Rampere Landfill

Baltinglass

Co. Wicklow

Waste Licence: W0066-03

Annual Environmental Report – 2010

Report Compiled by: Wicklow County Council

April 2011

Introduction:

This document covers the requirements of condition 11.7 of Waste Licence W0066-03 in providing the Agency with an Annual Environmental Report (AER) for Rampere Landfill, Baltinglass, Co. Wicklow. The contents of this AER contain as a minimum the information outlined in *Schedule G: Content of Annual Environmental Report* of the above licence and is prepared in accordance with relevant guidelines issued by the Agency.

The AER summaries the environmental performance of Rampere landfill between January 2010 and December 2010 and outlines proposals for the 2011 reporting period to help minimise environmental impacts.

Wicklow County Council operate Rampere Landfill and have also prepared this AER with assistance provided by RPS Consulting Engineers.

1.0 Reporting Period

This AER covers the period 1st January 2010 up to and including 31st December 2010.

2.0 Waste Activities Carried Out

The following Waste Activities are approved and are carried out in accordance with the Third Schedule of the Waste Management Act 1996:

- Class 4 – Surface Impoundment, including placement of liquid or sludge into pits, ponds or lagoons. *This activity is limited to the storage of leachate.*

- Class 5 – Specially Engineered Landfill, including placement into lined discreet cells which are capped and isolated from one another and from the environment. *This activity is limited to the deposal of the waste types specified in this licence.*

The following Waste Activities are approved and are carried out in accordance with the Fourth Schedule of the Waste Management Act 1996:

- Class 4 – Recycling or reclamation of other inorganic materials. *This activity is limited to the storage of inorganic materials at the Civic Amenity Facility and the recovery and the reuse of inert waste from the landfill restoration and construction works.*

- Class 13 – Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on a premises where such waste is produced. *This activity is limited to the temporary storage of waste prior to inspection, recycling, recovery and/ or reuse at the facility or elsewhere.*

Note: The Landfill is also licensed to carry – out Class 3 of the Third schedule of the Waste Management Act (i.e. Land Treatment, including biodegradation of liquid or sludge discards). This activity is limited to the deposition of treated sewage sludge at the landfill up to a maximum of 3,000 tonnes per annum. During this reporting period this activity was not carried out at the landfill.

3.0 Types and Quantities of Waste Accepted

3.1 Types of Waste Accepted

Rampere Landfill accepts municipal, commercial and non hazardous wastes, including household waste for disposal on-site. No hazardous wastes can be disposed of at this facility although household hazardous waste may be stored at the Civic Recycling Centre prior to their removal for recovery. The composition of waste is inspected by the operators at the tip face prior to disposal at the facility. Rampere Landfill can accept treated sewage sludge (up to 3,000 tonnes) for disposal, however as stated above no such waste was accepted at the site during the reporting period.

Construction and Demolition (C&D) waste is not accepted at the facility for disposal although suitable C&D waste is reused in the construction of internal service roads. Soil is also stockpiled at the site and used for daily cover as required.

The current licence allows for the disposal of **50,000** tonnes per annum at the site.

The following materials are accepted at the on –site Civic Recycling Centre:

- Glass
- Aluminium Cans
- Metals
- Waste Electronic and Electrical Equipment (WEEE)
- Waste Engine Oil
- Batteries (Domestic & Automotive)
- Used Light Bulbs and Tubes
- Newspaper, Magazines & Cardboard
- Plastics
- Old Clothes & Textiles

3.2 Total Quantities Of Waste Accepted

The total amount of waste accepted at Rampere Landfill site for disposal during this reporting period was **28,167.76 tonnes**.

The following table provides a breakdown of the above tonnage into each waste type accepted at the landfill for disposal.

Table 3.1 – Waste Disposal Breakdown – Rampere 2008

Waste Type	European Waste Catalogue No.	Tonnage
Bulky Waste	20 03 07	348.82
Mechanically Treated	19 12 12	2,588.94
Mixed Municipal	20 03 01	24,321.77
Residual Mixed Waste	17 02 01	32.86
Street Cleaning Residues & Litter	20 03 03	758.73
Screenings	19 08 01	116.64
	Total	**28,167.76**

3.3 Methods of Waste of Deposition

All landfill waste delivered to the facility are subjected to the following procedure:

1. All waste loads arriving on site are weighed in at the weighbridge. Details of waste type and origin are confirmed to the weighbridge operator.
2. Upon arrival at the active tipping area all large hollow objects and other large articles are crushed, broken up, flattened or otherwise made into smaller volume pieces.
3. The working face of the landfill is no more than 2.5 meters in height after compaction, no more than 25 meters wide and has a slope of no greater than one in three.
4. All waste deposited at the working face is compacted immediately (all breaks are staggered).
5. The working face of the operational cell is covered with suitable material at the end of each day to minimise any nuisances occurring.
6. Any waste deemed to be in contravention of the waste license and/or unsuitable for recovery or disposal at the facility is removed for recovery/disposal at an appropriate alternative facility. Such waste is stored in the waste quarantine area only.

All recyclable materials brought to the facility are subject to the following procedure:

1. Only private and small commercial vehicles use the facility. The Civic Waste Facility is not to be used as a transfer station for disposal of waste by commercial waste disposal contractors or local authority waste collection vehicles.

2. Unless the prior agreement of the Agency is given only household waste and waste for recovery is accepted at the Civic Waste Facility.
3. There is no cap on the quantity of waste to be accepted at the Civic Waste Facility. No hazardous waste (excluding waste oil, batteries and fluorescent tubes) shall be deposited at the facility. Wicklow County Council organises an annual collection of Household Hazardous Waste for which the public can bring this waste type on a pre-arranged date. This waste is removed from the site on the day of collection and brought to an approved off – site facility.
4. Waste sent off-site for recovery or disposal is only to be conveyed to an authorised waste contractor as agreed by the Agency.
5. All wastes removed off site for recovery or disposal are transported from the facility to the consignee in a manner that does not adversely affect the environment.

Provision is made at Rampere landfill for households and small businesses to bring domestic waste directly to the landfill. This waste generally comprises of household waste and non-recoverable waste, this material is placed in an enclosed container and is brought to the tipping face at the landfill on a weekly basis.
Materials accepted at the Civic Amenity are separated out and stored in labelled receptacles in accordance with condition 5.12 of the Waste Licence. These materials are subsequently transported off-site for treatment. Recyclable materials are sent off site for further recovery and the hazardous materials are also sent off site to suitable licensed or permitted facilities for disposal or recovery.

Table 3.2 overleaf provides a breakdown of the tonnage of each waste type accepted at the Civic Recycling Centre.

Table 3.2 –Waste Recycling – Breakdowns 2010

Waste Type	European Waste Catalogue	Tonnes
Textiles	20 01 11	5.32
Glass Packaging – Bottles & Jars	15 07 01	49.44
Lead Batteries	16 06 01	0.9
Paper & Cardboard	20 01 01	78.36
Fluorescent Tubes & Bulbs	20 01 21	0.32
Waste Oils	20 01 26	4.76
WEEE	20 01 36	63.74
Plastic Packaging	15 01 02	13.30
Metals	20 01 40	95.30
Metal Drink Cans	15 01 04	3.16

Details on the collection companies and off –site recycling facilities where the above materials were sent are listed below.

Table 3.3 – Off Site Waste Movements

Waste Type	Collector (Permit Number)	Destination (Permit/ Licence No.)
Clothes & Textiles	Textile Recycling (WCP/WW/416/06A)	Textile Recycling, Dublin (WPR 014)
Aluminium Cans	Glassco (WCP/WW/387/08B)	Glassco, Kildare (WP 247/2006)
Glass Packaging – Bottles & Jars	Glassco (Sept – Dec) (WCP/WW/387/08B)	Glassco, Kildare (WP 247/2006)
Lead Batteries	Rathcliffe (Sept – Dec) (WCP/WW/379/08B)	Recycling Village, Louth (WP 2007/20)
Paper & Cardboard	Wicklow Co. Co. (N/A) Bailey Waste (WCP/WW/235)	Bailey Waste, Dublin (WPT 94)
Fluorescent Tubes & Bulbs	Irish Lamp Recycling (WCP/WW/51/05A)	KMK Metals, Tullamore (W0113-03)
Waste Oils	ENVA (WCP/WW/40/06D)	ENVA, Laois (WL 184-01)
WEEE	Rathcliffe (WCP/WW/379/08B)	Rehab, Tallaght (WPR 033/02)
Plastics	Recyclenet (WCP/WW/21/06B)	Recyclenet, Kildare (WP 109/2003)
Metals	Leon Recycling (WCP/WW/33/05B)	Leon Recycling, Arklow (WP ESS/15/8/12)

A weighbridge was installed at the site in early 2000 to accurately record waste quantities being disposed of at the facility. Table 3.4 below details the level of waste intake at the site from 1997 up to and including 2010.

Table 3.4 – Waste Intake at Rampere 1997 – 2008

Year	Tonnes
1997	11,395
1998	10,430
1999	5,555
2000	1,710
2001	8,042
2002	6,499
2003	1,629
2004	16,302
2005	8,869
2006	11,504
2007	49,980
2008	45,986
2009	31,401
2010	28,168

3.2 Site Capacity

The estimated capacity of the landfill extension site (Area 4) is approximately 320,000m^3 (i.e. it can accept approximately 250,000 tonnes) and its footprint is 8.2 hectares. Filling commenced in Cell1 on January 2006 and was completed in December 2007. Filling of Cell 2 commenced in January 2008 and was completed in June 2009. Filling of cell 3A commenced in July 2009 and was on-going at year-end 2010.

Table 3.5 – Details of existing areas

Area	Active Period	Tonnes Deposited
Area 1	1980 – 1996	90,000 – 95,000
Area 2	1997 – 2002	30,000 – 35,000
Area 3	2003 –2005	26,801
Area 4	2006 – 2009	167,039

3 Environmental Monitoring

The following sections summarise the environmental monitoring undertaken at and around the Rampere Landfill during the reporting period of January 2010 to December 2010.

Compliance monitoring at the landfill commenced in May 2002. Samples were collected and analysed by TelLabs, Tullow, CO. Carlow. This compliance-monitoring programme continues on from the baseline monitoring which began at the site in September 1998.

The parameters and frequency of monitoring are specified in Schedule D of the facility's waste licence (W0066-03). The environmental monitoring programme involves annual monitoring of the full list of parameters and a reduced list of parameters, which are monitored at various intervals throughout the year.

The period of this Annual Environmental Report (AER) is from January 2010 up to and including December 2010. In total four quarterly monitoring reports have been referenced in the completion of this AER. All results and monitoring included in this report have previously been submitted to the Agency throughout 2010 and early 2011.

Table 4.1 Quarterly Reports Breakdown

Quarters	Duration	Submitted
Quarter 1	January – March 2010	April 2010
Quarter 2	April – June 2010	July 2010
Quarter 3	July – September 2010	October 2010
Quarter 4	October – December 2010	January 2011

4.1 SUMMARY REPORT ON EMISSIONS

Emissions	Significance
Surface Water	Surface Water is monitored at six locations in the Rampere Stream as it passes the landfill. During 2010 there were exceedances at a number of locations especially during the first quarter of the year. However it is worth noting that during this period, S.W. upstream up the landfill showed elevated levels of NH4 and COD, these levels can be seen to reduce as the water passes the landfill. Similarly during the third quarter, elevated levels of NH4, BOD, COD & Suspended solids were monitored at PD1 which is from an off-site source, this had knock on effects on monitoring points downstream of this location in particular SW6 and SW8. There were no exceedances in quarter 4 of 2010. The Biological Assessment of the Rampere stream showed no change on river quality between upstream and downstream monitoring locations. However one monitoring location located in line with the landfill has shown a deterioration in quality, the report states that no conclusions can be drawn from this particular analysis due to the low water volume in the stream at the time and the dry spell experienced for several pervious months.
Groundwater	Groundwater monitoring showed levels in most wells below agreed trigger levels. The exception being AQ4, GW2 and GW3, which have shown high levels of contaminants for the past number of years. It is believed that this is due to agricultural activity in the vicinity. During the reporting period the Agency requested biological analysis on these wells in order to detect bacteria, following this analysis, large amounts of bacteria were discovered in these wells which does further indicate agricultural contamination of this area .
Leachate	Leachate characteristics measured were representative of typical landfill leachate.
Landfill Gas	Perimeter Landfill Gas monitoring showed no licence exceedances during the year.
Flare	Annual analysis carried out on the flare showed all parameters well below licence limits.
Noise	Noise level limits were exceeded at some locations during the year. The predominant cause of these exceedances is due to passing traffic.
Dust	All dust monitoring were well within licence limits.

4.2 SURFACE WATER

Healthy Buildings International (H.BI.) Co. Dublin collected and analysed samples of surface water for the first quarter of 2010, while Tellabs carried out the sampling and analysis for the remaining three quarters of the year. As detailed in the licence, eight surface water monitoring locations (SW2- SW6 and SW* in the stream, discharge points PD-1 and PD-2.The conditions for the surface water monitoring at the site are stipulated in Schedule D of Waste Licence WL 0066-02.

These standards provide guidelines and a Maximum Admissible Concentration (MAC) permitted for each of the water quality parameters.

