Waterford City Council Compost Facility
Green Road
Waterford City

Annual Environmental Report 2008

Prepared By
Veolia Environmental Services Limited

Environmental Protection Agency Licence W0234-01

E.P.A. Headquarters
Johnstown Castle Estate
Wexford

Veolia Environmental Services (Ireland) Limited
On Behalf Of
Waterford City Council
Waste Composting Facility

Waterford

Annual Environmental Report

For the reporting period

1st January 2008 to 31st December 2008

Prepared by: Mr. Michael Storan
Compost Facility Manager
Veolia Environmental Services Ltd.
31st April 2009

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1.0 INTRODUCTION

The facility is located at:-

Waterford City Council
Composting Facility
Green Road
Waterford City

The facility is managed by-

Veolia Environment Services (Ireland) Limited
Six Cross Roads Business Park
Waterford City

Tel. (051) 333944 Fax. (051) 333945

Waterford City Council began operations at the composting facility in January 2004. The waste material accepted at this facility consists of Brown Bin organic household waste collected from the public in Waterford City, Waterford County, Wexford County and brown bin commercial organic waste from Veolia Environmental Services Ltd within the south east region. The facility licensee is Waterford City Council and is managed by Veolia Environmental Services Ltd.

The facility received a waste licence from the Environmental Protection Agency in December 2007. This Annual Environmental Report is the first report for this facility and is based upon information gathered from its operations under waste licence no. W0234-01 for the year 2008.

The facility has a maximum licence acceptance tonnage of 20,000 tonnes per annum. However the facility has accepted less than 10,000 tonnes per annum since operations began in 2004. This was due to the modular design of the current facility with the expectation of a development phase to increase the capacity of the existing facility to 20,000 tonnes per annum in the future as detailed within the waste licence application in 2007.

The facility received approval from The Department of Agriculture to process catering waste in October 2006 and as such is required to meet strict processing protocols governed by the Animal By-Product Regulations.

The current facility operates an in-vessel composting system. This comprises a waste reception building for the acceptance of biowaste. Pre-treatment of waste including shredding and mixing takes place indoors and material is semi-processed in enclosed digester units for 10-14 days known as first stage treatment. Second stage treatment takes place outdoors on aerated curing pads where turning and maturation takes place. The final compost product when processed is screened at 12mm particles size. This final compost product is collected at site from members of the public and landscapers for landscaping purposes.

At the time of preparing this report Waterford City Council had taken the decision to cease waste acceptance at the facility in the short term to facilitate the proposed new indoor development of a 20,000 tonne facility. The construction phase is due to commence at the end of 2009 and to carry

on throughout 2010. A period of consultation will take place with the Agency at a time when all the information is available to Waterford City Council before any development works take place.

1.1 VEOLIA Environment Services Limited Environmental Policy

Veolia Environment Services (Ireland) Limited is fully committed to the operation of its facilities to the highest environmental standards and fully supports and adheres to that policy.

It is the policy of Veolia Environment Services (Ireland) Limited to protect the local environment and to minimise the impact of the operation on the environment. To achieve this objective it is committed to:

- Adhering to all relevant environmental legislation and relevant statutory obligations that relate to its activities both on and off site.
- Ensuring that all operations carried out by the company are done in a manner which ensures that environmental protection is taken into account.
- Providing and maintaining site facilities that are designed, constructed, operated and maintained to encompass the principles of good environmental practice.
- Striving to achieve a continuous improvement in efficiency of operations and environmental performance.
- Striving to minimise the quantity of waste disposed of at landfill and increasing the amount of material recycled / recovered.
- Providing environmental information to the community and responding positively to queries or complaints.
- Providing adequate training to all employees on environmental awareness and resource management.

(Signed Morgan Toner, Managing Director, Veolia Environmental Services (Ireland) Ltd, 01/10/07.)

2.0 EMISSIONS FROM THE FACILITY

Environmental monitoring results for the reporting period are outlined in the following sections. An interpretation of the results and impacts on the environment are also presented. A site plan showing the position of each monitoring location is included in the Appendices Section A.

2.1 Emissions to Surface Water.

Site emissions to surface water are addressed in Condition 5 and Schedule C.2.1 of waste licence W0234-01. The licence requires quarterly testing at one surface water monitoring point. The samples were tested for COD, BOD, Suspended Solids and Ammonia. All sampling was carried out by the facility manager and analysis carried out by Envirolab Laboratories, Christendom, Ferrybank, Waterford City. A summary of analysis of surface water for 2008 can be found in Table 2.1 below. A surface water monitoring result graph can be found in Appendices Section B.

Table 2.1 Emissions to Surface Water 2008.

	COD (mg/L)	BOD (mg/L)	Sus. Solids (mg/L)	Ammonia (mg/L)
Q1 2008	1028	**469**	**106**	34.7
Q2 2008	2430	**975**	**710**	278
Q3 2008	320	**107**	**138**	2.82
Q4 2008	252	**91**	**199**	8.28
ELV		20	30	

The Emission Limit Values in the waste licence W0234-01 for surface water are 20mg/L and 30mg/L for BOD and Suspended Solids respectively.
As can be seen from Table 2.1 above Both BOD and Suspended Solids exceeded the Emission Limit Values set out in the licence for all four quarters of 2008. This has been primarily due to outdoor operations including turning and screening of compost. As a consequence, yard surfaces become contaminated and are responsible for contamination of the surface water at the facility resulting in elevated BOD and Suspended Solids. Waterford City Council are currently investigating the installation of a series of grit traps and sand filtration system to remove large quantities of solids from the surface water collection system in conjunction with the installation of an oil/water interceptor. Waterford City Council have employed the services of Fehily & Timoney & Co. as consultants to carry out this work.

2.2 Trade Effluent/Leachate Emissions

All leachate and trade effluent is collected at the facility via the leachate collection system and stored in the leachate storage tank located on site. Leachate/trade effluent is collected from the following areas;

Toilets
Leachate collection from the waste reception building floor
Leachate collection from the digester units
Leachate from the curing pad area
Wheel wash run-off at waste reception building

All trade effluent/leachate is stored in the leachate storage tank until such time as it is removed to an appropriate treatment facility by means of a vacuum tanker. There are no process effluent/leachate emissions to sewer.

In 2008 there was a total of 1413.19 tons of leachate was transported off-site for treatment. Table 2.2 below provides the tonnages and end destination of leachate treated off site on 2008.

Table 2.2a Tonnage of leachate/trade effluent transported off-site 2008

Leachate/trade effluent transported off-site 2008		
Dates	**Tonnage**	**Treatment Facility**
January to April 2008	281.28	B.E.O.F.S. of Camphill Community, Ballytobin, Callan, co. Kilkenny. WMP05/2005
May to December 2008	1131.91	Waterford Proteins, Christendom, Ferrybank, Waterford City. Licence No. P0040-02
Total	**1413.19**	

Site emissions of trade effluent/leachate are addressed in Condition 3.14 and Schedule C.3 of waste licence W0234-01. The licence requires quarterly testing at one leachate/trade effluent water monitoring point. All sampling was carried out by the facility manager and analysis carried out by Envirolab Laboratories, Christendom, Ferrybank, Waterford City. A summary of analysis of leachate/trade effluent water for 2008 can be found in Table 2.2b below. A leachate emissions graph can be found in Appendices section D.

Table 2.2b Leachate/trade effluent Emissions 2008

Leachate/trade effluent analysis 2008					
Analysis	**Frequency**	**Q1 2008**	**Q2 2008**	**Q3 2008**	**Q4 2008**
pH	Quarterly	6.5	6.7	8.0	6.0
BOD (mg/L)	Quarterly	4813	10325	3131	5575
COD (mg/L)	Quarterly	11350	13740	5570	6180
Metals	Quarterly				
Mercury (ug/L)		0.07	0.16	0.12	0.061
Cadmium (ug/L)		2.6	3.8	0.9	1.5
Thallium (ug/L)		<1	<1	<1	<1
Arsenic (ug/L)		20.5	47.5	11.1	14.3
Lead (ug/L)		99.2	72.7	60.8	66.6
Chromium (ug/L)		21.8	55.6	8.1	15
Copper (ug/L)		0.117	0.169	0.121	0.0659
Nickel (ug/L)		54.1	101	47.3	23.7
Zinc (ug/L)		1210	2350	274	911
Ammonia (mg/L)	Quarterly	544	1500	6500	202
Sulphate (mg/L)	Quarterly	106.4	<1	<10	<1
Organic Screen	Annually			See appendices for full lab report.	

There are no Emission Limit Values for leachate/trade effluent set out in Licence W0234-01.

2.3 Emissions to Groundwater 2008

Site emissions to groundwater are addressed in Condition 3.25 and Schedule C.5 of Waste Licence W0234-01. The licence requires groundwater monitoring to take place annually at the facility. Two groundwater monitoring wells (1 no. up-gradient and 1 no. down- gradient) were installed by Golder Associates Ireland at the facility between the 18th and the 21st of February 2008. Groundwater samples were taken by Golder Associates Ireland on the 6th March 2008.

The parameters analysed for are in accordance with Table C.5 of waste licence W0234-01. All parameters were below IGV Guideline values and are below the European Communities (Drinking Water) (No. 2) regulations 2007 S.I. 278 of 2007. All full report can be found in the Appendices Section E.

2.4 Monitoring of Emissions to Air 2008

It is a requirement of waste licence W0234-01 to carry out Air and odour monitoring of the biofilters in operation at the facility. Monitoring of the biofilter performance was carried out twice during the reporting period for 2008 in accordance to Schedule C.1.2. In addition an odour assessment and the condition and Depth of each biofilter is assessed on a daily basis and recorded.
There are 10 woodchip based biofilters in operation at the facility. Two Biofilters (DBF1 and DBF2) are located on the Digester Pad area to remove odour from the 20 Digester Units in operation. In addition, eight biofilters (CBF1 to CBF8) are in operation at the curing pad area to remove odour from the material processing outdoors on the curing piles.

All biofilter bed media analysis was sampled by the facility manager and analysis carried out by Envirolab Laboratories, Christendom, Ferrybank, Waterford during the periods May/June 2008 and November 2008. Table 2.4a below provides the findings of the bed media analysis for each biofilter (DBF1 to CBF8) for the measurement required under licence W0234-01.

All biofilter gas inlet and outlet sampling and measurements were carried out by Odour Monitoring Ireland, Unit 23 De Granville Court, Dublin Rd, Trim, Co. Meath during the periods July 2008 and December 2008. Tables 2.4b to 2.4e provides the findings of the inlet and outlet gas analysis for the measurements required under licence W0234-01.

Table 2.4a Biofilter Air & Odour Monitoring 2008 (Bed Media)

Biofilter Air & Odour Monitoring 2008			
Monitoring Point	**Parameter**	**Analysis Result 1half**	**Analysis Result 2half**
Digester Biofilter DBF1	Odour assessment	Ok	Ok
	Condition	Normal	Normal
	Depth	Small drop in depth	Normal
	Mositure content	68.2%	73.71%
	pH	3.9	5.5
	Ammonia	156 mg/L N	2.8 mg/L N
	Total viable counts	3.5 x 10 (6) cfu	1.2 x 10 (6) cfu
Digester Biofilter DBF2	Odour assessment	Ok	Ok
	Condition	Normal	Normal
	Depth	Samll drop in depth	Normal
	Mositure content	65.5%	71.05%
	pH	4.3	6.3
	Ammonia	275 mg/L N	36.5 mg/L N
	Total viable counts	4.1 x 10 (6) cfu	4.8 x 10 96) cfu
Curing Biofilter CBF1	Odour assessment	Ok	Ok
	Condition	Normal	Normal
	Depth	Normal	Normal
	Mositure content	68.2%	65.89%
	pH	4.6	5.0
	Ammonia	15 mg/L N	2.5 mg/L N
	Total viable counts	3.5 x 10 (6) cfu	3.6 x 10 (5) cfu
Curing Biofilter CBF2	Odour assessment	Ok	Ok
	Condition	Normal	Normal
	Depth	Normal	Normal
	Mositure content	70%	75.75%
	pH	5.1	4.9
	Ammonia	17 mg/L N	27 mg/L N
	Total viable counts	1.14 x 10 (7) cfu	2.1 x 10 (5) cfu
Curing Biofilter CBF3	Odour assessment	Ok	Ok
	Condition	Normal	Normal
	Depth	Normal	Normal
	Mositure content	68.4%	75.13%
	pH	5.6	5.3
	Ammonia	42 mg/L N	4.1 mg/L N
	Total viable counts	7.2 x 10 (6) cfu	2.4 x 10 (5) cfu
Curing Biofilter CBF4	Odour assessment	Ok	Ok
	Condition	Normal	Normal
	Depth	Normal	Normal
	Mositure content	68.1%	66.81%
	pH	4.8	7.2
	Ammonia	160 mg/L	2.3 mg/L N
	Total viable counts	3.7 x 10 (6) cfu	6.8 x 10 (5) cfu
Curing Biofilter CBF5	Odour assessment	Ok	Ok
	Condition	Normal	Normal
	Depth	Normal	Normal
	Mositure content	70.5%	73.33%
	pH	4.4	4.9
	Ammonia	56 mg/L N	2.9 mg/L N
	Total viable counts	8.7 x 10 (5) cfu	1.8 x 10 (5) cfu
Curing Biofilter CBF6	Odour assessment	Ok	Ok
	Condition	Normal	Normal
	Depth	Small drop in depth	Normal
	Mositure content	73.9%	69.99%
	pH	3.8	6.2
	Ammonia	57 mg/L	3.3 mg/L N
	Total viable counts	1.0 x 10 (8) cfu	1.46 x 10 (6) cfu
Curing Biofilter CBF7	Odour assessment	Ok	Ok
	Condition	Normal	Normal
	Depth	Small drop in depth	Normal
	Mositure content	60.1%	71.95%
	pH	6.1	6.5
	Ammonia	310 mg/L N	1.2 mg/L N
	Total viable counts	1.18 x 10 (8) cfu	3.10 x 10 (6) cfu

Curing Biofilter CBF8	Odour assessment Condition Depth Mositure content pH Ammonia Total viable counts	Ok Normal Small drop in depth 72.8% 4.8 35 mg/L N 1.1 x 10 (7) cfu	Ok Normal Normal 71.59% 6.5 1.7 mg/L N 3.9 x 10 (6) cfu

In addition to the biofilter bed media monitoring requirements above, measurement were also required biannually in 2008 for both the inlet and outlet gas for each biofilter at the facility under Schedule C.1.2 of the waste licence. Inlet and outlet gas measurements were required for Ammonia, Hydrogen Sulphide, Mercaptans and Amines. Tables 2.4b, 2.4c, 2.4d and 2.4.4e provide the results of analysis for each of these parameters respectively. Biofilter Gas emissions graph can be found in Appendices Section F.

Table 2.4b Inlet and Outlet Gas 2008 (Ammonia)

Biofilter Inlet and Outlet Gas 2008 - Ammonia				
Monitoring Point	**1st Period 2008**		**2nd Period 2008**	
	Inlet Ammonia mg/Nm-3	**Outlet Ammonia mg/Nm-3**	**Inlet Ammonia mg/Nm-3**	**Outlet Ammonia mg/Nm-3**
DBF1	11.38	2.98	26.44	3.12
DBF2	12.37	4.95	19.12	3.99
CBF1	2.81	1.07	11.91	1.33
CBF2	2.60	0.89	22.12	1.45
CBF3	2.73	1.01	13.11	2.45
CBF4	4.28	0.56	12.33	1.03
CBF5	2.13	0.68	8.91	1.09
CBF6	3.36	0.78	9.88	0.56
CBF7	2.96	1.15	1.12	2.12
CBF8	2.41	0.68	3.11	0.45

Table 2.4c Inlet and Outlet Gas 2008 (Hydrogen Sulphide)

Biofilter Inlet and Outlet Gas 2008 – Hydrogen Sulphide				
Monitoring Point	**1st Period 2008**		**2nd Period 2008**	
	Inlet H2S ppb	**Outlet H2S ppb**	**Inlet H2S ppb**	**Outlet H2S ppb**
DBF1	900	70	940	59
DBF2	960	69	930	71
CBF1	45	14	33	16
CBF2	58	10	46	9
CBF3	53	18	51	12
CBF4	62	12	56	14
CBF5	55	19	67	13
CBF6	74	18	68	15
CBF7	44	14	39	17
CBF8	40	8	39	6

Table 2.4d Inlet and Outlet Gas 2008 (Mercaptans)

Biofilter Inlet and Outlet Gas 2008 – Mercaptans				
Monitoring Point	**1st Period 2008**		**2nd Period 2008**	
	Inlet Mercaptans mg/Nm-3	**Outlet Mercaptans mg/Nm-3**	**Inlet Mercaptans mg/Nm-3**	**Outlet Mercaptans mg/Nm-3**
DBF1	0.69	0.08	0.55	0.14
DBF2	0.66	0.09	0.54	0.11
CBF1	0.32	0.08	0.49	0.10
CBF2	0.38	0.07	0.44	0.13
CBF3	0.34	0.11	0.43	0.16
CBF4	0.26	0.10	0.41	0.08
CBF5	0.16	0.05	0.39	0.08
CBF6	0.19	0.07	0.21	0.06
CBF7	0.14	0.04	0.23	0.12
CBF8	0.10	0.03	0.24	0.09

Table 2.4e Inlet and Outlet Gas 2008 (Amines)

Biofilter Inlet and Outlet Gas 2008 – Amines				
Monitoring Point	**1st Period 2008**		**2nd Period 2008**	
	Inlet Amines mg/Nm-3	**Outlet Amines mg/Nm-3**	**Inlet Amines mg/Nm-3**	**Outlet Amines mg/Nm-3**
DBF1	5.50	0.65	4.70	0.55
DBF2	5.60	0.62	4.80	0.73
CBF1	4.90	0.62	5.1	0.77
CBF2	5.50	0.22	4.9	0.13
CBF3	4.10	0.31	3.9	0.35
CBF4	4.90	0.29	3.7	0.33
CBF5	4.20	0.47	3.6	0.36
CBF6	3.89	0.41	2.65	0.34
CBF7	3.80	0.18	2.9	0.23
CBF8	2.78	0.13	3.88	0.24

Summary

Bed media analysis during 2008 has shown moisture content at the required levels to support good microbial growth and is supported by the results of total viable counts in the required range. Ammonia levels are well below the levels where inhibitory effects are produced within the bed media and overall are in the low to medium range for biofilters that were in operation for approximately 18 months. The bed media was changed out after the first period of analysis resulting in a lower ammonia content for the second measurement period. With the exception of the pH levels that are outside the expected range of 6.0 to 8.0 the overall performance of the bed media was good in 2008.

The Ammonia, Hydrogen Sulphide and Mercaptans are within the emission limit values as per Schedule B1 of waste licence W0234-01 with an average overall VOC removal efficiency of 73-99% of all inlet VOC's for the first period and 25.5 – 93.7% removal for the second period 2008.

3.0 WASTE MANAGEMENT RECORD

3.1 Waste Received at the Facility 2008.

Waste received at the facility consists of Non-hazardous biodegradable (household and commercial organic waste and green waste) waste. The primary sources for waste received are as follows;

Brown Bin Organic Household organic collection from Waterford City Council.
Brown Bin Organic Household organic collection from Waterford County Council.
Brown Bin Organic Household organic collection from Wexford County Council.
Brown Bin Organic Commercial collection from Veolia Environmental Services.
Green waste Collected at Drop-off amenity at the facility from the public.

A breakdown of the waste received at the facility in 2008 can be found in Table 3.1 below.

Table 3.1 Tonnage Waste Received at Facility in 2008.

Tonnage Waste Received at Facility 2008						
Period 2008	**Waterford City Council**	**Waterford County Council**	**Wexford County Council**	**Veolia Environmental**	**Green Waste**	**Woodchip**
January	284.9	223.3	5.7	114.6	30	
February	219.6	173.4	5.1	100.9	40	
March	232.4	148.3	5.3	95.3	60	
April	336.3	242.7	5.6	111.2	80	
May	475.3	172.6	5.4	112.4	80	77.6
June	375.3	271.5	7.9	119.1	80	
July	420.6	145.9	4.9	113.5	80	
August	263.6	37.3	4.8	65.1	80	
September	419	0	4.9	96.3	70	
October	318	0	5.1	94.22	60	
November	209.1	0	4.7	83	60	
December	198.4	0	6.6	42.4	40	
	3752	1415	66	1148	760	78
Total Received	**7141**					

A total of 7,141 tons was received at the facility in 2008. The 78 tons of woodchip received at the facility was used as replacement bed media for the biofilters on site. Approximately 760 tons of green waste was received from members of the public and landscapers using the drop-off amenity area. This green waste was primarily used as bulking agent in the process in order to provide sufficient aeration for aerobic conditions. In September 2008 Waterford County Council ceased bringing biowaste to the facility.

3.2 Tonnage Waste Leaving Facility 2008

Waste leaving the facility in 2008 consists of the following;

Waste from contamination segregated during the process.
Leachate collected during compost process
Batches of compost that failed to meet the Animal By-Product Regulation protocols as required by the Department of Agriculture, Food and Forestry.

A breakdown of the waste leaving the facility in 2008 can be found in Table 3.2 below.

Table 3.2 Tonnage Waste Leaving Facility 2008

Tonnage Waste Leaving Facility 2008			
Period 2008	**Contamination Landfilled**	**Leachate Collected and Treated**	**Failed Batches Landfilled**
January	34.4	120.2	
February	130.1	73.6	
March	122.4	39.7	
April	145	47.7	
May	0	58.4	
June	69.4	208.9	
July	24.5	293.2	
August	148.1	132.7	148.2
September	164.4	56.4	
October	0	108.2	
November	73.68	178.0	
December	30.2	96.0	
	942	1413	148
Total Leaving	2503		

A total of 5,503 tons of material left the facility in 2008. 942 tons of waste was due to contamination from material collected at source and screened/recovered during final stages of processing. This contamination mainly consists of plastic, metal, textiles and glass received from brown bin contamination from local authorities collection. All contamination was transported and landfilled to Powerstown Landfill in Co. Carlow.

1413 tons of leachate/trade effluent was collected during the process in 2008. Leachate/trade effluent is collected from the following sources on site;

Washdown from waste reception building floor.
Wheel wash at waste reception building.
Leachate from Digester pad area.
Leachate from Curing pad area.
Toilets.

All leachate/trade effluent is collected via the leachate collection system and pumped into a leachate storage tank on site. The leachate was removed from the tank by a vacuum tanker and transported to a waste water treatment plant at Waterford Proteins, Christendom, Ferrybank, Waterford City.

In August 2008 a batch of compost consisting of 148.1 tons failed to meet the E.coli protocols set out in the Animal By-Product Regulations. The Department of Agriculture, Food and Forestry were contacted and the compost batch in question was removed to Youghal Landfill (Licence Reg No. W0068-02) under the supervision of an inspector from the Department.

3.3 Tonnage Waste Recovered at Facility 2008

A total of 7,141 tons of waste was received in 2008 for processing. Approximately 30-40% by weight of moisture is lost to the atmosphere during the composting/degradation process. Following the maturation process, approximately 4600 tons of material was available for screening.

Evaluating a moisture loss of 35% (2500 tons), therefore 4600 tons was available for screening with total of 2200 tons approximately of final compost product of particle size less than 12mm is produced.

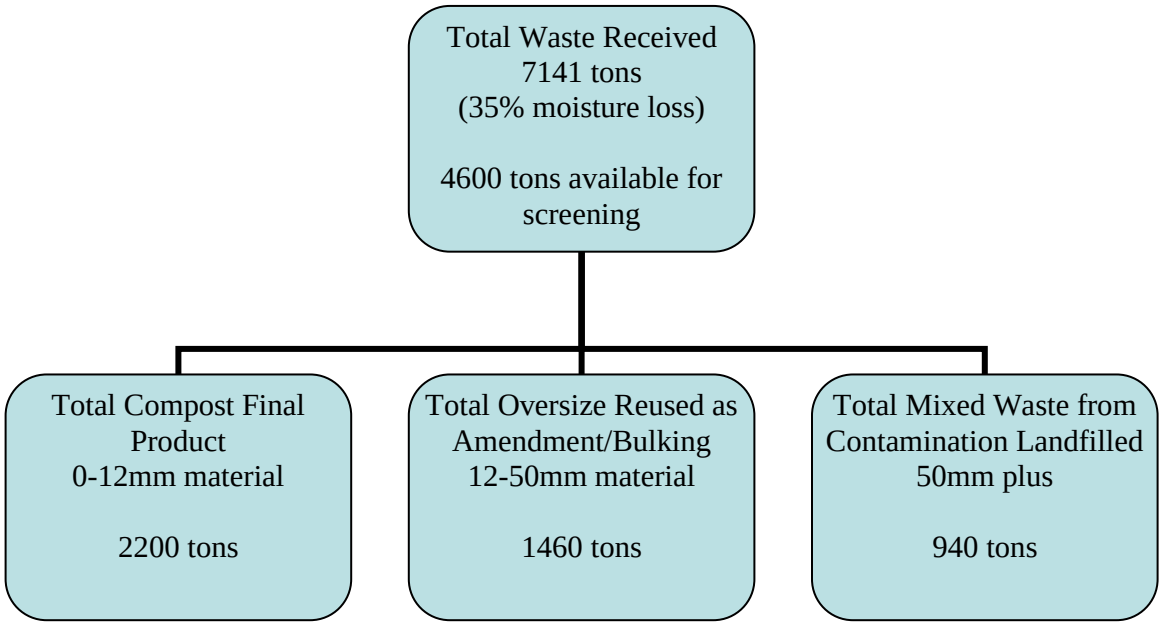
The remainder, 2400 tons consists of oversize materials. This oversize material with a particle size of greater than 12mm was screened again at 50mm to remove contamination due to plastics, metals, glass and textiles. The result of this second screening produced 940 tons of mixed municipal waste that was landfilled.

The final fraction of oversize material in the particle size range of 12-50mm, was re-introduced into the process as amendment/bulking agent to aid the aeration process and as cover material on the curing pad piles. This volume totalled approximately 1460 tonnes.

In 2008 all 12mm final compost product produced at the facility was removed by members of the public and local landscapers.

A breakdown of the material recovered can be found in diagram 3.3 below.

Diagram 3.3 Recovery of Compost Fractions 2008.



4.0 RESOURCE CONSUMPTION SUMMARY

Resources consumed at the facility include electricity, diesel fuel, water, odour neutralising solution, disinfectant, engine oil and hydraulic oil.

Major items of energy and resource consumption at the facility in 2008 are detailed in Table 4.1 below. As this is the first year an annual environmental report is required for the facility no comparisons can be made at this point to efficiency rates as compared to previous years. This format will be adopted within the report for 2009.

Table 4.1 Resource Consumption 2008

Resource Consumption 2008			
Resource Category	**Quantity**	**Tonnage Processed**	**Consumption per Tonne**
Electricity (KWH)	210	7141	0.029
Diesel (litres)	33060	7141	4.63
Water (m3)	3500	7141	0.49
Odour Neutraliser (m3)	5000	7141	0.70
Disinfectant (litres)	350	7141	0.05
Engine Oil (litres)	180	7141	0.025
Hydraulic Oil (litres)	150	7141	0.021

Electrical consumption is required for the operation process control fans and motors for the aeration systems on site. These systems are in continuous operation. Additional electrical consumption is required for general lighting and office equipment.

33,060 Litres of diesel oil was consumed in 2008.
Diesel consumption is required for the following equipment operated at the facility in 2008;

Waste Shredder/mixer
Senobogen loader in waste reception building
Komatsu Loader for turning and screening operations
Doppstadt Screen for final compost screening.
Roll-on/Roll-off vehicle for movement of digester box units.
Generator for wheel wash operation at waste reception building.
Steam washer for cleaning operations.

It is envisaged that following the proposed new development in 2009 that the facility will be less reliant upon the use of diesel operated equipment and alternatively electrically driven equipment will be incorporated.

5000 m3 of Odour Neutraliser solution was consumed on site in 2008. The odour neutraliser system is in operation 5 days per week and for night-time operations when turning and screening activities are carried out.

Approximately 3500m3 of water from mains source was consumed in 2008. This consumption primarily arose from the installation of a wheel wash system at the waste reception building in

April 2008. The wheel was consumes approximately 1m3 of water from mains per day. A smaller volume of water is consumed form daily cleaning activities by use of a portable steam cleaner used throughout the facility.
In general a higher volume of water would be expected to be consumed throughout the year for process requirements. It is estimated that water consumption for turning operations was in the region of 3-4,000 m3 per annum for previous years.

350litres of disinfectant was used at the facility in 2008 as required by Department of Agriculture Animal By-Product regulations. Disinfectant is used in footbaths and for wash-down operations. All disinfectant used at the facility for wash down operations in 2008 was collected on site and transferred to the leachate storage tank.

180 litres and 150 litres of engine and hydraulic oil respectively was consumed in 2008. these oils were used for general maintenance of mobile equipment operating at the facility.

5.0 COMPLAINTS SUMMARY

Condition 11.5 of waste licence W0234-01 requires the licence holder to make written record of any complaints made by internal and/or external bodies resulting from activities at the facility. A summary of all complaints for 2008 is listed in table 5.0 below.

Table 5.0 Complaints Summary 2008

Complaints Summary 2008					
Date	**Record No.**	**Source**	**Complaint**	**Cause**	**Corrective Actions**
14/04/08	OC 01/08	External – Mr John Brennan Brennan Hygiene	Odour	Screening Operations	Screening operations ceased
09/05/08	OC 02/08	External – Mr. John Brennan Brennan Hygiene	Odour	Tipping Digester unit contents	Operation completed, Material covered immediately
11/07/08	OC 03/08	External – Mr. John Brennan Brennan Hygiene	Odour	No activities at time of complaint	Non taken
16/09/08	OC 04/08	External – Mr. John Brennan Brennan Hygiene	Odour	General Operations	Complaint taken by Waterford City Council
26/09/08	OC 05/08	External – Mr. John Brennan Brennan Hygiene	Odour	No activities at time of complaint	Non Taken

There were five complaints made in 2008 for the facility. In each instance the complaint was made from the same individual, Mr. John Brennan of Brennan Hygiene. Brennan Hygiene is a commercial premise located within the Six Cross Roads Business Park adjacent to the compost facility. The business is located approximately 150meters from the compost facility boundary to the south.

On each occasion upon receiving the complaint the facility manage carried out an investigation for the source of the complaint with the exception of the complaint made on 16/09/08 when the facility manager was unavailable and the complaint was received through Waterford City Council.

In light of these complaints operations are kept to a minimum during daytime hours and all turning and screening activities are carried out at the facility between the hours of 5.30pm and 11.00pm. in order to minimise the nuisance caused by operations to external businesses and the general public.

6.0 ENVIRONMENTAL OBJECTIVES & TARGETS

A schedule of Environmental Objectives & Targets for the Environmental Management programme is attached.

7.0 E.M.P. REPORT 2008

The Environmental Management Programme for 2008 is attached.

8.0 E.M.P. REPORT 2009

At the time of preparing this AER report in March 2009, Waterford City Council had taken the decision to cease operations at the existing facility in order to facilitate the development of the proposed new 16,000 ton capacity facility. Waste material ceased to be accepted at the facility from 9th March 2009.Waterford City Council have indicated that the duration of the short term closure will be in the order of 12-18 months in order to prepare the procurement process and initiate and complete the construction phases. It is envisaged that the new facility will not become fully operational until end 2010/ start 2011.

There remains approximately 1,600 tonnes of material in various stages of processing on the curing pad area at present. A submission was made to the Agency with regards to the short-term closure of the facility which included the processing of the existing material in full and the closure and decommissioning of all site operations and equipment. It is expected that all the material in process will be fully processed by September 2009 and removed off-site. The facility will subsequently be decommissioned thereafter (End September 2009) to make way for the construction of the new development.

With respect to the existing EMP, the achievement of many of the Objectives and Targets are founded around this new development and the technology it will provide. After consulting with the Agency it was agreed that due to the closure of the facility for 12-18months it would be more appropriate at this time to set aside the existing EMP and to re-develop a new set of Objectives& Targets and include them in a new set of EMP projects once the new facility is completed and operational.

To this purpose there is no E.M.P proposal report submitted for 2009.

9.0 PRTR REPORT 2008

The PRTR Report for 2008 is attached.

10.0 PRTR REPORT 2009

At the time of preparing this AER report in March 2009, Waterford City Council had taken the decision to cease operations at the existing facility in order to facilitate the development of the proposed new 16,000 ton capacity facility. Waste material ceased to be accepted at the facility from 9th March 2009.Waterford City Council have indicated that the duration of the short term closure will be in the order of 12-18 months in order to prepare the procurement process and initiate and complete the construction phases. It is envisaged that the new facility will not become fully operational until end 2010/ start 2011.

Subsequently with the closure of the facility in March 2009 and to the minimal activities envisaged throughout the year at the facility there would be insufficient information regarding emissions to formalise a proposed PRTR report for 2009.

11.0 NOISE MONITORING REPORT SUMMARY

Golder Associates Ireland was commissioned by Waterford City Council to undertake an environmental noise survey of the facility in 2008. The noise survey was carried out on 20th and 21st February 2008. Measurements were taken at 5 no. locations in and around the facility. The survey was carried out during normal operating day-time and night-time conditions in accordance with Condition 6.12 and Schedule C.4 of waste licence w0234-01.

Noise measurements were recorded at the Southern (N1), Northern (N2) and Eastern (N3) site boundaries and at 2 locations outside of the facility to the North West (NS1) and East (NS2). Of the five monitoring locations 2 no. (NS1 and NS2) can be considered to be noise sensitive receptors. The locations of all noise monitoring points are given in Appendices Section G.

Noise levels at the site boundary monitoring points were compared to the 55 dB(A) daytime and 45 db(A) night-time sound pressure levels specified in the waste licence. Measurements were also taken for the L_{Aeq}, L_{A10}, L_{A90} data.

Table 11a Noise Monitoring Locations

Measurement No.	Reference No.	Monitoring Period	Description
1	N1	Day/Night-time	Southern Site Boundary
2	N2	Day/Night-time	Northern site Boundary
3	N3	Day/Night-time	Eastern Site Boundary
4	N4	Day/Night-time	North West of Site
5	N5	Day/Night-time	East of Site

The noise levels recorded at each monitoring location, including noise sensitive locations for day-time and night-time monitoring requirements are presented in Table 2.4b below.

Table 11b Day-time and Night-time Noise Measurements.

Monitoring Point	$L_{Aeq\ 30min}$ dB(A)	$L_{A10\ 30min}$ dB(A)	$L_{A90\ 30min}$ dB(A)	$L_{Aeq\ 30min}$ dB(A)	$L_{A10\ 30min}$ dB(A)	$L_{A90\ 30min}$ dB(A)
	Day-time			Night-time		
N1	73	74	63	55	69	47
N2	70	72	58	52	55	44
N3	60	66	56	49	54	42
NS1	69	72	54	63	57	49
NS2	64	66	60	59	62	44

Summary

Day-time LAeq noise levels recorded during the monitoring period ranged between 60 dB(A) and 73 dB(A). A day-time noise limit of 55 dB(A) LAeq from the facility at the noise monitoring locations is stipulated in Schedule C.5 of the waste licence. The noise levels at the specified noise locations exceeded 55dB(A). However, the noise levels at these monitoring locations were

affected by other external factors such as road traffic noise on the surrounding access routes as well as on-going operational noise at the facility.
Traffic into and out of the facility consisting of commercial vehicles and public vehicles has a significant impact on the noise environment at monitoring location N2 during the day-time it was noted, during the survey, that traffic noise is audible at the 3 no. on-site monitoring locations namely N1, N2 and N3.

The Night-time LAeq noise measurements ranged in value between 49dB(A) and 63dB(A). A Night-time noise limit of 45dB(A) LAeq from the facility at the noise monitoring locations is stipulated in Schedule C.5 of the waste licence.
On-site noise sources during the night-time included telescopic loader movements, screening equipment and automated ventilation systems. The LAeq noise level at boundary locations exceeded the limit of 45dB(A) however the facility is situated in an area that is surrounded by industrial premises.

Both the noise sensitive locations NS1 and NS2 were above the 45dB(A) limit set out in the licence. This is as a result of both noise sensitive locations being dominated by traffic noise.

In conclusion, noise emissions from the operations at the facility do not dominate the noise environment in the area. The facility is situated adjacent to a fully operational business park which is industrial and commercial in its nature. The LA90 values, which are indicative of the background noise environment and indicate that the noise climate of the area is influenced by a number of continuous noise sources i.e. traffic on access routes and the outer ring road. Therefore the activities at the compost facility do not give rise to unacceptable noise levels considering the impact from other activities in the area.

12.0 AMBIENT MONITORING SUMMARY

Ambient monitoring requirements for 2008 under licence W0234-01 Schedule C.5 include Dust, Odour Measurement, Odour Modelling, Bacteria, Aspergillus fumigatus and PM_{10}.

12.1 Dust Monitoring

There is a requirement under licence W0234-01 to carry out dust deposition measurements on a quarterly basis for monitoring points D1 (Southern boundary), D2 (North Western boundary) and D3 (North Boundary) of the facility. All dust sampling was carried out by the facility manager and analysis by Envirolab Laboratories, Christendom, Ferrybank, Waterford City. Table 12.1 provides the results for dust analysis carried out in 2008.

Table 12.1 Dust Deposition Monitoring 2008

Dust Deposition Monitoring 2008					
Monitoring Points	**Q1**	**Q2**	**Q3**	**Q4**	**ELV**
	mg/m2/day	**mg/m2/day**	**mg/m2/day**	**mg/m2/day**	**mg/m2/day**
D1	47.7	28.8	14.5	31.0	350
D2	197.1	19.8	14.7	12.6	350
D3	25.8	47.5	76.2	17.9	350

The primary source of dust deposition on site may be attributed to movement of vehicles, turning of compost on curing pads and screening operations. There were no exceedances of the emission limit values set out in licence W0234-01 during 2008. Dust deposition monitoring graph can be found in Appendices Section H.

12.2 Odour Measurement 2008

There is a requirement under licence W0234-01 to carry out Odour measurement on a quarterly basis at the facility. Schedule C.5 requires odour measurements to be taken by olfactometric measurement and analysis for mercaptans, hydrogen sulphide, ammonia and amines. Olfactometric measurements are taken and recorded daily by the facility manager. All analysis for mercaptans, hydrogen sulphide, ammonia and amines were taken by Odour Monitoring Ireland for the reporting period. Table 12.2 below provides the results for the odour measurements during 2008. Odour measurement monitoring graph can be found in Appendices Section I.

Table 12.2 Odour Measurement 2008

Odour Measurement 2008					
Monitoring Location	**Parameter**	**Q1**	**Q2**	**Q3**	**Q4**
Location 1	**Odour threshold conc (OuEm-3)**	33	48	42	38
	H2S (ppb)	<3	<3.0	<3.0	<3.0
	Mercaptans (ug/m3)	<20	<30	<25	<23
	Amines (ug/m3)	<50	<62	<71	<65
	Ammonia (mg/Nm3)	<0.144	<0.144	<0.18	<0.13
Location 2	**Odour threshold conc (OuEm-3)**	148	121	105	114
	H2S (ppb)	<3	<3.0	<3.0	<3.0
	Mercaptans (ug/m3)	<18	<42	<38	<24
	Amines (ug/m3)	<42	<54	<68	<61
	Ammonia (mg/Nm3)	4.5	2.30	3.12	0.32
Location 3	**Odour threshold conc (OuEm-3)**	78	98	77	66
	H2S (ppb)	<3	<3.0	<3.0	<3.0
	Mercaptans (ug/m3)	<26	<36	<23	<25
	Amines (ug/m3)	<48	<50	<59	<55
	Ammonia (mg/Nm3)	1.50	0.75	0.89	<0.16

All odour sampling and analysis was performed in accordance with the EN13725:2003. all hydrogen sulphide concentrations recorded at each monitoring location were less than 3ppb in ambient air. No significant ambient air concentrations of Mercaptans or aliphatic amines were detected downwind of the facility operations. Increased levels of Ammonia were detected downwind of the facility operations. This was as a result of the second stage phase static aerated pile composting which is carried on outdoors. This is due to be upgraded as part of the facility new development incorporating a biofilter with ammonia scrubber which will alleviate such emissions in future.

12.3 Odour Modelling 2008

No Odour Modelling was carried out during 2008.

12.4 Bacteria Monitoring 2008

Table 12.4 illustrates the results from bioaerosol air quality monitoring. Both aspergillus fumigatus and total mesophillic bacteria were assessed on the day of sampling namely 7th May 2008. All sampling and analysis was carried out by Odour Monitoring Ireland.

Table 12.4 Bioaerosol concentration levels 2008

Bioaerosol Concentration levels 2008			
Location ID	**Average Aspergillus fumigatus conc (cfu m-3)**	**Average Mesophillic bacteria conc (cfu m-3)**	**Sample Count**
Loc 1	<8	94	3
Loc 2	48	2148	3
Loc 2	26	897	3

No background levels of bioaerosols are available for the facility operations so the significance of background levels cannot be discussed.
In accordance with the assessment criteria, bioaerosol concentrations are within the assessment criterion range for Aspergillus fumigatus and in the mid range for total Mesophillic bateria during 2008. Bioaerosols monitoring graph can be found in Appendices Section J.

12.5 PM_{10} (ug/m3) Monitoring 2008

Odour Monitoring Ireland were commissioned to undertake a PM_{10} (Particulate matter 10um aerodynamic diameter) monitoring program in the vicinity of the facility annually in accordance with schedule C.5 of the waste licence W0234-01. due to the fact that there was no available power at the monitoring location PM1, PM_{10} monitoring was performed using a battery operated gravimetric PM_{10} monitor. Table 12.5 illustrates the average ambient PM_{10} concentrations for one fixed monitoring location at the facility.

Table 12.5 Average Ambient PM_{10} Concentration 2008

Average Ambient PM_{10} Concentration 2008			
Monitoring Location	**Grid Ref.**	**Sample Number**	**Average conc. value**
PM 1 02/07/2008	258234, 109596	243895	28
Limit value		**SI271 of 2002**	**50**

The ambient air concentration levels of PM_{10} were below the statutory 24-hour average ambient air concentration level of 50 ug/m3 at monitoring location PM1

13.0 TANK AND PIPELINE INSPECTION REPORT

13.1 Underground Pipeline Assessment

No survey was carried out in 2008 for assessment of integrity on the underground surface water and leachate pipework system at the facility. A CCTV surveillance of all existing drainage on site to include new and old pipework will be carried out in 2009.

13.2 Leacahte storage and sumps

The leachate storage tank, leachate tank bund, leachate sump and surface water sump were tested for integrity following completion of works in December 2007 by Brendan O Rourke Construction Ltd. A copy of the integrity test certification was forwarded to the Agency on 4th March 2008. Both sumps, leachate tank and bund passed the integrity testing carried out over a 48hr period. Integrity test certification can be found in Appendices Section K.

14.0 REPORTED INCIDENTS SUMMARY

Condition 11 of the Waste Licence requires that the licence holder make written records of any incident that may have the potential for environmental contamination of surface water or groundwater, or posing an environmental threat to air or land, or requiring and emergency response by the Local Authority.
Several incidents were recorded during the reporting period and a summary is presented in Table 11.0 below. An outline of steps taken to minimise the emissions, prevent recurrence of future potential emissions and remedial actions undertaken is also presented.

Table 14.0 Recordable Incidents 2008.

