



**Comhairle Contae an Chláir**

---

**Clare County Council**  
**Central Waste Management Facility, Ballyduffbeg, Inagh, Co Clare.**  
**► Annual Environmental Report**  
**2009**

Prepared by:

Environment and Water Services Directorate, Clare County Council.

---

## 1. CONTENTS

---

<b>1.0</b>	<b>Contents</b>	<b>2</b>
<b>2.0</b>	<b>Introduction</b>	<b>4</b>
2.1	Preamble	4
2.2	Reporting Period	4
2.3	Waste activities carried out at CWMF	4
<b>3.0</b>	<b>Materials/Waste transported on/off site</b>	<b>5</b>
3.1	Quantity of disposed waste	5
3.2	Methods of deposition of waste	6
3.3	Civic Amenity Area	6
3.4	Leachate Quantities	8
3.5	Landfill Gas Management January to December 2009	9
3.6	Resource and energy consumption summary	11
<b>4.0</b>	<b>Summary of Monitoring and Emissions</b>	<b>12</b>
4.1	General	12
4.2	Landfill Gas	13
4.3	Landfill Gas Flare	13
4.4	Dust	14
4.5	Noise	15
4.6	Surface Water, Groundwater and Leachate	16
4.6.1	Surface Water	16
4.6.2	Groundwater	21
4.6.3	Leachate	27
4.7	Biological and Ecological Monitoring	31
4.8	Summary details re EPA site visits/audits during 2009	32
<b>5.0</b>	<b>Works programme 2009- 2010</b>	<b>33</b>
5.1	Report of Development works for 2009	33
5.2	Progress to Site restoration	33
5.3	Proposed Development 2010	34
5.4	Site Survey and Remaining Void Capacity	34
<b>6.0</b>	<b>Financial Aspects</b>	<b>35</b>
6.1	Annual Budget and Operating Costs	35
6.2	Portion of Gate Fees for Environmental Improvement Projects	35
<b>7.0</b>	<b>Review</b>	<b>36</b>
7.1	Nuisance Controls	36
7.1.1	Litter Control	36
7.1.2	Birds	36
7.1.3	Vermin	37
7.1.4	Fires	37

## 7.0

### Review (cont'd)

---

7.1.5	Vehicles	37
7.1.6	Odours	37
7.1.7	Dust	38
7.1.8	Visual Intrusion	39
7.1.9	Noise	39
7.1.10	Complaints Register	39
7.2	Environmental Objectives	39
7.3	Programme of public information	43
7.4	Management and staffing structure	44
7.5	Environmental Incidents and Complaints	44
7.6	Waste Reduction and Recovery	45
7.7	Biodegradable Waste/Diversion from Landfill	45
7.8	Landfill Directive	46

## 8.0

### Appendices

---

8.1	Licensed Activities at CWMF
8.2	Water Balance Calculation
8.3	Management Structure
8.4	Summary of Incident Reports
8.5	Monitoring Point Location Map

---

## **2. INTRODUCTION**

---

### **2.1. Preamble.**

The Environmental Protection Agency granted Clare County Council a waste licence for the Central Waste Management Facility (CWMMF) located at Ballyduff Beg, Inagh, County Clare, on 13th June 2001. The waste licence reference number is W0109-01.

This report addresses Condition 2.3 of the waste licence for the facility. Condition 2.3 states that within six months of the date of grant of this licence, the licensee shall submit to the Agency for its agreement, within 13 months of the date of grant of the licence and within one month of the end of each year thereafter, an Annual Environmental Report (AER).

The AER shall include as a minimum the information specified in Schedule B: Content of Annual Environmental Report of this licence and shall be prepared in accordance with any relevant written guidance issued by the Agency.

This report is prepared within the context of Schedule B (Content of the Annual Environmental Report). Where support information is required it is presented in the appendices.

### **2.2. Reporting Period**

This report covers the period January 1<sup>st</sup> to December 31<sup>st</sup> 2009.

### **2.3. Waste Activities carried out at CWMMF.**

Waste activities at the CWMMF are restricted to those outlined in Part 1 Activities of the waste licence, these are reproduced in Appendix 8.1.

Municipal solid non-hazardous waste is accepted at the facility from both commercial and domestic customers and disposed of in engineered lined cells.

The Civic Amenity Area provides recycling receptacles for the collection and recycling of various recyclable waste streams, the materials accepted are detailed in Table 3.3

A composting area has been developed to accept and treat green waste from domestic customers only. It has been operational since January 2006 with a total of 1094t of domestic 'green waste' diverted from landfill between 2006 and the end of 2009.

### 3. MATERIALS/WASTE TRANSPORTED ON/OFF SITE

#### 3.1. Quantity of disposed waste

The quantity of Municipal Solid Waste (MSW) disposed of in 2009 is shown in Table 3.1.

**TABLE 3.1: QUANTITY (TONNES) OF MSW DISPOSED OF IN 2009.**

Month	Domestic Waste	Commercial Waste	Total
January	840	560	1400
February	480	320	800
March	522	348	870
April	564	376	940
May	630	420	1050
June	708	472	1180
July	1530	1020	2550
August	1716	1144	2860
September	1752	1168	2920
October	1626	1084	2710
November	2526	1684	4210
December	2523	1682	4205
<b>Total</b>	<b>15417</b>	<b>10278</b>	<b>25,695</b>

**TABLE 3.2: WASTE VOLUME (TONNES) ACCEPTED FOR LANDFILLING SINCE JULY 2002**

Period	Waste Type			Cumulative Total
	Household	Commercial	Total	
July 2002 - June 2003	31,548	5,799	37,347	37,347
July 2003 - June 2004	33,522	9,764	43,287	80,634
July 2004 - December 2004	19,929	10,055	29,934	110,568
January - December 2005	30,773	22,169	52,942	163,510
January - December 2006	20,227.26	13,484.84	33,712.1	197,222
January - December 2007	26,386	19,903	46,289	243,511
January - December 2008	19,996	13,328	33,324	276,835
January - December 2009	15,417	10,278	25,695	302,530

### **3.2. Method of Deposition of Waste**

Waste is deposited in compacted layers from the base of the cell up. A 37 tonne steel-wheeled compactor is used to compact the waste. A minimum of three passes of the compactor is employed over each load received.

All exposed areas of the active cell are covered daily with a layer of GeoPoly with additional cover material applied to the surface of the geopoly. Larger quantities of cover material are applied over the geopoly on a weekly basis. Up to mid-December 2009, the cover material comprised a 50:50 combination of wood ash and ASR. However ASR has not been used as cover material since that time (see also section 4.8) and ash is now used alone as weekly cover.

Nuisance control measures are employed to reduce to a minimum the effect of landfilling operations. These are detailed in section 7.0

### **3.3. Civic Amenity Area**

All non-commercial customers are directed to the Civic Amenity site. Within the site, various receptacles are provided for collection of recycling materials. The materials accepted for recycling are outlined in Table 3.3. Collection receptacles for household waste deposited by the public are also provided. The collection of Waste Electrical and Electronic Equipment (WEEE) commenced on August 13<sup>th</sup> 2005. All WEEE is stored on site prior to collection by the nominated contractor.

Composting of green waste commenced in January 2006. An Aerated Static Pile system is being employed. The air that is drawn through the composting material is expelled through a biofilter of woodchip to reduce any possible odours. The compost that is produced is used mainly on site for soil conditioning and landscaping purposes. Small quantities of compost have been used in the past by the gardening section of Clare County Council. However all of the material produced in 2009 was used on site as a soil improver. The Council began accepting garden waste in January 2006 with a total of 1381t recovered to the end of 2009.

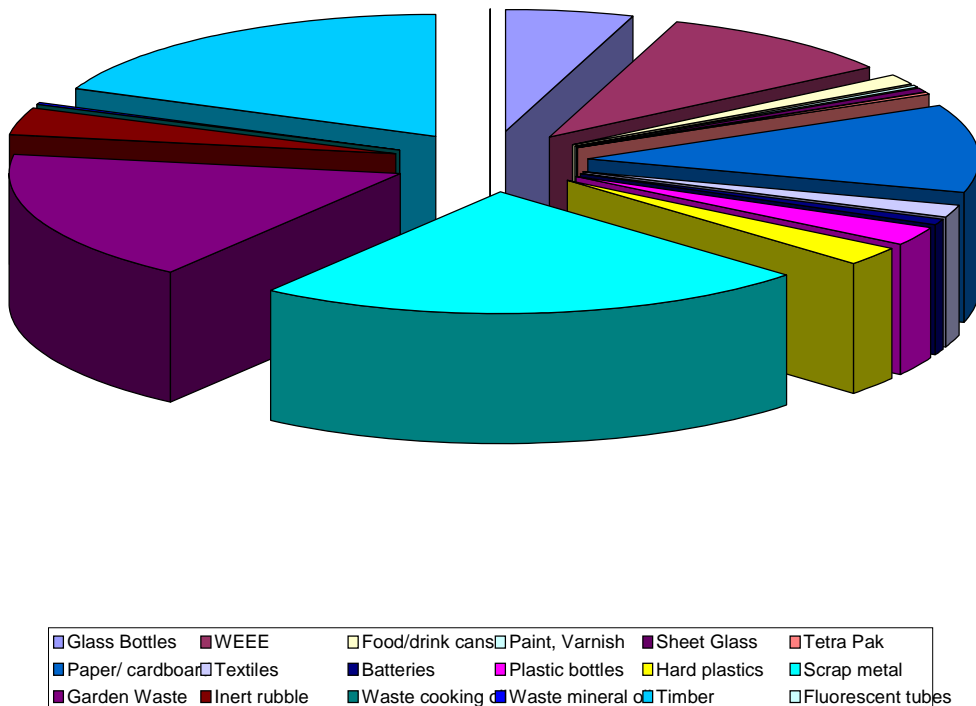
Hard plastics have been accepted at the facility for recovery since mid 2008.

In early 2009, construction & demolition waste from domestic customers was accepted with the agreement of the Agency. A total of approximately 60 tonnes was received during the year. This material was used in the construction of haul roads, mainly within the active cell.

**TABLE 3.3: QUANTITY (TONNES) OF MATERIALS RECOVERED IN 2009**

Material	Quantity	Material	Quantity	Material	Quantity
Glass Bottles	86	Textiles	25	Waste cooking oil	1
WEEE	169	Batteries	14	Waste mineral oil	7
Food/drink cans	21	Plastic bottles	42	Timber	306
Paint, Varnish	5.1	Hard plastics	43	Fluorescent tubes	0.5
Sheet Glass	11	Scrap metal	383	ASR	5,530
Tetra Pak	4	Garden Waste	287	Ash	6,174
Paper/ cardboard	192	Inert rubble	60	<b>Total</b>	<b>13,360</b>

**Fig. 3.1: Quantity of Household Waste Recovered (% by wt)  
January to December 2009**

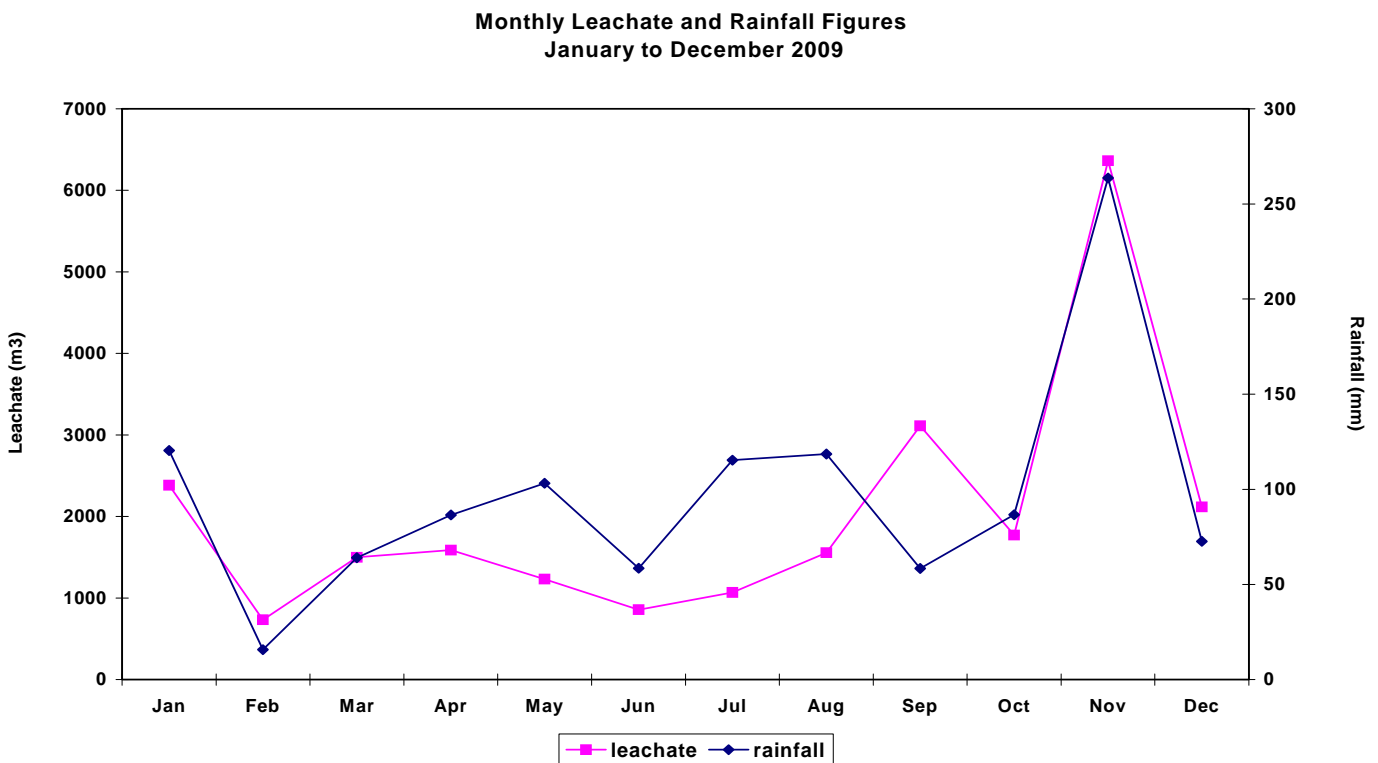


### 3.4. Leachate Quantities.

Leachate collected from within each landfill cell and from designated hard-standing areas around the site is held in two storage tanks in the civic amenity area prior to being transported by Lack Plant Hire (permit number WCP/LK/115/05c) to wastewater treatment plants in Lisdoonvarna, Sixmilebridge and Bunlicky (Limerick City Main Drainage). In total, 24,282 tonnes of leachate was transported off site during 2009. The quantities moved each month are graphed against monthly rainfall in figure 3.2 below.

As would be expected, the tonnage of leachate transported correlates closely with monthly rainfall figures for the year.

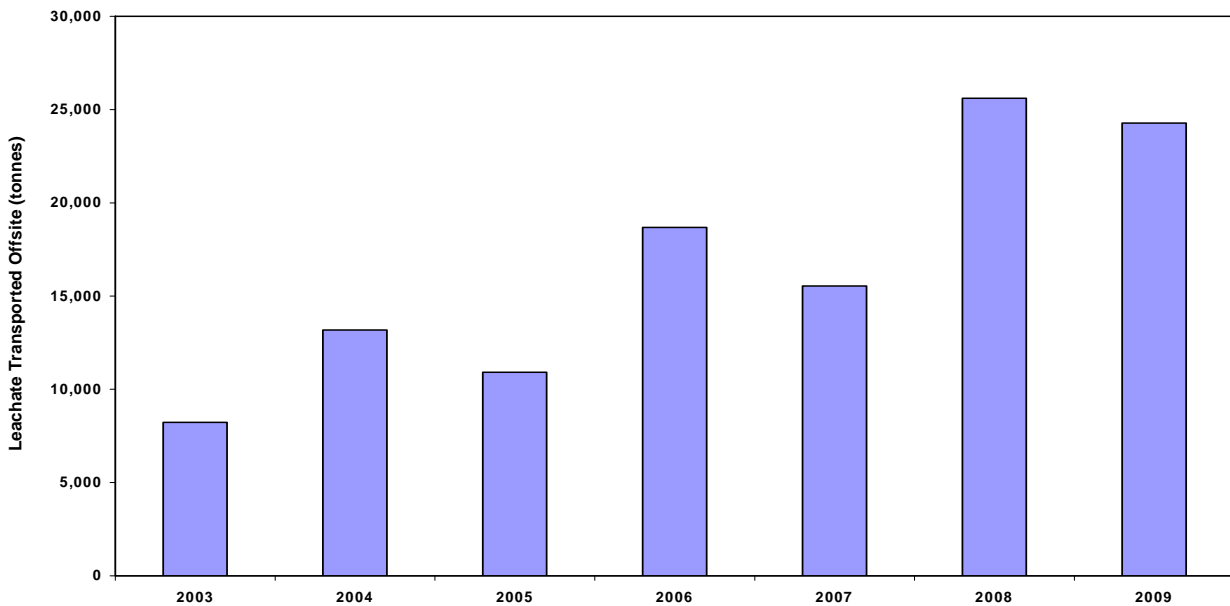
Figure No 3.2: 2009 rainfall and leachate levels:



Annual total leachate volumes from 2003 to 2009 are shown in figure 3.3.



