

**ANNUAL ENVIRONMENTAL REPORT**  
**FOR**  
**GREENSTAR LTD. - BALLYNAGRAN LANDFILL**  
**LICENCE NO. W0165-02**  
**JANUARY – DECEMBER 2011**

**Prepared For: -**

Greenstar Ltd.,  
Ballynagran Landfill,  
Ballynagran,  
Co. Wicklow

**Prepared By: -**

O' Callaghan Moran & Associates,  
Granary House,  
Rutland Street,  
Cork.

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Client		Greenstar Ltd – Ballynagran Landfill W0165-01		
Report No	Date	Status	Prepared By	Reviewed By
0481705	26/03/2012	Draft	Barry Sexton MSc	Michael Watson MA.
0481705	28/03/2012	Final	Barry Sexton MSc	Michael Watson MA.

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## 1. INTRODUCTION

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This is the 2011 Annual Environmental Report (AER) for Greenstar Ltd's (Greenstar) non-hazardous residual landfill at Coolbeg & Kilcandra, Ballynagran, County Wicklow. It covers the twelve month period from 1<sup>st</sup> January 2011 to 31<sup>st</sup> December 2011. The facility received its Waste Licence (W0165-01) in September 2003. The licence was reviewed and reissued in March 2010.

The content of the AER is based on Schedule G of the Licence and the report format follows guidelines set in the "*Guidance Note for Annual Environmental Report*" issued by the Environmental Protection Agency (Agency)<sup>1</sup>. Cognisance was also taken of the AER Draft Guidance Document issued in January 2012<sup>2</sup>.

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<sup>1</sup> EPA (Environmental Protection Agency) 1999 Waste Licensing – Draft Guidance on Environmental Management Systems and Reporting to the Agency

<sup>2</sup> EPA (Environmental Protection Agency) 2012 Draft AER Guidance Document

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## **2. SITE DESCRIPTION**

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### **2.1 Site Location & Layout**

The site, which encompasses approximately 128 ha, is located on the eastern side of the Wicklow Mountains in the townlands of Ballynagran, Coolbeg and Kilcandra. It is approximately 5 km to the south west of Wicklow Town and 3.5 km to the south east of Glenealy. It is on the southern side of an east-west ridge at an elevation between 52 and 147m Ordnance Datum (OD).

The site layout is shown on the topographical survey drawing included in Appendix 1 and includes: -

- Waste Reception Area;
- Weighbridges (2 No.);
- Wheel Wash;
- Waste Quarantine & Inspection Areas;
- Landfill Cells;
- Leachate Storage lagoon;
- Surface Water Pond;
- Administration Block (offices, stores, canteen, toilets and showers);
- Oil Storage Tank & Bund;
- Security Fencing.
- Landscaped Areas
- Landfill gas utilisation compound

### **2.2 Site History**

The facility was granted a Waste Licence (W0165-01) by the Agency on 5<sup>th</sup> September 2003 which was reviewed (W0165-02) on the 23<sup>rd</sup> March 2010.

The facility will be developed in five phases. The initial phase involved the provision of five (5) landfill cells (1, 2, 3, 4 and 5A/B), and the entire supporting infrastructure. In 2007 the Agency approved the development of two additional cells (Cells 6 and 7), which were constructed in 2008 and became active in 2009. An active gas abstraction and flaring system was commissioned in April 2007. Cells 9 and 10 were constructed in 2009 and 2010

respectively and despite being EPA approved for waste placement; they did not receive any waste in 2011. A landfill gas utilisation plant was commissioned and began operating in January 2011. Subsequent phases will involve the provision of additional landfill cells and the associated expansion of leachate, landfill gas and surface water control measures. Waste has been placed to final profile heights in Cells 1, 2 and part of 5 before approximately 16,000 m<sup>2</sup> of permanent capping was undertaken in Cells 1, 2 and 5. Following this, grass was sown on the cap to improve the visual aspect of it and aid slope stability.

### 2.3 Waste Activities Carried Out at the Facility

The facility is a full containment landfill, which is designed to accept treated waste for final disposal. The licensed waste activities are summarised in Tables 2.1 and 2.2.

**Table 2.1** Licensed Waste Disposal Activities, in accordance with the Third Schedule of the Waste Management Act 1996 as amended

Class 1	Deposit on, in or under land (including landfill).
Class 4	Surface impoundment, including placement of liquids or sludge discards into pits, ponds or lagoons: This activity is limited to the storage and management of leachate and surface water at the facility.
Class 5	Specially engineered landfill, including placement into lines discrete cells which are capped and isolated from one another and the environment: This is the principal activity. This activity is limited to the construction of the landfill in distinct phases consisting of specially engineered lined cells, the deposit of non-hazardous waste into these lined cells and the collection of leachate and landfill gas.
Class 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: This activity is limited to the treatment of leachate at the facility.
Class 13	Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced. This activity is limited to the storage of unacceptable waste prior to its transport off-site to another facility.

**Table 2.2** Licensed Waste Recovery Activities, in accordance with the Fourth Schedule of the Waste Management Act 1996 as amended

Class 4	Recycling or reclamation of other inorganic materials. This activity is limited to the use of recycled construction and demolition waste as cover and/or construction material at the facility.
Class 9	Use of any waste principally as a fuel or other means to generate energy: This activity is limited to the utilisation of landfill gas at the facility.
Class 11	Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule: This activity is limited to the use of recycled construction and demolition waste at the facility.
Class 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: This activity is limited to the storage of recycled construction and demolition waste prior to reuse.

## 2.4 Waste Types & Volumes

Only non-hazardous, solid, residual waste is accepted for disposal. Hazardous and liquid wastes are not accepted. All wastes delivered to the facility are subject to Waste Acceptance Procedures that have been approved by the Agency, as specified in Condition 5.3 of the Waste Licence.

The facility is licensed to accept 175,000 tonnes of waste per annum. The following waste types and volumes, as specified in Schedule A of the Waste Licence, can be accepted: -

- Household (62,500 tonnes),
- Commercial (67,500 tonnes),
- Industrial (45,000 tonnes),

## 2.5 Waste Received & Consigned

A breakdown of the different types and quantities of wastes received and consigned from the facility in 2011 are shown in Tables 2.3, 2.4 and 2.5.

**Table 2.3** Waste Received 2011

<b>European Waste Code Categories</b>	<b>Description</b>	<b>Tonnes</b>
20106	LDF Agricultural	<b>4</b>
70514	LDF Filter Cake	<b>116</b>
170904	C&D Inert Mixed	<b>2,216</b>
	Soil & Stones	<b>749</b>
180104	LDF Health Care	<b>38</b>
190203	LDF Stabilised	<b>2,307</b>
190801	LDF Screening	<b>1,521</b>
	LDF Stabilised	<b>3</b>
190902	LDF Filter Cake - Rec.	<b>1,863</b>
190905	Ion Exchange Resins	<b>6</b>
191207	Wood	<b>8,242</b>
	SUP Woodchip	<b>464</b>
191209	C&D Inert Mixed	<b>44</b>
	Fines C&D	<b>12,007</b>
	Fines C&I	<b>21,105</b>
	Soil & Stones	<b>30</b>
	SUP Building Materials	<b>12,897</b>
	SUP Stone	<b>27</b>
19 12 12	Residual wastes from mechanical treatment	<b>83,088</b>
200138	Wood	<b>36</b>
200301	MSW Municipal Mixed	<b>63,148</b>
200303	LDF Street Cleaning	<b>110</b>
200307	C&I Dry Mixed	<b>133</b>
190802	Grit	<b>29</b>
	LDF Screening	<b>7</b>
191006	Fractions from shredding of ELV's	<b>1,433</b>
190599	Stabilised MSW Fines	<b>566</b>
<b>Total</b>		<b>212,192</b>

**Table 2.4** Waste Consigned 2011

<b>European Waste Code Categories</b>	<b>Description</b>	<b>Tonnes</b>	<b>Destination</b>
19 07 03	Waste Water	8.96	Enva Portlaoise
19 07 03	Leachate	3,197.65	Enniskerry Waste Water Treatment Plant (WWTP)
19 07 03	Leachate	17,750.7	Greystones WWTP
19 07 03	Leachate	3,577.48	Veolia WWTP
19 07 03	Leachate	3,756.68	Rilta Environmental Ltd
<b><i>Total waste consigned</i></b>			<b>28,294.47</b>

**Table 2.5** Waste Recovered 2011

<b>European Waste Code Categories</b>	<b>Description</b>	<b>Tonnes</b>
<i>Waste for recovery</i>		
19 09 02	Filtercake	1,863
19 12 07	Shredded wood used on site for engineering	8,742
19 12 09	Stones and fines used for engineering	46,088
17 09 04	Soil and stones	2,987
<b><i>Total waste for recovery</i></b>		<b>59,680</b>

## **2.6 Landfill Capacity**

The most recent topographic survey for the landfill cell footprint is included in Appendix 1. The facility has a design capacity of approximately 2,770,000 m<sup>3</sup>. It is estimated that the void space consumed since the site opened up until 5<sup>th</sup> January 2012 is approximately 917,000 m<sup>3</sup>.

## **2.7 Method of Deposition of Wastes**

### *2.7.1 Waste Acceptance*

The waste accepted for disposal is residual waste from County Wicklow and adjoining counties, from household, commercial and industrial sources. At present the majority of waste is delivered to the facility by waste contractors based in County Wicklow. Waste contractors have systems in place whereby the recyclable fraction is either collected separately, or else separation is carried out mechanically at their facilities.

All waste is delivered to the site in Heavy Goods Vehicles (HGV) and small refuse trucks provided with the appropriate covers to prevent loss of load. Each vehicle first proceeds to the incoming weighbridge where it is weighed. The weighbridge operator and/or the facility manager may at their own discretion request the load to be tipped in the Waste Inspection Area.

The vehicles then proceed to the active waste disposal area where waste is deposited under the direction of a banks man. The vehicles weigh out at the outgoing weighbridge and receive an individual weighbridge docket before exiting the site. Each landfill cell is divided into a number of grids, which are used to identify the areas where waste is deposited. Each load is assigned the relevant grid number.

### *2.7.2 Working Face*

Waste is deposited close to and above the advancing tipping face. In accordance with Condition 5.6.1 the active face is confined to a height of 2.5 metres after compaction, a width of 25 metres and a slope no greater than 1 in 3. Deposited waste is spread in shallow layers on the inclined surface and compacted. Steel-wheeled compactors operate on the gradient of the more shallow face, pushing thin layers of waste and applying compaction pressure to them. The site operatives inspect the deposited waste for items that are not acceptable under the Waste Licence, such as tyres, gas bottles, batteries etc. These are removed and stored in appropriate areas for later removal from the facility to appropriately licence facilities. Each day waste is deposited to form a block, which is compacted and covered as described above. The following day a new block of waste is deposited adjacent to the existing block. The waste is covered at the end of each day with a covering of fines and woodchips



This ordered method of waste deposition enables areas, which have been filled and are to be left for a period to be progressively restored over the site life, minimising the areas of active waste deposition.

## **2.8 Report on Development and Restoration at the Site**

Waste was placed to final profile heights in Cells 1, 2 and part of 5 before approximately 16,000 m<sup>2</sup> of permanent capping was undertaken in Cells 1, 2 and 5. Following this grass was sown on the cap to improve the visual aspect of it and aid slope stability. Waste was continued to be placed in Cells 3, 4, 6 and 7. There was no new flares added in 2011, however a landfill gas engine was connected to the Haase Flare in January 2011 and fully commissioned.

Further permanent capping works of Cells 3, 4 and 6 are planned in Quarter 3 of 2012 as part of the facility's restoration plan. The amount of landfill gas utilised as a resource for electricity generation is to increase with the addition of a further landfill gas engine in Quarter 3, 2012.

## **2.9 Progress and Implementation of Landscaping Programme**

There was no additional tree planting at the facility during the reporting period. There was maintenance carried out on all existing trees planted, in terms of weeding and pruning.

## **2.10 Report on Meeting the Requirements of the Landfill Directive**

The site is fully compliant with the requirements of the Landfill Directive.

Greenstar, as a highly sophisticated integrated waste management company fully appreciates the requirement to comply with the landfill directive and the obligations with regards to the diversion of biodegradable waste from landfill. The company has invested heavily in state of the art material recycling systems in Greenstar Sarsfieldscourt and Greenstar Millennium Park with the aim of utilising a once landfill bound resource as solid refuse fuel which can be used as an alternative in fuelling cement kilns in Ireland or abroad. Black bin waste collected by the company is stabilised at innovative composting facilities. Greenstar has helped Ireland comply with its biodegradable waste diversion targets for 2010 and are ready to invest in further waste management technologies as soon as waste policy in Ireland is agreed among all its stakeholders.

## **2.11 Programme for Public Information**

During 2011 the site accommodated all requests for site visits and tours.

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### **3. ENVIRONMENTAL MONITORING**

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Greenstar implements a comprehensive environmental monitoring programme to assess the significance of emissions from site activities. The programme includes groundwater, surface water, leachate, landfill gas, noise, dust and particulate monitoring and a biological assessment of the of the three streams (Ballynagran, Ford and Killandra) as well as the Three Mile Water River, Ballynagran Co. Wicklow. The monitoring locations are shown in Appendix 1.

The monitoring results, including the full laboratory reports, were submitted to the Agency at quarterly intervals in the reporting period. This section presents a summary of the monitoring with summary graphs showing trends. A summary of all monitoring data is included in Appendix 2.

#### **3.1 Groundwater Monitoring**

##### *3.1.1 Groundwater Levels*

Up until June 2011 groundwater levels were measured monthly in the sixteen (16 No.) groundwater wells on site. Following approval by the Agency on the 1<sup>st</sup> June 2011, the monitoring frequency was reduced from monthly to quarterly (Ref Agency Letter W0165-02/AP26DM). There are eight groundwater monitoring locations with one deep and one shallow well at each location. The monitoring confirms that the direction of groundwater flow in the bedrock aquifer is from the north west to the south east.

During 2011, twenty (20 No.) private groundwater wells were sampled and analysed. These sampling events took place in Q-3 and Q-4 of 2011. The results of the analysis were reported in the Q-3 and Q-4 quarterly reports. All residents received copies of the results from their respective wells.

##### *3.1.2 Groundwater Quality*

Groundwater quality was monitored in the on-site monitoring wells and reported to the Agency at quarterly intervals. The sampling was carried out in accordance with internationally accepted techniques and control procedures and the analyses were completed by a laboratory using standard and internationally accepted procedures.

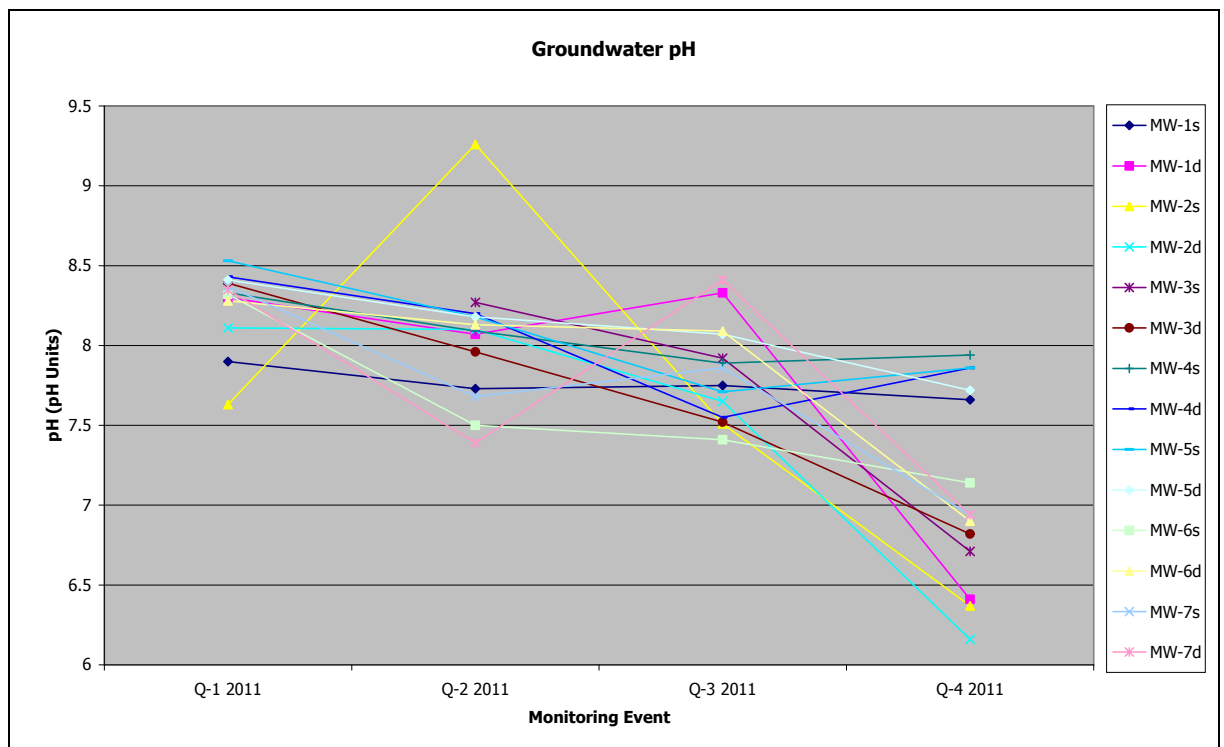
The groundwater analysis is compared to the licence specific trigger levels as well as the Interim Guideline Values (IGVs) for groundwater published by the Agency and the

Groundwater Regulations Threshold Value (GTV) which were introduced in 2010 (S.I. 9 of 2010).