Recordable Incidents 2008				
Date	**Record No.**	**Nature of Incident**	**Cause**	**Corrective Action**
27/03/08	EI 01/08	Exceedance ELV for Surface Water BOD and Suspended Solids.	Solids/Mud/Dust on yard surfaces from screening and turning operations outdoors. Rain Run-off entering surface water drainage system.	New Proposed development to incorporate all activities indoors.
21/04/08	EI 02/08	Exceedance in ELV for annual noise survey		
12/06/08	EI 03/08	Exceedance ELV for Surface Water BOD and Suspended Solids.	Solids/Mud/Dust on yard surfaces from screening and turning operations outdoors. Rain Run-off entering surface water drainage system.	Installation of series of grit traps and oil water interceptor required.
05/09/08	EI 04/08	Exceedance ELV for Surface Water BOD and Suspended Solids.	Solids/Mud/Dust on yard surfaces from screening and turning operations outdoors. Rain Run-off entering surface water drainage system.	Installation of series of grit traps and oil water interceptor required.
10/11/08	EI 05/08	Exceedance ELV for Surface Water BOD and Suspended Solids.	Solids/Mud/Dust on yard surfaces from screening and turning operations outdoors. Rain Run-off entering surface water drainage system.	WCC contacted consultants with regards to installation of grit traps, sand filtration system and oil/water interceptor
*25/01/08		*Leachate leaks from Curing Pad Area.	*Portable walls used in the construction of	*Investigation of ground/soil and

		Possible contamination of soil and groundwater on site.	curing pads do not contain leachate fully.	groundwater on site. Leachate drainage collection system was installed to collect spills from the area at the curing pad.

*Following a site visit from the Agency on 25th January 2008 it was found that there were small leachate leaks occurring from the back walls of the curing pad area that had flowed to unprotected ground along the sides of the curing pads. An investigation was carried out for potential contamination of groundwater on 24th April 2008 and a report of the findings were sent to the Agency. The Agency was not satisfied to the extent of the investigation and a second investigation is due to be carried out by Golder Associates in 2009. The findings of the investigation will be forwarded to the Agency at this point.

15.0 ENERGY EFFICIENCY AUDIT REPORT SUMMARY

An energy efficiency audit report is a requirement as a part of the facility's Environmental Management Programme in accordance with the waste licence W0234-01 for the facility. Waterford City Council has consulted the Agency's guidance notes and recommendations on Energy Efficiency Audit in carrying out an energy audit for the facility.

15.1 Input Information:

Information from previous years electrical and diesel usage were available for the audit.
A list of major plant and equipment was compiled.
There was at least 12 months data for electricity and diesel usage for 2008.
The details of the tonnage processed for 2008 and previous years were available.
Weather conditions were not deemed applicable for the energy audit.

The following input information was complied for the Audit;

In 2008 a total of 210KWh of electricity was consumed.
In 2008 a total of 33,060 litres of Diesel fuel was consumed.
In 2008 the total tonnage processed at the facility was 7141 tonnes of waste.

In 2007 a total of 227KWh of electricity was consumed.
In 2007 a total of 23,335 litres of Diesel fuel was consumed.
In 2007 the total tonnage processed at the facility was 7739 tonnes of waste.

In 2006 a total of 186KWh of electricity was consumed.
In 2006 a total of 16,500 litres of Diesel fuel was consumed.
In 2006 the total tonnage processed at the facility was 7100 tonnes of waste.

The list of major plant and equipment that consume electricity and diesel includes the following;

Senebogen Loader waste reception building	Diesel
Komatsu Loader curing pad area	Diesel
Doppstadt Screen	Diesel
Doppstadt Shredder/mixer	Diesel
RO/RO vehicle	Diesel
Generator for Wheel Wash	Diesel
40 no.s Digester fans	Electrical
8 no.s Curing fans	Electrical
Steam washer	Electrical
Lighting	Electrical

15.2 Evaluation of Energy Performance:

For the purposes of this audit the performance was measured as the number of tonnes processed per KWH and per Litres of fuel used in 2008. This information could then be compared to similar rates obtained in previous years operations. Table 15.2 below provides the electrical and diesel fuel consumption from 2006 to 2008. A breakdown of the usage per tonne of waste processed is also provided.

Table 15.2 Evaluation of Energy Performance 2006 to 2008.

Evaluation of Energy Performance 2006 to 2008					
Period	**Electrical Usage KWh**	**Diesel Usage Litres**	**Tonnage Processed**	**KWh/tonne**	**Litres/Tonne**
2008	210	33,060	7141	0.0294	4.62
2007	227	23,335	7739	0.0293	3.01
2006	186	16,500	7100	0.0262	2.32

Electrical Consumption.

As can be seen from the information supplied in the above table there has been little or no change in the electrical consumption of the facility from 2006 to 2008 with the usage per tonne ranging from 0.0262 to 0.294KWh/tonne. The overall tonnage remained relatively constant with a variation of approximately 600 tonnes for the period.

It is estimated that in the region of 90% of the total electrical consumption is related to the operation of the aeration fans on site. Regardless of an increase or decrease of the tonnage throughput, the electrical usage will remain relatively constant due to the fact that the fans are in operation continuously 365 days of the year.

Diesel Consumption

Diesel consumption has increased from 2.32 litres/tonne in 2006 to 4.62 litres/tonne in 2008 at the facility.

In 2006 there was only one loader in operation at the facility, however following the recommendations from the Dept of Agriculture under the Animal By-Product Regulation a second loader was required in order to isolate operations from the waste reception building 'dirty' area and the curing pad 'clean' areas. The machine incorporated at this time was a Komatsu loader that has a much higher diesel consumption compared with the existing Senobogen loader.

In May 2007 a second doppstadt drum (50mm) was purchased by Waterford City Council to aid in the removal of contamination from the waste received. This subsequently equated to all the waste received being double handled/screened, firstly at 50mm to remove contamination and then at 12mm to produce the final compost product. This would subsequently have resulted in an increase in the diesel consumption of 3.01 litres/tonne for a portion of that year (7 months).

In April 2008 an automatic wheel wash system was installed as a requirement of waste licence W0234-01 and by the Department of Agriculture. At the time of installation the facility was at its maximum electrical capacity. As a result a diesel operated generator was employed to operate this equipment.

The combined continual operation of the wheel wash system and a full year of double screening of the waste material has subsequently increased the diesel usage in 2008 to 4.62 litres/tonne. This equates to more than double usage from 2006.

15.3 Audit Recommendations:

Recommendations were identified whereby improvements for the energy performance of the site can be made where technically possible.

Double screening/handling.

The need to double screen all waste tonnage received at the facility can be eliminated by purchasing a double drum doppstadt screen. These modern screens have now become available on the market in light of the increase in the composting sector in Ireland and its subsequent processing requirements. A double screen, incorporating both a 50mm and a 12mm drum within the one machine would eliminate the double handling of all tonnage received and subsequent significantly reduce the diesel usage at the facility.

Generator

A switch from a diesel operated generator to electric mains operation for the wheel wash system would reduce the overall usage of diesel at the facility. A motion sensor is currently in use on the wheel wash to reduce the volumes of water used however the generator must be continuously in operation to pump water when required at an instance. An electric driven pump would only require minimal power consumption as it would only require power when required 3-4 times daily..

Shredder/mixer operation

A switch from the diesel operated shredder/mixer to an electric engine machine would reduce the diesel usage on site. These machines are currently available on the market for the composting industry and are more efficient than their diesel counterparts.

Process control

The current curing pad system in place does not provide the operator with the means to switch off areas that may not be in use for short periods of time while turning and removal of material from areas when screening. A system that allows the fans to be shutdown in areas not in use would be more beneficially form an energy point of view. Such systems are available however require an overhaul of the current design parameters on site. This system will be discussed further in the overall context of the new development.

Night-time operations

In order to maintain a level of odour control for neighbouring premises the facility currently operates at night-time to carry out turning and screening operations outdoors. There is a requirement to turn and screen 3-4 nights per week. An indoor facility would reduce the night-time operations that are required to maintain odour nuisance to neighbours. This would subsequently reduce the electrical usage for powerful outdoor lighting equipment running 30 hours per week.

Operational changes

The current facility operates an in-vessel system comprising small 30m3 digester boxes. These boxes require the batches to be processed in small volumes resulting in an increase in electrical consumption and diesel consumption required by a Roll-on/Roll-off vehicle to move the units around the various processing areas on site. A switch to a tunnel system would eliminate the use of the digester box system and subsequently reduce the electric and diesel consumption. The current digester box system has also proven to be a more labour intensive system to operate.

15.4 Implementation of Recommendations:

The recommendations can be in the form of modification or replacement of existing plant and/ or equipment or a modification of operational procedures.

In the context of the above audit recommendations the proposed new facility development is addressing all of the issues in relation to an overall more efficient process at the design phase. WTT who are employed by Waterford City Council for the design phase of the new development have addressed the requirement of the facility in accordance with energy efficient processes as follows;

The current dopstadt screen will become inactive and will be replaced by an electrically driven screen. This screen will incorporate a double drum (50mm and 12mm) to reduce the double handling to a single event thus eliminating the use of diesel power and reduce the electrical consumption that would have otherwise been required at the existing facility for the operation. This machine will come on-line in 2010 when construction phases are completed.

There will no longer be a need for the generator on site. WTT are currently investigating the possibility of eliminating the requirement for a wheel wash at the reception building. They are proposing a depressed floor/tipping bay in the waste reception building that will eliminate the requirement for the waste vehicles to access the waste building floor. The vehicles will reverse up to the bay and tip their loads into the building. As a consequence there may be no requirement to operate a wheel wash system as there will be no contact of the vehicle with waste on the building floor. Approval will be sought from the Department of Agriculture and the Agency for such a system as part of the licence application.

The shredder/mixer will be switched to an electrically driven machine fixed within the waste reception thus eliminating the use of diesel.

The process will ultimately be controlled more satisfactorily with the operation of a tunnel composting system as apposed to the digester unit system currently in operation. This will enable larger volumes and a reduced number of batches to be processed with ultimately less numbers of fans in operation at any one time. There will also be the possibility to switch off any fans that are not required for areas/tunnels that do not require processing at any time. Thus the electrical usage per tonne of material processed is greatly reduced.

There will be no requirement for night-time operations to maintain control over odour nuisance. All operations will take place indoors under negative air therefore the turning and screening operations can take place in day-time hours eliminating the requirement for lighting at night.

While incorporating the tunnel system there will no longer be a requirement for a Roll-on/Roll-off vehicle on site. Tunnel composting eliminates the need for this equipment. Therefore there will be a reduction in the use of diesel to operate this equipment.

All of the aforementioned recommendations will be put into place as part of the final phase of development once construction is completed. It is envisaged that the construction phase will be completed by mid to end 2010.

15.5 Main Report:

The main report includes the following;

Overview of the activities at the site with the main energy consumers.

The compost facility has a maximum capacity to process 10,000 tonnes per annum of source separated biodegradable household and commercial waste. The facility also processes green waste collected at the facility from members of the public at its drop-off amenity area.

In 2008, the year of the energy audit, a total of 7141 tonnes of waste including green waste was processed at the facility. The main components of the operations and their associated major energy consumers are detailed as follows;

WASTE PRE-TREATMENT

Doppstadt Shredder	Diesel Operated
Senobogen Loader	Diesel Operated
Wheel Wash System	Diesel Operated

Waste is delivered and deposited on a daily basis within the enclosed waste reception building. The pre-treatment/mixing takes place within the building. A diesel operated doppstadt shredder shreds and mixes the waste into the required particle size and consistency. A diesel operated Senobogen loader is required to load the digester units within the building. A diesel operated automatic wheel wash system is in place at the waste reception building to remove debris from vehicles exiting the building.

DIGESTER PROCESSING

40 Digester unit fans	Electrical Operated
RO/RO vehicle	Diesel Operated

Once the pre-treated waste has been transferred into the digester unit it is transferred to the digester pad area. The transfer of the digester unit takes place by means of a Roll-on/Roll-off vehicle that is diesel driven. There are 20 digester units in total in operation at the facility. Each digester unit has two associated fans (inlet and outlet) for aeration purposes. The fans are electrically powered and are in operation continuously 365 days of the year. The material within the digester unit is monitored continuously over a 10-14 day period for temperature. Once the digester unit batch has achieved its required time v's temperature protocol it is removed to the curing pad area for further processing.

CURING PAD PROCESSING

Komatsu Loader	Diesel Operated
8 curing pad fans	Electrical Operated
RO/RO vehicle	Diesel Operated

The material within the digester unit is transferred and tipped into the appropriate space within the curing pad area by means of the Roll-on/Roll-off vehicle. Once tipped the Komatsu loader forms a compost pile with the material and covers the pile with oversize material from the back end of the process to maintain odour control.

The curing pad area consists of two aerated curing pads each containing 4 fans for aeration purposes. The fans are similar to the digester unit fans and are electrically powered. Each fan is running continuously 365 days of the year.
The piles are turned approximately every 2 weeks on the curing pad area to ensure sufficient mixing and to maintain the material in an active condition. This turning requires the use of a diesel driven Komatsu loader. Once the material has been turned three times and/or the material has reached maturity then the piles are screened.

SCREENING

Doppstadt Screen	Diesel Operated
Komatsu Loader	Diesel Operated

Once the material has completed the curing phase each pile is individually screened using a diesel driven doppstadt screen. The piles firstly are screened through a 50mm drum screen to remove contamination associated with plastic, metals, glass and textiles. This contamination is removed to landfill. The material < 50mm is re-screened through a 12mm drum screen to produce the final compost product. The fraction between 50mm and 12mm is stored on site and reused back in the process as amendment material and/or cover material for compost piles on the curing pad area.

Details of the audit with respect to the weather and site production levels.

Since operations began in January 2004 there have been no contributing factors associated with weather conditions in respect to energy efficiency at the facility.

Site production levels have historically shown a consistent pattern with regards to the volumes of waste processed on an annual or seasonal basis in any given year. The evidence suggests that there is a repeated increase in tonnages processed during the summer months in comparison to the winter months. This is due to the increase in green waste collected at the household and at the drop-off amenity site during the summer months. Table 15.5 below details the tonnage received v's the energy consumption in 2008.

Table 15.5 Energy Consumption v's Tonnage Processed 2008

Energy Consumption v's Tonnage Processed 2008					
Period	Tonnage	Electrical Usage KWh	Diesel Usage litres	KWh/ton	Litres/ton
Jan 08	659	16.3	2624	0.0247	3.98
Feb 08	538	16.3	2626	0.0303	4.88
Mar 08	540	18.7	2611	0.0346	4.83
Apr 08	756	18.7	2841	0.0247	3.76
May 08	845	17.6	3133	0.0208	3.71
Jun 08	854	17.6	3445	0.0206	4.03
Jul 08	765	18.4	2488	0.0240	3.25
Aug 08	451	18.4	2112	0.0408	4.68
Sep 08	600	16.6	3544	0.0276	5.91
Oct 08	488	16.6	2901	0.0340	5.94
Nov 08	357	17.2	2665	0.0482	7.46
Dec 08	287	17.2	2069	0.0599	7.21
TOTALS	7140	209.6	33059	Av. 0.294	Av. 4.63

As can be seen from the above table there is generally an increase in tonnage accepted at the facility from the months April through to September 2008.

The Electrical usage for the facility remains relatively constant regardless of the tonnage accepted due to the fans in operation continuously. In this instance, in the months when the tonnage is relatively low the waste material has a longer duration for processing throughout the facility. This is indicated by the increase in KWh per tonne processed relative to the decrease in tonnage at these times.

The diesel usage at the facility is generally directly proportional to the tonnage accepted at the facility for processing with an increase in diesel usage during the summer months. However, the data also indicates an increase in the Litres/ton usage rate in the last four months of 2008. This increase in the rate would be typical from a year to year basis. The increase in Litres per tonne can be attributed to the material that was accepted during the summer months that subsequently is screened 3-4 months later at the back end of the facility. The higher the tonnage during the summer period is directly proportional to the diesel consumption required for screening this material during the winter period.

Details of the period covered by the Audit.

The period covered by the audit was from January to December 2008.

Details of the scope of the Audit.

As this was the first energy efficiency audit carried out at the facility the scope of the audit was generalised and the energy usage levels were taken as a whole. There was no specific information recorded or an assessment for individual items of equipment for electrical and diesel usage. It is envisage that in subsequent years an individual energy performance study will be carried out on various aspects of the operations and their associated equipment.

The status of the energy management system at the site.

The following information indicates the status of the energy management system at the site as based upon the EPA Guidance Note on Energy Efficiency Auditing.

Energy Policy	No explicit policy
Organising	No energy management or any formal delegation of responsibility for energy consumption
Motivation	No contact with users
Information Systems	Little or no information system. Energy consumption is accounted for on a monthly to bi-monthly basis
Marketing	No promotion of energy efficiency.
Investment	No investment in increasing energy efficiency of current premises. Future investment will be instigated by Waterford City Council under the scope of the new facility development in 2009/2010.

Using this system adopted from the guidance notes the current facility attains a status of Level 0.

16.0 ODOUR MANAGEMENT PLAN

ODOUR MANAGEMENT PLAN

Odour Monitoring Ireland was commissioned by Celtic Composting Systems Ltd. (CCS) to carry out an odour impact assessment of the current composting operations located at the composting facility in May 2005. The purpose of this assessment was to determine the potential for the generation of odour impact on the surrounding environment.

From the report it was predicted that odour impact will be perceived by the industrial units located in the vicinity of the current facility while the composting process is in operation. Twelve industrial facilities will perceive an odour concentration of between 3.0 and 38.0 Oue m3 at the 98^{th} percentile in a worst-case meteorological year. All other receptors in the vicinity of the facility will perceive an odour concentration less than 3.0 Oue m3.

Potential odours were recognised from the following operations at the facility;

Waste Reception Building
Mixing/preparation of waste loads
Digestion of waste in Digester Units
Biofilter performance on Digester Pad Area
Leachate collection
Tipping of loads from Digester Units onto Curing pads
Pile formation on Curing Pads
Turning of material on Curing pads
Biofilter performance on Curing Pads
Screening of finished compost

The following recommendations from the report are presented here and are the foundations for an Odour Abatement/management Plan for the facility.

16.1 Odour Management System

In order to satisfy the recommendations of the odour assessment each section of the operations are discussed separately and the recommendations described to minimise potential odours.

WASTE ACCEPTANCE/RECEPTION

It has long been established that the nature or schedule of the waste collection system is a major contributing factor at compost facilities. The Waterford City Council compost facility receives brown bin waste from three main sources namely

Waterford City Council Domestic sector
Waterford County Council Domestic sector
Veolia Environmental Services commercial sector

Both Waterford City and County Council operate a three weekly collection system based upon a Pay-By-Use system. The system has shown historically a participation rate of approximately 25% thus the waste received at the compost facility has been determined to be between 9-12 weeks old. Consequently the waste when received is odorous in its nature.

Upon arrival the waste vehicle is directed to the waste reception building. Once inside, the door of the reception building is automatically closed before the load is tipped from the vehicle. The current odour abatement system using an odour neutralising agent is put into operation. The operator will assess the load and record the degree of odour emitted from each load. Only when the waste vehicle has closed the rear of the vehicle will the automatic door open for his exit. Upon exiting the reception building the automatic fast shut door will close immediately behind.

In the event that a load is deemed too odorous to process the operator will place the load into an appropriate area within the building, cover the load with amendment or green waste material to minimise odour and the load will be removed off site to an appropriate facility as soon as possible.

The reception building is fitted internally with one odour control atomising unit that emits an odour control mist. The units force water through two spinning meshes to produce an ultra-fine mist of 280 billion droplets per litre. The mist stays in the air and mixes readily with dust particles and odour producing molecules pulling them down to the ground. In addition masking agents are used in conjunction with this system to produce an acceptable scent in the air.

Records of assessment of waste loads are recorded on the Raw Material Inspection Checklist.
Records of unacceptable waste loads are maintained in the Unacceptable Waste Register.

MIXING/PREPATATION OF WASTE LOADS

Once the material has been assessed it is loaded into the mixer within the reception building. When mixing takes place the doors of the reception building are kept closed. In the event that amendment material is required in the form of oversize material or green waste, the operator collects the material from the storage area. Each time the shutter door is opened to allow access to the mixer and closed once the process is completed.

The odour control atomising units are put into operation while the mixing process takes place.

DIGESTER OPERATIONS

Each empty digester unit is placed in the appropriate position in preparation for loading. In order to prevent malfunction of the digester and to prevent the loss of odour to the atmosphere while the digester unit is in operation mode, the operator carries out a visual check for the following;

Roof seals
Door seals
Floor seals
Valve clear
Roof opening
Bullhorns
Leaks
Air In/Out clear.

Records of the above visual maintenance checks are recorded in the Digester Maintenance checklist.

Once mixing is completed and the digester unit is filled, the operator hydraulically seals down the unit. The digester unit is then power washed to remove any debris before it is transferred to the outside Digester Pad Area. Once it is in position within the digester pad area the air handling coupling system and leachate collection is connected. The operator checks for the loss of air when the unit is put into operation.

The aeration system operates continuously while the digester is in operational mode. The logistics software indicates automatically whether a fan has malfunctioned. The operator checks the motor operations from the logistics software on a daily basis. In the event that there is a motor/fan malfunction appropriate repairs will be carried out or the replacement of the entire motor unit.

There is an odour control atomising unit fitted on the exterior eastern wall of the reception building at the digester pad area to mitigate potential odours from the digester pad.

BIOFILTER PERFORMANCE

Exhaust air is collected from the digester units and blown into the biofilters on a continuous cycle. The biofilter media is composed of a mix of woodchip and matured compost in the ration of 7:1 as recommended by the technology supplier (Celtic Composting Systems).

The biofilters are visually checked on a daily basis for odour, condition and depth and leaks. Records of visual checks are recorded in the Daily Biofilter Checklist. Additional biofilter performance information is collected in accordance with Schedule C of waste licence W0234-01.

In the event that there is poor performance the appropriate remedial action will be carried out.

A more detailed account of biofilter performance/monitoring can be found in the biofilter management plan for the facility.

LEACHATE COLLECTION/STORAGE

Leacahte is collected passively from the digester units on a daily basis. The operator opens the leachate collection valves every morning upon arrival on site. The leachate is collected and stored in the leachate collection tank on site via the local collection drainage system and leachate sump. This event takes approximately 15 minutes to complete.

Leachate is also collected from the waste reception building floor throughout operations during the day.

All leachate is collected via underground pipes to the leachate sump chamber. The sump chamber contains a pump that is operated by high and low level switches that pump the leachate accordingly into the bunded leachate tank. The leachate sump chamber has a heavy duty manhole cover that remains in place at all times and is only removed occasionally for inspection.

The leachate tank is composed of steel construction and has a capacity for 103m3. The tank contains a high level alarm to prevent overfilling of the tank. Approximately 2-3 m3 of leachate is collected on a daily basis. The tank is vented to the outside air via a rechargeable carbon filter in the roof.

The leachate is currently removed for off-site treatment 2-3 times per week. This is carried out by vacuum tanker. The tank contains a coupling unit which is attached to the tanker hosing. This operation does not emit any odour as the connection between the leachate tank and the tanker vehicle is a seal piped operation.

TIPPING DIGESTER LOADS

Once the digestion process is completed the loads are tipped into the appropriate area within the aerated curing pad. The operator forms the load into a pile containing 6-8 individual loads. The action of forming this pile has the potential to create odour. Each individual compost load is immediately covered with oversize material to minimise odour generation on site. Air is mechanically drawn down through the material on the pad and exits via a biofilter. There are 8 biofilters in total in operation at the curing pad area, one for each quarter of each pad.

The performance of the aeration system fans/motors can be monitored from the logistics software. The operator monitors the fans on a daily basis. In the event that a motor malfunctions the appropriate repairs are carried out or the motor unit is replaced.

The biofilter media is composed of a mix of woodchip and matured compost in the ration of 7:1 as recommended by the technology supplier.

The biofilters are visually checked on a daily basis for odour, condition and depth. Records of visual checks are recorded in the Daily Biofilter Checklist.
Additional biofilter performance information is collected in accordance with Schedule C of waste licence W0234-01.

In the event that there are leaks or poor performance the appropriate remedial action will be carried out.
A more detailed account of biofilter performance/monitoring can be found in the biofilter Management Plan for the facility.

TURNING ON CURING PADS

The initial pile is stored in the designated area within the curing pad for a period of approximately 2 weeks. At approximately every two week intervals the material is turned into the next available place within the curing pad. Each pile is turned a total of 3 times over its duration on the curing pad. This turning and aeration maintains appropriate conditions within the composting matrix. As a consequence the action of turning of the piles has the potential to create odour.

In order to minimise the odour impacts associated with turning, this operation is carried out as much as possible in appropriate meteorological conditions (i.e. unstable, higher wind speeds, clear sky, in opposite directed to industrial receptors).

In addition to the above meteorological conditions, turning operations only take place between the hours of 17.30 and 23.30 weekdays. This coincides with the normal closing hours of the adjacent business park.

Once turned the compost piles are covered with oversize material to minimise odour generation on site.

BIOFILTER PERFORMANCE ON CURING PADS

Exhaust air is collected from the curing piles and blown into the biofilters on a continuous cycle. The biofilter media is composed of a mix of woodchip and matured compost in the ration of 7:1 as recommended by the technology supplier.

The biofilters are visually checked on a daily basis for odour, condition and depth. Records of visual checks are recorded in the Daily Biofilter Checklist.
Additional biofilter performance information is collected in accordance with Schedule C of waste licence W0234-01.

In the event that there are leaks or poor performance the appropriate remedial action will be carried out.

A more detailed account of biofilter performance/monitoring can be found in the biofilter Management Plan for the facility.

SCREENING

Each compost pile is turned at least 3 times for its duration on the curing pad area. This equates to a minimum of 8 weeks duration. The operator checks the temperature and moisture of the pile on a weekly basis to ensure the maturation process is progressing along the curing pad.

Once the pile has reached the fourth zone on the curing pad it will spend approximately 2 weeks in this zone. Little or no water will be added at this stage as this can have detrimental effects when the material is to be screened. When the final 2 weeks have passed the operator removes the material and loads it into a dopstaddt screen.

This operation takes place outdoors and has the potential to create odour.

The screening phase odour is minimised by correct operational procedures and pile management compliance. There is an odour control atomising unit fixed to the roof of the storage shed to mitigate potential odours in this area and is in operation when the screening process take place.

In order to minimise the odour impacts associated with screening this operation is carried out as much as possible in appropriate meteorological conditions (i.e. unstable higher wind speeds, clear sky, in opposite direction to industrial receptors).

In addition to the above meteorological conditions, screening operations only take place between the hours of 17.30 and 23.30 weekdays. This coincides with the normal closing hours of the adjacent business park.

16.2 Odour Control Procedures

Veolia Environmental Services. Waterford Compost Facility Revision 0

STANDARD OPERATING PROCEDURE **WASTE ACCEPTANCE/UNACCEPTABLE WASTE**	**PROCEDURE NUMBER** **OP 001** **VERSION 1**
UPDATED BY: Michael Storan	ISSUE DATE: September 2007
APPROVED BY: n/a	REPLACES VERSION: n/a
PERSONNEL INVOLVED: Facility Manager, All Operational Staff, Waste Suppliers to facility	
PROCEDURE PURPOSE: Ensure the correct waste type and category is received and processed in accordance with ABP's Regulations and EPA Licence requirements at the facility.	
SCOPE OF PROCEDURE: Applies to all waste accepted from commercial and public sources.	
DESCRIPTION OF TASKS: 1. The existing facility accepts source separated household organic waste, green waste and commercial segregated organics. 2. Only approved categories are accepted at the facility. The facility currently only accepts catering waste as the only Animal By-Product material defined under EU Regulation 1774/2002 as 'all waste food including used cooking oil originating in restaurants, catering facilities and kitchens, including central kitchens and household kitchens.' 3. Documentation regarding the suppliers and types of waste supplied to the facility will be maintained on site. 4. All waste loads received at the facility shall be recorded over the weighbridge system. 5. On acceptance each waste load shall be directed to the Waste Reception Building for processing. Only when the reception building doors are closed will the load be tipped onto the floor. 6. The waste handlers, and/or the teleporter operator shall be familiar with the waste types that are acceptable at the facility. 7. The waste handlers shall inspect each load of waste. 8. If unacceptable or hazardous waste loads or items are identified, the waste handlers shall notify the Facility Manager and place the waste into the waste quarantine area. If in the event that the entire load is deemed unacceptable the load will be segregated from processing waste within the waste handling building.	

9. The compost facility manager will identify the driver of the delivery vehicle and the source of the waste.
10. The supplier responsible for the waste load/item will be informed and given the opportunity to collect the waste from the facility and arrange the correct disposal. Alternatively the company will arrange for the collection and disposal of the waste in question.
11. Details of the waste types and the disposal used will be recorded in the Unacceptable Waste Report Register.
12. In the event that the waste load is deemed unacceptable due to the level of contamination (non-hazardous) material present and/or odour, the operator shall inform the compost facility manager.
13. The manager shall make arrangements for the load to be removed off-site to an appropriate facility immediately by an appropriate waste contractor.
14. Records of these events will also be recorded in the Unacceptable Waste Report Register.

EXPECTED RESULTS AND ACTIONS FOLLOWING DEPARTURE FROM THIS PROCEDURE

Failure to follow this procedure may result in a breach of Animal By-Product Regulations and processing protocols, breach of EPA Licence requirements.

RELATED DOCUMENTATION:

Weighbridge records, Unacceptable waste records, waste inspection checklist

DATE OF PROCEDURE REVIEW

September 2008

PERSON RESPONSIBLE FOR UPDATING THIS PROCEDURE:

Michael Storan

STANDARD OPERATING PROCEDURE **WASTE MIXING**	**PROCEDURE NUMBER** **OP 002** **VERSION 2**
UPDATED BY: Michael Storan	ISSUE DATE: October 2007
APPROVED BY:	REPLACES VERSION: n/a

PERSONNEL INVOLVED:
Facility Manager, all Operational Staff

PROCEDURE PURPOSE:
Ensure the waste is received and processed in accordance with ABP's and Environmental Standards.

SCOPE OF PROCEDURE:
Applies to all waste accepted from commercial and public sources.

DESCRIPTION OF TASKS:

1. Biowaste is tipped onto the Waste Reception Building Floor from the back of collection vehicle currently from Waterford City, Waterford County and Veolia Environmental Services. Only catering waste as the only Animal By-Product material defined under EU Regulation 1774/2002 will be accepted at the facility. When material from Veolia is being unloaded a bed of woodchip is applied on the floor to soak up any excess liquid. Tipping of waste loads only takes place when the reception building doors are closed.
2. Each load is checked by the manager or suitable appointee and a Raw Material Inspection sheet is filled in recording the date, origin of load, weight, approximate age, odour levels, contamination level and acceptance/non-acceptance.
3. Recipe mix is determined by the manager or appointee depending on condition of the load. Required ingredients and water are loaded into the mixer and allowed blend until a homogenous blend is achieved. Mixing operations only take place when the reception building doors are closed.
4. The material is conveyed into an empty digester unit until the mixer is emptied. The operation is repeated until the digester is full. The digester is closed, sealed and powerwashed down before being picked up by a Roll/on Roll/off vehicle and placed back onto the Digester Pad Area.
5. Any material not processed at the end of the day is piled into a corner and covered with overs or woodchip to control odour and kept overnight. Concrete walls and floors are washed down daily with a portable powerwasher. This will be recorded on a daily cleaning schedule.
6. An air extraction system will be in operation in the material reception building to maintain negative pressure within the building. This will be based on four air changes per hour. This process air is passed through a large biofilter to remove odours.

EXPECTED RESULTS AND ACTIONS FOLLOWING DEPARTURE FROM THIS PROCEDURE
Failure to follow this procedure may result in a breach of processing protocols and environmental control.

RELATED DOCUMENTATION:
Raw Material Inspection Sheet.

DATE OF PROCEDURE REVIEW
October 2008

PERSON RESPONSIBLE FOR UPDATING THIS PROCEDURE:
Michael Storan

STANDARD OPERATING PROCEDURE **TIPPING LOADS ONTO CURING PADS**	**PROCEDURE NUMBER** **OP 005** **VERSION 1**
UPDATED BY: Michael Storan	ISSUE DATE: October 2007
APPROVED BY:	REPLACES VERSION: n/a

PERSONNEL INVOLVED:
Facility Manager, all Operational Staff

PROCEDURE PURPOSE:
Ensure That digester boxes are emptied into appropriate are on ASP curing pad.

SCOPE OF PROCEDURE:
Applies to all Digester units on the tipped onto curing pad area.

DESCRIPTION OF TASKS:

1. Once the required time/temperature profile has been achieved for the digester unit the unit is switched off.
2. The coupling hoses and the temperature probe are removed and the digester coupling blank is attached to the exhaust of the digester by the operator.
3. The operator lifts the digester unit onto the rear of the RO/RO vehicle and proceeds to the designated area on the ASP curing pad.
4. A layer of woodchip is placed into the area where the load will be tipped.
5. The operator opens the rear door of the digester unit and reverses into position onto the curing pad.
6. The operator uses the lifting mechanism on the RO.RO vehicle allowing the material to be tipped from the digester into the appropriate position.
7. The digester unit is returned into the lower position on the RO/RO vehicle and the operator closes the rear door.
8. The operator proceeds to the waste reception building. The digester is dropped into position for a new waste batch.
9. A second operator loads the waste material into a pile on the asp curing pad. Once formed the operator covers the new load on the curing pad with oversize material or woodchip..
10. This process is repeated for 6-8 digester units until a larger pile is formed on zone 1 of the curing pad.

EXPECTED RESULTS AND ACTIONS FOLLOWING DEPARTURE FROM THIS PROCEDURE
Failure to follow this procedure may result in a loss of traceability within the pile logistics software.

RELATED DOCUMENTATION:
Pile Logistics Software records.

DATE OF PROCEDURE REVIEW
October 2008

PERSON RESPONSIBLE FOR UPDATING THIS PROCEDURE:
Michael Storan

STANDARD OPERATING PROCEDURE **COVERING LOADS ON ASP CURING PAD**	**PROCEDURE NUMBER** **OP 006** **VERSION 1**

UPDATED BY: Michael Storan ISSUE DATE: October 2007

APPROVED BY: REPLACES VERSION: n/a

PERSONNEL INVOLVED:
Facility Manager, all Operational Staff

PROCEDURE PURPOSE:
Ensure that digester boxes emptied onto curing pad are appropriately covered.

SCOPE OF PROCEDURE:
Applies to all waste loads entering curing pad area.

DESCRIPTION OF TASKS:

1. Once a waste load from a digester has been tipped onto the appropriate area on the curing pad the operator forms the waste into a pile consisting of 6-8 other digester loads.
2. Each individual waste load is subsequently covered with screened oversize material.
3. Approx 0.5m of oversize material is sufficient to cover the waste load.
4. When a pile is completed consisting of 6-8 waste loads the operator returns to replace overs to areas that may not be sufficiently covered.
5. Following turning of piles the operator covers all the turned piles on the pad with oversize material. This prevents waste at the surface becoming exposed to the air minimising attraction of birds and pests and minimising odour on site.

EXPECTED RESULTS AND ACTIONS FOLLOWING DEPARTURE FROM THIS PROCEDURE
Failure to follow this procedure may result in exposure of waste loads to the surface resulting in a cooling effect of piles. Failure may also result in attraction of vermin pests and birds to the facility and increase the likelihood of creating odour on site.

RELATED DOCUMENTATION:

DATE OF PROCEDURE REVIEW
October 2008

PERSON RESPONSIBLE FOR UPDATING THIS PROCEDURE:
Michael Storan

STANDARD OPERATING PROCEDURE **TURNING PILES ON ASP CURING PAD**	**PROCEDURE NUMBER** **OP 007** **VERSION 1**

UPDATED BY: Michael Storan ISSUE DATE: October 2007

APPROVED BY: REPLACES VERSION: n/a

PERSONNEL INVOLVED:
Facility Manager, all Operational Staff

PROCEDURE PURPOSE:
Ensure that curing piles are turned efficiently to attain maximum maturation rates.

SCOPE OF PROCEDURE:
Applies to all compost pile on the curing pad area.

DESCRIPTION OF TASKS:

1. Digester loads are formed into larger piles consisting of 6-8 loads within zone 1 of the curing pad area
2. There are four designated zones within each curing pad area labelled zone 1-4.
3. Once material has reached maturation in zone 4 or when tonnages dictate material to be moved through the process, the material in zone 4 is removed with the loader and transferred through the doppstadt screen
4. When emptied, each pile is subsequently turned using the loader into the appropriate space next to it on the curing pad eg. Zone 3 into 4, 2 into 3 and 1 into 2.
5. This creates an empty area within zone 1 to allow fresher material form digester units to be tipped after digestion process.
6. While turning the material into the relevant zone a second operator applies water onto the piles. Turning of the piles only takes place in appropriate meteorlogical conditions and in the hours between 1730 and 23.30.
7. The second operator makes an assessment of the quantity of water that needs to be applied to each pile based upon experience an maintaining an moisture content of approx 50%.
8. The second operator shall unblock any of the air vents that may have become blocked from previous turning operations.
9. Following turning of all three zones/piles the loader operator covers the pile with oversize material.
10. The turning of each pile is recorded on the pile logistics software.

EXPECTED RESULTS AND ACTIONS FOLLOWING DEPARTURE FROM THIS PROCEDURE
Failure to follow this procedure may result in exposure of waste loads to the surface resulting in a cooling effect of piles. Failure may also result in attraction of vermin pests and birds to the facility and the creation of unwanted odours on site.

RELATED DOCUMENTATION:

DATE OF PROCEDURE REVIEW
October 2008

PERSON RESPONSIBLE FOR UPDATING THIS PROCEDURE:
Michael Storan

STANDARD OPERATING PROCEDURE **CLEANING ASP AIR VENTS**	**PROCEDURE NUMBER** **OP 008** **VERSION 1**
UPDATED BY: Michael Storan	ISSUE DATE: October 2007
APPROVED BY:	REPLACES VERSION: n/a

PERSONNEL INVOLVED:
Facility Manager, all Operational Staff

PROCEDURE PURPOSE:
Ensure that air ventilation system on curing pads are cleaned to maintain sufficient air flow from compost piles to biofilter and prevention of anaerobic condition forming in compost piles.

SCOPE OF PROCEDURE:
Applies to all compost piles on the curing pad area.

DESCRIPTION OF TASKS:

1. The aeration system for the curing pads consists of a series of vents along the length of the curing pad buried deep within the concrete floor.
2. The vents allow air access from the pile through a set of blowers at the rear of the curing pad and exhaust air is blown through the biofilters located at the end of each pad.
3. The operator checks the vents after each set of piles has been turned for air access.
4. In the event that the vents are blocked the operator removes the individual grills on the curing pad floor and manually removes any material that may be causing blockage.
5. Every 6 months the operator carries out a complete clean out of the system whereby the manifold at the rear of the curing pads are removed and the in floor pipes are cleaned by use of a pipe cleaner.

EXPECTED RESULTS AND ACTIONS FOLLOWING DEPARTURE FROM THIS PROCEDURE
Failure to follow this procedure may result in a drop off of biofilter performance and result in the formation of anaerobic areas within the piles.

RELATED DOCUMENTATION:

DATE OF PROCEDURE REVIEW
October 2008

PERSON RESPONSIBLE FOR UPDATING THIS PROCEDURE:
Michael Storan

STANDARD OPERATING PROCEDURE **SCREENING MATURED COMPOST**	**PROCEDURE NUMBER** **OP 010** **VERSION 1**
UPDATED BY: Michael Storan	ISSUE DATE: October 2007
APPROVED BY:	REPLACES VERSION: n/a

PERSONNEL INVOLVED:
Facility Manager, all Operational Staff

PROCEDURE PURPOSE:
Ensure that the correct compost piles are screened in sequence and are recorded on the pile logistic software.

SCOPE OF PROCEDURE:
Applies to all mature compost pile movements on the curing pad area.

DESCRIPTION OF TASKS:

1. Each compost pile will be turned at least 3 times for its duration on the curing pad area. This will equate to approx 8-10 weeks duration.
2. The operator will check the moisture content and temperature of the pile on a regular basis to ensure the maturation process is progressing along the curing pad.
3. Once the material/pile has reached zone 4 it will spend approx 2 week in this zone.
4. Little or no moisture will be added to the compost in zone 4 as this can have detrimental effects when screen the material.
5. When the two weeks have passed or the volumes of material dictate that a space is require on the curing pad, the operator removes the pile next in sequence in zone 4.
6. Screening operations are only performed in appropriate meteorological conditions and between the hours 1730 and 2330.
7. The material is loaded into a doppstadt sm-518 screen.
8. The material will first pass through a 50mm screen and later through a 12 mm screen to provide the final product <12mm.
9. All finished compost is stored in the storage shed once produced.
10. Screened batches removed from the curing pad area are recorded on the pile logistics software.

EXPECTED RESULTS AND ACTIONS FOLLOWING DEPARTURE FROM THIS PROCEDURE
Failure to follow this procedure may result in the wrong sequence of compost being screened.

RELATED DOCUMENTATION:
Pile logistics software.

DATE OF PROCEDURE REVIEW
October 2008

PERSON RESPONSIBLE FOR UPDATING THIS PROCEDURE:
Michael Storan

STANDARD OPERATING PROCEDURE **LEACHATE COLLECTION/DISPOSAL**	**PROCEDURE NUMBER** **OP 026** **VERSION 1**
UPDATED BY: Michael Storan	ISSUE DATE: JANUARY 2008
APPROVED BY:	REPLACES VERSION: n/a

PERSONNEL INVOLVED:
Facility Manager, all Operational Staff

PROCEDURE PURPOSE:
Ensure that leachate collection is carried out with minimal impacts to the environment.

SCOPE OF PROCEDURE:
Applies to leachate collected from digester pad area, curing pad area and reception floor.

DESCRIPTION OF TASKS:

1. Leachate is collected from the digester units on a daily basis. The operator opens the leachate release valve every morning upon arrival.
2. The leachte removed is removed from each of the 20 digester units in operation.
3. The leachate is collected in the leachate drainage system via flexible hosing on the pad to drainage from each digester unit.
4. The leachate is then collected in the leachate sump where it is pumped into the storahe tank.
5. This operation take approx 15min each day with minimal exposure to the atmosphere.
6. Leachate from the waste reception floor is continusosly collected over the working day via the drainage system.
7. Leachate from the floor is collected in the leachate sump and also pumped forward into the holding tank.
8. Leacahte from the curing pad is collected via the drainage vents on the pad to a collection sump.
9. The curing pad leachate is pumped forward into the leachate sump where it is then pumped into the holding tank.
10. All leachate collection takes place within an underground piping network thus reducing the exposure of odour to the atmosphere.
11. Approximately 2-3m3 of leachate is collected each day in the holding tank. The holding tank is fitted with a replaceable activated carbon filter to remove odour to the atmosphere.
12. The tank is fitted with a high level alarm system.
13. Leachate is removed at appropriate times by vacuum tanker and transported to a relevant disposal/treatment facility on a weekly basis.

EXPECTED RESULTS AND ACTIONS FOLLOWING DEPARTURE FROM THIS PROCEDURE
Failure to follow this procedure may result in exposure of leachate to the surrounding environment.

RELATED DOCUMENTATION:
Inspection chamber records.
Leacahte disposal/weighbridge records

DATE OF PROCEDURE REVIEW
January 2009

PERSON RESPONSIBLE FOR UPDATING THIS PROCEDURE:
Michael Storan

16.3 Investigation of Odour Complaints

All environmental complaints including odour complaints with regard to the activities of the compost facility are recorded, investigated and actioned where necessary. The environmental manage will ensure that all odour complaints written and verbal, from internal and external sources, are recorded on an Environmental Complaints assessment Form.

