ANNUAL ENVIRONMENTAL REPORT

By

Louth County Council

To

Environmental Protection Agency

For

Waste licence Reference (W0033-01)

Reporting Period January – December 2015

DROGHEDA LANDFILL SITE COUNTY LOUTH

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1 Introduction

This Annual Environmental Report (AER) has been prepared to meet the requirements of Condition 2.8 of Waste Licence W0033-01 for Drogheda Landfill and includes the information listed in Schedule C of the Waste Licence. Drogheda Landfill Site has been in operation since 1983 and has ceased accepting waste for disposal since the waste licence was granted on 30th December 1999 as required by the Waste Management (Licensing) Regulations, 1997.

The site is located 600 metres north of the River Boyne on the north-west edge of Drogheda town. The site is adjacent to Leonards Cross at the junction of the R168 road to Collon (and there on to the newly constructed M1) and Cement Road, a minor road linking the Slane Road and the N1 primary road northwards from Drogheda to Dundalk. The site is approximately 32 hectares in extent and was formally a limestone quarry. The site was developed on the benches of the redundant limestone quarry. The site has historically operated on a dilute and disperses principle.

Facility information summary is provided in Table 1.1

Table 1.1 Facility Information Summary

AER Reporting Year	2015
Licence Register Number	W0033-01
Name of site	Drogheda Landfill Site
Site Location	Collon Road
NACE Code	3821
Class/Classes of Activity	Landfill HRC

1.1 Site Geology

A hydrogeology review was undertaken for the site in 2014. The site geology description below is taken from this report (Drogheda Landfill Hydrogeological Review, BlueRock Environmental Limited, 2014).

1.1.1 Regional Bedrock Geology

According to the GSI Bedrock **Geology Map** of Ireland the site is underlain by limestone bedrock of Lower Carboniferous age and classified as Dinantian Pure Bedded Limestones of the Tullyallen Formation (TF). Geological mapping records these rocks dipping less than 20 degrees to the south-southwest with an approximate east-west strike. The Tullyallen Formation is bounded to the north by Silurian metasediments and volcanics belonging to the Glaspistol Formation (GF) and to the west by Dinantian pure bedded limestones of the Platin Formation (PT). The limestones have been deformed into a syncline that dips towards the River Boyne. The bedrock in the region is tectonically juxtaposed by the Slane Fault which trends in an ENE-WSW direction approximately 650 metres to the north of the northern site boundary. Two cross faults are recorded intersecting the Slane Fault, trending in a NNW – SSE direction – one approximately 700 metres west of the site and the second approximately 1200 metres east of the site. The cross fault to the west throws the Tullyallen Formation against the stratigraphically younger Glaspistol Formation.

1.1.2 Site Geology

Depths to bedrock recorded within existing monitoring boreholes at the site range between 0 and 44 bgl. Exposed limestone is evident at the landfill cliff edges surrounding the flooded former quarry void. The bedrock walls show strong vertical jointing and incorporate clay-infilled collapse structures and solution cavities. Logs from two boreholes drilled into the Tullyallen Formation to depths of 54 and 72 m in the same area also report cavities accounting for approximately 10% of the total rock penetration (NERDO, 1981). A previous borehole, drilled in 1998 along the southern boundary of the site (i.e. borehole BH10), recorded a 6m water filled void 27m below the surface. The width and extent of this karst feature is unknown.

Borehole logs from the surrounding area also record well developed karstification. Two trial boreholes drilled in Mell townland through the Tullyallen and Yellowbatter limestone formations (penetrating to 72 and 54.7 metres deep) showed cavities accounting for approximately 10% of the total rock penetration (NERDO, 1981). Both the geological log and the caliper log of the 1979 drilling work at borehole PWSBH01 at Drybridge (to the west of the landfill site) show substantial karstification, including fissure zones at 15 m, 25 m and at 40 mbgl (NERDO, 1981). The three fissures intersected were filled with unconsolidated material. Borehole records from the site investigation for the M1 Northern Motorway recorded cavities/fissures with vertical depths of up to 3 metres (BMA, 1996).

Depths to bedrock were recorded by both boreholes and a Geophysical Survey undertaken by BMA Geoservices in June 2005. Levels recorded ranged between 10 and 30 mOD.

1.1.3 Site Overburden

Most of the overburden was removed during the quarrying activities at the site. However, subsoils surrounding the quarried area of the site (*i.e.* along the northern and western site boundaries) comprise till derived from Lower Palaeozoic shale and sandstones (TLPSsS). Closer to Drogheda and along the Boyne Valley, subsoils consist of Irish Sea Till, derived from Irish Sea basin deposits. Depths of overburden at the site range between 0m (in the southern region of the site) and 44 mbgl (borehole BH5A) to the north of the site. The waste material, as mentioned previously was placed on the exposed limestone benches of the former quarry. Thickness of this waste material across the site is currently unclear. The depth of waste at the site is currently unclear. However, the geophysical survey undertaken by BMA Geoservices in June 2005 suggests thickness of waste ranging between 5 and 35 mbgl.

1.1.4 Groundwater Vulnerability

Groundwater vulnerability is dictated by the nature and thickness of the material overlying the uppermost groundwater. This means that vulnerability relates to the permeability and thickness of the subsoils. A detailed description of the groundwater vulnerability categories can be found in the Groundwater Protection Schemes document (DELG/EPA/GSI, 1999) and in the draft GSI Guidelines for Assessment and Mapping of Groundwater Vulnerability to Contamination (Fitzsimons et al, 2003).

A draft groundwater vulnerability map for Co. Louth has been developed by the GSI. The vulnerability rating for the site, given the exposed bedrock, is classified as extreme vulnerability.

1.1.5 Hydrology

Surface water in this area generally drains from the high ground southwards towards the River Boyne which is located approximately 450 metres south of the site and flows in a west-east direction towards the Irish Sea. A stream, named as Drybridge stream for this report, flows in a north-south direction approximately 450 metres to the west of the site.

1.1.6 Regional Hydrogeology

The GSI has classified the underlying bedrock aquifer as a regionally important karstified aquifer (Rkd) dominated by diffuse flow. The site is located within the Drogheda Urban Groundwater Body (GWB), which has been classified as being of “Good” status. The groundwater body descriptions are available from the GSI website: www.gsi.ie and the

'status' is obtained from the Water Framework Directive website: www.wfdireland.ie/maps.html.

1.2 Restoration Works Undertaken

The following restoration works were undertaken at the site during 2005-2007;

- Installation of 55 No. gas extraction wells
- Installation and commissioning of an active gas extraction flare and methane stripper
- Installation of capping layers consisting of Gas Drainage Layer, LLDPE capping and Surface Water Drainage Layer (A total area of approximately 101,650m^2).
- Reinforcement of the capping system using georgic on slopes greater than 1 in 2.5
- Surface Water Drainage System
- Construction of a 1.0m high safety bund along cliff edges on the site to improve safety.
- Subsoil and topsoil have been placed above the capping layer to a depth of 850mm and 150mm respectively across the site.

1.3 Report Period

The report period for this Annual Environmental Report (AER) is from January to December 2015.

2 Waste Activities Carried Out at the Facility

The licensed disposal activities, in accordance with the Third Schedule of the Waste Management Act, 1996, are restricted to those listed as follows;

- 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

Licensed waste recovery activities, in accordance with the Fourth Schedule of the Waste Management Act, 1996, are restricted to those listed as follows;

- Class 2 Recycling or reclamation of organic substances, which are not used as solvents (including composting and other biological transformation processes).
- Class 3 Recycling or reclamation of metals and metal compounds.
- Class 4 Recycling or reclamation of other inorganic materials.
- Class 10 The treatment of waste on land with a consequential benefit for an agricultural activity or ecological system.
- Class 11 Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.
- 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 collecting, on the premises where such waste is produced.

3 Quantity and Composition of Waste Received and Disposed of During the Reporting Period and Each Previous Year

Table 3.1 shows waste quantities accepted at Drogheda landfill site from 1997-2006. The landfill site is now closed. The site ceased accepting waste for disposal since the waste licence was granted on 30th December 1999; however waste were brought on site for restoration and capping following this date.

Table 3.2 provide the quantities of waste accepted for recycling at Drogheda Civic Waste Facility in 2015. 317 tonnes was sent for disposal as results of contamination of the recyclables, waste accepted for disposal and bulky waste.

Table 3.1 Waste Quantities Accepted (Tonnes) at Landfill Site

Waste Types	1997	1998	1999	2000	2001
Total	75,350[1]	86,000[1]	40,000[1]	58,506[1]	27,085[1]
Waste Types	**2002**	**2003**	**2004**	**2005**	**2006**
Total	21,288[1]	-	8,744	-	58,584[2]

Table 3.2 Waste Quantities (Tonnes) at Civic Waste Facility

Waste Types	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Accepted for Recycling	1,405		3,170	3,521	4,020	3,447	3,086	2,578	2,622	2.726
To landfill/ incinerator					52		390	387	317	166

[1] 1997 to 2002 figures based on estimates.
[2] Capping material under the Capping and Restoration Contract.

Table 3.3 Waste Quantities Accepted for Recycling at Drogheda Civic Waste Facility in 2015

Material Type	EWC Codes	Tonnage	Name of Destination Facility(ies), or Collector(s) if Directly Exported
Mixed residual waste	20 03 01	166	Indaver Incinerator W0167-02
Garden	20 02 01	946	Dundalk Town Council W0034
Cardboard and Paper (packaging)	15 01 01	312	Peute Europe Nl6000076
Cardboard and Paper (non packaging)	20 01 01	134	Peute Europe Nl6000076
Glass packaging	15 01 07	154	Glasson NI LN06/08
Metals (aluminium cans)	15 01 04	9	Tinnelly N.I LN09/10
Metals (steel cans)	15 01 04	38	Tinnelly N.I LN09/10
Other municipal metals (non-packaging)	20 01 40	226	Tinnelly N.I LN09/10
plastic packaging	15 01 02	109	Shabra Plastics MN 080022-01
Clothes/textiles for recovery or disposal	20 01 10 & 20 01 011	31	Cookstown NI WMEX 01/11
wood packaging	15 01 03	236	Dundalk Town Council W0034-02
wood non-packaging	20 01 38	353	Dundalk Town Council W0034-02
lead acid batteries and accumulators	16 06 01*	12	Rilta W0192-02
Total		**2,726**	

4 Methods Of Deposition Of Waste

4.1 Landfill

The site ceased to accept waste for disposal when the waste licence was granted in December 1999. The only materials accepted at the site were inert wastes, which was utilised for capping at the site. Phase 1 capping works were completed in September 2007.

4.2 Civic Waste Facility

The Civic Waste Facility is open;

- Monday - Friday 9.30am - 6.00pm
- Saturday 9.00am - 3.00pm

The following are accepted at the Civic Waste Facility;

- cardboard,
- magazines/paper,
- glass (green, brown, clear),
- aluminium drink cans,
- steel food tins,
- domestic plastics,
- textiles (e.g. clothes) and footwear,
- car and household batteries,
- scrap metal,
- wood,

- electrical and domestic appliances,
- green garden waste,
- miscellaneous.

All waste deposited at the Civic Waste Facility are placed;

- Into a receptacle for recovery, or
- into a designated inspection area.

The storage containers and storage areas are clearly labelled with yellow backgrounds and black/green writing to indicate their content.

There are samples or signage describing the type of waste which can deposited into each container.

5 Summary Report on Emissions

5.1 Emissions to Air

There is no continuous air emission monitoring at Drogheda landfill site. Periodic/non-continuous monitoring is carried out on the flare. This is further discussed in Section 6.12.

In accordance with The PRTR Regulations releases of pollutants and off site transfers of waste by facilities operating in relevant industrial sectors are to be reported by the EPA to the European E-PRTR website where the facility exceeds specified thresholds. The PRTR reporting and landfill gas survey have been completed for Drogheda landfill site and submitted to the EPA. The PRTR is including in Appendix A.

There is a 750m3/hr landfill gas flare in operation at Drogheda landfill site. Based on model predications and information from the landfill gas flares the estimated net emission of methane from the flare combustion process and both surface and lateral emissions from the landfill body is 102,743 kg/year.

Table 5.1 Net Methane Emission

Quantities of Methane Flared and / or Utilised	T (Total) kg/Year
Total estimated methane generation (as per site model)	244,457
Methane flared	141,714
Methane utilised in engine/s	0.0
Net Methane Emission	102,743

5.2 Emissions to Groundwater and Surface Water

There are no direct emissions to groundwater. A water balance calculation has been completed for Drogheda landfill site and is presented in Appendix B. The site is unlined and an area of approximately 101,650 m^2 has been capped. There is no active leachate extraction system on the site. Infiltration in restored areas has been calculated using range of 2-10% of total rainfall. This equates to 2,433 to 9,531 m^3 of leachate produced.

Water discharges from the capped areas of the site via two concrete silt interceptors which discharge the surface water into the quarry lake (SW4 and SW5). This is further discussed in Section 6.9.

5.3 Emissions to Waste Water Treatment Works

There is no continuous wastewater (sewer) emissions monitoring at Drogheda landfill site. Periodic/non-continuous monitoring is carried out at discharge point to sewer from Civic Waste Facility (S2). This is further discussed in Section 6.10.

Condensate from the landfill gas extraction system is currently transported off site to Drogheda wastewater treatment plant via tanker. An estimated 25 m^3 was sent for disposal. The estimated volume discharged from Civic Waste Facility (area 13,500 m^2) is approximately 11,858 m^3 for 2015. This is within the volume limit of the licence.

6 Summary of results and interpretations of environmental monitoring, including plans of all monitoring locations including 12 digit grid references

6.1 Monitoring Locations

Monitoring is carried out at locations and at frequencies as specified in Schedule F of the waste licence. Permanent access to all monitoring points is maintained.

The results contained in this report were assessed as follows;

- EPA Interim guideline values3 (IGV),
- SI No 278 of 2007 EC (Drinking water) Regulations (DWR),
- SI No 9 of 2010 European Communities Environmental Objectives (Groundwater) Regulations 2010 as amended (GWR 2010).
- SI No 294 of 1989 European Communities (Quality of Surface Water Intended for the Abstraction of Drinking Water) Regulations (SWQS),and
- SI No 272 of 2009 European Communities Environmental Objectives (Surface Water) Regulations 2009 (EQS).

Boreholes BH4A and BH10A were installed in March 2000. Boreholes BH1A, BH2A, BH3A, BH5A, BH6A, BH7, BH8A, BH9A and BH11A were installed in August 2001.

These points were surveyed in October 2001 and grid reference points are given in Table 6.1 below. LG1 to LG7 were installed in October 1998. LG8 to LG10 were installed in February 2012.

Leachate monitoring points L1A to L5A were installed in February 2000. No samples of leachate were collected as these monitoring locations are dry. All monitoring points are shown in Drawing No. IBR0856/100 Monitoring Locations in Appendix C.

[3]EPA (2003) Towards setting guideline values for the protection of groundwater in Ireland. Interim Report

Table 6.1 Grid References of Monitoring Points

Monitoring Points	Easting	Northing
Groundwater Boreholes		
BH1A	306777	276414
BH2A	306869	276471
BH3A	307055	276063
BH4A	306959	276523
BH5A	307047	276563
BH6A	307182	275918
BH7	307239	276620
BH8A	307246	275890
BH9A	307394	275853
BH10A	307500	275928
BH11A	307699	276158
Surface Water		
SW1	307164	276270
SW2	307414	276470
SW3	307388	275910
Gas Piezometers		
LG1	306773	276393
LG2	306820	276330
LG3	306867	276283
LG4	306913	276218
LG5	306949	276171
LG6	307564	276281
LG7	307580	276241
LG8	TBS[4]	TBS

[4] Monitoring points to be surveyed

Monitoring Points	Easting	Northing
LG9	TBS	TBS
LG10	TBS	TBS
Leachate		
L1A	307021	276228
L2A	307028	276337
L3A	307216	276378
L4A	307291	276334
L5A	307359	276279
Noise		
N1	306786	276384
N2	306850	276238
N3	307311	275840
Dust		
DG1	306854	276352
DG2	307024	276073
DG3	307539	275993
DG4	307131	275903

6.2 Groundwater

As required under the Waste Licence, groundwater monitoring has been undertaken at the borehole locations as set out in Table 3 of the waste licence. Schedule F of the waste licence requires the monitoring of certain parameters on either a quarterly or annual basis as shown in Table 6.2.

Table 6.2 Groundwater Parameters Monitoring Frequencies

Monitoring Frequency	BH1A, BH4A, BH6A, BH9A, BH10A, BH11A	BH2A, BH3A, BH5A, BH7A, BH8A
Quarterly	Visual Inspection and Odour, Groundwater Level, Ammoniacal Nitrogen, Chloride, Cadmium, Chromium, Electrical Conductivity, pH, Temperature, Iron, Lead, Manganese, Potassium, Sodium, Barium, Nickel, Nitrate, Nitrite, Phenol, Zinc, Dissolved Oxygen, Total Suspended Solids, TON, TOC, Zinc	Visual Inspection and Odour, Groundwater Level, Ammoniacal Nitrogen, Electrical Conductivity, pH, Temperature, Chloride, Dissolved Oxygen, Cadmium, Chromium, Iron, Lead, Manganese, Potassium, Sodium, TON, TOC, Barium, Nickel, Nitrate, Nitrite, Phenol
Annually	Boron, Calcium, Copper, Cyanide, Fluoride, Magnesium, Mercury, Sulphate, Total Alkalinity, Total Phosphorous, Residues on Evaporation, Faecal Coliforms, Total Coliforms, List I & II substances	Boron, Calcium, Copper, Cyanide, Fluoride, Magnesium, Mercury, Sulphate, Total Alkalinity, Total Phosphorous, Residues on Evaporation, Zinc, Faecal Coliforms, Total Coliforms

These results are presented graphically and in table format in Appendix D.

Parameters that are indicative of possible leachate contamination include Ammoniacal-N, Conductivity, Iron, Chloride and heavy metals.

Boreholes BH1A BH2a, BH4a and BH7 provide an indication of the upgradient baseline groundwater characteristics whilst BH3a, BH6a, BH8a, BH9a, BH10a and BH11a considered as intermediate and downgradient locations.

BH6A, BH8A and BH9A typify the downgradient location for flow from the site. In addition, BH11A provides information on the nature of the groundwater deep beneath the landfill site and BH10A provides downgradient information in a borehole, which was penetrated through a karst and hence is potentially an area of relatively high groundwater flows emanating from the site. BH5A is no longer considered an upgradient borehole as it appears to be influenced by leachate emission from the adjacent waste.

Table 6.3 provides a summary of results in 2015 from groundwater monitoring boreholes throughout the monitoring period.

Table 6.3 Summary of 2015 Results from Groundwater Monitoring Boreholes

	Units	No. of Samples	Minimum	Maximum	Mean
Alkalinity	**mg/l CaCO3**	11	140	387	245
Aluminium	**ug/l**	42	<10.0	12	
Ammonia	**mg/l N**	42	<0.020	2	
Antimony	**ug/l**	42	<1.0	3.5	
Arsenic	**ug/l**	42	<1.0	9.8	
Barium	**ug/l**	42	11	60	41
Beryllium	**ug/l**	42	<1.0	<1.0	
Boron	**µg/l**	42	16	170	66
Cadmium	**µg/l**	42	0.02	0.4	0.07
Calcium	**mg/l Ca**	42	21	160	93
Chloride	**mg/l Cl**	42	15	75	32.5
Chromium	**µg/l**	42	1	8.3	3.0
Cobalt	**µg/l**	42	<1.0	<1.0	
Coliform Bacteria	**(No/100 ml)**	11	1	980	127
Conductivity	**µS/cm @ 25**	42	387	904	621
Copper	**µg/l**	42	1	4.6	2.7
Cyanide	**mg/l**	11	<0.05	<0.05	
D.O.	**% Saturation**	42	20	94	63
E_ Coli	**No/100 ml**	11	0	2	0.8
Fluoride	**mg/l**	11	<0.20	<0.20	
Iron	**µg/l**	42	<10.0	65	
Lead	**µg/l**	42	<1.0	<1.0	
Magnesium	**mg/l Mg**	42	2.4	26	10
Manganese	**µg/l**	42	<5.0	51	
Mercury	**µg/l**	11	<0.020	<0.020	
Molybdenum	**µg/l**	42	<1.0	10	

	Units	No. of Samples	Minimum	Maximum	Mean
Nickel	**µg/l**	42	<1.0	5.7	
Nitrite	**mg/l N**	42	<0.004	0.025	
o-Phosphate	**mg/l P**	22	0.027	0.048	0.0
pH	**0**	42	6.7	8.3	7.4
Phenol	**mg/l**	42	<0.002	<0.025	
Potassium	**mg/l**	42	0.34	30	8.3
Selenium	**µg/l**	42	<1.0	110	
Sodium	**mg/l**	42	7.4	36	18.2
Strontium	**µg/l**	42	78	260	156
Sulphate	**mg/l SO4**	42	5	118	40
Temp	**℃**	42	6.1	16	11.3
Thallium	**µg/l**	42	<1.0	<1.0	
T.O.C.	**mg/l**	42	<1.5	9.4	3.9
T.O.N	**mg/l N**	42	0.21	8.3	3.1
Uranium	**µg/l**	42	<1.0	14	
Vanadium	**µg/l**	42	<1.0	3.5	
Zinc	**µg/l**	42	1.8	24	9.3

6.2.1 Upgradient

The pH levels for all upgradient boreholes remain between the IGV and DWR of 6.5 and 9.5.

All upgradient boreholes Electrical Conductivity levels were below the IGV of 1,000µS/cm and DWR of 2,500µS/cm.

Ammonia concentrations were below the GWR 2010 (0.175 mg/l N), IGV (0.15 mg/l) and DWR (0.30 mg/l) throughout the year.

Chloride levels exceeded the IGV of 30 mg/l in BH4A. All other boreholes upgradient were below the GWR 2010 (187.5 mg/l Cl) and DWR (250 mg/l). The highest chloride level was 27 mg/l in BH1A.

Elevated concentrations of potassium were consistently recorded in BH7A. Potassium levels were highest in BH7A in September (30 mg/l).

Aluminium, Antimony, Barium, Boron, Calcium, Cadmium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Nitrite, Sodium and Zinc concentrations were below the GWR 2010, DWR and IGV.

Arsenic and exceeded the GWR 2010 at BH7A in February and September. Selenium exceeded the DWR at BH7A on all monitoring dates.

All upgradient boreholes showed no abnormal change in TOC and TON concentrations.

Total Phenol levels were analysed and were less than the lower detection limit for the methodology used. (This varies throughout the monitoring period) and as a result could be below the IGV of 0.5 µg/l. Ortho-Phosphate exceeded the IGV at BH1A and BH2A in April

Concentrations above the limit of detection were measured for the following parameters;

- Strontium
- Vanadium
- Uranium[5]

Cyanide concentration of <0.05 mg/l were detected in all upgradient boreholes. This concentration is the lowest limit of detection for the methodology used for cyanide; therefore this could be lower than the WTL and IGV of 0.01 mg/l. The results were below the DWR of 0.05 mg/l.

All other parameters were below the IGV, GWR 2010 and DWR for those comparable or below the limit of detection.

[5] World Health Organisation (2011) Guidelines for Drinking-water Quality, Fourth Edition. Table A3.3 Guideline values for chemicals that are of health significance in drinking-water. Uranium 30 µg/l.

6.2.2 Downgradient

The pH levels for all boreholes remain between the IGV and DWR of 6.5 to 9.5 pH units throughout the monitoring period.

All downgradient boreholes recorded Electrical Conductivity levels were below the IGV of 1,000 µS/cm and DWR of 2,500µS/cm.

Ammonia concentrations were below the GWR 2010 (0.175 mg/l N), IGV of 0.15 mg/l and the DWR of 0.3 mg/l

Chloride levels exceeded the IGV of 30 mg/l except BH6A and BH7A. All boreholes upgradient were below the GWR 2010 (187.5 mg/l Cl) and DWR (250 mg/l). The highest chloride level was 75 mg/l in BH3A.

Elevated concentrations of potassium were consistently recorded BH11A. BH10A concentrations of potassium slightly exceeded the IGV throughout the monitoring period. Potassium levels were highest in BH11A in April (20 mg/l).

Aluminium, Antimony, Arsenic Barium, Boron, Calcium Cadmium, Chromium, Lead, Iron, Magnesium, Manganese, Molybdenum Sodium, Nickel, Nitrite, Zinc concentrations were below the GWR 2010, DWR and IGV.

As with the upgradient boreholes, all downgradient boreholes also showed no abnormal change in TOC and TON concentrations.

Total Phenol levels were analysed and were less than the lower detection limit for the methodology used. (This varies throughout the monitoring period) and as a result could be below the IGV of 0.5µg/l.

Ortho-Phosphate exceeded the IGV at BH3A in April.

Concentrations above the limit of detection were measured for Strontium.

Cyanide concentration of <0.05 mg/l were detected in all downgradient boreholes. This concentration is the lowest limit of detection for the methodology used for cyanide; therefore this could be lower than the WTL and IGV of 0.01 mg/l. The results are below the DWR of 0.05 mg/l.

All other parameters were below the IGV, GWR 2010 and DWR for those comparable or below the limit of detection.

6.2.3 Borehole BH5A

BH5A is no longer considered an upgradient borehole as it appears to be influenced by leachate emission from the adjacent waste.

The pH levels remain between the IGV and DWR of 6.5 and 9.5.

Ammonia concentration ranged from 0.020 to 2.0 mg/l N during the monitoring period. BH5A exceeded the GWR 2010 (0.175 mg/l N), IGV (0.15 mg/l) and DWR (0.30 mg/l) for ammonia in February and March.

Chloride concentrations were above the IGV of 30 mg/l but were below the GWR 2010 of 187.5 mg/l C (ranging between 17 and 75 mg/l).

Aluminium, Barium, Electrical Conductivity, Cadmium, Chromium, Iron, Manganese, Molybdenum, Nickel, Nitrite, Potassium, Sodium, Zinc concentrations were below the GWR 2010, DWR and IGV.

Total Phenol levels were analysed and were less than the lower detection limit for the methodology use.

BH5A recorded the highest TON concentration (8.3 mg/l) during the monitoring period.

Concentrations above the limit of detection were measured for the following parameters;

- Strontium;
- Uranium[6].

All other parameters were below the IGV, GWR 2010 and DWR for those comparable or below the limit of detection.

[6] World Health Organisation (2011) Guidelines for Drinking-water Quality, Fourth Edition. Table A3.3 Guideline values for chemicals that are of health significance in drinking-water. Uranium 30 µg/l.

6.3 Hydrogeological Review

A hydrogeological review was undertaken for the site in 2014 and a conceptual site model has been developed for the site. The report found that water quality results from all monitoring boreholes suggest that monitoring boreholes BH4a and BH5a have been impacted from leachate generated from the waste body. The elevated concentrations of ammonia and manganese within BH5a and manganese, iron, nickel and barium within BH4a have regularly been recorded above typical background concentrations for the general region in addition to the IGV and GWR. The remaining monitoring boreholes and flooded former quarry void do not indicate significant impact from the waste body and the risks posed to groundwater wells to the south or downgradient of the site is considered to be low.

6.4 Surface Water

SW1 and SW3 are samples from the lake on site. Water within the former quarry void is considered to be groundwater and will be assessed against the DWR, IGV and GWR 2010. Monitoring point SW2 is located in the cement works pond, which is adjacent and upstream of the site.

Schedule F of the waste licence requires the monitoring of certain parameters on either a quarterly or annual basis; the frequency of the monitoring of surface water parameters are shown in Table 6.4.

Surface water results are presented in Appendix E.

Table 6.4 Surface Water Monitoring Frequency

Monitoring Frequency	Parameter
Quarterly	Ammoniacal Nitrogen, BOD, COD, Chloride, Dissolved Oxygen, Electrical Conductivity, pH, Total Suspended Solids, Temperature, Cadmium, Chromium, Iron, Lead, Potassium, Total Phosphorous, Barium, Nickel, Nitrate, Nitrite, and Phenol
Annually	Calcium, Copper, Magnesium, Manganese, Mercury, Sulphate, Sodium, Total Alkalinity, TON, and Zinc

Table 6.5 provides a summary of results in 2015 from quarry surface water locations throughout the monitoring period.

Table 6.5 Summary of 2015 Results from surface water Monitoring locations

	Units	No. of Samples	Minimum	Maximum	Mean
Alkalinity	**mg/l CaCO3**	3	132	139	135
Aluminium	**ug/l**	12	<10.0	<10.0	
Ammonia	**mg/l N**	12	<0.020	0.085	
Antimony	**ug/l**	12	<1.0	1.2	
Arsenic	**ug/l**	12	<1.0	1.4	
Barium	**ug/l**	12	25	59	42
Beryllium	**ug/l**	12	<1.0	<1.0	
B.O.D.	**mg/l O_2**	12	<1.0	2.1	
Boron	**µg/l**	12	150	180	164
Cadmium	**µg/l**	12	<0.020	0.02	
Calcium	**mg/l Ca**	12	15	47	33
C.O.D.	**mg/l O_2**	12	<20	31	
Chloride	**mg/l Cl**	12	50	62	58
Chromium	**µg/l**	12	<1.0	<1.0	
Cobalt	**µg/l**	12	<1.0	<1.0	
Conductivity	**µS/cm @ 25**	12	366	520	456
Copper	**µg/l**	12	<1.0	2	
Cyanide	**mg/l**	3	<0.05	<0.05	
D.O.	**% Saturation**	12	82	121	100
Iron	**µg/l**	12	<10.0	17	14
Lead	**µg/l**	12	<1.0	<1.0	

	Units	No. of Samples	Minimum	Maximum	Mean
Magnesium	**mg/l Mg**	12	8.4	20	13
Manganese	**µg/l**	12	6.3	33	20
Mercury	**µg/l**	3	<0.020	<0.020	
Molybdenum	**µg/l**	12	<1.0	2	
Nickel	**µg/l**	12	1.2	4.3	3
Nitrite	**mg/l N**	12	<0.004	<0.004	
o-Phosphate	**mg/l P**	6	<0.010	<0.010	
pH	**0**	12	8.1	9.3	9
Phenol	**mg/l**	12	<0.002	0.04	
Potassium	**mg/l**	12	6.7	27	13
Selenium	**µg/l**	12	<1.0	2.4	
Sodium	**mg/l**	12	21	38	32
Strontium	**µg/l**	12	80	180	123
Sulphate	**mg/l SO4**	12	24	29	26
Suspended Solids	**mg/l**	12	<4	33	
Temp	**℃**	12	4.4	16.1	11
Thallium	**µg/l**	12	<1.0	<1.0	
T.O.N	**mg/l N**	12	<0.20	<0.20	
Uranium	**µg/l**	12	<1.0	<1.0	
Vanadium	**µg/l**	12	<1.0	<1.0	
Zinc	**µg/l**	12	1.1	150	20

6.4.1 Quarry Lake

SW1, SW2, SW3 were below the DWR, IGV and GWR 2010 for the following parameters, Aluminium, Ammonia, Antimony, Arsenic, Barium, Boron, Cadmium, Calcium, Chromium, Conductivity, Copper Iron, Lead, Magnesium Manganese, Mercury, Molybdenum, Nickel, Nitrite, pH, Sodium, and Zinc.

