Wexford County Council

Holmestown Waste Management Facility
W0191-02

Annual Environmental Report 2010

Quality Control Sheet

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EXECUTIVE SUMMARY

This *Annual Environmental Report* has been prepared for Holmestown Waste Management Facility, Waste Licence 191-2, for the reporting period from **1 January 2010 to 31 December 2010 inclusive**. The report includes the information specified in Schedule H of the Waste Licence, Content of the Annual Environmental Report, in accordance with Waste Licensing - *Draft Guidance on Environmental Management Systems (EMS) and Reporting to the Agency, 1999'.* The main topics discussed within this report are as follows:

- General Site Information
- Management and Staffing
- Reported Incidents and Complaints
- Development Works
- Waste Acceptance and Handling
- Emissions Management
- Environmental Nuisances
- Resource and Energy Consumption
- Environmental Monitoring and Emissions

The waste management facility commenced accepting waste on site on 29 April 2008 in the northern end of the landfill, namely Cells 3 + 4 in Phase 1, being used first. Cell 1 was being used as the active tipping area at the end of the reporting period. The total quantity of waste accepted at the facility for the reporting period 1st January to 31st December 2010 was 32,602kg's.

An environmental management system was prepared for Holmestown Waste Management Facility in October 2008 consisting of the following elements:

- Schedule of Environmental Objectives and Targets
- Environmental Management Plan
- Corrective Action Procedures
- Awareness and Training Programme

A number of objectives and targets were developed for the facility which are reviewed and updated where appropriate on an annual basis.

The majority of engineering works associated with the general development of the site including the preparation of Phase 1, Cells 1-4, were completed from 2006-2008. The installation of the twin gas lines from phase 1 to the enclosed gas flare and other minor operational works were completed in 2009.

The enclosed flare was commissioned in August 2009 and put into permanent operation in September 2009. Horizontal and vertical infrastructure has been installed in cells 1, 2, 3, and 4. The volumes of landfill gas extracted varied from 180M^3/hr to 270M^3/hr during the reporting period. Gas extraction rates were maximised in 2010 to minimise odours. The gas quality remained relatively constant during the reporting period with CH_4 values of approx. 32%.

The construction of the Phase 2 landfill cells commenced in June 2010 and was completed in December 2010.

The Phase 2 landfill footprint encompasses approximately 17,500 m2. Lining of the cells involved the placing of approximately 16,600 m³ of an engineered clay and the laying and welding of approximately 17,000 m² of HDPE liner. A 500 mm drainage blanket was laid on the cell floors with a protective geotextile placed on the cell side slopes.

Wexford County Council carried out a comprehensive environmental monitoring programme during 2010 in compliance with the waste licence conditions. The monitoring programme incorporated Landfill Gas, Leachate Level & Quality, Surface Water Quality, Groundwater Level & Quality, Noise, Dust, Odour, Meteorological and topographical surveys. Results to date suggest that there is no notable pollution from operational activities.

There was a number of recurring category 3 incidents in 2010. These were related to:

- peripheral gas wells;
- groundwater monitoring;
- Noise.

The elevated gas and groundwater results were detected pre-landfilling and are not related to site operations. Reports to date have summarized that the elevated results recorded are due to naturally occurring elements in the site soils.

The elevated noise readings were also not attributed to site operations. Noise reports commented that all the elevated readings were caused by either the N25 or local noises in close proximity to the sampling device (e.g. tractor passing, dog barking etc.).

Reports have been submitted to the EPA that review peripheral gas, groundwater and surface water pond results and provide proposals for control and trigger levels where applicable. A similar report is proposed to review noise monitoring.

No complaints were received during this reporting period.

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APPENDICES

1 INTRODUCTION

1.1 General Information

The Annual Environmental Report (AER) for Holmestown Waste Management Facility includes as a minimum the information specified in Schedule H of the Waste Licence 191-1, *Content of Annual Environmental Report.*

The AER has been prepared in accordance with the Environmental Protection Agency (EPA) publication *'Waste Licensing – Draft Guidance on Environmental Management Systems (EMS) and Reporting to the Agency, 1999'* and further guidance provided on the EPA website. This document is the third AER prepared for the site.

The reporting period for this AER is **1 January 2010 to 31 December 2010 inclusive**.

1.2 Site information

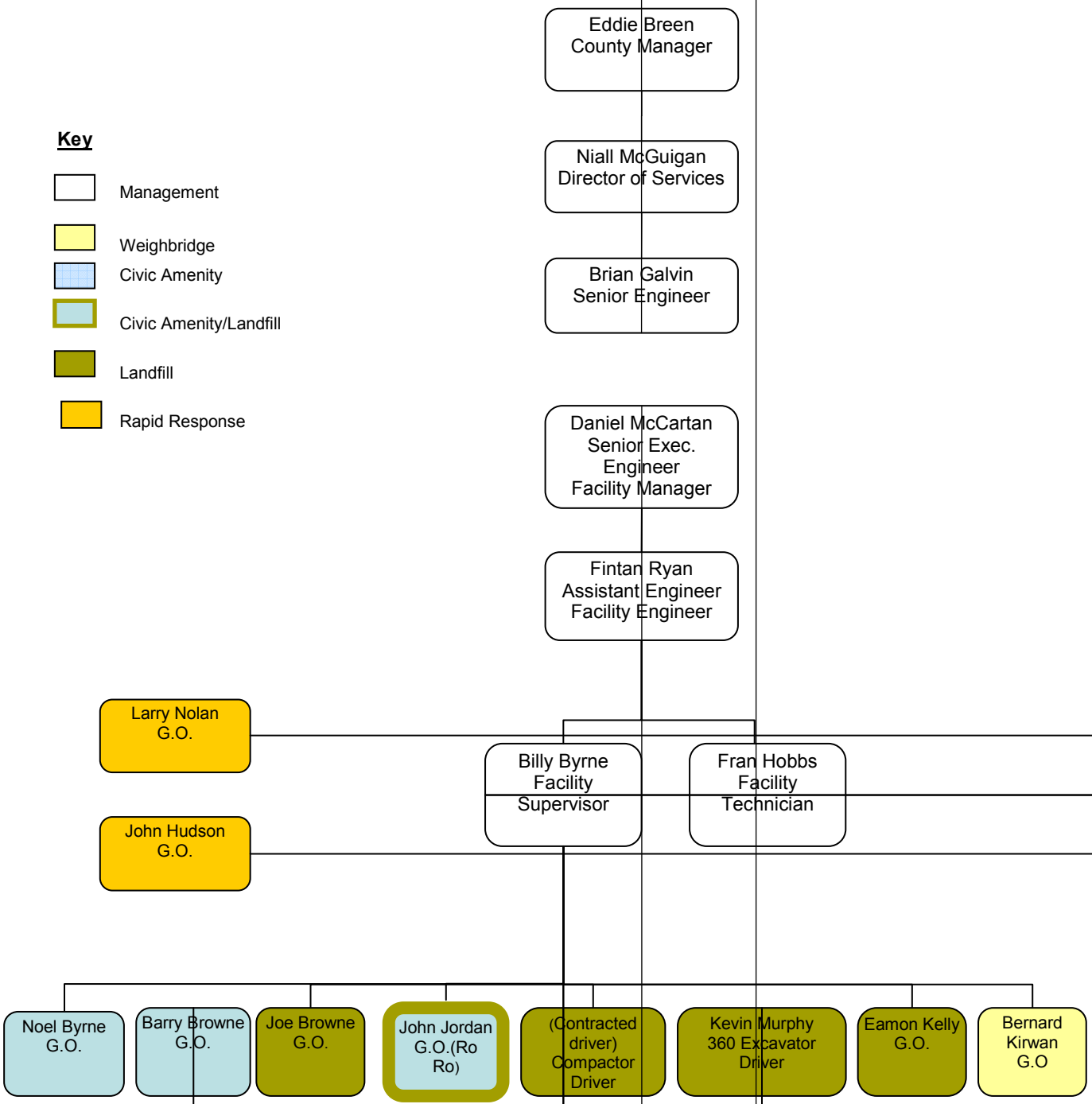
Table 1 Site information on Holmestown Waste Management Facility

HOLMESTOWN WASTE MANAGEMENT FACILITY	
Waste licence register no:	W0191-2 (revised date 24/03/2010)
Name and address of operator:	Wexford County Council County Hall Spawell Road County Wexford
Name and address of facility:	Holmestown Waste Management Facility Barntown County Wexford
Site Description:	Holmestown Waste Management Facility is located within the town lands of Holmestown Great, Glenduff, Bolgerstown, Muchwood and Ballyeaton, approximately 8 kilometres west from Wexford Town (National Grid Reference 2973, 1230). The site which lies to the north of the N25, Wexford to New Ross road comprises an area of approximately 63 hectares of which 15 hectares will be used for landfilling and is situated within a mixed forested plantation of mainly coniferous trees known as Holmestown Wood. The property is bounded by agricultural lands to the North, South, East and West. The land use in the surrounding area is good quality grazing and is intensely farmed to the west, north and east by dairy and livestock farmers. There are a number of dwellings surrounding the site including farmhouses, residences and a nursing home. The site is within the catchment of the Slaney River, and a number of small streams drain the site to the Slaney, less than 2km away. A site location map is provided as **Appendix G.**

2 MANAGEMENT & STAFFING STRUCTURE

2.1 Management and staffing structure for Holmestown Waste Management Facility

Management structure for Holmestown Waste Management Facility 2010



The Holmestown waste management facility was operated by Wexford County Council during 2010 with consultancy support provided by sub consultants including Fehily Timoney & Company, Irish Biotech Services and Odour monitoring Ireland. Details of the management structure during the reporting period for the facility are provided above.

2.2 Financial provisions

In accordance with Condition 12.1 Wexford County Council paid a sum of €21,730.71 to the Environmental Protection Agency for the management and monitoring of the waste licence.

2.2.1 *Provision for the Closure, Restoration and Aftercare*

Wexford County Council (WCC), as a Local Authority, has made the necessary provisions, for the development, management, restoration and aftercare of Holmestown Waste Management Facility. WCC has assigned a full time permanent engineer for the management of the facility. Wexford County Council is committed to the ongoing provision of funding for all site development works, environmental monitoring costs and restoration and aftercare works at Holmestown Landfill for the duration of the Waste Licence.

2.2.2 Community Support and Development

An environmental monitoring committee (EMC) was established in July 2005 and includes two members of the Barntown Environmental Alliance, two elected members of Wexford County Council and two Wexford County Council officials. The Committee meets once a month. A community support and development fund has been set up by Wexford County Council.

2.3 Review of Environmental Liabilities

Condition 12.2.2 states the licensee shall arrange for the completion of a Environmental Liabilities Risk Assessment (ELRA) to address the liabilities from past and present activities. Work on the ELRA has commenced and a report shall be submitted to the Agency for agreement when completed.

2.4 Environmental Management System

Condition 2.3 requires the licensee to establish and maintain an Environmental Management System (EMS) at the facility. The site environmental management system was prepared in October 2008 and revised in 2010. The EMS consists of the following elements:

- Schedule of Environmental Objectives and Targets
- Environmental Management Plan
- Corrective Action procedures
- Awareness and training Programme

2.4.1 *Environmental Objectives & Targets – Progress*

The Environmental Objectives and Targets for the period January 2011 to December 2011 and details of progress made regarding each objective are detailed in Table 2 and 3 hereafter. In summary the objectives and targets established include the following;

- Objective No 1: Operate facility in accordance with the conditions of the waste licence and promote continual environmental improvement
- Objective No 2: Improve Environmental Performance of the facility by maintaining a comprehensive monitoring regime
- Objective No 3: Maximise recycling levels within the civic amenity and site office
- Objective No 4: Promote energy efficiency in the site offices
- Objective No 5: Minimisation of Complaints

2.4.2 *Environmental Management Plan*

An environmental management plan (EMP) was prepared and as part of the EMS in October 2008 and reviewed in January 2010. The EMP comprises information on the following topics:

- Site description
- Site infrastructure
- Types of waste accepted on site
- Civic amenity site
- Leachate Collection and treatment Leachate Management System
- Landfill Gas Abatement Methods
- Surface water Control Measures
- Environmental Monitoring
- Site Security and Site Offices
- Operational Matters
- Noise and dust abatement
- Vermin and litter control
- Fires
- Restoration and Aftercare

2.4.3 *Corrective action Procedure*

Procedures are in place in accordance with Condition 2.3.2.3 of the licence to monitor, measure, audit and record the environmental performance of the environmental management system. These procedures establish how non-conformance within the system is dealt with and how any corrective and preventive action is carried out. A corrective action procedure was prepared in October 2008 and included in the overall EMS report.

2.4.4 *Awareness and Training Programme*

In accordance with Condition 2.3.2.4 of the licence, an awareness and training programme has been developed to increase environmental awareness among staff and identify training needs of all personnel working at Holmestown waste management facility. The facility manager has overall responsibility for reviewing training needs on an annual basis to ensure that all staff have the necessary skills and level of awareness to carry out their duties to the highest environmental and safety standards. A training schedule summarizing staff training proposals for 2011 is included in Appendix B.

Table 2 Achievements of Objectives and Targets for 2010

Achievements of Objectives and Targets for 2010			
Objective	**Comments**	**Target**	**Progress**
Objective No 1: Operate facility in accordance with the conditions of the waste licence and promote continual environmental improvement			
1.1 Maintain landfill gas management on site	Development of a horizontal and vertical pipework system as the placement of waste expands in 2010.	December 2010	Complete
1.2 Programme of regular inspections of the foul and surface water drainage infrastructure & desludge as necessary.	Weekly inspections of all foul and surface water infrastructure to be carried out.	December 2010	Complete
1.3 Implement waste pre-treatment objectives in accordance with national policy and best practice.	Implement EPA pre-treatment policy in accordance with licence.	December 2010.	Partially Complete
Objective No 2: Improve environmental performance of the facility by maintaining a comprehensive monitoring regime			
2.1 Monitor the groundwater quality and review groundwater trigger levels	Finalise interim trigger level review.	Aug 2010	Complete
2.2 Monitor the data from the Inlet of the storm water retention pond and review the trigger levels	Finalise interim trigger level review.	Aug 2010	Complete
2.3 Establish a meteorological station on-site as per Waste Licence Condition 8.10	Weather station to be installed during 2010.	June 2010	Substantially complete
2.4 Regularly review environmental monitoring data and monitor changes in trends	Maintain trend analysis graphs for 2010	2010	Complete

Achievements of Objectives and Targets for 2010			
Objective	**Comments**	**Target**	**Progress**
Objective No 3: Maximise recycling levels within the civic amenity and site office			
3.1 Promote dry recyclables collection in the site offices	All staff to participate in and be made fully aware of recycling objectives	2010	Complete
3.2 Increase public awareness of the recycling facility through advertising	School tours of the facility are scheduled in coming year, and radio and paper advertising will be continued.	2010	Complete
3.3 Maintain the civic amenity facility in a tidy and orderly manner	Daily inspections carried out.	2010	Complete
Objective No 4: Promote energy efficiency in the site offices			
4.1 Ensure all lights and appliances are powered off upon leaving the building	All staff consulted regarding energy efficiency in the site offices. All computers will be turned off remotely at night by the IT department.	2010	Complete
4.2 Liaise with Wexford County Council regarding proposals for the conversion of vehicles to biofuels	Review of cost benefit analysis of conversion of vehicles to be carried out in 2010	December 2010	Not Complete
Objective No 5: Minimisation of Complaints			
5.1 Effectively deal with complaints	All complaints are recorded in the complaints register and fully investigated with action plans implemented immediately where necessary	2010	Complete
5.2 Review complaints register and formulate action plans for next period to minimise/reduce complaints	Complaints register reviewed by the facility manager on a regular basis. Issues identified	2010	Complete

Achievements of Objectives and Targets for 2010			
Objective	**Comments**	**Target**	**Progress**
	are fully investigated and action plans put in place to reduce or eliminate future complaints		
5.3 Improve housekeeping practices to minimise the number of complaints received	Litter picking of the site and surrounding areas daily, onsite noise monitioring to reduce noise impact daily.	2010	Complete
5.4 Maintain the site in an orderly and accessible fashion	All staff responsible for upkeep of site	2010	Complete
5.5 Engage with the local community through meetings	The local community are kept informed through the EMC committee.	2010	Complete
5.6 Maintain site vehicle speed limits to mitigate potential dust formation. Spray in dry weather.	Contractor hired in to spray roads in dry weather.	2010	Complete
5.7 Odour management – landfill gas extraction and use of woodchip on active areas	Permanent gas extraction system was operational during 2010. Woodchip and sand used on active areas of landfill as daily cover in conjunction with Hessian matting.	2010	Complete

Table 3 Objectives and Targets for 2010

Objectives and Targets for 2011			
	Comments	**Target**	**Responsibility**
Objective No 1: Operate facility in accordance with the conditions of the waste licence and promote continual environmental improvement			
1.1 Maintain landfill gas management on site	Further develop the horizontal and vertical pipework system as the placement of waste expands in 2011.	December 2011	Facility Engineer
1.2 Programme of regular inspections of the foul and surface water drainage infrastructure & desludge as necessary.	Weekly inspections of all foul and surface water infrastructure to be carried out.	December 2011	Facility Manager
1.3 Implement waste pre-treatment objectives in accordance with national policy and best practice.	Implement EPA pre-treatment policy in accordance with licence.	December 2011.	Facility Manager
Objective No 2: Improve environmental performance of the facility by maintaining a comprehensive monitoring regime			
2.1 Monitor the groundwater quality and review groundwater trigger levels	Finalise interim trigger level review and submit report to EPA.	January 2011	Facility Manager
2.2 Monitor the data from the Inlet of the storm water retention pond and review the trigger levels	Finalise interim trigger level review and submit report to EPA.	January 2011	Facility Manager
2.3 Establish a meteorological station on-site as per Waste Licence Condition 8.10	Weather station to be completed during 2011 and fully commisioned	July 2011	Facility Manager
2.4 Regularly review environmental monitoring data and monitor changes in trends	Maintain trend analysis graphs for 2011	December 2011	Facility Technician
Objective No 3: Maximise recycling levels within the civic amenity and site office			

