



ANNUAL ENVIRONMENTAL REPORT

For

**BALBANE LANDFILL SITE
Co. Donegal**

Waste Licence Reference: W0090-1

By

Donegal County Council

For

Environmental Protection Agency

Reporting Period:

January to December 2008

March 2008

TABLE OF CONTENTS

	<u>Page No</u>
1.0 Introduction	2
2.0 Reporting period	2
3.0 Waste Activities carried out at the facility	3
4.0 Quantity and Composition of waste received and disposed of during the reporting period and each previous year.	4
5.0 Summary report on emissions, results and interpretation of environmental monitoring.	5
6.0 Volume of leachate produced and volume of leachate transported / discharged off site	7
7.0 Report on development work undertaken during the reporting period, and a timescale for those proposed during the coming year.	7
8.0 Report on restoration of completed cells/phases	7
9.0 Site survey showing existing levels of the facility at the end of the reporting period	7
10.0 Annual water balance calculation and interpretation	8
11.0 Reported incidents and complaints summaries	8
12.0 Review of Nuisance Controls	8
13.0 Report on financial provisions made under this license, management and staffing structure of the facility and a programme for public information.	9
14.0 Report on training of staff	10
15.0 Resources and energy consumption	10
16.0 Report on environmental management programme	10

1 INTRODUCTION

- 1.1 This Annual Environmental Report (AER) has been prepared to meet the requirements of Condition 11.5 of Waste Licence 90-1 for Balbane Landfill Site, and includes the information listed in Schedule F of the Licence.
- 1.2 Balbane Landfill Site is located approximately 6.5 km north of Killybegs, in the townland of Balbane, County Donegal. The landfill covers an area of approximately 2.9 hectares. The landfill site was developed to operate on the dilute and disperse principle whereby leachate generated by rainfall was allowed to disperse into the surrounding environment.
- 1.3 Donegal County Council submitted an application to the Environmental Protection Agency for the continued operation of the landfill site, as required by the Waste Management (Licensing) Regulations 1997. On the 13th of November 2001 the Environmental Protection Agency granted the Council a Waste Licence (registration number 90-1) for the facility, in accordance with the Third Schedule of the Waste Management Act, 1996.

2 REPORT PERIOD

- 2.1 The report period for this Annual Environmental Report (AER) is from January to December 2008. The site closed in January 2004.

3 WASTE ACTIVITIES CARRIED OUT AT THE FACILITY

- 3.1 In accordance with Condition 1 of the waste licence only those waste types and quantities of waste listed in Schedule A shall be disposed of at the facility unless the prior agreement of the Agency has been obtained. The maximum annual tonnage of individual waste types for disposal is listed in Schedule A of the Waste Licence at 7,500 tonnes from the date of grant of licence for municipal waste and 70,000 tonnes of inert material of the purpose of restoration.
- 3.2 The licensed waste disposal activities in accordance with the Third Schedule of the waste Management Act, 1996 are restricted to those listed as follows:
- **Class 1:** Deposit on, in or under land (including landfill).
This activity is limited to deposition of municipal and inert waste.
 - **Class 4:** Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons. This activity is limited to leachate collection and treatment.
 - **Class 13:** Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced. This activity is limited to leachate collection and storage prior to treatment.
- 3.3 When operational, access to site was controlled by the Site Manager. All persons availing of the site had to report to the site office at the time of entering and leaving the landfill site. Access was restricted to those times when staff were on duty and the site is now secured to prevent unauthorised entry.

4 QUANTITY AND COMPOSITION OF WASTE RECEIVED AND DISPOSED OF DURING THE REPORTING PERIOD AND EACH PREVIOUS YEAR.

- 4.1 A temporary computerised weighbridge was installed at the site in 2002 and this was used to record waste data figures until the facility closed in January 2004. No waste has been received at the site since closure. Annual figures for the period 1998-2008 are shown in Table 4.1.

Table 4.1 Waste Quantities Accepted (tonnes)

Waste Types	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Municipal Waste (20 03 01)	3228	3716	4721	4107	5069	2790	187	0	0	0	0
Street Cleanings (20 03 03)						57	3	0	0	0	0

5 SUMMARY REPORT ON EMISSIONS, RESULTS AND INTERPRETATION OF ENVIRONMENTAL MONITORING

5.1 ENVIRONMENTAL MONITORING REQUIREMENTS

The locations, frequencies and parameters which are required to be monitored at Balbane Landfill Site are specified in Schedule F of the Waste Licence. Details of these are shown on Drawing Nos 5234.40 /107 and 5234.40/06 and are given in Appendix A.

5.2 MONITORING RESULTS

Results of monitoring for the period for surface water, groundwater, leachate and gas are contained in tabular and graphical format in Appendix B.

5.3 GROUNDWATER

5.3.1 Results are assessed against the Maximum Admissible Concentrations (MAC's) set out in the EC Quality of Water for Human Consumption Regulations 1988, the EC Drinking Water Regulations 2000 and the EPA Interim Report, Towards Setting Guideline Values for the Protection of Groundwater in Ireland. Groundwater locally flows in a south-easterly direction and GW1 reflects baseline conditions upstream of the site. GW4 & GW2 are downstream but in waste. It should be noted that BH2 is also located within waste is considered to be a leachate well.

5.3.2 Results from this period indicate that leachate continues to be released from the waste body into the local groundwater environment.

5.4 SURFACE WATER

5.4.1 Surface water results are assessed against the Surface Water Quality Standards (SWQS) as laid out in the EC Quality of Surface Water Intended for the Abstraction of Drinking Water Regulations 1989. S1 is upstream of the site, whilst S4 – S7 inclusive are downstream. S2 and S3 were relocated and relabelled at the request of the EPA.

5.4.2 Upstream of the waste body results of analysis shows chloride and nitrite levels to be raised above the MAC. Downstream, levels of ammonia are consistently above MAC close to the landfill and reduce gradually further downstream. Other parameters indicative of leachate are also raised relative to the MAC. Downstream results would indicate that leachate continues to be released from the waste body into the local surface water environment and levels are comparable to those recorded during the last reporting period.

5.5 LEACHATE

5.5.1 Leachate quality varies during the lifetime of a landfill depending on the stage of decomposition of waste. Results from BH1, the leachate well are presented in Appendix B. Some characteristic parameters have been compared with those of 'typical' raw leachate in Table 5.1 below.

Table 5.1 Raw Leachate Concentrations 2008

PARAMETER	Balbane Landfill Site		From 30 samples from UK/Irish landfills accepting domestic waste Results in mg/l		
	Min.Conc	Max.Conc	Min.Conc	Max.Conc	Mean
Ammonia (mg/N)	<0.01	15.39	<0.2	1700	491
BOD	3.1	4.2	4.5	>4800	>834
COD	10	57	<10	33,700	3078
Chloride (mg/l)	25	245	27	3410	1256
Iron (mg/l)	0.612	0.612	0.4	664	54.4
Potassium (mg/l)	18.4	18.4	2.7	1480	491
Sodium (mg/l)	139.3	139.3	12	3000	904
TON (mg/l N)	<0.01	0.1	/	/	/
Conductivity (μ S/cm)	1302	1838	503	19,200	7789
pH (pH units)	6.4	6.5	6.4	8.0	7.2

5.5.2 Table 5.1 compares raw leachate concentrations detected at Balbane with 'typical leachate composition from 30 samples from UK/Irish Landfills accepting mainly domestic waste' (taken from EPA Manual for Landfill Operational Practices). Parameters measured all compare well with typical leachate ranges shown and with the results issued last period.

5.6 PERIMETER GAS MONITORING

The gas monitoring peizometers on the site at Balbane are located within waste, and are not perimeter wells. As such results (as contained in Apendix B) are indicative of methanogenic gas processes that would be occurring under anaerobic conditions.

5.7 DUST MONITORING

As previously agreed with the Agency, monitoring of dust ceased as there are currently no operations being undertaken on the site. When any activity commences, such as restoration works for example, a dust-monitoring programme will be resumed.

5.8 METEOROLOGICAL MONITORING

Meteorological data is contained in Appendix C.

6 VOLUME OF LEACHATE PRODUCED AND VOLUME OF LEACHATE TRANSPORTED DISCHARGED OFF SITE

- 6.1 A water balance calculation has been undertaken and is presented in Appendix C. It estimates that 9734m³ of leachate will have been generated from this waste body during the period. Due to a lack of collection infrastructure there is not currently any leachate transported off site. Correspondingly it is assumed that all leachate generated disperses into the surrounding environment.

7 REPORT ON DEVELOPMENT WORK UNDERTAKEN DURING THE REPORTING PERIOD, AND A TIME SCALE FOR THOSE PROPOSED DURING THE COMING YEAR.

- 7.1 The landfill is currently scheduled for restoration during 2009.

8 REPORT ON RESTORATION OF COMPLETED CELLS / PHASES

- 8.1 The Restoration and Aftercare Plan was submitted to the Agency in October 2004 and approved in November 2004.
- 8.2 Of Donegal County Council's five closed landfill sites Balbane is now scheduled for restoration fourth and next. A request to reprioritise the order of restoration of the last two remaining unrestored closed landfill sites (Churchtown Landfill Site (W0062-1) and Balbane Landfill Site) was submitted to the Agency in December 2008. The current proposed date for restoration of Balbane is 2009.

9 SITE SURVEY SHOWING EXISTING LEVELS OF THE FACILITY AT THE END OF THE REPORTING PERIOD

- 9.1 A topographical survey of the site was last carried out in December 2002. This was included in the 2002 AER.

10 ANNUAL WATER BALANCE CALCULATION AND INTERPRETATION

A water balance calculation has been undertaken and is presented in Appendix C. The calculation for monthly water balance is as follows

$$Lo = [ER (A) + LW + IRCA + ER (I)] - [aW]$$

Where

Lo = leachate produced (m³)

ER = effective rainfall

A = area of cell (m²)

LW = liquid waste

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

a = absorptive capacity of waste (m³/t)

W = weight of waste deposited

I = surface area of lagoons (m²)

11 REPORTED INCIDENTS AND COMPLAINTS SUMMARIES.

- 11.1 Other than the reporting of on-going emissions exceedances detected in the routine monitoring programme, no incidents occurred during the monitoring period and no complaints were received.

12 REVIEW OF NUISANCE CONTROLS

- 12.1 As the facility is no longer operational, all areas formerly used for the placement of municipal waste have been covered by clay and topsoil. There has been a reduction in the incidence of nuisances resulting from this. However, precautionary measures are employed to ensure the detection and appropriate management of any nuisances that may arise. As part of the Environmental Management System for the site a procedure has been developed to provide for regular inspections of the site as part of the quarterly monitoring programme.

12.2 PEST CONTROL (vermin and flies)

Pest control is undertaken by a contractor on site. ISS lay Rodenticide (Broifacoum) in bait boxes located on site and its effectiveness monitored by checking on a regular basis to assess if bait is taken.

12.3 DUST CONTROL

Dust is principally generated within the site by the trafficking of vehicles along the landfill access. Since the site is now non-operational there is no traffic to generate a dust nuisance. If a problem were identified during the inspection programme then appropriate measures would be taken, but this is considered unlikely. When any activity is occurring on the site in future such as either receipt of restoration materials, and / or restoration works, then more regular inspections (and monitoring of dust levels in line with Licence requirements) will resume. Damping down of dusty areas will accordingly be done as and when necessary.

12.4 LITTER

A litter problem could principally arise from two sources, firstly from illegal dumping, and secondly from exposed areas of waste. Areas of exposure are checked for during the quarterly inspections, and where necessary, the cover is improved. The site is on the regular inspection route of the Litter Warden for the area, and when any problems arise the Warden investigates the incident and clean-up is carried out by the Mobile Litter Unit. If ever necessary litter pickers are deployed inside the landfill.

12.5 BIRDS

In order to prevent birds from scavenging over the landfill, the cover has been improved and seeding carried out across the full surface. Regular inspections check for areas of exposure and monitor for the presence of birds.

12.6 ODOURS

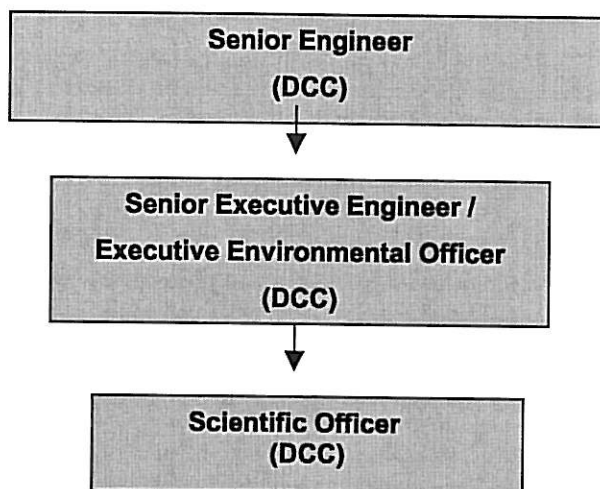
Odours associated with trace aromatics in landfill gases are generally dispersed by prevailing winds.