Potassium exceeded the IGV of 5 mg/l in all locations. Chloride concentrations were above the IGV of 30 mg/l in all locations but were within the GWR 2010 overall threshold value range of 24-187.5 mg/l Cl. Dissolved oxygen ranged from 82 to 121%. Phenol concentration ranged from <0.002 to 0.04 mg/l above the IGV of 0.5µg/l.

Concentrations above the limit of detection were measured for the following parameters:

- Selenium SW2 (range 1.2 to 2.4 µg/l),
- Strontium (range 80 to 180 µg/l).

All other parameters were below the IGV, GWR 2010 and DWR for those comparable or below the limit of detection.

6.4.2 Capped Area

Table 6.6 provides a summary of results in 2015 from surface water locations throughout the monitoring period.

Table 6.6 Summary of 2015 Results from Capped Area

	Units	No. of Samples	Minimum	Maximum	Mean
Alkalinity	**mg/l CaCO3**	2	189	350	270
Aluminium	**ug/l**	8	10	130	43
Ammonia	**mg/l N**	8	<0.020	0.13	
Antimony	**ug/l**	8	<1.0	<1.0	
Arsenic	**ug/l**	8	<1.0	<1.0	
Barium	**ug/l**	8	32	57	46

	Units	No. of Samples	Minimum	Maximum	Mean
Beryllium	**ug/l**	8	<1.0	<1.0	
B.O.D.	**mg/l O2**	8	<1.0	1	
Boron	**µg/l**	8	21	36	26
Cadmium	**µg/l**	8	<0.020	0.09	
Calcium	**mg/l Ca**	8	64	130	103
C.O.D.	**mg/l O_2**	8	<20	20	
Chloride	**mg/l Cl**	8	8	20	12
Chromium	**µg/l**	8	<1.0	1.3	1
Cobalt	**µg/l**	8	<1.0	<1.0	
Conductivity	**µS/cm @ 25**	8	402	687	560
Copper	**µg/l**	8	1.6	4.6	3
Cyanide	**mg/l**				
D.O.	**% Saturation**	8	63	101	83
Iron	**µg/l**	8	<10.0	<10.0	
Lead	**µg/l**	8	<1.0	<1.0	
Magnesium	**mg/l Mg**	8	6.5	9.4	8
Manganese	**µg/l**	8	<5.0	5.7	6
Mercury	**µg/l**	2	<0.020	<0.021	
Molybdenum	**µg/l**	8	<1.0	1.3	1
Nickel	**µg/l**	8	<1.0	<1.0	
Nitrite	**mg/l N**	8	<0.004	0.015	
o-Phosphate	**mg/l P**	4	<0.010	<0.010	

	Units	No. of Samples	Minimum	Maximum	Mean
pH	**0**	8	7.7	8.2	8
Phenol	**mg/l**	8	<0.002	<0.002	
Potassium	**mg/l**	8	1.1	4.2	2
Selenium	**µg/l**	8	<1.0	<1.0	
Sodium	**mg/l**	8	8.4	12	10
Strontium	**µg/l**	8	170	250	213
Sulphate	**mg/l SO4**	8	14	18	16
Suspended Solids	**mg/l**	8	<4	10	
Temp	**℃**	8	5.6	13.8	10
Thallium	**µg/l**	8	<1.0	<1.0	
T.O.N	**mg/l N**	8	0.45	1.7	1
Uranium	**µg/l**	8	1.3	3	2
Vanadium	**µg/l**	8	<1.0	1.1	
Zinc	**µg/l**	8	<1.0	8.3	

SW4 and SW5 monitor the surface water arising from the capped area. The majority of the parameters were below the lower level of detection for the methodology used for analysis or the Surface Water Quality Standards (SWQS) laid out in the European Communities (Quality of Surface Water Intended for the Abstraction of Drinking Water) Regulations 1989, European Communities Environmental Objectives (Surface Water) Regulations 2009 Environmental quality standard (EQS) and the European communities (Drinking Water) (No. 2) Regulations 2007 parametric value (DWR) were comparable.

Ammonia, Barium, BOD, COD, Cadmium, Chromium, Chloride, Dissolved Oxygen, Electrical Conductivity, Lead, Iron, Nickel, Nitrite Potassium ,pH, Total Suspended Solids, were below the SWQS, EQS and DWR.

Phenol concentration were <0.002 mg/l. This is the lower limit of detection for the methodology used and as a result could be below the IGV of 0.5 µg/l. Dissolved Oxygen levels ranged from 63 to 101%.

TON concentrations ranged from 0.45 to 1.7 mg/l.

Concentrations above the limit of detection were measured for the following parameters:

- Strontium (range 170 to 250 µg/l).
- Uranium (range 1.3 to 3 µg/l).

All other parameters were below the IGV, GWR 2010 and DWR for those comparable or below the limit of detection.

6.5 Discharge to Sewer

There are two discharge points to sewer, treated condensate from the methane stripper (S1) and the discharge point to sewer from Civic Waste Facility (S2).

Monitoring at S2 during the year showed no exceedances in the emission limits to sewer as shown in Table 6.7. The estimated volume discharged from Civic Waste Facility (area 13,500 m^2) was approximately 11,858 m^3 for 2015. This is within the limit of the licence.

S1 was not sampled during the monitoring period as the tank was empty on sampling dates.

Condensate from the methane stripper is tankered from site following agreement with EPA and Waste Water Treatment Plant Operator. There were no emissions to sewer from S1.

Table 6.7 Emission Limit Values for Emissions to Sewer Civic Waste Facility (S2)

Parameter Emission Limit Value	Grab Sample mg/l ELV	Feb	April	Sept	Nov
BOD_5	335	1.4	2.1	2.0	<1.0
COD	450	<20	<20	<20	<20
Ammoniacal Nitrogen NH4-N	35	0.30	0.31	0.72	0.14
Suspended Solids	294	<4	<4	4	<4

Parameter Emission Limit Value	Grab Sample mg/l ELV	Feb	April	Sept	Nov
Sulphates (as SO_4)	240	5	4	<2	4
pH	6 – 9	7.6	7.3	7.8	7.8
Temperature	32℃	nm	9.5	nm	11.2

6.6 Perimeter Gas Monitoring

The licence trigger levels for the following landfill gases are greater than or equal to 1.0% v/v Methane (CH_4) and greater than or equal to 1.5% v/v Carbon Dioxide (CO_2). Landfill gas monitoring results have been provided for the period and are shown in Appendix F.

From the results it can be seen that CH_4 was detected around the perimeter of the site (LG1 – LG9). Readings ranged from 0.0 to 0.2% v/v which is below the trigger level of 1.0% v/v. .

CO_2 ranged from 0.0 to 1.4% v/v which is below the trigger level of 1.5% v/v except for LG4 which exceeded the trigger level in January (2.0 % v/v) in April (1.6 % v/v), May (1.6 % v/v),June (1.7 % v/v) and August (1.5 % v/v).

CH_4 was not detected greater than 0.2% v/v in the groundwater boreholes (BH1A to BH11A). CO_2 ranged from 0.0 to 1.3 % v/v which is below the trigger level of 1.5% v/v.

6.7 Flue Gas Monitoring

Flue gas monitoring was also undertaken on the permanent landfill gas flare. All monitoring was carried out in accordance with Environmental Protection Agency Office of Environmental Enforcement (OEE) Air Emission Monitoring Guidance Note 2 (AG2). This report has been submitted to the EPA.

CO, NOx as NO2 and SO2 results were within the typical emission limit values used for such installations in Ireland.

6.8 Dust Monitoring

Dust monitoring was carried out on three occasions during this monitoring period. Table 6.8 details the results of the dust monitors installed on site. The waste licence requires dust

deposition limits to be no more than 350 mg/m^2/day. From Table 6.8 can be seen that all dust deposition levels in all periods are below the limit.

Table 6.8 Results from Dust Monitoring Analysis, Drogheda Landfill Site (mg/m^2/day)

Sampling Location	Dust Monitor 1	Dust Monitor 2	Dust Monitor 3	Dust Monitor 4
July	59.6	58.1	206.2	322.4
September	121.6	151.2	104.7	91.5
November	129.6	10.6	5.3	149.7

6.9 Noise

The measurements were completed on Wednesday 17th and Thursday 18th of February 2016 in accordance with the following environmental noise standards:

- ISO 1996: 2007 Acoustics – Description and Measurement of Environmental Noise, Parts 1-4
- EPA Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) 2016

The range of noise levels at each noise sensitive location during respective measuring periods were as follows:

NSL 1: Daytime: LAeq (T 30 min) 75-77dBA;

Evening time: LAeq (T 15 min) constant at 74dBA;

Night time: LAeq (T 15 min) 63-66dBA

NSL 2: Daytime: LAeq (T 30 min) 75-76dBA;

Evening time: LAeq (T 15 min) constant at 72 dBA;

Night time: LAeq (T 15 min) 60-66dBA.

NSL 3: Daytime: LAeq (T 30 min) 65-66dBA;

Evening time: LAeq (T 15 min) constant at 64dBA;

Night time: LAeq (T 15 min) 60-63dBA.

The report found that traffic was found to be the predominant source of noise at all locations. Reduced traffic noise levels during the night-time measuring period provides a more accurate representation of background noise against which any potential noise levels arising from the site activities could be compared. The findings show that during the night-time measurements and during lulls in traffic noise there was no noise audible from the landfill site. Hence it is considered to be in compliance with NG4 and the requirements of Waste Licence W0033.

6.10 Ecology

An assessment of the ecology of the Quarry Lake and adjoining habitats was undertaken on 1st October 2015. This has been submitted to the EPA. The macroinvertebrate data indicate moderately productive conditions at all three sites assessed, with no significant change in the conditions of the two quarry lakes since 2013.

7 Resource and Energy Consumption Summary

An energy efficiency audit has not been carried out at this facility as the landfill site is closed it is not a requirement of the licence. Consumption of resources for the reporting period is shown in Table 7.1 below.

Table 7.1 Consumption of Resources

Parameters	Unit	CWF and Landfill 2013	CWF and Landfill 2014	CWF and Landfill 2015	Energy Consumption +/- %
Water	m^3	340	310	300	-3
Electricity	kWh	3,560	3,120	2950	-5

8 Development Works

8.1 Proposed Development of the Site and Timescale of Such Development

Completion of Phase 2 of capping works when consultation with landowners re - historical waste deposited outside the facility boundary is complete.

8.2 Report on Development Works Undertaken During the Reporting Period, and Those Proposed During the Coming Year

No development works were undertaken in 2015. There are no proposed development works to be undertaken in 2016.

8.3 Report on Restoration

Phase 1 of the Restoration Capping Works for Drogheda Landfill Site has been completed satisfactorily in accordance with the contract specification, the licence conditions and EPA correspondence Ref. W0033-01/AK17EM. The CQA report has been completed and is available on site for inspection.

9 Volume of Leachate Produced and Volume of Leachate Transported / Discharged Off-Site

The site was permanently capped during 2007 except for an area along the boundary of the site (approximately 3,000m^2). No leachate is collected from the facility.

Condensate from the landfill gas extraction system is currently transported off site to Drogheda wastewater treatment plant. An estimated 22 m^3 was sent for disposal.

9.1 Monthly Water Balance Calculation and Interpretation

The calculation for monthly water balance is as follows

$$Lo = [ER (A) + LW + IRCA + ER (1)] – [aW]$$

Where;

Lo = leachate produced (m^3)

ER = effective rainfall

A = area of cell (m^3)

LW = liquid waste

IRCA = infiltration through restored areas and capped areas (m)

a = absorptive capacity of waste (m^3/t)

W = weight of waste deposited

l = surface area of lagoons (m^2).

A water balance calculation for 2015 is presented in Appendix B using rainfall data from metrological station at Dublin Airport. Infiltration in restored areas would be in the range of 2-10% in the worst case scenario for a geosynthetic clay liner cap. This estimates the leachate production for 2015 will be in the range of 2,433 to 9,531 m^3.

10 Site Survey Showing Existing Levels of the Facility at the End of the Reporting Period

A topographical survey was undertaken at the site in 2007 following the completion of Phase 1 restoration. This survey was submitted to the EPA in December 2007. A topographical survey was also undertaken in 2015.

11 Estimated Annual Quantity of Landfill Gas Emitted from the Site

A 750m^3/hr flare has been installed at the facility. Field balancing is undertaken at the facility as required. The average flow rate from the flare in 2015 was 150 m^3/hr. The average methane concentration was 25% v/v. The total hours run was 4,968.

The landfill gas extraction system shut down periodically during 2015 due to a low flow or low methane levels. Once landfill gas flow and concentration are sufficient the flare was restarted.

12 Estimated Annual Quantity of Indirect Emissions to Groundwater

The site was formally a limestone quarry and the landfill was developed on the benches of the redundant limestone quarry. The site has historically operated on a dilute and disperse principle.

The GSI has classified the underlying bedrock aquifer as a regionally important karstified aquifer (Rkd) dominated by diffuse flow. The site is located within the Drogheda Urban Groundwater Body (GWB) which has been classified as being of "Good" status. The vulnerability rating for the site, given the exposed bedrock, is classified as extreme vulnerability.

The site was permanently capped during 2007 except for an area along the boundary of the site (approximately 3,000m^2). No leachate is collected from the facility. Condensate from the landfill gas extraction system is currently transported off site to Drogheda wastewater treatment plant. An estimated 25 m^3 was sent for disposal

There are no direct discharges to groundwater. A water balance calculation has been undertaken and is included in Appendix B using rainfall data from meteorological station at Dublin Airport. This estimates the leachate production for 2015 will be in the range of 2,433 to 9,531 m^3.

13 Environmental Objectives and Targets

13.1 Schedule of Environmental Objectives and Targets for the Forthcoming Year

Objectives and targets to be undertaken in 2016 for Drogheda Landfill Site are as follows:

- Continue to liaise with landowners re - historical waste deposited outside the facility boundary. This is an ongoing process.
- Investigate downsizing flare to improve run times

14 Full Title and a Written Summary of Any Procedures Developed by the Licensee in the Year which Relates to the Facility Operation

The Environmental Management System (EMS) for the facility was updated in 2007 to take into consideration works undertaken at the site. This has been forwarded to the OEE under a separate cover.

15 Tank, Pipeline and Bund Testing and Inspection Report

There are no tanks or bunds on site. The landfill gas extraction system including condensate tank is serviced annually.

16 Reported Incidents and Complaints Summaries

No complaints were reported to the EPA during the monitoring period. Five incidents were reported in 2015 as shown on Table 16.1.

Two compliance investigations are currently ongoing with the EPA due to the historic waste placed outside the site boundary and a slope slippage.

Table 16.1 Incidents for 2015

Incident	Description of Incident
Category 1	1 Incident reported due to CO_2 in perimeter borehole. 4 incidents reported due to shut down of flare

17 Reports on Financial Provision Made Under this Licence, Management and Staffing Structure of the Facility, and a Programme for Public

17.1 Management and Staffing Structure

The management and staffing structure for the facility is as follows;

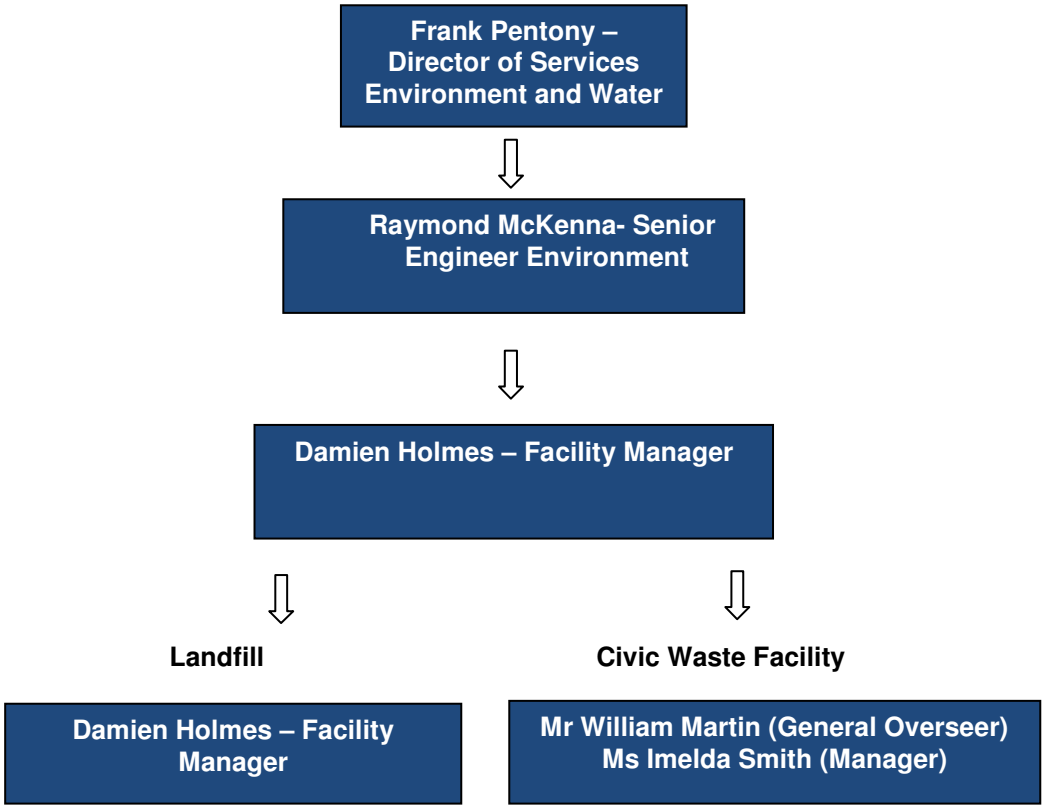


Figure 17.1 Management Structure at Drogheda Landfill Site

The public information programme is provided in the Environmental Management System for the site.

17.2 Annual Budget and Site Running Costs

The civic amenity facility is operated by third party (V & W Recycling) on behalf of Drogheda Borough Council. A €3.00 entrance charge is applicable to all users of the site except for the disposal of electrical goods.

Funding is provided by Louth County Council for all monitoring requirements.

17.3 Environmental Liabilities

An Environmental Liability Risk Assessment has not been carried out at this facility as the landfill site is closed it is not a requirement of the licence.

Appendix A

PRTR Reporting

| PRTR# : W0033 | Facility Name : Drogheda Landfill - Drogheda Borough Council | Filename : W0033_2015.xls | Return Year : 2015 |

Guidance to completing the PRTR workbook

PRTR Returns Workbook

Version 1.1.19

REFERENCE YEAR	2015

1. FACILITY IDENTIFICATION

Parent Company Name	Louth County Council
Facility Name	Drogheda Landfill - Drogheda Borough Council
PRTR Identification Number	W0033
Licence Number	W0033-01

Classes of Activity

No.	class_name
-	Refer to PRTR class activities below

Address 1	Collon Road
Address 2	Mell
Address 3	Drogheda
Address 4	
	Louth
Country	Ireland
Coordinates of Location	-6.37152 53.7277
River Basin District	IEEA
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous waste
AER Returns Contact Name	Damien Holmes
AER Returns Contact Email Address	damien.holmes@loutcoco.ie
AER Returns Contact Position	Executive Scientist
AER Returns Contact Telephone Number	042 9392920
AER Returns Contact Mobile Phone Number	086 6097315
AER Returns Contact Fax Number	041 6854623
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	6
User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

Activity Number	Activity Name
50.1	General
50.1	General

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

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

4. WASTE IMPORTED/ACCEPTED ONTO SITE

Guidance on waste imported/accepted onto site

Do you import/accept waste onto your site for on-site treatment (either recovery or disposal activities) ?	

4.1 RELEASES TO AIR Link to previous years emissions data | PRTR# : W0033 | Facility Name : Drogheda Landfill - Drogheda Borough Council | Filename : W0033_2015.xls | Return Year : 2015 | 11/04/2016 10:06

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0

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

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs				
POLLUTANT		METHOD			QUANTITY				
			Method Used		Flare				
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	Emission Point 2	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
01	**Methane (CH4)**	C	OTH	Gassim minus actual flared	2892.1	0.0	102742.5	0.0	99850.4

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

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

RELEASES TO AIR					Please enter all quantities in this section in KGs				
POLLUTANT		METHOD			QUANTITY				
			Method Used		Flare				
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	Emission Point 2	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					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) flared or utilised on their facilities to accompany the figures for total methane generated. Operators should only report their Net methane (CH4) emission to the environment under T(total) KG/yr for Section A: Sector specific PRTR pollutants above. Please complete the table below:

Landfill: Drogheda Landfill - Drogheda Borough Council

Please enter summary data on the quantities of methane flared and / or utilised	**T (Total) kg/Year**	**M/C/E**	**Method Used**		**Facility Total Capacity m3 per hour**	
			Method Code	**Designation or Description**		
Total estimated methane generation (as per site model)	244,457	C	Gassim model	from model	N/A	
Methane flared	141,714	C	Actual flared	from records	0.0	(Total Flaring Capacity)
Methane utilised in engine/s	0.0				0.0	(Total Utilising Capacity)
Net methane emission (as reported in Section A above)	102,743	C	Gassim minus actual fla	Net figure	N/A	

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

Please enter all quantities on this sheet in Tonnes

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Haz Waste : Name and Licence/Permit No of Next Destination Facility Non Haz Waste: Name and Licence/Permit No of Recover/Disposer	Haz Waste : Address of Next Destination Facility Non Haz Waste: Address of Recover/Disposer	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					
To Other Countries	**15 01 01**	**No**	312.0	paper and cardboard packaging	R3	M	Weighed	Abroad	Peute Europe,Nl6000076	Baahoekweg 4,LA Dordrecht,,,.,Netherlands		
Within the Country	15 01 02	No	109.0	plastic packaging	R3	M	Weighed	Offsite in Ireland	Shrabra,MN 080022-01	.,Killycard ind est Bree,Castleblayey,Co Monaghan ,Ireland		
Within the Country	15 01 03	No	236.0	wooden packaging	R3	M	Weighed	Offsite in Ireland	Dundalk Town Council,W0034-02	Newry Road,.,Dundalk,.,Ireland		
To Other Countries	15 01 04	No	47.0	metallic packaging	R4	M	Weighed	Abroad	John Tinnelly & Sons,LN09/10	Newtowncloughogue,Newry, Co Down,BT38 8LZ,United Kingdom		
To Other Countries	15 01 07	No	154.0	glass packaging	R5	M	Weighed	Abroad	Glassdon ,NI licenceLN/06/08	52 Creagh Road,Toomebridge,Co Antrim,BT41 3SE,United Kingdom		
Within the Country	16 06 01	Yes	12.0	lead batteries	R4	M	Weighed	Offsite in Ireland	Rilta Environmental Ltd,Licence No W0192-02	Block 402,Grants Drive,Greenogue Business Park,Rathcoole Co Dublin,Ireland	Rilta Environmental Ltd,Licence No W0192-02,Block 402,Grants Drive,Greenogue Business Park,Rathcoole Co Dublin,Ireland	Block 402,Grants Drive,Greenogue Business Park,Rathcoole Co Dublin,Ireland
Within the Country	16 06 04	No	0.0	alkaline batteries (except 16 06 03)	R4	M	Weighed	Offsite in Ireland	Rilta Environmental Ltd,Licence No W0192-02	Block 402,Grants Drive,Greenogue Business Park,Rathcoole Co Dublin,Ireland		
Within the Country	19 07 03	No	23.0	landfill leachate other than those mentioned in 19 07 02	D9	C	Volume Calculation	Offsite in Ireland	Drogheda Waste Water Treatment Plant ,D0041-01	Marsh Road ,Drogheda ,Co Louth,.,Ireland		
To Other Countries	20 01 01	No	134.0	newspaper and magazines	R3	M	Weighed	Abroad	Peute Europe,Nl6000076	Baahoekweg 4,LA Dordrecht,,.,.,Netherlands		
To Other Countries	20 01 11	No	31.0	textiles	R3	M	Weighed	Abroad	Cookstown NI,WMEX 01/11	36 Magheralane Road,Randalstown,County Antrim,BT41 2NT,United Kingdom		
Within the Country	20 01 38	No	353.0	wood other than that mentioned in 20 01 37	R3	M	Weighed	Offsite in Ireland	V&W Recycling,W0034-02	Newry Road ,Dundalk,Co Louth,.,Ireland		
To Other Countries	20 01 40	No	226.0	metals	R4	M	Weighed	Abroad	John Tinnelly & Sons,WMEX 20/01	Newtowncloughogue,Newry, Co Down,BT38 8LZ,United Kingdom		
Within the Country	20 02 01	No	946.0	biodegradable waste	R3	M	Weighed	Offsite in Ireland	V&W Recycling,W0034-02	Newry Road ,Dundalk,Co Louth,.,Ireland		
Within the Country	20 03 01	No	83.0	mixed municipal waste	D5	M	Weighed	Offsite in Ireland	Indaver Ireland,W0167-02	Carranstown,Duleek,.,.,Ireland		

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

Appendix B
Water Balance Calculation

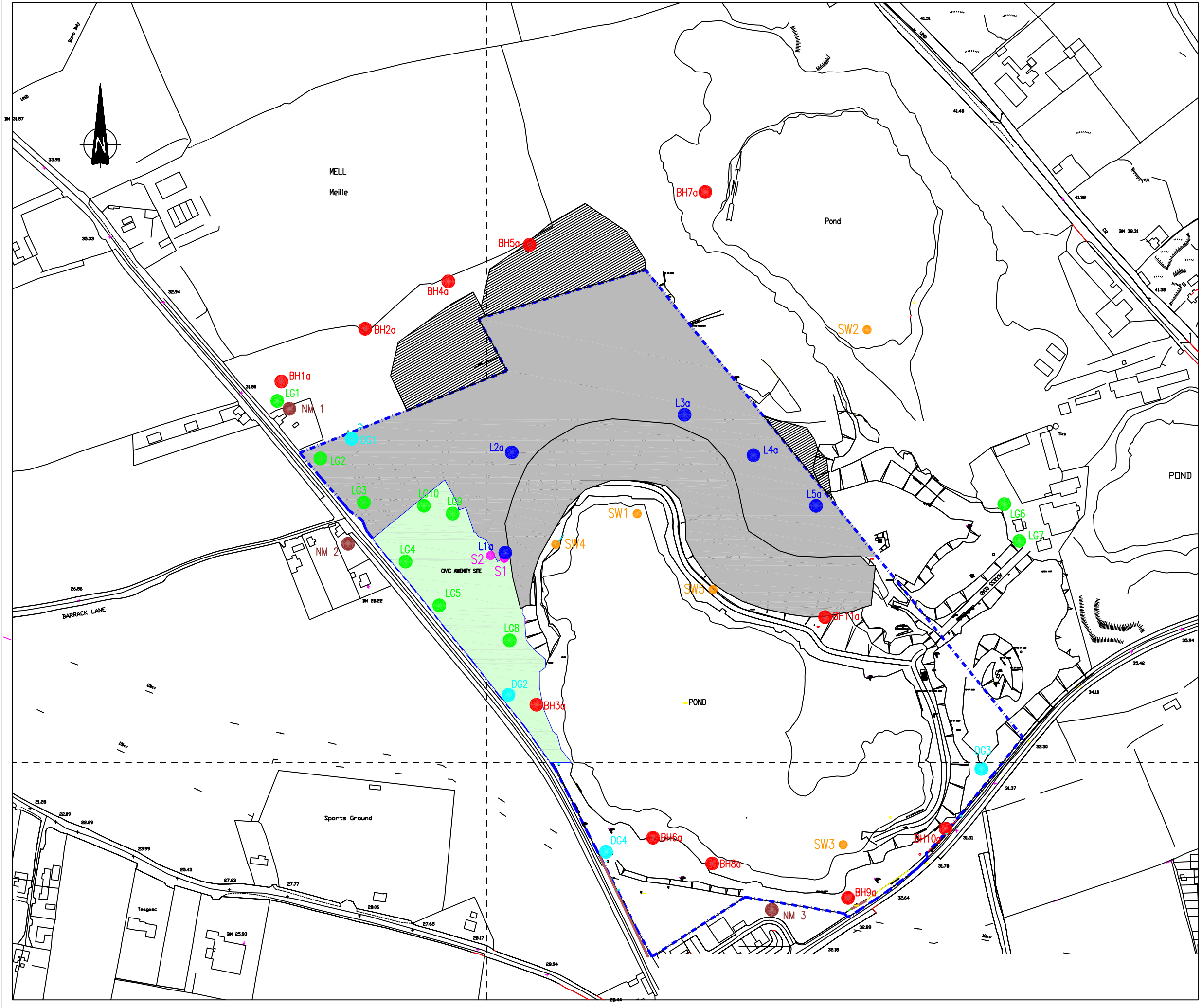
WATER BALANCE CALCULATION - Drogheda

Year 2015	Active Phase	Active Area A(m^2)	Waste Input t/year	Active Area Infiltration R(A)(m^3)	Liquid Waste LW(m^3)	Temporary Restored Area	Temporary Restored area infiltration IRCA(m^3)	Permanently Restored Area	Restored area infiltration IRCA(m^3)	Total Water	Cumulative Water	Absorptive Capacity aW(m^3)	Cumulative Absorptive Capacity	Cumulative leachate	Leachate produced Lo(m^3)
2015	Closed	0	0	878.40	0	3,000	659	101000	8872	9531	9531	0	0	9531	9531
Total				**878**											**9531**

Assumptions

1. IRCA =	**Temporary**		25%	% of annual rainfall
	Permanently	**(2-10%)**	10%	% of annual rainfall
2. Absorptive Capacity = Waste density of 0.8 tonnes/m^3. Estimated absorptive capacity			0.06	t/m^3
3. Rainfall data (R) taken from Dublin Airport (=			878.4	mm
4.Capping Area			101,000	m^2
Future permanent cap area			3,000	m^2

Appendix C
Drawings



NOTES

1. Verifying Dimensions.
   The contractor shall verify dimensions against such other drawings or site conditions as pertain to this part of the work.

2. Existing Services.
   Any information concerning the location of existing services indicated on this drawing is intended for general guidance only. It shall be the responsibility of the contractor to determine and verify the exact horizontal and vertical alignment of all cables, pipes, etc. (both underground and overhead) before work commences.

3. Issue of Drawings.
   Hard copies, dwf and pdf will form a controlled issue of the drawing. All other formats (dwg, dxf etc.) are deemed to be an uncontrolled issue and any work carried out based on these files is at the recipients own risk. RPS will not accept any responsibility for any errors arising from the use of these files, either by human error by the recipient, listing of un-dimensioned measurements, compatibility issues with the recipient's software, and any errors arising when these files are used to aid the recipients drawing production, or setting out on site.