**Fig: 3.3: Annual Leachate Tonnages  
(2003 to 2009)**



The annual tonnage of leachate generated at the site has increased in the past seven years with the development of new cells. The accepted rate of rainfall infiltration (and resultant leachate generation) into a fully capped cell is 10%. Clare County Council is currently using pump run time data generated by our SCADA system to calculate actual infiltration rates. This data will be submitted with the 2010 AER.

A water balance calculation for the site is attached in Appendix 8.2. This calculation gives a theoretical leachate volume for the year of just under 20,000 tonnes, based on Shannon rainfall figures. The actual leachate volume for 2009 was 24,282 tonnes, reflecting the higher rainfall levels experienced at this site. Runoff from capped side slopes into the active cell was also a contributory factor in the increased leachate volumes during the year. A rainflap was installed on the adjoining side slope to the current active cell in January 2010 to address this problem.

### **3.5. Landfill Gas Management, January to December 2009**

The landfill gas flare has been operating on a 24-hour basis since August/September, 2004. The gas collection network was extended during 2009 to include cell 11, with seven gas wells installed in the cell during October 2009. By the end of 2009, landfill gas was being actively extracted from a total of 55 vertical gas extraction wells. The cell 11 wells were connected to the flare via temporary lines in October 2009. Permanent lines have since been installed.

Active gas extraction has been in place in all active cells since February 2009 via a network of horizontal gas extraction lines which are buried in the waste as the cell is constructed. The purpose of this sacrificial gas collection system is to assist in the control of gas odours from active cells.

Filling of cell 11, which began in July 2008, was completed at the end of August 2009. Filling of cell 12 commenced on the 31<sup>st</sup> August 2009. Permanent cap was applied to cell 11 between November and December 2009. This work included the installation of an LLDPE liner (gas barrier layer) to the top and side slopes of the cell.

The flare was upgraded in May 2008 from a total capacity of 750m<sup>3</sup>/hr to 850m<sup>3</sup>/hr and is currently running at 80% of capacity. Because landfill gas rates vary due to differential decomposition of the waste, the level of methane in a waste cell can fluctuate, decreasing over time as the waste becomes substantially biodegraded. Should oxygen levels in the gas feed to the flare rise to 8%v/v, the flare will shut down. The gas field is balanced by site staff on a weekly basis (and more frequently where required) to address this issue and to ensure that methane-rich gas is delivered to the flare. Maintaining the integrity of the pipe network and freeing blocked lines is also an essential element of the gas management system.

During 2009, the flare burned a total of 5,582,829m<sup>3</sup> of landfill gas (average flow of 664m<sup>3</sup>/hr). Mean landfill gas levels of methane and carbon dioxide were 48%v/v and 26%v/v respectively. Average burn temperature in the flare was 1038°C.

By the end of 2009, landfill gas was being extracted from five permanently capped cells in phase one (cells 1, 2, 3, 4 and 5), four permanently capped cell in phase two (cells 6, 7, 8 and 9) and from two permanently capped cells in phase 3 (cells 10 and 11).

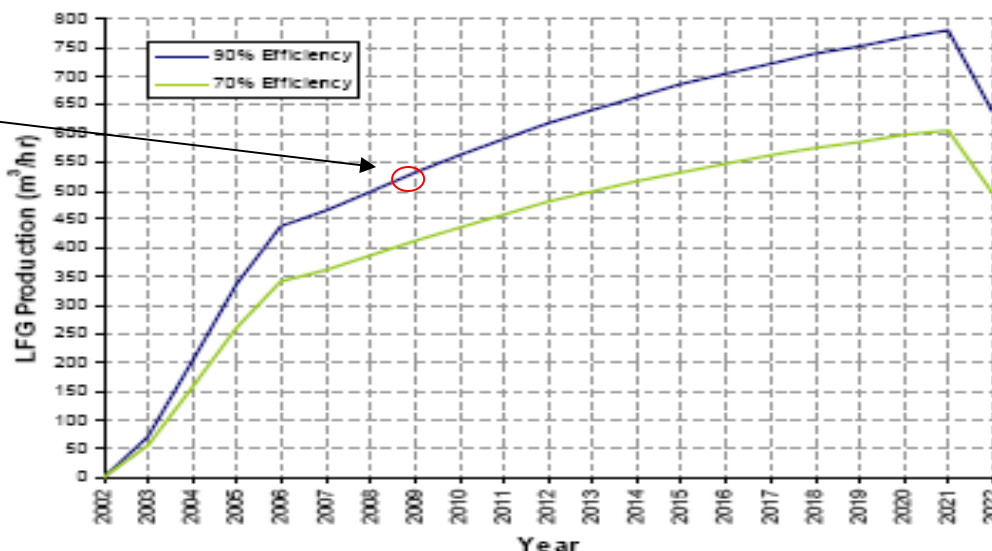
During the year an application was submitted to ESB Networks for a grid connection for an engine with the total generating capacity of 1MW. Clare County Council is presently awaiting a decision on the application.

In February 2008, Tobin Consulting Engineers prepared a supplementary report to their original report on Landfill Gas Utilisation at Ballyduff Beg. Both reports estimated LFG production using the GasSimLite model. The supplementary report utilised sensitivity analysis to evaluate the impact on LFG production of the diversion of biodegradables from landfill. Gas generation was evaluated under a number of different scenarios based on varying tonnages of waste landfilled and on whether or not significant diversion of biodegradables had been achieved. The supplementary report predicts a significant reduction in landfill gas generated when the targets in the National Biowaste Strategy are achieved, up to a 37% reduction in 2021.

The figure below (figure 3.4) illustrates estimated LFG production rates for 2009 based on an annual waste intake of 40,000 tonnes and no diversion of biodegradables from landfill. While diversion of biodegradables commenced in September 2009, it was mainly carried out by the major collectors in urban areas only so of the available scenarios in the model, this one is considered to be most representative of operation between 2002 and end of 2009.

**Figure 3.4: Predicted Landfill Gas Generation, 2002 to 2022**

2009 LFG production: 531m<sup>3</sup>/hr, based on 40,000 TPA waste received with no reduction in biodegradable fraction (to 2009)



### 3.6. Resource and Energy Consumption Summary

The resource and energy consumption is outlined below for diesel and electricity consumption on-site during the year.

**TABLE 3.4: RECORDED DIESEL CONSUMPTION IN 2008**

Plant/Machinery	Unit	Quantity
Generator	litres	400
Water Pump	litres	300
JCB, Tractor, Dumper and Track machine (CCC)	litres	19,303
CCC Site Vehicle (Toyota Pick-up)	litres	1,318
Compactor and Dozer (Lack Plant Hire-Active cell)	litres	35,000
Hyundai Track Machine and Dumper (Kearney Plant Hire)	litres	13,000
<b>Total amount of Diesel Consumed:</b>	<b>litres</b>	<b>69,321</b>

Diesel consumption figures are based on plant hire contractor information and CCC records for its own vehicles.

Electricity consumption was approximately 185,000 kWh for reporting period, January to December 2009.

---

#### **4. SUMMARY OF MONITORING AND EMISSIONS**

---

##### **4.1. General**

Section 4.0 presents the results of groundwater, surface water, leachate, noise and dust monitoring for compliance with Condition 9 of Waste Licence Register No. W0109-01 for the period January to December 2009. Monitoring was conducted in accordance with Schedule E of the Waste Licence as indicated in Table 4.1 below.

**TABLE 4.1: CENTRAL WASTE MANAGEMENT FACILITY (W0109-01) MONITORING SCHEDULE**

<b>Schedule</b>	<b>Monitoring Requirement</b>
E.1	Landfill Gas
E.2	Landfill Gas Flare
E.3	Dust
E.4	Noise
E.5	Surface water, Groundwater and Leachate

Monitoring was carried out at the locations and frequencies specified in each of the above referenced schedules of the Waste Licence unless otherwise noted in this report. Surface water, groundwater, leachate, noise and dust monitoring surveys were conducted by TMS Environment Limited. Conservation Services assessed biological quality of surface waters. Biosphere Environmental Services carried out the ecological surveys for the facility. Biannual monitoring of flare stack emissions was carried out by TMS Environment Ltd. Environmental monitoring locations are shown in Drawing No. 1, attached in Appendix 8.5.

##### **4.2. Landfill Gas**

See also section 3.5 above. Monitoring of waste body wells was carried out on a weekly basis throughout the year. Gas monitoring results were submitted to the Agency in monthly reports during the year. Monitoring of perimeter wells was conducted on a weekly basis throughout the year at LG1 to LG21b. Methane levels at a number of wells were elevated during the year, due to the ongoing decomposition of vegetation left in place prior to construction of the embankments. A number of investigations were carried out over the past five years which have confirmed this assessment. As final

confirmation, Odour Monitoring Ireland (OMI) carried out a comparative assessment of the VOC profile of the landfill gas and of the perimeter well gas in early 2007. Results of the assessment showed no relationship between the two VOC profiles, indicating that elevated perimeter well methane levels are unrelated to landfilling activities.

#### 4.3. Landfill Gas Flare

The outlet from the landfill gas flare was monitored on two occasions during the year. Results were submitted to the Agency in separate reports for each survey. A summary of survey findings is given in table 4.2 below:

**TABLE 4.2: FLARE MONITORING RESULTS:**

Parameter (units)	16 <sup>th</sup> June 2009	15 <sup>th</sup> December 2009	Emission Limit <sup>1</sup>
Nitrogen Oxides (NO <sub>x</sub> ) as NO <sub>2</sub> (mg/Nm <sup>3</sup> )	9.37	71	150 mg/m <sup>3</sup> for Flare Stacks
Carbon Monoxide (CO) (mg/Nm <sup>3</sup> )	<1.43	29	50 mg/m <sup>3</sup> for Flare Stacks
Sulphur Dioxide (SO <sub>2</sub> ) (mg/Nm <sup>3</sup> )	3.27	<2.88	-
Temperature (°C)	1010	1,020	-
Volumetric Flow Rate (Nm <sup>3</sup> /hr)	682	639	3,000
Vinyl Chloride (mg/Nm <sup>3</sup> )	<1.59	-	-
Acetonitrile (mg/Nm <sup>3</sup> )	<1.59	-	-
Dichloromethane (mg/Nm <sup>3</sup> )	<1.59	-	-
Tetrachloroethylene (mg/Nm <sup>3</sup> )	<1.59	-	-
TA Luft Class I (mg/Nm <sup>3</sup> )	<1.59	-	20 mg/m <sup>3</sup> (at mass flows >0.1 kg/hr)
TA Luft Class II (mg/Nm <sup>3</sup> )	<1.59	-	100 mg/m <sup>3</sup> (at mass flows >2 kg/hr)
TA Luft Class III (mg/Nm <sup>3</sup> )	<1.59	-	150 mg/m <sup>3</sup> (at mass flows >3 kg/hr)
HCl (mg/Nm <sup>3</sup> )	9.81	-	50 mg/m <sup>3</sup> (at mass flows >0.3kg/hr)
HF (mg/Nm <sup>3</sup> )	<0.09	-	5 mg/m <sup>3</sup> (at mass flows >0.05 kg/hr)

All results were within emission limit values specified in Schedule F.4. of Waste Licence W0109-01.

#### 4.4. Dust

Three ambient dust-monitoring surveys were carried out during the year. Results are summarised below in table 4.3.

**TABLE 4.3: TOTAL DUST MONITORING RESULTS.**

Sample location	Monitoring Period			Limit for Dust Deposition (mg/m <sup>2</sup> /day)
	15 <sup>th</sup> July to 26 <sup>th</sup> August 2009	7 <sup>th</sup> September to 12 <sup>th</sup> October 2009	15 <sup>th</sup> December to 6 <sup>th</sup> January 2009	
ST1	34	40	135	350
ST2	15	42	99	350
ST6	23	74	170	350
ST7	18	161	NR (broken gauge)	350

All results were below the licence limit of 350mg/m<sup>2</sup>/day.

PM<sub>10</sub> monitoring was carried out over four twenty-four hour periods as detailed below:

ST1: 7<sup>th</sup> September 2009

ST2: 7<sup>th</sup> September 2009

ST6: 8<sup>th</sup> September 2009

ST7: 8<sup>th</sup> September 2009

All results were within the licence limit of 50ug/m<sup>3</sup>. These results were submitted in the quarterly environmental monitoring report for October to December 2009.

#### 4.5. Noise

Results of noise monitoring carried out during the year are summarised in Table 4.4. Survey results were submitted to the Agency in the environmental monitoring report for each quarter. An additional survey was carried out during 2009 to compensate for the fact that the results of the second 2008 noise survey were mislaid and so our consultants were not able to issue a report for the survey.

2009 Survey findings were similar to previous reports, with noise levels at noise sensitive locations NS4 and NS5 in compliance with the 55 dB(A) daytime limit and noise levels at NS1, NS2 and NS3 above licence limits. The elevated noise levels at NS1, NS2 and NS3 were attributed to passing road traffic, as was reflected in the high L<sub>10</sub> readings recorded at each monitoring point. Site noise did not contribute to the measured noise levels at these locations.

Monitoring at new location NS6 commenced during the second noise survey carried out in 2008. However 2008 results are not available (see first paragraph under 4.5). Results for 2009 were in compliance with the 55 dB(A) daytime limit for the March and

August surveys. A higher result was obtained during the December 2009 survey due to machinery operating in a nearby field. The monitoring consultant noted in the report that site activities were not audible.

**TABLE 4.4: ENVIRONMENTAL NOISE SURVEY RESULTS.**

Location ID	26 <sup>th</sup> March 2009			18 <sup>th</sup> August 2009			14 <sup>th</sup> December 2009		
	L <sub>Aeq</sub> , 30min dB(A)	L <sub>A90</sub> , 30 min dB(A)	L <sub>A10</sub> , 30 min dB(A)	L <sub>Aeq</sub> , 30min dB(A)	L <sub>A90</sub> , 30 min dB(A)	L <sub>A10</sub> , 30 min dB(A)	L <sub>A90</sub> , 30 min dB(A)	L <sub>A10</sub> , 30 min dB(A)	L <sub>A90</sub> , 30 min dB(A)
NS1	69	52	77	62	36	63	71	45	77
NS2	69	54	72	59	36	49	70	41	75
NS3	72	47	80	61	37	70	71	45	77
NS4	55	46	58	54	35	50	55	34	43
NS5	52	42	61	55	36	57	44	29	37
NS6	53	46	57	54	41	59	65*	37	71

#### 4.6. Surface Water, Groundwater and Leachate

##### 4.6.1. Surface Water

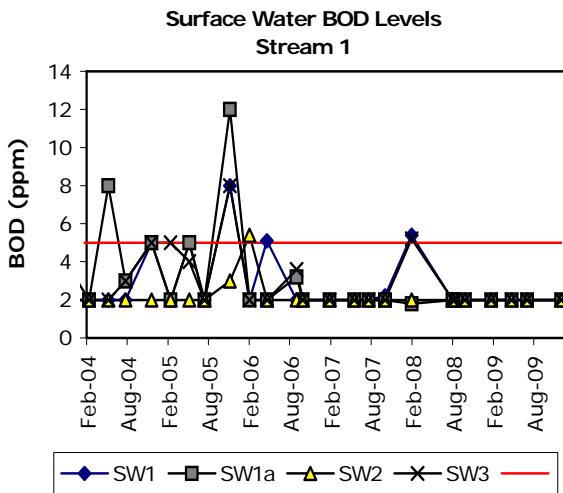
Surface water monitoring was carried out on a quarterly basis at SW1, SW1a, inlet to the stormwater pond (SW inlet), outlet from the sand filter (SW outlet), SW2, SW3, SW4, SW5, SW7, SW8, SW9, SW10, SW11 and SW12 (an eastern boundary drain feeding into Stream 2). Access to sample point SW6 is not permitted by the landowner. Samples were analysed for the parameters specified in Schedule E5 of Waste Licence W0109-01. In addition, as in previous years, surface water was monitored on a monthly basis for total suspended solids. Weekly surface water visual inspections were also carried out. Sample locations are shown on the drawing attached in Appendix 8.5. A second stormwater pond was constructed during 2006/2007 as part of the phase 3 development programme. The pond was fully operational by February 2008. Monitoring of the inlet to and outlet from the pond commenced at that time.

Results for key parameters (ammonia, BOD and total suspended solids) are discussed in this report. Detailed results of all surface water monitoring carried out during the year have previously been submitted to the Agency in quarterly reports.

