Comhairle Chontae Chill Mhantáin
WICKLOW COUNTY COUNCIL

BALLYMURTAGH LANDFILL
Waste Licence W0011-01

ANNUAL ENVIRONMENTAL REPORT 2008

June 2009

RPS

Ballymurtagh Landfill
W0011-01

Annual Environmental Report 2008

DOCUMENT CONTROL SHEET

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1 INTRODUCTION

This Annual Environmental Report (AER) summarises the environmental performance of Ballymurtagh landfill between January and December 2008 and outlines proposals for the 2009 reporting period to help minimise environmental impacts. RPS have prepared this AER on behalf of Wicklow County Council in accordance with the conditions of waste licence W0011-01, the Environmental Protection Agency (EPA) "Draft Guidance on Environmental Management Systems and Reporting to the Agency" and the EPA "Landfill Manuals – Landfill Monitoring 2nd Edition".

Wicklow County Council operate Ballymurtagh Landfill in accordance with Waste Licence Register No. W0011-01.

It is the policy of Wicklow County Council to comply fully with the conditions of this waste licence, to minimise impact on the environment and ensure that members of staff are aware of the environmental impacts associated with their work on the landfill.

1.1 WASTE MANAGEMENT POLICY

The County Wicklow Waste Management Plan outlines the following policy;

"*..to move quickly to a 'maximum recycling' scenario, which will meet the wishes of the public and also meet the mandatory targets for recycling set out by government… The Council aims to arrest and counteract the current trend of waste growth through concerted measures aimed at waste minimisation and prevention".*

1.2 SITE DESCRIPTION

Ballymurtagh Landfill is located in the townlands of Ballymurtagh, Ballygahan Upper, Ballygahan Lower, and Tinnahnich in the Vale of Avoca approximately 1.5 km north-west of the village of Avoca in County Wicklow. It is situated in the catchment of the Avoca River, which rises in the Wicklow Mountains and enters the Irish Sea at Arklow. The landfill is located within a disused Open Lode pit of the former Avoca Mines. Prior to landfilling the pit was used for the settlement of mine tailings, a layer of which underlies the body of waste. The bedrock underlying the landfill consists of volcanic rock, which is part of the Avoca Formation. The lithologies based on drilling carried out by the Geological Survey of Ireland consists of light greenish grey, fine grained, well foliated metavolcanic rock.

The principal activity between 1989 to 2002, was to 'deposit in, on or under land', Waste acceptance ceased for landfilling on the 31st December 2002 and recycling is now the principal activity. It is estimated that approximately 480,000m^3 of waste were deposited at the site since it commenced operation in 1989. The Civic Waste Facility was opened in February 2003. The layout of the facility is shown on Figure 2.2.

Restoration works in accordance with the Waste Licence commenced in October 2004 and were completed in November 2005. The site has been landscaped and vegetation was successfully established during 2006.

1.3 WASTE ACCEPTANCE

A procedure for the acceptance of waste at the Civic Waste Facility has been developed and is outlined in the Environmental Management Plan (EMP).

2 ENVIRONMENTAL MONITORING

The following sections summarise the monitoring undertaken at Ballymurtagh during the 2008 reporting period. More detailed interpretations can be found within the quarterly monitoring reports, which were submitted to the Agency throughout 2008.

2.1 SURFACE WATER

TE Laboratories (TelLabs), Co Carlow collected and analysed samples from 5 monitoring locations (including the Civic Waste Site) (see Figure 2.1) specified in the waste licence. Samples were collected in February, May, August and November. Parameters requiring annual analysis were monitored in November. Results were compared with the European Community (Quality of Surface Water intended for Abstraction of Drinking Water) Regulations, 1989 (S.I. No. 294 of 1989) and the EPA's Environmental Quality Objectives and Environmental Quality Standards (a discussion document, from 1997).

Section 2.1.1 summarises the overall surface water quality at the landfill. However, it should be noted that the Ballygahan Adit and Ballymurtagh Road Adit carry acid mine drainage (AMD). Surface water quality monitoring points SW2 and SW3 respectively are located in close proximity to these adits. Parameters which would mainly originate from acid mine drainage include sulphate, copper, lead, iron, manganese and zinc along with low pH and elevated electrical conductivities.

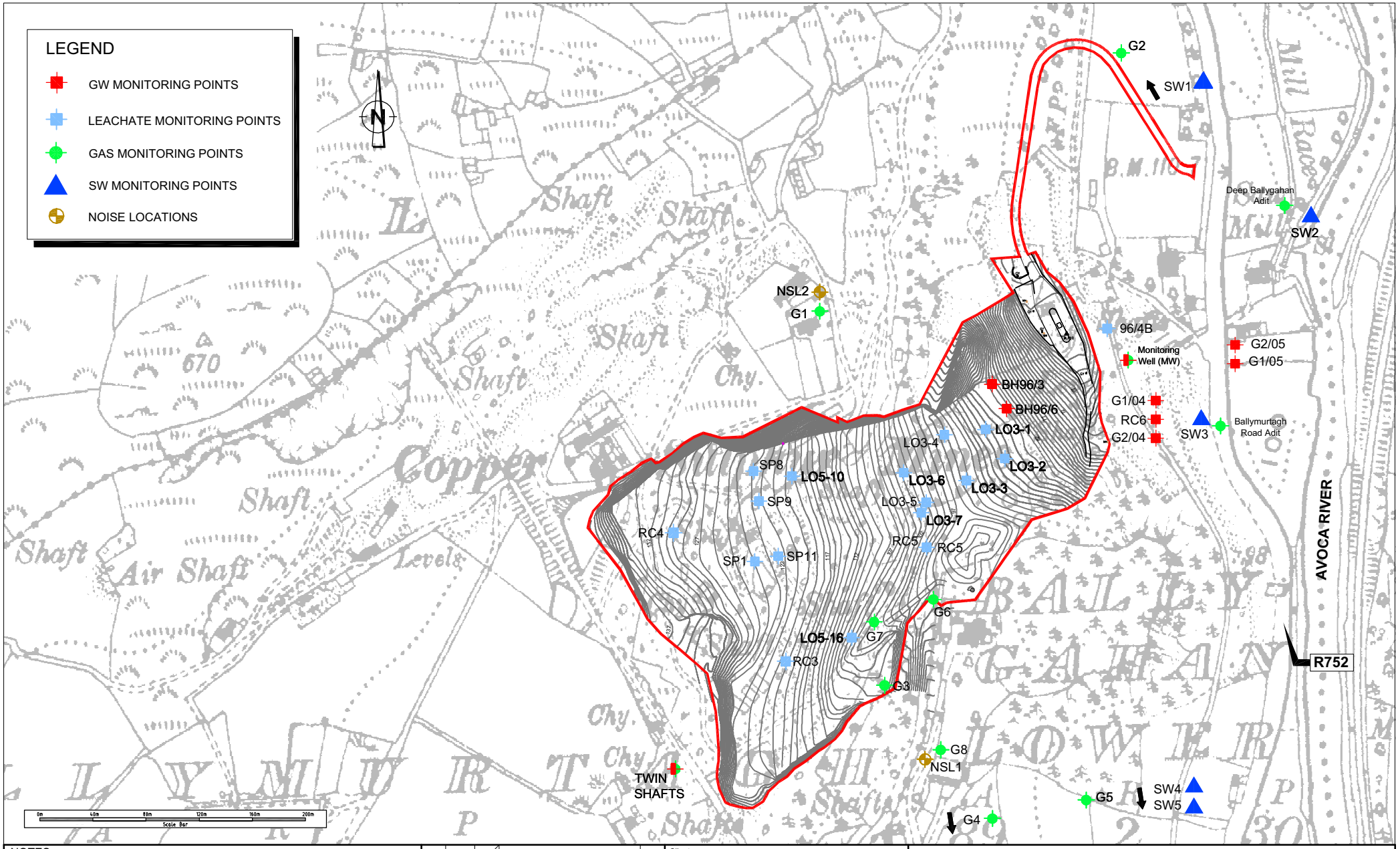
Full copies of all results can be found in Appendix A.

2.1.1 Interpretation

Surface water quality upstream of the facility (at SW1 and SW2) was generally of good quality during the 2008 monitoring period with no quarterly limits exceeded. Iron was recorded during the annual round of monitoring and was elevated at both monitoring points. SW1 recorded a level of 0.27mg/lFe at SW1 and SW2 recorded a level of 0.31mg/lFe. Manganese was also elevated at SW2 at 0.05mg/lMn.

Surface water quality at SW3 (Ballymurtagh Road Adit) shows evidence of Acid Mine Drainage in the form of low pH (range 3.8 – 4.3) (see Figure 2.1), elevated conductivity (ranging from 1870µS/cm to 2150µS/cm), and elevated sulphate (1363mg/l – 1535mg/l). Sulphate concentrations were elevated throughout the year and remain similar to those recorded in previous years as shown in Figure 2.3. Elevated concentrations of iron, cadmium, manganese, lead and zinc were also detected in the annual sample. Low dissolved oxygen concentrations were recorded in the 4th quarter (4.9mg/l) and this is likely due to seasonal variances. BOD levels were elevated in comparison to 2007 (<3mg/l – 21mg/l). Ammonium levels were also high at SW3 (2.4mg/l NH_4 to 10mg/l NH_4), however they are gradually decreasing as can be seen in Figure 2.2. Since the site was capped ammonium levels have gradually decreased.

Surface water quality at SW4 and SW5, (approx 300-400m downstream of SW3) is generally of good quality and similar to that of 2007. Manganese was elevated at 0.07mg/l at SW4 and 0.05mg/l at SW5 during the annual round of monitoring which is lower than the result for manganese recorded in 2007. Iron was also slightly elevated. All other parameters were within recommended limits.



NOTES

1. Verifying Dimensions.
   The contractor shall verify dimensions against such other drawings or site conditions as pertain to this part of the work.
2. Existing Services.
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HF	PL	PL	June 2009

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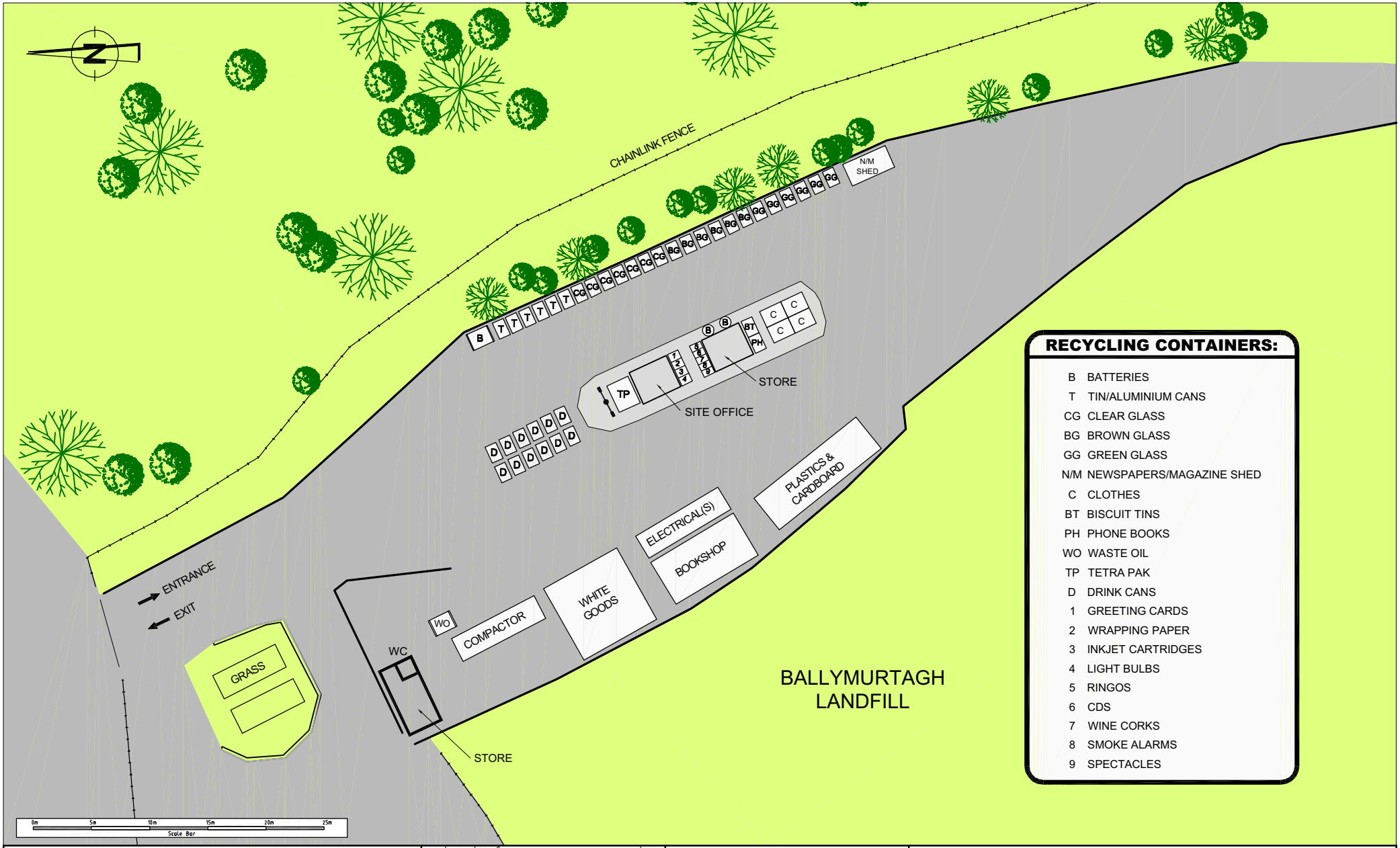
Drawing Status	Sheet Size	Scale
Preliminary	A4	NTS

Drawing Number: MDE0046/Figure 2.1

Rev: A01

Title: MONITORING POINTS



RECYCLING CONTAINERS:

B	BATTERIES
T	TIN/ALUMINIUM CANS
CG	CLEAR GLASS
BG	BROWN GLASS
GG	GREEN GLASS
N/M	NEWSPAPERS/MAGAZINE SHED
C	CLOTHES
BT	BISCUIT TINS
PH	PHONE BOOKS
WO	WASTE OIL
TP	TETRA PAK
D	DRINK CANS
1	GREETING CARDS
2	WRAPPING PAPER
3	INKJET CARTRIDGES
4	LIGHT BULBS
5	RINGOS
6	CDS
7	WINE CORKS
8	SMOKE ALARMS
9	SPECTACLES

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Drawing Status	Sheet Size	Scale
Preliminary	A4	NTS

Drawing Number: MDE0046/Figure 2.2

Rev: A01

Title: LAYOUT OF AVOCA CIVIC WASTE FACILITY

Figure 2.3: pH concentrations at all surface water monitoring locations from February 2005 to November 2008