4. Datum:

5. Key

- Site Boundary
- Capped Area within Licensed Boundary
- Approx Extent of Waste Outside Licensed Boundary
- L1 Leachate Borehole
- LG Landfill Gas Monitoring Point
- DG Dust Monitoring Gauge
- BH Groundwater Borehole
- NM Noise Monitor
- SW Surface Water Monitoring Point
- S1 Sewer

rev	amendments	drawn	date

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Client
Drogheda Borough Council

Project
Drogheda Landfill Site

Title
Monitoring Locations

Drawing Status	Sheet Size	Drawing Scale
Preliminary	A3	1:4,000

Drawing Number	Rev
IBR0509 /100	-

Project Leader	Drawn By	Date	Initial Review
DD	AMcG	May 2013	AMcG

Appendix D
Groundwater Results

				Drogheda Landfill Site Groundwater Quality																				
Monitoring Point:					**BH1A**																			
Date Collected		**DWR**	**IGV**	**2010 GW Regs**	**31-Jan-13**	**12-Feb-13**	**26-Mar-13**	**16-Apr-13**	**08-May-13**	**11-Jun-13**	**23-Jul-13**	**07-Aug-13**	**17-Sep-13**	**08-Oct-13**	**19-Nov-13**	**03-Dec-13**	**18-Feb-14**	**08-Apr-14**	**09-Sep-14**	**18-Nov-14**	**24-Feb-15**	**14-Apr-15**	**08-Sep-15**	**17-Nov-15**
Alkalinity	**mg/l CaCO3**							344										202				305		
Aluminium	**ug/l**	**200**	**200**	**150**	<5	55		<5	<5	113.7	<5	<5	<5	<5	<10	<10	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Ammonia	**mg/l N**	**0.23 mg/l N**	**0.11 mg/l N**	**0.175**	<0.03	<0.03	<0.03	<0.03	<0.03	0.03	<0.03	<0.03	<0.03	0.03	0.035	0.02	0.028	0.047	<0.020	<0.020	<0.020	<0.020	<0.020	0.028
Antimony	**ug/l**	**5**			<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic	**ug/l**		**10**	**7.5**	0.6	1.24		2.29	1.27	1.12	1.58	2.42	1.95	1.5	2.14	3.24	<1.0	<1.0	<1.0	2.2	1.2	1.1	1.8	1
Barium	**ug/l**		**100**		84.2	75		26.5	17.8	66.1	33.3	18.4	19.9	19.1	46.8	29.7	80	77	80	42	59	43	29	24
Beryllium	**ug/l**				<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
B.O.D.	**mg/l O2**																							
Boron	**µg/l**	**1000**	**1000**	**750**	11.7	14.3		20	21.3	17	26.8	22.8	21.6	22.4	21.6	27.6	12	12	11	21	16	29	20	21
Cadmium	**µg/l**	**5**	**5**	**3.75**	<0.1	<0.1		0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.1	0.1	0.03	0.03	0.06	0.11	0.1	0.23	0.24	0.4
Calcium	**mg/l Ca**		**200**		81.1	85.97		131.99	136.73	114.28	135.45	139.73	138.33	147.88	102.77	104.95	85	70	78	110	100	110	140	140
C.O.D.	**mg/l O2**																							
Chloride	**mg/l Cl**	**250**	**30**		13	16	14	27	29	19	25	30	39	39	26	28	13	12	12	23	18	23	27	34
Chromium	**µg/l**	**50**	**30**	**37.5**	<0.5	0.9		1.6	1.4	0.7	1.5	0.9	1	1.7	1.3	3.9	1.4	<1.0	<1.0	1.5	1.8	1.3	1.3	1.9
Cobalt	**µg/l**				<0.5	<0.5		<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Coliform Bacteria	**(No/100 ml)**	**0**						21										172				109		
Conductivity	**µS/cm @ 25**	**2500**	**1000**	**1875**	508	546	422	761	819	636	752	820	849	860	650	704	504	430	477	668	581	670	771	822
Copper	**µg/l**	**2000**	**30**	**1500**	1.1	1.8		2.2	4.9	6.5	3.9	4.5	3.5	5.1	2	2	2.2	<1.0	1.6	1.5	1.9	3.4	3	4.6
Cyanide	**mg/l**	**0.05**	**10**					<0.05										<0.05				<0.05		
D.O.	**% Saturation**				51			32			28			30			60	67	92	52	52	45	34	32
E_Coli	**No/100 ml**	**0**						0										3				2		
Fluoride	**mg/l**	**0.8**	**1000**					<0.150										0.15				<0.20		
Iron	**µg/l**	**200**	**200**		<10	101.3		11.4	<10	256.8	21.9	<10	20	<10	<10	<10	<10.0	<10.0	<10.0	<10.0	<10.0	16	<10.0	<10.0
Lead	**µg/l**	**25**	**10**	**18.75**	<0.5	2.4		<0.5	<0.5	5.2	<0.5	<0.5	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Magnesium	**mg/l Mg**		**50**		8.92	9.17		10.32	9.08	10.47	10.27	9.82	9.14	9.27	9.99	9.41	9.3	10	10	9.4	9.8	9.5	9.7	9.3
Manganese	**µg/l**	**50**	**50**		4.6	32.2		3.2	1.2	208.4	3	1.5	1.9	1.5	<5	<5	<5.0	<5.0	<5.0	<5.0	7	5	<5.0	14
Mercury	**µg/l**	**1**	**1**	**0.75**	nm	nm		<0.05	nm	nm	nm	nm	nm	nm	nm	nm		<0.050				<0.020		
Molybdenum	**µg/l**		**35**		<0.5	<0.5		0.5	<0.5	<0.5	1.4	<0.5	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	5	<1.0	<1.0	<1.0	<1.0
Nickel	**µg/l**	**20**	**20**	**15**	<0.5	1.8		5.1	7.4	5.8	2.8	4.6	4.3	6.3	1.4	1.9	<1.0	<1.0	<1.0	1.1	1.3	3.3	3.1	5.2
Nitrite	**mg/l N**	**0.5**	**0.1**	**0.375**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
o-Phosphate	**mg/l P**		**30**					0.07										<0.010				0.048		
pH		**6.5 - 9.5**			6.1	7.4	7.4	7.1	7.2	7.3	7.2	7.4	7.1	7.1	7.3	7.1	7.2	7.1	7.5	7.1	7.1	6.7	7	7.2
Phenol	**mg/l**		**0.0005**		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.025
Potassium	**mg/l**		**5**		1.14	1.81		5.68	6.41	3.4	5.31		7	7.72	3.84	4.47	1.3	0.98	0.74	3.4	2.6	4.1	5	6.9
Sampling Depth	**m**				17.6	15.1	15.7	19.9	21.4	20.9	22.8	23.2	24.1	22.6	22.9	22	18	19.9	22.1	21.6	19.2	20.8	23.6	23.9
Selenium	**µg/l**	**10**			0.6	<0.5		<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Silver	**µg/l**				nm	nm		nm																
Sodium	**mg/l**	**200**	**150**	**150**	8.98	10.52		16.14	16.21	12.88	15.21	16.53	17.7	18.69	15.72	15.19	8.8	8.7	8.3	13	11	14	15	18
Strontium	**µg/l**				189.6	196.78		209.45	200.11	220.4	210.61	218.41	199.58	212.03	189.86	189.2	190	190	200	200	200	200	200	200
Sulphate	**mg/l SO4**	**250**	**200**	**187.5**				22.4										6.8				18		
Suspended Solids	**mg/l**																							
Temp	**°C**				9.1	8.3	7.2	10.7	11.5	11.3	21.3	14.2	10.7	13.4	8.2	8.1	9	13.7	12.3	12.9	9.1	10.7	11.1	10.1
Thallium	**µg/l**				<0.1	<0.1		0.3	0.34	0.2	0.27	0.33	0.4	0.45	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Time sampled					11:00	13:25	13:50	10:20	13:20	12:55	0.4513889	0.5486111	0.5625	10:50	10:35	13:35	12:55	10:45	13:00	10:20	10:40	13:10	14:35	13:55
Tin (µg/l)	**µg/l**				nm	nm		nm																
T.O.C.	**mg/l**	**NAC**			62.8			<1.5			<1.5			2.1			<1.5	1.8	3	1.9	1.7	2.5	1.6	<1.5
T.O.N	**mg/l N**		**NAC**		0.33	0.99	0.45	2.82	2.9	1.47	2.27	3.11	2.73	2.83	1.5	2.2	<0.20	<0.20	<0.20	1.9	1.1	2	2.9	3.5
Total S Solids	**mg/l**																							
Uranium	**µg/l**				3.79	9.14		20.52	14.34	9.42	15.06	21.38	14.94	12.51	17.88	26.88	2.3	<1.0	<1.0	17	8.8	11	14	9
Vanadium	**µg/l**				1.06	1.91		2.8	1.67	1.75	2.5	3.48	2.78	1.83	3.5	5.55	<1.0	<1.0	<1.0	3.3	1.6	1.7	2.5	<1.0
Zinc	**µg/l**		**100**		20.5	25		20.4	20.5	23.9	23.6	13.3	11.4	13.6	15.2	15.1	13	12	8.6	11	20	20	12	20
Water Level m OD	**31.953**				14.353	16.853	16.253	12.053	10.553	11.053	9.153		7.853		9.053	9.953	13.953	12.053	9.853	10.353	12.753	11.153	8.353	8.053

	Drogheda Landfill Site Groundwater Quality																								
Monitoring Point:					**BH2A**																				
Date Collected		**DWR**	**IGV**	**2010 GW Regs**	**31-Jan-13**	**12-Feb-13**	**26-Mar-13**	**16-Apr-13**	**08-May-13**	**11-Jun-13**	**23-Jul-13**	**07-Aug-13**	**17-Sep-13**	**08-Oct-13**	**19-Nov-13**	**03-Dec-13**	**18-Feb-14**	**08-Apr-14**	**09-Sep-14**	**18-Nov-14**	**24-Feb-15**	**14-Apr-15**	**08-Sep-15**	**17-Nov-15**	
Alkalinity	**mg/l CaCO3**							348										353				308			
Aluminium	**ug/l**	**200**	**200**	**150**	<5			5.5			5.1			<5			<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	12	<10.0	
Ammonia	**mg/l N**	**0.23 mg/l N**	**0.11 mg/l N**	**0.175**	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.020	<0.020	<0.020	0.021	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Antimony	**ug/l**	**5**			<0.5			<0.5			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Arsenic	**ug/l**		**10**	**7.5**	0.51			0.6			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Barium	**ug/l**		**100**		69.8			63			64.2			62.9			56	59	57	55	56	57	57	60	
Beryllium	**ug/l**				<0.5			<0.5			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
B.O.D.	**mg/l O2**																								
Boron	**µg/l**	**1000**	**1000**	**750**	19.3			28.5			30.3			33.1			58	36	32	25	26	29	22	23	
Cadmium	**µg/l**	**5**	**5**	**3.75**	<0.1			<0.1			<0.1			<0.1			0.03	0.06	0.03	0.06	0.04	0.05	0.03	0.03	
Calcium	**mg/l Ca**		**200**		118.55			124.92			128.86			128.36			140	130	120	110	120	110	110	110	
C.O.D.	**mg/l O2**																								
Chloride	**mg/l Cl**	**250**	**30**		12			14			16			16			20	19	18	18	18	18	16	18	
Chromium	**µg/l**	**50**	**30**	**37.5**	<0.5			1.5			1.4			1.4			2.2	<1.0	<1.0	1	2	1.1	1.2	1.5	
Cobalt	**µg/l**				<0.5			<0.5			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Coliform Bacteria	**(No/100 ml)**	**0**						10										365				79			
Conductivity	**µS/cm @ 25**	**2500**	**1000**	**1875**	675	694	691	707	724	722	719	726	730	728	738	735	719	724	703	664	639	645	636	668	
Copper	**µg/l**	**2000**	**30**	**1500**	2.8			5.3			1.6			1.8			<1.0	2.1	2	2.7	3	3.2	3.5	2.4	
Cyanide	**mg/l**	**0.05**	**10**					<0.05										<0.05				<0.05			
D.O.	**% Saturation**				39			47			36			98			51	49	56	71	55	53	62	44	
E_ Coli	**No/100 ml**	**0**						0										3				0			
Fluoride	**mg/l**	**0.8**	**1000**					<0.150										0.16				<0.20			
Iron	**µg/l**	**200**	**200**		<10			20			<10			<10			<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	11	28	
Lead	**µg/l**	**25**	**10**	**18.75**	<0.5			<0.5			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Magnesium	**mg/l Mg**		**50**		10.03			11.3			11.42			11.27			9.4	12	12	10	10	10	9.2	10	
Manganese	**µg/l**	**50**	**50**		2.3			2.6			3.2			<1			<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	15	<5.0	
Mercury	**µg/l**	**1**	**1**	**0.75**	nm			<0.05			nm			nm				<0.050				<0.020			
Molybdenum	**µg/l**		**35**		<0.5			<0.5			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	2	<1.0	<1.0	<1.0	
Nickel	**µg/l**	**20**	**20**	**15**	<0.5			2.9			<0.5			1			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Nitrite	**mg/l N**	**0.5**	**0.1**	**0.375**	<0.002			<0.002			<0.002			<0.002			<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	
o-Phosphate	**mg/l P**		**30**					0.04										0.033				0.048			
pH		**6.5 - 9.5**			7	7.2	7.1	7.1	7.1	7.1	7.1	7.2	7.2	7.1	7.2	7.2	7.2	7.2	7.4	7.1	7.1	7.1	7.2	7.2	
Phenol	**mg/l**		**0.0005**		<0.002			<0.002			<0.002			<0.002			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.025	
Potassium	**mg/l**		**5**		2.51			3.06			3.23			3.44			24	3.9	3.1	2.6	2.7	2.7	2.9	2.9	
Sampling Depth	**m**				17.8	15.9	15.6	19.4	21	21.7	22.7	24.5	25	14.2	14.9	22.4	17	21.1	22	21.7	19.9	21.5	22.4	23	
Selenium	**µg/l**	**10**			<0.5			0.7			0.7			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Silver	**µg/l**				nm			nm																	
Sodium	**mg/l**	**200**	**150**	**150**	8.92			10.64			11.19			11.83			22	14	13	9.8	10	10	9.3	11	
Strontium	**µg/l**				199.05			213.84			219.43			228.56			200	210	210	190	190	190	180	200	
Sulphate	**mg/l SO4**	**250**	**200**	**187.5**				15.8										20.7				16			
Suspended Solids	**mg/l**																								
Temp	**°C**				9.4	7.4	6	11	11.5	11.3	21.4	14.5	10.5	15.2	9.2	nm	8.6	10.7	10.9	12.4	6.9	10.9	12.1	10.1	
Thallium	**µg/l**				<0.1			0.11			<0.1			0.11			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Time sampled					11:25	13:10	13:25	10:55	13:00	12:40	11:15	12:50	13:05	11:20	10:50	13:15	12:40	11:15	12:40	10:50	10:55	12:40	14:15	13:35	
Tin (µg/l)	**µg/l**				nm			nm																	
T.O.C.	**mg/l**	**NAC**			85.9			3.4			3.9			4.1			3.5	3.6	4.6	5.8	5.4	5.2	6.2	4	
T.O.N	**mg/l N**		**NAC**		0.73			1.74			2			2.13			2.3	2.1	1.9	1.2	1.4	1.5	1.9	2	
Total S Solids	**mg/l**																								
Uranium	**µg/l**				0.94			1.06			0.99			1.07			<1.0	1	1	<1.0	<1.0	<1.0	<1.0	<1.0	
Vanadium	**µg/l**				0.75			<0.5			0.55			0.75			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Zinc	**µg/l**		**100**		9.6			7.4			6.4			7.6			5.2	8.1	4.7	5.7	9.6	10	5.9	11	
Water Level m OD	**32.362**				14.562	16.462	16.762	12.962	11.362	10.662	9.662		7.362		17.462		15.362	11.262	10.362	10.662	12.462	10.862	9.962	9.362	

	Drogheda Landfill Site Groundwater Quality																								
Monitoring Point:					**BH3A**																				
Date Collected		**DWR**	**IGV**	**2010 GW Regs**	**31-Jan-13**	**12-Feb-13**	**26-Mar-13**	**16-Apr-13**	**08-May-13**	**11-Jun-13**	**23-Jul-13**	**07-Aug-13**	**17-Sep-13**	**08-Oct-13**	**19-Nov-13**	**03-Dec-13**	**18-Feb-14**	**08-Apr-14**	**09-Sep-14**	**18-Nov-14**	**24-Feb-15**	**14-Apr-15**	**08-Sep-15**	**17-Nov-15**	
Alkalinity	**mg/l CaCO3**							272										254				285			
Aluminium	**ug/l**	**200**	**200**	**150**	<5			<5			<5			5.2			<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Ammonia	**mg/l N**	**0.23 mg/l N**	**0.11 mg/l N**	**0.175**	<0.03	0.03	<0.03	0.03	<0.03	<0.03	<0.03	<0.03	0.23	0.04	0.9	0.34	<0.020	0.058	<0.020	0.038	<0.020	<0.020	0.094	0.025	
Antimony	**ug/l**	**5**			<0.5			<0.5			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Arsenic	**ug/l**		**10**	**7.5**	<0.5			<0.5			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Barium	**ug/l**		**100**		56.6			54.5			54.3			56.5			63	53	50	44	47	52	48	54	
Beryllium	**ug/l**				<0.5			<0.5			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
B.O.D.	**mg/l O2**																								
Boron	**µg/l**	**1000**	**1000**	**750**	52.7			56.4			61.6			59.4			31	66	66	58	62	64	60	60	
Cadmium	**µg/l**	**5**	**5**	**3.75**	<0.1			<0.1			<0.1			<0.1			0.04	0.03	0.06	0.05	0.04	0.05	0.04	0.03	
Calcium	**mg/l Ca**		**200**		128.73			135.93			139.73			134.28			130	140	140	120	130	140	130	130	
C.O.D.	**mg/l O2**																								
Chloride	**mg/l Cl**	**250**	**30**		54			62			56			51			77	67	63	51	55	75	51	41	
Chromium	**µg/l**	**50**	**30**	**37.5**	0.6			1.7			2			2			2.1	1.1	<1.0	1.4	2.1	1.5	1.7	1.7	
Cobalt	**µg/l**				<0.5			<0.5			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Coliform Bacteria	**(No/100 ml)**	**0**						14										>2420				3			
Conductivity	**µS/cm @ 25**	**2500**	**1000**	**1875**	849	822	840	883	895	889	879	862	864	874	903	901	922	898	882	812	812	904	842	794	
Copper	**µg/l**	**2000**	**30**	**1500**	1.1			0.8			<0.5			1.2			4.2	<1.0	2.1	<1.0	<1.0	1.6	<1.0	<1.0	
Cyanide	**mg/l**	**0.05**	**10**					<0.05										<0.05				<0.05			
D.O.	**% Saturation**				56			61			50			62			50	47	52	60	nm	59	68	74	
E_ Coli	**No/100 ml**	**0**						0										0				0			
Fluoride	**mg/l**	**0.8**	**1000**					<0.150										0.16				<0.20			
Iron	**µg/l**	**200**	**200**		17.4			<10			<10			11.9			<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Lead	**µg/l**	**25**	**10**	**18.75**	<0.5			<0.5			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Magnesium	**mg/l Mg**		**50**		8.18			8.89			9.09			9.03			12	9.5	9.6	7.9	8.6	9.3	8	7.6	
Manganese	**µg/l**	**50**	**50**		7.5			6.5			3.1			4.6			<5.0	<5.0	7.4	11	<5.0	<5.0	6.5	27	
Mercury	**µg/l**	**1**	**1**	**0.75**	nm			<0.05			nm			nm				<0.050				<0.020			
Molybdenum	**µg/l**		**35**		<0.5			<0.5			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Nickel	**µg/l**	**20**	**20**	**15**	<0.5			0.8			<0.5			1			1.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Nitrite	**mg/l N**	**0.5**	**0.1**	**0.375**	0.004			0.004			0.002			0.012			<0.004	0.006	0.005	0.043	<0.004	0.005	0.025	<0.004	
o-Phosphate	**mg/l P**		**30**					0.02										0.039				0.031			
pH		**6.5 - 9.5**			7.2	7.2	7.1	7.2	7.2	7.2	7.1	7.2	7.1	7.1	7.1	7.1	7.1	7.2	7.2	7.1	7.2	7.1	7.2	7.2	
Phenol	**mg/l**		**0.0005**		<0.002			<0.002			<0.002			<0.002			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.025	
Potassium	**mg/l**		**5**		21.35			22.02			24.58			25.5			3.4	27	22	18	19	20	15	13	
Sampling Depth	**m**				23	23.8	26.1	24.9	25	26.4	26.8	26.3	27	13	13.2	27.8	26.1	26.8	25.8	24.9	26	25.7	26.1	26.5	
Selenium	**µg/l**	**10**			0.9			0.6			0.7			0.7			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Silver	**µg/l**				nm			nm																	
Sodium	**mg/l**	**200**	**150**	**150**	17.77			20.7			20.88			20.53			13	23	23	19	20	30	20	20	
Strontium	**µg/l**				177.3			189.75			195			204.77			220	180	190	170	180	190	170	170	
Sulphate	**mg/l SO4**	**250**	**200**	**187.5**				75.4										74.7				66			
Suspended Solids	**mg/l**																								
Temp	**°C**				9.4	9.5	9.2	11.1	11.1	11	13.8	13	10.7	11.8	10.4	8.6	10.3	10.7	11.8	10.9	10	10.9	11.3	10.3	
Thallium	**µg/l**				<0.1			<0.1			<0.1			<0.1			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Time sampled					13:05	10:15	10:25	13:45	10:35	10:10	10:30	10:00	14:30	10:40	11:35	nt	09:35	13:40	14:40	10:30	13:15	10:30	10:15	10:00	
Tin (µg/l)	**µg/l**				nm			nm																	
T.O.C.	**mg/l**	**NAC**			69.6			2.1			2.6			3.3			2.1	2.3	4.3	2.9	2.7	2.8	2.6	2.4	
T.O.N	**mg/l N**		**NAC**		3.76			4.03			4.52			4.16			6.7	6.1	6.9	6.7	6.6	6.5	6.2	5.6	
Total S Solids	**mg/l**																								
Uranium	**µg/l**				0.66			0.69			0.71			0.73			1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Vanadium	**µg/l**				0.56			<0.5			<0.5			0.59			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Zinc	**µg/l**		**100**		17.1			19.5			5.9			25			8.3	22	16	24	21	18	16	20	
Water Level m OD	**33.664**				10.664	9.864	7.564	8.764	8.664	7.264	6.864		6.664		20.464	5.864	7.564	6.864	7.864	8.764	7.664	7.964	7.564	7.164	

	Drogheda Landfill Site Groundwater Quality																								
Monitoring Point:				**BH4A**																					
Date Collected		**DWR**	**IGV**	**2010 GW Regs**	**31-Jan-13**	**12-Feb-13**	**26-Mar-13**	**16-Apr-13**	**08-May-13**	**11-Jun-13**	**23-Jul-13**	**07-Aug-13**	**17-Sep-13**	**08-Oct-13**	**19-Nov-13**	**03-Dec-13**	**18-Feb-14**	**08-Apr-14**	**09-Sep-14**	**18-Nov-14**	**24-Feb-15**	**14-Apr-15**	**08-Sep-15**	**17-Nov-15**	
Alkalinity	**mg/l CaCO3**							376														387			
Aluminium	**ug/l**	**200**	**200**	**150**	11.3	843.6		<5	<5								<10.0			<10.0	<10.0	<10.0			
Ammonia	**mg/l N**	**0.23 mg/l N**	**0.11 mg/l N**	**0.175**	<0.03	<0.03	<0.03	<0.03	<0.03								<0.020			<0.020	<0.020	<0.020			
Antimony	**ug/l**	**5**			<0.5	<0.5		<0.5	<0.5								<1.0			<1.0	<1.0	<1.0			
Arsenic	**ug/l**		**10**	**7.5**	<0.5	1.5		<0.5	<0.5								<1.0			<1.0	<1.0	<1.0			
Barium	**ug/l**		**100**		12.8	26.6		10	9.5								12			10	11	12			
Beryllium	**ug/l**				<0.5	<0.5		<0.5	<0.5								<1.0			<1.0	<1.0	<1.0			
B.O.D.	**mg/l O2**																								
Boron	**µg/l**	**1000**	**1000**	**750**	31.7	31.7		27.3	29.5								29			34	32	40			
Cadmium	**µg/l**	**5**	**5**	**3.75**	<0.1	0.2		<0.1	<0.1								<0.020			<0.020	0.02	0.02			
Calcium	**mg/l Ca**		**200**		156.38	157.46		149.85	150.84								160			150	160	150			
C.O.D.	**mg/l O2**																								
Chloride	**mg/l Cl**	**250**	**30**		43	42	42	42	42								41			40	41	41			
Chromium	**µg/l**	**50**	**30**	**37.5**	<0.5	2.3		1.2	1.1								1.7			<1.0	1.8	1.1			
Cobalt	**µg/l**				<0.5	1.3		<0.5	<0.5								<1.0			<1.0	<1.0	<1.0			
Coliform Bacteria	**(No/100 ml)**	**0**						40														5			
Conductivity	**µS/cm @ 25**	**2500**	**1000**	**1875**	919	904	901	911	921								882			888	865	866			
Copper	**µg/l**	**2000**	**30**	**1500**	1	3.1		2.3	0.8								<1.0			<1.0	<1.0	<1.0			
Cyanide	**mg/l**	**0.05**	**10**					<0.05														<0.05			
D.O.	**% Saturation**				22			83									87			70	75	72			
E_ Coli	**No/100 ml**	**0**						0														0			
Fluoride	**mg/l**	**0.8**	**1000**					<0.150														<0.20			
Iron	**µg/l**	**200**	**200**		74.1	1451.2		24.6	<10								<10.0			13	17	47			
Lead	**µg/l**	**25**	**10**	**18.75**	<0.5	1		<0.5	<0.5								<1.0			<1.0	<1.0	<1.0			
Magnesium	**mg/l Mg**		**50**		13.05	13.24		13.24	12.89								13			13	14	14			
Manganese	**µg/l**	**50**	**50**		<1	202.4		<1	2.4								<5.0			<5.0	<5.0	<5.0			
Mercury	**µg/l**	**1**	**1**	**0.75**	nm	nm		<0.05	nm													<0.020			
Molybdenum	**µg/l**		**35**		<0.5	<0.5		<0.5	<0.5								<1.0			<1.0	<1.0	<1.0			
Nickel	**µg/l**	**20**	**20**	**15**	<0.5	3.7		13.3	1.1								<1.0			<1.0	<1.0	<1.0			
Nitrite	**mg/l N**	**0.5**	**0.1**	**0.375**	<0.002	<0.002	<0.002	<0.002	<0.002								<0.004			<0.004	<0.004	<0.004			
o-Phosphate	**mg/l P**		**30**					0.02														<0.010			
pH		**6.5 - 9.5**			6.4	7	7.1	7.2	7.3								7.2			7.3	7.2	7			
Phenol	**mg/l**		**0.0005**		<0.002	<0.002	<0.002	<0.002	<0.002								<0.002			nm	<0.002	<0.002			
Potassium	**mg/l**		**5**		1.31	1.31		1.39	1.39								1.7			1.2	1.3	1.3			
Sampling Depth	**m**				16.9	17	18	20.2	22								18.5			16.3	24.1	24.5			
Selenium	**µg/l**	**10**			<0.5	<0.5		<0.5	<0.5								<1.0			<1.0	<1.0	<1.0			
Silver	**µg/l**				nm	nm		nm																	
Sodium	**mg/l**	**200**	**150**	**150**	18.46	19.02		18.58	17.94								19			19	19	20			
Strontium	**µg/l**				258.6	270.93		255.14	248.87								260			250	260	260			
Sulphate	**mg/l SO4**	**250**	**200**	**187.5**				52.1														49			
Suspended Solids	**mg/l**																								
Temp	**°C**				9.3	8.2	7.1	10.8	11.7								9.2			12.3	9	10.8			
Thallium	**µg/l**				<0.1	<0.1		<0.1	<0.1								<1.0			<1.0	<1.0	<1.0			
Time sampled					11:55	12:50	13:10	11:30	12:45								12:20			11:10	11:15	12:15			
Tin (µg/l)	**µg/l**				nm	nm		nm																	
T.O.C.	**mg/l**	**NAC**			94.5			<1.5									<1.5			1.8	1.8	3			
T.O.N	**mg/l N**		**NAC**		3.15	3.27	3.14	3.27	3.11								4			3.8	3.5	3.7			
Total S Solids	**mg/l**																								
Uranium	**µg/l**				4.2	4.63		4.98	4.58								4.5			4.4	4.4	4.5			
Vanadium	**µg/l**				0.61	2.19		<0.5	<0.5								<1.0			<1.0	<1.0	<1.0			
Zinc	**µg/l**		**100**		4.1	10.4		3.7	4.7								2.5			2.3	2.1	2.2			
Water Level m OD	**33.57**				16.67	16.57	15.57	13.37	11.57																