Objectives and Targets for 2011			
	Comments	**Target**	**Responsibility**
3.1 Promote dry recyclables collection in the site offices	All staff to participate in and be made fully aware of recycling objectives	December 2011	All Staff
3.2 Increase public awareness of the recycling facility through advertising	School tours of the facility are scheduled in coming year, and radio and paper advertising will be continued.	December 2011	Facility Manager
3.3 Maintain the civic amenity facility in a tidy and orderly manner	Daily inspections carried out.	December 2011	Civic Amenity Staff
Objective No 4: Promote energy efficiency in the site offices			
4.1 Ensure all lights and appliances are powered off upon leaving the building	All staff consulted regarding energy efficiency in the site offices. All computers will be turned off remotely at night by the IT department.	December 2011	All Staff
4.2 Liaise with Wexford County Council regarding proposals for the conversion of vehicles to biofuels	Review of cost benefit analysis of conversion of vehicles to be carried out in 2011	December 2011	Facility Engineer
Objective No 5: Minimisation of Complaints			
5.1 Effectively deal with complaints	All complaints are recorded in the complaints register and fully investigated with action plans implemented immediately where necessary	December 2011	Facility Manager
5.2 Review complaints register and formulate action plans for next period to minimise/reduce complaints	Complaints register reviewed by the facility manager on a regular basis. Issues identified are fully investigated and action plans put in place to reduce or eliminate future	December 2011	Facility Manager

Objectives and Targets for 2011			
	Comments	**Target**	**Responsibility**
	complaints		
5.3 Improve housekeeping practices to minimise the number of complaints received	Litter picking of the site and surrounding areas daily, onsite noise monitioring to reduce noise impact daily.	December 2011	All Staff
5.4 Maintain the site in an orderly and accessible fashion	All staff responsible for upkeep of site	December 2011	All Staff
5.5 Engage with the local community through meetings	The local community are kept informed through the EMC committee.	December 2011	Facility Manager
5.6 Maintain site vehicle speed limits to mitigate potential dust formation. Spray in dry weather.	Contractor hired in to spray roads in dry weather.	December 2011	Facility Supervisor
5.7 Odour management – landfill gas extraction and use of woodchip on active areas	Permanent gas extraction system was operational during 2010. Woodchip and sand used on active areas of landfill as daily cover in conjunction with Hessian matting.	December 2011	Facility Engineer

2.4.5 *Full title of any procedures developed by the licensee in the year which relates to the facility operation*

During the reporting period January – December 2010 no new site procedures were developed at the facility however HWMF001 was revised. All procedures are kept on file at the site office and all staff are made fully aware of new/revised procedures as they are developed. The procedures developed for the site are as follows:

- HWMF001 Waste Acceptance Procedure rev.2
- HWMF002 Waste Handling Procedure
- HWMF003 Communications Procedure
- HWMF004 Environmental Records Procedure
- HWMF005 Corrective Action Procedure
- HWMF006 Leachate Handling Procedure
- HWMF007 Emergency Response Procedures
- HWMF008 Firewater Risk Retention assessment
- HWMF009 Entering onto private property procedure
- HWMF010 Civic Amenity procedures
- HWMF011 Weighbridge procedures
- HWMF012 Fire Evacuation - Emergency Procedure
- HWMF013 Accident and reporting procedure

2.4.6 *Report on communication programme*

In accordance with Condition 2.4.1 of the waste licence a communications programme has been developed at the facility. Information leaflets have been produced and distributed in 2010 to provide the local community and other interested parties with information on the location of the facility, opening hours, site rules and the types of waste that are accepted for disposal or recycling. An environmental monitoring committee also convene once a month to discuss a range of matters relating to the management and operation of the waste management facility. In addition Wexford County Council provides the following documentation for public viewing at the site office and at the Wexford County Hall:

Table 4 List of records available for public viewing in relation to the landfill

List of records available for public viewing
Waste Licence W00191-2
Waste Licence application
Correspondence with the EPA
Incident / complaints records
Audit records
Waste acceptance records
Rejected waste records

All monitoring records
Surface water inspection forms
Leachate removal records
Bird / vermin control reports

3 REPORTED INCIDENTS & COMPLAINTS SUMMARIES

3.1 Incidents

A recurring category 3 incident which was initially reported to the EPA on 11 January 2008 relating to the detection of carbon dioxide and methane gas at a number of gas monitoring boreholes continued to be in exceedence of its trigger level during the period January to December 2010.

Monitoring of gas wells was carried out between September 2007 and March 2008. Naturally occurring methane and carbon dioxide were regularly detected in a number of boreholes located outside the perimeter of the constructed lined cells during routine monitoring on site prior to waste acceptance. As a means of investigating these recurring gas levels the EPA requested that an investigation be carried out on site, this was undertaken between March and April 2008.

The investigation found existing levels of naturally occurring methane and carbon dioxide in the area as a result of the breakdown of organic material in the soil. An assessment was carried out and the risk associated with naturally occurring methane and carbon dioxide on the site was deemed not to be significant due to the underlying geology of the area. The presence of clay which has a low permeability acts as a natural containment material preventing gas from travelling through the ground for any considerable distance. The cells are also fully lined with a double liner system consisting of a geocomposite liner on top of an engineered clay liner. A number of recommendations were made to monitor and manage the landfill in the absence of perimeter gas wells through maintaining a negative pressure within the waste body. Two reports were submitted to the EPA during April and December 2008 entitled:

- Investigation of Naturally Occurring Background Gas Levels at Holmestown Landfill – Risk Assessment and Recommendations. (Revision 1)
- Investigation of Naturally Occurring Background Gas Levels at Holmestown Landfill – Risk Assessment and Recommendations – Trace Gas Analysis. (Revision 2)

A review of the peripheral gas borehole results as recommended in previous reports has been completed. The review incorporates all results to the end of 2009. This report will form the basis for future works/monitoring

Another recurring category 3 incident was the exceedence of trigger levels for groundwater boreholes. Results were outside interim trigger levels in a number of the on-site groundwater boreholes tested. The elevated levels date back to pre-landfilling and have been recorded both upstream and downstream of the landfill footprint. Similar to gas readings the elevated results are prevalent downstream in the north east corner where the bulk of the on site excavation works were carried out and appear to be due to a non-landfill source in the soil. The main soil mass is low permeability clay with sand and gravel lenses. Groundwater movement in the soil zone is relatively slow resulting in low flows. This enables emissions to build up locally around a source as appears to be indicated from the results.

Subsequent to ongoing interim trigger level exceedences, a report reviewing all groundwater data to the end of 2009 was completed.

Exceedences of noise trigger levels were also noted during the reporting period. The excessive noise was attributed to traffic on the N25 roadway or local noise sources (dogs barking etc.) during monitoring for all the monitoring locations that tested above the licence limit.

A report is proposed to review noise monitoring and investigate the monitoring locations where licence limit exceedences have been recorded frequently.

3.2 Complaints

No complaints were received during this reporting period.

4 DEVELOPMENT WORKS UNDERTAKEN DURING THE REPORTING PERIOD & THOSE PROPOSED FOR THE COMING YEAR

4.1 Landfill Engineering Works

Condition 3.1 of the licence states that the licensee shall establish all infrastructure referred to in the licence prior to the commencement of the licensed activities or as required by the waste licence. In accordance with Condition 3.2 proposals for all Specified Engineering Works reports (SEW's) have been submitted to the Agency for approval. A list of these reports to date is as follows. Due to a numbering error SEW No. 7 was omitted i.e. the follow on report from SEW No. 6 is in fact SEW No. 8.

- SEW Report No. 1: Development of the facility including preparatory works and lining – October 2005
- SEW Report No. 2: Installation of the Civic Amenity Facility – October 2005
- SEW Report No. 3: Installation of the Landfill Gas System – October 2005
- SEW Report No. 3A: Installation of the Landfill Gas System (Revised) – September 2007
- SEW Report No. 4: Installation of the Leachate Management System – October 2005
- SEW Report No. 5: Installation of the Groundwater Control Infrastructure – October 2005
- SEW Report No. 6 Installation of the Surface Water Management Infrastructure – October 2005
- SEW Report No. 8: Installation of Clay Liner – February 2007
- SEW Report No. 9: Access to Additional Cells – July 2008
- SEW Report No. 10: Landfill Cell Development Phase 2 – April 2009

4.1.1 *Completed Engineering Works to end of 2010*

The majority of engineering works associated with the general development of the site including the preparation of Phase 1, Cells 1-4, were completed during 2006 and 2007. During the latter part of 2008 engineering works associated with the completion of contract 3 and snagging works were completed. During 2009 the installation of the twin gas lines from phase 1 to the enclosed gas flare and other minor operational works was completed. Landfill Cell Development Phase 2 commenced in June 2010 and was completed in December 2010.

A description of other minor engineering works completed at Holmestown Waste Management facility during 2010 is as follows:

Table 5 **Summary of Development Works 2010**

Start Date	Development Works
March	○ Installation of horizontal and vertical pipe work for landfill gas infrastructure
April	○ Maintenance works to on site surface water

	streams and channels
June	○ Construction of new access crossing ○ Installation of new internal road in cells
July	○ Resurfacing works to site roads ○ Removal of windblown trees on boundary of site
December	○ Resurfacing works to site roads

4.1.2 *Proposed Engineering Works 2011*

A description of engineering works proposed at Holmestown Waste Management Facility for 2011 is as follows:

Table 6 **Summary of Proposed Development Works 2011**

Start Date	Development Works
July	○ Seal south east periphery and southern side slopes of Phase 1.
August	○ Install intermediate cap on phase 1, cells 1 & 2.

4.2 Restoration and Aftercare

Acceptance of waste to Holmestown commenced during April 2008 with the placement of waste into Cells 3 and 4 of Phase 1. Cells 1 and 2 were being used as the active tipping area at the end of the 2010. In accordance with section 5.7.5 of the licence, permanent capping is not programmed until 24 months after the cells are filled to the required level. An interim clay cap has been installed where applicable. No permanent capping works were carried out on site during 2010.

5 WASTE ACCEPTANCE & HANDLING

5.1 Waste Activities carried out at the Facility

In accordance with Schedule A of the Licence, Holmestown Waste Management facility is licensed to accept 80,000 tonnes of waste per annum. This includes 55,000 tonnes of non-hazardous household and commercial waste, 5,000 tonnes of waste for composting, 8,000 tonnes of construction and demolition waste for recovery and 12,000 tonnes of household and commercial waste for recovery.

Both waste recovery and disposal operations took place on site at Holmestown Waste Management facility during 2010.

5.2 Waste Acceptance and Handling Procedures

Holmestown Waste Management facility opened in April of 2008, as a replacement landfill for Killurin which ceased accepting waste on site at the end of June 2008. Currently waste is being placed in cell 1 of Phase 1 which is at the northern end of the landfill footprint.

Each waste stream is charachterised in accordance with European Waste Catalogue (EWC) codes, and on site verification is carried out to confirm waste types. A waste acceptance procedure and a waste handling procedure have been developed. Both procedures are kept on file at the site administration building.

If any waste load is found to contain a waste type not acceptable for disposal or recovery at the facility then the consignment is rejected and a waste rejection form completed. The waste collector will return the load to an appropriate waste disposal/recovery facility and the environmental waste enforcement section of Wexford County Council is informed. A written record of each load of waste entering and leaving the facility including weights is kept in the weighbridge office.

5.3 Waste Deposition

Waste is brought to the active tipping face by refuse transport vehicles. Each vehicle is reversed to the tipping face and the load ejected / tipped out. The waste is spread out and compacted into the active tipping area through the use of a steel wheeled compactor and covered as soon as possible with suitable material. The compaction process is a continuous one and the compactor is in operation almost continuously during site operating hours. Several passes are made over the consignment of waste prior to pushing the remnants over the Tipping Face itself. These passes are necessary to achieve the required optimum compaction of 0.8 tonnes/cubic meter. The deposition of the remnants of the consignment, i.e. a small fraction of the consignment, over the Tipping Face gradually extends the Tipping Face into the active cell thereby filling it.

Hessian matting and woodchip/sand mix are used to cover the working area at the end of each day as per the Procedure for Waste Handling *(HWMF 002*). Wood chip/sand mixture is used for the purposes of cover material at the facility. Advantages of the woodchip/ sand include: excellent trafficking qualities, low road maintenance, odour abatement and it is suited to the use of the landfill as a bioreactor. At the end of each day a layer of cover material is placed over any exposed hessian matting to provide adequate protection.

In accordance with Condition 5.4 of the licence only one working face is operational at any one time with a maximum working face height of 2.5m after compaction. The working face is kept to less than 25m wide with a slope no greater than 1 in 3.

All waste consigned off-site during 2010 was disposed of to facilities licensed or permitted to accept or treat that waste. Transport of waste was carried out in accordance with the *Waste Management (Collection Permit) Regulations, SI 820 of 2007, and Amendment Regulations, SI 87 of 2008* as appropriate.

5.4 Total quantity of wastes accepted on site

The total quantity of waste accepted at the facility for the reporting period 1st January to 31st December 2010 was 32,602 tonnes.

A summary of the total quantity of waste accepted at the facility for the reporting period is presented in Appendix E.

A summary of the total quantity material used for cover material and construction of internal roads and installation of horizontal and vertical pipework used in the landfill for the reporting period is presented in Appendix E.

5.4.1 *Statement on the achievement of the waste acceptance and treatment obligations*

In June 2010 a revised waste acceptance procedure was developed for the acceptance and handling of all wastes at HWMF. This procedure includes details of the treatment of all waste carried out in advance of acceptance at the facility. It also includes methods for the characterisation, classification and coding of waste.

Facility records from 1st July 2010 to 31st December 2010 show that 55.56% by weight of municipal solid waste accepted for disposal to the body of the landfill comprised of biodegradable municipal waste. This figure has exceeded the maximum allowable figure of 47%, however Wexford County Council endeavour to comply with this licence requirement in the coming reporting period.

5.5 Total Quantity of Waste Consigned Off Site

The total quantity of waste consigned off site at Holmestown Waste Management facility for the reporting period 1st January to 31st December 2010 was 16,163 tonnes.

A summary of the total quantity of waste consigned off site for the reporting period is presented below in Appendix E

The total volume of leachate sent off site for treatment at Enniscorthy and Wexford Wastewater Treatment Works was 15,364 tonnes.

5.6 Remaining capacity of the site

Waste was first accepted on site at Holmestown Waste Management facility during April 2008. The site is designed to provide for the disposal and recovery of a maximum of 80,000 tonnes of waste per annum comprising non-hazardous household and commercial waste, waste for composting, construction and demolition waste for recovery and household and commercial waste accepted for recovery at the civic waste facility and materials recovery facility.

Wexford County Council intention, in planning, constructing and operating the Holmestown Landfill Facility is to provide a void space for 900,000 tonnes of compacted municipal solid waste and to place same in accordance with the profile set by An Bord Pleanala grant of planning and the EPA licence.

Based on an allowance for 25% for daily cover material and achieving 0.8 tonnes/m3 compaction ratio an overall volume capacity requirement of 1,406,250 cubic meters is estimated over the operational life of the facility.

The site will be in filled and restored on a phased basis over a twenty year period with each phase lasting approximately 2 years. The waste figures allow for a reduction in waste quantity to comply with the Landfill Directive. A topographical survey carried out in January 2011 showed that the volume of waste present within Cells 1, 2, 3 and 4 was approximately 72,799m3.

5.7 Area occupied by waste

A topographical survey completed in January 2011 showed the area of waste present within Cells 1, 2, 3 and 4 to be 16493m^2. The overall area where waste will be land filled is approximately 15.2 ha (152,000 m^2).

6 Emissions Management

6.1 Landfill Gas Management

The installation of the landfill gas control system is an ongoing process and develops further as each of the cells is filled with waste. Horizontal and vertical infrastructure is placed concurrent with waste. The pipe work systems are then connected to a 500m^3 enclosed gas flare. The enclosed flare was commissioned in August 2009 and put into permanent operation in September 2009 replacing the temporary open flare with carbon filter which operated from January to August 2009.

More detailed information on the landfill gas extraction currently being installed on site can be found in the following report which can also be viewed on file in the site office:

- *SEW Report No. 3A: Installation of the Landfill Gas System (Revised) which was submitted to the EPA in September 2007*

6.1.1 *Estimated annual and cumulative quantities of landfill gas emitted from the site.*

The volumes of landfill gas extracted varied from 180M^3/hr to 270M^3/hr during the reporting period. Gas extraction rates have been maximised to minimise odours. The gas quality remained static during the reporting period from 28% CH_4 up to 33% CH_4. The total volume of CH4 flared off on site during 2010 was 441,914 M^3 calculated from site records The cumulative volume from commencement of flaring to the end of 2010 is 929,098 M^3

Further gas modelling will commence when the landfill is established. Currently we are installing infrastructure in accordance with best practice to ensure that gas capture is maximised. We are confident from the absence of odour in and around the site and by maintaining a negative pressure in the landfill that gas capture at HWMF is satisfactory.

6.2 Leachate, Groundwater and Surface Water Management

6.2.1 *Leachate*

Leachate is generated by incident rainfall seeping into the landfill and becoming contaminated by contact with the waste product, and by the decomposition of the waste itself. Other potential sources of leachate generation, such as groundwater and surface water ingress are prevented from entering the waste fill areas through a number of site specific engineering works.

Leachate from Cells 1, 2, 3 & 4 is pumped directly to the leachate treatment plant using the cell pumps. A road tanker then removed the treated leachate from the leachate balancing tank to Wexford Town Wastewater Treatment Plant for final treatment and disposal.

The on-site leachate treatment plant was commissioned during 2009 and began to accept leachate directly from Phase 1 for treatment. The treatment plant provides a capacity of approximately 1200 m^3, equivalent to a process retention time of 15 days at the maximum flow (average estimate is 55m^3 per day, estimated peak flow is 80m^3 per day). The plant comprises of the following main elements, together with ancillary pipe work to convey the leachate between tanks:

- 2 x Sequencing batch reactor (SBR);
- Treated leachate balance tank (TLBT);
- Raw leachate feed pump;
- Venturi aerators;
- Decant pump;
- Final discharge pump;
- Alkali dosing facilities; and
- Nutrient dosing facilities.

Monthly volumes of leachate tankered off site are presented in Table 7 below.

Table 7 Leachate volumes removed from site in 2010

Month	Volume (m^3)
January	2,976
February	1,253
March	930
April	1,076
May	365
June	670
July	1,010
August	676
September	2,049
October	611
November	2,377
December	1,371
Total	**15,364**

Integrity testing of the leachate storage tanks was carried out during December 2007. The test was carried out in accordance with the procedure described in the *Civil Engineering specification for the Water Industry (CESWI).* All tanks assessed passed the integrity test. These tanks are due for retesting during 2011.

6.2.2 *Groundwater*

Condition 3.10 of the licence states that effective groundwater management infrastructure shall be provided and maintained at the facility during construction, operation, restoration and aftercare of the facility. As a minimum, the infrastructure is required to be capable of the following:

- Protection of groundwater resources from pollution by the waste activities
- Protection of other infrastructure, such as the liner; from any adverse effects caused by groundwater.