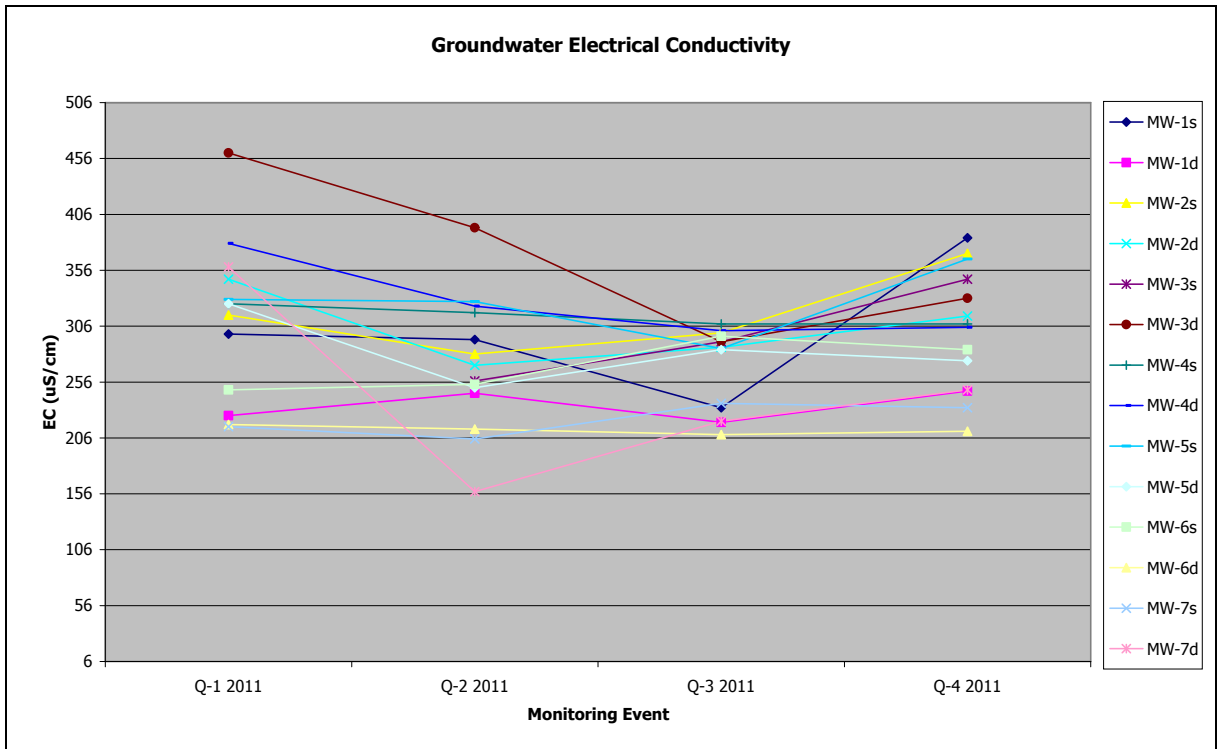
The IGV represent typical background or unpolluted conditions; however levels higher than the IGV may occur naturally depending on the local geological and hydrogeological conditions. While the GTV's are more appropriate for large scale abstraction wells used for potable supply, they can be used to assess the significance of contamination where present in non potable groundwater supplies. Because GTVs have not been established for all of the parameters monitored, the relevant IGV was used for comparative purposes.

The 2011 results were generally consistent with those obtained during the monitoring completed before the start of site development works. The monitoring programme confirms that the site activities are not impacting on groundwater quality. The monitoring detected elevated pH levels in groundwater wells, MW1s and MW2s and low pH in MW6s in Q-1. Elevated levels of ammoniacal nitrogen were detected at the public wells PW22 and PW23 and elevated chloride at PW4 in Q-3 2011. These wells were sampled again in Q-4 and the levels of ammonia and chloride were normal. Elevated levels of orthophosphate were detected in MW2s, MW3s, MW4s, MW4d and MW5d in Q4. Elevated levels of manganese were detected in MW5s in Q4. The trend of key indicator parameters analysed for in 2011 including pH, EC, chloride and ammonia are presented in Figures 3.1 to 3.4 below.

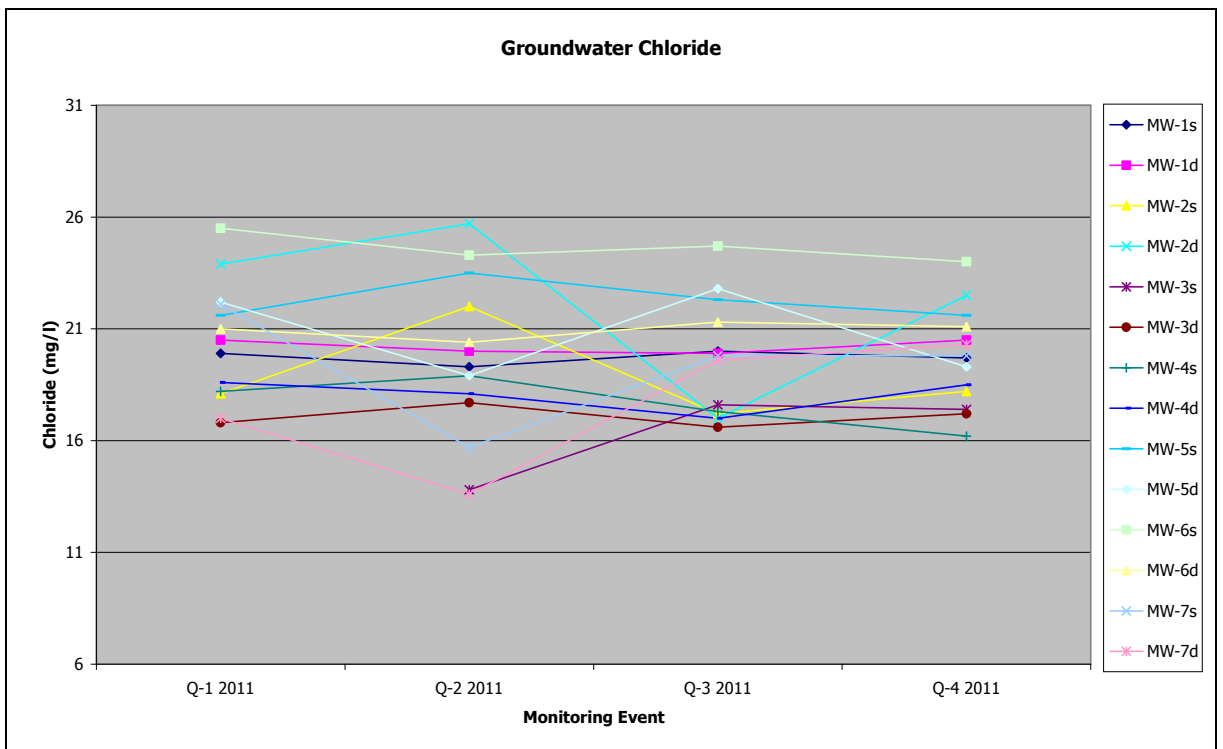
**Figure 3.1** Groundwater pH trend data



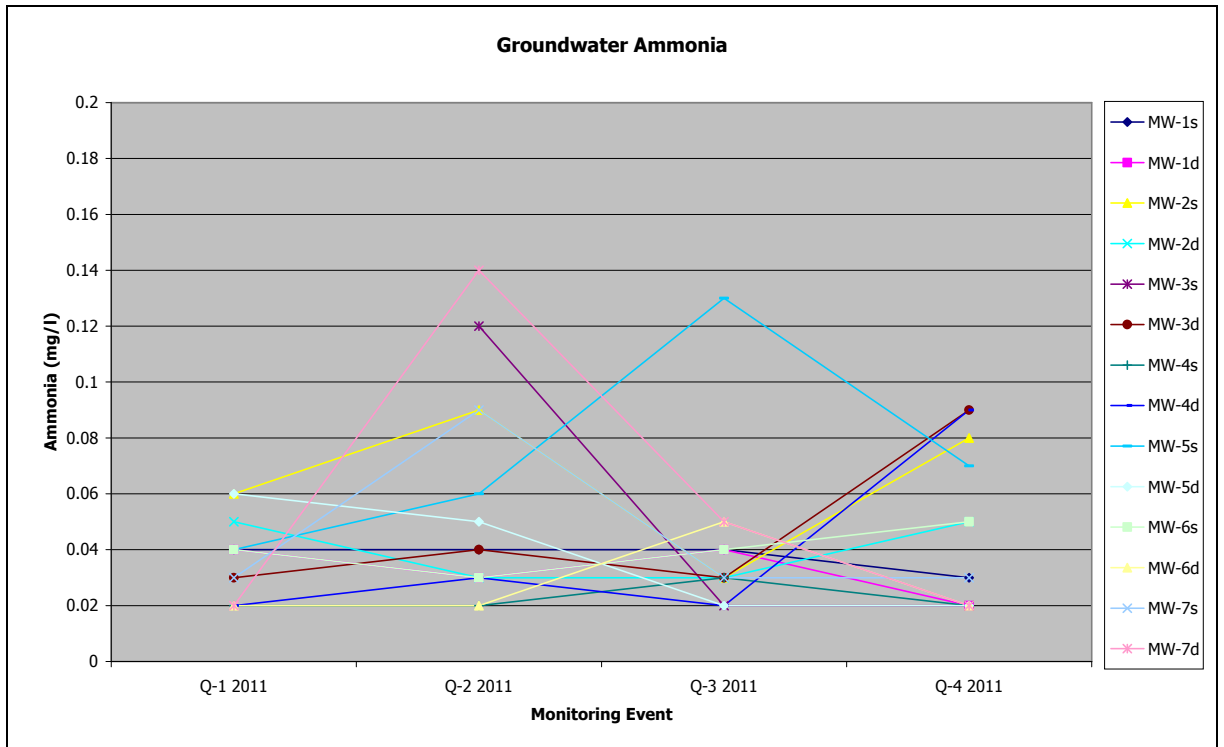
**Figure 3.2** Groundwater Electrical Conductivity trend data



**Figure 3.3** Groundwater Chloride trend data



**Figure 3.4** Groundwater Ammonia trend data



## **3.2 Surface Water Monitoring**

The site is within the catchment of three streams (Ballynagran, Ford and Killandra) as well as the Three Mile Water River. The catchments are characterised by sudden high flows coinciding with high rainfall periods and particularly low flows in the drier summer months.

### *3.2.1 Visual Assessment*

Greenstar carries out weekly inspections of the surface water drainage system. The inspections completed in the reporting period did not identify the presence of any impact on the drainage system associated with site activities.

### *3.2.2 Chemical Assessment*

The surface water monitoring was conducted quarterly at the ten monitoring locations specified in the Licence and reported to the Agency on a quarterly basis. The sampling was carried out in accordance with internationally accepted techniques and control procedures, the analyses were completed by a laboratory using standard and internationally accepted procedures.

Suspended solids were marginally higher than the limit of 35mg/l at SW-10 in Q-2; there were also elevated levels of iron and manganese at SW-9 and SW-10 in Q-4. The levels were normal at the locations downstream of SW-10. Continuous monitoring at the outfall of the surface water lagoon and downstream of it has not shown any impact by the site activities. The 2011 results confirm that this remains the case and that site activities are not impacting on surface water quality.

## **3.3 Leachate**

The monitoring programme involves the collection and testing of leachate samples from the collection sumps and the storage lagoon. The 2011 results indicate an increase in leachate strength throughout the monitoring period, which is expected given the age of the facility. Leachate is removed off site to a Waste Water Treatment Plant (WWPT) as agreed with the Agency.

### **3.4 Landfill Gas (LFG)**

Landfill gas is monitored on a monthly basis in wells located outside the waste body. Ballynagran staff members conducted landfill gas monitoring for eleven of the twelve monitoring events, OCM staff conducted the gas monitoring on the remaining twelfth event. In total 23 no. landfill gas monitoring wells were monitored monthly at Ballynagran during 2011.

Monthly gas results are sent to OCM for inclusion in each quarterly environmental monitoring report. These were included as an appendix in each report sent to the Agency during 2011.

During 2011, methane levels were detected in levels above the licence emission limit value (ELV) of 1% at locations MG16 and MG17. The methane levels have fluctuated over the course of the year with a high of 23% v/v recorded in MG16 in November 2011. A high of 64.8% was detected in MG17 during the November 2011 monitoring round.

Elevated levels of Carbon Dioxide were detected in levels above the licence emission limit value of 1.5% v/v in monitoring wells in MG1, 2, 3, 5, 6, 8, 9, 11, 13, 14, 15, 16, 17, 18 and 20 during 2011. The highest level detected was recorded in monitoring well MG17 in September 2011 at a level of 27.3% v/v.

The high CH<sub>4</sub> and CO<sub>2</sub> levels can be explained by the high baseline concentrations in these wells before the facility began accepting waste.

Historically, high concentrations of methane and carbon dioxide were recorded in MG15, MG16, MG17 and MG18 in October 2006, which was prior to the placement of any waste in the landfill. Background CH<sub>4</sub> and CO<sub>2</sub> concentrations continue to be elevated outside the perimeter of the landfill active waste area. These concentrations are consistent with baseline levels recorded prior to the period of active landfilling on the site. The concentrations may be as a result of the natural degradation of organic material and historical waste having been placed in the vicinity prior to the current operators being active at the site.

Analysis carried out in the vicinity of Ballynagran on two occasions in 2007, and reported by Odour Monitoring Ireland (OMI), showed a VOC profile that is significantly different when comparing perimeter gas wells with active gas wells. In their report, they state that it is highly unlikely that methane and carbon dioxide concentrations in the perimeter gas wells are the results of lateral or horizontal landfill gas migration.

They indicate that the most likely source of the high measurements is from disturbed ground from the construction phase and results represent natural degradation of organic material.

### **3.5 Noise Surveys**

Noise surveys were conducted on four occasions at the locations specified in Table D.1.1 of the Waste Licence. The surveys were carried out in accordance with International Standards Organisation 1996: Acoustics-description and Measurement of Environmental Noise (Parts 1, 2 and 3).

The results at the noise sensitive locations indicate that noise from the site complied with the licence limits.

### **3.6 Dust Monitoring**

Dust deposition is monitored monthly at seven monitoring locations (AD-6, 7, 8, 9, 10, 11 and 12) as specified in Table D.1.1 of the Waste Licence. There was one exceedance of the dust deposition limit of 350 mg/m<sup>2</sup>/day at AD-6 (654 mg/m<sup>2</sup>/day) in February 2011. The AD-6 dust jar at the time of sampling was noted to contain a lot of organic matter suggesting that the result may have been caused by tampering. All of the remaining 2011 monitoring results were less than the deposition limit set in the Licence (350 mg/m<sup>2</sup>/day) and dust is not an issue at the facility.

### **3.7 PM<sub>10</sub>**

PM<sub>10</sub> levels were monitored on four occasions at the locations specified in Table D.1.1 in March, June, September and November 2011. All measurements were below the trigger level of 50 µ/m<sup>3</sup>.

### **3.8 Meteorological Monitoring**

Climate data for 2011 was collected from the synoptic stations at Casement Aerodrome and Ashford Climatological Station which is located 16 km to the north of the facility. The rainfall data was taken from the Ashford station as it is closer to the landfill site than Casement. Table 3.1 below details summary monthly data for 2011.



**Table 3.1** Meteorological Data: Ashford and Casement Aerodrome – 2011

Ashford Station					Casement Aerodrome Station				
Month	Rainfall	Max Temp	Min Temp	Average Temp	Average Wind Speed	Average Wind Direction (Degrees from North)	Average MSL Pressure (hPa)	Average Relative Humidity (%)	Average Potential Evapotranspiration (mm)
Jan	42.0	12.6	-4.4	-4.4	8.8	191.1	1017.8	89.0	0.3
Feb	134.0	14.7	-2.8	-2.8	11.1	186.8	1008.9	88.9	0.6
Mar	24.6	16.7	-2.9	-2.9	7.4	150.6	1021.5	82.8	1.1
Apr	17.6	20.4	0.8	0.8	8.5	155.3	1018.7	76.9	2.2
May	49.6	18.7	0.9	0.9	13.5	202.1	1014.5	76.1	2.5
Jun	86.4	23.7	1.0	1.0	8.6	203.5	1013.8	79.4	2.7
Jul	42.8	20.6	6.4	6.4	6.4	206.8	1013.1	79.4	2.6
Aug	27.7	23.6	4.8	4.8	7.6	207.9	1012.2	81.8	2.0
Sep	46.1	20.9	4.6	4.6	12.6	212.0	1008.6	82.3	1.7
Oct	108.4	21.6	0.2	0.2	12.7	206.3	1012.7	86.8	1.0
Nov	102.3	16.3	-0.4	-0.4	11.5	169.3	1011.6	84.5	0.6
Dec	49.1	15.0	-1.1	-1.1	15.6	229.8	1008.9	88.5	0.4

### 3.9 Biological Monitoring

The annual biological assessment of the three streams (Ballynagran, Ford and Killandra) as well as the Three Mile Water River, Ballynagran Co. Wicklow was carried out on the 10<sup>th</sup> August 2011.

A Q Value of 3 (moderate) was assigned to all three sites in 2011. The Q values assigned in 2011 were the same as those awarded in 2010 and only slight differences in Q value have been recorded since 2008.

As there were no significant differences in results from the sites which can be considered up gradient of the landfill (SW1-SW3) and those considered down-gradient of the landfill (SW4-SW10) there are no indications that the landfill development is having a significant impact on water quality in the surrounding watercourses.

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## 4. SITE DEVELOPMENT WORKS

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### 4.1 Summary of Resource & Energy Consumption

The principal energy resources consumed at the site are electricity, water for potable supply oil, vehicle wheel cleaning and dust suppression, diesel fuel and hydraulic oils. All site vehicles are fuelled by diesel. Table 4.1 presents an estimate of the resources used on-site in 2011.

**Table 4.1** Resources Used On-Site

<b>Resource</b>	<b>Units</b>	<b>Total Consumption in 2011</b>
Electricity	kWh	106,443
Diesel Oil	Litres	188,020 litres
Water, potable supply	Litres	52000 litres
Water, dust suppression	Litres	1,300,000 litres
Water, wheelwash	Litres	110,000 litres
Hydraulic Oils	Litres	1000 litres

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## 5. EMISSIONS

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### 5.1 Leachate

There are no direct emissions from leachate generated on-site as it is collected in the main leachate storage lagoon prior to removal off-site for treatment. The total volume of leachate tankered off-site during the reporting period January 2011 – December 2011 was 28,282 m<sup>3</sup>. Detailed figures are presented in Table 5.1 below.

**Table 5.1** Leachate taken off site in 2011.

<b>Month 2010</b>	<b>Volume ( m3)</b>
January	3619
February	3433
March	3259
April	1851
May	1966
June	1989
July	457
August	1597
September	3660
October	1998
November	2437
December	1890
<b>Total</b>	<b>28,282</b>

Water balance calculations were prepared using guidance in the Agency's Landfill Manual-Landfill Site Design and are based on total rainfall data from the Casement and Ashford Met stations and the volumes of waste deposited at the site during the reporting period. The calculations are presented in Table 5.2.

It was assumed that all of the incident rainfall on the active cells had the potential to generate leachate. An absorptive capacity of 0.025 m<sup>3</sup>/tonne was used based on a waste density of 0.8 tonnes/m<sup>3</sup>.