- European Communities Council Directive 98/83/EC. This directive was originally transposed into Irish Law by the EC (Drinking Service) Regulations SI 439 of 2000. These regulations were replaced by SI 106 of 2007, which were later revoked by the EC (Drinking Water) regulations SI 278 of 2007 with immediate effect. These regulations outline indicator parametric values for drinking water.
- EC (Quality of Water Intended for Human Consumption) Regulations, 1988, S.I. No. 81, hereafter referred to as the Drinking Water Standards.
- S.I. No. 294/1989: European Communities (Quality Of Surface Water Intended For The Abstraction of Drinking Water) Regulations, 1989.

Surface water analysis at Rampere primarily monitors the quality of the Rampere Stream that adjoins the licensed facility. The table overleaf outlines the location of surface water monitoring points at Rampere.

Table 4.1: Surface Water Monitoring Locations.

Monitoring Point	Location
SW2	Monitors the stream as it passes the old landfill
SW3	Monitors the stream as it passes the old landfill
SW4	Located downstream of the entire facility
SW5	Monitors the quality of a spring located adjacent and uphill of the landfill
SW6	Upstream of the entire facility
SW8	Monitors the stream as it passes the facility
PD 1	Water run-off from adjacent lands piped under the landfill and discharged to stream. In addition the discharge from the two surface water retention ponds pass into PD1.
PD2	Pipe discharge into stream from spring at SW5

SW2: This monitoring location is located midway along the landfill site.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
NH_4	<0.08 - 0.1	<0.3 – 0.7	<0.08 - **4.2***	[1
BOD	<2 - 4	<1- 1	<1 – **21****	5
Chloride	14 - 16	14 – 17	14 -17	250
COD	<4 – 16	<20 – 26	<4 – **42****	40
Conductivity	338 - 517	452 – 501	496 - 539	1000 us/cm
Dissolved Oxygen	6.6 - 10.6	3 – 11.3	6.1 – 10	No Abnormal Change
pH	7.5 - 7.9	7.6 – 8.4	8.0 – 8.5	6 – 9
Suspended Solids	4 - **45**	5 – 30	<1 –**117****	35
Temperature	7 - 15	8.6 – 13	8.1 – 15	25 ^{O}C

*This high level occurred during the first quarter analysis of 2010.

**This high level occurred during the second quarter analysis of 2010.

SW3: This monitoring location is immediately downstream of the landfill site.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
NH_4	<0.08 – 0.16	<0.3 – 0.6	<0.08 - **1.4***	[1
BOD	<3	<1 – 1	1 - <2	5
Chloride	14 - 16	16 – 17	14 – 17	250
COD	<4 – 20	<20	4 - <20	40
Conductivity	433 – 517	447 – 509	498 - 527	1000 us/cm
Dissolved Oxygen	6.5 - 8.4	3 – 4.1	8.8 - 13.7	No Abnormal Change
pH	7.7 - 7.8	7.8 – 8.4	7.7 - 8.2	6 – 9
Suspended Solids	2 – 23	3 – 35	4 – 10	35
Temperature	7.4 - 15	8.3 –13	8.4 - 17	25 ^{O}C

*This high level occurred during the first quarter analysis of 2010.

SW4: This monitoring location is approximately 200 meters downstream of the landfill site.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
NH_4	<0.08 – 0.12	<0.4 – 0.8	<0.08 - 0.5	[1
BOD	<2 – 3	<1 – 1	<1 – **6*** **	5
Chloride	14 – 16	15 – 17	15 – 17	250
COD	<4 – 18	< 20 – 28	5 - 32	40
Conductivity	432 - 556	439 – 511	500 - 535	1000 us/cm
Dissolved Oxygen	6.4 - 10.3	2.6 – 4.1	8.6 - 11	No Abnormal Change
pH	7.4 – 7.9	7.6 – 8.4	7.9 – 8.2	6 – 9
Suspended Solids	3 - 13	10 – **39**	3 – **45*** **	35
Temperature	7.2 – 15	8.2 – 12	8.3 - 16	25 ^{O}C

***This high level occurred during the third quarter analysis.

SW5: This monitoring location is a spring located up- gradient of the landfill. The spring supplies the facility with drinking water.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
NH_4	<0.08	<0.3 – 0.9	<0.08 - <0.3	[1
BOD	<2	<1- 1	1 - <2	5
Chloride	16 - 17	15 – 19	16 - 22	250
COD	<4 - 11	<20 – 25	<4 - <20	40
Conductivity	345 - 491	424 – 484	418 - 496	1000 us/cm
Dissolved Oxygen	6.6 - 9.6	1.9 – 4.7	8.8 - 9.7	No Abnormal Change
pH	6.8 - 7.4	7.2 – 8.1	7.3 – 7.6	6 – 9
Suspended Solids	<1 – 6	2 – 3	<1 - <2	35
Temperature	7 - 14	8.1 – 13	8.0 -18	25 ^{O}C

SW6: This monitoring location is located upstream of the landfill site.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
NH_4	<0.08	<0.3	<0.08 – **17.6***	[1
BOD	<2 - <4	<1- 2	2 – 6	5
Chloride	14 – 16	14 – 16	12 - 114	250
COD	<4 – 14	<20 – 25	< 4 – **46***	40
Conductivity	450 - 541	323 – 396	396 - 536	1000 us/cm
Dissolved Oxygen	6.2 – 11.8	**<0.5** - 7. 7	8.7 – 10	No Abnormal Change
pH	7.5 – 7.9	8.1 – 8.5	8.0 - 8.1	6 – 9
Suspended Solids	1 – 11	4 – 22	2 – 6	35
Temperature	8 – 15	8 – 13	8.3 - 15	25 ^{O}C

*This high level occurred during the first quarter analysis of 2010.

SW8: This monitoring location is located alongside the extension area of the landfill site.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
NH_4	0.08	<0.3 – 0.9	<0.08 - **1.7***	[1
BOD	<2 - <5	<1	<1 - < 5	5
Chloride	12 - 16	15 – 17	14 – 17	250
COD	<4 - 28	<20 - **107**	4 – **46***	40
Conductivity	345 - 515	446 - 500	475 - 541	1000 us/cm
Dissolved Oxygen	6.6 – 10.7	2.4 - 5.8	6.1 - 9.9	No Abnormal Change
pH	7.6 – 7.9	7.7 – 8.2	8.0 - 8.5	6 – 9
Suspended Solids	5 – **59**	4 - 14	2 - 12	35
Temperature	7 – 15	8.2 - 12	8.4 -15	25 ^{O}C

*This high level occurred during the first quarter analysis of 2010.

PD1: This pipe discharges water collected from adjoining farmland, the adjacent public road and the on-site surface water retention ponds located. It is located between sampling points SW2 and SW8.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
NH_4	< **9.0**	<0.3 – 0.8	<0.08 – **1.1***	[1
BOD	**129**	1 - 4	<1 – **12*****	5
Chloride	38	14 – 16	15 – 17	250
COD	**357**	<20	6 - **103*****	40
Conductivity	772	378 - 500	533 - 635	1000 us/cm
Dissolved Oxygen	8.2	2.4 - 3.1	5.8 - 10.0	No Abnormal Change
pH	7.5	7.4 - 8.1	7.9 - 8.5	6 – 9
Suspended Solids	**221**	6 - 9	7 – **35**	35
Temperature	6.5	8.1 - 13	8.0 -16	25 ^{O}C

*This high level occurred during the first quarter analysis of 2010.

***This high level occurred during the third quarter analysis of 2010.

PD2: This water discharge point is a man made drain located at the older part of the landfill between SW2 and SW3 and is used to drain the adjacent agricultural land.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
NH_4	<0.08 - 0.33	<0.3	<0.08 - <0.3	[1
BOD	<2 – 3	<1	1 - 2	5
Chloride	16 – 18	16 - 19	14 - 42	250
COD	<4 – 8	<20 – 32	<4 – 20	40
Conductivity	346 - 450	298 - 387	327 - 526	1000 us/cm
Dissolved Oxygen	7.0 - 10.1	4.1 – 8.6	9.0 - 10	No Abnormal Change
pH	6.8 - 8.3	7.2 - 8.5	8.1 – 8.4	6 – 9
Suspended Solids	3 - **73**	5 - 12	<1 - 13	35
Temperature	7 - 16	8.2 - 13	8.1 – 17	25 ^{O}C

4.2.1 Annual Biological Assessment of Rampere Stream

The annual Biological Assessment was carried out at 7 monitoring locations (sites 1, 2 , 3 , 3A, 4, A &B). The assessment took place on September 4th 2010 as required by Condition 8.11 of the Waste Licence. Conservation Services carried out the biological assessment field survey of the Rampere stream and the Slaney River. The Sampling sites are shown in Figure 4.1. The report can be found in Appendix A.

The Biotic index (Q- rating) was determined for each site based on the relative abundance of indicator species. The assessment was carried out in accordance with the biological assessment procedure used by the EPA.

Biotic Index	Water Quality	Quality Status
Q5	Good	Unpolluted Waters
Q4-5	Fair- Good	
Q4	Fair	
Q3-4	Doubtful – Fair	Slightly Polluted Waters
Q3	Doubtful	Moderately Polluted Waters
Q2-3	Poor- Doubtful	
Q2	Poor	Seriously Polluted Waters
Q1-2	Bad – Poor	
Q1	Bad	

Biological Assessment Rampere Stream & River Slaney

Site Number	Location	Q Rating July 2003	Q Rating Sept 2004	Q Rating May 2005	Q Rating June 2006	Q Rating Sept 2007	Q Rating Sept 2008	Q Rating Sept 2009	Q Rating Sept 2010	Pollution Status
Site 1	Rampere: Upstream of Landfill	Q3	Q3	Q3	Q3	Q3	Q2- 3	Q2- 3	Q3	Moderate Pollution
Site 2	Rampere: Just Upstream of Landfill	Q3	Q3	Q3	Q3	Q3	Q2- 3	Q2- 3	Q2- 3	Moderate Pollution
Site 3	Rampere: Just downstream of Landfill	Q3	Q3/0	Q3	Q3	Q2(t)	Q2-3	Q2-3	Q2-3 (t)	Moderate Pollution
Site 4	Rampere: Just Before confluence with Slaney	Q3	Q3	Q3	Q3 – Q4	Q3	Q 3	Q 3	Q3	Moderate Pollution
Site A	Slaney: Upstream of Rampere confluence	Q4	Q4	Q4-5	Q4	Q3-4	Q3- 4	Q3- 4	Q4	Unpolluted Waters
Site B	Slaney: Downstream of Rampere confluence	Q4	Q4	Q4-5	Q4	Q3-4	Q3- 4	Q3- 4	Q4	Unpolluted Waters

As with previous years sites immediately upstream and downstream of the landfill are given a moderately polluted Q- rating of Q2-3 on the basis of the assessment. However for the first time since biological monitoring began in 2002, the macro invertebrate data indicated a minor deterioration in the water quality between the upstream and downstream sites. The biological water quality remains Q2-3 just downstream of the landfill. The biological rating at site 4, which is at the confluence of the Rampere stream and the river Slaney remains Q3.

According to the report, no conclusions can be drawn regarding the cause of the deterioration in water quality recorded between sites 1 and 2 of the stream at this location. “Given the small size of the stream and the low flow volumes at the time of sampling and for several months previously, the deterioration would be consistent with any one of the following:

1) Localised agricultural runoff effects.
2) Landfill effects
3) Accidental of deliberate introduction of pollutants at the public road crossing

No deterioration is evident in the condition of the river Slaney downstream of the with the Rampere confluence stream. In fact, though both sides merit an unpolluted Q4 rating, the invertebrate data indicate marginally better water quality at site 2 downstream of the confluence than at site 1 c.600m upstream at Tuckmill Bridge. This may reflect point or diffuse sources upstream of Tuckmill Bridge.

4.3 GROUNDWATER

H.B.I. sampled Ground water for the first quarter of the year while T.E. Laboratories sampled and analysed groundwater samples for the remaining three quarters of the year from 15 existing groundwater locations (both monitoring wells and private wells) as shown in DG006 attached as Appendix B. Groundwater was sampled quarterly and annually in accordance with Schedule D of the waste licence.

The groundwater monitoring programme consists of monitoring locations both within and surrounding the site and at five private household wells within a 500m radius of the landfill site. The monitoring wells analysed throughout this reporting period are GW2 – GW7, AQ1, BD4, BD5 and BD1. The private wells monitored were H1- H5. SW5, which originates as a groundwater was sampled under the surface water-monitoring schedule. See section 4.2 for details.

Groundwater results recorded during this period have been compared with trigger levels set for various parameters at the facility under condition 4.2 of the facility's waste licence. Where limits are not set, relevant groundwater guidelines and regulations are used for comparison. These documents provide guidelines and a Maximum Admissible Concentration (MAC) permitted for various water quality parameters. The following documentation was consulted when assessing groundwater quality at Rampere:

- EPA Interim Guideline Values for Groundwater
- EC Groundwater Directive (80/86/EEC)
- European Communities Council Directive 98/83/EC. These were invoked into Irish Law by the EC (Drinking Water) regulations SI 278 of 2007.
- EC Groundwater Directive, which is a "daughter" Directive of the EC Dangerous Substances Directive (76/160/EEC).

A table outlining location details and status of each Groundwater borehole is attached overleaf.

