 7**	**RC 8**

5.6 NOISE

5.6.1 Introduction

Daytime noise levels were recorded in January 2009 at five locations at Dungarvan Landfill Site, B1-4 and NSL1, as specified in the licence monitoring schedule D. These locations are shown in fig. DUN-EIS-003, attached. There are limits of 55 dB Leq(30) daytime, and 45 dB Leq(30) night-time imposed as a condition of the licence. Night-time measurements were not considered necessary as the landfill does not operate at night.

A Cirrus 800A Sound Level Meter was used. The meter was calibrated and checked with a 94 dB calibrator before and after each measurement. Broadband and Frequency Band analysis measurements were conducted at each location. A summary of results is presented in the table below. Octave band analysis for 5 monitoring locations are presented in figures 6.1 to 6.5 below.

5.6.2 Noise levels

Table 5.6.1 - 2009 Noise levels

1998 "Baseline" noise levels

Site	*Date of Monitoring*	*L(A)eq[30mins] dB*	*$L(A)_{10}$ [30 mins]*	*$L(A)_{90}$ [30 mins]*
B1	8/1/09 *Baseline 1998*	44.6 56	45.1 68	43.4 58
B2	8/1/09 *Baseline 1998*	45.5 50	44.3 51	43.0 46
B3	8/1/09 *Baseline 1998*	43.6 46	44.2 47	43.0 43
B4	8/1/09 *Baseline 1998*	45.6 47	45.9 50	44.9 45
NSL1	8/1/09 *Baseline 1998*	43.4 54	44.1 55	41.8 34

5.6.3 Discussion

Noise levels were compliant at all locations with the noise emission requirement of 55 dB(A) LAeq (30 mins). Noise levels recorded in January 2009 were generally lower than baseline levels of 1998.

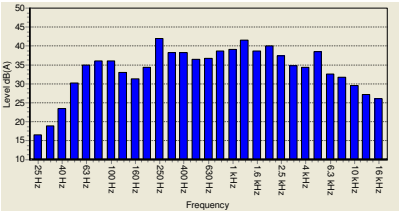


Fig 5.6.1 Dungarvan landfill noise monitoring8/1/09, location B1, octave band analysis, A weighting

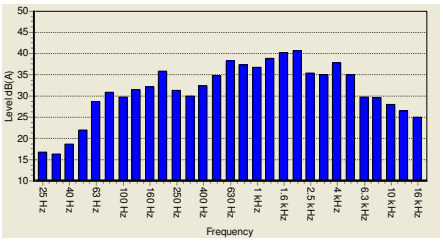


Fig 5.6.2 Dungarvan landfill noise monitoring 8/1/09, location B2, octave band analysis, A weighting

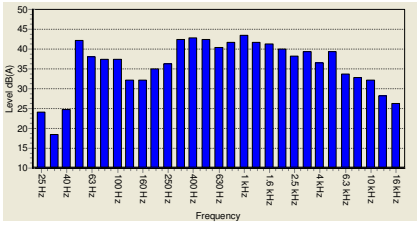


Fig 5.6.3 Dungarvan landfill noise monitoring8/1/09, location B3, octave band analysis, A weighting

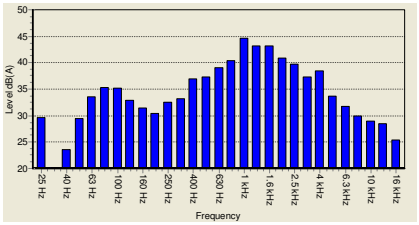


Fig 5.6.4 Dungarvan landfill noise monitoring8/1/09, location B4, octave band analysis, A weighting

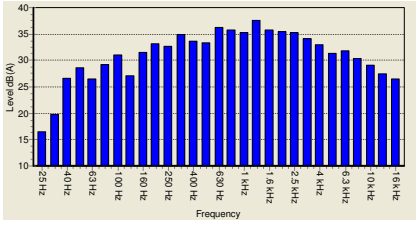


Fig 5.6.5 Dungarvan landfill noise monitoring8/1/09, location NSL1, octave band analysis, A weighting

5.7 DUST

5.7.1 Introduction / Methodology

Dust deposition rates were measured between 8/1/09 and 10/2/09 over a period of 34 days at five locations (B1, B2, B3, B4, and D1) at Dungarvan Landfill. The measurement method was the Bergerhoff deposition method.

5.7.2 Results

Table 5.7.1 - Dust Deposition at Dungarvan Landfill 8/1/09 to 10/2/09

Location	Deposition Rate mg/sq. m/day
B1	131
B2	74.9
B3	132.4
B4	88.2
D1	152.4

5.7.3 Discussion

Dust deposition rates were below the limit expected to give rise to nuisance (350 mg/m2/day).

5.8 ECOLOGICAL SURVEY

5.8.1 INTRODUCTION

Limosa Environmental was commissioned by Waterford County Council to conduct a biological monitoring survey of the River Colligan in close proximity to the now closed Dungarvan Landfill, as part of on-going monitoring requirements of the Dungarvan Waste Disposal Site waste licence. Dungarvan landfill was closed and capped in 2003 after 30 years of operation; the site now operates as an integrated waste management facility under EPA Licence Reg. No. 32-2. The licence requirements for ecological / biological monitoring were amended in 2009 from the former broader monitoring requirements to that of aquatic biological quality Q rating at three locations, two on the River Colligan and one in a drainage ditch which runs along the southern boundary of the site.

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Dungarvan Landfill site is located at Ballynamuck Middle, Dungarvan, Co Waterford. It is predominantly surrounded by agricultural land, although wetland habitats occur in association with the River Colligan which flows in a west to east direction along the northern perimeter of the site before flowing down the River Colligan Estuary into Dungarvan Harbour. Dungarvan landfill was closed and capped in 2003 after 30 years of operation; the site now operates as an integrated waste management facility under EPA Licence Reg. No. 32-2. As part of the licence requirements, as amended in 2009, annual biological quality Q rating monitoring is to be undertaken at three locations, two on the River Colligan and one in a drainage ditch which runs along the southern boundary of the site.

The results of the 2009 biological assessment of the River Colligan indicated good water quality status at both sampling sites following analysis of the surface water quality and biological water quality data recorded. As in previous years the diversity of invertebrates decreased moving downstream in the brackish water reaches of the river from sites SW2 to SW1. An increase in the macroinvertebrate diversity was noted at site SW2 compared with 2008, whereas a slight decrease in the species diversity was recorded at site SW1 compared to 2008. However, this decrease is due to the absence of two species found in 2008, that of eels and stickleback. Other than this the macro-invertebrates recorded in the current survey remained very similar to those recorded in 2008 and thus it is considered that there has been no change in water quality.

These findings coupled with the review of water quality measurements taken on site and EPA chemical water quality data between 2008 and 2009, show continued good water quality indicating that Dungarvan Landfill site is not negatively impacting the River Colligan.

Although the European Eel was not recorded within in the current survey it has been recorded previously and it is likely that they are still present in the river in the tidal reaches of the River Colligan.

Site SW4 (pond site) is a new sampling location that has been added in 2009. The pond had an average diversity of invertebrates and contained both mayfly and damselflies that are indicators of better water quality.

The water quality of the pond is considered fair to good but there is some evidence that it is being enriched by nutrients which should be monitored to ensure that the water quality does not become further enriched.

5.11 CONCLUSIONS

Water quality at the River Colligan surface water sites in the vicinity of the landfill was satisfactory throughout 2009.

The results of groundwater monitoring are in line with results from previous rounds of testing carried out since 1999. As indicated in previous reports, some of the boreholes within the current working area appear to be impacted by leachate from the landfill in terms of ammonia and iron, however groundwater outside the landfill site was generally satisfactory.

Leachate quality was as expected for a landfill accepting mainly domestic and inert waste. Metal and trace organics concentrations were low. Based on toxicity tests carried out and leachate management, attenuation and dilution, no toxic effect from landfill leachate is expected.

No noise nuisance was indicated during the annual noise survey.

Dust deposition levels were below nuisance levels.

The ecological survey of the landfill and estuarine area carried out during 2009 recorded a diversity of habitats and wildlife and concluded that the increase in the diversity of species at downstream connecting sites, coupled with the review of water quality measurements taken on site and EPA chemical water quality, reflects good water quality indicating that Dungarvan Landfill site is not negatively impacting the River Colligan.

Overall, water and ecological quality in the vicinity of the landfill were satisfactory and there was no indication that the landfill was having a detrimental impact on the surrounding environment.

5.12 Meteorological Data.

Monthly meteorological data is attached in Appendix F.

6. Sequence and timescale for development and restoration of the facility

a) Landfill Capping and Restoration

A Restoration and Aftercare Plan has been approved by the EPA and capping will commence in 2007. Capping was completed in 2008.

b) Landfill Gas & Leachate Management

Tank and pipeline testing and inspection report

As part of the leachate and gas systems required under the licence, 1549m of leachate pipework (315mm, 225mm, 160mm, 90mm, 63mm), 3334m of gas pipework (250mm, 90mm), and 3 No. gas manifolds, were installed in 2009. All pipework was pressure tested in accordance with the contract and passed.

Two No. 25m3 Glass lined steel leachate storage tanks were erected onsite in 2009, however works onsite were suspended before final testing and commissioning. In May 2010, one of these tanks was brought into use as a leachate storage tank, and was (water) tested prior to usage. It is notable that a full inspection and test of both tanks is still required, once all fittings are completed.

Report on progress made and proposals being developed to minimise generation of leachate for disposal

As per the information in the waste licence review submission (Dec-08), capping works were completed in mid 2008. The final capping system generally comprises of a gas collection layer, LLDPE liner, drainage layer, subsoil layer and topsoil layer as follows:

- 150-300mm layer of topsoil; underlain by
- Subsoil such that thickness of topsoil and subsoil is at least 1m thick; underlain by
- A surface water geocomposite layer; underlain by
- 1mm LLDPE liner (a low permeability geomembrane material).
- Geocomposite gas collection layer.

The capping layers will provide protection from the ingress of rain into the site and thus minimise leachate generation.

Wetland ponds were constructed in 2008 for the purpose of treating leachate. Leachate extraction wells are located strategically across the site in order to maximise collection efficiency. Furthermore, rainwater will assist in the dilution of leachate within the constructed wetlands.

The leachate and gas collection pipework and ancillary items was completed in 2009.

Work on the completion of the Landfill Gas and Leachate Management system were hindered by financial restrictions encountered by the licensee during the reporting period.

The leachate extraction system layout has been included in Appendix J

Development / Infrastructural works summary (completed in previous year or prepared for current year)

In 2009, as part of the leachate and gas systems required under the licence, 1549m of leachate pipework (315mm, 225mm, 160mm, 90mm, 63mm), 3334m of gas pipework (250mm, 90mm), and 3 No. gas manifolds, were installed. Two No. 25m3 Glass lined steel leachate storage tanks were erected.

A flare trial was carried out in 2009 to confirm the size of permanent flare required. A closed permanent flare of 100 m3/hr capacity was assessed as required, and is due for installation in July 2010.

7. Topographical survey

A Topographical survey is attached in Appendix G.

8. Schedule of Environmental Objectives and Targets for the forthcoming year

Objective 1 – To maintain site infrastructure to the standards outlined in Condition 3 of the Waste Licence

Target 1.1 - Any defect to the existing infrastructure will be repaired / replaced as quickly as possible on an ongoing basis.

Objective 2 – That no specified emissions from the facility, shall exceed the limit values, set out in Condition 6 and Schedule C of the Waste Licence.

Objective 3 – To maintain the Monitoring Programme as outlined in Condition 8 and Schedule D of the Waste Licence.

Target 3.1 – To carry out the monitoring programme as outlined in Condition 8 and Schedule D of the Waste Licence.

Target 3.2 – To submit Monitoring Reports to the Agency within the timescale as outlined in Schedule E of the Waste Licence.

Objective 4 – To establish good record keeping and that all records are held at the facility office to comply with Condition 10 of the Waste Licence.

Objective 5 – That no emergency situation occurs on the site.

Target 5.1 – Ensure the contingency arrangements as outlined in Condition 9 of the Waste Licence are implemented throughout the year. A document entitled 'Emergency Response Procedures' forms the nucleus of the contingency arrangements and is currently with the Agency.

Objective 6 – To restore the landfill on an ongoing basis in such a way that final works have a minimal impact on the surrounding environment.

Objective 7 – To complete Gas Management System.

Objective 8 – To complete Leachate Management System

Objective 9 – To complete Landscaping and Seeding of Landfill Cap

Objective 10 – To complete Gas collection pipework and install permanent flare.

Objective 11 – Finalise tenders for SCADA dilution system

Objective 12 - Install leachate dilution tanks by direct labour and bring tanks into use as part of leachate extraction system.

Objective 13 – Complete Contract for SCADA system

9. Full title and a written summary of any procedures continued during the reporting period

The European Council Directive 90/313/EEC on the *Freedom of Access to Information on the Environment* recognises the significance of the public's access to information relating to the environment. At present, copies of all documents and correspondence relating to Waste Licence 32-2 are on display at the Civic Offices, Dungarvan.

A communications programme will be put in place as required under condition 2.4.1 of the Waste Licence to ensure that members of the public can obtain information concerning the environmental performance of Ballynamuck Landfill. This in turn will address any local community concerns and allow the public the opportunity to provide feedback on the facility.

The Facility Manager will be responsible for the implementation of this programme, which shall form part of the routine operation and management of the facility. Further support will be provided from the Environment Section of Waterford County Council if required.

Programme

Information to be provided at the Facility

1. The following information will be available for inspection at the Site Office, and will be maintained by the Facility Manager.

- Map of the Facility showing all environmental monitoring points
- Current Waste Licence for the Facility
- All records relating to the Facility
- Civic Waste Records
- Nuisance Inspection
- Integrity Tests of Bunds
- Complaints Register
- Incidents Register

- Environmental Monitoring Records (Groundwater, Surface water, Leachate, Landfill Gas, Noise and Meteorological Data).
- Emergency Response Procedure
- Programme for the control and Eradication of Vermin and Flies
- The current EMS for the Facility
- Annual Environmental Report
- Visitors Book

This documentation will also be maintained as part of compliance requirements with Waterford County Council Environment Section's EMAS (Environmental Management and Audit Scheme) Certificate which was obtained in 2009.

2. The Waste Acceptance hours under condition 1.7.1.2 of the Waste Licence are

Monday – Friday 9.00am – 1.00pm and 1.30pm – 5.00pm,

Saturday's 9.00am – 1.00pm.

3. All visitors are required to sign a Visitors Book at the site office outlining their reason for visiting. Unauthorised personnel are not allowed access to the site.

4. Members of the public may arrange a site visit by contacting the Facility Manager prior to their visit. For Health and Safety reasons all visitors must have appropriate clothing (High Vis-jacket, Walking boots/Wellingtons). The Facility Manager or Caretaker shall accompany all visitors on site visits. A number of school visits to the facility took place during the reporting period

5. If information is requested that is not available at the site, the interested party will be directed to the Environment Section of Waterford County Council at the Civic Offices in Dungarvan.

6. Written Requests for Information

All requests concerning the environmental performance of the facility should be made in writing to:

Facility Manager

Ballynamuck Waste Disposal Site

Dungarvan, Co. Waterford.

7. The Facility Manager shall copy all requests to:

Senior Engineer
Environment Section
Waterford County Council
Civic Offices
Dungarvan
Co. Waterford

8. Each request should indicate the name, address and contact telephone number of the concerned party, an outline of the required information and the manner in which they require the information i.e. copy of record, e-mail etc.

9. Waterford County Council shall make replies in writing within twenty working days of receiving the written request.

10. The information required shall be issued in paper format unless otherwise requested by the concerned party. Requests that require information in digital format may require more time than the twenty working days as outlined previously.

11. If requested Waterford County Council will provide a clear explanation of the information provided.

12. If the concerned party requests the examination of a particular report/document relating to the facility, then it will be made available for viewing at the Landfill site office.

13. ***Media Requests***

The Director of Services within the Environment Section of Waterford County Council shall nominate a liaison person to respond to requests made by the media for information relating to the environmental performance of the facility.

14. ***Feedback from the public***

The Facility Manager will record any comments or suggestions made by the public during their visits and the opportunity will also be available to submit a written comment to the landfill site office. Copies of such minutes or submissions will be kept in a register by the Facility Manager and will also be copied to the Environment Section, for the attention of the

Senior Engineer. If requested a reply will be provided by the Council within twenty working days.

Emergency Response Procedures

Scope

The Emergency Response Procedures apply but is not limited to the following incidents occurring:

- Fire / Explosions
- Spillages
- Migration of Landfill Gas
- Environmental Pollution
- Injury or serious accident to persons
- Any other incident, which may pose a significant threat to persons or the environment.

Responsibility

1. The Facility Manager is responsible for the implementation of the Emergency Response Procedure and for the training of all landfill personnel and contractors in effective emergency response procedures.
2. In the event of a major fire or an explosion the Senior Rostered Fire Officer will be notified immediately via the Regional Fire
3. In the event of a serious accident or injury to a person the Ambulance service should be contacted
4. In the event of other incidents e.g. spillages or environmental pollution the Senior Environment Engineer will be notified and will assume responsibility along with the Facility Manager.

Procedure

In the event of an accident occurring the following procedure will be adopted:

- Evacuate the immediate area within the site if necessary
- Inform other site users
- Remain upwind of any hazard area
- Contact site office and advise in detail of the emergency
- Ensure entrance/exit gate is not obstructed

- Contact fire Brigade, Ambulance, Gardaí, and / or Senior Engineer, Waterford County Council as required by dialing 999 or 112
- If incident occurs outside office hours an emergency telephone contact number will be provided on the site notice board
- Personnel shall report to the designated assembly point at the site office
- All areas affected by the incident shall remain closed until given the all-clear by an authorised person

In the event of landfill gas being detected in the site office the following procedure will be followed:

- Raise the alarm
- Evacuate the site office
- Notify relevant senior personnel in Waterford County Council or emergency services if necessary
- Immediately conduct gas survey to identify source
- Remedy cause of problem
- Document incident properly

In the event of a spillage, the Facility Manager shall apply a suitable absorbent material to contain and absorb any spillage at the facility. Once contained the Facility Manager shall have regard to the Corrective Action Procedure.
In the event of a serious threat to the environment, the Facility Manager shall take all necessary short-term action to minimise any further impact and allow the Corrective Action Procedure.

Records

Details of any incident will be recorded in a written register, which will be maintained at the site office

Waste Characterisation & Acceptance Procedures for the Acceptance, Storage and Segregation of Waste

The Civic Waste Facility at Dungarvan Landfill accepts waste from Domestic Householders only.
The following items are accepted:

Waste Electronic and Electrical Equipment – Cages are provided for the collection and storage of small electrical goods. Members of the public are instructed to place all items into these cages by Waterford County Council Employees.

Paint – A 20ft container allows for the collection and storage of paint cans. Members of the public are instructed to place all items on the floor of the container where they are later packed in to steel drums by Waterford County Council Employees.

White Goods (Cookers, washing machines, driers, fridges, freezers) - A 20 ft container allows for the collection and storage of all White goods. Members of the public are instructed to leave all items near the door of the container where they are later double stacked by Waterford County Council Employees.

Glass – Bottle banks are in place to facilitate the disposal of green, brown and clear glass bottles. There is also a small skip in place for the collection of flat glass where it is removed off site for recovery at a later stage**.**

Hazardous Materials (These are collected and stored in a 40ft container)

Cooking Oil – Waterford County Council employees place all cooking oil in steel drums.

Car oil – Members of the public are instructed to leave all cans beside the oil collection unit where it is later emptied in to the unit by Waterford County Council employees.

Fluorescent tubes – Are collected and stored in a specifically made timber coffin.

Domestic Batteries – These are collected and stored in plastic barrels.

Car Batteries – These are collected are stored in specifically designed battery receptacles.

Obsolete medicines - These are collected and stored in plastic barrels.

Aerosols – These are collected and stored in plastic barrels (all aerosols are separated in to flammable, non – flammable, toxic prior to packing. The aerosols are stacked in layers and covered with vermiculite which is a fire proofing material)

Pesticides - These are collected and stored in plastic barrels.

Scrap metal – Members of the public are instructed to place all metal items in to an open skip where it is later removed off site for recovery

Bulky Items (Beds, Carpets, Mattresses, etc) - Members of the public dispose of these items in to a 20ft container where they are later disposed of to the tip head.

Household Waste – Members of the Public place domestic waste in to a closed skip where it is later disposed of to the tip head.

Rubble - Members of the Public place rubble waste in to an open skip. This is kept on site for use in the haul roads

Clay & Top soil - Members of the Public place clay & topsoil in to an open skip. This is kept on site for use in restoration works.

Household Dry Recyclables – Members of the public dispose of recycling material in to a closed skip where it is later removed off site for recovery.

Timber - Members of the Public place timber products in to an open skip where it is later removed off site for recovery.

10. Reported Incidents and Complaints

There were no reported incidents or complaints for the reported period.

11. Management and Staffing of the Facility

Management and staffing of the facility is attached in Appendix H.

12. Programme for Public Information

All files are held at the site office and at the Civic Offices Dungarvan Co. Waterford

13. Report on training of staff

Both the Facility Manager and Deputy Manager have attended the Fás Waste Management Training Course. Site personnel have attended the Fás Safe Pass program, Waste Facility Operative Course and site operatives attended a course in the handling, storage and removal of Waste from the Civic Amenity Site. Training Courses for 2007 will include manual handling training, Waste Facility Operative Course, Fire Fighting and fire extinguisher training and a refresher First Aid Course. All staff have also undertaken EMAS Certification training during the reporting period.