At Holmestown Waste Management facility the cell formation levels have been designed so that they will be a minimum of 2m above the expected winter water-table levels. The nature of the excavation elsewhere on site is shallow so groundwater is not expected to be encountered.

Groundwater resources are protected from waste related pollution by the construction of a quality-assured composite lining system, which comprise the following:

- 1,000 mm compacted engineered clay with hydraulic conductivity (k) ≤ 1 x 10^{-9} m/sec; overlain by
- 2 mm fully-welded HDPE liner.

Leachate arising from waste activities is contained within the landfill by the lined system and conveyed to the on-site leachate treatment plant via sealed pipe systems. Effluent will eventually be removed from site via a pumped rising main to Wexford Wastewater Treatment Plant as outlined in *Specified Engineering Works Report No. 4*. There will be no discharge to groundwater from any aspect of the development.

Foul water will drain to a proprietary wastewater treatment plant on site. Effluent from the wastewater treatment plant will discharge to the leachate treatment plant.

6.2.3 *Surface Water*

In accordance with the licence conditions (condition 3.10), surface water is collected on site via a network of drains, and is fed into the surface water collection pond to the north of the site at SWP1. The water settles in the pond and is then released to a petrol interceptor tank via SWP2. From there the surface water flows in an easterly direction to the stream on the east of the site, and enters the stream at SW4.

The following describes the various aspects of surface water collection systems:

- All clean surface water from paved roads and roofed areas on site drains into the constructed surface water drainage system and drains to the surface water pond via carrier pipes and open channels.
- Surface water from the civic amenity area is collected in gullies, and drains and diverted to the leachate treatment plant via a carrier pipe.

- Surface water run-off from the screening berm at the north end of the site is collected by a number of embankment swales and directed to the surface water pond.

- Surface water in constructed landfill cells in which waste has not yet commenced is pumped to the surface water pond. Water is pumped from the cells via the cell side riser sleeves. The pumps discharge water to an open channel located on top of the perimeter embankment, which then discharges to the surface water pond.

The surface water pond located to the north east of the landfill is lined with a 1 m thick layer of clay, engineered to ensure a maximum permeability of 1 x 10^{-9} m/sec. The pond is designed to attenuate peak flows up to a 1 in 100 year return period, and to fully contain peak flows up to a 1 in 5 year return period. The pond is designed to cater for the worst case scenarios during the lifetime of the entire landfill. The allowable discharge from the pond has been reduced below baseline flow levels in order to enable water settlement and achieve a suspended solids content less than 25 mg/l.

6.2.4 *Water Balance Calculations*

The objective of the assessment of water balance calculations is to understand and predict the liquid inputs and outputs of the facility. In order to predict the approximate leachate volumes which would be generated on-site water balance calculations have been calculated for the period 1st January 2010 to 31st December 2010 to estimate the approximate volumes of leachate that would have been generated during the reported period.

The water balance addressed the volume of leachate generated at the site including the estimated annual infiltration of rainfall. The water balance methodology is described below and the calculation is shown in appendix F.

The water balance calculations are based on the methodology specified in the EPA's Landfill Site Design Manual. The calculation used is as follows: -

Lo = [ER(A) + LW + IRCA +ER(l)] – [aw]

Lo = leachate produced (m3)

ER = effective rainfall (m) (Use actual rainfall (R) for active cells)

A = area of cell (m2)

LW = liquid waste (m3)

IRCA = infiltration through restored and capped areas (m)

l = surface area of lagoon (m2)

a = absorptive capacity of new waste (m3/t)

w = weight of waste deposited (t/a)

An absorptive capacity of 0.025 m3 per tonne was assumed.

The meteorological data used was obtained from the nearby Met Eireann meteorological station at Rosslare. The total rainfall from 1st January 2010 to the 31st December 2010 was approximately 945 mm. Meteorological data is presented in Appendix D.

The landfill areas included in the calculations were the active fill and temporary capped areas. Actual (total) rainfall rates were used for the active fill areas. As the active areas of cells 1 and 2 were uncapped during part of 2010 it is estimated that 100% of this rainwater would have entered the waste body. An 80% infiltration rate was used for temporary restored areas. This is in accordance with the EPA Landfill Site Design Manual. An absorptive capacity of 0.025m3 per tonne was assumed.

The active and temporary areas for waste placement in 2010 are presented in Table 8 below.

Table 8 Active and temporary areas in 2010

Year	Months	Waste Placement location	Active Area (m^2)	Temp Cap (m^2)
2010 (1st Jan to 31st May)	5	Ph 1 (Cell 2)	4350	8700
2010 (1st June to 31st Dec)	7	Ph 1 (Cell 1)	4350	13050

The estimated volume of leachate generated for the period 1st January 2010 to the 31st December 2010 is 11584m3 (a calculated summary is included in Appendix F). During the same period 15364 m3 of leachate was removed from the site for treatment in the waste water treatment plant at Enniscorthy and Wexford. A monthly breakdown of leachate volumes removed is presented in table 7.

As stated above the water balance calculations are based on the EPA's Landfill Site Design Manual. The manual states that water balance calculation of an active landfill will have an accuracy factor of 2 approx. The estimated volume of leachate generated shows an under estimation of 25% of what was actually removed for treatment. One possible reason for the under estimation of leachate generation is due to surface water infiltration into phase 1 during the construction of phase 2. This happened on two occasions when surface water pumps failed in phase 2 and the water infiltrated into phase 1. No records of the quantities of surface water infiltration are available to quantify exact volumes. Based on this estimate leachate management at HWMF appears satisfactory.

7 ENVIRONMENTAL NUISANCES

7.1 Review of environmental nuisance control at the facility for the reporting period

Condition 8.15 of the Waste Licence states that the licensee will inspect the facility and its immediate surrounds for nuisances caused by litter, vermin, birds, flies, mud, dust and odours. Nuisances at Holmestown Waste Management facility are logged in a weekly tick-box report and action is taken immediately to address any identified issues. Table 9 below summarises the measures implemented on site to combat environmental nuisances during 2010.

Condition 7.3 of the Waste Licence states that litter fencing shall be installed and maintained around the perimeter of the active tipping area prior to the disposal of waste in any cells and that all litter control infrastructure shall be inspected on a daily basis. A litter fence was installed and maintained around Cells 1, 2, 3 & 4 during the reporting period. The litter control infrastructure is inspected on a daily basis and any defect remedied immediately. Any loose litter or other litter identified on site is removed and disposed of in an appropriate manner and all vehicles delivering waste to or removing waste from Holmestown Waste Management facility are appropriately covered.

Table 9 Environmental Nuisance Control during 2010

Nuisance	Mitigation Measures in Place
Birds	*Jim O Connor* –contracted for bird control, presented on site on a daily basis for the duration of the reporting period. Birds of prey used to control birds. Daily log kept and weekly report produced. Reports kept at site office.
Vermin	*QPL Hygiene.* Permanent bait points set up on site (internal and external). Inspections carried out on a monthly basis. If infection found then weekly inspections until rodent free. Monthly reports produced and kept at site office.
Litter	Daily litter picking and litter inspections are carried out. Inspection log kept at site office. Litter fencing has been erected around Cells 1, 2, 3 & 4. Permanent litter fencing was erected around Phase 2
Flies	*QPL Hygiene* employed to control flies. Inspections carried out on a weekly basis. If flies present then treated through spraying. Weekly reports kept in site office.
Odour	Fixed monitoring points established both on and off site and assessed as required. All waste is covered with a hessian material at the end of each day and an odour neutralising agent is used on site when deemed necessary. Odour inspections adhere to recommendations from the Office of Environmental Enforcement's method of assessment of odours.

Condition 11.5 of the licence states that prior to the commencement of waste disposal, the licensee shall submit to the Agency for its agreement a proposal for the control and eradication of vermin and fly infestations at the facility.

A number of proposals were produced by Wexford County Council during 2008 and submitted to the Agency for approval. These proposals have since been approved and implemented on site in order to address the issue of nuisance monitoring as follows:

- Control and eradication of vermin and fly infestation proposal.
- Odour monitoring proposal

Copies of both proposals and associated correspondence with the Agency are kept on file at the site office.

8 RESOURCE & ENERGY CONSUMPTION

8.1 Electricity and Energy Usage

Electricity usage for the reporting period was estimated at 239,007 KW. The administration building at Holmestown has been designed with energy efficiency in mind. The following is a list of energy saving mechanisms that have been implemented:

- Control of internal lighting based on occupancy and the level of available natural light.
- Hot water heated by a combination of wood chip boiler and highly efficient vacuum tube solar panels
- Under floor heating system and wood chip boiler providing all heat for administration building
- Mechanical heat recovery unit which uses exhaust warm air to heat cold air coming into the building
- Rainwater harvester in operation to collect water from building roof for reuse in toilets
- Building management system monitors the temperature in each room and controls
- Integral mini wind turbine and solar panel power each light column in operation in the car park area.
- A wind turbine was constructed on site in October 2009. This is located south east of the Administration Building and provides power to the building.

8.2 Water

During dry periods in 2010 approximately 60,000 litres of water was used on site for the purposes of dust suppression (this water was won on site from the storm water storage pond). As there was no water meter installed in the site office to date to monitor water intake, no domestic water usage data is available. A rainwater harvester is in operation to supply water for sanitary use.

8.3 Diesel

Total diesel fuel consumption is estimated to be 36,452 litres from 01st January to 31st December 2010.

9 EMISSIONS & ENVIRONMENTAL MONITORING SUMMARY

9.1 Emissions and environmental monitoring

A summary of Environmental parameters monitored at Holmestown Landfill carried out during this reporting period (January 2010 – December 2010) is contained in Table 10 below. The location of all monitoring points is included in Appendix G.

All industries have to annually report environmental emissions and waste transfer data through a web-based form as part of their AER. The E-PRTR Regulation (EC) No 166/2006 concerning the establishment of a European Pollutant Release and Transfer Register came into force in February 2006 and was brought into Irish law through SI No 123 of 2007. The PRTR 2010 document is included in Appendix A.

Table 10 A summary of emissions & environmental monitoring as specified in Waste Licence 191-2

Emissions Monitoring	Frequency
Landfill Gas Flare	Continuously/Annually
Leachate Leachate Treatment Plant	Continuously/Quarterly/Annually
Surface Water Pond	Continuously/Quarterly/Annually
Environmental Monitoring	**Frequency**
Landfill Gas Site Office Gas migration monitoring Boreholes Gas field Balancing	Continuously Monthly As required
Leachate Leachate levels Visual, odour and temperature Leachate analysis	Continuous Quarterly Annual
Surface water	Quarterly / Annual
Groundwater Levels	Monthly

Environmental Monitoring	Frequency
Groundwater	Quarterly / Annual
Noise	Quarterly
Dust	Tri-Annually and Annually
Odour	Daily/Weekly/As required

9.2 Monitoring

Wexford County Council carries out a comprehensive monitoring programme, in compliance with the waste licence conditions. The monitoring programme includes Landfill Gas, Leachate Level & Quality, Surface Water Quality, Groundwater Level & Quality, Noise, Dust, Odour, Meteorological and Topographical surveys.

Results are interpreted using either pre-defined emission limits or in the case of more variable systems such as water bodies by comparison with pre-operational (baseline) trends. Licence Monitoring at HWMF follows the principles set out in the following:

- 1999/31/EC. *Council Directive on the Landfill of Waste.* Official Journal of European Communities.
- Campbell, R. et al. (2003), *Landfill Manuals: Landfill Monitoring, 2nd Edition.* EPA.

There are emission limits in the license for gas, noise and dust parameters. Interim Trigger Levels (based on available data) have also been set for emissions from the storm water attenuation pond and selected groundwater parameters. Control Rule principles as referred to in the Landfill Directive have been established for groundwater monitoring (see Quarter 3 & 4 report for 2009 for further details) and will be progressed as more data is collected. In accordance with the Licence/best practice we measure a number of additional parameters to supplement emission limit/trigger level data. All the data measured is reviewed and utilised for interpretation where applicable.

Monitoring during this reporting period was carried out according to Schedule D of Waste Licence W191-01. Monitoring for 2010 is summarized in this section.

9.3 Emissions Monitoring:

9.3.1 *Landfill Gas Flare*

One enclosed type flare (in accordance with Section 3.14.1.of the licence) is in operation at HWMF. The flare was commissioned in August 2009. The flare is located at the eastern side of the facility adjacent to the Leachate Treatment Plant. The flare is connected to the active cells via a 355mm OD PE pipe that runs both over and underground. The flares maximum operating capacity is 500m3/hr and it is set to burn at >1000 degrees C. The retention time for the flare is 0.5 sec. The main components of the flare include:

- Control valves;
- Knock out Pot with filter;
- Flame arresters;
- Gas booster (variable speed motor)
- Sampling equipment for both influent bulk gases and emissions;
- Temperature control by thermocouple and louvers;
- Human Machine Interface;
- Call out System.
- Connection to SCADA

Emission limit values for landfill gas plant are set out in Schedule C.6 of our License and are summarized in the Table 11 below.

Table 11 Flare Emission Limits

Parameter	Flare Enclosed Emission Limit Value[Note 1]	Utilisation Plant Emission Limit Value[Note 1]
Nitrogen oxides (NO_x)	150mg/m^3	500mg/m^3
CO	50mg/m^3	50mg/m^3
Particulates	n/a	130mg/m^3
Total Organic carbon (TOC)	10mg/m^3	10mg/m^3

Note1: Dry gas referenced to 5% oxygen by volume for utilisation plants and 3% oxygen by volume for flares.

The operation of the flare unit is continuously monitored and recorded by the SCADA system. A call out system is linked to the SCADA which notifies WCC staff via text message if the preset control limits are breached. The SCADA is linked to the Administration Building and the internet. Flare performance is monitored by staff on an ongoing basis.

Flare emission results

A flare emission and efficiency test was carried out in accordance with specified requirements on the flare unit in November 2010. The report concluded that CO, NOx, as NO_2 and TOC in the landfill flare exhaust stack were well within the emission limit values specified in Schedule C6 of Waste Licence W00191-02. The full report has been submitted to the EPA under separate cover.

9.3.2 *Leachate Treatment Plant*

Emission limit values for leachate discharged to sewer are set out in Schedule C.7 of our License and are summarized in the Table 12 below.

Table 12 Emission Limits for Leachate Being Discharged to Sewer

Emission Point Reference: LTP3

Volume to be emitted: Maximum in one day 80m³

Parameter	Emission Limit Value
	Daily Mean Concentration (mg/l)
BOD	200
COD	750
Ammoniacal Nitrogen ($NH_{4+}N$)	10
Nitrate Nitrogen	1500
Alkalinity	1000
Dissolved Methane	0.2

Monitoring frequency and analysis techniques for emissions to sewer are set out in Table D.8.1 of the licence.

Leachate treatment plant results

The on site Leachate Treatment Plant was commissioned in 2009. All leachate following pre treatment (in accordance with section 5.12.4 of the Licence) was tankered off-site for final treatment at Wexford Wastewater Treatment Plant. It is noted that the Leachate Treatment Plant was fully compliant with the emission limits throughout 2010.

9.3.3 *Surface Water Pond*

Two sampling points SWP1 and SWP2 are located on the inlet and outlet of the attenuation pond respectfully. Schedule C4 of the Licence sets discharge limits for the level of suspended solids from the outlet (SWP2) of the attenuation pond. The discharge limit is detailed in Table 13 below.

Table 13 Surface Water Discharge Limit.

Measured at the outlet of the surface water pond (SWP2).

Level (Suspended Solids mg/l)
25

In accordance with sections 3.22.1(c) and 6.5.3 of the Licence monitoring of surface water entering and discharging from the attenuation pond is ongoing. Proposals have been submitted to the Agency detailing criteria/trigger levels that determine when the outlet from the pond shall be closed. The pond outlet will close automatically if the trigger levels at the inlet (SWP1) are breached. The parameters monitored include conductivity, pH and TOC. Interim levels have been set which are to be reviewed when more data is available. The interim trigger levels are summarised in Table 14 below.

Table 14 Interim Trigger Levels for the Attenuation Pond.

Monitoring Point	pH		Electrical Conductivity	TOC
	Upper	Lower		
	pH		uS/cm	mg/l
SWP1	9.5	6.5	2500	-
SWP2	9.5	6.5	2500	-

The interim trigger level review recommends that TOC trigger levels are set when sufficient data has been accrued. For full details of attenuation pond trigger levels see report as follows:

- Fehily Timoney and Company (January 2008). Trigger Levels for Surface Water Retention Ponds.

In addition Section 3.22.1 of the Licence requires levels in the surface water retention pond, flows to perimeter streams and quality of the surface water at the inlet to the surface water lagoons and being discharged to the perimeter streams to be recorded on telemetry. Similar to the pond inlet (and in addition to quarterly environmental monitoring) pH, electrical conductivity and TOC are being recorded continuously at the outlet (SWP2). A SCADA monitoring / control system is operational and can be accessed in the Administration Building on site. Discharges from the pond to the surfacewater stream were manually controlled, grab samples, SCADA data and visual inspection are used to ascertain optimum release conditions.

In 2010 flows to the pond were limited to:

- main access road drainage from the entrance gate to the head of the western track;
- water pumped from waste free cell 1 in Phase 1;
- An open surfacewater channel that crosses the footprint of the proposed Phase 2 area at high level and discharges into the surface water swale prior to the pond inlet works.
- Phase 2 area during the construction phase. The level of suspended solids in the water during the construction period was controlled in settlement tanks prior to being discharged to the pond.
- Water pumped from waste free cells in Phase 2.

All other surface water sources (including run off from the Civic Amenity site and Maintenance Building) are directed to the LTP for pre-treatment in accordance with the Licence and then removed by tanker off-site to Wexford Waste Water Treatment Plant.

Surface water pond emission results

Elevated levels of ammonia were recorded at the pond in Q3, the probable source was thought to be an open surfacewater channel in the Phase 2 area and following its removal no further exceedences were recorded. A graph depicting results for pond trigger levels is included in Appendix C.