Complaints can be received through two main sources.;

Public and commercial complaints received by the Environmental department of Waterford City Council and
Public and commercial complaints received by Veolia at the compost facility offices.

In the event that a complaint is received by Waterford city Council, the details are forwarded immediately to the Compost facility Manage by telephone or fax including the relevant contact details. The compost facility manager can then contact the individual responsible for raising the complaint to investigate further.

The Environmental Manager/facility manager will process the environmental complaint form in conjunction with the Odour Complaint Log as recommended under the guidance information from the EPA.

Each complaint form will be completed with information detailing the name and address of the complaintant, when known, and the time and date of the receipt of the complaint. The complaint form will also contain a reference number and detail the nature of the complaint including the time and date of the incident.

The Environmental officer/facility manager will investigate each odour complaint in accordance with the guidance instruction of the EPA recommended odour Complaint Log. The results will indicate whether the complaint is valid, the cause of the complaint, and whether corrective action is required. If corrective action is required the Environmental/Facility manager will initiate corrective action.

The Environmental/Facility manager will notify all complaintants of the results of the investigation and any associated corrective action, where possible. The Complaints Assessment Form will detail the date that the information was sent to the complaintants and authorised by the signature of the Environmental/facility manager.

All completed forms will be placed within a register of environmental complaints and maintained on file by the Environmental/facility manager.

16.4 Operator Training Odour Management

Veolia environmental services Ltd. Has determined the necessary competences and needs for personnel performing work affecting environmental quality. These are clearly visible in job descriptions, which are available for all employees.

Where necessary, training and development will be provided to satisfy training need requirements. Records of all training and development initiatives are maintained, as well as all records of education, skills and experience.

When specifically dealing with odour management, both the facility operators and manager are aware of their duties both from a processing and an environmental impact point.

All employees have undergone a three month detailed training course form the technology provider for process control and the mitigation of environmental impacts associated with the operations.

The following is a list of specific duties for operators and the requirement for odour control at the various stages of processing.

DUTIES	**ODOUR CONTROL MEASURES**
RECEPTION BUILDING	
Supervise waste tipping onto floor.	Ensure closed door strategy before tipping of waste.
Inspect waste on floor	Record odour level of waste Quarantine very odorous loads Cover quarantine loads with oversize Remove asap from facility
Mix feedstock in auger mixer	Apply appropriate amendment material to ensure aerobic conditions
Load digester with feedstock waste	Ensure even spread of material to prevent air short circuiting
Removal of debris from outside digester	Powerwash digester unit before leaving building
Maintain closed door strategy	
Operation of odour control atomiser	Adjust concentration of masking agent appropriate to level of odorous material received
Operation of wheel cleaning equipment	Ensure vehicle wheels are sufficiently washed to prevent waste transported outside reception by wheels
Cleaning	Clean reception building floor daily after operations Clean mixer and loaders
DIGESTER PAD	
Sweep digester pad when digester are in reception building	Removal of debris that may become odorous
Coupling of aeration system to digesters	Check for air leaks and repair or replace when necessary
Coupling of leachate pipes to digesters	Ensure pipes are aligned with drainage collection system
Maintenance check of digesters on floor	Record and repair faults
Ensure no short circuiting of air from digester in operation mode	Visually check for escaping steam and odour
Keep digester pad free of leachate spills and standing water	Powerwash entire digester pad area at minimum of one week intervals. Clean local spills immediately
Biofilter monitoring	Daily check and record for condition and depth Opening of condensate valves daily to prevent back pressure
Operation of odour control atomiser	Adjust concentration of masking agent appropriate to requirements
CURING PAD	
Manage tipping of digester on curing pad	Addition of amendment material to soak excess leachate from digesters
Form curing piles	Cover immediately with oversize material
Aeration network	Keep grates clear and clean
Shape pile and clean edges	Removal of debris from leachate collection system to prevent blockages
Turn piles	Between 17.30 and 23.30 only weekdays During favourable meteorological conditions

	Ensure all three external odour atomisers are in operation Cover turned piles with oversize material
Biofilters	Daily check and record for depth condition and leaks
SCREENING	
Logistics software	Check to ensure only matured compost is screened
Screen at 50mm and 12mm	Between 17.30 and 23.30 only weekdays During favourable meteorological conditions Ensure all three external odour atomisers are in operation Cover turned piles with oversize material
Storage	All screened materials to be stored under cover immediately.

17.0 RAW MATERIALS USAGE AND WASTE REDUCTION

An assessment is required to be carried out of the efficiency of the use of raw materials in the process and a reduction in the waste generated at the facility.

Raw Materials Usage 2008.

The composting of organic waste is a natural process that essentially requires the following elements;

Suitable Organic Matter
Water
Air.

The technology provided for at the facility increases the rate of this natural process. The following is a list and a description of use for the raw materials that are required at the facility in order to process organic waste and contribute to the control of environmental aspects including odour, dust, bioaerosols;

Water
Electricity
Diesel
Woodchip
Odour Neutraliser

17.1 Water Usage Efficiency 2008.

Water is required in the compost process in order to provide the composting bacterial cultures with sufficient moisture levels to actively decompose the organic matter provided. Due to the heat produced by this activity the waste material will lose moisture throughout the processing period. It is estimated that approximately 50% moisture can be lost through the process from material received at the facility.

The facility processed approximately 7100 tons of organic waste including household organics and green waste in 2008. Approximately 0.5m3 of water was used per tonne of waste received throughout the process. The total of water used therefore was in the region of 3500 m3.

The figure of 3500m3 of water would typically represent the volumes required for the activities at this and similar facilities. All water used in the process was from mains water supply. Due to the nature and design of the facility it is not possible to re-circulate this water and all volumes used either escape to the atmosphere or are collected as leachate and is treated at an approved treatment facility. This is not an efficient means of water usage.

It is envisaged that as part of the new development a water re-use design will be incorporated in order to reuse the process water, leachate and rain water run-off within the process more effectively and therefore vastly reducing the demand on mains water supply.

17.2 Electricity Usage Efficiency 2008.

Electricity is required at the facility to provide power mostly to operate the motors/fans that provide aeration to the process. Smaller volumes of electricity are required for lighting, operating the odour control system and general office equipment.

To provide aeration control in the digester phase of the process electricity is required to power the inlet and outlet fan of each digester unit. There are currently 40 fans operating for the 20 digester units provided. These fans operate 24hrs a day and 7 days per week throughout the year. Electricity is required to power the outlet fans associated with the curing phase of the process. There are currently 8 fans operating 24hrs per day and 7 days per week throughout the year.

Approximately 210 KWH of electricity was consumed in 2008. 7100 tonnes of waste were processed resulting in an electrical usage of 0.03 KWH of electricity used per tonne. The electrical usage remains constant regardless of the current annual throughput of waste tonnage. In the event that less or more tonnage is received the material is processed for a longer/shorter period with the fans subsequently running at the same levels throughout the process.

Waterford City Council does not have any information at present with regards to a comparison to the current efficiency rates of electrical usage per tonne of material processed at the facility, however it is envisaged that with the development of the new 20,000 tons facility there will be a substantial decrease in the KWH per tonne ratio and subsequently an increase in electrical efficiency per tonne of material processed when larger volumes are accepted for processing.

17.3 Diesel Usage Efficiency 2008.

Diesel is required in the process to operate the following machinery/equipment at the facility;

Waste reception building loader
Waste Shredder/mixer
Roll on/Roll off vehicle for transporting digester units into place.
Compost loader for turning and screening process.
Screen for removal of contamination and production of 12mm compost product.
Operate generator for wheel wash system
Operate steam cleaner.

Approximately 33,000 litres of diesel were consumed at the facility in 2008 to operate the above aforementioned equipment. 7100 tonnes of waste were processed resulting in a diesel usage of 4.2 litres used per tonne. In comparison to similar composting facilities this usage is high and is inefficient.

Due to the facility design there is more demand upon the use of machinery to facilitate the required turning and screening. The Doppstadt screen utilised at the facility is a single drum machine requiring the drum to be switched out when removing contamination and then replaced when screening the final compost product. This in effect requires the handling/screening of all the tonnage at the facility twice. This substantially increases the diesel usage on site. It is envisaged that the new development will incorporate a double drum screen that will reduce the handling by half of the material and subsequently half the energy usage for this individual operation.

It is envisaged that the design of the new facility development will encompass more electrical equipment rather than diesel and therefore the new operations will become less reliant upon diesel energy to operate equipment.

17.4 Woodchip/Amendment Usage Efficiency 2008.

Woodchip is used in the process as an amendment material to provide bulking agent into the waste material to provide aeration pores to aid the process. Woodchip is also required at the facility to provide biofilter bed media for the control of process air.

In 2008 there was no requirement for woodchip to be imported on site for use as amendment as there was sufficient amendment provided from shredded green waste from the public amenity site and oversize material (12-50mm) from the back end of the screening process.

Approximately 80 tons (400m3) of woodchip was imported and used as biofilter media. The removal of the old media was reused as bulking agent within the process.

17.5 Odour Neutraliser Usage Efficiency 2008.

In addition to the use of biofilters at this facility and odour control system is also in operation. This system comprises of 4 odour atomising units that propel a mix/solution of water and odour neutraliser/masking agent into the air.

In 2008 approximately 5,000 litres of odour neutraliser solution was consumed at the facility. There are no comparisons to be made with other composting facilities for the use of such a solution as Waterford City Council are currently the only Animal By-Product approved facility operating outdoors within Ireland. However in comparison to 2007, when 8,000 litres of neutralising solution was used, a reduction of approximately 30% was achieved without an increase in odour complaints.

18.0 MINIMISE WATER DEMAND AND TRADE EFFLUENT

18.1 Water Demand 2008.

There is a requirement under the waste licence W0234-01 to minimise water usage throughout the process and subsequently minimise the volumes of trade effluent/leachate that is associated with the composting process.

There is no water meter in operation at the current facility. Water usage is a requirement for the composting process to be carried out efficiently and there is a greater demand upon the material under process in the curing phase of the process. In 2008 a total of 7141 tons of waste was processed with a requirement for approximately 0.5m3 of water per ton of waste to process this material.

The total estimated volume of water used during 2008 was 3500m3. All water used in the process in 2008 came from mains supplied. There is no means to collect surface water or roof run-off and reuse at the current facility.

It is a requirement at the design phase of the proposed new development that roof run-off rain water is collected and re-used within the process. Waterford City Council have commissioned WTT (Composting Design Consultants) to provide the new development with capacity storage to collect roof-run-off and where possible surface water run-off (when required) and re-use within the process where possible without having an adverse impact on the composting process.

18.2 Trade Effluent/Leachate Produced 2008.

Leachate is a naturally occurring by-product of the composting process. Leachate is produced by microbial breakdown of the organic material received in the waste. All leachate and trade effluent produced on site is collected via the leachate collection system and stored in the leachate storage tank located on site. Leachate/trade effluent is collected from the following areas;

Toilets
Leachate collection from the waste reception building floor
Leachate collection from the digester units
Leacahte from the curing pad area
Wheel wash run-off at the waste reception building

There are no means to collect trade effluent and leachate at the current facility and to reuse within the process. All trade effluent/leachate is stored in the leachate storage tank until such time as it is removed to an appropriate treatment facility by means of a vacuum tanker. There were no process effluent/leachate emissions to sewer in 2008.

In 2008 there was a total of 1413.9 tons of trade effluent/leachate transported off-site for treatment. Table 18.2 below provides the tonnages and end destination of leachate treated off site in 2008.

Table 18.2 Tonnage of leachate/trade effluent transported off-site 2008

Leachate/trade effluent transported off-site 2008		
Dates	**Tonnage**	**Treatment Facility**
January to April 2008	281.28	B.E.O.F.S. of Camphill Community, Ballytobin, Callan, co. Kilkenny. WMP05/2005
May to December 2008	1131.91	Waterford Proteins, Christendom, Ferrybank, Waterford City. Licence No. P0040-02
Total	**1413.19**	

It is a requirement at the design phase of the proposed new development that leachate is collected and re-used within the process. Waterford City Council have commissioned WTT (Composting Design Consultants) to provide the new development with capacity storage to collect leachate in combination with rainwater roof run-off and re-use within the process where possible without having an adverse impact on the composting process.

19.0 DEVELOPMENT/INFRASTRUCTURAL WORKS

It is a requirement in accordance with the waste licence W0234-01 that a summary report is prepared for any development/Infrastructural works completed in the reporting year and to provide the agency with a summary of works prepared for the current year.

19.1 Development/Infrastructural Works 2008

March 2008:
An Automatic wheel wash system was installed in March 2008. The installation of this system is a requirement of the waste licence. The wheel wash system was installed at the entrance to the waste reception building in accordance with the recommendations of the Department of Agriculture under the Animal By-Product Regulations. The location of the wheel wash system at the waste reception building was chosen to minimise the potential for microbial cross contamination of traffic from the 'dirty' waste reception building area and the 'clean' composting yard area.
The wheel wash system was installed at a new entrance on the western side of the waste reception building.

March 2008:
The original access door on the western side of the waste reception building was closed off to accommodate the installation of the wheel wash system

March 2008:
The wheel wash 'dirty' water was connected into the existing leachate collection system from the current curing pad area.

April 2008:
The existing entrance at the southern side of the waste reception building was partially closed off with the installation of a 2.5 meter wall. A roller shutter door was installed at this entrance to the top of the walled partition. This work was carried out under the recommendations of the Department of Agriculture to prevent access of the 'clean' loader into the building while transferring green waste and amendment material indoors and subsequently preventing microbial cross contamination of both 'dirty' and 'clean' areas at the facility.

April 2008:
Minor repairs were carried out to the existing floor of the waste reception building. In addition two drainage sumps were installed in the waste reception building floor for more efficient leachate collection.

May 2008:
An automatic fast door system with motion sensors was installed at the new entrance of the waste reception building as required by DAFF and EPA in order to maintain a closed environment within the waste reception building at all times when processing.

19.2 Development/Infrastructural Works 2009.

At the time of submitting the application for a waste licence to the Agency in 2007, Waterford City Council envisaged that the facility would be expanded at some point in the future to accommodate brown bin waste from other local authorities in the south east region. As part of this application a waste licence was submitted for an expansion of the facility to accept 20,000 tonnes per annum of non-hazardous biodegradable household and commercial organic and green waste, subject to the approval of infrastructure by the Agency and its implementation as per Condition 3.20.3 of this licence.

In March 2008 a planning permission application was submitted by Waterford City Council for the development of a 20,000 ton facility on the existing facility footprint. Waterford City Council employed Celtic Composting Systems Ltd. during this period for the preliminary design phase of this project.

In June 2008 the planning permission was approved.

In December 2008 Waterford City Council employed the services of WTT (Waste Treatment Technologies – Holland) for the design of a 16,000 ton facility. The brief for this design was for WTT to develop a facility to meet all EPA Licence requirements and all DAFF Animal By-Product Regulations.

In January 2009 WTT presented Waterford City Council with design drawings that incorporated their brief.

In March 2009 Waterford City Council made the decision to cease operations at the existing composting facility in order to facilitate the new development. As part of this short-term closure it is envisaged that a period of 4-6 months will be required to process the existing material on site and carry out a short term closure and decommissioning of the facility. All decommissioning of the existing facility is due to be completed by 31st September 2009.

Waterford City Council expect to be in a position to commence the new development by end 2009 and/or start 2010.

The new development will encompass the following;

- Facility Capacity of 16,000 tonnes per annum household and commercial organic waste.
- Indoor waste reception building with associated automatic wheel wash system.
- Indoors mixing and shredding of waste as pre-treatment to composting.
- Indoor removal of contamination (plastics/metal/textiles) as pre-treatment to composting.
- Indoor aerated tunnel composting.
- Indoor screening material to 12mm particle size as pre-pasteurisation.
- Indoor tunnel pasteurisation of 12mm compost material to 70C/1hr.
- Indoor reuse of oversize material as bulking agent at front end of process.
- Indoor storage of 12mm compost final material.
- Air extraction/handling of all indoor activities.
- Biofilter extraction of process air in conjunction with scrubber system.
- Re-use of all leachate produced as by-product of compost process.
- Re-use of rainwater roof run-off within the process.
- Public amenity green waste drop-off area.

Preliminary Drawings for the new 16,000 tonnes facility supplied by WTT can be found in Appendices.

Waterford City Council is currently pursuing talks with the Department of Environment with regards to the new development. Waterford City Council will contact the Agency at a future date once all the information including timeframes relating to the new facility development are in place. No development works will take place until such time as a final proposal has been finalised, forwarded to the Agency and approved.

Section L of the Appendices provides design details of the proposed new development as supplied by WTT design consultants.

20.0 FINANCIAL PROVISION/MANAGEMENT STRUCTURE/ PUBLIC INFORMATION

20.1 Financial Provision

In accordance with Condition 10.2 and 10.3 of the waste licence W0234-01 Waterford City Council have submitted a Residuals Management Plan and an Environmental Liabilities Risk Assessment of the facility therein.

Measures taken by Waterford City Council to prevent environmental damage to the surrounding environment have been highlighted throughout this AER and were subsequently addressed in the risk assessment and environmental response procedure under the following headings:

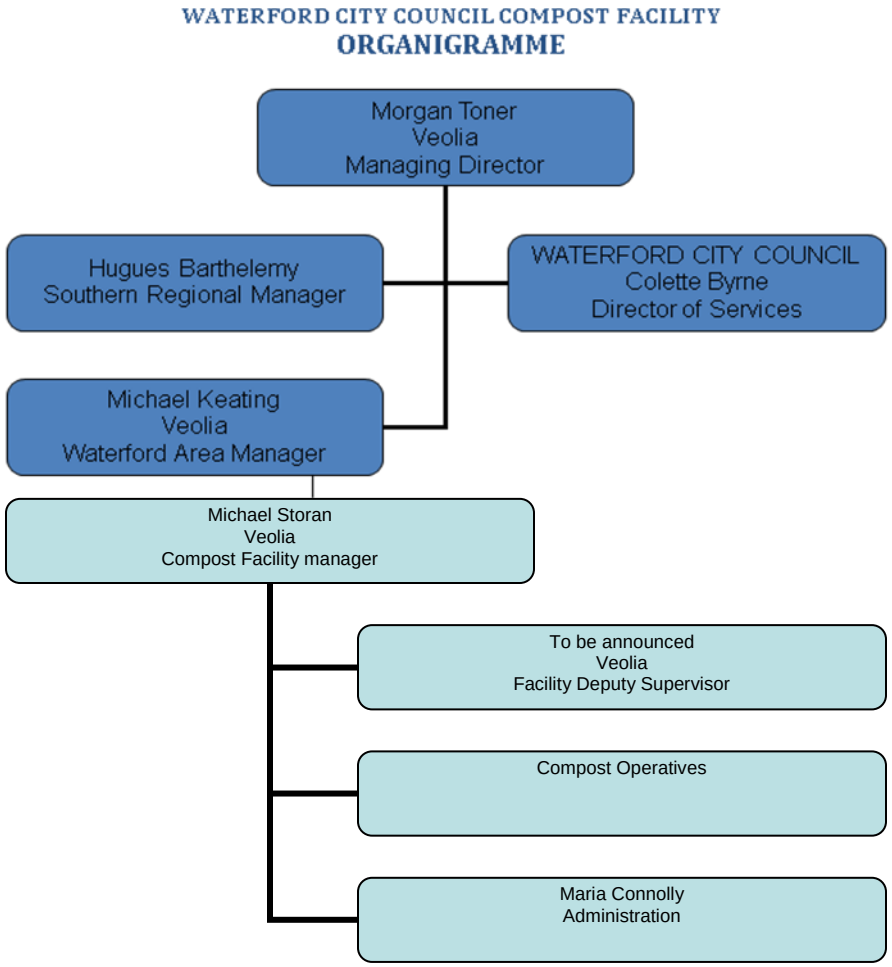
Surface Water
Groundwater
Leachate Management
Emissions to Air
Human Beings
Materials Stored at the Facility
Wastes Generated and Stored at the Facility
Fire Water Run-off

The submitted Environmental Liabilities Risk Assessment recommended that Waterford City Council set aside approx 700,000 Euro as a financial provision to cover worst case of abnormal operations at the facility. This could be in the form of a bond, financial allocation or an insurance premium as detailed in the financial provision scenarios provided by Golder Associates within the report.

Alternatively another form once agreed with the Agency, which would guarantee the availability of funds for potential liabilities arising from emergency situations occurring from the operations of the site and/or closure and decommissioning of the site could be approved.

To date Waterford City Council have not provided a financial provision for the approval of the Agency.

20.2 Management Structure



20.3 Communications Programme

In compliance with condition 2.2.2.7 of the waste licence, a communications programme is maintained to ensure that members of the public can obtain information on the environmental performance of the company at all times. During the reporting period there were no requests from members of the public to inspect any of the records and files listed below.

In addition, Waterford City Council have been providing a communications programme to members of the public through their Environmental department since operation began in 2004. Waterford City Council have employed an Environmental Welfare/Education Officer who has adopted a communications programme that includes:

Information by use of door to door leaflets

Information by local radio and television advertisements

Contact hotline for members of the public with queries regarding collection and material types accepted at the facility.

Waterford City Council have taken a proactive approach regarding the development of the facility within the community. In April 2008, Waterford City Council brought a number of representatives from the Ballybeg housing group, management from the Six Cross Roads Business Park and local councillors to visit a compost facility in Belgium. The purpose of such a visit was to address any issues regarding the proposed facility development and to provide the public with a general representation of the proposed development plan for the existing compost facility.

Waterford City council and Veolia Environmental Services have also attended a meeting with local residents held in Ballybeg community centre in May 2008 to discuss the current facility operations and the proposed development.

The list of documents available for inspection is as follows:

- Training Records
- Communication Records
- Environmental Monitoring Results
- Complaints Register
- Non-Compliance Records
- Corrective Action Records
- Unacceptable Waste Records
- Pest/Vermin Control Records
- Daily transactions for incoming and outgoing vehicles
- Current Waste Licence
- Waste Licences of Destination Facilities

- Waste Collection permits of Hauliers
- Veolia Safety Statement
- Daily/Weekly Inspection Reports
- Emergency Response Procedures
- Consultants CV's
- Environmental Procedures
- Tonnage Records
- Recycling Information
- Material Safety Data Sheets
-

All telephone and written requests are answered verbally if this is sufficient or in writing if required. In any case the Compost facility Manager will reply to all such requests within 5 working days. All public visits for inspection of records must be prearranged with the Compost Facility Manager.

Information regarding Veolia Environmental Services can also be found on the company's web site at www.veolia.ie, or by contacting

The Compost Facility Manager

Veolia Environment Services Limited (Ireland), Six Cross Roads Business Park,

Waterford City.

Information can also be found by contacting Waterford City Council Environmental Department and/or by website www.waterfordcity.ie

Waterford City Council creates awareness of the Compost Facility as part of their Environmental Education program. In order to ensure that the information is accessible to the general public, it is promoted in a number of ways:

1. **Radio and newspaper ads**: Waterford City Council places ads with local radio stations and newspapers at various times throughout the year regarding the Compost Facility, e.g. availability of compost, opening hours at Christmas time, acceptance of trees/ hedges, etc

2. **Newsletters**: Waterford City Council's Environmental Services section delivers a newsletter to each waste customer in the city at the beginning of each year. Information is included in this newsletter regarding the Compost Facility, along with information regarding the percentage of household waste being diverted from landfill in the previous year.

3. **Press releases**: Information is released to the press as press releases on a regular basis. The theme of these press releases varies according to the time of the year and issues at hand. However, they have dealt with issues such as recycling rates and participation, how the composting process works, contamination levels, etc.

4. **Website**: there is a page on www.waterfordcity.ie dedicated to what can and can't be put into the brown bin (for organic waste) and explaining why only organic materials can be put into this bin.

5. **Sign** at Compost Facility site: Direction signage is in place to lead people from the main Cork Road to the Compost Facility on the Green Road. There is also a sign at the entrance to the Compost Facility, which provides information on opening hours, charges, contact information (both office and mobile numbers) and website details.

6. **Talks**: the composting process is dealt with in all waste management talks to schools and community groups. These talks are popular with both Primary and Secondary Schools and are highlighted in a letter regarding environmental education resources available to schools at the beginning of each school year. Tours of the Compost Facility are also available to interested groups.

21.0 CLOSURE, RESTORATION & AFTERCARE PLAN

In accordance with Condition 10.1 and 10.2 of the waste licence for the facility, Waterford City Council are required to provide to the Agency a fully costed plan for the decommissioning or closure of the site or part thereof.

Under the scope of the Residuals Management Plan a fully costed decommissioning and/or closure plan was submitted to the Agency. The management of the facility have prepared a task list with associated estimated costs involved with the closure of the facility. These costs cover the known liabilities associated with the closure of the compost facility and remediating the facility back to its original status. This task list is presented below.

Task 1
Stop accepting waste at the facility for processing.

Timeframe: 1 day to contact the relevant authorities and suppliers of waste to the facility.
1 week to contact the public to inform them of the closure of the facility for green waste drop-off.

Estimate Cost: No cost.

Task 2
Process the existing waste at the facility.

Timeframe: 5 months total. Minimum 2 weeks to process the existing waste in the digester units. 4-5 months to process this material and subsequent existing material on the curing pad area. Once digester units have been emptied they will be steam washed inside the waste reception building.

Once the curing pad material has been removed the pads will be steam washed to remove any debris from the area.

Removal of waste associated with contamination of waste loads will be carried out as normal operations over the period of 4-5 months.

Estimated Cost: 300,000 Eur.

Task 3
Collection of final compost from general public from storage area.

Timeframe: 2 months.
Estimated Costs: No cost.

Task 4
Emptying of leachate tank to wastewater treatment plant.

Timeframe: 5 months total. This would run concurrent with processing the existing waste at the facility.

Estimated cost: 100,000 Eur.

Task 5

Once leachate tank is emptied, desludging of entire leachate drainage network system Including grit traps, sumps and pumping chambers and wheel wash. Transfer of desludged material by tanker to relevant wastewater treatment plant. All leachate and associated valves and pumps decommissioned.

Timeframe: 1 week.
Estimated cost: 20,000 Eur.

Task 6

Desludging all surface water drainage network system including grit traps, sumps and pumping chambers. Transfer of desludged material to relevant wastewater treatment plant.

Timeframe: 1 week.
Estimated cost: 10,000 Eur.

Task 7

Removal of all waste mobile plant and equipment including loaders, roadsweeper, mixers and shredders. Machinery to be returned to suppliers in the event of rental/lease. Purchased equipment to be sold to relevant interested parties.

Timeframe: 2 weeks.
Estimated cost: No cost.

Task 8

Removal of all digester units to relevant metal recycling company or resale to commercial/public parties. Removal of all associated pipework to same.

Timeframe: 2 weeks
Estimated cost: No cost.

Task 9

Steam cleaning all surfaces of waste reception building.

Timeframe: 4 hours
Estimated cost: No cost.

Task 10

Decomissioning of all electrical systems including aeration motors and fans and all associated process control equipment.

Timeframe: 1 day
Estimated cost: 3,000 Eur.

The total estimated cost of the known closure and remediation of the compost facility is 430,000 Eur. It is envisaged that the proposed environmental liability insurance that is currently being arranged will cover the costs associated with this process.

As of 9th March 2009 Waterford City Council has taken the decision to cease operations at the facility to facilitate the proposed new development of the site to an indoor 20,000 ton capacity

facility. Currently all brown bin material being collected in Waterford City and Waterford County is diverted to 2 Animal By-Product facilities at Miltown Composting in Co. Tipperary and Waddock Composting Co. Carlow. The waste material currently in various stages of processing at the facility will be processed fully over the period April to September 2009.

22.0 ENVIRONMENTAL LIABILITIES

In accordance with Condition 10.2.3 of the waste licence Waterford City Council are required to carry out a Residual Management Plan. The Environmental Liability Risk Assessment was carried out by Golder Associates in 2008 and is contained within the Residual Management Plan for the facility.

In addition in accordance with Condition 12.3 the licensee is required to provide an annual statement as to the measures taken at the site in relation to the prevention of environmental damage, and the financial provisions in place in relation to the underwriting of costs for remedial actions following anticipated events (including closure) or accidents/incidents, as may be associated with the carrying on of the activity.

Details of the Environmental Liability Risk Assessment are included in the Appendices as a section of the Residual Management Plan for the facility.

It is considered that there are no short, medium or long term environmental liabilities associated with potential nuisances (litter, dust, noise and birds) from the composting activities. These potential nuisances, which are considered to represent minor risks, are subject to individual conditions in the waste licence and are amenable to effective control. Future environmental liabilities are therefore confined to incidents such as fires, spills and leaks.

A facility specific assessment of the risks presented by such incidents was prepared in the Golder Environmental Risk Assessment Report and included the following;

Surface Water
Groundwater
Leachate Management
Emissions to Air
Human Beings
Materials Stored at the Facility
Wastes Generated and Stored at the Facility
Fire Water Run-off

Unplanned Incidents & Suggested Costs
The identified risks of unplanned incidents and the likely costs of the remedial works to adequately address the associated environmental impacts are presented in Table 22.1 below.

Table 22.1 Unplanned Incidents & Suggested Costs

Unplanned Incidents & Suggested Costs		
Risk	Risk Score	Most Likely Cost (Euro)
R1 Fire breaking out at the facility	6	200,000
R2 Escape of leachate to subsoils and groundwater due to damage to containment system	4	100,000
R3 Explosion at the facility	4	100,000
R4 Esacpe of leachate to surface water drainage system causing contamination	8	100,000
R5 Operational accident leading to the release of	4	50,000

oil/chemicals to surface water drainage system		
R6 Damage to the leachate collection system or holding tank	6	50,000
R7 Fire water run-off containment	8	100,000

*The Risk Score is calculated by multiplying the likelihood score by the severity score.

An assessment has been made of the above environmental risks at the facility and the measures associated with the actions required are included within the Emergency Response Procedure for the facility.

23.0 QUANTITY WASTE RECOVERED RECEIVED & DISPOSED 2008 AND PREVIOUS YEARS

Waste received at the facility consists of Non-hazardous biodegradable (household and commercial organic waste and green waste) waste. The primary sources of waste received are as follows;

Brown bin organic household collection from Waterford City Council.
Brown bin organic household collection from Waterford County Council.
Brown bin organic household collection from Wexford County Council.
Brown bin organic commercial collection from Veolia Environmental Services Ltd.
Green waste collected at drop-off amenity at the compost facility from the public.

A breakdown of the waste received, recovered and disposed of at the facility with relevant EWC codes can be found in Table 23.0 below;

Table 23.1 Tonnage waste received, recovered and disposed 2008.

Tonnage Waste Received, Recovered and Disposed 2008				
Month	**Tonnage Biowaste Received EWC 200108**	**Tonnage Green Waste Received EWC 200203**	**Tonnage Compost Recovered EWC 190599**	**Tonnage Waste Disposed EWC 200301**
Jan 08	628.5	30	200	34.4
Feb 08	499	40	200	130.1
Mar 08	481.3	60	200	122.4
Apr 08	695.8	80	200	145
May 08	765.7	80	200	0
Jun 08	774.1	80	200	69.4
Jul 08	684.9	80	200	24.5
Aug 08	370.8	80	100	148.1
Sep 08	520.2	80	200	164.4
Oct 08	417.3	70	In Process	0
Nov 08	296.8	60	In Process	73.7
Dec 08	247.4	40	In Process	30.2
TOTAL	**6381.8**	**780**	***1700**	**942.2**

*It is estimated that once processed fully the volume of final compost produced from October to December 2008 will attribute an additional 500 tons of final compost resulting in a total of 2200 tons produced for 2008.

A breakdown of the waste received, recovered and disposed for previous years at the facility with relevant EWC codes can be found in Table 23.1 below.

Table 23.1 Tonnage waste received, recovered and disposed 2005-2008.

Tonnage Waste Received, Recovered and Disposed 2005-2008				
Year	**Tonnage Biowaste Received EWC 200108**	**Tonnage Green Waste Received EWC 200203**	**Tonnage Compost Recovered EWC 190599**	**Tonnage Waste Disposed EWC 200301**
2005	7237	600	2200	1564
2006	7100	600	2200	1180
2007	7739	700	2400	831
2008	6382	780	*1700	942
TOTAL	**28458**	**2680**	**8500**	**4517**

*A total of 1700 tons of compost has been produced in 2008 up to an including September 2008. There is approximately 5-600 tons of compost to be produced from material still in process at the facility for 2008.

24.0 WASTE RECOVERY REPORT

In Addition to Section 3.0 Waste Management Record and Section 23.0 Quantity Waste Recovered, Received and Disposed of in this report, the Waste Recovery Report submitted to the Agency under www.wastesurvey.ie in February 2009 as the annual waste survey can be found in the Appendices which together provide the contribution by this facility to the achievement of the recovery targets and strategy in national and European Union waste policies.

In addition, at the time of preparing this AER Waterford City Council have taken the decision to cease operations in the short-term to facilitate a new development of the existing facility. This new development will increase the capacity of the facility from currently 10,000 tonnes to 20,000 tonnes per annum. This will further progress the contribution to removal of biowaste from landfill under the National Biowaste Strategy and increase the contribution by this facility towards the achievement of national and European waste policies.

25.0 PROCEDURES SUMMARY

The following hygiene procedures were introduced at the facility in August 2008 in addition to the Standard Operating Procedures that have been in place.
These hygiene procedures were introduced following the recommendations of the Department of Agriculture Food and Forestry under the Animal By-Product Regulations.

HYGIENE PROCEDURES

PROCEDURE NO	DESCRIPTION
HP 001	**WHEEL WASH OPERATION**
HP 002	**FOOTBATH OPERATION**
HP 003	**WASTE RECEPTION CLEANING**
HP 004	**WASTE RECEPTION MOBILE PLANT**
HP 005	**KOMATSU LOADER**
HP 006	**DIGESTER PAD CLEANING**
HP 007	**ROADSWEEPING YARD**

STANDARD HYGIENE PROCEDURE **WHEEL WASH OPERATION**	**PROCEDURE NUMBER** **HP 001** **VERSION 1**
UPDATED BY: Michael Storan	ISSUE DATE: August 6th 2008
APPROVED BY:	REPLACES VERSION: n/a

PERSONNEL INVOLVED:
Facility Manager, all Operational Staff, All suppliers of Animal By-Products

PROCEDURE PURPOSE:
Ensure that vehicles entering and exiting the waste reception are cleansed in accordance with animal by-products regulations

SCOPE OF PROCEDURE:
Applies to all waste accepted from commercial and public sources.
Applies to all mobile equipment within the waste reception building.

DESCRIPTION OF TASKS:
1. An automatic wheel wash is located at the entrance to the waste reception building.
2. All vehicle delivering waste to the facility are required to wash their vehicle wheels before entering the waste reception building.
3. The wheel wash will automatically start once the vehicle has mounted the wheel wash unit.
4. The wheel wash header tank contains approved disinfectant which is applied to the vehicle wheels.
5. The operator is responsible to ensure adequate disinfectant is applied to the wheel wash header tank on a daily basis. Approx 2-3 litres of disinfectant is added daily.
6. Once the vehicle has passed to the far end of the wheel wash an automatic fast shut door will open allowing access to the waste reception building.
7. The automatic fast shut door closes behind the vehicle once it has entered the building.
8. On exiting the waste reception building the wheel wash automatically washes the wheels of the vehicle.
9. The bunded area around the wheel wash collects any excess liquid run-off and is diverted to the leachate holding tank until removed to an appropriate facility.
10. In the event that the automatic wheel wash is not in operation due to a malfunction or maintenance the portable steam wash unit is employed to carry out this procedure.

EXPECTED RESULTS AND ACTIONS FOLLOWING DEPARTURE FROM THIS PROCEDURE
Failure to follow this procedure may result in material being transferred from the dirty reception area to the outside yard and increasing the risk of cross contamination at the facility.

RELATED DOCUMENTATION:

DATE OF PROCEDURE REVIEW
August 2009

PERSON RESPONSIBLE FOR UPDATING THIS PROCEDURE:
Michael Storan

STANDARD HYGIENE PROCEDURE **FOOTBATH OPERATION**	**PROCEDURE NUMBER** **HP 002** **VERSION 1**
UPDATED BY: Michael Storan	ISSUE DATE: August 6th 2008
APPROVED BY:	REPLACES VERSION: n/a

PERSONNEL INVOLVED:
Facility Manager, all Operational Staff and all visitors to the facility

PROCEDURE PURPOSE:
Ensure that the risk of cross contamination from the waste reception to the outside yard is kept to a minimum.

SCOPE OF PROCEDURE:
Applies to all personnel and visitors who enter the waste reception building.

DESCRIPTION OF TASKS:
1. The waste reception building has an entrance door to facilitate personnel and visitors.
2. A footbath is located at the rear of the entrance door.
3. The footbath contains approved disinfectant for the cleansing of boots.
4. A water hose is also located adjacent to the footbath.
5. It is the responsibility of the operator to ensure that the footbath is regularly topped up with sufficient disinfectant.
6. All personnel and visitors who exit the waste reception building must wash excess debris from their boots by using the water hose supplied.
7. Once excess debris has been removed from boots the personnel/visitor must walk through the footbath containing disinfectant before leaving the waste reception building.

EXPECTED RESULTS AND ACTIONS FOLLOWING DEPARTURE FROM THIS PROCEDURE
Failure to follow this procedure may result in an increased risk of cross contamination from the waste reception building to the outside yard.

RELATED DOCUMENTATION:
ABP Regulations

DATE OF PROCEDURE REVIEW:
August 2009

PERSON RESPONSIBLE FOR UPDATING THIS PROCEDURE:
Michael Storan

STANDARD HYGIENE PROCEDURE **WASTE RECEPTION BUILDING**	**PROCEDURE NUMBER** **OP 003** **VERSION 2**
UPDATED BY: Michael Storan	ISSUE DATE: November 2008
APPROVED BY:	REPLACES VERSION: n/a

PERSONNEL INVOLVED:
Facility Manager, all Operational Staff.

PROCEDURE PURPOSE:
Ensure that the waste reception building is cleansed on a daily basis.

SCOPE OF PROCEDURE:
Applies to the waste reception building area.

DESCRIPTION OF TASKS:
1. All material that is accepted within the waste reception building is to be removed/processed within 24hrs of its arrival.
2. Any material that is accepted in the afternoon that cannot be processed on the same day is stockpiled into a corner and covered with oversize or shredded green material. This waste is processed the following morning.
3. Once removed at the end of the day all walls are hot washed down by use of portable steam cleaner.
4. The operator ensures that the temperature dial is set to 90C + before commencing the clean down.
5. Once walls have been washed down the entire floor is washed with the portable steam cleaner.
6. Records of daily reception building cleaning are recorded in the Daily cleaning records.
7. It is the responsibility of the waste reception building operators to carry out and record the cleaning events on a daily basis.

EXPECTED RESULTS AND ACTIONS FOLLOWING DEPARTURE FROM THIS PROCEDURE
Failure to follow this procedure may result in an increase risk of cross contamination from the reception building and the outside yard.

RELATED DOCUMENTATION:
Daily cleaning records.

DATE OF PROCEDURE REVIEW:
August 2009

PERSON RESPONSIBLE FOR UPDATING THIS PROCEDURE:
Michael Storan

STANDARD HYGIENE PROCEDURE **WASTE RECEPTION MOBILE EQUIPMENT**	**PROCEDURE NUMBER** **OP 004** **VERSION 1**
UPDATED BY: Michael Storan	ISSUE DATE: August 2008
APPROVED BY:	REPLACES VERSION: n/a

PERSONNEL INVOLVED:
Facility Manager, all Operational Staff

PROCEDURE PURPOSE:
Ensure that the waste loader and mixer within the waste reception building are cleansed daily.

SCOPE OF PROCEDURE:
Applies to the waste loader and mixer within the waste reception building

DESCRIPTION OF TASKS:
1. A Senobogen loader and a waste mixer are housed within the waste reception building.
2. These vehicles are kept within the waste reception building and may only leave in the event of a malfunction or for maintenance.
3. At the end of each production day the waste loader is hot washed down to remove any debris from wheels and body.
4. At the end of each production day the waste mixer is hot washed down to remove any debris from base and body.
5. This is carried out before the floors and walls of the waste reception building are steam washed down to prevent re-dirtying the floor of the building.
6. The waste reception building operators are responsible for the carrying out and recording of the task on a daily basis.
7. Records are kept on the daily cleaning checklist.

EXPECTED RESULTS AND ACTIONS FOLLOWING DEPARTURE FROM THIS PROCEDURE
Failure to follow this procedure may result in the increased risk of cross contamination form the waste reception building and outside yard.

RELATED DOCUMENTATION:
Daily cleaning records

DATE OF PROCEDURE REVIEW:
August 2009

PERSON RESPONSIBLE FOR UPDATING THIS PROCEDURE:
Michael Storan

STANDARD HYGIENE PROCEDURE **KOMATSU LOADER**	**PROCEDURE NUMBER** **OP 005** **VERSION 1**
UPDATED BY: Michael Storan	ISSUE DATE: August 2008
APPROVED BY:	REPLACES VERSION: n/a

PERSONNEL INVOLVED:
Facility Manager, all Operational Staff

PROCEDURE PURPOSE:
Ensure that the komatsu loader used for forming and turning pile is adequately cleansed between operations to reduce the risk of cross contamination.

SCOPE OF PROCEDURE:
Applies to all washing of komatsu loader between semi-processed piles and finished material.

DESCRIPTION OF TASKS:
1. Material that has been removed for the digester boxes is transferred to the aerated curing area for second stage processing.
2. Each second stage pile is composed of material from 8-10 digester boxes.
3. Each pile is formed using the komatsu loader.
4. This material is deemed semi-processed and must pass the required pathogen test.
5. Once the pile has been formed the komatsu loader bucket and wheels are washed within the wheel cleaning area to ensure that no cross contamination occurs when it subsequently comes into contact with material that has been processed further within the facility.
6. The bucket of the komatsu loader is placed within the bunded area of the wheel wash and is manually hot washed by use of the portable steam cleaner.
7. The process is repeated on a daily basis and is recorded in the cleaning checklist by the operator.

EXPECTED RESULTS AND ACTIONS FOLLOWING DEPARTURE FROM THIS PROCEDURE
Failure to follow this procedure may result in an increased risk of cross contamination between second stage processed material and other compost piles/material at the facility.

RELATED DOCUMENTATION

DATE OF PROCEDURE REVIEW:
August 2009

PERSON RESPONSIBLE FOR UPDATING THIS PROCEDURE:
Michael Storan

STANDARD HYGIENE PROCEDURE **DIGESTER PAD CLEANING**	**PROCEDURE NUMBER** **OP 006** **VERSION 1**
UPDATED BY: Michael Storan	ISSUE DATE: August 2008
APPROVED BY:	REPLACES VERSION: n/a

PERSONNEL INVOLVED:
Facility Manager, all Operational Staff

PROCEDURE PURPOSE:
To ensure that the digester pad is cleaned at a minimum of weekly basis to reduce the risk of cross contamination between semi-processed material and the yard.

SCOPE OF PROCEDURE:
Applies to the cleansing of the digester pad area.

