

Ballyogan Landfill Facility and Recycling Park Waste Licence W0015-01



Annual Environmental Report 2008



**Ballyogan Landfill Facility
and Recycling Park
Waste Licence W0015-01**

Annual Environmental Report

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1 INTRODUCTION AND SITE DESCRIPTION

This Annual Environmental Report (AER) for Ballyogan Landfill Facility and Recycling Park for 2008 has been prepared by RPS on behalf of Dun Laoghaire Rathdown County Council (DLRCC). The AER includes, where applicable, the information specified in Schedule C of Waste Licence W0015-01, 'Content of the Annual Environmental Report', and has been prepared in accordance with the Environmental Protection Agency publication 'Waste Licensing - Draft Guidance on Environmental Management Systems and Reporting to the Agency' (1999).

1.1 WASTE LICENCE REGISTER NUMBER

Dun Laoghaire Rathdown County Council are the licensee for the Ballyogan Landfill Facility and Recycling Park under Waste Licence W0015-01. Ballyogan Landfill (now closed) is operated by DLRCC and Ballyogan Recycling Park (BRP) is operated by Greenstar under a three year short term contract with DLRCC. This contract elapsed in 2008 but has been extended to April 2009. These facilities are located in Jamestown, Carrickmines, Dublin 18.

1.2 REPORTING PERIOD

The reporting period for the purposes of this AER is January to December 2008 inclusive.

Quarterly reports follow the standard periods of:

- Quarter 1: January - March
- Quarter 2: April - June
- Quarter 3: July - September
- Quarter 4: October - December

1.3 WASTE ACTIVITIES AND QUANTITIES

The principal activity at the Ballyogan Facility up to March 2005 was 'deposit in, on or under land' within the landfill site. Commissioning of the Baling Station within the BRP began in January 2005. The landfill ceased accepting waste on 29th March 2005 and subsequently the principal activity shifted to the Baling Station where waste was baled and transported off-site for disposal at Arthurstown Landfill, Kill, Co. Kildare. Recycling facilities are provided for members of the public at the Civic Recycling Facility (CRF) within the Recycling Park, under the operation of Greenstar.

The total quantity of waste landfilled between 1975 when the landfill opened and March 2005 is estimated at 3,079,673 tonnes.

1.4 SITE DESCRIPTION

Local Environmental Conditions

Ballyogan Landfill Facility and Recycling Park is located in the Townland of Jamestown, Carrickmines, Dublin 18, approximately 7km south west of Dun Laoghaire. The surrounding area is characterised by

a mixture of agricultural, recreational, residential and commercial land use. The total site area is approximately 62 hectares, 43 of which have been used for landfilling. The BRP currently occupies approximately 11 hectares. The remaining area consists of the landfill site entrance and service roads, former landfill site compound, landfill gas combustion plant and other services. The site layout is shown on Figure 1.1.

Topography

Ballyogan Landfill is a 'land raise' situation where the landfill has been built on the original ground topography. The landfill rises between 10-30m above the original ground surface. The levels of the original topography ranged from circa 84m OD (Poolbeg) in the northeast of the site to circa 109m OD in the south west of the site. The Ballyogan Stream is situated in the north of the site and marks the lowest point. Generally, older areas of the landfill were filled to approximately 10m above the original levels, whilst filling in the centre of the site continued to approximately 30m above the original ground. A valley transverses the site due to the presence of ESB high voltage power lines. Waste was tipped on either side of the power lines creating the valley profile.

The Recycling Park is located between Ballyogan Road and the Ballyogan Stream. The site slopes away from the road and southwards towards the stream.

Geology

The Ballyogan Facility is underlain by Granite bedrock, which lies at the northern edge of the Leinster Granite Massif that formed the Wicklow Mountains. There is a degree of weathering at the top of the bedrock under most of the site and surrounding land. On average 0.5-1m of the granite is weathered.

The overburden geology of the Ballyogan area is dominated by boulder clay deposited in an ice sheet, which moved south-eastwards over the granite terrain and pushed up against the Dublin Mountains to the south and west of the site. Some discrete pockets of outwash sand and gravel were deposited by melt water as the ice sheet retreated. There are also alluvial sand and gravel deposits associated with the Ballyogan Stream.

Landfill Containment Details

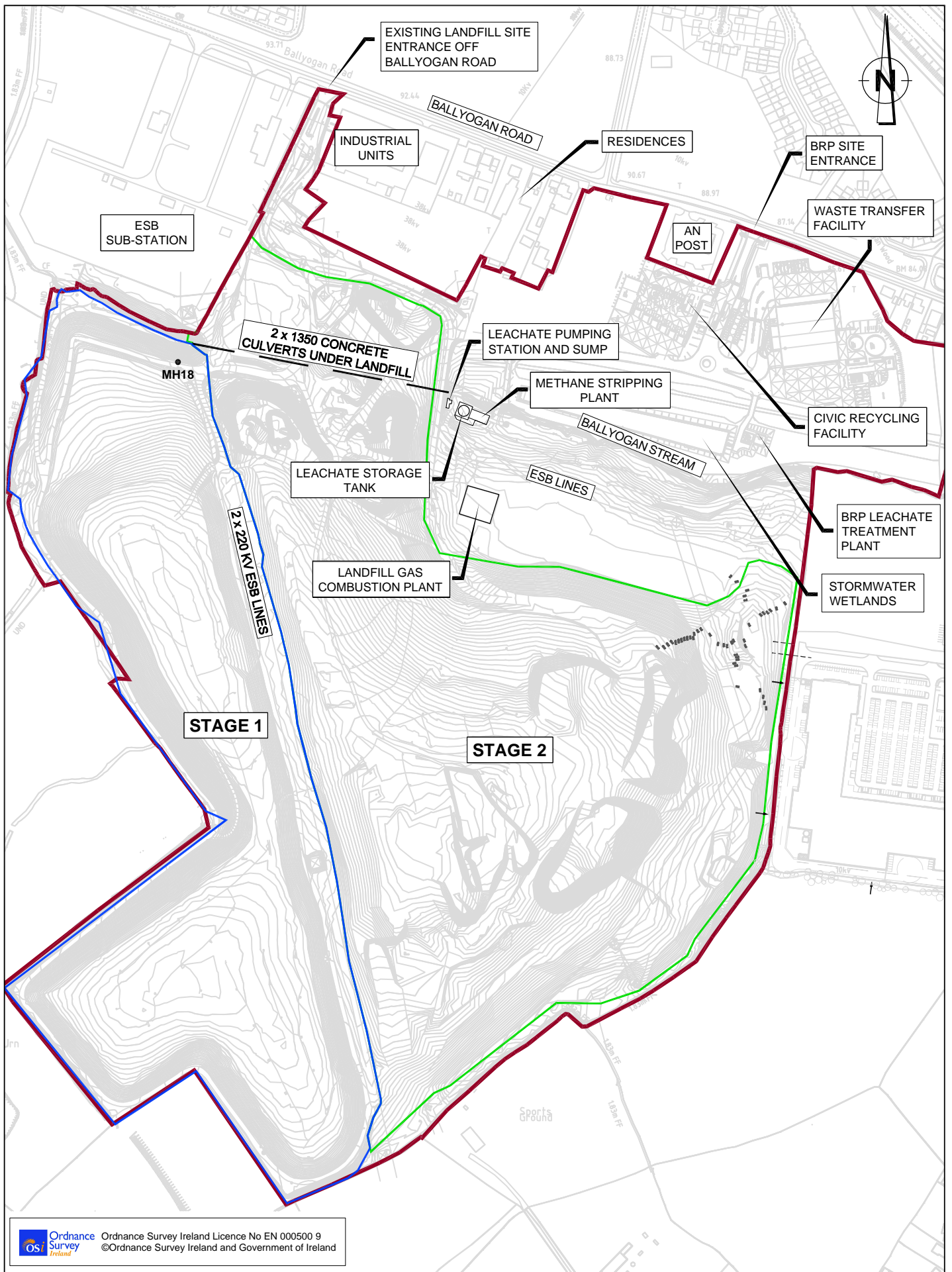
The naturally occurring low permeability boulder clay underlying the landfill site provides a natural liner for the landfill. Bund walls were constructed from imported clay to act as lateral containment. Leachate is collected via a network of pipes which are directed to the leachate sump. The leachate lagoon has been replaced with a new system of leachate management comprising a leachate storage tank and methane stripping plant, both of which are located adjacent to the leachate sump. Leachate from the site is discharged to the Carrickmines sewer which runs through the northern part of the site.


Stage 2 of landfill capping is currently underway. This contract will cap the Eastern side of the site. Capping is expected to be largely complete in September 2009.

Hydrogeology

Established ground water flow patterns are from southwest to northeast through the site towards the Ballyogan Stream. North of the stream the direction of flow is northwest to southeast. It appears that the Ballyogan Stream and/or the sand and gravel deposits running along its channel are acting as a discharge area for the groundwater in both over burden and bedrock.

Previous intrusive investigations (boreholes and trial pits) at the site have shown that groundwater moves slowly in the bedrock and overburden and therefore, the underlying geology is not considered significant as a potential or existing water source.




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 Annual Environmental Report 2008
Title:
 SITE LAYOUT

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Hydrology

The Ballyogan Stream is located in the northern part of the site, and separates the landfill from the Recycling Park. The stream is culverted under the oldest area of waste for a length of approximately 250m. It flows eastwards and joins the Loughlinstown River approximately 2.5km east of the site.

The 'Golf Stream' was previously culverted through the landfill in the south west of the site. It was diverted in 2005 to flow around the landfill along the western boundary of the site, as part of the Stage 1 Capping works. This stream drains areas to the west of the site, including the adjacent golf course. It formerly discharged into an open drain along the south eastern boundary of the landfill. The diversion works in 2005 re-directed it to flow northwards and join the Ballyogan Stream. The south east boundary drain flows eastwards from the landfill to meet the Glenamuck Stream. The Glenamuck Stream then flows northwards and joins the Ballyogan Stream approximately 300m east of the site.

Local Meteorology

A meteorological station in the BRP records the local meteorological conditions on a daily basis. Rainfall for the twelve month period from January to December 2008 was recorded at 965.7mm. It should be noted that 15 days of data is absent from the records due to technical difficulties encountered at the meteorological station in the BRP.

2 MANAGEMENT OF THE ACTIVITY

2.1 MANAGEMENT AND STAFFING STRUCTURE

Ballyogan Landfill and Recycling Park is under the overall operational control of the Director of Services as well as the Senior Engineer, Water and Waste Services, Dun Laoghaire - Rathdown County Council.

Once waste acceptance ceased in 2005, the number of staff at the landfill was reduced to the Landfill Manager Mr Brian Cryan, with office support from the Senior Executive Engineer, and the Senior Engineer from DLRCC Water and Waste Services. Table 2.1 outlines the details of the management personnel for the site.

Table 2.1: Management Personnel for Ballyogan Landfill

Name	Contact Details
Frank Austin Director of Services, Water and Waste Services	Dun Laoghaire Rathdown County Council County Hall Marine Road Dun Laoghaire Tel: 01 - 2054700 Fax: 01 - 2054736
Peter Goodwin Senior Engineer, Water and Waste Services	
Michael Whelan Senior Executive Engineer, Water and Waste Services	
Brian Cryan, Site Manager Site representative for DLRCC for the Landfill and the Recycling Park	Ballyogan Landfill and Recycling Park Ballyogan Road Carrickmines Dublin 18 Tel: 01 - 2913600 Fax: 01 - 2913625
Note: In June 2008 Michael Whelan replaced Bernard Egan as Senior Executive Engineer, Water and Waste Services, DLRCC	

Greenstar's staff structure for the BRP as at December 2008 is outlined in Table 2.2 below. The Landfill Manager's office has been located in the BRP since waste acceptance ceased in 2005. The Landfill Manager's role has since expanded to include supervision of the Operator's (Greenstar) activities at the CRF, Baling Station and ancillary activities, and management of the Operating Contract. Support is also provided by the Senior Executive Engineer.

Table 2.2: Greenstar's Staff Structure at the BRP

Role	Name
General Manager	Mark Heesom
Engineering Manager/Operations Engineer	David Sweeney
Operations Supervisor	Derek Turner
Facility Administrator	Jacqui King
Weighbridge Operator	Audrius Janusauskas
Security Staff	Cill Dara Security
Waste Transfer Facility	
Control Room Operative	Michael Kelleher
Plant Operator	Piotr Topkin
Maintenance Fitter	Jarlath Reynolds
Civic Recycling Facility	
Team Leader	Alan McNulty
General Operatives	Keith Halpin
	Kieran McFarlane
	James Dunne
	Anthony Byrne
	Kevin Walshe

2.2 SCHEDULE OF ENVIRONMENTAL OBJECTIVES AND TARGETS FOR THE FORTHCOMING YEAR

A schedule of Objectives and Targets for the period 2009 - 2010 is set out in Table 2.3 below. With respect to the landfill, since waste acceptance ceased in March 2005, the objectives and targets relate mainly to the protection of the receiving environment and the restoration and aftercare of the site.

Table 2.3: Objectives and Targets for 2009

SCHEDULE OF OBJECTIVES AND TARGETS 2009				
Objective	Target	Measures	Timescale	Designation of Responsibility
Maintain as a minimum level 2008 levels of waste recovery from waste arising at CRF.	As a minimum target, to maintain 2008 levels of waste recovery and recycling of 72%.	2008 recovery percentage as target and baseline measures, respectively.	Reported on monthly, and measured over 2009.	Greenstar
Reduce service level complaints at CRF by a further 10% on 2008	10% reduction upon 2008 figures.	Complaint Records	Reported on monthly and measured over 2009.	Greenstar
Reduce reportable accidents to zero.	Zero occurrence of reportable accidents.	Accident Records.	Reported on monthly and measured over 2009.	Greenstar
Maintain (and improve if possible) lower levels of incidents recorded.	All facility users to be fully compliant with site safety rules.	Incident Records	Reported on monthly, and measured over 2009.	Greenstar
Support of the Dublin Waste Region Waste Management Protocols to ensure that inputs into Arthurstown Landfill Site are in line with regional requirements to preserve void space.	40,000 tonnes maximum throughout into WTF during 2009.	Waste Input Records	Reported on monthly, and measured over 2009.	Greenstar
Remove odour nuisances during 2009.	Reduce odour complaints to zero.	Complaints Records and Community Liaison Groups.	Reported on monthly and measured throughout 2009.	Greenstar

SCHEDULE OF OBJECTIVES AND TARGETS 2009				
Objective	Target	Measures	Timescale	Designation of Responsibility
Minimise nuisances to immediate boundary neighbours.	Ensure facility operations do not give rise to complaints from immediate neighbours.	Improvement measured against 2008 complaint records.	Reported on monthly and measured throughout 2009.	Greenstar
Submit Exit Plan to DLRCC and comply with handover according to terms of STOC.	Handover facility in original state less normal wear and tear.	Inspection and DLRCC sign off.	April 2009	Greenstar
Minimise energy and water usage through effective measures across the site.	Maintain baling rates and maintain energy awareness with staff.	Utility bills/real time monitoring	Measured monthly	Greenstar
Provide for the biological treatment of organic waste.	Construction of a 45,000 tonne capacity organic waste composting facility.	Appoint a PPP Design and Build Contractor for the construction of this facility.	Summer 2010	Senior Engineer, Water & Waste Services
Reduce leachate generation.	Complete the capping of the landfill.	Stage 2 capping contract has been procured and is currently being executed.	Largely complete by late 2009	Senior Engineer, Water & Waste Services
Reduce the number of incidents of landfill gas exceedence at the perimeter of the site, and reduce landfill gas emissions to the atmosphere.	Complete the capping of the landfill and the installation of a perimeter LFG Management System.	Stage 2 capping is underway as described above. This is inclusive of the installation of a perimeter system. Flaring options of excess are currently under consideration.	Timescale for this project is under consideration.	Senior Engineer, Water & Waste Services
Undertake representative environmental monitoring of the facility.	Replace monitoring infrastructure lost due to development works.	Installation of replacement wells by an appointed drilling contractor.	Following completion of the capping works.	Senior Engineer, Water & Waste Services

SCHEDULE OF OBJECTIVES AND TARGETS 2009				
Objective	Target	Measures	Timescale	Designation of Responsibility
Methane Stripping Plant (Landfill) undertake energy assessment during 2009 with aim of reducing usage.	Reduce consumption by 10%	Utility bills	Measured monthly	Senior Engineer, Water & Waste Services
Support of the Dublin Waste Region Waste Management Protocols	Have up to date best practice operational procedures in place for the CRF and former Landfill.	Appoint Operating Contractor	December 2009	Senior Engineer, Water & Waste Services

2.3 REPORT ON THE PROGRESS TOWARDS ACHIEVEMENT OF THE ENVIRONMENTAL OBJECTIVES AND TARGETS CONTAINED IN THE PREVIOUS YEARS REPORT (AER 2007)

A Schedule of Objectives and Targets for 2008 - 2009 was submitted to the Agency with the AER for 2007. Table 2.4 outlines the progress made in 2008 towards achieving these targets.