9.4 Environmental Monitoring

9.4.1 *Landfill Gas*

Gas sampling was carried out on site prior to construction. Initially groundwater wells were sampled until gas wells were installed around the proposed landfill footprint. Pre-construction results showed elevated levels of carbon dioxide at a number of locations. One elevated methane reading was recorded. The majority of the pre-construction gas wells were in filled during the construction phase. Peripheral landfill monitoring boreholes GS11-GS17 (as detailed in Schedule D, Table D1.1, of our Licence) were installed in conjunction with Phase 1 of the landfill cells. Prior to landfilling high naturally occurring Methane and Carbon Dioxide levels were measured in these boreholes and an investigation was carried out at the request of the Agency. The high readings are all concentrated in the north east corner of the facility where the bulk of the excavation work was carried out. As part of the investigation nine additional boreholes (GW2-GW10) were installed. Subsequent reports noted the elevated levels of carbon dioxide and methane pre-construction and summarized that *'It is likely therefore that when fill material was placed on top of this virgin ground, it acted like a semi-impermeable blanket, inhibiting venting of gases and causing a build up of gas in the ground.'*

The reports recommended that for a two year period monitoring is carried out at all boreholes at intervals not exceeding one month. Additionally, vertical and horizontal gas extraction pipes are monitored (at weekly intervals approx.) to assess pressures within the waste body to ensure that negative pressures are maintained. For full details of the investigation into the naturally occurring gases see reports as follows:

- Fehily Timoney and Company (April 2008). Investigation of Naturally Occurring Background Gas Levels at Holmestown Landfill. Risk Assessment and Recommendations, Rev 1;
- Fehily Timoney and Company (December 2008). Investigation of Naturally Occurring Background Gas Levels at Holmestown Landfill. Trace Gas Analysis, Rev 2;

In accordance with Section 3.24.1 (b) of the Licence, landfill gas is monitored continuously in all site buildings. WCC have also installed Gas monitoring equipment in two local dwellings at the owner's request.

To allow for settlement gas sampling points within the waste will be installed when the landfill cap is completed. As noted above monitoring of the in-cell gas infrastructure is ongoing.

Landfill gas concentration limits measured in any service duct or manhole on, at or immediately adjacent to the facility and/or at any other point located outside the body of the waste are set out in Schedule C.2 of our License and are summarized in the Table 15 below.

Table 15 Landfill Gas Concentration Limits

Methane	Carbon Dioxide
20% LEL (1% v/v)	1.5% v/v

A summary of gas monitoring points is included in Table 16 below.

Table 16 Gas Environmental Monitoring Points

List of landfill gas monitoring points for 2009	
Points	**Description**
GS11, GS12, GS13, GS14, GS15, GS16, GS17	Perimeter gas migration monitoring wells
GB1, GB2, GB3, GB4	Gas monitoring points in buildings
GW2 East west, GW3 East west, GW4 North south, GW5, GW6, GW7, GW8, GW9 East west, GW10	Gas investigation wells (March/April 2008)
Waste cells	All vertical extraction wells in Phase 1.

Landfill gas results

Methane and Carbon Dioxide levels remain elevated in a number of the monitoring wells. Elevated readings were initially recorded before landfilling operations commenced with Borehole GS13 consistently recording the highest readings with methane levels as high as 50.1% (Dec.2010). The elevated readings are concentrated along the north east periphery of the phase 1 landfill footprint where the bulk of the excavation work was carried out.

Methane and carbon dioxide results for the peripheral gas boreholes have tended to fluctuate dramatically. The results on average, however, indicate that the level and location of gas release has not varied significantly since the pre-landfilling stage (Q1, 2008) and contamination from the landfill cell is not suspected.

Three boreholes GS17, GW5 and GW10 have not exceeded trigger levels to date. GW5 and GW10 are located in virgin ground and GS17 is the most southerly borehole on the eastern perimeter of Phase 1.

Elevated results were also recorded pre and post landfilling operations for groundwater in the north east corner.

Plots detailing trends for Methane and Carbon Dioxide (licenced emission limit parameters) for the peripheral boreholes GS11-GS17 are included in Appendix C. Refer to Quarterly monitoring reports 2010 for full details.

Gas has not been detected in any of the site buildings.

A report to review of the peripheral gas borehole results was submitted to the EPA in 2010.The review incorporates all results to the end of 2009 and will form the basis for future works/monitoring.

9.4.2 *Flare.*

See section 9.3.1 for general information on the flare. Landfill gas utilisation plant/enclosed flare parameters and monitoring frequency are set out in Table D.7.1 of our License. The enclosed flare parameters, monitoring frequency and analysis method are summarized in Table 17 below.

Table 17 Flare Parameters and Monitoring Frequency

Parameter	Flare (enclosed)	Analysis
	Monitoring Frequency	**Method / Technique**
Inlet		
Methane (CH_4)%v/v	Continuous	Infrared analyser
Carbon dioxide (CO_2)%v/v	Continuous	Infrared analyser
Oxygen (O_2)%v/v	Continuous	Electrochemical
Total Sulphur	Annually	Ion chromatography
Process Parameters		
Combustion Temperature	Continuous	Temperature Probe / Datalogger

The results of parameters which are monitored continuously are transferred and stored on the SCADA system. A backup data logging system was commissioned in February 2010.

In addition, regular monitoring of inlet gas is carried out as part of the gas field balancing procedure. The equipment used for the detection and quantification of landfill gas is a GA2000 – ATEX Certified Gas Analyser.

The operation of the flare unit is continuously monitored and recorded by the SCADA system. A call out system is linked to the SCADA which notifies WCC staff via text message if preset control limits are breached.

Flare results

The reporting element of the SCADA system was commissioned in 2010. Daily on site inspections were also carried out the results have shown that the flare has operated satisfactorily since it was commissioned.

A backup data logging system was commissioned at the flare in February 2010. Data is downloaded from the backup datalogger quarterly and maybe utilised for future reports if required.

9.4.3 *Leachate*

See section 6.2.1 for general information on the Leachate Treatment Plant. Six leachate sampling locations have been established and maintained as detailed in Schedule D, Table D1.1, of the license. Three points LTP-1, LTP-2 and LTP-3 are located within the leachate treatment compound. The remainder of the monitoring points (L2, L3 & L4) are located in the corresponding waste cells. In accordance with our licence, leachate levels are continuously monitored and are recorded on the SCADA system. Leachate levels for the landfill cells are maintained at 1.0m over the top of the liner at the base of the landfill in accordance with section 5.12.2 of our licence.

Leachate parameters and monitoring frequency are set out in Tables D.5.1 of the License. Continuous and quarterly monitored leachate parameters, monitoring frequency and analysis method are summarized in Table 18 below.

Table 18 Leachate Parameters and Monitoring Frequency

Parameter	Flare (enclosed)	Analysis
	Monitoring Frequency	**Method / Technique**
On-site Leachate		
Visual	Quarterly	Visual
Odour	Quarterly	Olfactory
Leachate Level	Continuous	Pressure transducer
Temperature.	Quarterly	Thermometer

Visual, odour and temperature inspections are carried out by site staff. Visual and odour assessment are based on visual and olfactory scales respectively (see quarterly monitoring reports 2010 for details). In cell leachate level is controlled and monitored by a combination of pumps, pressure probes and the SCADA system. Level is recorded in meters above ordnance datum (mAOD).

Leachate results

No significant visual, odour or temperature change was noted in 2010. Leachate levels in the landfill cells is maintained at <1.0m above the liner at the base of the landfill.

Annual leachate quality was sampled in June 2010 in accordance with Table D5.1 of the Licence. The annual leachate quality report is submitted under separate cover in accordance with schedule F of the licence.

9.4.4 *Surface Water*

Eleven surface water sampling locations have been established and maintained as detailed in Schedule 4, Table D1.1, of the license. Two points SW4 and SW5 are located downstream of Phase 1 of the landfill. Nine are located on watercourses upstream: SW1; SW2, SW2A; SW3; SW3A; SW6; SW7; SW8; SW9 of current operations. There are two principal surface water streams one flowing from SW9 to SW5 and another from SW2 to SW5. Each is made up from a number of smaller streams and drainage ditches. These combine to the north east of the site and flow east, north east towards the river Slaney. Monitoring point SW5 is located downstream of the main junction of these streams. The northern edge of the landfill is 1.8km approx. from the River Slaney. The first surface water samples were collected in 2002. Pre-construction and pre-landfilling results are utilised as baseline data for comparison as required.

The objective of environmental monitoring is to screen for environmental pollution due to facility operations. Surface water bodies within and downstream of the facility are at risk. The relevant monitoring points are SW4 & SW5 (both downstream of the main operational areas), SWP1 & SWP2 (the attenuation pond monitoring points) and to a lesser extent SW1, SW2, SW2A, SW3, SW3A, and SW6 which are also on the Holmestown site but are upstream of all major activities. The other monitoring locations (SW7, SW8 & SW9) are upstream and offsite and their results are only interpreted if an influence in onsite streams is suspected. Surface water monitoring locations are summarized in Table 19 below.

Table 19 **Surface Water monitoring locations**

Surface water monitoring locations	
Surface water monitoring point	SW1, SW2, SW2a, SW3, SW4, SW5, SW6, SW7, SW8, SW9

The parameters tested in this report (in accordance with Table D.5.1 of the license) are as follows: Ammoniacal Nitrogen; Electrical Conductivity; Chloride; Dissolved Oxygen; Temperature; Ph; BOD; COD; Total Suspended Solids (TSS); Visual Inspection/Odour (weekly)

Surface water results

A visual inspection of each of the surface water monitoring locations was carried out on a weekly basis during 2010 as per licence requirements. The visual inspection and surface water quality results for 2010 did not indicate pollution from facility activities.

Elevated ammonia results 0.76mg/l and 0.48mg/l was recorded at SWP1 in Q1 and SWP2 in Q3. The suspected source of an open drain in Phase 2 was removed in 2010. A number of elevated chloride readings were recorded in Q3, 2010 and were consistent at both upstream and downstream sampling locations. The elevated readings do not appear to be linked to HWMF activities.

The annual suite of surfacewater monitoring which includes a more comprehensive list of chemical parameters compared to the quarterly groundwater monitoring suite was carried out on 03rd June 2010 at all surfacewater monitoring locations as per Schedule D. The test results suggest that no pollution is entering the surfacewater from the landfill. The annual surfacewater analysis report is submitted under a separate cover in accordance with Schedule F of the licence.

9.4.5 *Surface water Biological Survey*

A biological survey of the surface water streams surrounding Holmestown Waste Management Facility was carried out on 05th August 2010. A total of 4 locations were selected for monitoring as follows:

- KS01 Upstream SE of facility within the site boundary – Un-named stream
- KS02 Downstream NE of the facility within the site boundary – Un-named stream
- KS03 Downstream of the facility within the site boundary – Polehore stream
- KS04 Upstream of the facility within the site boundary – Polehore stream

The overall quality of the un-named stream both upstream and downstream of the facility was determined to be moderately polluted and rated as Q3 at each of the monitoring points using the EPA Q-value rating system. The overall quality of the Polehore stream both upstream and downstream of the facility was determined to be moderately polluted and rated as Q3 at each of the monitoring points using the EPA Q-value rating system. There were no signs of animal access to the river at any of the monitoring locations. There was no noticeable difference in water quality between upstream and downstream locations. All surface water biological monitoring locations are detailed in Appendix G. A copy of the biological monitoring report is kept on file at the site office and can be viewed upon request.

9.4.6 *Surface water pond quality: SWP1 – SWP2*

For general details on the pond see section 9.3.3 above. SWP1 and SWP2 are also monitored as part of the quarterly monitoring suite (see section 9.3.3 above). Elevated ammonia results 0.76mg/l and 0.48mg/l was recorded at SWP1 in Q1 and SWP2 in Q3. The elevated levels were kept under review and the suspected source of an open drain in Phase 2 was removed in 2010, no further exceedences were recorded. More details are presented in the quarterly monitoring reports submitted to the agency during the reporting period.

9.4.7 *Groundwater*

Groundwater monitoring was carried out at a total of 7 on-site and 13 off-site private well locations on a quarterly basis as detailed in Schedule D of the waste licence. Appendix G shows the location of all groundwater monitoring locations on site. Groundwater monitoring locations are summarized in Table 20 below.

Table 20 **Groundwater Monitoring Locations**

Groundwater Monitoring Locations	
Existing Groundwater Monitoring Wells	BH1, BH2, BH3, BH6, BH7, BH8, BH9.
Private well monitoring points	PW1, PW2, PW2A, PW2B, PW4, PW5, PW6, PW7, PW8, PW9, PW10, PW11, PW11A.

In accordance with section 6.4.2 of the Licence a report has been submitted to the Agency detailing proposals for interim trigger levels for Groundwater results. Three parameters were selected based on suitability: Ammoniacal Nitrogen; Conductivity; Chloride. Interim levels have been set which are to be reviewed when more substantial data is available. The interim trigger levels are summarised in Table 21 below.

Table 21 **Interim Trigger Levels for Groundwater.**

Parameter	Unit	Interim Trigger Level
Ammoniacal Nitrogen	mg/l	0.3
Electrical Conductivity	uS/cm	1000
Chloride	mg/l	30

The interim trigger level report (in accordance with the Landfill Directive) proposes Control Rule principles for groundwater management at HWMF. The Control Rule principal involves the establishment of Control Levels and Trigger Levels. A Control Level is set as an indicator of possible environmental pollution. A Trigger Level is defined as the level at which significant adverse environmental effects have occurred. Control Levels are used to instigate review/remediation works prior to significant environmental pollution taking place. Due to a lack of data the report submitted sets the Control Level equal to the Trigger Level. WCC have adopted the principal that until suitable Control Levels have been set any results recorded above the interim levels will be treated as a trigger event. For full details on the Interim Trigger Levels for groundwater see report as follows:

- Fehily Timoney and Company (January 2008). Groundwater Monitoring Trigger Levels.

Groundwater results

Results are outside interim trigger levels in a number of the on-site groundwater boreholes tested. The elevated levels date back to pre-landfilling and have been recorded both upstream and downstream of the landfill footprint. Similar to gas readings the elevated results are prevalent downstream in the north east corner where the bulk of the on site excavation works were carried out and appear to be due to a non-landfill source in the soil. The main soil mass is low permeability clay with sand and gravel lenses. Groundwater movement in the soil zone is relatively slow resulting in low flows. This enables emissions to build up locally around a source as appears to be indicated from the results.

Monitoring of groundwater levels was carried out at each of the on-site locations on a quarterly basis with the use of a dip meter. Groundwater levels remained relatively consistent throughout the monitoring period, with only minor variations in groundwater levels recorded in accordance with prevailing weather conditions. See quarterly reports for full details.

Monitoring results were not available for BH7 or BH8 during 2010 as the wells were found to be dry at time of sampling.
Historical trend graphs of groundwater trigger levels (ammoniacal nitrogen, conductivity, chloride) are included in Appendix C

A total of thirteen private wells are monitored around the facility. Interim trigger level exceedences for conductivity and chloride were recorded at a number of the wells. A review of private well results is considered outside the scope of standard reporting. The results will be utilised for more rigorous reviews if required. See quarterly reports for results.

- A report titled *Groundwater Monitoring Trigger Levels* which reviewing all quarterly groundwater data to the end of 2009 was submitted the EPA during 2010.

The annual suite of groundwater monitoring which includes a more comprehensive list of chemical parameters compared to the quarterly groundwater monitoring suite was carried out on 03 June 2010 at all borehole and private well monitoring locations as per Schedule D. The test results suggest that no pollution is entering the groundwater from the landfill. The annual groundwater analysis report is submitted under separate cover in accordance with Schedule F of the licence.

9.4.8 *Noise*

Ten potentially noise sensitive locations are sampled at HWMF on a quarterly basis in accordance with Table D.1.1 of the Licence and amendments thereof. Emission limit values for noise are set out in Schedule C.1 of our License and are summarized in the Table 22 below.

Table 22 Noise Emission Limits

Day Db(A)L_{Aeq}(*30*[1] minutes)	Night Db(A)L_{Aeq}(*30*[1] minutes)
55	45

1. *Duration amended to 30mins in accordance with Table D.4.1 of the licence and current standard practice.*

Noise monitoring frequency and technique are summarized Table 24 below.

Table 23 Noise Monitoring: Frequency and Technique

Parameter	Monitoring Frequency	Analysis Method/Technique
$L(A)E_Q$ **[30 minutes]**	Quarterly	Standard[Note1]
$L(A)_{10}$ [30 minutes]	Quarterly	Standard[Note1]
$L(A)_{90}$ [30 minutes]	Quarterly	Standard[Note1]
Frequency Analysis *(U3* Octave band analysis)	Quarterly	Standard[Note1]

Note 1: *"International Standards Organisation. ISO 1996. Acoustics- description and Measurement of Environmental noise. Parts 1, 2 and 3."*

Leq(t): is the continuous equivalent sound level over a specified time (t), where t represents a 30-minute period during this survey. This measure is used to give an indication of the average noise level over the specified time period.

L10 and L90: are both statistical noise levels. L10 Indicates that for 10% of the monitoring period, the sound levels were greater than the quoted value. L90 Indicates that for 90% of the monitoring period, the sound levels were greater than the quoted value. L10 is used to express event noise. L90 is used to express background noise, usually filtering out loud, intermittent interferences such as traffic noise.

During the quarterly monitoring octave band recordings were made at what was deemed the most susceptible noise monitoring locations to landfill activity, N8 and N5. These locations were specifically chosen due to the proximity to the waste

management facility and therefore the possible impact of noise emissions on these locations.

Noise results

A number of elevated noise monitoring results were noted for both day and night monitoring in 2010. The elevated noise levels have been attributed to external factors (e.g. N25, vehicles passing, dogs barking etc.) for the majority of the results recorded. No significant tonal noises were recorded. See quarterly reports for full details. Historical trend graphs of noise results are included in Appendix C.

A report is proposed to review noise monitoring and investigate the monitoring locations where licence limit exceedences have been recorded frequently. This report is to be completed by an independent noise measurement specialist.

9.4.9 *Dust*

Advanced Engineering Solutions carried out dust monitoring at ten representative locations using Bergerhoff dust gauges on three separate occasions during 2010, as specified in Schedule D.3.1 of the waste licence. Sampling locations and results are provided in the table below. The location of all dust monitoring locations can be found in Appendix G.

- The dust deposition limit of 350 mg/m2/day was not exceeded during 2010

9.4.10 *PM_{10} Monitoring*

PM_{10} monitoring was carried out as per Licence condition D.3.1 over a 24 hour period from 06.12.10 to 18.12.10. The PM_{10} monitoring locations were the same locations used for the ambient dust monitoring. All results were noted to be below the trigger value of 50ug/m3 as specified in the waste licence. PM_{10} monitoring results are included in Appendix C.