Borehole	Current Status	Comment	Grid Reference
AQ1	Blocked	To be re-drilled in 2010.	286613, 191645
AQ4	Functioning	Re-drilled during 2009.	286816, 191611
BD1	Functioning	In Extension Area	286362, 191761
BD4	Functioning	In Extension Area	286409, 191581
BD5	Blocked	To be re-drilled in 2010.	286784, 191592
GW1	Functioning	Re-drilled during 2009	286844, 191590
GW2	Functioning	In Stockpile Area	286892, 191622
GW3	Functioning	In Stockpile Area	286986, 191630
GW4	Blocked	To be re-drilled in 2010.	286525, 191719
GW5	Functioning	In Extension Area	286459,191791
GW6	Functioning	In Extension Area	286491, 191756
GW7	Functioning	In Extension Area	286459, 191791
H1	Functioning	Household Well	286214, 191591
H2	Functioning	Household Well	286025, 191686
H3	Functioning	Household Well	286704, 191979
H4	Functioning	Household Well	286641, 192115
H5	Functioning	Household Well	286258, 191638
H6	Functioning	Household Well	286723, 191472

A comparison for each of the above wells with the most previous years data is included below.

AQ4A: This well is located beneath the old landfill, in Area3. This well was re-drilled during 2009.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
Conductivity	Was previously blocked.	677 – 971	837 –947	1000
NH4		**10 – 22.8**	**6 - 15.3**	0.5
Chloride		11 - **64**	**55 - 87**	30
Dissolved Oxygen		<0.5 – 11	3.4 – 7.4	Any abnormal Change
pH		6.8 – 7.0	6.9 – 7.2	6.5 – 9.5
Temperature		8.1 – 13	6.9 – 16	25

BD1: This well is located within the site to the west of the extension area.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
Conductivity	314 – 970	378 - 841	683 - 947	1000
NH4	<0.08 – **0.72**	<0.3 – **4.7**	<0.08 - <0.3	0.5
Chloride	13 - 15	14 - 20	15 - 29	30
Dissolved Oxygen	3.3 – 7.3	1.5 – 6.3	1.0 – 7.3	Any abnormal Change
pH	6.7 - 7.5	6.9 – 8.2	7.2 – 7.4	6.5 – 9.5
Temperature	6.3 - 16	8.3 - 13	7.7 – 16	25

BD4: This well is located within the site at the southern end of the extension area.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
Conductivity	475 - 556	494 - 560	476 - 738	1000
NH4	<0.08	<0.3 – **2.4**	<0.08 - <0.3	0.5
Chloride	13 - 14	14 - 16	13 - 16	30
Dissolved Oxygen	6.1 – 9.9	3.1 - 11.7	3.5 - 8.5	Any abnormal Change
pH	7.0 - 7.8	7.4 - 8.2	7.0 – 7.6	6.5 – 9.5
Temperature	8 - 12	8 - 14	8 – 15	25

GW1: This well is located in the stockpiling area. This well was re-drilled during 2009.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
Conductivity	Was previously blocked	400 - 902	395 – 520	1000
NH4		<0.3 – **2.6**	<0.3 - **0.5**	0.5
Chloride		16 - 29	18 – 21	30
Dissolved Oxygen		1.2 - 3.8	3.7 - 7.4	Any abnormal Change
pH		6.8 – 7.8	6.8 - 7.0	6.5 – 9.5
Temperature		8.2 - 14	8 – 16	25

GW2: This well is beneath the stockpiling area to the east, outside of the landfill.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
Conductivity	**1900 - 2090**	461 –510	**1130 – 1864**	1000
NH4	**27 - 307**	<0.3 - **7.8**	**7.0 – 25**	0.5
Chloride	**30 - 35**	21 - **37**	20 – **49**	30
Dissolved Oxygen	0.6 – 3.8	<0.5 - 1.6	<0.5 –2.8	Any abnormal Change
pH	**6.3 -** 6.6	7.0 - 8.0	6.7 - 6.8	6.5 – 9.5
Temperature	7.8 - 14	12 - 13	8 – 17	25

GW3: This well is beneath the stockpiling area further to the east, outside of the landfill.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
Conductivity	1564 - 2030	1420 - 1810	890 -1480	1000
NH4	14 – 35	19.1 - 35.8	2.8 - 17	0.5
Chloride	30 - 35	32 – 39	25 - 57	30
Dissolved Oxygen	1.0 – 2.4	<0.5	2.6 - 4.3	Any abnormal Change
pH	6.4 - 6.8	6.6 – 6.7	6.9 – 7.2	6.5 – 9.5
Temperature	8.2 - 14	12 – 13	9 – 16	25

GW5: This well is beneath the landfill extension area in line with Cell2. Monitoring began at this location in 2007.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
Conductivity	445 -601	614 - 634	588 - 667	1000
NH4	<0.08	<0.3 - 4.2	<0.08 - <0.3	0.5
Chloride	15 - 16	16 -17	15 – 18	30
Dissolved Oxygen	4.3 – 6.1	1.0 - 5.6	4.0 - 8.8	Any abnormal Change
pH	7.0 - 8.0	7.3 - 7.7	7.5 - 7.8	6.5 – 9.5
Temperature	8.5 - 14	12 –13	8 – 16	25

GW6: This well is beneath the landfill extension area in line with Cell3. Monitoring began at this location in 2007.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
Conductivity	625 - 785	663 - 744	572 - 732	1000
NH4	<0.08	<0.3 - 5	0.08 - 0.3	0.5
Chloride	16 –20	14 - 26	15 - 23	30
Dissolved Oxygen	2.9 – 6.6	1.3 - 4	2.6 - 8.4	Any abnormal Change
pH	7.1 – 7.8	7.3 – 7.7	7.4 -7.8	6.5 – 9.5
Temperature	7.7 – 14	8 - 14	8.0 - 15	25

GW7: This well is beneath the landfill extension area in line with Cell3B. Monitoring began at this location in 2007.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
Conductivity	496 - 604	592 - 598	572 - 620	1000
NH4	<0.08	<0.3	<0.08 - <0.3	0.5
Chloride	14 –16	14 - 15	15 - 19	30
Dissolved Oxygen	7.1 - 8.6	2.1 - 6.1	4.0 - 8.8	Any abnormal Change
pH	7.0 - 7.8	7.7 - 8.1	7.6 - 7.8	6.5 – 9.5
Temperature	7.8 - 16	8.1 - 12	8 – 14	25

4.2.2 Private Wells

The following tables compare analysis of five household wells within a 500m radius of the landfill site.

H1: This household well is located to the southwest of the landfill extension area.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
Conductivity	548 - 573	531 – 585	572 – 580	1000
NH4	<0.08	<0.3	<0.08 - <0.3	0.5
Chloride	15 - 16	16 - 22	13 – 17	30
Dissolved Oxygen	7.2 - 9.7	1 - 4.5	8.9 - 12.6	Any abnormal Change
pH	6.9 - 7.5	7.5 - 8.3	7.2 - 7.7	6.5 – 9.5

H2: This household well is located to the west of the landfill extension area.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
Conductivity	495 - 522	505 – 534	518 - 534	1000
NH4	<0.08	<0.3 – **2.3**	<0.08 - <0.3	0.5
Chloride	15 - 17	15 – 17	13- 20	30
Dissolved Oxygen	5.2 - 9.4	1 – 4.1	2.8 – 9.8	Any abnormal Change
pH	7.0 - 7.7	7.2 - 8.3	7.3 – 7.6	6.5 – 9.5

H3: This household well is located to the north of the landfill extension area.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
Conductivity	510 - 547	540 - 578	558 - 571	1000
NH4	<0.08	<0.3 - 1	<0.08 - <0.3	0.5
Chloride	12 - 15	15 – 17	16 - 21	30
Dissolved Oxygen	6.0 – 9.2	1 - 3.0	2.4 – 9.8	Any abnormal Change
pH	6.7 - 7.5	7.1 - 8.2	7.1 – 7.6	6.5 – 9.5

H4: This household well is located to the northwest of the landfill extension area.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
Conductivity	667 - 700	408 - 706	659 - 717	1000
NH4	<0.08	<0.3 – 0.4	<0.08 - <0.3	0.5
Chloride	18 - 26	19 - 28	23 - 30	30
Dissolved Oxygen	6.3 - 9.5	1 - 2.7	4.2 - 9.7	Any abnormal Change
pH	6.9 - 7.8	7.6 - 8.2	7.3 - 7.7	6.5 – 9.5

H5: This household well is located to the west of the landfill extension area.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Trigger & Limit Levels
Conductivity	589 - 657	640 - 672	632 - 659	1000
NH4	<0.08	<0.3	<0.08 - <0.3	0.5
Chloride	18 - 20	18 – 20	17 - 20	30
Dissolved Oxygen	5.6 - 8.4	1 - 4.7	2.3 - 9.8	Any abnormal Change
pH	7.1 – 7.8	7.2 - 8.3	7.3 - 7.9	6.5 – 9.5

4.3 Leachate

Leachate is monitored at three locations throughout the year. The results were compared with typical leachate data composition for new and mature landfills from 'Integrated Solid Waste Management' by Tchobanglous, Thiesen and Vigil (1993).

Leachate is monitored in accordance with the facility's Waste Licence for various parameters and on a continual basis for leachate level.

Leachate Monitoring Points	Location	Details	Grid Reference
LM	LM	In mature Landfill	286615, 191546
Leachate Chamber	Area 4	New Landfill 2 yrs	286548, 191682

LM: This Leachate point is located in Area 1 in the old part of the landfill. This waste is up to 8 years old and is therefore considered mature. During the annual monitoring of Leachate at the Landfill this well was reported blocked. The well has now been repaired and analysis will continue in 2009.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	Mature Landfill (>10yrs old)
NH4	68	317	903	20 –40
Chloride	38	1250	2200	100 - 400
Conductivity	1664	11,500	11,380	-
pH	6.7	7.6	8.3	6.6 – 7.5
TON	<0.17	<0.3	<0.17	80 - 120

Leachate Chamber: The Leachate collection chamber stores leachate from Cells 1, 2 and 3 of the extension area. The waste from cell 1 is five years old, the waste from cell 2 is a maximum of three years old, the waste from cell 3A is from two years in place. Overall this leachate can be considered to come from a new landfill. This leachate is similar to levels expected for a mature landfill.

Parameter (mg/l) unless stated	Results 2008	Results 2009	Results 2010	New Landfills (<2yrs old)
NH4	241	317	461	10-7800
Chloride	541	565	720	200- 3000
Conductivity	6260	7580	7390	-
pH	7.1	7.3	8.2	4.5 – 7.5
TON	<4.14	N/A	<0.86	10 – 800

4.4 Landfill Gas

There are nine Landfill Gas monitoring points in the vicinity of the landfill – older monitoring points are now connected to the flare. In accordance with Condition 8.1 of the Waste Licence, landfill gas is monitored on a monthly basis. The monthly monitoring results are included in the relevant quarterly monitoring reports. Perimeter monitoring wells are useful when monitoring for potential of site migration of gases.

Table 4.5.1

Name of Monitoring Point	Location
BD4	West end of extension area
GW1	East of site – Stockpiling area
LFG1	East of site – Stockpiling area
LFG2	South of site – adjacent field
LFG3	Southwest of site – adjacent filed
LFG4	South – within site
LFG5	Southwest – within site
BD1	Northwest – within site
GW5	North – within site
GW6	North – within site

Schedule C of (C.2) of the Waste Licence WL 0066-02 sets out limits for landfill gas concentrations (see table below).

Table 4.5.2

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

Landfill gas monitoring results are presented in the following tables.

Table 4.5.3 – Perimeter Landfill Gas Monitoring 2008

Jan- 10	LFG1	LFG2	LFG3	BD4	LFG4	LFG5	BD1	GW6	GW5
	0.4	0	0	0	0	0	0	0	0
	4.8	5.4	0.3	0.3	0.3	0.3	1.9	1.1	0.3
	15.1	11.5	19.7	19.8	19.7	19.8	18.1	18.8	19.8
Feb- 10	LFG1	LFG2	LFG3	BD4	LFG4	LFG5	BD1	GW5	GW6
	0.7	0	0	0	0	0	0	0	0
	5.0	3.2	0.1	0.1	1.2	0.8	0.6	0.3	0.7
	15.1	18.6	20.1	20.3	18.9	19.8	19.5	19.7	19.2
Mar – 10	LFG1	LFG2	LFG3	BD4	LFG4	LFG5	BD1	GW5	GW6
	0.5	0	0	0	0	0	0	0	0
	4.9	4.4	0.3	0.3	0.3	0.4	1.2	0.9	0.5
	15.0	7.7	19.6	19.6	19.8	19.6	19	19.1	19.6
Apr –10	LFG1	LFG2	LFG3	BD4	LFG4	LFG5	BD1	GW5	GW6
	0.6	0	0	0	0	0	0	0	0.5
	4.2	5.1	0.3	0.4	0.8	0.4	0.3	1.5	2.3
	15.5	11.9	19.8	20.2	19.9	19.7	19.8	18.2	17.2
May –10	LFG1	LFG2	LFG3	BD4	LFG4	LFG5	BD1	GW5	GW6
	1.1	0.2	0	0	0	0	0	0	0
	6.6	7.2	0.5	0.3	1.3	0.5	1.6	0.4	0.7
	12.7	14.6	19.3	19.7	18.6	19.2	18.3	19.7	19.3

June 10LFG1	LFG2	LFG3	BD4	LFG4	LFG5	BD1	GW5	GW6
0.9	0	0	0	0	0	0	0	0
0.9	0.9	1.3	1.4	0.6	0.7	0	0	0
18.3	20.5	19.5	19.1	20.1	20.4	20.6	20.8	19.8

July - 10LFG1	LFG2	LFG3	BD4	LFG4	LFG5	BD1	GW5	GW6
0.4	0	0	0	0	0	0	0	0
0.4	1.1	0	0	1	0.2	0	0	0
18.8	18.4	20.8	20.6	18.8	19.9	19.9	20.1	20.1

August - 10LFG1	LFG2	LFG3	BD4	LFG4	LFG5	BD1	GW5	GW6
0.2	0	0	0	0	0	0	0	0
0.9	1.1	0.3	0.4	0.9	0.3	0	0	0
18.6	18.5	19.8	20.0	19.6	19.4	19.9	20.0	20.1

Sept- 10 LFG1	LFG2	LFG3	BD4	LFG4	LFG5	BD1	GW5	GW6
0	0	0	0	0	0	0	0	0
1.2	1	0.5	0.1	0.9	0.6	0	0	0
18.9	18.4	19.2	19.3	19.4	19.7	20.1	20.5	20.1

Oct- 10 LFG1	LFG2	LFG3	BD4	LFG4	LFG5	BD1	GW5	GW6
0	0	0	0	0	0	0	0	0
0.9	0.8	0.2	0.9	0.5	0.3	0	0	0
19.6	19.7	20.4	19.5	20.1	20.2	20.6	20.7	20.7

Nov- 10 LFG1	LFG2	LFG3	BD4	LFG4	LFG5	BD1	GW5	GW6
0	0	0	0	0	0	0	0	0
0.9	0.9	1.3	1	0.6	0.4	0	0	0
19.3	19.6	18.5	18.3	20.4	20.2	20.5	20	20.1

4.5 Flare Emissions

A fully enclosed flare was installed at the facility in August 2007. Due to a lack of landfill gas on site the flare was running on a part-time basis i.e. eight hours per day until October 2008. The flare now operates on a twenty-four hour continuous basis. As the landfill footprint expands, additional wells are added to extract the produced gas.