13 REPORT ON FINANCIAL PROVISIONS MADE UNDER THIS LICENSE, MANAGEMENT AND STAFFING STRUCTURE OF THE FACILITY AND A PROGRAMME FOR PUBLIC INFORMATION

- 13.1 Donegal County Council being a local authority is able to provide the necessary finances to ensure the proper management, development and restoration of Balbane Landfill Site.
- 13.2 Overall responsibility for the ongoing operations and development of the landfill site is held by the Senior Engineer. The Senior Engineer is assisted by a Senior Executive Engineer and an Executive Environmental Officer assigned to the Environment Section of Donegal County Council.
- 13.3 As part of the Environmental Management System (EMS) for the site, a communication programme (in accordance with Condition 2.8 of waste licence) is provided in Section 2 of the

EMS to ensure that members of the public can obtain information concerning the environmental performance of the facility at all reasonable times.

13.4 The Management Structure at Balbane Landfill site is set out below.



14 REPORT ON STAFF TRAINING

14.1 No training has been undertaken as the facility is now closed and there are no operational personnel on the site.

15 RESOURCES AND ENERGY CONSUMPTION SUMMARY

15.1 No energy was consumed on the site during the reporting period.

16 REPORT ON ENVIRONMENTAL MANAGEMENT PROGRAMME

16.1 An Environmental Management Programme (EMP) was revised in 2004 to take into consideration the closure of the site and was submitted in to the Agency in December 2004 for its agreement. A public communication programme has been initiated in accordance with Condition 2 of the Waste Licence to ensure that information concerning the environmental performance is available at reasonable times. The public may view environmental records at the Donegal County Council headquarters. Details regarding this are contained in Section 2 of the Environmental Management System Manual.



NOTES

KEY

- SITE BOUNDARY
- GW GROUNDWATER MONITORING POINT
- BH LEACHATE MONITORING POINT
- D DUST MONITORING POINT
- BH LANDFILL GAS MONITORING POINT

MONITORING TYPE	REF NO	GRID REFERENCE
LEACHATE & GAS	BH1	171300 383157
	BH2	171339 383110
	BH3	171476 383136
GROUNDWATER	GW1	171246 383193
	GW2	171427 383055
	GW4	171503 383048
DUST	D1	171384 383176
	D2	171314 383128
	D3	171538 383137

GRID COORDINATES DETERMINED FROM SITE SURVEY

A	UPDATED GRID COORDINATES SITE BOUNDARY ADDED	JD JULY 05	AMcG JULY 05
REV	DESCRIPTION	BY DATE	CHECK DATE

DRAWN BY JD DATE AUG 2003	CHECK BY KAD DATE AUG 2003	APPROVED DD DATE AUG 2003
PLOT SCALE 1:1000	SCHEDULES	SHEET SIZE A3

CLIENT
DONEGAL COUNTY COUNCIL

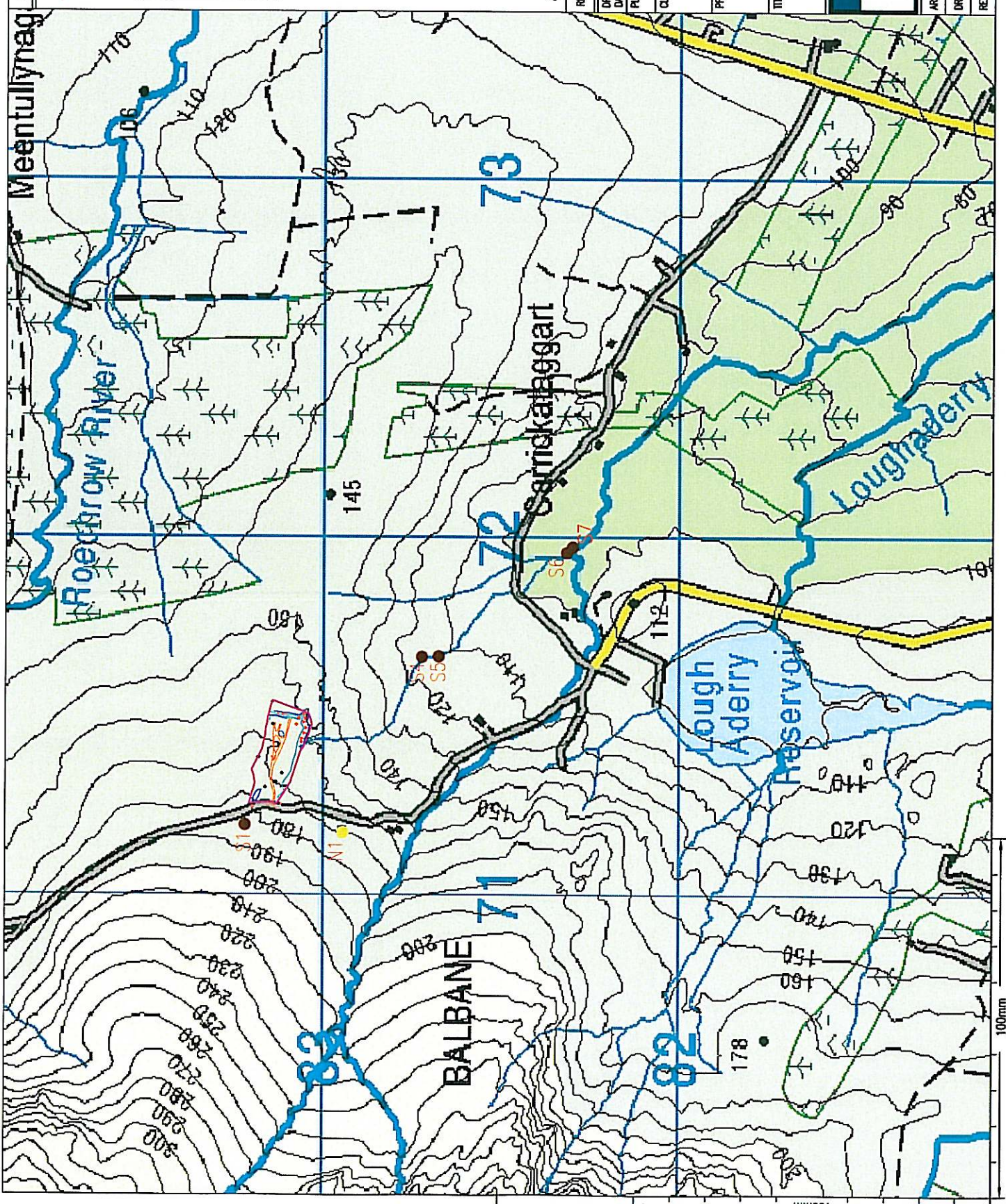
PROJECT
BALBANE LANDFILL SITE

TITLE
MONITORING LOCATIONS

RPS Kirk McClure Morton
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ARCHITECT	DWG. STATUS
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	CONST. <input type="checkbox"/>
	RECORD <input type="checkbox"/>



NOTES

- SITE BOUNDARY
- SURFACE WATER MONITORING POINT
- NOISE MONITORING POINT

MONITORING TYPE	REF NO	GRID REFERENCE	
SURFACE WATER	SW1	17187 363215	
	SW4	17167 362720	
	SW5	17168 362673	
	SW6	17169 362314	
	SW7	17165 362297	
	NOISE	N1	17166 362940

REV	DESCRIPTION	CHECK BY	DATE	DATE
A	UPDATED GRID COORDINATES	AMG	JULY 05	JULY 05

DRAWN BY AMG
 CHECK BY AMG
 APPROVED DD
 DATE SEPT 2004
 DATE SEPT 2004
 DATE SEPT 2004
 SCHEDULES
 SHEET SIZE A3
 CLIENT DONEGAL COUNTY COUNCIL

PROJECT BALBANE LANDFILL SITE
 TITLE SURFACE WATER MANAGEMENT

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ARCHITECT	DWG. STATUS
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100mm

APPENDIX A

**MONITORING LOCATIONS, FREQUENCIES AND
PARAMETERS**

Table A1 Grid References of Monitoring Points

Monitoring Points	Easting	Northing
Boreholes		
GW1	171246.5649	383193.1516
GW2	171427.2239	383055.9240
GW4 Note 1	171503.0898	383048.6637
Surface Water Monitoring		
S1	To be determined	
S4	To be determined	
S5	To be determined	
S6 Note 2	To be determined	
S7 Note 2	To be determined	
Gas Piezometers		
BH1	171300.3033	383157.7656
BH2	171339.4609	383110.6149
BH3	171475.8577	383135.7863
Dust		
D1	171384.5481	383176.7779
D2	171314.6629	383128.5125
D3	171538.3837	383137.6433
Leachate		
BH2	171339.4609	383110.6149

NOTE 1 – GW3 WAS REPLACED BY GW4 WHEN THE LANDFILL MASS EXTENDED PAST THE LOCATION OF GW3

NOTE 2 – SW2 AND SW3 WERE REPLACED BY SW6 AND SW7

Table A2 Groundwater Parameters and Monitoring Frequencies

Monthly	Quarterly	Annually	
Temperature	Chloride	Boron	Magnesium
Groundwater Level	Dissolved Oxygen	Cadmium	Manganese
	Sodium	Calcium	Mercury
	TON	Chromium	Orthophosphate
	TOC	Copper	Zinc
	Phenols	Cyanide	
	Ammoniacal Nitrogen	Fluoride	
	Electrical Conductivity	Lead	
	pH	List I/II substances	
	Iron	Sulphate	
	Potassium		

Table A3 Surface Water Parameters Monitoring Frequencies

Monthly	Quarterly	Annually	
Temperature	Chloride	Iron	Magnesium
pH	Dissolved Oxygen	Cadmium	Manganese
Ammoniacal Nitrogen	COD	Calcium	Mercury
BOD		Chromium	Orthophosphate
Electrical Conductivity		Copper	Zinc
TSS		Sodium	Potassium
		Fluoride	TON
		Lead	Sulphate
		List I/II substances	

APPENDIX B
RESULTS OF MONITORING

Location		Balbane, Killybegs, Co. Donegal											
Sample Type		surface water											
Site No		SW1											
Date of Sample		Jan 08	Feb 08	Mar 08	Apr 08	May 08	Jun 08	Jul 08	Aug 08	Sept 08	Oct 08	Nov 08	Dec 08
Lab No		1429	1711	1898	2827	3419	3797	4801	5198	5896	6542	7552	7557
pH		5.5	6.3	5.5	6.0	6.4	6.5	6.1	6.3	6.9	6.2	5.8	5.8
Temp	C	10.13	9.86	11	11.76	16.7	15.5	18.54	18.3	14.2	10.6	8.7	8.9
Electrical Conductivity	uS/cm	98	68	119	79	90	559	27	31	37	50	79	60
Ammonical Nitrogen	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	0.01	0.01	<0.01	<0.01	<0.01	<0.01
COD	mg/l	---	3	4	<0.01	<1	---	---	21	24	8	10	2
BOD	mg/l	0.8	1.6	0.7	0.8	<0.01	0.9	0.6	0.4	0.1	0.6	1.1	0.8
Dissolved Oxygen	mg/l	10.53	11.56	11.18	9.77	8.55	8.64	9.62	8.91	9.09	11.21	10.37	10.01
SS	mg/l	<0.01	0.4	<0.01	<0.01	<0.01	8.0	0.4	16.2	1.2	0.2	1.0	0.4
Residue on Evaporator	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Calcium	ug/l	---	---	---	---	---	1856	---	---	---	---	---	---
Cadmium	ug/l	---	---	---	---	---	<0.4	---	---	---	---	---	---
Chromium	ug/l	---	---	---	---	---	<0.05	---	---	---	---	---	---
Chloride	mg/l	---	---	35	---	---	---	---	9	7	14	---	---
Chlorine	mg/l	---	---	---	---	27	13	---	---	---	---	---	---
Copper	ug/l	---	---	---	---	---	<1	---	---	---	---	---	---
Cyanide	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Iron	ug/l	---	---	---	---	---	63	---	---	---	---	---	---
Lead	ug/l	---	---	---	---	---	<1	---	---	---	---	---	---
Magnesium	ug/l	---	---	---	---	---	---	---	---	---	---	---	---
Manganese	ug/l	---	---	---	---	---	1291	---	---	---	---	---	---
Mercury	ug/l	---	---	---	---	---	6	---	---	---	---	---	---
Nickel	ug/l	---	---	---	---	---	<0.05	---	---	---	---	---	---
Potassium	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Sodium	mg/l	---	---	---	---	---	0.3	---	---	---	---	---	---
Sulphate	mg/l	---	---	---	---	---	9.5	---	---	---	---	---	---
Zinc	ug/l	---	---	---	---	---	7	---	---	---	---	---	---
Total Alkalinity as CaCO3	mg/l	---	---	---	---	---	19	---	---	---	---	---	---
Total Organic Carbon	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Total Oxidised Nitrogen	mg/l	0.034	0.07	<0.01	<0.01	0.019	<0.01	0.025	0.027	<0.01	0.2	<0.01	<0.01
Arsenic	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Barium	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Boron	ug/l	---	---	---	---	---	---	---	---	---	---	---	---
Flouride	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Total Phenols	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Phosphorous	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Selenium	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Silver	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Microtox	Toxic Units	---	---	---	---	---	---	---	---	---	---	---	---
Microtox	Toxic Units	---	---	---	---	---	---	---	---	---	---	---	---
Nitrite	mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	0.26	0.11	0.12	<0.03	<0.03	<0.03	<0.03
Nitrate	mg/l	0.13	0.31	<0.04	2.74	0.04	<0.04	<0.04	<0.04	<0.04	0.88	<0.04	<0.04
Phosphate - ORTHO	mg/l	0.008	<0.0001	0.004	0.003	0.007	<0.0001	<0.0001	<0.0001	0.006	0.006	<0.0001	<0.0001
Phosphate - TOTAL	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Total Coliforms	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Facel Coliforms	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Depth	m	---	---	---	---	---	---	---	---	---	---	---	---

