

MEATH COUNTY COUNCIL



BASKETSTOWN LANDFILL FACILITY

ANNUAL ENVIRONMENTAL REPORT

APRIL 2010 - MARCH 2011

1. Introduction

This Annual Environmental Report (AER) for Basketstown Landfill has been prepared in accordance with condition 11.3 of the Waste Licence (W0010-02) granted by the E.P.A. to Meath County Council. This AER contains the information as specified in Schedule E of the Waste Licence: *Content of the Annual Environmental Report*.

The reporting period for this AER refers to **1st April 2010 to 31st March 2011** inclusive.

The landfill stopped accepting waste on 22nd December, 2001. An application to the EPA for a Review Licence following site closure was compiled and submitted in October 2002. The Review Licence, W0010-02 was issued by the EPA on 22nd April 2004.

All remaining capping works for Phase 1 and Phase 2 were completed by March 2004. The majority of restoration works and infrastructure were also completed prior to this reporting period and are detailed in previous AER's.

2. Management and Staffing Structures

Up until September 2007, Basketstown Landfill was operated by Meath County Council (MCC) with consultancy support provided by Enviros Consulting Ltd. From September 2007, Meath County Council has managed the site without the assistance of Enviros Consulting Ltd. During the reporting period, MCC maintained a daily presence on the site provided by the site operative. This operative retired from his position in October 2008 and a weekly site inspection is now carried out by the Site Supervisor. It is anticipated that MCC will employ the services of a consultant to supervise any major engineering works as are deemed necessary.

Contact Person	Telephone No
Director of Environment Section (MCC) Brendan McGrath	046-9097000
Acting Senior Engineer (MCC) Gerry Lynn	046-9097000
Executive Engineer (MCC) Declan Grimes	046-9097000
Site Supervisor (MCC) Paul Luke	046-9097000

3. Financial provisions

MCC, as a Local Authority, has made the necessary provisions for the management, restoration and aftercare of the Basketstown landfill site. MCC has assigned responsibility for the landfill aftercare to a full time officer, who holds qualifications as a Landfill Manager. The Council is committed to the ongoing provision of the officers salary, and the funding of monitoring and other costs associated with the upkeep of the Waste Licence.

4. Programme for Public Information

In June 2006 MCC published the latest edition of the newsletter informing the public of developments at Basketstown Landfill. Copies of this newsletter were distributed to all the residents within 0.5km of the landfill. Further copies were made available to the public at MCCs offices in Navan and Trim and in the public library in Trim. No further issues have been published due to the lack of activity at the site.

5. Environmental Objectives & Targets

5.1 Objectives & Targets for coming year

See Appendix I for description of Objectives & Targets for period April 2011 - March 201.

6. Reported Incidents and Complaints Summaries

6.1 Incidents

There were a total of 18 incidents, which occurred during the reported period.

These incidents included six (6) instances of persistent exceedances and 12 (twelve) isolated incidents of CO₂ trigger levels (1.5%) for perimeter gas levels.

Due to the age of the facility some of the gas wells were prone to gas line disconnections resulting in repeated flare shut down, these were blocked and the flare restarted.

In the past, all incidents recorded on site were reported to the EPA until 7th October, 2003, when the EPA requested MCC to cease notification of weekly CO₂ trigger level exceedances. All incidents continue to be kept on the public file in the site office.

There was no significant impact on the environment arising from any of these incidents.

6.2 Complaints

There were no complaints received in the reporting period which relate to the operation of the facility under the Waste Licence.

7. Restoration works

There was no restoration works carried out in the reporting period. Details of earlier restoration works can be found in previous AER's for the facility.

8. Environmental Nuisances

As a fully restored site, nuisances are no longer a problem.

9. Waste Acceptance and Handling

9.1 Waste activities carried out at the facility

Since 21st December 2001, the site has not accepted any waste. There was no soil imported into the site during the reporting period.

9.2 Quantities of waste removed off-site for treatment

During the reporting period 11,854 m³ of Leachate (Contaminated Groundwater) was tankered off-site to Navan Wastewater Treatment Plant, Ferganstown, Navan, Co, Meath for treatment before being discharged into the River Boyne.

10. Emissions Management

10.1 Landfill Gas Management

As mentioned previously during the reporting period, there were a number of incidents where the Landfill Gas Flare shutdown. Along with the disconnections, shut down occurs with electrical power cuts and the occasional instance of poor quality landfill gas causing the flame to extinguish. Every effort is made to ensure that the gas quality is at a high enough level to sustain the Flare. A gas balance exercise is carried out frequently on all 54

Gas Wells to ensure optimum quality gas is being extracted and poor quality gas wells are closed off.

10.1.1 Estimated annual and cumulative quantities of landfill gas emitted from the site

The gas extraction system operated at an inlet flow rate in the region of 730m³/hr, recorded from daily inlet monitoring during the reporting period. In the reporting period, the flare operated for 4,625 hours which gives an approximate annual total gas combustion figure of 3,346,250 m³/yr. This compares to approx. 7,436,119 m³/yr of gas produced on site for a total year (8,760hrs in year).

Table 1 Summary of gas combustion values

Reporting Period	Gas Combustion
2010-2011	3,346,250m ³ /yr
2009-2010	5,493,750m ³ /yr
2008-2009	6,134,900m ³ /yr
2007-2008	5,999,300m ³ /yr
2006-2007	6,397,100m ³ /yr
2005-2006	6,793,200m ³ /yr
2004-2005	7,884,000m ³ /yr
2003-2004	8,760,000m ³ /yr
2002-2003	9,636,000m ³ /yr

Assuming the figure of 30% methane in the total landfill gas, this estimates a methane production of 1,003,385m³/yr or 673,412kg/yr for April 2010 to March 2011. It must be noted that the above figures are approximate values based on best available emission data. Overall, the indications are that gas production at Basketstown is decreasing and that minimal amounts of methane are likely to be released as fugitive emissions.

10.1.2 Circumstances of decrease of gas combustion.

Since 2009 the landfill has been suffering from an increase in the amount of liquid that accumulates in the gas line. This along with the failure of the pneumatic condensate pumps and the repeated disconnections led to the continual problem of flare shutdown and sometimes for a significant length of time. Remedial works are ongoing and it is hoped that these will these will rectify the problems encountered.

10.2 Leachate, groundwater and surface water management

Measures to minimise the volume of leachate generation and to limit its impact on groundwater and surface water are currently in place. Prior to the capping, water entered the waste mass at Basketstown Landfill by two routes, groundwater entry from the surrounding area and rainwater entry through the surface of the site. The waste body was capped in 2003 and rainwater is now diverted to clean surface water ditches surrounding the site, instead of percolating through the waste body. This has reduced the amount of leachate generated. The ingress of groundwater into the waste body however, cannot be eliminated.

10.2.1 Leachate volume

All leachate is collected via two sumps and pumped into the 250m³ concrete holding tank. The two sumps collect leachate/contaminated groundwater from a spring in the centre of the waste body and a ditch located at the southern boundary of the site. Both of these collection pathways are now enclosed and capped and do not collect rainwater. Leachate removal via tanker to Navan Wastewater Treatment Plant has continued throughout the reporting period. The volume of leachate tankered off-site during the reporting period was 11,640 m³.

The amount of condensate produced in the gas extraction pipelines during this reporting period was low being <10m³.

Table 2 Summary of leachate volume removed

Reporting Period	Leachate Volume
2010-2011	11,640m ³
2009-2010	11,854m ³
2008-2009	10,078m ³
2007-2008	9,565m ³
2006-2007	10,749m ³
2005-2006	6,127m ³
2004-2005	6,100m ³
2003-2004	9,276m ³
2002-2003	16,107m ³

Meath County Council will continue to make very effort to ensure that the maximum amount possible of contaminated water/leachate is removed from the site for treatment.

10.2.2 Leachate Composition

Typical characteristics of the leachate removed off-site for treatment are presented in Table 3.

Table 3 Characteristics of the contaminated water/leachate removed from Basketstown Landfill pre and post capping

Parameter	08/02/02 Pre-capping	04/03/10 Post-capping
pH	7.16	-
BOD ₅ (mg/L)	2.5	3.7
Ammoniacal N (mg/L)	100	133

The comparison of leachate strength before and 6 years after capping of the site shows an increase in concentration for many

of the parameters, which is to be expected as less surface water is now available for dilution of the leachate. However, when comparing the Basketstown values against typical leachate concentrations generated at contained landfill sites, where ammoniacal nitrogen concentrations typically may exceed 1500mg/l, it is evident that the leachate collected from this site is quite dilute due to the infiltration of groundwater into the base of the site.

11. Environmental Monitoring and Emissions Summary

11.1 Summary report on emissions

A summary of emissions monitoring undertaken at Basketstown Landfill in the reporting period is outlined in Table 4 below. Further details are provided in the following Section 9.2 and in the Appendix.

Table 4 Summary of Emissions Monitoring

Emission Monitoring + frequency	Significance
Landfill Gas (weekly/monthly)	Carbon Dioxide (CO ₂) levels regularly exceeded trigger levels during monthly monitoring at perimeter well locations. Methane levels were below trigger levels at all locations with no readings noted above 0.0% CH ₄ . Monitoring of the in-waste gas abstraction wells showed concentrations of methane and carbon dioxide in the order of 30% and 25% respectively. Gas monitors located in the site offices have not recorded any methane or carbon dioxide readings > 0% in the reporting period.
Surface water (Quarterly + Annual)	There are no prescribed emission limit values in the Waste Licence for surface water quality parameters. However, a number of surface waters in the vicinity of the site do appear to be experiencing some problems with water quality. Elevated conductivity, chloride and ammoniacal nitrogen results were observed at S5, which is the Tobernabeenog

	<p>Spring. This is in essence, a groundwater sample where it breaks the surface and represents the quality of the groundwater at this point. This water is collected and sent to the leachate storage tank and treated along with other contaminated waters.</p> <p>The surface waters south of the site at S3 and S4 appear to be experiencing some contamination with elevated levels of ammoniacal nitrogen and chloride during the year. This was borne out in results obtained by the Agency in 2009. This is likely to be caused by the appearance of a spring outside the landfill site, which is contaminated at periods of high rainfall and hence high groundwater levels.</p> <p>Biological Monitoring of the specified sites was carried out in Sept. 2009 and the results forwarded to the Agency.</p>
Groundwater (Quarterly + Annual)	<p>No wells, deemed to be upstream of the landfill, demonstrated any elevated levels of ammoniacal nitrogen. Nearly all the wells downstream of the site demonstrated elevated levels of ammoniacal nitrogen, chloride, total organic carbon and conductivity with the exception of the deep well BH 14.</p> <p>Elevated ammoniacal nitrogen results were obtained for boreholes BH7, BH8, BH9, BH 15 and BH18 which are all located downstream of the main body of waste.</p> <p>Water quality in private wells was generally good. MCC has provided mains-supplied drinking water to the residents in the vicinity of the landfill who had been receiving bottled water for the past number of years.</p>
Leachate (Annual)	<p>Results showed elevated ammoniacal nitrogen and chloride levels indicating a low/medium strength leachate.</p>

11.2 Environmental Monitoring

Monitoring during this reporting period was carried out in accordance with Schedule C of the Review Waste Licence W0010-02.