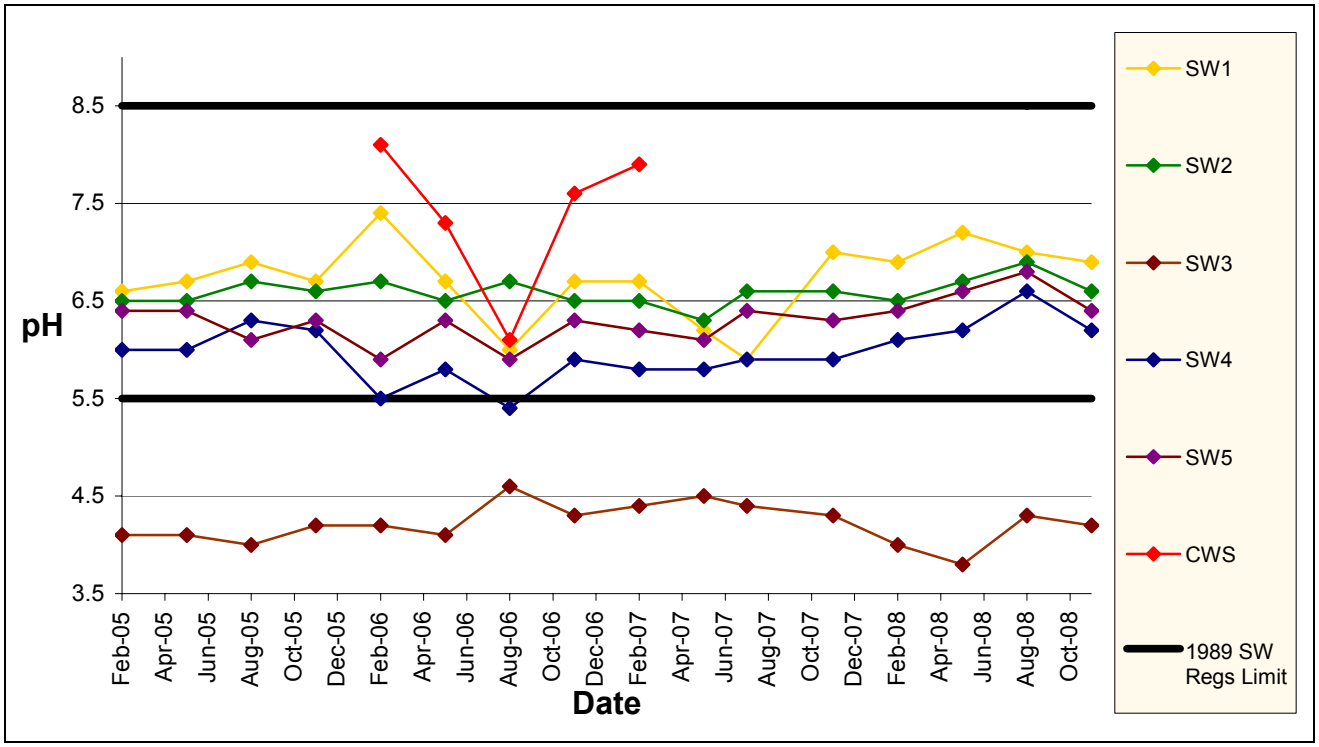


Figure 2.4: Ammoniun concentrations at SW3 from August 04 to November 08

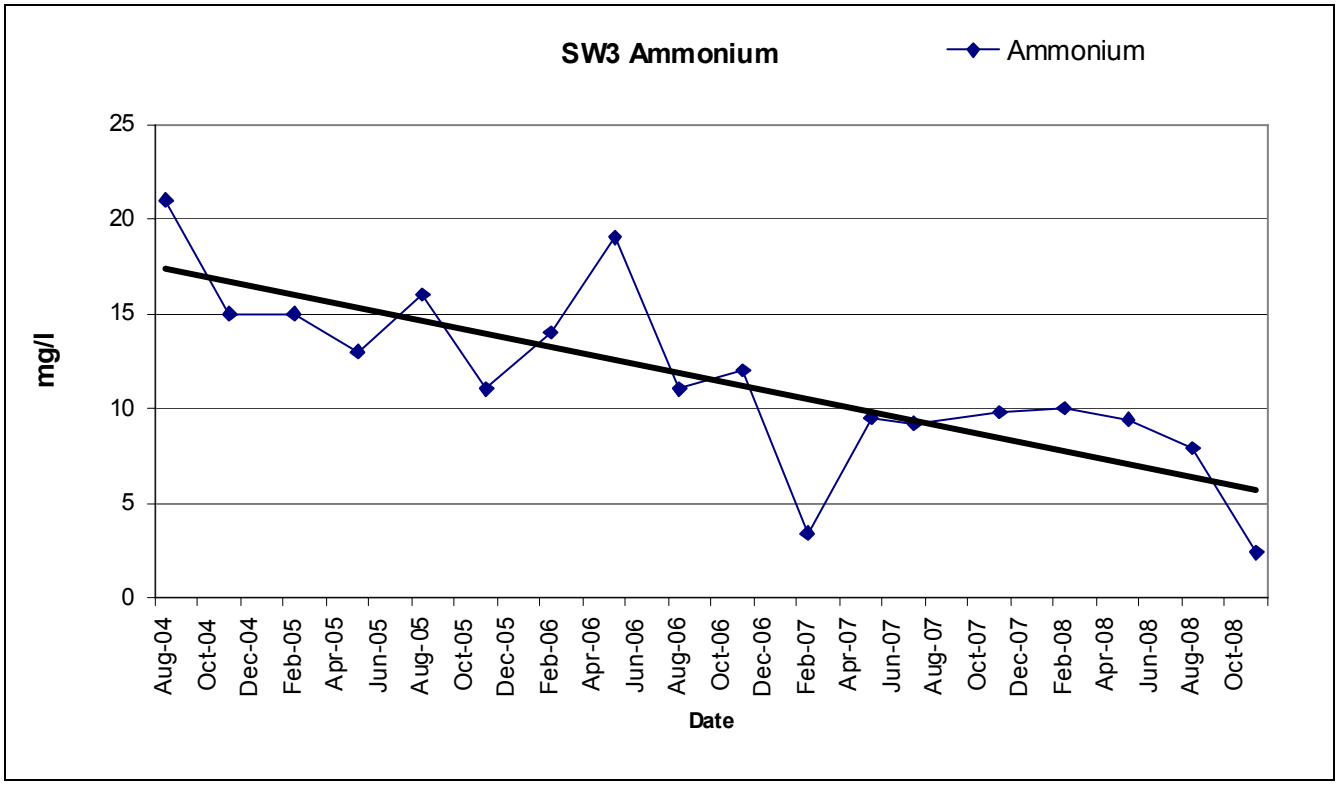
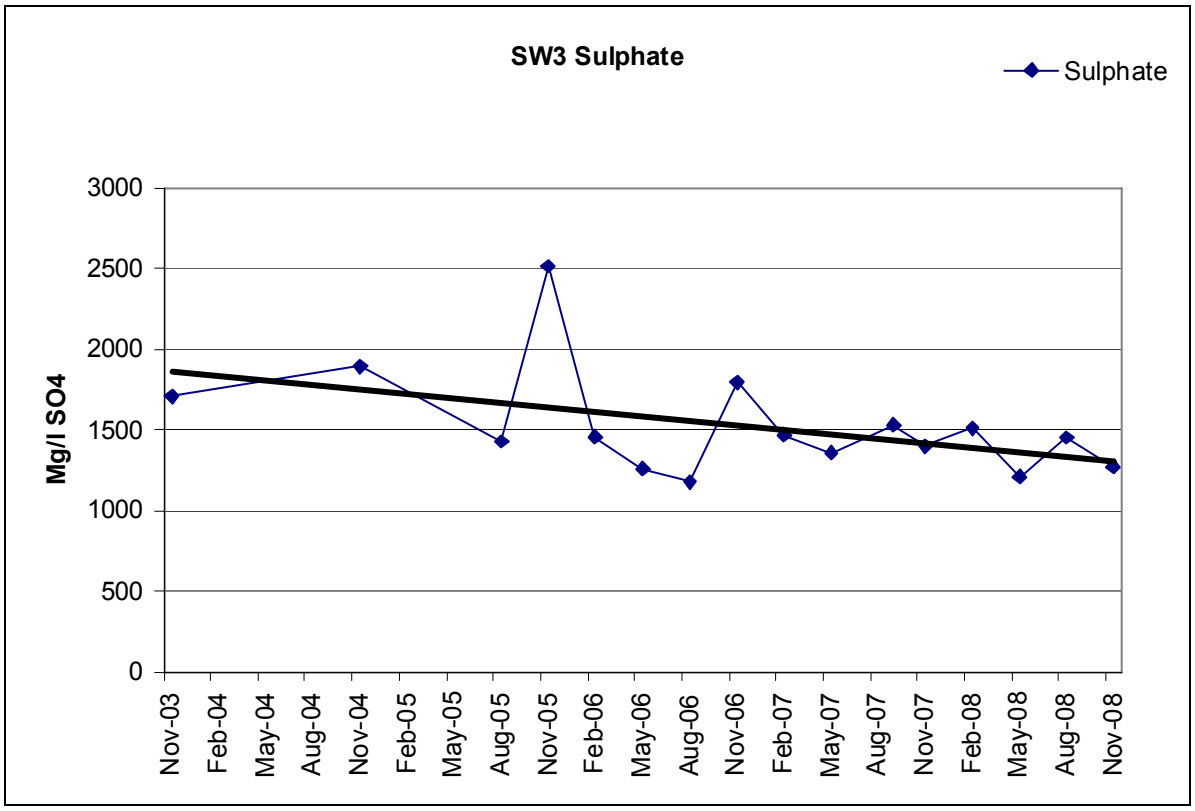


Figure 2.5: Sulphate concentrations at SW3 from November 03 to November 08



2.1.2 ELV Compliance

There is a surface water discharge limit of 35mg/l suspended solids. No exceedances of this limit were recorded during 2008.

2.2 GROUNDWATER

TelLabs took groundwater samples in February, May, August and November 2008, the results of which are contained within Appendix A. Four private groundwater wells (Thomas Merrigan, Donal O' Leary, Eddie Coleman and Jeffery Green) were also monitored in 2008. Parameters that require analysis on an annual basis were sampled in November.

As discussed in the 'Monitoring Infrastructure Assessment Report' and the 'Groundwater Flow and Contaminant Transport Modelling Study', Ballymurtagh Landfill is located within a disused open mine pit, which is underlain by 6 - 16.5m of mine tailings and an underground mine. This underground mine was allowed to flood after closing and overflows mainly at the Ballymurtagh Road Adit (SW3) and on occasion at the Deep Ballygahan Adit (SW2). Therefore, any leachate generated within the body of waste seeps into the underground tailings and subsequently into the underground mine. Therefore, any landfill leachate contamination would be observed at the Ballymurtagh Road Adit (SW3).

RC6 was dry for all rounds of monitoring in 2008. G2/04 has been dry for all rounds of monitoring since November 2005, it was however possible to obtain a sample from G2/04 in November 2008, likely due to increased rainfall.

The following interpretations summarise the overall groundwater quality. More detailed interpretations can be found within the quarterly monitoring reports, which were submitted to the Agency throughout the reporting period.

2.2.1 Interpretation

The groundwater up-gradient of the landfill (Twin Shafts) is generally of good quality, however during analysis of annual parameters in the fourth quarter high concentrations of zinc (1mg/l), manganese (0.17mg/l), cadmium (0.009mg/l) and calcium (3809mg/l) were recorded. Bacteriological quality is generally poor and high concentrations of coliforms are likely to originate from local agricultural practices.

BH96/3 is located down gradient but adjacent to the main body of waste and is therefore more representative of leachate than groundwater. Samples taken at BH96/3 are of poor quality with conductivity, ammonia, iron, potassium, total coliforms and sulphate exceeding the relevant EU MAC limits on all sampling occasions. Faecal coliforms exceeded concentrations for the 3rd and 4th quarters. Calcium, manganese and magnesium were also elevated in the 4th quarter for the annual round of monitoring.

Groundwater quality at other down-gradient (G1/04, G1/05 and G2/05) monitoring points is also considered poor with low pH concentrations, incidences of high conductivity, iron and sulphate concentrations. Exceedances for ammonium were recorded at G1/04. The limits for copper, magnesium, manganese, zinc, iron, lead, fluoride, chromium, and cadmium were also exceeded at most of the sampling wells during monitoring of annual parameters. Incidents of high total coliforms were recorded throughout the year indicating poor bacteriological quality.

Water quality at the private wells is generally good. However the pH concentrations were outside the recommended range in all wells throughout the year. The only exception to this is Donal O'Learys well recording a pH of 6.5 in the 3rd quarter. Elevated total coliforms were detected in all wells; O'Learys well in the 1st Quarter, all wells in the 3rd quarter and all except Greens well in the 4th quarter. Feacal coliforms were also high at O'Learys well in the 1st & 3rd quarter and at Merrigans well in the 3rd quarter. Iron and manganese were elevated in the 2nd and 4th quarters in Greens Well Interpretations and results ere provided to each well owner after each quarter.

As discussed above in Section 2.2, it is considered that SW3 (Ballymurtagh Road Adit) is representative of down-gradient conditions, details of which are outlined in Section 2.1.1.

2.3 LEACHATE

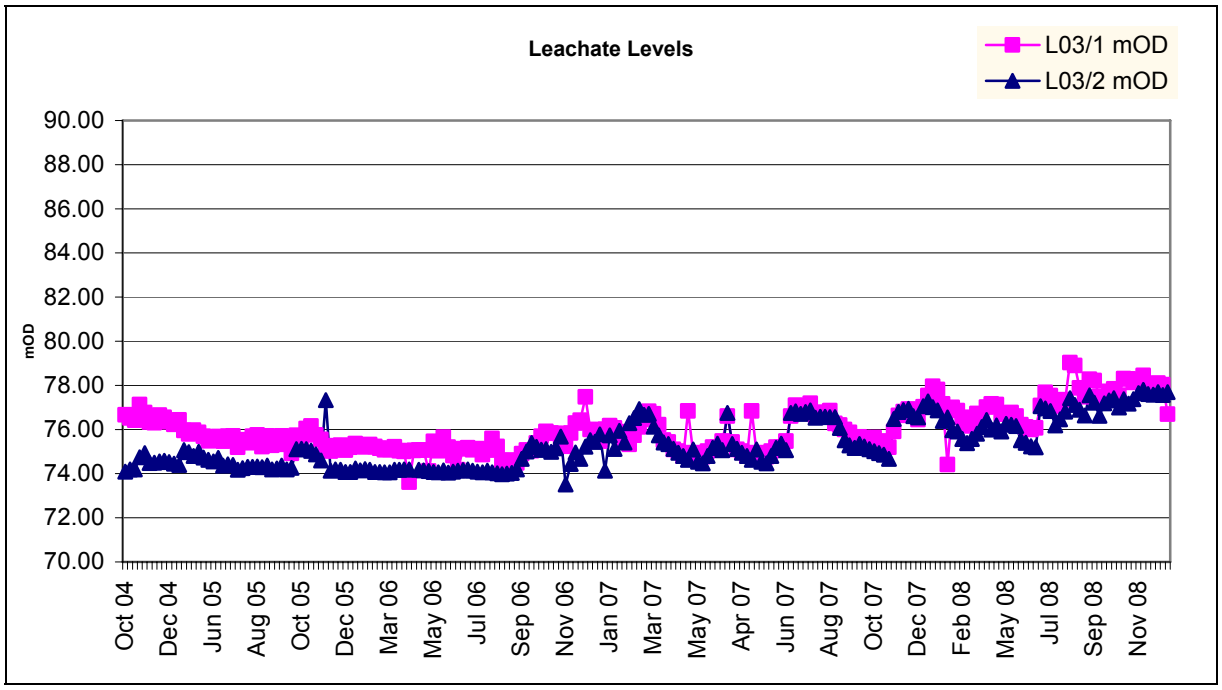
Leachate samples were taken from leachate monitoring points L05/10 and L05/16 in all quarters of this monitoring period. Samples were not obtained from the remainder of the wells (i.e. L03/1, RC3, RC4, RC5, V9 and SP9) as these wells are no longer operational. The samples obtained in November were analysed for a broader range of parameters to comply with the annual monitoring requirements of the licence. The results were compared with typical leachate compositions of 30 samples from UK/Irish landfills (EPA, 1997).

The concentrations of most of the indicator parameters, including all the metals for most of the samples taken, are within the typical/average values for landfill leachate.

2.3.1 Leachate Levels

Leachate levels fluctuate throughout the year as shown in Figure 2.6.

Figure 2.6: Leachate Levels at L03/1 and L03/2 – August 2004 to December 2008



2.4 NOISE

Noise monitoring was undertaken by Euro Environmental at 2 monitoring locations (NSL1 and NSL4) (see Figure 2.1) in March 2009. The 55dB(A) day limit was not exceeded at monitoring point NSL4. NSL 1 exceeded the recommended daytime limits of 55dB(A) at 57dB(A), although this was attributed to traffic on the main road. No noise could be heard from operations at the landfill at NSL1 at the time of monitoring. No noise emanating from the flare was audible at NSL1, the nearest noise sensitive location to the flare.

2.5 GAS

Wicklow County Council undertook landfill gas monitoring during 2008 at those monitoring locations shown on Figure 2.1, summary results of which are contained in Appendix A.

CO_2 levels exceeded the limit of 1.5 %v/v at G6 (2.0% - 4.6%) and at G7 (3.0% - 5.3%) throughout the reporting period. Exceedances of CO_2 were recorded at other wells on occasion during the reporting period as shown in Appendix A. CH_4 levels did not exceed the Emission Limit Value at any of the points monitored during the reporting period.

2.5.1 Investigation into Elevated CO_2 levels

RPS carried out a Phase 1 desk study review of the available and relevant geological, hydrogeological and geochemical information for the area including the landfill itself and the mine workings. This report was forwarded to the agency on 5th December 2007.

2.6 LANDFILL GAS FLARE

Irish Power Systems Ltd undertook monitoring of the landfill gas flare and gas abstraction sampling points throughout 2008. Methane levels averaged at 24%, carbon dioxide at 28% and oxygen at 1.3%. Although the methane content is low and decreasing, this is indicative of the stage of the microbial degradation. The remaining % is most likely made up of hydrogen, nitrogen, carbon monoxide and water vapour derived from the atmosphere. The methane, carbon dioxide and oxygen levels recorded at the flare have decreased proportionately. O_2 levels have increased slightly in comparison to 2007.

RPS undertook the flare outlet monitoring in September to comply with the bi-annual requirements, results of which are included in Appendix A.

2.6.1 Gas Flare Unit Efficiency

Gas monitoring reports are included in Appendix A.

As reported in these reports efficient combustion is taking place within the combustion chamber of the flare and in general, is operating under the original manufacturers specification

Recently the availability of gas required to operate the flare has reduced. This may result in the flare being turned off at specific times to allow gas to build up. This will be monitored throughout 2009.

2.7 METEOROLOGICAL DATA

No meteorological data was obtained on-site during the reporting period, however data is provided by the weather station at Casement Aerodrome/Poulaphouca.

2.8 SITE SURVEY

A site survey was undertaken in July 2008 and is attached in appendix B**.**

2.9 ECOLOGY

An assessment of the ecology of the restored landfill and adjoining habitats was carried out in May 2009 and a report will be forwarded on to the agency in the near future.

3 WASTE TYPES

The landfill ceased disposal of waste in December 2002. In total 480,000 tonnes of waste was disposed of at the facility.

Table 3.2 provides summary information on wastes received at the Civic Waste Facility and which was subsequently sent off-site for recovery during 2008.

Table 3.1: Approximate Total Quantities of Waste Accepted at the Civic Waste Facility during 2008

Waste Type	EWC Code	Approx. Monthly Quantities	Materials transported Off-site
Aluminium cans	19 12 03	472 Kg	5663 Kg
Steel Cans	20 01 40	1345 Kg	16140 Kg
Paper / Cardboard packaging / tetrapak	20 01 01	21816 Kg	261792 Kg
Fluorescent tubes / Bulbs	20 01 21	45 Kg	543 Kg
Fridges / Freezers	20 01 23	1183 Kg	14195 Kg
WEE small: Photocopiers, Keyboards, TVs, Videos, Monitors, Printers, PCs, Scanners, Smoke alarms	20 01 36	3171 Kg	38050 Kg
Plastics	20 01 39	5755 Kg	69063 Kg
Batteries	20 01 33/34	537 Kg	6441 Kg
Mixed Municipal Waste	20 03 01	853 Kg	10240 Kg
Waste Oils	20 01 25/26	275 Kg	3300 Kg
Ink jet cartridges,	08 03 13	26 Units	308 Units
Glass	20 01 02	7043 Kg	84519 Kg
WEE large: Cookers, Washing machines, Dryers	19 12 02	2618 Kg	31421 Kg
Textiles, Clothes	20 01 10/11	2110 Kg	25320 Kg
Scrap Metal	20 01 40	1682 Kg	20180 Kg
Mobile Phones		17 Units	204 Units

Quantities of waste accepted at the facility have remained similar to that of 2007. There was an increase in plastics accepted at the site from 47,721 kg in 2007 to 69,063Kg in 2008 and textiles from 2,786Kg in 2007 to 25,320Kg in 2008. Glass and bulbs also showed a significant increase of 14,460Kg and 131Kg respectively. Most of the other materials collected remained at similar levels to 2007. Overall, the Civic Waste Site is very busy with a large portion of the community making use of the facility.

4 MASS BALANCE OF SPECIFIED SUBSTANCES (MBSS)

According to the Agency's 'Waste Licensing, Draft Guidance on Environmental Management Systems and Reporting to the Agency', the purpose of a MBSS is to produce a detailed analysis of the facility in order to itemise and quantify all material flows i.e. Inputs = Output + Accumulation + Consumption - Generation. As activities at the landfill ceased in December 2002, the main inputs during 2008 relate to incoming waste to the Civic Amenity Site. The main outputs are leachate (see section 4.4), air emissions, i.e. landfill gas (see section 4.3), noise (see section 2.4) and waste departing the Civic Waste Facility (see section 3). In terms of generation, leachate and air emissions (mainly landfill gas) are generated because of the decomposition of waste, which result in their output. However, as the site was restored during 2005 and 2006, it is expected that these emissions will continue to reduce over time. The main activity at the Civic Waste Facility is the transfer of the waste disposed of at the site to suitable recovery/recycling facilities.

4.1 EPRTR REQUIREMENTS

As part of the requirements of the European Pollutant Release and Transfer Register, Ballymurtagh Landfill uploaded the results of emissions on the 22nd June 2009. Further details can be seen in Appendix C.