Table 2.4: Schedule of Objectives and Targets 2008 - 2009: Progress Towards Achievement

SCHEDULE OF OBJECTIVES AND TARGETS 2008 - 2009: PROGRESS TOWARDS ACHIEVEMENT			
Objective	Target	Project	% Completion
Maintain and increase 2008 levels of waste recovery from wastes arising at CRF.	<p>As a minimum target, to maintain existing levels of waste recovery and recycling.</p> <p>To explore and determine new methods, systems and practices of increasing diversion levels.</p>	<p>2008 recovery percentage as baseline measure.</p> <p>Measured by either improvement in recycling percentage; and/or recovery of materials not previously diverted; specific measures to be developed for individual waste streams where possible and measurable.</p>	<p>2008 recovery rate was 72% (by weight) down on 2007 recovery rate of 74% (by weight).</p> <p>A gypsum/plasterboard skip provided in July 2008.</p> <p>Fire extinguisher receptacle provided in September 2008</p>
To improve CRF information systems for customers.	<p>Review of existing best practice and report back to Client.</p> <p>Introduce more information leaflets and destination information for users.</p>	<p>Report to Client</p> <p>Information Leaflet</p>	<p>Other proposed improvements put on hold pending the appointment of a long term operator (decision expected mid 2009)</p> <p>New DLRCC signage installed in Spring 2009</p>
To have the most knowledgeable and skilled CRF staff in order to provide the highest level of service to customers.	All staff to have all necessary knowledge and skills to best advise and assist CRF users.	Customer and Employee feedback and monitoring	Ongoing Training & Development programme in place
Reduce service level complaints at CRF by a further 10% on 2007.	10% reduction on 2007 figures (for aspects under Greenstar control)	Complaint Records	Target reached – 50% Reduction
Reduce reportable accidents to zero.	Zero occurrence of reportable accidents.	Accident Records	1 reportable (to HSA) accident

SCHEDULE OF OBJECTIVES AND TARGETS 2008 - 2009: PROGRESS TOWARDS ACHIEVEMENT			
Objective	Target	Project	% Completion
Significant reduction in safety related incidents to achieve full compliance with all site safety rules by 31/12/07.	All facility users to be fully compliant with site safety rules at all times by end of the year. Initial focus upon WTF users (drivers and crews) to achieve full compliance with PPE and conduct rules.	Incident Records	73% reduction on 2007 incidents
Support of the Dublin Waste Region Waste Management Protocols to ensure that inputs into Arthurstown Landfill Site are in line with regional requirements to preserve void space.	40,000 tonnes maximum throughout into WTF during 2008.	Waste Input Records	24% achieved. Tonnages down due to 3 rd Party operators.
Remove odour nuisances during 2008.	Minimise odour complaints attributable to the operation of the CRF and WTF, upon successful commissioning of additional odour management control measures in January 2007.	Complaints Records and Community Liaison Groups.	77% reduction in odour complaints, down to 5 no.
Minimise nuisances to immediate boundary neighbours.	Ensure facility operations do not give rise to complaints from immediate neighbours.	Improvement measured against 2007 complaint record.	Excluding odour complaints, complaints in 2008 (1 No.) lower than in 2007 (4 No.)
Maintain average DLRCC refuse freighter turnaround time at 2006 levels	Maintain average turnaround time of no greater than 8min.	Measure from weighbridge to weighbridge from WIMS records.	Turn around times decreased to 5 min 20 sec.

SCHEDULE OF OBJECTIVES AND TARGETS 2008 - 2009: PROGRESS TOWARDS ACHIEVEMENT			
Objective	Target	Project	% Completion
Undertake detailed Energy, Materials and Water Usage Assessment during 2008 with aim of reducing usage.	Implement recommended measures detailed in last years energy report.	Measures to be developed during audits.	Electricity consumption in 2008 down by 31% [reduced baling) Gas consumption in 2008 down by 7% Water consumption in 2008 down by 19% Chemical usage in 2008 down by 27%
Provide for the biological treatment of organic waste.	Construction of a 45,000 tonne capacity organic waste composting facility.	Procure a PPP Design and Build Contractor for the construction of this facility.	Bids were received in December 2007 and a decision is awaited.
Reduce leachate generation.	Complete the capping of the landfill.	Stage2 Capping Contractor on site August 2008	Substantial Completion by late 2009.
Reduce the number of incidents of landfill gas exceedence at the perimeter of the site, and reduce landfill gas emission to the atmosphere.	Complete the capping of the landfill and the installation of a LFG Management System.	Procure a contractor for Stage 2 Capping Works (scope includes LFG Management System).	Flare contractor to be appointed. The timescale for this project is under consideration.
Undertake representative environmental monitoring of the facility.	Replace monitoring infrastructure lost due to development works.	Installation of new wells as required by an appointed drilling contractor.	Next round of replacement of wells due to take place once the capping of the landfill is completed.
Fire Safety Warden appointment	Appoint and train a competent person to act as site fire warden taking on responsibility to bring all fire safety aspects to the attention of management.	Appointment of a competent person to act as site fire warden.	Completed in 2008. A fire safety warden was appointed in 2008.
Update operations and Maintenance Manual for the BRP including all site procedures and implement staff training programme on same.	Have up to date best practice operational procedures in place and associated training matrix for each member of staff.	Update operations and Maintenance Manual for the BRP. Implement a staff training programme on same.	Operations and Maintenance Manual updated in 2008. Staff training programme in place.

2.4 PROPOSED ENVIRONMENTAL MANAGEMENT PROGRAMME

The existing Environmental Management Programme (EMP) dated March 2008, outlines the operational procedures for the landfill site.

2.5 PROGRAMME FOR PUBLIC INFORMATION

RPS Group were engaged by Dún Laoghaire Rathdown County Council in 2006 to providing public relations input for the Ballyogan Landfill and Recycling Park. Prior to 2006 Enviro Consulting Ltd carried out this function.

For 2008 this work involved the following:

- Liaison Group Meetings
- Website

At the request of DLRCC, Councillors and community members, RPS have maintained the existing liaison group format, as was previously implemented by Enviro Consulting Ltd.

The liaison group meetings provide a forum where DLRCC and the community can discuss the issues that concern stakeholders. It also ensures that stakeholders are informed of developments regarding the Recycling Park, Landfill and the Biological Treatment Facility.

Formal and informal meetings were held with the Community members. Informal meetings were held in absence of the contractor in order to inform the community representatives as to the plans for the Biological Treatment Plant.

Formal meetings were held on the following dates:

- 31/01/2008
- 19/03/2008
- 15/05/2008
- 26/06/2008
- 07/08/2008
- 10/09/2008
- 22/10/2008
- 24/11/2008

During 2008 presentations by experts were hosted:

1. Presentation from Ian Blenkarn- CBiol CSci FRIPH GradMCIWM- **Clinical wastes at the Ballyogan Landfill- request for expert opinion regarding possible infection risks** held on the 31st January.

This expert was brought in as an independent opinion in judging the risks associated with clinical waste that was found during excavation work that was taking place during the preliminary works for the capping of the landfill.

The presentation indicated that no 'fresh' wastes were located. Review of site records confirmed that the last wastes received for deposit at Ballyogan was at least 2 years ago. This is taken as the minimum age of wastes at Ballyogan. Documents recovered from the site show dates suggesting deposit between 17 and 20 years ago, though this is less important and the minimum date of 2 years is the more significant factor.

The report concluded that the wastes at Ballyogan do not pose any additional risk to the environment, local residents or to the workers on-site. The age of those wastes determined by uncovered records, their physical condition, and the evidence that has been reviewed of biological analysis of surface water and leachate suggests that the site is effectively extinct.

The purpose of the presentation was to allow the Liaison Group an opportunity to hear the results and ask the expert any questions they had regarding his findings. Most of those present were relieved at the findings and at the way issue was handled by DLRCC and RPS, and felt that these processes should be continued during stage 2 of the landfill capping.

2. Presentation from Josef Barf- expert from the European Compost Forum. The purpose of this presentation was to give some context to Composting in **Germany and the Wurzburg facility** and to answer any questions that may be raised by the Group.

This presentation arose as members of the liaison committee visited a biological treatment facility in Wurzburg, Germany, that was cited as an example of a facility could possibly be like.

In returning from the visit, there were a number of questions:

1. A statement indicating their position regarding their acceptance or otherwise of food waste containing meat
2. With regards to odour and distance to the nearest neighbour, please provide an indication of distance to the nearest sensitive receptor – i.e. local resident house or office type premises or commercial premises where people work on daily basis

The presentation was received well by those in attendance, who were able to ask the expert how Germany, which has been using biological treatment facilities for many years, has dealt with the issue.

Future meetings are planned until the handover to the new contractor for the entire site.

Website

The Dún Laoghaire Rathdown County Council website www.dlrcoco.ie includes downloadable (PDF) versions of the minutes of the liaison group meetings. This website is maintained by the DLRCC.

3 ENVIRONMENTAL NUISANCES, INCIDENTS AND COMPLAINTS

3.1 ENVIRONMENTAL NUISANCES

Since waste acceptance ceased in 2005, nuisance inspections at the landfill have been undertaken weekly by the Landfill Manager.

In 2008, the contractor for the Stage 2 Capping Works (including leachate management works), Priority Construction Ltd, operated under the conditions of Waste Licence W0015-01 with respect to nuisance control.

Nuisance abatement at the BRP is as follows:

Odour

In general terms, odour is managed through the following housekeeping measures:

- Use of fast acting doors in reception hall, and air curtains to main doors in baling hall;
- Road sweeping and daily wash down of process areas and reception hall;
- No waste is left on the floor at the end of each day;
- Use of detergents as necessary.

Odour extraction and abatement equipment in the form of a carbon filter unit, as well as an air extraction dust filter unit has been fitted at the Waste Transfer Facility by Greenstar. Odour in the Stage 2 capping works has been managed, where applicable, by the application of an odour neutraliser.

Dust

Dust generation in the BRP is not a significant issue. It is generally managed through regular wash down and cleaning coupled with daily road sweeper usage.

Dust control for the Stage 2 Capping Contract is managed using road sweepers to wet and clean tarmac roads, wetting of internal haul roads and speed restrictions.

Litter

Measures employed to control litter are as follows:

- Twice daily litter pick within the site and immediate environs; more frequently in windy weather;
- Use of road sweeper daily;
- Internal waste transfer procedures within the WTF minimise litter drop during the transfer process.

Noise

Measures employed to minimise noise impact are as follows:

- Specific operating regimes are in place to minimise periods of operation to avoid noise generation at sensitive times e.g later start at weekends;
- Timer controls are fitted to some items of equipment to prevent operation outside of the working day.

Vermin

Greenstar have a contract with Pest Guard who visit the site on a planned basis to bait for mice and rats and spray for insects.

3.2 SUMMARY OF REPORTED INCIDENTS

There were a total of 29 reported incidents during the period January 2008 to December 2008.

These incidents included 9 instances of exceeded trigger levels of CO₂ and 2 instances of exceeded trigger levels for CH₄. There was one instance of exceeded day and night time noise levels. A full summary is given in Table 3.1.

Table 3.1: Summary of Reported Incidents, January 2008 - December 2008

Date	Incident Report No.	Details	Corrective Action/Conclusions
5th February 2008	130	Discharge of untreated leachate from landfill to sewer. Failure to monitor the discharge from landfill to sewer as set out in Schedule G.6	The plant was inspected, pipes and pipework were cleaned out. No obstruction was detected. Continuous monitoring
19 th December 2007*	131	Exceedances of the emission limit values for CO from the Landfill Gas Combustion Plant Engine BN01.	The gas plant operators carried out a major overhaul of BN01 in March 2008.
17th February 2008	132	Failure of pH monitor on discharge to sewer from the Methane Stripping Plant was noted. Inaccurate pH data on discharge to sewer from 06:30 on 17th February 2008 to date.	The pH probe was replaced and calibrated
4th February 2008	133	Exceedances of CH ₄ trigger levels at GW77a and exceedances of CO ₂ trigger levels at GW9a, GW48a, GW75a, GW77a, GW79a, GW81.	Extend the landfill gas collection system.
21st March 2008	134	Failure of TOC Analyser on inlet to Stormwater Wetlands.	System was restored after TOC system error was detected.
26th March 2008	135	Exceedances of CH ₄ trigger levels at GW77a and exceedances of CO ₂ trigger levels at GW75a, GW77a	Extend the landfill gas collection system.
17th April 2008	136	Exceedances of CO ₂ trigger levels at GW4, GW5, GW9a, GW19a, GW20a, GW24, GW48a, GW49a, GW51a, GW53a, GW59a, GW75a, GW76a, GW77a, GW79a, GW81, GW82, GW83	Extend the landfill gas collection system.
15th May 2008	137	Failure of TOC Analyser on inlet to Stormwater Wetlands.	Analyser was repaired.
19th May 2008	138	Exceedances of CO ₂ trigger levels at GW12a, GW16, GW17, GW19a, GW20a, GW24, GW44, GW47a, GW48a, GW53a, GW59a, GW66, GW75a, GW76a, GW77a, GW79a, GW81, GW82, GW83, GW84.	Extend the landfill gas collection system.