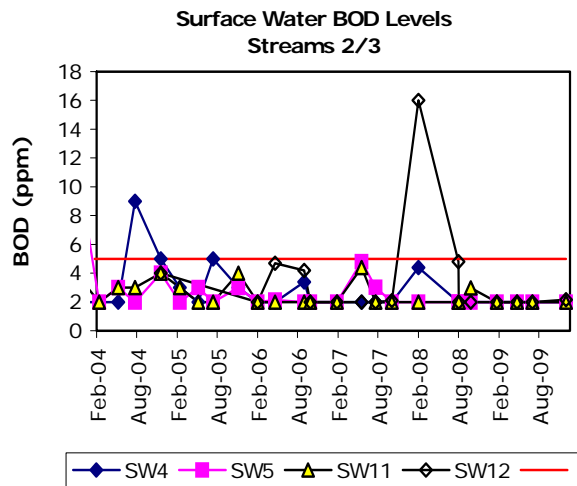
**4.6.1.1. Surface Water BOD:**

BOD results for surface water streams and for the inlet and outlet to the stormwater ponds are graphed in figures 4.1 to 4.3. The 5ppm BOD limit for Salmonid Waters is also shown on the graphs. This limit is included for comparative purposes only; none of the surface water streams are designated Salmonid waters.

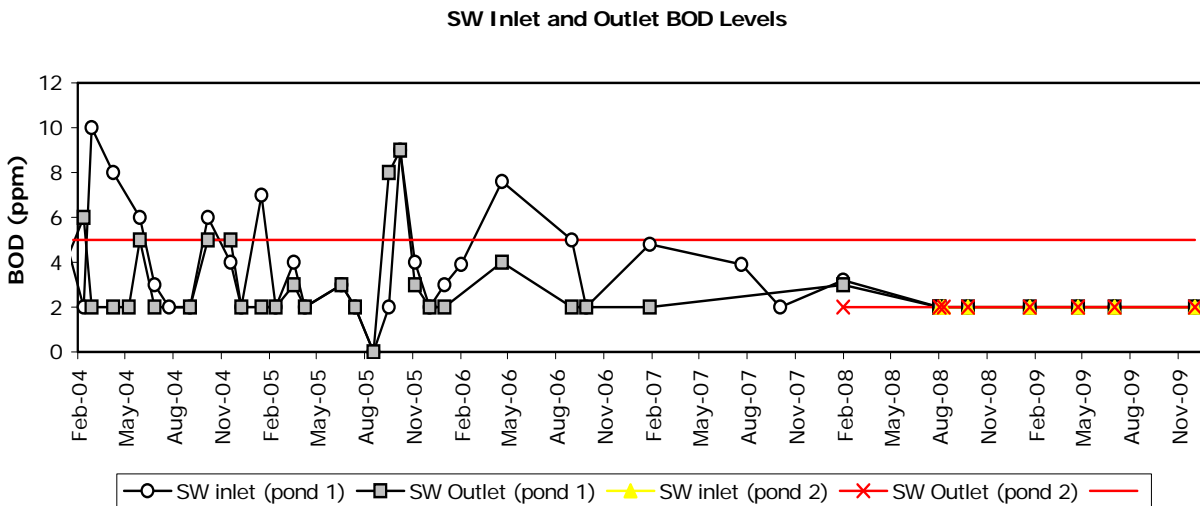
**Figure 4.1**



**Figure 4.2**



**Figure 4.3**



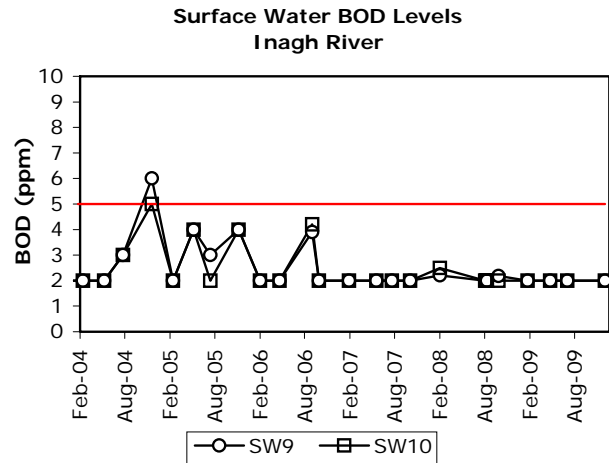
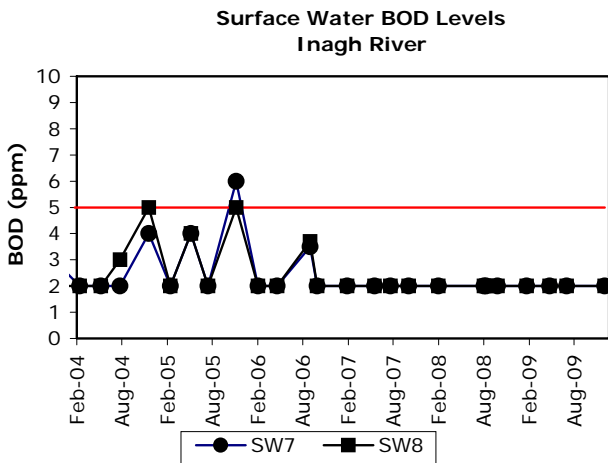
As can be seen from the graphs, BOD results for samples from all site streams and for inlet and outlet samples from both surface water ponds were below the 5ppm comparative limit throughout 2009.



BOD results for Inagh river monitoring locations are graphed in figures 4.4 and 4.5. The 5ppm BOD limit for Salmonid Waters is also shown on the graphs for comparative purposes only. The Inagh river is not a designated Salmonid water.

Figure 4.4

Figure 4.5



BOD results for all Inagh river samples were well below 5ppm in 2008.

**4.6.1.2 Surface Water Ammonia:**

Surface water ammonia levels in Streams 1, 2 and 3 and the Inagh river are graphed in figures 4.6 to 4.9 for the six year period from 2004 to end of 2009. The ammonia limit for salmonid waters is shown on the graphs for comparative purposes only. As stated above, none of the surface waters sampled are of salmonid water quality.

Figure 4.6

Figure 4.7

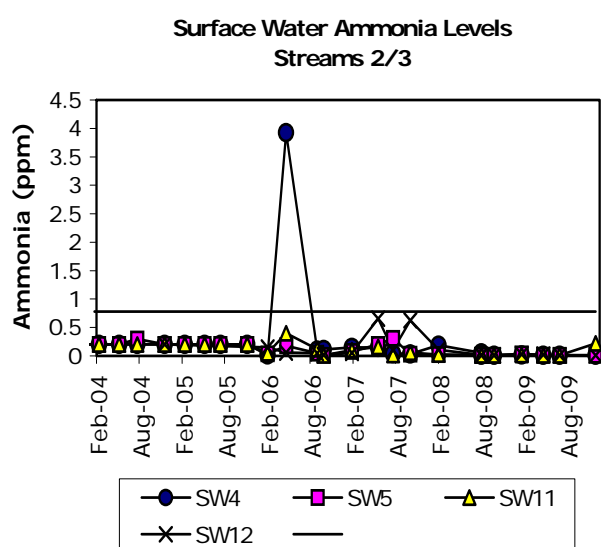
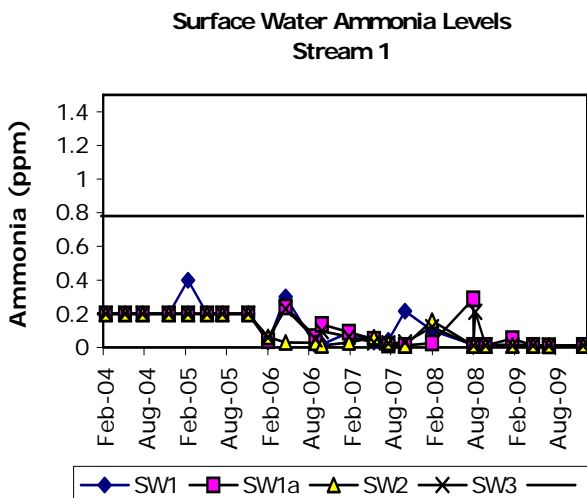


Figure 4.8

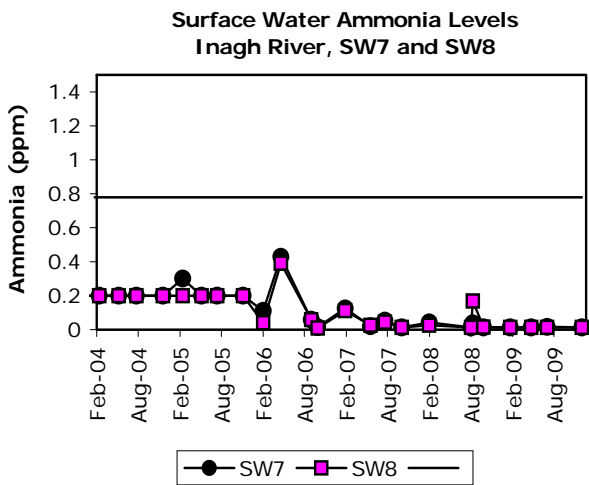
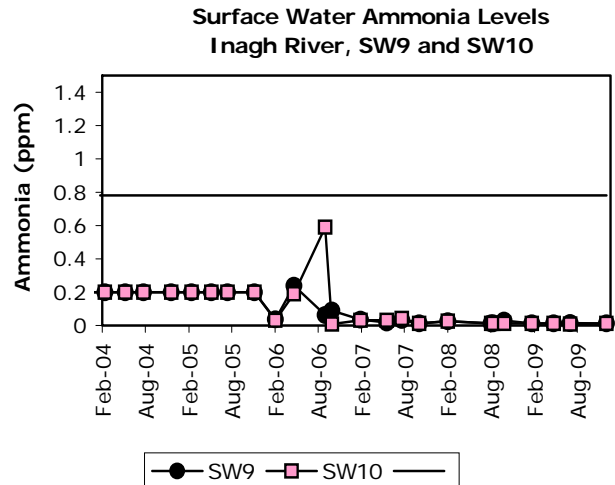


Figure 4.9



Ammonia results have been consistently below the limits for salmonid waters throughout the six-year period for all surface water samples except SW4. Ammonia levels at SW4 in stream 2 (upstream of the landfill) were slightly elevated in May 2006 but have been below the salmonid limit since that time.

Ammonia levels in SW inlet and outlet samples were very low throughout the year with the exception of one result for outlet 2 on the 14<sup>th</sup> December 2009. The pH result at that time was also elevated at 11.6. These anomalous results are believed to be due to contamination of the sample containers, as reported for three groundwater samples collected on the same date (ref incident report number 2010/07).

#### 4.6.1.3 Surface Water Suspended Solids.

All surface water monitoring locations are visually inspected each week and monthly surface water samples are analysed for suspended solids levels by TMS Environment Ltd. Results obtained for 2008 and 2009 are graphed in figures 4.10 to 4.14. The 25ppm suspended solids limit for Salmonid waters is included in figures 4.10 to 4.13 for comparative purposes only. The 35ppm licence limit for surface waters discharging from the site is shown on figure 4.14.

Figure 4.10

Surface Water Suspended Solids Levels  
Inagh River, SW7 and SW8

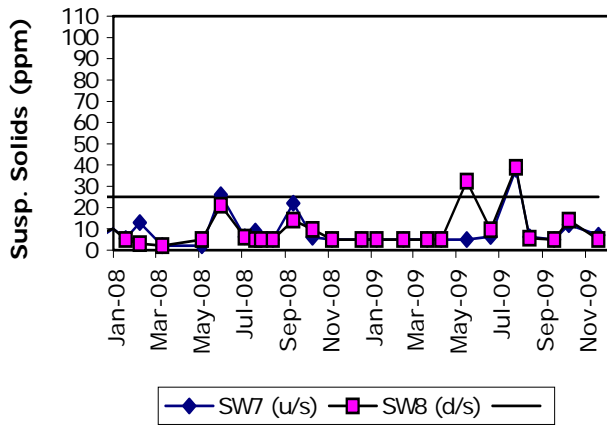
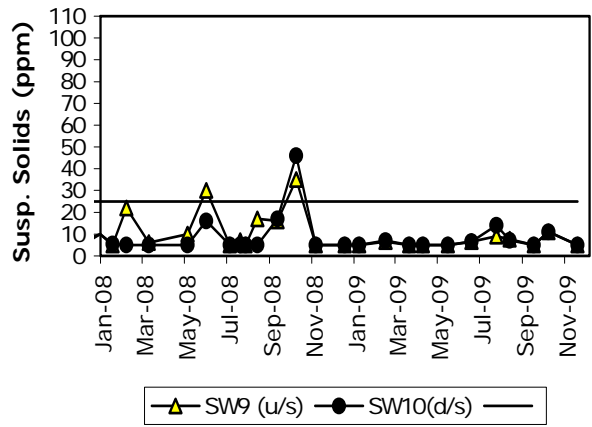


Figure 4.11

Surface Water Suspended Solids Levels  
Inagh River, SW9 and SW10



As can be seen from figures 4.10 and 4.11, during 2009, Inagh River suspended solids levels were slightly above 25ppm on one occasion at SW7 (upstream of the confluence with streams 2/3) and on two occasions at SW8 (downstream of the confluence with streams 2/3).

There were occasional peaks in suspended solids levels in streams 1, 2 and 3 during the year (see figures 4.12 and 4.13).

Figure 4.12

Surface Water Suspended Solids Levels  
Stream 1

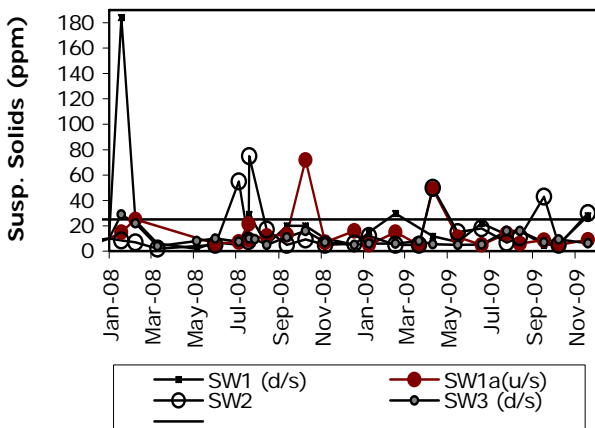
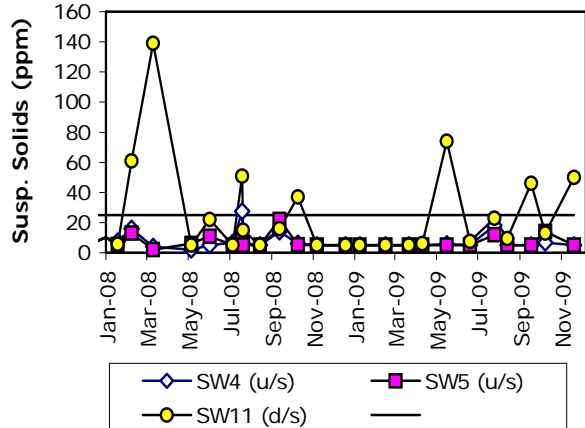


Figure 4.13

Surface Water Suspended Solids Levels  
Streams 2 and 3

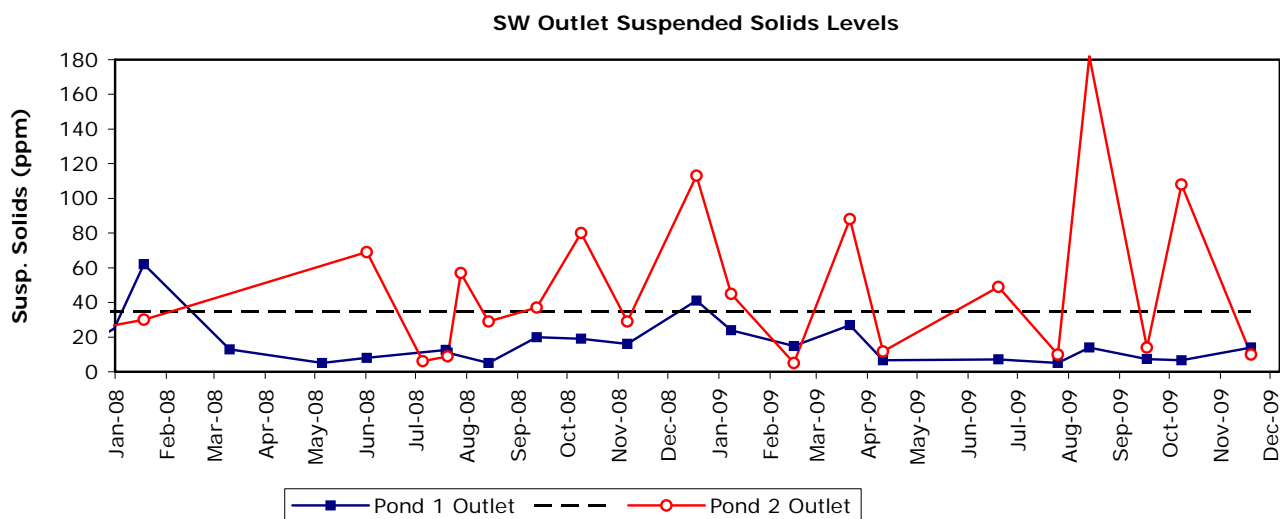


As can be seen from figures 4.12 and 4.13, slightly elevated suspended solids results were obtained on occasion at sample points both upstream and downstream of the discharge from stormwater ponds 1 and 2. The elevated results are most likely due to

the prolonged heavy rainfall which was experienced particularly in July and November 2009.