The calculations indicate that approximately 25,604m<sup>3</sup> of leachate was generated in 2011. The calculations take into account the placement of capping on 16,000m<sup>2</sup> of the landfill. The calculation assumes that the capping has been in place for the whole of 2011 and therefore underestimates the total amount of leachate generated. Therefore the estimated leachate volumes are slightly lower than the 28,282 m<sup>3</sup> of leachate that was removed during the reporting period.

## 5.2 Landfill Gas

The enclosed 2500 m<sup>3</sup>/hour landfill gas flare was installed in February 2008 and is connected to 82 No. vertically drilled and passive gas wells, 70 No. gas wells (sacrificial) and 30 No. horizontal gas wells. A landfill gas engine was connected to the Haase Flare in January 2011 and fully commissioned.

Landfill gas infrastructure such as the different variety of wells is installed progressively as the waste is placed and the different gas well types are chosen to meet the specific needs of that particular landfill area.

A Landfill Utilisation Compound was constructed in late 2010 and one Landfill Gas Engine commissioned. The facility is currently exporting 0.75 MWhr to the national grid. The Main Enclosed flare which is connected to the landfill gas engine is extracting on average 2,500m<sup>3</sup>/hour of landfill gas presently. The facility installed a further Enclosed Flare in Cell 7 in May 2010 to replace two open flares situated there since December 2008. Currently this Enclosed Flare is extracting 1,500 m<sup>3</sup>/hour poorer quality landfill gas from Cells 6 and 7.

## 5.3 Estimated Annual and Cumulative Quantity of Indirect Emissions to Groundwater

The potential sources of indirect emissions to groundwater from the facility are as follows:

- **Landfill Base** – The landfill has a composite base lining system comprising a HDPE geomembrane and a half metre thick layer of Bentonite Enhanced Soil. A leak detection survey of the HDPE geomembrane after placement of the drainage stone layer was completed and defects to the HDPE liner were repaired in accordance with industry standards.
- **Surface Water Collection and Treatment System** – Surface water from the paved access roads and landfill cell swale drain is collected and discharged into the surface water lagoon along with groundwater collected at the interceptor sump located below the landfill cells. Water from the lagoon discharges to the reed bed which further filters the water before it is finally discharged to the Ford Stream.
- **Treated Sewage Effluent** – There is a biocycle wastewater treatment plant located adjacent to the weighbridge which treats the canteen and office waste water prior to being pumped to the leachate holding tank via the foul-water sump. Leachate (containing foul water) is tankered off-site to a waste water treatment plant via a vacuum tanker.

In summary, as the landfill is fully contained, there are no indirect emissions to groundwater

## **5.4 Surface Water**

Rainfall run-off on the undeveloped parts of the site discharges directly to the surface water drainage system. Rainfall on active fill areas is collected in the leachate collection system. The surface drainage from all roads is directed to the surface water retention pond via an oil interceptor. Drainage from the waste inspection and quarantine bays is directed to the leachate lagoon. The retention pond design and capacity meets the requirements of the Waste Licence. The inlet to the pond is fitted with a Class 1 Full Oil interceptor.

**Table 5.1 Annual Leachate Volume**

Yr.	Active Cell No.	Active Area	Waste Input	Active Infiltration	Intermediate Restoration	Intermediate Restored Area	Intermediate Infiltration	Final Restoration	Restored Area	Restored Infiltration	Liquid Waste	Total Leachate	Absorptive Capacity	Annual Leachate Generation
		Uncapped (m <sup>2</sup> )	(t)	(m <sup>3</sup> )	Cell No.	(m <sup>2</sup> )	(m <sup>3</sup> )	Cell No.	(m <sup>2</sup> )	(m <sup>3</sup> )	(m <sup>3</sup> )	(m <sup>3</sup> )	(m <sup>3</sup> )	
2011	3, 4, 5, 6, 7	40,700	212,000	<b>29,735</b>				1, 2 & part of 5	16,000	<b>1168.96</b>	0	30,904	5,300	<b>25,604</b>
Cell area (m <sup>2</sup> )						-		Estimated maximum waste input ( t/year)					200,000	
Total rainfall (m/year)						0.7306		Liquid waste input (t/year)					0	
Effective Rainfall post vegetation (m/year)						0.189		Final Infiltration					0.07306	10% of Effective Rainfall per annum
Density of <i>in-situ</i> waste (t/m <sup>3</sup> )						0.8		Intermediate Infiltration					0.43836	60% of Effective Rainfall per annum
Absorptive capacity (m <sup>3</sup> /t)						0.025								
Effective Rainfall before vegetation assumed to be (m)						0.45								

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## **6. NUISANCE CONTROL**

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In accordance with Condition 7 of the waste licence, Greenstar is committed to ensuring that the facility does not give rise to nuisance at the facility or in the immediate area of the facility. The potential sources of nuisance at a landfill facility are odour, vermin, birds, flies, mud, dust and litter. A procedure, (F09j - Completion of Daily Site Condition Reports) has been drawn up to comply with Condition 7 and is being carried out at the facility.

### **6.1 Odour**

In accordance with Condition 8.12.2 of the waste licence, Greenstar has submitted a programme to the Agency for the monitoring and assessment of odours emissions arising from the facility. An odour control and monitoring procedure (F 09 r) has been drawn up and carried out in 2011.

Good operational practices on site are the main controls to avoid odour nuisances. These include procedures relating to the Operation Start-Up and Shut-Down (F 09 001) and Waste Acceptance (F 09 a (IV)) (dealing with the handling, depositing and covering of waste at the facility). These procedures have been written in accordance with the Landfill Manual .Landfill Operational Practices., published by the Agency and are incorporated into the odour control and monitoring procedure onsite.

Landfill gas extraction wells and a landfill gas flare are currently in operation. This active gas extraction system allows for the long term control of any potential odours. Independent experts (Odour Monitoring Ireland) conducted monitoring on behalf of the Office of Environmental Enforcement in July 2011 and September 2011. The PID/FID survey highlighted areas where there could be potential for VOC escape, by measuring VOC levels around the landfill area. Recommendations from their study of the site have been implemented.

In accordance with daily condition reports, odour inspections are carried out on a daily basis by site staff at the facility and also in response to any odour complaints. In the monitoring period there have been complaints in relation to odours and these are dealt more specifically in Reported Incidents and Complaints. (Section 7).

## **6.2 Vermin and Birds**

Inspections for vermin are carried out on a weekly basis for rodents and on a daily basis for birds, in particular crows. Specialist contractors are employed by Greenstar to control vermin and birds at the facility. Vermin control measures used as part of this programme include internal and external bait boxes, rodenticides and insect control measures. The specialist contractor visits the site at regular intervals throughout the year to inspect the control measures and assess their effectiveness. These control measures have been found to be successful.

## **6.3 Flies**

Particularly during the warmer months, attention is paid to observations of flies. Any observations are recorded on the Daily Site Condition Report (F09(j)(i)). The Facility Manager or the Site Supervisor is notified immediately in order to take measures to eliminate any significant fly populations from establishing.

## **6.4 Dust and Mud**

The site roads are inspected on a daily basis for mud or dust and any observations recorded on the Daily Site Condition Report ((F09(j)(i)). Special attention is paid to dust during the dry months and mud during the wet months and the Site Supervisor or the Facility Manager is notified immediately in order to take measures to minimise or eliminate any potential nuisances arising from mud or dust accumulating on site roads. Some measures include the use of a wheelwash, road sweeper and the use of a water bowser to dampen access roads and stockpiles during periods of dry weather.

## **6.5 Litter**

Litter is controlled by fencing which was installed around the landfill footprint as specified in the waste licence. Portable litter fencing is also used at the working face, which can be moved to various points around the working face depending on the wind direction. Litter inspections are carried out and recorded as part of the daily inspection, which is outlined in the Completion of Daily Site Condition Reports (F09j (i)) and the Procedure for Litter Prevention & Assembly/Disassembly of Nets (F 09 g). The presence of litter is noted on the Inspection Form and removed immediately if practicable. Any litter noted at or outside the boundary fence, which appears to be illegally dumped, is inspected for any indications of identity if possible and reported to the Facility Manager.



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## **7. ENVIRONMENTAL INCIDENTS AND COMPLAINTS**

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### **7.1 Incidents**

There were five minor incidents of Non Urgent Category 3 level with regard to trigger levels specified in Condition 6.4.2 of the licence and six minor incidents of Non Urgent Category 3 level excess emissions specified in Schedule C of the licence. These were reported to the agency as soon as the licensee was notified and did not cause any environmental impacts.

### **7.2 Register of Complaints**

Greenstar maintains a register of complaints in compliance with Condition 10.4. Details of all complaints received during the reporting period and the action taken by Greenstar are available at the facility.

The site received 158 complaints during 2011. A table illustrating the date, the issue, the corrective action taken and date the complaint was closed is provided in Appendix 3.

A summary of the overall number of complaints and issues are:

- 156 complaints with regards to odour
- 1 complaint regarding litter
- 1 complaint regarding flies

Complaints were responded to via the complaints procedure.

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## **8. ENVIRONMENTAL MANAGEMENT SYSTEM**

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### **8.1 Management Structure**

The Management Structure as required by Condition 2.2.1 of the waste licence was submitted to the Agency on 14<sup>th</sup> December 2004, before the start of waste activities and updated in each AER.

#### *8.1.1 Site Management Structure*

The day to day management of the facility and supervision of waste activities are the responsibility of the General Manager, nominated Deputy Manager(s) and the site operatives. The positions and names of the persons who provide management and supervision are set out below: -

- Chief Executive Officer, Rosheen McGuckian
- Operations Director, Geoff Bailey
- General Manager – Landfill Development and Management, Donal Monaghan
- General Manager, John Jones
- Assistant Landfill Manager, Robert Kirwan
- Site Foreman, Michael Macleod
- Landfill Clerk, Angela Bates
- General Operatives, Joseph Donohue, Kevin Healy, Joseph Moore, Mathew Powell and John Kinsella

#### *8.1.2 Responsibilities*

Greenstar, as the licensee, is responsible for ensuring that the requisite resources are provided to operate the facility in accordance with the objective of the EMP and the Waste Licence conditions.

The General Manager or nominated Deputy is responsible for ensuring that the day to day operation of the facility is carried out in accordance with the EMP, the Waste Licence conditions and the Operating Procedures.

The General Manager or nominated Deputy is responsible for ensuring that the environmental monitoring programme is carried out and reports submitted to the Agency in accordance with the schedule in the EMP and the Waste Licence conditions.

The General Manager or nominated Deputy is responsible for arranging that the specified engineering works, the leachate and landfill gas management programmes and the restoration programmes are properly implemented.

The General Manager or nominated Deputy is responsible for ensuring that the Corrective Action Procedures, Emergency Response Procedures and Contingency Arrangements specified in the EMP and the Waste Licence are implemented.

The General Manager or nominated Deputy is responsible for arranging appropriate training programmes for all facility personnel and for maintaining training records.

The General Manager, nominated Deputy and designated staff are responsible for implementing the waste acceptance procedures, including the assessment of suitability of the waste for disposal and recording the data specified in the Waste Licence. They are responsible for receiving and recording complaints from members of the public at the facility and informing the General Manager or nominated Deputy of the complaints.

The General Manager, nominated Deputy, Site Foreman and designated staff are responsible for ensuring compliance with conditions relating to waste inspection, placement and nuisance control (e.g. daily cover, litter, dust, vermin, birds).

### *8.1.3 Staff Training*

All training was carried out as scheduled in the training plan for 2011. A summary of all training to date can be seen in Appendix 4.

Any facility staff who performs duties which involve interpretation of monitoring results or site inspections, will receive the appropriate training by the General Manager or nominated deputy, prior to carrying out such duties.

All facility staff will receive further training in their individual areas of activity. This training will comprise theoretical sessions as well as practical training. All such training will be recorded and documented in individual training files.

## **8.2 EMP**

Greenstar have implemented an Integrated Management System (IMS) in accordance with the requirements of Occupational Health and Safety Assessment Series (OHSAS) 18001:2007 and International Standard Organisation (ISO) 14001:2004 in order to manage the Health, Safety and Environmental performance of their business and to control health and safety risk and to minimise their environmental aspects and impacts. Ballynagran Residual Landfill was the first Greenstar landfill to gain certification for both ISO14001 and ISO 18001 Environmental, Health and Safety management systems.

The IMS has been developed for the achievement of continual improvement taking into the requirements of the Waste Licence Conditions. Greenstar has prepared and effectively implement documented procedures and instructions in accordance with the requirements of both the OHSAS 18001:2007 and ISO 14001:2004.

As part of this IMS Greenstar has developed a list of environmental, management, operating and maintenance procedures, details of which are outlined in Appendix 5. The schedule of Objectives and Targets, including their status for 2011 (Table 8.1), as well as the proposed Objectives and Targets for 2012 (Table 8.2) are presented below.

### *8.2.1 Schedule of Objectives 2011*

Table 8.1 describes the implementation of the objectives and targets in the reporting period.

### *8.2.2 Schedule of Objectives 2012*

Greenstar has set a schedule of targets and objectives for 2012. These are presented in Table 8.2.

## **8.3 Communications Programme**

The Communications Programme required by Condition 2.4 of the waste licence, was established three months before the start of waste activities and has been submitted to the Agency.

In December 2011, a newsletter relating to activities at Ballynagran Residual Landfill was sent out to all local householders.

Ballynagran Landfill pursues an active programme of disseminating information on its operations to all interested parties. This is undertaken through a variety of means including site tours, the company website, presentations and open days. During 2008, a short film was produced detailing how the facility was constructed and is operated. The film is shown to all those visiting the facility.

The overall communications programme contains the following objectives:

- To promote public awareness of Greenstar's activities and environmental policies;
- To maintain an ongoing dialogue with authorities that have direct involvement with waste;
- To make available Environmental Performance Data to all interested parties;
- To disseminate information relating to the operation and management of the site;
- To encourage liaison between the site and local residents and those who may be affected by the site operations,
- To provide general information on waste management issues;
- To ensure all users and customers of the site are conversant with the requirements of the site waste licence;
- To ensure that all objectives are, where possible, measurable and quantifiable;

The objectives of the programme are met through the following elements as appropriate:

- Personal contact;
- Residents meetings/Liaison groups;
- Information displays;
- Information packs;
- Site visits;
- Web page;
- Educational links; and
- Published information

**Table 8.1** Progress Report on Schedule of Objectives and Targets for 2011

<b>1. Development of landfill gas infrastructure and gas utilisation plant</b>
16 <sup>th</sup> September 2011 – 18 extra vertical wells were drilled.
11 <sup>th</sup> January 2011 – Landfill Gas Utilisation Engine installed.
13 <sup>th</sup> August 2011 - installed 6 new passive built gas wells.
Throughout 2011 - installed additional 125 mm gas ring and 180mm gas ring in Cell 4, 6 and 7. Approximately 20 horizontal trenches installed during the year.
18 <sup>th</sup> September 2011 - 16,000 m2 of Cell 1, 2 and 5 were permanently capped improving landfill gas collection.
<b>2. Review and assess effectiveness of nuisance controls</b>
March 2011 – Annual review of O&T completed by GM.
26 <sup>th</sup> May 2011 – on going.
06 <sup>th</sup> Aug 2011 – on going.
30 <sup>th</sup> Nov 2011 – no changes – on going.
<b>3. Nuisance from vehicles movements</b>
March 2011 – Annual review of O&T completed by GM.
26 <sup>th</sup> May 2011 – ongoing.
19 <sup>th</sup> Aug 2011 – Continuation of tipping in Cells 6, 3, 4 and 7 in preparation for final capping heights.
30 <sup>th</sup> Nov 2011 – no changes.
<b>4. Further development of relationship with neighbouring communities / reduce environmental complaints</b>
12 <sup>th</sup> Mar 2012 – all complaints are up to date.
March 2012 – Annual review of O&T completed by GM.
Greenstar Ballynagran Landfill Community Fund was formally established during 2010.
The fund provides support to local community organisations which are located within 3km of the landfill.
Allocation of money from the fund is managed by Local Residents, Greenstar, Wicklow County Council and local Councillors
Community liaison committee meetings were held throughout 2010. The liaison committee decides which community facilities and environmental projects the fund is to support in the local area.
The community liaison fund paid out the following amounts during 2011 –

1.Glenealy National School, new boiler and radiators – 25k.
2.Ballynagran Energy Plus Community Project – 149k.
3.Small Grants Scheme to upgrade local residents houses – 240k.
4.Kilbride Church – 77k.
26 <sup>th</sup> May 2010 – An Bord Pleanála have confirmed the Community Liaison Committee levy, while facility sponsorship however has been given to the following in 2010 :-
Red Kite Project.
Buffers Alley Hurling Team Golf Classic.
Glenealy National School Golf Classic.
UCD Engineering Design Challenge.
Rathnew Soccer Club.
BNG are continuing to support Wicklow Lifeboats and made a further donation in June 2011.
Greenstar Ballynagran has decided to support the <b>Ballynagran Zero Carbon Community Project</b> which aims to make the local area carbon neutral using the community liaison fund to implement local sustainable projects.
<b>5. Planting programme</b>
There was no additional tree planting at the facility during 2011.
Maintenance involving re-stacking and re-tying of existing trees was carried out during November 2011.
18 <sup>th</sup> Mar 2012 - next planting programme will commence in 2012 budget dependant.
<b>6. Awareness and Training Programme</b>
The next awareness training is due in June 2012 for all staff members and in September 2012 for Renton Plant contractors. Contractors to site are inducted to site before commencing work, part of the inductions includes information on the environmental systems operating on site and how to handle environmental emergency situations.
<b>Assess and Review Energy Consumption</b>
During 2011 an energy audit was undertaken and consideration given to recommendations. However, further development of thorough energy management systems was being in Spring 2011.

**Table 8.2** Schedule of Objectives and Targets for 2012

Originated from	Objective	Target including timescale
F01 - impact no. 1 / AER 2008, 2009, 2010 & 2011	Develop landfill gas collection infrastructure and gas utilisation plant.	Extend gas collection infrastructure into new cells, respond to increased gas generation by installing additional flares and engines, as required. Expand LFG utilisation plant and set up extra engines. Collect and burn approximately 100% of all landfill gas generated by the facility. In 2012 permanently cap sections of cell 6, 3, 4 and 5 to improve gas containment and increase FID surveys from biannually to quarterly. (for timescale see project sheet)
F01 – impact no. 3 / AER 2009,2010 & 2011	Minimise risk of potential water pollution from generation of leachate	Minimise leachate generation. In 2012 permanently cap sections of cell 6, 3, 4 and 5 to reduce leachate generation. (for timescale see project sheet)
F01 – impact no. 5 / AER 2009,2010 & 2011	Reduce dust nuisance on environment and surrounding neighbours	All dust emissions in accordance with Licence (for timescale see project sheet)
F01 – impact no. 4 / AER 2009,2010 & 2011	Avoid contamination of groundwater after a spillage or emergency situation	Carry out spillage emergency response training (for timescale see project sheet)
F01 – impact no. 6 and AER 2008, 2009, 2010 & 2011	Reduce risk of wind blown litter when the site is operating in adverse weather conditions	Ensure site remains compliant with Licence conditions which refer to wind blown litter (for timescale see project sheet)
Risk assessment (hazard no. 4) / AER 2009	To reduce the risk of site personnel being hit by a vehicle	To significantly reduce this type of incident on site.