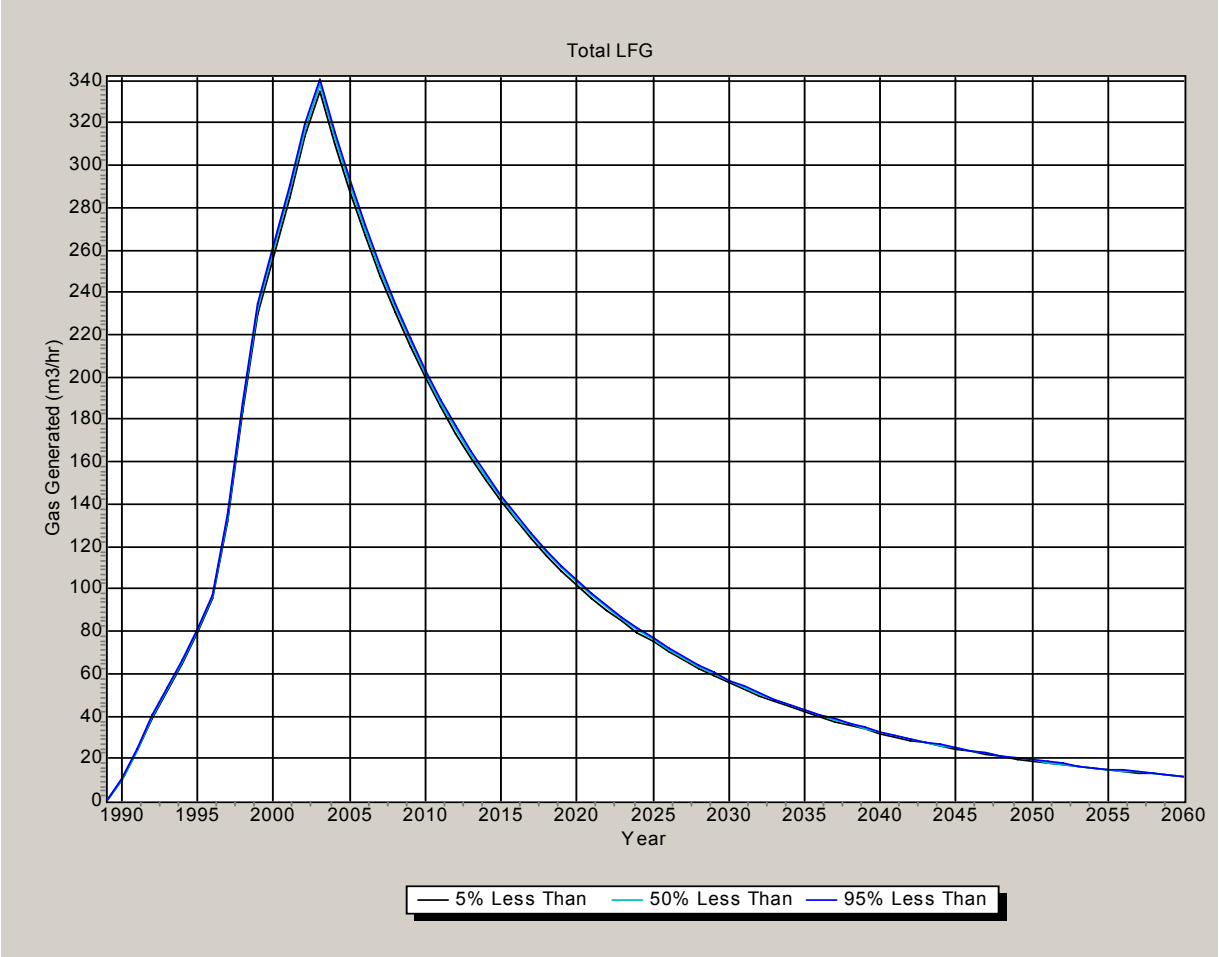
4.2 RESOURCE AND ENERGY CONSUMPTION SUMMARY

The operation of the landfill required 55,113 units of electricity, 2,800L of diesel (to operate the generator at the civic amenity site) and 6,221L of water during 2008.

4.3 ESTIMATED & CUMULATIVE QUANTITES OF LANDFILL GAS

GasSim, a landfill gas modeling software package (developed by the UK Environmental Agency), was used to simulate the expected production of landfill gas at Ballymurtagh Landfill based on the input information (see Table 3.1). Figure 4.1 shows the average hourly rate of landfill gas generation for each year for Ballymurtagh landfill.

Figure 4.1: Average hourly rate of landfill gas generated at the facility for each year 1995 to 2030**.**

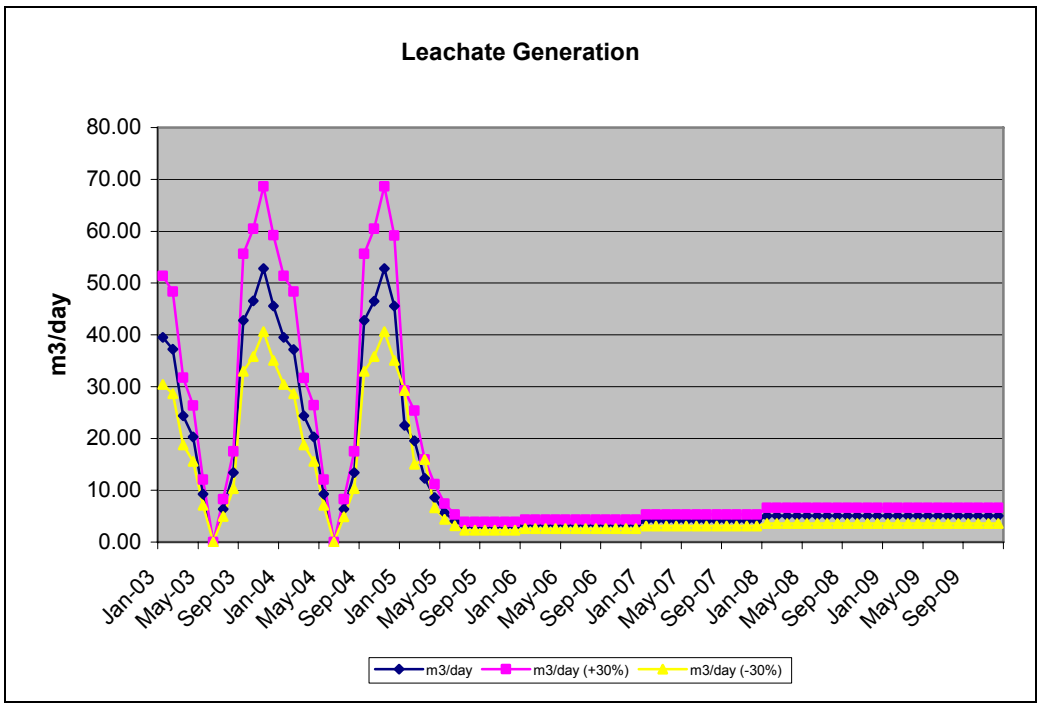


The flare at Ballymurtagh has a capacity of 500m^3/hr.

4.4 MONTHLY WATER BALANCE CALCULATION AND INTERPRETATION

Monthly rainfall data obtained from the nearest Met Eireann weather station at Poulaphouca, Co. Wicklow recorded a total of approximately 1110.3mm of rainfall in 2008. This is significantly higher than that recorded in previous years. Evapotranspiration data was obtained from Met Éireann's weather station at the Casement Aerodrome as it was not available from the weather station at Poulaphouca. The total estimated amount of rainfall lost to evapotranspiration is estimated at 546mm. Monthly volumes of leachate were calculated for the entire landfill area based on monthly rainfall, area and the stage at which the area is at i.e. completely filled and permanently capped. The water balance calculations are outlined in Appendix D. Figure 4.2 shows the estimated leachate generation for the reporting period and projections for 2009.

Figure 4.2: Estimated leachate generation at Ballymurtagh Landfill 2003-2009 (+/-30%)



It is estimated that up to 1876 m^3 of leachate were generated during the reporting period, 156m^3/month. This amount is high when compared to the estimated figure of 91m^3/month as calculated before capping. This is due to high rainfall in 2008. Evapotranspiration was slightly higher than 2007 however did not compensate for increased rainfall during the 2008 period.

4.5 EMISSIONS TO GROUNDWATER

The landfill was designed on a 'dilute and disperse' principle with no leachate containment measures put in place. The leachate, which is attenuated by the underlying soil and groundwater, drains naturally to the Avoca River.

5 SITE DEVELOPMENT WORKS

5.1 DEVELOPMENT WORKS UNDERTAKEN DURING 2008

A new shed for the storage of WEEE was erected in June 2008.

5.2 PROPOSED DEVELOPMENT WORKS

There are currently no proposals for any side development works.

6 ENVIRONMENTAL MANAGEMENT

The Facility Manager, assisted by the Senior Engineer, is responsible for achieving the schedule of objectives and targets, which are set out in the EMP. The responsibilities and time scales for achieving the objectives and targets for 2009 - 2013 are outlined in Table 6.1. As waste acceptance ceased in 2002, the objectives and targets mainly relate to the protection of the receiving environment and the aftercare of the facility.

Table 6.2 discusses the % completion of the Schedule of Objective & Targets set for 2008 - 2012.

6.1 ENVIRONMENTAL INCIDENTS

Corrective Action Report Forms relating to incidents occurring in 2008 are included in in quarterly reports forwarded to the agency throughout the year. There were no complaints in 2008.

6.2 PROCEDURES

The updated Environmental Management Plan and associated procedures was forwarded to the Agency in August 2008.

6.3 REPORTS ON FINANCIAL PROVISIONS

Wicklow County Council allocates funding on an annual basis from its revenue sources. The fund will be maintained in an amount always sufficient to underwrite the current Restoration and Aftercare Plan in accordance with Condition 11 of the Waste Licence.

Table 6.1: Schedule of Environmental Objectives and Targets for 2009 - 2013

SCHEDULE OF OBJECTIVES AND TARGETS 2009 - 2013			
Objective	**Target**	**Responsible Party**	**Completion Date**
Improve the environmental performance of the facility	Undertake regular reviews of Facility to assess compliance of site with Waste Licence	Facility Manager	Ongoing
	Submit Application for Review of Waste Licence (and accompanying EIS)	Director of Services	2009
Reduce potential odour at the facility	Minimise the number of landfill gas flare shutdowns and ensure that the flare is operating as near to 100% of the time as possible.	Facility Manager	Ongoing
Encourage public to recycle their waste	To inform the public of the waste accepted at the civic waste facility by issuing information at the civic waste facility office to members of the public, radio and newspaper advertisements	CWF Supervisor Facility Manager	Ongoing
Provide for the protection of the receiving environment.	Wicklow County Council will support any remedial action taken to improve the quality of the Avoca River. A report into the investigation of treatment of groundwater discharges from the adits was completed in February 2007. (University of Newcastle)	Senior Engineer	Ongoing
Accept additional waste materials at the Civic Waste Facility	Source further recycling/re-use opportunities	CWF Supervisor Facility Manager	Ongoing

Table 6.2. % Completion of Schedule of Objectives & Targets for 2008

SCHEDULE OF OBJECTIVES AND TARGETS 2008				
Objective	**Target**	**Responsible Party**	**% Completion**	**Comment**
Improve the environmental performance of the facility	Undertake regular reviews of conditions of Waste Licence to assess compliance of site	Facility Manager	100	Compliance of the facility is discussed on a regular basis.
Reduce potential odour at the facility	Clearly identify the source of any carbon dioxide trigger level exceedences recorded at perimeter boreholes	Facility Manager	100	A Phase 1 desk study report on the investigation into elevated carbon dioxide levels was submitted to the Agency in December 2007.
Encourage public to recycle their waste	To inform the public of the waste accepted at the civic waste facility by issuing information at the civic waste facility office to members of the public, radio and newspaper advertisements	CWF Supervisor Facility Manager	Ongoing	
Provide for the protection of the receiving environment.	Wicklow County Council will support any remedial action taken to improve the quality of the Avoca River	Senior Engineer	Ongoing	A report into the investigation of treatment of groundwater discharges from the adits was completed in February 2007. An EIS for Ballymurtagh will be prepared in 2009.
	Actively participate in the identification and implementation of appropriate measures to minimise the impact of the landfill on groundwater and surface water in the area	Facility Manager		
Reduce the potential for long-term environmental impacts	Implement the Landscaping Plan	Facility Manager	100%	Landscaping is now complete.
	Minimise the number of landfill gas flare shutdowns and ensure that the flare is operating as near to 100% of the time as possible	Facility Manager	Ongoing	
Accept additional waste materials at the Civic Waste Facility	Source further recycling/re-use opportunities	CWF Supervisor Facility Manager	Ongoing	

7 STAFFING AT BALLYMURTAGH LANDFILL

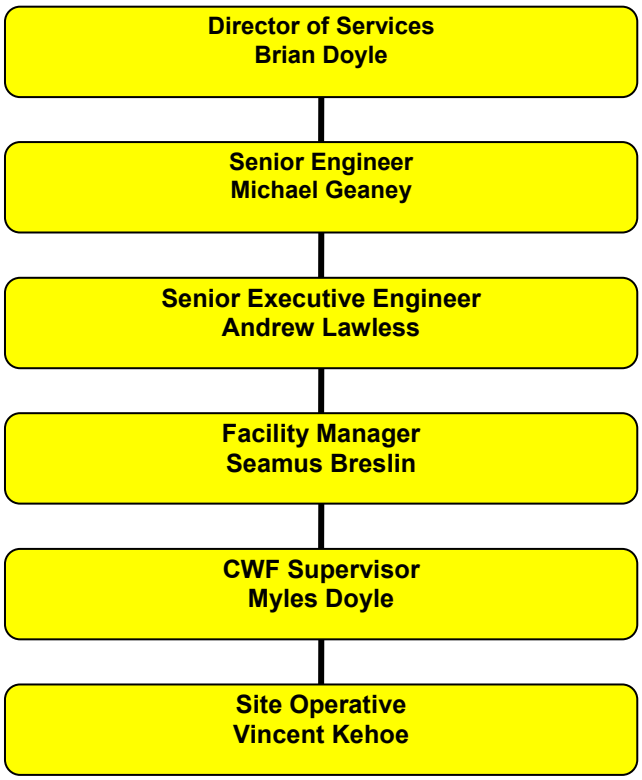
The site is under the overall operational control of the Director of Services and the Senior Engineer who provide office support as required. The Facility Manager is responsible for the day-to-day supervision and management of the site. The Facility Manager maintains regular contact with County Buildings, with regular site visits from the Senior Executive Engineer. RPS Consulting Engineers advises Wicklow County Council on operations at the facility and waste licence compliance issues. Table 7.1 provides details of the management as at June 2008.

Table 7.1: Managerial Staff

Position	Contact details
Mr Brian Doyle, Director of Services (Environmental & Sanitary Services)	Wicklow County Council, County Buildings, Wicklow. Telephone No: 0404 20100 Fax No: 0404-67792
Mr Michael Geaney, Senior Engineer (Environmental & Sanitary Services)	Wicklow County Council, County Buildings, Wicklow.
Mr Andrew Lawless, Senior Executive Engineer (Environmental & Sanitary Services)	Wicklow County Council, County Buildings, Wicklow.
Mr Seamus Breslin, Facility Manager	Wicklow County Council, County Buildings, Wicklow.

Figure 7.1 outlines the management structure for the site. A supervisor is also employed to run the civic waste facility. Any changes to this structure will be submitted to the Agency for agreement in accordance with Condition 2.6 of Waste Licence Reg. No. W0011-1.

Figure 7.1: Management Structure & Organisational Chart



7.1 ECONOMIC CONTRIBUTION

The operation of the landfill employed 4 local employees when it was in operation. Since closing in December 2002, one employee has taken the position of site supervisor at the Civic Waste Facility and another employee as Civic Waste Facility operator.

8 NUISANCE CONTROL

Wicklow County Council undertake weekly inspections of the landfill and civic waste facility to identify any environmental nuisances caused by litter, dust, odour and vermin. An inspection form is outlined in the EMP and forms part of the Corrective Action Procedure.

8.1 LITTER

The Facility Manager ensures that the facility is kept free from litter. In the event of fly tipping, the Facility Manager notifies and organises for the proper disposal of the waste.

8.2 ODOUR

In the event of odour detection, the Facility Manager has regard to the Corrective Action Procedure.

Irish Power Systems (IPS) visit the site on a weekly basis to maintain the gas extraction system so as to minimise flare failure which may lead to landfill gas migration and subsequent odour complaints.

8.3 VERMIN CONTROL

The Procedure for the Control of Vermin (set out in the EMP) outlines measures to ensure that vermin do not give rise to nuisance at the landfill and civic waste facility.

The Facility Manager oversees the implementation of the procedure for the control and eradication of pests. However, since waste acceptance has ceased at the landfill facility, the potential for vermin, pests, birds, etc has been much reduced.

APPENDIX A

Monitoring Results

Parameter	Units	Surface Water Regulations 1989 Max. Admissable Conc.	Environmental Quality Standards (proposed by EPA, 1997) Proposed Limits	SW1 Whitesbridge s/w sample Sampled: 11/11/08 Analysed: 12/11/08	SW1 Whitesbridge s/w sample Sampled: 07/08/08 Analysed: 07/08/08	SW1 Whitesbridge s/w sample Sampled: 19/5/08 Analysed: 19/5/08	SW1 Whitesbridge s/w sample Sampled: 5/2/08 Analysed: 5/2/08
pH		**5.5 < pH < 8.5**	**5.5 <pH < 9.0**	6.9	7.0	7.2	6.9
Temperature (on site)	^{o}C	**25**		6	14	11	8
Conductivity	uS/cm at $20^{o}C$	**1,000**	**1,000**	58	55	86	59
C.O.D.	mg/l O_2	**40**	**None**	20	26	32	9
B.O.D.	mg/l O_2	**5**	**5**	<3	<5	8	<2
Dissolved Oxygen (on site)	mg/l O_2	**<5**	**<9 (@ 50% of the time)**	7.5	9.3	13.6	9.7
Total Suspended Solids	mg/l SS	**35**		4	3	4	6
Total Oxidised Nitrogen	mg/l N	**5**	**11.36**	0.9			
Total Alkalinity	mg/l HCO_3		**None**	12			
Ammonium	mg/l NH_4	**0.2**	**20ug/l NH_3 un-ionised Ammonia**	<0.08	<0.08	<0.08	<0.08
Calcium	mg/l Ca		**None**	5			
Cadmium	mg/l Cd	**0.005**	**0.005**	<0.0002			
Chromium	mg/l Cr	**0.05**	**0.05**	<0.001			
Chloride	mg/l Cl	**250**	**250**	8	8	10	10
Copper	mg/l Cu	**0.05**	**0.005 - 0.112**	0.0094			
Iron	mg/l Fe	**0.2**	**1**	0.27			
Lead	mg/l Pb	**0.05**	**0.05**	<0.004			
Magnesium	mg/l Mg		**None**	2			
Manganese	mg/l Mn	**0.05**	**0.3**	0.03			
Mercury	mg/l Hg	**0.001**	**0.001**	<0.000012			
Total Phosphorus as P	mg/l P	**-**	**-**	0.06			
Phosphate	mg/l P_2O_5	**0.5**	**0.07 mg/l P (0.32 mg/l P_2O_5) (for Seriously polluted river (Q<2)**	<1			
Potassium	mg/l K		**None**	<1			
Sodium	mg/l Na		**None**	5			
Sulphate	mg/l SO_4	**200**	**200**	5	5	9	6
Zinc	mg/l Zn	**3**	**0.03 - 0.5**	0.06			

Parameter	Units	Surface Water Regulations 1989 Max. Admissable Conc.	Environmental Quality Standards (proposed by EPA, 1997) Proposed Limits	SW2 Upstream adit s/w sample Sampled: 11/11/08 Analysed: 12/11/08	SW2 Upstream adit s/w sample Sampled: 07/08/08 Analysed: 07/08/08	SW2 Upstream adit s/w sample Sampled: 19/5/08 Analysed:19/5/08	SW2 Upstream adit s/w sample Sampled: 5/2/08 Analysed: 5/2/08
pH		**5.5 < pH < 8.5**	**5.5 <pH < 9.0**	6.6	6.9	6.7	6.5
Temperature (on site)	^{o}C	**25**		6	14	11	8
Conductivity	uS/cm at 20^{o}C	**1,000**	**1,000**	57	63	94	61
C.O.D.	mg/l O_2	**40**	**None**	16	22	19	16
B.O.D.	mg/l O_2	**5**	**5**	<3	<5	4	<3
Dissolved Oxygen (on site)	mg/l O_2	**<5**	**<9 (@ 50% of the time)**	8.0	9.3	12.1	10.1
Total Suspended Solids	mg/l SS	**35**		5	2	3	8
Total Oxidised Nitrogen	mg/l N	**5**	**11.36**	0.9			
Total Alkalinity	mg/l HCO_3		**None**	12			
Ammonium	mg/l NH_4	**0.2**	**20ug/l NH_3 un-ionised Ammonia**	<0.08	<0.08	<0.08	<0.08
Calcium	mg/l Ca		**None**	5			
Cadmium	mg/l Cd	**0.005**	**0.005**	<0.0005			
Chromium	mg/l Cr	**0.05**	**0.05**	<0.001			
Chloride	mg/l Cl	**250**	**250**	8	9	10	10
Copper	mg/l Cu	**0.05**	**0.005 - 0.112**	0.017			
Iron	mg/l Fe	**0.2**	**1**	0.31			
Lead	mg/l Pb	**0.05**	**0.05**	<0.01			
Magnesium	mg/l Mg		**None**	2			
Manganese	mg/l Mn	**0.05**	**0.3**	0.05			
Mercury	mg/l Hg	**0.001**	**0.001**	<0.000012			
Total Phosphorus as P	mg/l P	**-**	**-**	<0.05			
Phosphate	mg/l P_2O_5	**0.5**	**0.07 mg/l P (0.32 mg/l P_2O_5) (for Seriously polluted river (Q<2)**	<1			
Potassium	mg/l K		**None**	<1			
Sodium	mg/l Na		**None**	5			
Sulphate	mg/l SO_4	**200**	**200**	7	7	15	7
Zinc	mg/l Zn	**3**	**0.03 - 0.5**	0.06			

