

Kerry County Council



Waste Licence Ref No. W0001-03

REPORT TITLE

**North Kerry Landfill
Annual Environmental Report**

Reporting Period:

January 2008 – December 2008

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1.0 Introduction

Kerry County Council operates a municipal solid waste landfill facility at Muingnaminnane, Kielduff, Tralee, Co. Kerry. It is located approximately 6 miles northeast of Tralee, in the Stacks Mountains. The landfill site accepts solid waste arising from the entire county of Kerry. This waste is placed in lined cells in a controlled manner. The landfill is operated under licence W0001-03 as issued by Environmental Protection Agency (EPA).

1.1 Description of on Site Activities

The principle activity at the landfill site is the placement of waste in specially engineered/lined discrete cells in accordance with Class 5 of the third schedule of the Waste Management Act 1996.

Other on site activities includes:

- 1.1.1 The placement of leachate into specially engineered/lined lagoons in accordance with Class 4 of the Third schedule of the Waste Management Act 1996;
- 1.1.2 Reclamation and recycling of metals and metal compounds in accordance with Class 3 of the Fourth Schedule of the Waste Management Act 1996;
- 1.1.3 Reclamation and recycling of organic materials i.e. paper, cardboard in accordance with Class 2 of the Fourth Schedule of the Waste Management Act 1996;
- 1.1.4 Reclamation and Recycling of inorganic materials notably glass and plastics in accordance with Class 4 of the Fourth Schedule;
- 1.1.5 There is an active gas collection and management system including the flaring of landfill site in operation on the site.

1.2 Quantity and Composition of Waste 1st Jan – 31st Dec 2008

The weight of the waste accepted into North Kerry Landfill Facility for disposal for the reporting period was 62,401 tonnes. This comprises of the following breakdown:

Waste Stream	Tonnes
Mixed Municipal	38,006
Commercial Waste	1,304
Household Waste	23,091
Total	62,401

Table 1 Waste Stream Break down for the Reporting Period.

Appendix I shows a breakdown per month of waste accepted into North Kerry Landfill for the reporting period.

Appendix II shows the breakdown of waste streams and their origin of at the landfill site.

Appendix III shows the breakdown of all material collected on site for transfer off site for recycling/recovery/final disposal.

1.3 Quantity of Waste disposed at facility: May 1994 – 31st Dec 2008

Since opening in May 1994 the total quantity of waste disposed of at the facility is 680,296 tonnes. Appendix IV shows a yearly break down of tonnage from 1994 – 2008.

1.4 Expected expiry date of Current Capacity

Waste disposal/placement is currently being carried out in cell 16; it is estimated at current waste disposal trends that waste disposal/placement in cell 16 will cease in December 2009.

The development of three new cells 17, 18, 19 started in June 2008. It is expected that cell 17 will be ready to receive waste by September 2009. A Construction Quality Assurance Report will be sent to the Agency for approval prior to the use of cell 17.

1.5 Method of disposal of waste at North Kerry Landfill

1.5.1 Large vehicle access/private cars with large trailers:

The current arrangement for disposing of waste in cell 16 is carried out on a pre-built pre-planned tip head. The tip head is constructed with custom made concrete blocks. This method was first introduced as the cells were built 7/9m into the original ground level and access to the cell would be difficult by large tipping trucks.

The tip head height is normally kept at a height of three metres, thus allowing sufficient capacity for waste to be deposited below the tip head prior to compaction. The tip head is guarded by a locked gate to prevent members of the public accessing the tip head without supervision.

The current system is set up such that two trucks can tip at the tip head simultaneously, without any waste being deposited on the tip head itself. Additionally, trucks are not required to track across the waste body itself. As sections of the cell fills vertically, the tip head is easily dismantled and moved further along the cell.

At the latter stage of a cells life, it is not feasible to maintain the purpose built tip head an access road is constructed on top of the placed/compacted waste. A temporary level tip is constructed. Waste is deposited on the flat and a bull dozer is used to push the waste ahead of the compacted for placement and further compaction.

The placement of waste and tip head procedures that are currently being used in North Kerry Landfill will have to be reviewed once cell 16 has been filled. A new filling sequence for cell 17 and subsequence cells (Phase 9) will be submitted to the agency during the next reporting year for approval prior to placement of waste.

1.5 Members of the public accessing the site with small quantities of waste.

The majority of members of the public do not access the tip head in order to dispose of their waste. These are normally directed to the public skip split level area adjacent to the weighbridge office to place their waste into a series of trailer. These trailers are removed from the public skip area on a regular basis and tipped at the tip head for placement/compaction. Trailers are emptied on average 10 times daily. The weighbridge supervisor takes note of the weight of each trailer before it emptied and this information is added to the daily tonnage records and the end of every day.

It is envisioned in 2009 that the current trailer system will be replaced with a series of static compactors and larger transfer bins. This will result in no members of the public being directed to the tip head area.

1.6 Members of the public accessing civic amenity area of the site

Appendix III outlines the types of waste which are accepted in NKL for further removal off site for recycling/recovery/disposal. This civic amenity area contains a number of receptacles into which members of the public can deposit specific waste types free of charge for recovery/recycling/disposal. In addition to the

concrete slab area there is a shed for the housing of WEEE and Hazardous waste collection.

It is envisioned that during the next reporting period that the recycling slab area and shed design will be revised, this revision will be submitted to the Agency for approval.

2.0 Summary Report on Emissions for the Reporting Period.

The following section outlines a summary of the all emission monitoring for the reporting period:

2.1 Emission to Water

2.1 Emission to Sewer

78,559 m³ of leachate was removed for North Kerry Landfill site during the reporting period. This equates to 2,953 loads over the 12 month period.

Appendix V shows the quantity of leachate removed per month from NKL to Tralee Sewerage treatment plant during the reporting period.

Table 2 shows the total emissions by element to the Tralee Wastewater Treatment Plant in 2008 and its comparison to 2007 figures.

Parameter	Mass Emission (Kg)	Mass Emission (Kg)
	Previous Year 2007	Current Reporting Year 2008
Leachate Volume (m3)	55,436	78,559
Ammonia (NH3)	36.588	42.83
Chlorides (as Cl)	46.248	37.71
Copper and compounds (as Cu)	<0.02	<0.02
Zinc and compounds (as Zn)	0.30	0.16
Cadmium and compounds (as Cd)	0.000002	0.000002
Chromium and compounds (as Cr)	0.0046	0.007
Lead and compounds (as Pb)	0.004	0.002
Nickel and compounds (as Ni)	0.0034	0.004
Mercury and compounds (as Hg)	0.0003	0.0003
Cyanides (as total CN)	0.00451	0.006
Sulphate	0.35	0.79
Potassium	25.168	21.13
Sodium	44.163	35.1
Calcium	6.99	21.53
Magnesium	5.742	5.99
Iron	0.471	0.69
Manganese (as Mn)	0.208	0.44
COD	745.61	116.79
BOD	32.042	36.06

Table 2 Emissions to Waste Water Treatment Plant Comparison 2007/2008

2.1.1 Emissions to Surface Waters/Surface Water Monitoring.

Groundwater:

The qualities of groundwater in 2008 for Boreholes 1-4 were satisfactory. Following the trend from earlier year's ammonia levels were detected in Borehole no5. Surface water appears to be intruding into at least one of the five wells as evident from levels of TOC. Boreholes 1,2,3 were tested for list 1,2 organics. The only organic compounds which were detected above the detection limit was in Borehole no 1 were traces of Chloroform were detected (7.4 µg/L). This however, is of no public health significance. Conclusion: no significant impact was noted on groundwater.

Surface Water:

Results from monitoring over the last ten years indicates that the most significant threat or impact from the landfill activities in surrounding water is suspended solids. In 2008 there was a decrease in suspended solid impact at W1 relative to 2007. Conclusion: Evidence of siltation was significantly less than in 2007 on surface water sites W1 and SW1 (headwaters Lee and Smeralagh). There was evidence of impact (ammonia levels) on W1 coming from Surface water lagoon SWML2.

Appendix VII contains a copy of the Annual Environment Report – Physio Chemical Monitoring of Muingnaminnane Landfill 2008.

2.2 Emission to Air

2.2.1 Landfill Gas Monitoring

Gas management at North Kerry Landfill is an interlinked system of mutually reinforcing actions no one of which can fully control or manage the generation of LFG from the deposited waste mass. In combination however, they comply fully with the requirements of the licence.

The Systems and Operations include:

- Active management of the gas control infrastructure
- Introduction of new gas collection systems
- Odour patrol and consequent reactive measures
- Monitoring and testing of infrastructure

The infrastructure in place at North Kerry Landfill includes the construction of a basal liner and capping system.

Outside the footprint of the landfill is a network of LFG monitoring boreholes. There are constructed in a grid around the footprint of the area that waste has been deposited within. These wells are monitored on a monthly cycle for the presence of a suite of indicator gases that would signal the possible migration of LFG.

Odour patrols are conducted on a weekly basis; all results are recorded and acted upon in the event of off site odour being detected.

2.2.2 Noise Monitoring

Kerry County Council commissioned Awn Consulting to carry out during the month of September 2008 the annual noise monitoring survey for North Kerry Landfill. The survey was carried out in accordance with *ISO 1996:1982:*

Acoustics – Description and Measurement of Environmental Noise and the *EPA Guidance Note – Guidance Note for noise in relation to Scheduled Activities*.

Measurements were conducted at three boundary locations and two noise sensitive locations in the vicinity of the facility. Location S2 was introduced in 2008 Survey as the tip head had extended in a northerly direction and the private dwelling near S2 is now the nearest noise sensitive location.

It was found that all locations surveyed are in compliance with the daytime and night time criteria of 55dB $L_{Aeq(30min)}$ and 45dB $L_{Aeq(30min)}$. It was noted that the activities from the landfill site were not audible at any stage during the monitoring periods at S1 or at S2.

Reference	Limit $L_{Aeq(30min)}$ dB	L_{Aeq} dB	L_{A90} dB
N1	55	55	53
N2		53	51
N3		43	36
S1		61	52
S2		51	47

Table 3 Comparison of Measured daytime L_{Aeq} and L_{A90} levels with Limit Values

Reference	Limit $L_{Aeq(30min)}$ dB	L_{Aeq} dB	L_{A90} dB
N3	45	33	33
S1		34	32
S2		29	28

Table 4 Comparison of Measured Night time L_{Aeq} and L_{A90} levels with Limit Values

2.2.3 Dust

A 28 day sample between the 27 June to 9th July was carried out by Southern Scientific Services Ltd on the behalf of Kerry County Council.

The following table of results show that dust deposits over this period are within the emission limit for the site.

Location	Total Particulates Mg/m ² /day	Dust Deposition Limit Mg/m ² /day
Station 1	51	350
Station 2	25	350
Station 3	27	350

Table 5 Dust Deposition results for Reporting Period.

Although the results are within the allowable dust deposition limits as set in Schedule C of Licence W0001-03: the following non compliances with waste licence W0001-03 have been observed by us:

- 2.2.3.1 Schedule C of our licence states that the results should be taken in 30 day composite sample, the test was from a 28 day composite sample;
- 2.2.3.2 Schedule D of our licence states that Dust monitoring should be carried out three times a year, twice during the period May to September. This was not carried out.

In relation to the above non compliances Kerry County Council will for the next reporting period and future reporting periods carry out all testing in accordance with Schedule C and Schedule D of Waste Licence W0001-03.

Appendix IX shows the result of dust monitoring carried out in the second quarter of the reporting period.

2.3 Energy Consumption.

The following is the energy consumption for North Kerry Landfill for the reporting period.

2.3.1 Diesel

The diesel usage for North Kerry Landfill for the reporting period was 95,436 litres. This is a reduction of 1,950 litres in comparison with 2005 figures.

2.3.2 Electricity

The electricity usage for the facility during the period was 141,575 kWh. This is a reduction of 13,075 kWh in comparison with 2005 figures.

3.0 Metrological Reporting

3.1 Rainfall Data

Rainfall for the reporting period 01/01/2008 – 22/12/2008 was 2078.9mm. This is an increase of 409.7mm on the 2007 reporting period.

True Evaporation for the reporting period was 348.96mm.

Month	Rainfall mm
January	292.4
February	116.0
March	169.1
April	59.9
May	51.8
June	134.8
July	171.6
August	258.8
September	177.7
October	339.7
November	158.5
December	145.6
Total	2078.9

Table 6 Rainfall Data for Reporting Period.

Appendix X shows the monthly rainfall and monthly evaporation for the reporting period.

4.0 Environmental Incidents and Complaints

There were no environmental incident reported to the Agency for the reporting period.