Originated from	Objective	Target including timescale
F01 - impact no. 7 / AER 2007, 2008, 2009, 2010 & 2011	Review and assess the effectiveness of nuisance control procedures including bird, rats and mice	Continually review and assess all nuisance control procedures to ensure minimal impact on surrounding area. Update reports on bird control and odour abatement measures. Prepare and implement odour nuisance management plan (for timescale see project sheet)
AER 2007, 2008, 2009, 2010 & 2011	Minimise nuisance from vehicle movements and uploading / tipping	Ensure noise, dust, odour from vehicle movements are minimised by correct implementation of relevant operational protocols (for timescale see project sheet)
AER 2007, 2008, 2009, 2010 & 2011	Continue to improve relationships with neighbouring communities / reduce environmental complaints	Develop communications with site neighbours and respond to queries as quickly as reasonably practicable, ensuring that any complaints are followed up in writing as soon as possible after receipt of complaint (for timescale see project sheet).
AER 2007, 2008, 2009, 2010 & 2011	Environmental monitoring	Ensure monitoring results comply with Licence limits and investigate any exceedances of emission limit value (for timescale see project sheet).
AER 2007, 2008, 2009, 2010 & 2011	Monitor progress of planting programme on a regular basis	Regularly review planted woodland area and ensure the replacement of any failed trees to ensure visual impact of site is minimised (for timescale see project sheet).
AER 2008, 2009, 2010 & 2011	Awareness and training programme	Carry out continued ISO and Health and Safety Training

Originated from	Objective	Target including timescale
H&S Policy / AER 2009/AER 2010/AER 2011	<ul style="list-style-type: none"> <li>• Promotion of H&amp;S amongst all employees and the generation of an ethos of continual improvement</li> <li>• Diligent management of operations by employing control mechanisms, procedures and processes that are technologically proven and economically feasible</li> <li>• Promotion of continual improvement, good health and safety work practices through continual review of O&amp;Ts</li> <li>• Fostering of openness, dialogue, enhanced communication and discussion with employees, clients, neighbours, suppliers, contractors and all interested parties regarding our H&amp;S and our O&amp;Ts</li> <li>• Publication and communication of our policy internally and ensuring its availability to the public and interested parties on request so that it is understood implemented and maintained</li> <li>• Measurement of performance by conducting regular audits and assessment of compliance with the OHSAS 18001:2007 standards, EHS policy, relevant legislation and regulatory requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Improvement driven Safety Observation Audit Reports are to be undertaken bi-monthly focussing on swiftly resolving problems as they occur</li> <li>• Develop H&amp;S training giving more focus on empowering employees to become safety representatives, as applicable</li> <li>• Look to develop staff interaction enabling keen spotting of potential problem or hazards through training and communication</li> <li>• Encourage feedback on equipment and resources including adequacy of PPE in protective properties, wear ability and durability and look at alternatives, where appropriate</li> <li>• Develop neighbour relations by encouraging site visits to complainants or mediation through local groups such as the liaison committee or anti-dump group also handling complaints with higher degree of positive feedback</li> </ul>

Originated from	Objective	Target including timescale
<p>AER 2008 &amp; 2009 / 2010 Energy Audit March 10/Jan 11</p>	<p>Assess and review resource and energy consumption at the site (AER 2008)            14 points from Energy Audit March 2011.            1. Review energy policy statement annually.            2. Provide appropriate training annually.            3.. Prepare targets and objectives            4. Annual summary on performance in AER            5. Assessment of energy efficiency of future plant and equipment            6. Communicate policy objectives to staff            7. Provide sub meters for gas utilisation plants            8. Bi-monthly data analyses and identification of efficiency opportunities            9. Annual summary report in AER            10. Provide awareness training to staff            11. Provide feedback to staff            12. Provide time sensors for office lighting            13. Consider introducing bio-diesel for mobile plant            14. Benchmark gas utilisation plant against KTK and IPS systems</p>	<p>Carry out energy efficiency and resource use audit            Annually next audit report to be carried out in January 2014.</p> <p>For 14 points of energy audit carried out in February 2011 see project sheet.</p>

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## **9. OTHER REPORTS**

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### **9.1 Financial Provision**

During 2010, the EPA Bank Guarantee was reviewed and is in place for €1,662,504. A copy of the bond was sent to the Agency in January 2011.

### **9.2 Landscape Programme**

There was no additional tree planting at the facility during 2011. There was maintenance carried out on all existing trees planted, in terms of weeding and pruning.

### **9.3 Surface Water and Leachate Management System Inspection and Slope Stability Assessment Report**

A surface water and leachate management system inspection and slope stability assessment report was prepared by Golder Associates and submitted to the Agency during the reporting period. The survey concluded that the slopes are not showing any signs of movement or distress and the surface water lagoon is in good condition.

### **9.4 European Pollutant Release and Transfer Register**

Under the European Pollutant Release and Transfer Register Regulation (EC) No. 166/2006 Greenstar are required to submit information annually to the Agency. A copy of the information submitted to the Agency via the web-based data reporting system is included in Appendix 6.

### **9.5 Tank, drum, pipeline and bund testing and inspection report**

All integrity testing is carried out on site every three years. Testing was carried out on site in 2010 and the reports submitted to the Agency. The testing for all infrastructure was found to be fit for purpose.

# **APPENDIX 1**

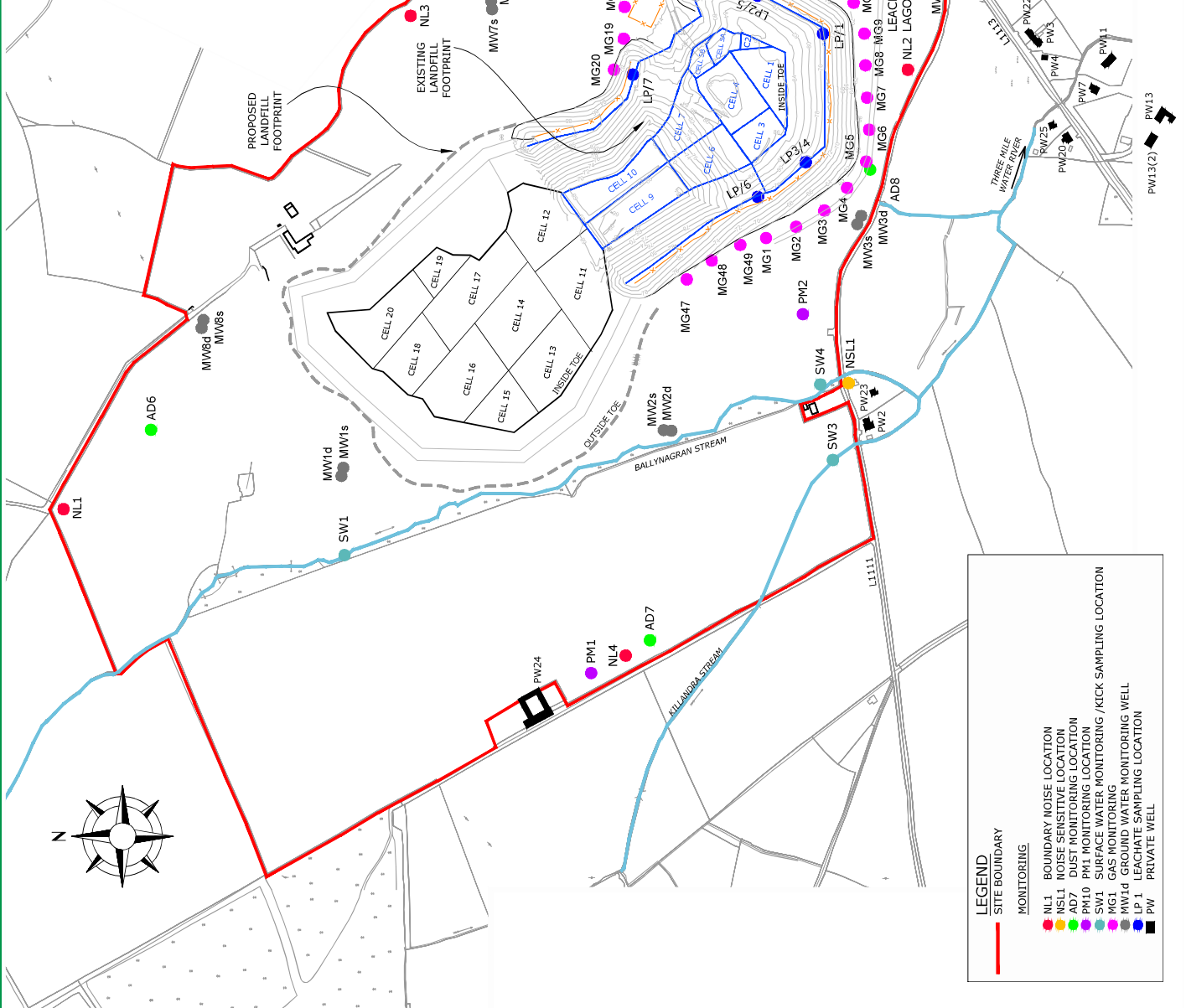
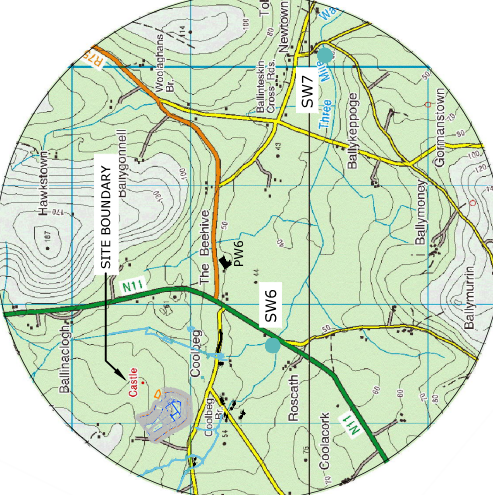
Topographic Survey with Monitoring Locations

Project No.	05	CC	05
Created by	POB	Reviewed by	TVM
ISSUE TO CLIENT		Date	JAN. 11
ISSUE TO CLIENT		Date	APR. 11
ISSUE TO CLIENT		Date	MAR. 12
Scale	1:3,000A1 & 6,000A3	Date	March 2012



**Golden Associates**  
 TOWN CENTRE HOUSE, DUBLIN ROAD, MAAS CO. MILDARE  
 TEL: 045 87 4411 - FAX: 045 87 4549 - www.golden.com

ORDNANCE SURVEY IRELAND  
 LICENCE NUMBER  
**AR0056012**



**LEGEND**

**SITE BOUNDARY**  
 ———

**MONITORING**

- NL1 BOUNDARY NOISE LOCATION
- NSL1 NOISE SENSITIVE LOCATION
- AD7 DUST MONITORING LOCATION
- AD10 SURFACE WATER MONITORING / KICK SAMPLING LOCATION
- SW10 SURFACE WATER MONITORING / KICK SAMPLING LOCATION
- MG1 GMS MONITORING
- MW1d GROUND WATER MONITORING WELL
- LP1 LEACHATE SAMPLING LOCATION
- PW PRIVATE WELL

# **APPENDIX 2**

Monitoring Results 2011

## **Groundwater Data**



<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>MW-1S</b>	<b>MW-1S</b>	<b>MW-1S</b>	<b>MW-1S</b>
pH	7.9	7.73	7.75	7.66
Electrical Conductivity	299	294	233	385
Chloride	19.9	19.3	20	19.7
Ammonia	0.04	0.04	0.04	0.03
Potassium	0.9	0.6	0.8	0.9
Dissolved Oxygen	9	10	11	10
Total Chromium		<1.5		<1.5
TOC	6	3	8	<2
Boron				<12
Cadmium				<0.5
Calcium				31.1
Copper				<7
Iron				<20
Lead				<5
Magnesium				5.1
Manganese				<2
Mercury				<1
Nickel				<2
Sodium				15
Zinc				<3
Fluoride				<0.3
Sulphate				9.73
Ortho Phosphate				<0.03
TON				8.8
Total Cyanide				<0.01
Alkalinity				64
Total Solids				190
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				613.1
Faecal Coliforms				0

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>MW-1D</b>	<b>MW-1D</b>	<b>MW-1D</b>	<b>MW-1D</b>
pH	8.3	8.07	8.33	6.41
Electrical Conductivity	226	246	220	248
Chloride	20.5	20	19.9	20.5
Ammonia	0.04	0.03	0.04	0.02
Potassium	0.6	0.6	0.8	0.9
Dissolved Oxygen	8	9	10	10
Total Chromium		<1.5		<1.5
TOC	2	4	5	<2
Boron				<12
Cadmium				<0.5
Calcium				27.6
Copper				<7
Iron				<20
Lead				<5
Magnesium				6.1
Manganese				<2
Mercury				<1
Nickel				<2
Sodium				17.6
Zinc				<3
Fluoride				<0.3
Sulphate				9.83
Ortho Phosphate				<0.03
TON				9.1
Total Cyanide				<0.01
Alkalinity				670
Total Solids				188
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				<1.0
Faecal Coliforms				0

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>MW-2S</b>	<b>MW-2S</b>	<b>MW-2S</b>	<b>MW-2S</b>
pH	7.63	9.26	7.51	6.37
Electrical Conductivity	316	281	300	371
Chloride	18.1	22	17.2	18.2
Ammonia	0.06	0.09	0.03	0.08
Potassium	1.1	1.3	1.1	1.3
Dissolved Oxygen	11	8	10	10
Total Chromium		<1.5		6.5
TOC	10	4	11	10
Boron				40
Cadmium				<0.5
Calcium				36.4
Copper				<7
Iron				48
Lead				<5
Magnesium				4
Manganese				<2
Mercury				<1
Nickel				<2
Sodium				33.1
Zinc				<3
Fluoride				<0.3
Sulphate				98.71
Ortho Phosphate				0.39
TON				1.6
Total Cyanide				<0.01
Alkalinity				524
Total Solids				289
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				3,076
Faecal Coliforms				100

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>MW-2D</b>	<b>MW-2D</b>	<b>MW-2D</b>	<b>MW-2D</b>
pH	8.11	8.1	7.65	6.16
Electrical Conductivity	348	271	287	315
Chloride	23.9	25.7	17	22.5
Ammonia	0.05	0.03	0.03	0.05
Potassium	0.7	0.6	1	2.1
Dissolved Oxygen	8	8	9	10
Total Chromium		<1.5		<1.5
TOC	7	2	8	8
Boron				<12
Cadmium				<0.5
Calcium				56.2
Copper				<7
Iron				<20
Lead				<5
Magnesium				8.9
Manganese				<2
Mercury				<1
Nickel				<2
Sodium				9.8
Zinc				<3
Fluoride				<0.3
Sulphate				13.64
Ortho Phosphate				<0.03
TON				<0.2
Total Cyanide				<0.01
Alkalinity				522
Total Solids				260
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				15,531
Faecal Coliforms				38

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>MW-3S</b>	<b>MW-3S</b>	<b>MW-3S</b>	<b>MW-3S</b>
pH		8.27	7.92	6.71
Electrical Conductivity		257	292	348
Chloride		13.8	17.6	17.4
Ammonia		0.12	0.02	0.02
Potassium		3.6	1.1	3.9
Dissolved Oxygen		6	11	10
Total Chromium		<1.5		<1.5
TOC		<2	11	2
Boron				30
Cadmium				1
Calcium				62.1
Copper				<7
Iron				<20
Lead				<5
Magnesium				8
Manganese				<2
Mercury				<1
Nickel				<2
Sodium				10.8
Zinc				4
Fluoride				<0.3
Sulphate				21.57
Ortho Phosphate				0.05
TON				1.6
Total Cyanide				<0.01
Alkalinity				854
Total Solids				212
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				48,840
Faecal Coliforms				23

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>MW-3D</b>	<b>MW-3D</b>	<b>MW-3D</b>	<b>MW-3D</b>
pH	8.39	7.96	7.52	6.82
Electrical Conductivity	461	394	292	331
Chloride	16.8	17.7	16.6	17.2
Ammonia	0.03	0.04	0.03	0.09
Potassium	1.3	1.3	1	1.7
Dissolved Oxygen	9	9	9	9
Total Chromium		<1.5		<1.5
TOC	8	<2	12	<2
Boron				33
Cadmium				0.6
Calcium				45.9
Copper				<7
Iron				<20
Lead				<5
Magnesium				8.8
Manganese				31
Mercury				<1
Nickel				<2
Sodium				17.2
Zinc				<3
Fluoride				<0.3
Sulphate				20.33
Ortho Phosphate				<0.03
TON				0.8
Total Cyanide				<0.01
Alkalinity				900
Total Solids				202
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				27,230
Faecal Coliforms				6

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>MW-4S</b>	<b>MW-4S</b>	<b>MW-4S</b>	<b>MW-4S</b>
pH	8.33	8.09	7.89	7.94
Electrical Conductivity	326	318	308	308
Chloride	18.2	18.9	17.3	16.2
Ammonia	0.02	0.02	0.03	0.02
Potassium	0.8	1	1.1	1.4
Dissolved Oxygen	8	8	9	7
Total Chromium		<1.5		<1.5
TOC	6	<2	13	<2
Boron				48
Cadmium				<0.5
Calcium				38.8
Copper				<7
Iron				<20
Lead				<5
Magnesium				8.8
Manganese				3
Mercury				<1
Nickel				<2
Sodium				20.5
Zinc				<3
Fluoride				<0.3
Sulphate				10.61
Ortho Phosphate				0.71
TON				0.2
Total Cyanide				<0.01
Alkalinity				142
Total Solids				190
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				1,986.30
Faecal Coliforms				0