However due to the extreme weather during December 2011 that sampling round was abandoned for Health & Safety reasons.

Sampling and monitoring locations are described in each of the sections below. Location plans showing the monitoring locations are attached.

11.2.1 Landfill Gas

In accordance with Schedule C.1 of the waste Licence W0010-02, the following monitoring has been carried out.

Table 5 Gas Monitoring Points

Perimeter Gas		
CO2 and CH4 levels (monthly)	27 points	Site Perimeter Gas Monitoring points
	North-West	PR1A - PR4A
	North-East	PR6A, PR7
	East	B8 - B10
	South-East	PR14A - PR16A
	South	PR18 - PR20, PR22 - PR24
		Gas Monitoring wells at residential sites
	West	GW1 - Murtagh
	East	GW2 - McKenna
	West	B1 - Walsh
West	B2 & B3 - Murtagh	
North-East	B4 - B7 - McCormack	

Carbon Dioxide (CO₂)

Perimeter Boreholes

The concentrations for CO₂ as measured in the perimeter boreholes have continued to fluctuate despite the landfill cap being finalised and gas migration control being fully implemented.

There have been several exceedances of the carbon dioxide trigger-level (1.5% volume per volume (v/v)) at a number of the 27 perimeter gas wells, indicating off-site presence of the gas. The highest peaks in perimeter boreholes were recorded in wells PR1A and PR4A to the North West of the site in which, readings in

excess of 5% CO₂ were recorded. To the North East of the site, the highest recorded level was 3.7% CO₂ at B5. The levels of CO₂ in the wells to the South West of the site were less prone to CO₂. The highest recorded level from these wells was 3.7% from PR15 but this was only one of three exceedences. The wells immediately to the East of the site (B8, B9 and B10) all had generally very low (< 1%) CO₂ readings however, the well near McKennas residence (GW2), which is >300m from the site had no exceedences.

Some monitoring locations appear to be subject to seasonal and annual fluctuations. This seasonal fluctuation may indicate that the observed increases in CO₂ relates to naturally occurring soil CO₂ that is affected by natural cycles, such as the activity of soil micro-organisms.

In November, 2008 MCC began monitoring the perimeter gas wells on a monthly basis after obtaining the required permission from the Agency. This change in the frequency of monitoring has not led to any noticeable change in the range of CO₂ readings recorded at each site. No methane readings above 0% were recorded since this change in frequency of monitoring. MCC will continue to monitor the effects of this change in frequency and refer to the EPA if any trends become apparent.

No readings were taken in December due to the extreme weather conditions in the area. Also the gas meter required a service and was sent off. In January we were informed that the meter was unserviceable and that we required a new meter, the new meter did not arrive until April 2011 and there was no other meter available in the mean time and so there are only 7 gas readings for the reporting period.

Residents' Gas Boreholes

At the boreholes on residents' properties, the following was recorded during this reporting period:

- **B1 Walshe's;** The CO₂ level in this borehole only exceeded the threshold limit of 1.5% once during the reporting period.

- **B2, B3 and GW1 Murtagh's;** The CO₂ concentrations at boreholes B2 and B3 were above the trigger level of 1.5% on three occasions between the two of them while Borehole GW1, located less than 50m from the Murtagh residence has CO₂ readings in the region of 2% during the reporting period. There was no obvious seasonal effect evident.

- **B4, B5, B6 and B7 Galtrim Lodge;**

The wells B4, B5, B6 and B7 consistently gave readings above 1.5%, while. The highest recorded concentration in these wells was 3.7% at B5.

- **GW2 McKennas;**

The CO₂ levels at this site were always below the trigger level of 1.5%.

Methane (CH₄)

Methane gas is the main indicator of landfill gas migration. During this reported period, methane was not detected at any of the perimeter monitoring wells. This is a positive trend which it is hoped will be maintained in the future.

11.2.2 Surface Water

Under Schedule C.3 of the Waste Licence W0010-02, the monitoring of surface water as listed below was required.

Table 6 Surface water Monitoring for period April 2009 - March 2010

Surface Water Monitoring Locations and Frequency			
Visual Inspection	4 points	S3-S6	Quarterly
Quality (Chemical)	8 points	S2-S5;S7-S9	Quarterly
(Biological)	10 points		Annual
<u>Wetland</u> Level Quality	1 point	W1	Quarterly Quarterly

Visual Inspection of surface water sites

Quarterly visual inspections of surface waters were conducted for monitoring points S3, S4, S5 and S6. An annual summary is provided in the following table:

Table 7 Visual Inspection Summary

Surface water monitoring location	Overview of results
S3 (d/s of the landfill to the south east of the site)	Flow: Low-medium at all times, not stagnant
	Weed growth/algae: weeds present but no algae
	Colour: Mainly clear with colour noted after prolonged rainfall in Winter periods
S4 (the Dangan River, south west of the site)	Flow: Low-medium at all times, not stagnant
	Weed growth/algae: weeds present but no algae
	Colour: Mainly clear with colour noted after prolonged rainfall in Winter periods
S5 (Tobernabeenog Spring)	Flow: Low - ran dry at start of June
	Weed growth/algae: some algal growth noted
	Colour: Mainly clear but orange scum (Iron) deposited at base of well
S6 (u/s of the landfill to the south east of the site)	Flow: Low-medium at all times, not stagnant
	Weed growth/algae: weeds present but no algae
	Colour: Mainly clear with colour noted after prolonged rainfall in Winter periods

Surface water quality issues are exacerbated by animal access points present upstream and along the Dangan River.

Surface Water quality analysis

Quarterly laboratory analysis of surface water quality is carried out. All 9 samples (including wetland sample) were collected quarterly by MCC staff and analysed by Alcontrol Laboratories on behalf of Meath County Council. The parameters tested for surface water quality are Ammoniacal Nitrogen, BOD, COD, Chloride, Dissolved Oxygen, Conductivity, Ph and Total Suspended Solids.

Ammoniacal Nitrogen and Chloride are considered to be useful indicators of leachate strength and are used to identify sampling points where leachate/contaminated waters may be having an impact.

Elevated levels of Ammoniacal Nitrogen were observed in the samples taken at S3, S4 and S5. The sample S5 is taken from a well and is more representative of the interaction between the leachate and the groundwater in that area. This well has been contaminated with leachate for some time and Ammoniacal Nitrogen readings in excess of 90 mg/L found in June 2010 and March 2011 confirm this.

The sampling points S3 and S4 however, as usual demonstrated elevated levels in surface waters to the south east of the site during the reporting period. It should be noted that S2 is upstream of the land-drain, which flows from the direction of the landfill and S3 is directly downstream of this drain and S4 is a further 4-500m further downstream again.

The ammonia levels in S2 are consistently <1mg/L while the levels in S3 have rise due to the impact of the drain coming from the direction of the landfill. MCC carried out a thorough investigation of this area and found there to be a number of springs which are rising to the surface in a field outside the boundary of the landfill site directly to the south east of the site. At times of sustained heavy rainfall and higher groundwater levels, these springs contain high levels of Ammonia as a result of the interaction between the groundwater and the leachate under the landfill. The springs flow into the adjacent land-drain and into the stream between S2 and S3 thus giving elevated ammonia levels. The springs mentioned above are located in a parcel of land outside of the landfill site. As mentioned earlier animal access might be a contributory factor for the high ammonia.

The levels of ammonia in sampling point S7, located approx. 1.5km d/s of S4 are lower, typically being <0.7mg/L.

The EPA requested that this situation be investigated further and Meath County Council appointed a hydro-geological consultant to investigate and report on all options for abatement of the problem. This report was submitted to the EPA in February 2010.

Chloride and Conductivity levels were found to be slightly elevated at S3 and S4 in line with the findings above. Other parameters including BOD and COD were generally found to be within acceptable levels at all sites with the exception of S5 for the reasons outlined above.

As part of the requirements of Schedule C.3 of the Waste Licence, MCC undertook a thorough annual examination of surface water quality sites for List I/II Organic Substances, Metals/Non metals, Mercury, Sulphate, Total Alkalinity, Total P/orthophosphate and Total Oxidised Nitrogen. The results from this analysis are illustrated in the Appendices, in summary there were no elevated levels of any of the above parameters recorded. All of the list I/II Organic substances were absent from the samples.

Biological Assessment

An annual biological quality survey of the Knightsbrook Catchment was conducted in 21st October 2010. Conservation Services, Ecological & Environmental Consultants were commissioned by Meath County Council to carry out biological sampling and water quality assessment in accordance with EPA Q-rating methodology at ten locations adjacent to the landfill site and on the Dangan and Cloneymeath/Knightsbrook Rivers.

The results of this survey were forwarded to the Agency at a previous date, a summary of the findings is included below:

The Knightsbrook River continues to have a significant pollution problem (see Map 2). The main channel upstream of its confluence with the Dangan 'River' (Site 4) has however improved significantly from Q1-2 to Q2-3 since 2006. This improvement has also occurred immediately downstream of the Dangan 'River' confluence (Site 5). As yet this improvement has not been reflected further downstream; at Site K02-0300 1km downstream of the Dangan confluence the Q-rating remains a moderately polluted Q2-3. Site K02-0360 5km downstream of the confluence and Site K02-0500 c.12 km downstream remain a moderately polluted Q3.

The results indicate continuing but significantly reduced pollution of the Knightsbrook River upstream of the Dangan confluence, which is upstream of any potential landfill impact. The biological monitoring data from sites on the Knightsbrook immediately upstream and downstream of its confluence with the Dangan 'River' contain no evidence that the Dangan 'River' (which flows from the vicinity of the Basketstown Landfill), causes any deterioration in the condition of the Knightsbrook River.

The invertebrate data indicate that the Dangan 'River' continues to be seriously polluted upstream and downstream of the drain which enters at grid reference N858 512 from the vicinity of Basketstown Landfill.

Unless there is some means by which landfill leachate can enter the Knightsbrook River other than via the Dangan River, the results of biological monitoring continue to contain no evidence that the landfill is responsible for the unsatisfactory condition of the Knightsbrook River.

11.2.3 Wetland Area

Results of the quarterly laboratory analysis taken from the wetland monitoring point W1 indicate that the water quality is of a relatively high standard. Ammoniacal Nitrogen levels in the reporting period were consistently <0.3mg/L and BOD levels were usually <5mg/L but the June sample produced a result of 17mg/L for some unknown reason. The water quality in this wetland area appears to be consistently good. The level of the wetland was increased during this prior reporting period as a result of a French Drain being introduced in the exit drain.

11.2.4 Groundwater

Table 8 Groundwater Monitoring Locations

Groundwater Monitoring Locations		
Shallow Boreholes - Upgradient	2 points	LM 16, BH11
Shallow Boreholes - Downgradient	4 points	BH5, BH7, BH8, BH9
Deep Boreholes - Upgradient	2 points	BH13, BH16
Deep Boreholes - Downgradient	3 points	BH14, BH15, BH18

Groundwater Levels

Groundwater levels were measured on a monthly basis using a dip meter. Groundwater levels remained relatively constant throughout the monitoring period, with only minor variations in groundwater levels in accordance with the prevailing weather conditions.