9.4.11 *Odour*

Odour monitoring was carried out at Holmestown waste facility during 2010 as per EPA Guidance. Five odour monitoring points previously agreed with the Agency were monitored and labelled OD1, OD2, OD3, OD4 and OD5. OD1 is located to the northeast of the landfill on a bordering farm property. OD2 is located on the landfill between the active tipping area and Holmestown Little Farm on the western boundary of the site. OD3 is located between the landfill and Bolgerstown Farm on the eastern boundary of the site OD4 is upwind of the landfill and OD5 is downwind of the landfill. Odour monitoring is based on a combination of odour persistence which is rated on a scale of 0 to 2 (0 = none, 1 = intermittent, 2 = persistent), and odour intensity which is rated on a scale of 0 to 4 (0 = none, 1 = faint, 2 = moderate, 3 = strong, 4 = very strong).

No odour persistence or intensity was recorded above 3 during 2010 at the monitoring points. No odour complaints were received during 2010. On a daily basis site personnel carry out a brief walkover of the site, to assess potential odour issues. If any odours are identified during the walkover measures are implemented to reduce or remove the source of the odour as soon as possible. Weekly odour monitoring is carried out at the five agreed points copies of all odour logs are kept on file at the site office and can be viewed upon request. Odour monitoring results for the reporting period are included in Appendix C.

9.4.12 *Bioaerosols*

Bioaerosols monitoring was not carried out on site at Holmestown during 2010. As per licence conditions bioaerosols monitoring is only required to be carried out upon commencement of composting operations on site. To date no composting of materials has taken place at Holmestown Waste Management facility.

9.4.13 *Meteorological monitoring*

All monitoring information was obtained from the weather station located at Johnstown Castle in Wexford; this station is within 10km of Holmestown Landfill site. A copy of the reports are available for review at the facility office. Meteorological graphs showing trends over time are available for review in Appendix D.

9.4.14 *Topographical Survey*

A topographical survey of the landfill cells was carried out in January 2011 and is included in Appendix G.

Condition 4.2 of the Waste Licence states that the final pre-settlement contours of the facility (mAOD) shall be as shown in Drawing No. 2.8 Rev A of the EIS Addendum. The final landform, after landfill settlement has taken place, will gradually slope upwards from a height of approximately 20m at the northern end of the site (Phase 1) to a height of 45m towards the south of the site. The maximum height recorded on the topographical survey of January 2010 was 25 m AOD in Cell 2 of Phase 1, located towards the northern end of the landfill.

APPENDICES

A. PRTR 2010

Environmental Protection Agency

Guidance to completing the PRTR workbook

AER Returns Workbook

Version 1.1.12

REFERENCE YEAR	2010

1. FACILITY IDENTIFICATION

Parent Company Name	Wexford County Council
Facility Name	Holmestown Waste Management Facility
PRTR Identification Number	W0191
Licence Number	W0191-02

Waste or IPPC Classes of Activity

No.	class_name
3.5	Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment.
3.1	Deposit on, in or under land (including landfill).
3.11	Blending or mixture prior to submission to any activity referred to in a preceding paragraph of this Schedule.
3.12	Repackaging 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.
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	##
4.10	The treatment of any waste on land with a consequential benefit for an agricultural activity or ecological system.
4.11	Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.
4.12	Exchange of waste for submission to 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.
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.

Address 1	Barntown
Address 2	Co. Wexford
Address 3	
Address 4	
Country	Ireland
Coordinates of Location	-6.57278 52.35079
River Basin District	IESE
NACE Code	3821

Main Economic Activity	Treatment and disposal of non-hazardous waste
AER Returns Contact Name	Fran Hobbs
AER Returns Contact Email Address	fran.hobbs@wexfordcoco.ie
AER Returns Contact Position	Technician
AER Returns Contact Telephone Number	053 9120922
AER Returns Contact Mobile Phone Number	087 9141105
AER Returns Contact Fax Number	
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	0
User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

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

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

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

4.1 RELEASES TO AIR

Link to previous years emissions data

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
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
03	Carbon dioxide (CO2)	M	ISO 12039:2001		372701.0	372701.0	0.0	0.0
02	Carbon monoxide (CO)	M	ISO 12039:2001		62.0	62.0	0.0	0.0
01	Methane (CH4)	M	ALT	EN13526	14.016	14.016	0.0	0.0
08	Nitrogen oxides (NOx/NO2)	M	EN 14792:2005		97.0	97.0	0.0	0.0
11	Sulphur oxides (SOx/SO2)	M	EN 14791:2005		41.17	41.17	0.0	0.0
07	**Non-methane volatile organic compounds (NMVOC)**	M	EN 13649:2001		9.67	9.67	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 AIR					Please enter all quantities in this section in KGs			
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					Please enter all quantities in this section in KGs			
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) flare 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: Holmestown Waste Management 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)	2871878.0	E	Site Model	LandGEM	N/A	
Methane flared	441914.0	M	Measured	Flare datalogger	500.0	(Total Flaring Capacity)
Methane utilised in engine/s	0.0				0.0	(Total Utilising Capacity)
Net methane emission (as reported in Section A above)	14.0	M	Measured	Flare stack	N/A	

4.2 RELEASES TO WATERS

Link to previous years emissions data

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 th

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT					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 PRTR POLLUTANTS

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT					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 WATERS					Please enter all quantities in this section in KGs			
POLLUTANT					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

4.3 RELEASES TO WASTEWATER OR SEWER

Link to previous years emissions data

SECTION A : PRTR POLLUTANTS

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
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					Please enter all quantities in this section in KGs			
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

4.4 RELEASES TO LAND

Link to previous years emissions data

SECTION A : PRTR POLLUTANTS

RELEASES TO LAND					Please enter all quantities in this section in KGs		
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					Please enter all quantities in this section in KGs		
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

Please enter all quantities on this sheet in Tonnes

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Haz Waste : Name and Licence/Permit No of Next Destination Facility Non Haz Waste: Name and Licence/Permit No of Recover/Disposer	Haz Waste : Address of Next Destination Facility Non Haz Waste: Address of Recover/Disposer	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					
Within the Country	20 01 21	Yes	0.33	Fluorescent tubes and other mercury-containing waste from CAS	R5	M	Weighed	Offsite in Ireland	KMK,W0113-03 WCP-07-08-0607-01	Cappinaur Industrial estate,Daingean Road,Tullamore,Co.Offally,Ireland	KMK,W0113-03 WCP-07-08-0607-01,Cappinaur Industrial Estate,Daingean Road,Tullamore,Co.Offally,Ireland	","","","","","","Ireland
Within the Country	**20 01 21**	**Yes**	0.0	","	R5	M	Weighed	Offsite in Ireland	",","	","","","","","","","","","Ireland	","","","","","","","","","Ireland	","","","","","","","","","Ireland
Within the Country	15 01 07	No	73.18	Glass packaging from CAS	R3	M	Weighed	Offsite in Ireland	Rehab Classco Ltd.,WP:247/2006	Unit 4 Oberstown Industrial Park ,Caragh Road ,Naas ,Co.Kildare ,Ireland		
Within the Country	19 07 03	No	15364.34	landfill leachate from on site treatment plant	D9	M	Weighed	Offsite in Ireland	Wexford Waste Water Treatment Plant," "	Trinity Street ,Wexford ,Co.Wexford ,".",Ireland		
Within the Country	20 01 10	No	22.06	clothes from CAS	R3	M	Weighed	Offsite in Ireland	Textile Recycling Ireland ,WPR/014	Glen Abby Complex,Belgard Road,Tallagh,Dublin,Ireland		
Within the Country	20 01 40	No	218.88	metals from CAS	R4	M	Weighed	Offsite in Ireland	Killurin Landfill,W016-2	Newtown Lower,The Deeps,Killurin Landfill,Co.Wexford,Ireland		
Within the Country	20 01 40	No	8.78	Aluminum Cans from CAS	R4	M	Weighed	Offsite in Ireland	Rehab Classco Ltd.,WP:247/2006	Unit 4 Osberstown Industrial Park ,Caragh Road,Naas,Co.Kildare,Ireland		
Within the Country	20 01 01	No	75.34	Cardboard from CAS	R3	M	Weighed	Offsite in Ireland	AES/Goff Ltd.,W00229-01	Kilrane ,Rosslare ,Wexford ,Co.Wexford,Ireland		
Within the Country	20 01 01	No	55.4	Newspaper from CAS	R3	M	Weighed	Offsite in Ireland	Recycling 2000,WP/06/06	Drinagh Business Park,Rosslare Road,Wexford,Co.Wexford,Ireland		
Within the Country	15 01 05	No	4.38	Tetrapac from CAS	R3	M	Weighed	Offsite in Ireland	AES/Goff Ltd.,W00229-01	Kilrane,Rosslare,Wexford,Co.Wexford,Ireland		
Within the Country	20 01 35	Yes	286.66	Mixed WEEE from CAS	R5	M	Weighed	Offsite in Ireland	Recycling Village ,RV0001	Unit 4 Tenure Business Park ,Monasterboice,Drocheda,Co.Louth,Ireland	","","","","","","","","","Ireland	","","","","","","","","","Ireland
Within the Country	13 02 08	Yes	8.74	Engine oil from CAS	R9	M	Weighed	Offsite in Ireland	Enva Environmental,084/1	Clonman,Portlaois,CoLaois," .",Ireland	","","","","","","","","","Ireland	","","","","","","","","","Ireland
Within the Country	16 01 07	Yes	0.48	Oil filters from CAS	R9	M	Weighed	Offsite in Ireland	Enva Environmental,084/1	Clonman,Portlaois,Co.Laois, ".",Ireland	","","","","","","","","","Ireland	","","","","","","","","","Ireland
Within the Country	20 01 99	No	31.8	Mixed dry recycables from CAS	R3	M	Weighed	Offsite in Ireland	AES/Goff Ltd.,W00229-01	Kilrane,Rosslare,Wexford,Co.Wexford,Ireland		
Within the Country	16 06 01	Yes	11.74	Batteries from CAS	R4	M	Weighed	Offsite in Ireland	Enva Environmental,084/1	Clonman,Portlaois,Co.Laois, ".",Ireland	","","","","","","","","","Ireland	","","","","","","","","","Ireland
Within the Country	20 01 25	No	1.28	Waste cooking oil from CAS	R9	M	Weighed	Onsite in Ireland	Enva Environmental,084/1	Clonman,Portlaois,Co.Laois, ".",Ireland		

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

B. Staff Training

Subject	Staff Member: Barry Browne	Noel Byrne	Bernard Kirwan	Joe Browne	Kevin Murphy	Eamon Kelly	Larry Nolan	John Hudson	Target Dates for completion	Details
HEALTH & SAFETY										
Fas Safe Pass										
Basic First Aid										
Occupational First Aid										
									Dec-11	Civil Defence
Heartsaver AED										
									Dec-11	Civil Defence
ENVIRONMENT AND LANDFILL COURSES										
CSCS Tickets -Loading Shovel										
									Dec-11	To be confirmed
CSCS Tickets -Compactor										
CSCS Tickets -360 Excavator										
CSCS Tickets -Dumper										
									Dec-11	To be confirmed
Fas Waste Management Certificate										
Manual Handling									renew as required	Internal Wex co co
Fas Waste Operatives Training Course										
Certificate in the Use of Fire Extinguishers									renew as required	
										Larry Brown Fire Safety
Small Plant Course										
Vehicle reversing training										
Customer Care										
										Internal Wex co co
ATEX training										
										Internal Wex co co
GENERAL COURSES										
E.C.D.L Computer Course										
										Westgate Computer Centre
Beginners Computers										
										Westgate Computer Centre

Course/ Training Complete

Course/ Training Not Complete

Recommend attend course/traini

Subject		Staff Member: Dan McCartan	Fintan Ryan	Fran Hobbs	Billy Byrne	Target Dates for completion	Details
HEALTH & SAFETY							
Fas Safe Pass						renew as required	
Occupational First Aid							
Certificate in Health & Safety , Welfare and management							
Current Health and Safety Legilistation (Course to be agreed)						Dec-11	
ENVIRONMENT AND LANDFILL COURSES							
Fas Waste Management Certificate							
Fas Waste Management On-Site Competency Assessment						Dec-11	F.A.S.
ATEX Tranining Course							C.M.S.E.
Manual Handling							
Customer Care						Dec-11	Internal Wex co co
Certificate in the Use of Fire Extinguishers							
New Conditions of Contract (Course to be agreed)						Dec-11	
IOSH Certificate of Competence in Environmental Noise Measurement							
GENERAL COURSES							
E.C.D.L Computer Course							
Certificate in Local Government Studies							
Financial software (Course to be agreed)						Dec-11	
Report Writing (Course to be agreed)						Dec-11	