47 complaints were received by the management of the facility for the reporting period. The complaints can be broken down into the following categories:

No. Complaints	Issue
26	<i>Odour</i>
8	<i>Illegal Dumping</i>
3	<i>Rubbish on main road</i>
3	<i>Uncovered/unsecure loads being admitted into the landfill site</i>
2	<i>Flies</i>
2	<i>Site Infrastructure</i>
2	<i>Noise from Leachate Lorries at Treatment plant</i>
1	<i>Windblown Litter</i>

Table 7 Breakdown of Complaints Received during the reporting period

Works done to alleviate the issues:

4.1 Odour:

4.1.1 A new gas management plan as submitted to the agency is being implemented on site.

4.1.2 Horizontal gas wells are being installed in the active cell and connected to the flare during active cell filling.

4.2 Illegal Dumping:

Quicker response time to complaints received, closer co-operation with litter warden for the area.

4.3 Rubbish on side of approach roads to landfill site.

Quarterly road side clean ups being carried out by Area Office on main road leading to the landfill site. Inspection of the waste from these clean ups revealed that it consisted (up to 90%) of plastic bottles, takeaway coffee/tea cups, takeaway wrappers etc which had been thrown out of car windows.

Larger items which have fallen from vehicles carrying waste to the landfill site are removed within 12hrs of a complaint being received.

4.4 Unsecured/Uncovered loads:

In October 2008 a “three strikes and your out policy” was introduced in relation to uncovered/unsecured loads entering the site. The driver of the vehicle is given a verbal warning on his/her first offence and his/her details are taken. If they reoffend a second time they are formally written to and advised that should they enter the landfill site with an covered load again they will be refused entry for a period of three months.

4.5 Flies:

The procedure for dealing with flies is currently under review and a revised procedure will be forwarded to the Agency once revised.

4.6 Site Infrastructure:

Complaints received in relation to the site infrastructure are dealt with immediately on site

4.7 Wind Blown Litter:

A New netting system has been put in place on site.

4.8 Noise from Leachate Lorries at Waste Water Treatment Plant early morning:

Arrangement with Leachate contractors that they will not enter the waste water treatment plant site before 7.30am

In October 2008 a new complaints recording system was put in place by management. This complaints procedure consists of a revised complaints form and follow up form and monthly reporting of all complaints to the Agency. Under this new procedure it is managements aim to deal with all complaints received in a timely manner.

Appendix XI has a full list of all complaints received.

5.0 Infrastructural Development during the Reporting period

Construction commenced on Phase 9 consisting of:

- Development of three new cells 17, 18, 19;
- Capping of Phase 7 cells 13, 14;
- Construction of new control building containing weighbridge supervisors office, manager's/deputy manager's offices, canteen, file room and public toilets;
- New weighbridge;
- New Scada system;
- New Wheel Wash;
- New Surface Water lagoon;
- & New Leachate holding tank.

This work was not completed in 2008 and will continue on into the next reporting period (2009).

6.0 Financial Reporting for period under review.

The total cost of operating the landfill site over the reporting period was €1,730,147.03. This can be further broken down to €1,652,152.05 for landfill disposal activities and €77,994.98 for recycling activities on site. Appendix XII shows a break down of expenditure for the reporting period.

The total adopted budget for the landfill for 2009 is €1,498,144. This can be further broken down to €1,431,144 for landfill disposal activities and €67,000 for recycling activities on site. Appendix XII contains the operating costs for 2008 and the projected budget for 2009.

7.0 Environmental Management Programme

The environmental management programme for the forthcoming year is to implements in full the conditions of Waste Licence W0001-03 under the following headings:

1. Scope;
2. Management;
3. Record keeping;
4. Infrastructure;
5. Waste Acceptance;
6. Nuisances;
7. Emissions;
8. Aftercare and Restoration;
9. Monitoring;
10. Contingency Arrangements;
11. Financial Provision.

7.1 Environmental Management Programme – Report

An updated Environment Management Programme for facility was forwarded to the Agency in September 2003.

This report addressed the following:

- Items specified in the Landfill Operational Practices Manual as published by the EPA.
- Management Structure
- Objectives and Targets which also includes
 - Designated of Responsibility for Achieving Targets
 - Timescale for Implementation
- Emergency Procedures
- Schedules of Drawings
- Operational Matters
- Closure and Aftercare.

7.2 Engineering Details which consist of:

- Site preparation and provision of services
- Containment details
- Leachate drainage, collection and treatment
- Landfill gas abatement methods
- Monitoring points for landfill gas, Leachate, surface water, groundwater etc.
- Fencing gates and other security
- Site access road and secondary side roads
- Offices, fuel stores etc,
- Current landscaping and tree planting
- Wheel cleaning infrastructure, weighbridge
- Surface water control resources

Appendix I

Monthly Tonnage for Reporting Period:

Waste disposed of in landfill site:

Waste Return Form

Month/08	Solid Mixed Municipal Waste (tonnes)	Inert Waste (tonnes)	Public Tipping Area (tonnes)	Tonnage
January	5662.19	959.22	54.26	5716.45
February	4719.43	383.28	43.07	4762.5
March	4528.94	347.38	53.78	4582.72
April	4958.72	348.77	44.38	5003.1
May	5542.53	2921.04	50.13	5592.66
June	4992.1	165.84	57.64	5049.74
July	6525.58	167.3	70.58	6596.16
August	5458.22	133.06	60.04	5518.26
September	5289.92	169.84	57.92	5347.84
October	4804.8	1367.12	69.14	4873.94
November	4671.64	1120.70	66.62	4738.26
December	4543.77	388.42	76.16	4619.87
Total	61697.78	471.97	703.72	62401.5

Table 8 Waste disposed of at Landfill site during reporting period.

Appendix II

Classification of Waste Brought directly to landfill during reporting period:

Name of EACH collector directly delivering waste from kerbside	Source of waste (Household, commercial, mixed municipal, industrial, C&D, other - if other, please specify)	Waste description	EWC code	Quantity disposed of at the landfill (tonnes)	Disposal code
Kerry County Council	Household/Commercial collection	Mixed waste	20 03 01	3,491	D5 - Engineered Landfill
Kerry County Council	Commercial Waste	Mixed Waste from County Council	20 03 01	448	D5 - Engineered Landfill
Kerry County Council	Mixed Municipal	Flytipping	20 03 03	160	D5 - Engineered Landfill
Kerry County Council	Mixed Municipal	Road Sweepings	20 03 03	52	D5 - Engineered Landfill
Tralee Town Council	Household/Commercial waste Collection	Mixed waste	20 03 01	6,034	D5 - Engineered Landfill
Tralee Town Council	Mixed Municipal	Road Sweepings	20 03 03	1,352	D5 - Engineered Landfill
Tralee Town Council	Mixed Municipal	Flytipping	20 03 03	204	D5 - Engineered Landfill
Listowel Town Council	Household/Commercial waste Collection	Mixed waste	20 03 01	743	D5 - Engineered Landfill
Listowel Town Council	Commercial Waste	Mixed waste from Town Council	20 03 01	5	D5 - Engineered Landfill
Listowel Town Council	Mixed Municipal	Road Sweepings	20 03 03	6	D5 - Engineered Landfill
Listowel Town Council	Mixed Municipal	Flytipping	20 03 03	2	D5 - Engineered Landfill
KWD	Household	Mixed waste	20 03 01	2626	D5 - Engineered Landfill
Dillon Waste	Household	Mixed waste	20 03 01	2560	D5 - Engineered Landfill
Dillon Waste	Commercial Waste	Mixed waste	20 03 01	522	D5 - Engineered Landfill
Higgins	Household waste	Mixed Waste	20 03 01	3085	D5 - Engineered Landfill
SWB	Household Waste	Mixed Municipal	20 03 01	2446	D5 - Engineered Landfill
Public	Household waste	Mixed waste	20 03 01	2106	D5 - Engineered Landfill
public	Mixed Municipal	flytipping	20 03 03	3	D5 - Engineered Landfill
Public	Commercial Waste	Mixed waste	20 03 01	329	D5 - Engineered Landfill

Table 9 Classification of Waste Brought directly to landfill during reporting period

Classification of waste transferred from other facilities to landfill during reporting period:

Name and licence/permit no of EACH facility from which waste was delivered		Waste description	EWC code	Quantity accepted (tonnes)	Disposal code	Quantity remaining in storage at end of year (tonnes)
Milltown Transfer Station	W0069-01	Mixed Municipal	20 03 01	4283	D5 - Engineered Landfill	0
Coolcaslagh Transfer Station	W0072-01	Mixed Municipal	20 03 01	5313	D5 - Engineered Landfill	0
Kenmare Transfer Station	W0086-01	Mixed Municipal	20 03 01	1663	D5 - Engineered Landfill	0
Caherciveen Transfer Station	W0087-01	Mixed Municipal	20 03 01	1911	D5 - Engineered Landfill	0
Dingle Civic Amenity	W0225-01	Mixed Municipal	20 03 01	69	D5 - Engineered Landfill	0
Dillons	WP07-03	Mixed Municipal	20 03 01	4465	D5 - Engineered Landfill	0
Higgins	WP50-04	Mixed Municipal	20 03 01	4598	D5 - Engineered Landfill	0
KWD	WP08-10	Mixed Municipal	20 03 01	13926	D5 - Engineered Landfill	0

Table 10 Classification of waste transferred from other facilities to landfill during reporting period

Appendix III

Waste collected on site and transferred off site for recycling/recovery/disposal:

Material type	EWC codes	Household waste (Tonnes)	Non-household waste (Tonnes)
organic waste (food and garden) Total	20 01 08; 20 02 01	600 approx	0
<i>food</i>	<i>20 01 08</i>	<i>0</i>	<i>0</i>
<i>garden</i>	<i>20 02 01</i>	<i>600</i>	<i>0</i>
mixed dry recyclables (eco-bags)	15 01 06; 20 03 01	23	0
cardboard, newspaper and other paper (Total)	15 01 01; 20 01 01	202	0
<i>*cardboard packaging</i>	<i>15 01 01</i>	<i>71</i>	<i>0</i>
<i>cardboard non-packaging</i>	<i>20 01 01</i>	<i>0</i>	<i>0</i>
<i>paper packaging</i>	<i>15 01 01</i>	<i>0</i>	<i>0</i>
<i>paper non-packaging</i>	<i>20 01 01</i>	<i>6</i>	<i>0</i>
<i>*newspaper and magazines</i>	<i>20 01 01</i>	<i>125</i>	<i>0</i>
glass (Total)	15 01 07; 20 01 02	32	0
<i>glass packaging(bottles)</i>	<i>15 01 07</i>	<i>32</i>	<i>0</i>
<i>glass non-packaging(sheet)</i>	<i>20 01 02</i>	<i>0</i>	<i>0</i>
metals (Total)	15 01 04; 20 01 40	179	0
<i>aluminium cans (packaging)</i>	<i>15 01 04</i>	<i>2</i>	<i>0</i>
<i>steel cans (packaging)</i>	<i>15 01 04</i>	<i>4</i>	<i>0</i>
<i>other metal packaging</i>	<i>15 01 04</i>	<i>1</i>	<i>0</i>
<i>other metals (non-packaging)(scrap)</i>	<i>20 01 40</i>	<i>171</i>	<i>0</i>
plastic (Total)	15 01 02; 20 01 39	31	0
<i>plastic packaging(bottles)</i>	<i>15 01 02</i>	<i>31</i>	<i>0</i>
<i>plastic non-packaging</i>	<i>20 01 39</i>	<i>0</i>	<i>0</i>

Material type	EWC codes	Household waste (Tonnes)	Non-household waste (Tonnes)
textiles (Total)	15 01 09; 20 01 11	24	0
textiles, packaging	15 01 09	0	0
textiles, non-packaging	20 01 11	24	0
wood (Total)	15 01 03; 20 01 38; 20 01 37*	2	0
wood packaging	15 01 03	0	0
wood non-packaging	20 01 38	2	0
mixed, uncontaminated wood packaging and non-packaging	15 01 03; 20 01 38	0	0
wood, treated, hazardous	20 01 37*	0	0
miscellaneous hazardous waste			
small batteries	20 01 34; 20 01 33*	480 1	0
lead acid batteries (Car Batteries)	16 06 01*	18 m3	0
waste mineral oils (lubrication, vehicle, machine etc.)	13 xx xx	5850 1	0
oil filters (vehicles)		960 1	0
oil containers (mineral oil) - plastic + metal		0	0
waste cooking or vegetable oils	20 01 25	0	0
aerosols	20 03 99	2880 1	0
waste paint and varnish (including containers)		1025 1	0