14. Statement on the costs of Landfill

The project budget as submitted to the Department of the Environment and Local Government (but not yet approved) as at the end of 2009 was €4,048,195 including VAT. The spend to end of year 2009 was €2,947,283.

15. Reports on Financial Charges and Provisions

Waterford County Council is responsible for providing annual fees to the Agency for monitoring and inspection of the site. The annual fee for 2009 for monitoring was €23,704 and €16,008 for the licence. A further €5000 was spent on the licence review. With regard to the details of financial provisions required under Condition 12.1.1 and 12.1.2 which are to be set aside in relation to the prevention of environmental damage and in order to underwrite the costs for remedial actions following anticipated events or incidents the licensee will establish, through consultation with the Agency, a timeframe for the provision and value of the required fund.

16. Slope Stability Assessment

The agency had requested that the above assessment be carried out. However as substantial works on remediation and landscaping have been carried out since the reporting period ended this will be forwarded under separate cover.

APPENDIX A

Quantity & Composition of Waste Received, Disposed of & Recovered during the reporting period.

Waste Accepted	Type	EWC Code	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Total
Recycling	Dry Material	15 01 01	9.1	8.36	7.88	8.94	7.88	10.54	11.86	9.18	7.88	6.24	8.24	17.32	113.42
	Textiles	04 02 22	0.18	0.52	0.26	0.36	0.08	0.54	1.46	0.12	0.64	0.34	0.22	0.24	4.96
	Fridges	16 02 11	0	0	0	0	0	0	0	0	0	0	0	0	33.62
	Large Household	16 02 13	0	0	0	0	0	0	0	0	0	0	0	0	115.39
	Small Household	16 02 13	0	0	0	0	0	0	0	0	0	0	0	0	58.32
	TV's Monitors	16 02 09	0	0	0	0	0	0	0	0	0	0	0	0	33.64
Scrapmetal	Scrap metal	17 04 07	1.26	3.12	2.1	2.82	5.28	3.16	3.68	3.02	1.8	1.52	2.56	2.86	33.18
Recovery	Clay	17 05 04	0	0	0	0	0	12.62	0	0	0	0	0	0	12.62
	Clay on Purchase	17 05 04	0	27.72	0	0.00	0	0	0	0	0	0	0	0	27.72
	Rubble	17 01 07	0	0	8.92	0	8	0	0	11.2	0	0	0	9.66	37.78
	Cooking Oil	02 09 99	0	0	0	0	0	0	0.6	0	0	0	0	0	0
Glass	Flat Glass	17 02 02	0	0	0	1.58	0	0	0	0	1.42	0	0	0	3
Compost	Compost	02 01 07	0	0	0	0	0	0	0	0	0	0	0	0	0
	Brown Bin	02 01 07	146.1	97.14	221.18	105.46	244.7	121.48	214.36	110.42	174.72	136.74	118.7	126.6	1817.6
	WCC Brown by DTC	02 01 07	0	0	0	0	0	0	8.46	5.82	13.8	10.1	7.66	13.44	59.28
	Brown Bin UDC	02 01 07	34.12	20.06	49.86	24.34	67.12	32.3	58.38	30.72	41.9	35.94	25.26	33.28	453.28
	Brown Bin Commercial	02 01 07	0	0	0	0	0	4.66	0	0	0	0	0	0	4.66
	Garden CoCo	02 01 07	0	0.16	0.1	0.38	0.4	0	0.5	0.34	0	0	0	0	1.88
	Garden UDC	02 01 07	0	0	0	0	0	0	0	0	0	0	2.12	0	2.12
	Garden Private	02 01 07	0	0	0	0	0	0	0	0	0	0	0	0	0
	Garden waste Lismore	02 01 07	0	0	0	0	0	0	0	0	0	0	0	0	0
	Garden waste Tramore	02 01 07	0	0	0	0	0	0	0	0	0	0	0	0	0
Timber	Timber	17 02 01	5.12	4.48	5.58	2.64	3.48	4.3	5.9	4.42	3.52	3.8	8.72	4.66	56.62
Hazardous	Aerosols	16 05 04	0	0.04	0	0	0	0	0	0	0	0.16	0	0	0.2
	Fluorescent Lamps	17 02 01	0	0	0	0	0	0	0	0	0	0	0	0	0.68
	Engine Oil	13 02 06	0	0.22	0	0	0	0	0	0	0	2.08	0	0	2.3
	Paint	08 01 21	0	0	0	0	0.56	0	0	0.64	0	0	0	0	1.2
	Batteries	16 06 01	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1
Total Accepted			195.88	161.82	295.88	146.52	337.5	189.6	305.2	175.88	245.68	197.02	173.48	208.06	2873.57

Figures received from WEEE Ireland 2009

Dungarvan Civic Amenity Site – Waste Accepted 2009

Waste Disposed	Type	EWC Code	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Total
Domestic	Domestic Bulky CoCo	20 03 01	8.08	9.9	10.66	8.90	3.02	5.14	7.34	6.14	4	3.24	4.62	6.2	77.24
	Bulky CoCo	20 03 01	0	5.16	7.72	12.72	3.9	0	0	0	3.04	0	0.9	5.5	38.94
	Domestic Bulky UDC	20 03 01	96.82	95.64	20.78	43.82	10.9	45.4	11.74	14.48	6.08	12.88	53.92	40.3	452.76
	Civic Skip	20 03 99	6.98	6.46	6.86	7.08	11.8	9.6	12.26	5.92	7.26	7.32	7.36	11.86	100.76
	Transferred from Lismore	20 03 99	17.3	28.48	27.08	37.48	26.7	39.88	47.32	23.3	29	23.96	34.5	0	335
	WCC Housing	20 03 99	1.06	0.74	0.46	0.36	1.28	0.62	0	0.9	1.54	0.62	0.96	2.12	10.66
	Clean Up	20 03 99	0	0	0	14.44	4.94	0	0	0	0	0	2.86	0	22.24
	Domestic CoCo	20 03 99	216.14	145.46	155.42	178.26	115.38	213	206.94	225.18	100.74	192.4	134.58	207.14	2090.64
	Dom CoCo by DTC	20 03 99	0	0	0	0.00	0	8.78	13.9	22.9	10.52	23.7	13.2	24.18	117.18
	Film Farm Plastics	02 01 04	0	0	0	0	0	0	95.77	0	0	0	0	0	95.77
	UDC Domestic	20 03 99	89.16	47.54	61.1	68.14	45.14	85.32	74.96	73.86	40.76	73.74	40.14	71.66	771.52
MRF Plant	MRF Plant	20 01 99	0	4.12	0	5.38	0	2.86	0	0	0	2.58	0	0	14.94
Litter	Roadsweeper	20 01 99	0	0	0	0.00	0	9.66	37.28	24.38	22.78	0	39.2	0	133.3
	RoadsweeperUDC	20 01 99	40.34	41.38	37.82	36.44	39.34	14.6	0	0	0	29.5	0	25.56	264.98
	Litterbins	20 03 99	13.36	19.12	18.58	13.10	17.5	14.76	17.16	15.32	6.88	14.82	13.08	10.24	173.92
	LitterbinsUDC	20 03 99	31.4	26.66	29.12	26.38	25.94	32.18	53.24	36.48	37.82	30.28	25.48	22.96	377.94
Total Disposed			**520.64**	**430.66**	**375.6**	**452.50**	**305.84**	**481.8**	**577.91**	**448.86**	**270.42**	**415.04**	**370.8**	**427.72**	**5077.79**

Dungarvan Civic Amenity Site – Waste Disposed 2009

Waste Transferred	Type	EWC Code	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Total
Compost	Compost	02 01 07	0	0	0	0	0	0	0	0	0	0	0	0	0
	CompostUDC	02 01 07	0	0	0	0	1.98	0	0	0	0	0	0	0	1.98
	Brown Bins	02 01 07	192.86	97.44	215.4	162.12	255.25	36.94	230.54	162.98	183.48	189.94	115.88	174.76	2017.59
	Fridges	16 02 11	0	0	0	0	0	0	0	0	0	0	0	0	33.62
	Large Household	16 02 13	0	0	0	0	0	0	0	0	0	0	0	0	115.39
	Small Household	16 02 13	0	0	0	0	0	0	0	0	0	0	0	0	58.32
	TV's Monitors	16 02 09	0	0	0	0	0	0	0	0	0	0	0	0	33.64
Recycling*	Dry Materials	15 01 01	8.32	8.4	7.88	8.96	7.9	10.5	8.84	7.46	8	6.36	8.32	12.18	103.12
	Textiles	04 02 22	0.18	0.52	0.26	0.36	0.1	0.58	1.22	0.12	0.56	0.34	0.22	0.24	4.7
	Timber	17 02 01	5.22	4.4	5.52	2.66	3.5	4.32	5.3	4.44	3.62	3.82	8.8	4.68	56.28
Scrapmetal	Scrapmetal	17 04 07	1.32	3.14	2.14	1.38	5.34	3.08	3.68	3.04	1.8	1.52	2.58	2.9	31.92
Recovery	Clay	17 05 04	0	0	0	0	0	12.62	0	0	0	0	0	0	12.62
	Rubble	17 01 07	0	0	8.92	0	8	0	0	11.2	0	0	0	9.66	37.78
	Dom CoCo	20 03 99	395.38	555.34	371.18	446.62	326.72	557.74	376.36	411.56	327.92	406.18	378.52	401.66	4955.18
	Garden CoCo	02 01 07	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cooking Oil	02 09 99	0	0	0	0	0	0	0	0	0	0	0	0	0
	Film Farm Plastics	02 01 04	0	0	0	0	0	0	95.77	0	0	0	0	0	95.77
Glass	Flat Glass	17 02 02	0	0	0	1.58	0	0	0	0	1.42	0	0	0	3
Hazardous	Aerosols	16 05 04	0	0.04	0	0	0	0	0	0	0	0	0	0	0.04
	Fluorescent Lamps	17 02 01	0	0	0	0	0	0	0	0	0	0	0	0	0.68
	Engine Oil	13 02 06	0	0.22	0	0	0	0	0	0.5	0	2.1	0	0	2.82
	Paint	08 01 21	0	0	0	0	0	0	0	0	0	0	0	0	0
	Batteries	16 06 01	0	0	0	0	0	0	0	0	0	0	0	0	0
Total			**603.28**	**669.5**	**611.3**	**623.68**	**608.79**	**625.78**	**721.71**	**601.3**	**526.8**	**610.26**	**514.32**	**606.08**	**7564.45**

Mr Binman	62	55	53	58	44	61	3	0	0	0	0	0	0	336

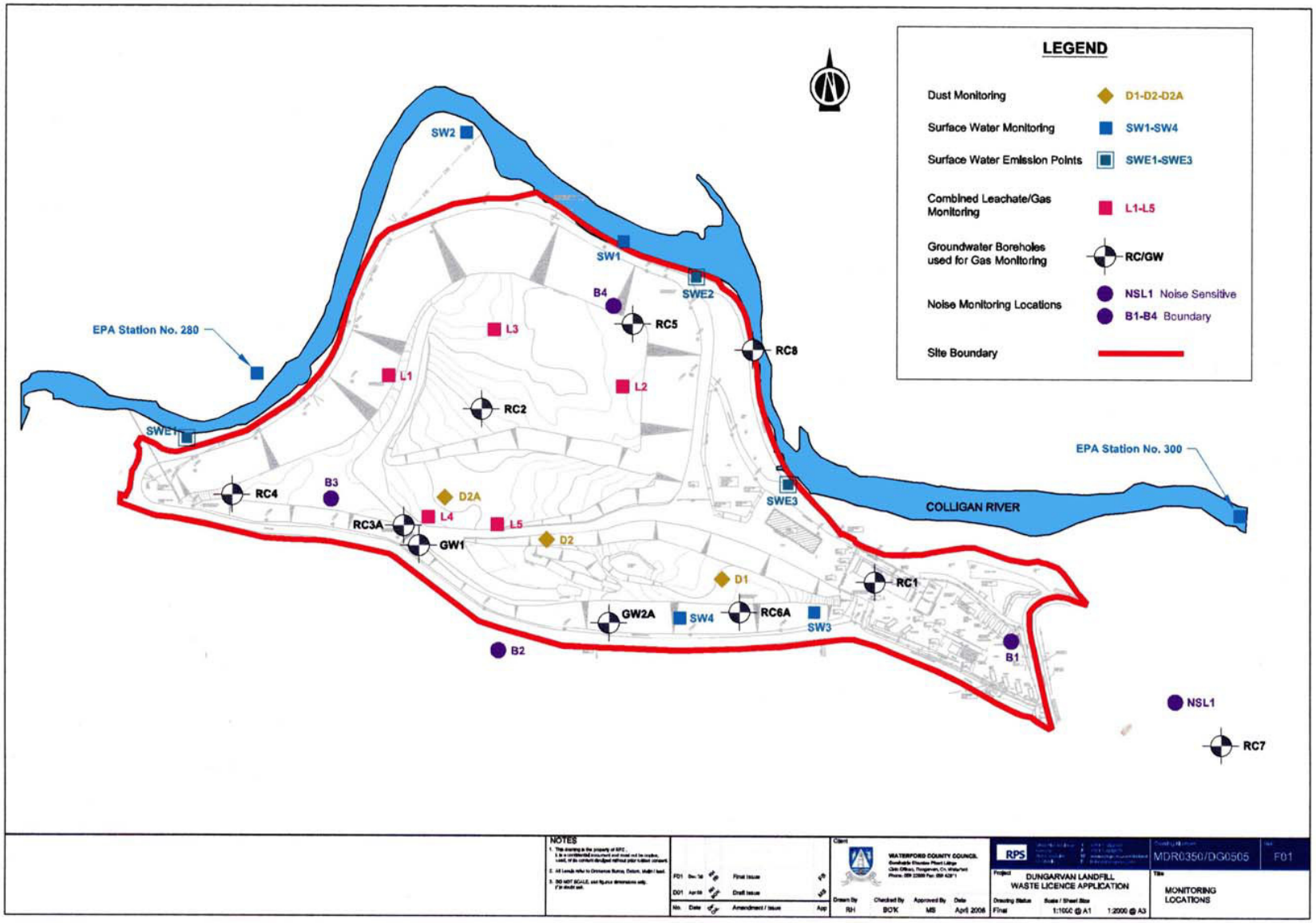
Figures received from WEEE Ireland 2009

Mr. Binman stopped paying for weighings from July 2009 onwards

Dungarvan Civic Amenity Site – Waste Transferred 2009

Appendix B

Monitoring Locations


LEGEND
Dust Monitoring
D1-D2-D2A
Surface Water Monitoring
SW1-SW4
Surface Water Emission Points
SWE1-SWE3
Combined Leachate/Gas Monitoring
L1-L5
Groundwater Boreholes used for Gas Monitoring
RC/GW
Noise Monitoring Locations
NSL1 Noise Sensitive
B1-B4 Boundary
Site Boundary
SW2
SW1
SWE2
B4
RC5
RC8
L3
L1
L2
RC2
EPA Station No. 280
SWE1
EPA Station No. 300
COLLIGAN RIVER
SWE3
RC4
B3
D2A
L4
L5
RC3A
GW1
D2
D1
RC1
GW2A
SW4
RC6A
SW3
B2
B1
NSL1
RC7
NOTES
WATERFORD COUNTY COUNCIL
RPS
MDR0350/DG0505
F01
DUNGARVAN LANDFILL
WASTE LICENCE APPLICATION
MONITORING LOCATIONS
Final Issue
Draft Issue
Amendment / Issue
RH
BCK
MS
April 2006
1:1000 @ A1
1:2000 @ A3

Appendix C

Surface Water Results

Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of:	Analysis of landfill site sample(s)
Report to:	Waterford County Council
Report date:	03/04/09

Facility:	**Dungarvan Waste Disposal Site** Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No:	W0032-01

Date collected:	18/02/2009	Date received:	18/02/2009

			Laboratory Ref:	2900981	2900982	2900983	2900984	2900985
			Type of sample:	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
			Location code:	WST-W0032-01-SW300	WST-W0032-01-SW1	WST-W0032-01-SW2	WST-W0032-01-SW280	WST-W0032-01-SW lagoon
			Sampling point:	Clear sample	Clear sample	Clear sample	Clear sample	Light brown colour
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	12:45	13:14	13:29	13:40	16:22
			Start/End - Dates of Analysis:	/				
			Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
	Parameter	Units	Limits					
F	Temperature	°C		-	8.0	8.1	8.0	7.6
F	Dissolved Oxygen (as %Sat)	% Saturation		-	108.0	109.0	108.0	116.0
	Biochemical Oxygen Demand	mg/l O2		-	1.2	1.3	1.6	2.9
	Suspended Solids	mg/l		-	<6	<6	<6	13

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA Dublin Laboratory,
   Cyanide Analysed in the EPA Cork Laboratory.
   Phenols Analysed in the EPA Castlebar Laboratory.
3) **nm** "Not measured"
4) **nd** "None detected"
5) **nt** "No time" - Time not recorded
6) **tntc** "Too numerous to count"
7) **F** "Field measured parameters"

Signed: Jan Smith Date: 3/4/09

Michael Neill, Regional Chemist

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Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of:	Analysis of landfill site sample(s)
Report to:	Waterford County Council
Report date:	17/08/09

Facility:	**Dungarvan Waste Disposal Site** Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No:	W0032-01

Date collected:	18/05/2009	Date received:	18/05/2009

58

			Laboratory Ref:	2902487	2902488	2902489	2902490	2902491
			Type of sample:	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
			Location code:	WST-W0032-01-SW1	WST-W0032-01-SW2	WST-W0032-01-SW280	WST-W0032-01-SW300	WST-W0032-01-SW lagoon
			Sampling point:	Brown colour	Light brown colour	Light brown colour	Light brown colour	Light brown colour
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	13:15	13:25	13:35	15:30	16:30
			Start/End - Dates of Analysis:					
			Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
Parameter		**Units**	**Limits**					
F	Temperature	°C		10.4	10.2	10.4	12.1	14.2
F	Dissolved Oxygen (as %Sat)	% Saturation		100.0	100.0	101.0	103.0	71.0
	Biochemical Oxygen Demand	mg/l O2		1.4	1.0	1.1	2.1	2.1
	Suspended Solids	mg/l		46	7	<6	36	32
	Chemical Oxygen Demand	mg/l O2		15	30	23	37	24

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA Dublin Laboratory,
   Cyanide Analysed in the EPA Cork Laboratory.
   Phenols Analysed in the EPA Castlebar Laboratory.
3) **nm** "Not measured"
4) **nd** "None detected"
5) **nt** "No time" - Time not recorded
6) **tntc** "Too numerous to count"
7) **F** "Field measured parameters"

Signed: Date: 17/8/09

Michael Neill, Regional Chemist

Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of:	Analysis of landfill site sample(s)
Report to:	Waterford County Council
Report date:	17/08/09

Facility:	**Dungarvan Waste Disposal Site** Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No:	W0032-01

Date collected:	18/05/2009	Date received:	18/05/2009

09

			Laboratory Ref:	2902487	2902488	2902489	2902490	2902491
			Type of sample:	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
			Location code:	WST-W0032-01-SW1	WST-W0032-01-SW2	WST-W0032-01-SW280	WST-W0032-01-SW300	WST-W0032-01-SW lagoon
			Sampling point:	Brown colour	Light brown colour	Light brown colour	Light brown colour	Light brown colour
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	13:15	13:25	13:35	15:30	16:30
			Start/End - Dates of Analysis:					
			Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
Parameter		**Units**	**Limits**					
F	Temperature	°C		10.4	10.2	10.4	12.1	14.2
F	Dissolved Oxygen (as %Sat)	% Saturation		100.0	100.0	101.0	103.0	71.0
	Biochemical Oxygen Demand	mg/l O2		1.4	1.0	1.1	2.1	2.1
	Suspended Solids	mg/l		46	7	<6	36	32
	Chemical Oxygen Demand	mg/l O2		15	30	23	37	24

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA Dublin Laboratory,
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   Phenols Analysed in the EPA Castlebar Laboratory.
3) **nm** "Not measured"
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5) **nt** "No time" - Time not recorded
6) **tntc** "Too numerous to count"
7) **F** "Field measured parameters"

Signed: Date: 17/8/09

Michael Neill, Regional Chemist

Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of:	Analysis of landfill site sample(s)
Report to:	Waterford County Council
Report date:	17/08/09

Facility:	**Dungarvan Waste Disposal Site** Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No:	W0032-01

Date collected:	18/05/2009	Date received:	18/05/2009

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			Laboratory Ref:	2902487	2902488	2902489	2902490	2902491
			Type of sample:	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
			Location code:	WST-W0032-01-SW1	WST-W0032-01-SW2	WST-W0032-01-SW280	WST-W0032-01-SW300	WST-W0032-01-SW lagoon
			Sampling point:	Brown colour	Light brown colour	Light brown colour	Light brown colour	Light brown colour
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	13:15	13:25	13:35	15:30	16:30
			Start/End - Dates of Analysis:					
			Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
	Parameter	Units	Limits					
F	Temperature	°C		10.4	10.2	10.4	12.1	14.2
F	Dissolved Oxygen (as %Sat)	% Saturation		100.0	100.0	101.0	103.0	71.0
	Biochemical Oxygen Demand	mg/l O2		1.4	1.0	1.1	2.1	2.1
	Suspended Solids	mg/l		46	7	<6	36	32
	Chemical Oxygen Demand	mg/l O2		15	30	23	37	24

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA Dublin Laboratory,
   Cyanide Analysed in the EPA Cork Laboratory.
   Phenols Analysed in the EPA Castlebar Laboratory.
3) nm "Not measured"
4) nd "None detected"
5) nt "No time" - Time not recorded
6) tntc "Too numerous to count"
7) F "Field measured parameters"