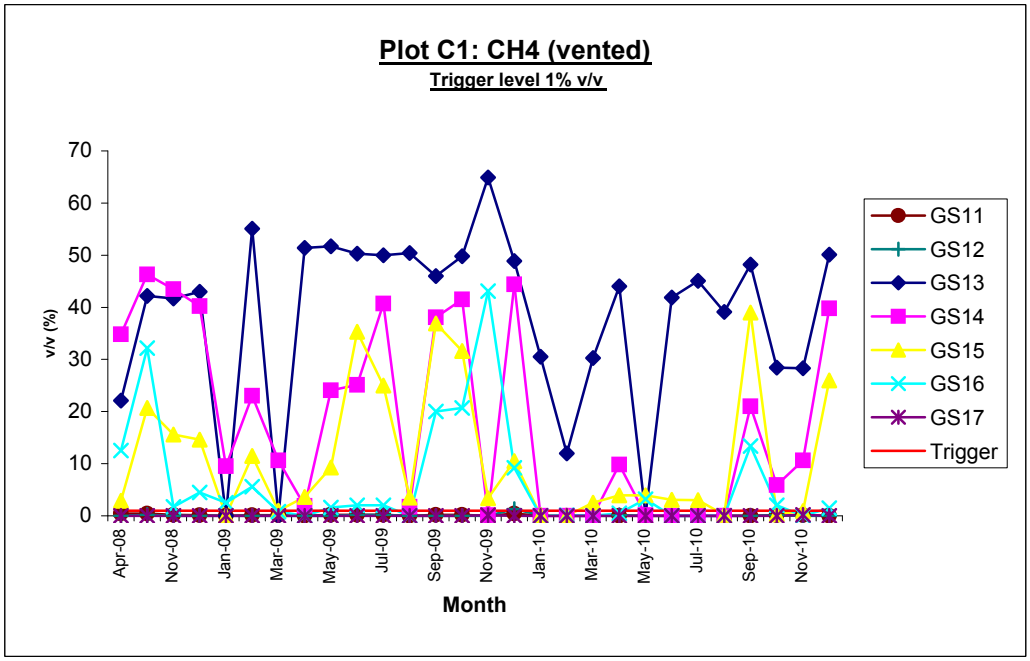
Course/ Training Complete

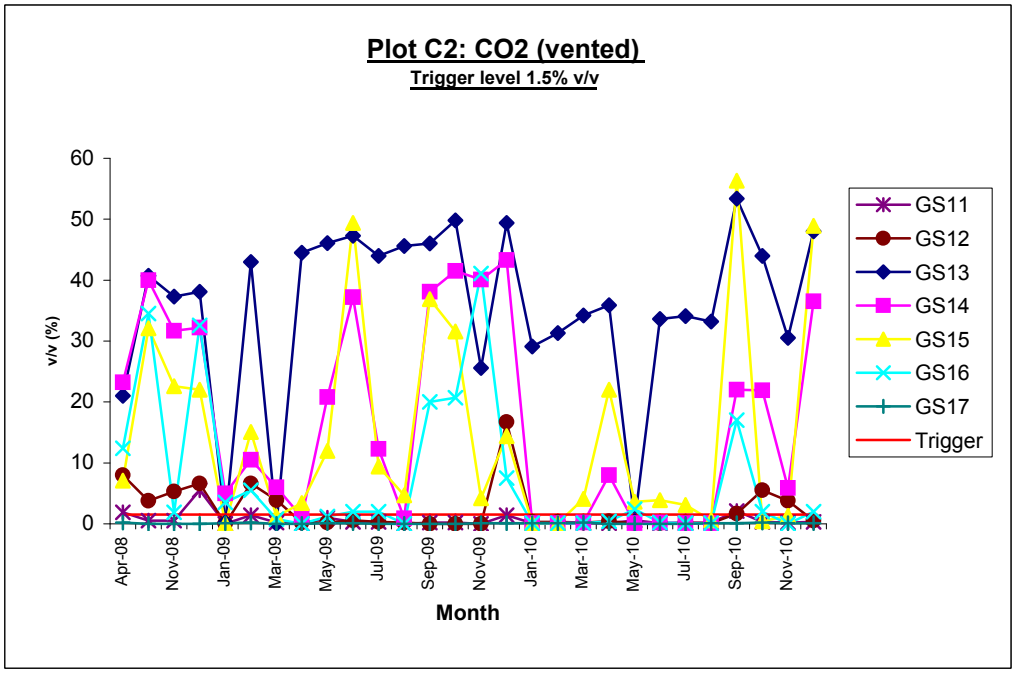
Course/ Training Not Complete

Recommend attend course/training

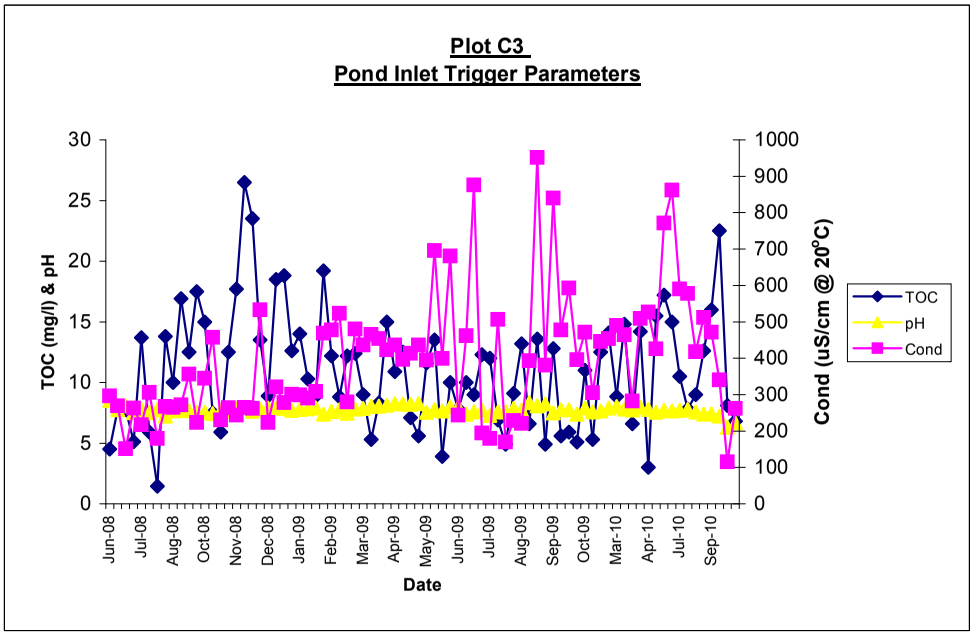
C. Monitoring Results and Graphs

Gas Monitoring Results 2010

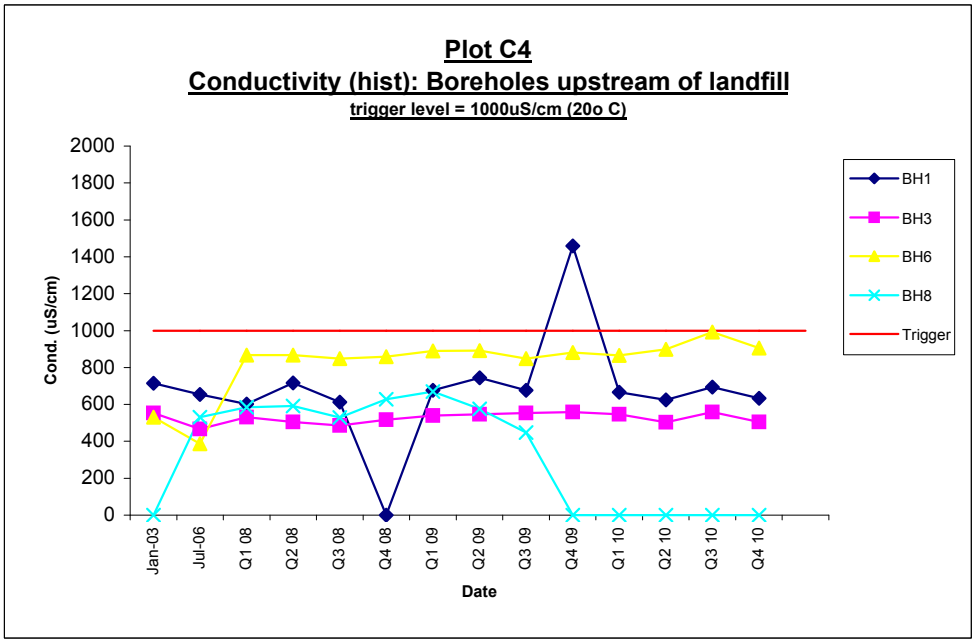


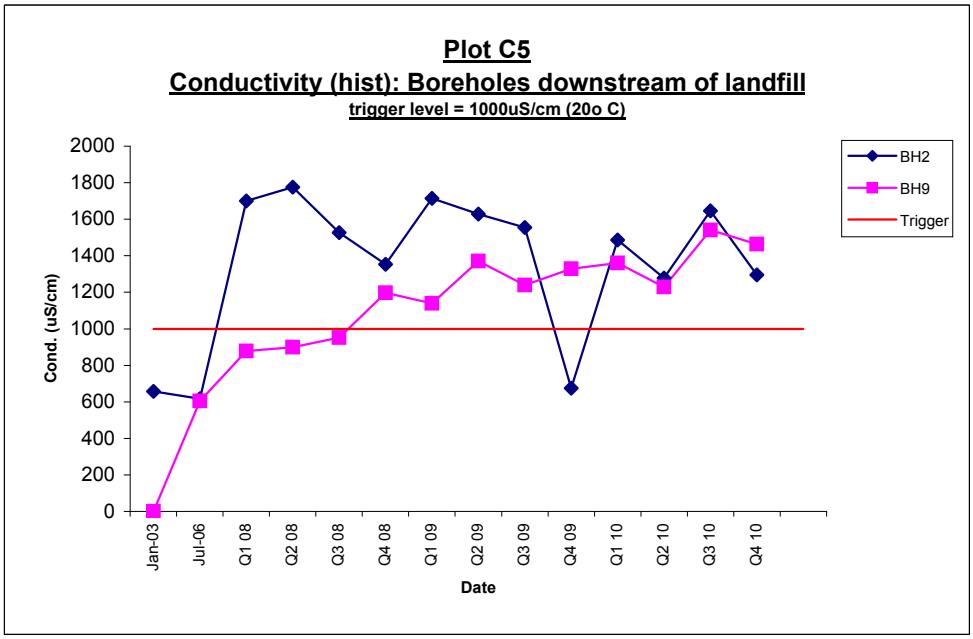


Surface Water Monitoring Results 2010

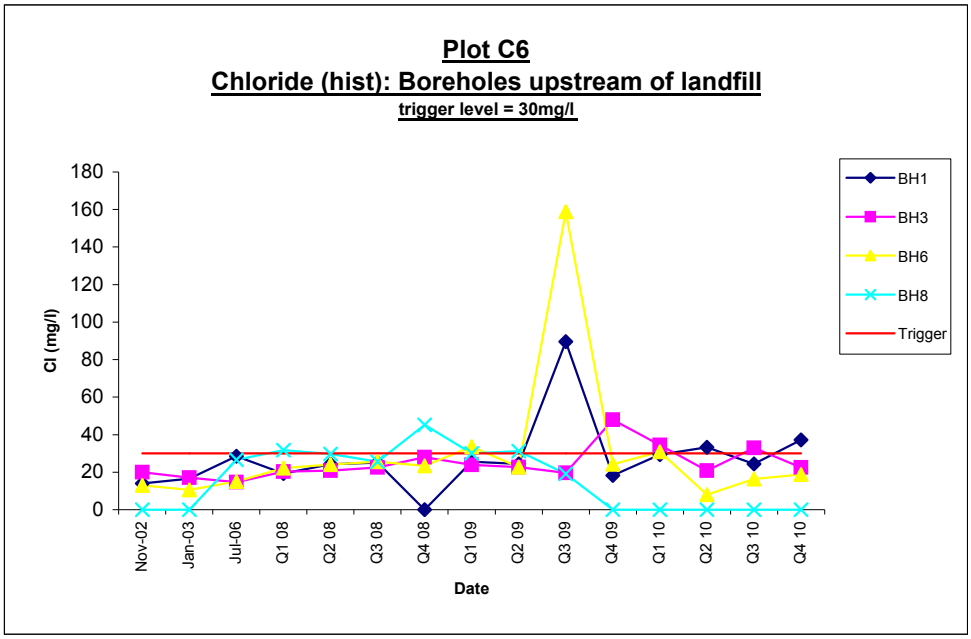


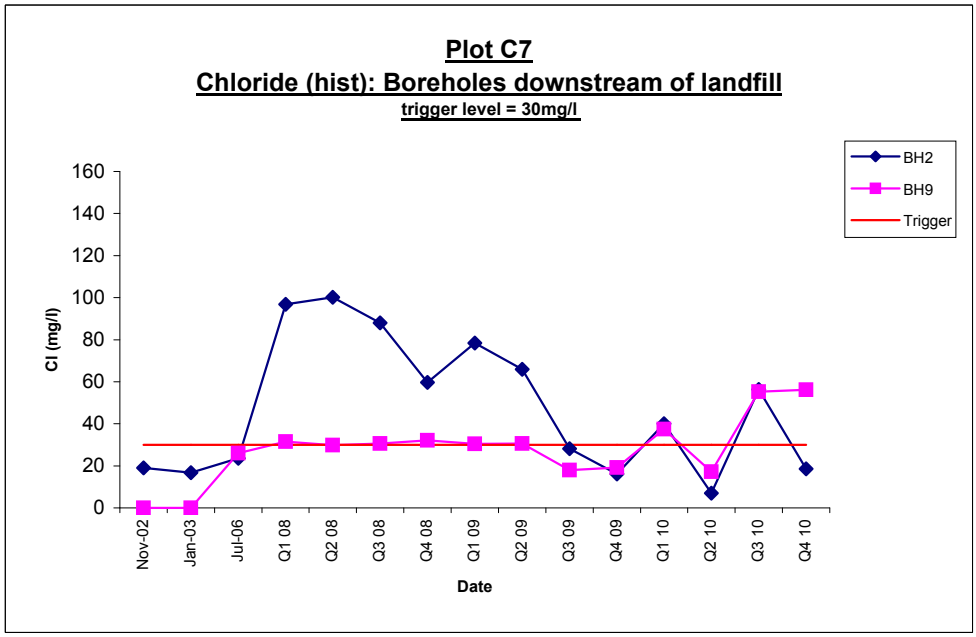
Ground Water Monitoring Results 2010



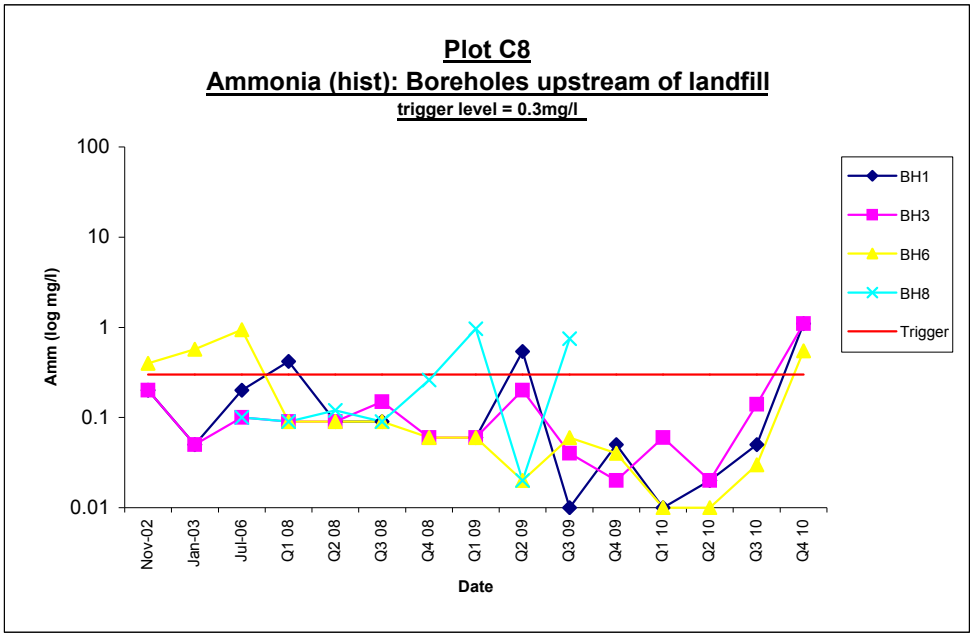


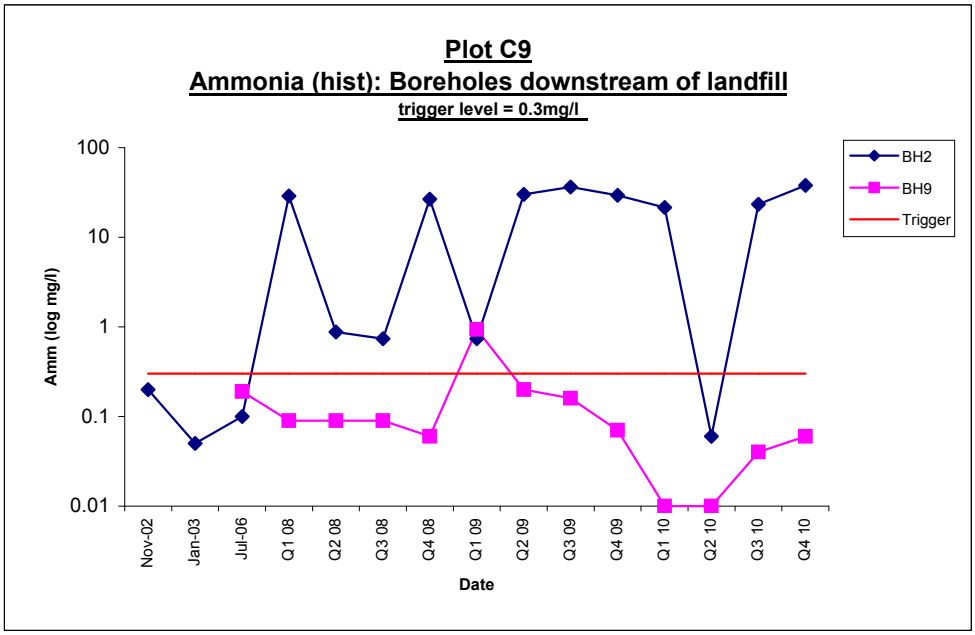
Ground Water Monitoring Results 2010



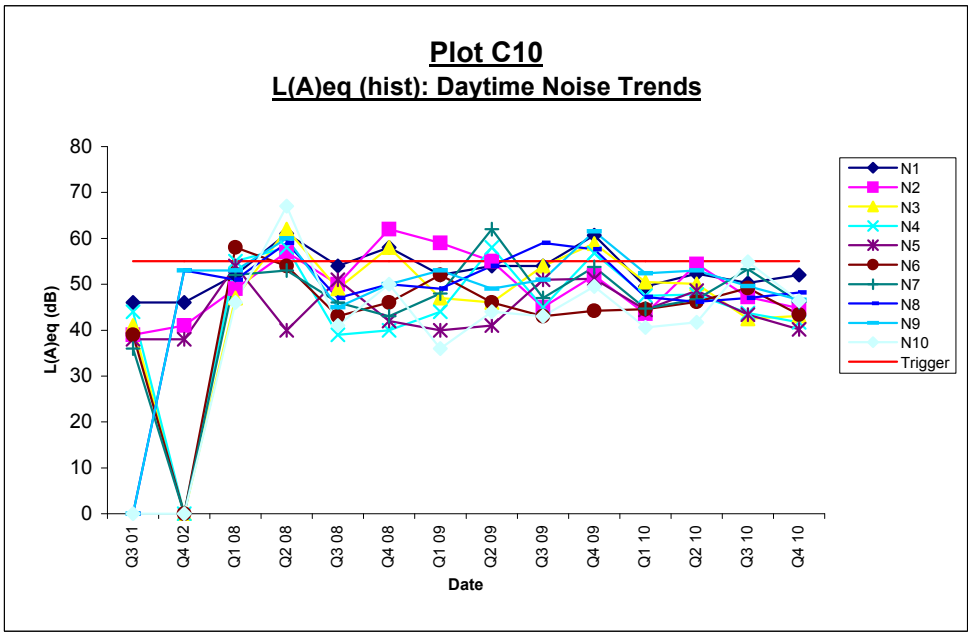


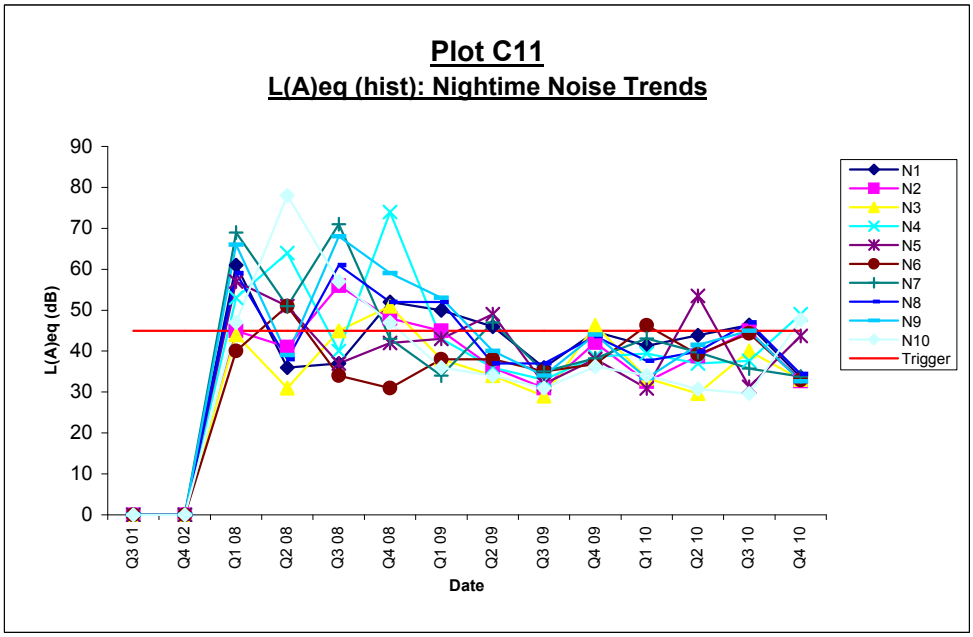
Ground Water Monitoring Results 2010



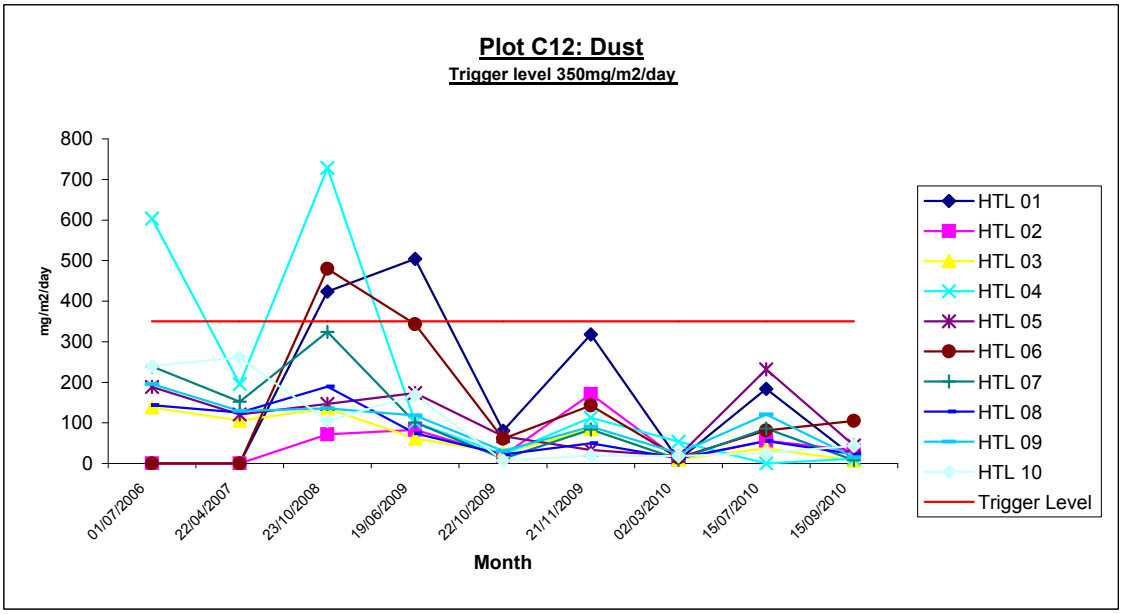


Noise Monitoring Results 2010





Dust Monitoring Results 2006 - 2010



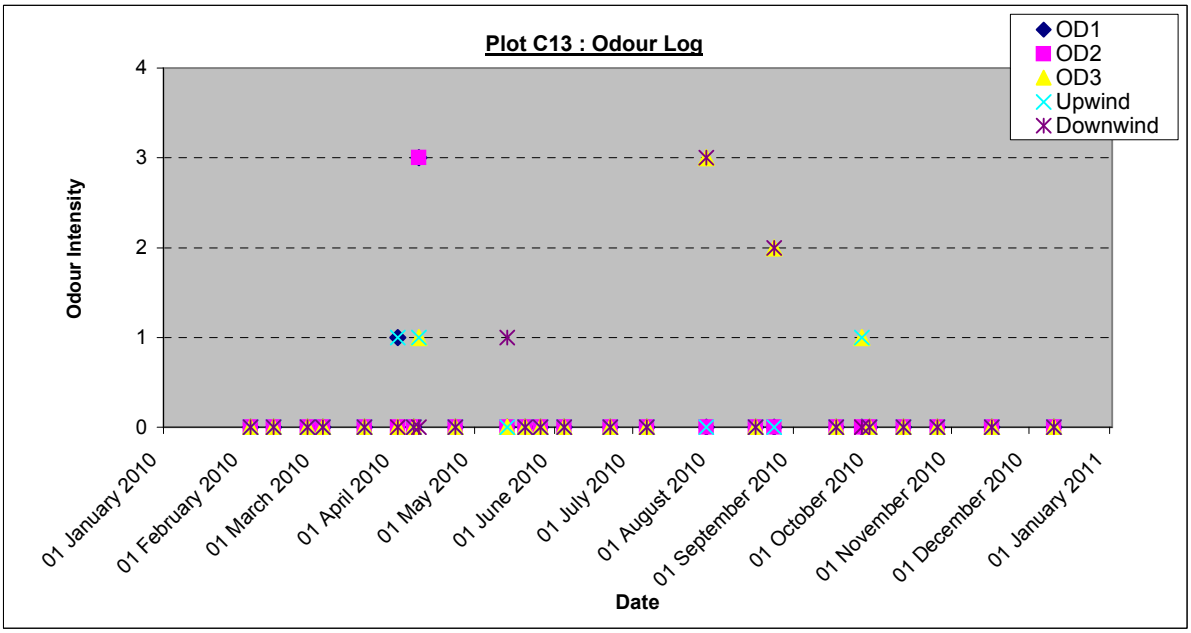
Dust Monitoring Results 2010

Dust Monitoring Locations and Frequency			
Dust analysis	On site	D1 – D10	
Dust Monitoring Results (mg/m^2/day)			