Parameter	Units	Surface Water Regulations 1989	Environmental Quality Standards (proposed by EPA, 1997)	SW3 B'murtagh Adit s/w sample	SW3 B'murtagh Adit s/w sample	SW3 B'murtagh Adit s/w sample	SW3 B'murtagh Adit s/w sample
				Sampled: 11/11/08	Sampled: 07/08/08	Sampled: 19/5/08	Sampled: 5/2/08
		Max. Admissable Conc.	Proposed Limits	Analysed: 12/11/08	Analysed: 07/08/08	Analysed:19/5/08	Analysed: 5/2/08
pH		**5.5 < pH < 8.5**	**5.5 <pH < 9.0**	4.2	4.3	3.8	4.0
Temperature (on site)	^{o}C	**25**		11	15	13	12
Conductivity	uS/cm at 20^{o}C	**1,000**	**1,000**	1870	2150	1941	2080
C.O.D.	mg/l O_2	**40**	**None**	18	24	24	22
B.O.D.	mg/l O_2	**5**	**5**	15	21	14	<3
Dissolved Oxygen (on site)	mg/l O_2	**<5**	**<9 (@ 50% of the time)**	4.9	7.3	6.0	6.1
Total Suspended Solids	mg/l SS	**35**		6	7	4	12
Total Oxidised Nitrogen	mg/l N	**5**	**11.36**	0.5			
Total Alkalinity	mg/l HCO_3		**None**	<5			
Ammonium	mg/l NH_4	**0.2**	**20ug/l NH_3 un-ionised Ammonia**	2.4	7.9	9.4	10.0
Calcium	mg/l Ca		**None**	184			
Cadmium	mg/l Cd	**0.005**	**0.005**	0.019			
Chromium	mg/l Cr	**0.05**	**0.05**	<0.001			
Chloride	mg/l Cl	**250**	**250**	37	38	44	43
Copper	mg/l Cu	**0.05**	**0.005 - 0.112**	0.035			
Iron	mg/l Fe	**0.2**	**1**	156			
Lead	mg/l Pb	**0.05**	**0.05**	0.355			
Magnesium	mg/l Mg		**None**	123			
Manganese	mg/l Mn	**0.05**	**0.3**	11			
Mercury	mg/l Hg	**0.001**	**0.001**	<0.000012			
Total Phosphorus as P	mg/l P	**-**	**-**	0.08			
Phosphate	mg/l P_2O_5	**0.5**	**0.07 mg/l P (0.32 mg/l P_2O_5) (for Seriously polluted river (Q<2)**	<1			
Potassium	mg/l K		**None**	10			
Sodium	mg/l Na		**None**	21			
Sulphate	mg/l SO_4	**200**	**200**	1275	1456	1211	1515
Zinc	mg/l Zn	**3**	**0.03 - 0.5**	13			

Parameter	Units	Surface Water Regulations 1989	Environmental Quality Standards (proposed by EPA, 1997)	SW4 Coal Yard s/w sample	SW4 Coal Yard s/w sample	SW4 Coal Yard s/w sample	SW4 Coal Yard s/w sample
				Sampled: 11/11/08	Sampled: 07/08/08	Sampled: 19/5/08	Sampled: 5/2/08
		Max. Admissable Conc.	Proposed Limits	Analysed: 12/11/08	Analysed: 07/08/08	Analysed:19/5/08	Analysed: 5/2/08
pH		**5.5 < pH < 8.5**	**5.5 <pH < 9.0**	6.2	6.6	6.2	6.1
Temperature (on site)	^{o}C	**25**		7	14	11	8
Conductivity	uS/cm at 20^{o}C	**1,000**	**1,000**	90	71	127	75
C.O.D.	mg/l O_2	**40**	**None**	16	19	22	<4
B.O.D.	mg/l O_2	**5**	**5**	<3	<3	7	<2
Dissolved Oxygen (on site)	mg/l O_2	**<5**	**<9 (@ 50% of the time)**	7.7	8.7	12.3	8.4
Total Suspended Solids	mg/l SS	**35**		3	3	9	6
Total Oxidised Nitrogen	mg/l N	**5**	**11.36**	0.8			
Total Alkalinity	mg/l HCO_3		**None**	9			
Ammonium	mg/l NH_4	**0.2**	**20ug/l NH_3 un-ionised Ammonia**	0.12	0.08	<0.08	<0.08
Calcium	mg/l Ca		**None**	5			
Cadmium	mg/l Cd	**0.005**	**0.005**	0.001			
Chromium	mg/l Cr	**0.05**	**0.05**	<0.001			
Chloride	mg/l Cl	**250**	**250**	8	8	11	10
Copper	mg/l Cu	**0.05**	**0.005 - 0.112**	0.012			
Iron	mg/l Fe	**0.2**	**1**	0.8			
Lead	mg/l Pb	**0.05**	**0.05**	0.007			
Magnesium	mg/l Mg		**None**	3			
Manganese	mg/l Mn	**0.05**	**0.3**	0.07			
Mercury	mg/l Hg	**0.001**	**0.001**	<0.000012			
Total Phosphorus as P	mg/l P	**-**	**-**	0.05			
Phosphate	mg/l P_2O_5	**0.5**	**0.07 mg/l P (0.32 mg/l P_2O_5) (for Seriously polluted river (Q<2)**	<1			
Potassium	mg/l K		**None**	<1			
Sodium	mg/l Na		**None**	5			
Sulphate	mg/l SO_4	**200**	**200**	12	13	31	14
Zinc	mg/l Zn	**3**	**0.03 - 0.5**	0.15			

Parameter	Units	Surface Water Regulations 1989	Environmental Quality Standards (proposed by EPA, 1997)	SW5 Avoca Bridge s/w sample	SW5 Avoca Bridge s/w sample	SW5 Avoca Bridge s/w sample	SW5 Avoca Bridge s/w sample
				Sampled: 11/11/08	Sampled: 07/08/08	Sampled: 19/5/08	Sampled: 5/2/08
		Max. Admissable Conc.	Proposed Limits	Analysed: 12/11/08	Analysed: 07/08/08	Analysed: 19/5/08	Analysed: 5/2/08
pH		**5.5 < pH < 8.5**	**5.5 <pH < 9.0**	6.4	6.8	6.6	6.4
Temperature (on site)	^{o}C	**25**		6	14	11	8
Conductivity	uS/cm at $20^{o}C$	**1,000**	**1,000**	61	61	110	64
C.O.D.	mg/l O_2	**40**	**None**	17	17	18	<4
B.O.D.	mg/l O_2	**5**	**5**	<3	<3	<3	<2
Dissolved Oxygen (on site)	mg/l O_2	**<5**	**<9 (@ 50% of the time)**	7.7	9.6	10.7	7.6
Total Suspended Solids	mg/l SS	**35**		4	2	3	7
Total Oxidised Nitrogen	mg/l N	**5**	**11.36**	0.9			
Total Alkalinity	mg/l HCO_3		**None**	11			
Ammonium	mg/l NH_4	**0.2**	**20ug/l NH_3 un-ionised Ammonia**	<0.08	<0.08	0.15	<0.08
Calcium	mg/l Ca		**None**	5			
Cadmium	mg/l Cd	**0.005**	**0.005**	0.00038			
Chromium	mg/l Cr	**0.05**	**0.05**	<0.001			
Chloride	mg/l Cl	**250**	**250**	8	8	11	10
Copper	mg/l Cu	**0.05**	**0.005 - 0.112**	0.008			
Iron	mg/l Fe	**0.2**	**1**	0.41			
Lead	mg/l Pb	**0.05**	**0.05**	0.006			
Magnesium	mg/l Mg		**None**	2			
Manganese	mg/l Mn	**0.05**	**0.3**	0.05			
Mercury	mg/l Hg	**0.001**	**0.001**	<0.000012			
Total Phosphorus as P	mg/l P	**-**	**-**	0.05			
Phosphate	mg/l P_2O_5	**0.5**	**0.07 mg/l P (0.32 mg/l P_2O_5) (for Seriously polluted river (Q<2)**	<1			
Potassium	mg/l K		**None**	<1			
Sodium	mg/l Na		**None**	5			
Sulphate	mg/l SO_4	**200**	**200**	8	8	22	9
Zinc	mg/l Zn	**3**	**0.03 - 0.5**	0.11			

Parameter	Units	EU Directive				
			Twin Shafts	Twin Shafts	Twin Shafts	Twin Shafts
			g/w sample	g/w sample	g/w sample	g/w sample
			Sampled 11/11/08	Sampled 07/08/08	Sampled 19/5/08	Sampled 5/2/08
		Max. Admissable Conc.	Analysed 12/11/08	Analysed 07/08/08	Analysed 19/5/08	Analysed 5/2/08
Water Level	**(m)**		**n/a**	**n/a**	**n/a**	**n/a**
Depth	**(m)**					
Visual Description	**-**		Colourless with some suspended solid	Clear, colourless	Clear, colourless	Clear, colourless
pH		**6.5 < pH < 9.5**	6.8	6.9	6.8	7.3
Temperature (on site)	^{o}C	**25**	9	13	12	9
Odour			Odourless	Odourless	Odourless	Odourless
Conductivity	uS/cm at $20^{o}C$	**1,500**	360	397	419	383
Residue on Evaporation	mg/l @ $180^{o}C$	**1,500**	218			
Dissolved Oxygen	mg/l O_2		7.3	8.0	8.0	8.4
Total Organic Carbon	mg/l	**No abnormal change**	2.1	1.2	1.4	2.3
Total Oxidised Nitrogen	mg/l N		4.2	3.2	2.5	6.6
Total Alkalinity	mg/l HCO_3		42			
Ammonium	mg/l NH_4	**0.3**	<0.08	<0.08	<0.08	<0.08
Boron	mg/l B	**1.0**	<0.017			
Calcium	mg/l Ca	**200**	3890			
Cadmium	mg/l Cd	**0.005**	0.009			
Chromium	mg/l Cr	**0.05**	<0.001			
Chloride	mg/l Cl	**250**	26	27	28	29
Copper	mg/l Cu	**0.5**	0.018			
Cyanide	mg/l CN	**0.05**	<0.01			
Flouride	mg/l F	**1.5**	0.13			
Iron	mg/l Fe	**0.2**	0.15	0.14	0.12	0.12
Lead	mg/l Pb	**0.05**	<0.004			
Magnesium	mg/l Mg	**50**	12			
Manganese	mg/l Mn	**0.05**	0.17			
Mercury	mg/l Hg	**0.001**	<0.000012			
Nitrate	mg/l NO_3	**50**				
Nitrite	mg/l NO_2	**0.5**				
Total Phosphorus as P	mg/l P	**2.18**	0.05			
Ortho-Phosphate	mg/l PO_4	**6**	<1			
Potassium	mg/l K	**12**	11	8	7	12
Phenols	mg/l C_6H_5OH	**0.0005**	<0.05	<0.05	<0.05	0.08
Sodium	mg/l Na	**200**	11	11	10	12
Sulphate	mg/l SO_4	**250**	95	115	119	98
Zinc	mg/l Zn	**1**	1			
Total Coliforms	CFU per 100 ml	**Nil**	>100	>100	>100	>100 cfu / 100mls
Faecal Coliforms	CFU per 100 ml	**Nil**	3	0	0	4 cfu / 100mls

Parameter	Units	EU Directive				
			G1/04	G1/04	G1/04	G1/04
			g/w sample	g/w sample	g/w sample	g/w sample
			Sampled 11/11/08	Sampled 07/08/08	Sampled 19/5/08	Sampled 5/2/08
		Max. Admissable Conc.	Analysed 12/11/08	Analysed 07/08/08	Analysed 19/5/08	Analysed 5/2/08
Water Level	**(m)**		**25.12**	**25.1**	**25.25**	**25.43**
Depth	**(m)**					
Visual Description	**-**		Yellow, turbid	Pale yellow, with suspended solids present	Yellow, cloudy	Turbid yellowish colour
pH		**6.5 < pH < 9.5**	2.9	3.0	3.0	3.0
Temperature (on site)	^{o}C	**25**	9	13	13	10
Odour			Slight septic odour	Odourless	Decaying food	slight organic odour
Conductivity	uS/cm at $20^{o}C$	**1,500**	9270	9850	9870	10220
Residue on Evaporation	mg/l @ $180^{o}C$	**1,500**	17889			
Dissolved Oxygen	mg/l O_2		6.1	3.9	7.9	4.0
Total Organic Carbon	mg/l	**No abnormal change**	9.9	9	9	11
Total Oxidised Nitrogen	mg/l N		<1.14	<1.43	<0.62	<1.04
Total Alkalinity	mg/l HCO_3		<5			
Ammonium	mg/l NH_4	**0.3**	0.39	1.2	1.2	1.3
Boron	mg/l B	**1.0**	<0.017			
Calcium	mg/l Ca	**200**	341			
Cadmium	mg/l Cd	**0.005**	0.833			
Chromium	mg/l Cr	**0.05**	0.133			
Chloride	mg/l Cl	**250**	21	30	32	10
Copper	mg/l Cu	**0.5**	140			
Cyanide	mg/l CN	**0.05**	<0.01			
Flouride	mg/l F	**1.5**	14			
Iron	mg/l Fe	**0.2**	84	84	148	111
Lead	mg/l Pb	**0.05**	0.343			
Magnesium	mg/l Mg	**50**	1248			
Manganese	mg/l Mn	**0.05**	55			
Mercury	mg/l Hg	**0.001**	0.000359			
Nitrate	mg/l NO_3	**50**				
Nitrite	mg/l NO_2	**0.5**				
Total Phosphorus as P	mg/l P	**2.18**	0.24			
Ortho-Phosphate	mg/l PO_4	**6**	<5			
Potassium	mg/l K	**12**	<5	<2	<5	<2
Phenols	mg/l C_6H_5OH	**0.0005**	0.08	0.06	<0.05	0.1
Sodium	mg/l Na	**200**	6	8	8	7
Sulphate	mg/l SO_4	**250**	12460	14135	14617	13880
Zinc	mg/l Zn	**1**	207			
Total Coliforms	CFU per 100 ml	**Nil**	10	>100	0	5 cfu / 20 mls
Faecal Coliforms	CFU per 100 ml	**Nil**	0	0	0	0 cfu / 20 mls

Parameter	Units	EU Directive	G2/04	G2/04	G2/04	G2/04
			g/w sample	g/w sample	g/w sample	g/w sample
			Sampled 11/11/08	Not sampled	Not sampled	Not sampled
		Max. Admissable Conc.	Analysed 12/11/08	Analysed -	Analysed -	Analysed -
Water Level **Depth** **Visual Description**	**(m)** **(m)** **-**		**n/a** Yellow, turbid with soily sediment			
pH		**6.5 < pH < 9.5**	3.2			
Temperature (on site)	^{o}C	**25**	9			
Odour			Mild Musty			
Conductivity	uS/cm at $20^{o}C$	**1,500**	159			
Residue on Evaporation	mg/l @ $180^{o}C$	**1,500**	5820			
Dissolved Oxygen	mg/l O_2		Not Recorded			
Total Organic Carbon	mg/l	**No abnormal change**	5.8			
Total Oxidised Nitrogen	mg/l N		4			
Total Alkalinity	mg/l HCO_3		<5			
Ammonium	mg/l NH_4	**0.3**	1.7			
Boron	mg/l B	**1.0**	0.19			
Calcium	mg/l Ca	**200**	204			
Cadmium	mg/l Cd	**0.005**	0.118			
Chromium	mg/l Cr	**0.05**	0.044			
Chloride	mg/l Cl	**250**	16			
Copper	mg/l Cu	**0.5**	57			
Cyanide	mg/l CN	**0.05**				
Flouride	mg/l F	**1.5**	3.1			
Iron	mg/l Fe	**0.2**	28			
Lead	mg/l Pb	**0.05**	0.242			
Magnesium	mg/l Mg	**50**	375			
Manganese	mg/l Mn	**0.05**	20			
Mercury	mg/l Hg	**0.001**	0.0032			
Nitrate	mg/l NO_3	**50**				
Nitrite	mg/l NO_2	**0.5**				
Total Phosphorus as P	mg/l P	**2.18**	14			
Ortho-Phosphate	mg/l PO_4	**6**	<1			
Potassium	mg/l K	**12**	1			
Phenols	mg/l C_6H_5OH	**0.0005**				
Sodium	mg/l Na	**200**	11			
Sulphate	mg/l SO_4	**250**	4074			
Zinc	mg/l Zn	**1**	37			
Total Coliforms	CFU per 100 ml	**Nil**	>100			
Faecal Coliforms	CFU per 100 ml	**Nil**	0			

Parameter	Units	EU Directive				
			G1/05	G1/05	G1/05	G1/05
			g/w sample	g/w sample	g/w sample	g/w sample
			Sampled 11/11/08	Sampled 07/08/08	Sampled 19/5/08	Sampled 5/2/08
		Max. Admissable Conc.	Analysed 12/11/08	Analysed 07/08/08	Analysed 19/5/08	Analysed 5/2/08
Water Level	**(m)**		**4.26**	**4.1**	**5**	**4.35**
Depth	**(m)**					
Visual Description	**-**		Clear, colourless	Clear, colourless	Clear, colourless	Clear, colourless
pH		**6.5 < pH < 9.5**	3.8	3.7	3.9	3.7
Temperature (on site)	^{o}C	**25**	10	13	11	9
Odour			Odourless	Odourless	Odourless	Odourless
Conductivity	uS/cm at 20^{o}C	**1,500**	2020	1628	1599	1980
Residue on Evaporation	mg/l @ 180^{o}C	**1,500**	2382			
Dissolved Oxygen	mg/l O_2		5.4	4.6	6.4	5
Total Organic Carbon	mg/l	**No abnormal change**	2.0	1.4	1.7	2.0
Total Oxidised Nitrogen	mg/l N		1.0	1.3	1.2	1.1
Total Alkalinity	mg/l HCO_3		<5			
Ammonium	mg/l NH_4	**0.3**	<0.08	<0.08	<0.08	<0.08
Boron	mg/l B	**1.0**	<0.017			
Calcium	mg/l Ca	**200**	207			
Cadmium	mg/l Cd	**0.005**	0.057			
Chromium	mg/l Cr	**0.05**	<0.005			
Chloride	mg/l Cl	**250**	15	16	13	15
Copper	mg/l Cu	**0.5**	11.8			
Cyanide	mg/l CN	**0.05**	<0.01			
Flouride	mg/l F	**1.5**	2.6			
Iron	mg/l Fe	**0.2**	25	0.17	0.26	25.8
Lead	mg/l Pb	**0.05**	0.279			
Magnesium	mg/l Mg	**50**	140			
Manganese	mg/l Mn	**0.05**	8.2			
Mercury	mg/l Hg	**0.001**	<0.000012			
Nitrate	mg/l NO_3	**50**				
Nitrite	mg/l NO_2	**0.5**				
Total Phosphorus as P	mg/l P	**2.18**	<0.05			
Ortho-Phosphate	mg/l PO_4	**6**	<1			
Potassium	mg/l K	**12**	2	2	2	2
Phenols	mg/l C_6H_5OH	**0.0005**	<0.05	<0.05	<0.05	<0.05
Sodium	mg/l Na	**200**	12	12	10	13
Sulphate	mg/l SO_4	**250**	1596	1156	1277	1716
Zinc	mg/l Zn	**1**	21			
Total Coliforms	CFU per 100 ml	**Nil**	0	1	27	0
Faecal Coliforms	CFU per 100 ml	**Nil**	0	0	0	0