Signed: Date: 17/8/09

Michael Neill, Regional Chemist

Report number:KK2901033/1

Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of:	Analysis of landfill site sample(s)
Report to:	Waterford County Council
Report date:	14/12/09

Facility:	**Dungarvan Waste Disposal Site** Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No:	W0032-01

Date collected:	10/09/2009	Date received:	10/09/2009

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			Laboratory Ref:	2904850	2904851	2904852	2904853	2904854	2904855	2904856
			Type of sample:	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
			Location code:	WST-W0032-01-SW300	WST-W0032-01-SW1	WST-W0032-01-SW2	WST-W0032-01-SW280	WST-W0032-01-SW	WST-W0032-01-SW	WST-W0032-01-SW lagoon
			Sampling point:	Clear sample	Clear sample	Clear sample	Clear sample	Top reed bed - Clear sample	Bottom reed bed - Clear sample	Clear sample
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	11:45	12:05	12:15	12:25	15:16	15:25	15:40
			Start/End - Dates of Analysis:							
			Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
Parameter		Units	Limits							
F	Temperature	°C		12.2	12.0	12.0	12.0	15.0	17.5	17.2
F	Dissolved Oxygen (as %Sat)	% Saturation		104.0	105.0	106.0	107.0	87.0	128.0	134.0
	Biochemical Oxygen Demand	mg/l O2		1.1	<0.5	0.5	0.5	0.8	1.8	5.4
	Suspended Solids	mg/l		<5	<5	<5	<5	<5	<5	8

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA, Dublin Laboratory.
   Cyanide Analysed in the EPA Cork Laboratory.
   Phenols Analysed in the EPA Castlebar Laboratory.
3) **nm** "Not measured"
4) **nd** "None detected"
5) **nt** "No time" - Time not recorded
6) **tntc** "Too numerous to count"
7) F "Field measured parameters"

Signed: Jean Scott Date: 14/12/09

pp Michael Neill, Regional Chemist

Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of:	Analysis of landfill site sample(s)
Report to:	Waterford County Council
Report date:	14/12/09

Facility:	**Dungarvan Waste Disposal Site** Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No:	W0032-01

Date collected:	10/09/2009	Date received:	10/09/2009

99

			Laboratory Ref:	2904850	2904851	2904852	2904853	2904854	2904855	2904856
			Type of sample:	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
			Location code:	WST-W0032-01-SW300	WST-W0032-01-SW1	WST-W0032-01-SW2	WST-W0032-01-SW280	WST-W0032-01-SW	WST-W0032-01-SW	WST-W0032-01-SW lagoon
			Sampling point:	Clear sample	Clear sample	Clear sample	Clear sample	Top reed bed - Clear sample	Bottom reed bed - Clear sample	Clear sample
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	11:45	12:05	12:15	12:25	15:16	15:25	15:40
			Start/End - Dates of Analysis:							
			Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
Parameter		**Units**	**Limits**							
F	Temperature	°C		12.2	12.0	12.0	12.0	15.0	17.5	17.2
F	Dissolved Oxygen (as %Sat)	% Saturation		104.0	105.0	106.0	107.0	87.0	128.0	134.0
	Biochemical Oxygen Demand	mg/l O2		1.1	<0.5	0.5	0.5	0.8	1.8	5.4
	Suspended Solids	mg/l		<5	<5	<5	<5	<5	<5	8

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA, Dublin Laboratory.
   Cyanide Analysed in the EPA Cork Laboratory.
   Phenols Analysed in the EPA Castlebar Laboratory.
3) **nm** "Not measured"
4) **nd** "None detected"
5) **nt** "No time" - Time not recorded
6) **tntc** "Too numerous to count"
7) **F** "Field measured parameters"

Signed: Jean Scott Date: 14/12/09

Michael Neill, Regional Chemist

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Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of:	Analysis of landfill site sample(s)
Report to:	Waterford County Council
Report date:	25/01/10

Facility:	**Dungarvan Waste Disposal Site** Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No:	W0032-01

Date collected:	30/11/2009	Date received:	30/11/2009

Appendix D

Ground Water Results

Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of:	Analysis of landfill site sample(s)
Report to:	Waterford County Council
Report date:	03/04/09

Facility:	**Dungarvan Waste Disposal Site** Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No:	W0032-01

Date collected:	18/02/2009	Date received:	18/02/2009

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				Laboratory Ref:	2900986	2900987	2900988	2900989	2900990
				Type of sample:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
				Location code:	WST-W0032-01-RC7	WST-W0032-01-RC4	WST-W0032-01-RC6a	WST-W0032-01-GW1	WST-W0032-01-RC3a
				Sampling point:	Clear sample with mud	Clear sample	Clear sample with mud	Light brown colour	Clear sample with mud
				Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
				Time Sampled:	12:42	14:02	15:24	15:50	15:55
				Start/End - Dates of Analysis:					
				Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
Parameter		**Units**	**Limits**						
F	Depth of Borehole	m			11.8	23	11.6	10.6	22
F	Water Level	m			1.2	16	7.6	3	14.4
F	Temperature	°C			11.2	11.0	11.4	12.4	11.4
F	Dissolved Oxygen (as %Sat)	% Saturation			30.0	62.0	28.0	20.0	3.3
	pH	pH			7.5	7.4	7.3	7.4	6.8
	Conductivity @25°C	µS/cm			2530	688	1013	2680	1424
	Ammonia	mg/l N			0.007	0.011	2.6	10	110
	Chloride	mg/l Cl			613	32	94	26	272
	Total Oxidised Nitrogen (as N)	mg/l N			10	15	17	<0.1	0.1
	Iron	ug/l			390	140	20000	nm	2300

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA Dublin Laboratory,
   Cyanide Analysed in the EPA Cork Laboratory.
   Phenols Analysed in the EPA Castlebar Laboratory.
3) **nm** "Not measured"
4) **nd** "None detected"
5) **nt** "No time" - Time not recorded
6) **tntc** "Too numerous to count"
7) **F** "Field measured parameters"

Signed: Jim Smith Date: 5/4/09

pp Michael Neill, Regional Chemist

Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of:	Analysis of landfill site sample(s)
Report to:	Waterford County Council
Report date:	17/08/09

Facility:	**Dungarvan Waste Disposal Site** Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No:	W0032-01

Date collected:	18/05/2009	Date received:	18/05/2009

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				Laboratory Ref:	2902492	2902493	2902494	2902495	2902496	2902497	2902498
				Type of sample:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
				Location code:	WST-W0032-01-RC4	WST-W0032-01-RC3a	WST-W0032-01-GW1	WST-W0032-01-RC8	WST-W0032-01-RC7	WST-W0032-01-RC6	WST-W0032-01-GW2a
				Sampling point:	Clear sample	Claer sample	Muddy sample	No sample - Borehole damaged	Clear sample	Light brown colour	Dry, no sample
				Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
				Time Sampled:	14:20	14:50	14:40	13:05	15:50	14:12	12:00
				Start/End - Dates of Analysis:				/			/
				Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
Parameter		**Units**	**Limits**								
F	Depth of Borehole	m			23	22	10.5	-	11.8	11.7	-
F	Water Level	m			15.9	12.5	3.4	-	10.4	7.8	-
F	Temperature	°C			11.4	12.9	12.5	-	11.7	11.9	-
F	Dissolved Oxygen (as %Sat)	% Saturation			60.0	21.0	18.0	-	22.0	26.0	-
	pH	pH			7.4	7.2	6.6	-	7.5	7.2	-
	Conductivity @25°C	µS/cm			101	2640	1156	-	2690	1006	-
	Ammonia	mg/l N			0.032	120	3.6	-	0.031	2	-
	Chloride	mg/l Cl			28	214	13	-	659	98	-
	ortho-Phosphate (as P)	mg/l P			0.048	0.036	<0.006	-	0.039	0.032	-
	Total Oxidised Nitrogen (as N)	mg/l N			15	1.7	1.2	-	2.2	17	-
	Alkalinity-total (as CaCO3)	mg/l CaCO3			247	628	528	-	219	288	-
	1,1,1,2-Tetrachloroethane	µg/l			<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,1,1-Trichloroethane	µg/l			<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,1,2,2-Tetrachloroethane	µg/l			<1	<1	<1	-	<1	<1	-
	1,1,2-Trichloroethane	µg/l			<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,1-Dichloroethane	µg/l			<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,1-Dichloroethene	µg/l			<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,1-Dichloropropene	µg/l			<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,2,3-Trichlorobenzene	µg/l			<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,2,3-Trichloropropane	µg/l			<0.6	<0.6	<0.6	-	<0.6	<0.6	-
	1,2,4-Trichlorobenzene	µg/l			<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,2,4-Trimethylbenzene	µg/l			<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,2-Dibromo-3-Chloropropane	µg/l			<1.3	<1.3	<1.3	-	<1.3	<1.3	-

		Laboratory Ref:	2 492	2902493	2902494	290.	2902496	2902497	2902498
		Type of sample:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
		Location code:	WST-W0032-01-RC4	WST-W0032-01-RC3a	WST-W0032-01-GW1	WST-W0032-01-RC8	WST-W0032-01-RC7	WST-W0032-01-RC6	WST-W0032-01-GW2a
		Sampling point:	Clear sample	Claer sample	Muddy sample	No sample - Borehole damaged	Clear sample	Light brown colour	Dry, no sample
		Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
		Time Sampled:	14:20	14:50	14:40	13:05	15:50	14:12	12:00
		Start/End - Dates of Analysis:				/			/
		Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
Parameter		**Units**	**Limits**						
	1,2-Dibromoethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,2-Dichlorobenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,2-Dichloroethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,2-Dichloropropane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,3,5-Trimethylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,3-Dichlorobenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,3-Dichloropropane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,4-Dichlorobenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	2,2-Dichloropropane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	2-Chlorotoluene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	4-Chlorotoluene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	4-Isopropyltoluene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Benzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Bromobenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Bromochloromethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Bromodichloromethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Bromoform	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Bromomethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	c-1,2-Dichloroethene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	c-1,3-Dichloropropene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Carbon Tetrachloride	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Chlorobenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Chloroform	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-

			Laboratory Ref:	2902492	2902493	2902494	2902495	2902496	2902497	2902498
			Type of sample:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
			Location code:	WST-W0032-01-RC4	WST-W0032-01-RC3a	WST-W0032-01-GW1	WST-W0032-01-RC8	WST-W0032-01-RC7	WST-W0032-01-RC6	WST-W0032-01-GW2a
			Sampling point:	Clear sample	Claer sample	Muddy sample	No sample - Borehole damaged	Clear sample	Light brown colour	Dry, no sample
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	14:20	14:50	14:40	13:05	15:50	14:12	12:00
			Start/End - Dates of Analysis:				/			/
			Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
Parameter		**Units**	**Limits**							
	Dibromochloromethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Dibromomethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Dichlorodifluoromethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Dichloromethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Ethylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Hexachlorobutadiene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Isopropylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	m,p-Xylene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Naphthalene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	n-Butylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	n-Propylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	o-Xylene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	sec-Butylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Styrene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	t-1,2-Dichloroethene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	t-1,3-Dichloropropene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	tert-Butylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Tetrachloroethene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Toluene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Trichloroethene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Trichlorofluoromethane	µg/l		<0.6	<0.6	<0.6	-	<0.6	<0.6	-
	Vinyl Chloride	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Aluminium	ug/l		<250	<250	<250	-	<250	<250	-

			Laboratory Ref:	2902492	2902493	2902494	2902495	2902496	2902497	2902498
			Type of sample:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
			Location code:	WST-W0032-01-RC4	WST-W0032-01-RC3a	WST-W0032-01-GW1	WST-W0032-01-RC8	WST-W0032-01-RC7	WST-W0032-01-RC6	WST-W0032-01-GW2a
			Sampling point:	Clear sample	Claer sample	Muddy sample	No sample - Borehole damaged	Clear sample	Light brown colour	Dry, no sample
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	14:20	14:50	14:40	13:05	15:50	14:12	12:00
			Start/End - Dates of Analysis:				/			/
			Status of results:	Final Report	Final Report	Final Report	Final Report	Final Report	Final Report	Final Report
Parameter		Units	Limits							
	Antimony	ug/l		<5	<5	<5	-	<5	<5	-
	Arsenic	ug/l		<5	<5	<5	-	<5	<5	-
	Barium	ug/l		<30	<30	<30	-	<30	<30	-
	Beryllium	ug/l		<5	<5	<5	-	<5	<5	-
	Boron	ug/l		<50	85	<50	-	<50	50	-
	Cadmium	ug/l		<5	<5	<5	-	<5	<5	-
	Calcium	mg/l		9.7	8.4	16	-	6.9	11	-
	Chromium	ug/l		<5	<5	<5	-	<5	<5	-
	Cobalt	ug/l		<5	<5	<5	-	<5	<5	-
	Copper	ug/l		<30	<30	<30	-	<30	<30	-
	Iron	ug/l		<250	<250	2000	-	<250	<250	-
	Lead	ug/l		<5	<5	<5	-	<5	<5	-
	Magnesium	mg/l		<5	<5	<5	-	5.4	<5	-
	Manganese	ug/l		<250	<250	970	-	<250	<250	-
	Mercury	ug/l		<5	<5	<5	-	<5	<5	-
	Molybdenum	ug/l		<5	<5	<5	-	<5	<5	-
	Nickel	ug/l		<5	7.1	<5	-	<5	<5	-
	Potassium	mg/l		<5	7.3	<5	-	<5	<5	-
	Selenium	ug/l		<5	<5	<5	-	<5	<5	-
	Sodium	mg/l		<5	20	<5	-	34	6.2	-
	Thallium	ug/l		<5	<5	<5	-	<5	<5	-
	Tin	ug/l		<10	<10	<10	-	<10	<10	-
	Uranium	ug/l		<5	<5	<5	-	<5	<5	-

			Laboratory Ref:	2902492	2902493	2902494	2902495	2902496	2902497	2902498
			Type of sample:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
			Location code:	WST-W0032-01-RC4	WST-W0032-01-RC3a	WST-W0032-01-GW1	WST-W0032-01-RC8	WST-W0032-01-RC7	WST-W0032-01-RC6	WST-W0032-01-GW2a
			Sampling point:	Clear sample	Claer sample	Muddy sample	No sample - Borehole damaged	Clear sample	Light brown colour	Dry, no sample
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	14:20	14:50	14:40	13:05	15:50	14:12	12:00
			Start/End - Dates of Analysis:				/			/
			Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
Parameter		**Units**	**Limits**							
	Vanadium	ug/l		<5	<5	<5	-	<5	<5	-
	Zinc	ug/l		<100	<100	<100	-	<100	<100	-

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA, Dublin Laboratory.
   Cyanide Analysed in the EPA Cork Laboratory.
   Phenols Analysed in the EPA Castlebar Laboratory.
3) **nm** "Not measured"
4) **nd** "None detected"
5) **nt** "No time" - Time not recorded
6) **tntc** "Too numerous to count"
7) **F** "Field measured parameters"

Signed: _____ Date: 17/8/09

Michael Neill, Regional Chemist

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Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of:	Analysis of landfill site sample(s)
Report to:	Waterford County Council
Report date:	17/08/09

Facility:	**Dungarvan Waste Disposal Site** Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No:	W0032-01

Date collected:	18/05/2009	Date received:	18/05/2009

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			Laboratory Ref:	2902492	2902493	2902494	2902495	2902496	2902497	2902498
			Type of sample:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
			Location code:	WST-W0032-01-RC4	WST-W0032-01-RC3a	WST-W0032-01-GW1	WST-W0032-01-RC8	WST-W0032-01-RC7	WST-W0032-01-RC6	WST-W0032-01-GW2a
			Sampling point:	Clear sample	Claer sample	Muddy sample	No sample - Borehole damaged	Clear sample	Light brown colour	Dry, no sample
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	14:20	14:50	14:40	13:05	15:50	14:12	12:00
			Start/End - Dates of Analysis:				/			/
			Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
Parameter		**Units**	**Limits**							
F	Depth of Borehole	m		23	22	10.5	-	11.8	11.7	-
F	Water Level	m		15.9	12.5	3.4	-	10.4	7.8	-
F	Temperature	°C		11.4	12.9	12.5	-	11.7	11.9	-
F	Dissolved Oxygen (as %Sat)	% Saturation		60.0	21.0	18.0	-	22.0	26.0	-
	pH	pH		7.4	7.2	6.6	-	7.5	7.2	-
	Conductivity @25°C	µS/cm		101	2640	1156	-	2690	1006	-
	Ammonia	mg/l N		0.032	120	3.6	-	0.031	2	-
	Chloride	mg/l Cl		28	214	13	-	659	98	-
	ortho-Phosphate (as P)	mg/l P		0.048	0.036	<0.006	-	0.039	0.032	-
	Total Oxidised Nitrogen (as N)	mg/l N		15	1.7	1.2	-	2.2	17	-
	Alkalinity-total (as CaCO3)	mg/l CaCO3		247	628	528	-	219	288	-
	1,1,1,2-Tetrachloroethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,1,1-Trichloroethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,1,2,2-Tetrachloroethane	µg/l		<1	<1	<1	-	<1	<1	-
	1,1,2-Trichloroethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,1-Dichloroethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,1-Dichloroethene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,1-Dichloropropene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,2,3-Trichlorobenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,2,3-Trichloropropane	µg/l		<0.6	<0.6	<0.6	-	<0.6	<0.6	-
	1,2,4-Trichlorobenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,2,4-Trimethylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,2-Dibromo-3-Chloropropane	µg/l		<1.3	<1.3	<1.3	-	<1.3	<1.3	-

			Laboratory Ref:	29 92	2902493	2902494	2902	2902496	2902497	2902498
			Type of sample:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
			Location code:	WST-W0032-01-RC4	WST-W0032-01-RC3a	WST-W0032-01-GW1	WST-W0032-01-RC8	WST-W0032-01-RC7	WST-W0032-01-RC6	WST-W0032-01-GW2a
			Sampling point:	Clear sample	Claer sample	Muddy sample	No sample - Borehole damaged	Clear sample	Light brown colour	Dry, no sample
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	14:20	14:50	14:40	13:05	15:50	14:12	12:00
			Start/End - Dates of Analysis:				/			/
			Status of results:	Final Report	Final Report	Final Report	Final Report	Final Report	Final Report	Final Report
Parameter		Units	Limits							
	1,2-Dibromoethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,2-Dichlorobenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,2-Dichloroethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,2-Dichloropropane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,3,5-Trimethylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,3-Dichlorobenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,3-Dichloropropane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,4-Dichlorobenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	2,2-Dichloropropane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	2-Chlorotoluene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	4-Chlorotoluene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	4-Isopropyltoluene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Benzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Bromobenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Bromochloromethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Bromodichloromethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Bromoform	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Bromomethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	c-1,2-Dichloroethene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	c-1,3-Dichloropropene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Carbon Tetrachloride	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Chlorobenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Chloroform	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-

			Laboratory Ref:	2902492	2902493	2902494	2902495	2902496	2902497	2902498
			Type of sample:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
			Location code:	WST-W0032-01-RC4	WST-W0032-01-RC3a	WST-W0032-01-GW1	WST-W0032-01-RC8	WST-W0032-01-RC7	WST-W0032-01-RC6	WST-W0032-01-GW2a
			Sampling point:	Clear sample	Claer sample	Muddy sample	No sample - Borehole damaged	Clear sample	Light brown colour	Dry, no sample
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	14:20	14:50	14:40	13:05	15:50	14:12	12:00
			Start/End - Dates of Analysis:				/			/
			Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
Parameter		**Units**	**Limits**							
	Dibromochloromethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Dibromomethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Dichlorodifluoromethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Dichloromethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Ethylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Hexachlorobutadiene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Isopropylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	m,p-Xylene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Naphthalene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	n-Butylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	n-Propylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	o-Xylene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	sec-Butylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Styrene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	t-1,2-Dichloroethene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	t-1,3-Dichloropropene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	tert-Butylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Tetrachloroethene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Toluene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Trichloroethene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Trichlorofluoromethane	µg/l		<0.6	<0.6	<0.6	-	<0.6	<0.6	-
	Vinyl Chloride	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Aluminium	ug/l		<250	<250	<250	-	<250	<250	-

			Laboratory Ref:	29 92	2902493	2902494	2902	2902496	2902497	2902498
			Type of sample:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
			Location code:	WST-W0032-01-RC4	WST-W0032-01-RC3a	WST-W0032-01-GW1	WST-W0032-01-RC8	WST-W0032-01-RC7	WST-W0032-01-RC6	WST-W0032-01-GW2a
			Sampling point:	Clear sample	Claer sample	Muddy sample	No sample - Borehole damaged	Clear sample	Light brown colour	Dry, no sample
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	14:20	14:50	14:40	13:05	15:50	14:12	12:00
			Start/End - Dates of Analysis:				/			/
			Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
Parameter		**Units**	**Limits**							
	Antimony	ug/l		<5	<5	<5	-	<5	<5	-
	Arsenic	ug/l		<5	<5	<5	-	<5	<5	-
	Barium	ug/l		<30	<30	<30	-	<30	<30	-
	Beryllium	ug/l		<5	<5	<5	-	<5	<5	-
	Boron	ug/l		<50	85	<50	-	<50	50	-
	Cadmium	ug/l		<5	<5	<5	-	<5	<5	-
	Calcium	mg/l		9.7	8.4	16	-	6.9	11	-
	Chromium	ug/l		<5	<5	<5	-	<5	<5	-
	Cobalt	ug/l		<5	<5	<5	-	<5	<5	-
	Copper	ug/l		<30	<30	<30	-	<30	<30	-
	Iron	ug/l		<250	<250	2000	-	<250	<250	-
	Lead	ug/l		<5	<5	<5	-	<5	<5	-
	Magnesium	mg/l		<5	<5	<5	-	5.4	<5	-
	Manganese	ug/l		<250	<250	970	-	<250	<250	-
	Mercury	ug/l		<5	<5	<5	-	<5	<5	-
	Molybdenum	ug/l		<5	<5	<5	-	<5	<5	-
	Nickel	ug/l		<5	7.1	<5	-	<5	<5	-
	Potassium	mg/l		<5	7.3	<5	-	<5	<5	-
	Selenium	ug/l		<5	<5	<5	-	<5	<5	-
	Sodium	mg/l		<5	20	<5	-	34	6.2	-
	Thallium	ug/l		<5	<5	<5	-	<5	<5	-
	Tin	ug/l		<10	<10	<10	-	<10	<10	-
	Uranium	ug/l		<5	<5	<5	-	<5	<5	-