*** Insufficient Sample / No Access
 --- Not Applicable

Location		Balbane, Killybegs, Co. Donegal											
Sample Type		surface water											
Site No		SW4											
Date of Sample		Jan 08	Feb 08	Mar 08	Apr 08	May 08	Jun 08	Jul 08	Aug 08	Sept 08	Oct 08	Nov 08	Dec 08
Lab No		1430	1712	1899	2828	3420	3798	4802	5199	5897	6543	7553	7558
pH		7.8	7.6	7.6	7.5	7.8	7.4	7.7	7.7	7.3	6.4	7.5	7.5
Temp	C	9.87	9.74	11.27	11.7	18.4	15.5	18.31	18.44	14.51	10.56	8.0	8.3
Electrical Conductivity	uS/cm	417	194	323	268	594	225	300	217	856	188	205	207
Ammonical Nitrogen	mg/l	8.73	2.27	5.65	1.14	5.62	1.98	8.44	4.63	33.08	6.44	4.43	4.01
COD	mg/l	---	8	17	338	46	50	---	34	30	29	1	5
BOD	mg/l	9.1	2.8	8.1	0.1	0.4	2.5	0.9	4.9	0.7	7.6	2.1	2.2
Dissolved Oxygen	mg/l	10.6	11.4	10.8	9.5	8.8	8.9	9.7	9.0	8.7	11.3	10.3	10.2
SS	mg/l	<0.01	<0.01	<0.0.1	0.4	1.2	15.0	2.2	9.4	0.2	0.4	1.4	0.8
Residue on Evaporator	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Calcium	ug/l	---	---	---	---	---	14840	---	---	---	---	---	---
Cadmium	ug/l	---	---	---	---	---	<0.4	---	---	---	---	---	---
Chromium	ug/l	---	---	---	---	---	<0.05	---	---	---	---	---	---
Chloride	mg/l	---	---	53	---	86	31	---	22	71	24	---	---
Chlorine	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Copper	ug/l	---	---	---	---	---	<1	---	---	---	---	---	---
Cyanide	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Iron	ug/l	---	---	---	---	---	---	---	---	---	---	---	---
Lead	ug/l	---	---	---	---	---	202	---	---	---	---	---	---
Magnesium	ug/l	---	---	---	---	---	3	---	---	---	---	---	---
Manganese	ug/l	---	---	---	---	---	5073	---	---	---	---	---	---
Mercury	ug/l	---	---	---	---	---	5	---	---	---	---	---	---
Nickel	mg/l	---	---	---	---	---	<0.05	---	---	---	---	---	---
Potassium	mg/l	---	---	---	---	---	5.6	---	---	---	---	---	---
Sodium	mg/l	---	---	---	---	---	22	---	---	---	---	---	---
Sulphate	mg/l	---	---	---	---	---	7	---	---	---	---	---	---
Zinc	ug/l	---	---	---	---	---	20	---	---	---	---	---	---
Total Alkalinity as CaCO3	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Total Organic Carbon	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Total Oxidised Nitrogen	mg/l	3.35	1.56	3.09	3.83	5.64	2.79	1.91	1.92	5.3	1.32	1.49	1.43
Arsenic	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Barium	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Boron	ug/l	---	---	---	---	---	---	---	---	---	---	---	---
Flouride	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Total Phenols	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Phosphorous	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Selenium	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Silver	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Microtox	Toxic Units	---	---	---	---	---	---	---	---	---	---	---	---
Microtox	Toxic Units	---	---	---	---	---	---	---	---	---	---	---	---
Nitrite	mg/l	0.07	<0.03	0.1	<0.03	<0.03	0.15	0.23	0.30	0.50	<0.03	<0.03	<0.03
Nitrate	mg/l	14.7	6.9	13.7	0.4	24.9	12.2	8.13	8.02	22.8	5.8	6.6	6.3
Phosphate - ORTHO	mg/l	0.05	0.05	<0.0001	0.17	0.06	<0.0001	<0.0001	<0.0001	0.22	0.04	0.07	0.06
Phosphate - TOTAL	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Total Coliforms	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Facel Coliforms	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Depth	m	---	---	---	---	---	---	---	---	---	---	---	---

*** Insufficient Sampl / No Access
 --- Not Applicable

Location		Balbane, Killybegs, Co. Donegal											
Sample Type		surface water											
Site No		SW5											
Date of Sample		Jan 08	Feb 08	Mar 08	Apr 08	May 08	Jun 08	Jul 08	Aug 08	Sept 08	Oct 08	Nov 08	Dec 08
Lab No		1431	1713	1900	2829	3421	3799	4803	5200	5898	6544	7554	7559
pH		7.8	7.5	7.6	7.6	7.5	7.3	7.5	7.5	7.9	6.8	7.4	7.5
Temp	C	6.69	9.41	11.07	11.72	17.3	15.5	18.31	18.48	14.43	10.24	8.1	8.5
Electrical Conductivity	uS/cm	285	136	232	186	735	63	156	118	477	127	141	144
Ammonical Nitrogen	mg/l	4.80	1.02	2.70	1.22	4.71	0.96	2.81	1.62	12.48	1.87	1.62	1.93
COD	mg/l	---	1	5	21	35	44	---	5	10	1	2	3
BOD	mg/l	4.4	2.6	2.2	1.2	<0.01	1.6	2.3	1.3	5.8	2.1	1.1	1.1
Dissolved Oxygen	mg/l	11.0	11.7	11.1	9.7	7.3	9.2	9.9	9.4	9.4	11.6	10.3	10.2
SS	mg/l	<0.01	0.6	<0.01	<0.01	1.4	4.2	2.0	3.6	0.2	0.4	0.6	0.4
Residue on Evaporator	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Calcium	ug/l	---	---	---	---	---	11410	---	---	---	---	---	---
Cadmium	ug/l	---	---	---	---	---	<0.4	---	---	---	---	---	---
Chromium	ug/l	---	---	---	---	---	<0.05	---	---	---	---	---	---
Chloride	mg/l	---	---	48	---	109	25	---	12	42	19	---	---
Chlorine	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Copper	ug/l	---	---	---	---	---	<1	---	---	---	---	---	---
Cyanide	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Iron	ug/l	---	---	---	---	---	151	---	---	---	---	---	---
Lead	ug/l	---	---	---	---	---	<1	---	---	---	---	---	---
Magnesium	ug/l	---	---	---	---	---	3786	---	---	---	---	---	---
Manganese	ug/l	---	---	---	---	---	3	---	---	---	---	---	---
Mercury	ug/l	---	---	---	---	---	<0.05	---	---	---	---	---	---
Nickel	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Potassium	mg/l	---	---	---	---	---	2.4	---	---	---	---	---	---
Sodium	mg/l	---	---	---	---	---	16.2	---	---	---	---	---	---
Sulphate	mg/l	---	---	---	---	---	10	---	---	---	---	---	---
Zinc	ug/l	---	---	---	---	---	12	---	---	---	---	---	---
Total Alkalinity as CaCO3	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Total Organic Carbon	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Total Oxidised Nitrogen	mg/l	1.20	0.46	0.8	1.25	5.77	1.27	0.61	0.53	2.06	<0.01	0.38	0.52
Arsenic	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Barium	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Boron	ug/l	---	---	---	---	---	---	---	---	---	---	---	---
Flouride	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Total Phenols	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Phosphorous	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Selenium	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Silver	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Microtox	Toxic Units	---	---	---	---	---	---	---	---	---	---	---	---
Microtox	Toxic Units	---	---	---	---	---	---	---	---	---	---	---	---
Nitrite	mg/l	<0.03	<0.03	<0.03	0.03	0.03	0.08	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Nitrate	mg/l	5.3	0.94	3.54	0.57	25.4	5.5	2.7	2.3	9.1	<0.04	1.7	2.3
Phosphate - ORTHO	mg/l	0.05	0.05	0.452	0.06	0.17	0.006	<0.0001	<0.0001	0.1	0.03	0.06	0.07
Phosphate - TOTAL	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Total Coliforms	---	---	---	---	---	---	---	---	---	---	---	---	---
Facel Coliforms	---	---	---	---	---	---	---	---	---	---	---	---	---
Depth	m	---	---	---	---	---	---	---	---	---	---	---	---