Material type	EWC codes	Household waste (Tonnes)	Non-household waste (Tonnes)
WEEE (Total)	various	249	0
fridges and freezers	20 01 35*; 20 01 36; 16 02 11*; 16 02 14	88.46	0
white goods (electrical and electronic)	20 01 36; 16 02 14	91.26	0
televisions and PC monitors	20 01 35*; 16 02 13*;	22.36	0
fluorescent tubes and lighting	20 01 21*	0.28	0
ICT- Information and Communications Technology Equipment, e.g Includes Computer Equipment	16 02 14	22.36	0
other electrical and electronic equipment, eg. White Goods incl. Washing Machines, Dryers etc, TVs, PCs, Small Items incl. toasters Radios	20 01 36; 20 01 35*	24.5	0

Table 11 Waste Collected on site and transferred off site for recovery/recycling/final disposal

Appendix IV

Cumulative tonnage 1994 – 2008:

	Waste Tonnes	Cumulative Tonnage
1994	16,902	<i>16,902.00</i>
1995	23,505	<i>40,407.00</i>
1996	23,722	<i>64,129.00</i>
1997	25,581.88	<i>89,710.88</i>
1998	33,529.67	<i>123,240.55</i>
1999	57,872.71	<i>181,113.26</i>
2000	60,473.65	<i>241,586.91</i>
2001	63,945.91	<i>305,532.82</i>
2002	62,821.52	<i>368,354.34</i>
2003	50,235.29	<i>418,589.63</i>
2004	48,054.47	<i>466,644.10</i>
2005	34,430.82	<i>501,074.92</i>
2006	60,025.22	<i>561,100.14</i>
2007	56,794.24	<i>617,894.38</i>
2008	62,401.50	<i>680,295.88</i>

Table 12 Cumulative Tonnage 1994 - 2008

Appendix V

Quantity of leachate removed from NKL to Tralee Wastewater Treatment Plant during the reporting period:

Month	<i>No Loads</i>	m3	Gallons
January	385	10,030.58	2,206,462.80
February	341	9,067.30	1,994,566.60
March	213	5,678.69	1,249,161.90
April	127	3,487.91	767,248.13
May	18	486.52	107,021.55
June	82	1,957.40	430,576.33
July	127	3,483.84	766,352.83
August	278	7,661.38	1,685,301.30
September	313	8,395.60	1,846,810.30
October	353	9,261.43	2,037,270.10
November	422	11,123.44	2,446,863.10
December	294	7,924.44	1,743,167.30
Total	2953	78,558.53	17,280,802.24

Table 13 Leachate Removal from Site 2008

Appendix VI - PRTR Returns

Appendix VII

Emissions to waters report:

ANNUAL ENVIRONMENT REPORT

Physio-chemical Monitoring of Muingnaminnane Landfill

2008

Prepared by:
David Lenihan
Senior Executive Chemist

24 February 2009

INTRODUCTION

As Part of requirements under EPA Licence for North Kerry landfill this laboratory produces a report on a six monthly basis as well as an annual detailed report. This report can thus be interpreted as *Laboratory contribution to Annual Environment report*. This report effectively also incorporates the *final six monthly report for 2008*

Enclosed are:

- annual results in spreadsheet format for Leachate, Surface Water and Groundwater as required per monitoring provisions as of licence requirements for 2008
- Interpretation of results pertaining to three matrices of concern i.e. Groundwater, Surface water and Leachate
- results from ELS contract laboratory pertaining to individual List 1 and List 2 organics which were analysed for in November at three groundwater locations *App3*
- trend graphs for Total organic Carbon results and associated conductivity measurements for each of boreholes
- trend graphs for Total ammonium measurements at Surface water lagoons, and at positions *W1* and *SW1*
- *Appendix 1* detailing sample locations and associated grid references used in report
- *Table 1* outlines trigger values for strategic parameters analysed in groundwater
- *Appendix 2* details list of List 1,2 Organics monitored and their associated Limits of detection (LODs)
- *Appendix 3* detailed results of List 1/2 organic parameters from ELS

Most of analysis was conducted at KCC laboratory.

Analysis on Parameters (*italics and asterix*) was farmed out to ELS laboratories Mahon Industrial Estate, Cork. Parameters analysed by ELS were: , **Cyanide** and **List 1 and List 2 organics**.

A summary of Environmental requirements has been prepared by Tobin Consulting engineers. This is the document we are using. The final round of results for 2008 was taken on the 11th Nov. Results are also included for monthly analysis of groundwater as required by provisions of old licence

In 2008 a total of **255** samples were sampled by KCC Laboratory personnel

Altogether **2036** tests were analysed to satisfy requirements of licence monitoring.

Of these **2017** tests were analysed in KCC laboratory

19 tests were analysed by *ELS laboratories*. The latter included Cyanide and List1 / 2 organics as required on an annual basis for three groundwater locations It must however be stressed that each test for SVOCs or VOCs contains up to 153 specific compounds

The monitoring locations monitored are as per requirements of new licence.

APP1 outlines locations and associated northings and eastings

Trigger limits

Trigger limits are required to be set for certain parameters in groundwater and submitted to EPA. I suggest that drinking water limits be used as template where possible, either at or slightly higher. However where drinking water limits cannot be adhered to because of natural conditions (non anthropogenic effects) i.e. Ph the trigger value would have to be more flexible. Accordingly I suggest following as outlined in **Table 1**. I suggest that these be applicable to Boreholes 1 to 4. Borehole 5 appears to be monitoring an aquifer which contains a lot of decaying organic matter more than likely from natural sources. Therefore trigger value for ammonia may be too strict.

Table I Parametric Trigger values for Groundwater

Parameter	units	Trigger value (max)	Trigger value(min)
Ammonium	mg/L	0.3	
Nitrite	mg/L	0.05	
Total Oxidised Nitrogen	mg/L	25	
	(NO ₃)		
Conductivity	Us/cm	1000	
Ph	Ph units	10	4.5
Dissolved Oxygen	mg/L		1.0
	O ₂		
Chloride	mg/L	200	
Flouride	ug/L	1000	
Sodium	mg/L	200	
Potassium	mg/L	10	
Boron	mg/L	1	
Copper	mg/L	1.0	
Zinc	mg/L	1.0	
Cadmium	ug/L	5	
Chromium	ug/L	50	
Arsenic	ug/L	10	

Parameter	units	Trigger value (max)	Trigger value(min)
Lead	ug/L	10	
Nickel	ug/L	20	
Mercury	ug/L	1.0	
Total Cyanide	ug/L	50	
<u>VOCs</u>			
Benzene	ug/L	5	
1,2 dichloroethane	ug/L	5	
Tetra chloroethene and Trichloroethene	ug/L	5	
Toluene	ug/L	5	
Phenols	mg/L	0.05	
<u>SVOCs</u>			
Atrazine	ug/L	1.0	
Simazine	ug/L	1.0	
Poly aromatic Hydrocarbons ¹	ug/L	1.0	
Pesticides ^{2,3}	ug/L	1.0	

¹ PAHs measured should include at least benzo(b)Fluoranthene, benzo(k) Fluoranthene, benzo(ghi)perylene, indeno(123-cd)pyrene Fluoranthene detection

² the trigger value applies to each individual pesticide measured.

³ Pesticides include organic insecticides, Organic herbicides, Organic nematocides, organic acaricides, organic algicides, organic rodenticides, organic slimicides, related products (inter alia, growth regulators)

List 1 and List 2 Organics

Under the provisions of monitoring requirements we are required to monitor List 1 and List 2 organic compounds in three groundwater locations on an annual basis, 2 surface water locations on a once off basis and 2 Leachate locations also on an once off basis. These locations have to be agreed with EPA. In this report we report on three groundwater locations which were monitored for these compounds

The compounds analysed comprised of two types Volatile Organic compounds (*VOCs*) and Semi Volatile organic compounds (*SVOCs*). VOCs comprise of organic compounds with boiling points close to or less than that of Water i.e. *Petroleum products* and common solvents –up to 83 compounds were screened for using Purge and Trap GC MS.

Semi Volatile compounds comprise of higher boiling point organics and comprise of classes of compounds such as *pesticides, herbicides, PCBs (polychlorinated Biphenyls)* and *PAHs (Poly aromatic Hydrocarbons)*. Up to 63 different compounds in this category were screened for. A list of these compounds, together with limits of detection is given in *Appendix 2*

As we possess and use *ICP-MS instrument we monitored many more locations for heavy metals than were strictly required i.e. 12 surface water, 7 Leachate, and 7 groundwater locations

* Inductively coupled Plasma Mass spectrometer

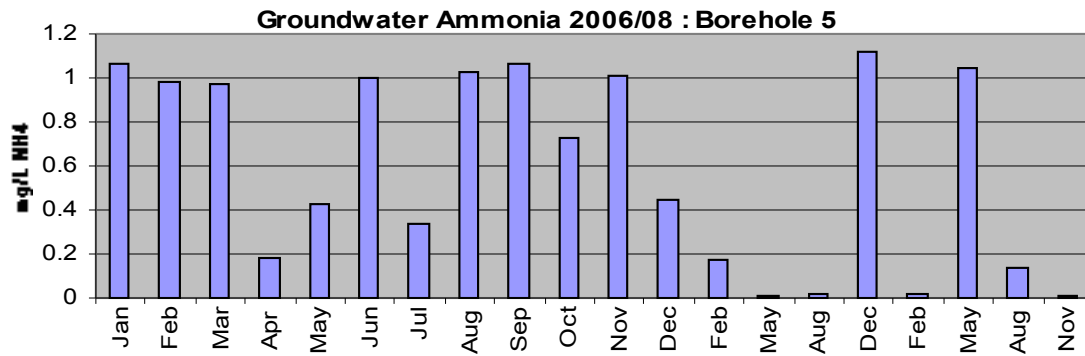
INTERPRETATION OF RESULTS

Groundwater:

The quality of groundwater in 2008 for Boreholes 1 – 4 was satisfactory.

Following from trend in earlier years Ammonia levels were detected in Borehole 5.
. See Fig 1.

Fig 1



Surface water appears to be intruding into at least one out of five wells as evident from levels of Total organic carbon i.e. Borehole 5

See trend graphs for Total Organic Carbon (with associated conductivity) for each Borehole (encl)

Boreholes 1, 2 and 3 were tested for list 1, 2 organics. The only Organic compounds which were detected above detection limit was in Bore Hole no 1 where traces of Chloroform were detected here i.e. 7.4 ug/L. This however is of no public health significance See accompanying report from ELS

Surface water:

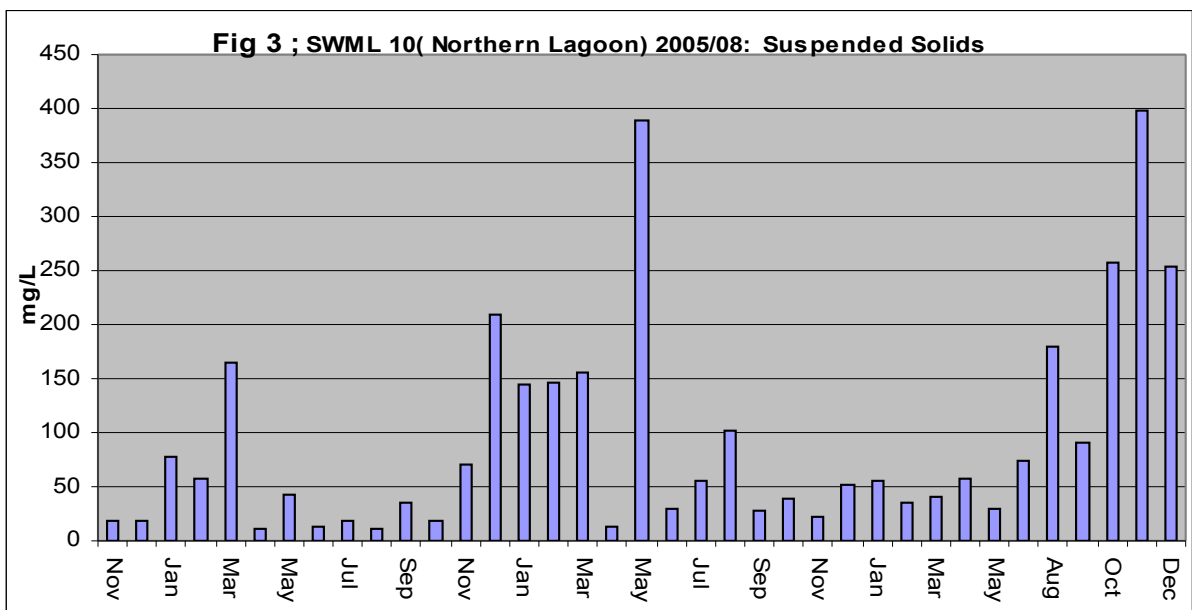
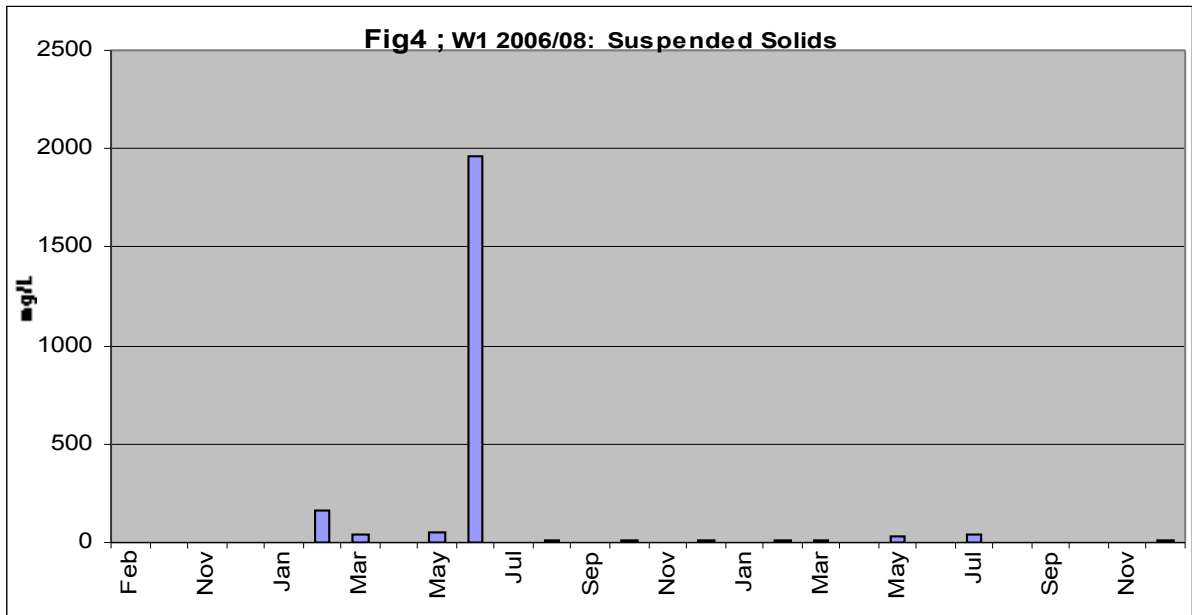
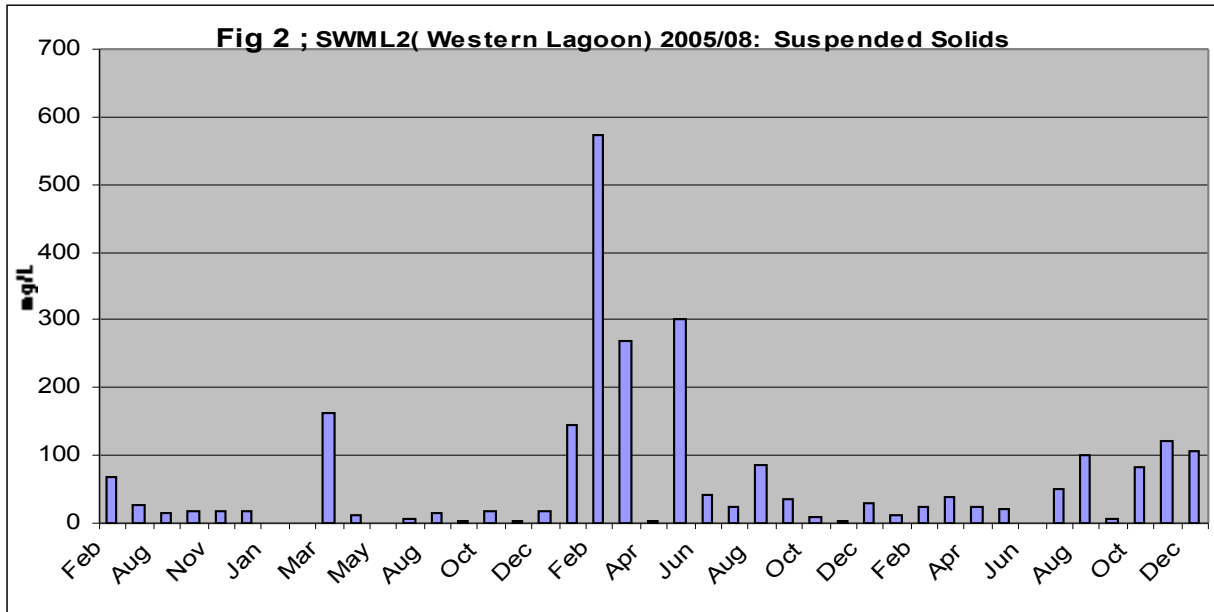
Results from monitoring over last 10 years indicates that most significant threat or impact from Landfill activities in surrounding waters is suspended solids

Samples were obtained “in site monitoring” from Stations **SWML 1,2,3,4,5,10,11 and 12**

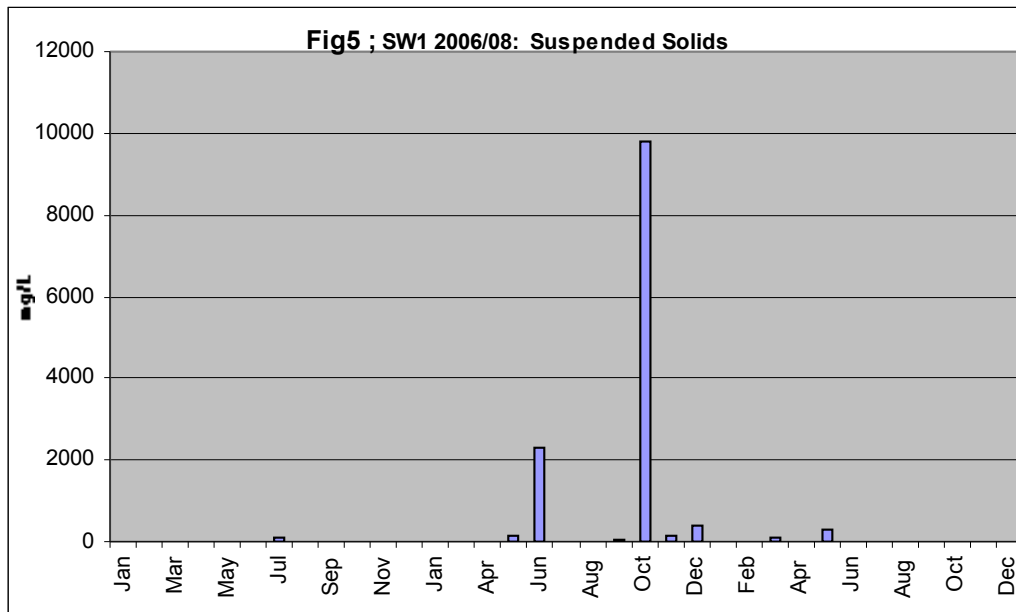
which are located in perimeter drains draining landfill. Monitoring of Stations 6,7,8 and 9

have ceased as they have been infilled as a result of site works. In 2007 there was a decrease in suspended solid impact at W1 relative to 2007. See Fig 4 Suspended solids @ W1 2006/2007.

Compare levels with that noted in two main surface water lagoons Fig 2 and 3



There was also much less significant impact from Suspended Solids on off site SW1 See Fig 5 Suspended solids @ sW1 2006/2008



High suspended solids in river waters may impair fish spawning grounds particularly in winter and spring. Occasional pulses of suspended matter entering these sites are probably the main contributory factor for unsatisfactory biological quality at this site

. Recent Ecological assessment of this site In 2007 denotes a Q3 value (moderate pollution). which still reflects some impact

Because of importance of this parameter monitoring of both W1 and SW1 are at a much higher frequency than license obligations

There was however an increase in Ammonia levels at W1 –though none at danger levels > 1 mg/l . The importance of this parameter in rivers is that it can dissociate to unionized Ammonia thus posing a lethal threat to fish and invertebrate life. This increase parallels a very high increase in parameter at surface water Lagoon SWML 2 in 2008. See accompanying trend graphs

Leachate results

Leachate was detected in all detection manholes for Cells 1 and 2 i.e. **LD1** and **LD2**.

Though impact is much less than latter there was an increase in impact on **LD3** relative to earlier years .

Conclusion

- ***No significant impact was noted on groundwater.***
- ***Evidence of siltation was significantly less than 2007 on surface water sites W1 and SW1 (headwaters of Lee and Smeralagh)***
- ***There was evidence of impact (Ammonium levels) on W1 coming from Surface water lagoon SWML2***

References:

1. ***Summary of Environmental Monitoring requirements For- Kerry Co Council Landfill, Muingnaminnane, Tralee, Co Kerry -Waste Licence Ref No: 1-3: Tobin Consulting Engineers***
2. ***Biological Invertebrate Monitoring of Surface Waters 2007; Laboratory KCC***

Appendix1: Details Sampling points referred to in report

<u>Location</u>	<u>comments</u>	<u>old or alternative name</u>	<u>Location Easting</u>	<u>Location Northing</u>
<u>Groundwater</u>				
<u>specified groundwater monitoring pts</u>				
Groundwater - BH-1			94697	117360
Groundwater - BH-2			94814	117306
Groundwater - BH-3			94808	117005
Groundwater - BH-4			95430	117040
Groundwater - BH-5			94917.5	117152.7
<u>Private boreholes adjacent to landfill</u>				
borehole: Dennis O Mahony	not specified in new licence		97390.7	118348.7
borehole: Gerry Sugrue	not specified in new licence		93037.8	116489.5
<u>Leachate</u>				
<u>Detection manholes</u>				
LD-1		leachate detection manhole 1	94909	117268
LD-2		leachate detection manhole 2	94894	117298
LD-3		leachate detection manhole from lagoon	94905	117264
<u>Lagoon sampling pts</u>				
LL-1		Leachate in lagoon 1	94904	117237
LL-2		leachate in Lagoon 2	94927	117166
LL-3		lagoon containing run off from compost	94979	117414
<u>Ancillary pts</u>				
Puraflo Treatment Inlet	not specified in new licence			
Puraflo Treatment Outlet	not specified in new licence		94867.2	117332
Wheelwash	Not specified in new licence			
<u>Surface water</u>				
<u>Off site sampling pts</u>				
Surface Water sampling point: W1	not specified in new licence	biological station	94493.3	117107.5
Surface water sampling point: E2	Not specified in new licence	O'Learys farm	95870.6	116575.6
Surface water sampling point: W2	Not specified in new licence		94493.3	117159.9
SW-1		previously E1	95471	117077
SW-2			95143.6	117969.4
SW-3			94853	118263
<u>On site sampling pts</u>				
SWML-1		previously 1	94948.3	117376.4
SWML-2		previously 2	94837.9	117263.7
SWML-3			94866	117221
SWML-4		previously 4	94883.9	117092.6
SWML-5			94911	117027
SWML-6			95009	117040
SWML-7			95131	117231
SWML-8			95110	117335
SWML-9			95102	117429
SWML-10			95092	117470
SWML-11		previously 11	95067	117520
SWML-12			94958	117384