The flare is computer controlled to provide optimum burning of the gas and ensure the minimum temperature at the stack of 1000^{o}C is achieved. A set point of 1020^{o}C is maintained continually.

The following parameters are monitored at the flare.

4.5.1 Flare Monitoring Parameters

Parameter	Frequency
Methane (CH_4) % v/v	Continuous
Carbon Dioxide (CO_2) % v/v	Continuous
Oxygen (O_2) % v/v	Continuous
Combustion Temperature	Continuous
Carbon Monoxide (CO)	Continuous
Total Fluorine	Annually
Total Sulphur	Annually
Total Chlorine	Annually
NO_x	Annually
SO_2	Annually
TOC	Annually
Hydrochloric acid	Annually
Hydrogen fluoride	Annually

The following table outlines flare emissions for annual parameters monitored.

Annual Parameter Monitoring - Enclosed Flare 2010

Parameter	Emission Value[1] (mg/m3)	Emission Limit[2] (mg/m3)
Nitrogen Oxides (NO_x) as NO_2	69.76	150
Carbon Monoxide (CO)	3.27	50
Sulphur Dioxide (SO_2)	85.86	No Limit specified in Licence
Temperature	1,301K	-
TOC	3.41	10
Hydrochloric acid	1.73	5
Hydrogen fluoride	0.87	50

Note: 1 Normalised to 273K, 101.3 kPa and 3% O2 reference.
Note 2 As stated in Schedule C.4 of Waste Licence W0066-03

All relevant parameters are below the compliance limit of the facility's Waste Licence. Given the results obtained from testing each parameter, the majority of concentrations can be considered low with respect to the relevant limit value.

4.6 Noise

Six noise sensitive locations (NSL1, NSL2, NSL3, NSL4, NSL5 and NSL6) have been identified in the vicinity of the landfill, see DG006 (rev. A16) in Appendix B. These are deemed noise sensitive areas, as they are located in close proximity to private dwellings. Noise Monitoring was conducted by Euro Environmental Services, Drogheda and IE Consulting, Carlow. The reports are held at the Landfill. As Detailed in Schedule D of the waste licence all noise monitoring must take place bi-annually (twice per year). In addition NSL4 is carried out for each quarter of the year.

Table 4.7.1 Noise Monitoring Frequency and Technique.

Parameter	Monitoring Frequency	Analysis Method/ Technique
$L(A)_{EQ}$	Biannual	Standard [Note 1]
$L(A)_{10}$	Biannual	Standard [Note 1]
$L(A)_{90}$	Biannual	Standard [Note 1]
Frequency Analysis (1/3 Octave band analysis)	Biannual	Standard [Note 1]

Note 1: International Standards Organisation. ISO 1996. Acoustics – description and measurement of environmental noise. Parts 1, 2 and 3.

All noise levels recorded during the monitoring period are compared to the emission limits as stipulated in the waste licence. Table 4.7.2 below shows the noise limits as they appear in Schedule C.

Table 4.7.2 Noise Emission Limits

Day Db (A) L_{Aeq} (30 minutes)	Night Db (A) L_{Aeq} (30 minutes)
55	45

A breakdown of each noise monitoring location is provided overleaf is provided overleaf.

Table 4.7.3 -Noise Analysis Quarter 1 - 2011

Monitoring Point	Date/ Time	Sampling Interval	$L(A)_{EQ}$	$L(A)_{10}$	$L(A)_{90}$	Comments
NSL – 1						
NSL - 2						
NSL – 3						
NSL – 4	09/02/10 11:26 – 11:56	30mins	55	47	52	
NSL – 5						
NSL - 6						

Table 4.7.4 -Noise Analysis Quarter 2 - 2011

Monitoring Point	Date/ Time	Sampling Interval	$L(A)_{EQ}$	$L(A)_{10}$	$L(A)_{90}$	Comments
NSL – 1	20/04/10 10:33	30 mins	**61.5**	59.8	35.1	Heavy Traffic entering and leaving the recycling facility. Ongoing bird song.
NSL - 2	20/04/10 13:35	30 mins	50.8	38.3	29.0	
NSL – 3	20/04/10 11:09	30 mins	**56.0**	49.8	32.7	Moderate to light traffic. Ongoing birdsong. Road works nearby.
NSL – 4	20/04/10 12:05	30 mins	53.4	51.2	33.6	
NSL – 5	20/04/10 12:44	30 mins	52.4	51.4	32.6	
NSL - 6	20/04/10 14:14	30 mins	52.4	50.2	31.5	

Table 4.7.5 -Noise Analysis Quarter 3 - 2010

Monitoring Point	Date/ Time	Sampling Interval	$L(A)_{EQ}$	$L(A)_{10}$	$L(A)_{90}$	Comments
NSL – 1						
NSL - 2						
NSL – 3						
NSL – 4	10/08/10 10:32	30 mins	54.5	48.5	37.4	Tractor working in field close by, 8 cars passed.
NSL – 5						
NSL - 6						

Table 4.7.6 -Noise Analysis Quarter 4 - 2010

Monitoring Point	Date/ Time	Sampling Interval	$L(A)_{EQ}$	$L(A)_{10}$	$L(A)_{90}$	Comments
NSL – 1	21/12/2010 10:32	30 mins	54.5	48.5	37.4	
NSL - 2	21/12/2010 15:23	30 mins	46.7	46.9	37.7	
NSL – 3	20/12/2010 17:05	30 mins	54.0	48.4	37.3	
NSL – 4	20/12/2010 16:30	30 mins	**58.6**	54.2	36.4	Landfill Machinery audible. Crows Calling. 22 cars passed.
NSL – 5	20/12/2010 15:58	30 mins	53.1	51.1	37.1	
NSL - 6	20/12/2010 15:04	30 mins	52.3	48.1	34.5	

4.7 DUST

Dust monitoring took place at monitoring locations D1 and D2 which can be seen in DG006 (Rev A16) in Appendix B. These locations were agreed with the Agency in September 2004.

Schedule D.3 of the waste licence states that D1 must be sampled three times a year (twice between May and September and once between October and April) and D2 must be sampled monthly. All monitoring results were compared to Schedule C.3 of the licence which allows a limit of 350 mg/m^2/day.

There were no exceedances of dust levels for the 2010 monitoring period.

Monitoring Points	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Limit mg/m^2/day
D1					82	111	133	33	192	192	101	147	350
D2	<10	<10	<10	44	28	32	83	45	81	81	56	72	350

5 MASS BALANCE OF SPECIFIED SUBSTANCES

5.1 Resource and Energy Consumption

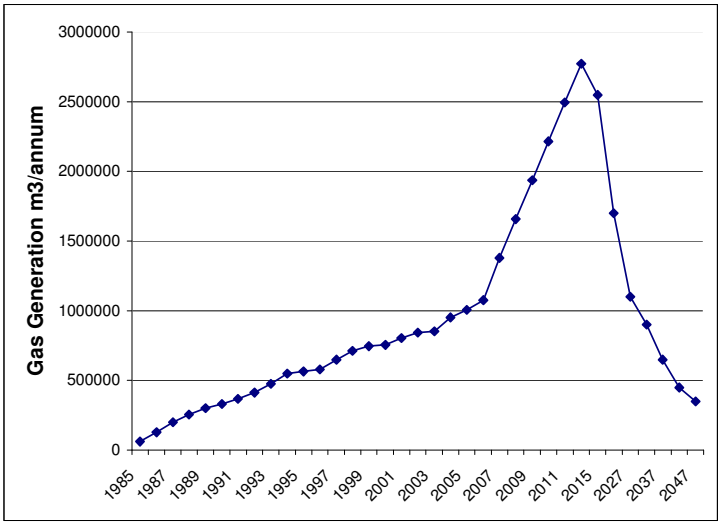
Table 5.1 Resources and Energy Consumption January 2008 – December 2008

Resource	Consumption 2008
Electricity	4,301 kw/hr
Diesel	86,775 litres
Water	164,305 litres

5.2 Estimated Annual and Cumulative Quantities of Landfill Gas Emitted From The Facility

The graph below outlines the estimated level of generation of landfill gas from the landfill from its opening in 1980 to December 2010. This estimation is based on a calculation considering the tonnage of waste contained in the landfill up to December 2010 and assumes that 50% of the waste is organic. It assumes that the capping system will be as outlined in the waste licence.

Figure 5.1 Estimated Total Cumulative Gas Generation at Rampere Landfill



5.3 Indirect Emissions To Groundwater

The following table indicates the status of capping and lining for the separate sections of the landfill.

Location	Status
Area 1	Unlined with Clay Capping
Area 2	Fully Lined and Capped
Area 3	Unlined but Capped.
Area 4	Lined – Cell 1 capped in 2009, Cell 2 capped in 2010.

Area 2 contains a lined cell. Area 4 contains four new cells (Cells 1, 2, 3a and 3b), which are all fully lined. Landfill in cell 1 ended in December 2007 and landfill began in cell 2 in January 2008, and was complete in June 2009. Landfill in Cell 3A began in July 2009 and is expected to be full by December 2011. Landfill in 3B will then follow.

The older areas of the landfill i.e. Areas 1 and 3, like any of similar age, are not engineered and there are no modern leachate containment measures in place. The leachate in these areas drains through the waste body and is naturally attenuated by the underlying soils.

5.4 Monthly Water Balance Calculation and Interpretation

Monthly rainfall data was obtained from the Met Eireann weather station at Poulaphouca, Co. Wicklow, which is approximately 16 kms due north of Rampere. It is calculated that the site received approximately 681mm of rainfall during the 2010 this compares to 816mm for 2008. The total amount of rainfall lost to evapotranspiration for 2010 was 514mm.

Monthly leachate volumes were calculated for the entire landfill area based on monthly rainfall for 2010, the surface area and status of each cell within the landfill (i.e. capped/ active etc.). Figure 5.2 overleaf shows the estimated leachate generation for the reporting period and for the coming years 2010 and 2011.

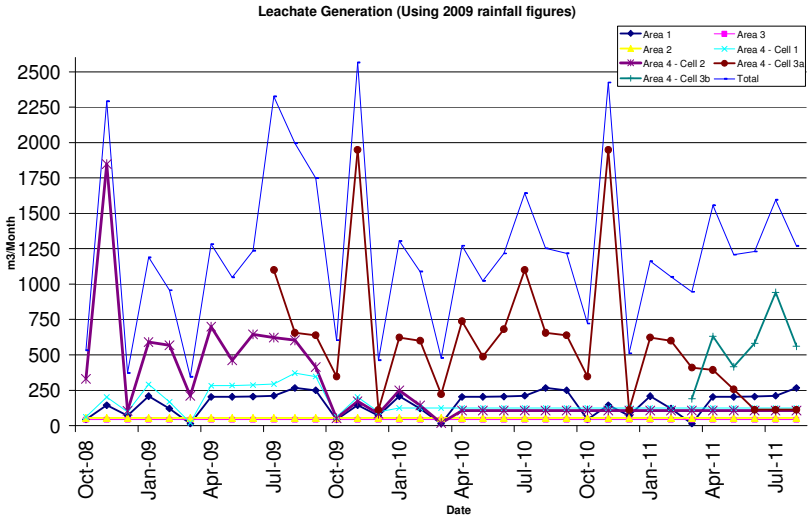


Figure 5.2 Estimated Leachate Generation at Rampere Landfill

The calculated total leachate generated at the site over the reporting period was 12,625m^3.
From the above graph, the trend in leachate generation is as follows:

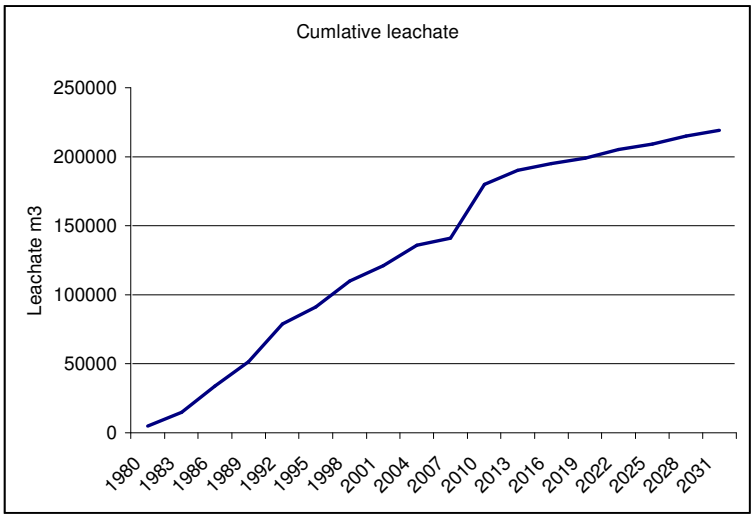
Area 1, represents the reinstated area at the site, this area generated low levels of leachate.