			Laboratory Ref:	2902492	2902493	2902494	2902495	2902496	2902497	2902498
			Type of sample:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
			Location code:	WST-W0032-01-RC4	WST-W0032-01-RC3a	WST-W0032-01-GW1	WST-W0032-01-RC8	WST-W0032-01-RC7	WST-W0032-01-RC6	WST-W0032-01-GW2a
			Sampling point:	Clear sample	Claer sample	Muddy sample	No sample - Borehole damaged	Clear sample	Light brown colour	Dry, no sample
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	14:20	14:50	14:40	13:05	15:50	14:12	12:00
			Start/End - Dates of Analysis:				/			/
			Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
Parameter		**Units**	**Limits**							
	Vanadium	ug/l		<5	<5	<5	-	<5	<5	-
	Zinc	ug/l		<100	<100	<100	-	<100	<100	-

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA, Dublin Laboratory.
   Cyanide Analysed in the EPA Cork Laboratory.
   Phenols Analysed in the EPA Castlebar Laboratory.
3) **nm** "Not measured"
4) **nd** "None detected"
5) **nt** "No time" - Time not recorded
6) **tntc** "Too numerous to count"
7) **F** "Field measured parameters"

Signed: Date: 17/8/09

Michael Neill, Regional Chemist

Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of:	Analysis of landfill site sample(s)
Report to:	Waterford County Council
Report date:	17/08/09

Facility:	**Dungarvan Waste Disposal Site** Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No:	W0032-01

Date collected:	18/05/2009	Date received:	18/05/2009

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			Laboratory Ref:	2902492	2902493	2902494	2902495	2902496	2902497	2902498
			Type of sample:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
			Location code:	WST-W0032-01-RC4	WST-W0032-01-RC3a	WST-W0032-01-GW1	WST-W0032-01-RC8	WST-W0032-01-RC7	WST-W0032-01-RC6	WST-W0032-01-GW2a
			Sampling point:	Clear sample	Claer sample	Muddy sample	No sample - Borehole damaged	Clear sample	Light brown colour	Dry, no sample
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	14:20	14:50	14:40	13:05	15:50	14:12	12:00
			Start/End - Dates of Analysis:				/			/
			Status of results:	Final Report	Final Report	Final Report	Final Report	Final Report	Final Report	Final Report
Parameter		Units	Limits							
F	Depth of Borehole	m		23	22	10.5	-	11.8	11.7	-
F	Water Level	m		15.9	12.5	3.4	-	10.4	7.8	-
F	Temperature	°C		11.4	12.9	12.5	-	11.7	11.9	-
F	Dissolved Oxygen (as %Sat)	% Saturation		60.0	21.0	18.0	-	22.0	26.0	-
	pH	pH		7.4	7.2	6.6	-	7.5	7.2	-
	Conductivity @25°C	µS/cm		101	2640	1156	-	2690	1006	-
	Ammonia	mg/l N		0.032	120	3.6	-	0.031	2	-
	Chloride	mg/l Cl		28	214	13	-	659	98	-
	ortho-Phosphate (as P)	mg/l P		0.048	0.036	<0.006	-	0.039	0.032	-
	Total Oxidised Nitrogen (as N)	mg/l N		15	1.7	1.2	-	2.2	17	-
	Alkalinity-total (as CaCO3)	mg/l CaCO3		247	628	528	-	219	288	-
	1,1,1,2-Tetrachloroethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,1,1-Trichloroethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,1,2,2-Tetrachloroethane	µg/l		<1	<1	<1	-	<1	<1	-
	1,1,2-Trichloroethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,1-Dichloroethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,1-Dichloroethene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,1-Dichloropropene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,2,3-Trichlorobenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,2,3-Trichloropropane	µg/l		<0.6	<0.6	<0.6	-	<0.6	<0.6	-
	1,2,4-Trichlorobenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,2,4-Trimethylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
	1,2-Dibromo-3-Chloropropane	µg/l		<1.3	<1.3	<1.3	-	<1.3	<1.3	-

			Laboratory Ref:	2902492	2902493	2902494	2902495	2902496	2902497	2902498
			Type of sample:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
			Location code:	WST-W0032-01-RC4	WST-W0032-01-RC3a	WST-W0032-01-GW1	WST-W0032-01-RC8	WST-W0032-01-RC7	WST-W0032-01-RC6	WST-W0032-01-GW2a
			Sampling point:	Clear sample	Claer sample	Muddy sample	No sample - Borehole damaged	Clear sample	Light brown colour	Dry, no sample
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	14:20	14:50	14:40	13:05	15:50	14:12	12:00
			Start/End - Dates of Analysis:				/			/
			Status of results:	Final Report	Final Report	Final Report	Final Report	Final Report	Final Report	Final Report
Parameter		Units	Limits							
1,2-Dibromoethane		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
1,2-Dichlorobenzene		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
1,2-Dichloroethane		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
1,2-Dichloropropane		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
1,3,5-Trimethylbenzene		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
1,3-Dichlorobenzene		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
1,3-Dichloropropane		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
1,4-Dichlorobenzene		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
2,2-Dichloropropane		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
2-Chlorotoluene		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
4-Chlorotoluene		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
4-Isopropyltoluene		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Benzene		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Bromobenzene		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Bromochloromethane		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Bromodichloromethane		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Bromoform		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Bromomethane		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
c-1,2-Dichloroethene		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
c-1,3-Dichloropropene		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Carbon Tetrachloride		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Chlorobenzene		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Chloroform		µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-

		Laboratory Ref:	2902492	2902493	2902494	2902495	2902496	2902497	2902498
		Type of sample:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
		Location code:	WST-W0032-01-RC4	WST-W0032-01-RC3a	WST-W0032-01-GW1	WST-W0032-01-RC8	WST-W0032-01-RC7	WST-W0032-01-RC6	WST-W0032-01-GW2a
		Sampling point:	Clear sample	Claer sample	Muddy sample	No sample - Borehole damaged	Clear sample	Light brown colour	Dry, no sample
		Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
		Time Sampled:	14:20	14:50	14:40	13:05	15:50	14:12	12:00
		Start/End - Dates of Analysis:				/			/
		Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
Parameter	**Units**	**Limits**							
Dibromochloromethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Dibromomethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Dichlorodifluoromethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Dichloromethane	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Ethylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Hexachlorobutadiene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Isopropylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
m,p-Xylene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Naphthalene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
n-Butylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
n-Propylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
o-Xylene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
sec-Butylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Styrene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
t-1,2-Dichloroethene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
t-1,3-Dichloropropene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
tert-Butylbenzene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Tetrachloroethene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Toluene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Trichloroethene	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Trichlorofluoromethane	µg/l		<0.6	<0.6	<0.6	-	<0.6	<0.6	-
Vinyl Chloride	µg/l		<0.5	<0.5	<0.5	-	<0.5	<0.5	-
Aluminium	ug/l		<250	<250	<250	-	<250	<250	-

			Laboratory Ref:	02492	2902493	2902494	2902495	2902496	2902497	2902498
			Type of sample:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
			Location code:	WST-W0032-01-RC4	WST-W0032-01-RC3a	WST-W0032-01-GW1	WST-W0032-01-RC8	WST-W0032-01-RC7	WST-W0032-01-RC6	WST-W0032-01-GW2a
			Sampling point:	Clear sample	Claer sample	Muddy sample	No sample - Borehole damaged	Clear sample	Light brown colour	Dry, no sample
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	14:20	14:50	14:40	13:05	15:50	14:12	12:00
			Start/End - Dates of Analysis:				/			/
			Status of results:	Final Report	Final Report	Final Report	Final Report	Final Report	Final Report	Final Report
Parameter		Units	Limits							
	Antimony	ug/l		<5	<5	<5	-	<5	<5	-
	Arsenic	ug/l		<5	<5	<5	-	<5	<5	-
	Barium	ug/l		<30	<30	<30	-	<30	<30	-
	Beryllium	ug/l		<5	<5	<5	-	<5	<5	-
	Boron	ug/l		<50	85	<50	-	<50	50	-
	Cadmium	ug/l		<5	<5	<5	-	<5	<5	-
	Calcium	mg/l		9.7	8.4	16	-	6.9	11	-
	Chromium	ug/l		<5	<5	<5	-	<5	<5	-
	Cobalt	ug/l		<5	<5	<5	-	<5	<5	-
	Copper	ug/l		<30	<30	<30	-	<30	<30	-
	Iron	ug/l		<250	<250	2000	-	<250	<250	-
	Lead	ug/l		<5	<5	<5	-	<5	<5	-
	Magnesium	mg/l		<5	<5	<5	-	5.4	<5	-
	Manganese	ug/l		<250	<250	970	-	<250	<250	-
	Mercury	ug/l		<5	<5	<5	-	<5	<5	-
	Molybdenum	ug/l		<5	<5	<5	-	<5	<5	-
	Nickel	ug/l		<5	7.1	<5	-	<5	<5	-
	Potassium	mg/l		<5	7.3	<5	-	<5	<5	-
	Selenium	ug/l		<5	<5	<5	-	<5	<5	-
	Sodium	mg/l		<5	20	<5	-	34	6.2	-
	Thallium	ug/l		<5	<5	<5	-	<5	<5	-
	Tin	ug/l		<10	<10	<10	-	<10	<10	-
	Uranium	ug/l		<5	<5	<5	-	<5	<5	-

			Laboratory Ref:	2902492	2902493	2902494	2902495	2902496	2902497	2902498
			Type of sample:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
			Location code:	WST-W0032-01-RC4	WST-W0032-01-RC3a	WST-W0032-01-GW1	WST-W0032-01-RC8	WST-W0032-01-RC7	WST-W0032-01-RC6	WST-W0032-01-GW2a
			Sampling point:	Clear sample	Claer sample	Muddy sample	No sample - Borehole damaged	Clear sample	Light brown colour	Dry, no sample
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	14:20	14:50	14:40	13:05	15:50	14:12	12:00
			Start/End - Dates of Analysis:				/			/
			Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
Parameter		**Units**	**Limits**							
	Vanadium	ug/l		<5	<5	<5	-	<5	<5	-
	Zinc	ug/l		<100	<100	<100	-	<100	<100	-

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA, Dublin Laboratory.
   Cyanide Analysed in the EPA Cork Laboratory.
   Phenols Analysed in the EPA Castlebar Laboratory.
3) nm "Not measured"
4) nd "None detected"
5) nt "No time" - Time not recorded
6) tntc "Too numerous to count"
7) F "Field measured parameters"

Signed: _____ Date: 17/8/09

Michael Neill, Regional Chemist

Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of:	Analysis of landfill site sample(s)
Report to:	Waterford County Council
Report date:	14/12/09

Facility:	**Dungarvan Waste Disposal Site** Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No:	W0032-01

Date collected:	10/09/2009	Date received:	10/09/2009

06

			Laboratory Ref:	2904857	2904858	2904859	2904860	2904861	2904862	2904863
			Type of sample:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
			Location code:	WST-W0032-01-RC4	WST-W0032-01-RC8	WST-W0032-01-GW2a	WST-W0032-01-RC3a	WST-W0032-01-GW1	WST-W0032-01-RC6a	WST-W0032-01-RC7
			Sampling point:	Clear sample	No tubing, no sample	Dry, no sample	Clear sample	Muddy brown sample	Clear sample	Muddy brown sample
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	13:00	13:07	12:45	14:35	14:30	16:00	16:35
			Start/End - Dates of Analysis:		/	/				
			Status of results:	Final Report	Final Report	Final Report	Final Report	Final Report	Final Report	Final Report
Parameter		Units	Limits							
F	Depth of Borehole	m		23.3	-	-	23	10.3	11.6	12
F	Water Level	m		16.2	-	-	13.7	3.2	7.6	10.8
F	Temperature	°C		11.7	-	-	12.9	14.0	11.8	12.5
F	Dissolved Oxygen (as %Sat)	% Saturation		56.0	-	-	20.0	9.0	21.3	16.0
	pH	pH		7.3	-	-	7.1	6.6	7.2	7.4
	Conductivity @25°C	µS/cm		676	-	-	1890	1456	973	1920
	Ammonia	mg/l N		0.1	-	-	75	8.1	2.1	0.04
	Chloride	mg/l Cl		29	-	-	153	17	86	399
	Total Oxidised Nitrogen (as N)	mg/l N		13	-	-	2.1	<0.5	16	5.2
	Iron	ug/l		<25	-	-	150	16000	84	44

Report number:KK2901831/1

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA, Dublin Laboratory.
   Cyanide Analysed in the EPA Cork Laboratory.
   Phenols Analysed in the EPA Castlebar Laboratory.
3) **nm** "Not measured"
4) **nd** "None detected"
5) **nt** "No time" - Time not recorded
6) **tntc** "Too numerous to count"
7) **F** "Field measured parameters"

Signed: Jean Smith Date: 14/12/09

pp Michael Neill, Regional Chemist

92

Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of:	Analysis of landfill site sample(s)
Report to:	Waterford County Council
Report date:	14/12/09

Facility:	**Dungarvan Waste Disposal Site** Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No:	W0032-01

Date collected:	10/09/2009	Date received:	10/09/2009

93

				Laboratory Ref:	2904857	2904858	2904859	2904860	2904861	2904862	2904863
				Type of sample:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
				Location code:	WST-W0032-01-RC4	WST-W0032-01-RC8	WST-W0032-01-GW2a	WST-W0032-01-RC3a	WST-W0032-01-GW1	WST-W0032-01-RC6a	WST-W0032-01-RC7
				Sampling point:	Clear sample	No tubing, no sample	Dry, no sample	Clear sample	Muddy brown sample	Clear sample	Muddy brown sample
				Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
				Time Sampled:	13:00	13:07	12:45	14:35	14:30	16:00	16:35
				Start/End - Dates of Analysis:		/	/				
				Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
Parameter		Units	Limits								
F	Depth of Borehole	m			23.3	-	-	23	10.3	11.6	12
F	Water Level	m			16.2	-	-	13.7	3.2	7.6	10.8
F	Temperature	°C			11.7	-	-	12.9	14.0	11.8	12.5
F	Dissolved Oxygen (as %Sat)	% Saturation			56.0	-	-	20.0	9.0	21.3	16.0
	pH	pH			7.3	-	-	7.1	6.6	7.2	7.4
	Conductivity @25°C	µS/cm			676	-	-	1890	1456	973	1920
	Ammonia	mg/l N			0.1	-	-	75	8.1	2.1	0.04
	Chloride	mg/l Cl			29	-	-	153	17	86	399
	Total Oxidised Nitrogen (as N)	mg/l N			13	-	-	2.1	<0.5	16	5.2
	Iron	ug/l			<25	-	-	150	16000	84	44

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA, Dublin Laboratory.
   Cyanide Analysed in the EPA Cork Laboratory.
   Phenols Analysed in the EPA Castlebar Laboratory.
3) **nm** "Not measured"
4) **nd** "None detected"
5) **nt** "No time" - Time not recorded
6) **tntc** "Too numerous to count"
7) F "Field measured parameters"

Signed: [signature] Date: 14/12/09

p/ Michael Neill, Regional Chemist

95

			Laboratory Ref:	2906036	2906037	2906038	2906039	2906040
			Type of sample:	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
			Location code:	WST-W0032-01-SW lagoon	WST-W0032-01-GW	WST-W0032-01-SW2	WST-W0032-01-SW280	WST-W0032-01-SW300
			Sampling point:	Clear sample	Clear sample	Clear sample	Clear sample	Clear sample
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	13:25	13:45	13:50	13:55	nm
			Start/End - Dates of Analysis:					
			Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
Parameter		**Units**	**Limits**					
F	Temperature	°C		5.1	6.6	6.5	6.4	5.7
F	Dissolved Oxygen (as %Sat)	% Saturation		91.0	97.0	97.0	97.0	97.0
	Chemical Oxygen Demand	mg/l O2		31	<20	<20	<20	<20
	Biochemical Oxygen Demand	mg/l O2		5.8	0.7	0.8	0.7	1.0
	Suspended Solids	mg/l		5	<5	<5	<5	5

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA Dublin Laboratory,
   Cyanide Analysed in the EPA Cork Laboratory.
   Phenols Analysed in the EPA Castlebar Laboratory.
3) **nm** "Not measured"
4) **nd** "None detected"
5) **nt** "No time" - Time not recorded
6) **tntc** "Too numerous to count"
7) **F** "Field measured parameters"

Signed: Jean Smith Date: 25/1/10

pp Michael Neill, Regional Chemist

Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of:	Analysis of landfill site sample(s)
Report to:	Waterford County Council
Report date:	25/01/10

Facility:	**Dungarvan Waste Disposal Site** Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No:	W0032-01

Date collected:	30/11/2009	Date received:	30/11/2009

97

			Laboratory Ref:	06041	2906042	2906043	2906044	2906045	2906046	2906047
			Type of sample:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
			Location code:	WST-W0032-01-RC4	WST-W0032-01-GW3a	WST-W0032-01-GW1	WST-W0032-01-RC6a	WST-W0032-01-RC8	WST-W0032-01-RC7	WST-W0032-01-GW2a
			Sampling point:	Clear sample	Clear sample	Muddy sample	Cloudy sample	No sample - no tubing in borehole	Cloudy sample	No sample - borehole dry
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	14:26	14:55	14:50	15:30	13:30	14:10	12:00
			Start/End - Dates of Analysis:					/		/
			Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
Parameter		Units	Limits							
F	Depth of Borehole	m		23.3	23	10.2	11.6	-	12.2	-
F	Water Level	m		16.5	14	4.1	8.2	-	11.4	-
F	Temperature	°C		10.5	11.8	11.4	10.7	-	9.9	-
F	Dissolved Oxygen (as %Sat)	% Saturation		56.0	19.0	30.0	31.0	-	28.0	-
	pH	pH		7.2	7.1	6.6	7.2	-	7.4	-
	Conductivity @25°C	µS/cm		675	1922	1310	896	-	1328	-
	Ammonia	mg/l N		0.14	72	5.4	1.3	-	0.01	-
	Chloride	mg/l Cl		29	143	16	67	-	219	-
	Total Oxidised Nitrogen (as N)	mg/l N		14	<0.5	<0.5	15	-	4.9	-
	Iron	ug/l		180	520	20000	110	-	130	-

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA, Dublin Laboratory.
   Cyanide Analysed in the EPA Cork Laboratory.
   Phenols Analysed in the EPA Castlebar Laboratory.
3) **nm** "Not measured"
4) **nd** "None detected"
5) **nt** "No time" - Time not recorded
6) **tntc** "Too numerous to count"
7) **F** "Field measured parameters"

Signed: Date: 25/1/10

Michael Neill, Regional Chemist

Appendix E

Leachate Results

Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of:	Analysis of landfill site sample(s)
Report to:	Waterford County Council
Report date:	03/04/09

Facility:	**Dungarvan Waste Disposal Site** Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No:	W0032-01

Date collected:	18/02/2009	Date received:	18/02/2009

101

			Laboratory Ref:	2900991	2900992	2900993	2900994	2900995	2900996	
			Type of sample:	Leachate	Leachate	Leachate	Leachate	Leachate	Leachate	
			Location code:	WST-W0032-01-L Interceptor	WST-W0032-01-L4	WST-W0032-01-L3	WST-W0032-01-L2	WST-W0032-01-L1	WST-W0032-01-L5a	
			Sampling point:	Open manhole	no sample - Borehole dry	no sample - Borehole damaged	no sample - Borehole damaged	no sample - Borehole missing	no sample - under water in reed bed lagoon	
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	
			Time Sampled:	13:08	15:40	12:00	12:00	12:00	15:00	
			Start/End - Dates of Analysis:		/	/	/	/	/	
			Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	
F	Temperature	°C		8.0	-	-	-	-	-	
	Chemical Oxygen Demand	mg/l O2		1202	-	-	-	-	-	
	Biochemical Oxygen Demand	mg/l O2		800.0	-	-	-	-	-	

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA, Dublin Laboratory.
   Cyanide Analysed in the EPA Cork Laboratory.
   Phenols Analysed in the EPA Castlebar Laboratory.
3) **nm** "Not measured"
4) **nd** "None detected"
5) **nt** "No time" - Time not recorded
6) **tntc** "Too numerous to count"
7) **F** "Field measured parameters"

Signed: _____ Date: 3/4/09

Michael Neill, Regional Chemist

Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of:	Analysis of landfill site sample(s)
Report to:	Waterford County Council
Report date:	17/08/09

Facility:	**Dungarvan Waste Disposal Site** Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No:	W0032-01

Date collected:	18/05/2009	Date received:	18/05/2009

103

			Laboratory Ref:	2902499	2902500	2902501	2902502	2902503	2902504
			Type of sample:	Leachate	Leachate	Leachate	Leachate	Leachate	Leachate
			Location code:	WST-W0032-01	WST-W0032-01-L2a	WST-W0032-01-L1	WST-W0032-01-L4	WST-W0032-01-L Interceptor	WST-W0032-01-L5a
			Sampling point:	No sample - Borehole missing	No sample - Borehole missing	No sample - Borehole missing	No sample - Borehole dry	No sample - Borehole missing	No sample - Borehole inaccessible
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry
			Time Sampled:	12:55	13:00	13:10	14:10	16:25	15:00
			Start/End - Dates of Analysis:	/	/	/	/	/	/
			Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**
	Time sampled			12:55					

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA, Dublin Laboratory.
   Cyanide Analysed in the EPA Cork Laboratory.
   Phenols Analysed in the EPA Castlebar Laboratory.
3) **nm** "Not measured"
4) **nd** "None detected"
5) **nt** "No time" - Time not recorded
6) **tntc** "Too numerous to count"
7) F "Field measured parameters"

Signed: Date: 17/8/09

Michael Neill, Regional Chemist

104

ALcontrol Laboratories

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

EPA
Seville Lodge
Callan Road
Kilkenny

Attention: Jean Smith

CERTIFICATE OF ANALYSIS

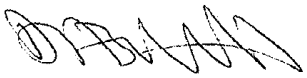
Date: 29 May 2009
Job: D_EPA_KKY-1
SDG Reference: 090526-30 **Report No.:** 57288
Your Reference:
Location:

A total of 6 samples was received on Friday May 22, 2009 and completed on Friday May 29, 2009. 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. We are pleased to enclose our report, it was a pleasure to be of service to you, and we look forward to our continuing association.