DESCRIPTION OF TASKS:

1. The digester pad area contains 20 digester boxes each of which is in a various state of process at any one time.
2. The digester pad area is hot washed by use of the portable steam cleaner at a minimum of weekly events.
3. The operator is responsible to ensure that leachate and debris is cleaned form this area to prevent cross contamination.
4. The operator records the cleaning events in the daily cleaning logs.
5. The area at the boundary of the digester pad area is cleaned daily by use of a roadsweeper to remove any debris that has been swept form the digester pad area.

EXPECTED RESULTS AND ACTIONS FOLLOWING DEPARTURE FROM THIS PROCEDURE
Failure to follow this procedure may result in an increase risk in the cross contamination of the digester pad area and the yard/second stage process.

RELATED DOCUMENTATION:
Facility Cleaning Checklist.

DATE OF PROCEDURE REVIEW:
August 2009

PERSON RESPONSIBLE FOR UPDATING THIS PROCEDURE:
Michael Storan

STANDARD HYGIENE PROCEDURE **YARD ROADSWEEPING**	**PROCEDURE NUMBER** **HP 007** **VERSION 1**
UPDATED BY: Michael Storan	ISSUE DATE: August 2008
APPROVED BY:	REPLACES VERSION: n/a

PERSONNEL INVOLVED:
Facility Manager, all Operational Staff

PROCEDURE PURPOSE:
To ensure that the yard surfaces are cleaned at a minimum of weekly basis to reduce the risk of cross contamination between semi-processed material and the yard.

SCOPE OF PROCEDURE:
Applies to the cleansing of the entire yard area.

DESCRIPTION OF TASKS:

1. A roadsweeper with wetting capabilities is currently employed at the facility to remove debris from operational activities as they occur.
2. The operators are responsible to ensure that the yard surfaces are kept free from debris and screenings to prevent/minimise cross contamination on site.
3. The operator is required to add 2-3 litres of disinfectant to the roadsweeper water tank when required. The disinfectant solution is applied to the yard surfaces in its normal course of operation while cleaning the yard surface.
4. The operator is required to record the use of the disinfectant in the roadsweeper in the daily cleaning checklist.
5. This procedure is carried out two / three times per week or as deemed necessary by Plant Manager of operatives.

EXPECTED RESULTS AND ACTIONS FOLLOWING DEPARTURE FROM THIS PROCEDURE
Failure to follow this procedure may result in an increase risk in the cross contamination between the second stage processing on the curing pad and fully processed materials.

RELATED DOCUMENTATION:
Facility Cleaning Checklist.

DATE OF PROCEDURE REVIEW:
August 2009

PERSON RESPONSIBLE FOR UPDATING THIS PROCEDURE:
Michael Storan

STANDARD HYGIENE PROCEDURE **FAILED BATCH CONTAMINATION**	**PROCEDURE NUMBER** **HP 008** **VERSION 1**
UPDATED BY: Michael Storan	ISSUE DATE: November 2008
APPROVED BY:	REPLACES VERSION: n/a

PERSONNEL INVOLVED:
Facility Manager, all Operational Staff

PROCEDURE PURPOSE:
To ensure that in the event of a pile failing the pathogenic test for the second stage processing that no cross contamination occurs to pasteurised or final compost material within the plant.

SCOPE OF PROCEDURE:
Applies to the area on the curing pad containing the failed pile and the cleansing of the entire yard area.

DESCRIPTION OF TASKS:

1. Each second stage processing take place on the curing pad area.
2. It is a requirement for each second stage pile to attain 60C/48hrs protocol.
3. Once this processing standard has been achieved pathogenic testing in the form of 5 samples of for E.coli testing must be carried out.
4. In the event that the pile has failed the E.coli test DAFF must be informed immediately of the failed batch/pile.
5. An assessment will be made by the Plant manager as to the availability of capacity at the time of the failure and a decision made as to whether the material will be reprocessed or landfilled.
6. In the event that the material can be reprocessed the material will be transferred back into the reception building by the komatsu (clean loader).
7. A section of the adjacent pile in the curing area that has subsequently passed the twin barrier protocols will also be removed and reprocessed to ensure no cross contamination has occurred. A sample will be taken of E.coli analysis of this adjacent pile to confirm no cross contamination.
8. A record will be kept of the initial failed batch and a documented investigation will be carried out by reviewing all the available records for the batch to determine how the failure event occurred.
9. Corrective actions will be carried out where necessary to prevent the reoccurrence of the incident.
10. In the event that the failed batch/pile cannot be reprocessed due to lack of capacity the material will be landfilled under the instruction of a representative from DAFF.
11. All production and waste acceptance will cease until a representative from DAFF is at the facility to oversee the removal.
12. The plant Manager and operatives will strictly observe the recommendation from DAFF during the material ‘clear out’.
13. All vehicles used to remove material will be disinfectant washed upon exiting the facility.
14. The area that contained the failed pile/batch will be subsequently sprayed with disinfectant and washed down with use of portable steam cleaner.
15. The Komatsu loader will be sprayed with disinfectant and washed down using the protable steam cleaner.
16. The entire yard roadsurface area will subsequently be roadswept with the use of disinfectant applied to the wash tank.
17. All loads exiting the facility to landfill will carry a transport document detailing the type of material to be landfilled.
18. The DAFF representative will sign-off each load as it leaves the facility.

19. A record will be returned from the landfill for each load disposed of.
20. The details of the removal will be forwarded to DAFF once completed with a copy of all loads from the landfill.

EXPECTED RESULTS AND ACTIONS FOLLOWING DEPARTURE FROM THIS PROCEDURE

Failure to follow this procedure may result in an increase risk in the cross contamination between the second stage processing on the curing pad and fully processed materials.

RELATED DOCUMENTATION:

Facility Cleaning Checklist.

DATE OF PROCEDURE REVIEW:

August 2009

PERSON RESPONSIBLE FOR UPDATING THIS PROCEDURE:

Michael Storan

26.0 REVIEW OF NUISANCE CONTROLS

It is a requirement under the waste licence for the facility to carry out daily inspections of the facility with regards to the potential to cause environmental nuisance on site. The inspections are carried out by the facility manager with particular regards to the following;

Odour
Litter
Vermin
Flies
Birds
Mud/Dust
Noise

A record of all inspections is maintained at the facility. A summary of each parameter is given here.

26.1 Odour Nuisance 2008.

There are four main sources of odour at the facility – Waste Reception & Mixing, Tipping Waste from Digester Units, Turning Compost Piles and Screening Compost Piles.
Odour control on site is maintained by a series of Biofilters in operation for the Digseter units when in process and for the Curing pad compost piles. In addition there are 4 odour control atomising units in operation at the facility. These units operate by propelling a mix of water and odour masking/neutralising agent into the surrounding air. The units are located within the waste reception building, the digester pad area and the screening and storage areas.

There have been 5 odour complaints made from external sources in 2008. A full description is given in Section 5.0 Complaints Summary.

There were two sampling events for biofilter performance on site including bed media analysis and inlet and outlet gas analysis. The results of the bed media performance showed that the overall performance was good with Ammonia, hydrogen Sulphide and mercaptans within the emission limit values as per Schedule B1 of the waste licence.

Odour measurements were carried out on a quarterly basis in 2008 in accordance with schedule C.5 of the waste licence. All hydrogen sulphide concentrations recorded at each monitoring location were less than 3ppb in ambient air. No significant ambient air concentrations of mercaptans or aliphatic amines were detected downwind of the facility. Increased levels of Ammonia were detected downwind of the facility operations. This was a result of the second stage phase static aerated pile composting which is carried on outdoors. This is due to be upgraded within the new development which will alleviate such emissions in future.

26.2 Litter Nuisance 2008.

Inspections for litter were carried out at the facility by the manager on a daily basis. Litter was observed at several locations approximately 1-2 times per week. Most litter at the facility can be associated with outdoor operations including turning of the piles and subsequent screening within the open yard. These activities create windblown litter associated with contamination, particularly

light plastic films. On occasion litter was deposited by members of the public at the facility entrance gates during hours when the facility was not in operation.

All litter associated either internally at the facility or externally from public sources was removed by operators on-site. A record of litter picks is kept on file at the facility. There were no complaints received at the facility with regards to litter in 2008.

26.3 Vermin Nuisance 2008.

Waterford City Council has employed the services of an external pest control company with regards to vermin control at the facility. A monthly inspection is carried out by Pestguard Pest Control for levels of vermin and associated activity. There were no large infestations recorded during 2008 pest inspections. On occasion it was observed that activities were recorded at several pest station locations on site but these were deemed low. There were no complaints received at the facility with regards to vermin in 2008.

26.4 Flies Nuisance 2008.

Waterford City Council has employed the services of an external pest control company with regards to fly control at the facility. Pestguard Pest Control carry out a programme of fly spraying control at the facility to minimise the potential for fly infestation at the facility. The facility underwent a fly control spray on a monthly basis for a six month period between the months of April to September 2008. There were no infestations with regards to flies at the facility in 2008. There were no complaints received at the facility with regards to flies in 2008.

26.5 Bird Nuisance 2008.

Bird activities at the facility are mainly associated with compost material in process at the curing pad phase. As all waste received at the facility is processed within the waste reception building and the sealed digester units on site when processing.

Controls in place at the facility for the curing area consist of the following;

All semi-processed material from the digester boxes is adequately cover using oversize material.
A bird distress caller system is in operation automatically on site and can be changed to operate manually in the event that an increase in bird numbers is observed.
Bird Control Ireland are employed to carry out bird culls on site in the event that the bird numbers are excessive.

On several occasions small numbers of birds were recorded at the facility in 2008. The distress caller was put into operation on each event. On one occasion Bird Control Ireland carried out a bird cull to reduce numbers on site. A record of bird inspections is maintained at the facility. There were no complaints received at the facility for bird nuisance in 2008.

26.6 Mud/Dust Nuisance 2008.

Mud and Dust at the facility are mainly associated with turning and screening operations carried on outdoors. Daily inspection for mud and dust on yard surfaces were carried out. In summary mud and dust was recorded on yard surfaces 3-4 times per week. There is a roadsweeper with wetting capabilities on site and on each occasion the roadsweeper was employed to remove mud and dust from road surfaces within the yard.

All dust monitoring carried out on a quarterly basis under the licence were within licence emission limit values in 2008. There were no dust complaints received at the facility in 2008.

26.7 Noise Nuisance 2008.

Golder Associates Ireland were employed to carry out a noise survey of the facility on 20th and 21st February 2008. There were exceedances in both day and nightime noise levels at monitoring locations at the facility. These were due to loader movements and screening equipment. Both the noise sensitive locations off site were above the limits set out in the licence however this was a result of both noise sensitive locations being dominated by traffic noise in the area. A full summary of this noise survey is contained in section 11.0 Noise Monitoring Report of this document.

There were no complaints received with regards to noise in 2008.

27.0 VOLUME TRADE EFFLUENT/LEACHATE PRODUCED

All leachate and trade effluent produced on site is collected via the leachate collection system and stored in the leachate storage tank located on site. Leachate/trade effluent is collected from the following areas;

Toilets
Leachate collection from the waste reception building floor
Leachate collection from the digester units
Leacahte from the curing pad area
Wheel wash run-off at the waste reception building

All trade effluent/leachate is stored in the leachate storage tank until such time as it is removed to an appropriate treatment facility by means of a vacuum tanker. There were no process effluent/leachate emissions to sewer.

In 2008 there was a total of 1413.9 tons of leachate transported off-site for treatment. Table 27.0 below provides the tonnages and end destination of leachate treated off site in 2008.

Table 27.0 Tonnage of leachate/trade effluent transported off-site 2008

Leachate/trade effluent transported off-site 2008		
Dates	**Tonnage**	**Treatment Facility**
January to April 2008	281.28	B.E.O.F.S. of Camphill Community, Ballytobin, Callan, co. Kilkenny. WMP05/2005
May to December 2008	1131.91	Waterford Proteins, Christendom, Ferrybank, Waterford City. Licence No. P0040-02
Total	**1413.19**	

28.0 ANY OTHER ITEMS SPECIFIED BY AGENCY

No other items were specified by the Agency for the reporting period.

APPENDICES

A	Section 2.0 Emissions from Facility	Site Plan with Monitoring Locations
B	Section 2.1 Surface Water Emissions	Monitoring Results Graph
C	Section 2.2 Leachate Emissions	Laboratory Report for Organic Screen
D	Section 2.2 Leachate Emissions	Monitoring Results Graph
E	Section 2.3 Groundwater Emissions	Laboratory Report
F	Section 2.4 Biofilter Gas Emissions	Monitoring Results Graph
G	Section 11.0 Noise	Noise Monitoring Locations
H	Section 12.1 Dust Deposition	Monitoring Results Graph
I	Section 12.2 Odour Measurement	Monitoring Results Graph
J	Section 12.4 Bioaerosols	Monitoring results Graph
K	Section 13.2 Integrity Tests	Integrity Test Certification
L	Section 19.0 Infrastructural Works	Design Drawings of New Development
M	Section 20.0 ELRA	Risk Assessment Document
N		Copy Animal By-Products Approval

APPENDIX A

Section 2.0

Site Plan Monitoring Locations

APPENDIX B

Section 2.1

Surface Water Emissions

APPENDIX C

Section 2.2

Leachate Emissions Organic Screen

APPENDIX D

Section 2.2

Leachate Emissions Monitoring Results

APPENDIX E

Section 2.3

Groundwater Emissions

APPENDIX F

Section 2.4

Biofilter Gas Emissions

APPENDIX G

Section 11.0

Noise

APPENDIX H

Section 12.1

Dust Monitoring

APPENDIX I

Section 12.2

Odour Measurement

APPENDIX J

Section 12.4

Bioaerosols

APPENDIX K

Section 13.2

Integrity Testing Certification

APPENDIX L

Section 19.0

Infrastructural Works

APPENDIX M

Section 20.0

Risk Assessment Documentation

APPENDIX N

Animal By-Products Approval

2008 SCHEDULE OF ENVIRONMENTAL OBJECTIVES AND TARGETS

Definitions

Emissions: Any discharges or noise generated by activities at the Waterford City Council Composting Facility, Green Road, Waterford City.
Targets: Goals or aims, which when achieved will result in a reduction in emissions from the facility or general improvement in the overall environmental performance of the facility.
Objectives: The means or actions by which targets will be achieved. This may include a measurable range of activities.
Target Date: The date or timeframe by which the ultimate target (aim or goal) will be achieved. Target dates may also be set for the completion of the objectives.
Responsible Person: Employee(s) with the overall responsibility of ensuring that the targets and objectives are completed on schedule.

ON THE STRUCTURE OF OBJECTIVES & TARGETS 2008

EPA Licence W0234-01 (Conditions 2.2.2.2, 6.8, 7.1, 7.3, and 7.4 respectively) requires the following be included in the schedule of Objectives and Targets:

1. Energy Use Reduction and Efficiency,
2. Cleaner Technology and Cleaner Production,
3. Prevention, Reduction and Minimization of Waste,
4. Programme for the Reduction of Fugitive Emissions,
5. Reduction of Quantity of Water Used on Site.

1. An audit of the energy efficiency of the site will be carried out in accordance with the guidance published by the Agency "Guidance Note on Energy Efficiency Auditing" and will be repeated at intervals as required by the Agency.
2. An assessment of the efficiency of use of raw materials in all processes, having particular regard to the reduction in waste generated at the facility will be carried out and will take into account best international practice for this type of activity.
3. The use of cleaner technology and cleaner production methods will be investigated and incorporated within the existing facility operations and future development of the facility.

4. The programme for the reduction of fugitive emissions will be based upon the findings of analysis and monitoring as required in accordance with the waste licence schedules of W0234-01. The programme will include appropriate combination of best available techniques to reduce fugitive emissions.

5. Opportunities for the reduction in the quantity of water used on site including recycling and reuse initiatives, wherever possible, will be incorporated while having as minimal impact on operational parameters as possible.

In addition to the aforementioned requirements of the facility EMP, Veolia recognise the requirement for the consideration of significant Environmental aspects for inclusion within the schedule of Environmental Objectives and Targets.

6. Achievement of Emission Limit Values for environmental parameters measured as required under the monitoring schedules of waste licence W0234-01. The achievement of emission limit values to include the following parameters;

(i) Emissions to Air
(ii) Emissions to Water
(iii) Emissions to Sewer
(iv) Noise emissions

7. Achievement of Compost quality Standards Class1 and Class 2.

Schedule of Environmental Objectives & Targets 2008

Summary:

What follows is the summary of 2008's Environmental Objectives & Targets. Environmental Management Programme project numbers are included and outlined elsewhere. These project reports detail the progress made to date in achieving these objectives and targets.

1. Energy & Resource Efficiency

Activity/Emission	Objective	Target	EMP Numbers:	Target Date	Status	Person Responsible
Energy Usage	OBT 1.1 Carry out energy efficiency audit	Complete audit and identify opportunities for savings Identify appropriate key performance indicators for future years.	EMP 01	December 2008	Ongoing	Facility Manager/Consultant
	OBT 1.2 Electrical usage reduction	Implement opportunities to reduce the overall electrical usage.	EMP 01	December 2009	Ongoing	Facility Manager
	OBT 1.3 Fossil fuel reduction	Implement opportunities to reduce the overall diesel usage.	EMP 01	December 2009	Ongoing	Facility Manager

2. Use of Cleaner Technology/Cleaner Production.

Activity/Emission	Objective	Target	EMP Numbers:	Target Date	Status	Person Responsible
Process improvements Facility Development	OBT 2.1 Increase efficiency of operations. Upgrade Technology and upgrade production.	Incorporate cleaner technology in proposed development for facility to include Change from diesel operated equipment to electrical where possible. Tunnel composting indoors Maturation indoors Screening Indoors Air handling on buildings Enclosed biofilter Scrubber system Biotrickling treatment unit.	EMP 02	October 2009	Ongoing	Waterford City Council. External Consultants & Contractors

3. Prevention, Reduction and Minimization of Waste.

Activity/Emission	Objective	Target	EMP Numbers	Target Date	Status	Person Responsible
Waste Minimization	OBT. 3.1 Reduce volume of waste to landfill from contamination sources.	Decrease level of contamination to < 5% at source. Currently running at approx 10% contamination.	EMP 03	January 2009	Ongoing	Waterford City Council Environmental Dept.
	OBT. 3.2 Reduce volumes of oversize material to landfill	Reduction in the volume of material accepted at the facility to allow for the reuse of larger quantities of oversize material to be reused. 2007 processed 7800 ton waste and 800 ton green 2008 target 6500 ton waste and 1000 ton green 2009 target 6000 ton waste and 1000 ton green	EMP 03	December 2008	Ongoing	Facility Manager
	OBT. 3.3 Reduce volumes of oversize material to landfill	Provide Increased capacity of facility to 21,000 t.p.a by end 2009 within new development to accept and process 16,000 ton waste and 5,000 ton of oversize materials in the process	EMP 03	December 2009	Ongoing	Waterford City Council environmental Dept.

4. Reduction of Fugitive Emissions.

Activity/Emission	Objective	Target	EMP Numbers :	Target Date	Status	Person Responsible
Dust	OBT. 4.1 Reduce dust emissions due to operational activities on site	Achieve Licence emission limit values of 350mg/m2/day when new indoor facility development is completed. Compost process to take place indoors.	EMP 04	December 2009	Ongoing	Waterford City Council Environmental Dept.
Odour	OBT. 4.2 Reduce Odour complaints due to operational activities on site.	Achieve zero odour complaints per annum. Reduce complaints when indoor facility development is completed. Facility to incorporate scrubber system and negative air handling on building.	EMP 04	December 2009	Ongoing	Facility Manager/Waterford City Council
Bacteria	OBT. 4.3 Reduce airborne bacteria due to operational activities on site.	New development to incorporate turning and screening indoors under negative air to reduce airborne bacteria exposure to the environment.	EMP 04	December 2009	Ongoing	Waterford City Council Environmental Dept. External Consultants

5. Reduction of Water Usage.

Activity/Emission	Objective	Target	EMP Numbers:	Target Date	Status	Person Responsible
Water Minimization	OBT.5.1 Measure volumes water required for processing without adverse effect to processing requirements.	Install water meter to quantify volumes water required for processing.	EMP 05	November 08	Ongoing	Waterford City Council Environmental Dept/MS Facility Manager
	OBT.5.2 Investigate the possible collection of Rainwater to be reused during processing so as to be less dependant upon mains water.	Rainwater collection tank to be installed as part of new facility development.	EMP 05	September 2009	Ongoing	Waterford City Council Environmental Department/External Consultants.
		Recirculation system to be incorporated to reuse as much as possible without adverse effect on processing.	EMP 05	December 2009		

6. Environmental Monitoring

Activity/Emission	Objective	Target	EMP Numbers:	Target Date	Status	Person Responsible
Air Emissions	OBT.6.1 Upgrade of existing biofilters To meet ELV's of licence W0234-01	1. Analysis of bed media to assess efficiency of microbe growth.	EMP 06	July 2008	Ongoing	Consultant/Facility Manager
		2. Measure Inlet and Outlet gasses for required parameters.		July 2008	Completed June 2008	Consultant/ Facility Manager
		3. Prepare Upgrade Plan of existing biofilters with Odour Moniroting Ireland.		September 2008	Ongoing	Consultant/Facility Manager
		4. Replace existing media with suitable soft wood or alternative method to seed biofilters.		October 2008	Ongoing	Consultant/Facility Manager
		5. Incorporate scrubber and biotrickling system into proposed new biofilter for new facility development		September 2009	Ongoing	Waterford City Council Environment Dept/Consultant

6. Environmental Monitoring

Emissions to Water	OBT.6.2 To achieve surface water ELV's in accordance with waste licence W0234-01.	To Install grit traps and Class 1 full retention oil interceptor in surface water collection system.	EMP 06	December 2008	Ongoing	Waterford City Council/ Consultant
		To separate surface water from roof run-off rainwater and divert from existing sewer drainage system. To be incorporated within new facility development.		September 2009	Ongoing	Waterford City Council/ Consultant
		This water is planned to be reused on site within the process.		December 2009	Ongoing	Waterford City Council/ Consultant

6. Environmental Monitoring

Emissions to Sewer	OBT.6.3 To achieve the ELV's for emissions to sewer in accordance with waste licence W0234-01.	To divert existing surface water emissions from sewer network. To be incorporated within new facility development	EMP 06	September 2009	Ongoing	Waterford City Council/ Consultant
		To re-direct leachate currently going to Waterford Proteins WWTP to Waterford City Council's WWTP for treatment	EMP 06	January 2009	Ongoing	Waterford City Council/ Consultant
		To reuse leachate collected from holding tank back into process.	EMP 06	December 2009		

6. Environmental Monitoring

Noise Emissions	OBT.6.4 To reduce the emissions caused by operational noise to the surrounding environment	Reduce noise emissions to 55dB daytime and 45dB night time levels by incorporating all processing activities indoors within new facility development.	EMP 06	December 2009	Ongoing	Waterford City Council/ Consultant

7. Compost Quality

Activity/Emission	Objective	Target	EMP Numbers:	Target Date	Status	Person Responsible
Compost Quality	OBT.7.1 To achieve Class1 and or Class2 compost quality in accordance with quality standard in waste licence W0234-01	Reduce levels of contamination in waste received at facility by < 5% to ensure no adverse effect on quality. Currently running at approx 10%.	EMP 07	December 2008	Ongoing	Waterford City Council/ Consultant
	OBT. 7.2 To investigate the means to pretreat waste material accepted at the facility to remove contamination.	Removal of contamination at front end of facility before further treatment	EMP 07	March 2009	Ongoing	Waterford City Council/ Veolia/ Consultant
		To incorporate new pre-treatment technologies into new development	EMP 07	December 2009	Ongoing	Waterford City Council/Veolia/ Consultant
	OBT. 7.3 To increase efficiency within process control by means of changing to tunnel composting to achieve a higher degree of maturation within the new proposed facility development.	Achieve maturation standards as set out in Licence W0234-01	EMP 07	June 2010	Ongoing	Waterford City Council/ Consultant/facility manager

7.0 E.M.P. REPORT 2008

The Environmental Management Programme for 2008 is attached.

Environmental Management Programme Projects

EMP 1 – Audit and assess energy and resource usage.

Objectives & Targets Referenced: OBT1.1, OBT1.2 & OBT1.3 of 2008-2013

Condition 7 of W0234-01 requires the completion of an energy efficiency audit based on EPA Guidelines by December 2008.

Obj 1.1 Veolia is currently studying the parameters recommended in the Guidelines and expects to start the study proper in the last quarter of 2008.

Obj 1.2 Reduction of overall electrical usage at the facility is to be incorporated where possible once the audit is completed. The facility is currently heavily reliant on diesel. The achievement of a more efficient process from an electrical usage per ton of waste processed should be attainable when the new facility development is completed and a higher tonnage is received at the facility.

Obj 1.3 Reduction in fossil fuel to be incorporated in the operations of the new facility by changing some of the existing technologies from diesel to electrical operated technology where possible.

Performance Report:

Obj 1.1

Energy efficiency audit was carried out in March 2009 based upon information gathered in 2008 for electrical and diesel consumption. The results of the audit indicated that the facility is not very energy efficient with an overreliance on diesel fuel as an energy supply for operations.

The electrical usage was 210KHh in total for 2008. This equates to 0.294KWh/tonne of waste processed.

The diesel usage was 33,060 litres in total for 2008. This equates to 4.62Litres/tonne of waste processed.

Several recommendations arose from the operations at the existing facility including a change over from Diesel operated machinery to electrical. More efficient handling of the waste can be achieved however not in the context of the current facility as this would required a completed overhaul of the equipment and processes.

In summary, in order to achieve a higher level of energy efficiency per tonne processed will require the facility to be re-developed to a more conventional type tunnel facility that is less reliant upon diesel power and can achieve an increase in tonnage.

Waterford City Council have employed WTT to provide the design of such a facility incorporating more energy efficient technology, methods and a maximum processing tonnage capacity of 16,000 tonnes per annum.

Obj 1.2

Electrical and diesel usage per tonne will be reduced within the overall operations under the new development. At present the facility is processing approx 7,000 tons per annum. With the expected increase in tonnage to be processed within the new development to be

in the region of 16,000 tons the electrical usage will decrease proportionally to the increase in tonnage processed.
Current rates suggest that the overall usage per ton is 0.294KWH for approximately 7100 tons processed.
16,000 tons processed at maximum capacity would have an electrical usage rate in the region of 0.131KWH per ton processed.
The current rate for diesel usage per ton is 4.63litres for approximately 7100 tonnes processed. It is proposed to switch much of the existing diesel operated equipment to electrically driven. This will reduce the usage rate of diesel.
16,000 tonnes to be processed at maximum capacity in conjunction with more efficient diesel machinery would have a diesel usage rate in the region of 0.9 to 1.1 litres per tonne processed.

Obj 1.3
WTT have been employed in December 2008 to design the new development of the existing facility. As part of the design WTT have been instructed to explore the opportunities to switch from diesel operated machinery to electrical wherever possible.
WTT to finalise designs including equipment by October 2009.

Target Completion Dates:
Obj 1.1 Energy Efficiency Audit December 2008
Completed March 2009.

Details of energy and electrical usage to be added January 2009

Change from Diesel to electrical December 2009

Reduction in Energy Usage/Ton December 2009
WTT to compile list of electrical equipment and energy efficiency rate per ton of material processed for future years consumption.
Actual Completion Date:

Project Status: Ongoing

Environmental Management Programme Projects

EMP 2 – Use of Cleaner Technology/Cleaner Production.

Objectives & Targets Referenced: OBT2.1 of 2008-2013

Condition 2.2 of W0234-01 requires the use of cleaner technology and cleaner production to be addressed within the Environmental Management System.

Veolia is currently working with Waterford City Council, Celtic Composting Systems and Odour Monitoring Ireland for the development of the facility to a 21,000 ton total capacity processing plant. The technology that will be incorporated into this development will include
Tunnel Composting Indoors
Maturation Indoors
Screening Indoors
Negative Air Handling on Buildings
Enclosed Biofilter with Ammonia scrubber and Biotrickling treatment unit.
Static Electric Screen
Static Electric Mixer/Shredder

Performance Report:
In May 2008 Planning Permission was obtained by Waterford City Council to build an Indoor compost facility with a capacity to receive 20,000 tons at the gate.

In June 2008 recommendations from Veolia have been put forward to Waterford City Council regarding the type of technology required and design considerations in order to meet the requirements of the Animal By-Products Regulations and the current EPA Licence.

In July 2008 a meeting was held with the Department of Agriculture regarding the type of technology to be incorporated and the protocols for ABP regulations within the new development. Some modifications for operational design were suggested by DAFF.

In July 2008 a visit took place with Waterford City Council and Odour Monitoring Ireland in the UK to inspect a biofilter system envisaged for the Waterford development.

In September 2008 Waterford City Council and Veolia took several visits to other tunnel composting facilities designed and currently in operation by CCS.

In November 2008 a decision was made to cease using CCS as the design company for the new development based upon past performance and on design quality to be delivered for future development.

In December 2008 WTT were approached by Veolia to propose the design for the new development for 20,000 tons facility.

In January 2009 WTT formalised a proposal for Waterford City council based upon recommendation from DAFF and the EPA Licence requirements. Costing were estimated for the new development in the region of 8-9mil.

In March 2009 the decision was made by Waterford City council to cease operations at the facility to make way for the new development. Expected time frame of 12 months.

Target Completion Date:
Design Phase to be completed by September 2008. Completed January 2009

Waterford City Council to Tender the civil/mechanical and electrical works by October 2008. Not Completed

January 2009 Waterford City Council to review and assess tender documents received. Not Completed

April 2009 Waterford City Council to be in position to commence works at facility.

Actual Completion Date:

Project Status: Ongoing

Environmental Management Programme Projects

EMP 3 – Prevention, Reduction and Minimization of Waste.

Objectives & Targets Referenced: OBT 3.1,3.2, 3.3 of 2008-2013

Condition 2.2 of W0234-01 requires the reduction and minimization of waste at the facility to be addressed.

Obj 3.1 Veolia and Waterford City Council will monitor the volumes of waste and contamination that are removed from the process and disposed to landfill. A target has been set to attain a level of approximately < 5% contamination in waste received at the facility.
Waterford City Council will roll-out a monitoring scheme to reduce the volumes of contamination due to plastics, metals and other household items form their collection system.

Obj 3.2 A reduction in the volume of material accepted at the facility will be incorporated to allow for the reuse of larger volumes of oversize material within the process by December 2008 thus reducing the volumes landfilled.
In 2007 processed 7800 tons brown bin waste and approx 800 tons green waste.
Target 2008 to process 6500 tons brown bin waste and approx1000 tons green waste.
Target 2009 to process 6000 tons brown bin waste and approx 1000 ton green.

Obj 3.3 Waterford City Council will provide additional capacity to the existing facility by developing the existing facility to receive a capacity of 16,000 tons of waste at the gate and allow in the development for an additional capacity of 5,000 tons for re-use of oversize materials. This will be incorporated fully by December 2009.

Performance will be measured by monitoring tonnage of material of both waste and oversize sent to landfill.

Performance Report:
Obj 3.1
August 2008 Waterford City Council to carry out monitoring of Brown bin collection by door to door bin checks for compliance.
Survey carried out by Waterford City Council and with information gathered at the facility estimate the contamination levels in the region of 8-10%.
In 2008 a total of 940 tons of waste was landfilled from 7141 tons of waste processed.
This resulted in a total of 13% of the waste material received landfilled. It is estimated that of the 940 tons landfilled in 2008 approximately 70% of this is contamination with the remainder being oversize woody material that cannot be separated at the time of screening.
This results in approximately 9% of the total received is due to contamination. This is outside the <5% required target for this objective.

Obj 3.2
Volumes of brown bin waste for June 2008 are 3800 tons and approx 400 tons green.
Volumes of brown bin waste for all 2008 are 6380 in total with approx 760 tons of green waste accepted and processed in addition.

Volumes of brown bin waste accepted monthly recorded.
Volumes are recorded for 2008 on monthly intake spreadsheets and total running tonnage breakdown spreadsheets.

Volumes of oversize contamination material from process to landfill recorded monthly.

In August 2008 Waterford County Council have cease to bring waste to the facility. This has resulted in a drop –off in tonnage in the region of 600 tons in 2008. It will be expected that in 2009 a proportional drop in waste contamination to be landfilled will apply. This parameter will be monitored in 2009.

Obj 3.3
Waterford City Council have taken the decision to cease operations at the facility in March 2009 to facilitate the new development.
WTT have provided details on the design and operations of this development including a capacity to accept 16,000 tons of waste from the region and to process approximately 5,000 tons of oversize material back through the process.

Target Completion Date:

Waterford Council monitoring scheme ongoing	
Reduction in volumes accepted	Completed August 2008
December 2008 full analysis of volumes processed	Completed January 2009
December 2008 full analysis of volumes to landfill	Completed January 2009
Additional Capacity in New development	December 2009

Actual Completion Date:

Status: Ongoing

Environmental Management Programme Projects

EMP 4 – Reduction of Fugitive Emissions.

Objectives & Targets Referenced: OBT4.1, OBT4.2, OBT 4.3 2008-2013

Condition 6.8 of W0234-01 requires a programme to be prepared for the identification and reduction of fugitive emissions using an appropriate combination of best available techniques to be included within the Environmental Management Programme.

Veolia have identified three main sources of fugitive emissions from the facility.

Obj 4.1 Dust from operational activities carried on outdoors. It is envisaged that with the completion of the indoor development fugitive emissions from dust sources will achieve their licence limits of 350mg/m2/day. Performance to be measured by quarterly monitoring.

Obj 4.2 Odour from operational activities carried on outdoors. It is envisaged that with the completion of the indoor development and the installation of negative aeration system on the buildings and incorporating a biofilter with a biotrickling system that a target of zero odour complaints can be achieved. Performance to be measured by recording numbers of odour complaints.

Obj 4.3 Airborne bacteria from operational activities carried on outdoors. It is envisaged that with the completion of the indoor development and the installation of negative aeration system to a closed biofilter that airbourne bacterial emissions will be maintained within licence limits. Performance to be measured by biannually and annual monitoring records.

Performance Report:
Obj 4.1
In July 2008 there was only as small amount of information regarding fugitive emissions from the facility as the monitoring programmes for Dust, Odour and Bacteria have only commenced since January 2008.
In December 2008 all dust monitoring was completed as per licence requirements throughout the year. All dust monitoring indicated that there were no emission limit valuves breach for all dust monitoring points.

Obj 4.2
There were 5 odour complaints received from external sources in total in 2008. The numbers of odour complaints will be recorded in 2009 as means of a comparison to indicate performance for odour control on site. It is envisaged that with the proposed new development to take place at the end of 2009 incorporating all activities indoors and the use of a biofilter system with an ammonia scrubber for air treatment, that a zero odour complaint target can be achieved.

Obj 4.3
Bacterial monitoring for 2008 indicated that all results were within guidelines of the waste licence.

Target Completion Date:
Dust Monitoring ongoing.

All dust monitoring results recorded are within licence limits for 2008.

Odour Monitoring Ongoing. New development with Biotrickling December 2009
Odour complaints for 2008 Nos. 5.

Bacterial Monitoring Ongoing. Air handling on new building December 2009
All Bacterial monitoring within guidelines in 2008.

Actual Completion Date:

Project Status: Ongoing

Environmental Management Programme Projects

EMP 5 – Reduction of Water Usage

Objectives & Targets Referenced: OBT5.1 and OBT5.2 of 2008-2013,

Reduction in the volumes of water used at the facility to be investigated and incorporated wherever possible without adverse effect upon the processing requirement at the facility.

Obj 5.1 A water meter needs to be installed to quantify the current volumes of water required at the facility by November 2008.

Obj 5.2 Waterford City Council to investigate and incorporate a system to collect rainwater roof run-off within the proposed new development by September 2009

Obj 5.3 Reuse as much water from surface water sources as is required within the new development process by December 2009.

Performance Report:

Obj 5.1

A water meter is scheduled to be installed at the facility in October 2008. Water usage reading can then be taken on a monthly basis to quantify the volume required per annum and per ton of material processed.

In December 2008 a water meter had not been installed by Waterford City Council.

Obj 5.2

Final conceptual design will be completed in August 2008 to incorporate the re-use of rainwater on site in the process.

In December 2008 the final design had not been completed. WTT were the new preferred design company employed by Waterford City Council at this stage.

Obj 5.3

WTT investigating a proposal to include the reuse of leachate and surface water. WTT to complete the proposal by October 2009.

Target Completion Date:

Obj 5.1 Installation of water meter November 2008. Not Completed

No water meter installed by January 2009. Waterford City Council have been informed of requirement to install water meter in February 2009.

Obj 5.2 New facility design finalised by September 2008. Not Completed

New facility design was not finalised by 2008. Waterford City Council took decision to not to run with CCS design. WTT are now the preferred option for delivering the design project.

WTT design finalised in January 2009. Completed

Obj 5.3 Rainwater collection and reuse September 2009. Not Completed

WTT developing system to incorporate reuse of surface rain water and leachate in new development by October 2009.

Actual Completion Date:

Project Status: Ongoing

Environmental Management Programme Projects

EMP 6 – Environmental Monitoring.

Objectives & Targets Referenced: OBT6.1, OBT 6.2, OBT 6.3, OBT.6.4 of 2008-2013.

Veolia has recognised that the environmental monitoring requires inclusion within the Environmental Management programme.

It specifically has identified the following to be included with objectives and targets:

Obj 6.1 Air Emissions from the existing biofilters to be monitored and to meet the requirements of licence W0234-01.
Replacing the existing biofilter media with softwood or alternative material under the recommendations of Odour Monitoring Ireland to seed biofilters.
Analysis of existing biofilters to determine current efficiency rates.
An upgrade plan to be developed for the existing biofilters on site to increase performance levels if required.
Incorporate a scrubber and biotrickling system within the new development for the biofilter.

Obj 6.2 Surface water emissions to be monitored and install a Class I full retention oil interceptor with associated grit traps to meet the licence limits W0234-01 by December 2008.
Separation of the Rainwater roof run-off from surface incorporated within the new facility development.

The current surface water emissions to sewer to be diverted from Six Cross roads Business Park sewerage network.

Obj 6.3 Continue collecting leachate in leachate storage tank on site. Leachate to be transferred to Waterford Proteins WWTP for treatment. Re-direct Leachate to Waterford City Council's WWTP when operational in January 2009
Reuse leachate in the process within the new development of the facility in December 2009.

Obj 6.4 Noise emissions to be monitored as required by W0234-01. The reduction of operational noise emissions to the surrounding environment by incorporating all processing activities indoors within the new facility development in December 2009.

Performance Report:
Obj 6.1
Biofilter bed media analysis carried out June 2008 and awaiting report
Inlet and Outlet gasses of biofilter media carried out July 2008.
Biofilter bed media analysis indicate that performance was good throughout 2008. The media was effective for removal of Ammonia, H2S, Mercaptans and Amines.

Media will not be replaced to softwood in 2009 as current media is effective in removal of odour.
An ammonia scrubber system is to be incorporated by WTT with the new development.

Obj 6.2
July 2008 surface water emissions for 1st and 2nd Quarter 2008 not within Emission limit values of W0234-01. Waterford City Council to incorporate grit traps and oil interceptor into existing surface water network system by December 2008.
Waterford City Council contacted Fehiley Timoney and Co in December 2008 with a view to installation of an oil water interceptor and associated sand filtration system.
As of February 2009 no further progress has been made by Waterford City Council regarding the installation of the oil interceptor or associated sand filtration system.
In December 2008 all 4 quarterly analysis for surface water in 2008 were outside the emission limit values of waste licence W0234-01.

Obj 6.3
In July 2008 all trade effluent currently collected in storage tank and transported to Waterford Proteins for waste water treatment. All leachate collected on site was transferred to Waterford Proteins throughout 2008. A total of 1413 tons was transported in 2008.
Transfer leachate to Waterford City Council WWTP 1st quarter 2009 when completed.
Reuse leachate on site targeted by December 2009.
All trade effluent has been diverted to Waterford City Council's WWTP at start of March 2009.

Obj 6.4
Noise emissions exceeded emission limit values for 1st quarter 2008. External traffic noise contributed to elevated noise readings at noise sensitive areas monitoring points.
A second noise report is to be carried out in June 2009.

Target Completion Date:
Analysis report from Odour Monitoring Ireland of existing biofilters due in August 2008.
Biofilter Upgrade Plan to be incorporated on site following findings of report in August 2008.
Upgrade will not take place following results of bed media analysis in 2008.

	Completed
Surface water interceptor installation December 2008	Not Completed
Diversion foul sewer and leachate for reuse September 2009	Not Completed
Noise reduction December 2009 within new development	Not Completed

Actual Completion Dates:

Status: Ongoing

EMP 7 – Compost Quality.

Objectives & Targets Referenced: OBT7.1 and OBT7.2 of 2008-2013.

Schedule F of W0234-01 requires the licence holder to meet the quality standards set by the Agency.

Obj 7.1 Waterford City Council and Veolia recognise the requirement to achieve at a minimum a Class 2 quality standard for the compost produced at the facility. In order to achieve this standard Waterford City Council must monitor and reduce the volumes of contamination from the brown bin collection scheme. The levels of contamination received in the waste are directly proportional to the levels of contamination and heavy metals obtained in the final compost product.
Waterford City council will roll-out bin checking schemes in the near future to address the situation regarding contamination of the brown bin. A target of < 5% must be achieved to ensure that Class 2 standard can be achieved.

Obj 7.2 Waterford City Council, Veolia and External Consultant are to investigate the means whereby contamination can be removed mechanically at the front end of the facility within the new facility development.

Obj 7.3 Maturation of the final compost product is required under W0234-01. The current facility does not process efficiently enough to achieve the current standard. It is envisaged that the technology to be incorporated within the new development will increase the efficiency of the maturation process by use of tunnel composting systems to attain the standard set out in W0234-01.

Performance Report.

Obj 7.1
Waterford City Council to begin door to door bin survey in July 2008.
Brown bin survey carried out in 2008 revealed that 940 tons of contamination was landfilled from 7140 tons waste accepted in total. This equates to 13% landfill rate and the equivalent of 9% contamination. This is outside the target of <5% set by the Council in 2008.

Obj 7.2
Veolia and Waterford City Council held meeting with CCS Consultant to explore mechanical treatment of contamination within new development in July 2008.
In December WTT were employed as new design company for the proposed development of the existing facility.
Veolia and Waterford City Council held meeting with WTT in January 2009. Several options were explored with a view to removal of contamination at the front end of process using various technologies including magnetic removal, screening and air handling.

Obj 7.3
Analysis of batches of final compost produced from January to September 08 indicate that all batches have not reached complete maturity/stability. Results of maturity testing detailed below;

Batch No.s	Specific Oxygen	Self heating	Cress Test
Jan 08	25	53	<10
Feb 08	26	53	<10
Mar 08	20	56	<10
Apr 08	12.7	31	<10
May 08	15	47	<10
Jun 08	13	25	<10
Jul 08	22.5	26	<10
Aug/Sep 08	21.4	24	<10

All batches labelled Jan to April 08 were reused as cover material on the curing pad piles in 2008. The batches May to Sep 08 were subsequently transported to Waterford City Council's landfill at Kilbarry, Waterford City in March 2009 as a result of the short-term closure. This material will be used for landscaping purposes in 2009 as remediation pf the landfill continues.

The results indicate that the process carried out at the existing facility is not efficient enough with regards to increasing the rate of degradation of the organic material and subsequently the maturity of the material does not meet the licence standard.

WTT are developing a composting facility that incorporates a tunnel process that greatly improves efficiency rates for maturation as compared with the existing facility operations.