Area 2, this section is fully capped and generated no leachate during the period.

Area 3, this section is fully capped and generated no leachate during the period.

Area 4, generated the most leachate during the period. During the period Cell 1 and Cell 2 were fully capped. Leachate production began Cell 3 during 2009 also.

Figure 5.3 Cumulative Leachate Production at Rampere Landfill



*Volumes estimated from a 30 year average

5.5 Volume of Leachate produced and Volume transported off – site

The amount of leachate produced at the site is dependant on two main factors (i.e. Rainfall and capping status). The model represented in figure 5.2 estimates that a total volume of 12,625 m^3 (i.e. 12,625,000 litres) of leachate was produced during 2010. The total volume of leachate removed from the site was 9,851 m^3 (i.e. 9,851,400 litres). The model has an accuracy of +/- 30% . the figures provided above are within this accuracy band.
Leachate was removed on a daily basis during site operation hours to Baltinglass sewage treatment plant.

6 Site Development Works

5.6 Works undertaken during the reporting period

5.6.1 Site Infrastructure

The following works were undertaken during the reporting period (January 2009 – December 2009).

Table 6.1 Status of Infrastructure Works

Site Infrastructure Works	Status
Installation of gas extraction wells in Cell 2 – Area 4	Complete – 100%
Relocation of Litter fence from Cell 2 to Cell 3B – Area 4	Complete – 100%
Installation of CCTV system	Complete – 100%
Permanent Cap of Cells 1 & 2 – Area 4	Complete – 100%
New upgrade to main entrance & new gate fitted.	Complete – 100%
Bury all landfill gas pipe work beneath ground level on finished cells.	Complete – 100%
Install surface water drainage system around the base of each capped cell.	Complete – 100%

5.7 Proposed for the forthcoming year 2011

Table 6.2 Proposed Site Works for 2011

Proposed Site Infrastructure – 2011
Install new landfill gas wells into cell 3A
Begin Capping program in cell 3A once complete
Address slope stability issues in old area of landfill

5.8 Restoration of filled cells

Area 1 was active from 1980 to the end of 1996. In this time, it is estimated that between 90,000 and 95,000 tonnes of waste were deposited. An investigation into the performance of the existing cap was carried out and a report was sent to the Agency in October 2003. It was recommended that the cap in Area 1 be retained as is, since the performance appears to be adequate.

Area 2 is a lined cell; this cell was fully capped in 2007. Area 3 is an unlined cell but was fully capped in 2007 also.

Cells 1 and 2 of Area 4 were capped during 2010. Filling of Cell 3A commenced in July 2009 and was on-going at the end of 2010. It is expected that land filling in Cell 3A will be complete by the end of 2011. This cell is then expected to be capped during 2012. Finally, Cell 3B will begin land filling during 2012, as this is a small cell it is expected that this cell will be complete by the end of 2012.

Under Rampere Landfill's planning permission, waste acceptance shall cease at the landfill on the 31st of December 2012.

7.0 Environmental Incidents and Complaints

7.1 Incidents

There were four recorded incidents at Rampere during 2010. In each case notification was made to the Agency in accordance with condition 11.2 of the waste licence. A summary of the three incidents is provided below.

Table 7.1 Summary of incidents at Rampere Landfill 2010

Date	Nature of Incident
13th Jan 2010	Leachate level exceeded 1m level in cell 3A
7th April 2010	Leachate level exceeded 1m level in cell 3A
19th July 2010	Leachate level exceeded 1m level in cell 3A
21st October 2010	Surface water exceeded trigger levels at 3 locations during quarter three analysis.
December 2010	Surface water exceeded trigger levels at 2 locations during quarter four analysis.
December 2010	Noise Level exceeded daytime limit at one location during quarter four analysis.

7.2 Complaints

There were twenty -three complaints received during 2010. The table overleaf outlines the details of these complaints.

Table 7.2 Details of complaints made during 2010

Date	Time	Name	Nature of Complaint	Actions Taken	Response
19.01.10	16:29	Sharon Birmingham	Very bad smell in back garden on Saturday afternoon & evening.	Investigated possible causes. Landfill closed at 1:00pm, flare in full operation, no leachate removed. Plenty of cover on waste over the weekend.	Discussed my findings with Sharon and explained we would keep monitoring the situation.
20.01.10	08:49	Sharon Birmingham	Bad smell when back door is opened going to school	Manager walked entire site could not strong odour. Only possible odour detected was from leachate pumping.	Contacted Sharon and explained that leachate was possible cause.
22.01.10	15:59	Sharon Birmingham	Bad smell in Backyard	Deputy landfill manager called to Sharon's house within 15 mins. and walked garden. Both agreed that there was no smell present. Eventually found that the smell was unrelated to landfill and was from old garden waste under Sharon's trees.	
27.01.10	10:30	Eamon Horan	Called to site to say he has been getting waste smells from time to time. He is particularly worried as the landfill is getting closer to his home.	Listened and discussed the operation of the landfill with Eamon.	Explained that we have been and will continue to do all measures possible to reduce the impact at his home.
02.02.10	13:30	Maree Horan	Had got a bad smell on the previous Saturday and for most of the week before.	Noted complaint and enquired as to the nature of the smell. Maree informed that it was a mix of gas and waste	Explained that we are continually capping the waste each day and that a permanent cap is currently being put in place.

Date	Time	Name	Nature of Complaint	Actions Taken	Response
15.02.10	15:30	Fiona Keogh	Very bad gassy type smell noticed on Saturday afternoon	Checked Flare operation – all fine. Checked wells – all fine. Some small amounts of old waste disturbed during capping works.	Removed old waste pile. Contacted Fiona and informed her of findings.
25.03.10	13:15	Maree Horan	Got a bad smell the previous Monday.	Discussed with Marie that capping works may be giving rise to odours due to the disturbance of waste.	
09.04.11	16:35 (By text)	Sharon Birmingham	"Very bad smell here now"	Informed Sharon that all operations on site had finished for the day, and that waste was well covered up.	
17.06.11	15:25 (By Text)	Sharon Birmingham	"Bad Smell at back door and back garden now"	Investigated possible causes of odour. Very little waste in today. Landfill well covered. Some odour detected at leachate tank.	Contacted Sharon and explained findings.
21/06/10	09:50	Maree Horan	Bad smell around Maree's home over the weekend especially Friday and Saturday nights.	Investigated possible causes, no major sources of odour found. Most of grading works for capping complete.	Contacted Maree regarding findings. Increased flowrate to flare.
23.06.10	08:45	Sharon Birmingham (By Text)	"Bad smell when come out into the backgarden"	Two waste loads had just tipped off at the landfill five mins. Before the complaint.	Contacted Sharon and explained that the possible cause was the waste as it was been tipped onto the ground.
10.07.10	10:00	Eamon Horan	General concern regarding landfill odour as the landfill gets closer to his home. Enquired if we could put more cover on the landfill.	Explained to Eamon that we will continue to operate the landfill to the highest standards.	Notified WCC of Eamon's request to use more cover.

Date	Time	Name	Nature of Complaint	Actions Taken	Response
04.08.10	13:30	Fiona Keogh	Smell of "Stinking " waste and gas smell at ther home. Smell not detectable at ther gate but could be got at house	Checked out landfill esp. active area found no obvious reasons for such odours.	Contacted Mrs. Keogh and informed her of findings.
06.09.10	13:40	Maree Horan	Bad smell around house and down the road over the weekend.	Checked site found flare ad worked fine all weekend. Waste was well covered.	Tried phoning Maree, no response.
17.09.10	15:15	Sharon Birmingham	"Bad smell over here now"	Checked out complaint wind direction appeared to be blowing in a direction away from Sharons house	Phoned Sharon and discussed this matter.
30/09/10	16:15 (By text)	Sharon Birmingham	"Bad smell at back door and garden"	Deputy Manager walked the site no obvious strong odours detected.	Informed Sharon of findings.
15.10.10	08:45 (By text)	Sharon Birmingham	"Bad smell here this morning"	Only possible reason for smell was due to the fact that three loads of waste had been deposited within fifteen minutes of complaint.	Loads were worked into the landfill immediately. Explained findings to Sharon.
30.10.10	16:00 (By text)	Sharon Birmingham	"Bad Smell coming across now"	Explained to Sharon that the landfill was now closed for the weekend since 1:00pm. Source would be investigated on Monday.	
17.11.10	2:30	Fiona Keogh	Has been getting bad smells over the past couple of days.	Tipping of waste probable cause.	Discussed with Fiona.

7.3 Non- Compliances and Observations

The EPA issued two non-compliances and three observations during the reporting year of 2010. Details of these are attached as Appendix C.

8.0 Review of Nuisance Controls

8.1 Dust

To effectively control any dust emissions and emissions of fine particle material from the active tipping area and general site the following measures are implemented:

1. Cover waste daily;
2. Spraying of internal haul roads during dry conditions
3. Apply speed restrictions
4. All vehicles other than cars pass through the wheel wash to minimise the transfer of dust onto the public road.

8.2 Odours

The principle odour abatement measures implemented are as follows:

1. Adequate cover;
2. Compaction of waste
3. Rapid burial of disturbed wastes and closure of such excavations;
4. Odorous material delivered to the site for disposal is placed in deep pits and covered immediately;
5. Any activities requiring the excavation of waste include the spraying of the exposed waste with odour suppressants as agreed with the agency.

8.3 Birds

Measured employed to detract birds from the site are:

1. Hired services of a falconer for at least three visits per week;
2. The working area is kept as small as possible and all other areas are covered with not less than 30cm of soil;
3. The waste is compacted;

8.4 Vermin, Pest and Fly Control

The principle measures adopted to deal with these problems are:

1. Compaction and adequate cover of waste to limit food sources;
2. Vermin control by baiting is monitored / replaced monthly
3. Fly control by spraying every month at breeding time.

It is to be noted that no rat poison or fly spray are stored on site.

8.5 Litter

Windblown litter is successfully reduced by the following practices:

1. Deposited waste is adequately covered and compacted;
2. The tipping front is below the surrounding soil bund and sheltered from the wind direction
3. Litter fencing is inspected daily and repaired if required;
4. Accumulated litter is collected daily and disposed of properly.

9.0 Schedule of Environmental Objectives and Targets

This schedule sets out the Environmental Objectives and Targets for the prevention of pollution and for the continual environmental improvements of the Rampere site. The purpose of this section is to summarise the percentage of completion for the objectives and targets in 2010 and also detail the corresponding objectives and targets for the period 2011.

9.1 Progress towards achievement of environmental objectives and targets

The table overleaf outlines the programme of objectives and targets for 2010 and progress made in achieving these targets. As stated in the licence, it is the responsibility of the Senior Executive Engineer to update the schedule of objectives and targets on an annual basis.