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>MW-4D</b>	<b>MW-4D</b>	<b>MW-4D</b>	<b>MW-4D</b>
pH	8.43	8.2	7.55	7.86
Electrical Conductivity	380	324	302	305
Chloride	18.6	18.1	17	18.5
Ammonia	0.02	0.03	0.02	0.09
Potassium	1.3	1	1.1	1.5
Dissolved Oxygen	8	8	9	9
Total Chromium		<1.5		<1.5
TOC	4	<2	11	<2
Boron				33
Cadmium				<0.5
Calcium				44.1
Copper				<7
Iron				<20
Lead				<5
Magnesium				8.6
Manganese				<2
Mercury				<1
Nickel				<2
Sodium				16.9
Zinc				<3
Fluoride				<0.3
Sulphate				17.46
Ortho Phosphate				0.05
TON				0.8
Total Cyanide				<0.01
Alkalinity				132
Total Solids				189
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				43,520
Faecal Coliforms				4



<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>MW-5S</b>	<b>MW-5S</b>	<b>MW-5S</b>	<b>MW-5S</b>
pH	8.53	8.18	7.71	7.86
Electrical Conductivity	330	328	286	366
Chloride	21.6	23.5	22.3	21.6
Ammonia	0.04	0.06	0.13	0.07
Potassium	0.7	1.3	0.9	1.6
Dissolved Oxygen	7	10	9	9
Total Chromium		<1.5		<1.5
TOC	4	<2	7	2
Boron				31
Cadmium				<0.5
Calcium				46.8
Copper				<7
Iron				<20
Lead				<5
Magnesium				9.1
Manganese				90
Mercury				<1
Nickel				<2
Sodium				17.3
Zinc				<3
Fluoride				<0.3
Sulphate				16.57
Ortho Phosphate				<0.03
TON				2.7
Total Cyanide				<0.01
Alkalinity				136
Total Solids				216
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				5,794
Faecal Coliforms				0

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>MW-5D</b>	<b>MW-5D</b>	<b>MW-5D</b>	<b>MW-5D</b>
pH	8.41	8.18	8.07	7.72
Electrical Conductivity	326	251	285	275
Chloride	22.2	18.9	22.8	19.3
Ammonia	0.06	0.05	0.02	0.02
Potassium	1.2	0.8	0.9	1.4
Dissolved Oxygen	7	9	9	5
Total Chromium		<1.5		<1.5
TOC	8	<2	12	<2
Boron				67
Cadmium				<0.5
Calcium				34.2
Copper				<7
Iron				<20
Lead				<5
Magnesium				9.1
Manganese				4
Mercury				<1
Nickel				<2
Sodium				16.5
Zinc				<3
Fluoride				<0.3
Sulphate				7.22
Ortho Phosphate				0.46
TON				0.5
Total Cyanide				<0.01
Alkalinity				124
Total Solids				165
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				4.1
Faecal Coliforms				0

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>MW-6S</b>	<b>MW-6S</b>	<b>MW-6S</b>	<b>MW-6S</b>
pH	8.32	7.5	7.41	7.14
Electrical Conductivity	249	254	297	285
Chloride	25.5	24.3	24.7	24
Ammonia	0.04	0.03	0.04	0.05
Potassium	1.1	0.7	0.8	0.9
Dissolved Oxygen	8	8	10	9
Total Chromium		<1.5		<1.5
TOC	6	<2	11	<2
Boron				<12
Cadmium				<0.5
Calcium				31.2
Copper				<7
Iron				<20
Lead				<5
Magnesium				7.7
Manganese				<2
Mercury				<1
Nickel				<2
Sodium				14.4
Zinc				<3
Fluoride				<0.3
Sulphate				9.53
Ortho Phosphate				<0.03
TON				7.1
Total Cyanide				<0.01
Alkalinity				76
Total Solids				481
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				141,360
Faecal Coliforms				0

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>MW-6D</b>	<b>MW-6D</b>	<b>MW-6D</b>	<b>MW-6D</b>
pH	8.28	8.13	8.09	6.9
Electrical Conductivity	218	214	209	212
Chloride	21	20.4	21.3	21.1
Ammonia	0.02	0.02	0.05	0.02
Potassium	1.2	0.5	0.7	0.8
Dissolved Oxygen	7	7	9	7
Total Chromium		<1.5		<1.5
TOC	6	<2	12	<2
Boron				<12
Cadmium				<0.5
Calcium				17.2
Copper				<7
Iron				<20
Lead				<5
Magnesium				5.7
Manganese				<2
Mercury				<1
Nickel				<2
Sodium				17.2
Zinc				<3
Fluoride				<0.3
Sulphate				5.11
Ortho Phosphate				<0.03
TON				3.7
Total Cyanide				<0.01
Alkalinity				60
Total Solids				124
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				73.8
Faecal Coliforms				0

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>MW-7S</b>	<b>MW-7S</b>	<b>MW-7S</b>	<b>MW-7S</b>
pH	8.37	7.68	7.86	6.94
Electrical Conductivity	216	205	237	233
Chloride	22.1	15.7	19.8	19.8
Ammonia	0.03	0.09	0.03	0.03
Potassium	0.6	0.6	0.7	0.7
Dissolved Oxygen	8	9	10	10
Total Chromium		<1.5		<1.5
TOC	7	<2	9	<2
Boron				<12
Cadmium				<0.5
Calcium				30.8
Copper				<7
Iron				<20
Lead				<5
Magnesium				5
Manganese				<2
Mercury				<1
Nickel				<2
Sodium				14.5
Zinc				<3
Fluoride				<0.3
Sulphate				9.21
Ortho Phosphate				<0.03
TON				9.4
Total Cyanide				<0.01
Alkalinity				62
Total Solids				186
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				<1.0
Faecal Coliforms				0

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>MW-7D</b>	<b>MW-7D</b>	<b>MW-7D</b>	<b>MW-7D</b>
pH	8.35	7.39	8.41	6.94
Electrical Conductivity	359	158	221	249
Chloride	17	13.6	19.6	20.3
Ammonia	0.02	0.14	0.05	0.02
Potassium	0.6	0.3	0.8	0.8
Dissolved Oxygen	9	8	10	10
Total Chromium		<1.5		<1.5
TOC	6	2	10	2
Boron				<12
Cadmium				<0.5
Calcium				28.3
Copper				<7
Iron				<20
Lead				<5
Magnesium				6.1
Manganese				<2
Mercury				<1
Nickel				<2
Sodium				17.4
Zinc				<3
Fluoride				<0.3
Sulphate				9.64
Ortho Phosphate				<0.03
TON				10.3
Total Cyanide				<0.01
Alkalinity				62
Total Solids				192
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				<1.0
Faecal Coliforms				0

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>MW-8S</b>	<b>MW-8S</b>	<b>MW-8S</b>	<b>MW-8S</b>
pH	Dry	Dry	Dry	Dry
Electrical Conductivity	Dry	Dry	Dry	Dry
Chloride	Dry	Dry	Dry	Dry
Ammonia	Dry	Dry	Dry	Dry
Potassium	Dry	Dry	Dry	Dry
Dissolved Oxygen	Dry	Dry	Dry	Dry
Total Chromium	Dry	Dry	Dry	Dry
TOC	Dry	Dry	Dry	Dry
Boron				Dry
Cadmium				Dry
Calcium				Dry
Copper				Dry
Iron				Dry
Lead				Dry
Magnesium				Dry
Manganese				Dry
Mercury				Dry
Nickel				Dry
Sodium				Dry
Zinc				Dry
Fluoride				Dry
Sulphate				Dry
Ortho Phosphate				Dry
TON				Dry
Total Cyanide				Dry
Alkalinity				Dry
Total Solids				Dry
VOCs				Dry
sVOCs				Dry
Pesticides				Dry
Total Coliforms				Dry
Faecal Coliforms				Dry

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>MW-8D</b>	<b>MW-8D</b>	<b>MW-8D</b>	<b>MW-8D</b>
pH	Dry	Dry	Dry	Dry
Electrical Conductivity	Dry	Dry	Dry	Dry
Chloride	Dry	Dry	Dry	Dry
Ammonia	Dry	Dry	Dry	Dry
Potassium	Dry	Dry	Dry	Dry
Dissolved Oxygen	Dry	Dry	Dry	Dry
Total Chromium	Dry	Dry	Dry	Dry
TOC	Dry	Dry	Dry	Dry
Boron				Dry
Cadmium				Dry
Calcium				Dry
Copper				Dry
Iron				Dry
Lead				Dry
Magnesium				Dry
Manganese				Dry
Mercury				Dry
Nickel				Dry
Sodium				Dry
Zinc				Dry
Fluoride				Dry
Sulphate				Dry
Ortho Phosphate				Dry
TON				Dry
Total Cyanide				Dry
Alkalinity				Dry
Total Solids				Dry
VOCs				Dry
sVOCs				Dry
Pesticides				Dry
Total Coliforms				Dry
Faecal Coliforms				Dry



## **Surface Water Data**

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>SW-1</b>	<b>SW-1</b>	<b>SW-1</b>	<b>SW-1</b>
pH	7.6	6.98	7.67	6.3
Electrical Conductivity	141	240	255	201
Chloride	15.5	15.8	25	16.8
Ammoniacal Nitrogen	<0.2	0.06	0.32	0.02
Total Suspended Solids	<2	<10	<10	<10
Dissolved Oxygen	12	11	11	11
BOD	<1	<1	<1	<1
COD	8.05	7	<7	<7
Boron			<12	
Cadmium			<0.5	
Calcium			61.3	
Copper			<7	
Iron			47	
Lead			<5	
Magnesium			9.4	
Manganese			5	
Mercury			<1	
Nickel			<2	
Potassium			2.3	
Sodium			20.9	
Zinc			<3	
Total Chromium			<1.5	
Sulphate			13.77	
Ortho Phosphate			<0.06	
Total Oxidised Nitrogen			3.1	
Total Alkalinity			162	

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>SW-2</b>	<b>SW-2</b>	<b>SW-2</b>	<b>SW-2</b>
pH	7.88	7.87	8.11	6.9
Electrical Conductivity	226	287	279	233
Chloride	28	28.5	27.8	25.9
Ammonia	<0.2	0.03	0.1	0.02
Potassium	<2	<10	<10	<10
Dissolved Oxygen	12	11	10	10
Total Chromium	<1	<1	<1	<1
TOC	<7	<7	8	<7
Boron			24	
Cadmium			<0.5	
Calcium			31.6	
Copper			<7	
Iron			37	
Lead			<5	
Magnesium			8.8	
Manganese			<2	
Mercury			<1	
Nickel			<2	
Potassium			2.7	
Sodium			19.9	
Zinc			8	
Total Chromium			7.8	
Sulphate			5.32	
Ortho Phosphate			<0.06	
Total Oxidised Nitrogen			3.3	
Total Alkalinity			84	

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>SW-3</b>	<b>SW-3</b>	<b>SW-3</b>	<b>SW-3</b>
pH	7.68	7.8	6.7	7.11
Electrical Conductivity	165	197	212	189
Chloride	17	17.7	18.4	18.1
Ammonia	<0.2	0.04	0.05	0.05
Potassium	<2	<10	<10	<10
Dissolved Oxygen	12.1	11	10	10
Total Chromium	<1	<1	<1	<1
TOC	<7	<7	<7	7
Boron			18	
Cadmium			<0.5	
Calcium			16.3	
Copper			<7	
Iron			22	
Lead			<5	
Magnesium			8.1	
Manganese			<2	
Mercury			<1	
Nickel			<2	
Potassium			2.5	
Sodium			15	
Zinc			10	
Total Chromium			<1.5	
Sulphate			9.5	
Ortho Phosphate			<0.06	
Total Oxidised Nitrogen			2.3	
Total Alkalinity			52	

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>SW-4</b>	<b>SW-4</b>	<b>SW-4</b>	<b>SW-4</b>
pH	7.72	7.89	6.69	7.15
Electrical Conductivity	144	176	201	154
Chloride	15.1	15	18.7	16.6
Ammonia	<0.2	0.04	0.06	0.02
Potassium	<2	<10	<10	<10
Dissolved Oxygen	11.5	10	10	10
Total Chromium	<1	<1	<1	<1
TOC	9.84	<7	21	8
Boron			17	
Cadmium			<0.5	
Calcium			16.3	
Copper			<7	
Iron			22	
Lead			<5	
Magnesium			8.1	
Manganese			<2	
Mercury			<1	
Nickel			<2	
Potassium			2.5	
Sodium			15	
Zinc			11	
Total Chromium			<1.5	
Sulphate			11.11	
Ortho Phosphate			<0.06	
Total Oxidised Nitrogen			2.3	
Total Alkalinity			50	

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>SW-5</b>	<b>SW-5</b>	<b>SW-5</b>	<b>SW-5</b>
pH	8.04	8.1	6.97	7.41
Electrical Conductivity	250	268	284	243
Chloride	26.4	27.8	30.5	24.8
Ammonia	<0.2	0.09	0.09	0.03
Potassium	5.64	<10	<10	<10
Dissolved Oxygen	11.6	10	10	10
Total Chromium	1.06	<1	<1	<1
TOC	12.1	<7	<7	<7
Boron			17	
Cadmium			<0.5	
Calcium			32.2	
Copper			<7	
Iron			26	
Lead			<5	
Magnesium			8.7	
Manganese			<2	
Mercury			<1	
Nickel			<2	
Potassium			2.4	
Sodium			19.4	
Zinc			12	
Total Chromium			8.7	
Sulphate			7.86	
Ortho Phosphate			<0.06	
Total Oxidised Nitrogen			3.8	
Total Alkalinity			80	

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>SW-6</b>	<b>SW-6</b>	<b>SW-6</b>	<b>SW-6</b>
pH	7.9	8.05	7.02	7.56
Electrical Conductivity	210	247	265	219
Chloride	22.8	24.5	25.5	21.7
Ammonia	<0.2	0.09	0.06	0.03
Potassium	<2	<10	<10	<10
Dissolved Oxygen	11.7	10	10	10
Total Chromium	1.3	<1	<1	<1
TOC	<7	<7	<7	8
Boron			17	
Cadmium			<0.5	
Calcium			28.2	
Copper			<7	
Iron			32	
Lead			<5	
Magnesium			8.9	
Manganese			<2	
Mercury			<1	
Nickel			<2	
Potassium			2.5	
Sodium			18.3	
Zinc			13	
Total Chromium			7.8	
Sulphate			8.78	
Ortho Phosphate			<0.06	
Total Oxidised Nitrogen			3.3	
Total Alkalinity			74	

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>SW-7</b>	<b>SW-7</b>	<b>SW-7</b>	<b>SW-7</b>
<b>pH</b>	8.29	8.41	7.73	7.9
<b>Electrical Conductivity</b>	298	350	419	281
<b>Chloride</b>	23.6	24.7	25.1	22.8
<b>Ammonia</b>	<0.2	0.05	0.05	0.04
<b>Potassium</b>	2	<10	<10	<10
<b>Dissolved Oxygen</b>	11.7	11	10	10
<b>Total Chromium</b>	<1	<1	<1	<1
<b>TOC</b>	10.6	<7	<7	<7
<b>Boron</b>			22	
<b>Cadmium</b>			<0.5	
<b>Calcium</b>			66.2	
<b>Copper</b>			<7	
<b>Iron</b>			42	
<b>Lead</b>			<5	
<b>Magnesium</b>			10.2	
<b>Manganese</b>			<2	
<b>Mercury</b>			<1	
<b>Nickel</b>			<2	
<b>Potassium</b>			2.3	
<b>Sodium</b>			17.3	
<b>Zinc</b>			9	
<b>Total Chromium</b>			8.1	
<b>Sulphate</b>			13.68	
<b>Ortho Phosphate</b>			<0.06	
<b>Total Oxidised Nitrogen</b>			3.2	
<b>Total Alkalinity</b>			170	



<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>SW-8</b>	<b>SW-8</b>	<b>SW-8</b>	<b>SW-8</b>
pH	7.99	8.11	6.99	7.82
Electrical Conductivity	237	269	297	252
Chloride	27.4	28.1	30.8	25.7
Ammonia	<0.2	0.11	0.05	0.07
Potassium	<4	<10	<10	<10
Dissolved Oxygen	11.5	11	10	10
Total Chromium	1.24	<1	<1	<1
TOC	11.1	<7	<7	<7
Boron			15	
Cadmium			<0.5	
Calcium			30.4	
Copper			<7	
Iron			28	
Lead			<5	
Magnesium			8.2	
Manganese			<2	
Mercury			<1	
Nickel			<2	
Potassium			2.3	
Sodium			18.6	
Zinc			9	
Total Chromium			8.2	
Sulphate			8.67	
Ortho Phosphate			<0.06	
Total Oxidised Nitrogen			4.1	
Total Alkalinity			76	

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>SW-9</b>	<b>SW-9</b>	<b>SW-9</b>	<b>SW-9</b>
pH	8.41	8.37	7.96	7.82
Electrical Conductivity	330	568	938	376
Chloride	16.1	64.6	91.3	15.1
Ammonia	<0.2	0.09	31.28	0.05
Potassium	6	<10	<10	<10
Dissolved Oxygen	11.4	9	8	10
Total Chromium	<1	<1	4	<1
TOC	9.69	<7	116	<7
Boron			322	
Cadmium			<0.5	
Calcium			60.1	
Copper			10	
Iron			399	
Lead			<5	
Magnesium			9	
Manganese			290	
Mercury			<1	
Nickel			11	
Potassium			33.6	
Sodium			80.8	
Zinc			<3	
Total Chromium			16.5	
Sulphate			12.15	
Ortho Phosphate			0.13	
Total Oxidised Nitrogen			0.8	
Total Alkalinity			340	

<b>Parameter</b>	<b>Q-1 2011</b>	<b>Q-2 2011</b>	<b>Q-3 2011</b>	<b>Q-4 2011</b>
	<b>SW-10</b>	<b>SW-10</b>	<b>SW-10</b>	<b>SW-10</b>
pH	8.35	8.31	7.02	7.7
Electrical Conductivity	344	332	299	382
Chloride	19.2	23.1	30.5	15.9
Ammonia	<0.2	0.07	0.13	0.05
Potassium	19	36	<10	<10
Dissolved Oxygen	10.7	9	10	9
Total Chromium	1.58	4	<1	<1
TOC	16.7	13	<7	12
Boron			15	
Cadmium			<0.5	
Calcium			30.8	
Copper			<7	
Iron			25	
Lead			<5	
Magnesium			8.2	
Manganese			<2	
Mercury			<1	
Nickel			<2	
Potassium			2.2	
Sodium			18.4	
Zinc			12	
Total Chromium			8.4	
Sulphate			8.94	
Ortho Phosphate			<0.06	
Total Oxidised Nitrogen			3.8	
Total Alkalinity			82	

**Noise Data**

**Noise Results 2011 Ballynagran W0165-02 Q1**

Location	Time	Measured Noise Levels (dB re. 2x10 <sup>-5</sup> Pa)				Comments
		L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	Specific level <sup>§</sup>	
NL1	09:26	41	45		39	Slight gusts of wind and distant operational noises.
NL2	10:23	44	46		40	Ejector trailers, distant operation noises such as reversing sirens. Bird songs, intermittent passing traffic.
NL3	08:29	44	47		43	Gusts of wind, distant operation noises such as reversing sirens, ejector trailers and earth moving vehicles.
NL4	12:12	56	45		37	Wind in trees and intermittent passing traffic.
NSL1	11:19	44	45		39	Wind in trees and intermittent passing traffic on L1113.
NSL2	14:13	64	61		47	Intermittent passing traffic on L1113 and bird song. Wind in trees.