Parameter	Units	EU Directive	G2/05	G2/05	G2/05	G2/05
			g/w sample	g/w sample	g/w sample	g/w sample
			Sampled 11/11/08	Sampled 07/08/08	Sampled 19/5/08	Sampled 5/2/08
		Max. Admissable Conc.	Analysed 12/11/08	Analysed 07/08/08	Analysed 19/5/08	Analysed 5/2/08
Water Level	**(m)**		**4.03**	**4.1**	**4.8**	**4.4**
Depth	**(m)**					
Visual Description	**-**		Clear, colourless	Pale Yellow with some suspended solids	Clear, grey / brown	Clear, colourless
pH		**6.5 < pH < 9.5**	3.8	3.8	3.7	3.8
Temperature (on site)	^{o}C	**25**	10	13	11	9
Odour			Odourless	Odourless	Odourless	Odourless
Conductivity	uS/cm at $20^{o}C$	**1,500**	1393	1327	1468	1407
Residue on Evaporation	mg/l @ $180^{o}C$	**1,500**	1460			
Dissolved Oxygen	mg/l O_2		6	6.6	7.3	6.2
Total Organic Carbon	mg/l	**No abnormal change**	1.7	1.2	1.6	9.2
Total Oxidised Nitrogen	mg/l N		1.3	1.4	1.4	1.3
Total Alkalinity	mg/l HCO_3		<5			
Ammonium	mg/l NH_4	**0.3**	<0.08	<0.08	<0.08	<0.08
Boron	mg/l B	**1.0**	0.02			
Calcium	mg/l Ca	**200**	160			
Cadmium	mg/l Cd	**0.005**	0.029			
Chromium	mg/l Cr	**0.05**	<0.001			
Chloride	mg/l Cl	**250**	15	18	14	21
Copper	mg/l Cu	**0.5**	7.7			
Cyanide	mg/l CN	**0.05**	<0.01			
Flouride	mg/l F	**1.5**	1.8			
Iron	mg/l Fe	**0.2**	0.45	0.45	0.39	0.34
Lead	mg/l Pb	**0.05**	<0.002			
Magnesium	mg/l Mg	**50**	81			
Manganese	mg/l Mn	**0.05**	4.7			
Mercury	mg/l Hg	**0.001**	<0.000012			
Nitrate	mg/l NO_3	**50**				
Nitrite	mg/l NO_2	**0.5**				
Total Phosphorus as P	mg/l P	**2.18**	0.07			
Ortho-Phosphate	mg/l PO_4	**6**	<1			
Potassium	mg/l K	**12**	2	2	2	2
Phenols	mg/l C_6H_5OH	**0.0005**	<0.05	0.05	<0.05	<0.05
Sodium	mg/l Na	**200**	11	13	11	15
Sulphate	mg/l SO_4	**250**	993	859	1103	1026
Zinc	mg/l Zn	**1**	9			
Total Coliforms	CFU per 100 ml	**Nil**	1	6	1	0
Faecal Coliforms	CFU per 100 ml	**Nil**	0	1	0	0

Parameter	Units	EU Directive	BH96/3	BH96/3	BH96/3	BH96/3
			g/w sample	g/w sample	g/w sample	g/w sample
			Sampled 12/11/08	Sampled 07/08/08	Sampled 19/5/08	Sampled 5/2/08
		Max. Admissable Conc.	Analysed- 12/11/08	Analysed 07/08/08	Analysed 19/5/08	Analysed 5/2/08
Water Level	**(m)**		**6.4**	**6.16**	**6.75**	**6.31**
Depth	**(m)**					
Visual Description	**-**		Brown, turbid, lots of suspended solids	Brown/yellowish colour, cloudy with suspended solids	yellow brown with minute suspended solids	Clear, yellowish colour
pH		**6.5 < pH < 9.5**	6.6	6.9	7.4	7.4
Temperature (on site)	^{o}C	**25**	14	14	16	11
Odour			Mild musty odour	Citrus odour	Musty smell	Slightly organic odour
Conductivity	uS/cm at 20^{o}C	**1,500**	3620	4120	3770	4230
Residue on Evaporation	mg/l @ 180^{o}C	**1,500**	2812			
Dissolved Oxygen	mg/l O_2		2.7	3.2	3.5	3.7
Total Organic Carbon	mg/l	**No abnormal change**	20	16	16	38
Total Oxidised Nitrogen	mg/l N		<0.25	<0.17	<0.5	<0.17
Total Alkalinity	mg/l HCO_3		930			
Ammonium	mg/l NH_4	**0.3**	123	157	131	205
Boron	mg/l B	**1.0**	0.313			
Calcium	mg/l Ca	**200**	432			
Cadmium	mg/l Cd	**0.005**	<0.0001			
Chromium	mg/l Cr	**0.05**	<1			
Chloride	mg/l Cl	**250**	46	54	49	75
Copper	mg/l Cu	**0.5**	0.0085			
Cyanide	mg/l CN	**0.05**	<0.01			
Flouride	mg/l F	**1.5**	0.67			
Iron	mg/l Fe	**0.2**	22	3.2	0.24	19
Lead	mg/l Pb	**0.05**	<0.002			
Magnesium	mg/l Mg	**50**	236			
Manganese	mg/l Mn	**0.05**	12			
Mercury	mg/l Hg	**0.001**	<0.000012			
Nitrate	mg/l NO_3	**50**				
Nitrite	mg/l NO_2	**0.5**				
Total Phosphorus as P	mg/l P	**2.18**	0.32			
Ortho-Phosphate	mg/l PO_4	**6**	<1			
Potassium	mg/l K	**12**	51	63	54	76
Phenols	mg/l C_6H_5OH	**0.0005**	<0.05	0.05	<0.05	0.11
Sodium	mg/l Na	**200**	39	49	41	58
Sulphate	mg/l SO_4	**250**	1742	1870	1946	1806
Zinc	mg/l Zn	**1**	0.02			
Total Coliforms	CFU per 100 ml	**Nil**	>100	>100	>100	69 cfu / 20 mls
Faecal Coliforms	CFU per 100 ml	**Nil**	1	1	0	0 cfu / 20 mls

Parameter	Units	EU Directive	RC6	RC6	RC6	RC6
			g/w sample	g/w sample	g/w sample	g/w sample
			Not Sampled	Not Sampled	Not Sampled	Not Sampled
		Max. Admissable Conc.	Analysed -	Analysed -	Analysed -	Analysed -
Water Level **Depth** **Visual Description**	**(m)** **(m)** **-**					
pH		**6.5 < pH < 9.5**				
Temperature (on site)	^{o}C	**25**				
Odour						
Conductivity	uS/cm at $20^{o}C$	**1,500**				
Residue on Evaporation	mg/l @ $180^{o}C$	**1,500**				
Dissolved Oxygen	mg/l O_2					
Total Organic Carbon	mg/l	**No abnormal change**				
Total Oxidised Nitrogen	mg/l N					
Total Alkalinity	mg/l HCO_3					
Ammonium	mg/l NH_4	**0.3**				
Boron	mg/l B	**1.0**				
Calcium	mg/l Ca	**200**				
Cadmium	mg/l Cd	**0.005**				
Chromium	mg/l Cr	**0.05**				
Chloride	mg/l Cl	**250**				
Copper	mg/l Cu	**0.5**				
Cyanide	mg/l CN	**0.05**				
Flouride	mg/l F	**1.5**				
Iron	mg/l Fe	**0.2**				
Lead	mg/l Pb	**0.05**				
Magnesium	mg/l Mg	**50**				
Manganese	mg/l Mn	**0.05**				
Mercury	mg/l Hg	**0.001**				
Nitrate	mg/l NO_3	**50**				
Nitrite	mg/l NO_2	**0.5**				
Total Phosphorus as P	mg/l P	**2.18**				
Ortho-Phosphate	mg/l PO_4	**6**				
Potassium	mg/l K	**12**				
Phenols	mg/l C_6H_5OH	**0.0005**				
Sodium	mg/l Na	**200**				
Sulphate	mg/l SO_4	**250**				
Zinc	mg/l Zn	**1**				
Total Coliforms	CFU per 100 ml	**Nil**				
Faecal Coliforms	CFU per 100 ml	**Nil**				

Parameter	Units	EU Directive	Thomas Merrigan	Thomas Merrigan	Thomas Merrigan	Thomas Merrigan
			g/w sample	g/w sample	g/w sample	g/w sample
			Sampled 11/11/08	Sampled 07/08/08	Sampled 19/5/08	Sampled 5/2/08
		Max. Admissable Conc.	Analysed 12/11/08	Analysed 07/08/08	Analysed 19/5/08	Analysed 5/2/08
Water Level	**(m)**		-	-	-	-
Depth	**(m)**		-	-	-	-
Visual Description	**-**		Clear,colourless	Clear,colourless	Clear,colourless	Clear,colourless
pH		**6.5 < pH < 9.5**	5.9	6.0	5.9	6.0
Temperature (on site)	^{o}C	**-**	9	14		10
Odour			Odourless	Odourless	Odourless	Odourless
Conductivity	uS/cm at $20^{o}C$	**1,500**	174	182	161	179
Residue on Evaporation	mg/l @ $180^{o}C$	**1,500**	127			
Dissolved Oxygen (on-site)	mg/l O_2		6.0	8.8	11.2	8.2
Total Organic Carbon	mg/l	**No abnormal change**	1.5	1.4	1.0	1.4
Total Oxidised Nitrogen	mg/l N		3.7	5.5	3.7	5.3
Total Alkalinity	mg/l HCO_3		34			
Ammonium	mg/l NH_4	**0.3**	<0.08	<0.08	<0.08	<0.08
Boron	mg/l B	**1.0**	<0.017			
Calcium	mg/l Ca	**200**	23			
Cadmium	mg/l Cd	**0.005**	<0.0002			
Chromium	mg/l Cr	**0.05**	<0.001			
Chloride	mg/l Cl	**250**	10	11	11	12
Copper	mg/l Cu	**0.5**	0.037			
Cyanide	mg/l CN	**0.05**	<0.01			
Flouride	mg/l F	**1.5**	<0.1			
Iron	mg/l Fe	**0.2**	<0.05	<0.05	<0.05	<0.05
Lead	mg/l Pb	**0.05**	<0.002			
Magnesium	mg/l Mg	**50**	4			
Manganese	mg/l Mn	**0.05**	<0.03			
Mercury	mg/l Hg	**0.001**	<0.000012			
Nitrate	mg/l NO_3	**50**				
Nitrite	mg/l NO_2	**0.5**				
Total Phosphorus as P	mg/l P	**2.18**	<0.05			
Ortho-Phosphate	mg/l PO_4	**6**				
Potassium	mg/l K	**12**	<1	1	1	1
Phenols	mg/l C_6H_5OH	**0.0005**	<0.05	<0.05	<0.05	0.09
Sodium	mg/l Na	**200**	7	7	6	7
Sulphate	mg/l SO_4	**250**	26	26	23	29
Zinc	mg/l Zn	**1**	0.01			
Total Coliforms	CFU per 100 ml	**Nil**	1	9	0	0 cfu / 100ml
Faecal Coliforms	CFU per 100 ml	**Nil**	0	3	0	0 cfu / 100ml

Parameter	Units	EU Directive	Donal O'Leary	Donal O'Leary	Donal O'Leary	Donal O'Leary
			g/w sample	g/w sample	g/w sample	g/w sample
			Sampled 11/11/08	Sampled 07/08/08	Sampled 19/5/08	Sampled 5/2/08
		Max. Admissable Conc.	Analysed 12/11/08	Analysed 07/08/08	Analysed 19/5/08	Analysed 5/2/08
Water Level	**(m)**		-	-	-	-
Depth	**(m)**		-	-	-	-
Visual Description	**-**		Clear, colourless	Clear, colourless	Clear, colourless	Clear, colourless
pH		**6.5 < pH < 9.5**	6.3	6.5	6.2	6.3
Temperature (on site)	^{o}C	**-**	6	14		10
Odour			Odourless	Odourless	Odourless	Odourless
Conductivity	uS/cm at 20^{o}C	**1,500**	149	135	130	136
Residue on Evaporation	mg/l @ 180^{o}C	**1,500**	96			
Dissolved Oxygen (on-site)	mg/l O_2		6.6	7.9	12.0	8.3
Total Organic Carbon	mg/l	**No abnormal change**	0.3	0.63	<0.25	0.4
Total Oxidised Nitrogen	mg/l N		4.1	2.9	2.9	4.2
Total Alkalinity	mg/l HCO_3		27			
Ammonium	mg/l NH_4	**0.3**	<0.08	<0.08	<0.08	<0.08
Boron	mg/l B	**1.0**	<0.017			
Calcium	mg/l Ca	**200**	9			
Cadmium	mg/l Cd	**0.005**	0.00013			
Chromium	mg/l Cr	**0.05**	<0.001			
Chloride	mg/l Cl	**250**	14	14	13	12
Copper	mg/l Cu	**0.5**	0.067			
Cyanide	mg/l CN	**0.05**	<0.01			
Flouride	mg/l F	**1.5**	<0.1			
Iron	mg/l Fe	**0.2**	<0.05	<0.05	<0.05	<0.05
Lead	mg/l Pb	**0.05**	<0.002			
Magnesium	mg/l Mg	**50**	7			
Manganese	mg/l Mn	**0.05**	<0.03			
Mercury	mg/l Hg	**0.001**	<0.000012			
Nitrate	mg/l NO_3	**50**				
Nitrite	mg/l NO_2	**0.5**				
Total Phosphorus as P	mg/l P	**2.18**	0.06			
Ortho-Phosphate	mg/l PO_4	**6**				
Potassium	mg/l K	**12**	2	2	2	2
Phenols	mg/l C_6H_5OH	**0.0005**	<0.05	<0.05	<0.05	0.12
Sodium	mg/l Na	**200**	11	10	10	11
Sulphate	mg/l SO_4	**250**	12	11	14	12
Zinc	mg/l Zn	**1**	0.09			
Total Coliforms	CFU per 100 ml	**Nil**	1	22	0	2 cfu / 100ml
Faecal Coliforms	CFU per 100 ml	**Nil**	0	3	0	2 cfu / 100ml

Parameter	Units	EU Directive	Eddie Coleman	Eddie Coleman	Eddie Coleman	Eddie Coleman
			g/w sample	g/w sample	g/w sample	g/w sample
			Sampled 11/11/08	Sampled 07/08/08	Sampled 19/5/08	Sampled 5/2/08
		Max. Admissable Conc.	Analysed 12/11/08	Analysed 07/08/08	Analysed 19/5/08	Analysed 5/2/08
Water Level	**(m)**		-	-	-	-
Depth	**(m)**		-	-	-	-
Visual Description	**-**		Clear,colourless	Clear,colourless	Clear,colourless	Clear,colourless
pH		**6.5 < pH < 9.5**	6.0	5.5	5.3	5.5
Temperature (on site)	^{o}C	**-**	8	14		10
Odour			Odourless	Odourless	Odourless	Odourless
Conductivity	uS/cm at 20^{o}C	**1,500**	136	126	127	127
Residue on Evaporation	mg/l @ 180^{o}C	**1,500**	63			
Dissolved Oxygen (on-site)	mg/l O_2		6.8	7.4	8.6	8.1
Total Organic Carbon	mg/l	**No abnormal change**	2.3	5.4	0.76	0.6
Total Oxidised Nitrogen	mg/l N		3.2	3.6	3.7	4
Total Alkalinity	mg/l HCO_3		11			
Ammonium	mg/l NH_4	**0.3**	<0.08	<0.08	<0.08	<0.08
Boron	mg/l B	**1.0**	<0.017			
Calcium	mg/l Ca	**200**	10			
Cadmium	mg/l Cd	**0.005**	<0.0005			
Chromium	mg/l Cr	**0.05**	<0.001			
Chloride	mg/l Cl	**250**	11	12	11	12
Copper	mg/l Cu	**0.5**	0.094			
Cyanide	mg/l CN	**0.05**	<0.01			
Flouride	mg/l F	**1.5**	<0.1			
Iron	mg/l Fe	**0.2**	<0.05	<0.05	<0.05	<0.05
Lead	mg/l Pb	**0.05**	<0.004			
Magnesium	mg/l Mg	**50**	5			
Manganese	mg/l Mn	**0.05**	0.04			
Mercury	mg/l Hg	**0.001**	<0.000012			
Nitrate	mg/l NO_3	**50**				
Nitrite	mg/l NO_2	**0.5**				
Total Phosphorus as P	mg/l P	**2.18**	<0.05			
Ortho-Phosphate	mg/l PO_4	**6**				
Potassium	mg/l K	**12**	2	2	2	2
Phenols	mg/l C_6H_5OH	**0.0005**	<0.05	<0.05	<0.05	0.08
Sodium	mg/l Na	**200**	8	9	7	8
Sulphate	mg/l SO_4	**250**	22	21	22	22
Zinc	mg/l Zn	**1**	0.07			
Total Coliforms	CFU per 100 ml	**Nil**	62	1	0	0 cfu / 100ml
Faecal Coliforms	CFU per 100 ml	**Nil**	0	0	0	0 cfu / 100ml

Parameter	Units	EU Directive	Jeffery Green g/w sample Sampled 11/11/08 Analysed 12/11/08	Jeffery Green g/w sample Sampled 07/08/08 Analysed 07/08/08	Jeffery Green g/w sample Sampled 19/5/08 Analysed 19/5/08	Jeffery Green g/w sample Sampled 5/2/08 Analysed 5/2/08
		Max. Admissable Conc.				
Water Level	**(m)**		-	-	-	-
Depth	**(m)**		-	-	-	-
Visual Description	**-**		Clear, colourless	Clear, colourless	Clear, colourless	Clear, colourless
pH		**6.5 < pH < 9.5**	5.6	5.7	5.4	5.7
Temperature (on site)	^{o}C	**-**	6	14		9
Odour			Odourless	Odourless	Odourless	Odourless
Conductivity	uS/cm at $20^{o}C$	**1,500**	134	126	122	129
Residue on Evaporation	mg/l @ $180^{o}C$	**1,500**	87			
Dissolved Oxygen (on-site)	mg/l O_2		6.4	6.6	7.5	6.0
Total Organic Carbon	mg/l	**No abnormal change**	1.3	0.61	0.58	1
Total Oxidised Nitrogen	mg/l N		2.7	1.7	1.5	1.9
Total Alkalinity	mg/l HCO_3		16			
Ammonium	mg/l NH_4	**0.3**	<0.08	<0.08	<0.08	<0.08
Boron	mg/l B	**1.0**	<0.017			
Calcium	mg/l Ca	**200**	11			
Cadmium	mg/l Cd	**0.005**	<0.0005			
Chromium	mg/l Cr	**0.05**	<0.001			
Chloride	mg/l Cl	**250**	10	11	12	12
Copper	mg/l Cu	**0.5**	0.057			
Cyanide	mg/l CN	**0.05**	<0.01			
Flouride	mg/l F	**1.5**	<0.1			
Iron	mg/l Fe	**0.2**	0.1	<0.05	0.4	<0.05
Lead	mg/l Pb	**0.05**	<0.002			
Magnesium	mg/l Mg	**50**	4			
Manganese	mg/l Mn	**0.05**	0.13			
Mercury	mg/l Hg	**0.001**	<0.000012			
Nitrate	mg/l NO_3	**50**				
Nitrite	mg/l NO_2	**0.5**				
Total Phosphorus as P	mg/l P	**2.18**	<0.05			
Ortho-Phosphate	mg/l PO_4	**6**				
Potassium	mg/l K	**12**	2	2	1	2
Phenols	mg/l C_6H_5OH	**0.0005**	<0.05	<0.05	<0.05	0.1
Sodium	mg/l Na	**200**	8	9	8	8
Sulphate	mg/l SO_4	**250**	26	26	27	29
Zinc	mg/l Zn	**1**	0.22			
Total Coliforms	CFU per 100 ml	**Nil**	0	1	0	0 cfu / 100ml
Faecal Coliforms	CFU per 100 ml	**Nil**	0	0	0	0 cfu / 100ml