	07/12/09 - 02/06/10	**02/06/10 - 17/08/10**	**17/08/10 - 13/10/10**
D1	8.5	183.8	15.5
D2	10.1	56.4	31.3
D3	9.9	37.1	6.8
D4	53.4	Missing*	11.9
D5	18.4	231.8	44.3
D6	14.5	81.1	105.3
D7	10	85.7	8
D8	12.3	55	23.2
D9	25.1	120.8	15.2
D10	17.9	26.1	43.4

PM_{10} Monitoring Results

PM_{10} Monitoring	
Location	**Result (ug/m3)**
D1	16
D2	14
D3	22
D4	27
D5	23
D6	24
D7	14
D8	28
D9	14
D10	16

Odour Monitoring Results 2010



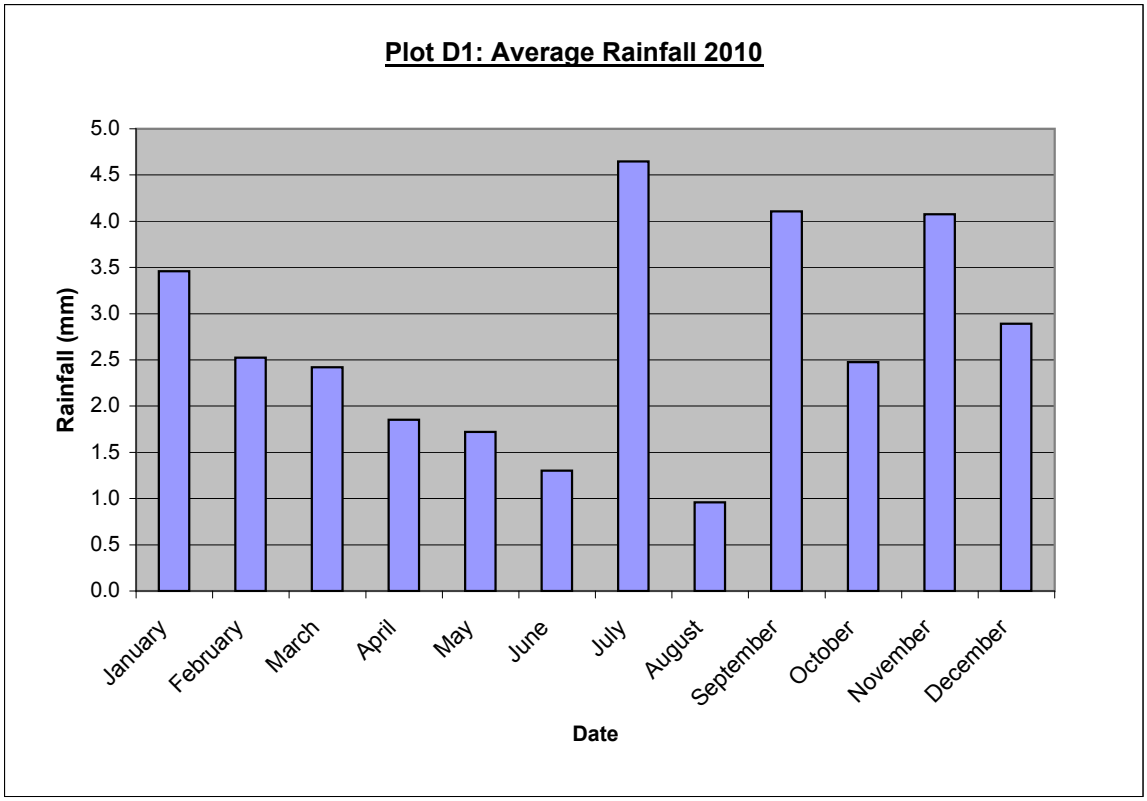
Legend

0	No detectable odour
1	Faint odour
2	Moderate odour
3	Strong odour
4	Very strong odour

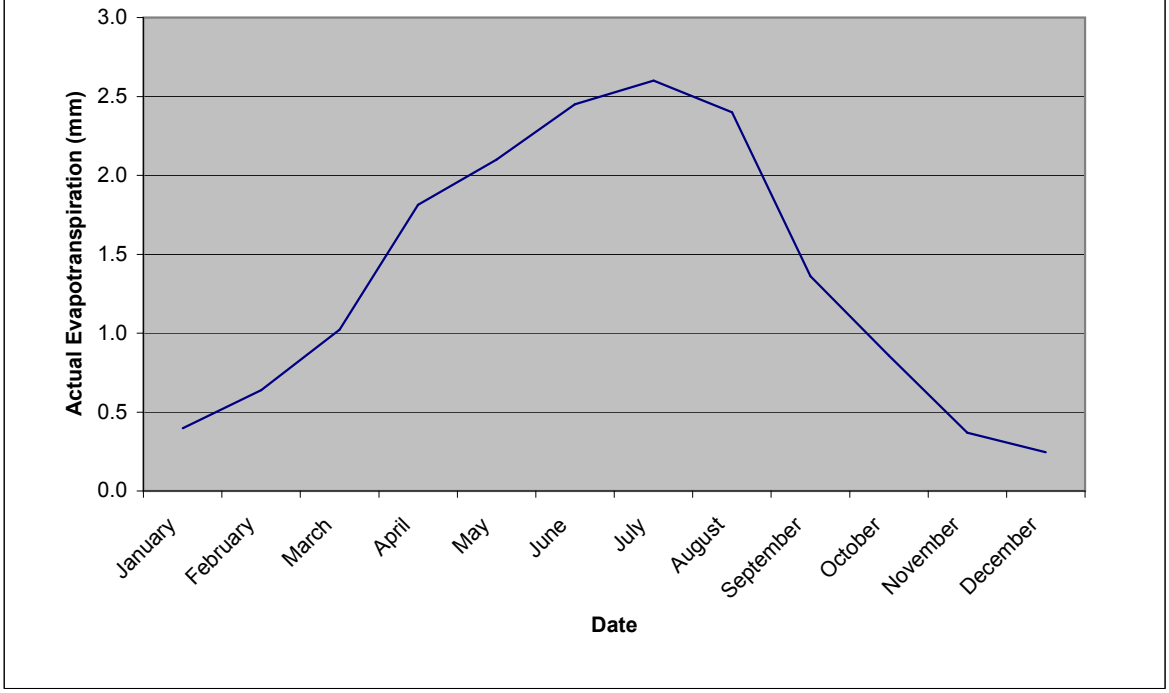
D. Meteorological Data Graphs

Meteorological Data Graphs

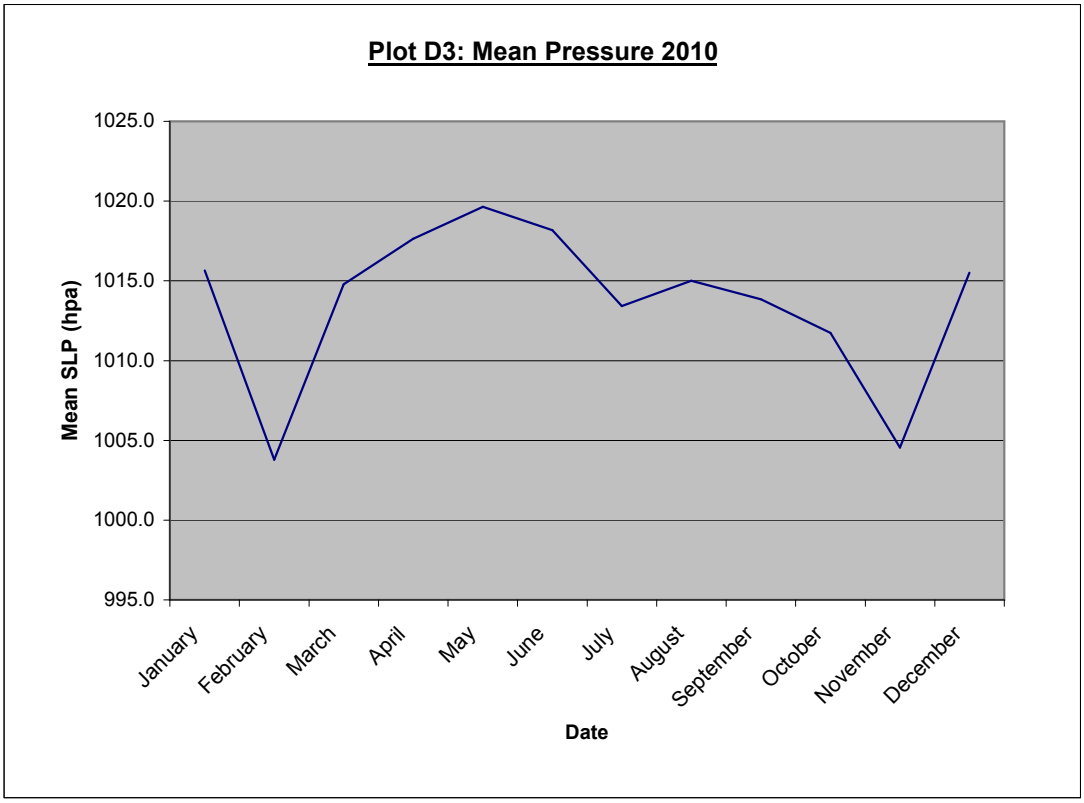
Plot D1: Average Rainfall 2010

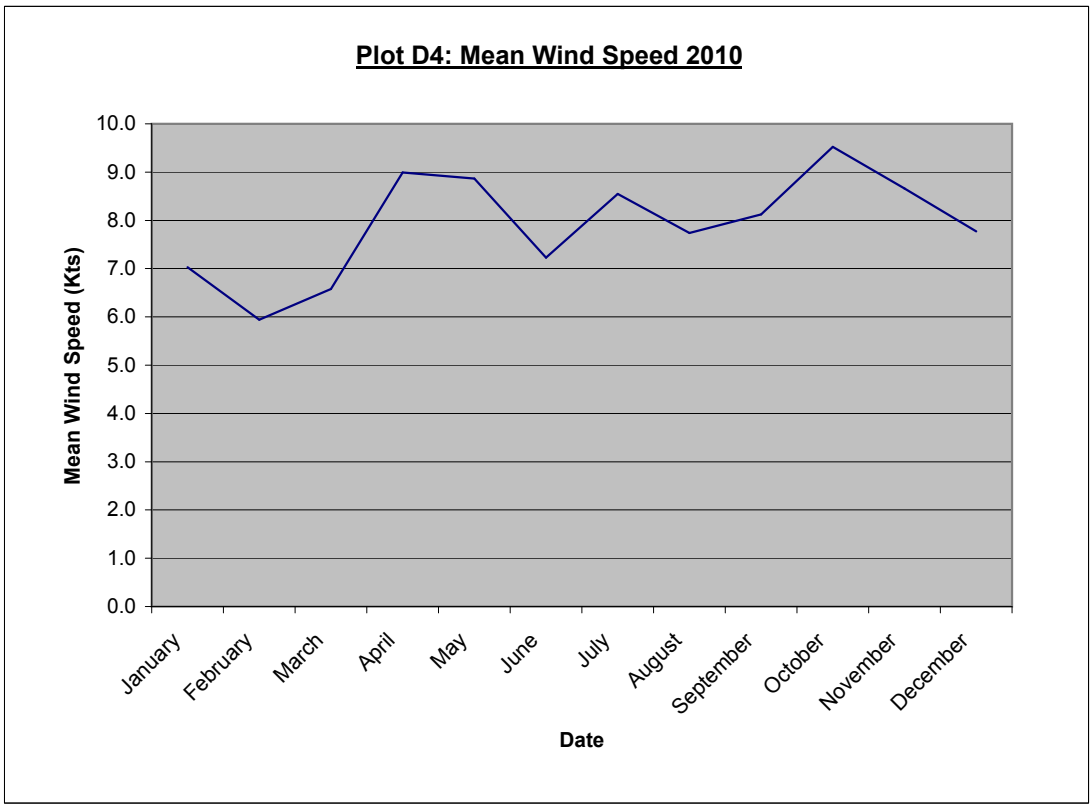


Plot D2: Predicted Evapotranspiration 2010

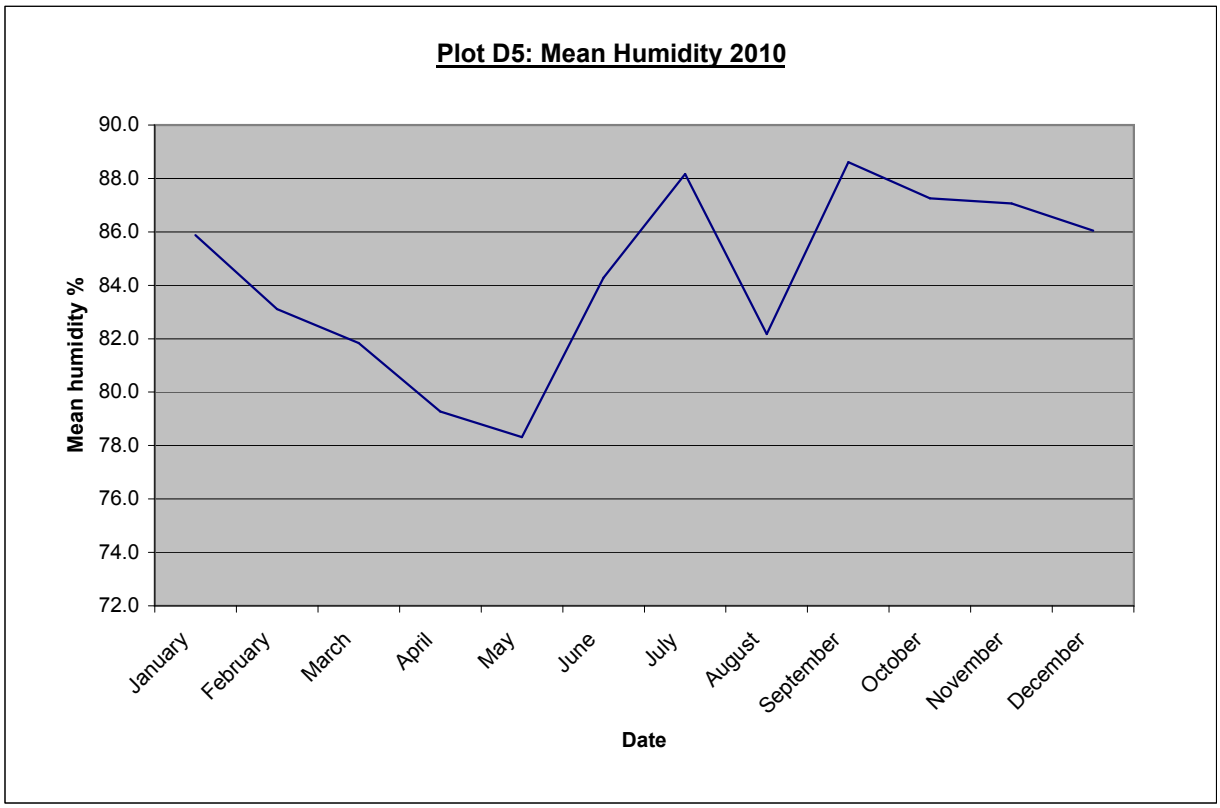


Meteorological Data Graphs





Meteorological Data Graphs



E. Summary of waste accepted and consigned off-site

Waste accepted to Holmestown Landfill from 1st January 2010 to 31st December 2010 (tonnes)