Date	Incident Report No.	Details	Corrective Action/Conclusions
3 rd June 2008	139	Discharge to sewer from monitoring station F17a. Emission Limit Value for dissolved methane exceeded.	Fault was rectified as soon as noted.
From 14 th January 2008 to 19 th February 2008	140	Exceedences of the trigger level for Dust at sampling locations D4a.	Unable to source suitable portable monitoring equipment. Dust monitoring locations will be re-examined on completion of the capping contract.
13 th March 2008	141	Exceedences of the trigger level for Suspended Solids in the discharge to sewer at sampling location F121b in the composite sample.	The result is difficult to explain as the maximum value found in the previous five monitoring rounds was 59 mg/l. There was no known problem with the Leachate Treatment plant at the time of sampling.
18 th June 2008	142	Loss of mains power to Methane Stripping Plant	Plant was monitored during power outage and power was restored within 3 hours. There was no discharge of untreated leachate.
5 th June 2008	143	Suspected malfunction in the operation of the dissolved methane sensor, monitoring the discharge to sewer from the Methane Stripping plant.	A replacement dissolved methane probe was installed in July 2008.
13 th June 2008	144	Exceedences of CO2 trigger levels at GW9a, GW17, GW19a, GW20a, GW48a, GW51a, GW53a, GW59a, GW75a, GW77a, GW79a, GW82, GW83, and GW84.	Extend the landfill gas collection system.
6 th July 2008	145	Failure to monitor the discharge from landfill to sewer as set out in Schedule G.6 Discharge of untreated leachate from landfill to sewer. Discharge to sewer from monitoring station F17a	The MSP discharge pipework was redesigned to reduce head losses and increase outlet flow.
25 th July 2008	146	Failure of TOC Analyser on inlet to Stormwater Wetlands.	The analysers were returned to manufacturers for repairs. Unable to source a suitable replacement.
(a) From 11 th August 2008 to 12 th August 2008 (b) From 12 th August 2008	147	Discharge of untreated leachate from landfill to sewer. Failure to monitor the discharge from landfill to sewer as set out in Schedule G.6 Discharge to sewer from monitoring station F17a	The MSP discharge pipework was redesigned to reduce head losses and increase outlet flow.

Date	Incident Report No.	Details	Corrective Action/Conclusions
to 12th August 2008 (c) From 16th August 2008 To 16th August 2008			
1st August 2008	148	Exceedances of CO2 trigger levels at GW9a, GW12a, GW15, GW19a, GW20a, GW51a, GW53a, GW56, GW76a, GW77a, GW79a, GW81, GW82, GW83.	Extend the landfill gas collection system.
From 5th August 2008 To 13th August 2008	149	Failure to monitor all the leachate discharge from landfill to sewer as set out in Schedule G.6 Discharge to sewer from monitoring station F17a	The MSP discharge pipe work was redesigned to reduce head losses and increase outlet flow.
1st September 2008	150	Maintenance checks on gas analysers for engines BN01 and BN02 showed that the gas supply lines to both analysers was severely restricted. As a result the analysers were malfunctioning and giving inaccurate readings. The analysers have been disabled pending repairs.	Unable to repair the gas analysers. Proposals for alternative monitoring equipment were submitted to the Agency.
From 5th September 2008 to 8th September 2008	151	Failure to monitor all the leachate discharged from landfill to sewer as set out in Schedule G.6 Discharge to sewer from monitoring station F17a	The MSP discharge pipe work was redesigned to reduce head losses and increase outlet flow.
29th August 2008	152	Exceedances of CO2 trigger levels at GW9a, GW19a, GW20a, GW24, GW48a, GW51a, GW53a, GW59a, GW75a, GW76a, GW77a, GW79a, GW81, GW82, GW83.	Extend the landfill gas collection system.
12th September 2008	153	Exceedances of CO2 trigger levels at GW1, GW3, GW4, GW5, GW6, GW8, GW9a, GW15, GW17, GW18, GW20a, GW47a, GW48a, GW49a, GW53a, GW56, GW58, GW76a, GW77a, GW79a, GW81.	Extend the landfill gas collection system.
Daytime : 8th October 2008 Time 10:00 to	154	Exceedances of daytime noise limit of 55dB LAeq (30 min) at monitoring points NSL 1, NSL 3, NSL 4 and NSL 5.	A complete report on this round of noise level monitoring was issued to the Agency.

Date	Incident Report No.	Details	Corrective Action/Conclusions
16:00 Night time 8th October 2008 to 9th October 2008 Time 22:00 to 01:00		Exceedences of nighttime noise limit of 45dB LAeq (30 min) at monitoring points NSL 1, NSL 2, NSL 3, NSL 4, NSL 5 NSL 6 and NSL 7.	
23rd Oct 2008	155	Exceedances of CO2 trigger levels at GW9a, GW10a, GW15, GW20a, GW24, GW45, GW48a, GW49a, GW51a, GW53a, GW56, GW59a, GW77a, GW79a.	Extend the landfill gas collection system.
24th Nov 2008	156	Failure to record continuous monitoring data for (a), discharge to sewer and (b), discharge of surface water to Ballyogan Stream	Unable to the reason for the failure of the SCADA PC. The cause was not power related.
12th Dec 2008	157	Failure of pH monitor on discharge to sewer from the Methane Stripping Plant was noted. This is resulting in the inaccurate measurement of pH on discharge to sewer from 12th December 2008 to date.	A replacement pH sensor was fitted and calibrated.
5th Dec 2008	158	Suspected malfunction in the operation of the dissolved methane sensor, monitoring the discharge to sewer from the Methane Stripping plant. This has resulted in the intermittent freezing of the output signal. Discharge to sewer from monitoring station F17.	A replacement sensor was installed On 6 th January 2009.
Note: Incident 131 occurred in 2007 however it was not included in the 2007 AER. This incident was reported in February 2008 and so is included in the 2008 AER.			

3.3 SUMMARY OF COMPLAINTS

During the reporting period, site management received a total of 19 complaints from 16 people. A breakdown of the nature of these complaints is given in Table 3.2 below. All complaints were recorded by site management and investigated. Corrective action was taken where necessary and follow-up contact and discussion with complainants was undertaken where appropriate. Full details of all complaints and outcomes are kept on file on site and at County Buildings.

Table 3.2: Summary of Complaints Received During Reporting Period

Date	Category	Number of Occurrences	Comments/Corrective Action
25 th of February 2008	Odour	6	Odours for the most part related to leakage from bin lorry and odour generated from white box storage in
9 th of June 2008			

Date	Category	Number of Occurrences	Comments/Corrective Action
16 th of July 2008			the lower yard. All odour complaints were logged and investigated. Where possible measures were taken to eliminate and minimise odour and additional odour control measures were put in place e.g. the sealing of the eaves of the Transfer Building, Air Control Curtains and the use of sprays.
15 th of August 2008			
19 th of August 2008			
27 th of August 2008			
10 th of June 2008	Noise	1	Noise mainly related to essential operations, such as, loading shovel pushing waste, contact between bucket and floor, trucks moving skips, skips on concrete, the Baling Station, and glass bottles in recycling skips. The complaint was logged and investigated. Where possible, measures were taken e.g. reduced the noise from bottles and otherwise complainants were advised of the restrictions.
4 th of February 2008	Procedural	9	Complaints due to the charging system in place at BRP. They included complaints regarding the charges in place, lack of clear signs, the malfunction of the cash register, payment methods and overcharging. All complaints were addressed and information, refunds or explanations were sent where appropriate.
3 rd of March 2008			
19 th of March 2008			
9 th of April 2008			
13 th of May 2008			
21 st of May 2008			
30 th of June 2008			
8 th of October 2008			
16 th of October 2008			
28 th of October 2008	Procedural	1	Complaint regarding the permit system in place at BRP for members of the public with vans. This complaint was submitted to the Minister for the Environment.
12 th of May 2008	Miscellaneous	4	These complaints were regarding incidents where the staff were allegedly aggressive or abusive. All complaints were logged and investigated. The staff were consulted and apologies were sent where appropriate.
17 th of July 2008			
16 th of October 2008 (same as above)			
28 th of October 2008 (same as above)			

4 SITE INFRASTRUCTURE

4.1 DEVELOPMENT WORKS UNDERTAKEN DURING THE REPORTING PERIOD

Capping of the Stage 1 area of the landfill (16 hectares) was substantially complete by May 2006. Two variations were added to the Stage 1 Capping Contract. The first variation comprised of the decommissioning of the on site leachate lagoon and the installation of a leachate storage tank and a methane stripping plant. This was completed in May 2007. The second variation consisted of the excavation to lower ground levels under high voltage ESB lines which traverse the landfill site.

The latter element of the works commenced in August 2007 and, following suspension of these works between October 2007 and February 2008, were completed in June 2008. This date also marks the completion of the overall Stage 1 Capping works.

Phase 1 of the Stage 2 Capping Works commenced in August 2008. The capping works involved the application of a permanent cap to the remaining 260,000m² landfill and all associated infrastructure including surface water and leachate collection networks.

4.2 PROPOSED DEVELOPMENT OF THE FACILITY AND TIMESCALE FOR SUCH DEVELOPMENT

The following works are due to be undertaken in 2009:

Stage 2 Capping of the Landfill and Gas Management Works

The remaining phases of the Stage 2 Capping Works are due to be completed in 2009.

This will include construction of a surface water drainage system, a perimeter gas collection system and upgrading and additions to the existing leachate collection system which will tie into the new leachate management infrastructure. Once capping is completed, BPS will complete the installation of the utilisable gas collection system.

Biological Treatment Facility

The Ballyogan Biological Treatment Facility will be constructed under a Public Private Partnership Design & Build Contract. The facility will be designed and constructed in accordance with the requirements of the Environmental Impact Statement for the BRP and Waste Licence W0015-01. Bids were received in December 2007 and are currently being evaluated.

4.3 ANNUAL TOPOGRAPHIC SITE SURVEY

The most recent topographic survey was carried out in October 2007 by BKS Surveys Limited. During 2008 extensive capping works were carried out on-site and due to this a topographic survey was not carried out for the whole site. Details of this were submitted to the agency. A complete survey will be carried out once capping is complete and forwarded to the Agency.

5 WASTE ACTIVITIES

Ballyogan Landfill and Recycling Park is licensed to accept a maximum of 400,000 tonnes per annum of municipal waste, industrial non-hazardous, and construction and demolition wastes combined. The types of waste accepted at the Recycling Park (Civic Recycling Facility and Waste Transfer Facility) are listed below:

- Household waste collected by Dun Laoghaire Rathdown County Council in the functional area of Dun Laoghaire Rathdown County Council or, in the case of emergency, from any other Local Authority from time to time, e.g in the event of baling equipment malfunction at other baling stations.
- Commercial waste (similar in character to household waste) collected by Dun Laoghaire Rathdown County Council in the functional area of Dun Laoghaire Rathdown County Council or, in the case of emergency, from any other Local Authority from time to time.
- Municipal solid waste collected by Greenstar or MSW from companies/facilities contracted to or part of the Greenstar group is also accepted at the BRP.
- Household waste which is transported directly to the CRF by householders, including green waste, household C&D waste.
- Household waste for recycling which is temporarily stored on site. These materials include glass, paper, cardboard, cans, metals, WEEE, etc.
- Household hazardous waste which is transported directly to the CRF by householders, including motor oil, fluorescent tubes, batteries etc.
- Non-hazardous C&D waste which is specifically required for site restoration purposes and which is accepted by agreement with the Local Authority, e.g topsoil or subsoil for capping layers.

5.1 QUANTITY AND COMPOSITION OF WASTE RECEIVED DURING THE REPORTING PERIOD

From January 2008 to December 2008, **32,590.12 tonnes** of municipal waste was accepted at the Ballyogan Facility, all of which was accepted between the Waste Transfer Facility and the Civic Recycling Facility. No wastes were disposed of to Ballyogan Landfill. A breakdown of the wastes accepted is as follows:

Table 5.1: Wastes accepted at Ballyogan Recycling Park in 2008

Category	EWC	Quantity (tonnes)
Non-hazardous municipal waste accepted at the Waste Transfer Facility.	15 01 01, 19 12 12, 20 01 01, 20 03 07, 20 03 01, 20 02 01	19,457.01
Non-hazardous municipal waste accepted at the Civic Recycling Facility.	See Table 5.3 for list of EWC Codes	12,161.2
Hazardous municipal waste accepted at the Civic Recycling Facility.	16 05 04; 20 01 21; 20 01 26; 20 01 27; 20 01 33; 20 01 35	971.91
Total		32,590.12
Note: In 2008, an input restriction was put in place for Ballyogan Recycling Park which led to the reduction of capacity of the WTF from 80,000 tonnes in 2007 to 40,000 tonnes in 2008.		

5.2 QUANTITIES OF WASTE REMOVED OFF SITE FOR RECOVERY OR DISPOSAL

Table 5.2 below provides a summary of wastes removed off site from the CRF for recycling, recovery or disposal. Table 5.3 outlines the quantities of waste removed off-site from the Waste Transfer Facility. A more detailed table including destinations of these wastes is included in Appendix A.

Table 5.2: Quantities of Waste Removed Off Site for Recovery or Disposal from the CRF

EWC Code	Material Type - CRF	Quantity (tonnes)
15 01 01	Cardboard	324.57
15 01 02	Plastic Packaging	158.64
15 01 04	Metallic Packaging	20.2
15 01 05	Composite Packaging / Tetra Pak	12.44
15 01 07	Glass Packaging	376.12
20 01 01	Paper	356.43
20 01 02	Glass non packaging	13.02
20 01 11	Clothing/Textiles	198.45
20 01 25	Edible Oil & Fat	4.58
17 08 02	Plasterboard	23.9
20 01 38	Wood	1156.21
20 01 40	Metals	456.22
20 02 01	Green Biodegradable Waste	4,702.56
20 02 02	Soil & Stones (Household C&D)	641.46
20 03 01	Mixed Municipal Waste	2,810.2
20 03 07	Bulky Waste	903.88
08 03 99	Printer Cartridges	0.68
16 05 04*	Gas Cylinders	8.4
20 01 21*	Fluorescent Tubes	1.1
20 01 26*	Motor Oil	14.8
20 01 27*	Paints, Inks, Adhesives (Household Hazardous Waste)	93.5
20 01 33*	Batteries	34.52
20 01 35*	Hazardous Discarded Electrical Equipment	819.59

EWC Code	Material Type - CRF	Quantity (tonnes)
16 05 05	Fire extinguishers	1.64
TOTAL		13,133.11
<ul style="list-style-type: none"> Hazardous Waste 		

Table 5.3: Quantities of Waste Removed Off Site from the Waste Transfer Facility for Disposal

Category	EWC Code	Quantity (tonnes)
Mixed Baled Municipal Waste	19 12 12	19,137.86
Waste from carbon filter and dust filter units	06 13 99	11.00
Leachate sludge	19 07 03	6.2
Waste from grit chambers and oil/water separators	13 05 08*	17.76
Farm Plastics	02 01 04	4.18
TOTAL		19,177.00

5.3 AREA OCCUPIED BY WASTE

The extent of the area occupied by waste at Ballyogan Landfill is approximately 43 hectares.

5.4 TOTAL ACCUMULATED QUANTITIES OF WASTE DEPOSITED

The total accumulated quantity of waste deposited at Ballyogan Landfill is estimated at 3,079,673 tonnes. This is based on the tonnages reported in the waste licence application from 1975 to 2000, and the subsequent recorded tonnages for 2001 to 2005. No wastes were accepted for landfilling in 2008.

5.5 REMAINING CAPACITY

The landfill reached capacity in March 2005 when acceptance of waste ceased.

It is estimated that approximately 3,079,673 tonnes of waste has been deposited at the site between 1975 when the site opened, and March 2005. This equates to 3,849,591m³ of waste. This figure is based on the tonnages reported in the waste licence application for the years 1975 to 1997, and the subsequent recorded tonnages to 2005.

When DLRCC submitted the Waste Licence Application in July 1998, the Recycling Park was intended to be completed by September 1999. However, construction of the Recycling Park didn't commence until January 2002, and additional void space was required to allow the landfill to remain open until commissioning of the Waste Transfer Facility. For the extension of the landfill, three new areas (Phases 1-3) were identified and agreed with the Agency, giving a total combined void space of approximately 350,000m³.

Phase 1: provided for 40,000m³ of void space and was filled to agreed levels by May 2003.

Phase 2: provided for 110,000m³ of void space and was filled to agreed levels by November 2004.