APPENDIX 2 ; LIST 1, 2 Organics

**SVOCs: (Semi Volatile base Neutrals) Std Method 6410 B
Liquid-Liquid Extraction GC/MS.**

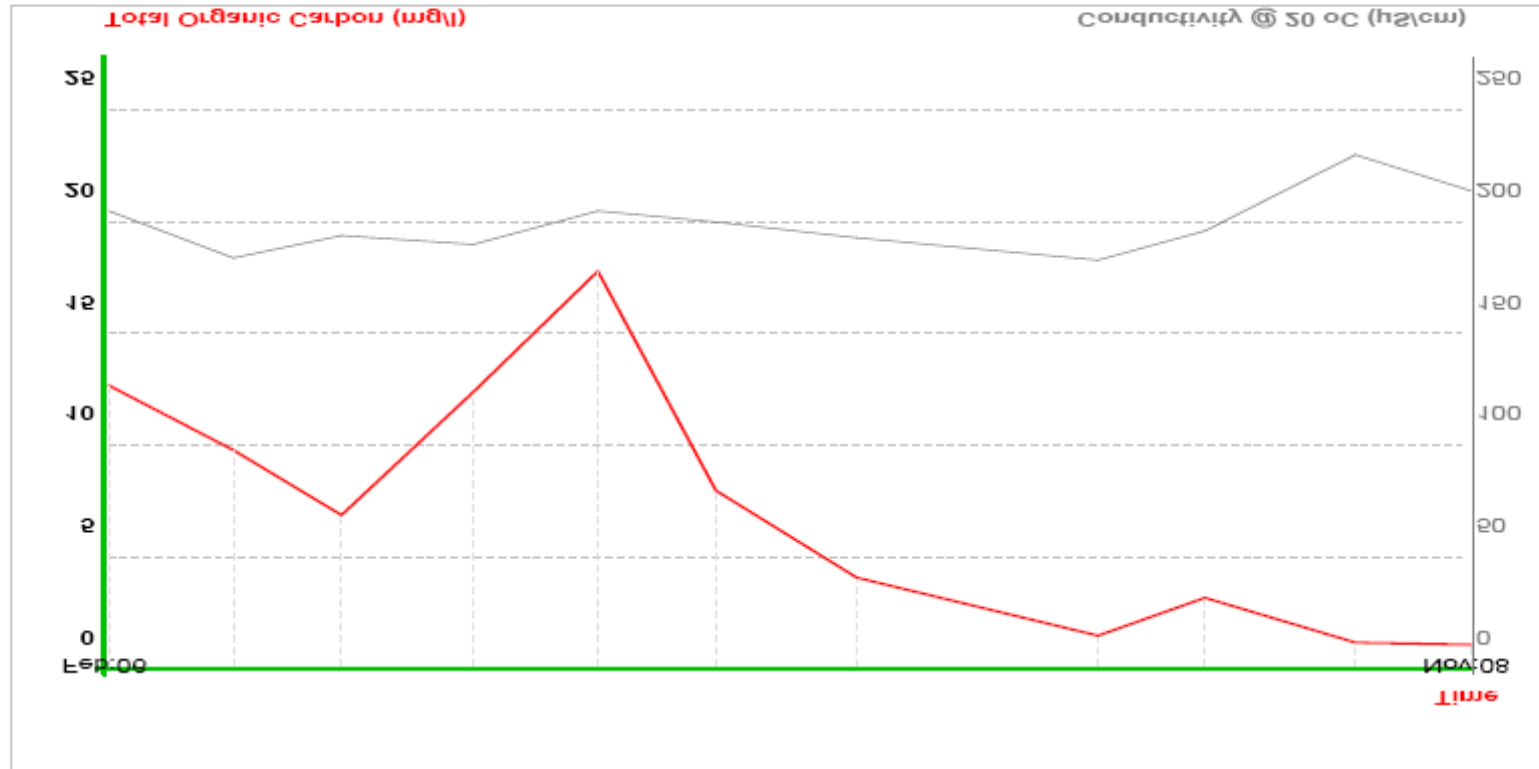
Parameter	limit of detectio n	units
1.3 - Dichlorobenzene	1	ug/l
1.4 - Dichlorobenzene	1	ug/l
Hexachloroethane	1	ug/l
bis(2-Chloroethyl) ether	1	ug/l
1,2-Dichlorobenzene	1	ug/l
bis(2-Chloroisopropyl) ether	1	ug/l
N-Nitrosodi-n-propylamine	1	ug/l
Nitrobenzene	1	ug/l
Hexachlorobutadiene	1	ug/l
1,2,4-Trichlorobenzene	1	ug/l
Isophorone	1	ug/l
Naphthalene	1	ug/l
bis(2-Chlororthoxy) methane	1	ug/l
Hexachlorocyclopentadiene	1	ug/l
2-Chloronaphthalene	1	ug/l
Acenaphthylene	1	ug/l
Acenaphthene	1	ug/l
Dimethyl phthalate	1	ug/l
2,6-Dinitrotoluene	1	ug/l
Fluorene	1	ug/l
4-Chlorophenyl phenyl ether	1	ug/l
2,4-Dinitrotoluene	1	ug/l
Diethyl phthalate	1	ug/l
N-Nitrosodiphenylamine	1	ug/l
Hexachlorobenzene	1	ug/l
a-BHC	1	ug/l
4-Bromophenyl phenyl ether	1	ug/l
y-BHC	1	ug/l
Phenanthrene	1	ug/l
Anthracene	1	ug/l
B-BHC	1	ug/l
Heptachlor	1	ug/l
d-BHC	1	ug/l
Aldrin	1	ug/l
Dibutyl phthalate	1	ug/l
Heptachlor epoxide	1	ug/l
Endosulfan I	1	ug/l
Fluoranthene	1	ug/l
Dieldrin	1	ug/l
4,4'-DDE	1	ug/l
Pyrene	1	ug/l
Endrin	1	ug/l

**VOCs : Std Method 6210 D-Purge and Trap Capillary
Column GCMS.Screening per USEPA 524.2 list.**

Parameter	limit of detectio n	units
Dichlorodifluoromethane	10.0	ug/l
Chloromethane	0.5	ug/l
Ethyl Chloride/Chloroethane	0.5	ug/l
Vinyl Chloride/Chloroethene *(0.5ppb)	0.5	ug/l
Vinyl Chloride/Chloroethene * (25ppb)	0.5	ug/l
Bromomethane	0.5	ug/l
Trichloromonofluoromethane	0.5	ug/l
Ethyl Ether/Diethyl Ether	0.5	ug/l
11 Dichloroethene	0.5	ug/l
Acetone	2.0	ug/l
Iodomethane/Methyl Iodide	0.5	ug/l
Carbon Disulphide	0.5	ug/l
Allyl Chloride	0.5	ug/l
Methylene Chloride/DCM	5.0	ug/l
2-Propenenitrile/Acrylonitrile	2.0	ug/l
Chlormethyl Cyanide/Chloroacetonitrile	0.5	ug/l
Nitrobenzene	0.5	ug/l
Propanenitrile	10.0	ug/l
Hexachlorobutadiene	0.5	ug/l
Trans-1,2 Dichloroethene	0.5	ug/l
MtBE	0.5	ug/l
11 Dichloroethane	0.5	ug/l
22 Dichloropropane	0.5	ug/l
cis-12 Dichloroethene	0.5	ug/l
2-Butanone	5.0	ug/l
Methyl Acrylate	5.0	ug/l
Bromochloromethane	0.5	ug/l
Methacrylonitrile	5.0	ug/l
Tetrahydrofuran	5.0	ug/l
Trichloromethane/ Chloroform*	1.0	ug/l
111 Trichloroethane	0.5	ug/l
1-Chlorobutane	0.5	ug/l
Carbon Tetrachloride	0.5	ug/l
11 Dichloropropene	0.5	ug/l
Benzene	0.1	ug/l
12 Dichloroethane)	0.1	ug/l
Trichloroethylene/ Trichloroethene	0.1	ug/l
12 Dichloropropane	0.5	ug/l
Dibromomethane	0.5	ug/l
Methyl Methacrylate	0.5	ug/l
Bromodichloromethane*	2.0	ug/l
13 Dichloropropene,cis	2.0	ug/l

Landfill - Muingnaminnane Landfill

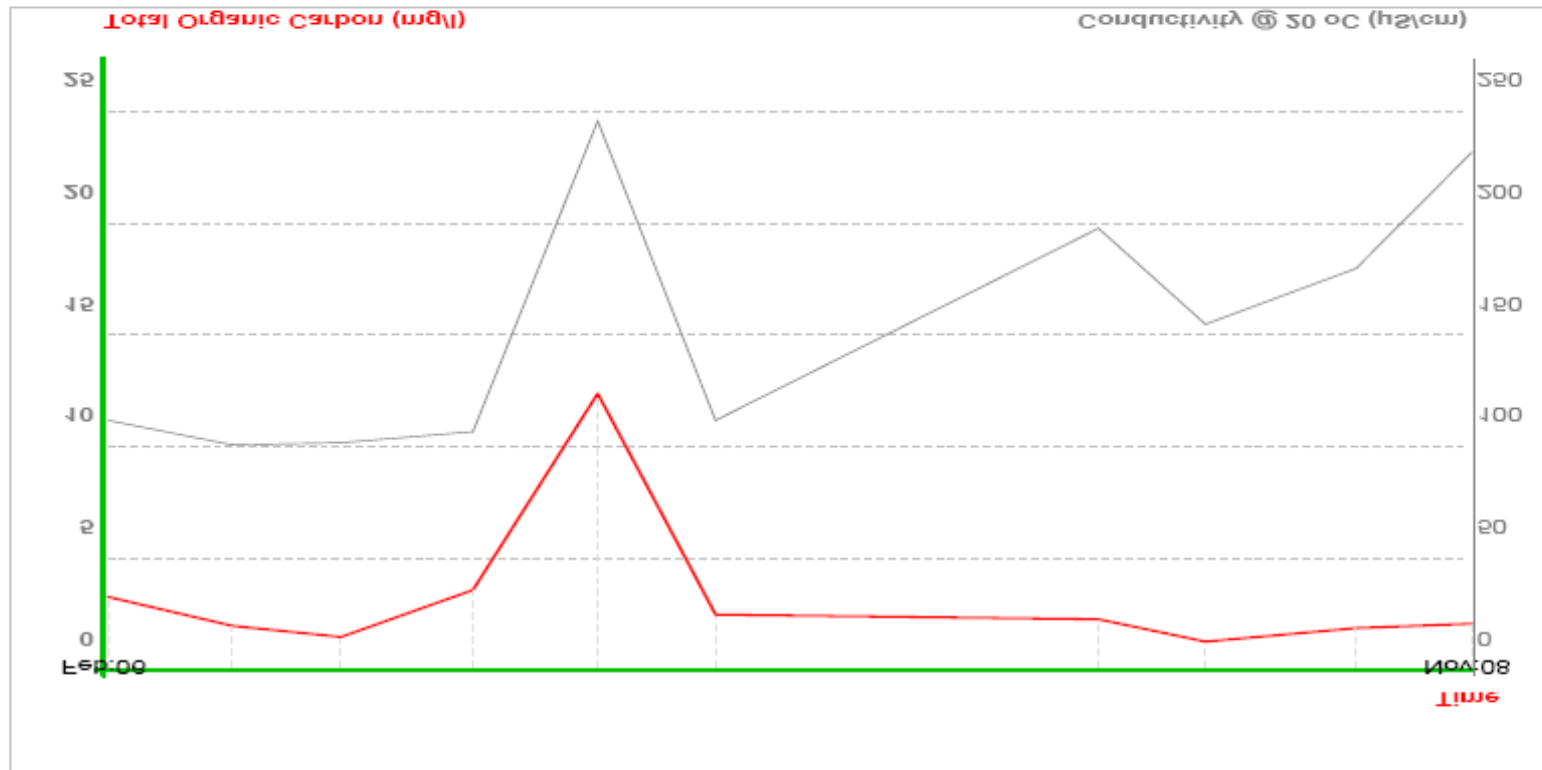
Parameter Trend Graph - Total Organic Carbon (mg/l)
Sample Location : Groundwater - BH-1 : 2 Selected Templates



Summary Statistics :	No. of Samples : 11	Maximum Result : 17.7	Mean : 7.01
		Minimum Result : < 1	Median : 6.8
			Standard Deviation : 5.61