\* Specific level: Sound pressure level contribution considered attributable to facility, determined from field notes, time history profiles, statistical analysis, frequency spectra and other parameters.

**Noise Results 2011 Ballynagran W0165-02 Q2**

Location	Time	Measured Noise Levels (dB re. 2x10 <sup>-5</sup> Pa)				Specific level#	Comments
		L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>			
NL1	1323-1338	43	45	32	<32	Site plant in cell faintly audible occasionally on breeze, including ejector trailer donkey engine x1 for 2 min. Bird song/calls and faintly audible distant traffic. Rustling vegetation. Aircraft.	
NL2	1253-1308	40	43	35	<35	Compactor reversing alarm faintly audible intermittently. No other site emissions audible apart from slightly audible ejector trailer donkey engine x1 for 2 min. N11 traffic continuously slightly audible in background. Bird song/calls and highly rustling vegetation. Aircraft. Quarry plant (or similar) slightly audible continuously to S. Sporadic road traffic outside boundary audible.	
NL3	1350-1405	43	45	40	40	Plant in active cell continuously clearly audible, including occasional truck movements and ejector trailer donkey engines. Bird song/calls, aircraft and rustling vegetation. No other noise audible.	
NL4	1534-1549	39	42	31	<31	No facility emissions audible. No sources audible other than rustling vegetation, aircraft and bird song/calls.	
NSL1	1509-1524	55	48	34	<34	No landfill facility emissions audible. Sporadic local traffic. Distant road traffic, and quarry plant or similar, faintly audible to S. Bird song/calls, aircraft and rustling vegetation.	
NSL2	1443-1458	59	54	38	<38	No emissions audible from facility apart from occasional truck movements audible at low level near weighbridge and maintenance area. Intermittent traffic on L1113 local road dominant when present. Bird song/calls, rustling vegetation and aircraft. N11 traffic slightly audible in background continuously.	

\* Specific level: Sound pressure level contribution considered attributable to facility, determined from field notes, time history profiles, statistical analysis, frequency spectra and other parameters.

**Noise Results 2011 Ballynagran W0165-02 Q3**

Location	Time	Measured Noise Levels (dB re. 2x10 <sup>-5</sup> Pa)				Comments
		L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	Specific level#	
NL1	1022-1037	41	44	37	<37	Mobile plant above active cell audible at low level at times, varying on breeze, particularly reversing alarms and ejector trailer donkey engines. N11 traffic to E slightly audible continuously in background. Bird song/calls and aircraft.
NL2	0937-0952	55	54	41	55	Sporadic 6x6 dumptruck movements on adjacent haul road dominant when present. Otherwise, excavator operating on landfill mound continuously clearly audible. Truck movements around maintenance and weighbridge areas also audible, incl ejector trailer donkey engine at maintenance area, dominant 0947-0948. Bird song/calls and aircraft.
NL3	1000-1015	46	48	44	46	Gas flare plant continuously audible and dominant. Mobile plant on mound above active cell also slightly audible over gas flare emissions. Local bird song/calls and aircraft. N11 slightly audible continuously in background to E.
NL4	0847-0902	40	42	32	35-37	Excavator on mound continuously slightly audible. 6x6 dumptrucks accessing mound occasionally audible at low level. Sporadic ejector trailer donkey engines also audible at low level. Bird song/calls and high altitude aircraft. Cattle lowing in surrounding fields occasionally. Distant road traffic to S slightly audible in background continuously.
NSL1	0824-0839	45	44	34	34	Tracked excavator operating on landfill mound continuously audible at low level, not significant. No other site noise audible apart from 6x6 dumptrucks occasionally accessing mound. Sporadic local road traffic dominant when present. Distant road traffic faintly audible continuously in background. Bird song/calls and high altitude aircraft.
NSL2	0805-0820	66	67	50	<50	Intermittent truck movements audible on internal access roadway. Tractor with bowser also audible in weighbridge area, including bowser pump operation 0813-0818. Offsite, N11 traffic continuously audible to N, and prominent in background. Intermittent local road traffic dominant when present. Bird song/calls and high altitude aircraft.

\* Specific level: Sound pressure level contribution considered attributable to facility, determined from field notes, time history profiles, statistical analysis, frequency spectra and other parameters.

**Noise Results 2011 Ballynagran W0165-02 Q4**

Location	Time	Pa)				Comments
		L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	Specific level*	
NL1	1414-1429	43	44	39	<39	Mobile plant above active cell continuously slightly audible, including ejector trailer donkey engine x1. Distant road traffic slightly audible also. Bird song/calls and aircraft.
NL2	1329-1344	45	47	42	<42	No landfill facility emissions audible, apart from sporadic truck movements on onsite access road to E, and wheeled compactor above active cell audible from 1341. N11 traffic to E and SE continuously dominant. Intermittent traffic audible on third class road outside boundary dominant when present. Bird song/calls and aircraft.
NL3	1353-1408	47	48	45	45-46	Excavator x2 and wheeled compactor above active cell, and gas flare plant, all continuously clearly audible. N11 traffic to E also almost continuously audible. No other noise audible, apart from bird song/calls and aircraft.
NL4	1257-1314	45	43	36	<36	Mobile plant at landfill facility continuously slightly audible. Distant road traffic to SE and S audible at low level. Bird song/calls and aircraft. Lightly rustling vegetation. Meas. paused at 0101 to allow truck pass; truck audible idling at 150 m thereafter to 1311, followed by departure past NL4, when meas. paused again.
NSL1	1233-1248	47	42	36	35-36	Mobile plant at landfill facility continuously audible at low level, not significant. Sporadic passing traffic movements on third class road dominant when present. N11 traffic continuously audible to SE in background, and also intermittent traffic on third class road to S. Bird song/calls, aircraft, and nearby watercourse flow.
NSL2	1212-1227	65	60	43	<43	No facility emissions audible, other than truck movement x1 on access road. Intermittent local road traffic dominant when present. N11 traffic continuously audible in background and significant. Bird song/calls and aircraft.

\* Specific level: Sound pressure level contribution considered attributable to facility, determined from field notes, time history profiles, statistical analysis, frequency spectra and other parameters.



**PM10 Data**

**PM10 Results 2011 Ballynagran W0165-02**

<b>Location</b>	<b>March PM<sub>10</sub> Concentration (µg/m<sup>3</sup>)</b>	<b>June PM<sub>10</sub> Concentration (µg/m<sup>3</sup>)</b>	<b>September PM<sub>10</sub> Concentration (µg/m<sup>3</sup>)</b>	<b>November PM<sub>10</sub> Concentration (µg/m<sup>3</sup>)</b>
Location PM1	10.9	22	24	16
Location PM2	19.4	21	23	21
Location PM3	9.3	16	22	20
Location PM4	11.4	18	28	18
<b>Limit Value</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>

## **Dust Data**

**Dust Results 2011 Ballynagran W0165-02**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>AD6</b>	284	654	NS	36.2	41.7	35.3	28.9	13.8	41.3	2.9	9.4	50.5
<b>AD7</b>	*	25.6	NS	91.3	124.1	122.4	100.8	54.5	149	33.9	93.1	56.8
<b>AD8</b>	42.9	14.6	NS	89.6	133.2	186.7	199.9	97	85.7	9.8	83.1	66.6
<b>AD9</b>	26.8	25.6	NS	70.6	67.8	72.1	63.2	51.7	10.7	8.6	66	25.3
<b>AD10</b>	32.2	43.8	NS	46.5	44.7	159.8	32.7	38.5	45	2.9	56	36.7
<b>AD11</b>	69.7	21.9	NS	48.2	112.1	77.8	74.5	163	80.9	83.2	57.1	82.7
<b>AD12</b>	26.8	11	NS	31.6	32.2	34.23	139.9	176.8	30	25.8	32.7	24.7

\* Dust jar broken

NS - denoted not sampled

## **Landfill Gas Data**

Landfill Gas Results 2011 Ballynagran W0165-02

Sample Station Number	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)
MG000001	0	0.1	0.1	0	0	0	0	0	0	0	0	0.1
MG000002	0	0	0	0.1	0	0	0	0	0	0	0	0
MG000003	0	0.1	0	0	0	0	0	0	0	0	0	0
MG000004	0	0	0.1	0	0	0	0	0	0	0	0	0
MG000005	0	0.1	0.1	0	0.1	0	-	-	-	-	0	0.1
MG000006	0	0	0.1	0	0	0	0	0	0	0	0	0
MG000007	0	0.1	0.1	0	0.1	0	0	0	0	Flooded	Flooded	Flooded
MG000008	Flooded	0.1	0	0.1	0.1	0	0	0	0	Flooded	Flooded	Flooded
MG000009	0	0.1	0	0	0	0	0	0	0	0	0	0
MG000010	0	0	0	0	0	0	0	0	0	0	0	0
MG000011	0	0	0.1	0	0	0	0	0	0	0	0	0
MG000012	0	0	0.1	0	0	0	0	0	0	0	0	0
MG000013	0	0	0.1	0	0	0	0	0	0	0	0	0
MG000014	0	0.1	0.1	0	0	0	0	0	0	0	0	0
MG000015	0	0	0.1	0	0	0	0	0	0	0	0	0
MG000016	0.1	11.2	17.8	15.6	9.6	23	18.8	18.8	12.3	10.3	6.2	11.9
MG000017	5.9	6.5	9.7	43.5	51.3	63	62.8	56.2	52.5	55.3	64.8	16.5
MG000018	0	0.4	0.1	0	0	0	0	0	0	0	0	0
MG000019	0	0.1	0.1	0	0	0.1	0	0	0	0	0	0
MG000020	Flooded	0.1	0.6	0	0	0	0	0	0	Flooded	Flooded	Flooded
MG000047	0	0.1	0.1	0	0	0	0	0	0	0	0	0.1
MG000048	0	0	0.1	0	0	0	0	0	0	0	0	0
MG000049	0	0.1	0.1	0	0	0	0	0	0	0	0	0

# - Problem with gas meter therefore it was not possible to take measurement

Landfill Gas Results 2011 Ballynagran W0165-02

Sample Station Number	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	CO <sub>2</sub> (% v/v)	CO <sub>2</sub> (% v/v)	CO <sub>2</sub> (% v/v)	CO <sub>2</sub> (% v/v)	CO <sub>2</sub> (% v/v)	CO <sub>2</sub> (% v/v)	CO <sub>2</sub> (% v/v)	CO <sub>2</sub> (% v/v)	CO <sub>2</sub> (% v/v)	CO <sub>2</sub> (% v/v)	CO <sub>2</sub> (% v/v)	CO <sub>2</sub> (% v/v)
MG000001	0.4	0.5	0.4	0.2	0.1	0	0	3.1	1.4	1.1	0.1	0.1
MG000002	0.1	1.3	0.1	2.4	2.9	3.2	3.3	0.1	0.1	0.6	4.1	0.1
MG000003	0.3	0.5	0.4	1.6	1.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1
MG000004	0.3	0.5	0.5	0.3	0.1	0.2	0.2	0.2	0.2	0.4	0.4	0.6
MG000005	1.3	2.2	2.3	0.3	0.1	0	-	-	-	-	8.4	1.3
MG000006	0.5	0.8	0.4	0.3	0.3	0.6	0.4	0.3	1.3	1.6	0.7	0.5
MG000007	1.1	0.1	0.4	0.4	0.4	0.1	0.2	0.1	0.1	Flooded	Flooded	Flooded
MG000008	Flooded	0.1	4.3	3.9	4.1	4.2	4.2	1.8	1.5	Flooded	Flooded	Flooded
MG000009	0.8	0.2	0.1	2.7	2.1	0.7	1.3	1.2	1.1	1.3	2.1	0.1
MG000010	5.6	0.1	0.1	1.2	0.1	0.2	1.5	1.1	0.9	0.8	0.1	0.1
MG000011	1.3	1.2	0.6	1.3	2	1.5	1.9	1.5	1.2	1.1	3.6	0.1
MG000012	0.5	0.4	0.3	0.3	0.4	0.5	0.6	0.6	0.5	0.8	0.6	0.6
MG000013	0.2	0.2	0.2	0.1	0.1	2.5	1.9	1.9	1.1	1	3.1	0.2
MG000014	0.6	0.3	0.3	0.6	0.8	1	0.9	0.9	0.7	0.6	2.6	2.4
MG000015	0.1	0.5	0.4	0	0	0.5	0.3	0.3	0.6	0.6	6.1	1.3
MG000016	1.3	3.1	3.1	2.7	1.9	5.3	5.8	6.8	9.4	11.9	11.9	8.7
MG000017	15.6	8.9	9.3	7.9	10.4	14.3	15.2	17.2	27.3	23.5	22.7	20.5
MG000018	4.6	2.3	1.3	1.1	0.4	0	0	0	0	0.1	11.3	0.1
MG000019	0.4	0.4	0.4	0.2	0.2	0	0	0	0	0.2	0.5	0.7
MG000020	Flooded	0.1	0.1	1.7	0.8	0.8	2.4	2.4	1.9			Flooded
MG000047	1.4	0.4	0.4	0	0.3	0.4	0.2	0.2	0.2	0.9	0.4	1.5
MG000048	0.1	0.1	0.1	0	0	0	0	0	0	0.2	0.1	0.1
MG000049	0.1	0.1	0.1	0	0	0	0	0	0	0.1	0.1	0.1

# - Problem with gas meter therefore it was not possible to take measurement

**Landfill Gas Results 2011 Ballynagran W0165-02**

Sample Station Number	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)
MG000001	20.9	21.5	20.9	20.5	20.4	20	20.4	20.4	20.1	20.3	19.7	21.4
MG000002	20.8	18.5	21.1	12.8	12.2	11.2	11.1	11.1	11.1	14.8	11.2	21.6
MG000003	21.2	21.5	20.9	19.6	19.9	19.7	20.4	20.4	20.4	20.1	19.6	21.5
MG000004	21	21.3	20.7	20.5	20.4	19.7	20	20	20	20.1	19.4	21.7
MG000005	20.6	20.3	19.8	20.6	20.7	19.8	-	-	-	-	8.6	21.3
MG000006	18.5	15.5	18.5	19.7	18.6	11.3	14.3	16.3	19.2	19.5	12.9	19
MG000007	20.1	21.2	20.9	18.9	19.8	19.6	20	20	20	Flooded	Flooded	Flooded
MG000008	Flooded	21.2	17.1	17.1	17.3	16.3	16.6	18	19.8	Flooded	Flooded	Flooded
MG000009	20.7	21.6	21.1	18.7	18.9	19.3	19.1	19.2	19.9	19.7	18.3	21.9
MG000010	15.9	21.5	21.2	19.3	20.8	19.8	18.6	18.9	19.6	19.5	19.8	22.3
MG000011	20.3	20.5	20.6	19.6	19	18.6	18.5	18.5	19.8	19.7	17	21.9
MG000012	20.3	20.7	20.7	19.9	20.2	19.1	19.2	19.2	20.2	20	17.5	20.5
MG000013	21.1	21.4	21.1	21.1	20.7	13.7	16.3	16.3	19.7	19.9	12.2	21.9
MG000014	18.1	20.8	21	17.9	12.8	9.9	11.3	11.3	14.5	15.7	4.4	5.5
MG000015	21	21.3	21	21.1	21.1	19.6	20.2	20.2	20.6	20.4	12.3	17.9
MG000016	19.7	15	13.7	16.8	18	12.1	11.7	10.9	12.8	14.8	7.2	5.1
MG000017	7.9	15.1	9.3	7.2	4.1	0.7	0.7	0.7	5.7	6.2	0.3	2.2
MG000018	12	15.4	18.5	20.2	20.4	20.3	20.3	20.3	20.3	20.4	1.8	22.1
MG000019	21.1	21.4	21	21	20.4	20.5	20.4	20.4	20.2	20.5	19.3	19.6
MG000020	Flooded	21.5	21.3	16.2	18.7	18.7	13.7	13.7	20.6			Flooded
MG000047	20.4	21.9	20.7	20.4	20.2	20	20.5	20.6	20.6	20.3	19.4	20.5
MG000048	21.1	21.7	20.9	20.4	20.4	20.1	20.3	20.3	20.4	20.6	19.6	21.3
MG000049	21	21.7	21.1	20	20.3	20.2	20.3	20.3	20.2	20.5	19.8	21.3

# - Problem with gas meter therefore it was not possible to take measurement



**Landfill Gas Results 2011 Ballynagran W0165-02**

Sample Station Number	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Barometric Pressure (mb)	Barometric Pressure (mb)	Barometric Pressure (mb)	Barometric Pressure (mb)	Barometric Pressure (mb)	Barometric Pressure (mb)	Barometric Pressure (mb)	Barometric Pressure (mb)	Barometric Pressure (mb)	Barometric Pressure (mb)	Barometric Pressure (mb)	Barometric Pressure (mb)
MG000001	1020	1028	1022	1024	1012	1009	1014	1006	1009	990	980	984
MG000002	1020	1028	1022	1024	1012	1008	1016	1006	1009	990	980	984
MG000003	1020	1028	1022	1025	1013	1010	1016	1006	1009	990	980	984
MG000004	1020	1028	1022	1025	1012	1009	1015	1006	1009	990	980	984
MG000005	1020	1028	1022	1025	1013	1009	-	-	-	-	980	984
MG000006	1020	1028	1022	1025	1012	1010	1016	1006	1009	990	980	984
MG000007	1020	1028	1022	1024	1013	1010	1015	1006	1009	990	980	984
MG000008	1020	1028	1022	1025	1013	1010	1015	1006	1009	990	980	984
MG000009	1020	1028	1022	1024	1013	1008	1016	1006	1009	990	980	984
MG000010	1020	1028	1022	1024	1013	1010	1015	1006	1009	990	980	984
MG000011	1020	1028	1022	1024	1012	1009	1014	1006	1009	990	980	984
MG000012	1020	1028	1022	1024	1013	1009	1015	1006	1009	990	980	984
MG000013	1020	1028	1022	1024	1013	1009	1014	1006	1009	990	980	984
MG000014	1020	1028	1022	1024	1012	1008	1015	1006	1009	990	980	984
MG000015	1020	1028	1022	1023	1011	1008	1014	1006	1009	990	980	984
MG000016	1020	1028	1022	1023	1011	1008	1012	1006	1009	990	980	984
MG000017	1020	1028	1022	1021	1010	1007	1014	1006	1009	990	980	984
MG000018	1020	1028	1022	1023	1010	1006	1013	1006	1009	990	980	984
MG000019	1020	1028	1022	1021	1010	1006	1013	1006	1009	990	980	984
MG000020	1020	1028	1022	1022	1010	1006	1014	1006	1009	990	980	984
MG000047	1020	1028	1022	1023	1011	1006	1015	1006	1009	990	980	984
MG000048	1020	1028	1022	1023	1012	1008	1015	1006	1009	990	980	984
MG000049	1020	1028	1022	1024	1011	1009	1015	1006	1009	990	980	984