	Drogheda Landfill Site Groundwater Quality																								
Monitoring Point:					**BH5A**																				
Date Collected		**DWR**	**IGV**	**2010 GW Regs**	**31-Jan-13**	**12-Feb-13**	**26-Mar-13**	**16-Apr-13**	**08-May-13**	**11-Jun-13**	**23-Jul-13**	**07-Aug-13**	**17-Sep-13**	**08-Oct-13**	**19-Nov-13**	**03-Dec-13**	**18-Feb-14**	**08-Apr-14**	**09-Sep-14**	**18-Nov-14**	**24-Feb-15**	**14-Apr-15**	**08-Sep-15**	**17-Nov-15**	
Alkalinity	**mg/l CaCO3**							266										278				248			
Aluminium	**ug/l**	**200**	**200**	**150**	<5			<5			<5		<5	<5			13	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Ammonia	**mg/l N**	**0.23 mg/l N**	**0.11 mg/l N**	**0.175**	6.78	6.13	3.44	2.37	1.27	0.49	0.15	0.08	<0.03	0.04	2.5	0.96	5.8	3.1	0.085	5.7	2	1.1	<0.020	<0.020	
Antimony	**ug/l**	**5**			<0.5			<0.5			<0.5		<0.5	<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Arsenic	**ug/l**		**10**	**7.5**	<0.5			<0.5			<0.5		<0.5	<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Barium	**ug/l**		**100**		101.2			20.9			10.9		27.9	9.7			99	31	13	81	24	22	12	13	
Beryllium	**ug/l**				<0.5			<0.5			<0.5		<0.5	<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
B.O.D.	**mg/l O2**																								
Boron	**µg/l**	**1000**	**1000**	**750**	169.7			105.4			68.7		117.3	61.5			180	130	77	170	110	92	57	56	
Cadmium	**µg/l**	**5**	**5**	**3.75**	0.5			0.1			<0.1		<0.1	<0.1			0.36	0.15	0.03	0.39	0.13	0.09	0.03	0.03	
Calcium	**mg/l Ca**		**200**		117.23			99.8			89.33		73.45	86.2			110	110	90	110	100	93	85	81	
C.O.D.	**mg/l O2**																								
Chloride	**mg/l Cl**	**250**	**30**		52		49	42			37		60	39			54	45	37	47	42	38	34	35	
Chromium	**µg/l**	**50**	**30**	**37.5**	<0.5			5.2			7.7		<0.5	8.3			2.5	4	7.2	1.7	5.7	5.7	8.1	8.1	
Cobalt	**µg/l**				0.6			<0.5			<0.5		<0.5	<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Coliform Bacteria	**(No/100 ml)**	**0**						78										62				83			
Conductivity	**µS/cm @ 25**	**2500**	**1000**	**1875**	919	908	856	740	688	645	613	611	590	601	742	702	884	782	620	870	706	660	597	589	
Copper	**µg/l**	**2000**	**30**	**1500**	5.1			2.1			0.6		0.9	<0.5			3.3	1.6	<1.0	3.2	<1.0	<1.0	<1.0	<1.0	
Cyanide	**mg/l**	**0.05**	**10**					<0.05										<0.05				<0.05			
D.O.	**% Saturation**				22		25	19			19			31			36	34	24	28	20	22	69	52	
E_ Coli	**No/100 ml**	**0**						61										0				0			
Fluoride	**mg/l**	**0.8**	**1000**					<0.150										0.17				<0.20			
Iron	**µg/l**	**200**	**200**		<10			10.9			<10		16.8	<10			21	<10.0	10	<10.0	<10.0	65	<10.0	13	
Lead	**µg/l**	**25**	**10**	**18.75**	<0.5			<0.5			<0.5		<0.5	<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Magnesium	**mg/l Mg**		**50**		15.37			13.44			11.33		4.74	10.48			15	15	12	15	14	13	11	11	
Manganese	**µg/l**	**50**	**50**		490.3			81.1			15.3		<1	1.7			490	75	7	410	51	32	<5.0	<5.0	
Mercury	**µg/l**	**1**	**1**	**0.75**	nm			<0.05			nm		nm	nm				<0.050				<0.020			
Molybdenum	**µg/l**		**35**		<0.5			<0.5			<0.5		<0.5	<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Nickel	**µg/l**	**20**	**20**	**15**	30.3			13.5			3.3		2	2.4			23	8.5	1.4	24	5.7	4.2	<1.0	<1.0	
Nitrite	**mg/l N**	**0.5**	**0.1**	**0.375**	0.053			0.006			0.016		<0.002	<0.002			0.643	<0.004	0.01	0.004	0.005	0.006	<0.004	<0.004	
o-Phosphate	**mg/l P**		**30**				0.03	0.04										0.032				0.027			
pH		**6.5 - 9.5**			7.2	7.1	7.1	7.1	7.2	7.2	7.1	7.3	7.4	7.1	7.1	7.2	7.1	7.1	7.1	7.1	7.2	7.1	7.4	7.4	
Phenol	**mg/l**		**0.0005**		<0.002			<0.002			<0.002		<0.002	<0.002			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.025	
Potassium	**mg/l**		**5**		10.4			6.11			3.87		2.5	3.45			11	8	3.9	9.1	5.6	4.7	3.1	3.1	
Sampling Depth	**m**				22.7	23		24	23.9	25.9	25.3	27.6	28.1	27.1	18	26	22.3	25.1	26	25.4	25.8	26	26.8	26.4	
Selenium	**µg/l**	**10**			0.6			0.5			<0.5		<0.5	<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Silver	**µg/l**				nm			nm																	
Sodium	**mg/l**	**200**	**150**	**150**	31.31			25.51			19.42		31.43	17.64			33	30	21	30	25	23	18	19	
Strontium	**µg/l**				227.34			143.67			108.87		94.35	109.61			220	160	120	220	150	130	100	110	
Sulphate	**mg/l SO4**	**250**	**200**	**187.5**			31.9	24.5										29.6				19			
Suspended Solids	**mg/l**																								
Temp	**°C**				9.2	10.2	9.8	10.8	12.6	12.2	20.2	14.8	10.5	14	9.9	nm	10.3	12.3	10.9	12.4	6.5	12	11.1	11.3	
Thallium	**µg/l**				2.66			0.57			0.22		<0.1	0.13			2.4	<1.0	<1.0	2	<1.0	<1.0	<1.0	<1.0	
Time sampled					12:25	12:35	12:05	11:55	12:30	12:15	11:45	12:30	11:45	11:50	11:20	13	12:00	11:50	12:15	11:40	11:40	11:45	13:50	13:15	
Tin (µg/l)	**µg/l**				nm			nm																	
T.O.C.	**mg/l**	**NAC**			79.7			<1.5			1.9			3.8			17.4	1.7	2.5	2.2	<1.5	1.7	<1.5	<1.5	
T.O.N	**mg/l N**		**NAC**		7.12		7.85	7.36			5.96		0.23	4.89			11	8.3	7.3	9.2	8.3	7.8	6.6	6.2	
Total S Solids	**mg/l**																								
Uranium	**µg/l**				0.93			1.34			1.03		0.24	1.04			<1.0	1.2	1	<1.0	1.2	1.2	1	<1.0	
Vanadium	**µg/l**				0.75			<0.5			0.58		<0.5	0.77			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Zinc	**µg/l**		**100**		30.9			9.2			6.2		5.1	5.3			25	9	6.3	20	7.6	16	3.2	9.9	
Water Level m OD	**36.13**				13.43	13.13		12.13	12.23	10.23	10.83		8.03		18.13	10.13	13.83	11.03	10.13	10.73	10.33	10.13	9.33	9.73	

	Drogheda Landfill Site Groundwater Quality																								
Monitoring Point:				**BH6A**																					
Date Collected		**DWR**	**IGV**	**2010 GW Regs**	**31-Jan-13**	**12-Feb-13**	**26-Mar-13**	**16-Apr-13**	**08-May-13**	**11-Jun-13**	**23-Jul-13**	**07-Aug-13**	**17-Sep-13**	**08-Oct-13**	**19-Nov-13**	**03-Dec-13**	**18-Feb-14**	**08-Apr-14**	**09-Sep-14**	**18-Nov-14**	**24-Feb-15**	**14-Apr-15**	**08-Sep-15**	**17-Nov-15**	
Alkalinity	**mg/l CaCO3**							182										198				163			
Aluminium	**ug/l**	**200**	**200**	**150**	<5	19		8.8	<5	25.1	<5	<5		5.5	<10	<10	<10.0	10	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Ammonia	**mg/l N**	**0.23 mg/l N**	**0.11 mg/l N**	**0.175**	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.08	0.03	<0.020	0.022	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Antimony	**ug/l**	**5**			<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Arsenic	**ug/l**		**10**	**7.5**	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Barium	**ug/l**		**100**		40.3	41.5		40.9	35.2	33.7	36	36		36	38.5	39.5	41	40	37	35	36	38	38	40	
Beryllium	**ug/l**				<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
B.O.D.	**mg/l O2**																								
Boron	**µg/l**	**1000**	**1000**	**750**	45.5	45.6		24.9	27.1	34.9	42.3	42.3		44	49.4	55.9	37	37	48	46	42	46	33	33	
Cadmium	**µg/l**	**5**	**5**	**3.75**	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.020	<0.020	0.02	<0.020	<0.020	0.02	<0.020	<0.020	
Calcium	**mg/l Ca**		**200**		63.29	63.76		70.98	67.47	70.84	69.16	69.16		66.69	66.58	64.84	68	71	67	64	68	65	66	64	
C.O.D.	**mg/l O2**																								
Chloride	**mg/l Cl**	**250**	**30**		16	16	15	14	16	17	23	23		27	38	44	22	20	27	26	21	22	17	20	
Chromium	**µg/l**	**50**	**30**	**37.5**	<0.5	1		0.9	0.8	0.7	1	1		1.2	<1	1.8	1.5	<1.0	<1.0	<1.0	1.3	<1.0	<1.0	1.3	
Cobalt	**µg/l**				<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Coliform Bacteria	**(No/100 ml)**	**0**						13										35				1			
Conductivity	**µS/cm @ 25**	**2500**	**1000**	**1875**	413	424	431	420	423	415	419	419	611	438	463	485	424	423	428	428	407	409	405	408	
Copper	**µg/l**	**2000**	**30**	**1500**	1.1	1.6		0.9	0.6	1.3	0.5	0.5		0.7	<1	1.2	6.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.9	
Cyanide	**mg/l**	**0.05**	**10**					<0.05										<0.05				<0.05			
D.O.	**% Saturation**				76			78			54	54		65			73	67	72	80	74	72	78	81	
E_ Coli	**No/100 ml**	**0**						0										0				0			
Fluoride	**mg/l**	**0.8**	**1000**					0.15										0.21				<0.20			
Iron	**µg/l**	**200**	**200**		17.2	50.7		29	<10	92.9	<10	<10		<10	15.5	10.1	<10.0	<10.0	<10.0	15	<10.0	10	<10.0	<10.0	
Lead	**µg/l**	**25**	**10**	**18.75**	<0.5	2.3		<0.5	<0.5	2.1	<0.5	<0.5		<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Magnesium	**mg/l Mg**		**50**		2.34	2.56		2.96	2.68	2.79	2.65	2.65		2.58	2.76	2.68	2.6	2.8	2.7	2.5	2.7	2.8	2.4	2.5	
Manganese	**µg/l**	**50**	**50**		2.6	8.8		4.5	1.1	17	1.5	1.5		1.6	<5	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	7.2	
Mercury	**µg/l**	**1**	**1**	**0.75**	nm	nm		<0.05	nm	nm	nm	nm		nm	nm	nm		<0.050				<0.020			
Molybdenum	**µg/l**		**35**		<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Nickel	**µg/l**	**20**	**20**	**15**	2.7	1		0.7	1.3	2.1	0.6	0.6		1.3	1.1	1.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Nitrite	**mg/l N**	**0.5**	**0.1**	**0.375**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		0.002	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	
o-Phosphate	**mg/l P**		**30**					0.02										0.028				<0.010			
pH		**6.5 - 9.5**			6.9	7.4	7.4	7.6	7.6	7.6	7.6	7.6	7.3	7.6	7.6	7.4	7.8	7.6	7.7	7.7	7.6	7.6	7.7	7.8	
Phenol	**mg/l**		**0.0005**		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002	nm	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.025	
Potassium	**mg/l**		**5**		0.86	0.79		1.19	1.23	0.81	1.3			1.11	1.54	1.41	1.3	1	0.96	0.86	0.91	1.3	0.76	0.88	
Sampling Depth	**m**				27.5	27.3	26.8	27.8	28.4	28.8	29.6	29.6	27.6	28.6	29.2	28.7	28.1	28.9	29	28.6	28.4	28.5	29	28.8	
Selenium	**µg/l**	**10**			<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Silver	**µg/l**				nm	nm		nm																	
Sodium	**mg/l**	**200**	**150**	**150**	15.25	16.09		11.91	11.86	14.56	15.87	15.87		16.44	18.56	19.86	14	15	18	16	15	17	13	14	
Strontium	**µg/l**				83.88	90		92.43	88.59	92.25	88.38	88.38		93.63	89.41	91.79	91	87	88	86	86	89	83	89	
Sulphate	**mg/l SO4**	**250**	**200**	**187.5**				11.6										11.9				14			
Suspended Solids	**mg/l**																								
Temp	**°C**				9.4	10.2	9.6	10.5	10.4	10.6	13.8	13.8	14.8	11	10	8.3	10.1	10.4	11	10.9	9.8	10.5	10.7	10.3	
Thallium	**µg/l**				<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Time sampled					10:40	10:30	10:45	10:00	10:50	10:25	11:20	11:20	12:30	11:20	12:10	10:45	9:45	10:15	10:05	10:50	10:15	11:00	10:45	10:20	
Tin (µg/l)	**µg/l**				nm	nm		nm																	
T.O.C.	**mg/l**	**NAC**			43.7			<1.5			<1.5	<1.5		2.5			<1.5	<1.5	3.4	1.5	<1.5	1.8	<1.5	3.2	
T.O.N	**mg/l N**		**NAC**		0.86	1.1	1.12	1.11	1.25	1.04	0.78	0.78		1.51	0.59	0.3	0.72	0.67	0.76	0.7	0.76	0.85	0.75	0.76	
Total S Solids	**mg/l**																								
Uranium	**µg/l**				0.41	0.42		0.4	0.39	0.47	0.39	0.39		0.44	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Vanadium	**µg/l**				0.51	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5		0.52	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Zinc	**µg/l**		**100**		22.4	29.7		30.6	8.6	13.6	4.4	4.4		18.7	29.7	17.2	16	8.7	5.1	15	6.4	7.4	9.1	11	
Water Level m OD	**35.951**				8.451	8.651	9.151	8.151	7.551	7.151	6.351		8.351		6.751	7.251	7.851	7.051	6.951	7.351	7.551	7.451	6.951	7.151	

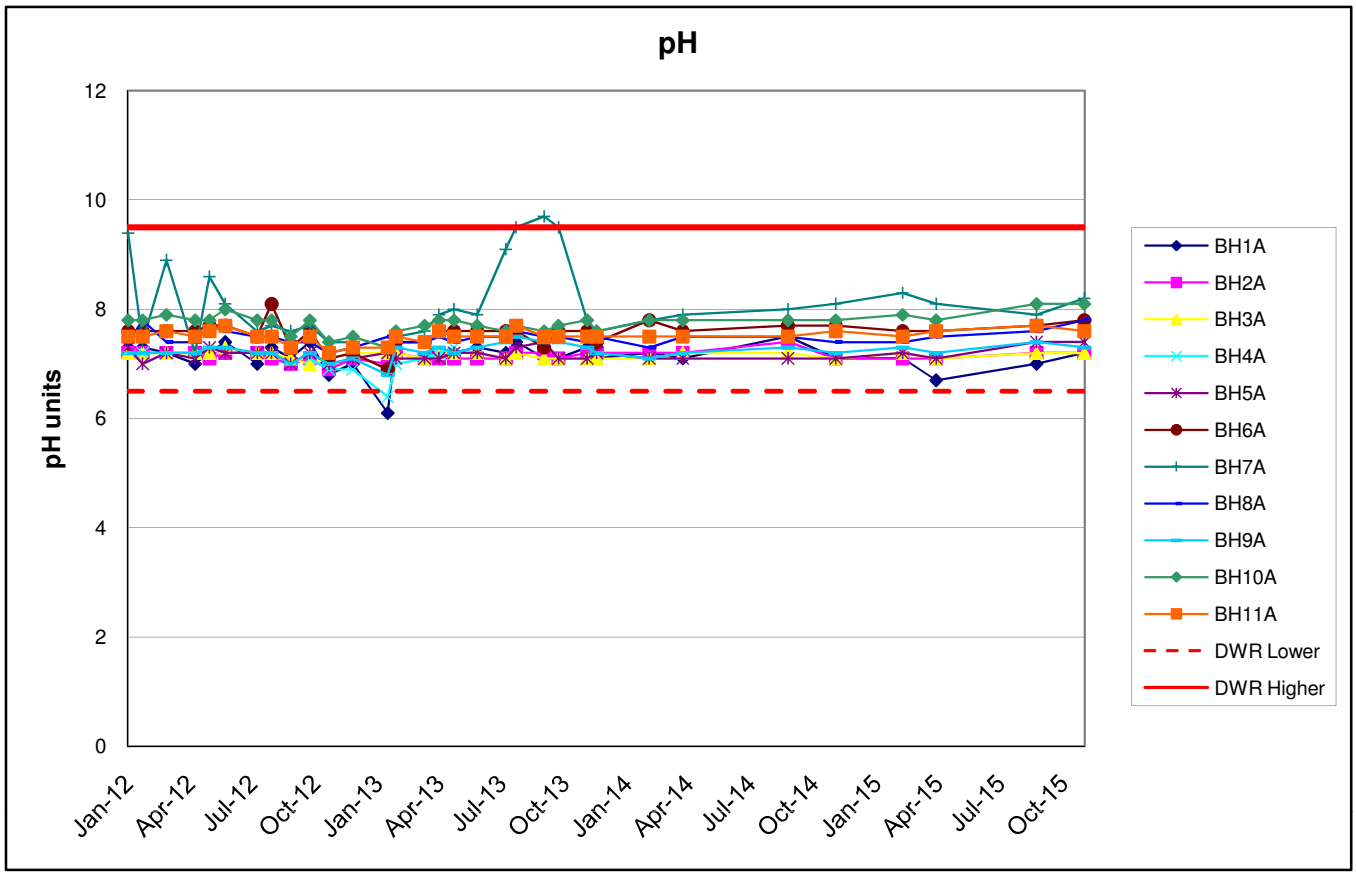
				Drogheda Landfill Site Groundwater Quality																				
Monitoring Point:					**BH7A**																			
Date Collected		**DWR**	**IGV**	**2010 GW Regs**	**31-Jan-13**	**12-Feb-13**	**26-Mar-13**	**16-Apr-13**	**08-May-13**	**11-Jun-13**	**23-Jul-13**	**07-Aug-13**	**17-Sep-13**	**08-Oct-13**	**19-Nov-13**	**03-Dec-13**	**18-Feb-14**	**08-Apr-14**	**09-Sep-14**	**18-Nov-14**	**24-Feb-15**	**14-Apr-15**	**08-Sep-15**	**17-Nov-15**	
Alkalinity	**mg/l CaCO3**							140										158				140			
Aluminium	**ug/l**	**200**	**200**	**150**	nm			14.6			29.4			59.5			<10.0	<10.0	11	<10.0	<10.0	<10.0	<10.0	<10.0	
Ammonia	**mg/l N**	**0.23 mg/l N**	**0.11 mg/l N**	**0.175**	nm	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.06	<0.020	<0.020	<0.020	<0.020	0.026	0.024	<0.020	<0.020	<0.020	<0.020	
Antimony	**ug/l**	**5**			nm			0.58			0.95			1.16			<1.0	<1.0	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	
Arsenic	**ug/l**		**10**	**7.5**	nm			8.74			44.61			47.05			<1.0	8.2	15	15	8.2	6.7	9.8	6	
Barium	**ug/l**		**100**		nm			32.6			10.3			8.4			41	30	24	28	31	28	29	32	
Beryllium	**ug/l**				nm			<0.5			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
B.O.D.	**mg/l O2**																								
Boron	**µg/l**	**1000**	**1000**	**750**	nm			38.8			26.2			33.6			37	53	60	55	49	50	60	65	
Cadmium	**µg/l**	**5**	**5**	**3.75**	nm			<0.1			0.2			0.1			<0.020	0.03	0.05	0.04	0.03	0.03	0.02	0.03	
Calcium	**mg/l Ca**		**200**		nm			58.95			13.39			12.16			68	75	46	56	62	60	46	58	
C.O.D.	**mg/l O2**																								
Chloride	**mg/l Cl**	**250**	**30**		nm			34			67			60			22	23	27	27	20	17	17	18	
Chromium	**µg/l**	**50**	**30**	**37.5**	nm			11.7			24.7			24.6			1.5	6.7	12	8.7	6.1	5.3	8.3	7.8	
Cobalt	**µg/l**				nm			<0.5			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Coliform Bacteria	**(No/100 ml)**	**0**						41										236				980			
Conductivity	**µS/cm @ 25**	**2500**	**1000**	**1875**	nm	578	577	571	561	565	627	621	606	595	451	454	424	539	471	540	468	442	439	511	
Copper	**µg/l**	**2000**	**30**	**1500**	nm			1.9			1			1.4			6.6	2.9	2.3	3.8	2.7	2.1	2.6	3.3	
Cyanide	**mg/l**	**0.05**	**10**					<0.05										<0.05				<0.05			
D.O.	**% Saturation**				nm			90			50			57			73	85	82	91	92	84	92	92	
E_ Coli	**No/100 ml**	**0**						0										1				0			
Fluoride	**mg/l**	**0.8**	**1000**					0.2										0.22				<0.20			
Iron	**µg/l**	**200**	**200**		nm			20.7			<10			<10			<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Lead	**µg/l**	**25**	**10**	**18.75**	nm			<0.5			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Magnesium	**mg/l Mg**		**50**		nm			7.53			1.59			2.1			2.6	9.6	7.6	8.6	8.8	8.6	9.1	13	
Manganese	**µg/l**	**50**	**50**		nm			1.4			<1			<1			<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
Mercury	**µg/l**	**1**	**1**	**0.75**	nm			0.1			nm			nm				<0.050				<0.020			
Molybdenum	**µg/l**		**35**		nm			18.8			63.9			70			<1.0	7.6	22	16	9.2	6.8	10	9.1	
Nickel	**µg/l**	**20**	**20**	**15**	nm			2.6			1.3			1			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Nitrite	**mg/l N**	**0.5**	**0.1**	**0.375**	nm			<0.002			<0.002			<0.002			<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	
o-Phosphate	**mg/l P**		**30**					<0.02										<0.010				<0.010			
pH		**6.5 - 9.5**			nm	7.5	7.6	7.9	8	7.9	9.1	9.5	9.7	9.5	7.8	7.6	7.8	7.9	8	8.1	8.3	8.1	7.9	8.2	
Phenol	**mg/l**		**0.0005**		nm			<0.002			<0.002			<0.002			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.025	
Potassium	**mg/l**		**5**		nm			45.55			124.56			113.3			1.3	23	39	33	21	16	30	22	
Sampling Depth	**m**				nm	6	5.4	6.8	8.7	9.2	9.3	10.2	13.1	9.8	10.3	9.1	28.1	9.4	12.3	11.7	8.4	8	12	10.9	
Selenium	**µg/l**	**10**			nm			71.8			109			100			<1.0	86	100	110	68	62	77	110	
Silver	**µg/l**				nm			nm																	
Sodium	**mg/l**	**200**	**150**	**150**	nm			13.55			18.09			16.66			14	11	10	11	9.8	9.1	7.4	8.3	
Strontium	**µg/l**				nm			218.29			267.75			47.14			91	230	150	210	210	210	170	190	
Sulphate	**mg/l SO4**	**250**	**200**	**187.5**				82.2										89.8				64			
Suspended Solids	**mg/l**																								
Temp	**°C**				nm	7.2	6	11	nm	11.4	19.5	14.6	10.6	14	9.6	nm	10.1	10.7	10.8	15.8	9.8	11.5	11.6	10.3	
Thallium	**µg/l**				nm			<0.1			<0.1			<0.1			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Time sampled					13:05	12:10	12:20	12:35	12:10	11:50	12:35	12:00	12:30	12:35	14:25	12:30	9:45	12:30	11:45	12:40	12:05	11:15	13:05	12:40	
Tin (µg/l)	**µg/l**				nm			nm																	
T.O.C.	**mg/l**	**NAC**			nm			2			1.8			2.3			<1.5	2.3	4.5	4.1	3.6	2.3	3.3	3.3	
T.O.N	**mg/l N**		**NAC**		nm			0.32			0.9			0.79			0.72	<0.20	0.36	0.36	0.25	0.25	0.44	<0.20	
Total S Solids	**mg/l**																								
Uranium	**µg/l**				nm			1.23			0.36			0.3			<1.0	1.5	<1.0	1.3	1.4	1.4	1	1.4	
Vanadium	**µg/l**				nm			2.23			41			44.47			<1.0	2	7.4	5	2	1.7	3.5	2.6	
Zinc	**µg/l**		**100**		nm			10.8			1.3			5.8			16	4.4	2.6	13	6.4	24	2.7	5.7	
Water Level m OD	**25.172**					19.172	19.772	18.372	16.472	15.972	15.872		12.072		14.872	16.072		15.772	12.872	13.472	16.772	17.172	13.172	14.272	

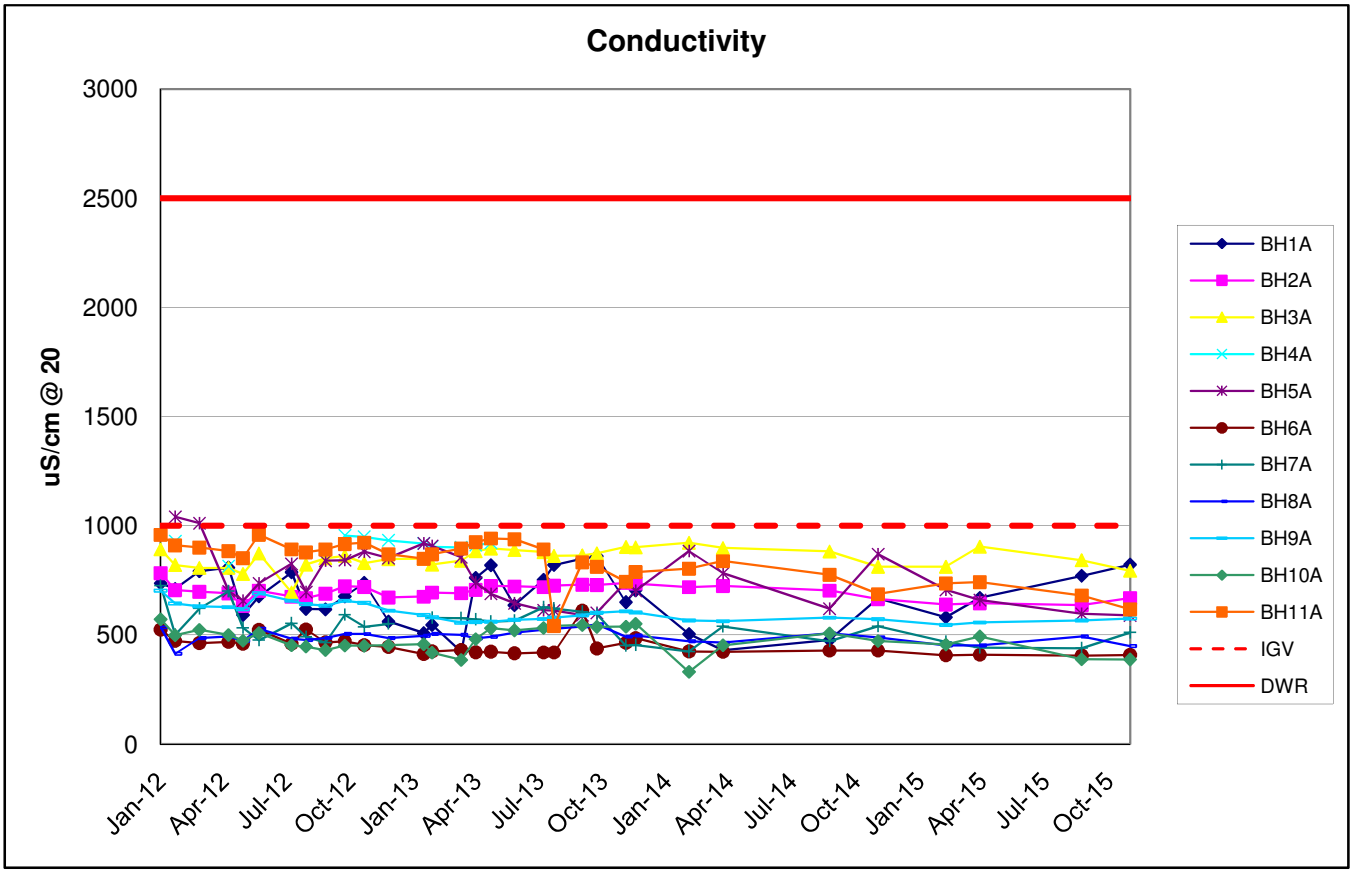
				Drogheda Landfill Site Groundwater Quality																				
Monitoring Point:					**BH8A**																			
Date Collected		**DWR**	**IGV**	**2010 GW Regs**	**31-Jan-13**	**12-Feb-13**	**26-Mar-13**	**16-Apr-13**	**08-May-13**	**11-Jun-13**	**23-Jul-13**	**07-Aug-13**	**17-Sep-13**	**08-Oct-13**	**19-Nov-13**	**03-Dec-13**	**18-Feb-14**	**08-Apr-14**	**09-Sep-14**	**18-Nov-14**	**24-Feb-15**	**14-Apr-15**	**08-Sep-15**	**17-Nov-15**	
Alkalinity	**mg/l CaCO3**							210										202				219			
Aluminium	**ug/l**	**200**	**200**	**150**	<5			<5			<5			<5			<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Ammonia	**mg/l N**	**0.23 mg/l N**	**0.11 mg/l N**	**0.175**	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Antimony	**ug/l**	**5**			<0.5			<0.5			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Arsenic	**ug/l**		**10**	**7.5**	<0.5			0.61			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Barium	**ug/l**		**100**		21.1			19.3			18.4			20.9			18	17	19	18	18	18	19	18	
Beryllium	**ug/l**				<0.5			<0.5			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
B.O.D.	**mg/l O2**																								
Boron	**µg/l**	**1000**	**1000**	**750**	20.7			20.6			55.1			78.7			23	26	41	27	23	24	49	26	
Cadmium	**µg/l**	**5**	**5**	**3.75**	<0.1			<0.1			<0.1			<0.1			<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Calcium	**mg/l Ca**		**200**		85.4			81.62			77.41			76.42			84	85	78	84	81	77	75	76	
C.O.D.	**mg/l O2**																								
Chloride	**mg/l Cl**	**250**	**30**		14			17			53			55			16	17	41	16	19	18	43	15	
Chromium	**µg/l**	**50**	**30**	**37.5**	0.8			1.3			1.1			1.2			2.2	<1.0	<1.0	1.4	1.6	1.1	1	1.5	
Cobalt	**µg/l**				<0.5			<0.5			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Coliform Bacteria	**(No/100 ml)**	**0**						16										9				5			
Conductivity	**µS/cm @ 25**	**2500**	**1000**	**1875**	496	505	500	484	491	510	524	528	539	549	492	497	471	464	507	488	451	452	493	449	
Copper	**µg/l**	**2000**	**30**	**1500**	0.7			<0.5			<0.5			0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Cyanide	**mg/l**	**0.05**	**10**					<0.05										<0.05				<0.05			
D.O.	**% Saturation**				86			90			56			49			90	84	74	93	91	87	62	94	
E_ Coli	**No/100 ml**	**0**						0										0				0			
Fluoride	**mg/l**	**0.8**	**1000**					<0.150										<0.150				<0.20			
Iron	**µg/l**	**200**	**200**		<10			<10			<10			17.1			22	<10.0	32	50	<10.0	<10.0	<10.0	<10.0	
Lead	**µg/l**	**25**	**10**	**18.75**	<0.5			<0.5			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Magnesium	**mg/l Mg**		**50**		3.95			3.77			3.2			3.72			4	4.1	4.1	4.1	3.8	3.8	2.8	3.7	
Manganese	**µg/l**	**50**	**50**		1.7			2			1.4			1.9			<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
Mercury	**µg/l**	**1**	**1**	**0.75**	nm			<0.05			nm			nm				<0.050				<0.020			
Molybdenum	**µg/l**		**35**		<0.5			<0.5			2			0.9			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Nickel	**µg/l**	**20**	**20**	**15**	<0.5			<0.5			<0.5			2.2			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Nitrite	**mg/l N**	**0.5**	**0.1**	**0.375**	<0.002			<0.002			<0.002			<0.002			0.005	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	
o-Phosphate	**mg/l P**		**30**					<0.02										<0.010				<0.010			
pH		**6.5 - 9.5**			7.5	7.4	7.4	7.5	7.4	7.5	7.5	7.6	7.5	7.5	7.4	7.5	7.3	7.5	7.5	7.4	7.4	7.5	7.6	7.8	
Phenol	**mg/l**		**0.0005**		<0.002			<0.002			<0.002			<0.002				<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.025	
Potassium	**mg/l**		**5**		0.5			0.71			0.87			1.73			0.65	0.41	0.93	0.32	0.34	0.37	0.63	0.42	
Sampling Depth	**m**				26.2	27.5	26.7	28.2	28.7	29.1	29.7	29.3	29.6	28.2	28.9	29.2	26.9	28.7	29.1	24.6	29	29	29	29.2	
Selenium	**µg/l**	**10**			1.5			2.1			<0.5			<0.5			1	<1.0	<1.0	1.2	1.1	<1.0	<1.0	<1.0	
Silver	**µg/l**				nm			nm																	
Sodium	**mg/l**	**200**	**150**	**150**	10.93			11.09			23.65			27.8			11	12	23	9.9	11	12	21	11	
Strontium	**µg/l**				94.44			89.39			85.5			91.66			91	88	90	95	87	89	78	88	
Sulphate	**mg/l SO4**	**250**	**200**	**187.5**				10.3										8.7				7			
Suspended Solids	**mg/l**																								
Temp	**°C**				9.4	10.1	9.7	10.5	10.5	10.4	12.4	11.9	10.4	11	9.9	8.4	10.3	10.7	10.8	10.8	10.1	10.6	10.9	10.3	
Thallium	**µg/l**				<0.1			<0.1			<0.1			0.1			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Time sampled					11:05	10:55	11:05	10:25	11:10	10:40	11:50	10:55	11:20	11:40	12:40	11:10	10:10	10:45	10:20	11:15	10:40	11:20	11:05	10:40	
Tin (µg/l)	**µg/l**				nm			nm																	
T.O.C.	**mg/l**	**NAC**			61.5			<1.5			1.8			2.4			<1.5	<1.5	3.4	2.2	<1.5	<1.5	1.9	<1.5	
T.O.N	**mg/l N**		**NAC**		0.33			0.35			0.12			0.27			0.44	0.2	<0.20	0.34	0.21	0.27	0.25	0.29	
Total S Solids	**mg/l**																								
Uranium	**µg/l**				0.36			0.33			0.25			0.27			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Vanadium	**µg/l**				<0.5			<0.5			<0.5			<0.5			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Zinc	**µg/l**		**100**		12.3			12.3			14.6			12.3			4.2	4.2	4.5	11	2.2	4.8	3.6	7.5	
Water Level m OD	**36.151**				9.951	8.651	9.451	7.951	7.451	7.051	6.451		6.551		7.251	6.951	9.251	7.451	7.051	11.551	7.151	7.151	7.151	6.951	