Parameter	Units	Typical Leachate Range (EPA Manual)	L05/10 Sampled:12/11/08 Analysed: 12/11/08	L05/10 Sampled:07/08/08 Analysed: 07/08/08	L05/10 Sampled:07/08/08 Analysed: 07/08/08	L05/10 Sampled:5/2/08 Analysed: 5/2/08
Leachate Level	**(m)**		-	-	15.35	-
Depth	**(m)**		-	-	-	-
Visual Description	-		Dark brown, turbid, lots of suspended solids	oily susbstance on surface brown/green colour with suspended soilds present	clear, brown coloured sample	Clear, yellowish brown colour
pH	pH unit	**6.4 - 8.0**	7.5	7.7	7.5	7.7
Temperature (on site)	^{o}C	**n/a**	36	37	32	20
Odour			Musty	Slight hydrocarbon smell	Musty smell	Herbal Odour
Conductivity	Ss/cm @20^{o}C	**503 - 19,200**	8240	9330	10580	9580
Dissolved Oxygen	mg/l O_2	**-**				
Alkalinity	mg/l $CaCO_3$	**176 - 8840**	4500			
C.O.D.	mg/l O_2	**<10 - 33700**	939	1117	1122	1018
B.O.D	mg/l O_2	**4.5 - >4800**	41	67	84	52
Total Oxidised Nitrogen	mg/l N	**n/a**	<0.41	<2.46	<0.9	<0.71
T.O.C.	mg/l C	**2.8 - <5690**				
Ammonia	mg/l NH_4	**<0.2 - 1700**	13	717	1271	1012
Boron	mg/l B	**<0.02 - 116**	0.069			
Cadmium	mg/l Cd	**<0.01 - 0.03**	0.0018			
Calcium	mg/l Ca	**43 - 1440**	77			
Chloride	mg/l Cl	**27 - 3410**	682	760	868	759
Chromium	mg/l Cr	**<0.04 - 0.56**	41			
Copper	mg/l Cu	**<0.02 - 0.16**	0.021			
Cyanide (total)	mg/l CN	**<0.05 - 0.16**	<0.01			
Fluoride	mg/l F	**n/a**	0.99			
Iron	mg/l Fe	**0.4 - 664**	6.4			
Lead	mg/l Pb	**<0.04 - 0.28**	7.2			
Magnesium	mg/l Mg	**18 - 470**	53			
Manganese	mg/l Mn	**0.1 - 23.2**	0.17			
Mercury	ug/l Hg	**<0.1 - 1.0**	<0.0001			
Nickel	mg/l Ni	**<0.03 - 0.33**				
Orthophosphate	mg/l PO_4	**<0.1 - 15.8**	9			
Phosphorus (Total)	mg/l P	**n/a**	7.8			
Potassium	mg/l K	**2.7 - 1480**	427			
Phenols	mg/l C_6H_5OH	**n/a**	<0.05	0.14	<0.05	0.25
Sodium	mg/l Na	**12 - 3000**	545			
Sulphate	mg/l SO_4	**<5 - 739**	41			
Zinc	mg/l Zn	**<0.01 - 6.7**	0.02			
Total Coliforms	CFU per 100 ml	**n/a**	>100	>100	67	>100 cfu / 40 mls
Faecal Coliforms	CFU per 100 ml	**n/a**	0	0	0	0 cfu / 40 mls

Note: L03/1, L03/3, SP9, RC3, RC4, RC5 and V9 were dry during sampling

Parameter	Units	Typical Leachate Range (EPA Manual)	L05/16 Sampled:12/11/08 Analysed: 12/11/08	L05/16 Sampled:07/08/08 Analysed: 07/08/08	L05/16 Sampled:07/08/08 Analysed: 07/08/08	L05/16 Sampled:5/2/08 Analysed: 5/2/08
Leachate Level	**(m)**		-	-	8.26	-
Depth	**(m)**		-	-	-	-
Visual Description	-		Brown, turbid, lots of suspended solids	yellow, suspended solids	yellow/green with suspended solids	Slightly turbid, yellowish colour with black suspended solids
pH	pH unit	**6.4 - 8.0**	6.2	6.9	6.7	6.8
Temperature (on site)	^{o}C	**n/a**	23	19	25	20
Odour			Mild musty odour	odourless	herbal	Herbal Odour
Conductivity	Ss/cm @20^{o}C	**503 - 19,200**	1162	1315	1647	1378
Dissolved Oxygen	mg/l O_2	**-**				
Alkalinity	mg/l $CaCO_3$	**176 - 8840**	538			
C.O.D.	mg/l O_2	**<10 - 33700**	60	44	113	161
B.O.D	mg/l O_2	**4.5 - >4800**	6	11	34	26
Total Oxidised Nitrogen	mg/l N	**n/a**	<0.17	<0.17	<0.17	<0.17
T.O.C.	mg/l C	**2.8 - <5690**				
Ammonia	mg/l NH_4	**<0.2 - 1700**	13	13	38	25
Boron	mg/l B	**<0.02 - 116**	0.107			
Cadmium	mg/l Cd	**<0.01 - 0.03**	0.00023			
Calcium	mg/l Ca	**43 - 1440**	197			
Chloride	mg/l Cl	**27 - 3410**	15	23	45	31
Chromium	mg/l Cr	**<0.04 - 0.56**	<1			
Copper	mg/l Cu	**<0.02 - 0.16**	0.158			
Cyanide (total)	mg/l CN	**<0.05 - 0.16**	<0.01			
Fluoride	mg/l F	**n/a**	0.29			
Iron	mg/l Fe	**0.4 - 664**	14			
Lead	mg/l Pb	**<0.04 - 0.28**	<0.004			
Magnesium	mg/l Mg	**18 - 470**	37			
Manganese	mg/l Mn	**0.1 - 23.2**	4.4			
Mercury	ug/l Hg	**<0.1 - 1.0**	<0.012			
Nickel	mg/l Ni	**<0.03 - 0.33**				
Orthophosphate	mg/l PO_4	**<0.1 - 15.8**	<1			
Phosphorus (Total)	mg/l P	**n/a**	0.58			
Potassium	mg/l K	**2.7 - 1480**	14			
Phenols	mg/l C_6H_5OH	**n/a**	<0.05	0.05	<0.05	<0.05
Sodium	mg/l Na	**12 - 3000**	29			
Sulphate	mg/l SO_4	**<5 - 739**	212			
Zinc	mg/l Zn	**<0.01 - 6.7**	0.020			
Total Coliforms	CFU per 100 ml	**n/a**	>100	>100	21	>100 cfu / 20 mls
Faecal Coliforms	CFU per 100 ml	**n/a**	0	0	0	0 cfu / 20 mls

LANDFILL GAS MONITORING FORM				
Facility Name: Ballymurtagh Landfill	**Facility Address:** Ballymurtagh, Avoca, Co. Wicklow			
Licence no.: W0011-01				
Licensee: Wicklow Co. Co.				
Date of Licensing:	**Date of sampling:** 30/01/2008		**Time of Sampling:**	
Instrument used: G A 2000	**Date Next Full Calibration:** November 2008			
	Last Field Calibration: (include date and gases)			
	November 2007			
Monitoring Personnel: Seamus Breslin	**Weather:**		**Barometric pressure:** 1010 - 1022	
			Mean Temperature: 4.9 C	
Results				
Sample Station Number	**CH_4 (%v/v)**	**CO_2 (%v/v)**	**O_2 (%v/v)**	**Comments:**
G1	0.0	0.6	20.1	
G2	0.0	**1.6**	17.6	
G3	0.0	0.0	20.9	
G4	0.0	**4.5**	13.1	
G6	0.0	**2.9**	16.1	
Ballygahan Adit (SW2)	0.0	0.0	20.9	
Ballymurtagh Adit (SW3)	0.0	0.1	20.8	
G7	0.0	**3.1**	20.3	
G8	0.0	0.3	20.3	
GW2/04	0.0	0.4	20.4	
RC6	0.0	0.0	20.8	
G1/04	0.0	0.0	20.7	
G1/05	0.0	0.6	20.4	
G2/05	0.0	1.0	19.6	
flare	26.5	26.0	0.9	
Twin Shafts	0.0	0.1	20.7	

LANDFILL GAS MONITORING FORM				
Facility Name: Ballymurtagh Landfill	**Facility Address:** Ballymurtagh, Avoca, Co. Wicklow			
Licence no.: W0011-01				
Licensee: Wicklow Co. Co.				
Date of Licensing:	**Date of sampling:** 29/2/2008		**Time of Sampling:**	
Instrument used: G A 2000	**Date Next Full Calibration:** November 2008			
	Last Field Calibration: (include date and gases)			
	November 2007			
Monitoring Personnel: Seamus Breslin	**Weather:**		**Barometric pressure:** 987 - 998	
			Mean Temperature: 8.5C	
Results				
Sample Station Number	**CH_4 (%v/v)**	**CO_2 (%v/v)**	**O_2 (%v/v)**	**Comments:**
G1	0.0	0.3	20.3	
G2	0.0	**2.4**	16.0	
G3	0.0	0.2	20.6	
G4	0.0	1.2	18.1	
G6	0.0	**3.5**	14.2	
Ballygahan Adit (SW2)	0.0	0.0	20.9	
Ballymurtagh Adit (SW3)	0.0	0.0	20.8	
G7	0.0	**3.6**	14.0	
G8	0.0	0.8	20.3	
GW2/04	0.0	0.3	20.4	
RC6	0.0	0.0	20.9	
G1/04	0.0	0.0	20.7	
G1/05	0.0	0.4	20.8	
G2/05	0.0	0.7	19.7	
flare	27.5	27.0	0.7	
Twin Shafts	0.0	0.0	20.8	

LANDFILL GAS MONITORING FORM				
Facility Name: Ballymurtagh Landfill	**Facility Address:** Ballymurtagh, Avoca, Co. Wicklow			
Licence no.: W0011-01				
Licensee: Wicklow Co. Co.				
Date of Licensing:	**Date of sampling:** 31/03/2008		**Time of Sampling:**	
Instrument used: G A 2000	**Date Next Full Calibration:** November 2008			
	Last Field Calibration: (include date and gases)			
	November 2007			
Monitoring Personnel: Seamus Breslin	**Weather:**		**Barometric pressure:** 997 - 1008	
			Mean Temperature: 12.8C	
Results				
Sample Station Number	**CH_4**	**CO_2**	**O_2**	**Comments:**
	(%v/v)	**(%v/v)**	**(%v/v)**	
G1	0.0	0.0	20.8	
G2	0.0	0.0	20.5	
G3	0.0	0.3	20.6	
G4	0.0	**4.8**	13.4	
G6	0.0	**3.6**	15.2	
Ballygahan Adit (SW2)	0.0	0.1	20.7	
Ballymurtagh Adit (SW3)	0.0	0.0	20.8	
G7	0.0	**3.5**	15.7	
G8	0.0	0.0	20.5	
GW2/04	0.0	0.4	20.6	
RC6	0.0	0.0	20.7	
G1/04	0.0	0.0	20.7	
G1/05	0.0	1.2	19.9	
G2/05	0.0	**1.9**	18.1	
flare	21.4	26.4	1.5	
Twin Shafts	0.0	0.0	20.9	

LANDFILL GAS MONITORING FORM	
Facility Name: Ballymurtagh Landfill	**Facility Address:** Ballymurtagh, Avoca, Co. Wicklow
Waste Licence no.: W0011-01	
Licensee: Wicklow Co. Co.	
Instrument used: G A 2000	**Date Next Full Calibration:** November 2007
	Last Field Calibration: November 2006
Monitoring Personnel: Seamus Breslin	

Results

Date	Sample Station Number	CH_4 (%v/v)	CO_2 (%v/v)	O_2 (%v/v)	Pressure ATM	Temp C
04/01/2008	Site Office	0.00	0.0	20.7	981	0.5
11/01/2008	Site Office	0.00	0.0	20.7	980	3.3
18/01/2008	Site Office	0.00	0.0	20.8	985	14
25/01/2008	Site Office	0.00	0.1	20.9	1015	11.3
01/02/2008	Site Office	0.00	0.0	20.8	987	4.2
08/02/2008	Site Office	0.00	0.1	20.8	1009	11.1
15/02/2008	Site Office	0.00	0.1	20.4	1022	5.5
22/02/2008	Site Office	0.00	0.0	20.8	1004	12.9
29/02/2008	Site Office	0.00	0.0	20.8	990	8.5
07/03/2008	Site Office	0.00	0.0	20.7	995	11.3
14/03/2008	Site Office	0.00	0.0	20.8	997	10.1
21/03/2008	Site Office	0.00	0.0	20.7	1002	8.3
28/03/2008	Site Office	0.00	0.0	20.8	975	9.6

LANDFILL GAS MONITORING FORM				
Facility Name: Ballymurtagh Landfill	**Facility Address:**			
Licence no.: W0011-01				
Licensee: Wicklow Co. Co.				
Date of Licensing:	**Date of sampling:** 29/04/08		**Time of Sampling:**	
Instrument used: G A 2000	**Date Next Full Calibration:** November 2008			
	Last Field Calibration: (include date and gases)			
Monitoring Personnel: Seamus Breslin	**Weather:**		**Barometric pressure:** 976 - 988	
			Mean Temperature: 12.9C	
Results				
Sample Station Number	**CH_4**	**CO_2**	**O_2**	**Comments:**
	(%v/v)	**(%v/v)**	**(%v/v)**	
G1	0.0	0.1	20.8	
G2	0.0	1.0	19.1	
G3	0.0	0.2	20.5	
G4	0.0	**6.3**	11.4	
G6	0.0	**2.7**	14.8	
Ballygahan Adit	0.0	0.0	20.8	
Ballymurtagh Adit	0.0	0.1	20.6	
G7	0.0	**3.3**	16.2	
G8	0.0	0.2	20.6	
GW2/04	0.0	0.3	19.6	
RC 6	0.0	0.0	20.8	
GW1/04	0.0	0.0	20.7	
GW1/05	0.0	1.3	19.3	
GW2/05	0.0	**1.7**	18.4	
FLARE	**24.8**	**26.6**	1.1	
TWIN SHAFTS	0.0	0.0	20.6	

LANDFILL GAS MONITORING FORM				
Facility Name: Ballymurtagh Landfill	**Facility Address:** Ballymurtagh, Avoca, Co. Wicklow			
Licence no.: W0011-01				
Licensee: Wicklow Co. Co.				
Date of Licensing:	**Date of sampling:** 29/5/08		**Time of Sampling:**	
Instrument used: G A 2000	**Date Next Full Calibration:** November 2008			
	Last Field Calibration: (include date and gases)			
Monitoring Personnel: Seamus Breslin	**Weather:**		**Barometric pressure:** 987 - 999	
			Mean Temperature: 14.8C	
Results				
Sample Station Number	**CH_4**	**CO_2**	**O_2**	**Comments:**
	(%v/v)	**(%v/v)**	**(%v/v)**	
G1	0.0	0.1	20.7	
G2	0.0	0.0	20.8	
G3	0.0	1.3	19.0	
G4	0.0	**2.7**	17.1	
G6	0.0	**3.4**	14.7	
Ballygahan Adit	0.0	0.0	20.7	
Ballymurtagh Adit	0.0	0.0	20.9	
G7	0.0	**3.1**	16.2	
G8	0.0	0.2	20.5	
GW2/04	0.0	0.1	20.3	
RC 6	0.0	0.0	20.7	
GW1/04	0.0	0.0	20.7	
GW1/05	0.0	1.1	19.6	
GW2/05	0.0	1.3	19.1	
FLARE	**24.9**	**26.8**	2.3	
TWIN SHAFTS	0.0	0.0	20.9	

LANDFILL GAS MONITORING FORM				
Facility Name: Ballymurtagh Landfill	**Facility Address:** Ballymurtagh, Avoca, Co. Wicklow			
Licence no.: W0011-01				
Licensee: Wicklow Co. Co.				
Date of Licensing:	**Date of sampling:** 30/06/2008		**Time of Sampling:**	
Instrument used: G A 2000	**Date Next Full Calibration:** November 2008			
	Last Field Calibration: (include date and gases)			
Monitoring Personnel: Seamus Breslin	**Weather:**		**Barometric pressure:** 1001 - 1013	
			Mean Temperature: 17.1C	
Results				
Sample Station Number	**CH_4**	**CO_2**	**O_2**	**Comments:**
	(%v/v)	**(%v/v)**	**(%v/v)**	
G1	0.0	0.2	20.7	
G2	0.0	0.0	20.9	
G3	0.0	1.4	18.4	
G4	0.0	2.5	17.6	
G6	0.0	2.0	15.5	
Ballygahan Adit	0.0	0.0	19.8	
Ballymurtagh Adit	0.0	0.1	19.7	
G7	0.0	3.4	15.1	
G8	0.0	0.2	20.5	
GW2/04	0.0	0.3	19.6	
RC 6	0.0	0.0	20.5	
GW1/04	0.0	0.1	20.6	
GW1/05	0.0	1.2	19.4	
GW2/05	0.0	1.3	19.6	
FLARE	21.4	25.9	1.8	
TWIN SHAFTS	0.0	0.0	20.9	

LANDFILL GAS MONITORING FORM	
Facility Name: Ballymurtagh Landfill	**Facility Address:** Ballymurtagh, Avoca, Co. Wicklow
Waste Licence no.: W0011-01	
Licensee: Wicklow Co. Co.	
Instrument used: G A 2000	**Date Next Full Calibration:** November 2007
	Last Field Calibration: November 2006
Monitoring Personnel: Seamus Breslin	

Results

Date	Sample Station Number	CH_4 (%v/v)	CO_2 (%v/v)	O_2 (%v/v)	Pressure ATM	Temp C
04/01/2008	Site Office	0.00	0.0	20.9	1015	14.6
11/01/2008	Site Office	0.00	0.0	20.8	979	8.2
18/01/2008	Site Office	0.00	0.0	20.7	986	12.7
25/01/2008	Site Office	0.00	0.0	20.8	1008	10.9
01/02/2008	Site Office	0.00	0.0	20.8	1003	14.1
08/02/2008	Site Office	0.00	0.0	20.7	999	18.7
15/02/2008	Site Office	0.00	0.0	20.8	997	16.6
22/02/2008	Site Office	0.00	0.0	20.8	999	16.5
29/02/2008	Site Office	0.00	0.0	20.8	1002	20.2
07/03/2008	Site Office	0.00	0.0	20.8	1006	17.6
14/03/2008	Site Office	0.00	0.0	20.9	1006	17.9
21/03/2008	Site Office	0.00	0.0	20.8	1003	15.1
28/03/2008	Site Office	0.00	0.0	20.8	1000	14.9