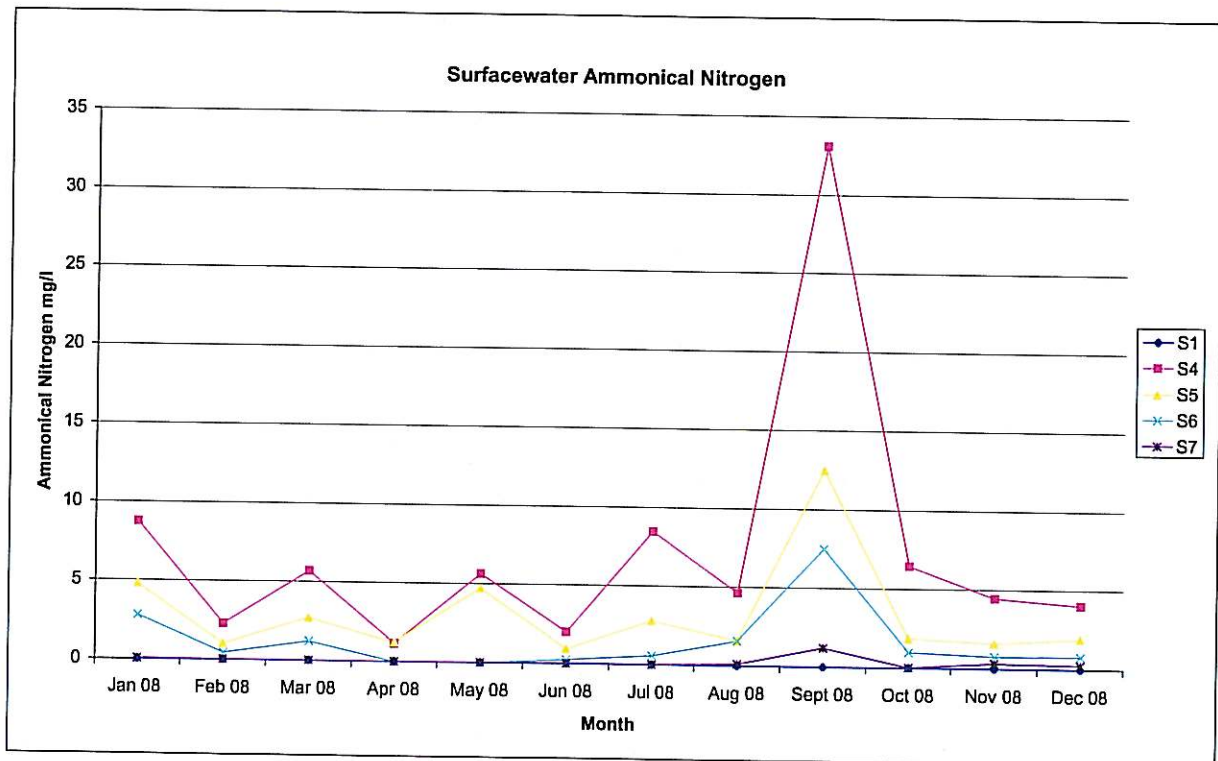
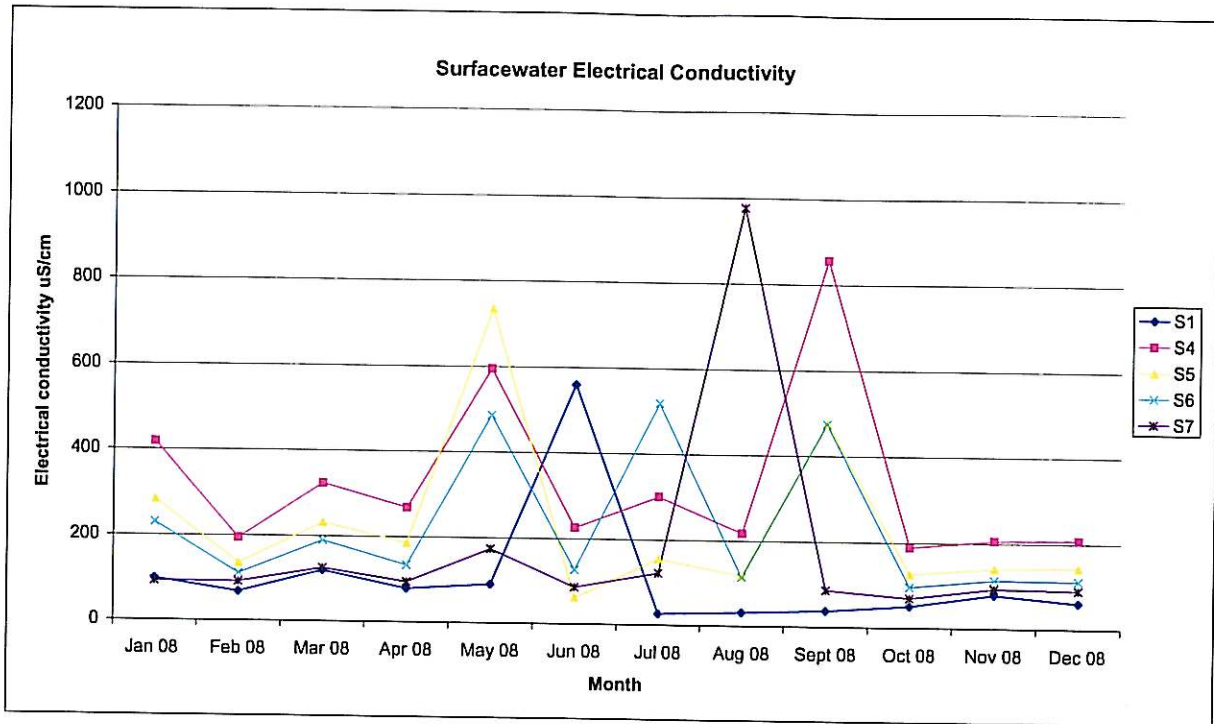
*** Insufficient Sample / No Access
 --- Not Applicable

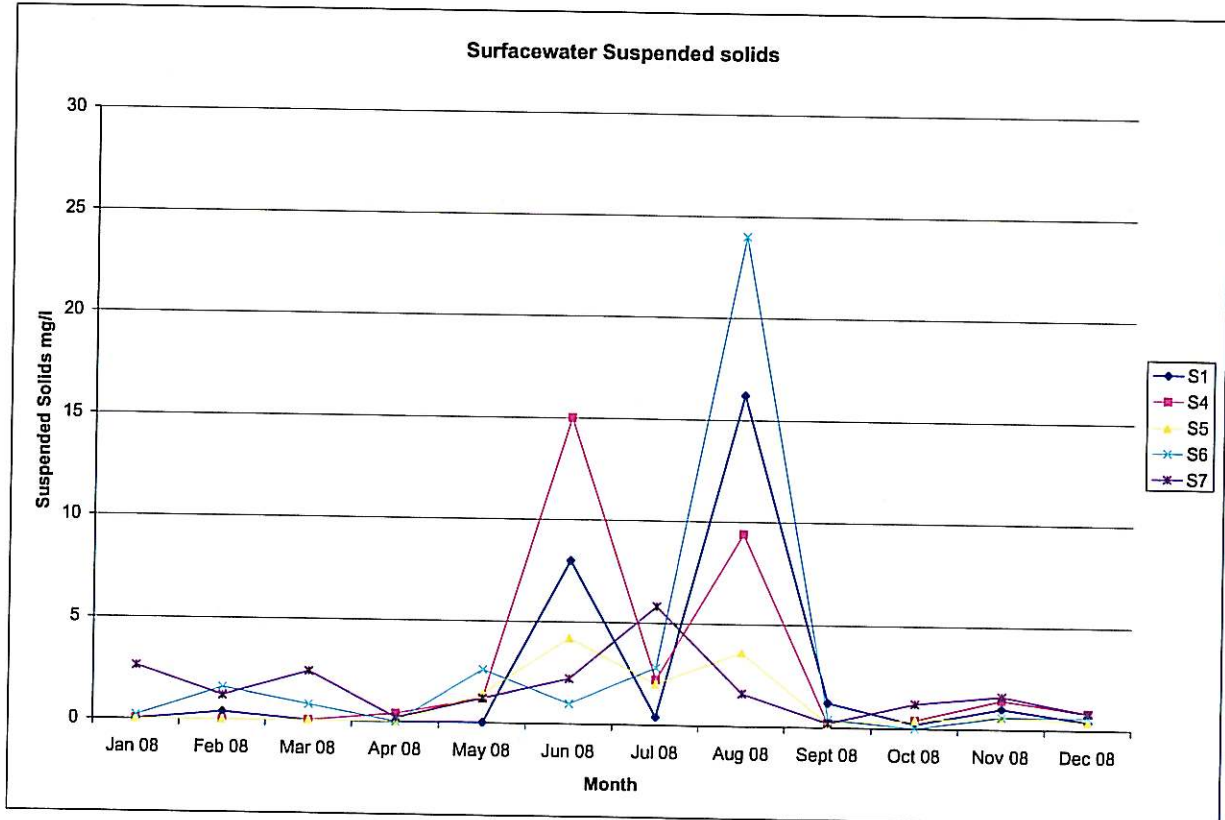
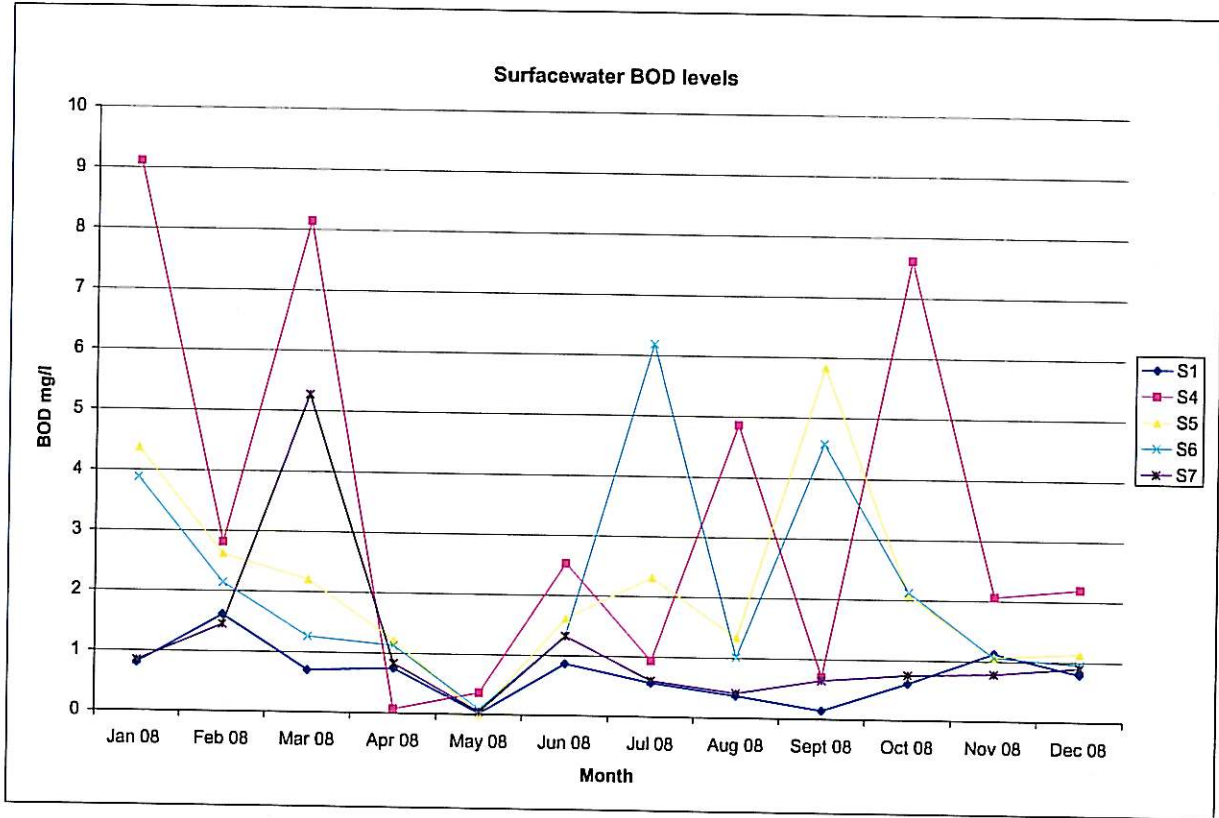
Location		Balbane, Killybegs, Co. Donegal											
Sample Type		surface water											
Site No		SW6											
Date of Sample		Jan 08	Feb 08	Mar 08	Apr 08	May 08	Jun 08	Jul 08	Aug 08	Sept 08	Oct 08	Nov 08	Dec 08
Lab No		1432	1714	1901	2830	3422	3800	4804	5201	5899	6545	7555	7560
pH		7.52	7.09	7.33	7.11	7.64	6.95	6.95	7.24	7.52	6.48	7.34	7.37
Temp	C	9.86	9.62	10.88	11.75	17.3	15.2	21.5	18.52	14.18	10.42	8.1	8.0
Electrical Conductivity	uS/cm	230	111	189	134	486	127	518	115	474	96	113	111
Ammonical Nitrogen	mg/l	2.78	0.44	1.22	<0.01	<0.01	0.26	0.6	1.59	7.47	0.99	0.78	0.8
COD	mg/l	---	2	7	23	<1	30	---	7	33	9	1	2
BOD	mg/l	3.88	2.14	1.26	1.13	0.08	1.32	6.19	1.01	4.57	2.12	1.06	0.95
Dissoved Oxygen	mg/l	10.55	11.49	11.03	9.95	8.3	8.76	8.54	9.59	9.17	11.44	10.13	10.17
SS	mg/l	0.2	1.6	0.8	<0.01	2.6	1.0	2.8	24	0.4	<0.01	0.6	0.6
Residue on Evaporator	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Calcium	ug/l	---	---	---	---	---	7802	---	---	---	---	---	---
Cadmium	ug/l	---	---	---	---	---	<0.4	---	---	---	---	---	---
Chromium	ug/l	---	---	---	---	---	<0.05	---	---	---	---	---	---
Chloride	mg/l	---	---	45	---	72	22	---	22	31	18	---	---
Chlorine	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Copper	ug/l	---	---	---	---	---	---	---	---	---	---	---	---
Cyanide	mg/l	---	---	---	---	---	<1	---	---	---	---	---	---
Iron	ug/l	---	---	---	---	---	---	---	---	---	---	---	---
Lead	ug/l	---	---	---	---	---	229	---	---	---	---	---	---
Magnesium	ug/l	---	---	---	---	---	<1	---	---	---	---	---	---
Manganese	ug/l	---	---	---	---	---	2926	---	---	---	---	---	---
Mercury	ug/l	---	---	---	---	---	2	---	---	---	---	---	---
Nickel	mg/l	---	---	---	---	---	<0.05	---	---	---	---	---	---
Potassium	mg/l	---	---	---	---	---	1.2	---	---	---	---	---	---
Sodium	mg/l	---	---	---	---	---	15.2	---	---	---	---	---	---
Sulphate	mg/l	---	---	---	---	---	12	---	---	---	---	---	---
Zinc	ug/l	---	---	---	---	---	21	---	---	---	---	---	---
Total Alkalinity as CaCO3	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Total Organic Carbon	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Total Oxidised Nitrogen	mg/l	1.05	0.24	0.62	0.57	4.95	0.83	---	<0.01	1.6	0.24	0.24	0.37
Arsenic	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Barium	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Boron	ug/l	---	---	---	---	---	---	---	---	---	---	---	---
Flouride	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Total Phenols	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Phosphorous	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Selenium	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Silver	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Microtox	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Microtox	Toxic Units	---	---	---	---	---	---	---	---	---	---	---	---
Nitrite	mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	0.8	---	<0.03	<0.03	<0.03	<0.03	<0.03
Nitrate	mg/l	4.6	1.06	2.7	<0.04	21.9	3.58	---	<0.04	7.07	1.06	1.06	1.64
Phosphate - ORTHO	mg/l	0.05	0.05	0.08	0.01	0.06	<0.0001	---	<0.0001	0.14	0.04	0.06	0.07
Phosphate - TOTAL	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Total Coliforms	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Facel Coliforms	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Depth	m	---	---	---	---	---	---	---	---	---	---	---	---