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

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occuring 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. Asbestos testing - we are not accredited for screen testing of asbestos fibres. We are only accredited for asbestos containing materials found in bulk samples.

Approved By:



Declan Burns
Lab Manager

UKAS TESTING
1291
GROUP

Validated

ALcontrol Laboratories Analytical Services

Job: D_EPA_KKY-1
Client Reference:
Location:

Customer: EPA
Attention: Jean Smith
Order No.: 23331
Report No: 57288

Sample ID	Depth	Container	Sample Type	Cyanide Complex/Free/Total/Thiocyan All	Phenols by HPLC (Vi) All
BLANK		Plastic NaOH (D)	LIQUID	X	X
GW1-2494		Plastic NaOH (D)	LIQUID	X	X
RC3A-2493		Plastic NaOH (D)	LIQUID	X	X
RC4-2492		Plastic NaOH (D)	LIQUID	X	X
RC6A-2497		Plastic NaOH (D)	LIQUID	X	X
RC7-2496		Plastic NaOH (D)	LIQUID	X	X

29/05/2009

Validated

ALcontrol Laboratories Analytical Services

Job: D_EPA_KKY-1 **Customer:** EPA
Client Reference: **Attention:** Jean Smith
Location: **Order No.:** 23331 **Report No:** 57288

Table of Results

Cyanide Complex/Free/Total/Thiocyan

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

	Sample ID			BLANK	GW1-2494	RC3A-2493	RC4-2492
	Depth(m)						
	Sample Type			Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
	Sample received date			22/05/2009	22/05/2009	22/05/2009	22/05/2009
	Sampled date			18/05/2009	18/05/2009	18/05/2009	18/05/2009
	SDG Ref			090526-30	090526-30	090526-30	090526-30
	Sample Ref			254220	254153	254157	254151
	LoD	Units	Method				
Total Cyanide	<0.05	mg/L	TM227	<0.0500 #	<0.0500 #	<0.0500 #	<0.0500 #

Cvanide Complex/Free/Total/Thiocyan

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

	Sample ID			RC6A-2497	RC7-2496
	Depth(m)				
	Sample Type			Water(GW/SW)	Water(GW/SW)
	Sample received date			22/05/2009	22/05/2009
	Sampled date			18/05/2009	18/05/2009
	SDG Ref			090526-30	090526-30
	Sample Ref			254149	254155
	LoD	Units	Method		
Total Cyanide	<0.05	mg/L	TM227	<0.0500 #	<0.0500 #

Phenols by HPLC (W)

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

	Sample ID			BLANK	GW1-2494	RC3A-2493	RC4-2492
	Depth(m)						
	Sample Type			Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
	Sample received date			22/05/2009	22/05/2009	22/05/2009	22/05/2009
	Sampled date			18/05/2009	18/05/2009	18/05/2009	18/05/2009
	SDG Ref			090526-30	090526-30	090526-30	090526-30
	Sample Ref			254220	254153	254157	254151
	LoD	Units	Method				
2.3.5 Trimethyl-Phenol	<0.003	mg/L	TM062	<0.00300 #	<0.00300 #	<0.00300 #	<0.00300 #
2-Isopropyl Phenol	<0.006	mg/L	TM062	<0.00600 #	<0.00600 #	<0.00600 #	<0.00600 #
Cresols	<0.006	mg/L	TM062	<0.00600 #	<0.00600 #	<0.00600 #	<0.00600 #
Phenol	<0.002	mg/L	TM062	<0.00200 #	<0.00200 #	<0.00200 #	<0.00200 #
Phenols Total of 5 Speciated	<0.025	mg/L	TM062	<0.0250	<0.0250	<0.0250	<0.0250
Xylenols	<0.008	mg/L	TM062	<0.00800 #	<0.00800 #	<0.00800 #	<0.00800 #
~~~~~~~~~~~~

Validated

ALcontrol Laboratories Analytical Services

Job: D_EPA_KKY-1 **Customer:** EPA

Client Reference: **Attention:** Jean Smith

Location: **Order No.:** 23331 **Report No:** 57288

Phenols by HPLC (W)

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

	Sample ID			RC6A-2497	RC7-2496
	Depth(m) Sample Type Sample received date Sampled date SDG Ref Sample Ref			Water(GW/SW) 22/05/2009 18/05/2009 090526-30 254149	Water(GW/SW) 22/05/2009 18/05/2009 090526-30 254155
	LoD	Units	Method		
2.3.5 Trimethyl-Phenol	<0.003	mg/L	TM062	<0.00300 #	<0.00300 #
2-Isopropyl Phenol	<0.006	mg/L	TM062	<0.00600 #	<0.00600 #
Cresols	<0.006	mg/L	TM062	<0.00600 #	<0.00600 #
Phenol	<0.002	mg/L	TM062	<0.00200 #	<0.00200 #
Phenols Total of 5 Speciated	<0.025	mg/L	TM062	<0.0250	<0.0250
Xylenols	<0.008	mg/L	TM062	<0.00800 #	<0.00800 #

29/05/2009
~~~~~~~~~~~~

Validated

ALcontrol Laboratories Analytical Services

Job: D_EPA_KKY-1 **Customer:** EPA
Client Reference: **Attention:** Jean Smith
Location: **Order No.:** 23331 **Report No:** 57288

Test Completion dates

SDG reference: 090526-30

Sample ID	Depth	Type	Cyanide	Phenols by HPLC (W)
BLANK		LIQUID	28/05/2009	28/05/2009
GW1-2494		LIQUID	28/05/2009	28/05/2009
RC3A-2493		LIQUID	28/05/2009	28/05/2009
RC4-2492		LIQUID	28/05/2009	28/05/2009
RC6A-2497		LIQUID	28/05/2009	28/05/2009
RC7-2496		LIQUID	28/05/2009	28/05/2009

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 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. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored, but not corrected or reported.
    For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. 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).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For 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 April 2009

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 SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	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
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

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)	D&C	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

Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of:	Analysis of landfill site sample(s)
Report to:	Waterford County Council
Report date:	17/08/09

Facility:	**Dungarvan Waste Disposal Site** Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No:	W0032-01

Date collected:	18/05/2009	Date received:	18/05/2009

112

			Laboratory Ref:	2902499	2902500	2902501	2902502	2902503	2902504	
			Type of sample:	Leachate	Leachate	Leachate	Leachate	Leachate	Leachate	
			Location code:	WST-W0032-01	WST-W0032-01-L2a	WST-W0032-01-L1	WST-W0032-01-L4	WST-W0032-01-L Interceptor	WST-W0032-01-L5a	
			Sampling point:	No sample - Borehole missing	No sample - Borehole missing	No sample - Borehole missing	No sample - Borehole dry	No sample - Borehole missing	No sample - Borehole inaccessible	
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	
			Time Sampled:	12:55	13:00	13:10	14:10	16:25	15:00	
			Start/End - Dates of Analysis:	/	/	/	/	/	/	
			Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	
	Time sampled			12:55						

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA, Dublin Laboratory.
   Cyanide Analysed in the EPA Cork Laboratory.
   Phenols Analysed in the EPA Castlebar Laboratory.
3) **nm** "Not measured"
4) **nd** "None detected"
5) **nt** "No time" - Time not recorded
6) **tntc** "Too numerous to count"
7) **F** "Field measured parameters"

Signed: Date: 17/8/09

Michael Neill, Regional Chemist

ALcontrol Laboratories

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

EPA
Seville Lodge
Callan Road
Kilkenny

Attention: Jean Smith

CERTIFICATE OF ANALYSIS

Date: 29 May 2009
Job: D_EPA_KKY-1
SDG Reference: 090526-30 **Report No.:** 57288
Your Reference:
Location:

A total of 6 samples was received on Friday May 22, 2009 and completed on Friday May 29, 2009. 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. We are pleased to enclose our report, it was a pleasure to be of service to you, and we look forward to our continuing association.

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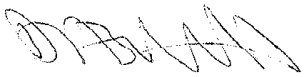
Approved By:



Declan Burns
Lab Manager

UKAS TESTING
1291

Validated

ALcontrol Laboratories Analytical Services

Job: D_EPA_KKY-1
Client Reference:
Location:

Customer: EPA
Attention: Jean Smith
Order No.: 23331
Report No: 57288

Sample ID	Depth	Container	Sample Type	Cyanide Complex/Free/Total/Thiocyan	Phenols by HPLC (W)
				All	All
BLANK		Plastic NaOH (D)	LIQUID	X	X
GW1-2494		Plastic NaOH (D)	LIQUID	X	X
RC3A-2493		Plastic NaOH (D)	LIQUID	X	X
RC4-2492		Plastic NaOH (D)	LIQUID	X	X
RC6A-2497		Plastic NaOH (D)	LIQUID	X	X
RC7-2496		Plastic NaOH (D)	LIQUID	X	X

Validated

ALcontrol Laboratories Analytical Services

Job: D_EPA_KKY-1 **Customer:** EPA
Client Reference: **Attention:** Jean Smith
Location: **Order No.:** 23331 **Report No:** 57288

Table of Results

Cyanide Complex/Free/Total/Thiocyan

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID			BLANK	GW1-2494	RC3A-2493	RC4-2492
Depth(m)						
Sample Type			Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date			22/05/2009	22/05/2009	22/05/2009	22/05/2009
Sampled date			18/05/2009	18/05/2009	18/05/2009	18/05/2009
SDG Ref			090526-30	090526-30	090526-30	090526-30
Sample Ref			254220	254153	254157	254151
	LoD	Units	Method			
Total Cyanide	<0.05	mg/L	TM227	<0.0500 #	<0.0500 #	<0.0500 #	<0.0500 #

Cyanide Complex/Free/Total/Thiocyan

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID			RC6A-2497	RC7-2496
Depth(m)				
Sample Type			Water(GW/SW)	Water(GW/SW)
Sample received date			22/05/2009	22/05/2009
Sampled date			18/05/2009	18/05/2009
SDG Ref			090526-30	090526-30
Sample Ref			254149	254155
	LoD	Units	Method		
Total Cyanide	<0.05	mg/L	TM227	<0.0500 #	<0.0500 #

Phenols by HPLC (W)

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID			BLANK	GW1-2494	RC3A-2493	RC4-2492
Depth(m)						
Sample Type			Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date			22/05/2009	22/05/2009	22/05/2009	22/05/2009
Sampled date			18/05/2009	18/05/2009	18/05/2009	18/05/2009
SDG Ref			090526-30	090526-30	090526-30	090526-30
Sample Ref			254220	254153	254157	254151
	LoD	Units	Method			
2.3.5 Trimethyl-Phenol	<0.003	mg/L	TM062	<0.00300 #	<0.00300 #	<0.00300 #	<0.00300 #
2-Isopropyl Phenol	<0.006	mg/L	TM062	<0.00600 #	<0.00600 #	<0.00600 #	<0.00600 #
Cresols	<0.006	mg/L	TM062	<0.00600 #	<0.00600 #	<0.00600 #	<0.00600 #
Phenol	<0.002	mg/L	TM062	<0.00200 #	<0.00200 #	<0.00200 #	<0.00200 #
Phenols Total of 5 Speciated	<0.025	mg/L	TM062	<0.0250	<0.0250	<0.0250	<0.0250
Xylenols	<0.008	mg/L	TM062	<0.00800 #	<0.00800 #	<0.00800 #	<0.00800 #
~~~~~~~~~~~~

Validated

ALcontrol Laboratories Analytical Services

Job: D_EPA_KKY-1 **Customer:** EPA

Client Reference: **Attention:** Jean Smith

Location: **Order No.:** 23331 **Report No:** 57288

Phenols by HPLC (W)

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

	Sample ID Depth(m) Sample Type Sample received date Sampled date SDG Ref Sample Ref			RC6A-2497 Water(GW/SW) 22/05/2009 18/05/2009 090526-30 254149	RC7-2496 Water(GW/SW) 22/05/2009 18/05/2009 090526-30 254155
	LoD	Units	Method		
2.3.5 Trimethyl-Phenol	<0.003	mg/L	TM062	<0.00300 #	<0.00300 #
2-Isopropyl Phenol	<0.006	mg/L	TM062	<0.00600 #	<0.00600 #
Cresols	<0.006	mg/L	TM062	<0.00600 #	<0.00600 #
Phenol	<0.002	mg/L	TM062	<0.00200 #	<0.00200 #
Phenols Total of 5 Speciated	<0.025	mg/L	TM062	<0.0250	<0.0250
Xylenols	<0.008	mg/L	TM062	<0.00800 #	<0.00800 #

29/05/2009
~~~~~~~~~~~~

Validated

ALcontrol Laboratories Analytical Services

Job: D_EPA_KKY-1 **Customer:** EPA
Client Reference: **Attention:** Jean Smith
Location: **Order No.:** 23331 **Report No:** 57288

Test Completion dates

SDG reference: 090526-30

Sample ID	Depth	Type	Cyanide	Phenols by HPLC (W)
BLANK		LIQUID	28/05/2009	28/05/2009
GW1-2494		LIQUID	28/05/2009	28/05/2009
RC3A-2493		LIQUID	28/05/2009	28/05/2009
RC4-2492		LIQUID	28/05/2009	28/05/2009
RC6A-2497		LIQUID	28/05/2009	28/05/2009
RC7-2496		LIQUID	28/05/2009	28/05/2009

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 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. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored, but not corrected or reported.
    For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. 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).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For 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 April 2009

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 SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	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
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

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)	D&C	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

Last updated April 2009

Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of:	Analysis of landfill site sample(s)
Report to:	Waterford County Council
Report date:	17/08/09

Facility:	**Dungarvan Waste Disposal Site** Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No:	W0032-01

Date collected:	18/05/2009	Date received:	18/05/2009

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			Laboratory Ref:	2902499	2902500	2902501	2902502	2902503	2902504	
			Type of sample:	Leachate	Leachate	Leachate	Leachate	Leachate	Leachate	
			Location code:	WST-W0032-01	WST-W0032-01-L2a	WST-W0032-01-L1	WST-W0032-01-L4	WST-W0032-01-L Interceptor	WST-W0032-01-L5a	
			Sampling point:	No sample - Borehole missing	No sample - Borehole missing	No sample - Borehole missing	No sample - Borehole dry	No sample - Borehole missing	No sample - Borehole inaccessible	
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	
			Time Sampled:	12:55	13:00	13:10	14:10	16:25	15:00	
			Start/End - Dates of Analysis:	/	/	/	/	/	/	
			Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	
	Time sampled			12:55						

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA, Dublin Laboratory.
   Cyanide Analysed in the EPA Cork Laboratory.
   Phenols Analysed in the EPA Castlebar Laboratory.
3) **nm** "Not measured"
4) **nd** "None detected"
5) **nt** "No time" - Time not recorded
6) **tntc** "Too numerous to count"
7) **F** "Field measured parameters"

Signed: _____ Date: 17/8/22

Michael Neill, Regional Chemist

ALcontrol Laboratories

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

EPA
Seville Lodge
Callan Road
Kilkenny

Attention: Jean Smith

CERTIFICATE OF ANALYSIS

Date: 29 May 2009
Job: D_EPA_KKY-1
SDG Reference: 090526-30 **Report No.:** 57288
Your Reference:
Location:

A total of 6 samples was received on Friday May 22, 2009 and completed on Friday May 29, 2009. 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. We are pleased to enclose our report, it was a pleasure to be of service to you, and we look forward to our continuing association.

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

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occuring 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. Asbestos testing - we are not accredited for screen testing of asbestos fibres. We are only accredited for asbestos containing materials found in bulk samples.

Approved By:

Declan Burns
Lab Manager

1291
GROUP

Validated

ALcontrol Laboratories Analytical Services

Job: D_EPA_KKY-1
Client Reference:
Location:

Customer: EPA
Attention: Jean Smith
Order No.: 23331
Report No: 57288

Sample ID	Depth	Container	Sample Type	Cyanide Complex/Free/Total/Thiocyan All	Phenols by HPLC (W) All
BLANK		Plastic NaOH (D)	LIQUID	X	X
GW1-2494		Plastic NaOH (D)	LIQUID	X	X
RC3A-2493		Plastic NaOH (D)	LIQUID	X	X
RC4-2492		Plastic NaOH (D)	LIQUID	X	X
RC6A-2497		Plastic NaOH (D)	LIQUID	X	X
RC7-2496		Plastic NaOH (D)	LIQUID	X	X

29/05/2009

Validated

ALcontrol Laboratories Analytical Services

Job: D_EPA_KKY-1 **Customer:** EPA
Client Reference: **Attention:** Jean Smith
Location: **Order No.:** 23331 **Report No:** 57288

Table of Results

Cyanide Complex/Free/Total/Thiocyan

Results Legend
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				BLANK	GW1-2494	RC3A-2493	RC4-2492
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				22/05/2009	22/05/2009	22/05/2009	22/05/2009
Sampled date				18/05/2009	18/05/2009	18/05/2009	18/05/2009
SDG Ref				090526-30	090526-30	090526-30	090526-30
Sample Ref				254220	254153	254157	254151
	LoD	Units	Method				
Total Cyanide	<0.05	mg/L	TM227	<0.0500 #	<0.0500 #	<0.0500 #	<0.0500 #

Cyanide Complex/Free/Total/Thiocyan

Results Legend
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				RC6A-2497	RC7-2496
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				22/05/2009	22/05/2009
Sampled date				18/05/2009	18/05/2009
SDG Ref				090526-30	090526-30
Sample Ref				254149	254155
	LoD	Units	Method		
Total Cyanide	<0.05	mg/L	TM227	<0.0500 #	<0.0500 #

Phenols by HPLC (W)

Results Legend
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				BLANK	GW1-2494	RC3A-2493	RC4-2492
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				22/05/2009	22/05/2009	22/05/2009	22/05/2009
Sampled date				18/05/2009	18/05/2009	18/05/2009	18/05/2009
SDG Ref				090526-30	090526-30	090526-30	090526-30
Sample Ref				254220	254153	254157	254151
	LoD	Units	Method				
2.3.5 Trimethyl-Phenol	<0.003	mg/L	TM062	<0.00300 #	<0.00300 #	<0.00300 #	<0.00300 #
2-Isopropyl Phenol	<0.006	mg/L	TM062	<0.00600 #	<0.00600 #	<0.00600 #	<0.00600 #
Cresols	<0.006	mg/L	TM062	<0.00600 #	<0.00600 #	<0.00600 #	<0.00600 #
Phenol	<0.002	mg/L	TM062	<0.00200 #	<0.00200 #	<0.00200 #	<0.00200 #
Phenols Total of 5 Speciated	<0.025	mg/L	TM062	<0.0250	<0.0250	<0.0250	<0.0250
Xylenols	<0.008	mg/L	TM062	<0.00800 #	<0.00800 #	<0.00800 #	<0.00800 #

29/05/2009

Validated

ALcontrol Laboratories Analytical Services

Job: D_EPA_KKY-1 **Customer:** EPA

Client Reference: **Attention:** Jean Smith

Location: **Order No.:** 23331 **Report No:** 57288

Phenols by HPLC (W)