Phase 3: provided for 200,000 m³ of void space. However, this area was reserved for inert waste only; no municipal waste would be permitted in this area.

By September 2004, it was estimated that the remaining capacity within the Phase 2 filling area would be filled by November 2004. The WTF wasn't due to be commissioned until January 2005, and as a result, a new area for extended filling was identified and agreed with the Agency. The most suitable area for filling at the time was within the Phase 3 area. This last area provided for 37,000m³ of void space. Filling ceased in this area in March 2005 when waste acceptance was transferred to the Waste Transfer Facility.

6 MASS BALANCE OF SPECIFIED SUBSTANCES (MBSS)

The purpose of the MBSS is to itemise and quantify all material flows at the facility. The concept of MBSS derives from the law of conservation of mass, which is equivalent to:

$$\text{Input} = \text{Output} + \text{Accumulation} + \text{Consumption} - \text{Generation}$$

Inputs to the facility in 2008 include municipal waste to the BRP, as well as electricity, water and fuel to run the facility. The main outputs are leachate (Section 6.3 and 7.7), air emissions (i.e landfill gas Section 7.1 and combustion plant exhaust emissions Section 7.2), dust (Section 7.4), noise (Section 7.3) and waste departing the Waste Transfer Facility and Civic Recycling Facility (Section 5.2).

In terms of generation, leachate is generated as a result of rainfall infiltration into the landfill as well as run-off from the WTF. Landfill gas is generated as a result of the decomposition of waste. Accumulation refers to the total amount of waste accumulated at the site since it opened in 1975. Capping of the site will result in reduced generation of leachate within the landfill and reduced emissions of landfill gas to the atmosphere.

6.1 RESOURCE AND ENERGY CONSUMPTION

Tables 6.1 and 6.2 summarise the resource and energy consumption at the Facility. Additional resources not listed here were used by the capping contractor.

Table 6.1: Resource and Energy Consumption at Ballyogan Landfill

Resource	Consumption (2008)
Electricity	BPS generated 9,068MWh at the Gas Combustion Plant.

Table 6.2: Resource and Energy Consumption at the BRP

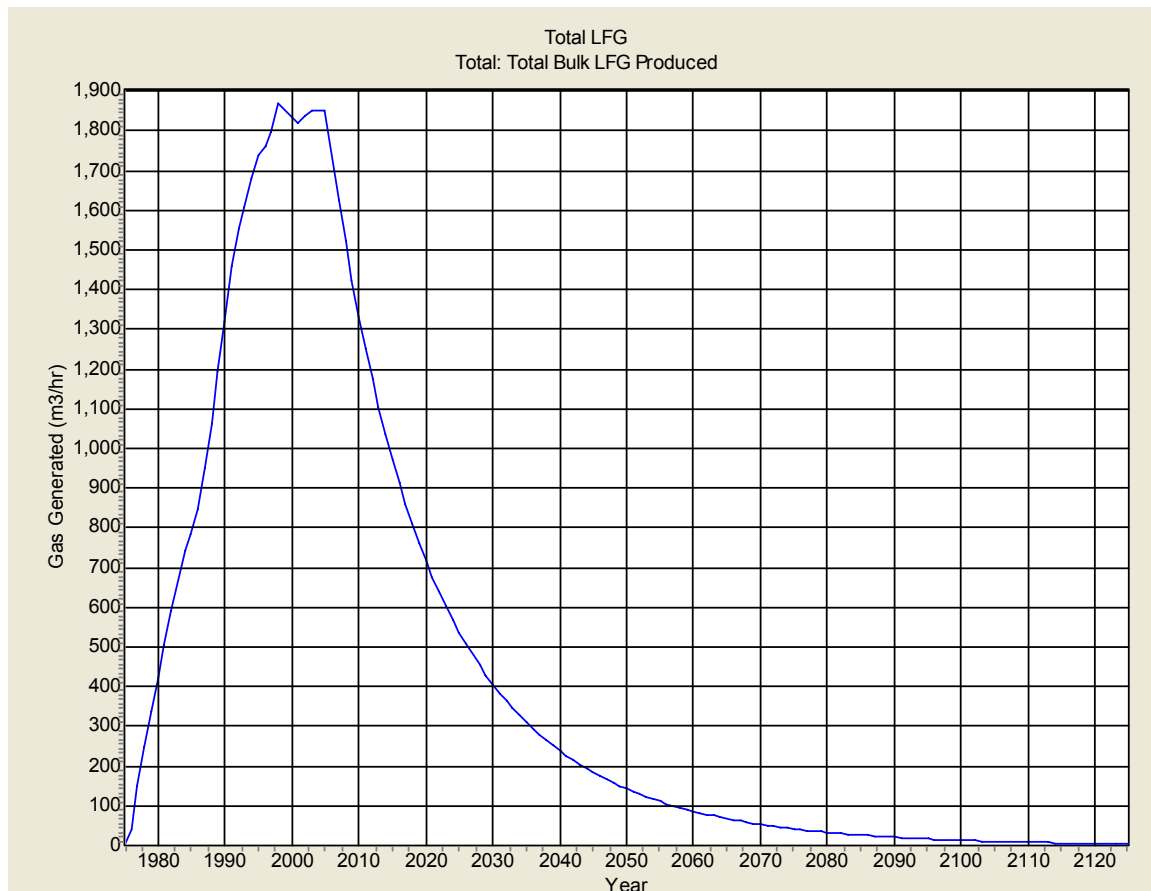
Resource	Consumption (2008)
Electricity	489,906 KWh
Gas	154,640 KWh
Fuel (diesel)	17,469 litres
Water	7177 m ³
Chemical Usage	Detergent: 225 litres Cleanair 100 Odour Neutraliser: 50 litres

6.2 ESTIMATED ANNUAL AND CUMMULATIVE QUANTITIES OF LANDFILL GAS EMITTED FROM THE SITE

Using the GasSim 2 modelling programme, the calculated quantity of landfill gas generated at the site in 2008 (January to December) is 12,702,000m³. The cumulative figure of landfill gas generated at the site over the life of the landfill to the end of 2008 has been calculated as 435,714,665.8m³. Much of this has already been extracted for combustion and electricity generation by BPS and much of it remains stored in the landfill within voids in the waste mass. A portion of it has been lost to the atmosphere over the years, a process which is being reduced by the progressive capping of the landfill. The total estimated landfill gas generation for the life of the site, updated for 2008, is shown in Figure 6.1 below.

From the GasSim 2.0 model run for the site for 2008, the estimated quantity of methane generated at the site is 3,921,888Kg. The estimated quantity of methane emitted from the site, post combustion i.e taking into account the quantity of gas that is consumed by combustion, is 727,000Kg for 2008.

Figure 6.1: Estimated Hourly LFG Generation at Ballyogan Landfill

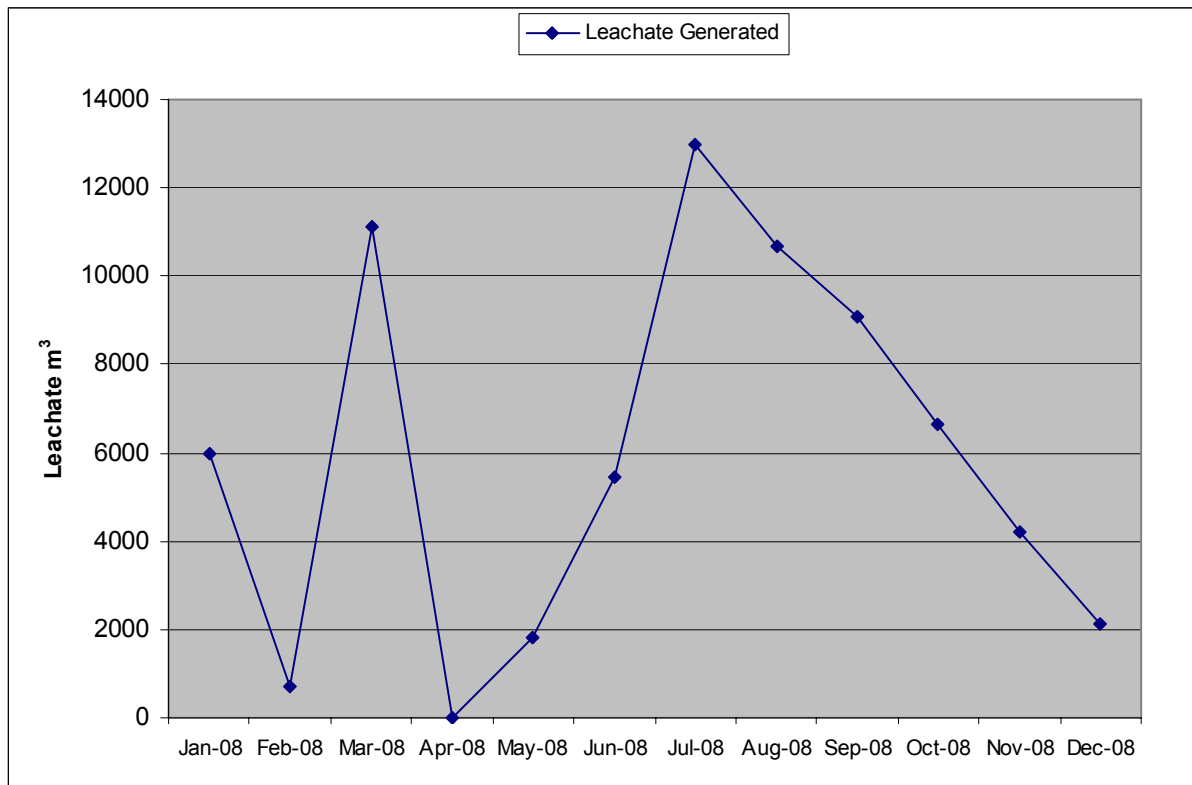


6.3 MONTHLY WATER BALANCE CALCULATIONS

Rainfall data obtained from the BRP on-site weather station reported 965.72mm of rainfall in the area for 2008. Data for 9 days of 2008 was not available due to technical difficulties on site. However this has been taken in to consideration and adjusted accordingly. The data recorded at the BRP on-site weather station is included in Appendix C. As per the 2007 calculations (and the EPA Landfill Site Design Manual (2000), evapotranspiration has been ignored to provide a safety factor in the calculations.

As per the method outlined in the EPA Landfill Site Design Manual (2000), monthly volumes of leachate were calculated for the entire landfill area based on monthly rainfall, and the stage at which the area is at i.e. restored areas with temporary clay cap or areas with completed engineered caps. The leachate lagoon was de-commissioned by 2007. Figure 6.2 shows the estimated leachate generation for the reporting period. The water balance calculations are outlined in Appendix B.

It is estimated that a total volume of leachate of 73,788.45m³ (73,788,450 litres) was generated during the reporting period (this does not take into account the effects of storage).

Figure 6.2: Monthly Leachate Generation at Ballyogan Landfill 2008

6.4 ESTIMATED ANNUAL AND CUMULATIVE QUANTITY OF EMISSIONS TO GROUNDWATER

Ballyogan Landfill is an unlined landfill relying on the underlying low permeability boulder clay and containment bunds constructed of clay, to contain the leachate. Notwithstanding this, overall since monitoring began, emissions to groundwater have not been significant in the context of an unlined landfill.

7 SUMMARY OF ENVIRONMENTAL MONITORING

RPS carried out all monitoring and reporting at Ballyogan Landfill for the 2008 reporting period.

All environmental monitoring locations as at December 2008 are shown on Figure 7.1 below.

All weekly, monthly and quarterly environmental monitoring results have been forwarded to the EPA as part of the routine quarterly reports. The results of the additional annual monitoring for surface water, groundwater, private wells and leachate were reported in the second quarterly report for the year.

Reports of all other biannual and annual monitoring (i.e. biological water quality, gas combustion plant exhausts and noise monitoring) have also been forwarded separately to the Agency.

This report provides a summary of the monitoring results for the 2008 reporting period. Copies of all monitoring results are kept on site at DL RCC offices.

7.1 LANDFILL GAS

Environmental monitoring for landfill gas is carried out for the parameters listed in Table F1.2 of Waste Licence W0015-01. Monitoring of the gas wells throughout the landfill is undertaken at monthly intervals.

At the beginning of 2008 a total of 51 gas monitoring wells were in use at the landfill, 49 perimeter wells and 2 in-waste wells (GW22, GW26). By the end of 2008 there were approximately 46 perimeter gas wells and 1 in-waste well monitored. In 2008, four gas wells were lost due to capping and construction works on or around the vicinity of the landfill.

Owing to the age of the landfill, no baseline information regarding the natural background levels of methane and carbon dioxide is available. Therefore, the trigger levels are set at 1% v/v and 1.5% v/v for methane and carbon dioxide respectively. For the purpose of licence compliance, the trigger levels only apply to the perimeter wells that are monitored on a monthly basis, where measurements may indicate the off-site migration of landfill gas.

Three exceedences of methane were detected in 2008 in January, February and March of 3.1%, 3.1% and 2.9% respectively. All three exceedences were recorded at GW77a. Carbon dioxide concentrations were elevated in several wells throughout 2008. This is consistent with previous years. The average number of wells per month where exceedences were recorded was 14. The maximum concentration recorded every month ranged from 3.8% in March to 16% in January. Elevated carbon dioxide levels may be attributed to other factors not necessarily indicative of landfill gas migration. Hedgerows and ditches and old sewage systems located along parts of the perimeter of the landfill may contribute to the presence of carbon dioxide detected in the perimeter wells.

7.2 LANDFILL GAS COMBUSTION PLANT

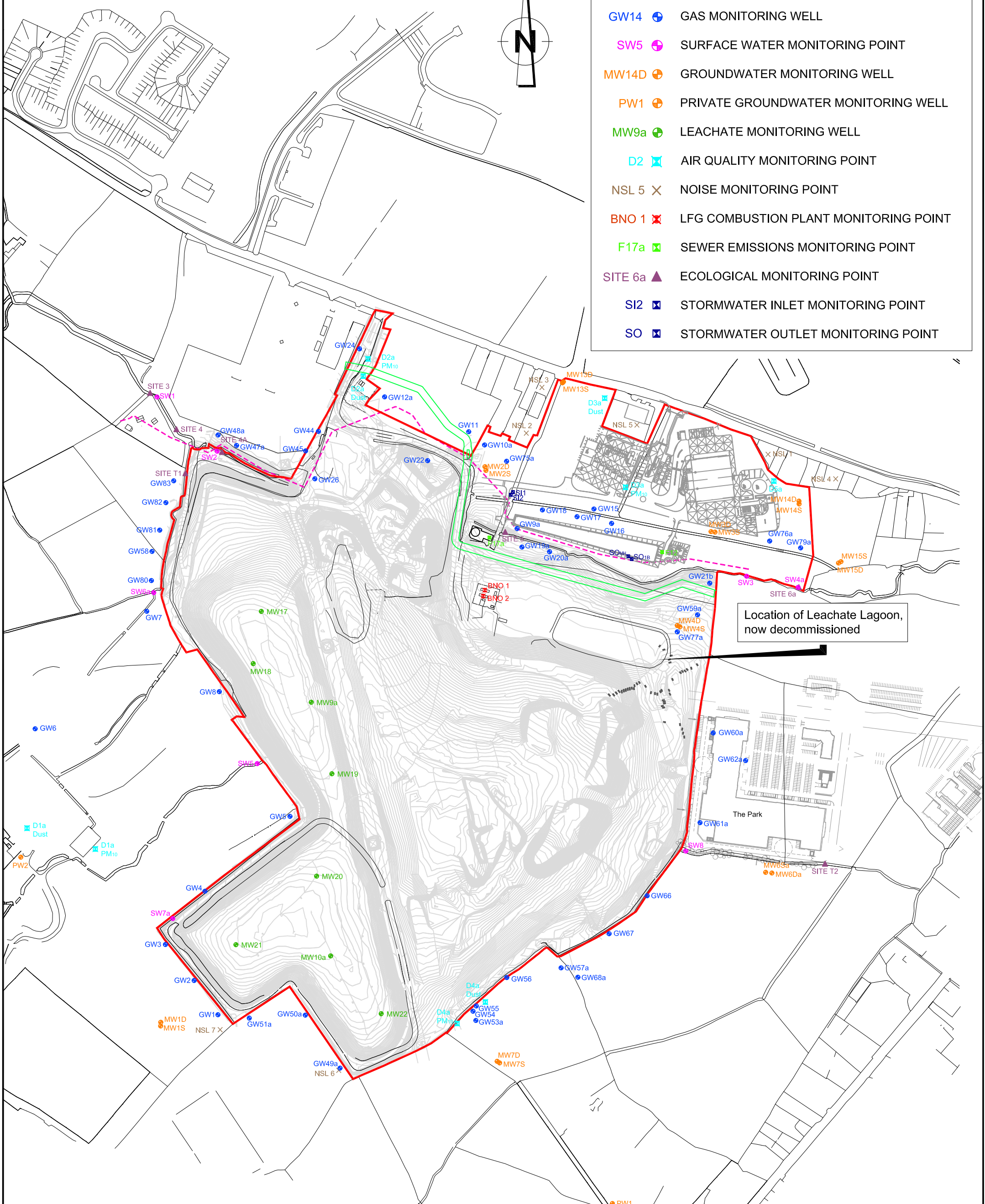
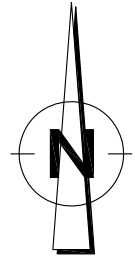
There are two monitoring stations at the Landfill Gas Combustion Plant; BN01 and BN02, located at the exhaust stacks of each of the two engines. The parameters for analysis are set out in Table F.2.2 of the Waste Licence, together with the required frequency of monitoring. Monitoring of the inlet gases to the combustion plant is also undertaken.