Groundwater Quality Analysis

Deep groundwater boreholes

Elevated levels of ammoniacal nitrogen were detected at BH15 and BH18 which both lie to the south of the site. Both of these sites are located 'downgradient' of the landfill, in relation to groundwater flow regime. However, Chloride levels and Conductivity readings for these sites were recorded as normal

during the same period. The ammoniacal nitrogen levels in Boreholes BH13, BH14 and BH16 were all approx. 0.3mg/L or less during the reporting period. BH14 is located less than 10m from the main body of waste and these results suggest that leachate/contaminated water migration is occurring in the upper layers of groundwater close to the landfill site.

Shallow groundwater boreholes

With the exception of BH11 which is located 'upgradient' of the waste body, all of the shallow boreholes demonstrated elevated levels of ammoniacal nitrogen. This indicates that there exists some level of leachate/contaminated water intrusion in the downgradient wells. BH11 is situated upgradient of the landfill and ammoniacal nitrogen levels were at or below 0.35mg/l during the reporting period.

The readings for ammoniacal nitrogen in the shallow contaminated boreholes varied from a reading of 1.2mg/L for BH5 to a reading in excess of 70mg/L which was recorded at BH9. Boreholes BH8 and BH9 are located within 10m of the main body of waste and the high levels of ammoniacal N found in these wells demonstrate that the immediate groundwaters in the vicinity of the landfill continue to be heavily contaminated by leachate. Elevated levels of Chloride, Conductivity and Total Organic carbon were also observed in line with the monitoring data obtained over the previous number of years.

The results of the water quality analysis carried out on all groundwater samples during the reporting period are presented in the Appendices.

Private well water analysis

In May 2009, MCC provided a piped mains supply of drinking water from the Trim water supply scheme to the residents near Basketstown landfill and therefore, the residents no longer receive a tankered supply of potable water.

During the reporting period, MCC were unable to take samples from these private wells due to a number of factors. In most cases, the pumps are no longer working due to lack of use.

11.2.5 Leachate

Table 10 Leachate Monitoring

Leachate Monitoring			
Composition	2 points	LM7 and LM11	Annually
Level	15 points	LM1 - LM15	Monthly

Leachate levels were monitored at locations LM1-15 however, as a number of the leachate monitoring wells are dry/blocked some changes have been made to the monitoring programme. These changes are listed below:

- GWAB1 is now blocked
- GWAB3 is now blocked
- GWAB5 is monitored in place of LM3
- GWAB7 is monitored in place of LM4
- GWAB8 is now blocked
- GWAB9 is monitored in place of LM6
- MC2 is monitored in place of LM9
- GWAB41 is monitored in place of LM15

These new monitoring points were chosen based on their proximity to the original monitoring points. The changes have been reported to the Agency for approval.

Leachate levels

Leachate levels were measured on a monthly basis using a dip meter. Leachate levels remained relatively constant throughout the monitoring period, with only minor variations in accordance with the prevailing weather conditions.

Leachate composition analysis

Samples were taken from 2 monitoring points (LM7 and LM11) and sent to Alcontrol Laboratories for analysis. The analytical results indicated that the leachate extracted from both of these sampling points was quite dilute compared to previous samples taken. The results of the analysis can be viewed in the table in the Appendices.

11.2.6 Meteorological monitoring

Meteorological data is collated by Met Eireann at Mullingar Weather Station, approximately 40km west of the site, which is the nearest met station to Basketstown Landfill. As per Schedule C.5 of the waste licence 10-2, *Meteorological Monitoring*, the following parameters are reported:

- Temperature (min & max);
- Evaporation;
- Evapotranspiration;
- Relative Humidity;
- Pressure;
- Wind direction;
- Wind speed; and
- Precipitation.

Graphs illustrating the data for each of these parameters are presented in the Appendices.

APPENDICES

1. Objectives and Targets 2011-2012

2. Perimeter Gas & Water Quality Tables

3. Laboratory Analysis Data

4. Meteorological Data Graphs

5. Sampling Location Maps

1. PRTR Returns Worksheet

1. Objectives and Targets 2011-2012

Due to the increased liquid gathering in the landfill gas system and the associated flare shut down Irish Biotech Systems are to survey and carry out works that will rectify the problems outlined earlier in the report. The Agency will be kept informed of work carried out.

This will hopefully remove the accumulating liquid and enhance the gas production of the site.

2.Perimeter Gas and Water Quality Monitoring Tables

Gas Monitoring:Basketstown Landfill Site,County Meath

DATE 15/04/2010

TIME 1200

Sampler P.Luke

INSTRUMENT GA94

Location	CH ₄ %	CO ₂ %	O ₂ %		Notes	CH ₄	CO ₂
GA94	-	-	-	-		Exceedence analysis for trigger level of	Exceedence analysis for trigger level of
Standard	5.0	5.0	5.0	-		1.0	1.5
PR1 A	0.0	2.4	16.0	1015			Exceedence
PR2 A	0.0	0	19.4	1015			
PR3 A	0.0	2.7	16.1	1015			Exceedence
PR4 A	0.0	0.0	19.3	1015			
PR5	0.0				Removed		
PR6 A	0.0	0.0	19.4	1015			
PR7	0.0				Waterlog		
PR8	0.0				Destroyed		
PR13	0.0				Removed		
PR14 A	0.0	0.7	18.9	1015			
PR15A	0.0	0.0	19.1	1015			
PR16 A	0.0	1.8	18.3	1015			Exceedence
PR17	0.0				Removed		
PR18	0.0	0.0	19.6	1016			
PR19	0.0	0.0	19.7	1015			
PR20	0.0	0.0	19.5	1015			
PR21	0.0				Removed		
PR22	0.0	0.0	19.4	1015			
PR23	0.0	0.0	19.4	1015			
PR24	0.0	0.0	19.6	1015			
PR28	0.0				Removed		
GW1	0.0	0.8	18.1	1015			
GW2	0.0	0.6	19.0	1013			
B1	0.0	0.0	19.4	1015			
B2	0.0	2.7	16.4	1015			Exceedence
B3	0.0	2.1	16.5	1015			Exceedence
B4	0.0	0.0	19.5	1015			
B5	0.0	2.7	13.4	1015			Exceedence
B6	0.0	2.0	17.7	1015			Exceedence
B7	0.0	0.6	19.0	1015			
B8	0.0	0.0	19.3	1014			
B9	0.0	0.0	19.3	1015			
B10	0.0	0.0	19.3	1015			

Gas Monitoring:Basketstown Landfill Site,County Meath

DATE 17/5/10

TIME1200

Sampler P.Luke

INSTRUMENT GA94

Location	CH ₄ %	CO ₂ %	O ₂ %		Notes	CH ₄	CO ₂
GA94	-	-	-	-		Exceedence analysis for trigger level of	Exceedence analysis for trigger level of
Standard	5.0	5.0	5.0	-		1.0	1.5
PR1 A	0.0	2.1	17.2	1012			Exceedence
PR2 A	0.0	1.7	18.1	1012			Exceedence
PR3 A	0.0	0.3	19.1	1012			
PR4 A	0.0	0.0	19.2	1012			
PR5	0.0				Removed		
PR6 A	0.0	0.0	19.3	1012			
PR7	0.0				Waterlog		
PR8	0.0				Destroyed		
PR13	0.0				Removed		
PR14 A	0.0	0.2	19.0	1013			
PR15A	0.0	0.2	19.1				
PR16 A	0.0	0.7	18.8	1012			
PR17	0.0				Removed		
PR18	0.0	0.1	19.4	1012			
PR19	0.0	0.9	18.8	1012			
PR20	0.0	1.0	18.6	1012			
PR21	0.0				Removed		
PR22	0.0	0.0	19.3	1012			
PR23	0.0	0.3	19.1	1012			
PR24	0.0	0.0	19.6	1012			
PR28	0.0				Removed		
GW1	0.0	1.8	17.9	1012			Exceedence
GW2	0.0	0.2	19.1	1010			
B1	0.0	0.2	19.0	1012			
B2	0.0	0.0	19.5	1012			
B3	0.0	0.0	19.6	1012			
B4	0.0	1.1	14.4	1012			
B5	0.0	0.1	19.4	1012			
B6	0.0	2.2	18.2	1012			Exceedence
B7	0.0	3.4	16.6	1012			Exceedence
B8	0.0	0.0	19.2	1012			
B9	0.0	0.0	19.2	1012			
B10	0.0	0.0	19.2	1012			

Gas Monitoring:Basketstown Landfill Site,County Meath

DATE 29/06/2010 TIME 1000
 Sampler P.Luke INSTRUMENT GA94

Location	CH ₄ %	CO ₂ %	O ₂ %		Notes	CH ₄	CO ₂
GA94	-	-	-	-		Exceedence analysis for trigger level of	Exceedence analysis for trigger level of
Standard	5.0	5.0	5.0	-		1.0	1.5
PR1 A	0.0	2.4	17.7	1008			Exceedence
PR2 A	0.0	0	19.8	1008			
PR3 A	0.0	0.1	19.8	1008			
PR4 A	0.0	4.5	17.0	1008			Exceedence
PR5	0.0				Removed		
PR6 A	0.0	0.0	19.8	1008			
PR7	0.0						
PR8	0.0				Destroyed		
PR13	0.0				Removed		
PR14 A	0.0	0.1	19.9	1009			
PR15A	0.0	3.1	16.3	1009			Exceedence
PR16 A	0.0	0.5	19.7	1009			
PR17	0.0				Removed		
PR18	0.0	0.0	19.7	1009			
PR19	0.0	0.0	19.8	1009			
PR20	0.0	1.8	18.6	1009			Exceedence
PR21	0.0				Removed		
PR22	0.0	0.0	19.7	1009			
PR23	0.0	0.7	19.1	1009			
PR24	0.0	0.0	19.5	1008			
PR28	0.0				Removed		
GW1	0.0	0.0	19.5	1008			
GW2	0.0	0.3	19.1	1007			
B1	0.0	1.3	19.0	1008			
B2	0.0	0.2	19.3	1008			
B3	0.0	0.3	19.1	1007			
B4	0.0	4.0	14.0	1008			Exceedence
B5	0.0	1.7	18.4	1008			Exceedence
B6	0.0	2.4	18.8	1007			Exceedence
B7	0.0	0.3	19.8	1007			
B8	0.0	0.1	19.5	1008			
B9	0.0	0.0	19.9	1008			
B10	0.0	0.0	19.9	1008			