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

	Sample ID			RC6A-2497	RC7-2496
	Depth(m)				
	Sample Type			Water(GW/SW)	Water(GW/SW)
	Sample received date			22/05/2009	22/05/2009
	Sampled date			18/05/2009	18/05/2009
	SDG Ref			090526-30	090526-30
	Sample Ref			254149	254155
	LoD	Units	Method		
2,3,5 Trimethyl-Phenol	<0.003	mg/L	TM062	<0.00300 #	<0.00300 #
2-Isopropyl Phenol	<0.006	mg/L	TM062	<0.00600 #	<0.00600 #
Cresols	<0.006	mg/L	TM062	<0.00600 #	<0.00600 #
Phenol	<0.002	mg/L	TM062	<0.00200 #	<0.00200 #
Phenols Total of 5 Speciated	<0.025	mg/L	TM062	<0.0250	<0.0250
Xylenols	<0.008	mg/L	TM062	<0.00800 #	<0.00800 #
~~~~~~~~~~~

Validated

ALcontrol Laboratories Analytical Services

Job: D_EPA_KKY-1
Client Reference:
Location:

Customer: EPA
Attention: Jean Smith
Order No.: 23331

Report No: 57288

Test Completion dates

SDG reference: 090526-30

Sample ID	Depth	Type	Cyanide	Phenols by HPLC (W)
BLANK		LIQUID	28/05/2009	28/05/2009
GW1-2494		LIQUID	28/05/2009	28/05/2009
RC3A-2493		LIQUID	28/05/2009	28/05/2009
RC4-2492		LIQUID	28/05/2009	28/05/2009
RC6A-2497		LIQUID	28/05/2009	28/05/2009
RC7-2496		LIQUID	28/05/2009	28/05/2009

29/05/2009

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 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. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored, but not corrected or reported.
    For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. 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).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For 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 April 2009

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 SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	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
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

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)	D&C	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

Last updated April 2009

Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of: Analysis of landfill site sample(s)
Report to: Waterford County Council
Report date: 14/12/09

Facility: **Dungarvan Waste Disposal Site**
Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No: W0032-01

Date collected: 10/09/2009 Date received: 10/09/2009

	Laboratory Ref:	2904864	2904865	
	Type of sample:	Leachate	Leachate	
	Location code:	WST-W0032-01-L Interceptor	WST-W0032-01-L4	
	Sampling point:	Cover could not be opened - no sample	no sample - insufficient volume	
	Sampled by:	Jim McGarry	Jim McGarry	
	Time Sampled:	14:05	14:13	
	Start/End - Dates of Analysis:	/	/	
	Status of results:	**Final Report**	**Final Report**	
Time sampled		14:05		

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA Dublin Laboratory,
Cyanide Analysed in the EPA Cork Laboratory.
Phenols Analysed in the EPA Castlebar Laboratory.
3) **nm** "Not measured"
4) **nd** "None detected"
5) **nt** "No time" - Time not recorded
6) **tntc** "Too numerous to count"
7) F "Field measured parameters"

Signed: Date: 14/12/09

Michael Neill, Regional Chemist

Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of: Analysis of landfill site sample(s)
Report to: Waterford County Council
Report date: 14/12/09

Facility: **Dungarvan Waste Disposal Site**
Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No: W0032-01

Date collected: 10/09/2009 Date received: 10/09/2009

Laboratory Ref:		2904864	2904865	
Type of sample:		Leachate	Leachate	
Location code:		WST-W0032-01-L Interceptor	WST-W0032-01-L4	
Sampling point:		Cover could not be opened - no sample	no sample - insufficient volume	
Sampled by:		Jim McGarry	Jim McGarry	
Time Sampled:		14:05	14:13	
Start/End - Dates of Analysis:		/	/	
Status of results:		**Final Report**	**Final Report**	
Time sampled		14:05		

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA Dublin Laboratory,
Cyanide Analysed in the EPA Cork Laboratory.
Phenols Analysed in the EPA Castlebar Laboratory.
3) **nm** "Not measured"
nd "None detected"
nt "No time" - Time not recorded
6) **tntc** "Too numerous to count"
7) F "Field measured parameters"

Signed: Date: 14/12/09

Michael Neill, Regional Chemist

Report number:KK2901832/1

Environmental Protection Agency
Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny

Report of:	Analysis of landfill site sample(s)
Report to:	Waterford County Council
Report date:	25/01/10

Facility:	**Dungarvan Waste Disposal Site** Ballynamuck Middle, Dungarvan, Co. Waterford
Reference No:	W0032-01

Date collected:	30/11/2009	Date received:	30/11/2009

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			Laboratory Ref:	2906048	2906049	2906050	2906051	2906052	2906053	
			Type of sample:	Leachate	Leachate	Leachate	Leachate	Leachate	Leachate	
			Location code:	WST-W0032-01-L Interceptor	WST-W0032-01-L4	WST-W0032-01-L2a	WST-W0032-01-L3	WST-W0032-01-L1	WST-W0032-01-L5a	
			Sampling point:	Brown colour	Low volume - unable to pump	Borehole damaged - Unable to sample	Borehole damaged - Unable to sample	Borehole damaged - Unable to sample	Borehole in reedbed - unable to sample	
			Sampled by:	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	Jim McGarry	
			Time Sampled:	13:13	15:10	nm	nm	nm	12:00	
			Start/End - Dates of Analysis:		/	/	/	/	/	
			Status of results:	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	**Final Report**	
F	Depth of Borehole	m		-	9.9	-	-	-	-	
F	Leachate Level	m		-	9.4	-	-	-	-	
F	Temperature	°C		7.7	-	-	-	-	-	
	Chemical Oxygen Demand	mg/l O2		12580	-	-	-	-	-	
	Biochemical Oxygen Demand	mg/l O2		>6000	-	-	-	-	-	

Comments:

1) Results highlighted and in bold are outside specified limits.
2) All Metals Analysed in the EPA, Dublin Laboratory.
   Cyanide Analysed in the EPA Cork Laboratory.
   Phenols Analysed in the EPA Castlebar Laboratory.
3) **nm** "Not measured"
4) **nd** "None detected"
5) **nt** "No time" - Time not recorded
6) **tntc** "Too numerous to count"
7) **F** "Field measured parameters"

Signed: Date: 25/11/10

pp Michael Neill, Regional Chemist

Appendix F

Meteorological Data

Johnstown Castle						
Year	Month	Day	Rainfall (mm)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Wind Speed (Knots)
2009	1	1	0.0	4.3	1.2	5.1
2009	1	2	0.0	5.7	2.6	9.4
2009	1	3	0.0	4.3	-2.2	4.2
2009	1	4	0.0	6.2	-0.2	3.6
2009	1	5	0.1	6.4	0.4	6.8
2009	1	6	0.0	2.3	-4.0	2.3
2009	1	7	0.0	5.5	-4.1	3.0
2009	1	8	0.0	5.3	-0.1	2.3
2009	1	9	0.0	6.3	3.8	5.3
2009	1	10	0.2	9.2	4.8	14.6
2009	1	11	20.3	10.5	8.4	19.1
2009	1	12	5.1	10.6	6.4	7.7
2009	1	13	0.4	7.8	0.6	4.0
2009	1	14	8.9	9.8	-0.1	10.7
2009	1	15	5.9	9.8	6.8	12.4
2009	1	16	3.7	9.1	5.5	10.1
2009	1	17	8.9	9.1	3.1	12.6
2009	1	18	1.5	7.2	1.1	9.4
2009	1	19	10.2	7.0	1.4	8.9
2009	1	20	0.6	5.3	0.4	6.7
2009	1	21	15.2	9.4	-0.5	8.5
2009	1	22	11.7	9.7	4.0	7.7
2009	1	23	0.7	7.0	0.8	6.2
2009	1	24	8.0	8.2	2.0	8.4
2009	1	25	4.4	8.2	4.2	10.2
2009	1	26	0.2	9.1	3.4	6.1
2009	1	27	3.5	9.4	5.4	4.5
2009	1	28	0.2	9.9	1.2	2.9
2009	1	29	5.4	9.1	4.4	12.7
2009	1	30	10.6	10.4	6.4	15.6
2009	1	31	3.8	6.9	5.3	11.8

Johnstown Castle						
Year	Month	Day	Rainfall (mm)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Wind Speed (Knots)
2009	2	2	5.5	3.3	-0.9	9.3
2009	2	3	17.1	3.0	-0.5	5.6
2009	2	4	8.3	5.1	2.6	10.2
2009	2	5	8.4	4.6	0.2	7.8
2009	2	6	0.0	4.3	-0.5	8.6
2009	2	7	0.0	4.6	-1.8	8.0
2009	2	8	6.6	7.6	-0.7	4.9
2009	2	9	0.0	4.9	0.9	7.1
2009	2	10	0.0	8.2	-1.8	5.8
2009	2	11	0.0	9.6	-0.6	3.6
2009	2	12	1.2	9.6	2.1	4.4
2009	2	13	0.0	11.3	6.2	3.3
2009	2	14	0.0	8.5	5.5	2.5
2009	2	15	0.0	10.8	5.8	4.6
2009	2	16	0.0	9.6	3.5	4.6
2009	2	17	0.0	10.9	6.4	4.1
2009	2	18	0.0	8.6	5.2	2.2
2009	2	19	0.0	10.3	5.0	3.4
2009	2	20	0.0	10.6	1.4	3.7
2009	2	21	0.0	10.3	2.0	4.3
2009	2	22	0.1	12.2	5.9	5.7
2009	2	23	0.0	12.3	2.9	3.7
2009	2	24	0.6	9.2	7.5	2.9
2009	2	25	0.4	11.3	4.5	4.3
2009	2	26	0.0	9.9	3.3	6.1
2009	2	27	0.0	9.7	5.4	6.9
2009	2	28	0.8	9.2	7.3	7.9

Johnstown Castle						
Year	Month	Day	Rainfall (mm)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Wind Speed (Knots)
2009	3	2	0.8	8.7	1.2	5.7
2009	3	3	8.3	7.6	-0.1	8.2
2009	3	4	0.4	5.5	-1.4	4.7
2009	3	5	0.0	9.5	-0.4	6.8
2009	3	6	1.8	9.1	1.1	5.0
2009	3	7	0.4	10.0	5.4	10.2
2009	3	8	0.6	6.6	2.2	10.8
2009	3	9	4.6	8.7	1.7	10.6
2009	3	10	0.6	13.0	4.2	6.2
2009	3	11	0.2	10.5	4.9	8.0
2009	3	12	0.2	13.4	8.1	6.9
2009	3	13	2.7	9.4	7.4	9.5
2009	3	14	0.0	12.2	3.3	6.0
2009	3	15	0.0	12.0	3.3	5.1
2009	3	16	0.2	11.4	3.2	3.9
2009	3	17	0.2	11.7	3.1	4.6
2009	3	18	0.2	8.3	4.6	3.1
2009	3	19	0.2	8.8	1.1	3.9
2009	3	20	0.2	9.7	3.4	4.8
2009	3	21	0.0	12.4	0.0	5.3
2009	3	22	0.0	14.4	2.3	4.8
2009	3	23	0.6	12.6	5.0	8.9
2009	3	24	0.0	9.9	1.5	7.5
2009	3	25	0.0	13.5	6.7	7.8
2009	3	26	2.1	11.6	2.5	10.0
2009	3	27	0.1	10.0	2.6	8.4
2009	3	28	0.0	8.6	0.6	11.1
2009	3	29	1.8	9.2	1.2	7.3
2009	3	30	0.2	13.1	6.8	3.6
2009	3	31	0.1	11.8	6.5	4.7

Johnstown Castle						
Year	Month	Day	Rainfall (mm)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Wind Speed (Knots)
2009	4	2	0.0	13.8	4.4	4.6
2009	4	3	7.1	10.8	5.4	6.4
2009	4	4	0.2	12.4	2.9	5.3
2009	4	5	0.1	11.0	1.4	6.3
2009	4	6	10.7	9.6	6.3	8.3
2009	4	7	9.7	10.6	5.0	12.0
2009	4	8	3.7	12.4	5.2	9.6
2009	4	9	8.5	10.3	7.1	14.3
2009	4	10	0.0	10.7	4.0	5.8
2009	4	11	0.1	11.7	1.8	4.5
2009	4	12	0.0	12.7	3.3	5.2
2009	4	13	10.3	9.6	7.8	8.3
2009	4	14	0.0	12.7	6.6	6.1
2009	4	15	1.9	10.9	8.1	7.6
2009	4	16	2.3	12.3	9.2	7.8
2009	4	17	5.9	10.6	8.2	5.9
2009	4	18	0.0	11.2	5.7	6.8
2009	4	19	0.1	14.6	5.2	4.1
2009	4	20	0.2	14.5	3.8	4.9
2009	4	21	0.1	14.7	7.9	7.3
2009	4	22	0.3	13.0	8.3	8.8
2009	4	23	6.6	12.0	9.7	7.6
2009	4	24	12.8	11.6	8.1	5.4
2009	4	25	16.5	9.8	5.8	9.7
2009	4	26	4.2	12.0	5.2	6.9
2009	4	27	4.7	11.4	4.6	5.6
2009	4	28	0.0	13.3	4.5	4.9
2009	4	29	8.0	12.0	8.0	8.1
2009	4	30	0.2	14.5	6.9	5.3

Johnstown Castle						
Year	Month	Day	Rainfall (mm)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Wind Speed (Knots)
2009	5	2	0.1	13.4	4.2	7.0
2009	5	3	0.0	13.8	5.1	5.8
2009	5	4	0.1	14.2	6.3	8.0
2009	5	5	0.0	16.7	9.9	8.8
2009	5	6	1.5	13.2	8.4	12.1
2009	5	7	1.2	12.4	6.2	12.2
2009	5	8	1.5	13.9	6.6	10.9
2009	5	9	0.4	13.2	8.2	9.3
2009	5	10	1.1	11.8	7.3	5.8
2009	5	11	0.0	13.0	9.1	9.6
2009	5	12	0.0	13.4	7.2	10.2
2009	5	13	0.4	10.3	8.9	6.7
2009	5	14	2.0	13.2	9.9	3.7
2009	5	15	1.7	12.6	7.4	6.2
2009	5	16	11.8	11.2	7.5	12.9
2009	5	17	19.0	11.9	7.6	10.6
2009	5	18	0.5	13.0	9.5	13.5
2009	5	19	0.7	13.8	8.3	9.5
2009	5	20	0.0	13.7	9.3	7.8
2009	5	21	1.0	14.1	7.5	5.8
2009	5	22	3.2	12.9	9.6	10.0
2009	5	23	1.3	15.9	7.0	7.4
2009	5	24	0.0	15.7	6.2	6.3
2009	5	25	0.0	16.8	8.4	6.7
2009	5	26	0.0	15.5	5.5	7.5
2009	5	27	10.5	17.9	9.0	10.0
2009	5	28	0.0	16.7	9.8	6.7
2009	5	29	0.0	18.2	9.8	5.3
2009	5	30	0.0	19.1	11.2	5.1
2009	5	31	0.0	18.8	11.6	5.4

Johnstown Castle						
Year	Month	Day	Rainfall (mm)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Wind Speed (Knots)
2009	6	2	0.0	24.2	13.0	3.4
2009	6	3	0.0	17.5	11.2	6.6
2009	6	4	0.0	16.8	10.2	4.5
2009	6	5	0.1	13.6	7.4	5.7
2009	6	6	11.9	10.5	6.1	8.7
2009	6	7	6.5	13.6	8.1	9.1
2009	6	8	0.3	14.1	10.1	8.5
2009	6	9	1.8	14.0	9.3	6.6
2009	6	10	0.0	15.4	8.6	4.7
2009	6	11	0.0	15.3	8.3	5.5
2009	6	12	7.0	16.9	9.4	6.1
2009	6	13	0.0	17.4	12.1	7.4
2009	6	14	0.1	17.9	11.4	6.9
2009	6	15	0.7	17.5	9.8	4.5
2009	6	16	0.4	18.9	10.2	6.9
2009	6	17	26.5	18.5	9.4	9.5
2009	6	18	1.0	16.3	8.0	7.3
2009	6	19	0.0	18.3	8.8	6.4
2009	6	20	0.0	19.5	11.0	6.0
2009	6	21	0.0	23.1	12.7	4.7
2009	6	22	0.0	21.6	15.6	4.4
2009	6	23	0.0	19.5	14.1	4.9
2009	6	24	0.0	19.2	13.5	6.0
2009	6	25	7.7	18.2	13.8	7.0
2009	6	26	11.1	18.5	12.4	4.6
2009	6	27	0.1	19.2	13.0	3.7
2009	6	28	2.2	16.6	12.7	4.7
2009	6	29	0.0	19.6	12.1	3.2
2009	6	30	0.7	21.6	12.3	4.4

Johnstown Castle						
Year	Month	Day	Rainfall (mm)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Wind Speed (Knots)
2009	7	2	28.1	18.6	15.4	4.1
2009	7	3	1.1	19.1	13.9	7.6
2009	7	4	8.3	18.8	12.7	6.8
2009	7	5	3.1	18.1	12.3	7.9
2009	7	6	21.5	17.5	11.1	5.2
2009	7	7	0.0	20.3	12.3	7.1
2009	7	8	0.0	17.5	11.9	5.5
2009	7	9	0.0	17.9	11.7	4.1
2009	7	10	5.3	15.8	11.1	4.6
2009	7	11	31.7	16.2	14.1	8.6
2009	7	12	1.9	17.5	13.0	10.5
2009	7	13	18.4	16.6	12.3	7.8
2009	7	14	0.5	18.6	12.4	6.9
2009	7	15	0.1	19.5	12.1	6.3
2009	7	16	5.3	16.4	10.7	2.9
2009	7	17	1.7	19.8	11.7	8.5
2009	7	18	1.9	17.1	11.8	5.9
2009	7	19	1.6	19.8	11.4	5.1
2009	7	20	0.0	17.9	10.0	6.7
2009	7	21	17.1	18.2	12.7	10.7
2009	7	22	1.3	17.5	13.4	11.9
2009	7	23	0.0	17.7	12.0	9.0
2009	7	24	13.1	18.4	11.2	5.2
2009	7	25	0.1	18.4	10.1	7.2
2009	7	26	10.6	17.6	13.6	12.4
2009	7	27	0.0	17.7	12.1	9.0
2009	7	28	19.5	16.9	13.3	10.5
2009	7	29	5.2	18.7	11.0	5.1
2009	7	30	0.2	17.0	9.3	6.9
2009	7	31	17.2	15.5	11.6	10.9

Johnstown Castle						
Year	Month	Day	Rainfall (mm)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Wind Speed (Knots)
2009	8	2	1.0	16.8	9.2	6.8
2009	8	3	17.8	17.7	13.8	10.4
2009	8	4	4.7	17.8	13.8	8.6
2009	8	5	0.2	18.4	12.3	8.5
2009	8	6	0.2	18.6	10.9	5.4
2009	8	7	0.0	18.3	11.1	5.5
2009	8	8	0.0	17.7	12.2	7.6
2009	8	9	0.7	17.7	14.0	7.0
2009	8	10	2.8	19.7	14.2	6.3
2009	8	11	0.0	20.6	12.6	5.3
2009	8	12	0.4	21.8	14.9	5.6
2009	8	13	0.0	17.8	11.5	4.5
2009	8	14	1.0	17.3	12.1	9.5
2009	8	15	4.3	20.3	11.4	9.4
2009	8	16	0.0	18.7	10.5	5.9
2009	8	17	0.5	19.5	13.7	7.8
2009	8	18	1.4	17.4	15.0	9.3
2009	8	19	30.4	17.4	15.4	9.2
2009	8	20	11.8	17.3	11.8	10.6
2009	8	21	0.5	17.0	11.5	7.5
2009	8	22	0.5	18.3	8.7	6.7
2009	8	23	10.9	17.8	11.0	9.7
2009	8	24	2.4	17.1	8.4	7.5
2009	8	25	2.1	17.2	11.1	6.7
2009	8	26	17.9	19.6	12.6	10.1
2009	8	27	0.2	17.1	10.1	8.1
2009	8	28	1.4	17.1	8.9	8.8
2009	8	29	0.2	16.4	8.6	6.6
2009	8	30	14.7	16.4	11.9	10.0
2009	8	31	34.6	16.0	12.8	10.8

Johnstown Castle						
Year	Month	Day	Rainfall (mm)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Wind Speed (Knots)
2009	9	2	29.1	15.6	11.6	7.6
2009	9	3	0.0	15.9	9.8	7.9
2009	9	4	0.0	17.4	7.4	7.3
2009	9	5	0.0	16.3	9.5	7.1
2009	9	6	12.0	15.3	12.8	9.6
2009	9	7	0.6	17.7	10.4	6.4
2009	9	8	6.2	16.6	10.2	9.8
2009	9	9	0.1	17.5	8.1	3.9
2009	9	10	0.0	16.7	9.1	6.1
2009	9	11	0.2	16.6	10.0	5.3
2009	9	12	0.0	16.8	9.6	5.2
2009	9	13	0.0	16.1	10.1	6.7
2009	9	14	0.0	14.7	9.8	5.6
2009	9	15	0.0	16.3	9.2	6.8
2009	9	16	0.0	16.2	10.3	7.3
2009	9	17	0.0	13.3	9.2	4.9
2009	9	18	0.0	17.8	10.5	2.7
2009	9	19	0.2	16.4	9.7	3.6
2009	9	20	0.0	16.5	7.2	5.0
2009	9	21	0.0	16.1	10.1	11.6
2009	9	22	0.2	18.3	10.7	8.2
2009	9	23	0.4	17.6	8.6	4.5
2009	9	24	0.1	16.3	6.7	4.0
2009	9	25	0.0	16.9	10.0	4.5
2009	9	26	0.0	16.7	11.0	2.7
2009	9	27	0.0	17.9	13.7	4.2
2009	9	28	0.0	18.5	11.2	4.8
2009	9	29	0.0	19.2	11.5	4.0
2009	9	30	0.0	18.3	11.0	3.9

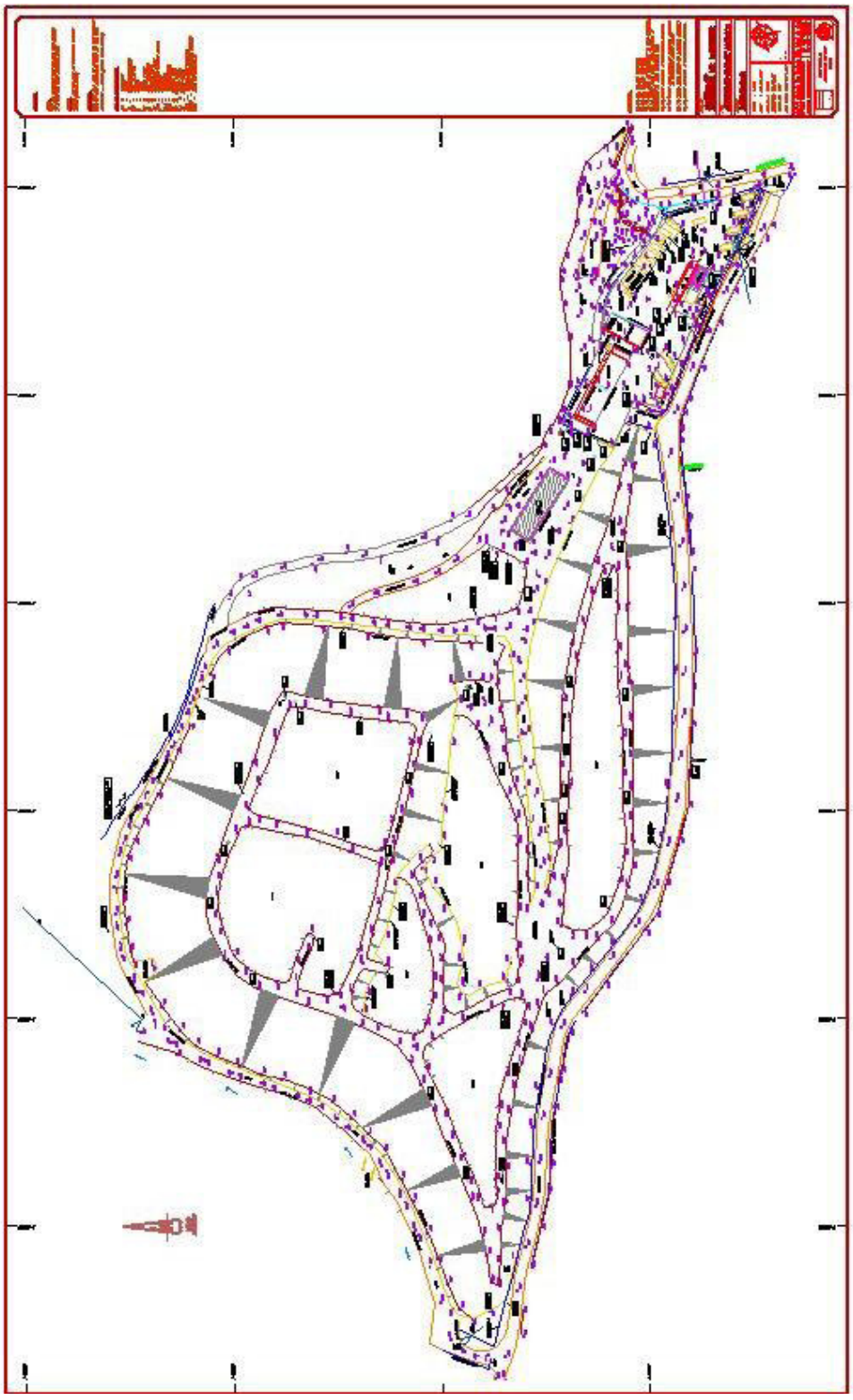
Johnstown Castle						
Year	Month	Day	Rainfall (mm)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Wind Speed (Knots)
2009	10	2	0.0	16.5	7.4	6.1
2009	10	3	0.2	16.5	8.1	8.3
2009	10	4	0.0	14.0	6.7	3.9
2009	10	5	2.2	15.7	6.5	3.5
2009	10	6	44.3	16.3	7.3	7.4
2009	10	7	0.0	11.5	5.7	5.2
2009	10	8	0.0	13.9	6.1	3.6
2009	10	9	4.6	14.4	9.3	7.2
2009	10	10	0.3	15.7	6.8	3.7
2009	10	11	1.7	17.4	7.3	5.7
2009	10	12	0.0	14.8	7.0	4.2
2009	10	13	0.4	15.7	8.5	3.1
2009	10	14	0.2	15.4	10.6	2.0
2009	10	15	0.0	15.1	10.9	2.5
2009	10	16	0.0	15.2	8.0	4.9
2009	10	17	0.0	13.7	5.6	2.8
2009	10	18	8.2	13.4	9.2	6.0
2009	10	19	1.3	13.1	10.7	10.6
2009	10	20	26.0	14.9	9.7	8.8
2009	10	21	11.0	14.7	10.4	11.9
2009	10	22	13.4	15.3	9.1	6.6