Inlet Monitoring

Bioverda Power Systems Ltd (BPS) carry out monitoring of the inlet gas to the landfill gas combustion plant on a weekly basis. Over the course of the year, yields of methane and carbon dioxide range from between 41 - 67% (average 54%) and 32 - 40% (average 36%) respectively. The reference composition values of landfill gas for use as fuel for the engines employed on site is set as 50% methane and 27% CO₂. Data for January 2008 to December 2008 is summarised in Table 7.1 below. Measured values recorded in excess of the reference composition levels are highlighted in bold.

LEGEND

- OUTLINE OF SITE
- - - CARRICKMINES SEWER
- BURIED ESB CABLES
- GW14 GAS MONITORING WELL
- ⊕ SW5 SURFACE WATER MONITORING POINT
- ⊕ MW14D GROUNDWATER MONITORING WELL
- ⊕ PW1 PRIVATE GROUNDWATER MONITORING WELL
- ⊕ MW9a LEACHATE MONITORING WELL
- ⊕ D2 AIR QUALITY MONITORING POINT
- X NSL 5 NOISE MONITORING POINT
- X BNO 1 LFG COMBUSTION PLANT MONITORING POINT
- X F17a SEWER EMISSIONS MONITORING POINT
- ▲ SITE 6a ECOLOGICAL MONITORING POINT
- ⊕ SI2 STORMWATER INLET MONITORING POINT
- ⊕ SO STORMWATER OUTLET MONITORING POINT



Location of Leachate Lagoon,
now decommissioned

The Park

Table 7.1: Weekly Inlet Gas Monitoring Results, January 2008 - December 2008

Fiscal Wk	Week Beginning	CH₄ %	CO₂ %	O₂ %
1	06/01/2008	42.1	34.6	1.2
2	13/01/2008	46.3	35	0.8
3	20/01/2008	45.9	33	1.8
4	27/01/2008	48	33.7	0.6
5	03/02/1008	46.7	36.7	0.5
6	10/02/2008	45.2	36.2	0
7	17/02/2008	45.5	34.1	0.3
8	24/02/2008	44.1	32.3	0.2
9	02/03/2008	44.8	33.6	0.9
10	09/03/2008	42.9	36.1	1.5
11	16/03/2008	46	35.4	1.2
12	23/03/2008	46.2	35.9	0.6
13	30/03/2008	45.6	33.4	0.1
14	06/04/2008	44.2	36.7	0.3
15	13/04/2008	45	34.8	0.4
27	06/07/2008	47	38	0.8
28	13/07/2008	46	37	0.7
29	20/07/2008	46	35	1.2
30	27/07/2008	44	37	1.3
31	03/08/2008	45	33	1
32	10/08/2008	43	34	0.6
33	17/08/2008	46	39	0.9
34	24/08/2008	42	40	0.8
35	31/08/2008	42	39	0.6
36	07/09/2008	45	39	1.1
37	14/09/2008	41	35	1
38	21/09/2008	43	38	0.7
39	28/09/2008	44	40	0.6
40	06/102008	52	32.4	1.8
41	13/102008	57	32	3.1
42	20/102008	60	36	2.8
43	28/102008	53	36	0.6
44	03/112008	67	35	0.7
45	10/112008	57	38	0.5
46	17/112008	53	37	0.8
47	24/112008	54	35	1.6
48	01/122008	49.3	34	1.8
49	08/122008	48.7	33.7	0.9
50	15/122008	56	36	0.7

Fiscal Wk	Week Beginning	CH ₄ %	CO ₂ %	O ₂ %
51	22/122008	52	35	0.8
52	29/122008	n/a	n/a	n/a

Note: - data for weeks 16- 26 was unavailable due to a failure with the sampling system.

Outlet Monitoring

Monitoring of gas combustion plant exhaust gases from the two combustion engines on site, BN01 and BN02, was carried out in October and November 2008, as per Schedule F.2 of the waste licence. A detailed report has already been prepared and sent to the Agency separately. A summary is provided below.

Carbon monoxide emissions are monitored on a continuous basis by an inline flue gas analyser.

A summary of the results obtained is provided in Table 7.2 below.

Table 7.2: Outlet Monitoring Results October 2008 and December 2008

Monitoring Point	Parameter	Round 1 (Oct 2008)	Round 2 (Nov 2008)	Emission Limit
		Result	Result	
BN01	Volumetric Flow Rate @ ntp	7,025.7 Nm ³ /hr	4,230.9 Nm ³ /hr	3000 m³/hr
	Nitrous Oxides (NO _x) as NO ₂	6.54 mg/Nm ³	498.2 mg/Nm ³	500 mg/m³
	Sulphur Dioxide	18.22 mg/Nm ³	14.04 mg/Nm ³	-
	Carbon Monoxide	710.93 mg/Nm ³	676.08 mg/Nm ³	650 mg/m³
	Particulates	n/a	0.15mg/m ³	130mg/m³
	TA Luft Class I	n/a	<1.78mg/Nm ³	20 mg/Nm³ (at mass flow >0.1kg/hr)
	TA Luft Class II	n/a	<1.78mg/Nm ³	100 mg/Nm³ (at mass flow >2 kg/hr)
	TA Luft Class II	n/a	<1.78mg/Nm ³	150 mg/Nm³ (at mass flow >3 kg/hr)
	Hydrogen chloride	n/a	2.13 mg/m ³	50 mg/Nm³ (at mass flow >0.3 kg/hr)
	Hydrogen Fluoride	n/a	0.89 mg/m ³	5 mg/Nm³ (at mass flow >0.05 kg/hr)
BN02	Volumetric Flow Rate @ ntp	5152.3 Nm ³ /hr	4,209 Nm ³ /hr	3000 m³/hr
	Nitrous Oxides (NO _x) as NO ₂	13.48 mg/Nm ³	401.88 mg/Nm ³	500 mg/m³
	Sulphur Dioxide	19.77 mg/Nm ³	17.82 mg/Nm ³	-
	Carbon Monoxide	847.98 mg/Nm ³	676.94mg/Nm ³	650 mg/m³
	Particulates	n/a	0.31mg/m ³	130mg/m³
	TA Luft Class I	n/a	<1.78mg/Nm ³	20 mg/Nm³ (at mass flow >0.1kg/hr)
	TA Luft Class II	n/a	<1.78mg/Nm ³	100 mg/Nm³ (at mass flow >2 kg/hr)

Monitoring Point	Parameter	Round 1 (Oct 2008)	Round 2 (Nov 2008)	Emission Limit
		Result	Result	
	TA Luft Class II	n/a	<1.78mg/Nm ³	150 mg/Nm ³ (at mass flow >3 kg/hr)
	Hydrogen chloride	n/a	1.25 mg/m ³	50 mg/Nm ³ (at mass flow >0.3 kg/hr)
	Hydrogen Fluoride	n/a	0.45 mg/m ³	5 mg/Nm ³ (at mass flow >0.05 kg/hr)

Note: - means no limit specified; n/a means monitoring not undertaken, only one round required.

All of the parameters analysed were within emission limits for both monitoring rounds, where relevant. Carbon monoxide is monitored from both exhaust stacks on a continuous basis by means of an on-line flue gas analyser. Whilst not required by the licence, carbon monoxide was also monitored during the bi-annual monitoring rounds, by means of a Testo 350 flue gas analyser, over a 30 minute sampling interval. The results of this analysis have been normalised to specified conditions (temperature 273K, pressure 101.3kPa, dry gas at 5% oxygen). The level determined for Carbon Monoxide (CO) emissions from both combustion plant engines BN01 and BN02 was in excess of the limits specified in schedule G.4 of Waste Licence 15-1 during both monitoring rounds.

With respect to the continuous monitoring of carbon monoxide, the results are reported as 'daily average carbon monoxide' in mg/m³. The existing equipment at Ballyogan Landfill does not permit continuous monitoring of oxygen or moisture content, and therefore it has not been possible to express the continuous results at the standard conditions specified in the licence. The reported results, as detailed in the quarterly reports, seem to be consistently high compared to the emission limit of 650mg/m³. However, since this limit is referenced to standard conditions, it is not currently possible to interpret the continuous results accurately.

7.3 NOISE

Seven noise sensitive locations (numbered NSL1-NSL7) are monitored in the vicinity of the Ballyogan Facility. Monitoring is undertaken in accordance with Schedule F.3 of Waste Licence W0015-01. A summary of the results is provided below.

Noise monitoring was conducted in October 2008. Tables 7.3 and 7.4 below outline the results obtained for the day time and night time monitoring respectively. The noise emission limits are 55 d(B)A L(A)_{eq} for day time and 45 d(B)A L(A)_{eq} for night time. The sampling interval in each case was 30 minutes. Exceedences are highlighted in bold.

The results of monitoring show that noise levels at some of the monitoring locations were exceeded a number of times during both the day and night time measurement periods. It has been noted however, that in most cases these higher levels were not caused as a result of noise generated from the landfill or landfill related activities and that noise sources external to the landfill were more dominant during the majority of surveying. During night time monitoring in particular, noise from the landfill was nearly non-existent (with the exception of noise from the landfill gas combustion plant). Noise from vehicular traffic was also the most dominant source of noise at a number of these locations. No tonal components in the noise can be attributable to activities related to the Ballyogan Landfill and associated works.

Table 7.3: Day Time Noise Monitoring Results 2008

Location	Start Time	L(A) _{eq}	L(A) ₁₀	L(A) ₉₀	Comments
NSL 1	11:02	63.3	66.5	50.8	Dry/Calm Dominant noise sources at this location were passing traffic along Ballyogan Rd and LUAS site works. Short term events like dog barking and vehicle parking within the vicinity of the meter also influenced the background noise levels.
NSL 2	14:45	48.4	49.7	43.0	Dry/Calm Dominant noise sources at this location were the movement of HGVs and containers (Landfill) passing traffic along Ballyogan Rd and LUAS site works audible in distance. Short term events like birdsong, aircrafts overhead, which passed at high altitude, and smashing bottles also affected the background noise levels.
NSL 3	15:20	62.3	64.7	50.6	Dry/Calm Dominant noise sources at this location were passing traffic along Ballyogan Rd, LUAS site works and rustling foliage. Short term events like pedestrians talking, vehicle parking within the vicinity of the meter and aircrafts overhead, which passed at high altitude, also affected the background noise levels.
NSL 4	11:37	63.5	66.5	50.7	Dry/Calm Dominant noise sources at this location were passing traffic along Ballyogan Rd and LUAS site works. Short term events like dog barking, aircrafts overhead, which passed at high altitude, pedestrians and vehicle parking within the vicinity of the meter also affected the background noise levels.
NSL 5	14:12	56.0	58.5	46.8	Dry/Calm Dominant noise sources at this location were passing traffic along Ballyogan Rd and LUAS site works. Short term events like dog barking, aircrafts overhead, which passed at high altitude, pedestrians and vehicle parking within the vicinity of the meter also affected the background noise levels.
NSL 6	12:55	52.4	55.9	45.0	Dry/Calm Dominant noise sources at this location were traffic passing along Enniskerry Rd., rustling foliage, dog barking and birdsong. Landfill inaudible at this location. Short term events like aircrafts overhead, which passed at high altitude, and kids playing also influenced the background noise levels.
NSL 7	13:29	45.4	47.4	41.9	Dry/calm Dominant noise sources at this location were

Location	Start Time	L(A) _{eq}	L(A) ₁₀	L(A) ₉₀	Comments
					traffic passing along Enniskerry Rd. audible in distance, rustling foliage and birdsong. Short term events like the movement of HGVs and containers (Landfill) audible in distance, dog barking and kids playing also influenced the background noise levels

Table 7.4: Night Time Noise Monitoring Results 2008

Location	Start Time	L(A) _{eq}	L(A) ₁₀	L(A) ₉₀	Comments
NSL 1	22:40	67.5	69.6	52.1	Dry/Calm Passing traffic along Ballyogan Road was the dominant source of noise.
NSL 2	00:27	47.0	50.2	41.0	Dry/Calm Dominant noise sources at this location were passing traffic along Ballyogan Rd audible in distance and humming noise from generator (LUAS site works). Short term events like pedestrians passing within the vicinity of the meter also affected the background noise levels.
NSL 3	23:53	56.4	53.5	43.3	Dry/Calm Dominant noise sources at this location were passing traffic along Ballyogan Rd and humming noise from generator (LUAS site works).
NSL 4	22:08	69.4	72.9	55.1	Dry/Calm Passing traffic along Ballyogan Road was the dominant source of noise.
NSL 5	23:17	56.8	58.1	42.3	Dry/Calm Dominant noise source at this location was passing traffic along Ballyogan Rd audible in distance.
NSL 6	22:05	67.4	71.2	53.6	Dry/windy Dominant noise sources at this location were rustling foliage and passing traffic along Enniskerry Rd.
NSL 7	22:39	67.1	70.7	55.1	Dry/windy Dominant noise sources at this location were rustling foliage and passing traffic along Enniskerry Rd audible in distance.

7.4 AIR QUALITY

Air quality monitoring locations around the Ballyogan Facility comprise five dust and five PM₁₀ monitoring locations (D1a - D5a). These are located around the perimeter of the facility and are monitored on a quarterly basis, in accordance with Schedule F.4 of the waste licence. Dust and PM₁₀ monitoring results are summarised in Table 7.5.

Exceedences are highlighted in bold.