Target Completion Dates:

Reduction in contamination rates December 2008.	Not Completed
Final proposal for mechanical treatment of contamination March 2009	Not Completed
Incorporate new pre-treatment technology by December 2009	Not Completed
Efficient control of maturation June 2010.	Not Completed

Actual Completion Dates:

Status: Ongoing

Environmental Protection Agency

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Version 1.1.04

	ouncil
	omposting Facility

Waste or IPPC Classes of Activity

No.	class_name
4.2	Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).
4.13	Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.
3.7	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 t...
3.13	Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.

Address 1	Green Road
Address 2	Waterford City
Address 3	
Address 4	
Country	Ireland
Coordinates of Location	3678.000
River Basin District	IESE
NACE Code	3832
Main Economic Activity	Recovery of sorted materials
AER Returns Contact Name	Michael Storan
AER Returns Contact Email Address	Michael.storan@veolia.ie
AER Returns Contact Position	Compost Facility Manager
AER Returns Contact Telephone Number	051-333944
AER Returns Contact Mobile Phone Number	086-8151443
AER Returns Contact Fax Number	051-333945
Production Volume	2200.0
Production Volume Units	Tonnes
Number of Installations	1
Number of Operating Hours in Year	4992
Number of Employees	5
User Feedback/Comments	
Web Address	www.veolia.ie

2. PRTR CLASS ACTIVITIES

Activity Number	Activity Name

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

Is it applicable?	No
Have you been granted an exemption ?	No
If applicable which activity class applies (as per Schedule 2 of the regulations) ?	
Is the reduction scheme compliance route being used ?	

4.1 RELEASES TO AIR

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR								
POLLUTANT		METHOD			QUANTITY			
		Method Used		Location 1				
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

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

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO AIR																		
POLLUTANT		METHOD			QUANTITY													
			Method Used		DBF 1	DBF 2	CBF 1	CBF 2	CBF 3	CBF 4	CBF 5	CBF 6	CBF7 and 8				
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	Emission Point 2	Emission Point 3	Emission Point 4	Emission Point 5	Emission Point 6	Emission Point 7	Emission Point 8	Emission Point 9	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
06	Ammonia (NH3)	M	NIOSH6016	Ion chromatography	95.8	170.56	10.44	10.18	21.44	9.79	10.9	8.3	27.1	364.51	0.0	0.0
86	Particulate matter (PM10)	M	EN 1234-1	Gravimetric	0.00001	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00001	0.0	0.0

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

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

RELEASES TO AIR												
POLLUTANT		METHOD			QUANTITY							
			Method Used		DBF 1 and 2	CBF 1 to 8	D1	D2	D3			
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	Emission Point 2	Emission Point 3	Emission Point 4	Emission Point 5	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
220	Mercaptans	M	PER	Sorbent Tube for reactive sprcies	26.06	19.09	0.0	0.0	0.0	45.15	0.0	0.0
215	Hydrogen sulphide	M	PER	Gold leaf analyser	2.77	4.09	0.0	0.0	0.0	6.86	0.0	0.0
210	Dust	M	PER	VDI2119	0.0	0.0	17.7	35.43	24.3	77.43	0.0	0.0

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

Additional Data Requested from Landfill operators

For the purposes of the National Inventory on Greenhouse Gases, landfill operators are requested to provide summary data on landfill gas (Methane) flared or utilised on their facilities to accompany the figures for total methane generated. Operators should only report their Net methane (CH4) emission to the environment under T(total) KG/yr for Section A: Sector specific PRTR pollutants above. Please complete the table below:

Landfill: Waterford City Composting Facility

Please enter summary data on the quantities of methane flared and / or utilised	**T (Total) kg/Year**	**M/C/E**	**Method Used: Method Code**	**Method Used: Designation or Description**	**Facility Total Capacity m3 per hour**	
Total estimated methane generation (as per site model)	0.0				N/A	
Methane flared	0.0				0.0	(Total Flaring Capacity)
Methane utilised in engine/s	0.0				0.0	(Total Utilising Capacity)
Net methane emission (as reported in Section A above)	0.0				N/A	

4.2 RELEASES TO WATERS

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

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

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

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

SECTION B : REMAINING PRTR POLLUTANTS

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

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

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

RELEASES TO WATERS								
POLLUTANT					QUANTITY			
			Method Used					
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

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

ity

4.3 RELEASES TO WASTEWATER OR SEWER

SECTION A : PRTR POLLUTANTS

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER

POLLUTANT		METHOD			QUANTITY			
			Method Used		L 1			
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
21	Mercury and compounds (as Hg)	M	PER	APHA 2005 3112B	0.000144	0.000144	0.0	0.0
18	Cadmium and compounds (as Cd)	M	PER	APHA 2005 3125B	0.0031	0.0031	0.0	0.0
17	Arsenic and compounds (as As)	M	PER	APHA 2005 3125B	0.032499	0.032499	0.0	0.0
23	Lead and compounds (as Pb)	M	PER	APHA 2005 3125B	0.105975	0.105975	0.0	0.0
19	Chromium and compounds (as Cr)	M	PER	APHA 2005 3125B	0.035325	0.035325	0.0	0.0
20	Copper and compounds (as Cu)	M	PER	APHA 2005 3125B	0.000166	0.000166	0.0	0.0
22	Nickel and compounds (as Ni)	M	PER	APHA 2005 3125B	0.079128	0.079128	0.0	0.0
24	Zinc and compounds (as Zn)	M	PER	APHA 2005 3125B	1.675818	1.675818	0.0	0.0

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

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

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER

POLLUTANT		METHOD			QUANTITY			
			Method Used		L1			
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
303	BOD	M	PER	APHA 2005 5210B	8422.0	8422.0	0.0	0.0
306	COD	M	PER	APHA 2005 5220D	13010.0	13010.0	0.0	0.0
238	Ammonia (as N)	M	PER	APHA 2005 4500 NH3F	3089.0	3089.0	0.0	0.0
343	Sulphate	M	PER	APHA 2005 4500 SO4	42.0	42.0	0.0	0.0

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

SECTION A : PRTR POLLUTANTS

RELEASES TO LAND							
POLLUTANT		METHOD			QUANTITY		
			Method Used				
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0

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

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

RELEASES TO LAND							
POLLUTANT		METHOD			QUANTITY		
			Method Used				
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0

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

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

Transfer Destination	European Waste Code	Hazardous	Quantity T/Year	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Name and Licence / Permit No. of Recoverer / Disposer / Broker	Address of Recoverer / Disposer / Broker	Name and Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)	Licence / Permit No. of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					
Within the Country	19 05 99	No	2200.0	Final Compost Product produced on site and free for distrubition to the public	R3	E	Volume Calculation	Onsite in Ireland	Waterford City Council compost facility W0234-01	Green Road, Waterford City		
Within the Country	20 03 01	No	940.0	Mixed Municipal Waste	D1	M	Weighed	Offsite in Ireland	Carlow County Council Landfill W0025-02	Powerstown Co. Carlow		

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

IMPORTANT INFORMATION

This Survey must be completed by a relevant and competent person within your organisation. This person should have detailed knowledge of onsite activities and processes during the reporting year in question.

All quantities must be reported as TONNES only.

Please contact the **NATIONAL WASTE REPORT HELPLINE on (01) 859 1199** if you require any further help on completing this questionnaire. This helpline will be available from 1 February 2009.

Please submit the completed return to **recyclers@wastesurvey.ie** or by post to **Resource Use Unit, EPA, PO Box 3000, Johnstown Castle Estate, Co. Wexford.**

COMPLETING THE SURVEY

PART 1 - COMPANY INFO

Please ensure all sections of this worksheet are completed.

Please use the free text box in Section 17 to include any commentary on the data. This may minimise the extent of validation and follow-up required on the submitted data.

PART 2 - WASTE HANDLED IN 2008

Please detail the tonnages of ALL wastes accepted onsite for composting in 2008. Please distinguish between wastes generated in Republic of Ireland (RoI) and wastes generated abroad.

Please provide details on the end uses of the compost produced onsite, including name of landfill if used for daily cover or engineering.

DISPOSAL AND RECOVERY CODES - TFS REGULATION

Disposal Operations (No Recovery)

D1	Landfill	Deposit into or onto land, (e.g., landfill, etc.)
D2	Land Treatment	Land treatment, (e.g., biodegradation of liquid or sludgy discards in soils, etc.)
D3	Injection	Deep injection, (e.g., injection of pumpable discards into wells, salt domes of naturally occurring repositories, etc.)
D4	Impoundment	Surface impoundment, (e.g., placement of liquid or sludge discards into pits, ponds or lagoons, etc.)
D5	Engineered Landfill	Specially engineered landfill, (e.g., placement into lined discrete cells which are capped and isolated from one another and the environment, etc.)
D6	Release To waters	Release into a water body except seas/oceans
D7	Release to sea	Release into seas/oceans including sea-bed insertion
D8	Biological Treatment	Biological treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the operations numbered D1- D12
D9	Physico chemical treatment	Physico chemical treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the operations numbered D1-D12 (e.g., evaporation, drying, calcination, neutralization, precipitation, etc.)
D10	Incineration on land	Incineration on land
D11	Incineration at sea	Incineration at sea
D12	Permanent storage (e.g., emplacement of containers in a mine, etc.)	Permanent storage (e.g., emplacement of containers in a mine, etc.)
D13	Blending or mixing prior to submission to any of the operations numbered D1-D12	Blending or mixing prior to submission to any of the operations numbered D1-D12
D14	Repackaging prior to submission to any of the operations numbered D1-D12	Repackaging prior to submission to any of the operations numbered D1-D12
D15	Storage pending any of the operations numbered D1-D12	Storage pending any of the operations numbered D1-D12

Recovery/Recycling/Re-use Operations

R1	Reuse as fuel	Use as a fuel (other than in direct incineration) or other means to generate energy
R2	Solvent recovery	Solvent reclamation/regeneration
R3	Organic substance recycling	Recycling/reclamation of organic substances which are not used as solvents
R4	Metal recovery	Recycling/reclamation of metals and metal compounds
R5	Inorganic substance recycling	Recycling/reclamation of other inorganic materials
R6	Regeneration of acids or bases	Regeneration of acids or bases
R7	Recovery of components used for pollution abatement	Recovery of components used for pollution abatement
R8	Recovery of components from catalysts	Recovery of components from catalysts
R9	oil recovery	Used oil re-refining or other reuses of previously used oil
R10	Landspreading	Land treatment resulting in benefit to agriculture or ecological improvement
R11	Use of residuals	Uses of residual materials obtained from any of the operations numbered R1-R10
R12	Waste Exchange prior to recovery	Exchange of wastes for submission to any of the operations numbered R1-R11
R13	Storage prior to recovery	Accumulation of material intended for any operation numbered R1-R12

PART ONE - GENERAL COMPANY INFORMATION

****PLEASE COMPLETE ALL SECTIONS****

1	Year to which Data Applies:	Calendar Year 2008
2	Company Name:	Veolia Environmental Services C/O Waterford City Council
3	*Trade Names* Trade Name 1: Trade Name 2: Trade Name 3:	Veolia Environmental Services Ltd
4	*Facility Address(es)* Address 1: Address 2: Address 3: Address 4:	Facility address - Green Road Waterford City Veolia address - Six Cross roads Business Park Waterford City
5	Addresses for correspondence if different to above:	Veolia Environmental Services Six Cross Roads Business Park Waterford City
6	Contact Name:	Mr. Michael Storan
7	Postion held within company:	Compost Facility Manager
8	Telephone Number:	086-8151443 051-333944
9	Fax Number:	051-333945
10	E-mail:	michael.storan@veolia.ie

Please enter the name of the person who will answer any queries we might have about the information submitted.

11 *Waste Activities Onsite*

Does your facility...		
	compost food or garden waste from household or commercial sources?	Yes
	manufacture mushroom compost?	No

Please specify an answer to both questions

12	Please enter the class/ grade of the compost produced by your company	Class 2
13	Does your company broker waste?	No **If YES, please confirm that details on these wastes are included in Part 2 of this Survey:** PLEASE SELECT **Additional explanatory text, if necessary:**
14	EPA Waste Licence Number/ Local Authority Waste Permit Number/ Certificate of Registration Numbers	W0234-01 Waterford City Council licensee
15	Does your company claim from Repak?	No **If YES, please state the waste stream(s) your company claims for:**
16	Please provide a brief description of activities that are carried out onsite including the types of wastes accepted onsite:	Brown bin collection from local authorities including Waterford City Council, Waterford County Council and Wexford County Council. Food waste and Green/garden waste from public. Veolia carry out commercial brown bin collection. Facility is an in vessel compost operation with additional static curing operations for maturation. Veolia environmental service manage the facility on behalf of Waterford City Council
17	Additional Information - Please give any additional information here which you think may be useful to us in compiling annual statistics on waste recycling. Please also include any comments you may have in relation to the improvement of this reporting form.	Total of 7141 tons of waste accepted in 2008 for processing. Approximately 2300 tons of final compost product produced. All final compost product was removed off-site by general public and landscapers for landscaping purposes. No compost product was used for landfill cover. Green waste 760 tons is comprised of material collected at the facility by means of public drop-off. 960 tons of waste generated from contamination from brown bin collection was disposed to landfill.
18	Finally, please confirm that you have read the 'Important Info' sheet:	Yes, I have read the 'Important Info' sheet

SUMMARY OF ALL WASTES COMPOSTED ONSITE IN 2008

Waste Description	EWC Code	Quantity accepted from ROI (TONNES)	Quantity accepted from abroad (TONNES)	Please provide details regarding the end use of the compost produced onsite, including name of landfill if used for daily cover or engineering.
MUNICIPAL WASTE				
Brown bin waste (kitchen/garden) separately collected from households	20 01 08	5,233.00		
Kitchen waste separately collected from commercial catering (hotels, canteens, commercial etc)	20 01 08	1,148.00		
Garden and park waste from commercial sector (landscapers etc.)	20 02 01	760.00		
Organic fines from mechanical treatment of municipal waste	19 12 12			
Paper and cardboard from municipal sources e.g. office paper, newspaper	20 01 01			
Paper packaging and cardboard packaging e.g., paper bags, wrapping paper	15 01 01			
Wood waste	20 01 38			
Wood packaging e.g., crates, cartons, cheese boxes, fruit trays	15 01 03			
Edible oil and fat	20 01 25			
Waste from markets	20 03 02			
Septic tank sludge	20 03 04			
WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING				
Poultry litter	02 01 06			
Pig manure	02 01 06			
Cattle manure	02 01 06			
Other animal faeces and manure and effluent	02 01 06			
Other agricultural horticultural etc. waste:				
<<Enter waste description here>>	SELECT			
<<Enter waste description here>>	SELECT			
<<Enter waste description here>>	SELECT			
<<Enter waste description here>>	SELECT			
WASTE FROM THE FOOD PROCESSING INDUSTRY				
<<Enter waste description here>>	SELECT			
<<Enter waste description here>>	SELECT			
<<Enter waste description here>>	SELECT			
<<Enter waste description here>>	SELECT			
WASTE FROM OTHER INDUSTRIES				
<<Enter waste description here>>	SELECT			
<<Enter waste description here>>	SELECT			
<<Enter waste description here>>	SELECT			
<<Enter waste description here>>	SELECT			
OTHER - If you handle any waste other than those mentioned in the list above, please use the blank rows below to provide information on quantities, treatment etc. (Add more rows if necessary - select a row, click 'Insert' and then 'Rows')				
<<Enter waste description here>>	SELECT			
<<Enter waste description here>>	SELECT			
<<Enter waste description here>>	SELECT			
<<Enter waste description here>>	SELECT			
<<Enter waste description here>>	SELECT			

APPENDICES

A	Section 2.0 Emissions from Facility	Site Plan with Monitoring Locations
B	Section 2.1 Surface Water Emissions	Monitoring Results Graph
C	Section 2.2 Leachate Emissions	Laboratory Report for Organic Screen
D	Section 2.2 Leachate Emissions	Monitoring Results Graph
E	Section 2.3 Groundwater Emissions	Laboratory Report
F	Section 2.4 Biofilter Gas Emissions	Monitoring Results Graph
G	Section 11.0 Noise	Noise Monitoring Locations
H	Section 12.1 Dust Deposition	Monitoring Results Graph
I	Section 12.2 Odour Measurement	Monitoring Results Graph
J	Section 12.4 Bioaerosols	Monitoring results Graph
K	Section 13.2 Integrity Tests	Integrity Test Certification
L	Section 19.0 Infrastructural Works	Design Drawings of New Development
M	Section 20.0 ELRA	Risk Assessment Document
N		Copy Animal By-Products Approval

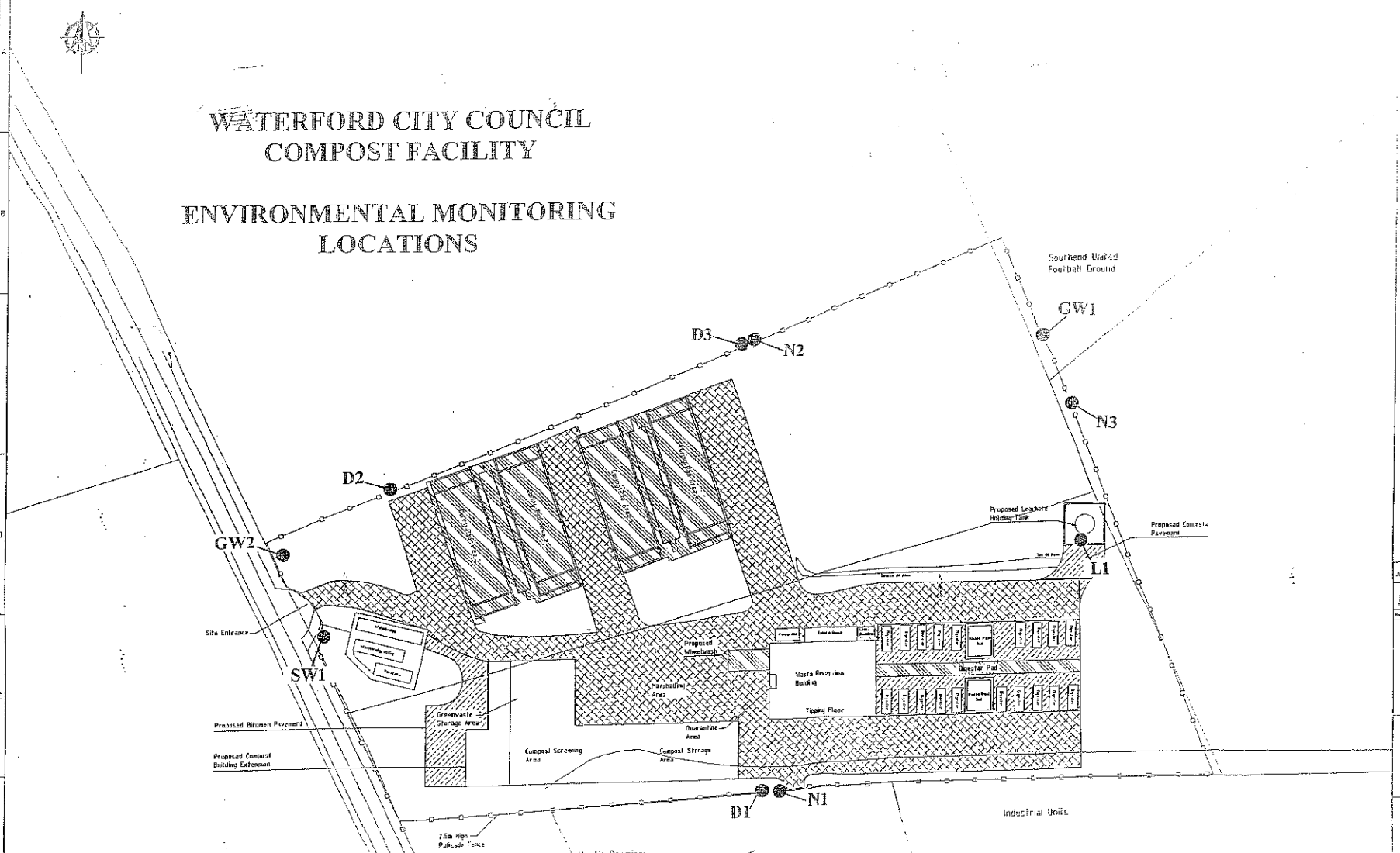
APPENDIX A

Section 2.0

Site Plan Monitoring Locations

WATERFORD CITY COUNCIL
COMPOST FACILITY

ENVIRONMENTAL MONITORING LOCATIONS



LEGEND

MONITORING LOCATIONS

GRID REFERENCES

NOISE
N1 E258344 N109524
N2 E258325 N109630
N3 E258408 N109609
NS1 E258058 N109985
NS2 E258794 N109543

DUST
D1 E258343 N109524
D2 E258240 N109597
D3 E258323 N109629

SURFACE WATER
SW1 E258227 N109555

LEACHATE
L1 E258391 N109577

GROUNDWATER
GW1 E258397 N109629
GW2 E258215 N109583

Rev.	Drawn	Chkd	Appd	Date	Description
A	GMC	TB	PH	17.04.07	ISSUE FOR APPROVAL

Name of Client
WATERFORD CITY COUNCIL

Name of Job
KILBARRY COMPOSTING FACILITY
WASTE LICENCE APPLICATION

Title of Drawing
ENVIRONMENTAL MONITORING LOCATIONS

Scales Used
A1 - 1:500, A3 1:1000

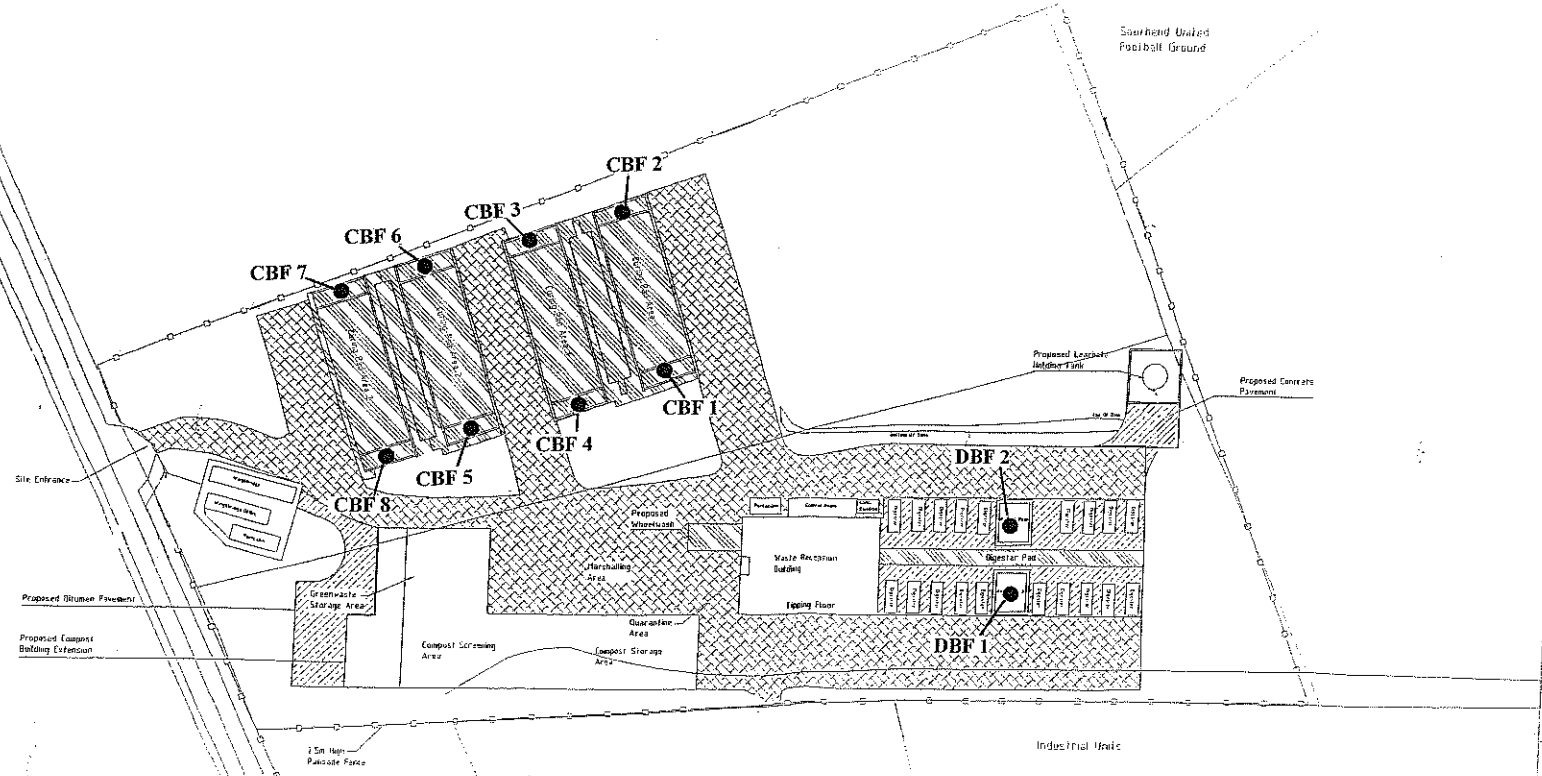
Dwg. No. 2006-289-01-301

Rev. A

FEHILY TIMONEY & COMPANY
CONSULTANTS IN ENGINEERING & ENVIRONMENTAL SCIENCES

WATERFORD CITY COUNCIL
COMPOST FACILITY

ENVIRONMENTAL MONITORING LOCATIONS



MONITORING LOCATIONS

GRID REFERENCES

DIGESTER BIOFILTERS

DBF 1	E258370	N109547
DBF 2	E258370	N109557

CURING PAD BIOFILTERS

CBF 1	E258310	N109584
CBF 2	E258300	N109614
CBF 3	E258285	N109608
CBF 4	E258295	N109578
CBF 5	E258277	N109573
CBF 6	E258268	N109604
CBF 7	E258254	N109597
CBF8	E258277	N109573

Rev.	Drawn	Check	Date	By	Description
A		Cork	17.05.07		ISSUE FOR APPROVAL
		Kay Griggs			
		Dore			

Revision History: A

Name of Client: WATERFORD CITY COUNCIL

Name of Job: KILBARRY COMPOSTING FACILITY WASTE LICENCE APPLICATION

Title of Drawing: ENVIRONMENTAL MONITORING LOCATIONS

Scales (Orig): A1 - 1:500, A3 1:1000

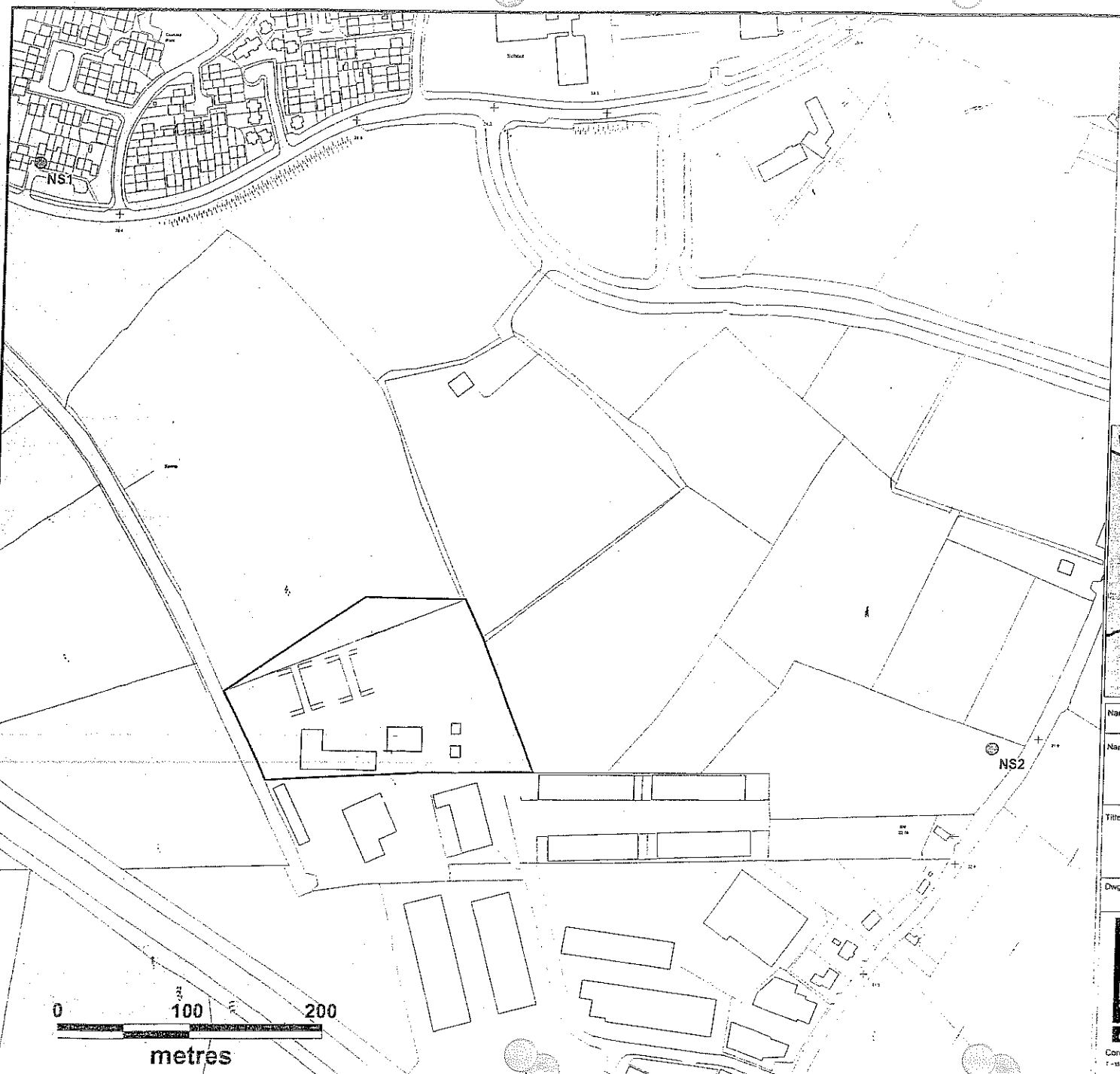
Dwg. No.: 2006-289-01-301

Rev.: A

Scale: 1:500

FEHILY TIMONEY

CONSULTANTS IN ENGINEERING & ENVIRONMENTAL SCIENCES

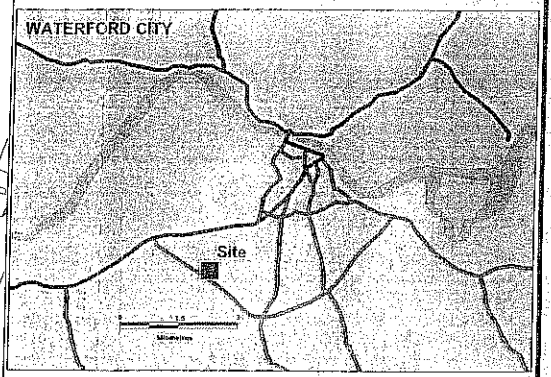


MONITORING LOCATIONS

GRID REFERENCES

NOISE SENSITIVE LOCATIONS

NS1 E258058 N109985
NS2 E258794 N109543



Name of Client	WATERFORD CITY COUNCIL
Name of Job	KILBARRY COMPOSTING FACILITY WASTE LICENCE APPLICATION
Title of Drawing	ENVIRONMENTAL MONITORING LOCATION MAP
Dwg. No.	2006-289-01-FIGURE E.1
Rev.	A

FEHILY TIMONEY & COMPANY
CONSULTANTS IN ENGINEERING & ENVIRONMENTAL SCIENCES
Core House, Pouladuff Rd. Cork, Ireland.
Mill House, Ashtown Gate, Navan Rd, Dublin 15, Ireland

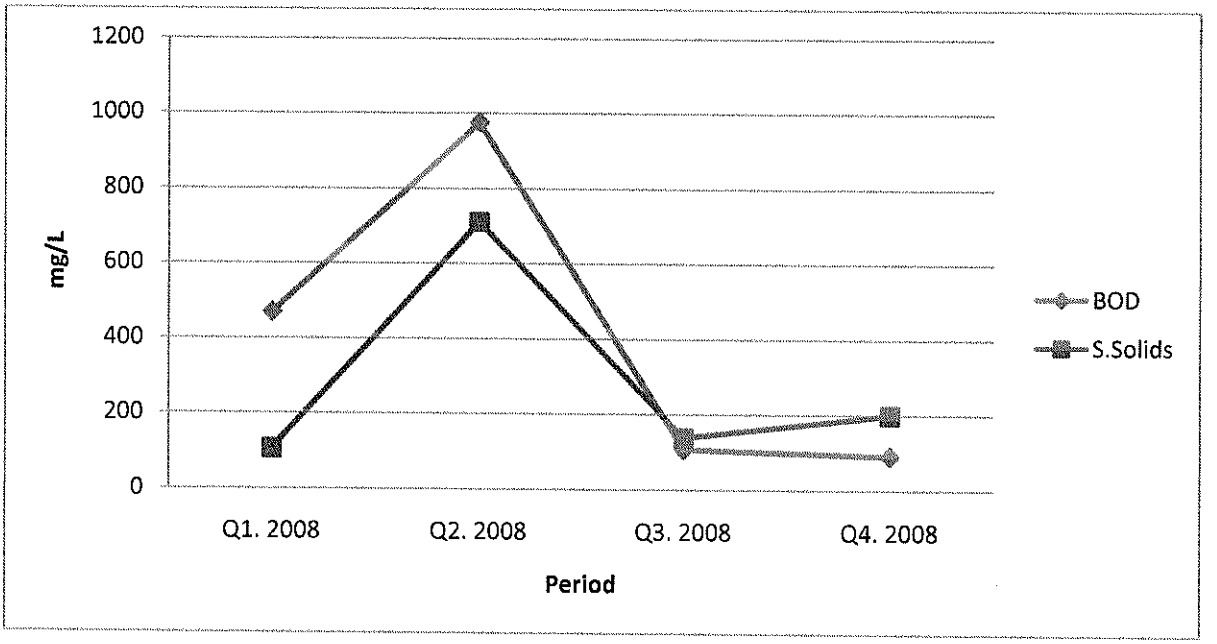
APPENDIX B

Section 2.1

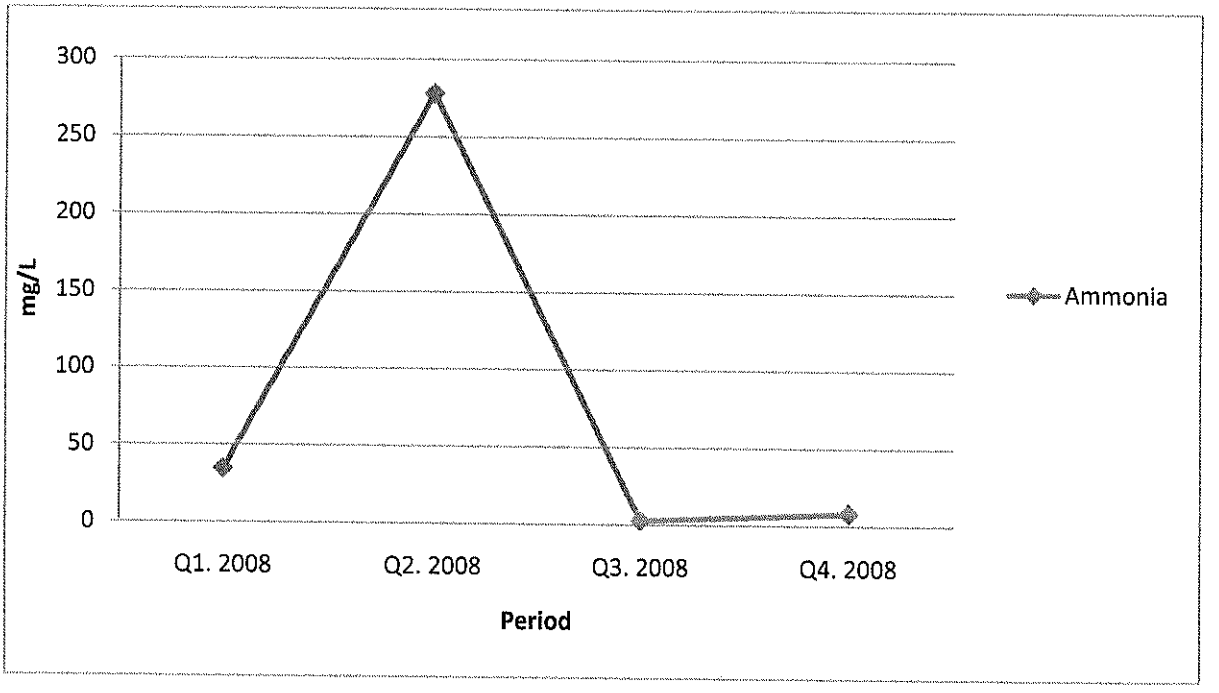
Surface Water Emissions

Surface Water Emissions

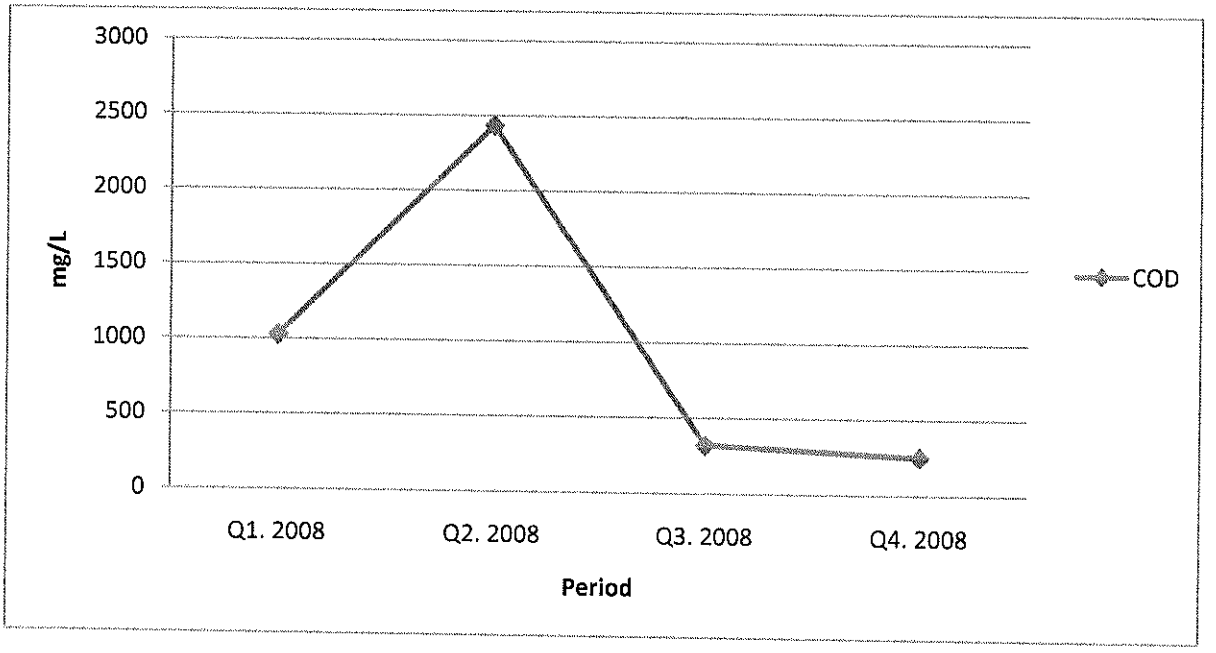
SURFACE WATER EMISSIONS **BOD and Suspended Solids (mg/L)**



SURFACE WATER EMISSIONS **Ammonia (mg/L)**



SURFACE WATER EMISSIONS COD (mg/L)



APPENDIX C

Section 2.2

Leachate Emissions Organic Screen

Christendom Enterprise Centre • Christendom •
Terrybank • Waterford • Co Waterford
Tel: +353 (0) 51 833 260
Fax: +353 (0) 51 833 261
E-mail: envirolab@esglabs.co.uk
Website: www.IMLab.ie

Envirolab

An Independent Analytical Accredited Laboratory

TEST CERTIFICATE

Mr Michael Storan
Veolia Environmental Services (Ireland) Ltd
Six Cross Roads Business Park
Carrignard
Waterford City
Ireland
Fax: 00353 51 333945

Certificate Number: TWAT008828-1 Final

Order Number:

Date Analysis Started: 24/12/2008

Date Reported: 15/01/2009

Lab Ref.	Sample Details	Method Number	Test	Result	Units	Flag
WAT19613	Desc: Leachate/Trade Effluent Monitoring Point L1. Date Sampled: 10/11/08. Date Received: 19/12/2008	NOT APPLICABLE	Transfer	See Attached Report		

Denis M Kent
Technical Manager

Disclaimers:

Unless otherwise stated, all results are expressed on an as received basis.

ence Park · Sittingbourne · Kent · ME9 8EF
+44 (0) 1795 858290
+44 (0) 1795 410784
mail: enquiries@esglabs.co.uk
eb site: www.eclipsescientific.co.uk

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TEST CERTIFICATE

Ms Denise Doyle
Envirolab
Part of Independent Micro Lab
Christendom
Ferrybank
Co Waterford
Ireland
Fax: 051 833261

Certificate Number: TSBN002157-2
Supplementary

Order Number:

Date Analysis Started: 21/12/2008

Date Reported: 18/01/2009

Lab Ref.	Sample Details	Method Number	Test	Result	Units	Flag
SBN4860	Desc: WAT19613 - Veolia. Leachate / Trade Effluent Monitoring point L1 Received Date: 20/12/2008 Sample Point: Miscellaneous water samples	SUB-CON	Dichlorodifluoromethane	<1	µg / l	S
		SUB-CON	Chloromethane	<1	µg / l	S
		SUB-CON	Chloroethene	<2	µg / l	S
		SUB-CON	Bromomethane	<20	µg / l	S
		SUB-CON	Chloroethane	<2	µg / l	S
		SUB-CON	Trichlorofluoromethane	<1	µg / l	S
		SUB-CON	1,1-dichloroethene	<1	µg / l	S
		SUB-CON	trans-1,2 - dichloroethene	<2	µg / l	S
		SUB-CON	1,1 - dichloroethane	<1	µg / l	S
		SUB-CON	cis-1,2 - dichloroethene	<1	µg / l	S
		SUB-CON	2,2 - dichloropropane	<1	µg / l	S
		SUB-CON	bromochloromethane	<1	µg / l	S
		SUB-CON	chloroform	<1	µg / l	S
		SUB-CON	1,1,1-Trichloroethane	<1	µg / l	S
		SUB-CON	1,1 - dichloropropene	<1	µg / l	S
		SUB-CON	Carbon Tetrachloride	<1	µg / l	S
		SUB-CON	Benzene	<1	µg / l	S
		SUB-CON	1,2-Dichloroethane	<2	µg / l	S
		SUB-CON	Trichloroethene	<1	µg / l	S
		SUB-CON	1,2 - dichloropropane	<1	µg / l	S
		SUB-CON	dibromomethane	<10	µg / l	S
		SUB-CON	Dichlorobromomethane	<5	µg / l	S
		SUB-CON	cis - 1,2 - dichloropropene	<10	µg / l	S
		SUB-CON	Toluene	<1	µg / l	S
		SUB-CON	trans1,2 - dichloropropene	<10	µg / l	S
		SUB-CON	1,1,2 - trichloroethane	<10	µg / l	S
		SUB-CON	1,3 - dichloropropane	<2	µg / l	S
		SUB-CON	Tetrachloroethene	<1	µg / l	S
		SUB-CON	dibromochloromethane	<10	µg / l	S

Disclaimers:

Unless otherwise stated, all results are expressed on an as received basis.
'S' indicates a test which was sub-contracted to a UKAS accredited laboratory who holds UKAS accreditation for this test.