2009	10	23	1.8	15.2	9.1	5.2
2009	10	24	8.1	15.5	11.8	12.9
2009	10	25	0.0	15.5	9.1	8.5
2009	10	26	2.0	13.9	6.7	4.2
2009	10	27	3.7	15.6	13.1	10.6
2009	10	28	0.7	16.2	13.2	6.6
2009	10	29	0.6	14.9	13.2	10.5
2009	10	30	18.8	14.9	13.6	11.6
2009	10	31	4.7	15.0	13.2	8.5

Johnstown Castle						
Year	Month	Day	Rainfall (mm)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Wind Speed (Knots)
2009	11	2	4.5	11.2	5.8	6.9
2009	11	3	1.4	11.9	5.9	
2009	11	4	3.8	12.2	6.2	9.3
2009	11	5	0.0	11.2	6.9	8.0
2009	11	6	6.8	12.3	3.8	7.1
2009	11	7	0.9	9.5	3.5	8.2
2009	11	8	0.0	11.5	6.2	6.9
2009	11	9	11.7	11.2	5.2	5.4
2009	11	10	3.5	10.5	5.8	6.2
2009	11	11	6.6	11.7	5.0	6.7
2009	11	12	14.8	12.1	7.7	9.9
2009	11	13	27.9	12.7	4.0	6.5
2009	11	14	11.9	10.9	6.2	8.5
2009	11	15	2.9	13.0	8.6	9.3
2009	11	16	8.7	12.1	7.8	11.5
2009	11	17	2.5	12.1	6.2	10.2
2009	11	18	11.7	13.4	11.1	18.0
2009	11	19	31.7	13.6	12.4	19.3
2009	11	20	0.9	12.5	7.3	8.1
2009	11	21	12.1	13.7	8.5	14.9
2009	11	22	4.4	10.0	6.6	14.6
2009	11	23	0.2	12.0	7.4	9.5
2009	11	24	5.4	12.9	6.9	15.0
2009	11	25	1.2	10.2	6.8	12.8
2009	11	26	0.0	8.5	4.3	8.4
2009	11	27	6.5	8.1	1.2	4.9
2009	11	28	8.4	5.6	1.5	5.6
2009	11	29	18.4	6.8	3.3	12.0
2009	11	30	0.0	5.4	0.8	10.3

Johnstown Castle						
Year	Month	Day	Rainfall (mm)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Wind Speed (Knots)
2009	12	2	4.3	10.9	3.9	5.6
2009	12	3	0.1	7.2	0.8	6.5
2009	12	4	15.2	11.0	0.0	6.3
2009	12	5	11.1	11.5	8.2	11.4
2009	12	6	3.1	9.9	6.0	11.3
2009	12	7	14.5	9.1	4.2	9.0
2009	12	8	4.8	11.5	4.0	9.1
2009	12	9	2.0	11.5	5.9	8.5
2009	12	10	0.1	11.2	2.9	3.4
2009	12	11	0.1	10.3	5.2	6.4
2009	12	12	0.0	7.9	4.8	5.7
2009	12	13	0.0	8.0	3.2	4.5
2009	12	14	0.0	7.0	2.3	8.1
2009	12	15	8.8	8.9	5.1	7.3
2009	12	16	2.8	6.4	3.9	6.7
2009	12	17	6.0	6.4	0.7	6.8
2009	12	18	1.8	1.7	-0.8	8.7
2009	12	19	0.6	4.2	-1.1	5.9
2009	12	20	0.0	3.1	-1.5	7.0
2009	12	21	0.0	4.0	-2.5	4.0
2009	12	22	0.0	3.2	-2.0	4.7
2009	12	23	7.1	4.5	-2.1	4.6
2009	12	24	0.0	4.5	-0.3	7.7
2009	12	25	8.6	7.9	-3.4	4.4
2009	12	26	2.6	8.9	2.8	6.7
2009	12	27	0.0	7.4	-0.7	7.2
2009	12	28	0.0	5.8	-1.0	7.3
2009	12	29	26.2	5.8	3.5	16.9
2009	12	30	28.4	5.7	4.4	15.2
2009	12	31	5.7	5.2	-0.6	11.7

Appendix G

Topographical Survey



Appendix H

Management Structure

Management Structure of Waterford County Council

County Manager Mr Ray O' Dwyer

⇩

Director of Services

Environment & Planning Mr. Brian White

⇩

Senior Engineer Mr. Gabriel Hynes

⇩

Senior Executive Engineer Mr. Jimmy Mansfield (during reporting period)

⇩

Executive Scientific Officer	**Executive Engineer**	**Environmental Consultants**
Mr. Paul Carroll	Ms. Aoife O Flaherty	MCOS

⇩

Civic Amenity Manager

Mr. David Regan

⇩ ⇩

Caretaker **3 – Site Operatives**

Mr. Bill O Keeffe

Appendix 1

Pollutant Release Transfer Register

Environmental Protection Agency

AER Returns Worksheet

Version 1.1.10

REFERENCE YEAR	2009

1. FACILITY IDENTIFICATION

Parent Company Name	Waterford County Council
Facility Name	Dungarvan Waste Disposal Site
PRTR Identification Number	W0032
Licence Number	W0032-02

Waste or IPPC Classes of Activity

N	class_name
	Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.
3.13	
	Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons.
3.4	
	Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.
4.11	
	Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.
4.13	
	Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).
4.2	
4.3	Recycling or reclamation of metals and metal compounds.
4.4	Recycling or reclamation of other inorganic materials.
	Use of any waste principally as a fuel or other means to generate energy.
4.9	

Address 1	Ballynamuck Middle
Address 2	Dungarvan
Address 3	Co. Waterford
Address 4	
Country	Ireland
Coordinates of Location	-7.64444 52.104
River Basin District	IESE
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous waste
AER Returns Contact Name	David Regan
AER Returns Contact Email Address	doregan@waterfordcoco.ie
AER Returns Contact Position	Executive Technician
AER Returns Contact Telephone Number	058 22063
AER Returns Contact Mobile Phone Number	086 8307065
AER Returns Contact Fax Number	058 45606
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	2145
Number of Employees	2
User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

Activity Number	Activity Name
50.1	General
50.1	General

3. SOLVENTS REGULATIONS (S.I. No. 543 of 2002)

Is it applicable?	No
Have you been granted an exemption ?	Yes
If applicable which activity class applies (as per Schedule 2 of the regulations) ?	
Is the reduction scheme compliance route being used ?	

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR								
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

ADD NEW ROW | DELETE ROW * * Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO AIR								
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
01	Methane (CH4)	C	Landgem	USEPA Landgem model	703600.0	703600.0	0.0	0.0
03	Carbon dioxide (CO2)	C	Landgem	USEPA Landgem model	1931000.0	1931000.0	0.0	0.0
07	Non-methane volatile organic compounds (NMVOC)	C	Landgem	USEPA Landgem model	30420.0	30420.0	0.0	0.0

ADD NEW ROW | DELETE ROW * * Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION C : REMAINING POLLUTANT EMISSIONS (As required in your Licence)

RELEASES TO AIR								
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
			Method Used					
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

ADD NEW ROW | DELETE ROW * * Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

Additional Data Requested from Landfill operators

For the purposes of the National Inventory on Greenhouse Gases, landfill operators are requested to provide summary data on landfill gas (Methane) flared or utilised on their facilities to accompany the figures for total methane generated. Operators should only report their Net methane (CH4) emission to the environment under T(total) KG/yr for Section A: Sector specific PRTR pollutants above. Please complete the table below:

Landfill: Dungarvan Waste Disposal Site

Please enter summary data on the quantities of methane flared and / or utilised

	T (Total) kg/Year	M/C/E	Method Used: Method Code	Method Used: Designation or Description	Facility Total Capacity m3 per hour	
Total estimated methane generation (as per site model)	0.0				N/A	
Methane flared	0.0				0.0	(Total Flaring Capacity)
Methane utilised in engine/s	0.0				0.0	(Total Utilising Capacity)
Net methane emission (as reported in Section A above)	0.0				N/A	

4.2 RELEASES TO WATERS

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

Data on ambient monitoring of storm/surface water or groundwater, conducted as part of your licence requirements, should NOT be submitted under AER / PRTR

RELEASES TO WATERS								
POLLUTANT					ADD EMISSION POINT	QUANTITY		
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

ADD NEW ROW | DELETE ROW *

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO WATERS								
POLLUTANT					ADD EMISSION POINT	QUANTITY		
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
17	Arsenic and compounds (as As)	E	Oth	Product of measured average concentration (in 2008) and estimated 2009 leachate flow.	0.05	0.05	0.0	0.0
79	Chlorides (as Cl)	E	Oth	Product of measured average concentration (in 2008) and estimated 2009 leachate flow.	3621.0	3621.0	0.0	0.0
19	Chromium and compounds (as Cr)	E	Oth	Product of measured average concentration (in 2008) and estimated 2009 leachate flow.	0.56	0.56	0.0	0.0
20	Copper and compounds (as Cu)	E	Oth	Product of measured average concentration (in 2008) and estimated 2009 leachate flow.	0.19	0.19	0.0	0.0
83	Fluorides (as total F)	E	Oth	Product of measured average concentration (in 2008) and estimated 2009 leachate flow.	38.8	38.8	0.0	0.0
23	Lead and compounds (as Pb)	E	Oth	Product of measured average concentration (in 2008) and estimated 2009 leachate flow.	0.24	0.24	0.0	0.0
22	Nickel and compounds (as Ni)	E	Oth	Product of measured average concentration (in 2008) and estimated 2009 leachate flow.	0.45	0.45	0.0	0.0
24	Zinc and compounds (as Zn)	E	Oth	Product of measured average concentration (in 2008) and estimated 2009 leachate flow.	0.74	0.74	0.0	0.0

ADD NEW ROW | DELETE ROW *

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

EMISSIONS (as required in your Licence)

RELEASES TO WATERS								
POLLUTANT					ADD EMISSION POINT	QUANTITY		
			Method Used					
	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
	Ammonia (as N)	E	Oth	Product of measured average concentration (in 2008) and estimated 2009 leachate flow.	2338.0	2338.0	0.0	0.0

4.3 RELEASES TO WASTEWATER OR SEWER

SECTION A : PRTR POLLUTANTS

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER								
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

ADD NEW ROW | DELETE ROW *

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER								
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
			Method Used					
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

ADD NEW ROW | DELETE ROW *

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION A : PRTR POLLUTANTS

RELEASES TO LAND							
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY	
			Method Used				
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0

ADD NEW ROW | DELETE ROW * * Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

RELEASES TO LAND							
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY	
			Method Used				
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Haz Waste : Name and Licence/Permit No of Next Destination Facility Non Haz Waste: Name and Licence/Permit No of Recover/Disposer	Haz Waste : Address of Next Destination Facility Non Haz Waste: Address of Recover/Disposer	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					
Within the Country	20 03 99	No	4413.09	Domestic Residual Waste	D1	M	Weighed	Offsite in Ireland	Cork County Council,W0068-02	Youghal,Co. Cork,,.,,Ireland		
To Other Countries	02 01 04	No	95.77	Farm film plastics	R5	M	Weighed	Abroad	Irish Farm Film Plastics Group,WMP044B	Waverly Office Park,Old Naas Road,Dublin 12,,,Ireland		
Within the Country	15 01 01	No	113.42	Mixed Dry Recyclables	R3	M	Weighed	Offsite in Ireland	Waterford County Council,W189-01	Materials Recovery Facilty,Shandon,Dungarvan, Co. Waterford,Ireland		
Within the Country	04 02 22	No	4.96	Textiles (Clothing)	R5	M	Weighed	Offsite in Ireland	Cookstown Textile Recyclers,ROC 1929 Carrier/Broker	Magherlane Road,Randalstown,Co. Antrim,,,Ireland		
To Other Countries	16 02 11	Yes	33.62	Fridges	R4	M	Weighed	Abroad	KMK Metals Recycling,WCP/KK/069(A)/06	Cappincur Industrial Estate,Daingean Road,Tullamore,Co. Offaly,Ireland	Varies,Varies,Various,Contact Laurence Kieran,WEEE Ireland,EPA Auditor Dermot Burke,Ireland	Various,Contact Laurence Kieran,WEEE Ireland,EPA Auditor Dermot Burke,Ireland
To Other Countries	16 02 13	Yes	115.4	Large Household (Washing Machines etc.)	R4	M	Weighed	Abroad	KMK Metals Recycling,WCP/KK/069(A)/06	Cappincur Industrial Estate,Daingean Road,Tullamore,Co. Offaly,Ireland	Varies,Varies,Various,Contact Laurence Kieran,WEEE Ireland,EPA Auditor Dermot Burke,Ireland	Various,Contact Laurence Kieran,WEEE Ireland,EPA Auditor Dermot Burke,Ireland
To Other Countries	16 02 13	Yes	58.32	Small household (Kettles, Irons etc)	R4	M	Weighed	Abroad	KMK Metals Recycling,WCP/KK/069(A)/06	Cappincur Industrial Estate,Daingean Road,Tullamore,Co. Offaly,Ireland	Varies,Varies,Various,Contact Laurence Kieran,WEEE Ireland,EPA Auditor Dermot Burke,Ireland	Various,Contact Laurence Kieran,WEEE Ireland,EPA Auditor Dermot Burke,Ireland
To Other Countries	16 02 09	Yes	33.64	TVs, monitors etc	R4	M	Weighed	Abroad	KMK Metals Recycling,WCP/KK/069(A)/06	Cappincur Industrial Estate,Daingean Road,Tullamore,Co. Offaly,Ireland	Varies,Varies,Various,Contact Laurence Kieran,WEEE Ireland,EPA Auditor Dermot Burke,Ireland	Various,Contact Laurence Kieran,WEEE Ireland,EPA Auditor Dermot Burke,Ireland
Within the Country	17 04 07	No	33.18	Scrap Metal	R5	M	Weighed	Offsite in Ireland	Mr. Binman,WCP/KK/069(A)/06	Luddenmore,Grange,Kilmallock,Co. Limerick,Ireland		
Within the Country	17 05 04	No	40.34	Clay	R3	M	Weighed	Offsite in Ireland	Mr. Binman,WCP/KK/069(A)/06	Luddenmore,Grange,Kilmallock,Co. Limerick,Ireland		
Within the Country	17 01 07	No	37.78	Rubble	R5	M	Weighed	Offsite in Ireland	Mr. Binman,WCP/KK/069(A)/06	Luddenmore,Grange,Kilmallock,Co. Limerick,Ireland		
Within the Country	17 02 02	No	3.0	Flat Glass	R5	M	Weighed	Offsite in Ireland	Mr. Binman,WCP/KK/069(A)/06	Luddenmore,Grange,Kilmallock,Co. Limerick,Ireland		
Within the Country	02 01 07	No	2338.82	Compost and Garden Waste	R3	M	Weighed	Offsite in Ireland	Miltown Composting Sytems Ltd,W0270-01	Fethard,Co. Tipperary,,.,,Ireland		
Within the Country	17 02 01	No	56.62	Timber	R3	M	Weighed	Offsite in Ireland	Mr. Binman,WCP/KK/069(A)/06	Luddenmore,Grange,Kilmallock,Co. Limerick,Ireland		
To Other Countries	16 05 04	Yes	0.2	Aerosols	R5	M	Weighed	Abroad	Enva Ireland,WCP/KK/059(A)07	Clonmanim Industrial Estate,Portlaoise,Co. Laois,,,Ireland	SBH Limited,Not Known,Unknown,Unknown, Unknown,Unknown,Germany	Unknown,Unknown,Unknown,Unknown,Germany
To Other Countries	16 02 11	Yes	0.68	Flourescent Lamps	R5	M	Weighed	Abroad	KMK Metals Recycling,WCP/KK/069(A)/06	Cappincur Industrial Estate,Daingean Road,Tullamore,Co. Offaly,Ireland	Varies,Varies,Various,Contact Laurence Kieran,WEEE Ireland,EPA Auditor Dermot Burke,Ireland	Various,Contact Laurence Kieran,WEEE Ireland,EPA Auditor Dermot Burke,Ireland
Within the Country	**13 02 06**	**Yes**	2.3	Engine Oil	R9	M	Weighed	Offsite in Ireland	Enva Ireland,WCP/KK/059(A)07	Clonmanim Industrial Estate,Portlaoise,Co. Laois,,,Ireland	Enva Ireland,WCP/KK/059(A)/06, Clonmanim Industrial Estate,Portlaoise,Co. Laois,,,Ireland	Clonmanim Industrial Estate,Portlaoise,Co. Laois,,,Ireland
Within the Country	08 01 21	Yes	1.2	Waste Paint	D5	M	Weighed	Offsite in Ireland	Enva Ireland,WCP/KK/059(A)07	Clonmanim Industrial Estate,Portlaoise,Co. Laois,,,Ireland	Enva Ireland,WCP/KK/059(A)/06, Clonmanim Industrial Estate,Portlaoise,Co. Laois,,,Ireland	Clonmanim Industrial Estate,Portlaoise,Co. Laois,,,Ireland
To Other Countries	16 06 01	Yes	0.1	Batteries	R6	M	Weighed	Abroad	Enva Ireland,WCP/KK/059(A)07	Clonmanim Industrial Estate,Portlaoise,Co. Laois,,,Ireland	Not Known,Not known,.,.,.,Campeen,Belgium	.,.,.,Campeen,Belgium
Within the Country	20 03 01	No	568.94	Bulky Wastes - Carpets, Lino, Mattresses etc	D1	M	Weighed	Offsite in Ireland	Cork County Council,W0068-02	Youghal,Co. Cork,,.,,Ireland		

Appendix I

Energy Efficiency Audit

Dungarvan Landfill & Civic Amenity Site
Energy Audit Report

25 June 2010

Client: Waterford County Council,
Civic Offices,
Dungarvan

Carried Out by Waterford Energy Bureau
Civic Offices,
Tankfield,
Tramore,
Co. Waterford

WATERFORD ENERGY BUREAU
Biúro Fuinnimh Phort Láirge

Déisi oc Declān co Brath

Energy Audit Contents

1. Summary

2. Electrical Tariff Analysis

3. Break Down in Electrical Consumption

4. Land Fill Gas Potential

5. Wind Turbine Installation & upgrade to installation

6. Recommendations

1. Summary