Table 7.5: Dust and PM₁₀ Monitoring Results for 2008

Monitoring Point	Quarter 1		Quarter 2		Quarter 3		Quarter 4		Limit	Limit
	Dustfall (mg/m ² /day)	PM ₁₀ (µg/m ³)	Dustfall (mg/m ² /day)	PM ₁₀ (µg/m ³)	Dustfall (mg/m ² /day)	PM ₁₀ (µg/m ³)	Dustfall (mg/m ² /day)	PM ₁₀ (µg/m ³)	Dustfall Limit (mg/m ² /day)	PM ₁₀ Trigger level (µg/m ³)
D1a	97.6	18.59	14.1	11.54	<10	14.93	21	19.28	350	50
D2a	86.1	10.72	4.6	9.89	14	15.43	90	13.64		
D3a	28.7	8.91	212.9	7.89	<10	20.63	123	29.99		
D4a	1,951.1	n/s	278.3	n/s	<10	n/s	142	n/s		
D5a	137.7	13.22	17.0	13.74	<10	16.87	34	19.37		

Note: PM₁₀ values are reported as 24 hour averages;
n/s -v means not sampled, no power outlet available during monitoring; n/s-c means not sampled, sample contaminated.

Dust Deposition

One exceedence for dustfall was recorded during the year; this was at D4a in Quarter 1 (February 2008), at a concentration of 1,951.1 mg/m²/day. It must be noted however that during the monitoring period, foliage and scrub clearance as well as root and stump removal was carried adjacent to the monitoring location on the Bective rugby club site. It is likely that this was the cause of the elevated level of deposition.

Particulate Matter (PM₁₀)

No exceedences were recorded at D1a, D2a, D3a and D5a for PM₁₀ monitoring in 2008. Monitoring was not carried out at monitoring location D4a PM₁₀, situated within the Bective Rugby due to the absence of a power outlet for monitoring equipment.

7.5 SURFACE WATER

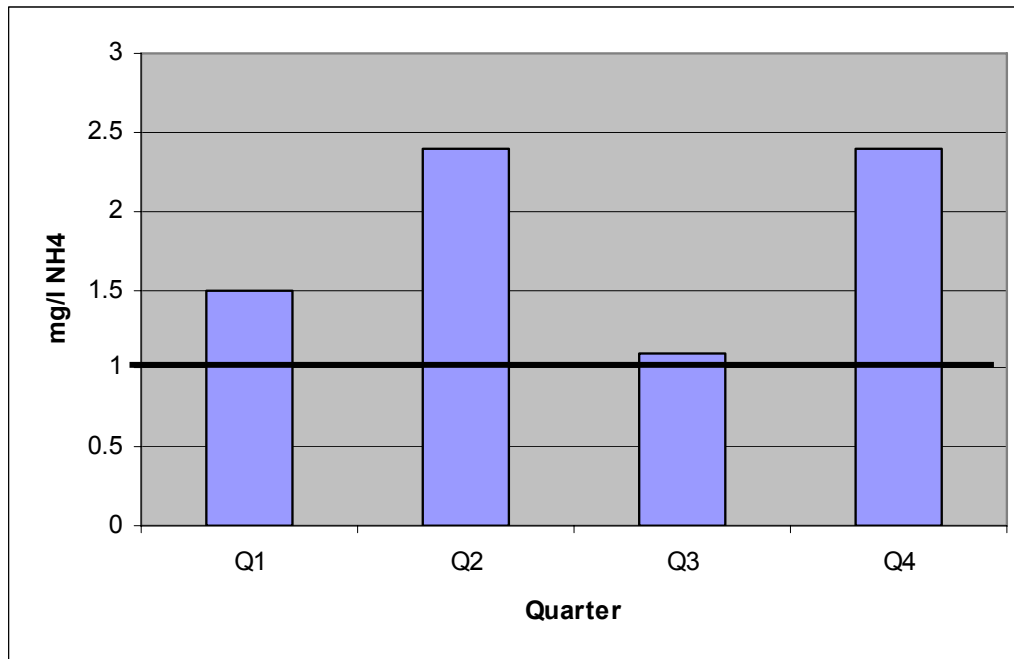
There are eight surface water monitoring locations around the landfill. Monitoring is carried out at quarterly and annual intervals as per Schedule F.5 of Waste Licence W0015-01. A visual and olfactory inspection of surface waters is also undertaken to provide a basic assessment of the condition of the surface water. The full list of parameters specified in Table F.5.4 of the Waste Licence is monitored on an annual basis. Annual monitoring was undertaken in May 2008, the results of which were submitted to the Agency in the Quarter 2 report.

For the annual monitoring, the majority of parameters analysed were within the range expected for clean waters. Magnesium was reported to be in excess at each of the monitoring locations while

phosphorus levels were in excess at SW1, SW3 and SW4. All other metals were recorded at concentrations well below threshold levels.

Ammoniacal nitrogen concentrations at SW8 were elevated throughout the year, as illustrated in Figure 7.2 below. This was the only location where high levels of ammoniacal nitrogen were recorded, which is a marked improvement on 2006.

Figure 7.2: Ammoniacal Nitrogen in Surface Water at SW8 during 2008



Suspended solid and COD concentrations were within the limits of 35mg/l set by the licence. Visual assessment of the surface water quality showed no evidence of significant contamination at any of the monitoring locations.

The majority of chemical parameters analysed in 2008 were within the range expected for clean waters. Overall, the quality of the surface water in the vicinity of the landfill in 2008 showed an improvement on the water quality in 2007.

7.6 GROUNDWATER INCLUDING PRIVATE WELLS

Groundwater

Ten groundwater monitoring stations are positioned around the perimeter of the landfill, MW1 - MW7 and MW13 - MW15. There are two monitoring wells at each location. A deep well (D) monitors groundwater in the bedrock and a shallow well (S) monitors groundwater in the overburden. Monitoring wells MW5S & MW5D were lost in November 2006 as a result of the ongoing development of The Park immediately east of the landfill. Monthly and annual groundwater monitoring was carried out in 2008, as per Schedule F.5 of Waste Licence W0015-01. The annual monitoring was undertaken in April 2008; the results of which were submitted to the Agency in the Quarter 2 report.

The results of the groundwater analyses are interpreted with reference to the EPA Interim Guideline Values, taken from the 2003 EPA publication - Toward Setting Guideline Values for the Protection of Groundwater in Ireland, Interim Report.

The results of the annual monitoring in Quarter 2 showed elevated concentrations of ammoniacal nitrogen, chloride, manganese, phosphorous, faecal coliforms and total coliforms. All of the metals analysed were recorded at concentrations below guideline values. No pesticides or volatile organics were detected. One semi-volatile organic compound - Bis(2-ethylhexyl)phthalate was detected in MW4S, MW4D, MW6S, MW6D, MW15S and MW15D. This compound, also known as DEHP, is used in the production of PVC and vinyl chloride resins, where it is added to plastics to make them flexible. There is no guideline value specified for this parameter.

Manganese concentrations were recorded in excess of the guideline value of 0.05mg/l in 2 out of the 18 monitored wells with a maximum concentration of 0.078 mg/l recorded at MW1S. This is significantly lower than the manganese concentration recorded in the 2007 annual monitoring round of 3.191mg/l. Elevated manganese concentrations can be indicative of organic pollution if accompanied by elevated ammonia, chloride, sodium or potassium.

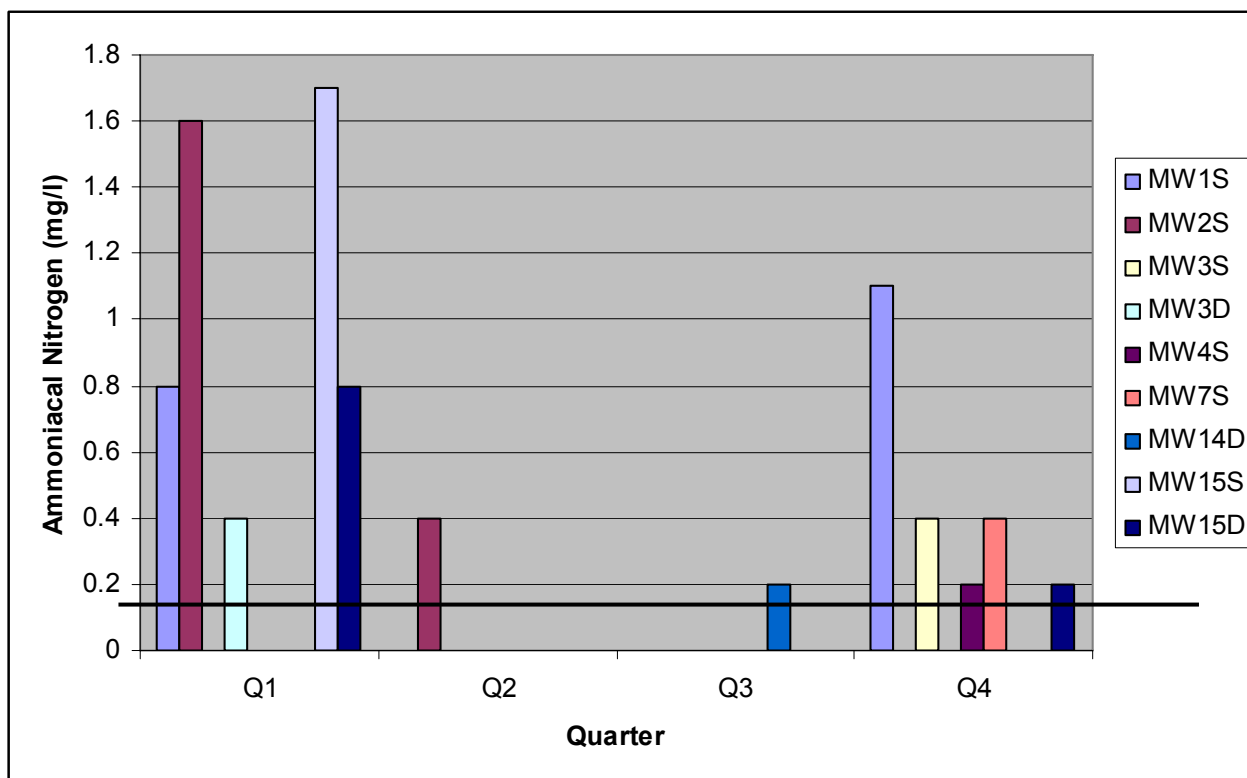
Phosphorous concentrations were found to be in excess of the guideline value of 0.03mg/l in 9 out of the 18 monitored wells with a maximum concentration of 0.61mg/l at MW2D. Phosphorus is primarily a surface water quality issue giving rise to eutrophication. It is typically retained in soils owing to the ability of soil particles to adsorb soluble phosphorus, and as such it usually doesn't reach the groundwater. Notwithstanding this, phosphorous is not particularly harmful to humans.

Total coliforms were detected in 12 out of the 18 groundwater monitoring wells. Faecal coliforms were detected in MW1D, MW3S and MW7D. Coliforms are not typically found in municipal landfill leachate. The presence of faecal coliforms in water samples is typically taken as an indicator of faecal contamination, for example from landspreading of animal manures or septic tank contamination.

Monitoring results throughout the year showed elevated levels of chloride and ammoniacal nitrogen at several locations and at varying levels. The results of ammoniacal nitrogen and chloride analyses are illustrated Figures 7.3 and 7.4 below.

The ongoing capping of the landfill will significantly reduce the generation of leachate and consequently will reduce the risk posed to groundwater quality in the area.

Figure 7.3: Wells where Ammoniacal Nitrogen was elevated in Groundwater during Quarterly Monitoring in 2008



Private Wells

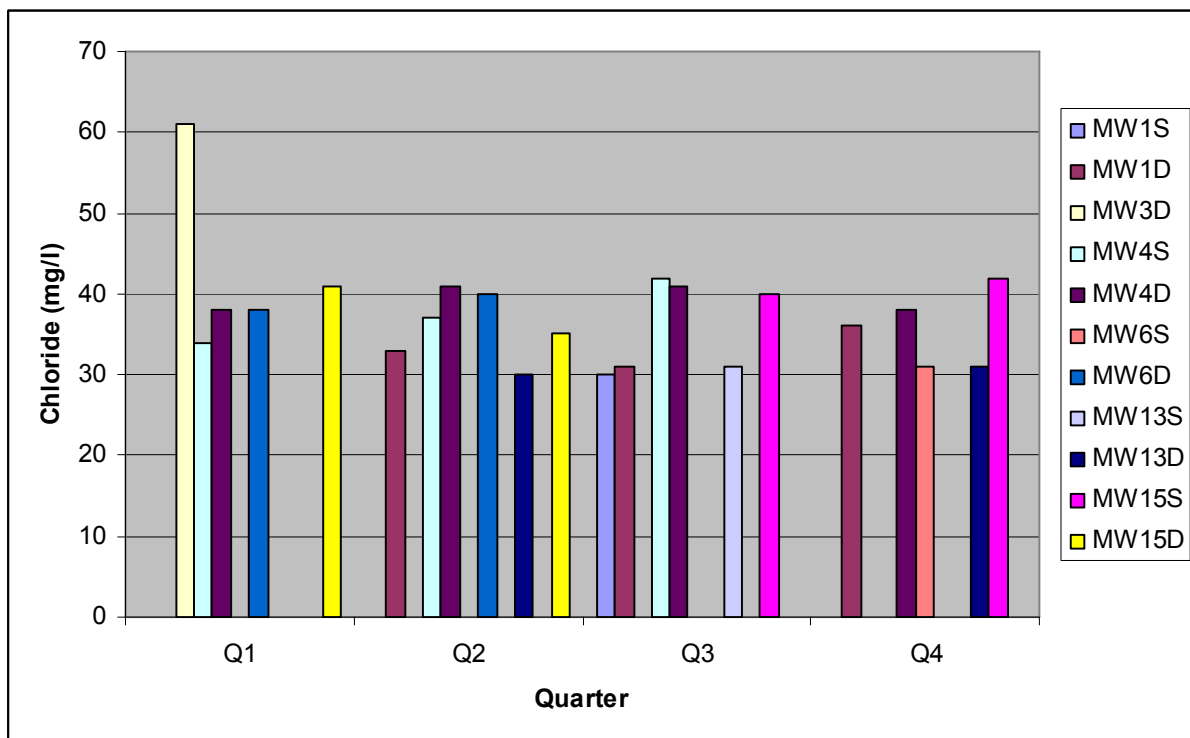
There are two private wells located within 500m of the landfill site. Neither well is nor has been used for drinking water purposes. PW1 is located on the Stepside Golf Course to the south west of the site, and is used for watering of greens and landscaped areas. PW2 is located at a private residence to the south east of the site and was used for watering of commercial vegetables. This well is no longer in use.

Monitoring of groundwater from the private wells was carried out on a monthly, quarterly and annual basis during 2007. The results of this monitoring are reported on a quarterly basis to the EPA. The annual monitoring was undertaken in April 2008; the results of which were submitted to the Agency with the Quarter 2 report.

No pesticides, VOCs or SVOCs were detected in PW1 or PW2.

For the annual monitoring round, all parameters analysed were found to be within the guideline values for PW1 and PW2.

Ammoniacal nitrogen was below the laboratory detection limit at both wells throughout the year. Chloride was elevated in PW1 in Quarter 1, Quarter 3 at 33mg/l and 36mg/l respectively. Chloride was elevated in PW2 in Quarter 4 at 52.8mg/l. Total Phenols were elevated in both PW1 and PW2 IN Quarter 3 at 3.7 µg/ and 1.1 µg/l respectively.

Figure 7.4: Groundwater Wells where Chloride was elevated in Groundwater during 2008

7.7 LEACHATE

Quarterly and annual monitoring of leachate was carried out as per Schedule F.5 of Waste Licence W0015-01. The results of this monitoring are reported on a quarterly basis to the EPA. The annual monitoring was undertaken in May 2008; the results of which were submitted to the Agency in the Quarter 2 report.