Suspended solids levels in both SW outlets are graphed below in figure 4.14.

**Figure 4.14**



As can be seen from the graph, the 35ppm suspended solids limit was exceeded for one outlet sample from pond 1 and six outlet samples from pond 2 during 2009. Both ponds were cleaned out during February 2009 and pond 2 was drained and cleaned again during May 2009. One of the site objectives for 2010 is to investigate options for improving solids settlement/stormwater management at the facility.

#### **4.6.2. Groundwater**

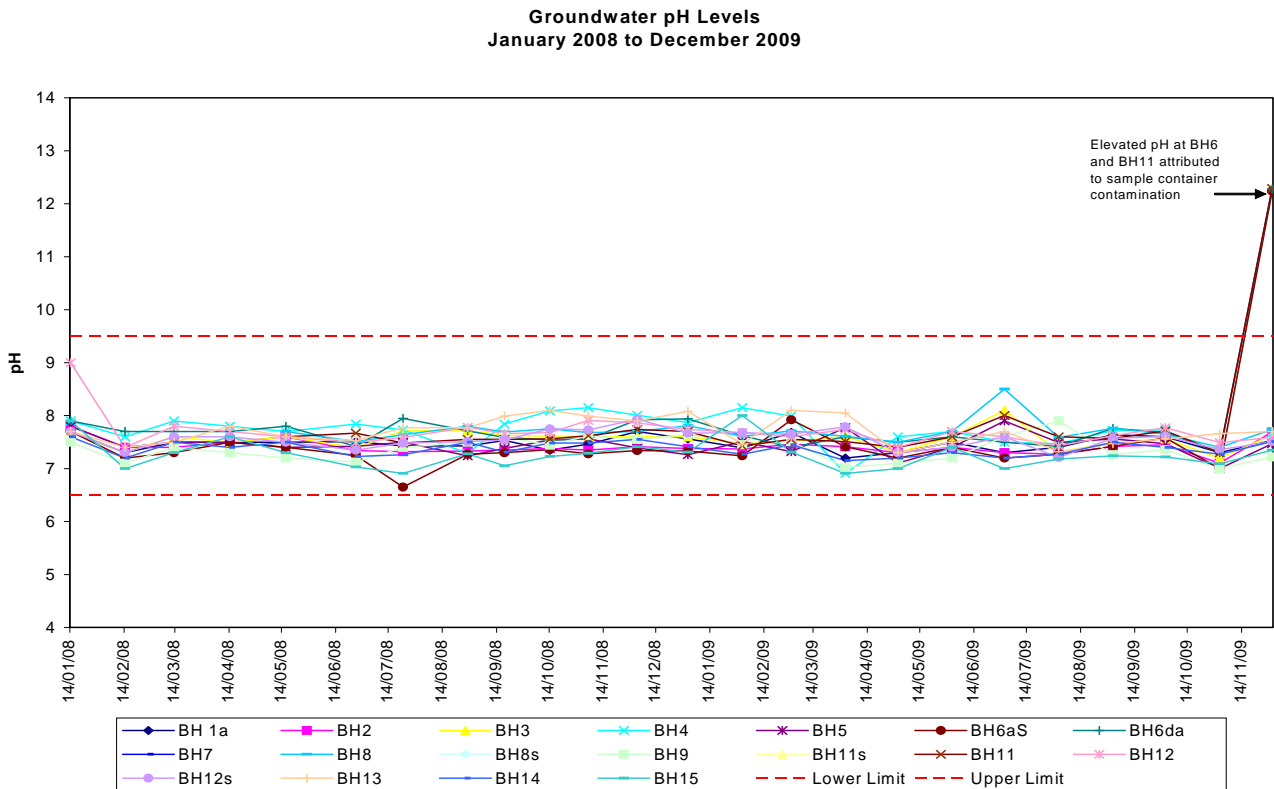
Groundwater monitoring was carried out on a monthly basis at BH1a, BH2, BH3, BH4, BH5, BH6As and BH6Ad, BH12s, BH12d, BH13, BH14 and BH15. Private wells and the site drinking water supply (canteen tap) were also sampled on a monthly basis during the year. Monitoring wells BH7 BH8 and BH11 were lost early in 2007 due to Phase III construction. Bh8 and Bh11 were replaced in March 2008. Samples were analysed for the parameters and frequency specified in Schedule E5 of Waste Licence W0109-01.

Results for key groundwater parameters, pH, conductivity and ammonia are summarised in this report. Results are compared with EPA Interim Guidance Values from "Towards setting guidance values for the protection of groundwater in Ireland", for comparative purposes. Detailed results of all groundwater monitoring carried out during the year were previously been submitted to the Agency in quarterly reports.

**4.6.2.1 Groundwater pH:**

Groundwater pH results from January 2008 to December 2009 are graphed below in figure 4.15. The EPA Interim Guidance Value range for pH (6.5 – 9.5) is also shown on the graph for comparative purposes.

**Figure 4.15**

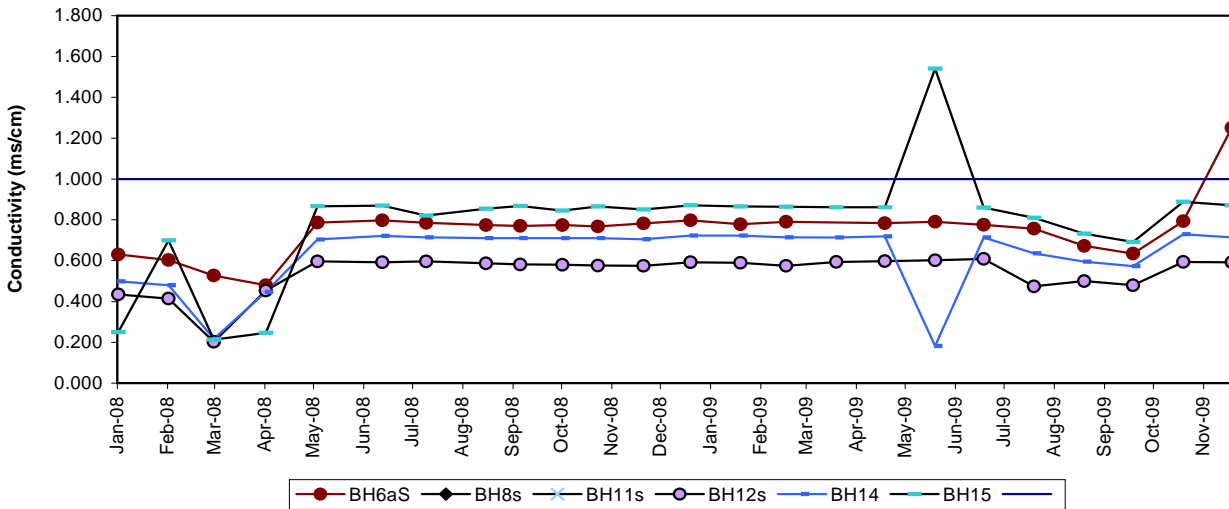


As can be seen from the graph, pH results were within the IGV range for all groundwater samples throughout 2008 and 2009 with the exception of results for BH6aS, BH6aD and BH11 in December 2009. pH, conductivity and ammonia levels for all three wells were very similarly elevated in the December monitoring round. Monitoring consultants for Clare County Council are of the opinion that these elevated results were due to sample container contamination (see incident report number 2010/07).

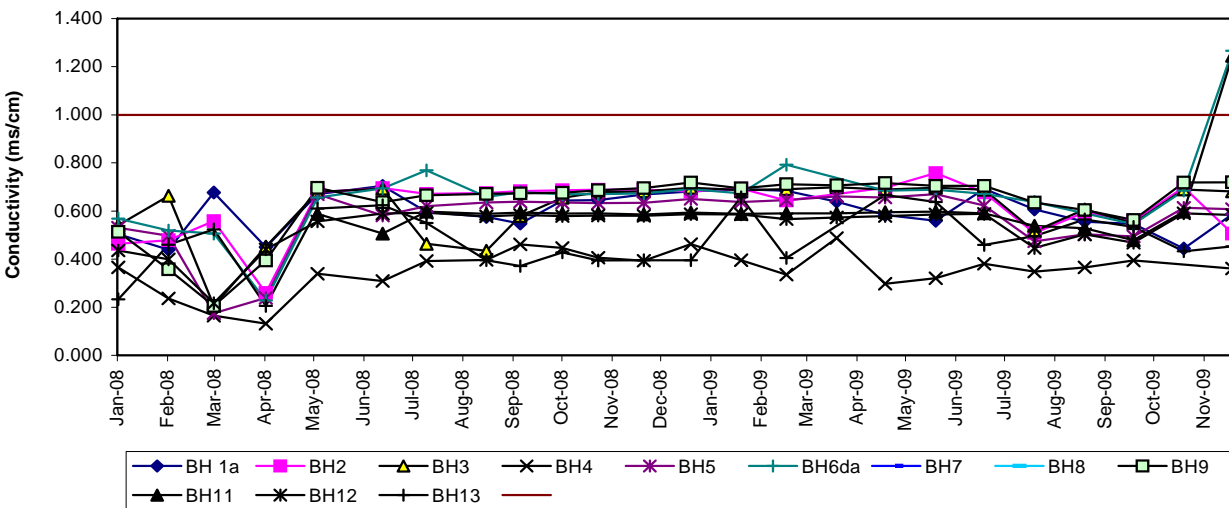
**4.6.2.2. Groundwater Conductivity:**

Groundwater conductivity results for 2009 are graphed in figures 4.16 and 4.17. The conductivity interim guidance value (IGV) of 1ms/cm is shown on the graphs for comparative purposes.

**Figure 16: Groundwater Conductivity Levels  
Overburden Wells**



**Figure 17: Groundwater Conductivity Levels  
Bedrock Wells**



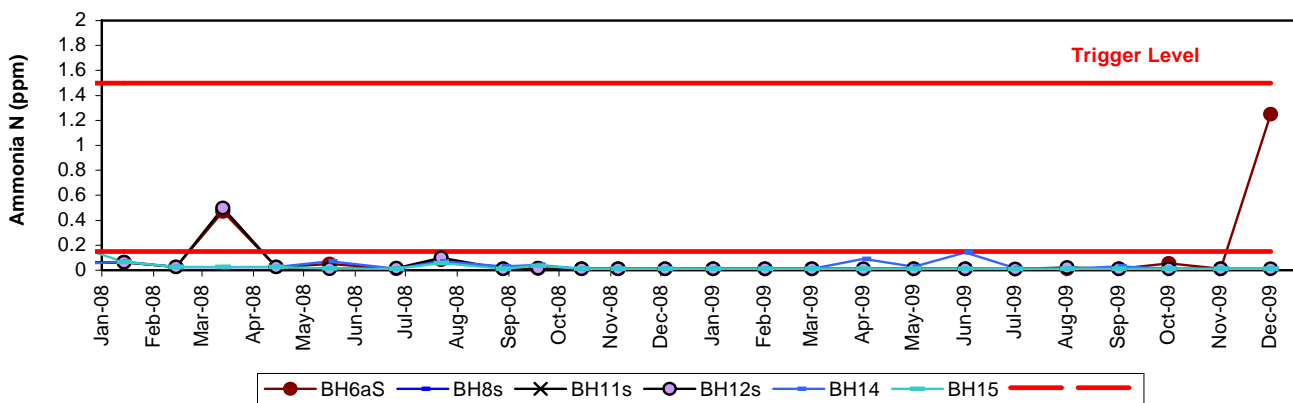
As can be seen from the graphs, groundwater conductivity levels were within the IGV for all groundwater wells with the exception of BH15 in June 2009 and BH6a (shallow and deep) and BH11 in December 2009. There have been occasional problems with elevated pH and conductivity levels in the area around BH6. These problems were thoroughly investigated in 2003 and were attributed to lime or concrete slurry contamination localised around BH6; the original BH6 nested pair of wells was installed on the stormwater pond access road, in a chamber below road level. As Clare County Council does not use lime at this facility, the most likely explanation for the lime contamination was considered to be concrete slurry runoff arising during construction of the chamber. The actions taken at that time, as agreed with the EPA, were to grout up the existing BH6 nested pair of wells and replace with BH6a (shallow and deep) and with two

additional overburden wells in the vicinity. The problem has recurred from time to time since then, indicating that the lime-contaminated water is perched and moving slowly across and down through the overburden. The elevated BH15 results in June 2009 are most likely due to this problem. However the December 2009 results are attributed to sample container contamination (see also 4.6.2.1 above).

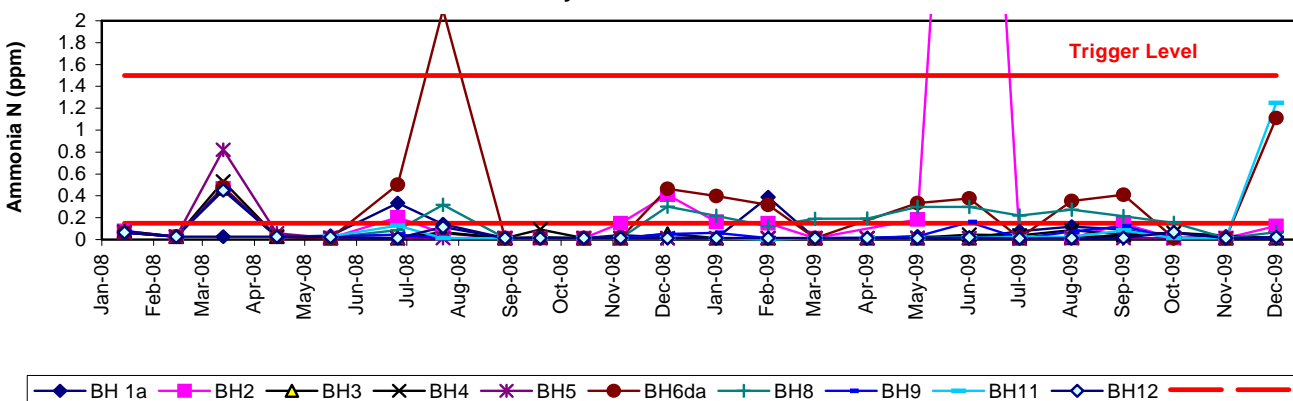
#### 4.6.2.3 Groundwater Ammonia

Groundwater ammonia results for 2008 and 2009 are graphed below in figures 4.18 and 4.19. The groundwater ammonia IGV of 0.15ppm and the CWMF in-house ammonia trigger level of 1.5ppm are also shown on the graphs for comparative purposes. A trigger level is defined in Waste Licence W0109-01 as “a parameter value which when achieved or exceeded requires certain actions to be taken”. These trigger levels were set in 2004 based on results obtained between May 2002 and December 2003. The trigger levels will be reviewed in 2010 based on the eight years of data now available.