LANDFILL GAS MONITORING FORM				
Facility Name: Ballymurtagh Landfill	**Facility Address:**			
Licence no.: W0011-01				
Licensee: Wicklow Co. Co.				
Date of Licensing:	**Date of sampling:** 24/07/08		**Time of Sampling:**	
Instrument used: G A 2000	**Date Next Full Calibration:** November 2008			
	Last Field Calibration: (include date and gases)			
Monitoring Personnel: Seamus Breslin	**Weather:**		**Barometric pressure:** 999 - 1011	
			Mean Temperature: 20C	
Results				
Sample Station Number	**CH_4**	**CO_2**	**O_2**	**Comments:**
	(%v/v)	**(%v/v)**	**(%v/v)**	
G1	0.00	0.00	20.8	
G2	0.00	0.00	20.9	
G3	0.00	**1.90**	17.9	
G4	0.00	**5.10**	10.3	
G6	0.00	**2.80**	14.3	
Ballygahan Adit	0.00	0.00	20.8	
Ballymurtagh Adit	0.00	0.00	20.9	
G7	0.00	**5.30**	11.9	
G8	0.00	0.00	20.8	
GW2/04	0.00	0.20	20.1	
RC 6	0.00	0.00	20.9	
GW1/04	0.00	0.00	20.9	
GW1/05	0.00	1.40	19.1	
GW2/05	0.00	0.90	19.4	
FLARE				
TWIN SHAFTS	0.00	0.00	20.9	

LANDFILL GAS MONITORING FORM				
Facility Name: Ballymurtagh Landfill	**Facility Address:** Ballymurtagh, Avoca, Co. Wicklow			
Licence no.: W0011-01				
Licensee: Wicklow Co. Co.				
Date of Licensing:	**Date of sampling: 28/08/08**		**Time of Sampling:**	
Instrument used: G A 2000	**Date Next Full Calibration:** November 2008			
	Last Field Calibration: (include date and gases)			
Monitoring Personnel: Seamus Breslin	**Weather:**		**Barometric pressure:** 1003 - 1018	
			Mean Temperature: 20.5C	
Results				
Sample Station Number	**CH_4**	**CO_2**	**O_2**	**Comments:**
	(%v/v)	**(%v/v)**	**(%v/v)**	
G1	0.0	0.2	20.5	
G2	0.0	0.0	20.6	
G3	0.0	0.0	20.9	
G4	0.0	**5.3**	8.7	
G6	0.0	**3.1**	13.2	
Ballygahan Adit	0.0	0.0	20.8	
Ballymurtagh Adit	0.0	0.1	20.6	
G7	0.0	**4.1**	13.3	
G8	0.0	0.2	20.6	
GW2/04	0.0	0.0	20.9	
RC 6	0.0	0.2	20.5	
GW1/04	0.0	0.0	20.8	
GW1/05	0.0	1.4	18.8	
GW2/05	0.0	**2.8**	16.2	
FLARE		**29.0**	0.3	
TWIN SHAFTS	0.0	0.0	20.9	

LANDFILL GAS MONITORING FORM				
Facility Name: Ballymurtagh Landfill	**Facility Address:** Ballymurtagh, Avoca, Co. Wicklow			
Licence no.: W0011-01				
Licensee: Wicklow Co. Co.				
Date of Licensing:	**Date of sampling:** 25/09/08		**Time of Sampling:**	
Instrument used: G A 2000	**Date Next Full Calibration:** November 2008			
	Last Field Calibration: (include date and gases)			
Monitoring Personnel: Seamus Breslin	**Weather:**		**Barometric pressure:** 1016 - 1029	
			Mean Temperature: 25/9/08	
Results				
Sample Station Number	**CH_4**	**CO_2**	**O_2**	**Comments:**
	(%v/v)	**(%v/v)**	**(%v/v)**	
G1	0.0	0.0	20.8	
G2	0.0	0.0	21.0	
G3	0.0	0.7	20.3	
G4	0.0	0.2	20.4	
G6	0.0	4.6	12.9	
Ballygahan Adit	0.0	0.0	20.8	
Ballymurtagh Adit	0.0	0.0	20.7	
G7	0.0	2.8	16.3	
G8	0.0	0.2	20.7	
GW2/04	0.0	0.1	20.8	
RC 6	0.0	0.0	20.9	
GW1/04	0.0	0.2	20.5	
GW1/05	0.0	0.7	19.7	
GW2/05	0.0	0.0	20.8	
FLARE	21.5	30.0	0.7	
TWIN SHAFTS	0.0	0.0	20.9	

LANDFILL GAS MONITORING FORM	
Facility Name: Ballymurtagh Landfill	**Facility Address:** Ballymurtagh, Avoca, Co. Wicklow
Waste Licence no.: W0011-01	
Licensee: Wicklow Co. Co.	
Instrument used: G A 2000	**Date Next Full Calibration:** November 2007
	Last Field Calibration: November 2006
Monitoring Personnel: Seamus Breslin	

Results

Date	Sample Station Number	CH_4 (%v/v)	CO_2 (%v/v)	O_2 (%v/v)	Pressure ATM	Temp C
04/07/2008	Site Office	0.00	0.0	20.9	1002	17.2
11/07/2008	Site Office	0.00	0.0	20.8	993	17.0
18/07/2008	Site Office	0.00	0.0	20.8	996	17.9
25/07/2008	Site Office	0.00	0.0	20.9	994	18.6
01/08/2008	Site Office	0.00	0.0	20.8	989	14.3
08/08/2008	Site Office	0.00	0.0	20.8	1001	17.8
15/08/2008	Site Office	0.00	0.0	20.8	1000	16.8
22/08/2008	Site Office	0.00	0.0	20.8	1005	17.9
29/08/2008	Site Office	0.00	0.0	20.9	1007	17.6
05/09/2008	Site Office	0.00	0.0	20.7	971	13.7
12/09/2008	Site Office	0.00	0.0	20.9	1001	15.3
19/09/2008	Site Office	0.00	0.0	20.8	1013	15.1
26/09/2008	Site Office	0.00	0.0	20.9	1020	12.5

LANDFILL GAS MONITORING FORM				
Facility Name: Ballymurtagh Landfill	**Facility Address:**			
Licence no.: W0011-01				
Licensee: Wicklow Co. Co.				
Date of Licensing:	**Date of sampling:** 30/10/08		**Time of Sampling:**	
Instrument used: G A 2000	**Date Next Full Calibration:** August 2009			
	Last Field Calibration: August 2008			
Monitoring Personnel: Seamus Breslin	**Weather:**		**Barometric pressure:** 999 - 1011	
			Mean Temperature: 20C	
Results				
Sample Station Number	**CH_4 (%v/v)**	**CO_2 (%v/v)**	**O_2 (%v/v)**	**Comments:**
G1	0.0	0.6	20.6	
G2	0.0	0.0	20.9	
G3	0.0	0.3	20.6	
G4	0.0	**4.6**	11.2	
G6	0.0	**3.7**	13.7	
Ballygahan Adit	0.0	0.0	21.0	
Ballymurtagh Adit	0.0	0.0	21.0	
G7	0.0	**2.5**	18.0	
G8	0.0	0.1	20.9	
GW2/04	0.0	0.1	20.9	
RC 6	0.0	0.0	20.9	
GW1/04	0.0	0.1	20.6	
GW1/05	0.0	0.9	19.6	
GW2/05	0.0	**2.2**	18.4	
FLARE	24.0	**28.0**	0.6	
TWIN SHAFTS	0.0	0.0	20.9	

LANDFILL GAS MONITORING FORM				
Facility Name: Ballymurtagh Landfill	**Facility Address:** Ballymurtagh, Avoca, Co. Wicklow			
Licence no.: W0011-01				
Licensee: Wicklow Co. Co.				
Date of Licensing:	**Date of sampling: 28/11/08**		**Time of Sampling:**	
Instrument used: G A 2000	**Date Next Full Calibration:** August 2009			
	Last Field Calibration: August 2008			
Monitoring Personnel: Seamus Breslin	**Weather:**		**Barometric pressure:** 1003 - 1018	
			Mean Temperature: 20.5C	
Results				
Sample Station Number	**CH_4 (%v/v)**	**CO_2 (%v/v)**	**O_2 (%v/v)**	**Comments:**
G1	0.0	0.3	20.6	
G2	0.0	0.0	20.9	
G3	0.0	0.3	20.6	
G4	0.0	**6.8**	7.9	
G6	0.0	**3.8**	14.2	
Ballygahan Adit	0.0	0.0	20.8	
Ballymurtagh Adit	0.0	0.1	20.7	
G7	0.0	**5.7**	12.1	
G8	0.0	0.4	20.2	
GW2/04	0.0	0.6	19.5	
RC 6	0.0	0.0	20.9	
GW1/04	0.0	0.0	20.7	
GW1/05	0.0	0.7	20.2	
GW2/05	0.0	**2.3**	17.9	
FLARE	23.0	**29.0**	0.5	
TWIN SHAFTS	0.0	0.2	20.7	

LANDFILL GAS MONITORING FORM				
Facility Name: Ballymurtagh Landfill	**Facility Address:** Ballymurtagh, Avoca, Co. Wicklow			
Licence no.: W0011-01				
Licensee: Wicklow Co. Co.				
Date of Licensing:	**Date of sampling:** 22/12/08		**Time of Sampling:**	
Instrument used: G A 2000	**Date Next Full Calibration:** August 2009			
	Last Field Calibration: August 2008			
Monitoring Personnel: Seamus Breslin	**Weather:**		**Barometric pressure:** 1016 - 1029	
			Mean Temperature: 25/9/08	
Results				
Sample Station Number	**CH_4**	**CO_2**	**O_2**	**Comments:**
	(%v/v)	**(%v/v)**	**(%v/v)**	
G1	0.0	0.2	20.7	
G2	0.0	0.0	20.8	
G3	0.0	0.5	20.5	
G4	0.0	**7.5**	8.1	
G6	0.0	**4.1**	14.5	
Ballygahan Adit	0.0	0.0	20.9	
Ballymurtagh Adit	0.0	0.0	20.8	
G7	0.0	**3.4**	15.6	
G8	0.0	0.0	20.9	
GW2/04	0.0	0.2	20.6	
RC 6	0.0	0.0	20.8	
GW1/04	0.0	0.1	20.6	
GW1/05	0.0	0.9	19.6	
GW2/05	0.0	1.3	19.4	
FLARE	22.0	**28.0**	0.4	
TWIN SHAFTS	0.0	0.2	20.8	

LANDFILL GAS MONITORING FORM	
Facility Name: Ballymurtagh Landfill	**Facility Address:** Ballymurtagh, Avoca, Co. Wicklow
Waste Licence no.: W0011-01	
Licensee: Wicklow Co. Co.	
Instrument used: G A 2000	**Date Next Full Calibration:** August 2009
	Last Field Calibration: August 2008
Monitoring Personnel: Seamus Breslin	

Results

Date	Sample Station Number	CH_4 (%v/v)	CO_2 (%v/v)	O_2 (%v/v)	Pressure ATM	Temp C
03/10/2008	Site Office	0.00	0.00	20.90	982	8.60
10/10/2008	Site Office	0.00	0.00	20.80	1007	14.40
17/10/2008	Site Office	0.00	0.00	20.80	1006	10.40
24/10/2008	Site Office	0.00	0.00	20.90	1005	9.10
31/10/2008	Site Office	0.00	0.00	20.80	999	8.30
07/11/2008	Site Office	0.00	0.00	20.90	982	9.80
14/11/2008	Site Office	0.00	0.00	20.80	1009	11.50
21/11/2008	Site Office	0.00	0.00	20.80	1008	9.90
28/11/2008	Site Office	0.00	0.00	20.90	984	4.00
05/12/2008	Site Office	0.00	0.00	20.80	978	7.80
12/12/2008	Site Office	0.00	0.00	20.90	993	3.70
19/12/2008	Site Office	0.00	0.00	20.90	1000	10.80
30/12/2008	Site Office	0.00	0.00	20.90	1013	5.20

Monitoring of Flare Emissions at Ballymurtagh Landfill June 2008

DOCUMENT CONTROL SHEET

Client	Wicklow County Council					
Project Title	Monitoring of Flare Emissions at Ballymurtagh Landfill					
Document Title	Emissions Monitoring June 2008					
Document No.	MDE0725Rp003					
This Document Comprises	DCS	TOC	Text	List of Tables	List of Figures	No. of Appendices
	1	1	6	1	0	1

Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
D01	Draft	Ronan Murphy	Ross Daly	Paul Chadwick	Dublin Environment	03.07.2008
F01	Final	Ronan Murphy	Ross Daly	Paul Chadwick	Dublin Environment	15.07.2008

TABLE OF CONTENTS

LIST OF TABLES

1 INTRODUCTION

This report presents the results of the flare monitoring undertaken at Ballymurtagh Landfill in accordance with Schedule E.6 of Waste Licence No. W0011-01.

Wicklow County Council commissioned RPS Group to monitor emissions to atmosphere from a Haase flare unit at Ballymurtagh Landfill, Ballygahan Upper, Ballygahan Lower, Tinnahinch, Co. Wicklow. The flare system is used to burn off landfill gas emitted from the decaying landfill waste and was sampled for emissions of:

- NO_X, CO, SO_2 (Biannual)
- Inorganic Acids: Hydrogen Chloride and Hydrogen Fluoride (Annual)
- TA Luft Class Volatile Organic Compounds (VOC's) (Annual)

Volumetric flow was also measured and compared to the manufacturers specifications.

This report will be submitted to the Environmental Protection Agency (EPA) on behalf of Wicklow County Council in order to satisfy the biannual monitoring requirements as laid out in Schedule E.6 of Waste Licence No. W0011-01.

2 MONITORING

Suitably qualified personnel from RPS Group conducted the monitoring on the flare unit on 20th June 2008. The sampling and analytical methodologies employed are outlined below.

2.1 FLUE GAS ANALYSIS

Flue gas emissions were measured using a Testo 350 XL flue gas analyser. This is a specialised flue gas analysis system fully equipped with electrochemical sensors. The Flue Gas Analyser measures the following parameters:

- Temperature
- Nitrogen Oxides (NO_x)
- Carbon Monoxide (CO)
- Sulphur Dioxide (SO_2)

Sampling rounds were conducted over a 30-minute period.

2.2 INORGANIC ACIDS

A sample of air was extracted using a low flow, intrinsically safe pump at a flow rate of 200 ml/min over 30 minute periods. The pump was calibrated before and after sampling. Sample air was then passed through a specialised silica gel absorbent glass (SKC) tube (226-119). This adsorption tube was analysed for hydrogen chloride and hydrogen fluoride by Gas Chromatography connected to Mass Spectrometer (GC-MS) using a UKAS accredited laboratory (RPS Laboratories, Manchester).

2.3 TA LUFT CLASS VOLATILE ORGANIC COMPOUNDS

Samples of the gas stream were extracted using low flow, intrinsically safe pumps at a flow rate of 200 ml/min. The pumps were calibrated before and after sampling. Organics in the gas stream were collected through specialised charcoal sorbent tubes (SKC tube 226-09). The sorbent tubes were analysed using a UKAS accredited laboratory (RPS Laboratories Manchester).

2.4 VOLUMETRIC FLOWS

All volumetric airflows were measured using an “L-type” pitot tube, a digital manometer and the Testo 350xl flue gas analyser with integrated temperature probe.

3 RESULTS

3.1 FLUE GAS ANALYSIS

The results of flue gas emissions monitoring from the flare unit at Ballymurtagh Landfill are presented in Table 3.1 below and compared with the emission limit values outlined in Schedule F.5 of the Waste Licence:

Table 3.1 Results of Flue Gas Monitoring from the Flare Unit

Parameter	Units	Emission Value[1]	Emission Limit[2]
Nitrogen Oxides (NO_x) as NO_2	(mg/Nm^3)	0	500
Carbon Monoxide (CO)	(mg/Nm^3)	39	650
Sulphur Dioxide (SO_2)	(mg/Nm^3)	14	-
Temperature	(℃)	1092.27	N/a

Note: 1 Normalised to 273K, 101.3 kPa and $\%O_2$ reference of 3
Note: 2 As stated in Schedule F.5. of Waste Licence 11-1

3.2 INORGANIC ACIDS

The results of Hydrogen Chloride (HCL) and Hydrogen Fluoride (HF) emissions monitoring from the Flare Unit at Ballymurtagh Landfill are presented in Table 3.3 below.

Table 3.3 Results of Inorganic Acids monitoring from the Flare Unit

Parameter	(mg/Nm^3)	
	Emission Value	Emission Limit
HF	0.18	5
HCL	0.91	50

3.3 TA LUFT CLASS VOLATILE ORGANIC COMPOUNDS

Results of previous monitoring work at the site indicated that volatile organic emissions to atmosphere were consistently below the prescribed emission limit values for class I, II and III TA Luft organics. Results of monitoring carried out during June 2008, show that total volatile organic compounds were

below the laboratory detection limit of 10µg. The emission limit value for TA Luft Class I organics is 20mg/m^3 or 20000µg/m^3. As the ELV for Class I organics is the lowest emission limit value for volatile organics it can be assumed therefore that Class I, II and III organics were all within the relevant emission limit value.

Table 3.2 Results of Total TA Luft Organics monitoring from the Flare Unit

Parameter	Emission Value (mg/Nm^3)	Class I TA Luft Organic Emission Limit (mg/m^3)
Total TA Luft Organics (VOCs)	13.34	20

3.4 VOLUMETRIC FLOW

The results of temperature and volumetric flow monitoring from the Flare Unit at Ballymurtagh Landfill are presented in the table 3.4 below.

Table 3.4 Results of Volumetric Flow & Temperature Monitoring from the Flare Unit

Parameter	Emission Value
Flow Rate (Nm^3/hr)	255
Stack Temperature (^{0}C)	1092.27

4 CONCLUSIONS

The level determined for Nitrogen Oxides (NOx as NO_2) from the Flare Unit are within the emission limit value stated in Schedule F.5 of Waste Licence W0011-01.

The level determined for Carbon Monoxide (CO) emissions from the Flare Unit are within the emission limit value stated in Schedule F.5 of Waste Licence W0011-01.

The levels determined for Hydrochloric acid (HCL) and Hydrofluoric acid (HF) were within the emission limit values stated in Schedule F.5 of Waste Licence W0011-01.

The levels determined for volatile organic compounds were within the emission limit values stated in Schedule F.5 of Waste Licence W0011-01.

The findings of the flare test show that all Waste Licence parameters listed in Waste Licence W0011-01 are within the limits specified in schedule F.5. These findings show that efficient combustion in taking place within the combustion chamber of the Ballymurtagh flare and in general, is operating under the original manufacturers specification.

Appendix A - Survey Details

Location

Ballymurtagh Landfill Site
Ballygahan Upper, Ballygahan Lower,
Tinnahinch,
Co. Wicklow

Personnel Present

Ronan Murphy – Environmental Consultant RPS

Date and Time

Tuesday 20th June 2008

12:30 – 14:30

Equipment

High Temperature Probe and Atmospheric Pressure Probe
Stackmite Isokinetic Sampler and Probe
Testo 350 xl Flue Gas Analyser
SKC Isokinetic Air Sampling Pump
SKC Sampling Media, Deionised Water and Glass Impingers

Monitoring of Flare Emissions at Ballymurtagh Landfill December 2008

DOCUMENT CONTROL SHEET

Client	Wicklow County Council					
Project Title	Monitoring of Flare Emissions at Ballymurtagh Landfill					
Document Title	Emissions Monitoring December 2008					
Document No.	MDE0725Rp004					
This Document Comprises	DCS	TOC	Text	List of Tables	List of Figures	No. of Appendices
	1	1	6	1	0	1

Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
D01	Draft	Ronan Murphy	Esther Villoria	Paul Chadwick	Dublin Environment	16/01/2009
F01	Final	Ronan Murphy	Esther Villoria	Paul Chadwick	Dublin Environment	26/01/2009

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LIST OF TABLES

1 INTRODUCTION

This report presents the results of the flare monitoring undertaken at Ballymurtagh Landfill in accordance with Schedule E.6 of Waste Licence No. W0011-01.