Certificate Number: TSBN002157-2
Supplementary

Order Number:

Lab Ref.	Sample Details	Method Number	Test	Result	Units	Flag
SBN4860	Continued from Page 1	SUB-CON	1,2 - dibromoethane	<5	µg / l	S
		SUB-CON	chlorobenzene	<1	µg / l	S
		SUB-CON	1,1,1,2 - tetrachloroethane	<10	µg / l	S
		SUB-CON	Ethylbenzene	<1	µg / l	S
		SUB-CON	m-xylene and p-xylene	<1	µg / l	S
		SUB-CON	o-xylene	<1	µg / l	S
		SUB-CON	styrene	<1	µg / l	S
		SUB-CON	bromoform	<10	µg / l	S
		SUB-CON	isopropylbenzene	<1	µg / l	S
		SUB-CON	1,1,2,2 - tetrachloroethane	<10	µg / l	S
		SUB-CON	bromobenzene	<1	µg / l	S
		SUB-CON	1,2,3 - trichloropropane	<50	µg / l	S
		SUB-CON	propylbenzene	<1	µg / l	S
		SUB-CON	2 - chlorotoluene	<1	µg / l	S
		SUB-CON	4 - chlorotoluene	<1	µg / l	S
		SUB-CON	1,3,5 - trimethylbenzene	<1	µg / l	S
		SUB-CON	tert - butylbenzene	<1	µg / l	S
		SUB-CON	1,2,4 - trimethylbenzene	<1	µg / l	S
		SUB-CON	sec - butylbenzene	<1	µg / l	S
		SUB-CON	1,3 - dichlorobenzene	<1	µg / l	S
		SUB-CON	4 - isopropyltoluene	<1	µg / l	S
		SUB-CON	1,4 - dichlorobenzene	<1	µg / l	S
		SUB-CON	1,2 - dichlorobenzene	<1	µg / l	S
		SUB-CON	n - butylbenzene	<1	µg / l	S
		SUB-CON	1,2 - dibromo - 3 - chloropropan	<50	µg / l	S
		SUB-CON	1,2,4-Trichlorobenzene	<1	µg / l	S
		SUB-CON	Hexachlorobutadiene	<1	µg / l	S
		SUB-CON	Napthalene	<10	µg / l	S
		SUB-CON	1,2,3-Trichlorobenzene	<2	µg / l	S
		SUB-CON	Purge & Trap GCMS Qualitative Screen	No significant peaks detected		

Note - all analysis was subcontracted to another laboratory on our approved list of subcontractors.

Adrian Goldsmith
Water Business Division Manager

Disclaimers:

Unless otherwise stated, all results are expressed on an as received basis.
'S' indicates a test which was sub-contracted to a UKAS accredited laboratory who holds UKAS accreditation for this test.

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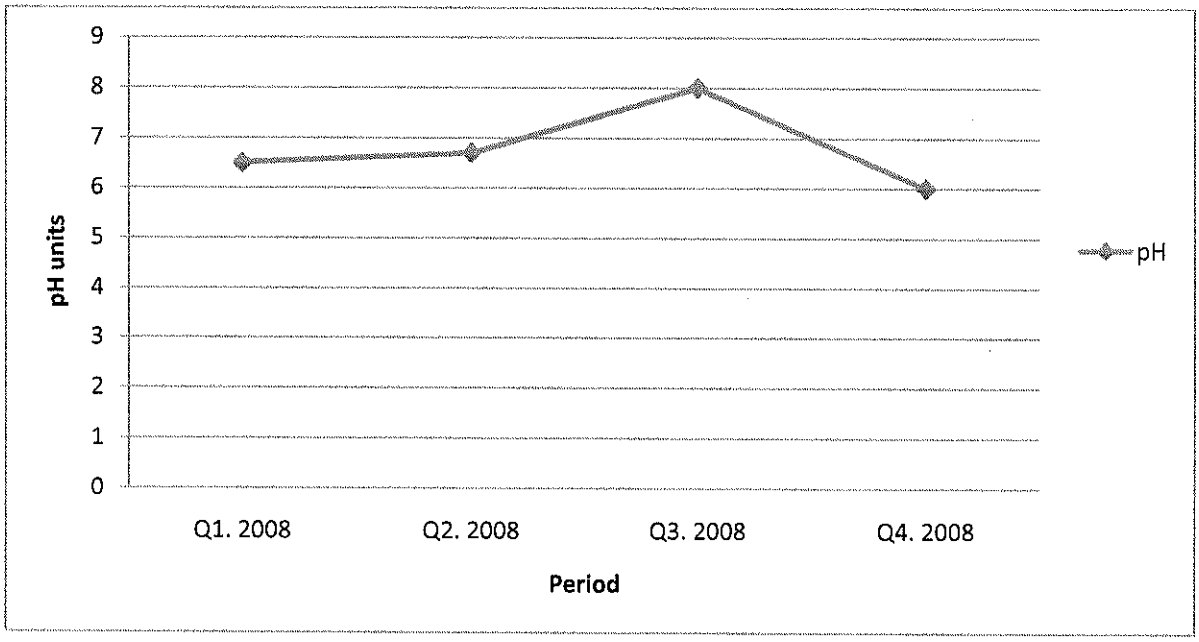
APPENDIX D

Section 2.2

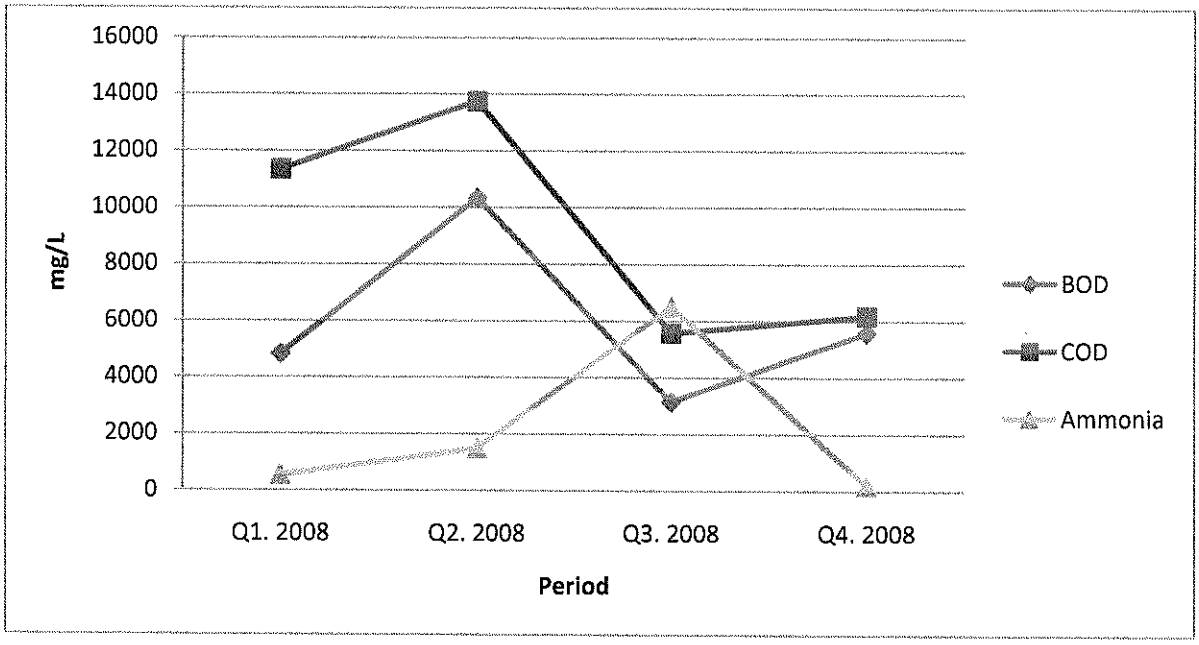
Leachate Emissions Monitoring Results

LEACHATE EMISSIONS

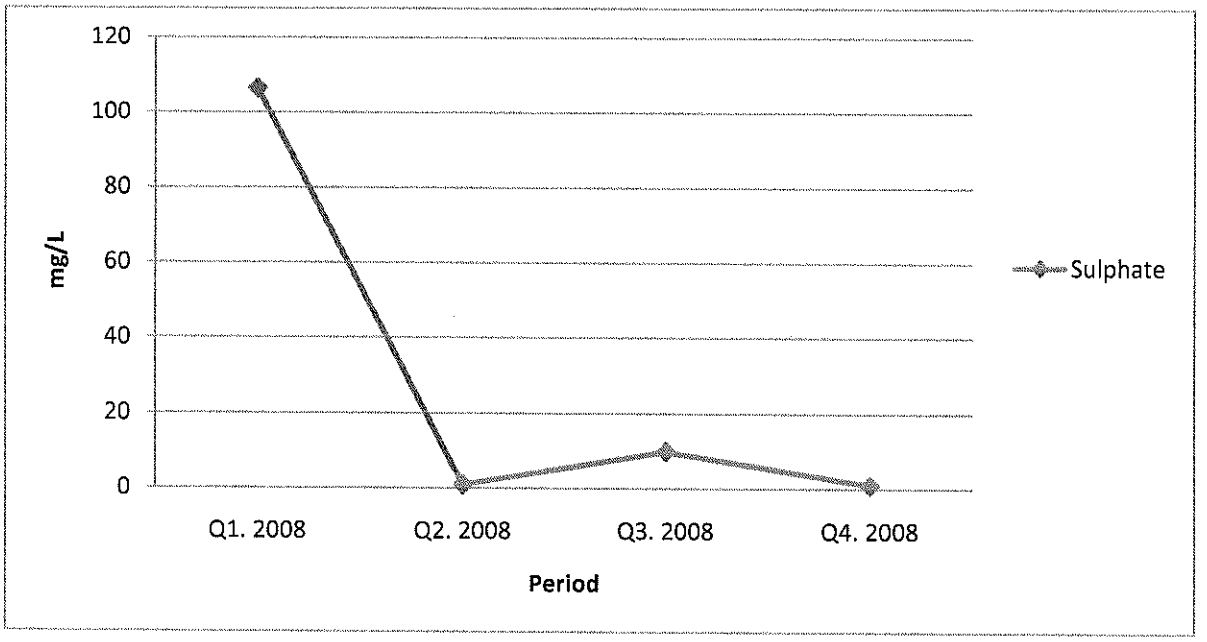
LEACHATE EMISSIONS **pH (pH units)**



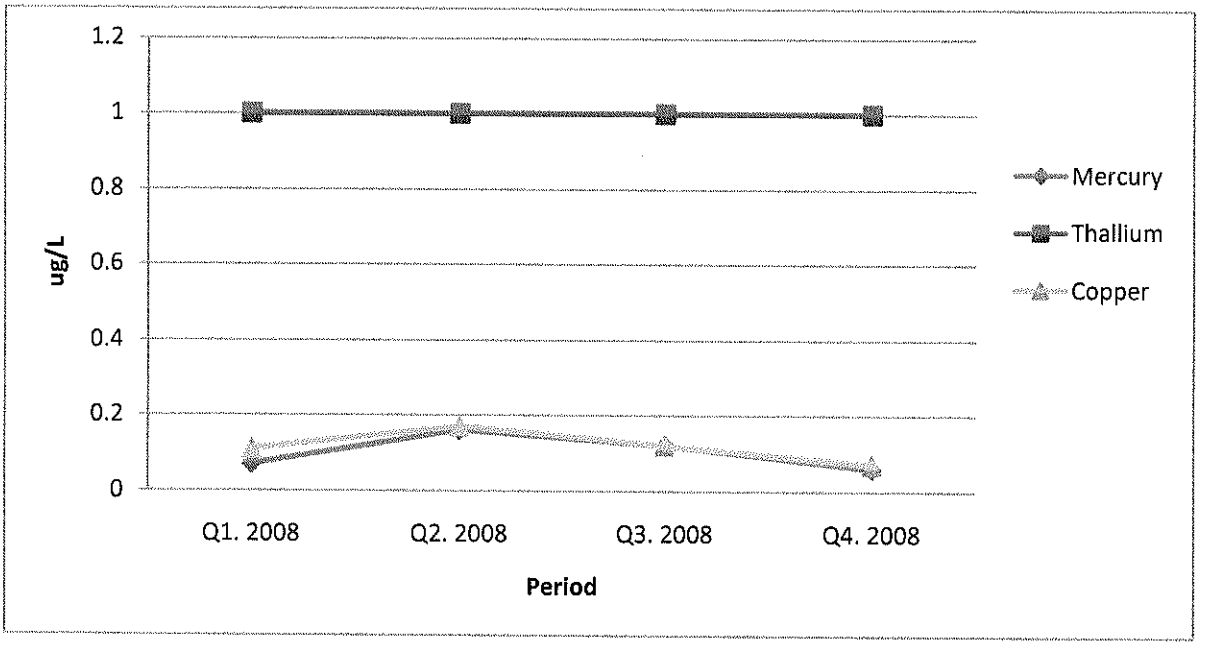
LEACHATE EMISSIONS **BOD, COD and Ammonia (mg/L)**



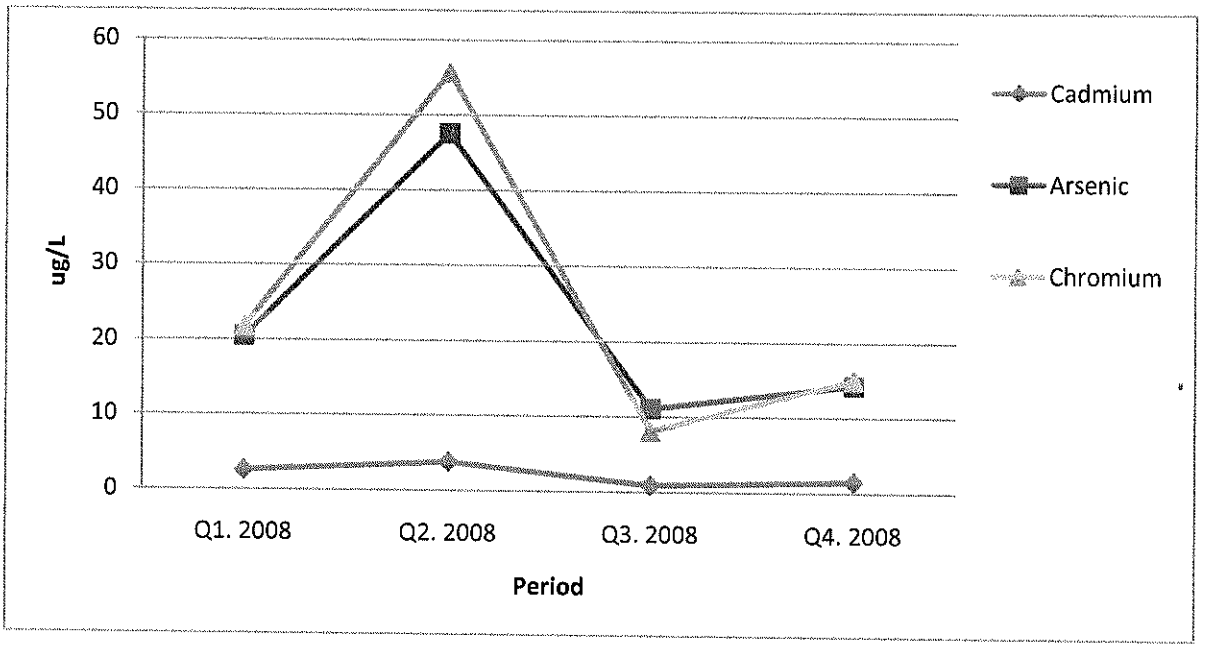
LEACHATE EMISSIONS Sulphate (mg/L)



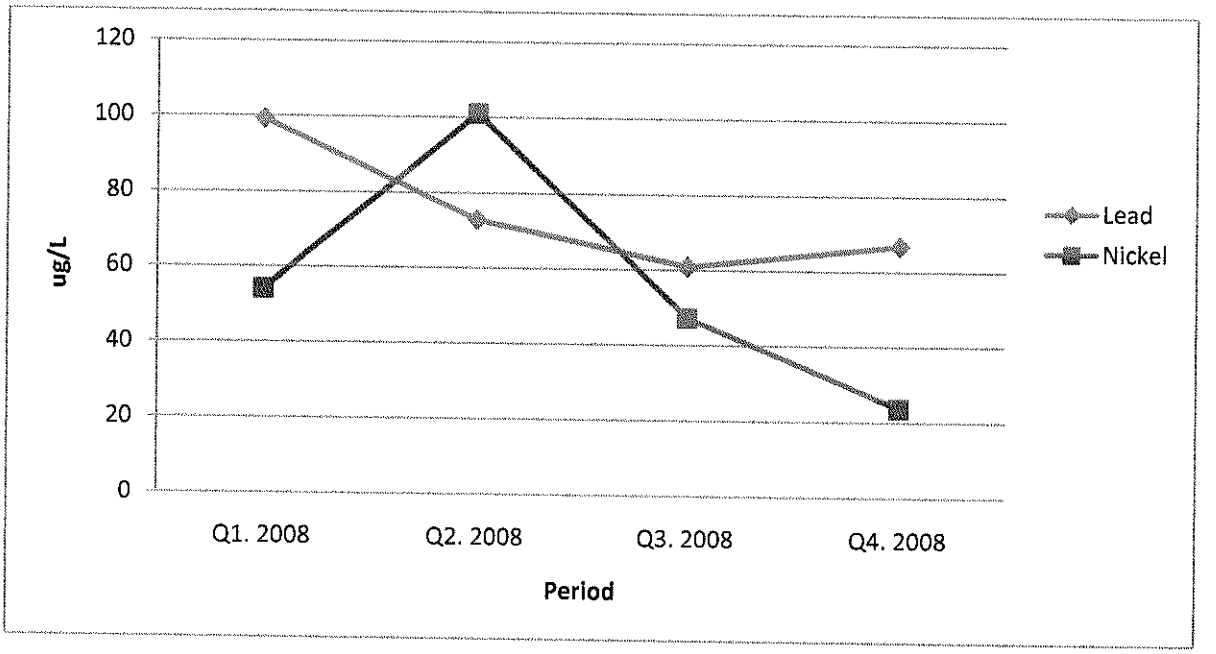
LEACHATE EMISSIONS METALS: Mercury Thallium Copper (ug/L)



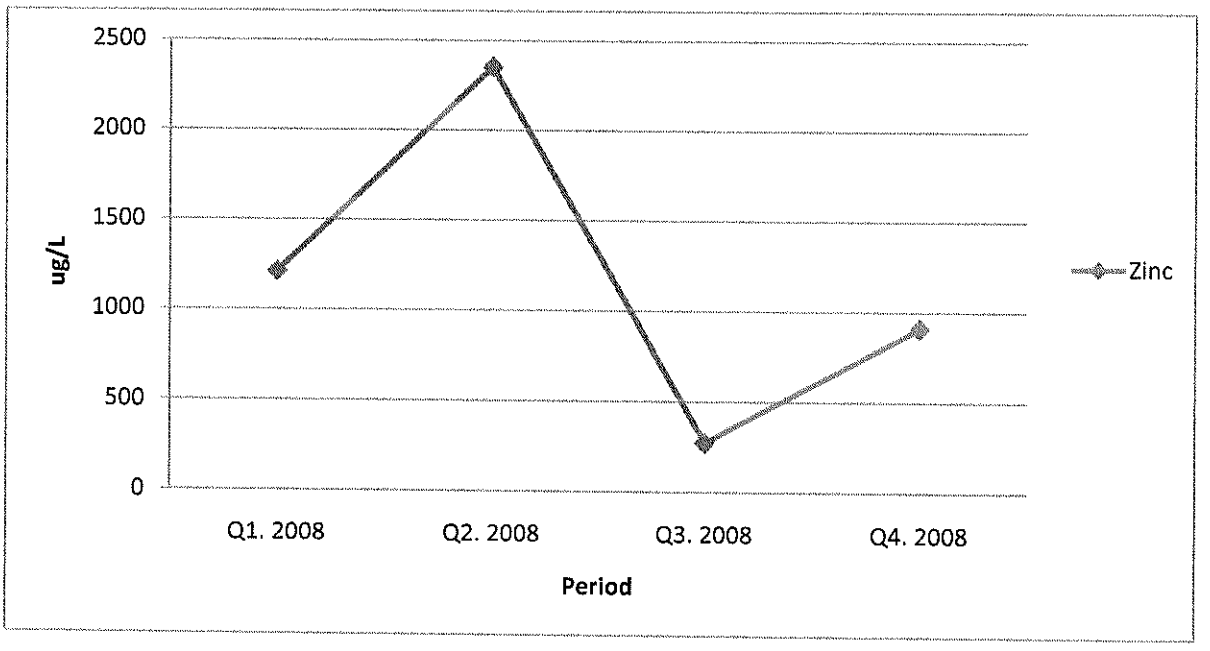
LEACHATE EMISSIONS **METALS: Cadmium Arsenic Chromium (ug/L)**



LEACHATE EMISSIONS **METALS: Lead and Nickel (ug/L)**



LEACHATE EMISSIONS **METALS: Zinc (ug/L)**



APPENDIX E

Section 2.3

Groundwater Emissions

Golder Associates Ireland
Town Centre House,
Dublin Road, Naas,
Co. Kildare, Ireland

Tel: [353] (0)45 874411
Fax: [353] (0)45 874549
http://www.golder.com

Mr. Michael Storan
Facility Manager
Waterford City Composting Facility
Green Road,
Waterford

01 April 2008

Job No: 07507190128

GROUND WATER SAMPLE ANALYSIS

Dear Michael,

Following the installation and development of 2 no. monitoring boreholes (1 no. up-gradient and 1 down-gradient) at the above facility between the 18th and the 21st of February 2008, groundwater samples were taken on the 6th of March 2008. Dedicated tubing and foot valves were used in each monitoring well. Three well volumes of water were removed from each well using a specialised pump prior to the samples being taken. Sample media was ordered beforehand from a fully accredited laboratory and used for each well.

Samples were stored at a constant temperature of 4 degrees celsius and collected from the offices of Golder Associates Ireland in Naas, Co. Kildare by a laboratory courier. The samples were taken by a Golder Associates geoscientist following standard procedures for groundwater monitoring. Field analysis was carried out at each location and notes were taken regarding any odour or colour that may have been present.

The parameters analysed for are in accordance with Table C.6 of Schedule C of Waste Licence Register Number W0234-01. All parameters are below IGV Guideline values and are below the European Communities (Drinking Water) (No. 2) Regulations 2007 S.I 278 of 2007.

Result tables for BH1 and BH2 are attached.

Yours sincerely,
GOLDER ASSOCIATES IRELAND

Garrett Byrne M.Sc., B.Sc.
Environmental Geoscientist

Bernadette Azzie PhD, MSc, BSc (Hons) Senior Environmental Geochemist.

Attachments: Grounwater Analysis Result Sheets.


N
BH1 WATER LEVEL
15.96
BH2 WATER LEVEL
15.52
BH3 WATER LEVEL
15.53
INFERRED
GROUNDWATER
FLOW DIRECTION
15.58
15.71
15.66
15.58
R639 BROOKLODGE EAST RD
LEGEND
SITE BOUNDARY
BH1
15.960
GOLDER BOREHOLE
INFERRED GROUNDWATER FLOW
CONTOURS mOD
ORDNANCE SURVEY IRELAND
LICENCE NUMBER
AR 0056006
VEOLIA ENVIRONMENTAL SERVICES
HYDROGEOLOGICAL ASSESSMENT
SEX CROSS ROADS, WATERFORD, CO. WATERFORD
GROUNDWATER FLOW CONTOUR MAP
1
A
Golder Associates Ireland

ATTACHMENTS

GROUNDWATER SAMPLE ANALYSIS TABLES

PROJECT: Veolia Waterford (Compost Facility) W0234-01

LOCATION: Waterford

RECORD OF MONITORING WELL BH1

BORING DATE: 18/02/08

SHEET 1 OF 3

DATUM: OD

EASTING: 109629.418

NORTHING: 258397.974

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
		GROUND SURFACE									BH1
0		Slightly damp light brown SANDY CLAY. Angular flakes of greywacke and slate with somw siltstone also.		0.00			20				Top of Pipe Elev. 20.47
1											1 m bentonite seal.
2							19				
3				17.47			18				
		Yellow very fine grained aluvial deposits.		3.00			17				
4											SWL 19/02/08
5	BERETTA T51 AIR ROTARY						16				9 m plain 50mm piping with sand and gravel surround.
6							15				
7							14				Water Strike 18/02/08
8							13				
9							12				
10		-- CONTINUED NEXT PAGE --					11				13 m slotted 50mm piping with sand and gravel surround.

GOLDER-IRELAND VEOLIA WATERFORD (COMPOST FACILITY) W0177-03.GPJ GLDR_LDN.GDT 08 DATA INPUT: GB

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: GB

CHECKED: TVM

PROJECT: Veolia Waterford (Compost Facility) W0234-01

LOCATION: Waterford

RECORD OF MONITORING WELL BH1

BORING DATE: 18/02/08

DATUM: OD

EASTING: 109629.418

NORTHING: 258397.974

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
10	BERETTA T61 AIR ROTARY	— CONTINUED FROM PREVIOUS PAGE — Yellow very fine grained aluvial deposits.					10				BH1
11							9				
12							8				
13							7				
14							6				
15							5				13 m slotted 50mm piping with sand and gravel surround.
16							4				
17							3				
18							2				
19							1				
20		— CONTINUED NEXT PAGE —									

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: GB

CHECKED: TVM

GOLDER-IRELAND VEOLIA WATERFORD (COMPOST FACILITY) W0177-03.GPJ GLDR_LDN 4/08 DATA INPUT: GB

PROJECT: Veolia Waterford (Compost Facility) W0234-01

LOCATION: Waterford

RECORD OF MONITORING WELL BH1

BORING DATE: 18/02/08

DATUM: OD

EASTING: 109629.418

NORTHING: 258397.974

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
20	BERETTA T61 AIR ROTARY	--- CONTINUED FROM PREVIOUS PAGE --- Yellow very fine grained alluvial deposits.					0				BH1
21							-1				13 m slotted 50mm piping with sand and gravel surround.
22				-1.53 22.00							
23											
24											
25											
26											
27											
28											
29											
30											

GOLDER-IRELAND VEOLIA WATERFORD (COMPOST FACILITY) W0177-03.GPJ GLDR_LDN 4/08 DATA INPUT: GB

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: GB

CHECKED: TVM

PROJECT: Veolia Waterford (Compost Facility) W0234-01

LOCATION: Waterford

RECORD OF MONITORING WELL BH2

BORING DATE: 19/02/08

SHEET 1 OF 3

DATUM: OD
EASTING: 109583.203
NORTHING: 258213.188

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
0	BERETTA T61 AIR ROTARY	GROUND SURFACE MADE GROUND		0.00			17				Top of Pipe Elev. 17.32 BH2
1		Brown grey SANDY CLAY		17.02 0.30			16				1m Bentonite seal.
2		Light brown and yellow SANDY CLAY with small and medium cobbles and boulders. Glacial outwash material.		15.32 2.00			15				
3							14				
4		Light brown and yellow SANDY CLAY with small cobbles and boulders. Glacial outwash material.		13.32 4.00			13				
5							12				12m plain 50mm piping with sand and gravel surround.
6		Dense dark brown and yellow marly CLAY. Slow drilling.		11.32 6.00			11				SWL 19/02/08
7							10				
8		Fine grained sandy CLAY with cobbles and boulders. Perched water pocket struck at 8.5m.		9.32 8.00			9				
9							8				
10		--- CONTINUED NEXT PAGE ---									

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: GB
CHECKED: TVM

GOLDER-IRELAND VEOLIA WATERFORD (COMPOST FACILITY) W0177-03.GPJ GLDR_LDN 14/08 DATA INPUT: GB

PROJECT: Veolia Waterford (Compost Facility) W0234-01

LOCATION: Waterford

RECORD OF MONITORING WELL BH2

BORING DATE: 19/02/08

DATUM: OD
EASTING: 109583.203
NORTHING: 256213.188

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
10		*--- CONTINUED FROM PREVIOUS PAGE ---*									BH2
		Fine grained sandy CLAY with cobbles and boulders. Perched water pocket struck at 8.5m.					7				*Water Strike 19/02/08*
11											12m plain 50mm piping with sand and gravel surround.
							6				
12											
							5				
13				4.32							
		Dark brown fine grained sandy CLAY. Very dense and sticky.		13.00			4				
14											
							3				
15	BERETTA T61 AIR ROTARY			2.32							
		Shattered grey and blue silty GRAVEL		15.00			2				
16											15m slotted piping with gravel pack surround
							1				
		Weathered GRAVEL and coarse sand. Outwash material.		0.82							
17				16.50			0				
18											
							-1				
19											
							-2				
20		*— CONTINUED NEXT PAGE —*									

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: GB
CHECKED: TVM

GOLDER-IRELAND VEOLIA WATERFORD (COMPOST FACILITY) W0177-03.GPJ GLDR_LDN M/DB DATA INPUT: GB

PROJECT: Veolia Waterford (Compost Facility) W0234-01

LOCATION: Waterford

RECORD OF MONITORING WELL BH2

BORING DATE: 19/02/08

DATUM: OD

EASTING: 109583.203

NORTHING: 258213.186

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp — W — Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
20		*— CONTINUED FROM PREVIOUS PAGE —*											BH2
		Weathered GRAVEL and coarse sand. Outwash material.					-3						
				-3.18 / 20.50									
21		Very coarse sandy weathered GRAVEL. Angular quartzite cobbles and boulders in return.					-4						
22							-5						
23	BERETTA T61						-6						
24	AIR ROTARY						-7						15m slotted piping with gravel pack surround
25							-8						
26							-9						
27				-9.68 / 27.00									
28													
29													
30													

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: GB

CHECKED: TVM

GOLDER-IRELAND VEOLIA WATERFORD (COMPOST FACILITY) W0177-03.GPJ GLOR_LDR 24/4/08 DATA INPUT: GB

Monitoring Well BH1: Chemical Analysis of Groundwater.

	UNIT	BH1	Drinking Water Standards	Drinking Water Standards
			Europoean Communities (Drinking Water)	Interim Guideline Values
DATE OF SAMPLE	-	06/03/2008	(Regulations S.I. No. 278 of 2007).	EPA
FIELD ANALYSIS				
General Water Quality Parameters				
Colour	-	Slightly Cloudy	No Abnormal Change	No Abnormal Change
Conductivity	µS/cm	610	1500 µS/cm	1000 µS/cm
Odour	-	No Odour		
pH	-	6.36	≥ 6.5 and ≤ 9.5	≥ 6.5 and ≤ 9.5
Temperature	°C	12	25 oC	25 oC
LABORATORY ANALYSIS				
General Water Quality Parameters				
Conductivity @ 25°C	µS/cm	554	1000 µS/cm	1000 µS/cm
COD	mg/l	<15	No Abnormal Change	No Abnormal Change
pH	C mg/l	6.91	≥6.5 and ≤ 9.5	≥6.5 and ≤ 9.5
Inorganics				
Ammoniacal Nitrogen	N mg/l	<0.2	-	-
Chloride	Cl mg/l	29	250 mg/l	30 mg/l
Total Ammonia as NH3	mg/l	<0.2	0.03 mg/l	0.03 mg/l
Organics - List I/II				
VOC's	µg/l	<1	-	-
Semi VOC's	µg/l	<1	-	-
Pesticides	µg/l	<1	-	-

LEGEND

" - " = No data reported or no analyses conducted.

< = Less Than

Monitoring Well BH2: Chemical Analysis of Groundwater.

	UNIT	BH2	Drinking Water Standards	Drinking Water Standards
			Europoean Communities (Drinking Water)	Interim Guideline Values
DATE OF SAMPLE	-	06/03/2008	(Regulations S.I. No. 278 of 2007).	EPA
FIELD ANALYSIS				
General Water Quality Parameters				
Colour	-	Slightly Cloudy	No Abnormal Change	No Abnormal Change
Conductivity	µS/cm	570	1500 µS/cm	1000 µS/cm
Odour	-	No Odour		
pH	-	6.51	≥ 6.5 and ≤ 9.5	≥ 6.5 and ≤ 9.5
Temperature	°C	13.2	25 oC	25 oC
LABORATORY ANALYSIS				
General Water Quality Parameters				
Conductivity @ 25°C	µS/cm	567	1000 µS/cm	1000 µS/cm
COD	mg/l	<15	No Abnormal Change	No Abnormal Change
pH	C mg/l	7.30	≥6.5 and ≤ 9.5	≥6.5 and ≤ 9.5
Inorganics				
Ammoniacal Nitrogen	N mg/l	<0.2	-	-
Chloride	Cl mg/l	39	250 mg/l	30 mg/l
Total Ammonia as NH3	mg/l	<0.2	0.03 mg/l	0.03 mg/l
Organics - List I/II				
VOC's	µg/l	<1	-	-
Semi VOC's	µg/l	<1	-	-
Pesticides	µg/l	<1	-	-

LEGEND

" - " = No data reported or no analyses conducted.

< = Less Than

ALcontrol Laboratories (Dublin)

18a Rosemount Business Park,
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CERTIFICATE OF ANALYSIS

Client: Golder Associates Ireland

Town Centre House
Dublin Road
Naas
Co. Kildare
Ireland

Attention: Garrett Byrne

Date: 27 March, 2008

Our Reference: 08-B01489/01

Your Reference: VEOLIA-07507140128

Location:

A total of 3 samples was received for analysis on Monday, 10 March 2008 and authorised on Thursday, 27 March 2008. Accredited laboratory tests are defined in the log sheet, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation. We are pleased to enclose our final report, it was a pleasure to be of service to you, and we look forward to our continuing association.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Signed

Lorraine Mc Namara

Lorraine McNamara
Laboratory Technical Manager

Cormac Lacey

Compiled By

Cormac Lacey

UKAS TESTING
1291

GROUP

Printed at 09:26 on 31/03/2008

ALcontrol Laboratories Ireland

Test Schedule

Ref Number: 08-B01489/01

Client: Golder Associates Ireland

Date of Receipt: 10/03/2008

Sample Type: WATER

Location:

Client Contact: Garrett Byrne

Client Ref: VEOLIA-07507140128

Detection Method				Calculation	GCMS	GCMS	KONE	METER	METER	SPECTRO	SPECTRO						
UKAS Accredited [Testing Laboratory] No. 1291						✓	✓	✓	✓	✓	✓						
ALcontrol Reference	Sample Identity	Other ID	P / V	Ammonia Total as NH3	Semi Volatile Organics	Volatile Organic Compounds	Chloride	Electrical Conductivity @ 25C	pH (Liquid)	Ammoniacal Nitrogen	COD Unfiltered						
08-B01489-S0001-A01	BH1	06/03/08	Plastic Bottle	-	X	-	X	X	X	-	X						
08-B01489-S0001-A07	BH1	06/03/08	Plastic Bottle + HNO3	On Hold													
08-B01489-S0001-A08	BH1	06/03/08	Plastic Bottle + NaOH	On Hold													
08-B01489-S0001-A09	BH1	06/03/08	Plastic Bottle + H2SO4	X	-	-	-	-	-	X	-						
08-B01489-S0001-A11	BH1	06/03/08	Volatile Vial	-	-	X	-	-	-	-	-						
08-B01489-S0001-A13	BH1	06/03/08	Volatile Vial	On Hold													
08-B01489-S0002-A01	BH2	06/03/08	Plastic Bottle	-	X	-	X	X	X	-	X						
08-B01489-S0002-A07	BH2	06/03/08	Plastic Bottle + HNO3	On Hold													
08-B01489-S0002-A08	BH2	06/03/08	Plastic Bottle + NaOH	On Hold													
08-B01489-S0002-A09	BH2	06/03/08	Plastic Bottle + H2SO4	X	-	-	-	-	-	X	-						
08-B01489-S0002-A11	BH2	06/03/08	Volatile Vial	-	-	X	-	-	-	-	-						
08-B01489-S0002-A13	BH2	06/03/08	Volatile Vial	On Hold													
08-B01489-S0003-A01	BH3	06/03/08	Plastic Bottle	-	X	-	X	X	X	-	X						
08-B01489-S0003-A07	BH3	06/03/08	Plastic Bottle + HNO3	On Hold													
08-B01489-S0003-A08	BH3	06/03/08	Plastic Bottle + NaOH	On Hold													
08-B01489-S0003-A09	BH3	06/03/08	Plastic Bottle + H2SO4	X	-	-	-	-	-	X	-						
08-B01489-S0003-A11	BH3	06/03/08	Volatile Vial	-	-	X	-	-	-	-	-						
08-B01489-S0003-A13	BH3	06/03/08	Volatile Vial	On Hold													

Notes : NUMERIC VALUES INDICATE ADDITIONAL SCHEDULING

* SUBCONTRACTED TO OTHER LABORATORY / ** SAMPLES ANALYSED AT THE CHESTER LABORATORY

ALcontrol Laboratories Ireland

Test Schedule Summary

Ref Number: 08-B01489/01
Client: Golder Associates Ireland
Date of Receipt: 10/03/2008

Sample Type: WATER
Location:
Client Contact: Garrett Byrne
Client Ref: VEOLIA-07507140128

* SUBCONTRACTED TO OTHER LABORATORY / ** SAMPLES ANALYSED AT THE CHESTER LABORATORY

SCHEDULE	METHOD	TEST NAME	TOTAL
X	Calculation	Ammonia Total as NH3	3
X	GCMS	Semi Volatile Organics	3
X	GCMS	Volatile Organic Compounds	3
X	KONE	Chloride	3
X	METER	Electrical Conductivity @ 25C	3
X	METER	pH (Liquid)	3
X	SPECTRO	Ammoniacal Nitrogen	3
X	SPECTRO	COD Unfiltered	3

☐ Interim
☑ Validated

ALcontrol Laboratories Ireland

Table Of Results

Ref Number: 08-B01489/01
Client: Golder Associates Ireland
Date of Receipt: 10/03/2008
(of first sample)

Sample Type: WATER
Location:
Client Contact: Garrett Byrne
Client Ref: VEOLIA-07507140128

	Detection Method	Calculation	GCMS	GCMS	KONE	METER	METER	SPECTRO	SPECTRO
	Method Detection Limit	<0.2mg/l	n/a	n/a	<1mg/l	<0.014mS/cm	napH Units	<0.2mg/l	<15mg/l
UKAS Accredited [Testing Laboratory] No. 1291				✓	✓	✓	✓	✓	✓
ALcontrol Reference	Sample Identity	Other ID	Total Ammonia as NH3	Semi Volatile Organics	Volatile Organic Compounds	Chloride	Electrical Conductivity @ 25C	pH	Ammoniacal Nitrogen as N	COD Unfiltered
			mg/l			mg/l	mS/cm	pH Units	mg/l	mg/l
08-B01489-S0001	BH1	06/03/08	<0.2	Done	Done	29	0.554	6.91	<0.2	<15
08-B01489-S0002	BH2	06/03/08	<0.2	Done	Done	39	0.567	7.25	<0.2	<15
08-B01489-S0003	BH3	06/03/08	<0.2	Done	Done	39	0.359	6.82	<0.2	<15

Notes : METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS CIRCUMSTANCES BEYOND OUR CONTROL.