**Figure 4.18: Groundwater Ammonia Levels, Overburden Wells  
January 2008 to December 2009**



**Figure 4.19: Groundwater Ammonia Levels, Bedrock Wells  
January 2008 to December 2009**

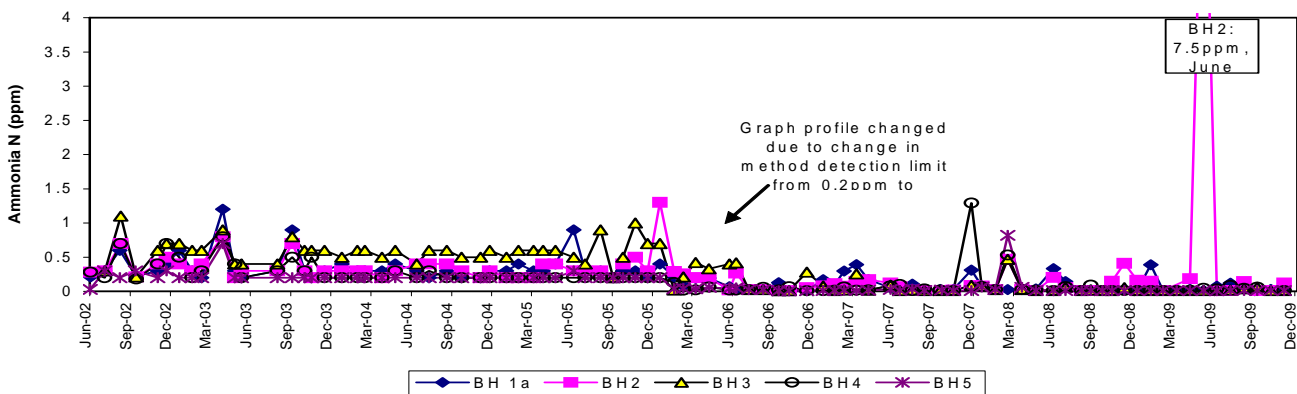


During the two-year period shown in the graphs, overburden groundwater ammonia levels ranged from <0.013 ppm (external laboratory method detection limit) to 1.25ppm (at BH6aS in December 2009). This result was attributed to contamination of

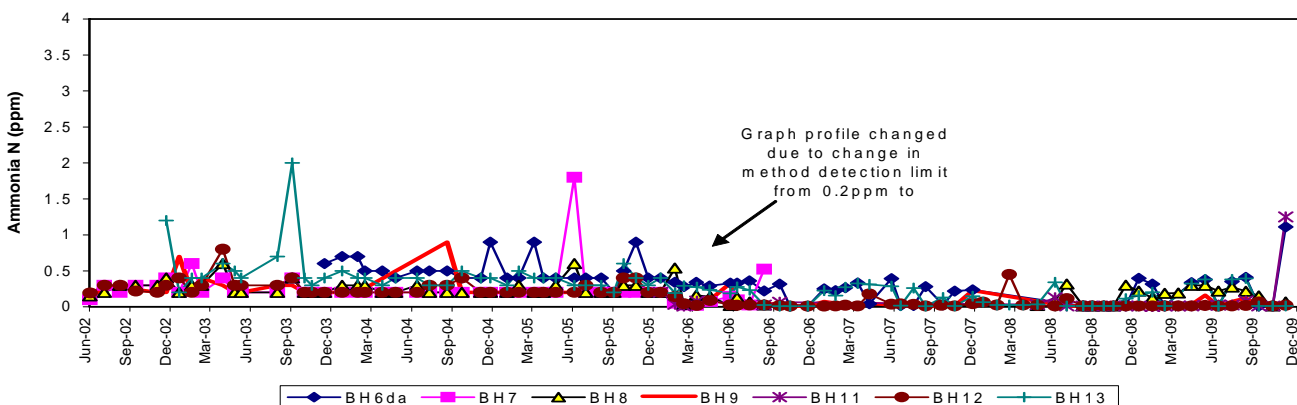
the sample container (see also preceding sections 4.6.2.1 and 4.6.2.2.). As noted in previous years, overburden groundwater ammonia levels were lower than bedrock levels during this period. Bedrock groundwater ammonia levels were elevated on a number of occasions during the two-year period. Two results exceeded the ammonia trigger level: Bh6ad in July 2008 and BH2 in July 2009. Incident reports were issued in response to these results. Results of follow-up surveys were satisfactory for both wells.

Groundwater ammonia results have fluctuated since monitoring commenced at the facility in June 2002. Elevated results have been measured on occasion in a number of wells, including upgradient bedrock well BH9 (see figure 4.20 below). These results indicate elevated background groundwater ammonia levels, unrelated to landfilling activities but possibly due to the extensive afforestation of the site.

**Figure 4.20A: Ammonia Levels in Bedrock Groundwater Wells June 2002 to December 2009**



**Figure 4.20B: Ammonia Levels in Bedrock Groundwater Wells June 2002 to December 2009**





#### 4.6.2.4 Groundwater Chloride.

Groundwater chloride levels from 2002 to 2009 are graphed in Figures 4.21 and 4.22. The EPA recommended interim guidance value for chloride (30ppm) is included in the graphs for comparative purposes. The in-house trigger level of 80ppm is also included in the graphs.

Figure 4.21: Groundwater Chloride Levels  
Bedrock Wells, 2002 to 2009

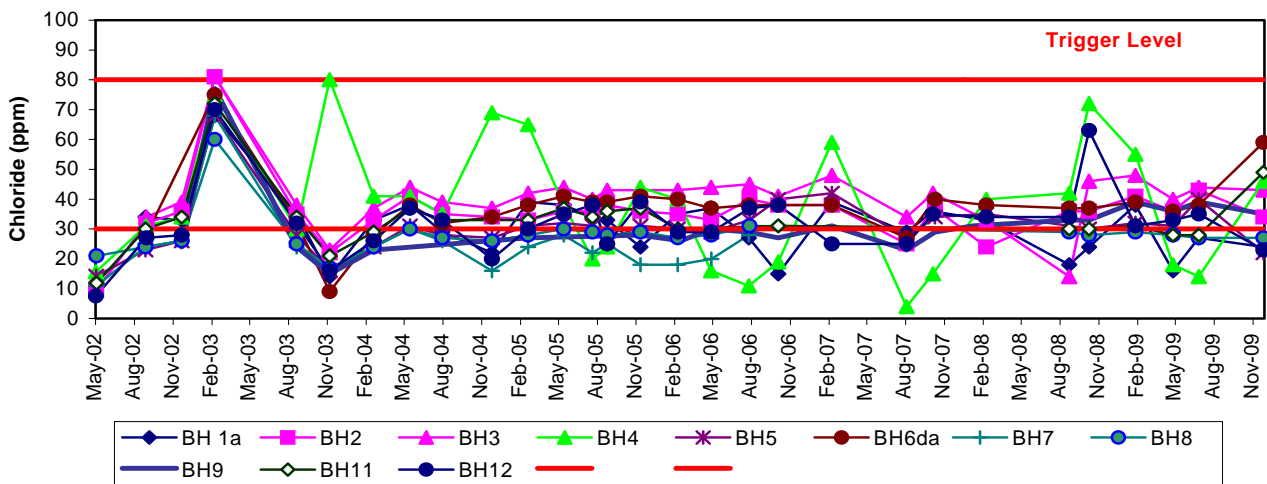
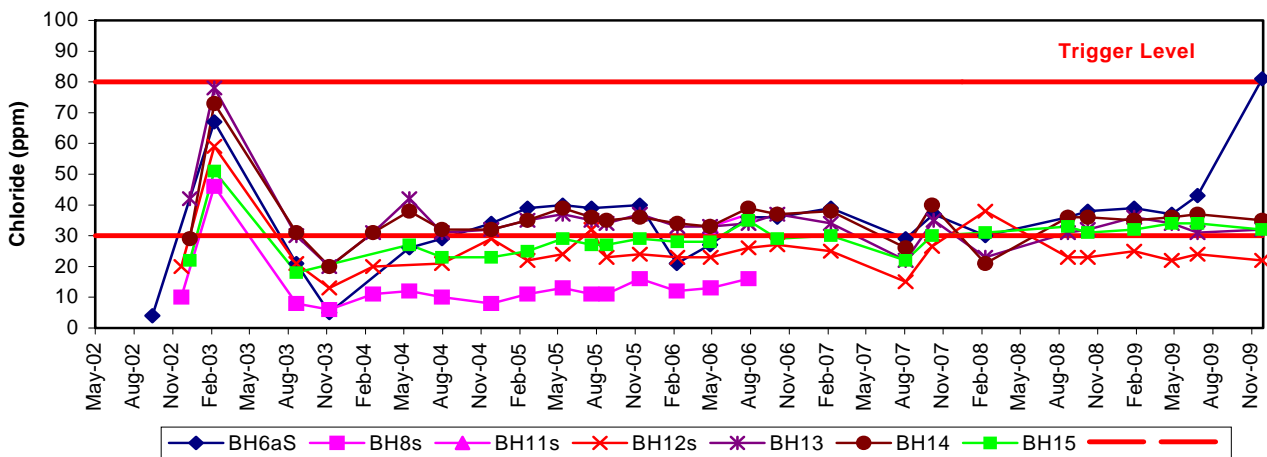


Figure 4.22: Groundwater Chloride Levels  
Overburden Wells, 2002 to 2009



As can be seen from the graphs, groundwater chloride results have fluctuated considerably since monitoring commenced at the site. This fluctuation has been observed in both upgradient and downgradient wells (see results for BH9a in figure 4.21). Results have not exceeded the in-house chloride trigger level of 80ppm. This trigger level will be reviewed in 2010 based on data obtained in the past eight years of monitoring at the site.

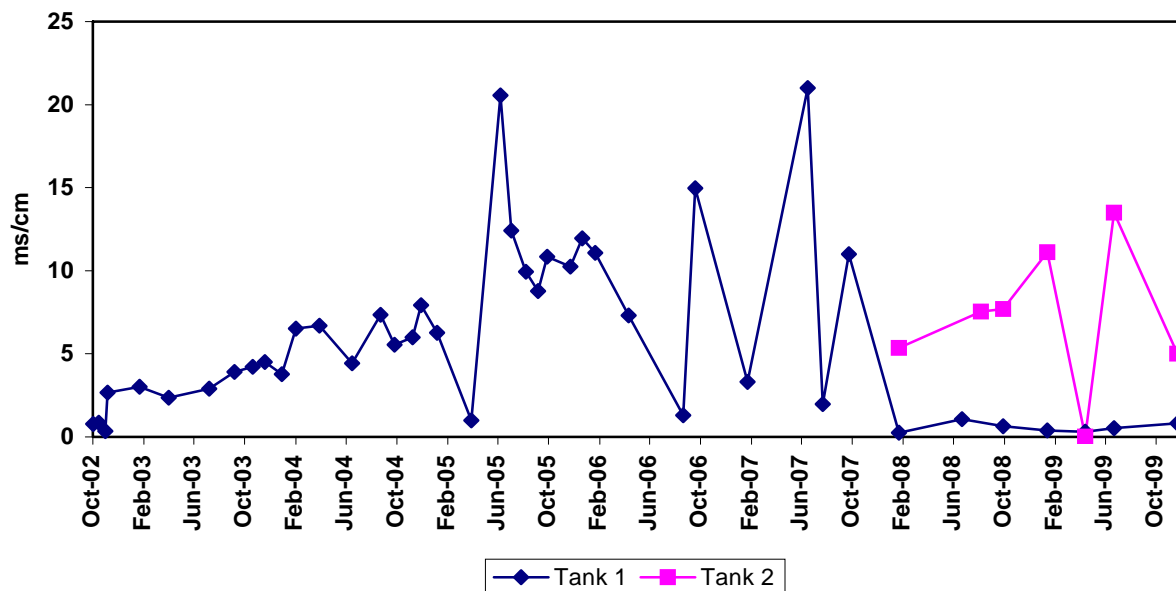
### 4.6.3. Leachate.

An underground leachate tank (Tank 1) was installed as part of the original development of the facility. Up to November 2007, all leachate generated on site was discharged to this tank, including landfill leachate from within the waste body and runoff from designated concrete areas of the civic amenity site. A second leachate tank (Tank 2) was installed in November 2007 as part of the phase 3 construction project. This tank now holds all leachate from the waste body and the older tank receives leachate/potentially contaminated runoff from the civic amenity area only. Results for both tanks for conductivity, BOD, COD and ammonia levels are graphed in figures 4.23 to 4.28 of this report. All results have previously been submitted in quarterly environmental reports for the facility.

#### 4.6.3.1 Leachate Conductivity

Leachate conductivity levels are graphed in figure 4.23. As would be expected with the removal of high strength landfill leachate from the old leachate lagoon (tank 1), conductivity levels in this tank dropped dramatically in 2008 and remained low throughout 2009. Higher levels were observed in the new tank.

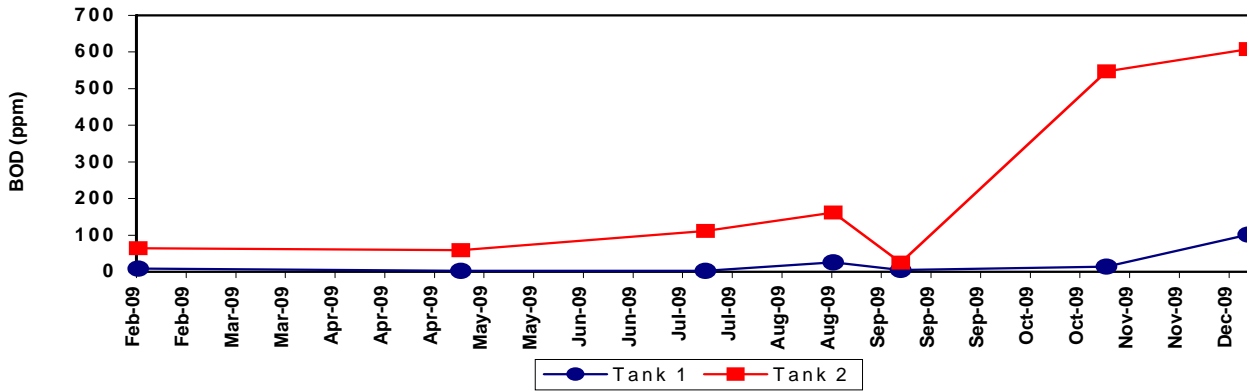
Figure 4.23: Leachate Conductivity Levels  
2002 to 2009



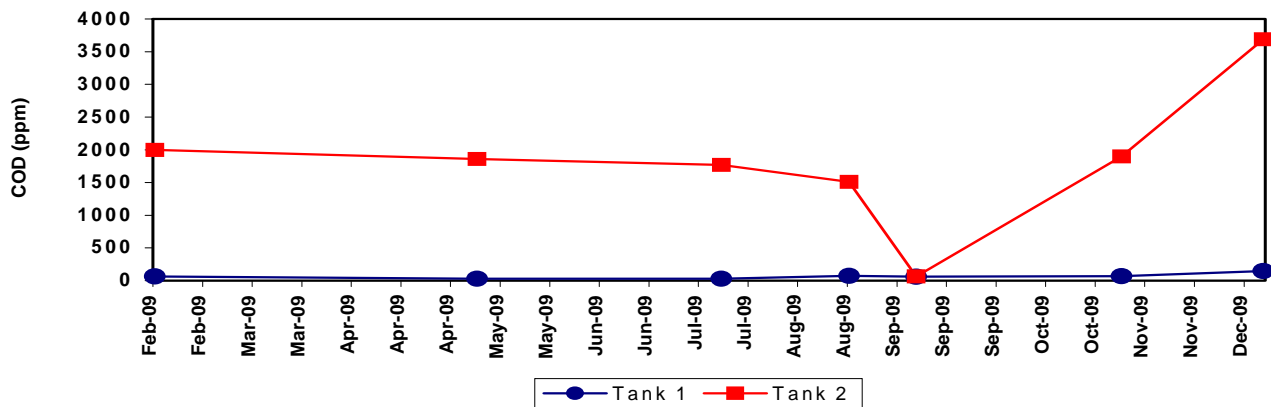
### 4.6.3.2 Leachate BOD and COD

Leachate BOD and COD results are graphed below in figures 4.24 and 4.25.

**Figure 4.24: Leachate BOD Levels  
January to December 2009**



**Figure 4.25: Leachate COD Levels  
January to December 2009**



As can be seen from the graphs, BOD and COD levels in tank 1 were significantly lower than in tank 2 for 2009. This is as expected given that the majority of the leachate flowing into tank 1 is uncontaminated surface water runoff from the civic amenity area. Clare County Council has requested approval from the EPA to modify the CA site leachate management system to allow areas of uncontaminated stormwater to discharge to surface water rather than leachate. This request excludes the compost facility and the offloading area around tank2; runoff from these areas is potentially contaminated and must be treated as leachate.

The leachate BOD:COD ratio is a useful tool for assessing leachate biodegradability. Ideal ratios should be in the region of 0.3 or greater. Additional leachate samples were collected for BOD and COD analyses during 2009 in order to obtain more information on leachate biodegradability. The ratios for leachate from each tank are graphed below in figure 4.26.