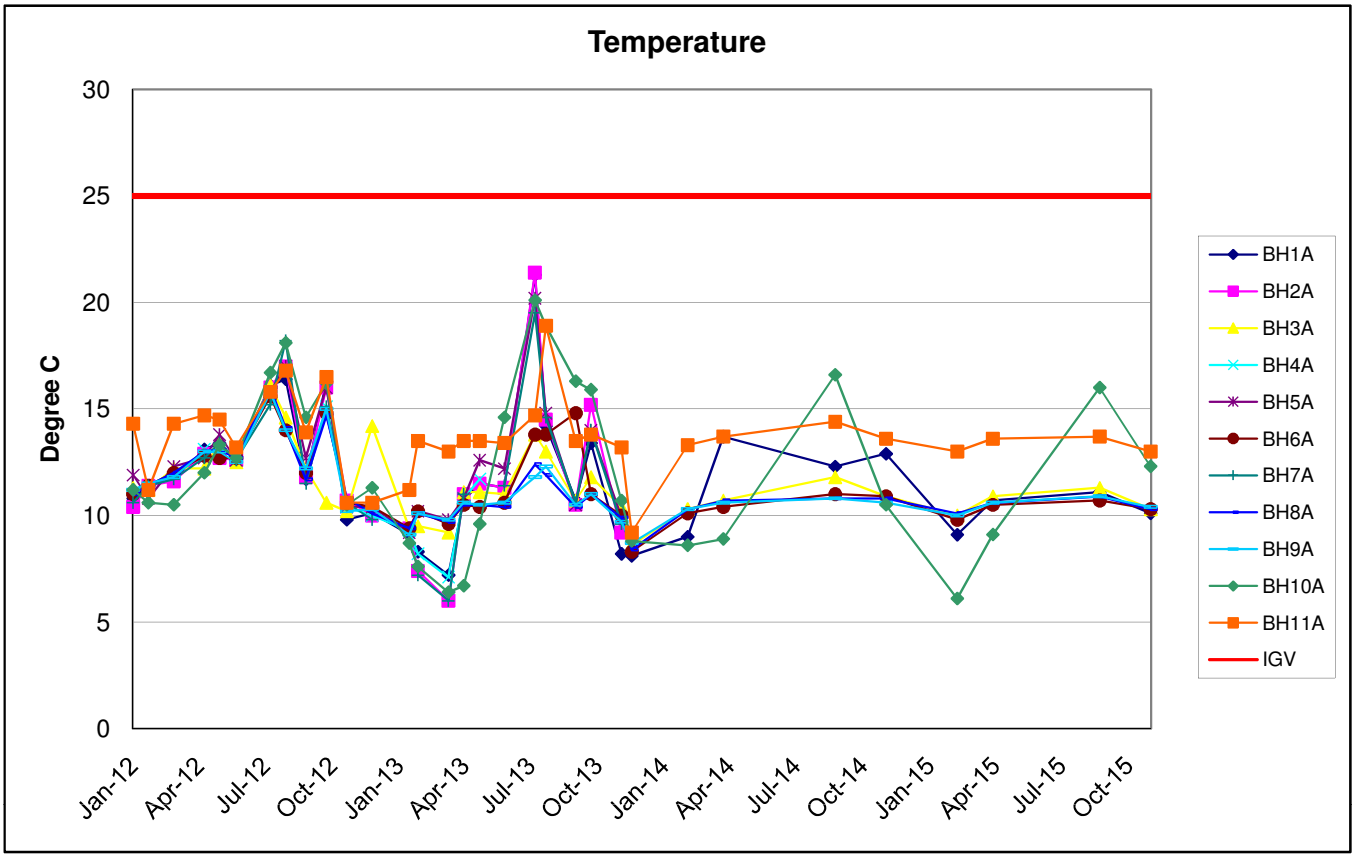
				Drogheda Landfill Site Groundwater Quality																				
Monitoring Point:					**BH9A**																			
Date Collected		**DWR**	**IGV**	**2010 GW Regs**	**31-Jan-13**	**12-Feb-13**	**26-Mar-13**	**16-Apr-13**	**08-May-13**	**11-Jun-13**	**23-Jul-13**	**07-Aug-13**	**17-Sep-13**	**08-Oct-13**	**19-Nov-13**	**03-Dec-13**	**18-Feb-14**	**08-Apr-14**	**09-Sep-14**	**18-Nov-14**	**24-Feb-15**	**14-Apr-15**	**08-Sep-15**	**17-Nov-15**
Alkalinity	**mg/l CaCO3**							268										246				269		
Aluminium	**ug/l**	**200**	**200**	**150**	<5	20.4		<5	<5	18.7	<5	<5	<5	<5	<10	<10	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Ammonia	**mg/l N**	**0.23 mg/l N**	**0.11 mg/l N**	**0.175**	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.020	0.026	<0.020	0.06	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Antimony	**ug/l**	**5**			<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	3.5	<1.0	<1.0	<1.0
Arsenic	**ug/l**		**10**	**7.5**	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Barium	**ug/l**		**100**		29.2	29.6		26.2	24.2	27.9	28.2	26.8	27.9	28.6	29.2	28.6	27	25	28	25	26	27	26	29
Beryllium	**ug/l**				<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
B.O.D.	**mg/l O2**																							
Boron	**µg/l**	**1000**	**1000**	**750**	24.7	23.7		25.3	30.6	69.5	112.2	108.5	117.3	109	86.8	78.8	26	29	57	28	28	31	73	51
Cadmium	**µg/l**	**5**	**5**	**3.75**	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.02	<0.02	0.02	<0.020	0.02	<0.020	0.02	<0.020	<0.020	<0.020
Calcium	**mg/l Ca**		**200**		109.07	108.06		106.02	97.02	94.68	80.88	75.04	73.45	82.83	86.84	89.65	110	110	100	100	100	100	90	95
C.O.D.	**mg/l O2**																							
Chloride	**mg/l Cl**	**250**	**30**		19	18	16	16	23	38	54	56	60	57	48	42	19	19	35	23	19	20	41	34
Chromium	**µg/l**	**50**	**30**	**37.5**	<0.5	1.7		1.3	1	0.7	1	<0.5	<0.5	1.9	<1	2	2.2	<1.0	<1.0	1.3	1.7	1.2	<1.0	1.6
Cobalt	**µg/l**				<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Coliform Bacteria	**(No/100 ml)**	**0**						3										0				3		
Conductivity	**µS/cm @ 25**	**2500**	**1000**	**1875**	591	581	556	559	561	569	573	580	590	602	608	603	567	563	579	572	546	557	567	575
Copper	**µg/l**	**2000**	**30**	**1500**	0.8	1.1		<0.5	0.5	1	0.7	0.8	0.9	0.6	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	2.8	<1.0	<1.0
Cyanide	**mg/l**	**0.05**	**10**					<0.05										<0.05				<0.05		
D.O.	**% Saturation**				66			63			26			24			61	50	43	79	56	59	35	56
E_ Coli	**No/100 ml**	**0**						0										0				0		
Fluoride	**mg/l**	**0.8**	**1000**					<0.150										<0.150				<0.20		
Iron	**µg/l**	**200**	**200**		24.4	11.7		<10	<10	34.5	<10	<10	16.8	<10	<10	<10	26	<10.0	11	<10.0	<10.0	<10.0	<10.0	<10.0
Lead	**µg/l**	**25**	**10**	**18.75**	<0.5	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Magnesium	**mg/l Mg**		**50**		4.26	4.41		4.55	4.28	4.88	5.16	4.78	4.74	4.9	4.89	5.03	4.3	4.5	4.9	4.1	4.6	4.5	4.4	4.3
Manganese	**µg/l**	**50**	**50**		2.2	7.4		1.1	<1	13	<1	<1	<1	<1	<5	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Mercury	**µg/l**	**1**	**1**	**0.75**	nm	nm		<0.05	nm	nm	nm	nm	nm	nm	nm	nm		<0.050						
Molybdenum	**µg/l**		**35**		<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	4.7	<1.0	<1.0	<1.0
Nickel	**µg/l**	**20**	**20**	**15**	<0.5	<0.5		<0.5	1.1	2.4	1.7	2.5	2	1.9	1.6	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nitrite	**mg/l N**	**0.5**	**0.1**	**0.375**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
o-Phosphate	**mg/l P**		**30**					0.02										0.012				<0.010		
pH		**6.5 - 9.5**			6.8	7.3	7.2	7.3	7.2	7.3	7.4	7.5	7.4	7.4	7.3	7.2	7.1	7.2	7.3	7.2	7.3	7.2	7.4	7.3
Phenol	**mg/l**		**0.0005**		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.025
Potassium	**mg/l**		**5**		0.63	0.66		0.97	1.08	1.31	2.45		2.5	2.55	2	1.81	0.64	0.97	1.1	0.39	0.59	0.67	1.1	1
Sampling Depth	**m**				26.5	25.3	26.2	27.3	27	27.4	28.7	27.5	28.1	27.1	27.5	28	25.2	27	25.4	28.4	28.9	26	26.1	26.2
Selenium	**µg/l**	**10**			<0.5	<0.5		<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Silver	**µg/l**				nm	nm		nm																
Sodium	**mg/l**	**200**	**150**	**150**	7.16	7.33		8.81	10.29	21.46	31.21	30.46	31.43	30.16	24.85	21.42	8.3	9.7	18	8.1	9.5	10	21	17
Strontium	**µg/l**				119.54	123.42		116.71	110.48	110.3	99.91	103.42	94.35	107.75	109.47	107.5	120	110	120	120	110	120	100	120
Sulphate	**mg/l SO4**	**250**	**200**	**187.5**				6										4.9				5		
Suspended Solids	**mg/l**																							
Temp	**°C**				9.1	10.1	9.8	10.6	10.5	10.6	11.8	12.3	10.5	11	9.7	8.7	10.3	10.6	10.8	10.6	10	10.6	10.9	10.4
Thallium	**µg/l**				<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Time sampled					11:30	11:15	11:25	10:55	11:30	11:05	12:10	11:15	11:45	12.05	13:00	11:35	10:30	11:15	10:45	11:35	11:05	11:45	11:45	10:55
Tin (µg/l)	**µg/l**				nm	nm		nm																
T.O.C.	**mg/l**	**NAC**			70.7			<1.5			1.6			2.3			<1.5	<1.5	2.4	<1.5	<1.5	1.6	3	<1.5
T.O.N	**mg/l N**		**NAC**		<0.08	<0.08	0.16	<0.08	0.08	<0.08	<0.08	0.16	0.23	<0.08	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.25	<0.20	<0.20
Total S Solids	**mg/l**																							
Uranium	**µg/l**				0.27	0.28		0.27	0.25	0.27	0.23	0.24	0.24	0.24	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vanadium	**µg/l**				<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.51	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Zinc	**µg/l**		**100**		6.4	3.1		4.8	4.4	3.5	2.7	4.2	5.1	7.6	21.2	5.6	5.1	4	5.9	8.8	1.8	3.7	4.6	13
Water Level m OD	**34.345**				7.845	9.045	8.145	7.045	7.345	6.945	5.645		6.245		6.845	6.345	9.145	7.345	8.945	5.945	5.445	8.345	8.245	8.145

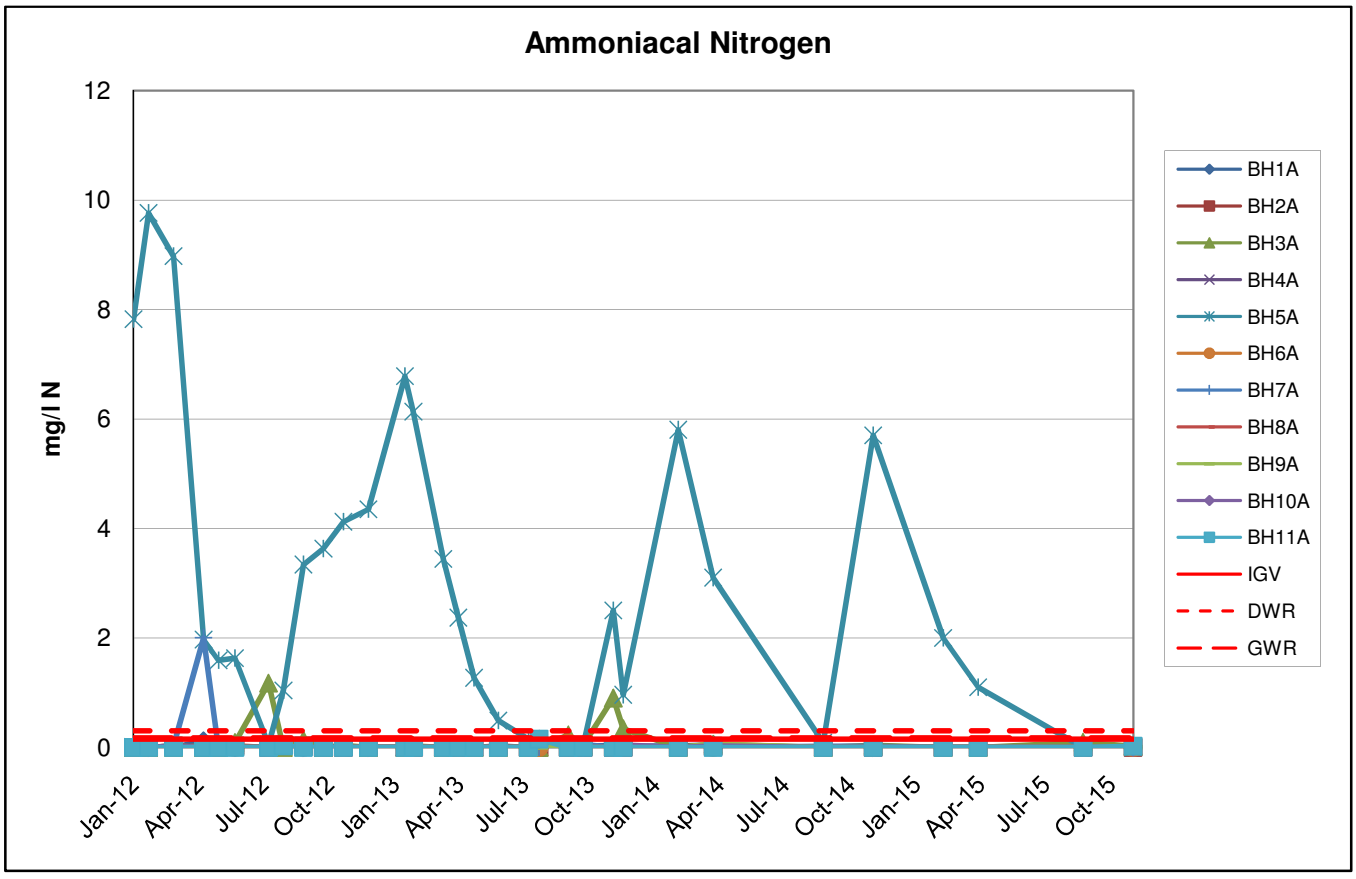
				Drogheda Landfill Site Groundwater Quality																				
Monitoring Point:					**BH10A**																			
Date Collected		**DWR**	**IGV**	**2010 GW Regs**	**31-Jan-13**	**12-Feb-13**	**26-Mar-13**	**16-Apr-13**	**08-May-13**	**11-Jun-13**	**23-Jul-13**	**07-Aug-13**	**17-Sep-13**	**08-Oct-13**	**19-Nov-13**	**03-Dec-13**	**18-Feb-14**	**08-Apr-14**	**09-Sep-14**	**18-Nov-14**	**24-Feb-15**	**14-Apr-15**	**08-Sep-15**	**17-Nov-15**
Alkalinity	**mg/l CaCO3**							135										142				141		
Aluminium	**ug/l**	**200**	**200**	**150**	5.8	99.5		16.2	6.6	200.3	10.3	6.3	13.3	11.9	14	<10	11	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Ammonia	**mg/l N**	**0.23 mg/l N**	**0.11 mg/l N**	**0.175**	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.15	0.05	<0.03	<0.020	0.049	<0.020	0.028	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Antimony	**ug/l**	**5**			<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic	**ug/l**		**10**	**7.5**	0.76	0.52		0.57	0.63	1.23	1.78	2.45	1.56	1.25	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	<1.0
Barium	**ug/l**		**100**		40.3	36.2		39.6	47.3	53.9	58.7	65.7	58.6	63.3	68.6	72.3	22	47	57	47	49	60	26	33
Beryllium	**ug/l**				<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
B.O.D.	**mg/l O2**																							
Boron	**µg/l**	**1000**	**1000**	**750**	127.7	98.4		139.6	172.1	191.8	206.4	193.6	194.7	204.2	191.6	186.9	33	120	190	150	130	160	170	160
Cadmium	**µg/l**	**5**	**5**	**3.75**	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.020	<0.020	0.02	<0.020	<0.020	<0.020	<0.020	<0.020
Calcium	**mg/l Ca**		**200**		41.9	41.64		46.86	41.82	43.75	42.68	40.85	38.97	41.5	42.65	42.38	47	51	41	39	47	46	21	23
C.O.D.	**mg/l O2**																							
Chloride	**mg/l Cl**	**250**	**30**		56	44	27	55	70	72	74	75	76	75	71	72	20	45	69	58	55	59	63	60
Chromium	**µg/l**	**50**	**30**	**37.5**	<0.5	1.6		1.2	<0.5	0.6	0.5	<0.5	<0.5	0.7	<1	<1	3.8	1.6	<1.0	<1.0	1.2	<1.0	<1.0	<1.0
Cobalt	**µg/l**				<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Coliform Bacteria	**(No/100 ml)**	**0**						2										93				23		
Conductivity	**µS/cm @ 25**	**2500**	**1000**	**1875**	457	418	385	481	531	521	532	541	545	537	538	551	330	452	507	472	456	493	388	387
Copper	**µg/l**	**2000**	**30**	**1500**	1.4	1.8		1.5	2.5	2.5	7.2	1.3	1.9	1	1.3	1.2	<1.0	1.2	1.3	1.5	<1.0	1.6	1.3	1
Cyanide	**mg/l**	**0.05**	**10**					<0.05										<0.05				<0.05		
D.O.	**% Saturation**				67			71			13			30			87	62	46	66	71	51	63	64
E_ Coli	**No/100 ml**	**0**						1										0				0		
Fluoride	**mg/l**	**0.8**	**1000**					<0.150										0.19				<0.20		
Iron	**µg/l**	**200**	**200**		<10	112.9		28.4	18	287.2	26.4	24.7	98.6	20.2	35	<10	13	<10.0	15	15	<10.0	17	<10.0	<10.0
Lead	**µg/l**	**25**	**10**	**18.75**	<0.5	1.1		<0.5	<0.5	0.9	<0.5	<0.5	1.1	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Magnesium	**mg/l Mg**		**50**		7.41	6.29		8.24	9.04	10.17	10.44	9.9	10.02	10.17	10.46	10.58	3.4	7.3	10	8.5	8.2	9.3	8.2	8.3
Manganese	**µg/l**	**50**	**50**		6.7	17.4		1.5	2	56.2	25.5	926.7	74.1	81.7	48.4	202.8	<5.0	<5.0	11	<5.0	<5.0	<5.0	<5.0	<5.0
Mercury	**µg/l**	**1**	**1**	**0.75**	nm	nm		<0.05	nm	nm	nm	nm	nm	nm	nm	nm		<0.050				<0.020		
Molybdenum	**µg/l**		**35**		0.6	0.7		0.6	<0.5	0.6	1	1.1	1	0.7	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	**µg/l**	**20**	**20**	**15**	2.5	2.5		4.6	4.6	6.2	4	6.6	5.6	5.7	5.8	5	<1.0	2.6	3.9	3.2	2.5	3.5	3.6	3.1
Nitrite	**mg/l N**	**0.5**	**0.1**	**0.375**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.012	0.009	<0.002	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
o-Phosphate	**mg/l P**		**30**					<0.02										0.019				<0.010		
pH		**6.5 - 9.5**			7.3	7.6	7.7	7.8	7.8	7.7	7.6	7.7	7.6	7.7	7.8	7.6	7.8	7.8	7.8	7.8	7.9	7.8	8.1	8.1
Phenol	**mg/l**		**0.0005**		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.025
Potassium	**mg/l**		**5**		5.92	4.67		6.33	7.88	8.64	9.18		8.89	9.4	8.91	8.6	1.4	5.4	8.3	6.7	5.9	7.1	6.9	6.5
Sampling Depth	**m**				25.2	25.1	23.8	25.3	25	25.3	26.9	26	25.9	17.9	18.2	25.5	23.9	25.1	24.7	24.2	25.7	25.9	25.9	26.1
Selenium	**µg/l**	**10**			<0.5	0.6		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	1.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Silver	**µg/l**				nm	nm		nm																
Sodium	**mg/l**	**200**	**150**	**150**	31.47	25.45		34.02	39.01	43.05	44.14	42.45	42.79	43.54	41.79	41.1	16	30	42	33	30	36	36	35
Strontium	**µg/l**				96.05	95.59		103.21	108.46	114.26	114.08	116.26	113.36	122.44	118.3	120.41	87	110	120	110	110	120	81	82
Sulphate	**mg/l SO4**	**250**	**200**	**187.5**				19.7										24				23		
Suspended Solids	**mg/l**																							
Temp	**°C**				8.7	7.6	6.4	6.7	9.6	14.6	20.1	18.9	16.3	15.9	10.7	8.8	8.6	8.9	16.6	10.5	6.1	9.1	16	12.3
Thallium	**µg/l**				<0.1	<0.1		<0.1	<0.1	<0.1	0.13	0.18	0.13	0.12	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Time sampled					11:45	11:35	11:50	11:20	11:45	11:25	12:30	11:35	12:00	12:20	13:15	11:55	10:55	11:45	11:10	11:55	11:30	12:10	12:20	11:15
Tin (µg/l)	**µg/l**				nm	nm		nm																
T.O.C.	**mg/l**	**NAC**			35.5			3.5			6.9			7.1			1.5	3.7	7.5	4.9	4.2	5.1	9.4	4.3
T.O.N	**mg/l N**		**NAC**		0.27	0.51	0.97	0.51	0.3	0.31	0.09	0.09	0.22	0.28	0.29	<0.20	2.4	0.64	<0.20	<0.20	0.47	<0.20	<0.20	<0.20
Total S Solids	**mg/l**																							
Uranium	**µg/l**				0.46	0.5		0.57	0.43	0.44	0.31	0.26	0.3	0.28	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vanadium	**µg/l**				0.51	<0.5		<0.5	<0.5	0.78	<0.5	<0.5	<0.5	0.61	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Zinc	**µg/l**		**100**		2.6	26.6		5.1	4	5	2.3	4.7	61.3	2.3	16.7	2	6.1	3.2	7.4	6.3	3.2	5.6	<1.0	1.9
Water Level m OD	**32.776**				7.576	7.676	8.976	7.476	7.776	7.476	5.876		6.876		14.576	7.276	8.876	7.676	8.076	8.576	7.076	6.876	6.876	6.676