Gas Monitoring:Basketstown Landfill Site,County Meath

DATE 26/07/2010

TIME1200

Sampler P.Luke

INSTRUMENT GA94

Location	CH ₄ %	CO ₂ %	O ₂ %		Notes	CH ₄	CO ₂
GA94	-	-	-	-		Exceedence analysis for trigger level of	Exceedence analysis for trigger level of
Standard	5.0	5.0	5.0	-		1.0	1.5
PR1 A	0.0	1.6	17.0	1007			Exceedence
PR2 A	0.0	1.4	16.9	1007			
PR3 A	0.0	1.7	17.5	1007			Exceedence
PR4 A	0.0	4.0	12.7	1007			Exceedence
PR5	0.0				Removed		
PR6 A	0.0	0.0	19.5	1007			
PR7	0.0				Removed		
PR8	0.0				Destroyed		
PR13	0.0				Removed		
PR14 A	0.0	0.0	19.3	1008			
PR15A	0.0	3.7	14.6	1008			Exceedence
PR16 A	0.0	0.2	19.4	1008			
PR17	0.0				Removed		
PR18	0.0	0.0	19.5	1007			
PR19	0.0	0.8	18.8	1007			
PR20	0.0	0.1	19.5	1007			
PR21	0.0				Removed		
PR22	0.0	0.0	19.5	1007			
PR23	0.0	0.1	19.4	1007			
PR24	0.0	0.0	19.5	1007			
PR28	0.0				Removed		
GW1	0.0	1.9	18.3	1007			Exceedence
GW2	0.0	0.1	19.4	1005			
B1	0.0	0.6	18.6	1007			
B2	0.0	0.0	19.6	1006			
B3	0.0	0.0	19.6	1006			
B4	0.0	1.2	18.4	1007			
B5	0.0	1.6	17.6	1007			Exceedence
B6	0.0	2.1	17.8	1007			Exceedence
B7	0.0	0.0	19.6	1007			
B8	0.0	0.0	19.1	1007			
B9	0.0	0.0	19.2	1007			
B10	0.0	0.0	19.3	1007			

Gas Monitoring:Basketstown Landfill Site,County Meath

DATE 09/08/2010 TIME1200
 Sampler P.Luke INSTRUMENT GA94

Location	CH ₄ %	CO ₂ %	O ₂ %		Notes	CH ₄	CO ₂
GA94	-	-	-	-		Exceedence analysis for trigger level of	Exceedence analysis for trigger level of
Standard	5.0	5.0	5.0	-		1.0	1.5
PR1 A	0.0	3.5	15.6	999			Exceedence
PR2 A	0.0	2.2	15.0	999			Exceedence
PR3 A	0.0	0.3	18.9	999			
PR4 A	0.0	5.0	13.3	999			Exceedence
PR5	0.0				Removed		
PR6 A	0.0	0.0	19.3	999			
PR7	0.0				Removed		
PR8	0.0				Destroyed		
PR13	0.0				Removed		
PR14 A	0.0	0.0	19.4	1000			
PR15A	0.0	0.2	19.2	1000			
PR16 A	0.0	0.2	19.2	1000			
PR17	0.0				Removed		
PR18	0.0	0.3	19.3	999			
PR19	0.0	1.1	18.5	999			
PR20	0.0	0.9	18.6	999			
PR21	0.0				Removed		
PR22	0.0	0.0	19.3	999			
PR23	0.0	1.1	18.5	999			
PR24	0.0	0.0	19.5	999			
PR28	0.0				Removed		
GW1	0.0	2.3	17.8	999			Exceedence
GW2	0.0	0.3	18.8	999			
B1	0.0	0.8	17.7	999			
B2	0.0	0.0	19.4	999			
B3	0.0	0.0	19.4	999			
B4	0.0	2.8	12.8	999			Exceedence
B5	0.0	0.2	19.2	999			
B6	0.0	2.2	17.5	998			Exceedence
B7	0.0	0.0	19.6	998			
B8	0.0	0.2	19.0	999			
B9	0.0	0.0	19.3	999			
B10	0.0	0.0	19.3	999			

Gas Monitoring:Basketstown Landfill Site,County Meath

DATE 20/09/2010 TIME1200
 Sampler P.Luke INSTRUMENT GA94

Location	CH ₄ %	CO ₂ %	O ₂ %		Notes	CH ₄	CO ₂
GA94	-	-	-	-		Exceedence analysis for trigger level of	Exceedence analysis for trigger level of
Standard	5.0	5.0	5.0	-		1.0	1.5
PR1 A	0.0	0.7	18.0	998			
PR2 A	0.0	2.8	15.7	998			Exceedence
PR3 A	0.0	0.2	19.1	998			
PR4 A	0.0	2.8	15.2	998			Exceedence
PR5	0.0				Removed		
PR6 A	0.0	0.1	19.1	998			
PR7	0.0				Removed		
PR8	0.0				Destroyed		
PR13	0.0				Removed		
PR14 A	0.0	0.1	19.3	999			
PR15A	0.0	0.0	19.4	998			
PR16 A	0.0	0.1	19.5	999			
PR17	0.0				Removed		
PR18	0.0	0.5	19.1	998			
PR19	0.0	1.6	18.4	998			Exceedence
PR20	0.0	0.0	19.2	999			
PR21	0.0				Removed		
PR22	0.0	0.0	19.3	999			
PR23	0.0	0.0	19.3	999			
PR24	0.0	0.0	19.3	998			
PR28	0.0				Removed		
GW1	0.0	1.5	17.5	998			Exceedence
GW2	0.0	0.3	19.1	996			
B1	0.0	0.2	19.2	999			
B2	0.0	0.0	19.3	998			
B3	0.0	0.0	19.3	998			
B4	0.0	0.3	19.1	998			
B5	0.0	3.6	14.2	998			Exceedence
B6	0.0	2.3	17.6	997			Exceedence
B7	0.0	0.0	19.6	998			
B8	0.0	0.0	19.0	998			
B9	0.0	0.0	19.2	998			
B10	0.0	0.0	19.3	998			

Gas Monitoring:Basketstown Landfill Site,County Meath

DATE 19/10/2010 TIME1200
 Sampler P.Luke INSTRUMENT GA94

Location	CH ₄ %	CO ₂ %	O ₂ %		Notes	CH ₄	CO ₂
GA94	-	-	-	-		Exceedence analysis for trigger level of	Exceedence analysis for trigger level of
Standard	5.0	5.0	5.0	-		1.0	1.5
PR1 A	0.0	2.2	17.4	1003			Exceedence
PR2 A	0.0	0	18.9	1003			
PR3 A	0.0	0.0	18.9	1002			
PR4 A	0.0	4.7	14.7	1003			Exceedence
PR5	0.0				Removed		
PR6 A	0.0	0.1	19.0	1002			
PR7	0.0				Removed		
PR8	0.0				Destroyed		
PR13	0.0				Removed		
PR14 A	0.0	0.9	18.8	1003			
PR15A	0.0	1.8	17.5	1002			Exceedence
PR16 A	0.0	0.1	19.1	1003			
PR17	0.0				Removed		
PR18	0.0	0.6	18.7	1003			
PR19	0.0	0.6	18.9	1003			
PR20	0.0	0.8	18.9	1003			
PR21	0.0				Removed		
PR22	0.0	0.0	19.3	1003			
PR23	0.0	0.6	19.1	1003			
PR24	0.0	0.0	18.9	1002			
PR28	0.0				Removed		
GW1	0.0	0.0	18.9	1002			
GW2	0.0	0.2	18.9	1001			
B1	0.0	1.7	16.9	1003			Exceedence
B2	0.0	0.0	18.9	1002			
B3	0.0	0.5	18.6	1002			
B4	0.0	2.5	14.0	1002			Exceedence
B5	0.0	0.0	19.1	1002			
B6	0.0	2.1	17.7	1002			Exceedence
B7	0.0	0.0	19.1	1002			
B8	0.0	0.0	18.9	1002			
B9	0.0	0.0	19.0	1002			
B10	0.0	0.0	19.0	1002			

Gas Monitoring:Basketstown Landfill Site,County Meath

DATE 08/11/2010

TIME1200

Sampler P.Luke

INSTRUMENT GA94

Location	CH ₄ %	CO ₂ %	O ₂ %		Notes	CH ₄	CO ₂
GA94	-	-	-	-		Exceedence analysis for trigger level of	Exceedence analysis for trigger level of
Standard	5.0	5.0	5.0	-		1.0	1.5
PR1 A	0.0	3.3	15.4	952			Exceedence
PR2 A	0.0	2.6	15.6	952			Exceedence
PR3 A	0.0	2.8	15.5	951			Exceedence
PR4 A	0.0	0.2	18.7	952			
PR5	0.0				Removed		
PR6 A	0.0						waterlogged
PR7	0.0				Removed		
PR8	0.0				Destroyed		
PR13	0.0				Removed		
PR14 A	0.0	1.5	18.6	953			Exceedence
PR15A	0.0	0.4	18.7	953			
PR16 A	0.0	3.5	17.9	953			Exceedence
PR17	0.0				Removed		
PR18	0.0	0.0	19.0	951			
PR19	0.0	0.0	91.1	952			
PR20	0.0	0.0	19.1	951			
PR21	0.0				Removed		
PR22	0.0	0.0	19.1	951			
PR23	0.0	1.1	18.1	951			
PR24	0.0	0.0	19.0	951			
PR28	0.0				Removed		
GW1	0.0	0.6	17.5	951			
GW2	0.0	0.1	18.7	950			
B1	0.0	0.1	19.0	952			
B2	0.0	0.0	19	951			
B3	0.0	2.2	16.1	951			Exceedence
B4	0.0	0.7	17.5	952			
B5	0.0	3.7	12.5	952			Exceedence
B6	0.0	1.7	17.5	952			Exceedence
B7	0.0	2.1	16.3	952			Exceedence
B8	0.0	1.0	17.6	952			
B9	0.0	5.2	11.4	952			Exceedence
B10	0.0	0.5	17.8	952			

3.Laboratory Analysis Data

Basketstown Landfill Waste Licence W0010-02

Surfacewater Annual Monitoring Data 2010-2011

Date	Sample Identity	Total Oxidised Nitrogen as N	Dissolved Mercury Low Level	Total Suspended Solids	Total Chromium	Total Phosphorous	Dissolved Boron Low Level	Dissolved Cadmium Low Level
		mg/l	ug/l	mg/l	ug/l	ug/l	ug/l	ug/l
04/03/2011	W1	2.37	<0.01	4	<3	32.7	15.8	<0.1
04/03/2011	S2	1.67	<0.01	7	<3	34.2	19.5	<0.1
04/03/2011	S3	1.68	<0.01	45.5	<3	130	28.9	0.15
04/03/2011	S4	2.58	<0.01	7.5	<3	31.7	31	<0.1
04/03/2011	S5	0.153	<0.01	24.5	3.2	54.4	1090	<0.1
04/03/2011	S7	2.64	<0.01	10	<3	32.4	27.1	<0.1
04/03/2011	S8	2.85	<0.01	12	<3	141	17.8	<0.1
04/03/2011	S9	2.37	<0.01	9.5	<3	125	18.7	<0.1

Date	Sample Identity	Dissolved Manganese Low Level	Dissolved Nickel Low Level	Dissolved Zinc Low Level	Dissolved Potassium	Dissolved Sodium	Fluoride	Sulphate
		ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	mg/l
04/03/2011	W1	71.2	3.3	5.26	3.56	7.24	-	3.7
04/03/2011	S2	129	7.74	3.7	<2.34	5.81	-	23.8
04/03/2011	S3	267	6.16	16.4	3.2	9.08	-	30.3
04/03/2011	S4	173	5.76	7.33	3.05	9.35	-	29.7
04/03/2011	S5	885	32.2	10	123	182	-	104
04/03/2011	S7	205	6.31	3.75	3.31	9.26	-	29.8
04/03/2011	S8	78.3	6.27	5.44	<2.34	15.2	-	28.8
04/03/2011	S9	86.4	6.77	15	<2.34	12.9	-	25.4