# - Problem with gas meter therefore it was not possible to take measurement

# **APPENDIX 3**

Complaints and Incidents 2011

### Incident Register 2011 for Greenstar Ballynagran Residual Landfill

Incident no.	Type of incident	Date of incident	Date of incident report	Details of incident
I-035	Excess Emission	08-Mar-11	14-Apr-11	NL4, NSL2, NSL3 over 55dB limit due to noise from non-landfill sources
I-036	Excess Trigger Level	24-Feb-10	14-Apr-11	Elevated pH levels in groundwater wells, MW 1S and MW 2S and low pH in MW6s
I-037	Excess Emission	Mar-11		AD 6 exceeded ambient dust quality standards. This jar contained a lot of organic matter, so result may be caused by tampering
I-038	Excess Emission	Apr-11	14-Apr-11	Suspended Solids value of 36mg/l at SW10 which is above the 35mg/l licence limit
I-039	Excess Trigger Level	05-Jul-11	04-May-11	9 locations of Elevated VOCs surface emissions
I-040	Excess Level of leachate in cells	31-Aug-11	22-Jul-11	Elevated leachate levels above the 1m in Cells 1, 3, 2/5 and 7
I-041	Excess Trigger Level	15-Sep-11	12-Oct-11	Elevated Ammoniacal N at PW22 and PW23 and elevated chloride at PW4
I-042	Excess Emission	15-Sep-11	12-Oct-11	Elevated iron and manganese above SI 249 of 1989 limits for surface water used for drinking

					water purposes at SW9 and SW10
<b>I-043</b>	Excess Trigger Level	29-Sep-11	12-Oct-11		4 locations of elevated VOCs surface emissions
<b>I-044</b>	Excess Emission	10/11/2011	11/01/2012		GW wells elevated over IGV results for MW2s, MW3s, MW4s, MW4d and MW5d for orthophosphate in Q4 and a higher than IGV value for managanese at MW5s in Q4.
<b>I-045</b>	Excess Emission	10/11/2011	11/01/2012		Elevated iron and managnese above SI 249 of 1989 limits for surface water used for drinking water purposes at SW9 and SW10

Complaint Number	Date/s of complaint	Name of Complainant	Number of complaints	Nature of Complaint	Corrective Action	Formal/ Informal F/I
<b>191</b>	03.01.10, 05.01.10 & 06.01.10	<b>Mr Mulvihill</b>	<b>3</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>

<b>192</b>	01.01.11, 02.01.11 03.01.11 , 06.01.11 & 07.01.11	<b>Ms Liz Hayden</b>	<b>5</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>193</b>	30.12.10	<b>Mr John Connolly</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>I</b>
<b>194</b>	30.12.10	<b>Mr Colin O'Neill</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>I</b>
<b>195</b>	30.12.10	<b>Mrs Liz Doyle</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>I</b>

<b>196</b>	<b>30.12.10</b>	<b>Mr. Paul Verdes</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>I</b>
<b>197</b>	<b>30.12.10</b>	<b>Mr. Stephen Verdes</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>I</b>
<b>198</b>	<b>29.12.10 &amp; 10.01.11</b>	<b>Mr. Pat King</b>	<b>2</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>199</b>	<b>13.01.11</b>	<b>Mrs. Fidelma King</b>	<b>2</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>200</b>	<b>17.01.11, 19.01.11 &amp; 23.01.11</b>	<b>Ms Liz Hayden</b>	<b>3</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>I</b>
<b>201</b>	<b>17.01.11</b>	<b>Mr. Emmet Bunn</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>202</b>	<b>18.01.11, 19.01.11 &amp; 21.01.11</b>	<b>Mr. Michael Mulvihill</b>	<b>3</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>

<b>203</b>	<b>20.01.11 &amp; 21.01.11</b>	<b>Mr. Martin Bunn</b>	<b>2</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>204</b>	<b>20.01.11</b>	<b>Mr. David Ryan</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>205</b>	<b>31.01.11</b>	<b>Mr. Michael Mulvihill</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>206</b>	<b>19.01.11</b>	<b>Mr Hubert Laird</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>207</b>	<b>08.02.11 &amp; 10.02.11</b>	<b>Ms Liz Hayden</b>	<b>2</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>208</b>	<b>05.02.11, 06.02.11 &amp; 10.02.11</b>	<b>Mr. Michael Mulvihill</b>	<b>3</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>209</b>	<b>16.02.11</b>	<b>Mr. Andy Broe (WicklowCC)</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>

<b>210</b>	17.02.11	<b>Mr. Pat King</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>211</b>	17.02.11	<b>Ms. Delphine Geogheghan</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>212</b>	28.02.11	<b>Mr. Michael Mulvihill</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>213</b>	01.03.11, 03.03.11 & 07.03.11	<b>Ms Liz Hayden</b>	<b>3</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>214</b>	15.03.11	<b>Mr. Michael Mulvihill</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>215</b>	16.03.11 , 23.03.11, 24.03.11, 25.03.11, 26.03.11 & 27.03.11	<b>Ms Liz Hayden</b>	<b>6</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>216</b>	24.03.11	<b>Mr. Michael Mulvihill</b>	<b>1</b>	<b>Odour/Flies</b>	Site Inspection carried out. No odour at boundary	<b>F</b>



<b>217</b>	26.03.11 & 27.03.11	<b>Mr. Michael Mulvihill</b>	<b>2</b>	<b>Odour/Litter</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>218</b>	07.04.11	<b>Ms Liz Hayden</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>219</b>	07.04.11 & 10.04.11	<b>Mr. Michael Mulvihill</b>	<b>2</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>220</b>	07.04.11	<b>Mr. Michael Mulvihill</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>221</b>	15.04.11 18.04.11 19.04.11 20.04.11 & 21.04.11	<b>Ms Liz Hayden</b>	<b>5</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>222</b>	15.04.11, 19.04.11, 21.04.11 & 26.04.11	<b>Mr. Michael Mulvihill &amp; Dean Mulvihill</b>	<b>5</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>223</b>	26.04.11, 27.04.11 , 28.04.11, 29.04.11	<b>Ms Liz Hayden</b>	<b>4</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>

<b>224</b>	<b>30.04.11</b>	<b>Ms Liz Hayden</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>225</b>	<b>28.04.11 &amp; 29.04.11</b>	<b>Mr. Michael Mulvihill</b>	<b>2</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>226</b>	<b>25.05.11</b>	<b>Anon</b>	<b>1</b>	<b>Litter</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>227</b>	<b>02.06.11, 03.06.11, 04.06.11, 05.06.11, 10.06.11</b>	<b>Ms Liz Hayden</b>	<b>6</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>228</b>	<b>07.06.11</b>	<b>Mr. Val Cosgrave</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>I</b>
<b>229</b>	<b>05.06.11 &amp; 12.06.11</b>	<b>Mr. Michael Mulvihill</b>	<b>2</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>230</b>	<b>17.06.11 &amp; 20.06.11</b>	<b>Mr. Michael Mulvihill</b>	<b>2</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>

<b>231</b>	<b>20.06.11</b>	<b>Ms Liz Hayden</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>232</b>	<b>26.06.11</b>	<b>Mr. Michael Mulvihill</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>233</b>	<b>30.06.11</b>	<b>Mr. Michael Mulvihill</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>234</b>	<b>06.07.11, 08.07.11, 11.07.11, 12.07.11, 13.07.11</b>	<b>Ms Liz Hayden</b>	<b>5</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>235</b>	<b>06.07.11</b>	<b>Mr. Michael Mulvihill</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>236</b>	<b>09.07.11</b>	<b>Mrs. Joanne Verdes</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>I</b>
<b>237</b>	<b>11.07.11 &amp; 12.07.11</b>	<b>Mr. Michael Mulvihill</b>	<b>2</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>

<b>238</b>	08.07.11	<b>Mr. Pat King</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>239</b>	20.07.11, 21.07.11, 22.07.11, 25.07.11, 26.07.11 & 28.07.11, 29.07.11	<b>Mrs. Liz &amp; Mr.Dернаun Hayden</b>	<b>6</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>240</b>	21.07.11, 20.07.11, 21.07.11, 28.07.11, 29.07.11	<b>Mr Michael &amp;Mrs. Edel Mulvihill</b>	<b>5</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>241</b>	21.07.11 & 28.07.11	<b>Mrs. Joanne Verdes</b>	<b>2</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>242</b>	24.07.11	<b>Ms. Jennifer Cope</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>243</b>	27.07.11, 28.07.11	<b>Mrs. Dephine Geoghegan</b>	<b>2</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>

<b>244</b>	01.08.11 & 03.08.11 & 09.08.11	<b>Ms Liz Hayden</b>	<b>3</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>245</b>	03.08.11	<b>Mr. John Sally</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>246</b>	29.07.11 & 08.08.11	<b>Mr. Michael Mulvihill</b>	<b>2</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>247</b>	12.08.11	<b>Mrs. Fidelma King</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>248</b>	15.08.11	<b>Mrs. Joanne Verdes</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>I</b>
<b>249</b>	16.08.11 & 18.08.11	<b>Mrs. Liz Hayden</b>	<b>2</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>250</b>	18.08.11	<b>Mr. Michael Mulvihill</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>

<b>251</b>	22.08.11, 23.08.11 & 26.08.11, 29.08.11	<b>Mr. Michael Mulvihill</b>	<b>4</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>252</b>	22.08.11, 23.08.11 & 26.08.11, 01.09.11	<b>Mrs. Liz Hayden</b>	<b>4</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>253</b>	<b>01.09.11</b>	<b>Mr. Philip Geoghegan</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>254</b>	<b>No specific date</b>	<b>Mr. Hubert Laird</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>255</b>	<b>08.09.11</b>	<b>Mrs. Liz Hayden</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>256</b>	<b>08.09.11</b>	<b>Mr. Stephen Verdes</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>I</b>
<b>257</b>	<b>20.09.11</b>	<b>Mrs. Dorothy Nolan</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>

<b>258</b>	<b>26.09.11</b>	<b>Mrs. Liz Hayden</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>259</b>	<b>26.09.11</b>	<b>Mr. Michael Mulvihill</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>260</b>	<b>23.10.11</b>	<b>Mrs. Liz Hayden</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>261</b>	<b>24.10.11</b>	<b>Mr. Michael Mulvihill</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>262</b>	<b>07.11.11</b>	<b>Mr. Michael Mulvihill</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>263</b>	<b>02.12.11</b>	<b>Mr. Val Cosgrave</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
<b>264</b>	<b>15.12.11</b>	<b>Mr. Michael Mulvihill</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>

<b>265</b>	<b>20.12.11</b>	<b>Mr. Michael Mulvihill</b>	<b>1</b>	<b>Odour</b>	Site Inspection carried out. No odour at boundary	<b>F</b>
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# **APPENDIX 4**

## Staff Training Records

Trainee	JONES, John	MACLEOD, Michael	KIRWAN, Robbie	MENZIES, Neil	POWELL, Matthew	DONOHUE, Joseph	MOORE, Joseph	HEALY, Kevin	KINSELLA, John	BATES, Angela	DUNN, Dominic	MURPHY, Noel	FITZGERALD, David	DONOHUE, Michael
Course / Trainer														Rennton Plant
Adverse Weather / John Jones	Oct-06	Oct-06	Oct-06			Oct-06	Oct-06	Jun-07	Oct-06	Dec-05				
Ascont Safety Induction	Oct-06	Oct-06	Oct-06			Oct-06	Oct-06	Jun-07	Oct-06	Oct-06				
Banksman Procedures	Jun-11				Jun-11			Jun-11						
Chainsaw Course / NIGEL KEANE consafe@mail.ie - EXPIRY DATE	Mar-14	Mar-14				Apr-14								
Cherry Picker Operation Course / Aerial Platform Hire Ltd - EXPIRY DATES	May-12 C	May-12 C				May-12 C								
Chemical Handling / John Lennon	Oct-06	Oct-06	Oct-06			Oct-06	Oct-06		Oct-06	Dec-05				
CIWM Member	Yes		Yes C											
Communication Skills / LGR Training	Aug-08	Aug-08												
Compactor Operation / Safety Solutions EXPIRY DATES	Oct-12 C	Oct-12 C				Oct-12 C	Oct-12 C							
Complaints Procedure / John Jones	Oct-06	Oct-06	Oct-06							Oct-06				
Daily Inspections / John Jones	Oct-06	Oct-06	Oct-06			Oct-06	Oct-06		Oct-06	Dec-05				
Driver qualification card EXPIRY DATE					Jan-15									
Dumptruck / Jo Donohue	Jun-07	Jun-07				Jun-07	Jun-07		Jun-07					
Dumptruck Operation / T Duignan - EXPIRY DATES (CSCS)	Sept-12 C	Sept-12 C				Sept-12 C	Jan-13 C	Jan-13 C	Jan-13 C	Dec-05				
Emergency Responses / John Jones	Oct-06	Oct-06	Oct-06			Oct-06	Oct-06		Oct-06	Dec-05				
Emergency Response Drill ACCIDENT	Oct-08	Oct-08	Oct-08			Oct-08	Oct-08	Oct-08	Oct-08	Oct-08				
Emergency Response Drill FIRE	May-09	May-09	May-09			May-09	May-09	May-09	May-09	May-09			May-09	
Emergency Response Drill FIRE	Mar-10	Mar-10	Mar-10			Mar-10	Mar-10	Mar-10	Mar-10	Mar-10	Mar-10	Mar-10	May-09	
Emergency Response Drill SPILL	Jun-09	Jun-09	Jun-09			Jun-09	Jun-09	Jun-09	Jun-09	Jun-09	Jun-09	Jun-09	Jun-09	Jun-09
Emergency Response Drill GENERAL EMERGENCY	Sep-10	Sep-10	Sep-10		Sep-10	Sep-10	Sep-10	Sep-10	Sep-10	Sep-10	Sep-10	Sep-10	Sep-10	Sep-10
Energy Policy and awareness training / Robert Kirwan	Mar-10	Mar-10	Mar-10		Jul-10	Mar-10	Mar-10	Mar-10	Mar-10	Mar-10				
Environmental Awareness training / Robert Kirwan	Jun-08	Jun-08	Jun-08		Jun-10	Jun-08	Jun-08	Jun-08	Jun-08				Sep-09	Sep-08
Excavator Operation / T Duignan - EXPIRY DATES (CSCS)	Complete C	Mar-15	Complete C	Autumn 07		Dec-12 C								
FAS Waste Management Course	Complete C	Complete C	Complete C											
Fire Safety and Procedures / John Lennon		Jan-07				Jan-07	Jan-07		Jan-07	Dec-05				
First Aid / NB Training Services or James Maye EXPIRY DATES		May-14							May-14					
First Line Supervisory Skills / Legal Island		Sept-07 C												
Fleet insurance procedures training	Feb-11	Feb-11	Feb-11		Feb-11	Feb-11								
Gas Management / CIWM	Jul-07	Jul-08	Mar-08 C	Sep-07		Apr-07	Apr-07							
Gas System Checks and Balancing / John Jones/Ciaran Geoghegan		Mar-09 C	Jan-08											
Hazard Identification & Risk Assessment Workshop / Oliver Callan			Jan-09											
Refresher Gas system check and balancing / Robert Kirwan		Oct-06	Oct-06			Oct-06	Oct-06	Jan-09	Jan-09	Dec-05				
H&S Induction / John Lennon	Oct-06	May-07	Apr-08	May-07	Jun-10	May-07	May-07	Oct-06	Oct-06	May-07				
H&S Statement and Risk Assessments / Jim Duff	Apr-08	Apr-08	Apr-08			Apr-08	Apr-08	Apr-08	Apr-08	May-07				
Refresher H&S Statement and Risk Assessments / Jim Duff	Nov-06	Nov-06	Apr-08			Nov-06	Nov-06	Apr-08	Apr-08	Nov-06				
Housekeeping Procedures / J Jones	Nov-06	Nov-06	Apr-09	Feb-07		Nov-06	Nov-06	Nov-06	Nov-06	Dec-05				
HR Induction / Fiona Gibby	Nov-06	Mar-09	Jan-08			Nov-06	Nov-06	Nov-06	Nov-06					
HR Disciplinary / Grievance Policy	Jan-08													
IOSH Managing Safety Course				Sep-07						Feb-10				
ISO 14001 EMS internal auditors course / SGS UK Ltd										Sept-07 C				
ISO 18001 OH&S internal auditors course / SGS UK Ltd										Oct-09				
ISO Training / Robbie Kirwan	Apr-08	Apr-08	Apr-08	May-07		Apr-08	Apr-08	Apr-08	Apr-08	Apr-08			Sep-08	Sep-08
KTK Gas System / Dominic														
KNK EMS system / R Wilkes	Oct-06	Oct-06	Oct-06			Oct-06	Oct-06			Apr-08				
Landfill Construction / John Jones	Oct-06	Oct-06	Oct-06			Oct-06	Oct-06	Jun-07	Oct-06	Dec-05				
Licence Conditions / John Jones	Oct-06	Oct-06	Oct-06			Oct-06	Oct-06	Jun-07	Oct-06	Dec-05				