Monitoring of leachate was undertaken at two monitoring wells in 2008 - MW9a and MW10a.

The results of the annual leachate sampling indicate exceedances in 6 categories: alkalinity, calcium, chloride, magnesium and potassium. However all monitored parameters were recorded at concentrations that are considered to be typical of leachate from municipal waste landfills.

7.8 STORMWATER WETLANDS

The inlet and outlet points from the stormwater wetlands in the Recycling Park are monitored on a continuous and weekly basis, as per Schedule F.6 of the waste licence.

The stormwater inflow is monitored continuously by an inline pH, TOC, conductivity and flow rate monitor. A weekly grab sample is also taken and analysed for ammonia and suspended solids. At the outlet, the flow is monitored continuously by an inline flow rate monitor and a weekly grab sample is taken for analysis of suspended solids and ammoniacal nitrogen.

The maximum concentration of total suspended solids recorded at the stormwater outlet was 13mg/l on 19/11/8/2008. This is well below the emission limit of 35mg/l. The majority of the results throughout the year were below the laboratory limit of detection. Similarly, the majority of results for ammoniacal

nitrogen at the outlet were below the laboratory limit of detection throughout the year; the maximum concentration recorded was 1.1mg/l on 29/04/2008. This is above the threshold value of 1mg/l.

The maximum discharge limit from the stormwater outlet point is 0.097 m³/sec or 97 l/s. The flow metre on site records flow at litres per second (l/s). The flow rate did not exceed the discharge limit on any occasion throughout 2008 and was largely well below this limit. The maximum flow for the year was recorded 21.49 l/s in April 2008. The maximum flows for the remaining three quarters were 18.45 l/s, 21.49 l/s and 13.24 l/s, for Q1, Q2, Q3 and Q4 respectively.

7.9 EMISSIONS TO SEWER

Emissions to sewer from the landfill and the Baling Hall are monitored on a continuous and monthly basis, as per Schedule F.7 of the waste licence.

For those parameters analysed on a monthly basis i.e ammoniacal nitrogen, BOD, COD, sulphates, suspended solids, detergents and extractable oils, grease and fats, the parameters which showed an exceedence was ammoniacal nitrogen from the landfill and total suspended solids from BRP. The remaining parameters were below the emission limits set out in the licence for the landfill and the BRP.

Ammoniacal nitrogen from the landfill was below the emission limit of 300mg/l in January, February and March. Exceedences were recorded in April, May, June, July, August, October and November with concentrations of 456.7mg/l, 341.3mg/l and 344.5mg/l, 432mg/l, 386mg/l, 463mg/l and 378mg/l respectively. In Decemeber the concentration returned to below the emission limit value at 199 mg/l.

For the parameters monitored on a continuous basis i.e flow, pH and temperature, as well as methane in the discharge from landfill, exceedences were recorded for methane and pH, whilst the remaining parameters were below the emission limits.

From the continuous data for the remainder of the year, methane was in excess of the emission limit value of 0.14mg/l on one occasion in Quarter 1 with a maximum concentration of 0.18mg/l on 31/3/2008. This elevated reading is likely to have been caused by fouling of the methane probe and as such does not accurately reflect the true methane readings for this period. Once the probe was cleaned, readings reverted to normal. There were no exceedences of methane recorded for the remainder of 2008.

The maximum discharge into the sewer per hour permitted by the waste licence is 108m³/hr. The combined recorded flow rates from both the landfill and baling hall were well below this. The maximum combined flow in 2008 from both discharges was 30.95m³/hr on 13/8/07 (24.4m³/hr from the baling hall and 6.55m³/hr from the landfill).

7.10 METEOROLOGICAL MONITORING

Meteorological information was recorded at an on-site weather station within the BRP. Due to technical difficulties data for 15 days of 2008 has not been provided. This has been taken in to account and adjusted accordingly to represent 2008. Graphical representations of monthly totals for precipitation are presented in Appendix C.

7.11 ECOLOGICAL MONITORING

Ecological monitoring was carried out at 7 locations around the facility in September 2008, as per Schedule F.10 of the waste licence. A complete survey report has already been sent to the Agency separately. A summary is provided below.

After a marked improvement in the background condition of the main stream of the Ballyogan river upstream of Ballyogan landfill in 2006, the river has returned to its usual moderately polluted condition in 2007 and 2008. The invertebrate data from September 2008 indicate moderately polluted (Q3) conditions at all sites on the Ballyogan River upstream and downstream of the landfill. However, the biological data contain no evidence of an impact on the river from the landfill.

The 2008 biological results indicate that water quality in the western stream is unchanged since 1999, with a continuing moderately polluted rating of Q3. It is not possible to rule out the possibility of some landfill contribution to the moderately polluted state of this stream in the absence of an upstream control site. However the Ballyogan River immediately upstream and downstream of its confluence with the Western Tributary (Sites 4 & 4A) also has a moderately polluted Q-rating of Q3. The biological monitoring results therefore contain no evidence of a significant biological impact from the landfill on the Ballyogan River via the Western Tributary.

For the eastern stream, the 2008 biological results indicate that water quality is unchanged since 1999, with a continuing moderately polluted rating of Q3. In the absence of an upstream control site, it is not possible to rule out the possibility of some landfill contribution to the moderately polluted state of this stream. In addition, biological assessment of water quality of the Glenamuck Stream (to which the Eastern stream flows) does not form a part of the present monitoring programme.

7.12 PRTR REPORTING

The PRTR report was submitted to the Agency in June 2009 in accordance with the requirements of the E-PRTR Regulations 2006. Gas Sim 2.0 was used to complete the E-PRTR and details of the uploaded results are presented in Appendix D.

8 FINANCIAL ARRANGEMENTS

In accordance with Condition 11 of Waste Licence W0015-01, Charges and Financial Provisions, Dun Laoghaire Rathdown County Council has made the necessary provisions to ensure that there is adequate funding for the management and development of Ballyogan Landfill Facility and Recycling Park, as well as the restoration of the landfill site.

APPENDIX A

DESTINATIONS OF WASTE REMOVED OFF-SITE FOR RECOVERY OR DISPOSAL

Non-Hazardous Waste sent off-site from the CRF for Recovery/Disposal

Description	EWC Code	Total Tonnes	Tonnes breakdown	Waste Licence/ Permit No.	Destination for Processing, Recovery or Disposal
Paper (non Packaging)	20 01 01	356.43	285.6	W0053-02	Greenstar, Fassaroe, Bray, Co.Wicklow
			71.37	WPR 014	Textile Recycling, Glen Abbey Complex, Belgard Road, Tallaght, Dublin 24
Cardboard Packaging	15 01 01	324.57	-	W0053-02	Greenstar, Fassaroe, Bray, Co.Wicklow
Tetra Pak	15 01 05	12.44	-	W0053-02	Greenstar, Fassaroe, Bray, Co.Wicklow
Metallic Packaging Aluminium	15 01 04	10.04	-	W0053-02	Greenstar, Fassaroe, Bray, Co.Wicklow

Description	EWC Code	Total Tonnes	Tonnes breakdown	Waste Licence/ Permit No.	Destination for Processing, Recovery or Disposal
Metallic Packaging Steel		10.16	8.78	W0053-02	Greenstar, Fassaroe, Bray, Co.Wicklow
			1.38	W0015-01	Waste Transfer Facility, BRP
Glass Packaging	15 01 07	376.12	-	WP 160-2004	Glassco, Ballymount , Dublin 12
Clothing/Textiles	20 01 11	198.45	-	WPR 014	Textile Recycling, Glen Abbey Complex, Belgard Road, Tallaght, Dublin 24
Plastic Bottles	15 01 02	44.21	-	W0053-02	Greenstar, Fassaroe, Bray, Co.Wicklow
Plastic Packaging	15 01 02	114.43	-	W0053-02	Greenstar, Fassaroe, Bray, Co.Wicklow
Wood	20 01 38	1,156.21	-	W0053-02	Greenstar, Fassaroe, Bray, Co.Wicklow
Soil & Stones "Construction Waste"	20 02 02	641.46	-	W0053-02	Greenstar, Fassaroe, Bray, Co.Wicklow
Metals	20 01 40	456.22	-	W0053-02	Greenstar, Fassaroe, Bray, Co.Wicklow

Description	EWC Code	Total Tonnes	Tonnes breakdown	Waste Licence/ Permit No.	Destination for Processing, Recovery or Disposal
Green Waste	20 02 01	4702.56	8.10	W0198-01	Bord na Mona, Tullamore
			4,396.85	WMP 2004/57	Enrich Composting, Kilcock , Co. Kildare
			297.6	W0053-02	Greenstar, Fassaroe, Bray, Co.Wicklow
Mixed Municipal Waste "Baleable"	20 03 01	2,810.2	-	W0015-01	Waste Transfer Facility, BRP
Bulky Municipal Waste "Non baleable"	20 03 07	903.88	901.17	W0053-02	Greenstar, Fassaroe, Bray, Co.Wicklow
Bulky Municipal Waste "Non baleable"			2.71	W0015-01	Waste Transfer Facility, BRP
Cooking Oil	20 01 25	4.58	-	WP 98084	Mitchell Taylor Exports Ltd, Newmarket, Dublin 8.
Plasterboard	17 08 02	23.9	-	-	Gypsum Recycling Ireland
Glass Non Packaging	20 01 02	13.02	-	WP 160-2004	Glassco, Ballymount , Dublin 12
Fire Extinguishers	16 05 05	1.64	-	-	Doyle & Doyle Wholesale
Printer Cartridges	08 03 99	0.68	-	-	David Kiernan
Total		12,161.73			

Non-Hazardous Waste sent off-site from the Waste Transfer Facility for Recovery/Disposal

Description	EWC Code	Tonnes	Waste Licence/ Permit No.	Destination for Processing, Recovery or Disposal
C&I Dry Mixed	19 12 12	19,137.86	W0004-01	Arthurstown Landfill, Kill, Co. Kildare
Waste from carbon filter and dust filter units	06 13 99	11	W0165-01	Ballynagran Landfill, Co. Wicklow
Leachate Sludge	19 07 03	6.2	D0034-01	Ringsend Treatment Works, Dublin 4
Waste from grit chambers and oil/water separators	13 05 08*	17.76	W0192-01	Rialta Environmental Ltd, Block 402, Grant's Drive, Greenogue Business Park, Rathcoole, County Dublin
Farm Plastics	02 01 04	4.18	-	FRS Lishugh
TOTAL		19,177		

Hazardous Waste sent off-site for Recovery/Disposal

Description	EWC Code	Tonnes	Waste Licence/ Permit No.	Destination for Processing, Recovery or Disposal
Fluorescent Tubes	20 01 21*	1.10	02/2000A (Kildare Waste Permit)	Irish Lamps, Kilkenny Rd., Athy, Co.Kildare
Motor Oil	20 01 26*	14.8	WO-184-01	ENVA Ireland Ltd., Clonminam Industrial Estate, Port Laoise, Co. Laois
Paints, Inks, Adhesives - Municipal Wastes	20 01 27*	93.5	W0054-01	Ecosafe Systems, Unit 1a, Allied Industrial Estate, Kylemore Road, Dublin 10
Batteries (Municipal)	20 01 33*	34.52	W0113-02	WEEE Recycle (KMK)
Hazardous discarded electrical equipment	20 01 35*	819.59	WP98099	Tech Rec, 51 Parkwest Industrial Estate, Nangor Road, Dublin 12
Gas Cylinders	16 05 04*	8.4	N/A	Calor Gas, Teoranta, Longmile Road, Dublin 12 BOC
Total		971.91		

APPENDIX B

WATER BALANCE CALCULATIONS

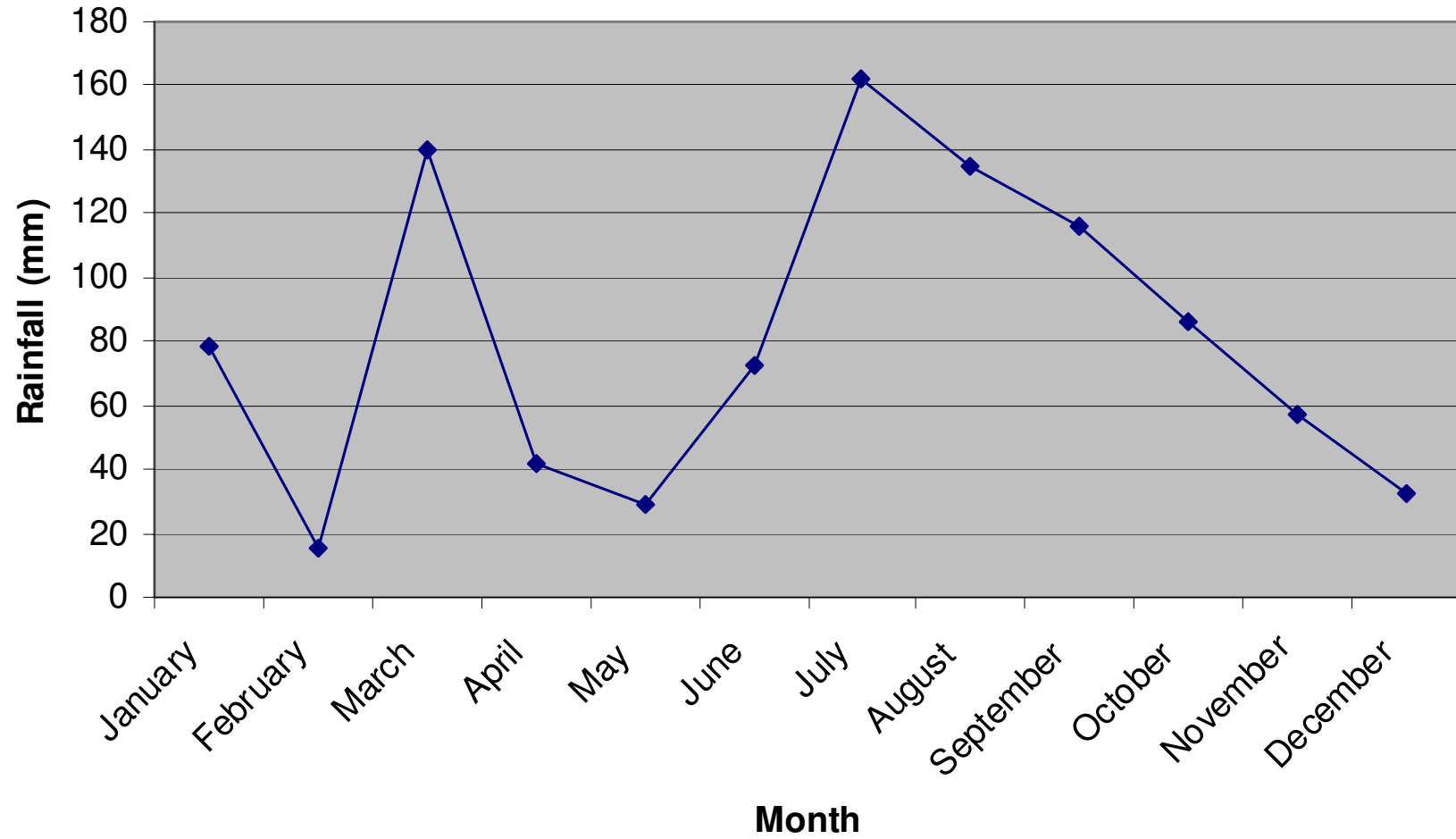
Ballyogan Landfill: Estimated Volume of Leachate Generated 2008