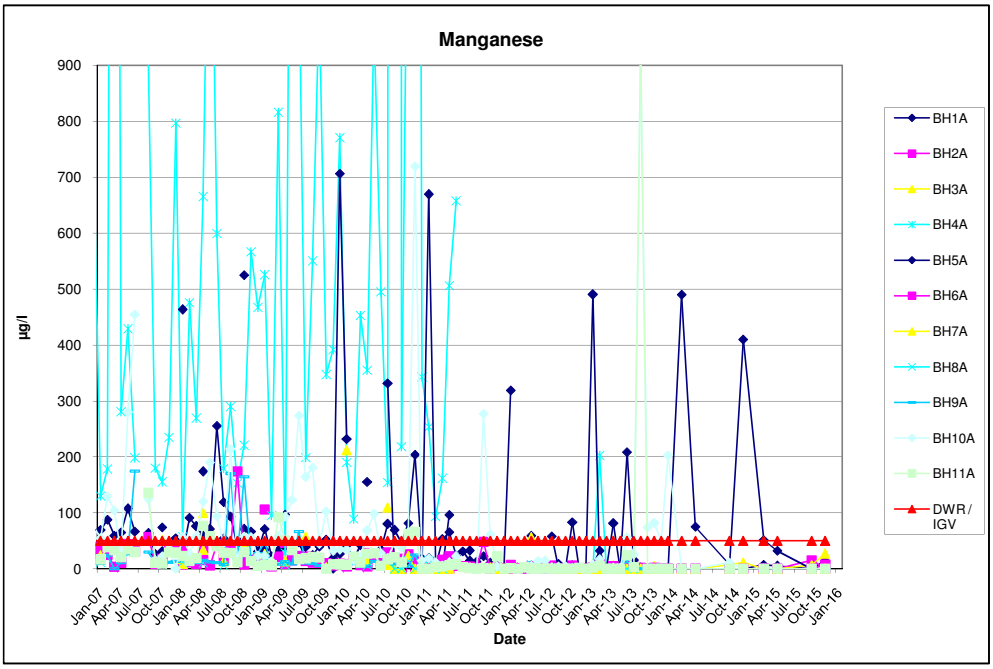
	Drogheda Landfill Site Groundwater Quality																							
Monitoring Point:				**BH11A**																				
Date Collected		**DWR**	**IGV**	**2010 GW Regs**	**31-Jan-13**	**12-Feb-13**	**26-Mar-13**	**16-Apr-13**	**08-May-13**	**11-Jun-13**	**23-Jul-13**	**07-Aug-13**	**17-Sep-13**	**08-Oct-13**	**19-Nov-13**	**03-Dec-13**	**18-Feb-14**	**08-Apr-14**	**09-Sep-14**	**18-Nov-14**	**24-Feb-15**	**14-Apr-15**	**08-Sep-15**	**17-Nov-15**
Alkalinity	**mg/l CaCO3**							226										222				225		
Aluminium	**ug/1**	**200**	**200**	**150**	<5	17.7		<5	<5	28	<5	6.3	<5	<5	<10	<10	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Ammonia	**mg/l N**	**0.23 mg/l N**	**0.11 mg/l N**	**0.175**	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.15	<0.03	<0.03	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.022
Antimony	**ug/1**	**5**			<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic	**ug/0**		**10**	**7.5**	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	2.45	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Barium	**ug/1**		**100**		41.4	42.2		39.6	36.3	40.6	36.5	65.7	31.6	31.1	27.4	31.6	41	39	36	34	42	41	31	33
Beryllium	**ug/2**				<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
B.O.D.	**mg/l O2**																							
Boron	**µg/l**	**1000**	**1000**	**750**	174.2	193.5		212.6	207.2	208.2	189.2	193.6	149.3	150.3	102.7	173.1	170	190	170	80	160	170	100	71
Cadmium	**µg/l**	**5**	**5**	**3.75**	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.03	0.03	0.04	<0.020	0.03	0.03	0.02	0.03
Calcium	**mg/l Ca**		**200**		90.18	93.9		98.86	96.47	107.97	101.55	40.85	85.98	89.87	81.77	81.41	87	96	84	78	93	80	77	73
C.O.D.	**mg/l O2**																							
Chloride	**mg/l Cl**	**250**	**30**		36	38	41	41	45	45	42	75	35	35	29	37	37	36	38	25	32	33	27	22
Chromium	**µg/l**	**50**	**30**	**37.5**	1.6	2.5		3.2	2	1.7	2.3	<0.5	2	2.6	2.9	3.7	2.6	2.1	1.6	2.9	2.4	1.9	2.3	2.8
Cobalt	**µg/l**				<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Coliform Bacteria	**(No/100 ml)**	**0**						5										172				10		
Conductivity	**µS/cm @ 25**	**2500**	**1000**	**1875**	849	869	896	925	942	938	892	541	833	812	744	788	804	838	776	687	736	742	681	617
Copper	**µg/l**	**2000**	**30**	**1500**	1.4	2.2		0.8	1	1.5	<0.5	1.3	0.8	<0.5	<1	1	1.4	<1.0	<1.0	2.2	<1.0	<1.0	<1.0	<1.0
Cyanide	**mg/l**	**0.05**	**10**					<0.05										<0.05				<0.05		
D.O.	**% Saturation**				45			40			37			55			53	38	55	72	38	33	45	65
E_ Coli	**No/100 ml**	**0**						0										1				0		
Fluoride	**mg/l**	**0.8**	**1000**					<0.150										0.15				<0.20		
Iron	**µg/l**	**200**	**200**		16.3	31.3		<10	<10	79.4	10.2	24.7	19.2	<10	<10	<10	<10.0	<10.0	<10.0	<10.0	<10.0	12	<10.0	<10.0
Lead	**µg/l**	**25**	**10**	**18.75**	<0.5	0.9		<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Magnesium	**mg/l Mg**		**50**		27.61	28.81		31.37	32.65	30.7	32.08	9.9	29.72	27.85	28.43	28.66	29	26	27	23	26	25	24	22
Manganese	**µg/l**	**50**	**50**		2	5.9		<1	<1	24.2	2.9	926.7	<1	<1	<5	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Mercury	**µg/l**	**1**	**1**	**0.75**	nm	nm		<0.05	nm	nm	nm	nm	nm	nm	nm	nm		<0.050				<0.020		
Molybdenum	**µg/l**		**35**		0.6	<0.5		0.6	<0.5	<0.5	1.1	1.1	0.6	<0.5	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	**µg/l**	**20**	**20**	**15**	0.5	0.6		0.7	2.1	2.3	<0.5	6.6	0.8	1.2	<1	1.3	<1.0	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nitrite	**mg/l N**	**0.5**	**0.1**	**0.375**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.012	<0.002	<0.002	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
o-Phosphate	**mg/l P**		**30**					<0.02										<0.010				<0.010		
pH		**6.5 - 9.5**			7.3	7.5	7.4	7.6	7.5	7.5	7.5	7.7	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.6	7.5	7.6	7.7	7.6
Phenol	**mg/l**		**0.0005**		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.025
Potassium	**mg/l**		**5**		22.37	24.78		25.07	25.32	24.15	23.03		18.62	18.71	14.33	20.84	22	24	20	10	19	20	14	9.9
Sampling Depth	**m**				12.4	14.2	11.1	13.9	14.7	14	16	26	15	15.8	16.3	15.1	14	14.2	18.6	18.2	14.8	14.9	15	17
Selenium	**µg/l**	**10**			0.9	1.1		1.4	0.9	0.9	1.1	<0.5	1.1	1.3	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	1	<1.0	<1.0
Silver	**µg/l**				nm	nm		nm																
Sodium	**mg/l**	**200**	**150**	**150**	27.35	30.31		33.26	32.72	36.08	32.35	42.45	26.01	26.16	20.78	30.98	29	31	29	17	28	27	19	15
Strontium	**µg/l**				189.63	176.52		192.15	173.86	187.86	175.08	116.26	151.87	161.31	141.87	148.07	180	170	150	180	190	150	130	150
Sulphate	**mg/l SO4**	**250**	**200**	**187.5**				190.2										125.6				118		
Suspended Solids	**mg/l**																							
Temp	**℃**				11.2	13.5	13	13.5	13.5	13.4	14.7	18.9	13.5	13.8	13.2	9.2	13.3	13.7	14.4	13.6	13	13.6	13.7	13
Thallium	**µg/l**				0.27	0.36		0.3	0.33	0.33	0.23	0.18	0.19	0.17	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Time sampled					12:20	13:50	14:15	12:15	13:55	13:25	13:10	11:35	14:00	13:15	13:35	13:50	13:30	12:45	13:45	12:50	12:15	12:55	15:05	11:55
Tin (µg/l)	**µg/l**				nm	nm		nm																
T.O.C.	**mg/l**	**NAC**			56.6			2.2			2.7			2.9			2.5	2.7	4.1	12.4	2.6	3.1	3.1	3
T.O.N	**mg/l N**		**NAC**		1.81	1.92	2.09	1.68	2.41	1.59	1.91	0.09	1.31	1.32	1.6	2.1	2.5	2.6	2.2	0.98	1.9	2.3	1.2	0.92
Total S Solids	**mg/l**																							
Uranium	**µg/l**				1.03	0.92		0.96	0.82	0.87	0.82	0.26	0.78	0.75	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vanadium	**µg/l**				0.61	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<1	1.13	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Zinc	**µg/l**		**100**		7.4	6.8		3.6	2.6	7.2	3.8	4.7	7	5	17.3	6.2	6.6	17	5.4	6.4	5.9	4	3	8.8
Water Level m OD	**21.715**				9.315	7.515	10.615	7.815	7.015	7.715	5.715		6.715		5.415	6.615	7.715	7.515	3.115	3.515	6.915	6.815	6.715	4.715

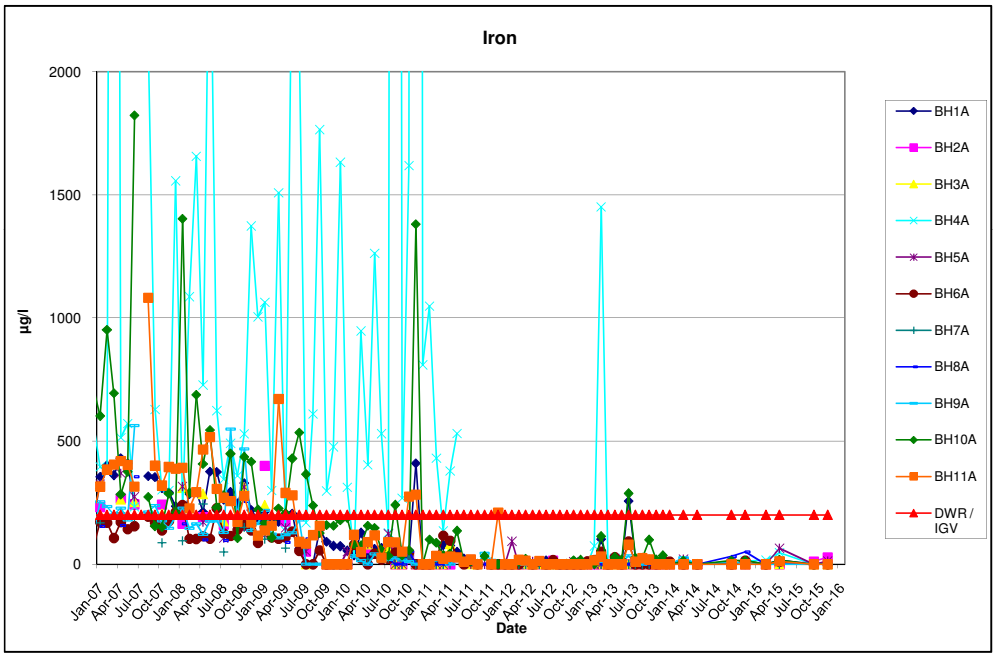

pH
pH units
12
10
8
6
4
2
0
Jan-12
Apr-12
Jul-12
Oct-12
Jan-13
Apr-13
Jul-13
Oct-13
Jan-14
Apr-14
Jul-14
Oct-14
Jan-15
Apr-15
Jul-15
Oct-15
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
BH7A
BH8A
BH9A
BH10A
BH11A
DWR Lower
DWR Higher

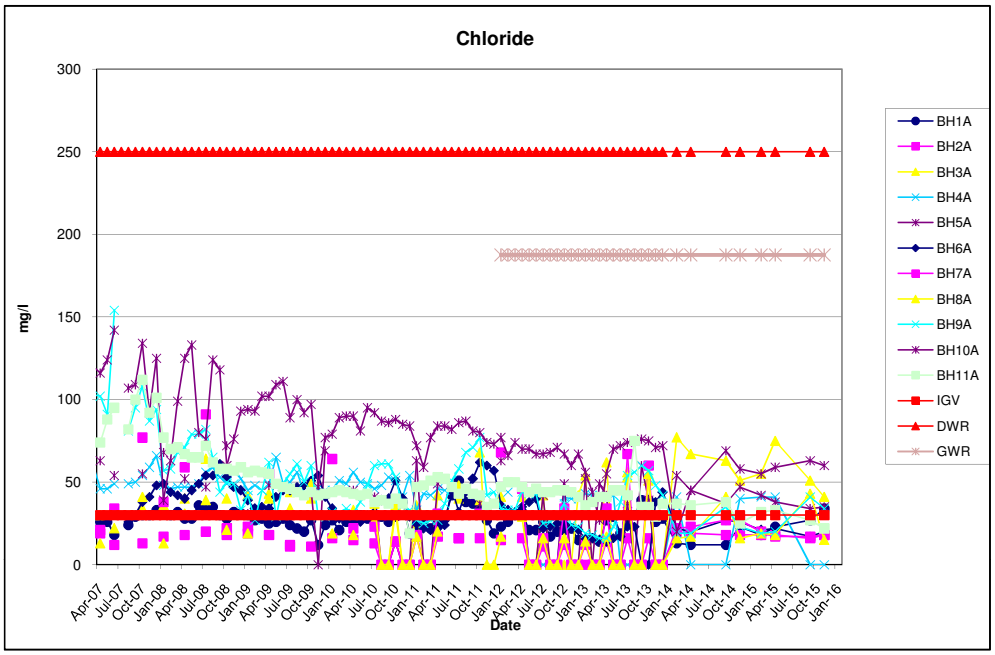

Conductivity
uS/cm @ 20
3000
2500
2000
1500
1000
500
0
Jan-12
Apr-12
Jul-12
Oct-12
Jan-13
Apr-13
Jul-13
Oct-13
Jan-14
Apr-14
Jul-14
Oct-14
Jan-15
Apr-15
Jul-15
Oct-15
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
BH7A
BH8A
BH9A
BH10A
BH11A
IGV
DWR

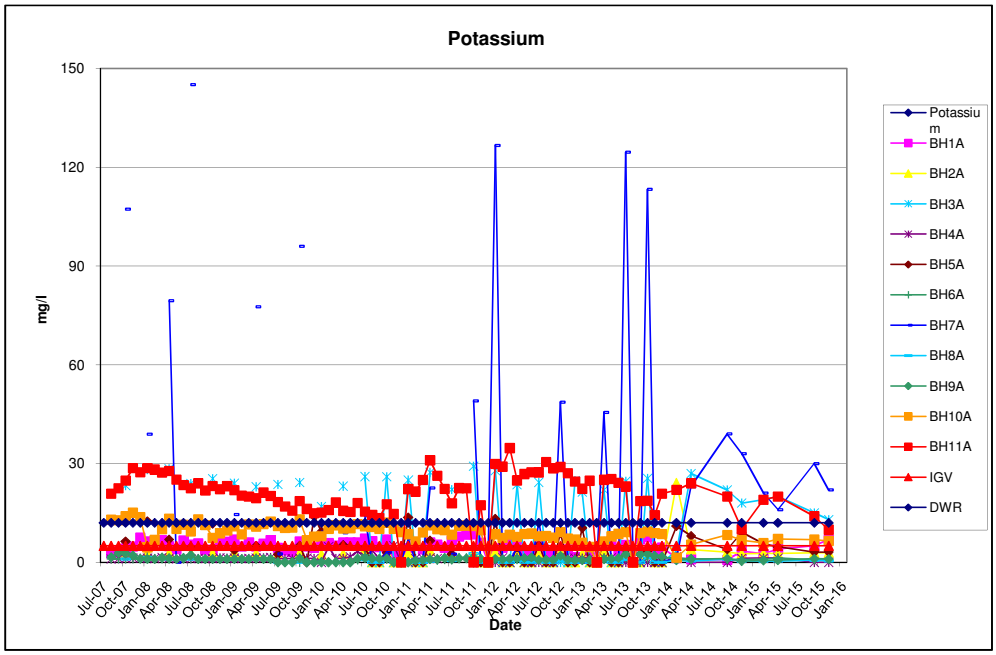

Temperature
Degree C
30
25
20
15
10
5
0
Jan-12
Apr-12
Jul-12
Oct-12
Jan-13
Apr-13
Jul-13
Oct-13
Jan-14
Apr-14
Jul-14
Oct-14
Jan-15
Apr-15
Jul-15
Oct-15
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
BH7A
BH8A
BH9A
BH10A
BH11A
IGV

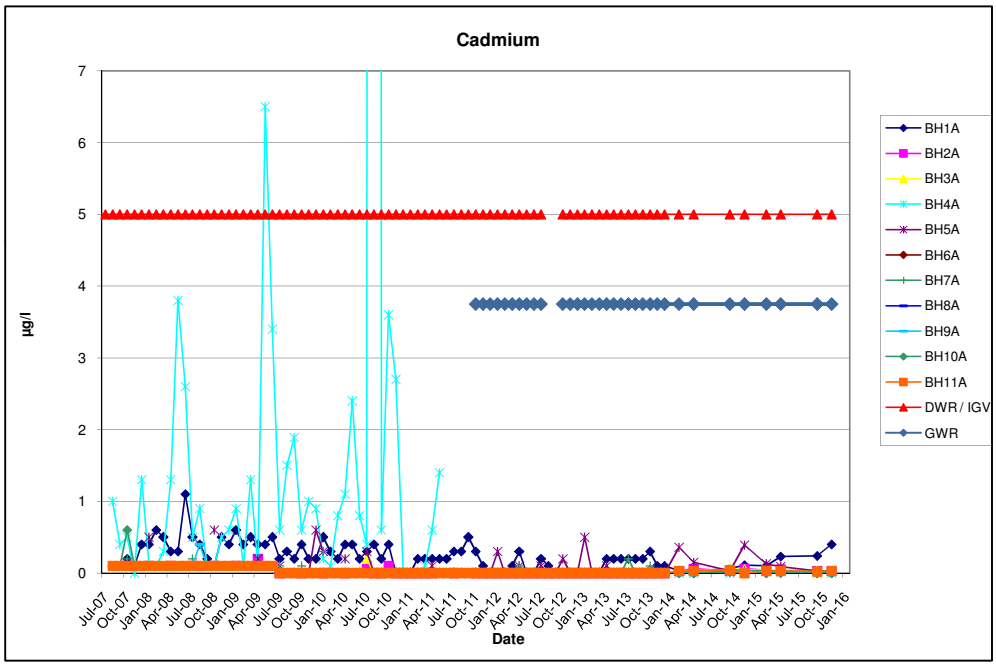

Ammoniacal Nitrogen
mg/l N
12
10
8
6
4
2
0
Jan-12
Apr-12
Jul-12
Oct-12
Jan-13
Apr-13
Jul-13
Oct-13
Jan-14
Apr-14
Jul-14
Oct-14
Jan-15
Apr-15
Jul-15
Oct-15
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
BH7A
BH8A
BH9A
BH10A
BH11A
IGV
DWR
GWR

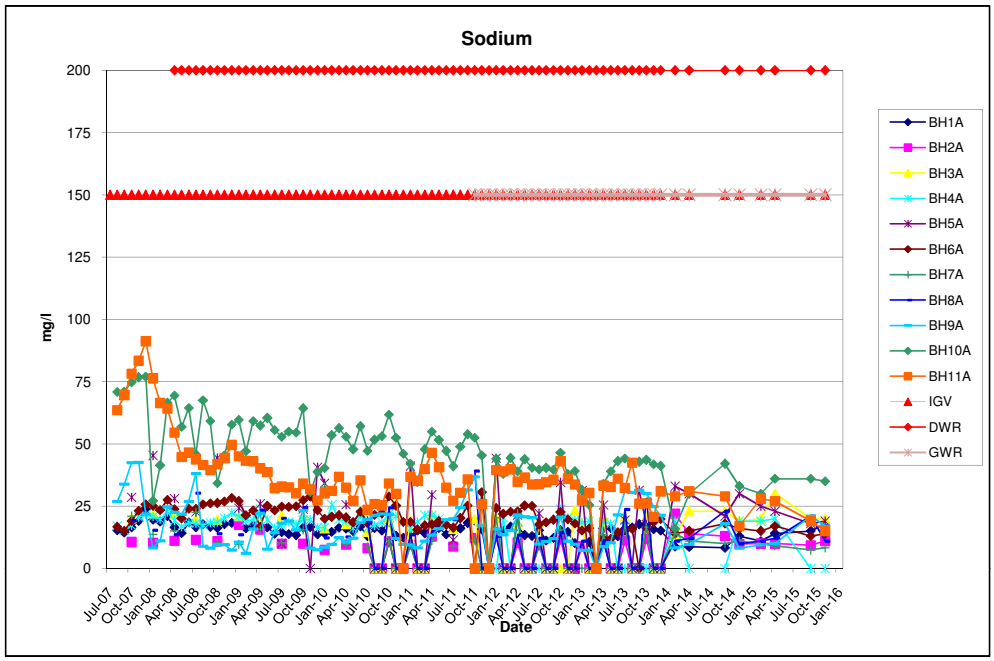

Manganese
µg/l
Date
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
BH7A
BH8A
BH9A
BH10A
BH11A
DWR / IGV

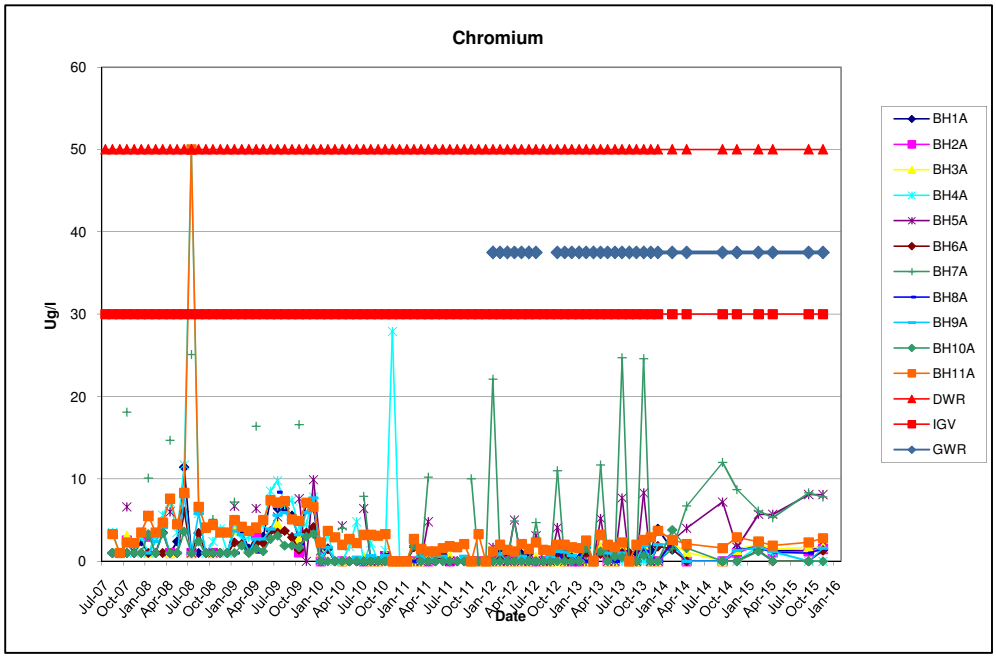

Iron
µg/l
Date
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
BH7A
BH8A
BH9A
BH10A
BH11A
DWR / IGV

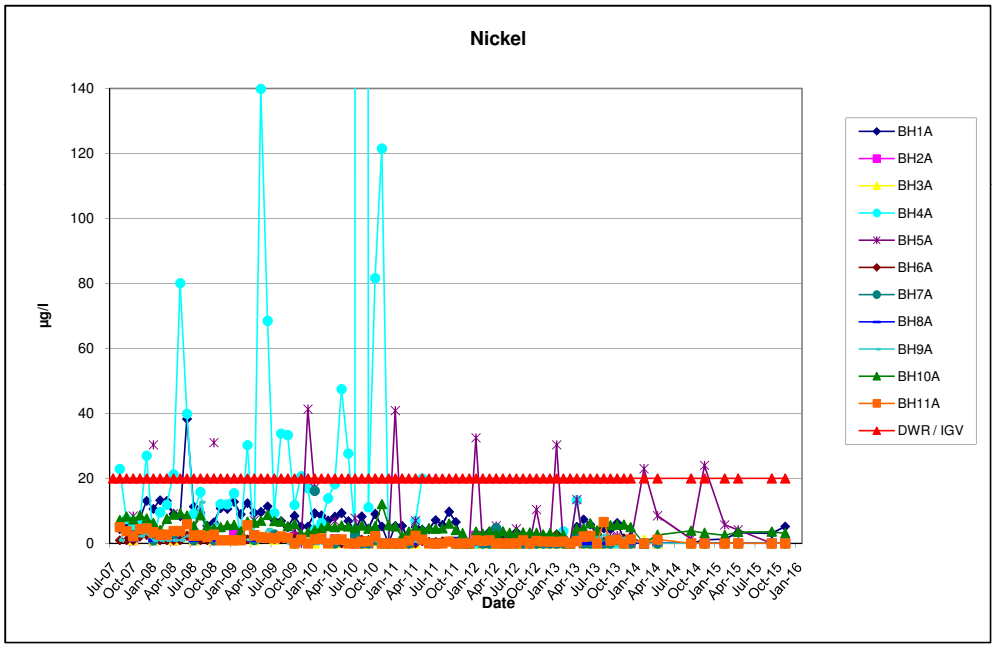

Chloride
mg/l
Date
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
BH7A
BH8A
BH9A
BH10A
BH11A
IGV
DWR
GWR

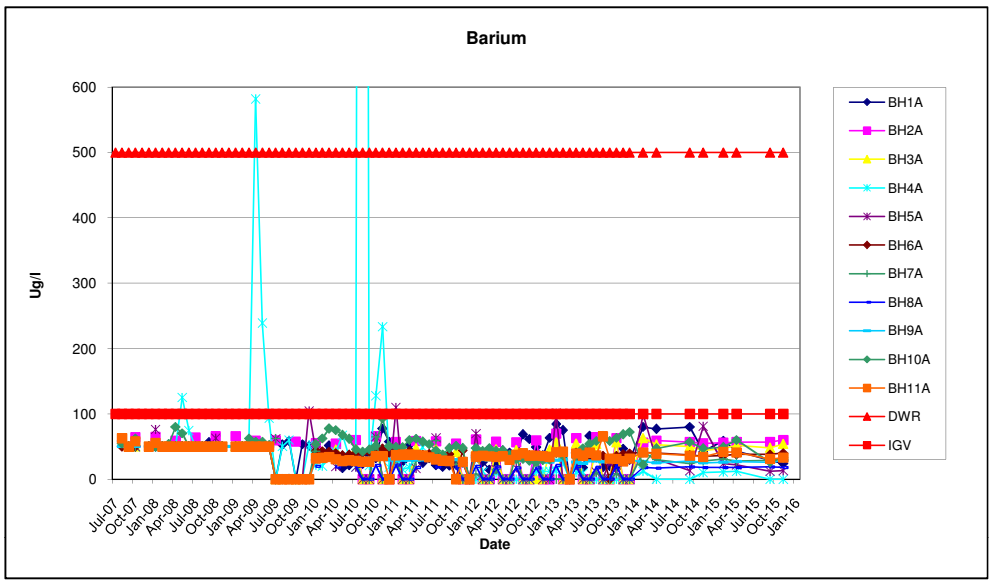

Potassium
150
120
90
60
30
0
mg/l
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
Jan-13
Apr-13
Jul-13
Oct-13
Jan-14
Apr-14
Jul-14
Oct-14
Jan-15
Apr-15
Jul-15
Oct-15
Jan-16
Date
Potassium
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
BH7A
BH8A
BH9A
BH10A
BH11A
IGV
DWR

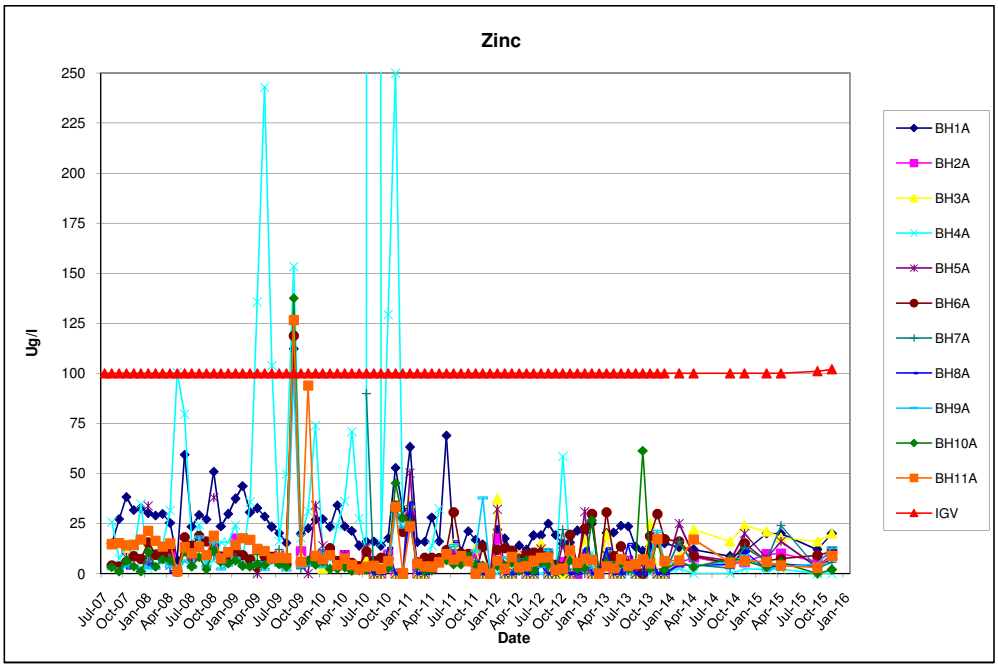

Cadmium
7
6
5
4
3
2
1
0
µg/l
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
Jan-13
Apr-13
Jul-13
Oct-13
Jan-14
Apr-14
Jul-14
Oct-14
Jan-15
Apr-15
Jul-15
Oct-15
Jan-16
Date
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
BH7A
BH8A
BH9A
BH10A
BH11A
DWR / IGV
GWR

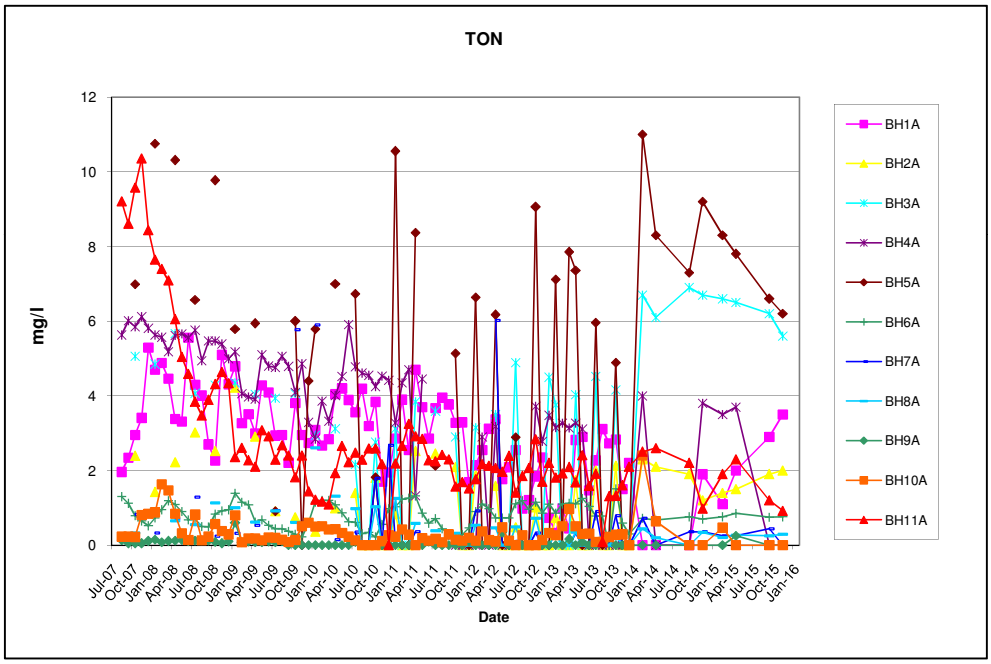

Sodium
200
175
150
125
100
75
50
25
0
mg/l
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
Jan-13
Apr-13
Jul-13
Oct-13
Jan-14
Apr-14
Jul-14
Oct-14
Jan-15
Apr-15
Jul-15
Oct-15
Jan-16
Date
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
BH7A
BH8A
BH9A
BH10A
BH11A
IGV
DWR
GWR

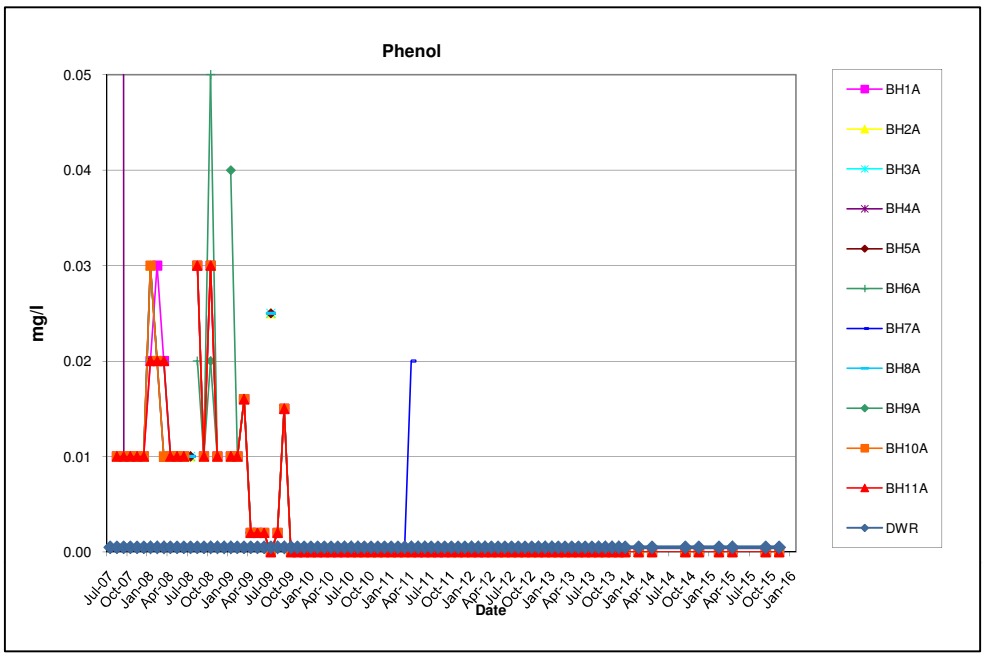

Chromium
Ug/l
Date
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
BH7A
BH8A
BH9A
BH10A
BH11A
DWR
IGV
GWR