Date	Sample Identity	Dissolved Calcium Low Level	Dissolved Copper Low Level	Dissolved Iron Low Level	Dissolved Lead Low Level	Dissolved Magnesium Low Level	ortho Phosphate as PO4
		mg/l	ug/l	mg/l	ug/l	mg/l	mg/l
04/03/2011	W1	15.9	0.983	<0.19	0.202	4.17	<0.05
04/03/2011	S2	11.8	1.68	0.147	0.129	6.9	<0.05
04/03/2011	S3	14.4	3.11	1.02	0.654	7.89	<0.05
04/03/2011	S4	15	1.67	0.673	0.14	7.8	<0.05
04/03/2011	S5	218	1.39	7.64	0.665	49.8	<0.05
04/03/2011	S7	14.9	1.49	<0.19	0.162	8.41	<0.05
04/03/2011	S8	25.6	1.94	<0.19	0.213	6.32	0.268
04/03/2011	S9	21.6	2.22	<0.19	0.381	6.47	0.07

Basketstown Landfill Waste Licence W0010-02

Groundwater Monitoring Data 2010-2011

Date	Sample Identity	Total Organic Carbon	Chloride	Dissolved Oxygen	Electrical Conductivity @ 25C	pH	Ammoniacal Nitrogen as N
		mg/l	mg/l	mg/l	mS/cm	pH Units	mg/l
28/6/10	BH11	6.68	7.8	7.97	0.864	7.8	0.332
13/10/10	BH11	10.8	7.9	3.81	0.892	7.34	<0.2
3/3/11	BH11	3.49	9.4	6.07	0.861	8.46	<0.2
28/6/10	BH13	4.39	5.7	7.82	0.414	8.28	0.318
13/10/10	BH13	3.82	7.4	3.89	0.326	8.4	<0.2
3/3/11	BH13	5.2	9	4.76	0.414	8.21	<0.2
28/6/10	BH14	<3	11.1	7.83	0.36	8.09	0.254
13/10/10	BH14	<3	11.8	5.61	0.34	7.86	<0.2
3/3/11	BH14	<3	11.4	6.33	0.401	8.32	<0.2
28/6/10	BH15	4.46	10.5	5.43	0.433	8.26	6.33
13/10/10	BH15	5.31	11.3	5.92	0.43	7.85	0.737
3/3/11	BH15	4.68	10.6	5.16	0.432	8.54	6.04
28/6/10	BH16	3.11	19.1	5.41	0.617	8.18	0.426
13/10/10	BH16	<3	21.7	3.63	0.605	8.1	0.312
3/3/11	BH16	3.12	23.1	5.84	0.644	8.29	0.316
28/6/10	BH18	5.22	11.3	6.25	0.353	8.41	7.84
13/10/10	BH18	5.14	11.8	4.56	0.331	7.85	7.51
3/3/11	BH18	5.72	11.4	7.26	0.348	8.19	7.8
28/6/10	BH5	5.04	108	5.62	0.981	8.05	0.981
13/10/10	BH5	5.97	106	4.02	0.942	7.43	6.28
3/3/11	BH5	7.91	108	6.79	1.02	8.29	0.825
28/6/10	BH7	10.6	59.6	5.15	1.15	8.13	1.15
13/10/10	BH7	17.6	119	3.86	1.48	7.08	24.1
3/3/11	BH7	16.2	74.7	6.27	1.41	8.27	21

Date	Sample Identity	Total Organic Carbon	Chloride	Dissolved Oxygen	Electrical Conductivity @ 25C	pH	Ammoniacal Nitrogen as N
		mg/l	mg/l	mg/l	mS/cm	pH Units	mg/l
28/6/10	BH8	20	120	3.07	1.52	8.09	1.52
13/10/10	BH8	14.5	88.1	3.4	1.29	7.32	29.8
3/3/11	BH8	25.1	15.7	6.82	0.96	8.15	0.759
28/6/10	BH9	44.8	361	7.33	2.98	7.59	95.5
13/10/10	BH9	40.3	325	5.14	2.77	7.3	103
3/3/11	BH9	6.24	202	4.33	2	8.02	72.9

4. Groundwater Monitoring Data Annual Sampling

CERTIFICATE OF ANALYSIS

Validated

SDG: 110304-106 Location: Basketstown Order Number: 240257029
 Job: D_MTHCC_FL_NVN-12 Customer: Meath County Council Report Number: 121411
 Client Reference: Attention: Paul Luke Superseded Report:

Results Legend			Customer Sample R		BH5	BH7	BH8	BH9	BH11	BH13
#	ISO17025 accredited.		Depth (m)		Water (GW/SW)	Water (GW/SW)	Water (GW/SW)	Water (GW/SW)	Water (GW/SW)	Water (GW/SW)
M	mCERTS accredited.		Sample Type		02/03/2011	02/03/2011	02/03/2011	03/03/2011	02/03/2011	03/03/2011
S	Non-performing work.		Date Sampled		04/03/2011	04/03/2011	04/03/2011	04/03/2011	04/03/2011	04/03/2011
AQ	Aqueous / filtered sample.		Date Received		110304-106	110304-106	110304-106	110304-106	110304-106	110304-106
diss.filt	Disolved / filtered sample.		SD Ref		3015176	3015179	3015180	3015186	3015181	3015187
tot.unfilt	Total / unfiltered sample.		Lab Sample No.(s)							
*	subcontracted test.		AOB Reference							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.									
Component	LOD/Units	Method								
Alkalinity, Total as CaCO3 (diss.filt)	<2 mg/l	TM043			370	475	475	755	415	235
Oxygen, dissolved	<0.3 mg/l	TM046			6.79	6.27	6.82	4.33	6.07	4.78
Organic Carbon, Total	<3 mg/l	TM090			7.91	16.2	25.1	6.24	3.49	5.2
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099			0.825	21	0.759	72.9	<0.2	<0.2
Fluoride	<0.5 mg/l	TM104			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120			1.02	1.41	0.96	2	0.861	0.414
Silicon (diss.filt)	<0.05 mg/l	TM129						5.65		1.95
Antimony (diss.filt)	<0.16 µg/l	TM152						0.778		<0.16
Arsenic (diss.filt)	<0.12 µg/l	TM152						7.08		0.264
Barium (diss.filt)	<0.03 µg/l	TM152						821		40.8
Beryllium (diss.filt)	<0.07 µg/l	TM152						<0.07		<0.07
Boron (diss.filt)	<9.4 µg/l	TM152			34.5	260	59.5	745	40.1	48.7
Cadmium (diss.filt)	<0.1 µg/l	TM152			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium (diss.filt)	<0.22 µg/l	TM152						33.9		8.74
Cobalt (diss.filt)	<0.06 µg/l	TM152						3.59		0.309
Copper (diss.filt)	<0.85 µg/l	TM152			1.15	1.69	1.88	2.03	1.44	0.911
Lead (diss.filt)	<0.02 µg/l	TM152			0.266	0.068	0.059	0.624	0.041	0.075
Manganese (diss.filt)	<0.04 µg/l	TM152			348	634	487	442	623	41.8
Molybdenum (diss.filt)	<0.24 µg/l	TM152						1.15		<0.24
Nickel (diss.filt)	<0.15 µg/l	TM152			8.17	17.6	12.2	45.2	8.97	3.1
Phosphorus (diss.filt)	<8.3 µg/l	TM152						47		9.02
Selenium (diss.filt)	<0.39 µg/l	TM152						7.42		1.54
Silver (diss.filt)	<1.5 µg/l	TM152						<1.5		<1.5
Tellurium (diss.filt)	<2 µg/l	TM152						<2		<2
Thallium (diss.filt)	<0.96 µg/l	TM152						<0.96		<0.96
Tin (diss.filt)	<0.36 µg/l	TM152						<0.36		<0.36
Uranium (diss.filt)	<1.5 µg/l	TM152						4.3		<1.5
Titanium (diss.filt)	<1.5 µg/l	TM152						3.09		<1.5
Vanadium (diss.filt)	<0.24 µg/l	TM152						10.5		2.27
Zinc (diss.filt)	<0.41 µg/l	TM152			190	2.81	3.1	49.2	4.26	6.54
Mineral oil >C10 C40 (aq)	<10 µg/l	TM172						<10		<10
Mercury (diss.filt)	<0.01 µg/l	TM183			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sulphate	<2 mg/l	TM184			25.2	205	89.7	90.3	78.6	3.7
Chloride	<2 mg/l	TM184			108	74.7	15.7	202	9.4	9
Nitrite as NO2	<0.05 mg/l	TM184						0.098		<0.05

SDG: 110304-106
 Job: D_MTHCC_FL_NVN-12
 Client Reference:

Location: Basketstown
 Customer: Meath County Council
 Attention: Paul Luke

Order Number: 240257029
 Report Number: 121411
 Superseded Report:

Results Legend			Customer Sample R								
#	ISO17025 accredited.		BH5	BH7	BH8	BH9	BH11	BH13			
M	mCERTS accredited.		Water (GW/SW)	Water (GW/SW)	Water (GW/SW)	Water (GW/SW)	Water (GW/SW)	Water (GW/SW)	Water (GW/SW)		
S	Non-conforming work.										
aq	Aqueous / settled sample.										
diss.filt	Dissolved / filtered sample.										
tot.unfilt	Total / unfiltered sample.										
*	subcontracted test.										
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.										
Component	LOD/Units	Method	SDG Ref	Lab Sample No.(s)	AGS Reference						
Phosphate (ortho) as PO4	<0.05 mg/l	TM184	110304-106	3015178	3015178	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184	110304-106	3015178	3015178	<0.1 #	0.198 #	2.23 #	2.15 #	<0.1 #	<0.1 #
Chromium (tot.unfilt)	<3 µg/l	TM191	110304-106	3015178	3015178	<3 #	<3 #	<3 #	4.18 #	<3 #	<3 #
Phosphorus (tot.unfilt)	<20 µg/l	TM191	110304-106	3015178	3015178	90.8 #	68.6 #	38.6 #	<20 #	<20 #	<20 #
Cyanide, Total	<0.05 mg/l	TM227	110304-106	3015178	3015178	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
Cyanide, Free	<0.05 mg/l	TM227	110304-106	3015178	3015178				<0.05 #		<0.05 #
Calcium (diss.filt)	<0.012 mg/l	TM228	110304-106	3015178	3015178	176 #	228 #	202 #	104 #	195 #	66 #
Sodium (diss.filt)	<0.076 mg/l	TM228	110304-106	3015178	3015178	41.5 #	64 #	14.6 #	145 #	8.41 #	8.47 #
Magnesium (diss.filt)	<0.036 mg/l	TM228	110304-106	3015178	3015178	21.5 #	22.7 #	18.4 #	39 #	9.07 #	13.2 #
Potassium (diss.filt)	<2.335 mg/l	TM228	110304-106	3015178	3015178	<2.34 #	24.4 #	4.79 #	95.7 #	5.71 #	<2.34 #
Iron (diss.filt)	<0.019 mg/l	TM228	110304-106	3015178	3015178	7.64 #	3.01 #	0.93 #	1.24 #	2.6 #	5.74 #
pH	<1 pH Units	TM266	110304-106	3015178	3015178	8.29 #	8.27 #	8.15 #	8.02 #	8.46 #	8.21 #