NDP = NO DETERMINATION POSSIBLE

Checked By : Cormac Lacey

* SUBCONTRACTED TO OTHER LABORATORY / ** SAMPLES ANALYSED AT THE CHESTER LABORATORY

Volatile Organic Compounds (EPA 624/8260)

Sample Name	-	**B01489-S0001 BH1 06/03/08**
		Golder Associates
Client/sample matrix	-	**Ireland/water**
Units	-	**ug/l**
Matrix	-	**water**

CAS No.	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<3
74-87-3**	Chloromethane	<1
75-01-4	Vinyl Chloride	<3
74-83-9**	Bromomethane	<3
75-00-3	Chloroethane	<2
75-69-4	Trichlorofluoromethane	<1
75-35-4**	1,1-Dichloroethene	<2
75-15-0	Carbon Disulphide	<1
75-09-2**	Dichloromethane	<2
1634-04-4**	Tert-butyl methyl ether	<1
156-60-5	Trans-1,2-Dichoroethene	<2
75-35-4	1,1-Dichloroethane	<1
156-59-2**	Cis-1,2-Dichloroethene	<2
594-20-7	2,2-Dichloropropane	<2
74-97-5**	Bromochloromethane	<2
67-66-3	Chloroform	<1
71-55-6	1,1,1-Trichloroethane	<2
563-58-6	1,1-Dichloropropene	<2
56-23-5	Carbontetrachloride	<1
107-06-2**	1,2-Dichloroethane	<2
71-43-2	Benzene	<1
79-01-6**	Trichloroethene	<1.5
78-87-5	1,2-Dichloropropane	<2
74-95-3**	Dibromomethane	<3
75-27-4	Bromodichloromethane	<3
10061-01-5	Cis-1,3-Dichloropropene	<1
108-88-3	Toluene	<1
10061-02-6**	Trans-1,3-Dichloropropene	<2
79-00-5**	1,1,2-Trichloroethane	<3
142-28-9**	1,3-Dichloropropane	<2
127-18-4	Tetrachloroethene	<0.4

CAS No.	Compound	Conc.
124-48-1	Dibromochloromethane	<3
106-93-4**	1,2-Dibromoethane	<2.5
108-90-7	Chlorobenzene	<1
630-20-6	1,1,1,2-tetrachloroethane	<1
100-41-4	Ethylbenzene	<1
108-38-3~	p/m-Xylene	<1
95-47-6	o-Xylene	<1.5
100-42-5	Styrene	<1
75-25-2**	Bromoform	<3
98-82-8	Isopropylbenzene	<1
79-34-5**	1,1,2,2-Tetrachloroethane	<3
96-18-4**	1,2,3-Trichloropropane	<2
108-86-1**	Bromobenzene	<1
103-65-01**	Propylbenzene	<1
95-49-8**	2-Chlorotoluene	<2
108-67-8**	1,3,5-Trimethylbenzene	<1
106-43-4**	4-Chlorotoluene	<1
98-06-06	Tert-Butylbenzene	<1
120-82-1**	1,2,4-Trimethylbenzene	<1.5
135-98-8**	Sec-Butylbenzene	<1
99-87-6**	4-Isopropyltoluene	<1
541-73-1**	1,3-Dichlorobenzene	<2
106-46-7**	1,4-Dichlorobenzene	<3
104-51-8	n-Butylbenzene	<1
95-50-1	1,2-Dichlorobenzene	<2
96-12-8**	1,2-Dibromo-3-Chloropropan	<5
120-82-1**	1,2,4-Trichlorobenzene	<4
87-68-3**	Hexachlorobutadiene	<1
91-20-3**	Naphthalene	<2
87-61-6**	1,2,3-Trichlorobenzene	<2

**** Non Accredited in soils**
~ also CAS No. 106-42-3
N.B Water Blank Correcte

Date Extracted:
20-Mar-08
Authorised by:
Sarah Dowling

Volatile Organic Compounds (EPA 624/8260)

Sample Name	-	**B01489-S0002 BH2 06/03/08**
		Golder Associates
Client/sample matrix	-	**Ireland/water**
Units	-	**ug/l**
Matrix	-	**water**

CAS No.	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<3
74-87-3**	Chloromethane	<1
75-01-4	Vinyl Chloride	<3
74-83-9**	Bromomethane	<3
75-00-3	Chloroethane	<2
75-69-4	Trichlorofluoromethane	<1
75-35-4**	1,1-Dichloroethene	<2
75-15-0	Carbon Disulphide	<1
75-09-2**	Dichloromethane	<2
1634-04-4**	Tert-butyl methyl ether	<1
156-60-5	Trans-1,2-Dichoroethene	<2
75-35-4	1,1-Dichloroethane	<1
156-59-2**	Cis-1,2-Dichloroethene	<2
594-20-7	2,2-Dichloropropane	<2
74-97-5**	Bromochloromethane	<2
67-66-3	Chloroform	<1
71-55-6	1,1,1-Trichloroethane	<2
563-58-6	1,1-Dichloropropene	<2
56-23-5	Carbontetrachloride	<1
107-06-2**	1,2-Dichloroethane	<2
71-43-2	Benzene	<1
79-01-6**	Trichloroethene	<1.5
78-87-5	1,2-Dichloropropane	<2
74-95-3**	Dibromomethane	<3
75-27-4	Bromodichloromethane	<3
10061-01-5	Cis-1,3-Dichloropropene	<1
108-88-3	Toluene	<1
10061-02-6**	Trans-1,3-Dichloropropene	<2
79-00-5**	1,1,2-Trichloroethane	<3
142-28-9**	1,3-Dichloropropane	<2
127-18-4	Tetrachloroethene	<0.4

CAS No.	Compound	Conc.
124-48-1	Dibromochloromethane	<3
106-93-4**	1,2-Dibromoethane	<2.5
108-90-7	Chlorobenzene	<1
630-20-6	1,1,1,2-tetrachloroethane	<1
100-41-4	Ethylbenzene	<1
108-38-3~	p/m-Xylene	<1
95-47-6	o-Xylene	<1.5
100-42-5	Styrene	<1
75-25-2**	Bromoform	<3
98-82-8	Isopropylbenzene	<1
79-34-5**	1,1,2,2-Tetrachloroethane	<3
96-18-4**	1,2,3-Trichloropropane	<2
108-86-1**	Bromobenzene	<1
103-65-01**	Propylbenzene	<1
95-49-8**	2-Chlorotoluene	<2
108-67-8**	1,3,5-Trimethylbenzene	<1
106-43-4**	4-Chlorotoluene	<1
98-06-06	Tert-Butylbenzene	<1
120-82-1**	1,2,4-Trimethylbenzene	<1.5
135-98-8**	Sec-Butylbenzene	<1
99-87-6**	4-Isopropyltoluene	<1
541-73-1**	1,3-Dichlorobenzene	<2
106-46-7**	1,4-Dichlorobenzene	<3
104-51-8	n-Butylbenzene	<1
95-50-1	1,2-Dichlorobenzene	<2
96-12-8**	1,2-Dibromo-3-Chloropropan	<5
120-82-1**	1,2,4-Trichlorobenzene	<4
87-68-3**	Hexachlorobutadiene	<1
91-20-3**	Naphthalene	<2
87-61-6**	1,2,3-Trichlorobenzene	<2

**** Non Accredited in soils**
~ also CAS No. 106-42-3
N.B Water Blank Correcte

Date Extracted:
20-Mar-08
Authorised by:
Sarah Dowling

Volatile Organic Compounds (EPA 624/8260)

Sample Name	-	**B01489-S0003 BH3 06/03/08**
		Golder Associates
Client/sample matrix	-	**Ireland/water**
Units	-	**ug/l**
Matrix	-	**water**

CAS No.	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<3
74-87-3**	Chloromethane	<1
75-01-4	Vinyl Chloride	<3
74-83-9**	Bromomethane	<3
75-00-3	Chloroethane	<2
75-69-4	Trichlorofluoromethane	<1
75-35-4**	1,1-Dichloroethene	<2
75-15-0	Carbon Disulphide	<1
75-09-2**	Dichloromethane	<2
1634-04-4**	Tert-butyl methyl ether	<1
156-60-5	Trans-1,2-Dichoroethene	<2
75-35-4	1,1-Dichloroethane	<1
156-59-2**	Cis-1,2-Dichloroethene	<2
594-20-7	2,2-Dichloropropane	<2
74-97-5**	Bromochloromethane	<2
67-66-3	Chloroform	<1
71-55-6	1,1,1-Trichloroethane	<2
563-58-6	1,1-Dichloropropene	<2
56-23-5	Carbontetrachloride	<1
107-06-2**	1,2-Dichloroethane	<2
71-43-2	Benzene	<1
79-01-6**	Trichloroethene	<1.5
78-87-5	1,2-Dichloropropane	<2
74-95-3**	Dibromomethane	<3
75-27-4	Bromodichloromethane	<3
10061-01-5	Cis-1,3-Dichloropropene	<1
108-88-3	Toluene	<1
10061-02-6**	Trans-1,3-Dichloropropene	<2
79-00-5**	1,1,2-Trichloroethane	<3
142-28-9**	1,3-Dichloropropane	<2
127-18-4	Tetrachloroethene	<0.4

CAS No.	Compound	Conc.
124-48-1	Dibromochloromethane	<3
106-93-4**	1,2-Dibromoethane	<2.5
108-90-7	Chlorobenzene	<1
630-20-6	1,1,1,2-tetrachloroethane	<1
100-41-4	Ethylbenzene	<1
108-38-3~	p/m-Xylene	<1
95-47-6	o-Xylene	<1.5
100-42-5	Styrene	<1
75-25-2**	Bromoform	<3
98-82-8	Isopropylbenzene	<1
79-34-5**	1,1,2,2-Tetrachloroethane	<3
96-18-4**	1,2,3-Trichloropropane	<2
108-86-1**	Bromobenzene	<1
103-65-01**	Propylbenzene	<1
95-49-8**	2-Chlorotoluene	<2
108-67-8**	1,3,5-Trimethylbenzene	<1
106-43-4**	4-Chlorotoluene	<1
98-06-06	Tert-Butylbenzene	<1
120-82-1**	1,2,4-Trimethylbenzene	<1.5
135-98-8**	Sec-Butylbenzene	<1
99-87-6**	4-Isopropyltoluene	<1
541-73-1**	1,3-Dichlorobenzene	<2
106-46-7**	1,4-Dichlorobenzene	<3
104-51-8	n-Butylbenzene	<1
95-50-1	1,2-Dichlorobenzene	<2
96-12-8**	1,2-Dibromo-3-Chloropropan	<5
120-82-1**	1,2,4-Trichlorobenzene	<4
87-68-3**	Hexachlorobutadiene	<1
91-20-3**	Naphthalene	<2
87-61-6**	1,2,3-Trichlorobenzene	<2

**** Non Accredited in soils**
~ also CAS No. 106-42-3
N.B Water Blank Correcte

Date Extracted:
20-Mar-08
Authorised by:
Sarah Dowling

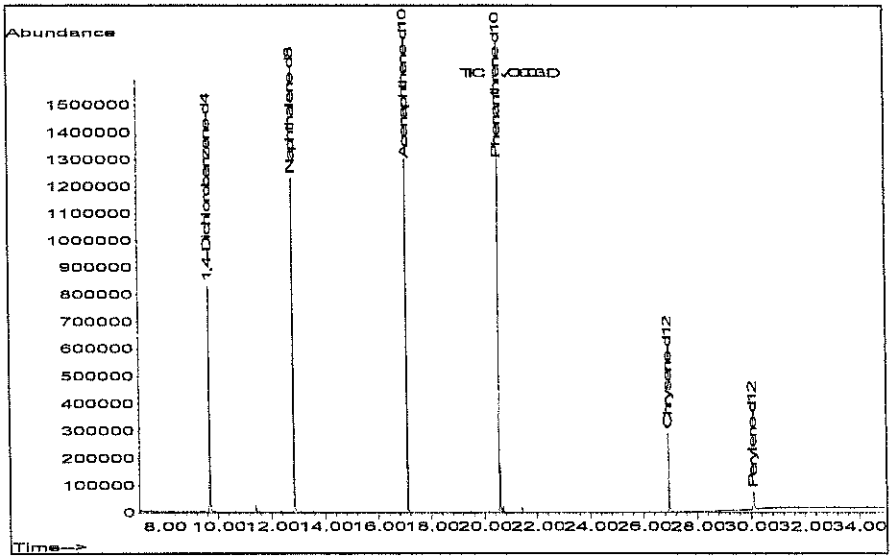
ALcontrol Geochem

Semivolatiles

Sample Identity - B01489-S0001 BH1
Client / Sample matrix - Golder Associates Ireland/water
Units - µg/l

CAS No	Compound	Conc.
108-95-2	Phenol	<1
95-57-8	2-Chlorophenol	<1
95-48-7	2-Methylphenol	<1
106-44-5	4-Methylphenol	<1
88-75-5	2-Nitrophenol	<1
100-02-7	4-Nitrophenol	<1
120-83-2	2,4-Dichlorophenol	<1
105-67-9	2,4-Dimethylphenol	<1
59-50-7	4-Chloro-3-methylphenol	<1
88-06-2	2,4,6-Trichlorophenol	<1
95-95-4	2,4,5-Trichlorophenol	<1
87-86-5	Pentachlorophenol	<1
541-73-1	1,3-Dichlorobenzene	<1
106-46-7	1,4-Dichlorobenzene	<1
95-50-1	1,2-Dichlorobenzene	<1
120-82-1	1,2,4-Trichlorobenzene	<1
98-95-3	Nitrobenzene	<1
103-33-3	Azobenzene	<1
118-74-1	Hexachlorobenzene	<1
91-20-3	Naphthalene	<1
208-96-8	Acenaphthylene	<1
83-32-9	Acenaphthene	<1
86-73-7	Fluorene	<1
85-01-8	Phenanthrene	<1
120-12-7	Anthracene	<1
206-44-0	Fluoranthrene	<1
129-00-0	Pyrene	<1
56-55-3	Benzo(a)anthracene	<1
218-01-9	Chrysene	<1
205-99-2	Benzo(b)fluoranthrene	<1

CAS No	Compound	Conc.
207-08-9	Benzo(k)fluoranthrene	<1
50-32-8	Benzo(a)pyrene	<1
193-39-5	Indeno(1,2,3-cd)pyrene	<1
53-70-3	Dibenzo(a,h)anthracene	<1
191-24-2	Benzo(ghi)perylene	<1
91-58-7	2-Chloronaphthalene	<1
91-57-6	2-Methylnaphthalene	<1
86-74-8	Carbazole	<1
78-59-1	Isophorone	<1
132-64-9	Dibenzofuran	<1
131-11-3	Dimethyl phthalate	<1
84-66-2	Diethyl phthalate	<1
84-74-2	Di-n-butylphthalate	<1
117-84-0	Di-n-octylphthalate	<1
117-81-7	Bis(2-ethylhexyl)phthalate	<1
85-68-7	Butylbenzylphthalate	<1
106-47-8	4-Chloroaniline	<1
88-74-4	2-Nitroanaline	<1
99-09-2	3-Nitroaniline	<1
100-01-6	4-Nitroaniline	<1
121-14-2	2,4-Dinitrotoluene	<1
606-20-2	2,6-Dinitrotoluene	<1
111-44-4	Bis(2-chloroethyl)ether	<1
101-55-3	4-Bromophenylphenylether	<1
7005-72-3	4-Chlorophenylphenylether	<1
67-72-1	Hexachloroethane	<1
87-68-3	Hexachlorobutadiene	<1
77-47-4	Hexchlorocyclopentadiene	<1
111-91-1	Bis(2-chloroethoxy)methane	<1
621-64-7	N-nitrosodi-n-propylamine	<1



Date Extracted: 25/03/08
Authorised By: Colm O'Leary

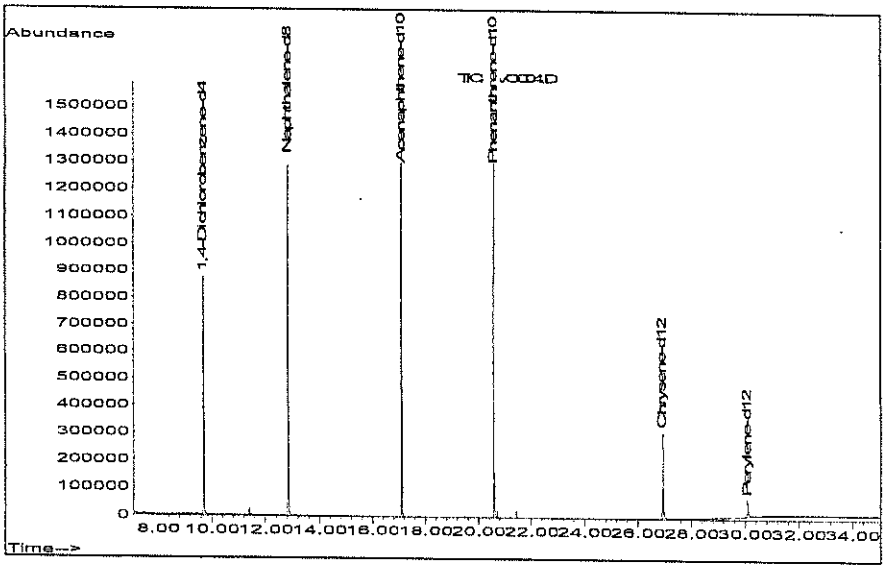
ALcontrol Geochem

Semivolatiles

Sample Identity - B01489-S0002 BH2
Client / Sample matrix - Golder Associates Ireland/water
Units - µg/l

CAS No	Compound	Conc.
108-95-2	Phenol	<1
95-57-8	2-Chlorophenol	<1
95-48-7	2-Methylphenol	<1
106-44-5	4-Methylphenol	<1
88-75-5	2-Nitrophenol	<1
100-02-7	4-Nitrophenol	<1
120-83-2	2,4-Dichlorophenol	<1
105-67-9	2,4-Dimethylphenol	<1
59-50-7	4-Chloro-3-methylphenol	<1
88-06-2	2,4,6-Trichlorophenol	<1
95-95-4	2,4,5-Trichlorophenol	<1
87-86-5	Pentachlorophenol	<1
541-73-1	1,3-Dichlorobenzene	<1
106-46-7	1,4-Dichlorobenzene	<1
95-50-1	1,2-Dichlorobenzene	<1
120-82-1	1,2,4-Trichlorobenzene	<1
98-95-3	Nitrobenzene	<1
103-33-3	Azobenzene	<1
118-74-1	Hexachlorobenzene	<1
91-20-3	Naphthalene	<1
208-96-8	Acenaphthylene	<1
83-32-9	Acenaphthene	<1
86-73-7	Fluorene	<1
85-01-8	Phenanthrene	<1
120-12-7	Anthracene	<1
206-44-0	Fluoranthrene	<1
129-00-0	Pyrene	<1
56-55-3	Benzo(a)anthracene	<1
218-01-9	Chrysene	<1
205-99-2	Benzo(b)fluoranthrene	<1

CAS No	Compound	Conc.
207-08-9	Benzo(k)fluoranthrene	<1
50-32-8	Benzo(a)pyrene	<1
193-39-5	Indeno(1,2,3-cd)pyrene	<1
53-70-3	Dibenzo(a,h)anthracene	<1
191-24-2	Benzo(ghi)perylene	<1
91-58-7	2-Chloronaphthalene	<1
91-57-6	2-Methylnaphthalene	<1
86-74-8	Carbazole	<1
78-59-1	Isophorone	<1
132-64-9	Dibenzofuran	<1
131-11-3	Dimethyl phthalate	<1
84-66-2	Diethyl phthalate	<1
84-74-2	Di-n-butylphthalate	<1
117-84-0	Di-n-octylphthalate	<1
117-81-7	Bis(2-ethylhexyl)phthalate	<1
85-68-7	Butylbenzylphthalate	<1
106-47-8	4-Chloroaniline	<1
88-74-4	2-Nitroanaline	<1
99-09-2	3-Nitroaniline	<1
100-01-6	4-Nitroaniline	<1
121-14-2	2,4-Dinitrotoluene	<1
606-20-2	2,6-Dinitrotoluene	<1
111-44-4	Bis(2-chloroethyl)ether	<1
101-55-3	4-Bromophenylphenylether	<1
7005-72-3	4-Chlorophenylphenylether	<1
67-72-1	Hexachloroethane	<1
87-68-3	Hexachlorobutadiene	<1
77-47-4	Hexchlorocyclopentadiene	<1
111-91-1	Bis(2-chloroethoxy)methane	<1
621-64-7	N-nitrosodi-n-propylamine	<1



Date Extracted: 25/03/08
Authorised By: Colm O'Leary

ALcontrol Geochem

Semivolatiles

Sample Identity - B01489-S0003 BH3
Client / Sample matrix - Golder Associates Ireland/water
Units - µg/l

CAS No	Compound	Conc.
108-95-2	Phenol	<1
95-57-8	2-Chlorophenol	<1
95-48-7	2-Methylphenol	<1
106-44-5	4-Methylphenol	<1
88-75-5	2-Nitrophenol	<1
100-02-7	4-Nitrophenol	<1
120-83-2	2,4-Dichlorophenol	<1
105-67-9	2,4-Dimethylphenol	<1
59-50-7	4-Chloro-3-methylphenol	<1
88-06-2	2,4,6-Trichlorophenol	<1
95-95-4	2,4,5-Trichlorophenol	<1
87-86-5	Pentachlorophenol	<1
541-73-1	1,3-Dichlorobenzene	<1
106-46-7	1,4-Dichlorobenzene	<1
95-50-1	1,2-Dichlorobenzene	<1
120-82-1	1,2,4-Trichlorobenzene	<1
98-95-3	Nitrobenzene	<1
103-33-3	Azobenzene	<1
118-74-1	Hexachlorobenzene	<1
91-20-3	Naphthalene	<1
208-96-8	Acenaphthylene	<1
83-32-9	Acenaphthene	<1
86-73-7	Fluorene	<1
85-01-8	Phenanthrene	<1
120-12-7	Anthracene	<1
206-44-0	Fluoranthrene	<1
129-00-0	Pyrene	<1
56-55-3	Benzo(a)anthracene	<1
218-01-9	Chrysene	<1
205-99-2	Benzo(b)fluoranthrene	<1

CAS No	Compound	Conc.
207-08-9	Benzo(k)fluoranthrene	<1
50-32-8	Benzo(a)pyrene	<1
193-39-5	Indeno(1,2,3-cd)pyrene	<1
53-70-3	Dibenzo(a,h)anthracene	<1
191-24-2	Benzo(ghi)perylene	<1
91-58-7	2-Chloronaphthalene	<1
91-57-6	2-Methylnaphthalene	<1
86-74-8	Carbazole	<1
78-59-1	Isophorone	<1
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131-11-3	Dimethyl phthalate	<1
84-66-2	Diethyl phthalate	<1
84-74-2	Di-n-butylphthalate	<1
117-84-0	Di-n-octylphthalate	<1
117-81-7	Bis(2-ethylhexyl)phthalate	<1
85-68-7	Butylbenzylphthalate	<1
106-47-8	4-Chloroaniline	<1
88-74-4	2-Nitroanaline	<1
99-09-2	3-Nitroaniline	<1
100-01-6	4-Nitroaniline	<1
121-14-2	2,4-Dinitrotoluene	<1
606-20-2	2,6-Dinitrotoluene	<1
111-44-4	Bis(2-chloroethyl)ether	<1
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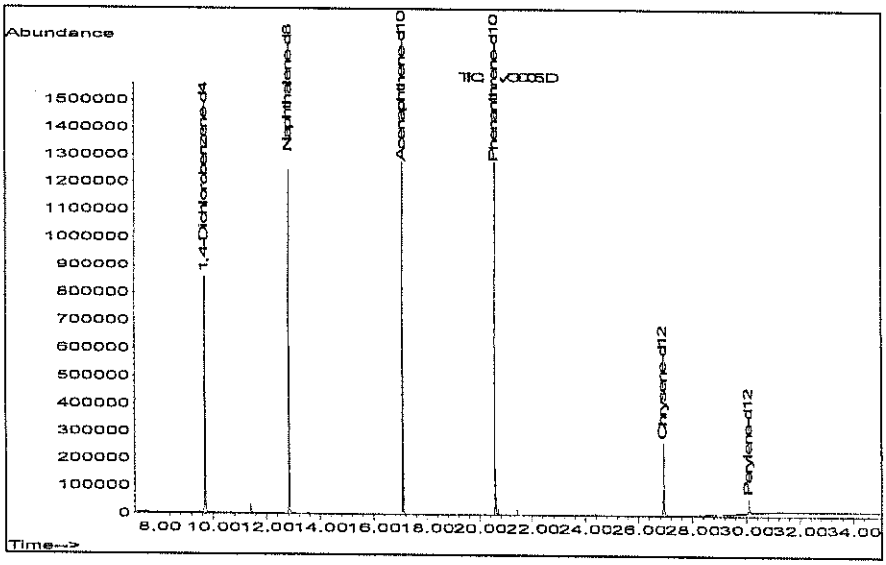
87-68-3	Hexachlorobutadiene	<1
77-47-4	Hexchlorocyclopentadiene	<1
111-91-1	Bis(2-chloroethoxy)methane	<1
621-64-7	N-nitrosodi-n-propylamine	<1



Date Extracted: 25/03/08
Authorised By: Colm O'Leary

APPENDIX

1. Results are expressed as mg/kg dry weight (dried at 30°C) on all soil analyses except for the following: NRA Leach tests, flash point, and ammoniacal N_2 by the BRE method, VOC, PRO, Cyanide, Acid Soluble Sulphide, SVOC, DRO, PAH, PCB, TPH CWG ,TPH by IR, OFGs and SEM.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. A sub sample of all samples received will be retained free of charge for one month for soils and one month for waters (sample size permitting), but may then be discarded unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, an asbestos screen is done in-house on soils and if no fibres are found will be reported as NFD – no fibres detected. If fibres are detected, then identification and quantification is carried out by ALcontrol Technichem or Alcontrol Shutlers in the UK . If a sample is suspected of containing asbestos, then drying and crushing will be suspended on that sample until the asbestos results are known. If asbestos is present, then no analysis requiring dry sample are undertaken.

7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace is present in the volatile sample.

8. NDP – No Determination Possible due to insufficient/unsuitable sample.

9. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.

10. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.

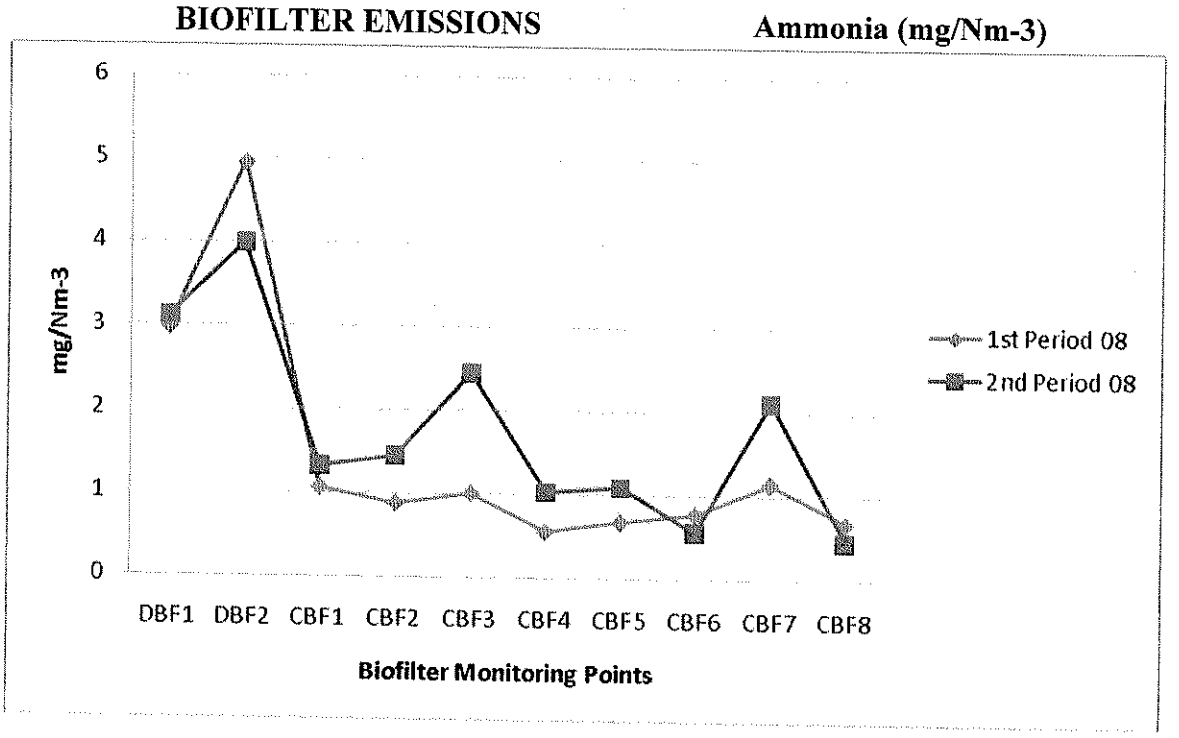
Last updated February 2005

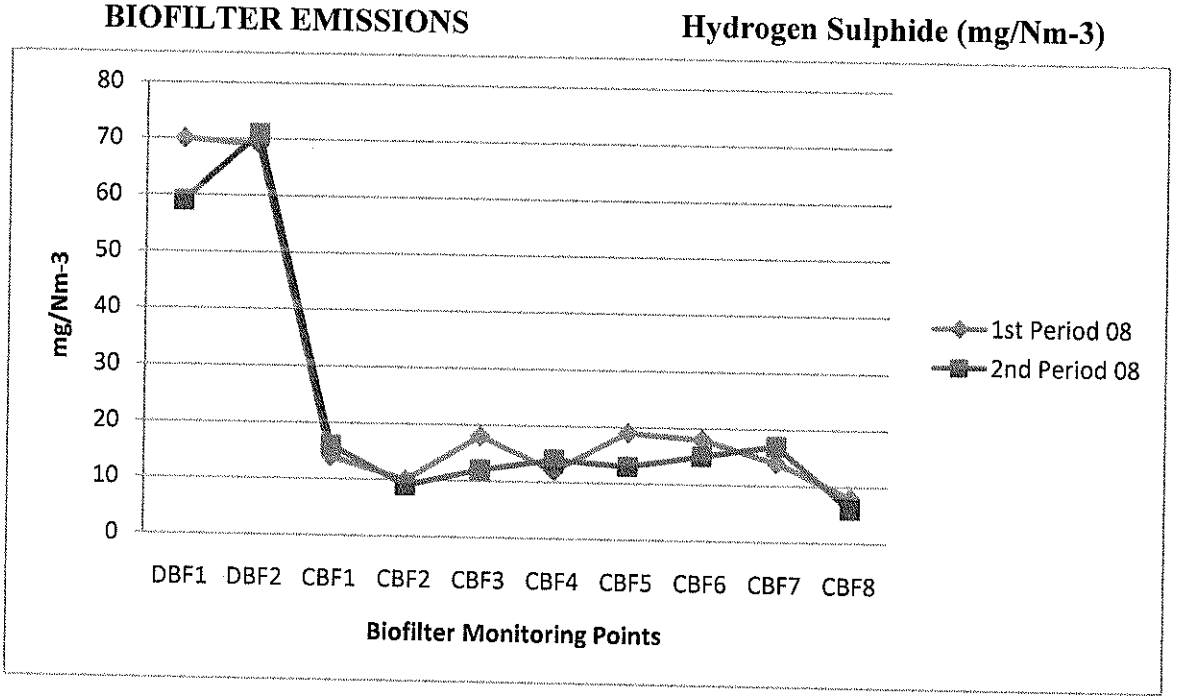
APPENDIX F

Section 2.4

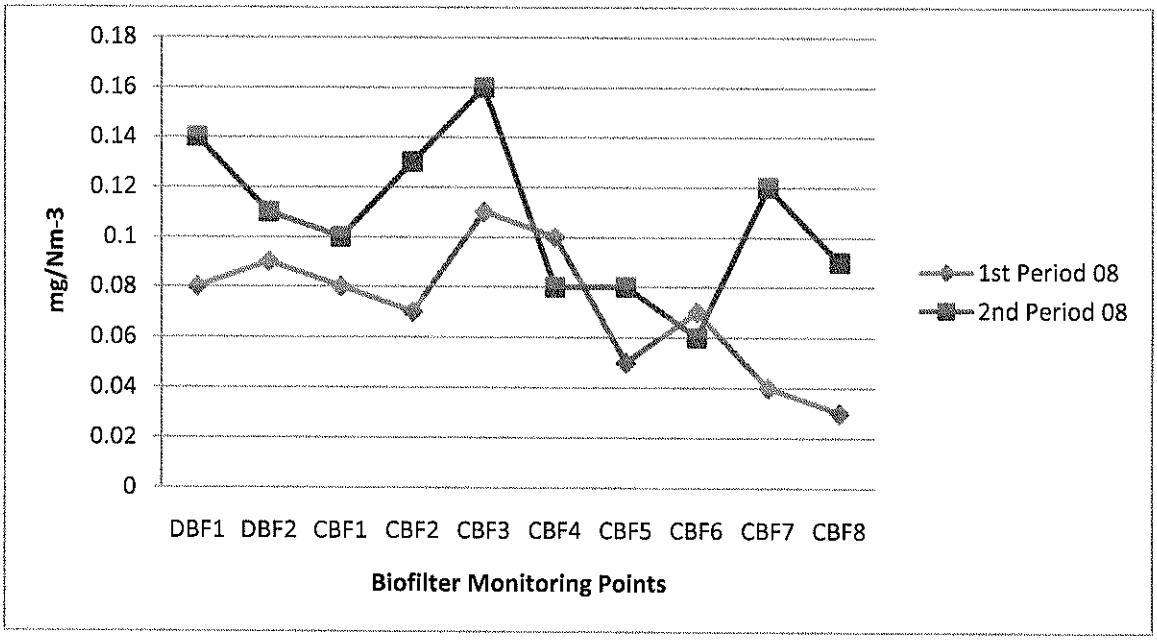
Biofilter Gas Emissions

BIOFILTER GAS EMISSIONS

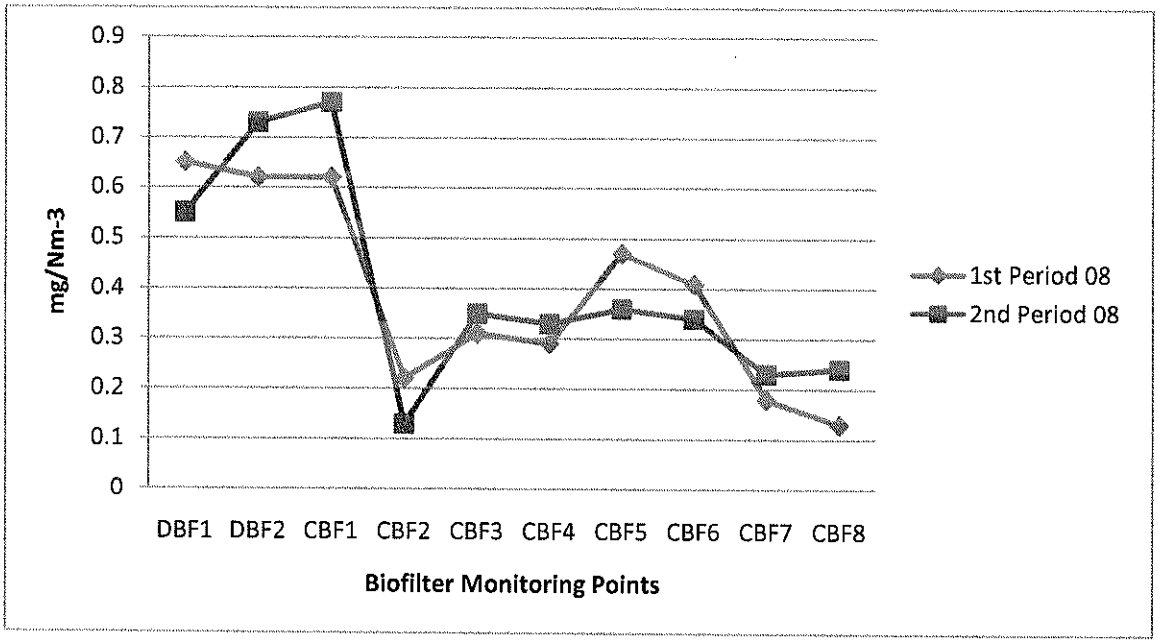




BIOFILTER EMISSIONS **Mercaptans (mg/Nm-3)**



BIOFILTER EMISSIONS **Amines (mg/Nm-3)**



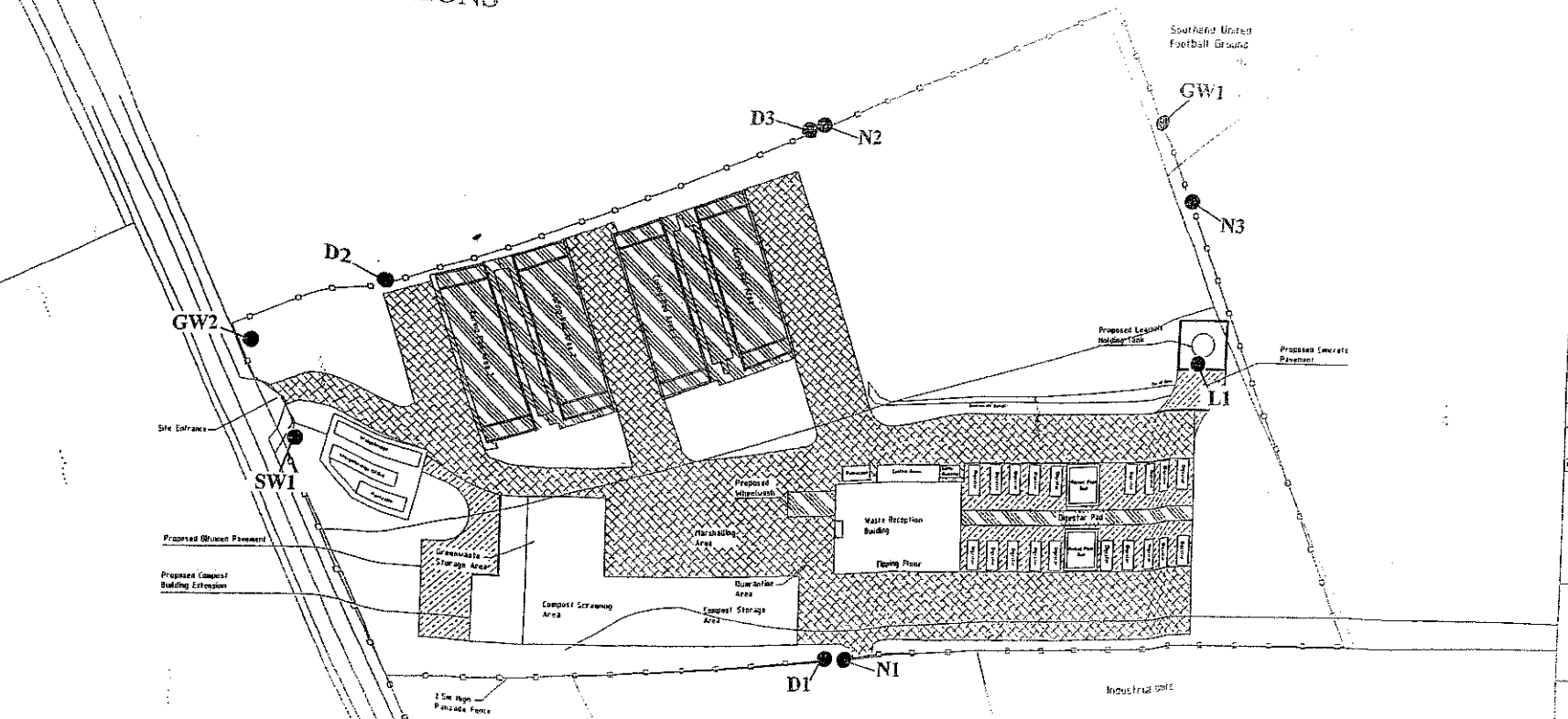
APPENDIX G

Section 11.0

Noise

WATERFORD CITY COUNCIL
COMPOST FACILITY

ENVIRONMENTAL MONITORING LOCATIONS



MONITORING LOCATIONS

GRID REFERENCES

NOISE
N1 E258344 N109524
N2 E258325 N109630
N3 E258408 N109609
NS1 E258058 N109985
NS2 E258794 N109543

DUST
D1 E258343 N109524
D2 E258240 N109597
D3 E258323 N109629

SURFACE WATER
SW1 E258227 N109555

LEACHATE
L1 E258391 N109577

GROUNDWATER
GW1 E258397 N109629
GW2 E258213 N109583

Rev.	Drawn	Chkd	Appd	By	Date	Description
A	GMC	TH	PK	Cork 17.04.07		ISSUE FOR APPROVAL

Name of Client
WATERFORD CITY COUNCIL

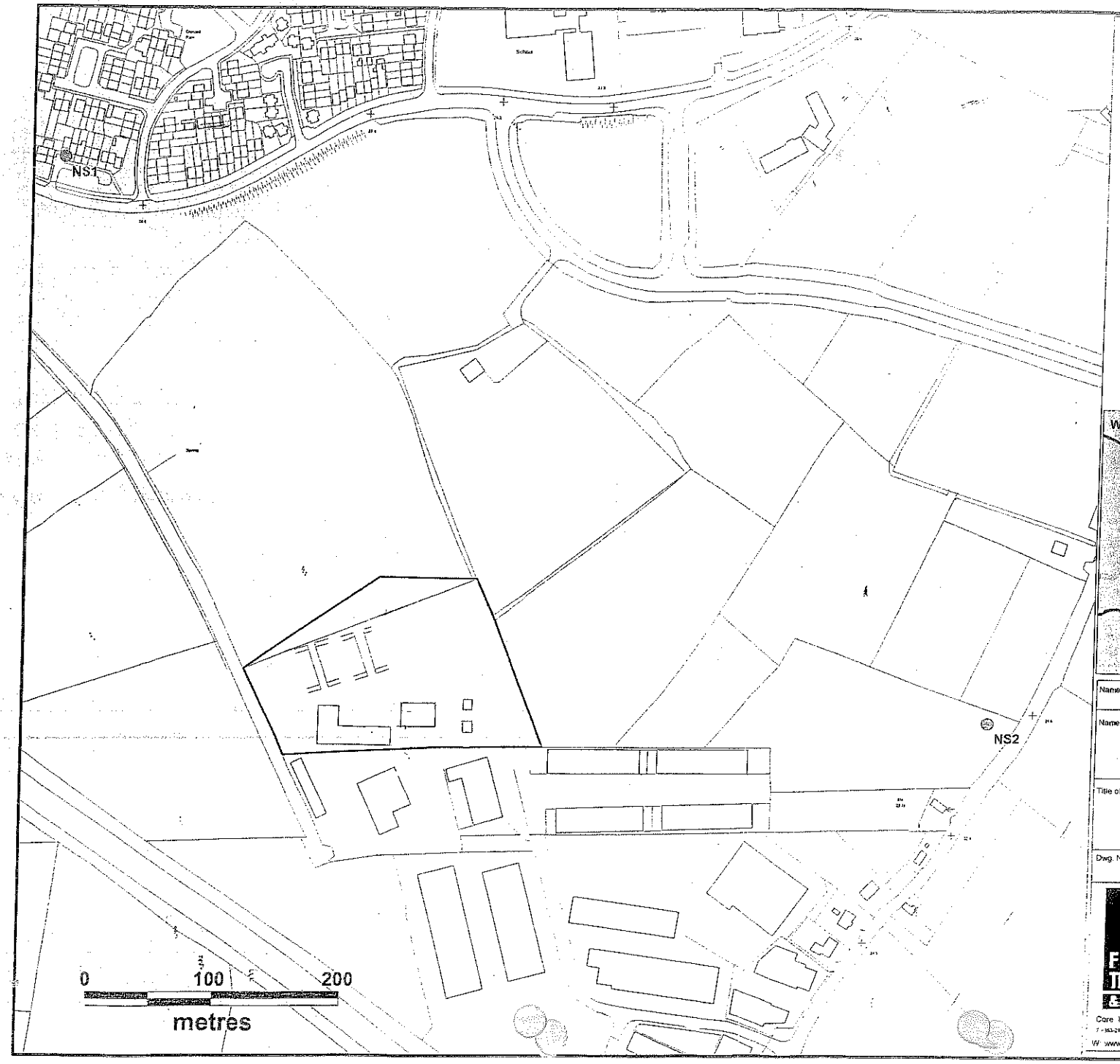
Name of Job
KILEARRY COMPOSTING FACILITY
WASTE LICENCE APPLICATION

Title of Drawing
ENVIRONMENTAL MONITORING LOCATIONS

Scales Used
A1 - 1:500, A3 1:1000

Dwg. No. 2006-289-01-301 | Rev. A

FEHILY TIMONEY COMPANY
CONSULTANTS IN ENGINEERING & ENVIRONMENTAL SCIENCES
Core House, Pouladuff Rd, Cork, Ireland.
T:+353-21-4964122, F:+353-21-4964464
Mill House, Ashtown Gate, Navan Rd, Dublin 15, Ireland.