*** Insufficient Sample / No Access
 --- Not Applicable

Location		Balbane, Killybegs, Co. Donegal											
Sample Type		surface water											
Site No		SW7											
Date of Sample		Jan 08	Feb 08	Mar 08	Apr 08	May 08	Jun 08	Jul 08	Aug 08	Sept 08	Oct 08	Nov 08	Dec 08
Lab No		1433	1715	1902	2831	3423	3801	4805	5202	5900	6546	7556	7561
pH		7.07	7.2	7.2	7.2	7.1	7.1	7.6	7.6	7.3	7	7.1	7.2
Temp	C	9.92	9.47	11.48	12.94	17.1	15	21	18.74	13.94	10.02	8.8	8.6
Electrical Conductivity	uS/cm	92	92	124	94	173	86	121	976	86	69	93	89
Ammonical Nitrogen	mg/l	0.03	<0.01	<0.01	0.004	<0.01	<0.01	<0.01	0.1	1.2	0.02	0.32	0.24
COD	mg/l	---	<0.01	4	45	<1	27	---	3	<0.1	<0.01	4	1
BOD	mg/l	0.84	1.45	5.27	0.83	0.04	1.32	0.6	0.41	0.64	0.75	0.78	0.9
Dissolved Oxygen	mg/l	11.42	11.74	11.54	10.22	8.75	9.23	10.5	10.06	9.53	11.72	10.17	10.04
SS	mg/l	2.6	1.2	2.4	0.2	1.2	2.2	5.8	1.6	0.2	1.2	1.6	0.8
Residue on Evaporator	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Calcium	ug/l	---	---	---	---	---	6531	---	---	---	---	---	---
Cadmium	ug/l	---	---	---	---	---	<0.4	---	---	---	---	---	---
Chromium	ug/l	---	---	---	---	---	<0.05	---	---	---	---	---	---
Chloride	mg/l	---	---	36	---	33	16	---	12	13	16	---	---
Chlorine	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Copper	ug/l	---	---	---	---	---	<1	---	---	---	---	---	---
Cyanide	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Iron	ug/l	---	---	---	---	---	158	---	---	---	---	---	---
Lead	ug/l	---	---	---	---	---	<1	---	---	---	---	---	---
Magnesium	ug/l	---	---	---	---	---	2023	---	---	---	---	---	---
Manganese	ug/l	---	---	---	---	---	10	---	---	---	---	---	---
Mercury	ug/l	---	---	---	---	---	<0.05	---	---	---	---	---	---
Nickel	mg/l	---	---	---	---	---	<0.2	---	---	---	---	---	---
Potassium	mg/l	---	---	---	---	---	10.6	---	---	---	---	---	---
Sodium	mg/l	---	---	---	---	---	7	---	---	---	---	---	---
Sulphate	mg/l	---	---	---	---	---	13	---	---	---	---	---	---
Zinc	ug/l	---	---	---	---	---	---	---	---	---	---	---	---
Total Alkalinity as CaCO3	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Total Organic Carbon	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Total Oxidised Nitrogen	mg/l	0.14	0.01	0.09	0.04	0.73	0.09	---	0.13	<0.01	0.05	0.26	0.18
Arsenic	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Barium	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Boron	ug/l	---	---	---	---	---	---	---	---	---	---	---	---
Flouride	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Total Phenols	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Phosphorous	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Selenium	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Silver	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Microtox	Microtox	---	---	---	---	---	---	---	---	---	---	---	---
Microtox	Microtox	---	---	---	---	---	---	---	---	---	---	---	---
Nitrite	mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	---	0.12	<0.03	<0.03	0.079	<0.03
Nitrate	mg/l	0.57	0.04	0.4	<0.04	0.89	0.35	---	0.4	<0.04	0.18	1.06	0.8
Phosphate - ORTHO	mg/l	0.001	0.05	0.032	0.07	0.06	0.004	---	<0.0001	0.24	0.001	<0.0001	<0.0001
Phosphate - TOTAL	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Total Coliforms	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Face Coliforms	mg/l	---	---	---	---	---	---	---	---	---	---	---	---
Depth	m	---	---	---	---	---	---	---	---	---	---	---	---

*** Insufficient Sample / No Access
 --- Not Applicable





Location		Balbane, Killybegs, Co. Donegal											
Sample Type		groundwater											
Site No		GW1											
Date of Sample		Jan 08	Feb 08	Mar 08	Apr 08	May 08	Jun 08	Jul 08	Aug 08	Sept 08	Oct 08	Nov 08	Dec 08
Lab No				1903			3802			5901			
pH				6.77			6.73			7.13			
Temp	C			11.86			14.3			16.2			
Electrical Conductivity	uS/cm			404			561			584			
Ammonical Nitrogen	mg/l			<0.01			0.1			0.11			
COD	mg/l												
BOD	mg/l												
Dissolved Oxygen	mg/l			5.43			2.91			4.13			
SS	mg/l			14			11.8			7			
Residue on Evaporator	mg/l						302						
Calcium	ug/l						89130						
Cadmium	ug/l						<0.4						
Chromium	ug/l						<0.05						
Chloride	mg/l			12			17			13			
Chlorine	mg/l												
Copper	ug/l						<1						
Cyanide	mg/l						<0.05						
Iron	ug/l						6.00			<2			
Lead	ug/l						<1						
Magnesium	ug/l						8849						
Manganese	ug/l						118						
Mercury	ug/l						<0.05						
Nickel	mg/l												
Potassium	mg/l						2.2			3			
Sodium	mg/l						37.6			34.4			
Sulphate	mg/l						17						
Zinc	ug/l						12						
Total Alkalinity as CaCO3	mg/l												
Total Organic Carbon	mg/l			4.9			7.8			10			
Total Oxidised Nitrogen	mg/l			0.14			0.12			<0.01			
Arsenic	mg/l												
Barium	mg/l												
Boron	mg/l						<3						
Flouride	ug/l						0.1						
Total Phenols	mg/l			<0.01			0.02			<0.01			
Phosphorous	mg/l												
Selenium	mg/l												
Silver	mg/l												
Microtox	mg/l												
Microtox	Toxic Units												
Nitrite	mg/l			<0.03			<0.03			<0.03			
Nitrate	mg/l			0.6			0.49			<0.04			
Phosphate - ORTHO	mg/l			<0.0001			<0.0001			0.1			
Phosphate - TOTAL	mg/l												
Total Coliforms	mg/l												
Facel/Coliforms	mg/l												
Depth	m	0.2	0.1	0.3	0.1	0.4	0.5	0.4	0.2	0.3	0.2	0.1	0.1

*** Insufficient Sample / No Access
 --- Not Applicable

VOLATILE ORGANIC COMPOUNDS		<i>Balbane Landfill Site Killybegs, Co.Donegal</i>	
Month:	June		
Location:	GW1		
Lab No:	3802		
PARAMETERS	UNITS	PARAMETERS	UNITS
Dichlorodifluoromethane	<1	1,2-Dibromoethane	<1
Chloromethane	<1	Tetrachloroethene	<1
Vinyl Chloride	<1	1,1,1,2-Tetrachloroethane	<1
Bromomethane	<1	Chlorobenzene	<1
Chloroethane	<1	Ethylbenzene	<1
Trichlorofluoromethane	<1	p/m-Xylene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
Dichloromethane	<1	Styrene	<1
Carbon disulphide	<1	1,1,2,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	o-Xylene	<1
1,1-Dichloroethane	<1	1,2,3-Trichloropropane	<1
tert-butyl methyl ether	<1	Isopropylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Bromochloromethane	<1	2-Chlorotoluene	<1
Chloroform	<1	Propylbenzene	<1
2,2-Dichloropropane	<1	4-Chlorotoluene	<1
1,2-Dichloroethane	<1	1,2,4-Trimethylbenzene	<1
1,1,1-Trichloroethane	<1	4-Isopropyltoluene	<1
1,1-Dichloropropene	<1	1,3,5-Trimethylbenzene	<1
Benzene	<1	1,3-Dichlorobenzene	<1
Carbontetrachloride	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	tert-Butylbenzene	<1
Bromodichloromethane	<1	1,2-Dichlorobenzene	<1
Trichloroethene	<1	n-Butylbenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<1
trans-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
Toluene	<1	1,2,3-Trichlorobenzene	<1
1,3-Dichloropropane	<1	Hexachlorobutadiene	<1
Dibromochloromethane	<1		

SEMIVOLATILE ORGANIC COMPOUNDS		<i>Balbane Landfill Site Killybegs, Co.Donegal</i>	
Month:	June		
Location:	GW1		
Lab No:	3802		
PARAMETERS	UNITS	PARAMETERS	UNITS
Phenol	<1	Benzo(k)fluoranthrene	<1
2-Chlorophenol	<1	Benzo(a)pyrene	<1
2-Methylphenol	<1	Indeno(1,2,3-cd)pyrene	<1
4-Methylphenol	<1	Dibenzo(a,h)anthracene	<1
2-Nitrophenol	<1	Benzo(ghi)perylene	<1
4-Nitrophenol	<1	2-Chloronaphthalene	<1
2,4-Dichlorophenol	<1	2-Methylnaphthalene	<1
2,4-Dimethylphenol	<1	Carbazole	<1
4-Chloro-3-methylphenol	<1	Isophorone	<1
2,4,6-Trichlorophenol	<1	Dibenzofuran	<1
2,4,5-Trichlorophenol	<1	Dimethyl phthalate	<1
Pentachlorophenol	<1	Diethyl phthalate	<1
1,3-Dichlorobenzene	<1	Di-n-butylphthalate	<1
1,4-Dichlorobenzene	<1	Di-n-octylphthalate	<1
1,2-Dichlorobenzene	<1	Bis(2-ethylhexyl)phthalate	<1
1,2,4-Trichlorobenzene	<1	Butylbenzylphthalate	<1
Nitrobenzene	<1	4-Chloroaniline	<1
Azobenzene	<1	2-Nitroaniline	<1
Hexachlorobenzene	<1	3-Nitroaniline	<1
Naphthalene	<1	4-Nitroaniline	<1
Acenaphthylene	<1	2,4-Dinitrotoluene	<1
Acenaphthene	<1	2,6-Dinitrotoluene	<1
Fluorene	<1	Bis(2-chloroethyl)ether	<1
Phenanthrene	<1	4-Bromophenylphenylether	<1
Anthracene	<1	4-Chlorophenylphenylether	<1
Fluoranthrene	<1	Hexachloroethane	<1
Pyrene	<1	Hexachlorobutadiene	<1
Benzo(a)anthracene	<1	Hexchlorocyclopentadiene	<1
Chrysene	<1	Bis(2-chloroethoxy)methane	<1
Benzo(b)fluoranthrene	<1	N-nitrosodi-n-propylamine	<1