2010 Schedule of Objectives and Targets		Date Reviewed: January 2011		
Objective	**Target**	**Plan**	**Responsible Party**	**Time Scale for Completion**
To establish site infrastructure	Maintain tagging of all on-site monitoring points	Carry out a monthly inspection and repair any damage	Facility Manager	Ongoing
	Improve the visual impact of the facility from the adjoining road	Monitor growth of recently planted trees.	Facility Manager	Ongoing
		Replace dead growth and reinforce existing hedgerow	Facility Manager	Ongoing
	Remove the requirement for storing large amounts of soil for capping. Increase waste capacity	Investigate new technologies for daily cover.	Facility Manager	Ongoing
	Install CCTV on site	Identify locations to be covered. Contact suppliers. Install CCTV	Facility Manager	100% Complete
To establish site infrastructure (cont'd)	Reduce members of the public tipping at face of landfill and children from getting out of cars	Cordon off area and erect warning signs	Facility Manager	Ongoing
To encourage / facilitate recycling	Improve information at recycling area, increase awareness of facility	Organise advertising on WCC website	Facility Manager	Ongoing
		Investigate advertising recycling centre during annual National Recycling weeks	Facility Manager	August 2011
	Divert waste from landfill	Only accept pre-treated waste	Facility Manager	On-going
		Daily Odour Monitoring	Facility Manager	Ongoing
To provide for the protection of the receiving environment		Commence and maintain record of local farming activities to correlate with monitoring results e.g. slurry spreading	Facility Manager	Ongoing
	Reduce dust levels arising	Dampen non-hard surface roads on site during dry weather. Control on-site vehicle speed	Facility Manager	Ongoing
	Reduce Leachate Generation	Complete capping of Areas 2 & 3	Facility Manager and Senior Executive Engineer	100% Complete

2010 Schedule of Objectives and Targets		Date Reviewed: January 2011		
Objective	**Target**	**Plan**	**Responsible Party**	**Time Scale for Completion**
To provide for the protection of the receiving environment (cont'd)	Reduce Leachate Generation (cont'd)	Walkabout survey to every day to monitor surface water quality etc., inspecting channels of surface monitoring, including stockpile area and slurry from farmers	Facility Manager	Ongoing
		Draw up record sheets for walkabout survey and record of farming activities	Facility Manager	100% Complete
	EMS	EMS team to undertake biannual internal audits	Facility Manager	Ongoing
	Eliminate nuisance of vermin	Audit vermin control performance and install more vermin monitoring points if necessary	Facility Manager	Ongoing
Maintain good relations with residents		Record complaints raised during resident meetings as well as personal complaints	Senior Executive Engineer	Ongoing. Records in meeting minutes
		Set up website/webpage for landfill on WCC website detailing opening hours, recyclable materials, environmental management/monitoring etc.	Senior Executive Engineer	June 2011
To improve and maintain staff training	Identify staff training needs	Draw up matrix and plan trainings	Facility Manager	Under the control of Wicklow County Council Head Office
		Make staff aware of new Health and Safety legislation as it arises	Facility Manager	Ongoing
		Scheme of self-assessment of performance and training needs	Employees	Ongoing
Health and Safety	Record any issues relating to Health and Safety on Site	Carry out fortnightly audit of PPE stock	Facility Manager	Ongoing
		Continue yearly Health and Safety audit on site	Facility Manager	September 2011
		Vaccination records for staff to be kept on site (shots etc.)	Facility Manager	Ongoing
		Draw up Traffic Management Plan	SEE	September 2011

Appendix A: Annual Biological Assessment

DRAFT REPORT

BIOLOGICAL MONITORING OF SURFACE WATER QUALITY IN THE VICINITY OF RAMPERE LANDFILL, COUNTY WICKLOW

September 2010

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APPENDIX 1 HABITAT ASSESSMENT AT SAMPLING SITES

1 INTRODUCTION

Conservation Services, Ecological & Environmental Consultants have been commissioned by Wicklow County Council to carry out biological sampling and water quality assessment of streams/rivers in the vicinity of the landfill at Rampere, County Wicklow. Sampling was carried out on 4th September 2010.

Biological water quality assessment by Conservation Services in the vicinity of the landfill was most recently carried out in September 2008 (Conservation Services 2008).

2 METHODOLOGY

2.1 SITE SELECTION

Sampling was carried out at seven sites specified by Wicklow County Council i.e. Sites 1, 2, 3, 4, A & B. (See Map 1). Site locations were recorded using GPS.

2.2 HABITAT ASSESSMENT

Habitat assessment was carried out at each of the sites selected for invertebrate/water quality assessment. These sites were assessed in terms of:

- Stream width and depth
- Substrate type, listing substrate fractions in order of dominance, i.e. large rocks, cobble, gravel, sand, mud etc.
- Flow type, listing percentage of riffle, glide and pool in the sampling area
- Instream vegetation, listing plant species occurring and their percentage coverage of the stream bottom at the sampling site
- Dominant bankside vegetation, listing the main species overhanging the stream
- Estimated summer cover by bankside vegetation, giving percentage shade of the sampling site
- Rating of the site as habitat for trout adult, nursery and spawning on a scale of Poor/Fair/Good/Very Good/Excellent. This rating assesses the physical suitability of the habitat; the presence/absence/density of salmonids at the

site will also depend on present and historical water quality and accessibility of the site to fish.

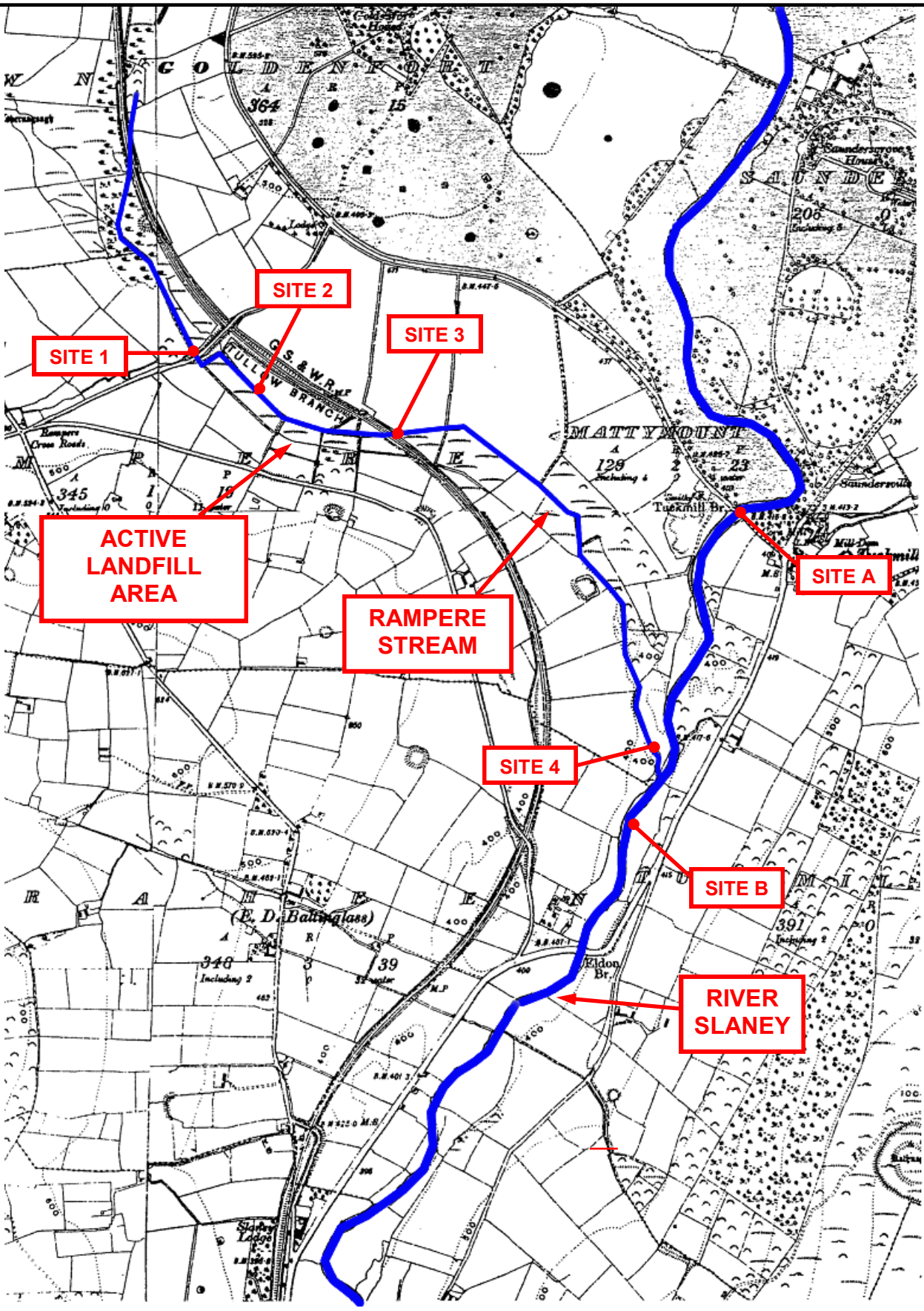
2.3 INVERTEBRATE SAMPLING AND WATER QUALITY ASSESSMENT

A kick and stone wash invertebrate sample was taken at each site (ISO 7828:1985) using standard methodology employed by EPA. Each sample was retained in a large plastic bag at the sampling site. Sample processing and preservation was carried out under laboratory conditions within 24 hours of sampling. Mud was removed from each sample by sieving under running water through a 500µ sieve. Sieved samples were then live sorted for 30 minutes in a white plastic sorting tray under a bench lamp (ISO 5667-3:1994) and if necessary using a magnifying lens. Macroinvertebrates were stored in 70% alcohol. Preserved invertebrates were identified to the level required for the EPA Q-rating method (McGarrigle *et al*, 2002) using high-power and low-power binocular microscopes when necessary. The preserved samples were archived for future examination or verification. Based on the relative abundance of indicator species, a biotic index (Q-rating) was determined for each site in accordance with the biological assessment procedure used by the Environmental Protection Agency (McGarrigle *et al*, 2002) and more detailed unpublished methodology (McGarrigle, Clabby and Lucey pers. comm.)

Biotic Index	Water Framework Directive Ecological Status	Quality Status
Q5	High	Unpolluted Waters
Q4-5	High	
Q4	Good	
Q3-4	Moderate	Slightly Polluted Waters
Q3	Poor	Moderately Polluted Waters
Q2-3	Poor	
Q2	Bad	Seriously Polluted Waters
Q1-2	Bad	
Q1	Bad	

MAP 1 LOCATION OF BIOLOGICAL ASSESSMENT SITES

Locations shown are approximate; for exact locations, see Grid References in text



3 RESULTS

Habitat at each site is described in Appendix 1. The Q-ratings are illustrated on Map 2. Q-ratings from 1998 to 2010 are tabulated in section 3.7.

3.1 SITE 1

The invertebrate community merits a Q-rating of Q3 indicating moderately polluted conditions, a slight improvement compared with Q2-3 in 2008.

INDICATOR GROUP	TAXON	2010
Group A - Pollution Sensitive	None recorded	
Group B - Less Pollution Sensitive	Glossosomatidae	1
Group C - Pollution Tolerant	*Gammarus duebeni*	c.110
	Rhyacophilidae	1
	Chironomidae (excluding *Chironomus*)	2
	Simuliidae	13
	Tipulidae	7
	Elmidae	4
Group D - Very Pollution Tolerant	*Helobdella stagnalis*	1
	Asellus aquaticus	5
Group E - Most Pollution Tolerant	None recorded	
Not assigned to an indicator group	Lumbricidae	23

3.2 SITE 2

The invertebrate community merits a Q-rating of Q2-3 indicating moderately polluted conditions.

INDICATOR GROUP	TAXON	2010
Group A - Pollution Sensitive	None Recorded	
Group B - Less Pollution Sensitive	Leuctridae	1
	Baetis muticus	1
	Limnephilidae	1
Group C - Pollution Tolerant	*Piscicola geometra*	1
	Gammarus duebeni	25
	Hydracarina	1
	Ephemerellidae	1
	Rhyacophilidae	5
	Veliidae	1
	Chironomidae (excl. *Chironomus* sp.)	23
	Tipulidae	4
Group D - Very Pollution Tolerant	Erpobdellidae	5
	Lymnaea peregra	1
	Asellus aquaticus	90
Group E - Most Pollution Tolerant	None recorded	
Not assigned to an indicator group	Lumbricidae	6
	Nematomorpha	1
	Muscidae	1

3.3 SITE 3

The invertebrate community at this site merits a Q-rating of Q2-3, indicating moderately polluted conditions.

INDICATOR GROUP	TAXON	2010
Group A - Pollution Sensitive	None recorded	
Group B - Less Pollution Sensitive	Limnephilidae	2
Group C - Pollution Tolerant	*Gammarus duebeni*	16
	Ephemerellidae	1
	Dytiscidae	3
	Veliidae	1
	Chironomidae (ex. *Chironomus* sp.)	57
	Simuliidae	12
	Tipulidae	9
Group D - Very Pollution Tolerant	Erpobdellidae	1
	Asellus aquaticus	7
Group E - Most Pollution Tolerant	Tubificidae	48
Not assigned to an indicator group	Lumbricidae	6
	Lumbriculidae	1

3.4 SITE 4

The invertebrate community at this site merits a Q-rating of Q3, indicating moderately polluted conditions.

INDICATOR GROUP	TAXON	2010
Group A - Pollution Sensitive	None Recorded	
Group B - Less Pollution Sensitive	Glossosomatidae	1
	Limnephilidae	4
	Sericostomatidae	2
Group C - Pollution Tolerant	*Gammarus duebeni*	c.200
	Ephemerellidae	1
	Rhyacophilidae	6
	Veliidae	1
	Chironomidae (excluding *Chironomus*)	3
	Simuliidae	3
	Tipulidae	5
	Elmidae	8
Group D - Very Pollution Tolerant	None recorded	
Group E - Most Pollution Tolerant	None recorded	
Not assigned to an indicator group	Lumbricidae	8
	Lumbriculidae	2

3.5 SITE A

Taking into account the predominantly glide nature of the site and the density of the aquatic macrophyte *Ranuculus* sp., the invertebrate community at this site merits a Q-rating of Q4 indicating unpolluted conditions.