Waterford Energy Bureau as part of its role for Waterford County Council Environment Dept. has carried out an energy audit of the Civic Amenity site / landfill in Dungarvan. The purpose of the energy Audit is to meet requirements set out in "Annual Environmental Report" (AER) by the Environmental Protection Agency & meet the Climate Change Strategy of Waterford County Council.

Areas examined during the audit includes;

- To assess the current energy consumption trends of the Civic Amenity Site.
- To examine alternative's energy efficiency technology that could be used to reduce
- energy consumption.
- To examine better means of operation to reduce energy consumption at the Civic Amenity Site.
- To assess the feasibility of installing alternative renewable technology.
- To examine the feasibility of utilising the land fill gas resource.

Items highlighted within the energy audit noted that energy cost savings can be made through improving the operational efficiency of the Civic Amenity Site which includes change in tariff structure & improved operational efficiency. The changing of the tariff will proceed following the installation of laechate pumping equipment. Further savings can be made through the installation of a large wind 3-phase 9 KW wind turbine. The current wind turbine which was installed as part of a display project requires maintenance to ensure that it returns to full operation.

Mechanisms are currently not available to facilitate the utilisation of the landfill gas, the methane volumes Are not yet available but calculations have shown that concentrations and grid access issues will inhibited the installation of a large scale CHP Plant where by electricity would be sold to the grid & excess heat would be dumped. The expected landfill gas rates will be too small to justify any form of capital expenditure on equipment that can be used for energy purposes. Other areas that were examined which turned out not to be feasible included the upgrading of methane for inclusion in converted vehicles or for pressurisation & export to the gas grid.

Waste Cooking oil is collected at the Civic Amenity site for conversion into biodiesel etc. This item requires further promotion among hotels / restaurants & school in order to maximise the collection of the oil. Eco-Ola collects the waste cooking oil periodically for processing into biodiesel.

The installation of a three phase wind turbine & improved operational efficiency are the most feasible option to saving energy at the Civic Amenity Site.

2. Electrical Tariff Analysis

The Dungarvan Landfill is supplied with a General Purpose Night Saver Tariff, which meets the electrical demand of the whole site, electrical demand of flare, public lighting & Porto cabin electrical demand. The current General Purpose Account Tariff is more than sufficient to meet electrical requirements of the site. However the installation of leachate pumping systems & permanent gas flare will result in the upgrading of tariff from general purpose night saver to low voltage maximum demand.

The purchasing of electricity in the deregulated electrical market has resulted in significant cost savings to Waterford County Council. Currently Waterford County Councils contracted price with Energia has an average unit cost of € 0.20 per KWh which includes standing charges etc. Electrical consumption is expected to double upon installation of lechate pumps & gas flare.

Dungarvan Landfill Electrical Consumption Analysis Bord Gais Old Rate 2010

	Jan - Feb 09	Mar-April 09	May-June 08	July-August 08	Sept-Oct 09	Nov-dec 09	Total
Day Units Consumed High Rate	4000	2251	3100	771	2300	4600	17022
Day Units Consumed Low Rate				0			
Night Units	1200	3600	1150	514	750	1400	8614
Total Units	5200	5851	4250	1285	3050	6000	25636
Day Unit Cost	€716	€403	€555	€138	€412	€823	€3,047
Night Unit Cost	€101	€304	€97	€43	€63	€118	€727
Section 58 Tax	€15	€0	€0	€0	€0	€0	€15
Standing Charge	€195	€195	€195	€195	€195	€195	€1,170
VAT 13.5%	€139	€122	€114	€51	€90	€153	€669
Total	€1,166	€1,024	€961	€427	€760	€1,290	€5,628
	The average cost per KWH= €5628 / 25636 = € 0.22						

Dungarvan Landfill Electrical Consumption Analysis Bord Gais Revised Rate 2010

	Jan - Feb 09	Mar-April 09	May-June 08	July-August 08	Sept-Oct 09	Nov-dec 09	Total
Day Units Consumed High Rate	4000	2251	3100	771	2300	4600	17022
Day Units Consumed Low Rate				0			
Night Units	1200	3600	1150	514	750	1400	8614
Total Units	5200	5851	4250	1285	3050	6000	25636
Day Unit Cost	€650	€366	€504	€125	€374	€748	€2,766
Night Unit Cost	€97	€304	€97	€43	€63	€118	€723
Section 58 Tax	€15	€0	€0	€0	€0	€0	€15
Standing Charge	€195	€195	€195	€195	€195	€195	€1,170
VAT 13.5%	€129	€117	€107	€49	€85	€143	€631
Total	€1,086	€981	€903	€413	€717	€1,204	€5,305
	The average cost per KWH= €5305 / 25636 = € 0.20						

Dungarvan Landfill Electrical Consumption Analysis Energia Rate 2010							
	Jan - Feb 09	Mar-April 09	May-June 08	July-August 08	Sept-Oct 09	Nov-dec 09	Total
Day Units Consumed High Rate	4000	2251	3100	771	2300	4600	17022
Day Units Consumed Low Rate				0			
Night Units	1200	3600	1150	514	750	1400	8614
Total Units	5200	5851	4250	1285	3050	6000	25636
Day Unit Cost	€646	€363	€500	€124	€371	€742	€2,815
Night Unit Cost	€105	€314	€100	€45	€65	€122	€751
Section 58 Tax	€15	€0	€0	€0	€0	€0	€15
Standing Charge	€195	€195	€195	€195	€195	€195	€1,170
VAT 13.5%	€130	€118	€107	€49	€85	€143	€641
Total	€1,089	€990	€903	€413	€717	€1,203	€5,393
	The average cost per KWH= €5393 / 25636 = € 0.20						

Dungarvan Landfill Electrical Consumption Analysis ESB Rate Pre MAY 2010							
	Jan - Feb 09	Mar-April 09	May-June 08	July-August 08	Sept-Oct 09	Nov-dec 09	Total
Day Units Consumed High Rate	4000	2251	3100	771	2300	4600	17022
Day Units Consumed Low Rate				0			
Night Units	1200	3600	1150	514	750	1400	8614
Total Units	5200	5851	4250	1285	3050	6000	25636
Day Unit Cost	€778	€438	€603	€150	€448	€895	€3,312
Night Unit Cost	€105	€314	€100	€45	€65	€122	€751
Section 58 Tax	€15	€0	€0	€0	€0	€0	€15
Standing Charge	€195	€195	€195	€195	€195	€195	€1,170
VAT 13.5%	€148	€128	€121	€53	€96	€164	€709
Total	€1,240	€1,075	€1,020	€442	€804	€1,376	€5,957
	The average cost per KWH= €5957 / 25636 = € 0.23						

3. *Break Down in Electrical Consumption*

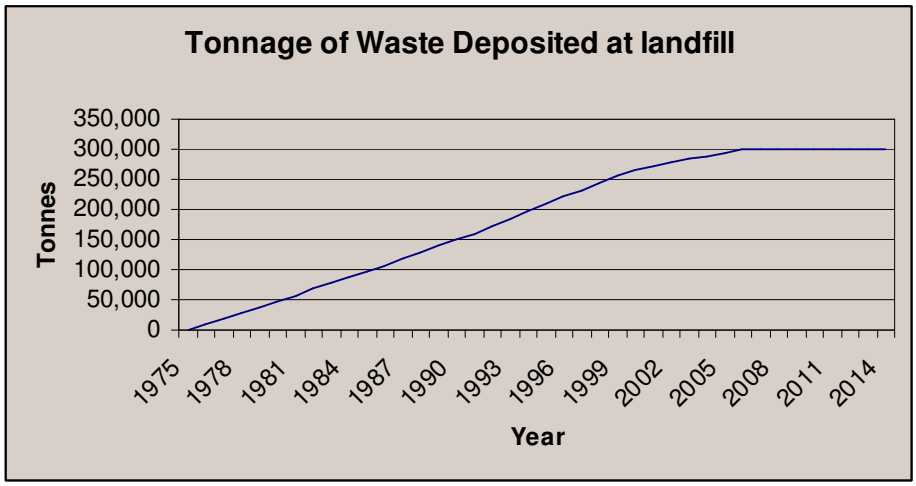
Dungarvan Landfill Electrical Consumption Breakdown for Office Area						
	Number of Items	***Hours per year***	***Electrical Loading in Watts***	***Total electrical Load KWh.YR***	***% of Total***	***Note***
External Site Lighting	11	1800	400	7920	***30.89***	metal halide lights
Computers	1	3000	270	810	***3.16***	
Compost Facility Fan	1	8769	800	7015.2	***27.36***	
Compaction Building	3	1000	350	1050	***4.10***	
Storage Heaters	2	1665	2000	6660	***25.98***	
Immersion Heaters	1	400	1500	600	***2.34***	
Lighting Internal	3	1250	57	213.75	***0.83***	
Fax Machine	1	8760	60	525.6	***2.05***	
				24794.55		

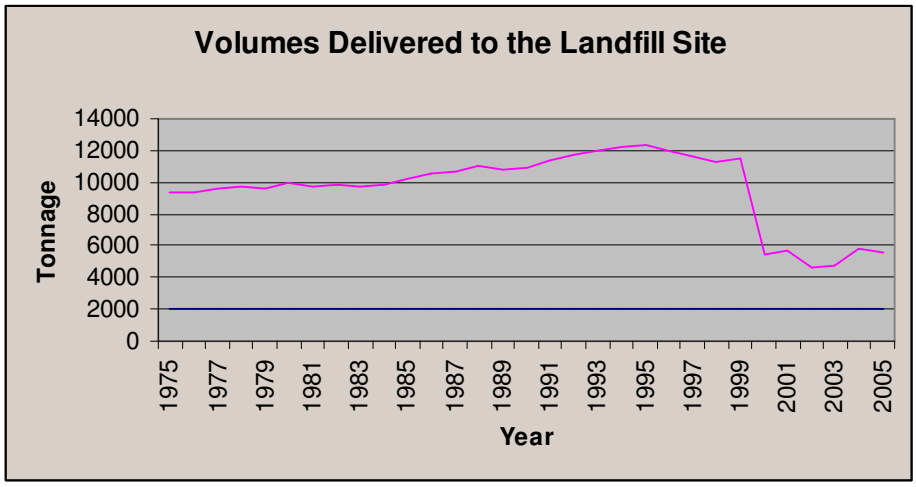
The installation of high pressure sodium bulbs to replace the current site light bulbs within the site lighting can have significant cost savings & a payback of 2/3 yrs.

4. *Land Fill Gas Potential*

The volume of waste that was disposed at the Dungarvan Landfill since 1975 is estimate at approximately 300,000 tonnes. A pumping trial has yet to take place however gas will be recorded for purposes of purchasing permanent gas flaring equipment. The percentage of the methane within the land fill gas will be clarified by pumping trial results.

Dungarvan landfill is located in County Waterford approximately 2km north west of Dungarvan off the N25 road on the southern edge of the Colligan River. The total area of the landfill site is approximately 6.5 hectares, and has been in operation since 1968. The landfill closed on 30th June 2003, but still acts as a transfer station for recyclable material.





Landfill Gas Energy utilisation Options

- The installation of a CHP Plant for the exporting of generated electricity to the grid is not known at this time however the expected methane content low gas flowrate may not be a viable option for utilisation in the generate electricity using reciprocating engines. The feasibility of increasing the low methane content by CO2 washing and limiting the O2 mix in the engine combustion (allowing for the high O2 content already present in the landfill gas), will be examined however this may not be feasible. Typical percentages of methane and flow rates to the minimum levels required (50% and 200kW/hour respectively) to support gas engine power generation.

- The capital cost of investing in infrastructure to up grade the land fill gas from its current level of 30%-50% methane to 95% methane for inclusion in specially converted vehicles is not economically feasible as the cost of the kit to up grade the gas including dryers etc. is approximately € 700,000 – € 1,000,000.

- The capital cost of investing in infrastructure to up grade the land fill gas from its current level of 30%-50% methane to 100% methane, which is then pressurised & upgraded for exported into the gas network at an alternative location is economically prohibitive. The approximate cost of such equipment including pressurisation cylinder system is approximately € 900,000 – € 1,200,000.

- The technology that supports the installation of a Micro-CHP unit that would power the land fill site & dump excess capacity onto the grid via the micro renewable program is not feasible as such technology is not available in Ireland.

5. Wind Turbine Installation & upgrade to installation

The installation of a 3-phase wind turbine to power the requirements of the landfill & export any excess electricity generated to the grid represents a credible option as the site location is significantly exposed.

The first 4,000 installations of small-scale wind turbines, photovoltaic, hydro and combined heat and power, will be offered 19 cent per kilowatt hour for the first 3,000 kWh generated per annum, and 9 cent above 3, 000 kWh. For any surplus energy sold back into the grid over the next three years under a five years contract.

Traditionally, the electricity network was designed to accommodate the flow of electricity from large centralised plants to costumers dispersed throughout the country. Micro-generation at local level now introduces two-way flows to the electricity system. Local generators will have the ability to be paid by the ESB for electricity that is surplus to their own requirements and exported. This Government measures includes grant assistance for 40% of the cost of 50 trial units (of up to 50 kW) countrywide. Applications are being accepted by SEI.

It is estimated that setting-up a micro-generated unit costs between € 15,000 and €30,000 for a single-phase unit. A pay-back is estimated on 5 to 10 years period. The initiative could change the nature of electricity generation in Ireland and help reduce the State's €6 billion a year spend on fossil fuels. For a three-phase unit, typical costs for setting-up range from € 40,000-€ 60,000. A pay-back is estimated on 5 to 10 years period. The maximum limit for the three-phase generator is 11kW, while the maximum limit for the single-phase generator is 5.75 kW. The ESB will not charge connection a micro-generator to the ESB network provided that turbine complies with EN50438.

Three Phase Turbine Installation at Civic Amenity Site

Turbine Type	Output per year KWh	Cost	Unit Cost of Electricity displaced	Unit Cost of Electricity exported	Electric Cost Savings	Payback on installation Yrs
Aircon 10 S 9.8 KW	20000	65,000	0.23	0.19	€ 4600	14

Note: The unit cost of electricity also includes a factor for vat, & savings made for reduced maximum import capacity & maximum demand.

The installation of a wind turbine at the Dungarvan landfill is less favourable to that of Tramore as the site is significantly less exposed and the resulting output a wind turbine installation would be significantly less.

Recommendations

Dungarvan Landfill Energy Audit			
Item	Cost	Payback	Note
Install wind turbine	€65,000	€ 4,600 annual cost saving, will have a resulting payback of 12/13 years	Note: significant wind speed at site however site exposed to sea conditions
Purchase Electricity in deregulated electrical market	7-10 % electrical cost savings	immediate	Item Currently being implemented
Replace light bulbs with high pressure sodium bulbs which use 50% of electrical demand of the site	€ 500	1-2 yrs	
Examine feasibility of utilising land fill gas			Item to be further examined
Further maximise the collection of waste cooking oil			Item to be further advertised among restaurants / hotels etc.

Appendix J

Leachate Extraction System Layout

REMAINING WORKS:

1. Award and construction / installation of the M&E-SCADA contract. This includes the site control hut, borehole pumps, all necessary M&E-SCADA equipment, connections at 2 No. leachate tanks, power supply.

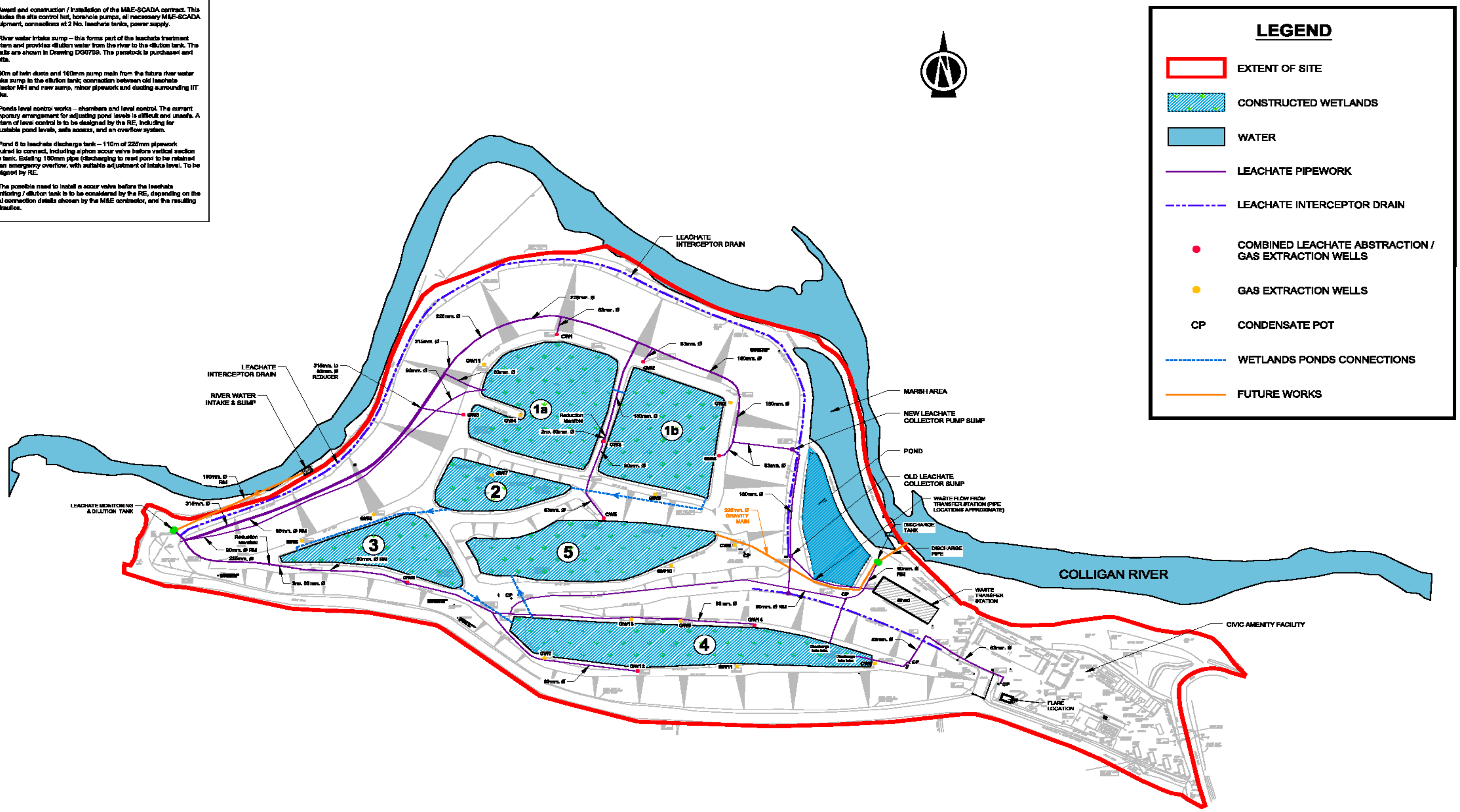
2. River water intake sump – this forms part of the leachate treatment system and provides dilution water from the river to the dilution tank. The details are shown in Drawing DG0709. The penstock is purchased and onsite.

3. 90m of twin ducts and 160mm pump main from the future river water intake sump to the dilution tank; connection between old leachate collector MH and new sump, minor pipework and ducting surrounding IIT tanks.

4. Ponds level control works – chambers and level control. The current temporary arrangement for adjusting pond levels is difficult and unsafe. A system of level control is to be designed by the RE, including for adjustable pond levels, safe access, and an overflow system.

5. Pond 5 to leachate discharge tank – 110m of 225mm pipework required to connect, including siphon scour valve before vertical section into tank. Existing 160mm pipe (discharging to reed pond to be retained as an emergency overflow, with suitable adjustment of intake level. To be designed by RE.

6. The possible need to install a scour valve before the leachate monitoring / dilution tank is to be considered by the RE, depending on the final connection details chosen by the M&E contractor, and the resulting hydraulics.



NOTES

1. This drawing is the property of RPS, it is a confidential document and must not be copied, used, or its content divulged without prior written consent.
2. All Levels refer to Ordnance Survey Datum, Malin Head.
3. DO NOT SCALE, use figured dimensions only, if in doubt ask.

No.	Date	Drn/Chk	Amendment / Issue	App
R01	June '10	RH / JP	As Built Issue	JP
C01	Aug '08	RH / BOK	Issue for Construction	PM

Client: WATERFORD COUNTY COUNCIL, Comhairle Chontae Phort Láirge, Civic Offices, Dungarvan, Co. Waterford. Phone: 058 22000 Fax: 058 42911

RPS — West Pier Business Campus, Dun Laoghaire, Co Dublin. T +353 1 4882900 F +353 1 2836676 W www.rpsgroup.com/ireland E ireland@rpsgroup.com

Drawn By	Checked By	Approved By	Date
RH	BO'K	PM	Aug 2008

Project: DUNGARVAN LANDFILL

Drawing Status: As Built — Scale / Sheet Size: 1:1000 @ A1, 1:2000 @ A3

Drawing Number: MDR0350/DG0606 — Rev: R01

Title: LEACHATE ABSTRACTION & TREATMENT SYSTEM