Landfill - Muingnaminnane Landfill

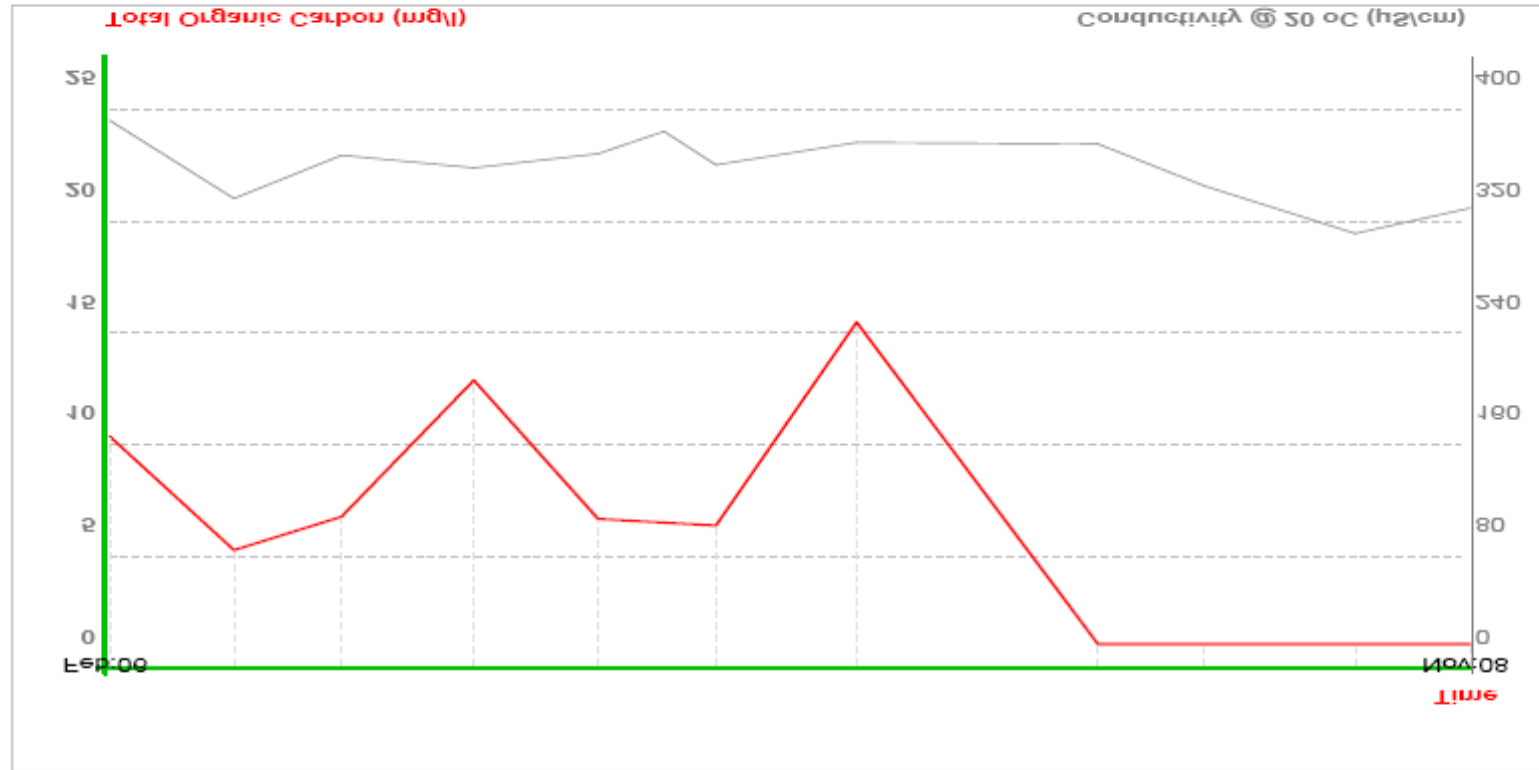
Parameter Trend Graph - Total Organic Carbon (mg/l)
Sample Location : Groundwater - BH-2 : 2 Selected Templates



Summary Statistics :	No. of Samples : 10	Maximum Result : 12.3	Mean : 3.19
		Minimum Result : 1.2	Median : 2.1
			Standard Deviation : 3.28

Landfill - Muingnaminnane Landfill

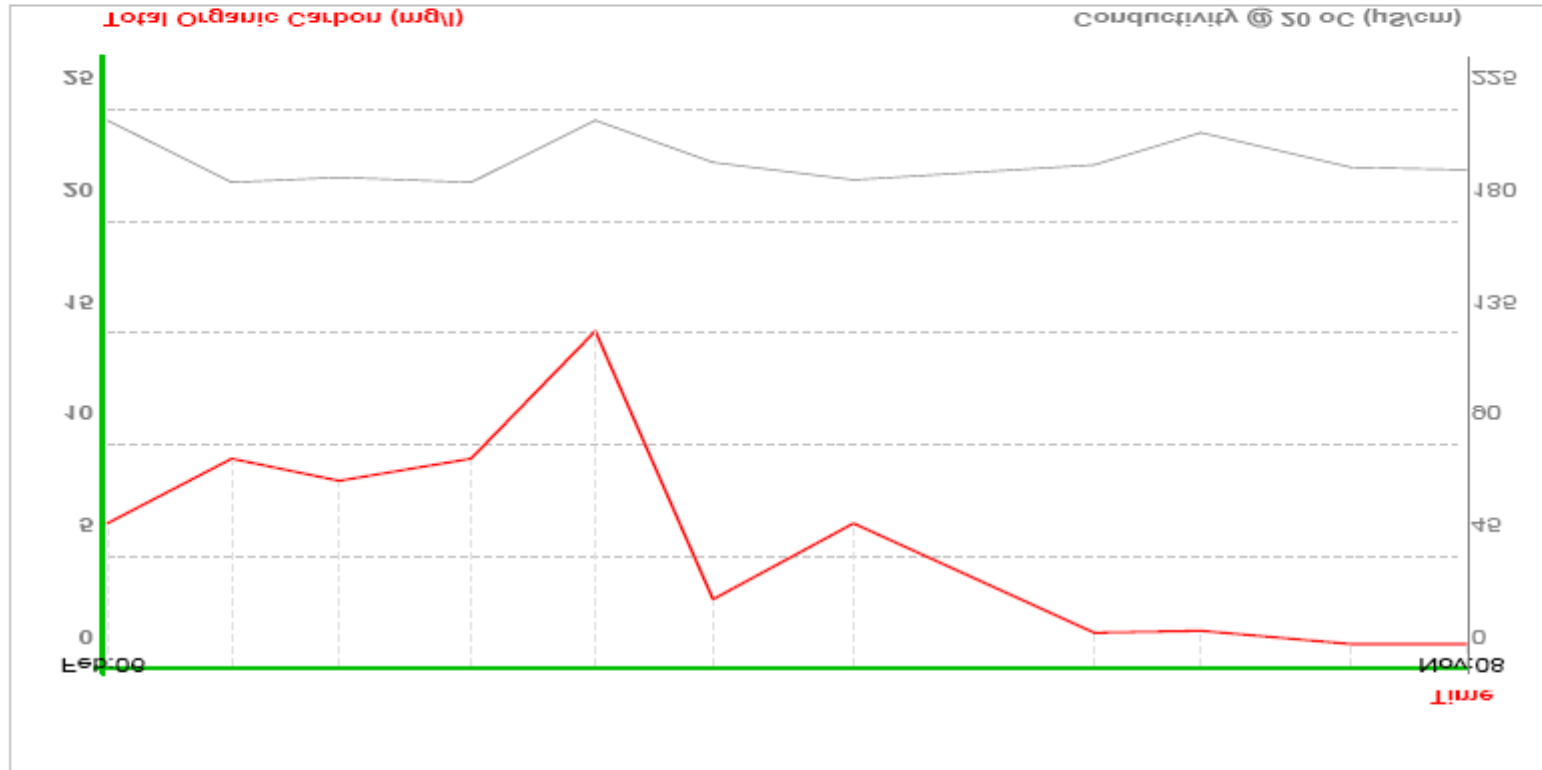
Parameter Trend Graph - Total Organic Carbon (mg/l)
Sample Location : Groundwater - BH-3 : 2 Selected Templates



Summary Statistics :		No. of Samples	Maximum Result	Mean
		: 11	: 15.4	: 5.94
			Minimum Result	Median
			: < 1	: 6.3
				Standard Deviation
				: 5.25

Landfill - Muingnaminnane Landfill

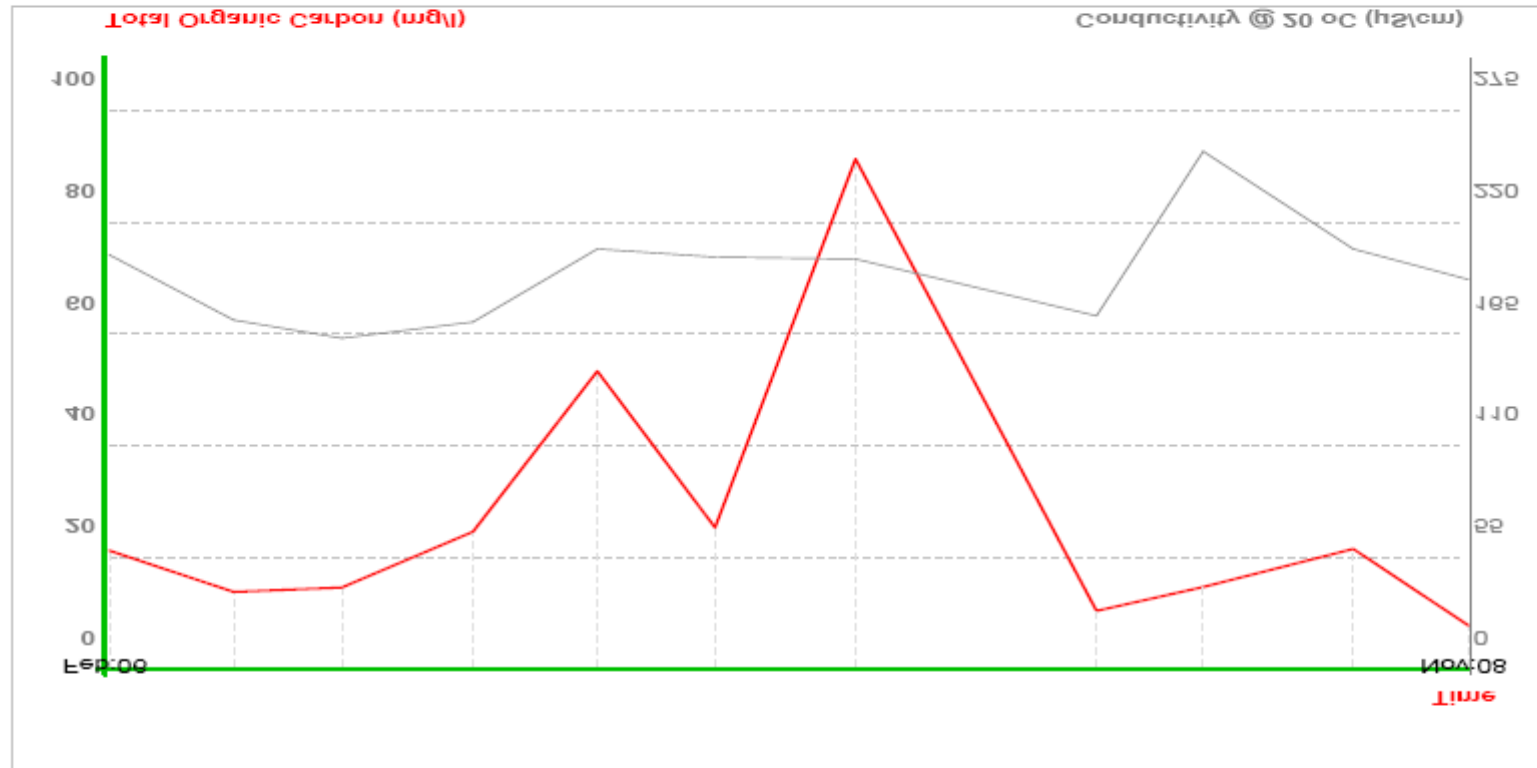
Parameter Trend Graph - Total Organic Carbon (mg/l)
Sample Location : Groundwater - BH-4 : 2 Selected Templates



Summary Statistics :	No. of Samples : 11	Maximum Result : 15	Mean : 5.62
		Minimum Result : < 1	Median : 6.4
			Standard Deviation : 4.65

Landfill - Muingnaminnane Landfill

Parameter Trend Graph - Total Organic Carbon (mg/l)
Sample Location : Groundwater - BH-5 : 3 Selected Templates



Summary Statistics :	No. of Samples	Maximum Result	Mean
	: 11	: 91	: 26.8
		Minimum Result	Median
		: 7.5	: 20.9
			Standard Deviation
			: 24.5

Appendix VIII

Noise Monitoring Report



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NORTH KERRY LANDFILL 2008 ANNUAL NOISE SURVEY

Technical Report Prepared For

**Kerry County Council
Town Hall
Tralee
Co. Kerry**

Technical Report Prepared By

Niall Vaughan BSc, AMIOA

Our Reference

NV/08/4504NR01

Date Of Issue

2nd October 2008



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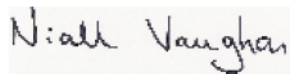
AWN Consulting Limited
Registered in Ireland No. 319812
Directors: F. Callaghan, C. Dilworth,
I. Durnolly, L. Porter
Associate Director: D. Kelly

EXECUTIVE SUMMARY

The North Kerry Landfill site in Muingnaminnane, Tralee, Co. Kerry, is subject to an IPPC Licence. The licence requirements in relation to noise are outlined in Condition 9.4 of the licence detailed below. Under the terms of the condition, the facility is required to conduct an annual noise monitoring survey at a number of designated noise monitoring locations in the vicinity of the facility to demonstrate compliance with the appropriate noise limits.

An environmental noise survey was carried out at the designated noise monitoring locations during the month of September 2008. The survey data has been analysed and it may be concluded that the North Kerry landfill facility would comply with the noise sections of their IPC Licence at their designated noise monitoring locations.