Figure 4.26: Leachate BOD:COD Ratios  
January to December 2009

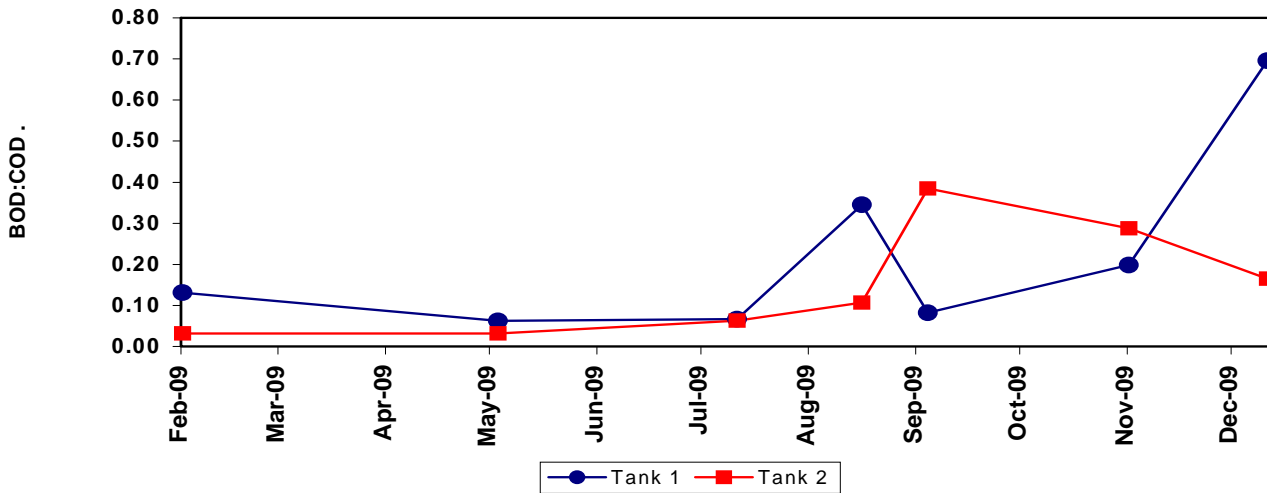
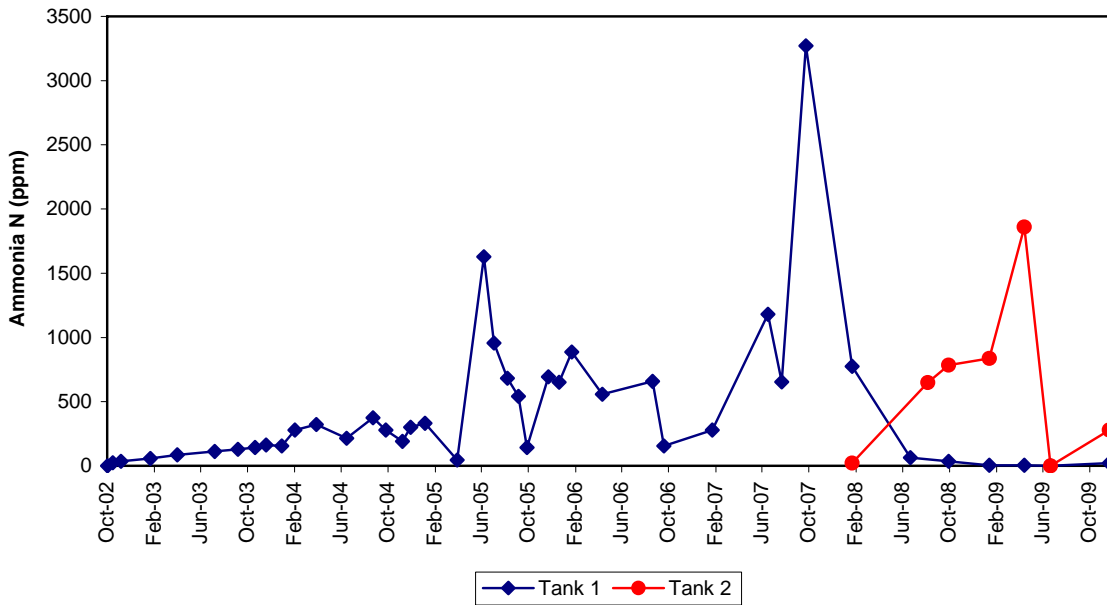


Figure 4.26 shows an increase in BOD:COD ratios for both tanks during 2009. Results were very low at the start of the year but increased gradually to satisfactory levels. The practice of recirculating leachate within the waste body has been discontinued since 2007 because it was felt that this practice could be resulting in a very high strength leachate with reduced biodegradability (see 2008 AER). From early 2007 to late 2009, only relatively low strength leachate from tank 1 was used for recirculation. All leachate recirculation was discontinued in late 2009 as CCC was of the opinion that it could be putting the gas collection network under pressure by significantly increasing gas production within the cells. This decision will be reviewed during 2010.

#### 4.6.3.3 Leachate Ammonia.

Leachate ammonia levels are graphed in figure 4.27. As can be seen from the graph, the concentration of ammonia has gradually increased from commencement of landfilling in 2002. This is as expected given that as the landfill ages and cells are capped, a higher strength leachate is generated due to reduced rainfall infiltration. The lower ammonia levels in tank 1 for 2008 and 2009 are due to the fact that landfill leachate has not been discharged to this tank since November 2007.

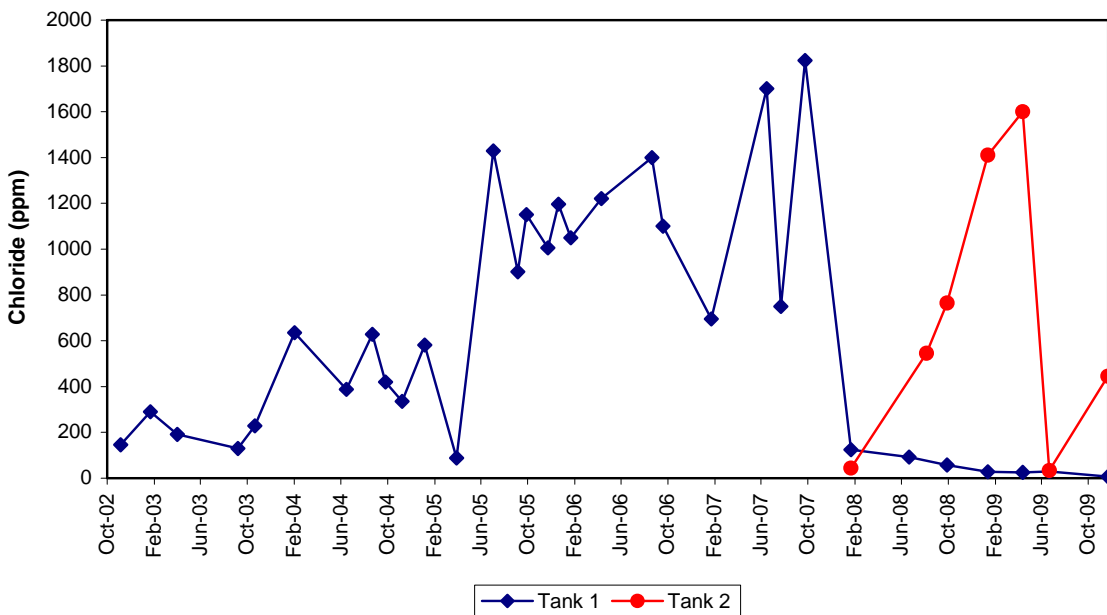
Figure 4.27: Leachate Ammonia Levels  
2002 to 2009



#### 4.6.3.4. Leachate Chloride

Leachate chloride levels are graphed in figure 4.28. As discussed above, the significant reduction in leachate chloride levels in the old leachate tank at the end of 2007 is due to the fact that the new tank was in operation and receiving all leachate from the landfill area from November 2007.

Figure 4.28: Leachate Chloride Levels  
2002 to 2009



In summary, levels of all leachate parameters were within the ranges expected for municipal waste landfills.

## **4.7. Biological / Ecological Status.**

### **4.7.1. Biological Monitoring:**

Biological and ecological monitoring surveys were carried out during the year in accordance with Condition 9.15 of W0109-01. Details have been submitted in separate reports to the Agency. The following conclusions were drawn:

The biological monitoring report concludes that there is No evidence of an impact from the landfill on surface waters. The report also highlights a small but significant improvement in the condition of the Inagh River from a moderately polluted (Q3) at the four sites in 2008, to a slightly polluted Q3-4 at all sites in 2009; a reversal of the deterioration recorded in 2008. It should be noted that the deterioration observed in the 2008 survey was not considered to be due to landfill activities.

### **4.7.2. Ecological Monitoring:**

A general habitat and vegetation survey was carried out on the 30<sup>th</sup> July 2009. The survey concluded that while there are no habitats of significant conservation value within the site, the site does provide useful habitat for local wildlife including such species as the common frog and badger.....Furthermore the diversity of species within the site is increasing as new habitats are being established (at the expense of closed canopy coniferous forest).

Two countryside bird surveys were carried out during the year, on the 7<sup>th</sup> May and 9<sup>th</sup> June. These surveys have been conducted at the facility since 2002. Twenty-eight bird species were recorded in 2009, which is within the range of previous years, with one new species recorded (kestrel). Crow numbers were higher than were recorded in 2008. On this matter, the 2009 survey report states that "while numbers of crows have generally been low during these surveys, the relatively high numbers recorded in June 2009 show that crows are always aware of potential scavenging opportunities at the landfill and would be quick to avail of such if bird control measures were to cease".

The bird control contract was awarded to a different company in July 2010.

Two surveys for Hen Harriers were carried out on the same dates as the countryside bird surveys. No sightings were made.

With the agreement of the Agency, the mammal survey frequency was reduced to once every two years in 2009. No mammal survey was carried out during the year.

#### **4.8. EPA Site Visits**

The following is a summary of EPA site visits made during 2009:

Between the 31<sup>st</sup> January and the 4<sup>th</sup> February 2009, EPA staff made a series of unannounced odour impact assessments in the environs of the CWMF during the early morning and late evening of each day. A total of 54 downwind/crosswind odour observations were conducted. For 14 of these observations, a level of odour was detected which the inspector considered to either result in significant impairment of the environment or to give rise to nuisance in the immediate area of the facility. Remedial works were carried out in response to the EPA findings. These included installation of additional sacrificial horizontal gas extraction lines in the active cell.

Odour Monitoring Ireland were engaged by the EPA to undertake a surface VOC emissions survey during the year. The survey was carried out in June 2009. Potential problems areas highlighted by the survey were addressed by CCC.

During June 2009, EPA staff carried out groundwater and surface water monitoring at the facility. Results were similar to results obtained by TMS Environment on behalf of Clare County Council. An elevated pH was recorded for BH6 by EPA staff. This is a localised problem at BH6 which has recurred on occasion in the last six years and which was previously reported to the EPA after investigation by CCC. The problem was attributed to lime contamination, resulting (most probably) from concrete slurry runoff arising during the installation of a belowground well chamber in the vicinity of BH6.

The EPA commenced a review of waste licence W0109-01 during 2009. A draft revised licence was issued to Clare County Council in October 2009. CCC submitted a response to the draft licence in November 2009. The final revised licence is expected to issue shortly.

A site audit was conducted by the EPA on the 4<sup>th</sup> December 2009. The audit findings included one non-compliance and a number of observations. The non-compliance was issued for the use of ASR as landfill cover; the EPA inspectors considered that the quality of the ASR stockpiled on site was not suitable for use as cover. It should be noted that CCC had audited the ASR suppliers one week prior to the EPA audit and had instructed them not to bring any further loads of ASR to the CWMF. Audit findings have since been addressed by CCC.

---

---

## 5. WORKS PROGRAMME 2009/2010

---

### 5.1. Development Works in 2009

Site development works that have been carried out during the reporting period are outlined in Table 5.1.

**TABLE 5.1: LIST OF DEVELOPMENT WORKS CARRIED OUT DURING 2009.**

Site Development Works	Date/Status
Installation of sacrificial horizontal gas extraction system in active cells (11 and 12)	Ongoing throughout 2009
Installation of temporary clay capping to cell 11	Complete 09.09
Modification of Civic Amenity site layout to accommodate introduction of recycling entrance charges.	January 2009
Extension of gas collection network including installation of new manifold and knockout pot	Complete 09.09
Extension of CA site capacity to include recovery of inert rubble from private households.	March 2009
Installation of leachate recirculation infrastructure in cell 11 (not in use)	Complete 10.09
Temporary connection of cell 11 gas wells to flare	Complete 10.09
Installation of LLDPE gas barrier to cell 11, 10, 12, 13 interfaces	Complete 11.09
Permanent capping of cell 11	Liner installation complete 12.09

Site development works that will be carried out in over the next 12 months are outlined in section 5.2.

### 5.2. Progress to Site Restoration

A Restoration Plan was submitted to the Agency in April 2003. The plan covered the following issues related to the restoration of the site, including:

- Final landfill profile
- Final cap construction
- Access roads
- Proposed land use
- Fencing and security
- Environmental monitoring and pollution



This plan is being progressed in a sequential manner as cells are completed.

The landfill profile is as set out in Figure 2.12 of the plan. Cells 1-5 of Phase 1, 6-9 of Phase 2 and 10-11 of Phase 3 are now permanently capped. Screening embankments for phases 4 & 5 were constructed as part of the phase 3 development works during 2007, with extensive landscaping of the embankments in late 2007 / early 2008.

### 5.3. Proposed Development Works 2010

The proposed development works for 2010 are set out in Table 5.2 below:

**TABLE 5.2: PROPOSED DEVELOPMENT OF THE FACILITY DURING 2009**

Site Development Works	Date
Installation of sealed end caps on leachate riser pipes for cells 1, 5, 10, 11, 12 and 13.	February 2010
Completion of final capping of cell 11	March 2010
Installation of permanent gas collection lines for 11 vertical wells in cells 10 and 11.	March 2010
Seeding of cell 11 cap	March/April 2010
Cleaning of storm water ponds	April 2010, weather dependent
Seeding other exposed clay areas on site	April 2010
Building vertical extraction wells in active cell*	April 2010
Installation of gas barrier to side slope of cell 12*	May 2010
Investigation expansion of recycling capability in CA site to include household food waste.	April 2010
Installation of additional rainflaps on side slopes of current active cell*	June 2010
Diversion of CA site stormwater from leachate collection system to stormwater management system.*	July 2010

*Note \*: Development works will be agreed in advance with the EPA before work can commence.*

### 5.4. Site Survey and Remaining Void Space

The site is surveyed to ensure that the landfill profile does not exceed the licence requirement. The most recent topographical survey was carried out in December 2009. This was submitted to the EPA under separate cover.

Landfilling commenced in cell 12 on the 31<sup>st</sup> August 2009. In January 2010 it was estimated that there was an approximate residual capacity for 90m<sup>3</sup> of waste between cells 12 and 13 of phase 3. At current pre-settlement compaction rates (0.6) and at

current waste intake, this equates to approximately 26 months of operation within the remaining phase 3 cells.

---

## 6. FINANCIAL ASPECTS

---

### 6.1. Annual Budget and Operating Costs

The annual budget for the Central Waste Management Facility for 2009 is outlined in Table 6.1 below.

**TABLE 6.1: SUMMARY OF FINANCIAL PROVISIONS 2009**

Item	2009 budget
CWMF - Landfill operation	€ 1,472,210
CWMF - Recycling centre operation	€ 310,620
CWMF - Compost operation	€ 37,454
Total	€ 1,820,284

### 6.2. Portion of Gate Fees for Environmental Improvement Projects.

The Community Fund, included in W0109-01, was a result of the Government Policy Statement on waste management "Changing Our Ways" - Local authorities working in partnership with local communities to mitigate the impact of waste management facilities on these communities through appropriate environmental improvement projects. An amount of €1.27 per tonne of waste (start 2002 index linked) accepted for disposal at the landfill is allocated to the Community Fund. The fund will be available for as long as the facility continues to accept waste for on site disposal. Eligible local communities to benefit from the Community Fund are Inagh, Cloonanaha and Kilnamona.

A structure was put in place for the distribution of the Community Fund, which was agreed with the Community Liaison and Monitoring Committee (CLMC). A weighting criteria ranging between 5 to 10 with projects nearest to the facility carrying the greatest weighting was also adopted.

In 2009, applications were invited for tranches 4 and 5 of the Community Fund for years 2007 and 2008. A total amount of €140,775 is available for distribution for the year 2009. Following a review on the Community Fund carried out by Exodea Europe

Consulting Ltd, it was recommended that three members of the Community Liaison Monitoring Committee sit on the adjudication panel along with three external members. Members from the Community Liaison Monitoring Committee include Sheila Mc Tighe, Tom Long and Michael Hehir. Catherine Dalton, Mary Immaculate College, University of Limerick, (Chairperson), Gerard Kennedy, Rural Resource Development Ltd and Mairead Corbett, Clare County Council represent the external members. The first meeting of the adjudication panel took place in March 2010.

---

## **7. REVIEW**

---

### **7.1. Nuisance Controls.**

Controls are in place to minimise nuisance from litter, birds, vermin, fires, vehicles, odours, dust, visual intrusion and noise associated with activities at the site. A complaints register is maintained at the facility, located in the site administration office. Control measures are described below under separate headings for each nuisance type:

#### **7.1.1. Litter Control**

Litter fencing is installed around the active cell to minimise windblown litter from the cell. Waste compaction and the use of adequate cover material also reduce the incidence of windblown litter. The active cell is closed during high winds. Perimeter fencing also intercepts any wind-blown litter. Areas within the site, including fencing, are inspected each day for litter and records are kept. Loose material is gathered and disposed of regularly to keep the site tidy. The main roads outside the facility are checked for litter during the daily odour patrol and cleanup is carried out as required. One of the site conditions for waste acceptance is that all waste is completely covered en route to the facility.

#### **7.1.2. Birds**

Clare County Council currently employs Falcon Bird Control to control bird activities on site. Both active and passive methods are employed. Falcon Bird Control maintains controls on site from dawn to dusk by way of flash kites, dummy launchers, ranger kites, acoustic distress calls and birds of prey. Birds of prey are flown daily (weather permitting) to discourage birds from congregating on site. An operational report is completed each day and a file copy kept at the site office. Bird scavenging is minimised by the compaction and daily covering of waste.