SDG: 110304-106 Location: Basketstown Order Number: 240257029
 Job: D_MTHCC_FL_NVN-12 Customer: Meath County Council Report Number: 121411
 Client Reference: Attention: Paul Luke Superseded Report:

Results Legend		Customer Sample R		BH14	BH15	BH16	BH18	LM7	LM11
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received BDG Ref Lab Sample No.(s) AQ3 Reference	Water(GW/SW)	03/03/2011	02/03/2011	02/03/2011	04/03/2011	110304-106	110304-106
M	accredited.								
S	Non-conforming work.								
AQ	Aqueous / filtered sample.								
diss.filt	Dissolved / filtered sample.								
total.filt	Total / unfiltered sample, subtracted test.								
%	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.								
Component	LOD/Units	Method							
Alkalinity, Total as CaCO3 (diss.filt)	<2 mg/l	TM043	215	215	205	185			
BOD, unfiltered	<1 mg/l	TM045					1	1.8	
Oxygen, dissolved	<0.3 mg/l	TM046	8.33 #	5.16 #	5.84 #	7.26 #			
Organic Carbon, Total	<3 mg/l	TM090	<3 #	4.68 #	3.12 #	5.72 #			
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2 #	6.04 #	0.316 #	7.8 #	27.9 #	50.5 #	
Fluoride	<0.5 mg/l	TM104	0.566 #	0.54 #	0.625 #	0.764 #	<0.5 #	<0.5 #	
COD, unfiltered	<7 mg/l	TM107					73 #	124 #	
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	0.401 #	0.432 #	0.644 #	0.348 #	1.76 #	1.72 #	
Silicon (diss.filt)	<0.05 mg/l	TM129	4.55 #						
Antimony (diss.filt)	<0.16 µg/l	TM152	<0.16 #						
Arsenic (diss.filt)	<0.12 µg/l	TM152	0.354 #						
Barium (diss.filt)	<0.03 µg/l	TM152	114 #						
Beryllium (diss.filt)	<0.07 µg/l	TM152	<0.07 #						
Boron (diss.filt)	<9.4 µg/l	TM152	28.8 #	19.4 #	<9.4 #	<9.4 #	332 #	497 #	
Cadmium (diss.filt)	<0.1 µg/l	TM152	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	0.135 #	
Chromium (diss.filt)	<0.22 µg/l	TM152	8.93 #						
Cobalt (diss.filt)	<0.06 µg/l	TM152	0.334 #						
Copper (diss.filt)	<0.85 µg/l	TM152	<0.85 #	<0.85 #	1.98 #	2.52 #	1.72 #	2.15 #	
Lead (diss.filt)	<0.02 µg/l	TM152	0.126 #	0.144 #	0.082 #	0.084 #	0.109 #	0.401 #	
Manganese (diss.filt)	<0.04 µg/l	TM152	484 #	177 #	508 #	497 #	3350 #	888 #	
Molybdenum (diss.filt)	<0.24 µg/l	TM152	0.542 #						
Nickel (diss.filt)	<0.15 µg/l	TM152	2.45 #	2.49 #	2.87 #	18.4 #	13 #	215 #	
Phosphorus (diss.filt)	<6.3 µg/l	TM152	12.8 #						
Selenium (diss.filt)	<0.39 µg/l	TM152	0.443 #						
Silver (diss.filt)	<1.5 µg/l	TM152	<1.5 #						
Tellurium (diss.filt)	<2 µg/l	TM152	<2 #						
Thallium (diss.filt)	<0.96 µg/l	TM152	<0.96 #						
Tin (diss.filt)	<0.36 µg/l	TM152	<0.36 #						
Uranium (diss.filt)	<1.5 µg/l	TM152	<1.5 #						
Titanium (diss.filt)	<1.5 µg/l	TM152	2.17 #						
Vanadium (diss.filt)	<0.24 µg/l	TM152	1.89 #						
Zinc (diss.filt)	<0.41 µg/l	TM152	18.9 #	2.33 #	5.82 #	4.68 #	20.2 #	132 #	
Mineral oil >C10 C40 (aq)	<10 µg/l	TM172	<10 #						
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01 #	<0.01 #	<0.01 #	0.0438 #	<0.01 #	<0.01 #	
Sulphate	<2 mg/l	TM184	8.1 #	<2 #	57 #	<2 #	11.8 #	62 #	

CERTIFICATE OF ANALYSIS

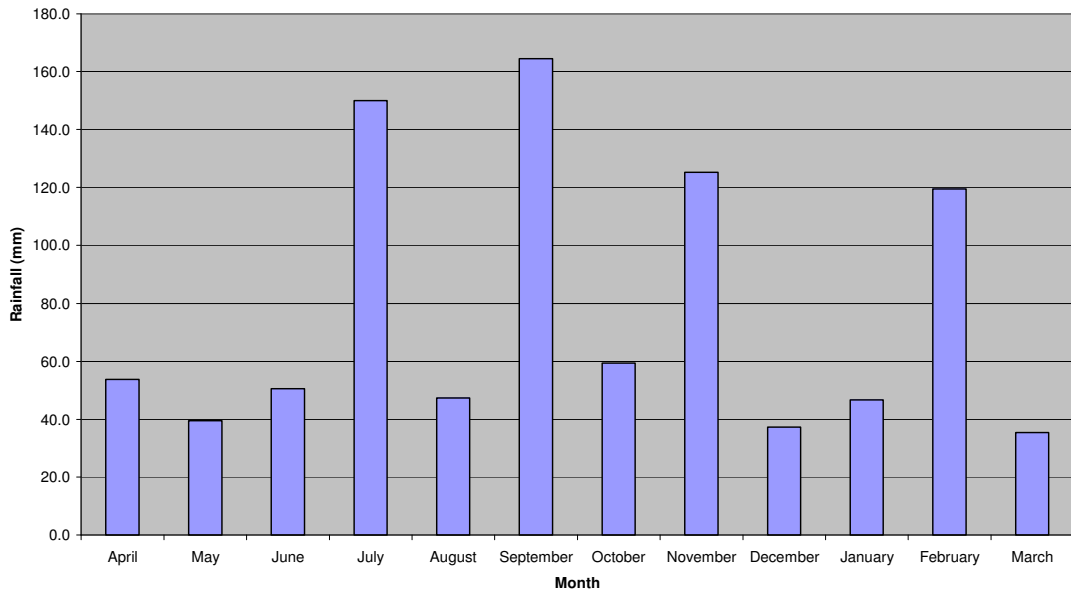
Validated

SDG: 110304-106 Location: Basketstown Order Number: 240257029
 Job: D_MTHCC_FL_NVN-12 Customer: Meath County Council Report Number: 121411
 Client Reference: Attention: Paul Luke Superseded Report:

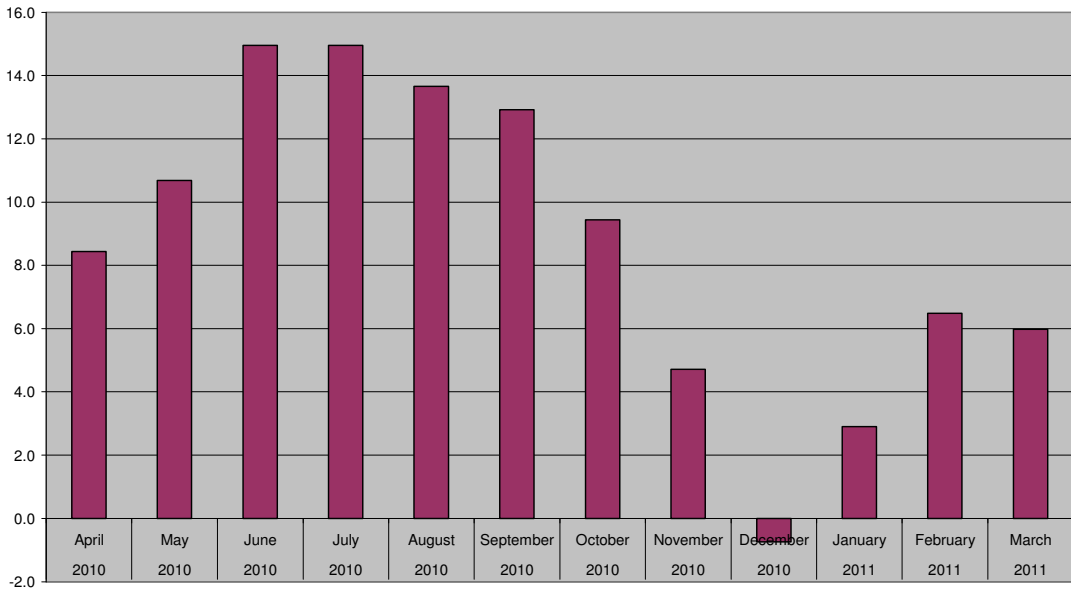
Results Legend		Customer Sample R	BH14	BH15	BH16	BH18	LM7	LM11
#	ISO17025 accredited.	Depth (m)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
M	ISO17025 accredited.	Sample Type	03/03/2011	02/03/2011	02/03/2011	02/03/2011	03/03/2011	03/03/2011
S	Non-conforming work.	Date Sampled	04/03/2011	04/03/2011	04/03/2011	04/03/2011	04/03/2011	04/03/2011
W	Aqueous / settled sample.	Date Received	110304-106	110304-106	110304-106	110304-106	110304-106	110304-106
dis.filt	Disolved / filtered sample.	SDG Ref	3015188	3015182	3015183	3015185	3015123	3015124
tot.unfilt	Total / unfiltered sample.	Lab Sample No.(s)						
-	subcontracted test.	AGS Reference						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.							
Component	LOD/Units	Method						
Chloride	<2 mg/l	TM184	11.4 #	10.6 #	23.1 #	11.4 #	55.9 #	135 #
Nitrite as NO2	<0.05 mg/l	TM184	<0.05 #					
Phosphate (ortho) as PO4	<0.05 mg/l	TM184	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
Chromium (tot.unfilt)	<3 µg/l	TM191	<3 #	<3 #	<3 #	<3 #	<3 #	5.27 #
Phosphorus (tot.unfilt)	<20 µg/l	TM191	<20 #	218 #	<20 #	93.2 #	171 #	244 #
Cyanide, Total	<0.05 mg/l	TM227	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
Cyanide, Free	<0.05 mg/l	TM227	<0.05 #					
Calcium (diss.filt)	<0.012 mg/l	TM228	73.2 #	74.9 #	114 #	49.9 #	329 #	330 #
Sodium (diss.filt)	<0.076 mg/l	TM228	10.3 #	10.5 #	12.8 #	10.7 #	55.3 #	98.8 #
Magnesium (diss.filt)	<0.036 mg/l	TM228	5.87 #	4.31 #	20.2 #	4.49 #	24.2 #	45.9 #
Potassium (diss.filt)	<2.335 mg/l	TM228	<2.34 #	<2.34 #	<2.34 #	3.23 #	25.2 #	61.9 #
Iron (diss.filt)	<0.019 mg/l	TM228	5.47 #	7.56 #	0.317 #	3.66 #	24.8 #	11 #
pH	<1 pH Units	TM256	8.32 #	8.54 #	8.29 #	8.19 #	7.86 #	8.13 #