Report Prepared By:



NIALL VAUGHAN
Acoustic Consultant

Report Checked By:



BRIAN JOHNSON
Senior Acoustic Consultant

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1.0 INTRODUCTION

Kerry County Council has commissioned AWN Consulting Limited to undertake the annual noise monitoring survey at its landfill site in Muingnaminnane, Tralee, Co. Kerry. The purpose of this survey is to comply with the annual noise monitoring requirements of the applicable Waste Licence (Register No. W11-3) as issued by the Environmental Protection Agency (EPA). The operations on site typically take place between 08:00hrs to 17:00hrs Monday to Friday and 09:00hrs to 13:00hrs Saturday.

The detail of Condition 9.4 of the Muingnaminnane Waste Licence as laid down by the Environmental Protection Agency (EPA) is as follows:

- *The licensee shall ensure that the activities shall be carried out in a manner such that emissions including dust, noise and odours do not result in significant impairment of, or significant interference with amenities or the environment beyond the facility boundary.*

Schedule G.3 details the following noise emission limits:

- *Daytime* 55dB L_{Aeq} (30 minutes)
- *Night time* 45dB L_{Aeq} (15 minutes)

Typical conditions applied by the EPA in relation to noise would be as follows:

- *There shall be no clearly audible tonal component in the noise emissions from the activity at any noise sensitive location.*
- *There shall be no clearly audible impulsive component in the noise emissions from the activity at any noise sensitive location.*
- *A noise survey of site operations shall be carried out on an annual basis.*

2.0 SURVEY DETAILS

An environmental noise survey was conducted in order to quantify the existing noise environment. The survey was conducted generally in accordance with ISO 1996: 1982: *Acoustics – Description and measurement of environmental noise* and the EPA guidance note – *Guidance Note For Noise In Relation To Scheduled Activities*: Specific details are set out below.

2.1 Choice of Measurement Locations

Measurements were conducted at three boundary locations and two noise sensitive locations in the vicinity of the Muingnaminnane Landfill Site.

Note: Location S2 was introduced for the 2008 survey as the tip had extended in a northerly direction. The private dwelling near to S2 is now the nearest noise sensitive location.

2.1.1 Location N1

This measurement location is located on the eastern boundary of the site. The location is adjacent open marsh, bog land and a planted forestry; the open area extends approximately 1 kilometre to the south - east, where the nearest residences are visible.

2.1.2 Location N2

This measurement location is also located on the eastern boundary. It has a line of sight to the site. It is located directly east of the current site activities. The boundary is adjacent open marsh and bog land; the open area extends approximately 1 kilometre to the east, where the nearest residences are visible.

2.1.3 Location N3

This measurement position is located on the western boundary of the landfill site. The active tip head has moved east away from this location. The location is adjacent a planted forestry and is also the boundary nearest the sensitive area S1.

2.1.4 Location S1 (NSL)

This noise sensitive location is adjacent to the nearest private occupied residence. It is situated on the approach road from Tralee to the facility.

2.1.5 Location S2 (NSL)

Location S2 is situated near to the northern boundary of the landfill site. It is accessed off the main road and is located in close proximity to the nearest private residence at this side of the landfill site. S2 is the nearest noise sensitive location.

2.2 **Survey Period**

Measurements were conducted over the course of the survey period as follows:

- 12:00hrs to 15:30hrs on 23/09/08
- 07:00hrs to 07:45hrs on 23/09/08

During the survey period it was noted the facility was in full operation.

The weather throughout the survey period was generally dry and calm.

Note that the landfill site has a landfill gas flare, which operates intermittently 24 hours a day. Therefore night-time measurements were conducted at locations S1, S2 and N3.

2.3 **Personnel and Instrumentation**

Niall Vaughan (AWN) conducted the noise level measurements during both the daytime and night - time survey periods.

The measurements were performed using a Brüel & Kjær Type 2260 Investigator Sound Level Meter. Before and after the survey the measurement apparatus was check calibrated using a Brüel & Kjær Type 4231 Sound Level Calibrator.

2.4 **Procedure**

Sample periods were 30 and 15 minutes long during the daytime and night - time survey periods respectively. The results were saved to the instrument memory for later analysis. Survey personnel noted all primary noise sources contributing to noise build-up.

2.5 Measurement Parameters

The survey results are presented in terms of the following five parameters:

L_{Aeq} is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.

L_{Amax} is the instantaneous maximum sound level measured during the sample period.

L_{Amin} is the instantaneous minimum sound level measured during the sample period.

L_{A10} is the sound level that is exceeded for 10% of the sample period. It is typically used as a descriptor for traffic noise.

L_{A90} is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

The "A" suffix denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to 2×10^{-5} Pa.

2.6 Results

2.6.1 Location N1

The results of measurements conducted at location N1 are summarised in Table 1.

Time	Period	Measured Noise Levels (dB re. 2×10^{-5} Pa)					Noise Sources
		L_{Aeq}	L_{Amax}	L_{Amin}	L_{A10}	L_{A90}	
15:15 – 15:45	Day	55	76	52	57	53	Landfill activity. Pest Control.

Table 1 Summary of results for Location N1

At the noise monitoring location N1 the ambient noise environment was dominated by the landfill activities. The main activities were track plant operating in the tip area and refuse trucks accessing the site. The reports from a shotgun, which is used for pest control, were also noted as an occasional contributor to the noise levels. The shotgun reports were regarded as being impulsive but were not audible at the noise sensitive locations.

Noise levels were of the order of 55dB L_{Aeq} and 53dB L_{A90} . No clearly audible tonal component was noted during this measurement period.

2.6.2 Location N2

The results of measurements conducted at location N2 are summarised in Table 2.

Time	Period	Measured Noise Levels (dB re. 2×10^{-5} Pa)					Noise Sources
		L _{Aeq}	L _{Amax}	L _{Amin}	L _{A10}	L _{A90}	
15:50 – 16:20	Day	53	79	50	54	51	Landfill traffic. Landfill activities. Birdsong.

Table 2 Summary of results for Location N2

Vehicular movements around the perimeter of the landfill were observed as the dominant source of noise for the duration of the monitoring period. Noise emanating from the activities within the tip were regarded as a background noise source. Birdsong was perceptible but was considered as a minor contributory noise source.

Noise levels were of the order of 53dB L_{Aeq} and 51dB L_{A90}. No clearly audible tonal or impulsive characteristics were noted during this measurement period.

2.6.3 Location N3

The results of measurements conducted at location N3 are summarised in Table 3.

Time	Period	Measured Noise Levels (dB re. 2×10^{-5} Pa)					Noise Sources
		L _{Aeq}	L _{Amax}	L _{Amin}	L _{A10}	L _{A90}	
11:45 – 12:15	Day	43	61	33	44	36	Traffic. Birdsong. Landfill.
22:48 – 23:03	Night	33	47	27	33	33	General ambient. Traffic.

Table 3 Summary of results for Location N3

At location N3 road traffic movements from the nearby main road dominated the noise environment for the daytime period. Birdsong and activities from the landfill site were noted as background noise sources.

Noise levels were of the order of 43dB L_{Aeq} and 36dB L_{A90}. No clearly audible tonal or impulsive characteristics were noted during this measurement period.

For the duration of the night-time monitoring period there were no individual noise sources of any impact. The noise environment was considered to be consistent with a rural environment. Distant road traffic was faintly perceptible on a couple of occasions but had minimal impact on the noise measurement. The landfill site was not audible at this location during the monitoring period.

Noise levels were of the order of 33dB L_{Aeq} and 33dB L_{A90}. No clearly audible tonal or impulsive characteristics were noted during this measurement period.

2.6.4 Location S1

The results of measurements conducted at location S1 are summarised in Table 4.

Time	Period	Measured Noise Levels (dB re. 2×10^{-5} Pa)					Comments
		L _{Aeq}	L _{Amax}	L _{Amin}	L _{A10}	L _{A90}	
11:01 – 11:31	Day	61	74	38	62	52	Traffic. Sheep.
22:15 – 22:30	Night	34	53	29	34	32	House boiler. Traffic.

Table 4 Summary of results for Location S1

Noise emissions from road traffic movements was the dominant noise source at this location. Noise from sheep bleating in a nearby field was present as a background noise source. The landfill site was not audible during this monitoring period.

Noise levels were of the order of 61dB L_{Aeq} and 52dB L_{A90}. No clearly audible tonal or impulsive characteristics were noted during this measurement period.

The operation of a domestic boiler was the main source of noise during the night-time period. Distant traffic noise provided a small amount of background noise. The landfill site was not audible at this location during the monitoring period.

Noise levels were of the order of 34dB L_{Aeq} and 32dB L_{A90}. No clearly audible tonal or impulsive characteristics were noted during this measurement period.

2.6.5 Location S2

The results of measurements conducted at location S1 are summarised in Table 5.

Time	Period	Measured Noise Levels (dB re. 2×10^{-5} Pa)					Comments
		L _{Aeq}	L _{Amax}	L _{Amin}	L _{A10}	L _{A90}	
16:30 – 17:00	Day	51	62	42	51	47	Landfill
23:18 – 23:33	Night	29	39	27	29	28	General ambient.

Table 5 Summary of results for Location S2

The landfill site was considered to be the dominant noise source at S2 during the daytime period. The noise consisted of the operations of the tracked plant and vehicles moving around the landfill site.

Noise levels were of the order of 51dB L_{Aeq} and 47dB L_{A90}. No clearly audible tonal or impulsive characteristics were noted during this measurement period.

In common with the night-time monitoring period at N3 there were no individual noise sources of any impact. The noise environment was considered to be consistent with a rural environment. The landfill site was not audible at this location during the monitoring period.

Noise levels were of the order of 34dB L_{Aeq} and 32dB L_{A90}. No clearly audible tonal or impulsive characteristics were noted during this measurement period.

3.0 DISCUSSION AND CONCLUSIONS

Table 6 and 7 below illustrate that all locations are in compliance with the daytime and night-time criterion of 55dB L_{Aeq} (30 minutes) and 45dB L_{Aeq} (30 minutes) respectively. It should be noted that the activities from the landfill site were not audible at any stage during the monitoring periods at S1 or at S2 the nearest noise sensitive location.

Reference	Limit L_{Aeq} (dB) 30 minutes	L_{Aeq} (dB)	L_{A90} (dB)
N1	55	55	53
N2		53	51
N3		43	36
S1		61	52
S2		51	47

Table 6 Comparison of Measured daytime L_{Aeq} and L_{A90} levels with Limit values

Reference	Limit L_{Aeq} (dB) 15 minutes	L_{Aeq} (dB)	L_{A90} (dB)
N3	45	33	33
S1		34	32
S2		29	28

Table 7 Comparison of Measured night time L_{Aeq} and L_{A90} levels with Limit values

**FIGURE 1
LANDFILL SITE**



NV/08/4504NR01

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APPENDIX A

1/3 Octave Centre Frequency Data

Daytime

Ref.	1/3 Octave Band Frequency Data																				
	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	
S1	34	36	38	40	40	43	45	46	46	47	47	48	47	47	46	43	41	38	35	31	
S2	19	16	19	20	23	24	22	24	25	25	26	26	26	23	21	20	19	19	19	13	
N3	12	14	13	14	15	17	18	17	20	20	20	20	20	19	19	19	18	15	13	13	
N1	33	32	33	34	31	31	32	34	38	37	38	37	37	37	37	36	34	32	30	28	
N2	30	30	30	32	33	33	36	38	39	39	40	40	39	39	40	39	37	37	33	28	

Night - time

Ref.	1/3 Octave Band Frequency Data																				
	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	
S1	24	22	21	21	22	22	23	25	26	28	31	32	34	32	33	31	29	28	25	26	
S2	12	11	12	12	13	12	15	14	14	18	17	20	22	21	20	22	21	18	14	13	
N3	18	20	19	22	22	23	25	26	26	29	29	28	26	25	26	25	23	19	19	16	

Appendix IX

Dust Monitoring Report:

Appendix X

Annual Rainfall and True Evaporation:

Month	Rainfall mm	True Evaporation mm
January	292.4	9.49
February	116.0	11.2
March	169.1	26.3
April	59.9	52.3
May	51.8	82.88
June	134.8	67.34
July	171.6	55.3
August	258.8	26.62
September	177.7	32.86
October	339.7	11
November	158.5	5.3
December	145.6	-1.05
Total	2078.9	348.96

Table 14 Annual rainfalls and true evaporation as measured on site

Appendix XI

Complaints/Complainants:

No.	Date	Complainant	Address	Nature	Dealt by
1	08/02/08	Brain O Connor	Glangeerty, Rathany, Ballymcelligot.	Illegal Dumping	Conal Murphy
2	11/02/08	Paudie Brosnan	Lissahane Listowel	Bag of rubbish on road	Conal Murphy
3	15/02/08	Dan O Callaghan	Reamore Kielduff	Odour	Conal Murphy
4	12/03/08	Tom Herlihy	Meenathee Rathany	Windblown Litter	Conal Murphy
5	20/03/08	James Leen		Secured Trailers	Conal Murphy
6	27/03/08	Maurice Sweeney		Odour	Conal Murphy
7	04/04/08	James Leen		Illegal Dumping	Conal Murphy
8	05/04/08	Don Brosnan		Odour	Conal Murphy
9	07/04/08	Dorris Blackwell		Odour	Conal Murphy
10	15/04/08	Noel Keane	Email	Odour	Conal Murphy
11	15/04/08	Patrick Casey	Dromaddamore Lyrecroumpane	Odour	Conal Murphy
12	16/04/08	Kathleen Herlihy	Meenathee Rathany	Odour	Conal Murphy
13	16/04/08	Jerry Sugrue	Keans Kielduff	Odour	
14	23/04/08	James Leen		Illegal Dumping	Tara McCarthy
15	23/04/08	Eileen Breen	Caher	Odour	
16	24/04/08	Maurice Sweeney	Maugha	Odour	
17	10/05/08	John Lyons	Kielduff	Illegal Dumping	Tralee AO
18	14/05/08	Eileen Breen	Caher	Odour	Conal Murphy
19	15/05/08	Dan O Callaghan	Reamore Kielduff	Odour	Conal Murphy
20	16/05/08	Maurice Harrington	Kielduff	Illegal Dumping	Enforcement
21	16/05/08	Noel Keane	Email	Odour	Conal Murphy
22	22/05/08	James Leen		Illegal Dumping	Conal Murphy
23	30/05/08	Noel Keane	Email	Odour	Conal Murphy

24	30/5/08	Dan O Callaghan	Reamore Kielduff	Odour	
25	30/05/08	Jerry Sugrue	Keam Rathany	Odour	
26	03/06/08	James Leen	Reamore	Illegal Dumping	Conal Murphy
27	12/06/08	Pat Daly		Infrastructure	Conal Murphy
28	13/06/08	James Leen		Illegal Dumping	Conal Murphy
29	07/07/08	Maurice Sweeney	Knocknacurran Lyre	Odour	Conal Murphy
30	27/08/08	Margaret Carmody		Flies	Conal Murphy
31	08/09/08	Dan O Callaghan	Reamore Kielduff	Odour	
32	08/09/08	Tom Herlihy		Odour	
33	16/09/08	Tom Herlihy		Odour	
34	17/09/08	Doris Blackwell		Odour	Tara McCarthy
35	18/09/08	Linda O Connor	Glenageenty	Odour	Tara McCarthy
36	22/09/08	Doris Blackwell		Odour	Conal Murphy
37	24/09/08	Dan O Callaghan	Reamore Kielduff	Odour	Conal Murphy
38	14/10/08	Rita Heffernan	Cahir Ballymacelligot	Odour	Tara McCarthy
39	14/10/08	Mr & Mrs Reidy	Muingnaminnane	Odour	Tara McCarthy
40	14/10/08	Anonymous		Illegal Dumping	Enforcement
41	15/10/08	Mary Jo Walsh	Kerries Tralee	Leachate truck noise	Tara McCarthy
42	31/10/08	Don Brosnan		Odour	Tara McCarthy
43	6/11/08	Mary Jo Walsh	Kerrie Tralee	Leachate Trucks noise	Tara McCarthy
44	11/11/08	Breda O Connor	Knocknagoshel	Main road condition	Tara McCarthy
45	4/12/08	James Leen	Rathmore Tralee	Illegal dumping	Tara McCarthy
46	31/12/08	Dan O Callaghan	Reamore Kielduff	Odour	Tara McCarthy

Appendix XII

Total Operational Cost Disposal NKL 2008:

Accelem	Accelem(T)	Job(T)	Total Charge Euro
60030	Wages	North Kerry Landfill	185,353.81
60040	Salaries	North Kerry Landfill	59,968.31
60100	ER PRSI	North Kerry Landfill	34,909.46
60200	Overtime	North Kerry Landfill	67,096.30
60300	Arrears	North Kerry Landfill	1,048.16
60400	Sick Pay	North Kerry Landfill	5,196.37
60500	Annual Leave	North Kerry Landfill	20,635.52
60510	Bank Holiday Leave	North Kerry Landfill	1,047.17
60600	Travel/Subsistence	North Kerry Landfill	5,205.15
60700	Eating on site allowance	North Kerry Landfill	2,414.90
65500	Minor Contracts- Trade Services & other works	North Kerry Landfill	600,054.51
65965	Transfer to/from Cap/Rev (Exp)	North Kerry Landfill	143,725.00
67500	Non-Capital Equip Purchase - Computers	North Kerry Landfill	1,474.14
68500	Non-Capital Equip Purchase - Other	North Kerry Landfill	7,159.68
69000	Hire (Ext) - Plant/Transport/Machinery & Equipment	North Kerry Landfill	12,940.79
69200	Repairs & Maint - Plant	North Kerry Landfill	27,922.22
69250	Repairs & Maint -Computer Equip	North Kerry Landfill	2,395.80
69260	Repairs & Maint - Other Equip	North Kerry Landfill	22,845.43
69400	Transfers from Machinery Yard	North Kerry Landfill	7,501.25
69600	Other Vehicle Expenses	North Kerry Landfill	641
70000	Materials	North Kerry Landfill	134,886.30
70990	Issues from Stores	North Kerry Landfill	11,230.80
70991	Returns to Stores	North Kerry Landfill	-134.11
71000	Insurance	North Kerry Landfill	2,181.14
73400	Staff Travelling & Subsistence Expenses	North Kerry Landfill	5,675.39
75000	Computer Software and Maintenance Fees	North Kerry Landfill	707.85
76000	Communication Expenses	North Kerry Landfill	2,438.36

77100	Courier	North Kerry Landfill	3,766.81
77200	Security - Property	North Kerry Landfill	36,160.94
78000	Training	North Kerry Landfill	10,429.08
79900	Consultancy/Professional Fees and Expenses	North Kerry Landfill	38,736.03
80000	Advertising	North Kerry Landfill	678.81
81000	Printing & Office Consumables	North Kerry Landfill	942.81
82100	Statutory Contributions to Other Bodies	North Kerry Landfill	18,701.00
85200	Cleaning	North Kerry Landfill	3,384.70
86000	Energy	North Kerry Landfill	96,796.18
99000	Miscellaneous Expenses	North Kerry Landfill	75,000.00
99050	Refunds	North Kerry Landfill	1,035.00
		North Kerry Landfill	1,652,152.05

Total Operation Cost Recycling 2008

Accelem	Accelem(T)	Job(T)	Total Charge
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			Euro
60030	Wages	North Kerry Landfill Recycling	22,136.20
60040	Salaries	North Kerry Landfill Recycling	3,627.00
60100	ER PRSI	North Kerry Landfill Recycling	3,985.55
60200	Overtime	North Kerry Landfill Recycling	8,843.09
60300	Arrears	North Kerry Landfill Recycling	309.19
60400	Sick Pay	North Kerry Landfill Recycling	0
60500	Annual Leave	North Kerry Landfill Recycling	1,860.20
60600	Travel/Subsistence	North Kerry Landfill Recycling	19
60700	Eating on site allowance	North Kerry Landfill Recycling	311.6
65500	Minor Contracts- Trade Services & other works	North Kerry Landfill Recycling	8,876.96
68500	Non-Capital Equip Purchase - Other	North Kerry Landfill Recycling	306.98
69000	Hire (Ext) - Plant/Transport/Machinery & Equipment	North Kerry Landfill Recycling	4,471.62
69200	Repairs & Maint - Plant	North Kerry Landfill Recycling	482
69260	Repairs & Maint - Other Equip	North Kerry Landfill Recycling	0
69400	Transfers from Machinery Yard	North Kerry Landfill Recycling	280.25
70000	Materials	North Kerry Landfill Recycling	9,554.37
70990	Issues from Stores	North Kerry Landfill Recycling	386.64
73400	Staff Travelling & Subsistence Expenses	North Kerry Landfill Recycling	301.97
75000	Computer Software and Maintenance Fees	North Kerry Landfill Recycling	0
76000	Communication Expenses	North Kerry Landfill Recycling	700.53
77100	Courier	North Kerry Landfill Recycling	450.53
77200	Security - Property	North Kerry Landfill Recycling	6,039.93
78000	Training	North Kerry Landfill Recycling	183.79
80000	Advertising	North Kerry Landfill Recycling	0
81000	Printing & Office Consumables	North Kerry Landfill Recycling	119.66
85200	Cleaning	North Kerry Landfill Recycling	305.05
86000	Energy	North Kerry Landfill Recycling	3,557.58
		North Kerry Landfill Recycling	77,109.68

Adopted budget for 2009 Disposal Activities:

Accele m	Accelem(T)	Job	Job(T)	Adopted Estimate
60030	Wages	5111009J	North Kerry Landfill	301,531.00
65500	Minor Contracts- Trade Services & other works	5111009J	North Kerry Landfill	411,000.00
65965	Transfer to/from Cap/Rev (Exp)	5111009J	North Kerry Landfill	149,000.00
68500	Non-Capital Equip Purchase - Other	5111009J	North Kerry Landfill	30,000.00
69000	Hire (Ext) - Plant/Transport/Machinery & Equipment	5111009J	North Kerry Landfill	30,000.00
69200	Repairs & Maint - Plant	5111009J	North Kerry Landfill	30,000.00
69260	Repairs & Maint - Other Equip	5111009J	North Kerry Landfill	100,000.00
69400	Transfers from Machinery Yard	5111009J	North Kerry Landfill	8,000.00
69600	Other Vehicle Expenses	5111009J	North Kerry Landfill	2,000.00
70000	Materials	5111009J	North Kerry Landfill	125,163.00
70990	Issues from Stores	5111009J	North Kerry Landfill	20,000.00
70991	Returns to Stores	5111009J	North Kerry Landfill	0
71000	Insurance	5111009J	North Kerry Landfill	2,500.00
73400	Staff Travelling & Subsistence Expenses	5111009J	North Kerry Landfill	350
75000	Computer Software and Maintenance Fees	5111009J	North Kerry Landfill	800
76000	Communication Expenses	5111009J	North Kerry Landfill	2,800.00
77100	Courier	5111009J	North Kerry Landfill	2,000.00
77200	Security - Property	5111009J	North Kerry Landfill	18,000.00
78000	Training	5111009J	North Kerry Landfill	10,000.00
80000	Advertising	5111009J	North Kerry Landfill	600
81000	Printing & Office Consumables	5111009J	North Kerry Landfill	2,400.00
82000	Voluntary Contributions to Other Bodies	5111009J	North Kerry Landfill	80,000.00
82100	Statutory Contributions to Other Bodies	5111009J	North Kerry Landfill	16,000.00
85200	Cleaning	5111009J	North Kerry Landfill	4,000.00
86000	Energy	5111009J	North Kerry Landfill	85,000.00
	Total Adopted Budget			1,431,144.00

Adopted Budget Recycling/Civic Amenity Area:

Accele m	Accelem(T)	Job	Job(T)	Adopted Estimate
60030	Wages	5020001X	North Kerry Landfill Recycling	41,228.00
65500	Minor Contracts- Trade Services & other works	5020001X	North Kerry Landfill Recycling	6,000.00
68500	Non-Capital Equip Purchase - Other	5020001X	North Kerry Landfill Recycling	0
69000	Hire (Ext) - Plant/Transport/Machinery & Equipment	5020001X	North Kerry Landfill Recycling	0
69200	Repairs & Maint - Plant	5020001X	North Kerry Landfill Recycling	0
70000	Materials	5020001X	North Kerry Landfill Recycling	0
73400	Staff Travelling & Subsistence Expenses	5020001X	North Kerry Landfill Recycling	1,000.00
75000	Computer Software and Maintenance Fees	5020001X	North Kerry Landfill Recycling	200
76000	Communication Expenses	5020001X	North Kerry Landfill Recycling	700
77200	Security - Property	5020001X	North Kerry Landfill Recycling	4,500.00
78000	Training	5020001X	North Kerry Landfill Recycling	3,000.00
80000	Advertising	5020001X	North Kerry Landfill Recycling	150
81000	Printing & Office Consumables	5020001X	North Kerry Landfill Recycling	600
82100	Statutory Contributions to Other Bodies	5020001X	North Kerry Landfill Recycling	4,000.00
85200	Cleaning	5020001X	North Kerry Landfill Recycling	1,000.00
86000	Energy	5020001X	North Kerry Landfill Recycling	4,622.00
		5020001X	North Kerry Landfill Recycling	67,000.00

Appendix XIII