Location		Balbane, Killybegs, Co. Donegal											
Sample Type		groundwater											
Site No		GW2											
Date of Sample		Jan 08	Feb 08	Mar 08	Apr 08	May 08	Jun 08	Jul 08	Aug 08	Sept 08	Oct 08	Nov 08	Dec 08
Lab No				1904			3803			5902			
pH				6.43			6.42			6.91			
Temp	C			19.5			16.6			15.33			
Electrical Conductivity	µS/cm			1290			144			116			
Ammonical Nitrogen	mg/l			14			0.02			<0.01			
GOD	mg/l												
BOD	mg/l												
Dissolved Oxygen	mg/l			2.88			8.25			2.7			
SS	mg/l			8			25.6			22			
Residue on Evaporator	mg/l						31						
Calcium	ug/l						10040						
Cadmium	ug/l						<0.4						
Chromium	ug/l						<0.05						
Chloride	mg/l			247			37			27			
Chlorine	mg/l												
Copper	mg/l						<1						
Cyanide	mg/l						<0.05						
Iron	ug/l						27			<2			
Lead	ug/l						<1						
Magnesium	ug/l						1035						
Manganese	ug/l						1						
Mercury	ug/l						<0.05						
Nickel	mg/l												
Potassium	mg/l						1.3			2.1			
Sodium	mg/l						14.2			8.5			
Sulphate	mg/l						<3						
Zinc	ug/l						18						
Total Alkalinity as CaCO3	mg/l												
Total Organic Carbon	mg/l			3.3			2.9			<2			
Total Oxidised Nitrogen	mg/l			<0.01			<0.01			1.27			
Arsenic	mg/l												
Barium	mg/l												
Boron	ug/l						<3						
Flouride	mg/l						<0.1						
Total Phenols	mg/l			<0.01			<0.01			<0.01			
Phosphorous	mg/l												
Selenium	mg/l												
Silver	mg/l												
Microtox	Toxic Units												
Microtox	Toxic Units												
Nitrite	mg/l			<0.03			<0.03			0.39			
Nitrate	mg/l			<0.04			<0.04			5.08			
Phosphate - ORTHO	mg/l			0.07			0.48			0.38			
Phosphate - TOTAL	mg/l												
Total Coliforms													
Facel Coliforms													
Depth	m	5.4	5.4	5.2	5.4	5.3	5.5	5.2	4.3	4	4.1	5.0	5.4

*** Insufficient Sample / No Access

--- Not Applicable

VOLATILE ORGANIC COMPOUNDS		<i>Balbane Landfill Site Killybegs, Co.Donegal</i>	
Month:	June		
Location:	GW2		
Lab No:	3803		
PARAMETERS	UNITS	PARAMETERS	UNITS
Dichlorodifluoromethane	<1	1,2-Dibromoethane	<1
Chloromethane	<1	Tetrachloroethene	<1
Vinyl Chloride	<1	1,1,1,2-Tetrachloroethane	<1
Bromomethane	<1	Chlorobenzene	<1
Chloroethane	<1	Ethylbenzene	<1
Trichlorofluoromethane	<1	p/m-Xylene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
Dichloromethane	<1	Styrene	<1
Carbon disulphide	<1	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	o-Xylene	<1
1,1-Dichloroethane	<1	1,2,3-Trichloropropane	<1
tert-butyl methyl ether	<1	Isopropylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Bromochloromethane	<1	2-Chlorotoluene	<1
Chloroform	<1	Propylbenzene	<1
2,2-Dichloropropane	<1	4-Chlorotoluene	<1
1,2-Dichloroethane	<1	1,2,4-Trimethylbenzene	<1
1,1,1-Trichloroethane	<1	4-Isopropyltoluene	<1
1,1-Dichloropropene	<1	1,3,5-Trimethylbenzene	<1
Benzene	<1	1,3-Dichlorobenzene	<1
Carbontetrachloride	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	tert-Butylbenzene	<1
Bromodichloromethane	<1	1,2-Dichlorobenzene	<1
Trichloroethene	<1	n-Butylbenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<1
trans-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
Toluene	<1	1,2,3-Trichlorobenzene	<1
1,3-Dichloropropane	<1	Hexachlorobutadiene	<1
Dibromochloromethane	<1		

SEMIVOLATILE ORGANIC COMPOUNDS		<i>Balbane Landfill Site Killybegs, Co. Donegal</i>	
Month:	June		
Location:	GW2		
Lab No:	3803		
PARAMETERS	UNITS	PARAMETERS	UNITS
Phenol	<1	Benzo(k)fluoranthrene	<1
2-Chlorophenol	<1	Benzo(a)pyrene	<1
2-Methylphenol	<1	Indeno(1,2,3-cd)pyrene	<1
4-Methylphenol	<1	Dibenzo(a,h)anthracene	<1
2-Nitrophenol	<1	Benzo(ghi)perylene	<1
4-Nitrophenol	<1	2-Chloronaphthalene	<1
2,4-Dichlorophenol	<1	2-Methylnaphthalene	<1
2,4-Dimethylphenol	<1	Carbazole	<1
4-Chloro-3-methylphenol	<1	Isophorone	<1
2,4,6-Trichlorophenol	<1	Dibenzofuran	<1
2,4,5-Trichlorophenol	<1	Dimethyl phthalate	<1
Pentachlorophenol	<1	Diethyl phthalate	<1
1,3-Dichlorobenzene	<1	Di-n-butylphthalate	<1
1,4-Dichlorobenzene	<1	Di-n-octylphthalate	<1
1,2-Dichlorobenzene	<1	Bis(2-ethylhexyl)phthalate	<1
1,2,4-Trichlorobenzene	<1	Butylbenzylphthalate	<1
Nitrobenzene	<1	4-Chloroaniline	<1
Azobenzene	<1	2-Nitroaniline	<1
Hexachlorobenzene	<1	3-Nitroaniline	<1
Naphthalene	<1	4-Nitroaniline	<1
Acenaphthylene	<1	2,4-Dinitrotoluene	<1
Acenaphthene	<1	2,6-Dinitrotoluene	<1
Fluorene	<1	Bis(2-chloroethyl)ether	<1
Phenanthrene	<1	4-Bromophenylphenylether	<1
Anthracene	<1	4-Chlorophenylphenylether	<1
Fluoranthrene	<1	Hexachloroethane	<1
Pyrene	<1	Hexachlorobutadiene	<1
Benzo(a)anthracene	<1	Hexachlorocyclopentadiene	<1
Chrysene	<1	Bis(2-chloroethoxy)methane	<1
Benzo(b)fluoranthrene	<1	N-nitrosodi-n-propylamine	<1

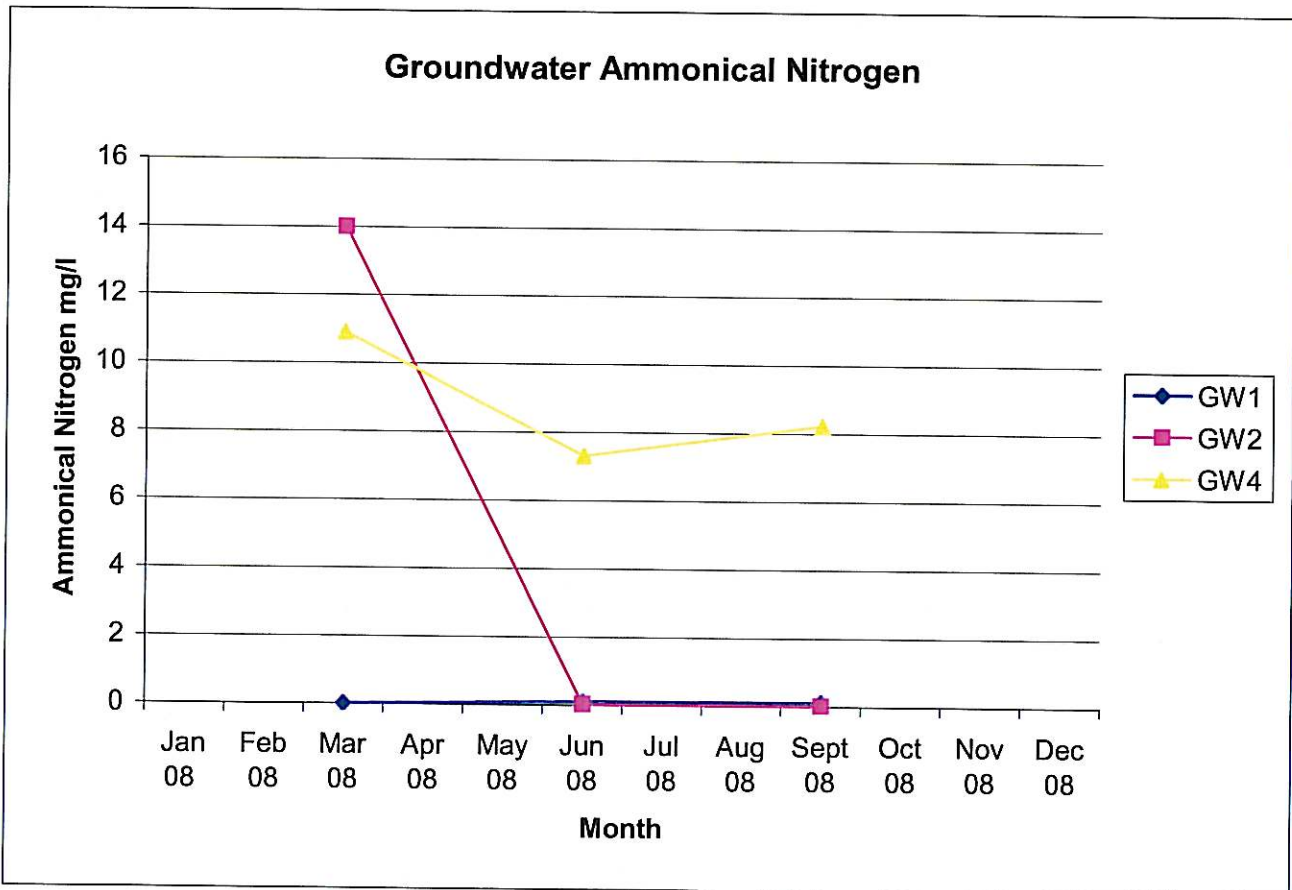
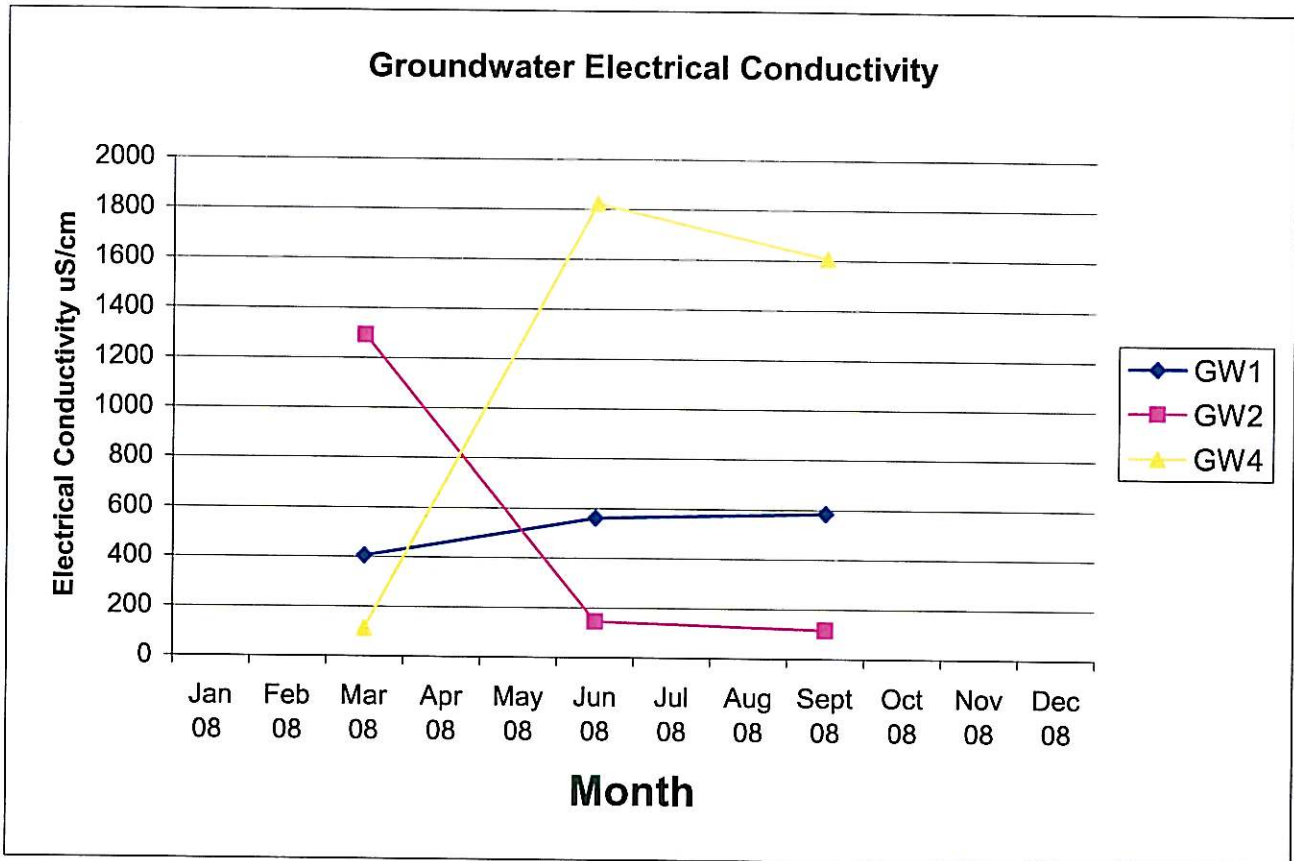
Location		Balbane, Killybegs, Co. Donegal											
Sample Type		groundwater											
Site No		GW4											
Date of Sample		Jan 08	Feb 08	Mar 08	Apr 08	May 08	Jun 08	Jul 08	Aug 08	Sept 08	Oct 08	Nov 08	Dec 08
Lab No				1905			3804			5903			
pH				6.68			7.04			7.17			
Temp	C			18.5			15.8			14.89			
Electrical Conductivity	uS/cm			114			1823			1608			
Ammonical Nitrogen	mg/l			10.9			7.31			8.24			
COD	mg/l												
BOD	mg/l												
Dissolved Oxygen	mg/l			2.09			8.13			2.1			
SS	mg/l			172			51.00			43.2			
Residue on Evaporator	mg/l						1137						
Calcium	ug/l						377500						
Cadmium	ug/l						<0.4						
Chromium	ug/l						<0.05						
Chloride	mg/l			247			252			216			
Chlorine	mg/l												
Copper	ug/l						<1						
Cyanide	mg/l						<0.05						
Iron	ug/l						85			10			
Lead	ug/l						<1						
Magnesium	ug/l						24830						
Manganese	ug/l						8444						
Mercury	ug/l						<0.05						
Nickel	mg/l												
Potassium	mg/l						11.7			12.4			
Sodium	mg/l						121			103			
Sulphate	mg/l						<3						
Zinc	ug/l						14						
Total Alkalinity as CaCO3	mg/l						21.1			15			
Total Organic Carbon	mg/l			17			<0.01			0.74			
Total Oxidised Nitrogen	mg/l			<0.01									
Arsenic	mg/l												
Barium	mg/l												
Boron	ug/l						53						
Flouride	mg/l						0.3						
Total Phenols	mg/l			<0.01			<0.01			<0.01			
Phosphorous	mg/l												
Selenium	mg/l												
Silver	mg/l												
Micrtox	Toxic Units												
Micrtox	Toxic Units												
Nitrite	mg/l			<0.03			<0.03			0.098			
Nitrate	mg/l			<0.04			<0.04			3.1			
Phosphate - ORTHO	mg/l			0.33			0.23			0.06			
Phosphate - TOTAL	mg/l												
Total Coliforms													
Facel Coliforms													
Depth	m	4.7	4.9	4.7	4.7	4.8	5.1	4.6	5.1	4.9	4.8	5.1	