### **7.1.3. Vermin**

Curtin Pest Control are employed by Clare County Council to control vermin. Daily covering of waste ensures that food waste is unavailable to minimise nuisance from vermin. The use of daily/weekly cover also mitigates against colonisation of the landfill active cell by flies. Spraying with an approved insecticide is utilised as required by trained personnel to further control fly/wasp levels. A log is kept of insecticide spraying. Curtin Pest Control conduct monthly inspections on site and maintain a baiting programme to control rat or mice infestations. Details of the inspections and baiting programme are kept on file at the facility.

### **7.1.4. Fires**

Adequate fire fighting equipment capable of handling small outbreaks of fire is maintained on site. Site staff are trained in the use of the equipment. In the event that a fire breaks out, it will be treated as an emergency and dealt with immediately. The county fire brigade & the EPA will be contacted in the event of any fire incident.

### **7.1.5. Vehicles**

All vehicles leaving the active tipping area are directed to use the dry-wheel shakeout and wheel wash unit prior to leaving the facility. In the event that mud and debris is carried from the active site onto the main access road due to inclement weather conditions the site manager will arrange that the road is cleaned. Internal roadways are brushed or wetted as required in dry periods.

All roads around the Civic Amenity area, the access roads to the flare and the old stormwater pond are tarred. Access roads around the active cell are stone-coated and are cleaned/scraped with fresh stone applied as required.

### **7.1.6. Odours**

#### **Waste odours:**

The haul road into the active cell is extended regularly as far as possible into the cell in order to reduce double handling of waste and minimise waste odours. Covering the waste on a daily basis with suitable material also helps to control waste odours from the active cell. The waste is covered during weekdays/weekends with a combination of suitable site clay, wood ash and a fabric material as a base (Geopoly) to minimise odours. Up to November 2009, ASR was also used in combination with the wood ash. Wood chip is used as a biofilter as required directly onto particularly odorous loads to filter the odour and to

assist in waste odour management. Control of odour is also achieved by minimising the active cell area.

### **Landfill Gas Odours:**

Landfill gas odours from within the active cell are controlled using a sacrificial horizontal gas extraction system to draw gas to the flare. A clay cap is placed on the side slopes of the active cell as the cell is constructed to minimise gas migration through the side slopes.

For completed waste cells, a gas barrier membrane (LLDPE) is installed on all top and side slopes to control gas release from within the cells. This membrane is sealed by welding to the adjoining LDPE/HDPE liners. Vertical gas extraction wells are installed within the filled cells and connected to the gas collection network to draw gas out of the cells to the flare. Capping of cell 11 was carried out during 2009 in line with this methodology. A total of seven gas wells were drilled in the cell to depths of up to 10m to draw gas to the flare. In terms of the gas collection infrastructure, larger diameter pipes (110mm ID) are now used instead of the original 63 mm pipes for connection of the wellheads to the gas collection network and all connections are now welded to ensure integrity of the collection network.

The flare has been upgraded on two occasions since installation. It was upgraded from 500m<sup>3</sup>/hr to 750m<sup>3</sup>/hr in August 2006 and was again upgraded in May 2008 from 750m<sup>3</sup>/hr to 850m<sup>3</sup>/hr to assist with the management of existing and future landfill gas production.

A daily odour patrol is carried out to investigate whether odours are present on-site and off-site. Results of all odour patrols are logged in a site folder. Where an offsite odour is detected, an incident report is issued to the Agency and measures are taken to deal with the odour. Independent odour patrols are also carried out on a random basis, generally twice per month, by Environmental Health Inspectors of the Health Services Executive based in Ennis.

### **7.1.7. Dust**

Site access roads are water-sprayed in dry weather to suppress dust. On very dry, windy days, this is done throughout the working day.

Ambient dust monitoring is carried out three times per annum at four boundary locations in accordance with the conditions of the waste licence. All results for 2009 were within the ambient dust limit of 350mg/m<sup>2</sup> per day.

### **7.1.8. Visual Intrusion**

The principle method of limiting visual intrusion is by the retention of a screening belt of trees around the site. The site entrance and access roads are also landscaped to minimise visual intrusion. The earthen embankments surrounding the landfill area to the east, west and north of the site were raised some years ago and new screening embankments were constructed as part of the phase 3 development works. These new embankments enclose future phases 4 & 5. All embankments have been grassed and planted with Scots Pine and Sitka Spruce. External contractors carry out twice- annual maintenance of the landscaped embankments.

### **7.1.9. Noise**

Two noise surveys are carried out each year at noise sensitive locations adjacent to the facility. Results indicate that noise generated by activities at the site comply with licence limits (see section 4.5 for further information).

### **7.1.10. Complaints Register**

Details of all complaints are recorded in the Complaints Register. This register is located in the site administration office. The register includes the name of the complainant, the nature of the complaint, the date of the complaint and the actions taken to remedy the complaint. The site manager signs off completed complaint forms. The Register is available for inspection by members of the public.

## **7.2. Environmental Objectives**

The site EMS is currently being updated to reflect changes in operation of the facility since the last update. The schedule of objectives and targets for the coming year are outlined in the EMS and are also summarised below:

### **7.2.1. Objective 1: Improve gas abstraction from capped and active cells:**

The current active cell is cell12, which was opened on the 31<sup>st</sup> August 2009. The estimated total waste capacity of cell 12 is approximately 38,000 tonnes, of which 20,000 tonnes have been landfilled to date. The current average weekly intake is 460 tonnes, indicating that cell 12 will be open at least until the end of December 2010, a total of 16 months. In view of this long active cell life, Clare County Council proposes to

increase the extraction efficiency from the active cell as follows (all works subject to EPA approval):

- Install a gas barrier on the side slope of cell 12, from the base of the cell up to bench height.
- Extract gas from underneath the gas barrier using horizontal slotted pipe-as for normal horizontal extraction in the active cell.
- Build vertical wells within cell 12 as the cell is constructed.

**Other proposed works:**

- Install end caps on the leachate risers from each of the landfill cells (point source emissions).
- Increase pipe diameter of gas well collection lines from 63mm to 110mm to improve collection efficiency and minimise line blockage due to leachate. These lines will be welded to further improve collection efficiencies between the well heads and gas manifolds.

**TABLE 7.1: LIST OF TASKS ASSOCIATED WITH IMPROVED GAS EXTRACTION FROM CAPPED AND ACTIVE CELLS.**

Task 1	Install end caps on all leachate riser pipes
Task 2	Investigate options for capping of side slope of cell 12
Task 3	Install welded 110mm lines for gas collection network, cell 11.
Task 4	Apply to EPA for permission to carry out capping of cell 12 side slope.
Task 5	Advertise for capping contractor
Task 6	Carry out side slope capping up to bench height
Task 7	Investigate options for built well installation and apply to EPA for approval
Task 8	Install wells, subject to approval being received

**TABLE 7.2: TIMESCALE OF TASKS ASSOCIATED WITH IMPROVING GAS EXTRACTION FROM CAPPED AND ACTIVE CELLS.**

	J	F	M	A	M	J	J	A	S	O	N.	D
Task 1		■										
Task 2			■									
Task 3		■	■									
Task 4			■	■								
Task 5				■								
Task 6					■	■						
Task 7				■								
Task 8						■						

**7.2.2. Objective 2: Provision of separate organics collection in Civic Amenity Area.**

In order to comply with draft revised licence W0109-02 and to achieve required targets in terms of diversion of biodegradable waste from landfill, CCC proposes to investigate the feasibility of introducing a separate organics container for householders using the CA site at the facility.

**TABLE 7.3: LIST OF TASKS ASSOCIATED WITH PROVISION OF SEPARATE ORGANICS COLLECTION CONTAINER AT THE CIVIC AMENITY SITE.**

Task 1	Investigate options for collecting/treatment of organics waste
Task 2	Carry out feasibility study on various options
Task 3	Select most suitable option and apply for approval to implement
Task 4	Implement option
Task 5	Assess effectiveness of system by means of customer surveys etc

**TABLE 7.4: TIMESCALE OF TASKS ASSOCIATED WITH INSTALLATION OF AN ORGANICS COLLECTION CONTAINER AT THE CWMF CA SITE.**

	J	F	M	A	M	J	J	A	S	O	N.	D
Task 1			■	■								
Task 2					■	■						
Task 3						■						
Task 4							■					
Task 5								■	■	■		



**7.2.3. Objective 3: Reduce the tonnage of leachate removed from the facility.**

Leachate generated on site is tankered to waste water treatment plants at Lisdoonvarna, Sixmilebridge and Limerick Main Drainage for treatment. During 2009, a total of 24,000 tonnes of leachate was removed from the CWMF for treatment at these facilities. Clare County Council considers that the potential exists to reduce the amount of leachate tinkered off site, by diverting clean rainwater away from the leachate collection network. This can be done in the active cell by installing rain flaps on fully capped side slopes to divert clean rainwater away from the active cell. In the civic amenity area, clean stormwater can potentially be diverted to the stormwater management system from the leachate collection system. The EPA have requested that CCC investigate the feasibility of installing an on site leachate treatment system.

**TABLE 7.5. LIST OF TASKS ASSOCIATED WITH LEACHATE REDUCTION PROJECT**

Task 1	Install rainflaps on side slopes of capped cells (subject to EPA approval)
Task 2	Investigate feasibility of diversion of surface water from CA site away from leachate holding tank.
Task 3	Apply for EPA approval re task 2.
Task 4	Implement modifications (assuming approval is received)
Task 5	Carry out feasibility study on the treatment of leachate on site (as required during EPA audit of December 2009)

**TABLE 7.6: TIMESCALE OF TASKS ASSOCIATED WITH LEACHATE REDUCTION PROJECT.**

	J	F	M	A	M	J	J	A	S	O	N.	D
Task 1												
Task 2												
Task 3												
Task 4												
Task 5												

**7.2.4. Objective 4: Progress project on installation of landfill gas engine.**

A preliminary report on landfill gas utilisation at Ballyduff Beg was completed by Tobin Consulting Engineers on behalf of Clare County Council in 2006. A supplementary report was issued in 2008, taking into account targets for diversion of biowaste from landfill and the impact of this on methane generation at the facility. An application was submitted to ESB Networks in August 2009 for a grid connection for a 1MW gas engine at the facility. Clare County Council is committed to pursuing this project to determine

whether an engine would be commercially viable and environmentally saleable for this facility. Tasks associated with this project for 2010 are outlined below:

**TABLE 7.7: LIST OF TASKS ASSOCIATED WITH INSTALLATION OF GAS ENGINE.**

Task 1	Evaluation of the future gas generation potential of the site, taking into the account reduced waste intake and the diversion of biowaste, pumping trials, gas quality and contaminants-July.
Task 2	Investigate power generation capacity based on information obtained from task 1-August
Task 3	Determine the export potential of energy generation on site and acquire grid connection for same -ongoing
Task 4	Identify commercial model for electricity generation on site and identify appropriate supplier, including seeking expressions of interest from appropriate bodies-September 10
Task 5	Determine cost element associated with grid connection/civil and electrical works/licence purchase/agreements with land owners etc-July-September
Task 6	Decide on course of action (with a view to installing early in 2011) based on commercial viability and environmental saleability of project

**TABLE 7.8: TIMESCALE OF TASKS ASSOCIATED WITH INSTALLATION OF GAS ENGINE.**

	J	F	M	A	M	J	J	A	S	O	N.	D
Task 1												
Task 2												
Task 3												
Task 4												
Task 5												

**7.2.5. Objective 5: Progress ISO 14001.**

While Clare County Council already operates a comprehensive Environmental Management System (EMS) as part of its EPA approved waste licence, it is an ongoing objective of this Council to achieve ISO 14001 to provide external validation of the EMS already in place at the site.

A summary of the project tasks and timeframe is set out in Table 7.1 and Table 7.2 below.

**Table 7.9: Lists of tasks associated with setting-up / maintaining ISO 14001.**

Task Number	Activity
Task 1	Update all site procedures to reflect new requirements of revised Waste Licence
Task 2	Arrange for site visit/assessment by NSAI
Task 3	Implement corrective actions/measures identified in assessment
Task 4	Registration Assessment, formal registration

**Table 7.10: Timescale of tasks associated with setting-up / maintaining ISO 14001**

	J	F	M	A	M	J	J	A	S	O	N.	D
Task 1												
Task 2												
Task 3												
Task 4												

### 7.3. Programme of Public Information

The following information is held in public files at the site offices and is available for the public inspection.

- A copy of the waste licence.
- All correspondence from the Agency relating to the facility.
- All correspondence from Clare County Council to the Agency relating to the facility.
- Copies of quarterly monitoring reports.
- Copies of annual environmental reports (AER).
- Copy of all procedures relating to the facility.
- Complaints Register.

Clare County Council personnel working at or associated with the site are available to meet with members of the public and answer queries regarding the facility if requested.

A monthly Community Liaison & Monitoring Committee (CLMC) meeting is held on the 1<sup>st</sup> Wednesday of each month at the Community Hall, Inagh. This affords members of the public the opportunity to ask questions, to comment on site operation and to seek information/clarification as required. The meeting also enables Clare County Council to

pass on any information regarding the operation of the facility during the preceding month and regarding planned future projects.

#### 7.4. Management and Staffing Structure

The current management structure is detailed in Appendix 8.3

#### 7.5. Environmental Incidents and Complaints

Condition 3 of the waste licence requires that the licensee shall make written records of environmental incidents. When incidents arise, completed incident reports are forwarded to the EPA by fax and hard copy. Details of recordable incidents and complaints during the reporting period are provided in appendix 8.4. A summary of the incident numbers and types is provided in table 7.9 below:

**TABLE 7.9: SUMMARY OF INCIDENTS RELATING TO SCHEDULE F DURING THE REPORTING PERIOD**

Nature of Incident	Number of Incidences
Off site odours detected during daily odour patrol	15
Perimeter well gas levels	13
Surface water suspended solids levels	5
Equipment malfunction	4
Flare downtime	3
Leachate Levels	3
Other	3

Condition 3 of the waste licence requires that the licensee shall make written records of all complaints. Details of complaints received during 2009 are summarised below.

**TABLE 7.10: RECORDED COMPLAINTS DURING 2009.**

Number of Complaints*	Nature of Complaint
14	12 offsite odour; 2 other

*Note\*:* For eight of these complaints, the complaint was received via the EPA or the monthly CLMC meeting and may have referred to a number of separate instances of offsite odour.

Corrective actions were taken in response to incidents and complaints, in accordance with the requirements of the licence and with the site Corrective Action Procedure.

## **7.6. Waste Reduction and Recovery**

### **7.6.1. Civic Amenity Centre**

In order to maximise waste recoveries in the area, the capacity of the civic amenity centre at the CWMF has been expanded over the years to include additional streams such as sheet glass, bulky plastic, metal and timber items, household green waste and household inert rubble. The full list of materials now accepted at the facility is provided below:

- Cardboard and paper
- Plastic bottles
- Glass bottles
- Steel and aluminium cans
- Timber items
- Disposable Light bulbs
- Waste engine oil
- Car batteries
- Paint/Varnish/pesticides etc
- Household green waste
- Tetrapaks
- Hard plastic
- Sheet glass
- Large metal items
- Textiles
- Fluorescent tubes and long-life bulbs
- Waste cooking oil
- Household and dry cell batteries
- WEEE
- Inert rubble

### **7.6.2. Composting Area**

The composting of green garden waste commenced in January 2006. Members of the public bring clean green waste e.g. cut grass, hedge and bush clippings etc. to the facility as well as to the Council's recycling centre in Ennis. The material is processed on site at Ballyduff Beg before being placed in aerated static piles. Air is continuously pumped through the piles by way of fans to provide the oxygen needed by the microorganisms breaking down the waste. The temperature of the material is monitored to maintain optimum composting conditions. Each pile is turned to ensure even decomposition. After approximately twelve weeks the material will have formed compost that the Council can use for on-site landscaping purposes or within the Gardening Section.

## **7.7. Biodegradable Waste/Diversion from Landfill**

The National Strategy on Biodegradable Waste (NSBW) sets out measures to progress the diversion of biodegradable municipal waste from landfill in accordance with the Landfill Directive.

Food waste is not currently accepted for composting at this facility. However plans are underway to provide a food waste container in the civic amenity area for use by cold callers to the site. The food waste will be transported to an offsite composting facility for treatment although options that would enable Clare County Council to utilise our own in

vessel food/green waste composters are also being considered. This initiative will be supported by a public education and awareness programme to encourage separation of food waste from the landfill stream.

For waste received at the CWMF landfill by commercial collectors, the biodegradable content of this waste should reduce significantly during 2010 as the 2009 Food Waste Regulations are complied with. These regulations (SI 508, 2009) require that commercial collectors carrying out kerbside collections from households must provide brown bins to 40% of households by the end of 2010 and that commercial facilities generating more than 50kg of food waste per week must separate food waste from their landfill waste stream. These regulations will be enforced in 2010 by Clare County Council's Environment Enforcement team.