4. Meteorological Data Graphs

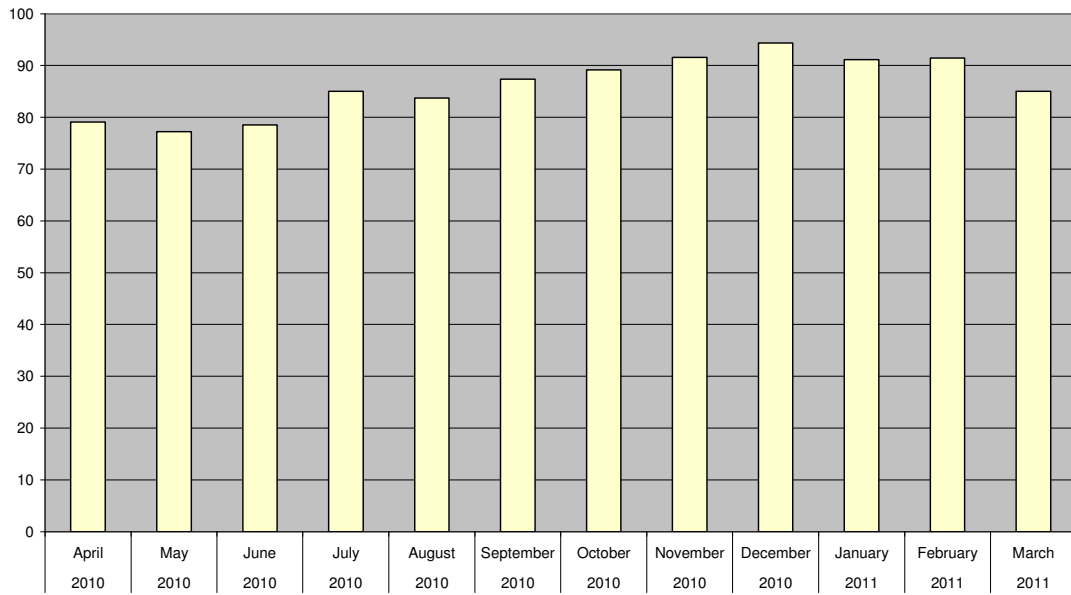
Rainfall



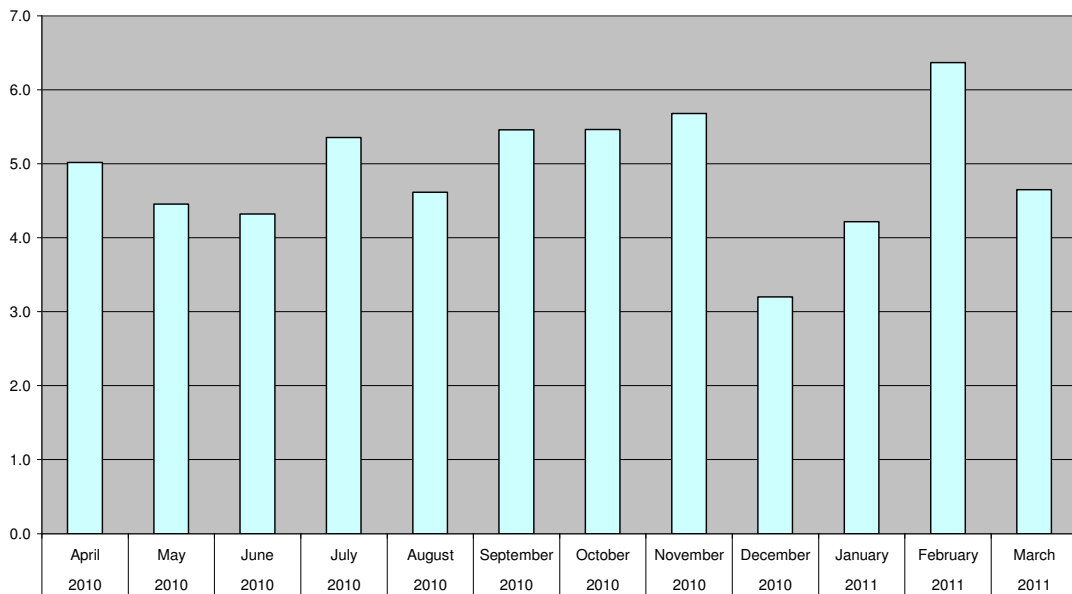
Temperature (Degrees Celsius)



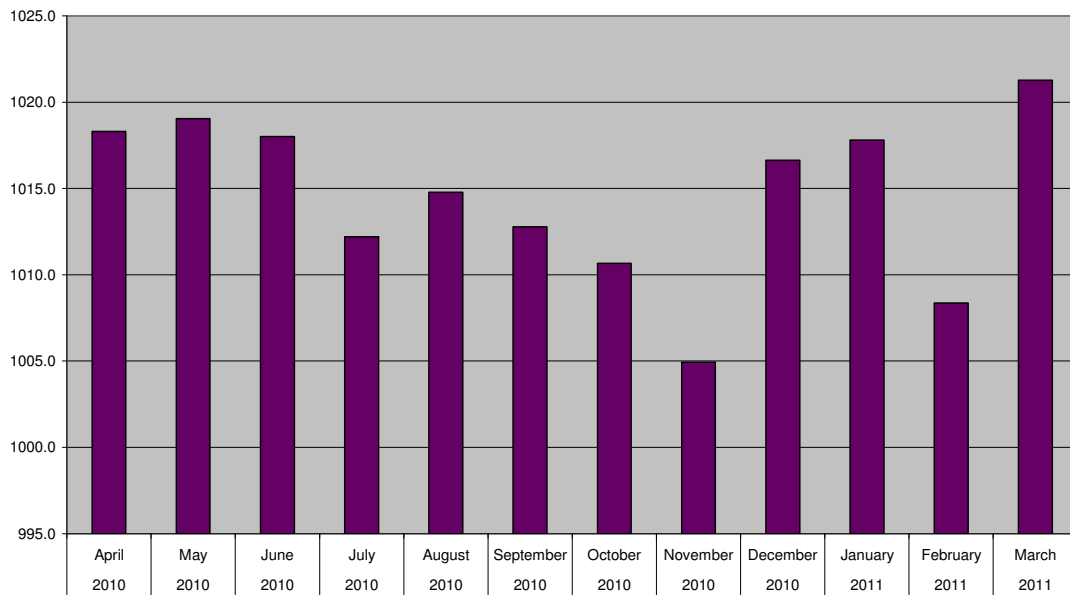
Relative Humidity (%)



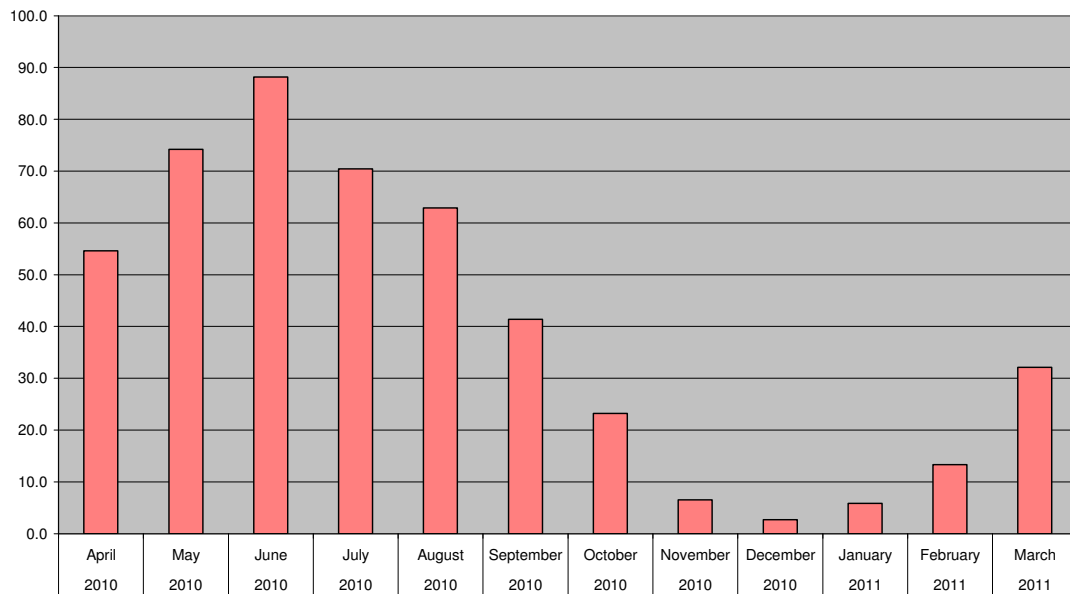
Wind Speed (Knots)



MSL Pressure (hPa)



Potential Evapotranspiration (Penman)

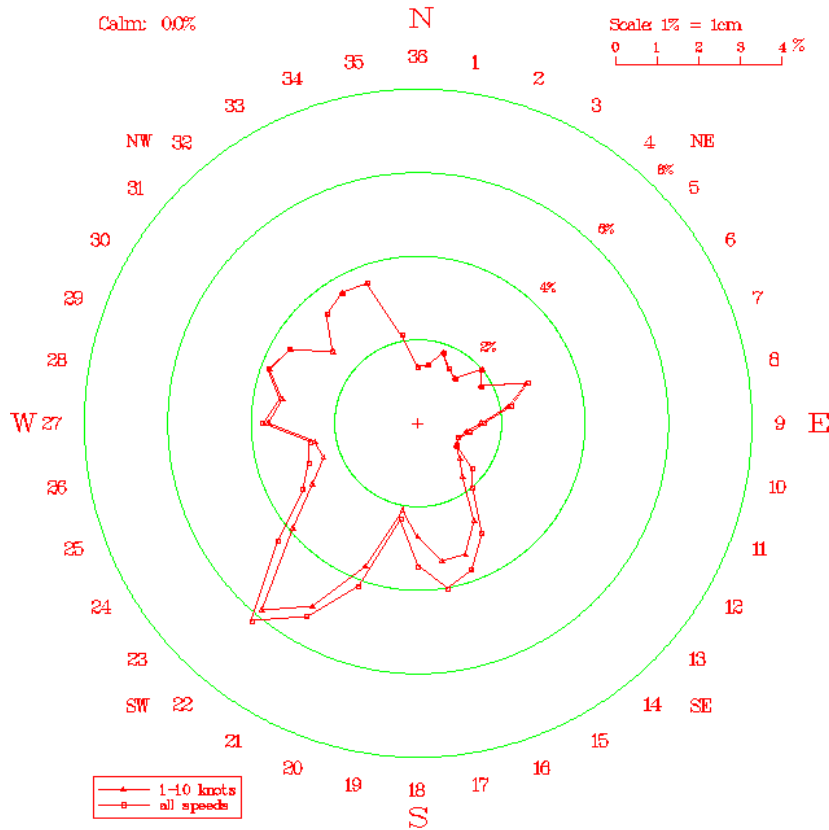


Wind Rose for Mullingar Station: April 2010 - March 2011

Mullingar

2010-2011

Percentage Frequency of Occurrence of Wind Directions



Percentage Frequency of Occurrence of Wind Speeds + less than 0.1

0	1-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	over 48 knots	%
0.0	36.2	38.7	19.1	5.5	0.5	0.0	0.0	0.0	0.0	0.0	%