*** Insufficient Sample / No Access

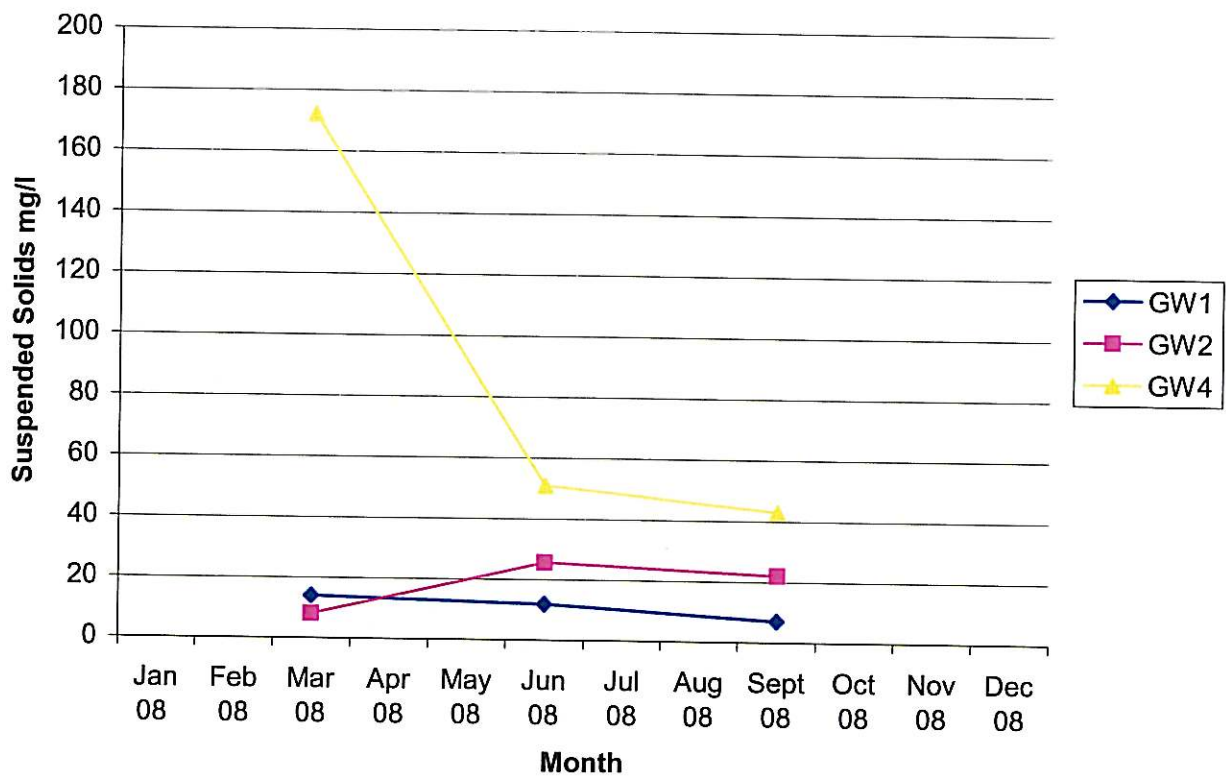
--- Not Applicable

VOLATILE ORGANIC COMPOUNDS		<i>Balbane Landfill Site Killybegs, Co. Donegal</i>	
Month:	June		
Location:	GW4		
Lab No:	3804		
PARAMETERS	UNITS	PARAMETERS	UNITS
Dichlorodifluoromethane	<1	1,2-Dibromoethane	<1
Chloromethane	<1	Tetrachloroethene	<1
Vinyl Chloride	<1	1,1,1,2-Tetrachloroethane	<1
Bromomethane	<1	Chlorobenzene	<1
Chloroethane	<1	Ethylbenzene	<1
Trichlorofluoromethane	<1	p/m-Xylene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
Dichloromethane	<1	Styrene	<1
Carbon disulphide	<1	1,1,2,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	o-Xylene	<1
1,1-Dichloroethane	<1	1,2,3-Trichloropropane	<1
tert-butyl methyl ether	<1	Isopropylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Bromochloromethane	<1	2-Chlorotoluene	<1
Chloroform	<1	Propylbenzene	<1
2,2-Dichloropropane	<1	4-Chlorotoluene	<1
1,2-Dichloroethane	<1	1,2,4-Trimethylbenzene	<1
1,1,1-Trichloroethane	<1	4-Isopropyltoluene	<1
1,1-Dichloropropene	<1	1,3,5-Trimethylbenzene	<1
Benzene	<1	1,3-Dichlorobenzene	<1
Carbontetrachloride	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	tert-Butylbenzene	<1
Bromodichloromethane	<1	1,2-Dichlorobenzene	<1
Trichloroethene	<1	n-Butylbenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<1
trans-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
Toluene	<1	1,2,3-Trichlorobenzene	<1
1,3-Dichloropropane	<1	Hexachlorobutadiene	<1
Dibromochloromethane	<1		

SEMIVOLATILE ORGANIC COMPOUNDS		<i>Balbane Landfill Site Killybegs, Co. Donegal</i>	
Month:	June		
Location:	GW4		
Lab No:	3804		
PARAMETERS	UNITS	PARAMETERS	UNITS
Phenol	<1	Benzo(k)fluoranthrene	<1
2-Chlorophenol	<1	Benzo(a)pyrene	<1
2-Methylphenol	<1	Indeno(1,2,3-cd)pyrene	<1
4-Methylphenol	<1	Dibenzo(a,h)anthracene	<1
2-Nitrophenol	<1	Benzo(ghi)perylene	<1
4-Nitrophenol	<1	2-Chloronaphthalene	<1
2,4-Dichlorophenol	<1	2-Methylnaphthalene	<1
2,4-Dimethylphenol	<1	Carbazole	<1
4-Chloro-3-methylphenol	<1	Isophorone	<1
2,4,6-Trichlorophenol	<1	Dibenzofuran	<1
2,4,5-Trichlorophenol	<1	Dimethyl phthalate	<1
Pentachlorophenol	<1	Diethyl phthalate	<1
1,3-Dichlorobenzene	<1	Di-n-butylphthalate	<1
1,4-Dichlorobenzene	<1	Di-n-octylphthalate	<1
1,2-Dichlorobenzene	<1	Bis(2-ethylhexyl)phthalate	<1
1,2,4-Trichlorobenzene	<1	Butylbenzylphthalate	<1
Nitrobenzene	<1	4-Chloroaniline	<1
Azobenzene	<1	2-Nitroaniline	<1
Hexachlorobenzene	<1	3-Nitroaniline	<1
Naphthalene	<1	4-Nitroaniline	<1
Acenaphthylene	<1	2,4-Dinitrotoluene	<1
Acenaphthene	<1	2,6-Dinitrotoluene	<1
Fluorene	<1	Bis(2-chloroethyl)ether	<1
Phenanthrene	<1	4-Bromophenylphenylether	<1
Anthracene	<1	4-Chlorophenylphenylether	<1
Fluoranthrene	<1	Hexachloroethane	<1
Pyrene	<1	Hexachlorobutadiene	<1
Benzo(a)anthracene	<1	Hexchlorocyclopentadiene	<1
Chrysene	<1	Bis(2-chloroethoxy)methane	<1
Benzo(b)fluoranthrene	<1	N-nitrosodi-n-propylamine	<1



Groundwater Suspended Solids



Location		Balbane, Killybegs, Co. Donegal											
Sample Type		leachate											
Site No		BH2											
Date of Sample		Jan 08	Feb 08	Mar 08	Apr 08	May 08	Jun 08	Jul 08	Aug 08	Sept 08	Oct 08	Nov 08	Dec 08
Lab No													
	pH			1906			3805			5904			
	Temp			6.5			6.4			6.4			
	C			18.7			15.5			15.12			
	Electrical Conductivity			1838			1345			1302			
	Ammonical Nitrogen			<0.01			14.85			15.39			
	COD			10			57			50			
	BOD			3.9			3.1			4.2			
	Dissolved Oxygen			6.7			2.37			8.55			
	SS			35.2			65.4			78.5			
	Residue on Evaporator												
	Calcium						82300						
	Cadmium						<0.4						
	Chromium						<0.05						
	Chloride			25			245			233			
	Chlorine												
	Copper						4						
	Cyanide						<0.05						
	Iron						612						
	Lead						1						
	Magnesium						44810						
	Manganese						15550						
	Mercury						<0.05						
	Nickel												
	Potassium						18.4						
	Sodium						139.3						
	Sulphate						<3						
	Zinc						15						
	Total Alkalinity as CaCO3												
	Total Organic Carbon												
	Total Oxidised Nitrogen			0.1			<0.01			0.08			
	Arsenic												
	Barium												
	Boron						283						
	Flouride						0.3						
	Total Phenols												
	Phosphorous												
	Selenium												
	Silver												
	Microtox												
	Microtox												
	Nitrite			<0.03			<0.03			<0.03			
	Nitrate			0.22			<0.04			0.35			
	Phosphate - ORTHO			0.1			0.05			0.03			
	Phosphate - TOTAL												
	Total Coliforms												
	Facel Coliforms												
	Depth	4.9	5.1	5.3	5.2	5.1	5.1	5.3	5.3	5.0	5.3	5.1	5.1