INDICATOR GROUP	TAXON	2010
Group A - Pollution Sensitive	*Perla bipunctata*	2
	Ecdyonurus sp.	2
	Heptagenia sp.	2
	Heptageniidae (small/damaged)	2
Group B - Less Pollution Sensitive	*Leuctra* sp.	10
	Baetis muticus	1
	Odontoceridae	2
	Limnephilidae	9
	Sericostomatidae	9
Group C - Pollution Tolerant	*Ancylus fluviatilis*	2
	Gammarus duebeni	105
	Hydracarina	53
	Baetis rhodani	10
	Ephemerellidae	2
	Hydropsychidae	13
	Elmidae	6
	Chironomidae (excl. *Chironomus*)	27
	Simuliidae	1
	Tipulidae	4
Group D - Very Pollution Tolerant	Sphaeriidae	1
Group E - Most Pollution Tolerant	None recorded	
Not assigned to an indicator group	Lumbricidae	1
	Ceratopogonidae	3

3.6 SITE B

The invertebrate community at this site merits a Q-rating of Q4 indicating unpolluted conditions.

INDICATOR GROUP	TAXON	2010
Group A - Pollution Sensitive	Chloroperlidae	1
	Perla bipunctata	8
	Ecdyonurus sp.	2
	Rhithrogena sp.	1
Group B - Less Pollution Sensitive	*Baetis muticus*	1
	Leuctra sp.	22
	Glossosomatidae	3
	Sericostomatidae	1
Group C - Pollution Tolerant	*Ancylus fluviatilis*	2
	Gammarus duebeni	32
	Hydracarina	1
	Baetis rhodani	26
	Ephemerellidae	3
	Hydropsychidae	10
	Rhyacophilidae	11
	Chironomidae	6
	Simuliidae	15
	Tipulidae	10
	Elmidae	28
Group D - Very Pollution Tolerant	*Lymnaea peregra*	1
Group E - Most Pollution Tolerant	None recorded	
Not assigned to an indicator group	Lumbricidae	1
	Ceratopogonidae	4

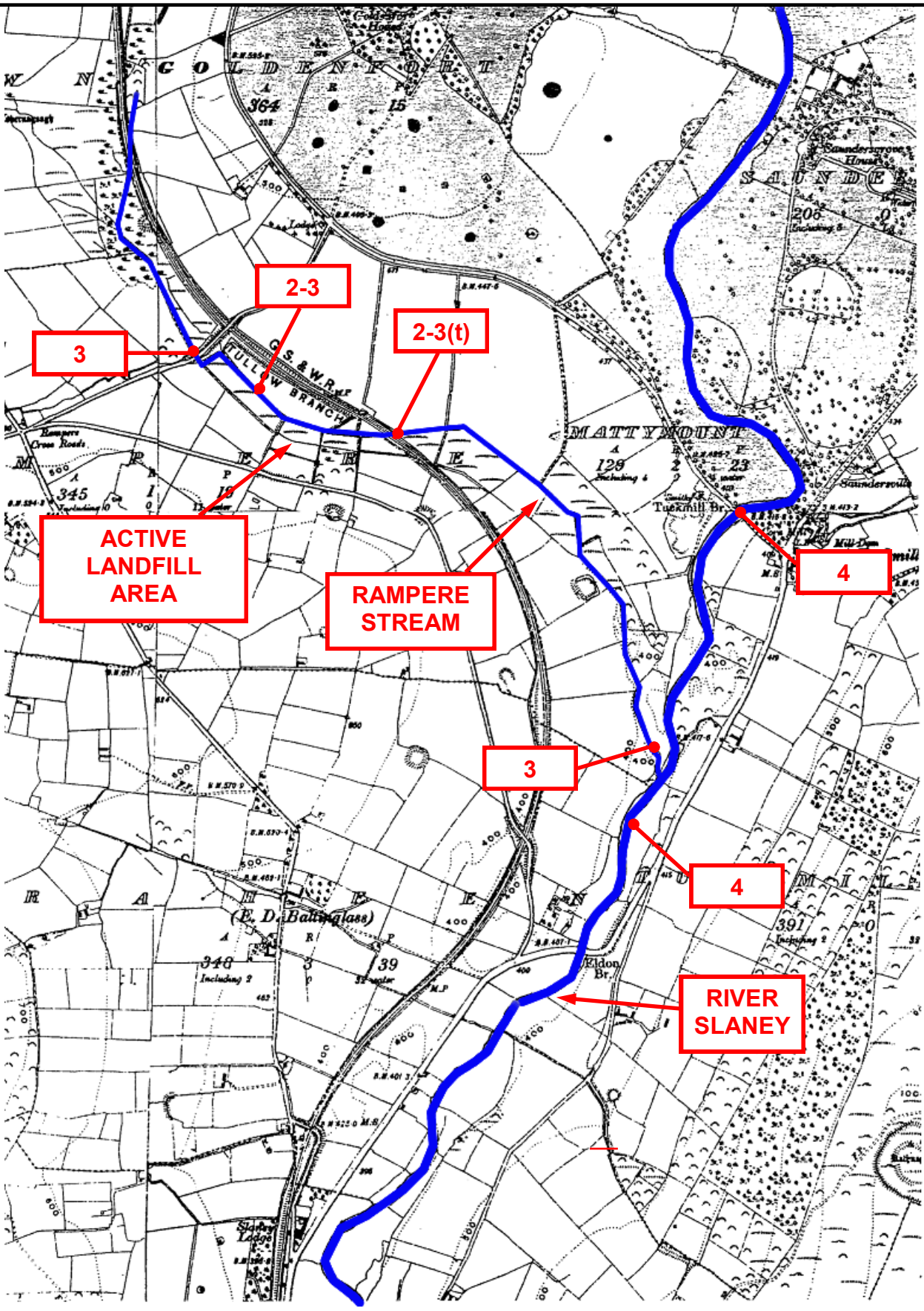
3.7 SUMMARY OF Q-RATINGS IN THE VICINITY OF RAMPERE LANDFILL 1998-2010

	EPA	CS	CS	EPA	CS	CS	EPA	CS	CS	CS	CS	CS	CS
	1998	**1998**	**2000**	**2001**	**2002**	**2003**	**2004**	**2004**	**2005**	**2006**	**2007**	**2008**	**2010**
Site 1	-	3	3	-	3	3	-	3	3	3	3	2-3	3
Site 2	-	-	-	-	3	3	-	3	3	3	3	2-3	2-3
Site 3	-	2	3	-	3	3	-	3/0	3*	3	2(t)	2-3	2-3(t)
Site 4	-	-	3	-	3	3	-	3	3*	3-4	3	3	3
Site A	5	4	4	4-5	4-5	4	4	4	4-5	4	3-4	3-4	4
Site B	-	4	4	-	4-5	4	-	4	4-5	4	3-4	3-4	4

t = tentative Q-rating due to suboptimal conditions for Q-rating method.
* suspected siltation impact
EPA data are from Clabby *et al* (1999, 2002 & 2005)

MAP 2 Q-RATINGS AT BIOLOGICAL ASSESSMENT SITES

Locations shown are approximate; for exact locations, see Grid References in text



4 CONCLUSIONS

As in previous years, sites on the Rampere Stream immediately upstream and downstream of the active landfill (Sites 1 & 2), were found to be moderately polluted in September 2010. However, for the first time since biological monitoring began in 2002, the macroinvertebrate data indicated a minor deterioration in water quality (from Q3 to Q2-3) between the upstream and the downstream sites. The biological water quality remains Q2-3 immediately downstream of the decommissioned landfill at Site 3. The Q-rating at Site 4 on the Rampere Stream just upstream of its confluence with the Slaney is unchanged at Q3.

On the basis of the biological data, no conclusions can be drawn regarding the cause of the minor deterioration in biological water quality recorded between sites 1 and 2. Given the small size of the stream and the low flow volumes at the time of sampling and for several months previously, the deterioration in Q-rating from Q3 at Site 1 to Q2-3 at Site 2 would be consistent with any of the following:

1. Localised agricultural runoff effects
2. Landfill effects
3. Accidental or deliberate introduction of pollutants at the public road crossing immediately downstream of Site 1.

No deterioration is evident in the condition of the Slaney River downstream of the confluence with the Rampere Stream. In fact, though both sites merit an unpolluted Q-rating of Q4, the invertebrate data indicate marginally better water quality at Site 2 downstream of the confluence than at Site 1 c.600m upstream at Tuckmill Bridge. This may reflect point source or diffuse pollution sources upstream of Tuckmill Bridge.

Signed on behalf of Conservation Services

_____

Bill Quirke BSc, MSc, MIEEM.

Date

5 REFERENCES

Clabby *et al* (1999) *Interim report on the biological survey of river quality - Results of the 1998 investigations.* Environmental Protection Agency.

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McGarrigle, M.L. *et al* (2002) *Water Quality in Ireland 1998-2000*. Environmental Protection Agency.

APPENDIX 1

HABITAT ASSESSMENT AT SAMPLING SITES

SITE 1

Site Code	1
Site Location	S8640 9181
Site Photograph	
Width	2m
Depth	5-10cm
Substrate	Gravel, Mud, Sand, few Cobble
Flow Type	Riffle 60% Glide 40%
Instream Vegetation	*Phalaris arundinacea* 20% *Rorippa nasturtium-aquaticum agg.*%
Dominant Bankside Vegetation	Nettle, Grass, *Phalaris arundinacea*
Estimated % summer Cover of Stream by Bankside Vegetation	<5%
Trout Adult Habitat	Poor-Fair
Trout Nursery Habitat	Fair
Trout Spawning Habitat	Fair-Good

SITE 2

Site Code	2
Site Location	S8660 9167
Site Photograph	
Width	2.5m
Depth	12cm
Substrate	Sand, Gravel, Mud, Cobble (few), Large Rocks
Flow Type	Fast Glide 80% Riffle 20%
Instream Vegetation	Phalaris arundinacea 10% Apium nodiflorum <5% Bryophyta <5% Algae <5%
Dominant Bankside Vegetation	Hawthorn
Estimated % summer Cover of Stream by Bankside Vegetation	20%
Trout Adult Habitat	Fair
Trout Nursery Habitat	Fair - Good
Trout Spawning Habitat	Poor – Fair

SITE 3

Site Code	3
Site Location	S8682 9163
Site Photograph	
Width	2.5m
Depth	15cm
Substrate	Mud, Sand, Fine Gravel
Flow Type	Glide 100%
Instream Vegetation	*Phalaris arundinacea* 15%
Dominant Bankside Vegetation	Grass, Nettle, *Phalaris*
Estimated % summer Cover of Stream by Bankside Vegetation	<5%
Trout Adult Habitat	Poor - Fair
Trout Nursery Habitat	Poor - Fair
Trout Spawning Habitat	Poor - None

SITE 4

Site Code	4
Site Location	S 8749 9089
Site Photograph	
Width	2-2.5m
Depth	12cm
Substrate	Sand, Gravel, Cobble, Silt
Flow Type	Glide 65% Riffle 35%
Instream Vegetation	*Ranunculus* sp. 20%
Dominant Bankside Vegetation	Alder
Estimated % summer Cover of Stream by Bankside Vegetation	20%
Trout Adult Habitat	Poor - Fair
Trout Nursery Habitat	Fair-Good
Trout Spawning Habitat	Fair

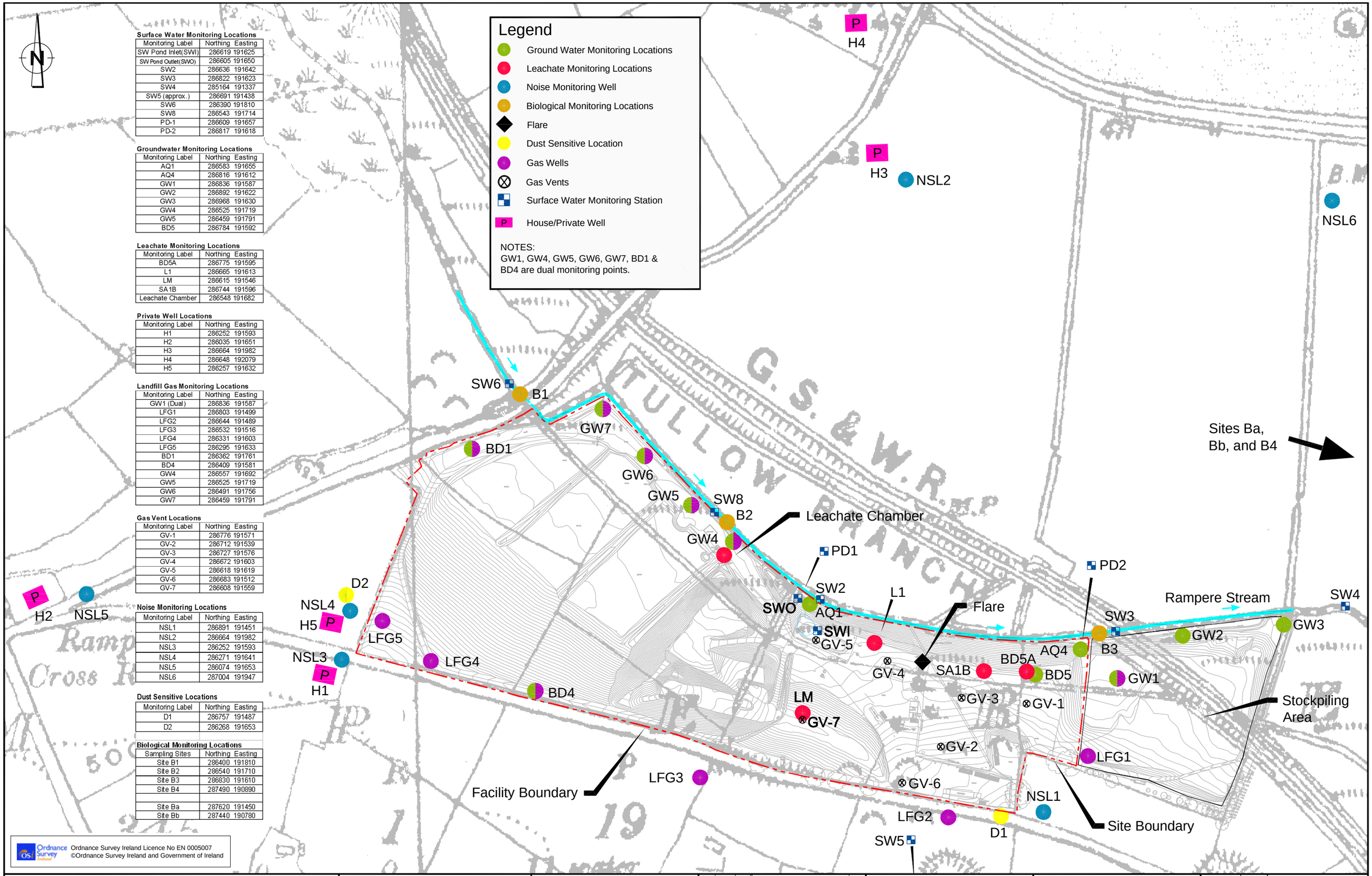
SITE A

Site Code	A
Site Location	S8763 9145
Site Photograph	
Width	c. 20m
Depth	10-40cm
Substrate	Sand, Cobble, Gravel, Large Rocks
Flow Type	Riffle 10% Glide 90%
Instream Vegetation	*Ranunculus* sp. 60% Moss 10%
Dominant Bankside Vegetation	Ash, Beech
Estimated % summer Cover of Stream by Bankside Vegetation	15%
Trout Adult Habitat	Good
Trout Nursery Habitat	Good
Trout Spawning Habitat	Fair