Month	Rainfall ¹ (mm)	Volume of Water/Infiltration (m ³)	
		Completed Areas - Temporary Cap ²	Completed Areas - Engineered Cap ³
January	78.5	6,119.1	439.32
February	15.5	1,209	86.80
March	140.0	10,920	784.00
April	41.8	3,257.28	233.86
May	28.8	2,243.28	161.06
June	72.2	5,631.6	404.32
July	162.4	12,667.2	909.44
August	134.6	10,501.14	753.93
September	115.8	9,032.4	648.48
October	86.4	6,739.2	483.84
November	57.5	4,486.56	322.11
December	32.4	2,527.2	181.44
Total	965.8	75,333.96	5,408.59
Total Volume of Water		80,742.55	
Volume of Water Absorbed into Waste Mass⁴		6,954.10	
TOTAL VOLUME OF LEACHATE GENERATED		73,788.45	
<p>Notes</p> <p>¹ Rainfall was recorded at the on-site weather station. Due to technical difficulties data was not obtained for 15 days of 2008. This has been taken in to account and an average for the year has been used to calculate the Total Rainfall for the year.</p> <p>² 4% infiltration of rainfall used as worst case scenario for capped areas.</p> <p>³ 30% infiltration of rainfall used for temporary capped areas.</p> <p>Average waste tonnages landfilled per annum: 99,344 tonnes; waste density: 0.8 tonnes/m³; absorptive capacity: 0.07m³/tonne.</p> <p>Engineered Capped Areas: 140,000m²</p> <p>Temporary Capped Areas: 260,000m²</p> <p>Leachate Lagoon de-commissioned.</p>			

APPENDIX C

METEOROLOGICAL DATA 2008

Monthly Rainfall 2008, BRP Weather Station



APPENDIX D

PRTR Report 2008



Environmental Protection Agency

| PRTR# : W0015 | Facility Name : Ballyogan Landfill Facility Ballyogan Recycling Park
| Filename : W0015_2008.xls | Return Year : 2008 |

AER Returns Worksheet

Version 1.1.04

REFERENCE YEAR	2008
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1. FACILITY IDENTIFICATION

Parent Company Name	Dun Laoghaire-Rathdown County Council
Facility Name	Ballyogan Landfill Facility Ballyogan Recycling Park
PRTR Identification Number	W0015
Licence Number	W0015-01

Waste or IPPC Classes of Activity

No.	class name
3.1	Deposit on, in or under land (including landfill).
3.4	Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons.
3.5	Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment.
3.6	Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1. to 10. of this Schedule.
3.7	Physico-chemical treatment not referred to elsewhere in this Schedule (including evaporation, drying and calcination) which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1. to 10. of t...
3.11	Blending or mixture prior to submission to any activity referred to in a preceding paragraph of this Schedule.
3.12	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.
4.1	Solvent reclamation or regeneration.
4.2	Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).
4.3	Recycling or reclamation of metals and metal compounds.
4.4	Recycling or reclamation of other inorganic materials.
4.6	Recovery of components used for pollution abatement.
4.9	Use of any waste principally as a fuel or other means to generate energy.
4.10	The treatment of any waste on land with a consequential benefit for an agricultural activity or ecological system.
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.

Address 1	Ballyogan Road
Address 2	Jamestown Townland
Address 3	Carrickmines

Address 4	Dublin 18
Country	Ireland
Coordinates of Location	544600.000
River Basin District	IEEA
NACE Code	382
Main Economic Activity	Waste treatment and disposal
AER Returns Contact Name	Michael Whelan
AER Returns Contact Email Address	mwhelan@dlrcoco.ie
AER Returns Contact Position	Senior Executive Engineer, Water and Waste Services
AER Returns Contact Telephone Number	01-2054700
AER Returns Contact Mobile Phone Number	
AER Returns Contact Fax Number	
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	0
User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

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

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

| PRTR# : W0015 | Facility Name : Ballyogan Landfill Facility Ballyogan Recycling Park | Filename : W0015_2008.xls | Return Year : 2008 |

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SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR								
POLLUTANT		METHOD			QUANTITY			
No. Annex II	Name	M/C/E	Method Used		Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
			Method Code	Designation or Description				
03	Carbon dioxide (CO2)	C	SSC	Gas Sim 2	7487026.0	23100000.0	0.0	15612974.0
01	Methane (CH4)	C	SSC	Gas Sim 2	32271.6	727000.0	0.0	694728.4
55	1,1,1-trichloroethane	C	SSC	Gas Sim 2 ; PI Report	0.0	13.4	0.0	13.4

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

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO AIR								
POLLUTANT		METHOD			QUANTITY			
No. Annex II	Name	M/C/E	Method Used		Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
			Method Code	Designation or Description				
15	Chlorofluorocarbons (CFCs)	C	SSC	Gas Sim 2 ; PI Report	0.0	19.1	0.0	19.1

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

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

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

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

Additional Data Requested from Landfill operators

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

Landfill: Ballyogan Landfill Facility Ballyogan Recycling Park

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)	3921888.0	C	OTH	Gas Sim 2 & Calcs	N/A
Methane flared	0.0	C	OTH	Gas Sim 2 & Calcs	0.0 (Total Flaring Capacity)
Methane utilised in engine/s	3194888.0	C	OTH	Gas Sim 2 & Calcs	1200.0 (Total Utilising Capacity)
Net methane emission (as reported in Section A above)	727000.0	C	OTH	Gas Sim 2 & Calcs	N/A

4.2 RELEASES TO WATERS

| PRTR# : W0015 | Facility Name : Ballyogan Landfill Facility Ballyogan Recycling Park | Filename : W0015_2008.xls | Return Year : 2008 |

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SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

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

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

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

SECTION B : REMAINING PRTR POLLUTANTS

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

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

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

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

SECTION A : PRTR POLLUTANTS

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER									
POLLUTANT		METHOD			QUANTITY				
No. Annex II	Name	M/C/E	Method Used		Landfill leachate to sewer Emission Point 1	BRP leachate to sewer Emission Point 2	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
			Method Code	Designation or Description					
06	Ammonia (NH3)	C	OTH	Scaled-up using monitoring results and flow data	5869.75	23.25	5893.0	0.0	0.0
01	Methane (CH4)	C	OTH	Scaled-up using monitoring results and flow data	0.0086	0.0	0.0086	0.0	0.0

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

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

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER									
POLLUTANT		METHOD			QUANTITY				
Pollutant No.	Name	M/C/E	Method Used		Landfill leachate to sewer Emission Point 1	BRP leachate to sewer Emission Point 2	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
			Method Code	Designation or Description					
303	BOD	C	OTH	Scaled-up using monitoring results and flow data	3314.7	113.59	3428.29	0.0	0.0
306	COD	C	OTH	Scaled-up using monitoring results and flow data	6553.95	190.81	6744.76	0.0	0.0
314	Fats, Oils and Greases	C	OTH	Scaled-up using monitoring results and flow data	17.1	0.57	17.67	0.0	0.0
343	Sulphate	C	OTH	Scaled-up using monitoring results and flow data	2398.13	29.13	2427.26	0.0	0.0
308	Detergents (as MBAS)	C	OTH	Scaled-up using monitoring results and flow data	291.75	28.43	320.18	0.0	0.0
240	Suspended Solids	C	OTH	Scaled-up using monitoring results and flow data	545.03	26.59	571.62	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

| PRTR# : W0015 | Facility Name : Ballyogan Landfill Facility Ballyogan Recycling Park | Filename : W0015_2008.xls | Return Year : 2008 |

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SECTION A : PRTR POLLUTANTS

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

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

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

RELEASES TO LAND							
POLLUTANT		METHOD			QUANTITY		
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

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

| PRTR# : W0015 | Facility Name : Ballyogan Landfill Facility Ballyogan Recycling Park | Filename : W0015_2008.xls | Return Year : 2008 |

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Transfer Destination	European Waste Code	Hazardous	Quantity T/Year	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Name and Licence / Permit No. of Recoverer / Disposer / Broker	Address of Recoverer / Disposer / Broker	Name and Address of Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)	Licence / Permit No. of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					
Within the Country	15 01 01	No	324.57	Cardboard Packaging	R13	M	Weighed	Onsite in Ireland	Greenstar, W0053-02	Fassaroe, Bray, Co. Wicklow		0
Within the Country	15 01 02	No	114.43	Plastic Packaging	R13	M	Weighed	Onsite in Ireland	Greenstar, W0053-02	Fassaroe, Bray, Co. Wicklow		0
Within the Country	15 01 02	No	44.21	Plastic Bottles	R13	M	Weighed	Onsite in Ireland	Greenstar, W0053-02	Fassaroe, Bray, Co. Wicklow		0
Within the Country	15 01 04	No	10.04	Aluminium cans	R13	M	Weighed	Onsite in Ireland	Greenstar, W0053-02	Fassaroe, Bray, Co. Wicklow		0
Within the Country	15 01 04	No	8.78	Steel cans	R13	M	Weighed	Onsite in Ireland	Greenstar, W0053-02	Fassaroe, Bray, Co. Wicklow		0
Within the Country	15 01 04	No	1.38	Steel cans	R13	M	Weighed	Onsite in Ireland	DLRCC, W0015-01	WTF, Ballyogan Recycling Pk, Carrickmines, Dublin 18		0
Within the Country	15 01 05	No	12.44	Tetra Pak	R13	M	Weighed	Onsite in Ireland	Greenstar, W0053-02	Fassaroe, Bray, Co. Wicklow		0
Within the Country	15 01 07	No	376.12	Glass Packaging	R13	M	Weighed	Onsite in Ireland	Glassco, WP 160-2004	Ballymount, Dublin 12		0
Within the Country	20 01 01	No	285.6	Paper non packaging	R13	M	Weighed	Onsite in Ireland	Greenstar, W0053-02	Fassaroe, Bray, Co. Wicklow		0
Within the Country	20 01 01	No	71.37	Paper, newspapers, magazines & books	R13	M	Weighed	Onsite in Ireland	Textile Recycling, WPR 014	Belgard Rd, Tallaght, D24		0
Within the Country	20 01 02	No	13.02	Glass non packaging	R13	M	Weighed	Onsite in Ireland	Glassco, WP 160-2004	Ballymount, Dublin 12		0
Within the Country	20 01 11	No	198.45	Textile, non packaging	R13	M	Weighed	Onsite in Ireland	Textile Recycling, WPR 014	Belgard Rd, Tallaght, D24		0
Within the Country	20 01 25	No	4.58	Waste Cooking and vegetable oils	R13	M	Weighed	Onsite in Ireland	Mitchell Taylor exports, Ltd, WP98084	Newmarket, Dublin 8		0
Within the Country	17 08 02	No	23.9	Plasterboard	R13	M	Weighed	Onsite in Ireland	Gypsum Recycling Ireland	Gypsum Recycling Ireland		0
Within the Country	20 01 38	No	1156.21	Wood	R13	M	Weighed	Onsite in Ireland	Greenstar, W0053-02	Fassaroe, Bray, Co. Wicklow		0
Within the Country	20 01 40	No	456.22	Metals	R13	M	Weighed	Onsite in Ireland	Greenstar, W0053-02	Fassaroe, Bray, Co. Wicklow		0
Within the Country	20 02 01	No	8.1	Green Waste	R13	M	Weighed	Onsite in Ireland	Bord Na Mona, W0198-01	Bord Na Mona, W0198-01		0
Within the Country	20 02 01	No	4396.85	Green Waste	R13	M	Weighed	Onsite in Ireland	Enrich Composting, WMP 2004/57	Kilcock, Co. Kildare		0
Within the Country	20 02 01	No	297.6	Green Waste	R13	M	Weighed	Onsite in Ireland	Greenstar, W0053-02	Fassaroe, Bray, Co. Wicklow		0
Within the Country	20 02 02	No	641.46	Soil & Stones Construction Waste	R13	M	Weighed	Onsite in Ireland	Greenstar, W0053-02	Fassaroe, Bray, Co. Wicklow		0
Within the Country	20 03 01	No	2810.2	Mixed municipal waste, baleable	R13	M	Weighed	Onsite in Ireland	DLRCC, W0015-01	WTF, Ballyogan Recycling Pk, Carrickmines, Dublin 18		0
Within the Country	20 03 07	No	901.17	Bulky Municipal Waste	R13	M	Weighed	Onsite in Ireland	Greenstar, W0053-02	Fassaroe, Bray, Co. Wicklow		0
Within the Country	20 03 07	No	2.71	Bulky Municipal Waste	R13	M	Weighed	Onsite in Ireland	DLRCC, W0015-01	WTF, Ballyogan Recycling Pk, Carrickmines, Dublin 18		0
Within the Country	08 03 99	No	0.68	Printer cartridges	R13	M	Weighed	Onsite in Ireland	David Kiernan	David Kiernan		0
Within the Country	16 05 04	Yes	8.4	Gas Cylinders	R13	M	Weighed	Onsite in Ireland	Calor Gas & BOC Gasses Irish Lamps, 02/2000A	Calor Gas & BOC Gasses Kilkenny Rd, Athy, Co. Kildare		0
Within the Country	20 01 21	Yes	1.1	Fluorescent Tubes and lighting	R13	M	Weighed	Onsite in Ireland	(Kildare permit) ENVA Ireland Ltd, WO-184-01	Clonmainam Ind Est, Portlaoise, Co. Laois		0
Within the Country	20 01 26	Yes	14.8	Waste mineral oils	R13	M	Weighed	Onsite in Ireland	01	01		0
Within the Country	20 01 27	Yes	93.5	Waste Paint & Varnish	R13	M	Weighed	Onsite in Ireland	EcoSafe Systems, W0054-01	EcoSafe Systems, W0054-01		0
Within the Country	20 01 33	Yes	34.52	Batteries	R13	M	Weighed	Onsite in Ireland	WEEE Recycle (KMK), W0113-02	Tullamore		0
Within the Country	20 01 35	Yes	819.59	Hazardous discarded electrical equipment	R13	M	Weighed	Onsite in Ireland	Tech Rec, WP98099	Nangor Rd, Dublin 12		0
Within the Country	16 05 05	No	1.64	Fire extinguishers	R13	M	Weighed	Onsite in Ireland	Doyle & Doyle Wholesale	Doyle & Doyle Wholesale		0
Within the Country	19 12 12	No	19137.86	Baled MSW	D13	M	Weighed	Onsite in Ireland	Arthurstown Landfill, W0004-01	Kill, Co. Kildare		0

Transfer Destination	European Waste Code	Hazardous	Quantity T/Year	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Name and Licence / Permit No. of Recoverer / Disposer / Broker	Address of Recoverer / Disposer / Broker	Name and Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)	Licence / Permit No. of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)	
						M/C/E	Method Used						
Within the Country	06 13 99	No	11.0	Waste from carbon and dust filter units	D14	M	Weighed	Onsite in Ireland	Ballynagran Landfill, W0165-01	Co. Wicklow		0	0
Within the Country	19 07 03	No	6.2	Waste from leachate treatment units	D14	M	Weighed	Onsite in Ireland	Ringsend Treatment Works, D0034-01	Ringsend, Dublin 4		0	0
Within the Country	13 05 08	Yes	17.76	Grit chambers and oil/water separators	D14	M	Weighed	Onsite in Ireland	Horizon Environmental	Horizon Environmental	Rialta Environmental Ltd, W0192-01		
Within the Country	02 01 04	No	4.18	Farm Plastics	D14	M	Weighed	Onsite in Ireland	FRS Lishugh	FRS Lishugh	Greenogue Business Park, Rathcoole, Co. Dublin		

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