Waste In	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly totals
CIVIC AMENITY WASTE	198.57	258.07	262.69	312.59	270.85	268.29	257.19	256.77	200.37	212.59	181.69	148.79	**2,828.46**
COMMERCIAL WASTE	267	140.84	99.46	184.62	163.86	141	146.92	138.48	153.76	210.4	82.66	86.38	**1,815.38**
DOMESTIC WASTE	1,995.57	2,231.07	2,743.10	2,421.99	2,417.13	2,306.51	1,872.05	2,317.17	2,173.73	1,885.84	1,917.47	2,064.99	**26,346.62**
ILLEGAL DUMPING / FLY TIPP	40.78	70.78	35.27	92.68	115.44	81.98	85.58	61.26	63.4	64.4	74.18	31.26	**817.01**
LITTERBINS	21.66	14.8	20.1	18.94	17.48	19.34	19.6	20.32	17.54	16.84	16.32	15.36	**218.3**
SWEEPINGS	80.86	83.84	95.5	53.08	48.56	45.92	25.56	12.36	18.14	20.53	66.54	24.92	**575.81**
Monthly Total:	**2,604.44**	**2,799.40**	**3,256.12**	**3,083.90**	**3,033.32**	**2,863.04**	**2,406.90**	**2,806.36**	**2,626.94**	**2,410.60**	**2,338.86**	**2,371.70**	**32,601.58**

Cover material and stone used in Holmestown Landfill from 1st January 2010 to 31st December 2010 (tonnes)

Material In	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly totals
LANDFILL COVER	85.60	125.16	220.00	90.14	121.80	112.76	110.82	53.84	202.60	127.62	149.02	114.30	**1,513.66**
SOIL / STONES	639.10	572.02	186.62	64.22	487.20	237.22	66.04	107.82	162.38	0.00	133.40	22.98	**2,679.00**
Monthly Total:	**724.70**	**697.18**	**406.62**	**154.36**	**609.00**	**349.98**	**176.86**	**161.66**	**364.98**	**127.62**	**282.42**	**137.28**	**4,192.66**

Waste consigned off-site from Holmestown Landfill from 1st January 2010 to 31st December 2010 (tonnes)

Waste Out	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly totals
BATTERIES :	0.00	1.58	0.54	1.70	0.86	1.60	2.36	1.02	0.82	0.00	1.26	0.00	**11.74**
FLUORESCENT LIGHTS :	0.00	0.06	0.03	0.00	0.02	0.00	0.08	0.00	0.12	0.00	0.02	0.00	**0.33**
GLASS BOTTLES :	8.28	5.34	5.18	6.72	6.04	6.26	6.96	6.44	6.88	4.64	4.10	5.28	**72.12**
LEACHATE	2975.74	1253.10	947.70	1058.42	364.66	670.20	1109.62	676.16	1979.90	611.38	2346.70	1370.76	**15,364.34**
PLASTIC BOTTLES :	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
TEXTILES :	2.00	1.80	2.32	1.70	1.76	2.48	2.14	2.10	1.58	1.96	1.60	0.62	**22.06**
SCRAP METAL	6.76	17.70	21.71	40.59	11.64	14.16	37.78	20.58	17.70	14.14	11.92	4.20	**218.88**
ALLUMINIUM CANS	0.40	0.26	0.24	0.38	0.22	0.26	0.30	0.26	0.32	0.16	0.12	0.22	**3.14**
CARDBOARD	8.96	5.12	6.72	5.36	6.24	4.70	7.18	8.02	5.68	5.04	6.40	5.88	**75.30**
NEWSPAPER	3.04	2.62	3.06	3.66	3.56	3.60	6.70	7.18	6.48	5.88	5.62	4.00	**55.40**
TETRAPACK	0.40	0.00	0.32	0.00	0.46	0.52	0.20	0.58	0.44	0.48	0.46	0.52	**4.38**
WASTE ELECTRONICS	17.88	30.48	29.50	27.92	23.34	26.68	24.90	35.04	23.36	18.34	21.12	8.10	**286.66**
WASTE ENGINE OIL	0.00	1.52	0.00	1.52	0.00	1.56	0.96	1.08	0.72	0.90	0.48	0.00	**8.74**
MAGAZINES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
MIXED DRY RECYCABLES	3.44	3.80	6.23	2.88	1.30	2.42	1.92	2.62	1.97	1.96	1.70	1.56	**31.80**
OIL FILTERS	0.00	0.18	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	**0.48**
PRINT CARTRIDGES	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.60	0.00	0.00	**1.40**
COOKING OIL	0.00	0.58	0.00	0.00	0.00	0.70	0.00	0.00	0.00	0.00	0.00	0.00	**1.28**
Monthly Totals:	**3,026.90**	**1,324.14**	**1,023.55**	**1,150.85**	**420.10**	**735.44**	**1,201.90**	**761.08**	**2,045.97**	**665.48**	**2,401.50**	**1,401.14**	**16,158.05**

F. Water Balance Calculation Spreadsheet

TABLE 1

Leachate Generation

Actual rainfall	945	mm/yr	actual data from met eireann (1st Jan to 31st dec)
Infiltration	**756**	mm (temporary restored areas) Assumes 80% of actual rainfall	80 %
	75	mm (restored areas) Assumes runoff of	90 %
	945	mm (waste - active and unrestored areas) - assumes all rainfall infiltrates into the waste	
Density	0.90	t/m3	
Waste input 2009	36,794.00	t	
Liquid waste input	0	m3/yr	
Absorptive Capacity	**0.025**	m3 per m3	
Site life	20	years	

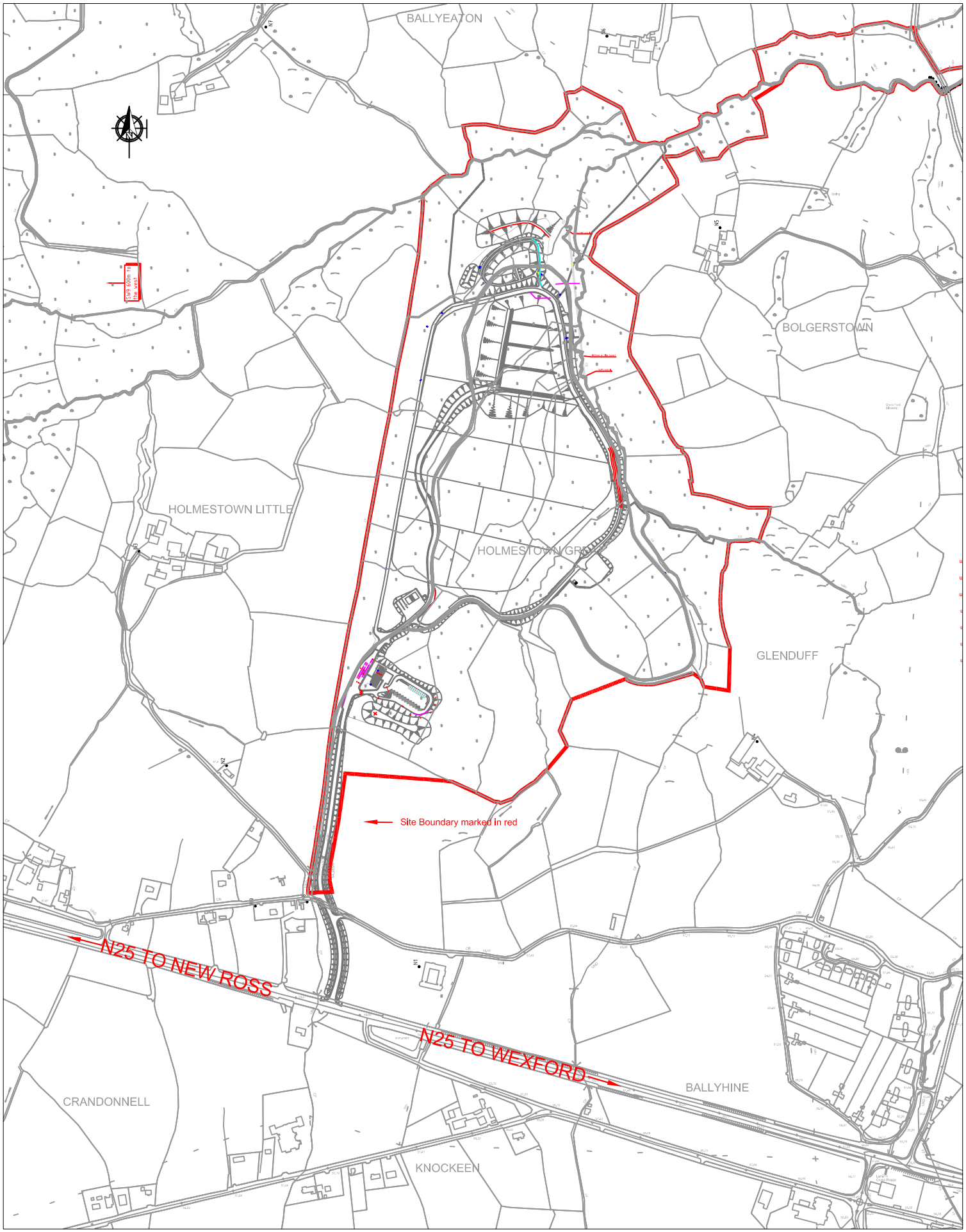
Year	Months	Phase	**Active Area**	**Temp Cap**	**Full Cap**	Waste Input 2010	Active Infiltration (m^3)	Temp Infiltn. m3	Restored Area Infiltration (m^3)	Total Water (m^3)	Cumulative Water (m^3)	Absorbtive Capacity (m^3)	Cumulative abs. capacit (m^3)	mulative leach generation (m^3)	leachate produced (Lo) (m^3)	Monthly leachate generation (m^3/mnt)	Leachate per day (m/day)	50% allowance
2010 (1st Jan to 31st May)	5	1 (Cell 2,3,4)	4350	8700		17,369	1,713	2,741	0	4,453	4,453	482	482	3,971	3,971	794	26	40
2010 (1st June to 31st dec)	7	1 (Cell 1,2,3,4)	4350	13050		19,425	2,398	5,755	0	8,153	12,606	540	1,022	11,584	7,613	1,655	55	83

Total 2010	11,584

Note

Does not account for the absorbtion of the landfill cover in this calculation(woodchip)
Tonnages based on both waste and cover.

G. Drawings



Wexford County Council

Holmestown Waste Management Facility

Wexford County Council,
Wexford
Tel: 053-9120922

PROJECT TITLE: Holmestown Waste Management Facility

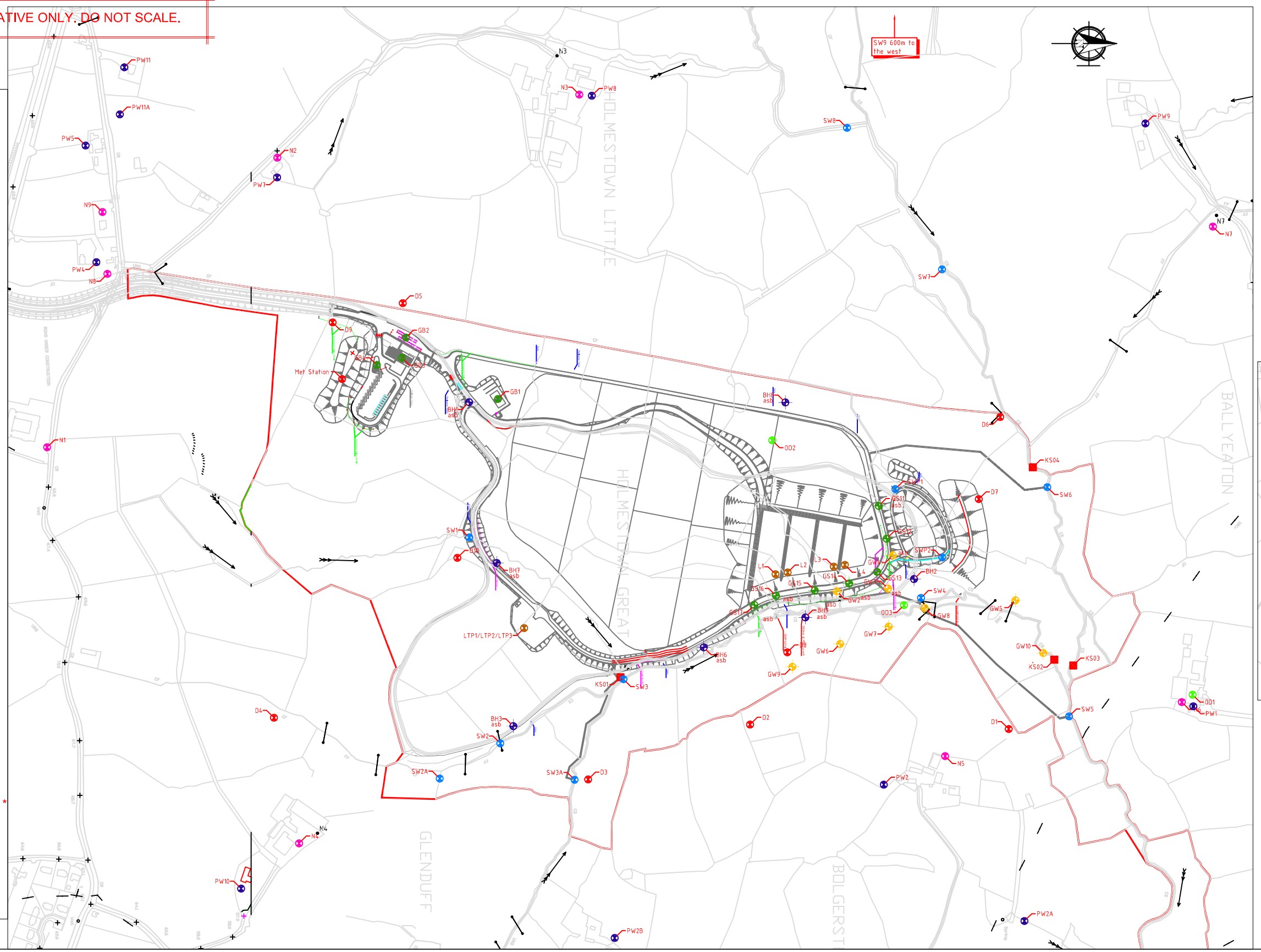
DRAWING TITLE: Appendix G1
Site Location Plan

DRAWN:
CHECKED:
DATE:
SCALE:
DRAWING No:

DRAWING IS INDICATIVE ONLY. DO NOT SCALE.

BH1	297039.975	122814.478	42.730
BH2	297295.299	123456.557	14.707
BH3	297507.600	122878.303	24.256
BH5	297119.292	123332.688	0.000
BH6	297393.948	123153.195	17.184
BH7	297272.112	122854.454	33.137
BH8	297040.294	123270.883	33.260
BH9	297350.708	123299.768	20.960
BH10	297199.000	123330.000	0
D1	297511.746	123593.241	0.000
D10	297264.704	122797.575	0.000
D2	297505.338	123219.998	0.000
D3	297584.534	122986.308	0.000
D4	297495.467	122532.866	0.000
D5	296897.046	122718.769	0.000
D6	297061.385	123580.954	0.000
D7	297179.909	123550.036	0.000
D8	297401.061	123273.780	0.000
D9	296924.792	122617.597	0.000
GB1	297035.277	122856.226	0.000
GB2	296946.653	122723.357	0.000
GB3	296975.975	122717.819	0.000
GB4	296986.415	122681.418	0.000
GS11	297189.710	123405.649	20.399
GS12	297237.100	123416.951	0.000
GS13	297284.965	123403.337	17.644
GS14	297301.651	123362.923	17.230
GS15	297311.668	123313.405	17.336
GS16	297318.999	123269.027	0.000
GS17	297332.800	123226.323	18.058
GW1	297323.000	123287.000	0.000
GW2	297313.000	123345.000	0.000
GW3	297309.000	123419.000	0.000
GW4	297261.000	123426.000	0.000
GW5	297326.000	123603.000	0.000
GW6	297389.000	123350.000	0.000
GW7	297360.000	123420.000	0.000
GW8	297337.000	123472.000	0.000
GW9	297422.000	123281.000	0.000
GW10	297402.000	123643.000	0.000
KS01	297437.000	123033.000	0.000
KS02	297411.663	123658.969	0.000
KS03	297420.128	123686.356	0.000
KS04	297134.000	123628.000	0.000
L1	297288.236	123256.667	0.000
L2	297285.790	123274.312	0.000
L3	297277.324	123340.796	0.000
L4	297274.776	123356.846	0.000
LTP1/LTP2/LTP3	297366.093	122893.971	0.000
N1	297033.882	122189.788	0.000
N2	296696.386	122554.241	0.000
N3	296595.962	122973.601	0.000
N4	297676.851	122569.145	0.000
N5	297617.057	123523.549	0.000
N6	297368.822	123878.943	0.000
N7	296786.508	123887.905	0.000
N8	296854.739	122292.802	0.000
N9	296765.477	122285.437	0.000
PW1	297478.990	123859.662	18.339
PW10	297742.159	122485.520	0.000
PW11	296556.602	122317.026	0.000
PW2	297546.337	123408.659	0.000
PW2A	297584.688	123553.368	0.000
PW2B	297827.481	123031.480	0.000
PW4	296837.889	122276.677	0.000
PW5	296669.494	122261.079	0.000
PW6	296748.425	122427.439	0.000
PW7	296715.488	122537.448	0.000
PW8	296597.554	122991.603	0.000
PW9	296637.600	123790.527	0.000
SW1	297235.091	122814.649	0.000
SW2	297532.459	122859.447	0.000
SW2A	297583.292	122772.100	0.000
SW3	297439.978	123037.355	0.000
SW3A	297585.017	122966.756	0.000
SW4	297322.540	123466.648	0.000
SW5	297493.552	123680.361	0.000
SW6	297162.636	123648.886	0.000
SW7	296848.257	123496.913	0.000
SW8	296643.949	123359.856	0.000
* SW9	296027.225	123314.992	0.000 *
SWP1	297165.348	123429.626	0.000
SWP2	297264.019	123497.170	0.000
OD1	297355.000	123880.000	
OD2	297095.000	123252.000	
OD3	297333.000	123442.000	
Met Station	297006.600	122631.300	0.000

* = Approximate, to be checked on site



Wexford County Council

Holmestown Waste Management Facility

Wexford County Council,
Wexford
Tel: 053-9120922

Drawing Notes

No.	Revision Description	Date	Ini.	Ckd.

Project Title
Holmestown Waste Management Facility

Drawing Title
Appendix G2
Monitoring Locations

Drawn	F. Ryan
Checked	FH
Date	21-04-11
Scale	1:6000
Surveyed	FR
Drawing No.	001

Wexford County Council

Holmestown Waste Management Facility

Wexford County Council,
Wexford
Tel: 053-9120922

Drawing Notes

No.	Revision Description	Date	Inl.	Ckd.

Project Title
Holmestown Waste Management Facility

Drawing Title
Appendix G3. Landfill survey jan 2011

Drawn	F. Ryan
Checked	FH
Date	21-06-11
Scale	1:6000
Surveyed	FR
Drawing No.	001