Wicklow County Council commissioned RPS Group to monitor emissions to atmosphere from a Haase flare unit at Ballymurtagh Landfill, Ballygahan Upper, Ballygahan Lower, Tinnahinch, Co. Wicklow. The flare system is used to burn off landfill gas emitted from the decaying landfill waste and was sampled for emissions of:

- NO_X, CO, SO_2 (Biannual)

Volumetric flow was also measured and compared to the manufacturers specifications.

This report will be submitted to the Environmental Protection Agency (EPA) on behalf of Wicklow County Council in order to satisfy the biannual monitoring requirements as laid out in Schedule E.6 of Waste Licence No. W0011-01.

2 MONITORING

Suitably qualified personnel from RPS Group conducted the monitoring on the flare unit on 26th November 2008. The sampling and analytical methodologies employed are outlined below.

2.1 FLUE GAS ANALYSIS

Flue gas emissions were measured using a Testo 350 XL flue gas analyser. This is a specialised flue gas analysis system fully equipped with electrochemical sensors. The Flue Gas Analyser measures the following parameters:

- Temperature
- Nitrogen Oxides (NO_x)
- Carbon Monoxide (CO)
- Sulphur Dioxide (SO_2)

Sampling rounds were conducted over a 30-minute period.

2.2 VOLUMETRIC FLOWS

All volumetric airflows were measured using an “L-type” pitot tube, a digital manometer and the Testo 350xl flue gas analyser with integrated temperature probe.

3 RESULTS

3.1 FLUE GAS ANALYSIS

The results of flue gas emissions monitoring from the flare unit at Ballymurtagh Landfill are presented in Table 3.1 below and compared with the emission limit values outlined in Schedule F.5 of the Waste Licence:

Table 3.1 Results of Flue Gas Monitoring from the Flare Unit

Parameter	Units	Emission Value[1]	Emission Limit[2]
Nitrogen Oxides (NO_x) as NO_2	(mg/Nm^3)	0.5	500
Carbon Monoxide (CO)	(mg/Nm^3)	119	650
Sulphur Dioxide (SO_2)	(mg/Nm^3)	48	-
Temperature	(℃)	1067	N/a

Note: 1 Normalised to 273K, 101.3 kPa and $\%O_2$ reference of 3
Note: 2 As stated in Schedule F.5. of Waste Licence 11-1

3.2 VOLUMETRIC FLOW

The results of temperature and volumetric flow monitoring from the Flare Unit at Ballymurtagh Landfill are presented in the table 3.4 below.

Table 3.2 Results of Volumetric Flow & Temperature Monitoring from the Flare Unit

Parameter	Emission Value
Flow Rate (Nm^3/hr)	404
Stack Temperature (^0C)	1067

4 CONCLUSIONS

The level determined for Nitrogen Oxides (NOx as NO_2) from the Flare Unit are within the emission limit value stated in Schedule F.5 of Waste Licence W0011-01.

The level determined for Carbon Monoxide (CO) emissions from the Flare Unit are within the emission limit value stated in Schedule F.5 of Waste Licence W0011-01.

The findings of the flare test show that all Waste Licence parameters listed in Waste Licence W0011-01 are within the limits specified in schedule F.5. These findings show that efficient combustion in taking place within the combustion chamber of the Ballymurtagh flare and in general, is operating under the original manufacturers specification.

Appendix A - Survey Details

Location

Ballymurtagh Landfill Site
Ballygahan Upper, Ballygahan Lower,
Tinnahinch,
Co. Wicklow

Personnel Present

Ronan Murphy – Environmental Consultant RPS

Date and Time

Wednesday 26th November 2008

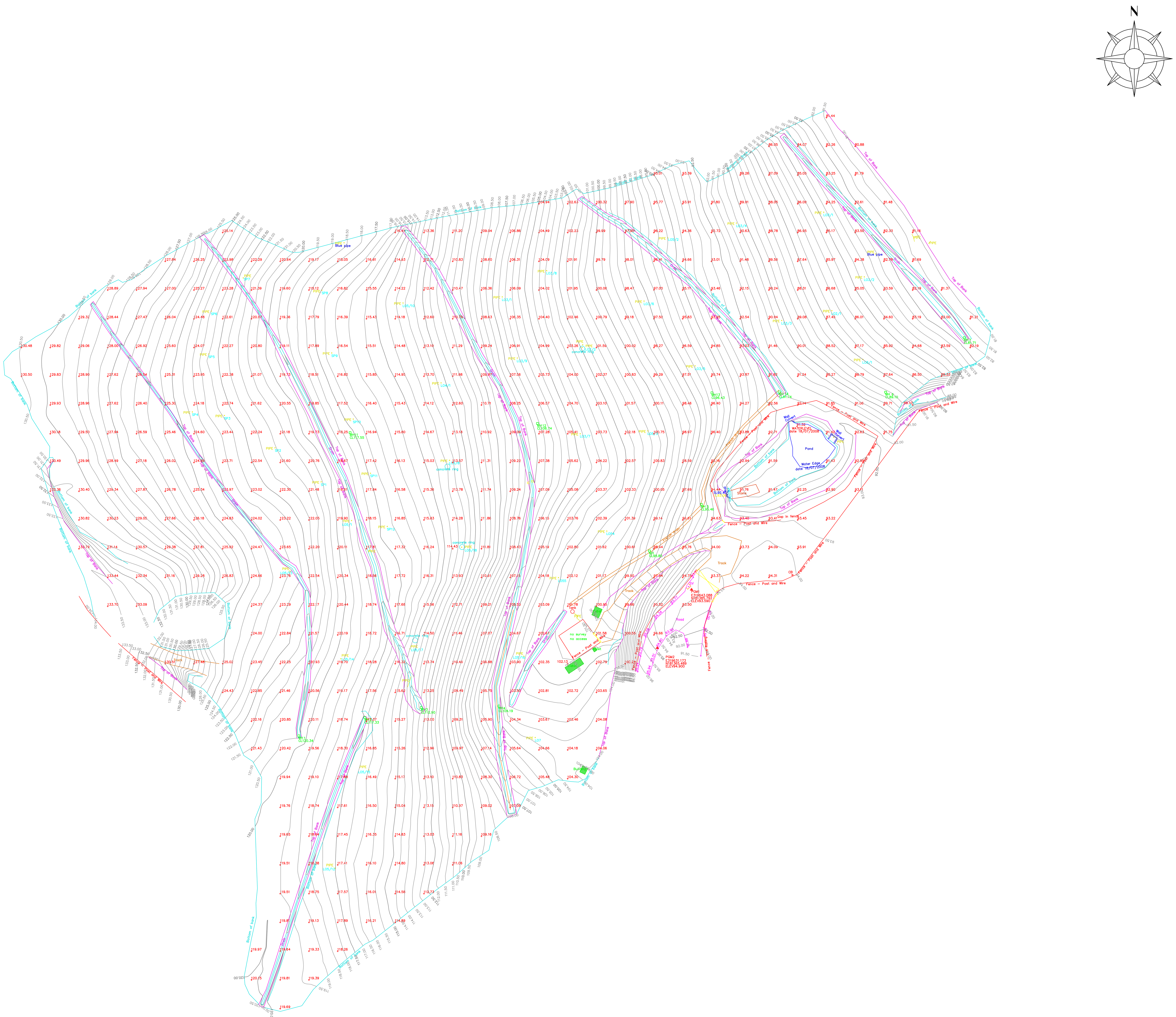
10:30 – 15:30

Equipment

High Temperature Probe and Atmospheric Pressure Probe
Stackmite Isokinetic Sampler and Probe
Testo 350 xl Flue Gas Analyser

APPENDIX B

Site Survey



Symbol	Details/Explanation
TP EP	POLE Telecom or ESB
CB	CONTROL BOX (ESB OR OTHER)
FH SV	HYDRANT, STOP VALVE
WSV WSC	WATER VALVE, WATER STOP COCK
MH MH CL+67.67m	MANHOLE & COVER LEVEL
GY	GULLY
TIC ESB	TELECOM or ESB INSPECTION COVER
IC	UNKNOWN INSPCTION COVER
CATV	CABLE TV INSPECTION COVER
EL EL	ROOF RIDGE LEVEL, ROOF EAVE LEVEL
SL IL	SOFFIT LEVEL, INVERT LEVEL
BOL BS	ROAD BOLLARD, BUS STOP
LP TF	LIGHT POLE, TRAFFIC LIGHT
RS SN	ROAD SIGN, SIGN
	TREE

BUILDING

FENCE LINE

WALL

ROAD EDGE

TOP OF KERB

CABLES OVERHEAD ESB TELECOM

HEDGE LINE

EDGE OF PATH

NOTES

Survey is based on Irish Grid coordinates and Malin Head Datum as derived from the rinex active stations network.

Rev.	By	Date	Description
–			

FCG Surveys

St John's Lane, Athy, Co Kildare, Ireland
Tel: 059 8632888 – Fax: 059 8632893
email: info@fcgsurveys.ie
web: www.fcgsurveys.ie

Client	RPS Group West Pier Business Campus Dun Laoghaire
Title	Topographical Survey of the site at Ballymurtagh Landfill
Date	18/07/2008
Drawing No.	FCG/2780/500/001
Scale	1:500
Drawn by:	MS
Checked By:	JR

Revision

–

APPENDIX C

E-PRTR

AER / PRTR Emissions Data Upload Queued for Processing

Your AER / PRTR Emissions Data XML Return file has been queued for automatic checking by our data system.

Please retain your tracking number below by printing this page. You should also electronically copy and paste the tracking number to a "Word" document and save this to your AER / PRTR Reporting folder on your computer under the name "2XXX AERPRTR Emissions Data XML Return Tracking Number.doc" (Where 2XXX is the year).

Your file will now undergo automated checking, you will receive a verification email within 24 hours. This email will specify one of two things:

Your file has passed the automated checking and the data has been imported successfully into the AER/ PRTR Database.

OR

Your file has failed the automated checking, and the data has not been imported into the AER / PRTR database. Please correct the identified error(s) in your Excel file and then create and upload your AER / PRTR Emissions data return again.

EPA Licence holders may now proceed to the Second AER / PRTR Reporting Task, the submission of your Full AER or Annual Environmental Report.

Non EPA-Licensed facilities have now completed your obligations to report under the PRTR Regulations. However, your report will be assessed in relation to its quality, completeness, consistency and credibility, and it is possible that further refinement or review of the information may be required by the EPA following the date of your submission.

Important - Your upload is not complete until you recieve the confirmation email which confirms that the file has passed the import validation.

Tracking Number: 265f13be7b638a1df27ea520f3d8c08b

Environmental Protection Agency

AER Returns Worksheet

Version 1.1.03

REFERENCE YEAR	2008

1. FACILITY IDENTIFICATION

Parent Company Name	Wicklow County Council
Facility Name	Ballymurtagh Landfill Facility
PRTR Identification Number	W0011
Licence Number	W0011-01

Waste or IPPC Classes of Activity

No.	class_name
4.11	Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.
4.13	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.
3.1	Deposit on, in or under land (including landfill).
3.2	Land treatment, including biodegradation of liquid or sludge discards in soils.
3.4	Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons.
3.6	Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1. to 10. of this Schedule.
3.7	Physico-chemical treatment not referred to elsewhere in this Schedule (including evaporation, drying and calcination) which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1. to 10. of t...
3.11	Blending or mixture prior to submission to any activity referred to in a preceding paragraph of this Schedule.
3.13	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 is produced.
4.2	Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).
4.3	Recycling or reclamation of metals and metal compounds.
4.4	Recycling or reclamation of other inorganic materials.
4.9	Use of any waste principally as a fuel or other means to generate energy.
4.10	The treatment of any waste on land with a consequential benefit for an agricultural activity or ecological system.

Address 1	Ballymurtagh, Ballygahan Upper, Ballygahan Lower
Address 2	Tinnahinch
Address 3	Co. Wicklow
Address 4	
Country	Ireland
Coordinates of Location	501300.000
River Basin District	IE-Eastern
NACE Code	3832
Main Economic Activity	Recovery of sorted materials
AER Returns Contact Name	Seamus Breslin
AER Returns Contact Email Address	sbreslin@wicklowcoco.ie
AER Returns Contact Position	Facility Manager
AER Returns Contact Telephone Number	087 2301627
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
5c	Installations for the disposal of non-hazardous waste
5d	Landfills

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 ?	

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR								
POLLUTANT		METHOD				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)	**Methane**	C	OTH	Gas Sim 2 & Calcs	7457.6	80400		72942.4
03 - Carbon dioxide (CO2)	Carbon Dioxide	C	OTH	Gas Sim 2 & Calcs	1843453.0	4107000.0	0.0	2263547.0
02 - Carbon monoxide (CO)	Carbon Monoxide (CO)	C	ssc	Gas Sim 2		3460		
08 - Nitrogen oxides (NOx/NO2)	Nitrogen oxides (Nox/NO2)	C	ssc	Gas Sim 2		1110.0	0.0	
11 - Sulphur oxides (SOx/SO2)	Sulphur oxides (Sox/SO2)	C	ssc	Gas Sim 2		2710.0		
86 - Particulate matter (PM10)	Particulate matter (PM10)	C	ssc	Gas Sim 2		66.9		

* 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				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

* 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				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

* 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: Ballymurtagh Landfill Facility

Please enter summary data on the quantities of methane flared and / or utilised	**T (Total) kg/Year**	**M/C/E**	**Method Used**		**Facility Total Capacity m3 per hour**	
			Method Code	**Designation or Description**		
Total estimated methane generation (as per site model)	818704.7	C	OTH	Gas Sim 2 & Calcs	N/A	
Methane flared	738304.7	C	OTH	Gas Sim 2 & Calcs	500.0	(Total Flaring Capacity)
Methane utilised in engine/s	0.0	C			0.0	(Total Utilising Capacity)
Net methane emission (as reported in Section A above)	80400.0	C	OTH	Gas Sim 2 & Calcs	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 Reporting as this only concerns Releases from your facility

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

* 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					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
					0.0	0.0	0.0	0.0

* 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 WATERS										
POLLUTANT					QUANTITY					
			Method Used							
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	Emission Point 2	Emission Point 3	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
240	Suspended Solids	C	OTH	Water Calcs	5588.0	0.0	0.0	5588.0	0.0	0.0

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

4.3 RELEASES TO WASTEWATER OR SEWER

SECTION A : PRTR POLLUTANTS

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER								
POLLUTANT		METHOD			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

* 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			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

* 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			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

* 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			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

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

Transfer Destination	European Waste Code	Hazardous	Quantity T/Year	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Name and Licence / Permit No. of Recoverer / Disposer / Broker	Address of Recoverer / Disposer / Broker	Name and Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)	Licence / Permit No. of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					
Within the Country	20 01 01	No	176.242	Newsprint/Mags	R13	M	Weighed	Offsite in Ireland	Bailey Waste WPT9/4 (Fingal Co Council) (WCP 235-07B)	Rosemount Business Park, Dublin 11		
Within the Country	15 01 01	No	82.17	Cardboard	R13	M	Weighed	Offsite in Ireland	Bailey Waste WPT9/4 (Fingal Co Council) (WCP 235-07B)	Rosemount Business Park, Dublin 11		
Within the Country	15 01 05	No	3.38	Beverage Cartons	R13	M	Weighed	Offsite in Ireland	Bailey Waste WPT9/4 (Fingal Co Council) (WCP 235-07B)	Rosemount Business Park, Dublin 11		
Within the Country	20 01 11	No	25.32	Textiles	R13	M	Weighed	Offsite in Ireland	National Council for the Blind (Mrs Quinns Charity Shop) 214-2005 (Kildare County Council) (WCP368-08B)	Kildare		
Within the Country	15 01 02	No	69.063	Household Plastic Packaging	R13	M	Weighed	Offsite in Ireland	County Council) (WPC 21-07B)	Rathdangan, Co Kildare		
Within the Country	15 01 07	No	84.519	Glass	R13	M	Weighed	Offsite in Ireland	Greenstar W0053-03 (WCP 68-06C)	Fassaroe, Bray, Co Wicklow		
Within the Country	15 01 04	No	5.663	Al Cans	R13	M	Weighed	Offsite in Ireland	68-06C)	Fassaroe, Bray, Co Wicklow		
Within the Country	15 01 04	No	16.14	Ferrous Cans	R13	M	Weighed	Offsite in Ireland	(ESS1254504/07A)	Hammond Lane, Dublin		
Within the Country	20 01 40	No	20.18	Scrap Metal	R13	M	Weighed	Offsite in Ireland	(ESS/15/54/365/08B)	Hammond Lane, Dublin		
Within the Country	20 03 01	No	10.24	Residual Wastes	R13	M	Weighed	Offsite in Ireland	Arklow Waste Disposal (W066-02) (ESS/15/54/05D)	Rampere, Baltinglass, County Wicklow		
Within the Country	20 01 33	Yes	5.728	Wet Batteries	R13	M	Weighed	Offsite in Ireland	Returnbatt (W0105-01) (WCP 54-05B)	Melita Road, Kildare		
Within the Country	20 01 21	Yes	0.543	Light Bulbs	R13	M	Weighed	Offsite in Ireland	02/2000B (Kildare Co Council) (WCP 51-07C)	Athy, Co Kildare		
Within the Country	20 01 25	No	0.7	Cooking Oil	R13	M	Weighed	Offsite in Ireland	ENVA (W0184-01) (W0184/01)	ENVA, Portlaoise, Co Laois		
Within the Country	20 01 26	Yes	2.6	Engine Oil	R13	M	Weighed	Offsite in Ireland	(W0184/01)	ENVA, Portlaoise, Co Laois		
Within the Country	20 01 25	No	83.666	All WEEE	R13	M	Weighed	Offsite in Ireland	(W0185/01)	Rathcoole, Co Dublin		
Within the Country	20 01 34	No	0.713	Dry Batteries	R13	M	Weighed	Offsite in Ireland	(WCP 54-05B)	Melita Road, Kildare		
Within the Country	20 01 35	Yes	18.36	Mobile Phones	R13	E	None	Offsite in Ireland	(Charity No. CHY12405)			
Within the Country	20 01 28	No	10.2	Ink Cartridges	R13	E	None	Offsite in Ireland	the jack and Jill foundation.			

* Select a row by double-clicking the Description of Waste then click the delete button

APPENDIX D

Water Balance Calculations

Medium precipitation, Covered cells **Surface flow %= 65**

Completed cell with topcover **Evaporation factor = 1** **Unit of data: mm**

	Jan		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	year
precipitation	154.5	42.7	101.1	40.4	17.6	79.7	111.8	177	101	144.6	77.8	62.1	1110.3
surface run-off	100	28	66	26	11	52	73	115	66	94	51	40	722
infiltration	54	15	35	14	6	28	39	62	35	51	27	22	389
potential evapotranspiration	22.6	26	40	56	89	83	81	63	43	27	11	5	546
	31	-11	-4	-42			-41	-1	-8	24	16	16	
waterdeficit (*)	0	-11	-15	-50	-50	-50	-50		-50	-26	-10	0	
	23	26	40	49	6	28	39	62	35	27	11	5	351
leachate, infiltration-act. evaporation	31	0	0	0	0	0	0	0	0	0	0	6	38
equalization, factor 12	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	37.5