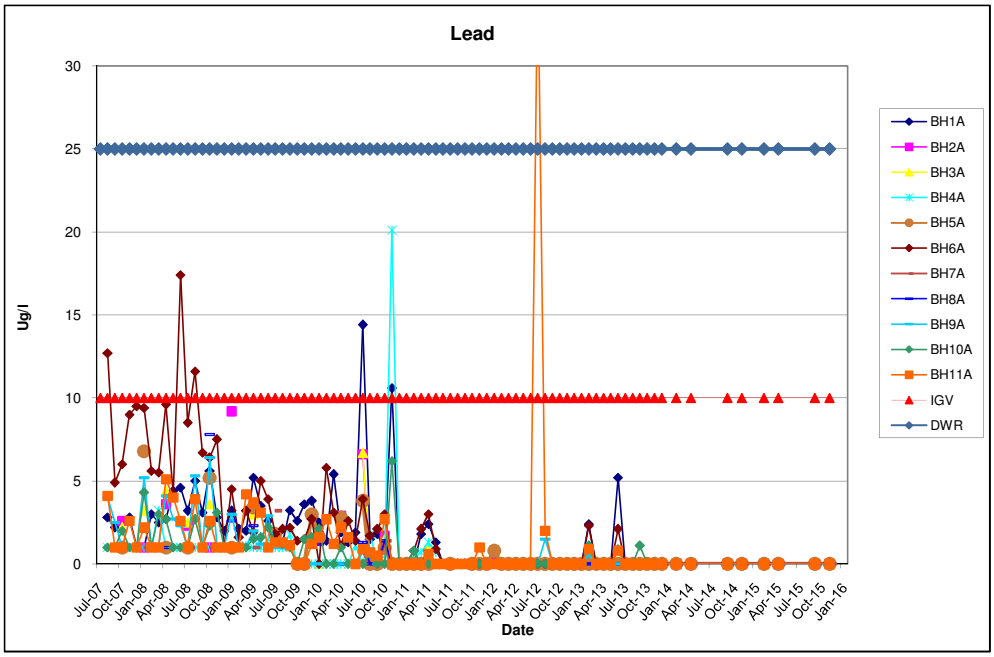

Nickel
µg/l
Date
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
BH7A
BH8A
BH9A
BH10A
BH11A
DWR / IGV

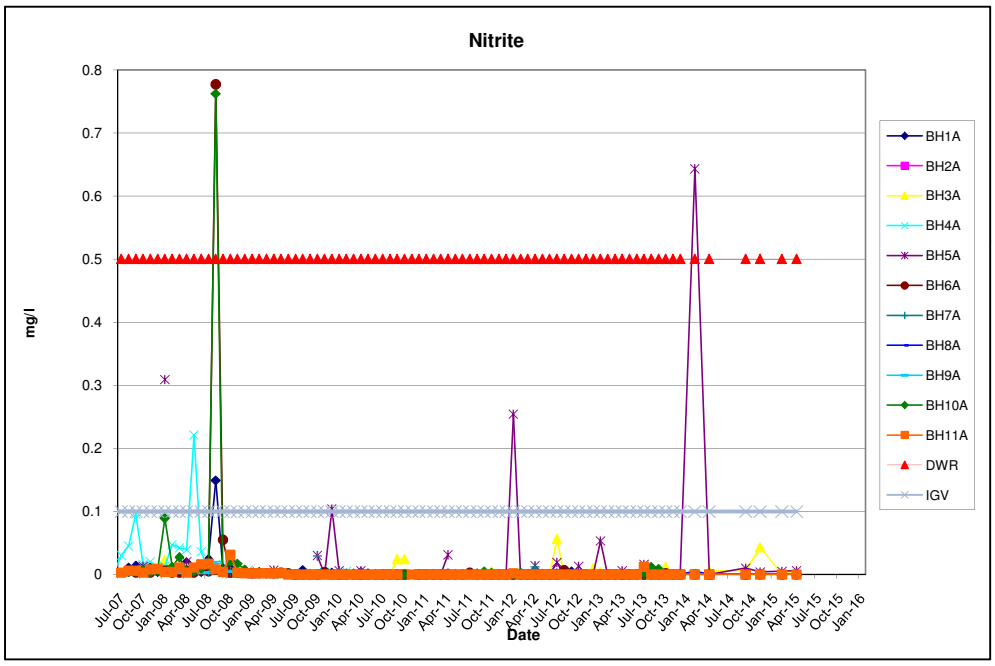

Barium
Ug/l
Date
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
BH7A
BH8A
BH9A
BH10A
BH11A
DWR
IGV

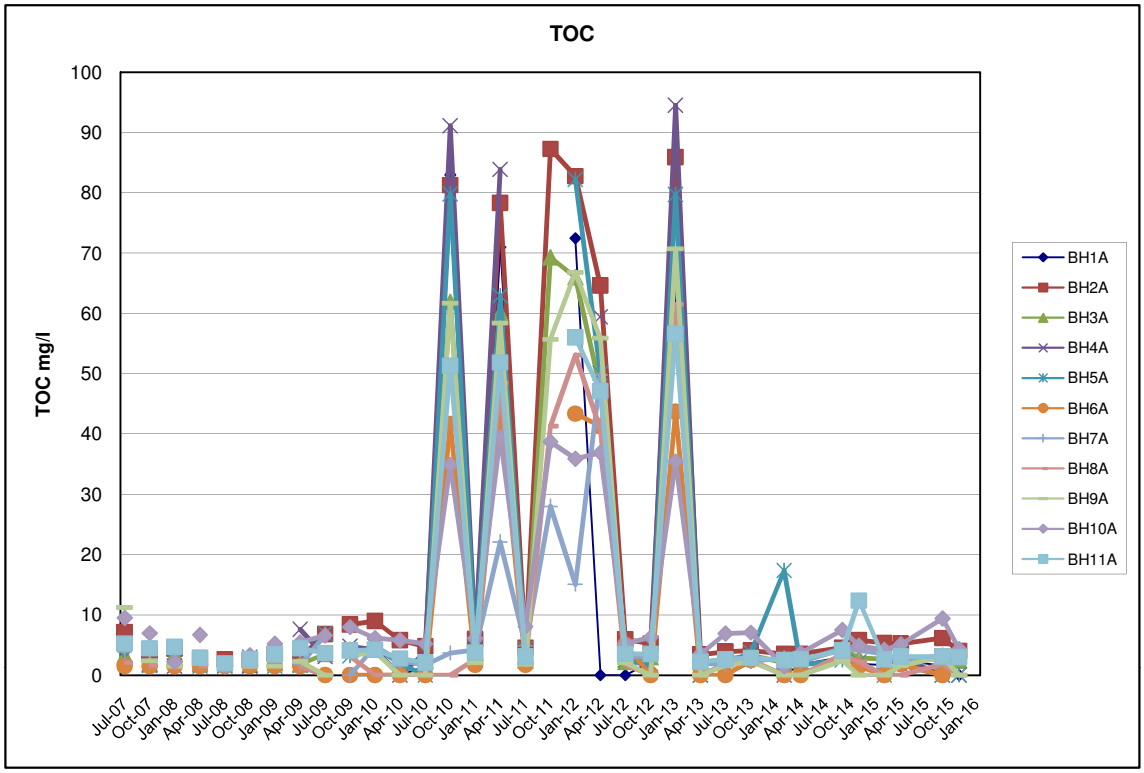

Zinc
Ug/l
Date
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
BH7A
BH8A
BH9A
BH10A
BH11A
IGV

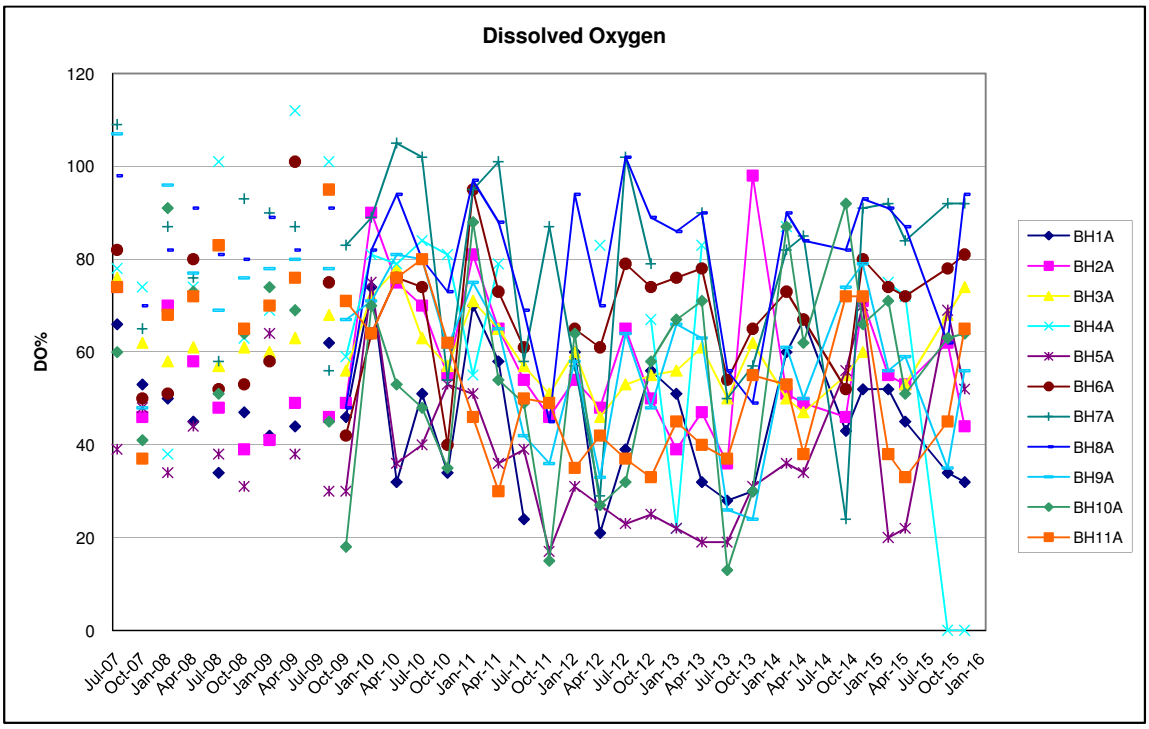

TON
mg/l
Date
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
BH7A
BH8A
BH9A
BH10A
BH11A


Phenol
mg/l
Date
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
BH7A
BH8A
BH9A
BH10A
BH11A
DWR


Lead
Ug/l
Date
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
BH7A
BH8A
BH9A
BH10A
BH11A
IGV
DWR


Nitrite
mg/l
Date
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
BH7A
BH8A
BH9A
BH10A
BH11A
DWR
IGV


TOC
TOC mg/l
100
90
80
70
60
50
40
30
20
10
0
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
Jan-13
Apr-13
Jul-13
Oct-13
Jan-14
Apr-14
Jul-14
Oct-14
Jan-15
Apr-15
Jul-15
Oct-15
Jan-16
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
BH7A
BH8A
BH9A
BH10A
BH11A


Dissolved Oxygen
DO%
120
100
80
60
40
20
0
Jul-07
Oct-07
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Jan-15
Apr-15
Jul-15
Oct-15
Jan-16
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
BH7A
BH8A
BH9A
BH10A
BH11A

Appendix E
Surface Water Results

Drogheda Landfill Site Surfacewater Quality

Monitoring Point:		SW1															
Date Collected		**DWR**	**IGV**	**2010 GW Regs**	**09-Oct-12**	**31-Jan-13**	**16-Apr-13**	**23-Jul-13**	**08-Oct-13**	**18-Feb-14**	**08-Apr-14**	**09-Sep-14**	**18-Nov-14**	**24-Feb-15**	**14-Apr-15**	**08-Sep-15**	**17-Nov-15**
Alkalinity	**mg/l CaCO3**						140				142				139		
Aluminium	**ug/1**	200	200	150	9.3	<5	<5	7.2	<5	<10.0	12	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Ammonia	**mg/l N**	0.23 mg/l N	0.15	0.175	<0.03	0.08	0.08	0.04	0.21	0.039	0.095	<0.020	<0.020	0.026	<0.020	<0.020	0.02
Antimony	**ug/l**	5			<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic	**µg/l**		10	7.5	1.97	0.82	0.74	2.09	1.99	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	1.4	1.4
Barium	**µg/l**		100		24.1	51.6	53.8	64.8	68.5	77	75	58	52	59	58	25	28
Beryllium	**µg/l**				<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
B.O.D.	**mg/l O2**				2.2	<1.5	<1.5	1.7	1.5	<1.0	<1.0	1.2	<1.0	<1.0	1.7	2.1	<1.0
Boron	**ug/l**	1000	1000	750	212.9	158	169.1	198.9	198.8	180	190	190	170	160	160	170	160
Cadmium	**µg/l**	5	5	3.75	<0.1	<0.1	<0.1	<0.1	<0.1	0.02	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.02
Calcium	**mg/l Ca**		200		21.47	39.04	42.92	39.31	38.88	49	52	39	37	47	45	15	18
C.O.D.	**mg/l O2**				22	<10	12	24	36	<20	<20	<20	<20	<20	<20	31	<20
Chloride	**mg/l Cl**	250	30	187.5	68	64	66	74	74	66	65	67	61	62	58	61	60
Chromium	**µg/l**	50	30	37.5	<0.5	<0.5	<0.5	0.6	0.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Cobalt	**µg/l**				<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Coliform Bacteria	**(No/100 ml)**	0															
Conductivity	**µS/cm @ 25**	2500	1000	1875	422	481	525	521	526	516	534	490	471	495	482	372	367
Copper	**µg/l**	2000	30	1500	1.9	0.9	1.6	9.6	<0.5	1.1	1.3	<1.0	<1.0	1.4	1.6	1.8	<1.0
Cyanide	**mg/l**	0.05	10												<0.05		
D.O.	**% Saturation**				99	92	100		103	98	91	103	96	98	97	121	94
E_ Coli	**No/100 ml**	0															
Fluoride	**mg/l**	0.8	1000														
Iron	**µg/l**	200	200		25.7	<10	10.3	26.1	19.3	16	18	<10.0	<10.0	<10.0	11	<10.0	<10.0
Lead	**µg/l**	25	10	18.75	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Magnesium	**mg/l Mg**		50		9.44	8.59	9.42	10.56	10.06	9.8	10	10	9	9.6	9.4	8.9	8.4
Manganese	**µg/l**	50	50		5.5	1.2	7.4	37.5	56.6	8	19	<5.0	5.5	<5.0	<5.0	<5.0	<5.0
Mercury	**µg/l**	1	1	0.75	nm	nm	<0.05	nm	nm		<0.050				<0.020		
Molybdenum	**µg/l**		35		0.6	<0.5	0.5	0.8	<0.5	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	**µg/l**	20	20	15	3.5	3.6	7.9	5.3	5.2	4.6	4.7	4.3	3.9	4.3	4	3.6	3.4
Nitrite	**mg/l N**	0.5	0.1	0.375	<0.002	0.004	0.005	<0.002	0.028	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
o-Phosphate	**mg/l P**		30				<0.02			0.01	<0.010				<0.010		
pH		6.5 - 9.5			8.5	7.9	8.2	8.2	8.4	8.2	8.2	8.5	8	8.3	8.4	9.3	8.4
Phenol	**mg/l**		0.0005		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.025
Potassium	**mg/l**		5		9.08	7.09	7.75	9.25	9.25	8.2	8.7	8.1	6.9	7.1	7.1	7.1	6.8
Sampling Depth	**mg/l**																
Selenium	**µg/l**	10			0.6	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Silver	**µg/l**				nm	nm	nm										
Sodium	**mg/l**	200	150	150	46.47	35.32	38.71	44.37	43.08	40	41	41	35	36	36	37	37
Strontium	**µg/l**				75.29	101.03	111.85	113.83	123.44	120	120	120	110	120	120	81	82
Sulphate	**mg/l SO4**	250	200	187.5			20.2				27.6				24		
Suspended Solids									6	<4	<4	4	<4	<4	<8	4	<4
Temp	**℃**				14.5	6.2	9.3	22	15.6	5.5	10.5	17.4	8.7	4.4	11.7	15.7	9.6
Thallium	**µg/l**				<0.1	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Time sampled					12:00	12:05	11:40	0.53125	12:50	13:15	0.51041667	13:20	12:20	11:45	12:40	14:35	11:30
Tin (µg/l)	**µg/l**				<1	nm	nm										
T.O.C.	**mg/l**	NAC															
T.O.N	**mg/l N**		NAC		<0.08	0.09	0.22	<0.08	0.11	<0.20	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Total Suspended Solids	**mg/l**				<5	<5	<5	<5									
Uranium	**µg/l**				0.38	0.45	0.52	0.34	0.24	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vanadium	**µg/l**				0.63	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Zinc	**µg/l**		100		1.5	10.9	5.2	1.8	2	12	8.3	1.8	8.4	57	4.6	11	5

Drogheda Landfill Site Surfacewater Quality

Monitoring Point:		SW2																
Date Collected		**DWR**	**IGV**	**2010 GW Regs**	**09-Oct-12**	**31-Jan-13**	**16-Apr-13**	**23-Jul-13**	**08-Oct-13**	**18-Feb-14**	**08-Apr-14**	**09-Sep-14**	**18-Nov-14**	**24-Feb-15**	**14-Apr-15**	**08-Sep-15**	**17-Nov-15**	
Alkalinity	**mg/l CaCO3**						138				142				135			
Aluminium	**ug/1**	200	200	150	<5	15	<5	<5	5.7	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Ammonia	**mg/l N**	0.23 mg/l N	0.15	0.175	<0.03	<0.03	0.1	<0.03	<0.03	<0.020	<0.020	<0.020	0.11	<0.020	<0.020	<0.020	0.085	
Antimony	**ug/l**	5			1	1.02	1.25	1.22	1.24	1.2	1.2	1.4	1.1	1.2	1.2	1.2	1.2	
Arsenic	**µg/l**		10	7.5	1.07	3.24	1.16	0.8	1.01	<1.0	<1.0	<1.0	1.2	1	<1.0	<1.0	1.2	
Barium	**µg/l**		100		41.5	19.3	38.8	40.5	41.8	43	40	38	39	40	39	39	41	
Beryllium	**µg/l**				<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
B.O.D.	**mg/l O2**				2.4	<1.5	1.7	<1.5	<1.0	1.8	1.4	<1.0	1.1	1.4	1.4	<1.0	1	
Boron	**ug/l**	1000	1000	750	212.4	83	158.9	169.2	173.4	170	170	180	170	170	170	160	160	
Cadmium	**µg/l**	5	5	3.75	<0.1	<0.1	<0.1	<0.1	<0.1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Calcium	**mg/l Ca**		200		37.34	30.37	36.37	36.42	36.25	36	38	35	37	37	35	35	35	
C.O.D.	**mg/l O2**				20	<10	14	16	18	<20	26	<20	<20	<20	<20	<20	<20	
Chloride	**mg/l Cl**	250	30	187.5	58	27	54	59	56	57	54	54	52	55	53	50	52	
Chromium	**µg/l**	50	30	37.5	0.6	2.1	0.5	0.9	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Cobalt	**µg/l**				<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Coliform Bacteria	**(No/100 ml)**	0																
Conductivity	**µS/cm @ 25**	2500	1000	1875	578	359	550	546	547	531	531	525	529	512	510	513	520	
Copper	**µg/l**	2000	30	1500	1.2	2.2	0.9	1.2	1.2	<1.0	1.1	1.2	1	1.4	1.1	1	<1.0	
Cyanide	**mg/l**	0.05	10															
D.O.	**% Saturation**				90	97	101	81	98	108	97	104	71	103	95	100	82	
E_ Coli	**No/100 ml**	0																
Fluoride	**mg/l**	0.8	1000															
Iron	**µg/l**	200	200		<10	15.3	<10	<10	<10	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Lead	**µg/l**	25	10	18.75	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Magnesium	**mg/l Mg**		50		22.25	11.93	19.11	20.16	20.27	20	20	21	19	20	19	20	19	
Manganese	**µg/l**	50	50		2	1	2.1	1.6	2.6	<5.0	5.6	<5.0	<5.0	<5.0	6.3	<5.0	<5.0	
Mercury	**µg/l**	1	1	0.75	nm	nm	0.4	nm	nm		<0.050				<0.020			
Molybdenum	**µg/l**		35		<0.5	2.2	0.6	2.1	2	2	1.4	2.2	2	1.5	2	1.3	1.5	
Nickel	**µg/l**	20	20	15	1.7	0.9	1.8	2.5	2	1.7	1.9	1.3	1.4	1.4	1.6	1.2	1.2	
Nitrite	**mg/l N**	0.5	0.1	0.375	<0.002	<0.002	<0.002	<0.002	<0.002	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	
o-Phosphate	**mg/l P**		30				<0.02			<0.010	<0.010				<0.010			
pH		6.5 - 9.5			8.3	8.1	8.4	8.6	8.5	8.5	8.6	8.6	8.1	8.5	8.3	8.8	8.1	
Phenol	**mg/l**		0.0005		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	nm	0.04	<0.002	<0.002	<0.025	
Potassium	**mg/l**		5		30.43	11.01	25.62	28.07	27.5	27	30	26	24	27	25	24	25	
Sampling Depth	**mg/l**																	
Selenium	**µg/l**	10			0.9	33.6	1.8	1.1	1.1	1.4	1.2	<1.0	1.1	1.3	1.4	1.2	2.4	
Silver	**µg/l**				nm	nm	nm											
Sodium	**mg/l**	200	150	150	29.33	10.5	22.49	23.68	23.4	24	24	23	22	23	23	21	22	
Strontium	**µg/l**				188.67	85.82	187.69	184.61	191.76	190	180	180	180	180	170	160	170	
Sulphate	**mg/l SO4**	250	200	187.5			46.8				44.3				29			
Suspended Solids									4	7	<4	<4	8	21	8	4	33	
Temp	**℃**				16.2	6.9	10.4	24.1	15.2	6.1	10.4	18	12.4	5.8	11.4	16.1	10.6	
Thallium	**µg/l**				<0.1	0.73	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Time sampled					12:45	13:15	13:10	12:20	10:55	11:40	13:00	11:55	12:10	12:30	11:00	12:50	12:50	
Tin (µg/l)	**µg/l**				<1	nm	nm											
T.O.C.	**mg/l**	NAC																
T.O.N	**mg/l N**		NAC		<0.08	<0.08	<0.08	<0.08	<0.08	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
Total Suspended Solids	**mg/l**				<5	11	10	<5										
Uranium	**µg/l**				0.23	0.23	0.25	0.27	0.28	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Vanadium	**µg/l**				0.84	10.11	<0.5	0.79	0.73	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Zinc	**µg/l**		100		2.8	17.6	3.6	1.4	2.5	2.2	3.4	3.1	5.1	3.1	150	1.3	1.5	

Drogheda Landfill Site Surfacewater Quality

Monitoring Point:		SW4													
Date Collected		**09-Oct-12**	**31-Jan-13**	**16-Apr-13**	**23-Jul-13**	**08-Oct-13**	**18-Feb-14**	**08-Apr-14**	**09-Sep-14**	**18-Nov-14**	**24-Feb-15**	**14-Apr-15**	**08-Sep-15**	**17-Nov-15**	
Alkalinity	**mg/l CaCO3**			324				333				189			
Aluminium	**ug/1**	19.2	11.4	8.7	78.9	53.2	11	<10.0	26	<10.0	18	32	130	17	
Ammonia	**mg/l N**	<0.03	<0.03	<0.03	<0.03	0.05	<0.020	0.025	0.047	<0.020	<0.020	<0.020	0.025	0.025	
Antimony	**ug/l**	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Arsenic	**µg/l**	0.75	0.66	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Barium	**µg/l**	44.6	46.4	43	27.6	40.1	43	50	54	41	38	32	41	57	
Beryllium	**µg/l**	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
B.O.D.	**mg/l O2**	<1.5	<1.5	<1.5	<1.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Boron	**ug/l**	50.3	23.5	25.3	25.7	21.9	23	34	48	31	28	22	25	36	
Cadmium	**µg/l**	<0.1	<0.1	<0.1	<0.1	0.2	0.05	0.02	0.08	0.03	<0.020	<0.020	0.02	0.05	
Calcium	**mg/l Ca**	125.71	113.03	112.32	36.99	56.21	120	130	120	110	93	69	64	120	
C.O.D.	**mg/l O2**	16	<10	<10	<10	18	<20	<20	<20	<20	<20	<20	<20	<20	
Chloride	**mg/l Cl**	11	14	15	14	12	23	17	18	14	14	11	8	20	
Chromium	**µg/l**	1.4	<0.5	0.8	0.8	1.1	1.5	<1.0	<1.0	<1.0	1.3	<1.0	<1.0	1.2	
Cobalt	**µg/l**	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Coliform Bacteria	**(No/100 ml)**														
Conductivity	**µS/cm @ 25**	717	629	651	299	391	629	681	652	630	523	412	402	679	
Copper	**µg/l**	3.8	3.1	2.7	3.4	2.2	2.5	2.7	2.8	2.5	2.4	2.1	2	3.2	
Cyanide	**mg/l**														
D.O.	**% Saturation**	57	87	93	85	62	82	87	42	89	80	92	94	87	
E_ Coli	**No/100 ml**														
Fluoride	**mg/l**														
Iron	**µg/l**	<10	21	<10	<10	<10	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Lead	**µg/l**	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Magnesium	**mg/l Mg**	10.98	8.19	8.76	7.26	6.72	8.1	11	10	7	8.1	6.5	7.6	9.4	
Manganese	**µg/l**	1.9	<1	1.5	<1	1.2	<5.0	<5.0	8.9	<5.0	<5.0	<5.0	<5.0	<5.0	
Mercury	**µg/l**	nm	nm	<0.05	nm	nm		<0.050				<0.020			
Molybdenum	**µg/l**	1.7	1.3	1	1	0.8	<1.0	1.4	1.8	<1.0	1.1	1.3	<1.0	1.1	
Nickel	**µg/l**	1	<0.5	1.1	1.3	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Nitrite	**mg/l N**	0.003	<0.002	<0.002	<0.002	0.02	<0.004	<0.004	0.021	<0.004	<0.004	<0.004	<0.004	<0.004	
o-Phosphate	**mg/l P**			<0.02			0.016	<0.010				<0.010			
pH		7.9	7.8	7.8	8.3	8	7.8	7.7	7.8	7.7	8.2	8.2	8.2	7.8	
Phenol	**mg/l**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.025	
Potassium	**mg/l**	2.25	1.05	1.86	5.3	7.41	1.4	1.8	3.1	0.73	2.6	3.4	4.2	1.4	
Sampling Depth	**mg/l**														
Selenium	**µg/l**	<0.5	<0.5	0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Silver	**µg/l**	nm	nm	nm											
Sodium	**mg/l**	14.04	9.14	9.49	10.26	9.96	10	11	13	8.5	10	9.4	8.9	12	
Strontium	**µg/l**	256.45	221.09	229.5	158.78	190.76	220	250	270	200	200	170	190	250	
Sulphate	**mg/l SO4**			16.4				28.5				18			
Suspended Solids						<4	4	4	<4	<4	<4	<4	<4	10	
Temp	**℃**	14.6	6.2	6.4	18.7	14.4	6.7	9.3	14.5	10.4	5.6	8.8	13.8	11.3	
Thallium	**µg/l**	<0.1	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Time sampled		12:40	12:35	12:30	13:25	13:25	13:40	12:55	13:55	13:15	12:25	13:10	15:15	12:10	
Tin (µg/l)	**µg/l**	<1	nm	nm											
T.O.C.	**mg/l**														
T.O.N	**mg/l N**	0.46	0.42	0.26	<0.08	0.11	0.91	0.32	0.88	0.54	0.77	0.6	0.45	0.88	
Total Suspended Solids	**mg/l**	<5	<5	<5	<5										
Uranium	**µg/l**	3.18	2.67	2.55	1.69	1.73	2.1	2.9	2.6	1.9	2.4	2	1.8	3	
Vanadium	**µg/l**	1.18	0.74	0.61	1	1.16	<1.0	<1.0	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	
Zinc	**µg/l**	2.4	2	2.7	2.5	3.1	4.7	7	3.9	7.1	<1.0	1.8	2.1	8.3	
	dry														