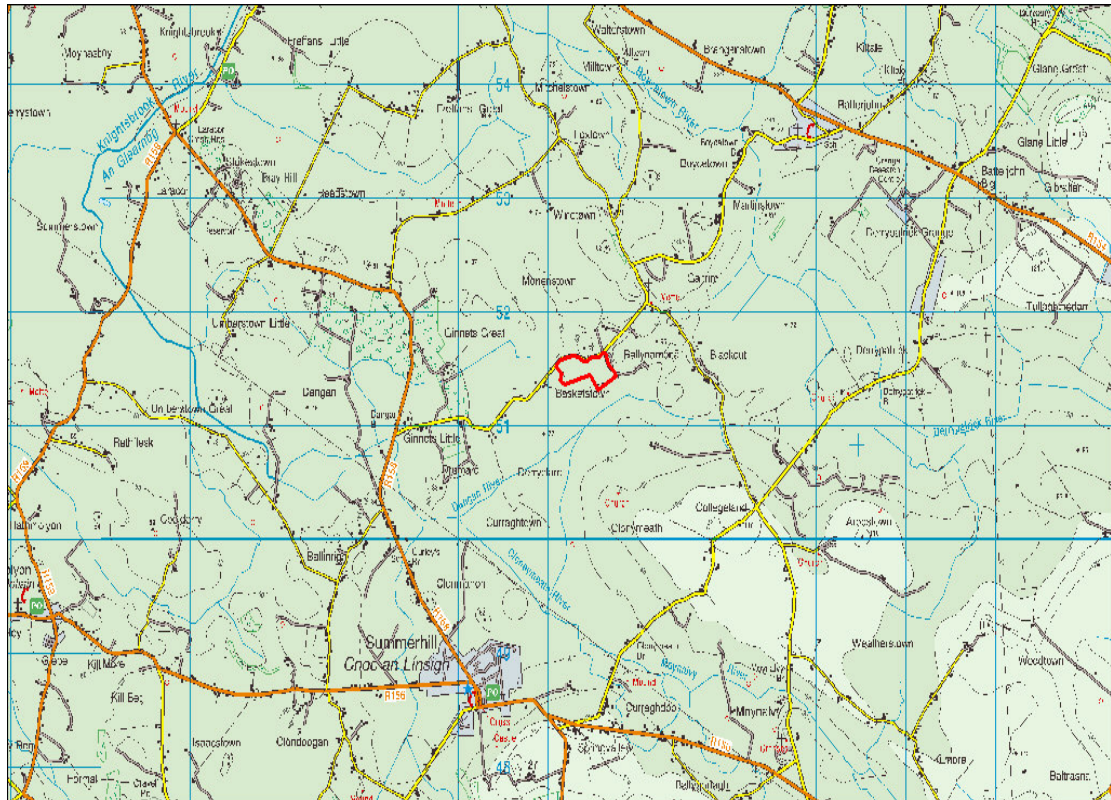
mean wind speed: 5.0 knots
anemometer height: 12m

standard deviation: 31 knots

Met Eireann, Glasnevin Hill, Dublin 9.

5. Sampling Location Maps

Site Location Maps



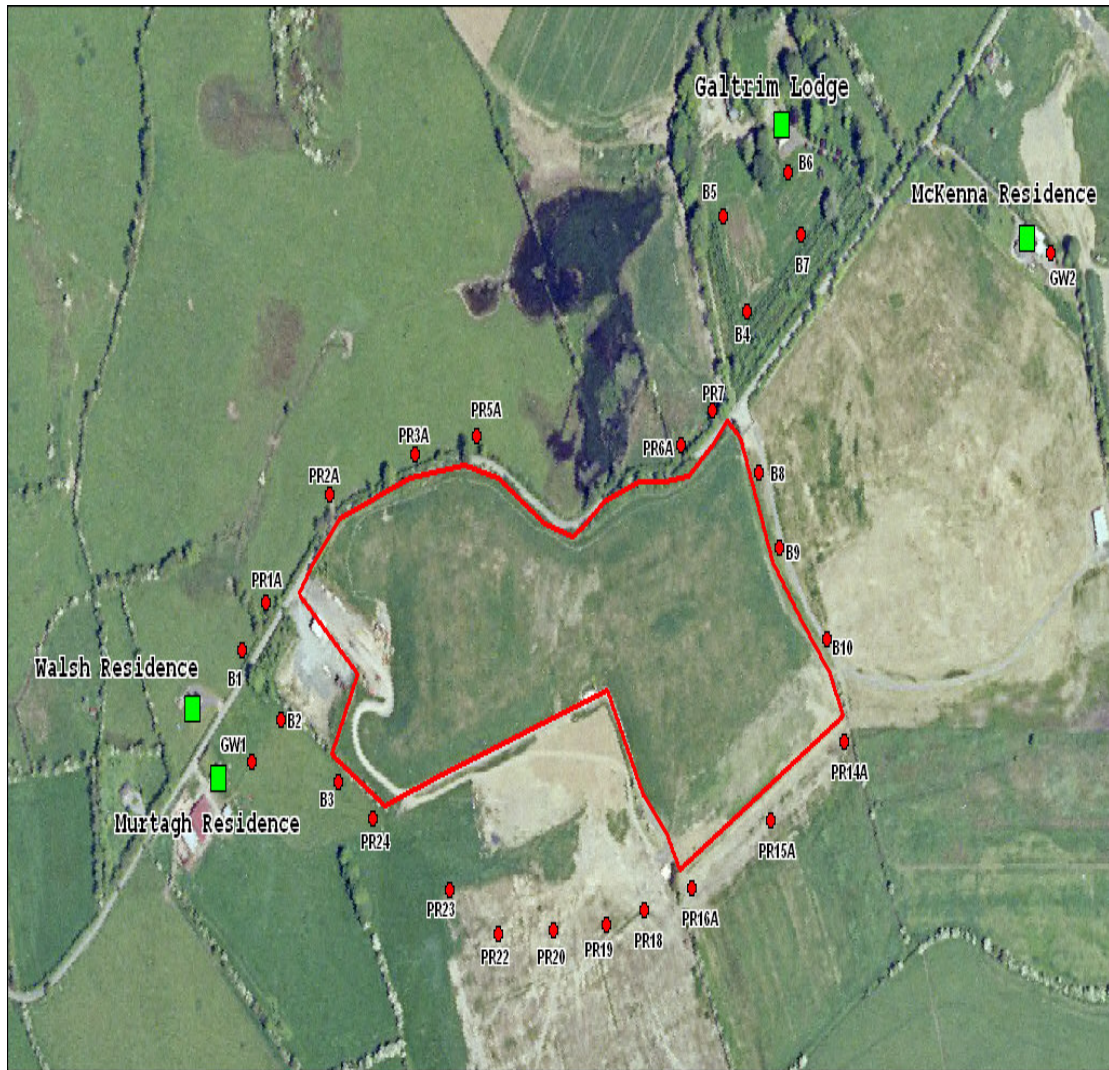
Surface water Monitoring Locations



Groundwater Monitoring Locations (including private wells)



Perimeter Gas Monitoring Locations



6. PRTR Returns Worksheets

Relevant worksheets only



AER Returns Worksheet

Version 1.1.10

REFERENCE YEAR 2009

1. FACILITY IDENTIFICATION

Parent Company Name	Meath County Council
Facility Name	Basketstown Landfill Facility
PRTR Identification Number	W0010
Licence Number	W0010-02

Waste or IPPC Classes of Activity

No.	class name
3.1	Deposit on, in or under land (including landfill). 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	The treatment of any waste on land with a consequential benefit for an agricultural activity or ecological system.
4.10	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	Use of any waste principally as a fuel or other means to generate energy.
4.9	
Address 1	Basketstown
Address 2	Summerhill
Address 3	Co. Meath
Address 4	
Country	Ireland
Coordinates of Location	-8.71329 53.5069
River Basin District	IEEA
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous waste
AER Returns Contact Name	Finbarr Quigley
AER Returns Contact Email Address	fquigley@meathcoco.ie
AER Returns Contact Position	Site Supervisor
AER Returns Contact Telephone Number	046-9097000/9097211
AER Returns Contact Mobile Phone Number	
AER Returns Contact Fax Number	
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	0
User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

Activity Number	Activity Name
5(d)	Landfills
5(c)	Installations for the disposal of non-hazardous waste
50.1	General

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

Is it applicable?	
Have you been granted an exemption?	
If applicable which activity class applies (as per Schedule 2 of the regulations)?	
Is the reduction scheme compliance route being used?	

PRINT THIS SHEET

HELP

CREATE AER XML RETURN & UPLOAD

4.1 RELEASES TO AIR

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR									
POLLUTANT			METHOD			ADD EMISSION POINT		QUANTITY	
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)	M	PER	EN13526:2002 with MCERT FID and Hydrocarbon cutter	1581.85	1581.85	0.0	0.0	
08	Nitrogen oxides (NOx/NO2)	M	PER	Flue gas analyser	1017.06	1017.06	0.0	0.0	
11	Sulphur oxides (SOx/SO2)	M	PER	Flue gas analyser	208.02	208.02	0.0	0.0	
07	Non-methane volatile organic compounds (NMVOC)	M	PER	EN13649:2002 in conjunction with ISO16017 european and International standard	38.71	38.71	0.0	0.0	
02	Carbon monoxide (CO)	M	PER	Flue gas analyser	36.43	36.43	0.0	0.0	
03	Carbon dioxide (CO2)	M	PER	NIR analyser with Flue gas analyser	2495150.0	2495150.0	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	
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	
84	Fluorine and inorganic compounds (as HF)	M	ISO15713:2006	International standard	6.22	6.22	0.0	0.0	
80	Chlorine and inorganic compounds (as HCl)	M	EN1911:1998	European standard	6.22	6.22	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	
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	
351	Total Organic Carbon (as C)	M	EN12619:2001	European standard	38.71	38.71	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:	Basketstown Landfill Facility				
	T (Total) kg/Year	M/C/E	Method Code	Designation or Description	Facility Total Capacity m3 per hour
Total estimated methane generation (as per site model)	0.0				N/A
Methane flared	1106135.03	M	PER	EN13526:2002 with MCERT FID and Hydrocarbon cutter	210240.0 (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

4.3 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			
No. Annex II	Name	M/C/E	Method Used		Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
			Method Code	Designation or Description				
06	Ammonia (NH3)	M			1569.4	1569.4	0.0	0.0
13	Total phosphorus	M			2.93	2.93	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			
Pollutant No.	Name	M/C/E	Method Used		Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
			Method Code	Designation or Description				
303	BOD	M			43.7	43.7	0.0	0.0
240	Suspended Solids	M			110.0	110.0	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				