### **7.8. Landfill Directive**

The overall aim of the Landfill Directive is "to prevent or reduce as far as possible negative effects on the environment, in particular the pollution of surface water, groundwater, soil and air, and on the global environment, including the greenhouse effect, as well as any resulting risk to human health, from the landfilling of waste, during the whole lifecycle of the landfill". The Landfill Directive represents a change in the way that waste is managed, requiring waste minimisation and increased levels of recycling and recovery. The Central Waste Management facility meets the following parameters outlined in the Directive: It is a newly developed, engineered, non-hazardous waste landfill and so meets the requirements of such a facility, as outlined in Annex I of the Directive. It is licensed as required under Article 7 of the Directive and managed in accordance with Article 8-13 of the Directive. The facility has a civic amenity area for acceptance of recyclable waste, household hazardous waste and household construction and demolition waste and green waste for on site recovery.

**Appendix 8.1**  
**Licensed Activities at CWMF**

**APPENDIX 1A: LICENSED WASTE DISPOSAL ACTIVITIES, IN ACCORDANCE WITH THE THIRD SCHEDULE OF THE WASTE MANAGEMENT ACT, 1996 - 2005**

Class 2.	<i>Land treatment, including biodegradation of liquid or sludge discards in soils: This activity is limited to the disposal of treated de-watered non-hazardous industrial sludge at the facility.</i>
Class 4.	<i>Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons: This activity is limited to the storage and management of leachate and stormwater in lined lagoons.</i>
Class 5.	<i>Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment. This activity is limited to the disposal of a maximum of 56,500 tonnes of non-hazardous waste, excluding sewage sludge, per annum into engineered lined cells.</i>
Class 6.	<i>Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1. to 10. of this Schedule: This activity is limited to leachate re-circulation and the disposal of compost that is produced on site.</i>
Class 7.	<i>Physico-chemical treatment not referred to elsewhere in this Schedule (including evaporation, drying and calcination) which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1. to 10. of this Schedule (including evaporation, drying and calcination): This activity is limited to possible future leachate treatment at the facility in order to reduce the strength and volume of leachate tankered off-site for treatment.</i>
Class 11.	<i>Blending or mixture prior to submission to any activity referred to in a preceding paragraph of this Schedule. This activity is limited to the mixing of waste at the Civic Waste Facility prior to being landfilled.</i>
Class 12.	<i>Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule. This activity is limited to the mixing or compaction of waste and the reloading of waste tipped for inspection into a container prior to landfilling at the facility or disposal off site.</i>
Class 13.	<i>Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced. This activity is limited to the storage of waste at the Civic Waste Facility prior to disposal either off site or at the landfill.</i>

**Appendix 1b: Licensed waste recovery activities, in accordance with the Fourth Schedule of the Waste Management Act, 1996 – 2005.**

Class 2.	<i>Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes): This activity is limited to the composting of waste and the recovery of organic wastes including timber, paper and cardboard at the facility.</i>
Class 3.	<i>Recycling or reclamation of metals and metal compounds: This activity is limited to the storage of metals including white goods, batteries and scrap metal at the facility pending further recovery off-site.</i>
Class 4.	<i>Recycling or reclamation of other inorganic materials: This activity is limited to the storage and recovery of glass and construction and demolition waste at the facility pending the recovery off-site or in the case of construction and demolition waste its use in landfill restoration and engineering works.</i>
Class 9.	<i>Use of any waste principally as a fuel or other means to generate energy: This activity is limited to the possible future use of landfill gas as an energy resource to produce electricity and heat.</i>
Class 10.	<i>The treatment of any waste on land with a consequential benefit for an agricultural activity or ecological system. This activity is limited to the use of compost as a soil conditioner at the facility for restoration.</i>
Class 11.	<i>Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule: This activity is limited to the use of compost and construction and demolition waste as cover material or in restoration, and the use of construction and demolition waste as building material at the facility.</i>
Class 13.	<i>Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced: This activity is limited to the storage of waste destined for recovery activities.</i>

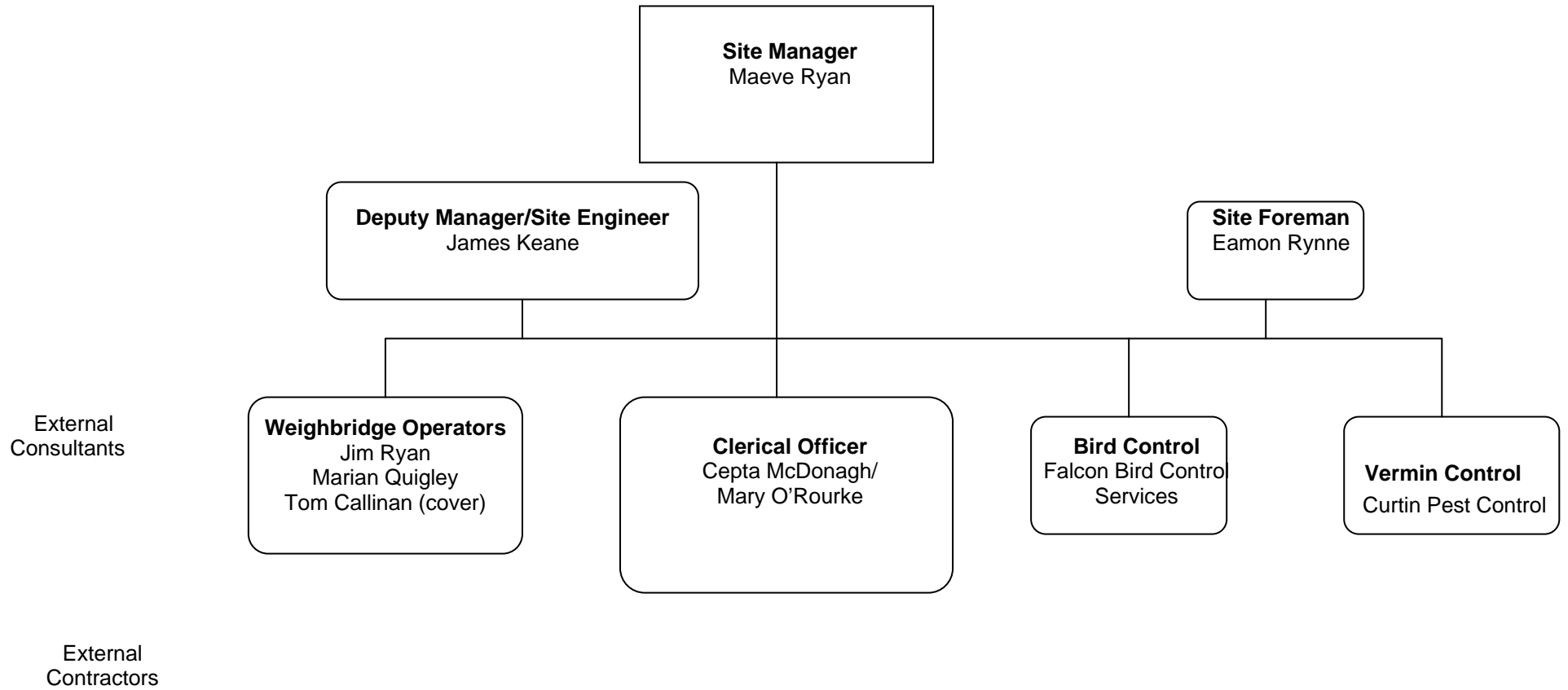


**Appendix 8.2**  
**Water Balance Calculation**

Month	Monthly Rainfall Figures (mm) (Shannon)	Landfill Operations			Area (m <sup>2</sup> )				Infiltration (m <sup>3</sup> )				Estimated Total Leachate (m <sup>3</sup> )	
		Active Cell	Temp Cap	Full Cap	Active Area*	Temp Cap	Full Cap*	Concrete	Active Area @ 100% estimated infiltration	Temp Cap 100% to leachate- 50% infiltration and 50% pumped to leachate)	Full Cap @ 10% estimated infiltration	Concrete @ 100% infiltration	Monthly	Cumulative
January	120.4	11	-	Cells 1 - 10	7,000	0	44,000	2,500	843	0	530	301	1,674	1,674
February	15.7	11	-	Cells 1 - 10	7,000	0	44,000	2,500	110	0	69	39	218	1,892
March	64.0	11	-	Cells 1 - 10	7,000	0	44,000	2,500	448	0	282	160	890	2,782
April	86.5	11	-	Cells 1 - 10	7,000	0	44,000	2,500	606	0	381	216	1,202	3,984
May	103.2	11	-	Cells 1 - 10	7,000	0	44,000	2,500	722	0	454	258	1,434	5,419
June	58.5	11	-	Cells 1 - 10	7,000	0	44,000	2,500	410	0	257	146	813	6,232
July	115.3	11	-	Cells 1 - 10	7,000	0	44,000	2,500	807	0	507	288	1,603	7,834
August	118.6	11	-	Cells 1 - 10	7,000	0	44,000	2,500	830	0	522	297	1,649	9,483
September	58.4	12	11	Cells 1 - 10	7,000	8,500	44,000	2,500	409	496	257	146	1,308	10,791
October	86.6	12	11	Cells 1 - 10	7,000	8,500	44,000	2,500	606	736	381	217	1,940	12,731
November	263.6	12	11	Cells 1 - 10	7,000	8,500	44,000	2,500	1,845	2,241	1,160	659	5,905	18,636
December	72.7	12	-	Cells 1 - 11	7,000	0	52,500	2,500	509	0	382	182	1,072	19,708
<b>Total:</b>													<b>19,708</b>	

**Appendix 8.3**  
**Management Structure**

**Appendix 8.3: Site Management Structure, Central Waste Management Facility**



**Appendix 8.4**  
**Summary of Incident Reports**

**Appendix 8.4: Incident Report Summary 2009 (i)**

<b>Date</b>	<b>Incident Number</b>	<b>Incident Type</b>	<b>Description</b>
09/01/2009	CWMF 2009/01(i)	Gas	Perimeter Wells; CH4 level exceeded LG1 LG5 LG7 LG7b LG8 LG11 LG12 LG13 LG19 LG20 LG21; CO2 level exceeded LG1 LG5 LG7 LG7b LG8 LG11 LG12 LG13 LG20 LG21
18/01/2009	CWMF 2009/02	Equipment	TOC meter shutdown
03/02/2009	CWMF 2009/03	Odour	Waste odour at SW3
03/02/2009	CWMF 2009/04(i)	Gas	Perimeter Wells; CH4 level exceeded LG1 LG7 LG7b LG8 LG11 LG12 LG13 LG19 LG20 LG21; CO2 level exceeded LG1 LG7 LG7b LG12 LG13 LG19 LG20 LG21
13/02/2009	CWMF 2009/05	Odour	Gas odour at Boolavan / Maghera Road
18/02/2009	CWMF 2009/06	Odour	Waste odour at Boolavan / Maghera Road
03/03/2009	CWMF 2009/07	Liner	Damage to new SW pond liner during cleaning
09/03/2009	CWMF 2009/08	Suspended Solids	S/S SW pond New & Outlet Jan
09/03/2009	CWMF 2009/09	Suspended Solids	S/S SW pond New Feb
09/03/2009	CWMF 2009/10(i)	Gas	Perimeter Wells; CH4 level exceeded LG7 LG7b LG8 LG13 LG19 LG20 LG21; CO2 level exceeded LG7 LG7b LG8 LG13 LG19 LG20 LG21
13/03/2009	CWMF 2009/11	Flare	Flare; thermo-coupler
20/03/2009	CWMF 2009/10(ii)	Gas	Perimeter Wells; CO2 level exceeded LG18
26/03/2009	CWMF 2009/10(iii)	Gas	Perimeter Wells; CO2 level exceeded LG12
06/04/2009	CWMF 2009/12(i)	Gas	Perimeter Wells; CH4 level exceeded LG7 LG7b LG8 LG13 LG20 LG21; CO2 level exceeded LG7 LG7b LG12 LG19 LG20 LG21
09/04/2009	CWMF 2009/12(ii)	Gas	Perimeter Wells; CH4 level exceeded LG11 LG12; CO2 level exceeded LG8 LG12
20/04/2009	CWMF 2009/12(iii)	Gas	Perimeter Wells; CH4 level exceeded LG19; CO2 level exceeded LG13
07/05/2009	CWMF 2009/13	Suspended Solids	S/S SW pond New April 09
15/05/2009	CWMF 2009/14(i)	Gas	perimeter wells: CH4 trigger level exceeded at LG7, LG 7b, LG8, LG13, LG20, LG21. CO2 trigger level exceeded at LG7, LG7b, LG8, LG12, LG13, LG19, LG20 and LG21
19/05/2009	CWMF 2009/15	PH probe	PH probe inlet new SW pond malfunction
20/05/2009	CWMF 2009/14(ii)	Gas	perimeter wells: CH4 trigger level exceeded at LG7, LG19. CO2 trigger level exceeded at LG11, LG16
20/05/2009	CWMF 2009/14(iii)	Gas	perimeter wells: CH4 trigger level exceeded at LG7a,
09/06/2009	CWMF 2009/16(i)	Gas	perimeter wells: CH4 trigger level exceeded at LG7a,

**Appendix 8.4 (cont'd): Incident Report Summary 2009 (ii)**

<b>Date</b>	<b>Incident Number</b>	<b>Incident Type</b>	<b>Description</b>
28/06/2009	CWMF 2009/16(ii)	Gas	perimeter wells: CO2 trigger level exceeded at LG8
06/07/2009	CWMF 2009/17	Flare	Thermocoupler malfunction
09/07/2009	CWMF 2009/18(i)	Gas	perimeter wells
21/07/2009	CWMF 2009/18(ii)	Gas	perimeter well
13/07/2009	CWMF 2009/19	Ground water	Ground water BR2 ammonia
22/07/2009	CWMF 2009/18(iii)	Gas	Perimeter wells
31/07/2009	CWMF 2009/20	odour	Waste odour at Boolavan / Maghera Road
07/08/2009	CWMF 2009/21(I)	Gas	Perimeter wells
07/08/2009	CWMF 2009/22	Gas	Perimeter well not reported in 18(I-iii)
12/08/2009	CWMF 2009/23	odour	Waste odour at B. Fitzgerald's residence
13/08/2009	CWMF 2009/21(ii)	Gas	Perimeter well
24/08/2009	CWMF 2008 24	SCADA	SCADA not logging
24/08/2009	CWMF 2009/25	SCADA	TOC reading incorrectly
31/08/2009	CWMF 2009/21(iii)	Gas	Perimeter wells
01/09/2009	CWMF 2009/26	Odour	Waste odour at B. Fitzgerald's residence
04/09/2009	CWMF 2009/27	Gas	Perimeter gas wells
10/09/2009	CWMF 2009/28	odour	Fresh waste odour at SW3
05/10/2009	CWMF 2009/29	Gas	Perimeter gas wells
23/10/2009	CWMF 2009/29(ii)	Gas	Perimeter gas wells
07/10/2009	CWMF 2009/30	Flare	Flare shutdown for 11 hrs. No text received.
07/10/2009	CWMF 2009/31	Odour	Waste odour at Boolavaun/Maghera Rd
12/10/2009	CWMF 2009/32	Odour	Waste odour at Boolavaun/Maghera Rd
23/10/2009	CWMF 2009/33	Odour	Waste odour at Carrowkeel/Maghera Rd
23/10/2009	CWMF 2009/34	SW	Suspended solids levels in storm2 outlet exceeded limits

**Appendix 8.4(cont'd) Incident Report Summary 2009 (iii)**

<b>Date</b>	<b>Incident Number</b>	<b>Incident Type</b>	<b>Description</b>
10/11/2009	CWMF 2009/35	Gas	Perimeter gas wells
17/11/2009	CWMF 2009/35(ii)	Gas	Perimeter gas wells
10/11/2009	CWMF 2009/36	Odour	Waste odour in vicinity of Long residence
16/11/2009	CWMF 2009/37	Odour	Waste odour at B. Fitzgerald's residence
25/11/2009	CWMF 2009/38	Cell leachate levels	Leachate level in cell 12 rose above limit level
25/11/2009	CWMF 2009/39	ll leachate level transdu	Cell 8 transducer reading incorrectly.
25/11/2009	CWMF 2009/40	Leachate Levels	Leachate levels in old lagoon rose to within 0.75m of freeboard
27/11/2009	CWMF 2009/41	Odour	Waste odour at Maghera Rd
07/12/2009	CWMF 2009/42	Gas	Perimeter well gas wells
16/12/2009	CWMF 2009/43	SW	Outlet suspended solids levels above limits
21/12/2009	CWMF 2009/44	Odour	Waste odour at Maghera Rd
22/12/2009	CWMF 2009/45	Odour	Odour in vicinity of site entrance
31/12/2009	CWMF 2009/46	Monitoring	Sample lines frozen at Storm 1 outlet



**Appendix 8.5**  
**Monitoring Point Location Map**