Drogheda Landfill Site Surfacewater Quality

Monitoring Point:		SW5													
Date Collected		09-Oct-12	**31-Jan-13**	**16-Apr-13**	**23-Jul-13**	**08-Oct-13**	**18-Feb-14**	**08-Apr-14**	**09-Sep-14**	**18-Nov-14**	**24-Feb-15**	**14-Apr-15**	**08-Sep-15**	**17-Nov-15**	
Alkalinity	**mg/l CaCO3**			298				367				350			
Aluminium	**ug/1**	14.9	9.1	9.2	94	76.9	12	<10.0	23	<10.0	10	<10.0	50	<10.0	
Ammonia	**mg/l N**	0.05	<0.03	0.03	0.07	0.05	<0.020	0.023	0.34	0.05	0.03	0.031	0.13	0.033	
Antimony	**ug/l**	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Arsenic	**µg/l**	0.87	0.52	0.55	0.6	0.57	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Barium	**µg/l**	50.1	48.2	41.9	41.6	56.2	44	49	55	41	44	47	53	57	
Beryllium	**µg/l**	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
B.O.D.	**mg/l O2**	<1.5	<1.5	<1.5	<1.5	<1.0	<1.0	<1.0	3.2	<1.0	<1.0	<1.0	<1.0	1	
Boron	**ug/l**	43.7	20.8	20.1	18.9	19	23	30	41	29	25	22	21	29	
Cadmium	**µg/l**	0.1	<0.1	<0.1	<0.1	<0.1	0.04	0.03	0.14	0.02	<0.020	<0.020	0.03	0.09	
Calcium	**mg/l Ca**	139.69	123.79	112.03	58.11	77.06	130	140	130	110	120	130	95	130	
C.O.D.	**mg/l O2**	15	<10	<10	23	19	<20	<20	20	<20	<20	<20	<20	20	
Chloride	**mg/l Cl**	10	12	18	16	15	21	15	18	16	13	11	8	13	
Chromium	**µg/l**	0.9	<0.5	0.7	0.6	1.1	1.2	<1.0	<1.0	<1.0	1.3	<1.0	<1.0	1.1	
Cobalt	**µg/l**	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Coliform Bacteria	**(No/100 ml)**														
Conductivity	**µS/cm @ 25**	751	665	633	390	482	655	715	683	730	621	637	522	687	
Copper	**µg/l**	2.8	2.7	2.3	2.5	1.8	2.4	2.5	2.2	3.3	2.2	2.1	1.6	4.6	
Cyanide	**mg/l**														
D.O.	**% Saturation**	38	83	120	63	76	80	98	19	86	63	101	63	86	
E_ Coli	**No/100 ml**														
Fluoride	**mg/l**														
Iron	**µg/l**	12.6	17.2	<10	<10	<10	<10.0	<10.0	14	15	<10.0	<10.0	<10.0	<10.0	
Lead	**µg/l**	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Magnesium	**mg/l Mg**	9.81	7.54	7.55	6.36	6.21	8.1	9.5	8.7	6.9	8.2	8.9	7.3	8.4	
Manganese	**µg/l**	3.6	1.4	1.7	<1	<1	<5.0	<5.0	11	<5.0	<5.0	<5.0	<5.0	5.7	
Mercury	**µg/l**	nm	nm	<0.05	nm	nm		<0.050				<0.020			
Molybdenum	**µg/l**	1.0	0.9	0.8	0.7	0.6	<1.0	<1.0	1.2	1.2	<1.0	<1.0	<1.0	<1.0	
Nickel	**µg/l**	0.5	<0.5	1.2	1.3	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Nitrite	**mg/l N**	0.008	<0.002	<0.002	0.008	0.016	<0.004	<0.004	0.057	<0.004	<0.004	<0.004	0.015	<0.004	
o-Phosphate	**mg/l P**			<0.02			0.018	<0.010				<0.010			
pH		7.8	7.7	7.8	8.1	8.2	7.7	7.5	7.8	7.7	7.9	7.8	8.1	7.7	
Phenol	**mg/l**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.025	
Potassium	**mg/l**	1.67	0.79	1.45	5.05	7.9	1	1.3	2.2	0.73	1.7	1.1	3.8	1.1	
Sampling Depth	**mg/l**														
Selenium	**µg/l**	<0.5	<0.5	0.5	0.6	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Silver	**µg/l**	nm	nm	nm											
Sodium	**mg/l**	13.10	8.31	9.05	9.34	9.78	9.8	11	13	8.7	9.4	9	8.4	9.5	
Strontium	**µg/l**	251.600	221.21	209.22	164.94	198.68	220	240	250	200	220	240	200	230	
Sulphate	**mg/l SO4**			12.9				18.7				14			
Suspended Solids						<4	5	<4	7	<4	<4	<4	<4	7	
Temp	**℃**	14.7	6.1	7.4	18.1	14.2	6.2	9.1	14.2	10.6	5.6	8.9	13.3	11.2	
Thallium	**µg/l**	<0.1	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Time sampled		12:50	12:45	13:05	13:40	13:40	14:10	13:25	14:15	14:10	14:20	13:50	15:40	15:00	
Tin (µg/l)	**µg/l**	<1	nm	nm											
T.O.C.	**mg/l**														
T.O.N	**mg/l N**	0.65	0.52	0.22	1.49	1.64	1.1	0.67	1.1	0.59	0.89	0.5	1.7	0.89	
Total Suspended Solids	**mg/l**	<5	<5	<5	<5										
Uranium	**µg/l**	2.48	2.13	1.95	1.36	1.32	2.1	2.3	2.1	2	1.9	2.4	1.3	2.1	
Vanadium	**µg/l**	1.22	0.75	0.51	0.84	1.17	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Zinc	**µg/l**	1.0	1.7	1.8	3.3	3	4.2	1.6	3	4.6	<1.0	1.6	2.8	3.5	
	dry														

Appendix F
Landfill Gas Results

LANDFILL GAS MONITORING FORM		
Facility Name: Drogheda Landfill **Waste Licence no.:** W0033-01	**Facility Address:** Mell Drogheda	
Licensee: Drogheda Borough Council		
Date of licensing:	**Date of sampling:** 20-01-2015	**Time of sampling:** 14:00hrs
Instrument used: Geotechnical Instruments GA2000	**Date Next Full Calibration:** July 2015 **Last Field Calibration:** (include date and gases)	
Monitoring Personnel: Damien Holmes	**Weather:** Showers	**Barometric pressure** 1016mb

Results

Sample Station Number	CH_4 (%v/v)	CO_2 (% v/v)	O_2 (% v/v)	CO ppm	H_2S ppm	Comments
BH1A	0.0	0.1	20.0	0	0	31.953m A.O D Top of Cover
BH2A	0.0	0.1	20.2	0	0	32.362m A.O.D Top of Cover
BH3A	0.0	1.1	19.8	0	0	33.664m A.O.D Top of Cover
BH4A	0.1	0.0	21.1	0	0	33.570m A.O.D Top of Cover
BH5A	0.0	0.4	19.6	1	0	36.130m A.O.D Top of Cover
BH6A	0.0	0.1	20.6	0	0	35.951m A.O.D Top of Cover
BH7A	0.2	0.0	20.2	0	0	25.172m A.O.D Top of Cover
BH8A	0.1	0.2	20.2	0	0	36.151m A.O.D Top of Cover
BH9A	0.2	0.6	20.4	0	0	34.345m A.O.D Top of Cover
BH10A	0.0	0.0	21.2	0	0	32.776m A.O.D Top of Cover
BH11A	0.1	0.0	20.8	0	0	21.715m A.O.D Top of Cover
LG1	0.2	0.4	19.8	0	0	
LG2	0.0	0.2	20.6	0	0	
LG3	0.1	1.3	19.2	0	0	
LG4	0.1	2.0	17.5	0	0	
LG5	0.0	0.1	20.6	2	0	
LG6	0.0	0.2	20.0	0	0	
LG7	0.1	0.1	21.3	0	0	
PZ8	0.1	0.1	21.1	0	0	Constructed 26/02/12
PZ9	0.1	0.0	20.8	0	0	Constructed 26/02/12
PZ10	0.1	0.0	21.1	0	0	Constructed 26/02/12

LANDFILL GAS MONITORING FORM		
Facility Name: Drogheda Landfill **Waste Licence no.:** W0033-01	**Facility Address:** Mell Drogheda	
Licensee: Drogheda Borough Council		
Date of licensing:	**Date of sampling:** 10-02-2015	**Time of sampling:** 14.00hrs
Instrument used: Geotechnical Instruments GA2000	**Date Next Full Calibration:** July 2015 **Last Field Calibration:** (include date and gases)	
Monitoring Personnel: Damien Holmes	**Weather:** Showers	**Barometric pressure** 1020mb

Results

Sample Station Number	CH_4 (%v/v)	CO_2 (% v/v)	O_2 (% v/v)	CO ppm	H_2S ppm	Comments
BH1A	0.0	0.2	21.0	1	0	31.953m A.O D Top of Cover
BH2A	0.0	0.1	20.4	0	0	32.362m A.O.D Top of Cover
BH3A	0.1	0.9	19.8	1	0	33.664m A.O.D Top of Cover
BH4A	0.0	0.1	21.1	0	0	33.570m A.O.D Top of Cover
BH5A	0.0	0.3	19.9	1	0	36.130m A.O.D Top of Cover
BH6A	0.1	0.1	20.4	0	0	35.951m A.O.D Top of Cover
BH7A	0.1	0.0	20.1	0	0	25.172m A.O.D Top of Cover
BH8A	0.0	0.1	20.2	1	0	36.151m A.O.D Top of Cover
BH9A	0.0	0.4	20.2	2	0	34.345m A.O.D Top of Cover
BH10A	0.0	0.2	20.9	0	0	32.776m A.O.D Top of Cover
BH11A	0.0	0.1	21.0	0	0	21.715m A.O.D Top of Cover
LG1	0.0	0.2	20.1	2	0	
LG2	0.0	0.2	21.1	0	0	
LG3	0.0	1.0	19.4	0	0	
LG4	0.1	1.1	19.4	0	0	
LG5	0.1	0.4	20.4	2	0	
LG6	0.0	0.1	20.2	0	0	
LG7	0.2	0.1	21.2	0	0	
PZ8	0.1	0.0	20.2	0	0	Constructed 26/02/12
PZ9	0.1	0.0	21.1	0	0	Constructed 26/02/12
PZ10	0.0	0.0	21.0	0	0	Constructed 26/02/12

LANDFILL GAS MONITORING FORM		
Facility Name: Drogheda Landfill **Waste Licence no.:** W0033-01	**Facility Address:** Mell Drogheda	
Licensee: Drogheda Borough Council		
Date of licensing:	**Date of sampling:** 19-03-2015	**Time of sampling:** 09.00hrs
Instrument used: Geotechnical Instruments GA2000	**Date Next Full Calibration:** July 2015 **Last Field Calibration:** (include date and gases)	
Monitoring Personnel: Damien Holmes	**Weather:** Dry	**Barometric pressure** 1010mb

Results

Sample Station Number	CH_4 (%v/v)	CO_2 (% v/v)	O_2 (% v/v)	CO ppm	H_2S ppm	Comments
BH1A	0	0.2	20.2	1	0	31.953m A.O D Top of Cover
BH2A	0.0	0.2	20.0	0	0	32.362m A.O.D Top of Cover
BH3A	0.1	1.1	19.6	0	0	33.664m A.O.D Top of Cover
BH4A	0.0	0.1	20.2	2	0	33.570m A.O.D Top of Cover
BH5A	0.0	0.4	20.1	3	0	36.130m A.O.D Top of Cover
BH6A	0.0	0.1	20.2	0	0	35.951m A.O.D Top of Cover
BH7A	0.0	0.1	20.0	0	0	25.172m A.O.D Top of Cover
BH8A	0.1	0.1	20.2	0	0	36.151m A.O.D Top of Cover
BH9A	0.0	0.2	20.2	0	0	34.345m A.O.D Top of Cover
BH10A	0.0	0.0	21.0	0	0	32.776m A.O.D Top of Cover
BH11A	0.0	0.1	20.2	0	0	21.715m A.O.D Top of Cover
LG1	0.0	0.1	20.1	0	0	
LG2	0.1	0.2	21.2	1	0	
LG3	0.1	1.3	18.2	0	0	
LG4	0.1	1.8	18.2	0	0	
LG5	0.0	0.1	21.2	2	0	
LG6	0.0	0.2	20.1	0	0	
LG7	0.0	0.0	21.2	0	0	
PZ8	0.0	0.0	21.1	0	0	Constructed 26/02/12
PZ9	0.0	0.0	21.1	0	0	Constructed 26/02/12
PZ10	0.1	0.0	21.2	0	0	Constructed 26/02/12

LANDFILL GAS MONITORING FORM		
Facility Name: Drogheda Landfill **Waste Licence no**.: W0033-01	**Facility Address:** Mell Drogheda	
Licensee: Drogheda Borough Council		
Date of licensing:	**Date of sampling:** **14-04-2015**	**Time of sampling:** **09.00hrs**
Instrument used: Geotechnical Instruments GA2000	**Date Next Full Calibration:** July 2015 **Last Field Calibration:** (include date and gases)	
Monitoring Personnel: Damien Holmes	**Weather:** **Dry**	**Barometric pressure** 1019mb

Results						
Sample Station Number	CH_4 (%v/v)	CO_2 (% v/v)	O_2 (% v/v)	CO ppm	H_2S ppm	Comments
BH1A	0	0.2	20.1	1	0	31.953m A.O D Top of Cover
BH2A	0.0	0.2	20.1	0	0	32.362m A.O.D Top of Cover
BH3A	0.1	0.9	19.7	0	0	33.664m A.O.D Top of Cover
BH4A	0.0	0.1	20.2	1	0	33.570m A.O.D Top of Cover
BH5A	0.0	0.5	19.9	2	0	36.130m A.O.D Top of Cover
BH6A	0.0	0.1	20.2	0	0	35.951m A.O.D Top of Cover
BH7A	0.0	0.1	20.1	0	0	25.172m A.O.D Top of Cover
BH8A	0.0	0.3	20.0	0	0	36.151m A.O.D Top of Cover
BH9A	0.0	0.2	20.2	0	0	34.345m A.O.D Top of Cover
BH10A	0.0	0.0	20.2	0	0	32.776m A.O.D Top of Cover
BH11A	0.0	0.2	20.2	0	0	21.715m A.O.D Top of Cover
LG1	0.0	0.1	20.1	0	0	
LG2	0.0	0.2	21.0	1	0	
LG3	0.1	1.2	18.1	0	0	
LG4	0.0	1.6	18.5	0	0	
LG5	0.0	0.2	20.2	1	0	
LG6	0.0	0.2	20.1	0	0	
LG7	0.0	0.0	20.2	0	0	
PZ8	0.0	0.0	20.3	0	0	Constructed 26/02/12
PZ9	0.0	0.0	20.3	0	0	Constructed 26/02/12
PZ10	0.0	0.0	20.3	0	0	Constructed 26/02/12

LANDFILL GAS MONITORING FORM		
Facility Name: Drogheda Landfill **Waste Licence no.:** W0033-01	**Facility Address:** Mell Drogheda	
Licensee: Drogheda Borough Council		
Date of licensing:	**Date of sampling:** 13-05-2015	**Time of sampling:** 12.00hrs
Instrument used: Geotechnical Instruments GA2000	**Date Next Full Calibration:** July 2015 **Last Field Calibration:** (include date and gases)	
Monitoring Personnel: Damien Holmes	**Weather:** Dry	**Barometric pressure** 1020mb

Results						
Sample Station Number	CH_4 (%v/v)	CO_2 (% v/v)	O_2 (% v/v)	CO ppm	H_2S ppm	Comments
BH1A	0	0.2	20.3	0	0	31.953m A.O D Top of Cover
BH2A	0.0	0.2	20.3	0	0	32.362m A.O.D Top of Cover
BH3A	0.1	1.2	19.4	0	0	33.664m A.O.D Top of Cover
BH4A	0.0	0.2	20.2	2	0	33.570m A.O.D Top of Cover
BH5A	0.0	0.3	20.2	0	0	36.130m A.O.D Top of Cover
BH6A	0.0	0.2	20.2	0	0	35.951m A.O.D Top of Cover
BH7A	0.0	0.1	20.1	0	0	25.172m A.O.D Top of Cover
BH8A	0.1	0.1	20.2	1	0	36.151m A.O.D Top of Cover
BH9A	0.0	0.2	20.2	0	0	34.345m A.O.D Top of Cover
BH10A	0.0	0.0	20.4	0	0	32.776m A.O.D Top of Cover
BH11A	0.0	0.2	20.2	0	0	21.715m A.O.D Top of Cover
LG1	0.0	0.1	20.1	0	0	
LG2	0.0	0.2	21.2	1	0	
LG3	0.2	1.2	18.0	0	0	
LG4	0.1	1.6	17.9	0	0	
LG5	0.0	0.2	20.4	1	0	
LG6	0.0	0.2	20.2	0	0	
LG7	0.0	0.0	20.4	0	0	
PZ8	0.0	0.0	20.1	0	0	Constructed 26/02/12
PZ9	0.0	0.0	20.2	0	0	Constructed 26/02/12
PZ10	0.0	0.0	20.2	0	0	Constructed 26/02/12

LANDFILL GAS MONITORING FORM		
Facility Name: Drogheda Landfill **Waste Licence no**.: W0033-01	**Facility Address:** Mell Drogheda	
Licensee: Drogheda Borough Council		
Date of licensing:	**Date of sampling**: 18-06-2015	**Time of sampling:** 12.00hrs
Instrument used: Geotechnical Instruments GA2000	**Date Next Full Calibration:** July 2015 **Last Field Calibration:** (include date and gases)	
Monitoring Personnel: Damien Holmes	**Weather:** Dry	**Barometric pressure** 1018mb

Results						
Sample Station Number	CH_4 (%v/v)	CO_2 (% v/v)	O_2 (% v/v)	CO ppm	H_2S ppm	Comments
BH1A	0	0.1	20.4	0	0	31.953m A.O D Top of Cover
BH2A	0.0	0.2	20.4	0	0	32.362m A.O.D Top of Cover
BH3A	0.1	1.1	19.2	0	0	33.664m A.O.D Top of Cover
BH4A	0.0	0.2	20.2	1	0	33.570m A.O.D Top of Cover
BH5A	0.0	0.2	20.3	0	0	36.130m A.O.D Top of Cover
BH6A	0.0	0.2	20.2	0	0	35.951m A.O.D Top of Cover
BH7A	0.0	0.1	20.2	0	0	25.172m A.O.D Top of Cover
BH8A	0.0	0.2	20.1	1	0	36.151m A.O.D Top of Cover
BH9A	0.0	0.2	20.2	0	0	34.345m A.O.D Top of Cover
BH10A	0.0	0.0	20.2	0	0	32.776m A.O.D Top of Cover
BH11A	0.0	0.2	20.2	0	0	21.715m A.O.D Top of Cover
LG1	0.0	0.1	20.1	0	0	
LG2	0.0	0.2	21.2	1	0	
LG3	0.2	1.3	18.2	1	0	
LG4	0.2	1.7	18.0	0	0	
LG5	0.0	0.2	20.4	1	0	
LG6	0.0	0.2	20.2	0	0	
LG7	0.0	0.0	20.4	0	0	
PZ8	0.0	0.0	20.2	0	0	Constructed 26/02/12
PZ9	0.0	0.0	20.3	0	0	Constructed 26/02/12
PZ10	0.0	0.0	20.2	0	0	Constructed 26/02/12

LANDFILL GAS MONITORING FORM		
Facility Name: Drogheda Landfill **Waste Licence no.:** W0033-01	**Facility Address:** Mell Drogheda	
Licensee: Drogheda Borough Council		
Date of licensing:	**Date of sampling:** 24-07-2015	**Time of sampling:** 10.00hrs
Instrument used: Geotechnical Instruments GA2000	**Date Next Full Calibration:** July 2015 **Last Field Calibration:** (include date and gases)	
Monitoring Personnel: Damien Holmes	**Weather:** Dry	**Barometric pressure** 1021mb

Results

Sample Station Number	CH_4 (%v/v)	CO_2 (% v/v)	O_2 (% v/v)	CO ppm	H_2S ppm	Comments
BH1A	0.0	0.2	20.2	0	0	31.953m A.O D Top of Cover
BH2A	0.0	0.2	20.2	0	0	32.362m A.O.D Top of Cover
BH3A	0.0	1.3	19.4	0	0	33.664m A.O.D Top of Cover
BH4A	0.0	0.2	20.2	0	0	33.570m A.O.D Top of Cover
BH5A	0.0	0.4	20.0	0	0	36.130m A.O.D Top of Cover
BH6A	0.0	0.2	20.2	0	0	35.951m A.O.D Top of Cover
BH7A	0.0	0.1	20.2	0	0	25.172m A.O.D Top of Cover
BH8A	0.0	0.1	20.2	1	0	36.151m A.O.D Top of Cover
BH9A	0.0	0.2	20.2	0	0	34.345m A.O.D Top of Cover
BH10A	0.0	0.0	20.4	0	0	32.776m A.O.D Top of Cover
BH11A	0.0	0.2	20.2	0	0	21.715m A.O.D Top of Cover
LG1	0.0	0.1	20.2	0	0	
LG2	0.0	0.2	20.2	1	0	
LG3	0.2	1.2	18.0	0	0	
LG4	0.2	1.4	18.2	0	0	
LG5	0.0	0.2	20.4	2	0	
LG6	0.0	0.2	20.2	0	0	
LG7	0.0	0.0	20.4	0	0	
PZ8	0.0	0.0	20.2	0	0	Constructed 26/02/12
PZ9	0.0	0.0	20.2	0	0	Constructed 26/02/12
PZ10	0.0	0.0	20.2	2	0	Constructed 26/02/12

LANDFILL GAS MONITORING FORM		
Facility Name: Drogheda Landfill **Waste Licence no.:** W0033-01	**Facility Address:** Mell Drogheda	
Licensee: Drogheda Borough Council		
Date of licensing:	**Date of sampling:** 21-08-2015	**Time of sampling:** 09.00hrs
Instrument used: Geotechnical Instruments GA2000	**Date Next Full Calibration:** December 2015 **Last Field Calibration:** (include date and gases)	
Monitoring Personnel: Damien Holmes	**Weather:** Dry	**Barometric pressure** 1020mb

Results						
Sample Station Number	CH_4 (%v/v)	CO_2 (% v/v)	O_2 (% v/v)	CO ppm	H_2S ppm	Comments
BH1A	0.0	0.2	20.2	1	0	31.953m A.O D Top of Cover
BH2A	0.0	0.2	20.2	0	0	32.362m A.O.D Top of Cover
BH3A	0.0	0.8	19.6	0	0	33.664m A.O.D Top of Cover
BH4A	0.0	0.2	20.2	1	0	33.570m A.O.D Top of Cover
BH5A	0.0	0.4	20.0	2	0	36.130m A.O.D Top of Cover
BH6A	0.0	0.1	20.2	0	0	35.951m A.O.D Top of Cover
BH7A	0.0	0.2	20.1	0	0	25.172m A.O.D Top of Cover
BH8A	0.0	0.4	20.0	0	0	36.151m A.O.D Top of Cover
BH9A	0.0	0.2	20.2	0	0	34.345m A.O.D Top of Cover
BH10A	0.0	0.0	20.2	0	0	32.776m A.O.D Top of Cover
BH11A	0.0	0.2	20.2	0	0	21.715m A.O.D Top of Cover
LG1	0.0	0.3	19.8	0	0	
LG2	0.0	0.2	21.0	1	0	
LG3	0.0	1.1	19.2	0	0	
LG4	0.0	1.5	18.8	0	0	
LG5	0.0	0.2	20.2	1	0	
LG6	0.0	0.2	20.1	0	0	
LG7	0.0	0.0	20.2	1	0	
PZ8	0.0	0.0	20.3	0	0	Constructed 26/02/12
PZ9	0.0	0.0	20.2	0	0	Constructed 26/02/12
PZ10	0.0	0.0	20.2	0	0	Constructed 26/02/12

LANDFILL GAS MONITORING FORM		
Facility Name: Drogheda Landfill **Waste Licence no.:** W0033-01	**Facility Address:** Mell Drogheda	
Licensee: Drogheda Borough Council		
Date of licensing:	**Date of sampling:** 17-09-2015	**Time of sampling:** 12.00hrs
Instrument used: Geotechnical Instruments GA2000	**Date Next Full Calibration:** December 2015 **Last Field Calibration:** (include date and gases)	
Monitoring Personnel: Damien Holmes	**Weather:** Dry	**Barometric pressure** 1020mb

Results						
Sample Station Number	CH_4 (%v/v)	CO_2 (% v/v)	O_2 (% v/v)	CO ppm	H_2S ppm	Comments
BH1A	0.0	0.2	20.4	0	0	31.953m A.O D Top of Cover
BH2A	0.0	0.2	20.2	0	0	32.362m A.O.D Top of Cover
BH3A	0.0	1.2	19.6	1	0	33.664m A.O.D Top of Cover
BH4A	0.0	0.2	20.2	1	0	33.570m A.O.D Top of Cover
BH5A	0.0	0.2	20.3	0	0	36.130m A.O.D Top of Cover
BH6A	0.0	0.4	20.0	0	0	35.951m A.O.D Top of Cover
BH7A	0.0	0.1	20.4	0	0	25.172m A.O.D Top of Cover
BH8A	0.0	0.4	20.2	1	0	36.151m A.O.D Top of Cover
BH9A	0.0	0.2	20.2	0	0	34.345m A.O.D Top of Cover
BH10A	0.0	0.2	20.0	0	0	32.776m A.O.D Top of Cover
BH11A	0.0	0.2	20.2	0	0	21.715m A.O.D Top of Cover
LG1	0.0	0.1	20.1	0	0	
LG2	0.0	0.2	21.2	1	0	
LG3	0.0	1.3	18.4	1	0	
LG4	0.0	1.4	18.2	1	0	
LG5	0.0	0.2	20.4	1	0	
LG6	0.0	0.2	20.1	0	0	
LG7	0.0	0.0	20.4	0	0	
PZ8	0.0	0.0	20.4	0	0	Constructed 26/02/12
PZ9	0.0	0.0	20.3	0	0	Constructed 26/02/12
PZ10	0.0	0.0	20.4	0	0	Constructed 26/02/12

LANDFILL GAS MONITORING FORM		
Facility Name: Drogheda Landfill **Waste Licence no.:** W0033-01	**Facility Address:** Mell Drogheda	
Licensee: Drogheda Borough Council		
Date of licensing:	**Date of sampling:** 22-10-2015	**Time of sampling:** 14.00hrs
Instrument used: Geotechnical Instruments GA2000	**Date Next Full Calibration:** December 2015 **Last Field Calibration:** (include date and gases)	
Monitoring Personnel: Damien Holmes	**Weather:** Dry	**Barometric pressure** 1012mb

Results						
Sample Station Number	CH_4 (%v/v)	CO_2 (% v/v)	O_2 (% v/v)	CO ppm	H_2S ppm	Comments
BH1A	0.0	0.0	20.4	0	0	31.953m A.O D Top of Cover
BH2A	0.0	0.0	20.4	0	0	32.362m A.O.D Top of Cover
BH3A	0.0	1.3	19.4	0	0	33.664m A.O.D Top of Cover
BH4A	0.0	0.0	20.2	1	0	33.570m A.O.D Top of Cover
BH5A	0.0	0.0	20.4	0	0	36.130m A.O.D Top of Cover
BH6A	0.0	0.4	20.0	0	0	35.951m A.O.D Top of Cover
BH7A	0.0	0.1	20.4	0	0	25.172m A.O.D Top of Cover
BH8A	0.0	0.4	20.2	1	0	36.151m A.O.D Top of Cover
BH9A	0.0	0.2	20.2	0	0	34.345m A.O.D Top of Cover
BH10A	0.0	0.2	20.0	0	0	32.776m A.O.D Top of Cover
BH11A	0.0	0.0	20.4	1	0	21.715m A.O.D Top of Cover
LG1	0.0	0.0	20.1	0	0	
LG2	0.0	0.2	21.2	1	0	
LG3	0.0	1.3	19.2	0	0	
LG4	0.0	1.1	19.2	1	0	
LG5	0.0	0.0	20.4	1	0	
LG6	0.0	0.2	20.1	0	0	
LG7	0.0	0.0	20.4	0	0	
PZ8	0.0	0.2	20.4	0	0	Constructed 26/02/12
PZ9	0.0	0.0	20.3	0	0	Constructed 26/02/12
PZ10	0.0	0.0	20.4	0	0	Constructed 26/02/12

LANDFILL GAS MONITORING FORM		
Facility Name: Drogheda Landfill **Waste Licence no.:** W0033-01	**Facility Address:** Mell Drogheda	
Licensee: Drogheda Borough Council		
Date of licensing:	**Date of sampling:** 30-11-2015	**Time of sampling:** 10.00hrs
Instrument used: Geotechnical Instruments GA2000	**Date Next Full Calibration:** December 2015 **Last Field Calibration:** (include date and gases)	
Monitoring Personnel: Damien Holmes	**Weather:** Dry	**Barometric pressure** 1016mb

Results						
Sample Station Number	CH_4 (%v/v)	CO_2 (% v/v)	O_2 (% v/v)	CO ppm	H_2S ppm	Comments
BH1A	0.0	0.0	20.2	1	0	31.953m A.O D Top of Cover
BH2A	0.0	0.0	20.2	0	0	32.362m A.O.D Top of Cover
BH3A	0.0	1.2	19.2	0	2	33.664m A.O.D Top of Cover
BH4A	0.0	0.0	20.4	1	0	33.570m A.O.D Top of Cover
BH5A	0.0	0.5	20.0	2	0	36.130m A.O.D Top of Cover
BH6A	0.0	0.1	20.2	0	0	35.951m A.O.D Top of Cover
BH7A	0.0	0.2	20.1	0	0	25.172m A.O.D Top of Cover
BH8A	0.0	0.4	20.0	0	0	36.151m A.O.D Top of Cover
BH9A	0.0	0.2	20.2	0	0	34.345m A.O.D Top of Cover
BH10A	0.0	0.0	20.2	0	0	32.776m A.O.D Top of Cover
BH11A	0.0	0.2	20.2	0	0	21.715m A.O.D Top of Cover
LG1	0.0	0.1	20.2	1	0	
LG2	0.0	0.2	20.1	1	0	
LG3	0.0	1.1	19.2	0	0	
LG4	0.0	1.3	19.1	0	0	
LG5	0.0	0.2	20.2	1	0	
LG6	0.0	0.1	20.2	0	0	
LG7	0.0	0.0	20.2	1	0	
PZ8	0.0	0.0	20.4	0	0	Constructed 26/02/12
PZ9	0.0	0.0	20.2	0	0	Constructed 26/02/12
PZ10	0.0	0.0	20.2	0	0	Constructed 26/02/12

LANDFILL GAS MONITORING FORM		
Facility Name: Drogheda Landfill **Waste Licence no.:** W0033-01	**Facility Address:** Mell Drogheda	
Licensee: Drogheda Borough Council		
Date of licensing:	**Date of sampling:** 16-12-2015	**Time of sampling:** 10.00hrs
Instrument used: Geotechnical Instruments GA2000	**Date Next Full Calibration:** December 2015 **Last Field Calibration:** (include date and gases)	
Monitoring Personnel: Damien Holmes	**Weather:** Dry	**Barometric pressure** 1010mb

Results						
Sample Station Number	CH_4 (%v/v)	CO_2 (% v/v)	O_2 (% v/v)	CO ppm	H_2S ppm	Comments
BH1A	0.0	0.2	20.2	0	0	31.953m A.O D Top of Cover
BH2A	0.0	0.2	20.2	0	0	32.362m A.O.D Top of Cover
BH3A	0.0	1.1	19.2	1	0	33.664m A.O.D Top of Cover
BH4A	0.0	0.2	20.2	0	0	33.570m A.O.D Top of Cover
BH5A	0.0	0.6	19.8	1	0	36.130m A.O.D Top of Cover
BH6A	0.0	0.2	20.2	0	0	35.951m A.O.D Top of Cover
BH7A	0.0	0.0	20.4	0	0	25.172m A.O.D Top of Cover
BH8A	0.0	0.0	20.4	1	0	36.151m A.O.D Top of Cover
BH9A	0.0	0.2	20.2	0	0	34.345m A.O.D Top of Cover
BH10A	0.0	0.0	20.4	0	0	32.776m A.O.D Top of Cover
BH11A	0.0	0.2	20.2	0	0	21.715m A.O.D Top of Cover
LG1	0.0	0.0	20.2	0	0	
LG2	0.0	0.2	20.2	1	0	
LG3	0.2	1.3	18.6	0	0	
LG4	0.0	1.0	19.0	0	0	
LG5	0.0	0.2	20.4	2	0	
LG6	0.0	0.0	20.2	0	0	
LG7	0.0	0.0	20.4	0	0	
PZ8	0.0	0.0	20.4	0	0	Constructed 26/02/12
PZ9	0.0	0.0	20.4	0	0	Constructed 26/02/12
PZ10	0.0	0.0	20.2	0	0	Constructed 26/02/12