SITE B

Site Code	B
Site Location	S8742 9081
Site Photograph	
Width	16m
Depth	10 - 30 cm
Substrate	Gravel, Cobble, Sand
Flow Type	Riffle 75% Glide 25%
Instream Vegetation	*Ranunculus* sp. 20% Filamentous Algae 10% Bryophyta 5%
Dominant Bankside Vegetation	Alder
Estimated % summer Cover of Stream by Bankside Vegetation	<5%
Trout Adult Habitat	Good
Trout Nursery Habitat	Good - Fair
Trout Spawning Habitat	Good

Appendix B: Environmental Monitoring Points – Rampere Landfill



Client:

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RPS Consulting Engineers

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NOTES

1. This drawing is the property of RPS Consulting Engineers, it is a confidential document and must not be copied, used, or its content divulged without prior written consent.
2. All Levels refer to Ordnance Survey Datum, Malin Head.
3. DO NOT SCALE, use figured dimensions only, if in doubt ask.

No.	Date	By / Ch	Amendment / Issue	App.
A16	Feb'08	HF / LOT	Biological Sampling Sites and Flare added	PL
A15	Apr'07	HF / LOT	Removal of Leachate Monitoring Well SA1A	MLW
A14	Feb'07	HF / LOT	NEW TOPOGRAPHICAL SURVEY	MLW
A13	May'06	HF / LOT	NEW TOPO SURVEY ADDED WITH STOCKPILE AREA	MLW

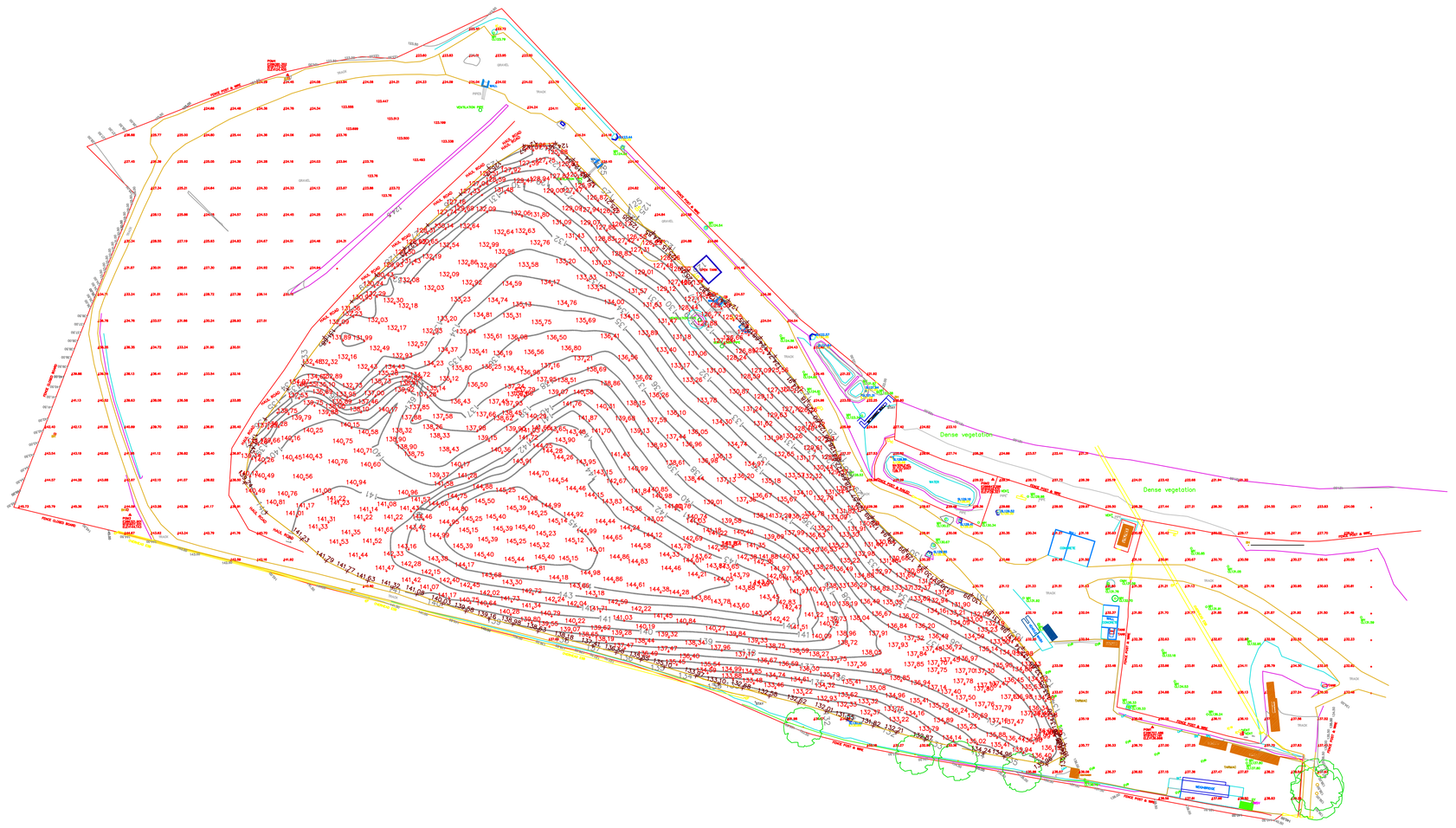
Project: Rampere Landfill Waste Licence Compliance

Title: ENVIRONMENTAL MONITORING POINTS

Drawn by:	HF	Job No:	067/515/001
Checked by:	MLW	File No:	067/515/001/DG0006A16
Approved by:	LOT	Drg. No:	DG0006
Scale:	1:2500@A3	Rev:	A16
Date:	Oct.'02		

Appendix C: EPA Annual Audit Report

Appendix D – Topographical Survey of Rampere Landfill



Symbol	Details/Explanation
TP EP	POLE Telecom or ESB
CB	CONTROL BOX (ESB OR OTHER)
FH	HYDRANT
WSV	WATER VALVE
WSC	WATER STOP COCK
MH MH CL+67.67m	MANHOLE & COVER LEVEL
GY	GULLY
ESB	ESB INSPECTION COVER
IC	UNKNOWN INSPCTION COVER
LP	LIGHT POLE
RS	SIGN POST
	TREE
	CONCRETE PLINTH
TIC	EIRCOM INSPECTION COVER
CATV	CABLE TV INSPECTION COVER
	BUILDING
	FENCE LINE
	WALL
	ROAD EDGE
	TOP OF KERB
	CABLES OVERHEAD ESB TELECOM
	HEDGE LINE
	EDGE OF PATH

NOTES

Survey is based on existing site grid and Malin Head Datum.

Rev.	By	Date	Description
–			

Wicklow County Council

Client	Wicklow County Council County Offices, Wicklow Co. Wicklow
Title	Topographical Survey oF Rampere Landfill 2011
Date	14th April. 2011
Drawing No.	Ram/2011/1000/001
Scale	NTS
Drawn by:	PB PC
Revision	–

Appendix E – PRTR Emissions Data 2010

Environmental Protection Agency

Guidance to completing the PRTR workbook

AER Returns Workbook

Version 1.1.11

REFERENCE YEAR	2010

1. FACILITY IDENTIFICATION

Parent Company Name	Wicklow County Council
Facility Name	Rampere Landfill
PRTR Identification Number	W0066
Licence Number	W0066-03

Waste or IPPC Classes of Activity

No.	class_name
3.5	Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment.
3.2	Land treatment, including biodegradation of liquid or sludge discards in soils.
3.4	Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons.
4.13	Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.
4.4	Recycling or reclamation of other inorganic materials.

Address 1	Rampere
Address 2	County Wicklow
Address 3	
Address 4	
Country	Ireland
Coordinates of Location	-6.52819 53.6439
River Basin District	IEEA
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous waste
AER Returns Contact Name	Robert Kelly (W0066)
AER Returns Contact Email Address	rkelly@wicklowcoco.ie
AER Returns Contact Position	Landfill Manager
AER Returns Contact Telephone Number	059 6481677
AER Returns Contact Mobile Phone Number	086 8517617
AER Returns Contact Fax Number	059 6481717
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	0
User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

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

4.2 RELEASES TO WATERS

Link to previous years emissions data

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

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

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

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

SECTION B : REMAINING PRTR POLLUTANTS

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

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

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

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT					QUANTITY			
			Method Used					
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
240	**Suspended Solids**	C	OTH	Rainfall Calcs	22.5	22.5	0.0	0.0

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

SECTION A : PRTR POLLUTANTS

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
06	Ammonia (NH3)	C	OTH	Weighbridge *Conc	4541.0	4541.0	0.0	0.0
79	Chlorides (as Cl)	C	OTH	Weighbridge *Conc	7093.0	7093.0	0.0	0.0
83	Fluorides (as total F)	C	OTH	Weighbridge *Conc	4.9	4.9	0.0	0.0
22	Nickel and compounds (as Ni)	C	OTH	Weighbridge *Conc	0.985	0.985	0.0	0.0
20	Copper and compounds (as Cu)	C	OTH	Weighbridge *Conc	0.49	0.49	0.0	0.0
18	Cadmium and compounds (as Cd)	C	OTH	Weighbridge *Conc	0.29	0.29	0.0	0.0

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

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

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used					
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
332	Ortho-phosphate (as PO4)	C	OTH	Weighbridge *Conc	49.25	49.25	0.0	0.0
374	Boron	C	OTH	Weighbridge *Conc	17731.0	17731.0	0.0	0.0
305	Calcium	C	OTH	Weighbridge *Conc	1793.0	1793.0	0.0	0.0
357	Iron	C	OTH	Weighbridge *Conc	22.5	22.5	0.0	0.0
338	Potassium	C	OTH	Weighbridge *Conc	4363.0	4363.0	0.0	0.0
341	**Sodium**	C	OTH	Weighbridge *Conc	5871.0	5871.0	0.0	0.0

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

4.1 RELEASES TO AIR

Link to previous years emissions data

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD				QUANTITY		
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
03	Carbon dioxide (CO2)	C	OTH	SITE DATA & PI Report, Gas Sim 2	24971.0	751994.0	0.0	727023.0
01	Methane (CH4)	C	OTH	SITE DATA & PI Report, Gas Sim 2	17904.0	593300.0	0.0	575396.0

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

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD				QUANTITY		
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
15	Chlorofluorocarbons (CFCs)	C	OTH	Gas Sim 2 - PI Report	0.0	13.3	0.0	13.3
14	**Hydrochlorofluorocarbons (HCFCs)**	C	OTH	Gas Sim 2 - PI Report	0.0	9.57	0.0	9.57

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

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

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

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

Additional Data Requested from Landfill operators

For the purposes of the National Inventory on Greenhouse Gases, landfill operators are requested to provide summary data on landfill gas (Methane) 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: Rampere Landfill

Please enter summary data on the quantities of methane flared and / or utilised	T (Total) kg/Year	M/C/E	Method Used: Method Code	Method Used: Designation or Description	Facility Total Capacity m3 per hour	
Total estimated methane generation (as per site model)	1470618.0	C	OTH	Gas Sim 2.0 Statistics calculations	N/A	
Methane flared	877318.0	M		SITE DATA	750.0	(Total Flaring Capacity)
Methane utilised in engine/s	0.0				0.0	(Total Utilising Capacity)
Net methane emission (as reported in Section A above)	593300.0	C	OTH	CH4 Generated - methane fl	N/A	

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					

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

Link to previous years waste data
Link to previous years waste summary data & percentage change