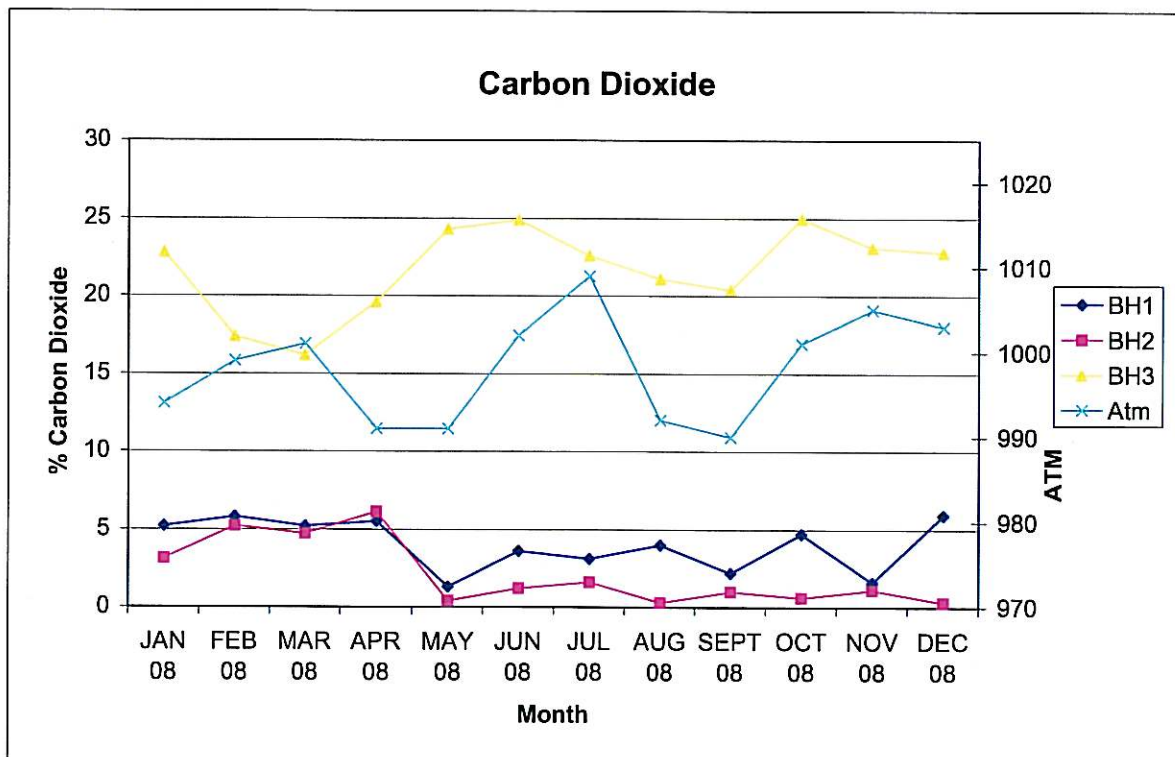
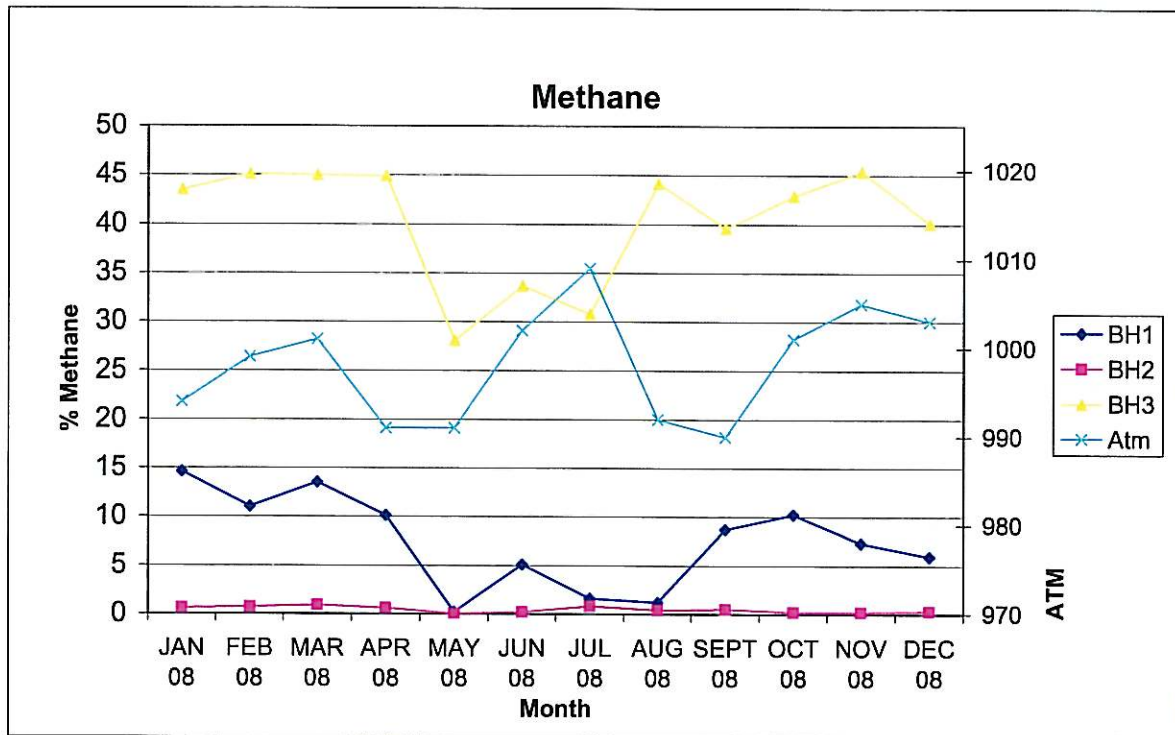
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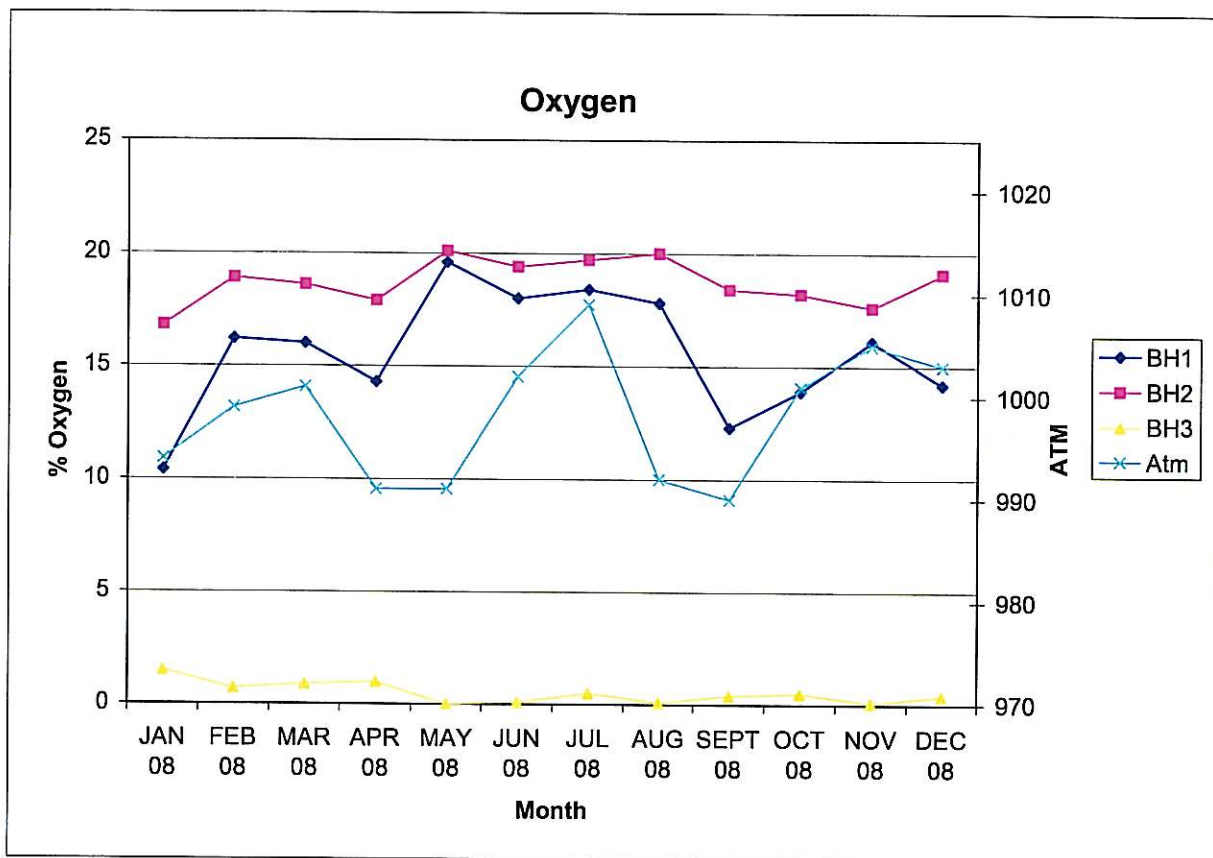
--- Not Applicable

Balbane Landfill Site, Killybegs, Co Donegal													
Gas Levels													
BH1													
PARAMETERS	UNITS	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	
		JAN 08	FEB 08	MAR 08	APR 08	MAY 08	JUN 08	JUL 08	AUG 08	SEPT 08	OCT 08	NOV 08	DEC 08
Methane	%	14.6	11.0	13.5	10.1	0.2	5.1	1.6	1.2	8.7	10.2	7.3	5.9
Carbon Dioxide	%	5.2	5.8	5.2	5.5	1.3	3.6	3.1	4.0	2.2	4.7	1.6	5.9
Oxygen	%	10.4	16.2	16.0	14.3	19.6	18.0	18.4	17.8	12.3	13.9	16.1	14.2
Atm. Pressure	mBar	994	999	1001	991	991	1002	1009	992	990	1001	1005	1003

Balbane Landfill Site, Killybegs, Co Donegal													
Gas Levels													
BH2													
PARAMETERS	UNITS	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	
		JAN 08	FEB 08	MAR 08	APR 08	MAY 08	JUN 08	JUL 08	AUG 08	SEPT 08	OCT 08	NOV 08	DEC 08
Methane	%	0.6	0.7	0.9	0.6	0	0.2	0.8	0.4	0.5	0.2	0.2	0.3
Carbon Dioxide	%	3.1	5.2	4.7	6.1	0.4	1.2	1.6	0.3	1.0	0.6	1.1	0.3
Oxygen	%	16.8	18.9	18.6	17.9	20.1	19.4	19.7	20	18.4	18.2	17.6	19.1
Atm. Pressure	mBar	994	999	1001	991	991	1002	1009	992	990	1001	1005	1003

Balbane Landfill Site, Killybegs, Co Donegal													
Gas Levels													
BH3													
PARAMETERS	UNITS	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	
		JAN 08	FEB 08	MAR 08	APR 08	MAY 08	JUN 08	JUL 08	AUG 08	SEPT 08	OCT 08	NOV 08	DEC 08
Methane	%	43.5	45.1	45	44.9	28.1	33.7	30.8	44.2	39.6	42.9	45.4	40.1
Carbon Dioxide	%	22.8	17.4	16.2	19.6	24.3	24.9	22.6	21.1	20.4	25.0	23.1	22.8
Oxygen	%	1.5	0.7	0.9	1	0	0.1	0.5	0.1	0.4	0.5	0.1	0.4
Atm. Pressure	mBar	994	999	1001	991	991	1002	1009	992	990	1001	1005	1003





APPENDIX C

WATER BALANCE CALCULATION AND METEOROLOGICAL DATA

BALBANE WATER BALANCE CALCULATION

Year	Active Area A(m ²)	Active Phase	Waste Input U(month)	Rainfall (mm)	Active Area Infiltration RA(m ²)	Liquid Waste LW(m ³)	Restored area	Temp Restored area RCA(m ²)	Temp Restored area Infiltration IRCA(m ³)	Total Water	Cumulative Water	Absorptive Capacity atW(m ³)	Cumulative Absorptive Capacity	Cumulative Leachate	Leachate produced Lo(m ³)
2008	Closed			1320				29500	9734	9734	9734				9734
Total										9734	9734				9734

Assumptions

IRCA=	Temp restored area infiltration of rainfall estimated % (25-30% of annual rainfall.EPA Manual)	
Temporary restored area	Area of landfill site temporary restored, site closed in Jan 2004	30%
Rainfall Data	Data taken from Ballyshannon. Evaporation losses have not been included	29,500 m ²
		1,320 mm

APPENDIX D
E-PRTR Regulations
(AER Electronic Reporting System)

At the time of reporting passwords for 2008 for the EPA's web-based database have not been issued to the Council. When these are issued and the return can be made a hard copy will be forwarded to the Agency under separate cover.