Document type	FORM	Training Schedule													
Title	F05														
Document No.	F05														
<b>Trainee</b> (C denotes a course where a certificate has been received and is on display in the offices)	Course / Trainer	JONES, John	MACLEOD, Michael	KIRWAN, Robbie	MENZIES, Neil	POWELL, Matthew	DONOHUE, Joseph	MOORE, Joseph	HEALY, Kevin	KINSELLA, John	BATES, Angela	DUNNE, Domic	MURPHY, Noel	FITZGERALD, David	DONOHUE, Michael
															Retton Plant
Licence Refresher Training (Cond. 5 and 7) / Neil Menzies	Apr-07	Jun-14	Jun-14	Jun-14		Jun-14	Apr-07	Apr-07	Jun-14	Apr-07	Apr-07	Jun-14	Jun-14		
Manual Handling Training - EXPIRY DATES	Oct-06	Oct-06	Oct-06	Oct-06		Oct-06	Oct-06	Oct-06	Jun-14	Oct-06	Oct-06	Oct-06			
Off site training / KTK					Nov-07										
Report Writing / Professional Development training															
Safe Pass - EXPIRY DATES	Apr-12 C	Apr-12 C	Oct-13	Oct-13		Jun-13	Jul-13	Apr-12 C	Nov-13	Jun-14	Feb-10				
Safety, Health & Welfare Programme FEIEC level 5 / NISO	Nov 08 C	Nov 08 C													
Senior Management Legal Briefing / Ray Byrne NIFAST	Oct-06	Oct-06	Oct-06	Oct-06	Feb-07		Oct-06	Oct-06		Oct-06	Oct-06				
Site Induction / John Jones	Oct-06	Oct-06	Oct-06	Oct-06	Jun-07		Oct-06	Jun-07		Jun-07					
Skid Steer / Michael Macleod	Sept-12 C	Sept-12 C					Sept-12 C	Sept-12 C	Sept-12 C	Sept-12 C					
Supervising Safety Course / NIFAST	Nov-07	Nov-07					Nov-07	Nov-07							
TBT Slips and Trips / J Jones	Jan-07	Jan-07	Jan-07	Jan-07			Jan-07	Jan-07	Jan-07	Jan-07					
TBT Banks Mans Procedure / John Jones	Feb-07	Feb-07					Feb-07	Feb-07	Feb-07	Feb-07	Feb-07				
TBT Walls Disease Refresher / John Jones	Mar-07	Mar-07					Mar-07	Mar-07	Mar-07	Mar-07	Mar-07				
TBT Fire Safety DVD / J Jones	May-07	May-07			May-07		May-07	May-07	May-07	May-07	May-07				
TBT Working in Confined Spaces / Neil Menzies	Jun-07	Jun-07					Jun-07	Jun-07	Jun-07	Jun-07	Jun-07				
TBT Correct use of Safety Belts / John Jones	Jul-07	Jul-07					Jul-07	Jul-07	Jul-07	Jul-07	Jul-07				
TBT Manual handling / M Macleod	Aug-07	Aug-07			Aug-07		Aug-07	Aug-07	Aug-07	Aug-07	Aug-07				
TBT Banksmans Procedures / John Jones	Oct-07	Oct-07			Oct-07		Oct-07	Oct-07	Oct-07	Oct-07	Oct-07				
TBT Material Safety Data Sheets / John Jones	Dec-07	Dec-07	Dec-07	Dec-07			Dec-07	Dec-07	Dec-07	Dec-07	Dec-07				
TBT Safe use of Pressure Washer / Micheal Macleod	Feb-08	Feb-08	Feb-08	Feb-08			Feb-08	Feb-08	Feb-08	Feb-08	Feb-08				
TBT Compaction of covering waste / John Jones	Mar-08	Mar-08					Mar-08	Mar-08	Mar-08	Mar-08	Mar-08				
TBT Horrific Accidents DVD / J Jones	Apr-08	Apr-08					Apr-08	Apr-08	Apr-08	Apr-08	Apr-08				
TBT Slips, Trips and Falls / DVD Safety Media	Jun-08	Jun-08					Jun-08	Jun-08	Jun-08	Jun-08	Jun-08			Jun-08	
TBT Fire Safety DVD / J Jones	Aug-08	Aug-08					Aug-08	Aug-08	Aug-08	Aug-08	Aug-08			Aug-08	Aug-08
TBT Manual handling DVD / J Jones	Sep-08	Sep-08	Sep-08	Sep-08			Sep-08	Sep-08	Sep-08	Sep-08	Sep-08				
TBT Banksmans Procedures / John Jones	Oct-08	Oct-08	Oct-08	Oct-08			Oct-08	Oct-08	Oct-08	Oct-08	Oct-08			Oct-08	
TBT Litter prevention and litter cages assembly / disassembly / MM	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08
TBT Suppression of dust / MM	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08
TBT Vermin control / MM	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08
TBT Handling tipping vehicles / MM	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08
TBT Random inspection of incoming loads / MM	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08
TBT Lone working process / MM	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08
TBT Handling and storage of batteries / MM	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08
TBT Record of tipping location / MM	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08
TBT Procedure for construction of landfill gas vents / MM	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08
TBT Ken Woodward Complete Safety	Jan-09	Jan-09	Jan-09	Jan-09			Jan-09	Jan-09	Jan-09	Jan-09	Jan-09			Jan-09	Jan-09
TBT Tractor Safety / DVD Safety Media	Jan-09	Jan-09	Jan-09	Jan-09			Jan-09	Jan-09	Jan-09	Jan-09	Jan-09			Jan-09	Jan-09
TBT Covering down procedure	Feb-09	Feb-09	Feb-09	Feb-09			Feb-09	Feb-09	Feb-09	Feb-09	Feb-09			Feb-09	Feb-09
TBT DVD on landfill operation and facility management / in house	Feb-09	Feb-09	Feb-09	Feb-09			Feb-09	Feb-09	Feb-09	Feb-09	Feb-09			Feb-09	Feb-09
TBT Risk assessment DVD / Safety Media	Apr-09	Apr-09	Apr-09	Apr-09			Apr-09	Apr-09	Apr-09	Apr-09	Apr-09			Apr-09	Apr-09
TBT Computer and workstation safety DVD	May-09	May-09	May-09	May-09			May-09	May-09	May-09	May-09	May-09			May-09	May-09
TBT Manual handling and electrical safety - farming DVD	Jun-09	Jun-09	Jun-09	Jun-09			Jun-09	Jun-09	Jun-09	Jun-09	Jun-09			Jun-09	Jun-09
TBT Procedure for handling needle stick (F09 005) / refresher	Jul-09	Jul-09	Jul-09	Jul-09			Jul-09	Jul 09 / Feb 10	Jul 09 / Feb 10	Jul 09 / Feb 10	Jul 09 / Feb 10			Jul-09	Jul-09



# **APPENDIX 5**

## Procedures Index



<b>Doc. No.: Control</b>	<b>Revision No.: As Shown</b>	<b>Issue Date: As Shown</b>
<b>Approved By:</b>	Malcolm Dowling – <i>Group Environmental Manager</i>	<b>Page 1 of 4</b>
	Oliver Callan – <i>Group H&amp;S Manager</i>	

<b>Integrated Procedures - IP</b>		
IP-01	Document & Record Control Procedure	Rev 01, 05/07/10
IP-02	Health & Safety Risk Assessment Procedure	Rev 01, 05/07/10
IP-03	Environmental Aspects & Impacts Procedure	Rev 01, 05/07/10
IP-04	Legal & Regulatory Requirements Procedure	Rev 02, 05/11/10
IP-05	Objectives, Targets & Management Programmes Procedure	Rev 01, 05/07/10
IP-06	Competence, Training & Awareness Procedure	Rev 01, 05/07/10
IP-07	Communication & Consultation Procedure	Rev 01, 05/07/10
IP-08	Monitoring, Measurement & Improvement Procedure	Rev 01, 05/07/10
IP-09	Evaluation of Compliance Procedure	Rev 02, 15/09/11
IP-10	Non Conformances, Corrective/Preventive Actions Procedure	Rev 03, 01/02/11
IP-11	Internal Audit Procedure	Rev 02, 07/06/11
IP-12	Management Review Procedure	Rev 01, 05/07/10
IP-13	Control of Contractors/Visitors Procedure	Rev 02, 29/10/10
IP-14	Health & Safety & Environmental Monitoring	Rev 02, 29/10/10
IP-15	Emergency Preparedness & Response Procedure	Rev 02, 01/02/11

<b>Safety Procedures - SP</b>		
SP-01	Permit to Work Procedure	Rev 01, 05/07/10
SP-02	Maintenance & Calibration Procedure	Rev 03, 04/04/11
SP-03	Mobile Plant Procedure	Rev 01, 05/07/10
SP-04	Fork Truck Procedure	Rev 01, 05/07/10
SP-05	Operation of Fixed Plant Procedure	Rev 01, 05/07/10
SP-06	Lock Out / Tag Out Procedure	Rev 01, 05/07/10
SP-07	Health & Safety Notification Procedure	Rev 01, 05/07/10
SP-08	Motor Claim Notification Procedure	Rev 01, 01/02/11
SP-09	MSW Shredder routine Maintenance & Clearing of Blockages Procedure (SCGT)	Rev 01, 01/12/11
SP-10	Weighbridge & Tipping Procedure (SCGT)	Rev 01, 01/12/11



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<b>Approved By:</b>	Malcolm Dowling – <i>Group Environmental Manager</i>	<b>Page 2 of 4</b>
	Oliver Callan – <i>Group H&amp;S Manager</i>	

<b>Environmental Procedures - EP</b>		
EP-01	Office Waste & Energy Management Procedure	Rev 01, 05/07/10
EP-02	Decommissioning and Aftercare Procedure	Rev 02, 14/09/11
EP-03	Environment Communications Procedure	Rev 02, 13/09/10
EP-04	Waste Permits & Licences Procedure	Rev 01, 05/07/10
EP-05	Waste Acceptance Procedure	Rev 01, 05/07/10
EP-06	Unacceptable Waste Procedure	Rev 01, 05/07/10
EP-07	Waste & Material Storage Procedure	Rev 01, 05/07/10
EP-08	Waste Processing Procedure	Rev 01, 05/07/10
EP-09	Site Infrastructure Procedure	Rev 01, 05/07/10
EP-10	Nuisance Management Procedure (Site Specific)	(Site Specific)
EP-11	Civic Amenity Site Procedure	Rev 01, 05/07/10



<b>Doc. No.: Control</b>	<b>Revision No.: As Shown</b>	<b>Issue Date: As Shown</b>
<b>Approved By:</b>	Malcolm Dowling – <i>Group Environmental Manager</i>	<b>Page 3 of 4</b>
	Oliver Callan – <i>Group H&amp;S Manager</i>	

**Amendment History**

Date	Amendment No.	Procedure No:	Revision No:	Comment	Authorised By
05.07.10	01	All	01	Initial Issue	M.D & O.C
13.09.10	02	EP-03	02	Issue of Incident Reports	M.D
20.09.10	03	IP-10	02	Env issues not logged on WIMS Database	M.D
29.10.10	04	IP-13	02	Use of M&M equipment by contractors	M.D & O.C
29.10.10	05	IP-14	02	Use of M&M equipment by contractors	M.D & O.C
29.10.10	06	SP-02	02	Inclusion of Maintenance Schedule	M.D & O.C
05.11.10	07	IP-04	02	Inclusion of other requirements	S.B & O.C
01.02.11	08	SP-08	01	Inclusion of new procedure	O.C
01.02.11	09	IP-10	03	Inclusion of SP-08	O.C
01.02.11	10	IP-15	02	Removal of SF-022	O.C
01.02.11	11	Contents	As shown	EP-10 Site Specific	M.D & O.C
01.02.11	12	Circ List	02	Amendment to document control	M.D & O.C
04.04.11	13	SP-02	03	Inclusion of Site Specific Maintenance schedules	O.C
07.06.11	14	IP-11	02	Inclusion of H&S & Env Internal Audit Schedules	M.D & O.C
14/09/11	15	EP-02	02	Inclusion of decommissioning of plant/equipment	S.B
15/09/11	16	IP-09	02	Inclusion of Statutory Inspections	O.C
01/12/11	17	SP-09	01	Inclusion of new procedure for SCGT	O.C
01/12/11	18	SP-10	01	Inclusion of new procedure for SCGT	O.C



# **APPENDIX 6**

E-PRTR Returns

# AER Returns Workbook

## REFERENCE YEAR 2011

### 1. FACILITY IDENTIFICATION

Parent Company Name	Greenstar Holdings Limited
Facility Name	Ballynagrán Residual Landfill
PRTR Identification Number	W0165
Licence Number	W0165-02

#### Waste or IPPC Classes of Activity

No.	class_name
3.5	Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment.
3.1	Deposit on, in or under land (including landfill).
3.13	Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.
3.4	Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons.
3.6	Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1. to 10. of this Schedule.
4.11	Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.
4.13	Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.
4.4	Recycling or reclamation of other inorganic materials.
4.9	Use of any waste principally as a fuel or other means to generate energy.

Address 1	Ballynagrán
Address 2	Codrag and Kilandra
Address 3	Co Wicklow
Address 4	
Country	Ireland
Coordinates of Location	-8.41098 51.914
River Basin District	IEEA
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous waste
AER Returns Contact Name	John Jones
AER Returns Contact Email Address	john.jones@greenstar.ie
AER Returns Contact Position	Landfill Manager
AER Returns Contact Telephone Number	0404-25440
AER Returns Contact Mobile Phone Number	+353 (0)866566328
AER Returns Contact Fax Number	+353 (0)404 22515
Production Volume	0,0
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	0
User Feedback/Comments	
Web Address	

### 2. PRTR CLASS ACTIVITIES

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

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

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

SECTION A : SECTOR SPECIFIC PRTTR POLLUTANTS

No. Annex II	POLLUTANT	RELEASES TO AIR				Please enter all quantities in this section in KGs			
		M/C/E	Method Code	Method Used	Designation or Description	F (Fugitive)	A (Accidental)	T (Total)	F (Fugitive)
03	Carbon dioxide (CO2)	C	OTH	GasSim2 calculation	2770090.0	0.0	2770090.0	0.0	0.0
01	Methane (CH4)	C	OTH	GasSim2 calculation	6392286.0	0.0	6392286.0	0.0	2736550.0
08	Nitrogen oxides (NOx/NO2)	C	EN 14792-2015	OMI Report	13293	5045.0	6374.8	0.0	0.0
11	Sulphur oxides (SOx/SO2)	C	PER	OMI Report	35902.0	12862.8	48664.8	0.0	0.0

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

SECTION B : REMAINING PRTTR POLLUTANTS

No. Annex II	POLLUTANT	RELEASES TO AIR				Please enter all quantities in this section in KGs			
		M/C/E	Method Code	Method Used	Designation or Description	F (Fugitive)	A (Accidental)	T (Total)	F (Fugitive)
					0.0	0.0	0.0	0.0	0.0

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

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

Pollutant No.	POLLUTANT	RELEASES TO AIR				Please enter all quantities in this section in KGs			
		M/C/E	Method Code	Method Used	Designation or Description	F (Fugitive)	A (Accidental)	T (Total)	F (Fugitive)
					0.0	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) emissions to the environment under 'Total' KG/yr for Section A. Sector specific PRTTR pollutants above. Please complete the table below.

Landfill: Ballynagar Residual Landfill				
M/C/E	Method Code	Method Used	Designation or Description	Facility Total Capacity m3 per hour
	6392286.0			
	4821197.0			
	1287437.0			
	2736550.0			

Please enter summary data on the quantities of methane flared and /or utilised  
 Total estimated methane generation (as per site model)  
 Methane flared  
 Methane utilised in engines  
 Net methane emission (as reported in Section A above)

4.2 RELEASES TO WATERS

[Link to previous years emissions data](#)

| PRTR#: W0165 | Facility Name : Ballynagran Residual Landfill | Filename : W0165\_2011.xls | Return Year: 2011 |

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**SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS**

**RELEASERS TO WATERS**

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

**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 !**

**Please enter all quantities in this section in KGs**

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

**SECTION B : REMAINING PRTR POLLUTANTS**

**RELEASERS TO WATERS**

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

**Please enter all quantities in this section in KGs**

\* 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)**

**RELEASERS TO WATERS**

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

**Please enter all quantities in this section in KGs**

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

**4.3 RELEASES TO WASTEWATER OR SEWER**

[Link to previous years emissions data](#)

| PRTR#: W0165 | Facility Name: Ballynagran Residual Landfill | Filename: W0165\_2011.xls | Rel:

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**SECTION A : PRTR POLLUTANTS**

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER							
No. Annex II	Pollutant Name	M/C/E	METHOD		QUANTITY		
			Method Code	Method Used Designation or Description	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) 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)**

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

**4.4 RELEASES TO LAND**

[Link to previous years emissions data](#)

| PRTR#: W0165 | Facility Name : Ballynagrán Residual Landfill | Filename : W0165\_2011.xls | Return Year : 2011 |

29/03/2012 10:25

**SECTION A : PRTR POLLUTANTS**

POLLUTANT		METHOD		QUANTITY	
No. Annex II	Name	M/C/E	Method Used Designation or Description	T (Total) KG/Year	A (Accidental) KG/Year
				0,0	0,0

**Please enter all quantities in this section in KGs**

\* 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)**

POLLUTANT		METHOD		QUANTITY	
Pollutant No.	Name	M/C/E	Method Used Designation or Description	T (Total) KG/Year	A (Accidental) KG/Year
				0,0	0,0

**Please enter all quantities in this section in KGs**

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

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation		Method Used		Location of Treatment	Hazardous Waste: Name and Licence/Permit No of Recoverer/Disposer	Non-Hazardous Waste: Name and Licence/Permit No of Recoverer/Disposer	Hazardous Waste: Address of Next Destination Facility	Non-Hazardous Waste: Address of Recoverer/Disposer	Name and License /Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
					M/C/E	M/C/E	M/C/E	M/C/E							
Within the Country	19 07 03	No	6.96	landfill leachate other than those mentioned in 19 07 02	R3	M	weighed		Offsite in Ireland	Erva,184-01		Clonnam Industrial Estate,Portlaoise ,County Laois,..,Ireland			
Within the Country	19 07 03	No	3197.65	landfill leachate other than those mentioned in 19 07 02	R3	M	weighed		Offsite in Ireland	ErmiskeryWWTP ,D0088-01		.....,Ireland			
Within the Country	19 07 03	No	17950.7	landfill leachate other than those mentioned in 19 07 02	R3	M	weighed		Offsite in Ireland	GreystonesWWTP ,D0010-01		.....,Ireland			
Within the Country	19 07 03	No	3577.48	landfill leachate other than those mentioned in 19 07 02	R3	M	weighed		Offsite in Ireland	Veolia,D0012-01		Wicklow,.....,Ireland			
Within the Country	19 07 03	No	3756.68	landfill leachate other than those mentioned in 19 07 02	R3	M	weighed		Offsite in Ireland	Rilta Environmental Ltd,W0192-01		Block 402 ,Grant's Drive ,Greenogue Business Park, Rathcoole ,Dublin,Ireland			