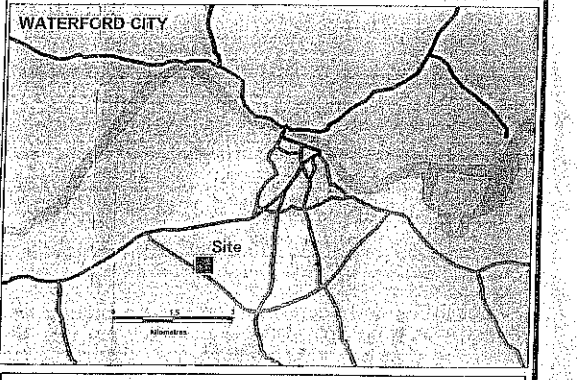


MONITORING LOCATIONS

GRID REFERENCES

NOISE SENSITIVE LOCATIONS

NS1 E258058 N109985
NS2 E258794 N109543



Name of Client	WATERFORD CITY COUNCIL
Name of Job	KILBARRY COMPOSTING FACILITY WASTE LICENCE APPLICATION
Title of Drawing	ENVIRONMENTAL MONITORING LOCATION MAP
Dwg. No.	2006-289-01-FIGURE E.1
Rev.	A

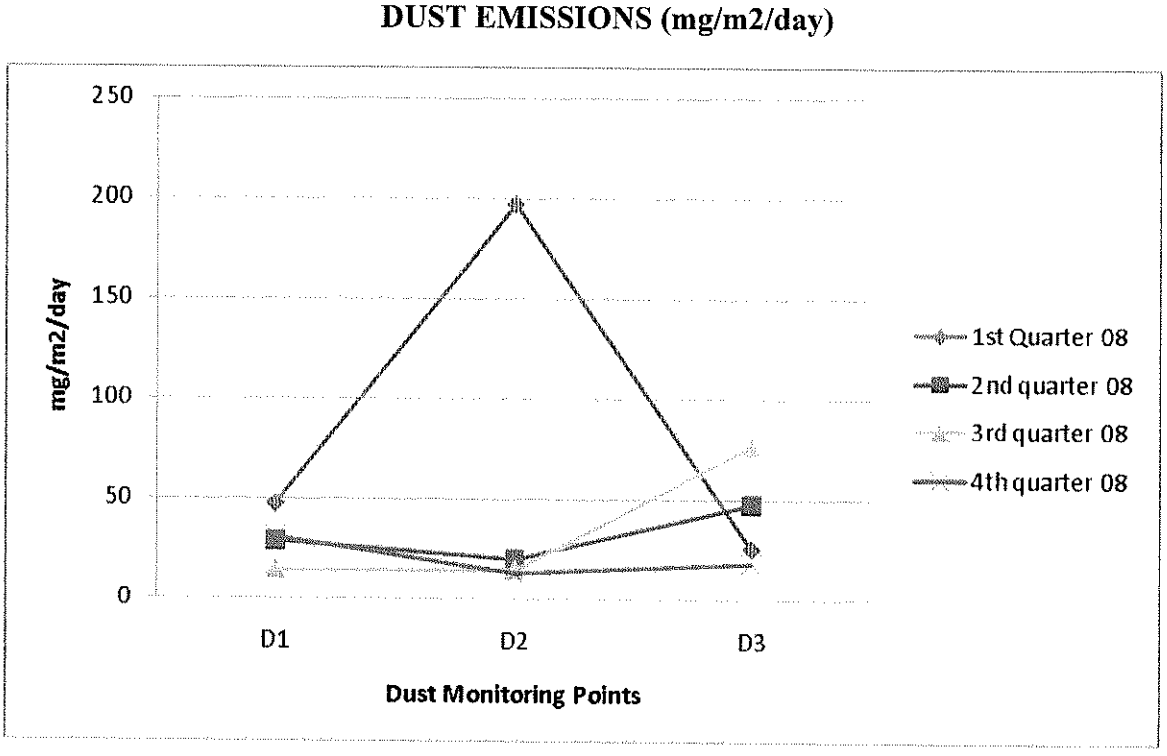
FEHILY TIMONEY & COMPANY
CONSULTANTS IN ENGINEERING & ENVIRONMENTAL SCIENCES
Core House, Pouladuff Rd, Cork, Ireland.
Mill House, Ashtown Gate, Navan Rd, Dublin 15, Ireland
W: www.fehilytimoney.ie, E: info@ftco.ie

APPENDIX H

Section 12.1

Dust Monitoring

DUST EMISSIONS



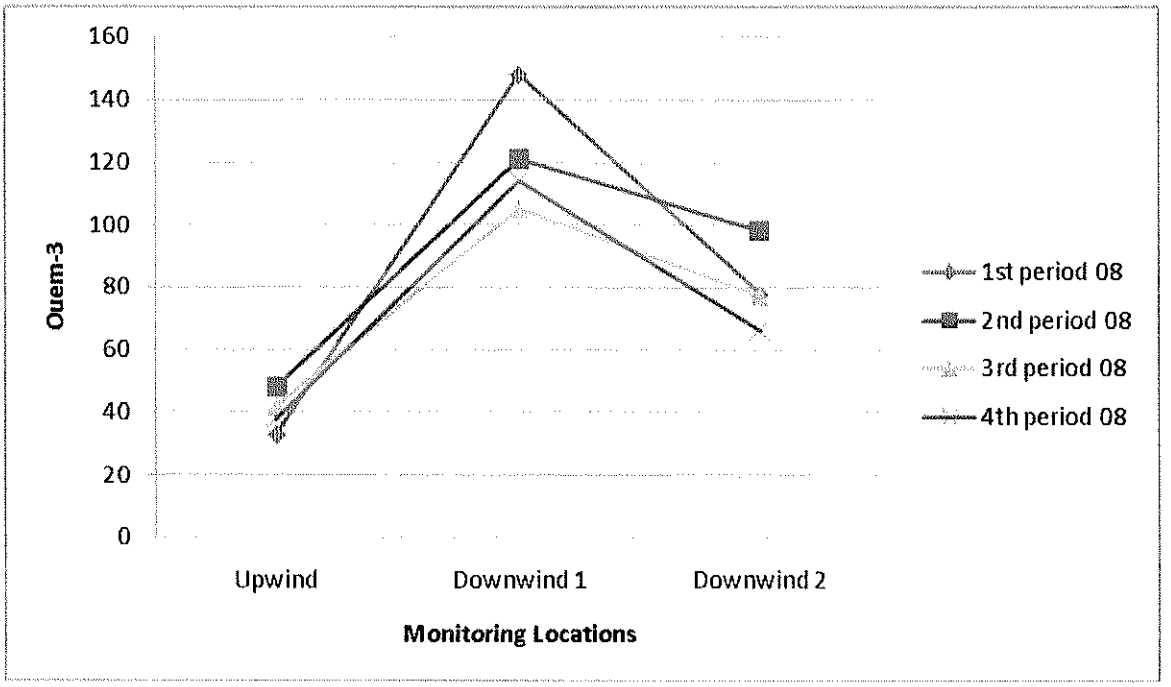
APPENDIX I

Section 12.2

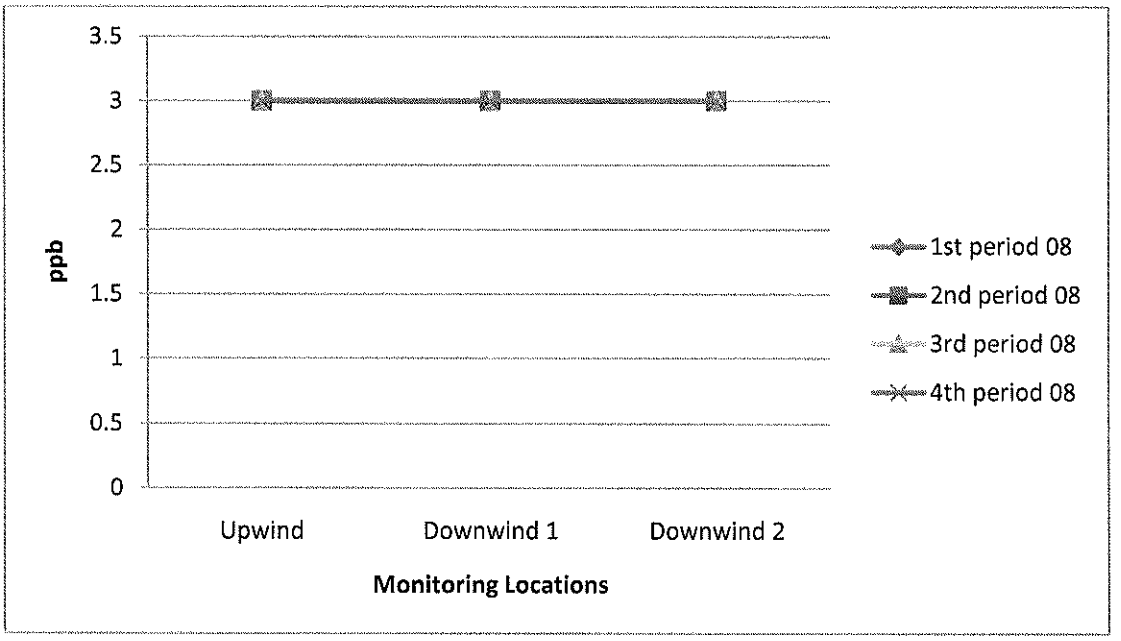
Odour Measurement

ODOUR MEASUREMENT

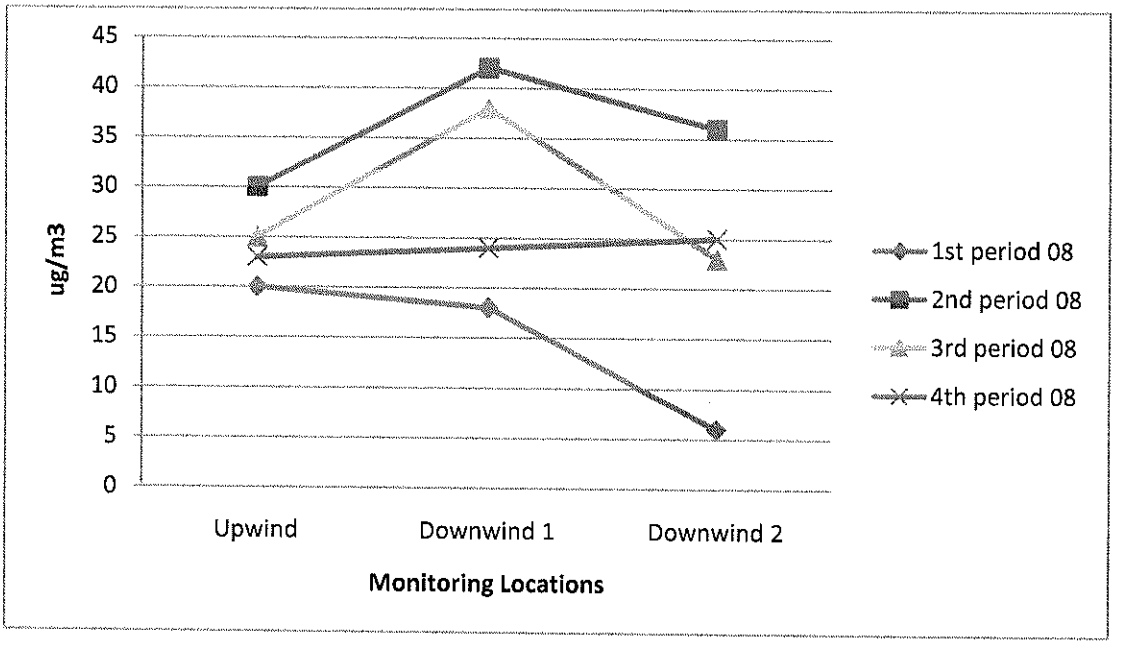
ODOUR MEASUREMENT **Odour Threshold Conc. (OUEM-3)**



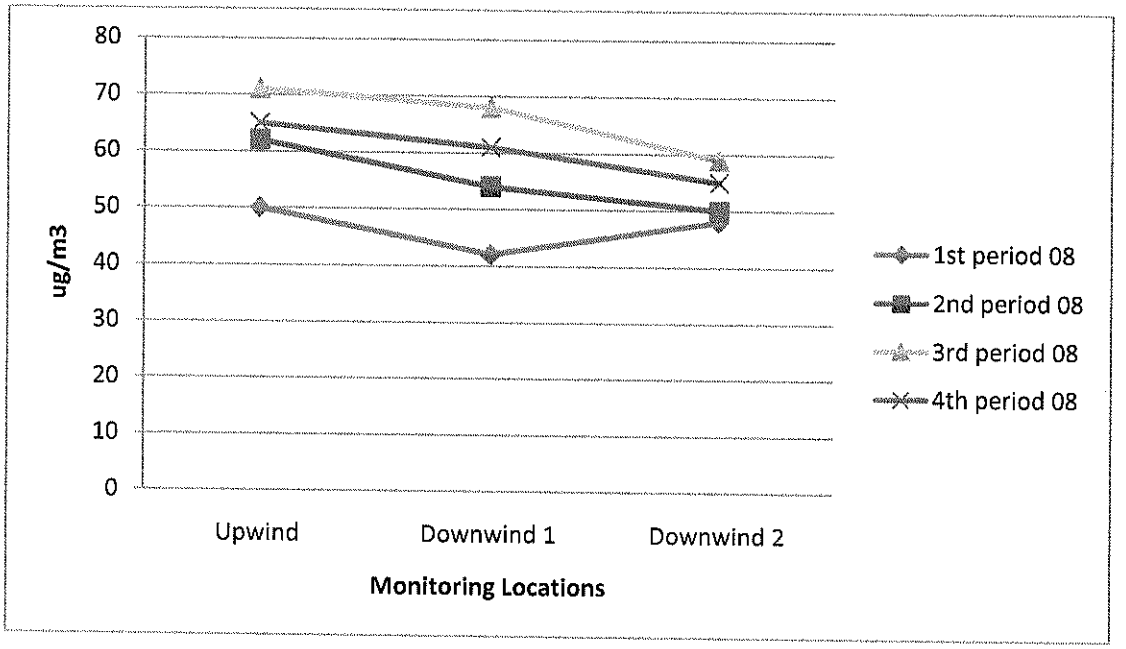
ODOUR MEASUREMENT **Hydrogen Sulphide (ppb)**



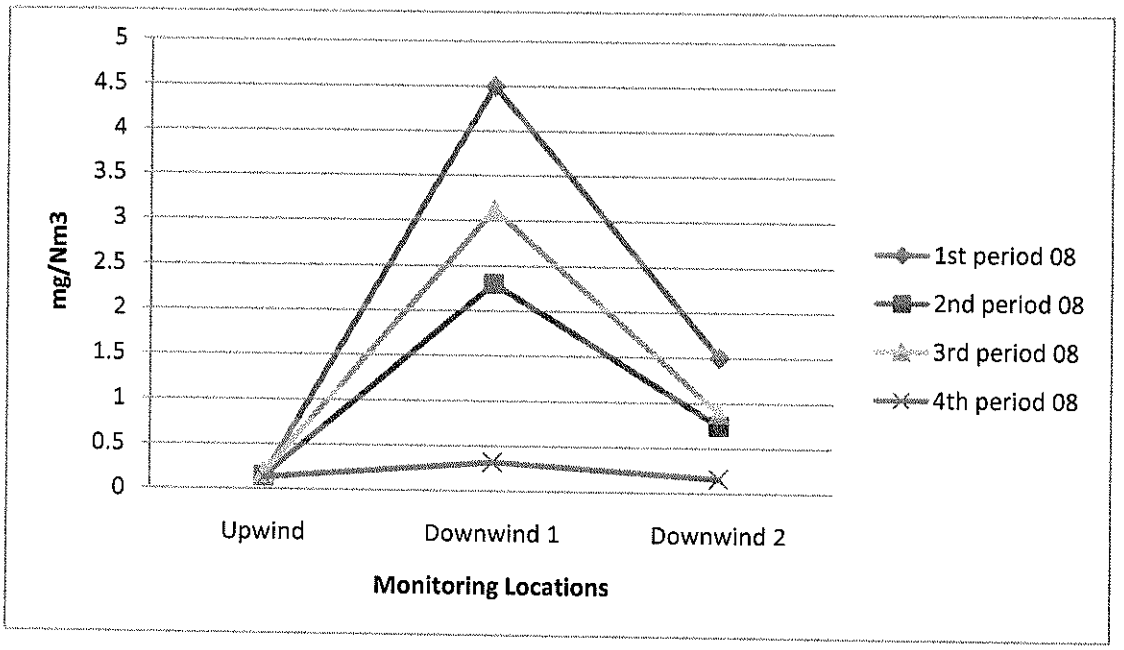
ODOUR MEASUREMENT Mercaptans (ug/m3)



ODOUR MEASUREMENT Amines (ug/m3)



ODOUR MEASUREMENT Ammonia (mg/Nm3)



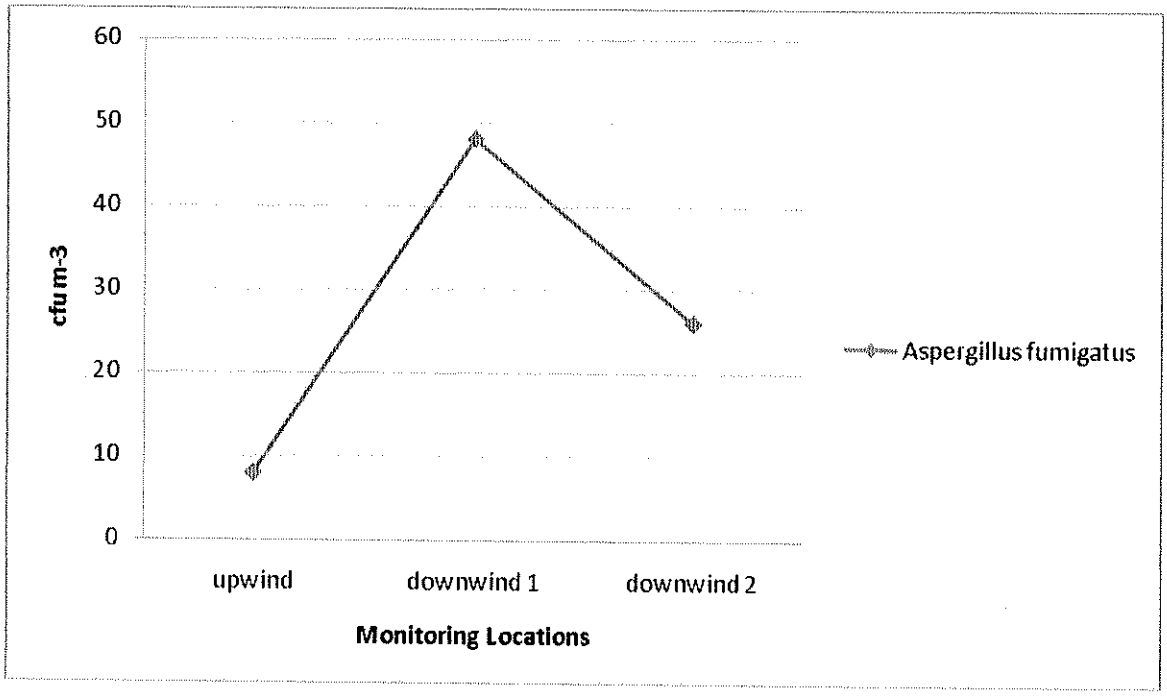
APPENDIX J

Section 12.4

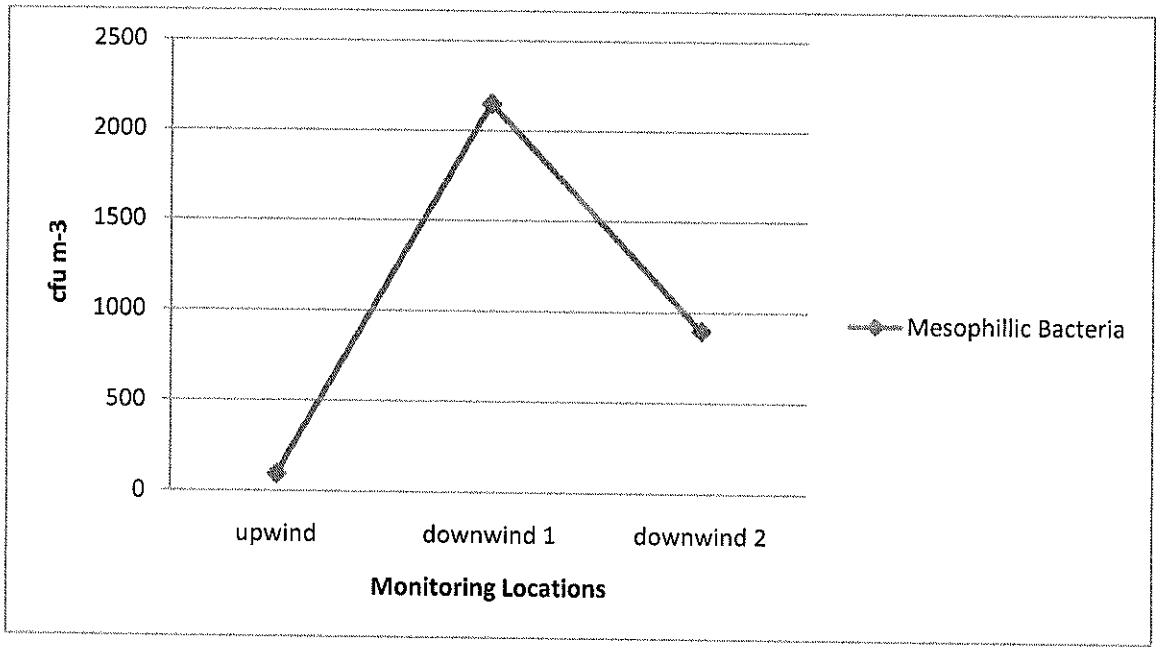
Bioaerosols

BIOAEROSOL EMISSIONS

BIOAEROSOL EMISSIONS **Aspergillus fumigatus (cfu m-3)**



BIOAEROSOL EMISSIONS **Mesophillic Bacteria (cfu m-3)**



APPENDIX K

Section 13.2

Integrity Testing Certification

QUALITY WITHOUT COMPROMISE

Compost Facility
Green Road
Killbarry
Waterford.

BO'R
CONSTRUCTION

Brendan O'Rourke Construction L
Unit 5A, Six Cross Roads Business Park, Waterfor
Tel/Fax: (051) 871733 Mobile (087) 256019
E.Mail: borconstruction@eircom.n

January 25, 2008

To whom it may concern,

Brendan O Rourke Construction Ltd are the main contractors to Waterford City Council at the Killbarry Composting Site and we are engaged in a contract for Immediate Civil Works, as part of this contract we installed a Leachade Storage tank C/W Bund Wall and 2no. Pump Chambers all of which were subjected to a 48Hour Test for Leakage , the results were all positive No Leaks. I hope clarifys the situtation, should you have any queries please don't hesitate to call,

Yours sincerely Brendan O Rourke

Brendan O'Rourke Construction Ltd.
Unit 5A, Six Cross Roads Business Park, Waterford.
Tel/Fax (051) 871733 Mobile (087)2560190
E.mail: borconstruction@eircom.net

Directors: B. O'Rourke, M. O'Rourke
Company Reg. No. : 190393
V.A.T. No.: IE 6590393 U

CONSTRUCTION INDUSTRY FEDERATION

APPENDIX L

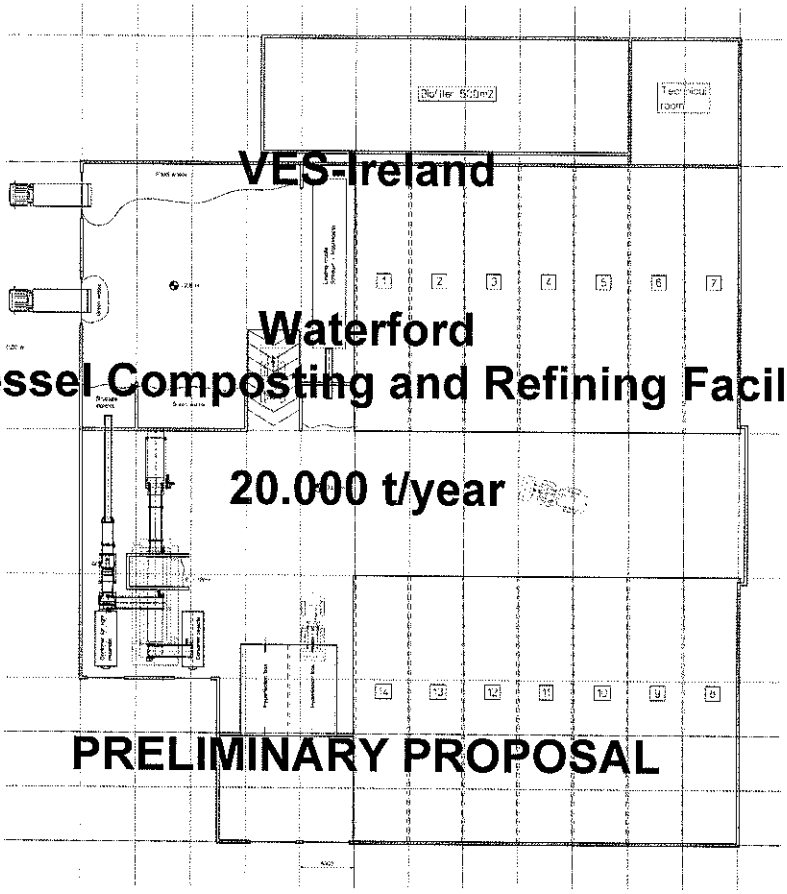
Section 19.0

Infrastructural Works

WASTE TREATMENT TECHNOLOGIES

ISO 9001:2000

Bedrijvenpark Twente 412, 7602 KM Almelo, The Netherlands
Tel. +31 (0)546 581230 / Fax +31 (0)546 579 000
E-mail: info@wtt.nl / Homepage: www.wtt.nl



VES-Ireland

Waterford
In Vessel Composting and Refining Facility

20.000 t/year

PRELIMINARY PROPOSAL

Offer : 27016

Date : January, 21st, 2009

Following your request, we are pleased to submit to your kind attention our preliminary and budget proposal for a 20.000 tpy capacity facility for the treatment of food and green source separated waste. The facility includes the following sub-systems:

- Waste preparation (mixing)
- In Vessel Composting
- In Vessel Compost Hygienisation
- Compost Refining

1. TECHNICAL PROPOSAL

Please refer to flow diagrams, mass balances and layouts already in your hands.
It goes without saying that we are available for providing a complete technical proposal whenever required.

2. COMMERCIAL CONDITIONS

Prices

Prices shall be considered as budget to be confirmed after final agreement on specific equipment and scope of supply.

COMPOSTING AND HYGIENISATION SYSTEMS **EURO 3.580.000**

Including:

- Phase 1 Tunnels (4 units)
- Phase 2 Tunnels (5 units)
- Maturation Tunnels (5 units)
- Hygienisation Tunnels/Boxes (2 units)
- General air treatment system
- Water treatment system
- Electrical and automation systems
- Transportation to site and installation
- Engineering, project management, supervision to start-up and training services

EQUIPMENT **EURO 1.080.000**

Including:

- KOMPTECH MASHMASTER Mixer and auxiliary equipment
- KOMPTECH 3-stage trommel screen
- KOMPTECH HHURRIKAN Air classifier
- Conveyors
- Dedusting unit
- Electrical and automation systems

- Transportation to site and installation
- Engineering, project management, supervision to start-up and training services.

All prices are subject to applicable VAT.

Other commercial conditions

- Delivery: DDU on site (INCOTERMS 2000)
- Validity of the offer: 90 days
- Other commercial conditions such as payments, delivery time etc. shall be agreed upon at a later stage of the project

Main exclusions

The scope considers a complete supply for the process electro-mechanical equipment.
Main exclusions are as follows:

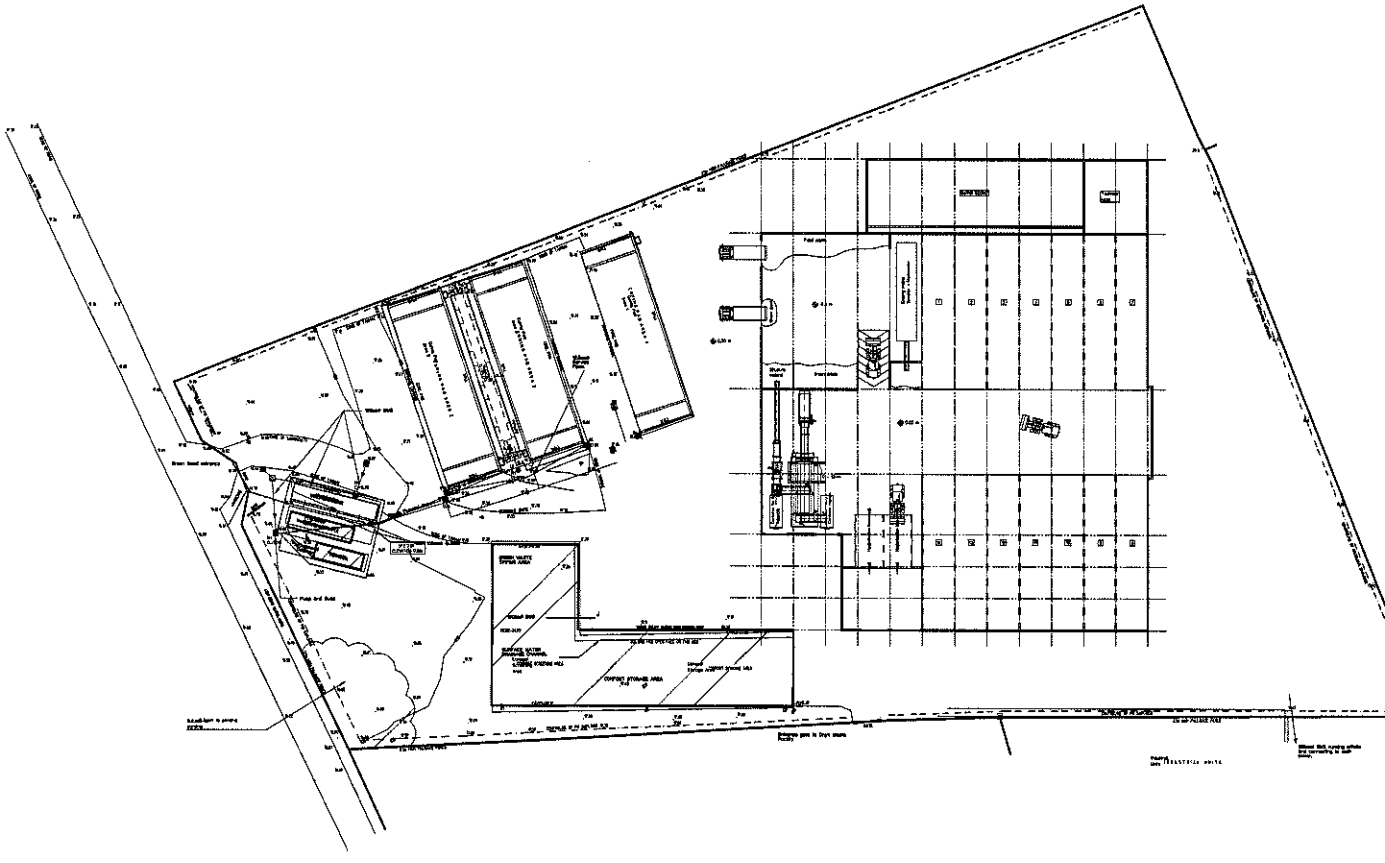
- All civil works and buildings and infrastructures
- Auxiliary systems (lighting, earthing, fire fighting, TVCC, etc)
- Underground piping (except tunnel spigot pipes)
- Electrical supply to our process switchboards, including transformers, power centres, power factor compensation, etc.
- Connection to battery limits of water and compressed air
- Containers, skips, wheel loaders, fork lifts, etc.
- Biofilter concrete floor and filling material
- Spare parts and consumables

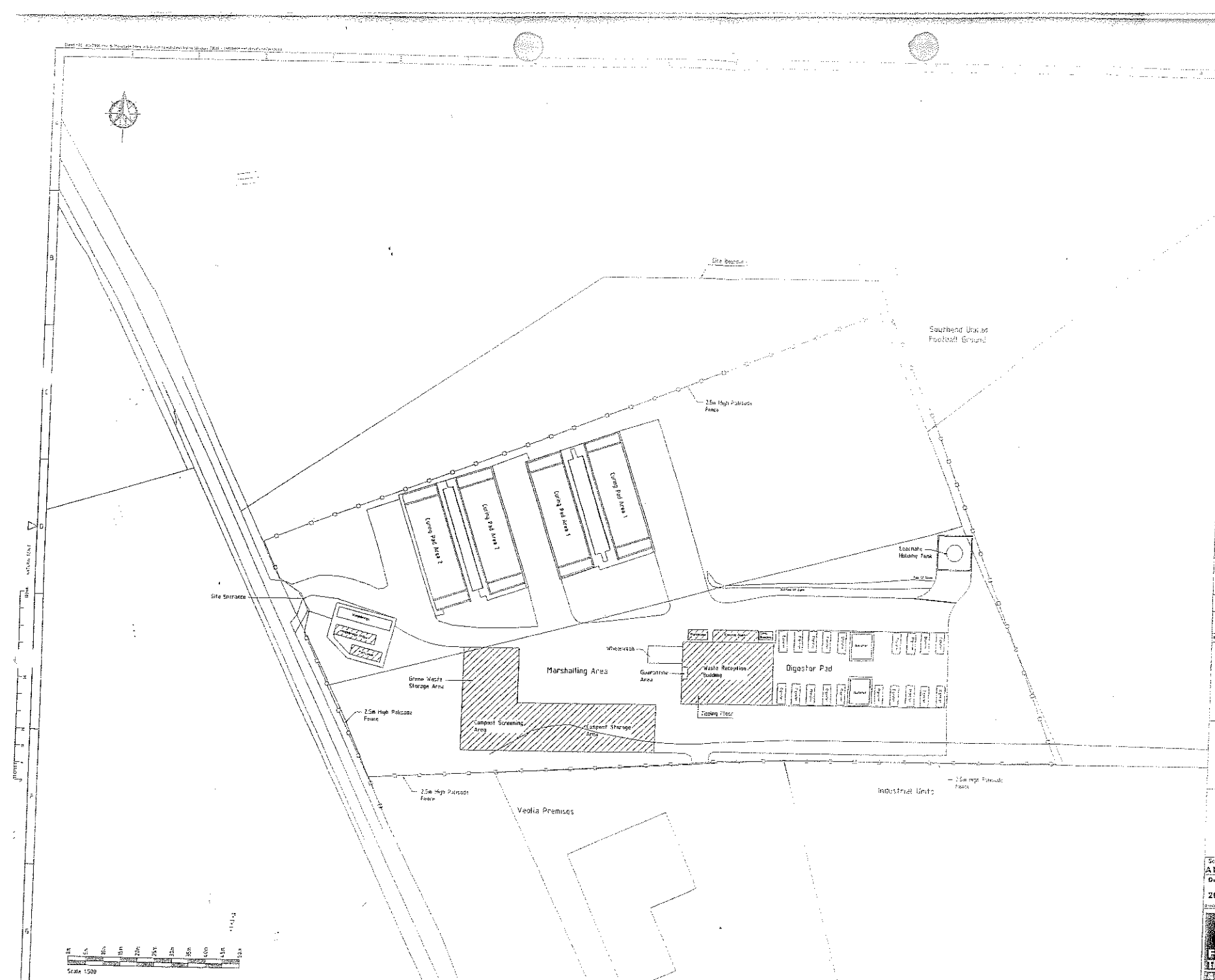
We hope that the above provides you with enough information at the moment but please consider this proposal as a basis for future discussions. Whenever requested, WTT will provide all the technical details required to define specifically all the proposed equipment.

Hoping that the above meets your expectations, we remain at your disposal for any further clarification of information you may need.

Yours faithfully,

Waste Treatment Technologies B.V.
Luca Eichenberg
Commercial Director





A	Clark	18.11.06	ISSUE FOR APPROVAL
Rev.	Drawn	Check	Approved
			Rev Origin Date

Description

Revision History

Name of Client

WATERFORD CITY COUNCIL

Name of Job

KILBARRY COMPOSTING FACILITY
WASTE LICENCE APPLICATION

Title of Drawing

EXISTING SITE LAYOUT

Scales Used

A1 - 1:500, A2 1:1000

Dwg. No.

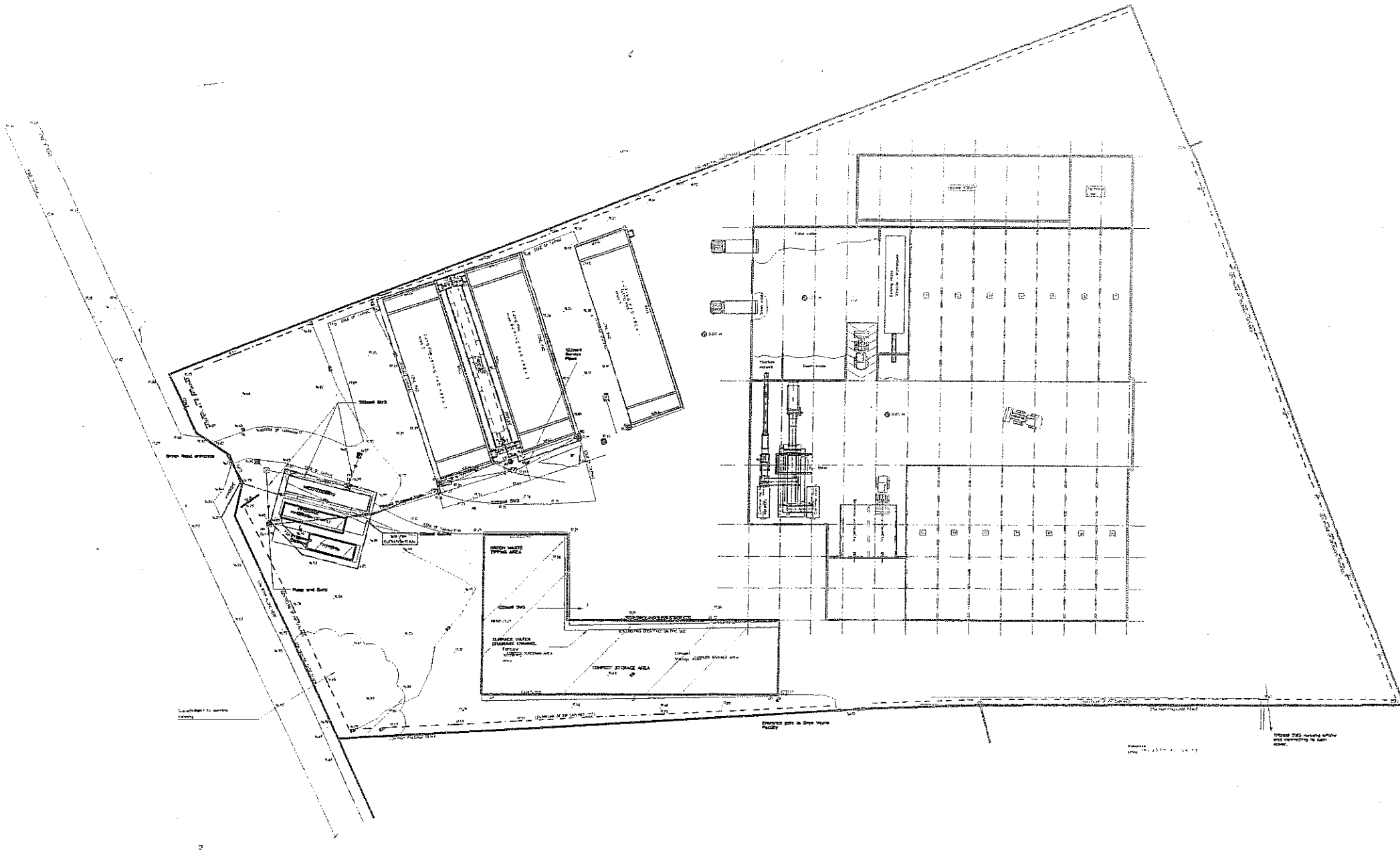
2006-299-01-101

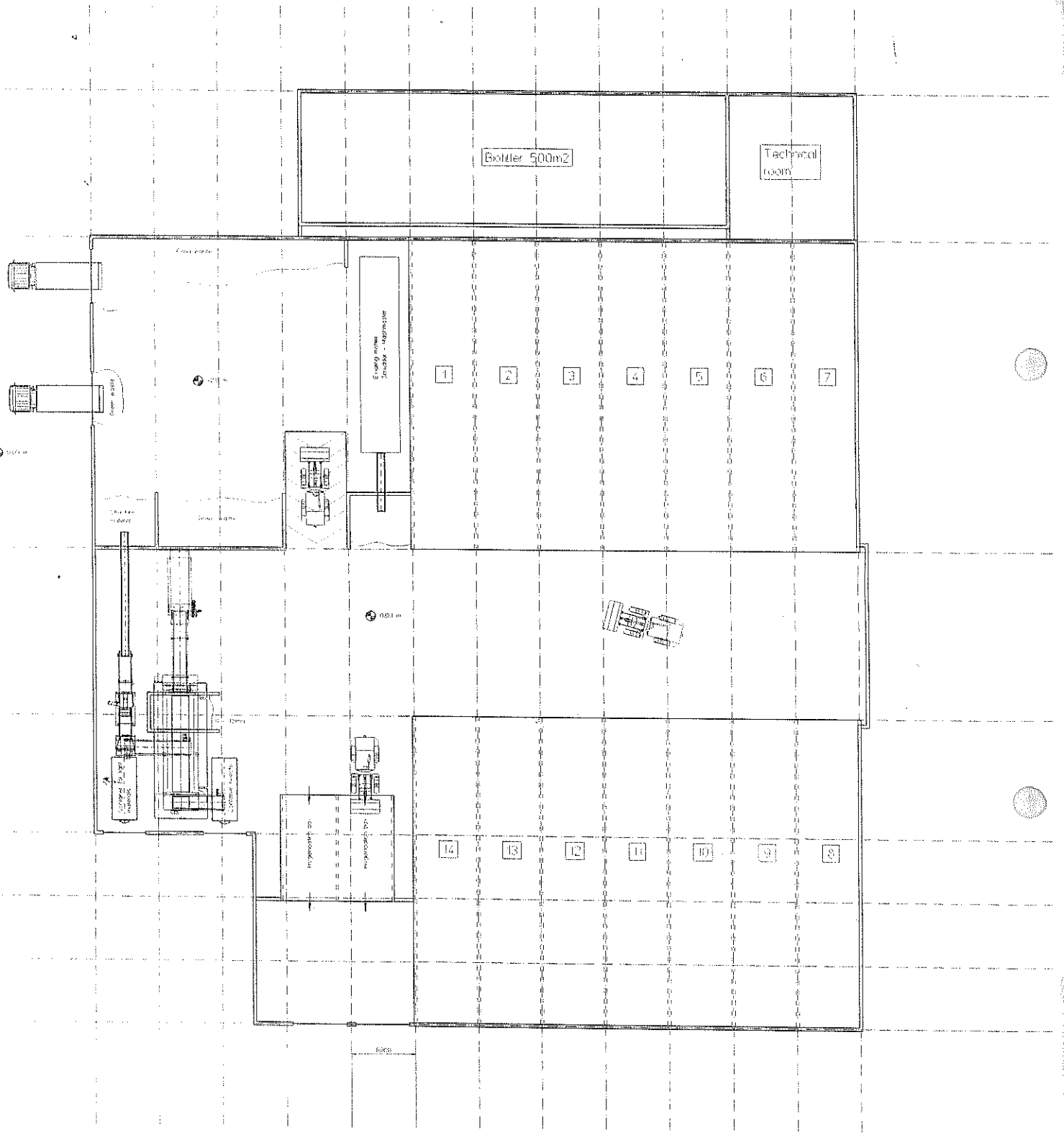
Rev.

A

FEHILY TIMONEY COMPANY

CONSULTANTS IN ENGINEERING & ENVIRONMENTAL SCIENCES




Bottler 500m2
Technical room
1
2
3
4
5
6
7
14
13
12
11
10
9
8

APPENDIX M

Section 20.0

Risk Assessment Documentation

4.2.3 Step 3: Environmental Liability Risk Assessment (ELRA) – Unknown Liabilities

The methodology used for the risk identification component of the ELRA is as follows;

1. Identification of possible hazard **sources.**
2. Identification of potential hazard **pathways.**
3. Identification and assessment of environmental **receptors** for those identified pathways.

The aim of the process is to provide an analysis of the environmental conditions at the compost facility so to provide a baseline by which environmental liabilities may be established and assessed.

Identification of the environmental pathways and receptors has been undertaken with reference to Waste Licence W00234-01 issued 20th December 2007, and in light of the environmental monitoring undertaken over the course of 2008.

Those receptors that are potentially susceptible to adverse impacts include human beings, air, soils, groundwater, surface water, adjoining landuses and occupants of nearby residences. Air, surface water and groundwater also act as pathways to human beings.

Environmental assessments completed as part of the application for the waste licence established that there are no significant current or historical environmental liabilities associated with the facility. The potential for future environmental liabilities is confined to impacts associated with licensed and unexpected emissions from the facility during the operational and post closure phases. Environmental liabilities are deemed to include contamination or damage to environmental media (air, surface water, soils and groundwater) which can act as pathways to sensitive receptors.

It is considered that there are no short, medium or long term environmental liabilities associated with potential nuisances (litter, dust, noise and birds) from the composting activities. These potential nuisances, which are considered to represent minor risks, are subject to individual conditions in the Waste Licence (Condition 6) and are amenable to effective control. Future environmental liabilities are therefore confined to incidents such as fires, spills and leaks. A facility specific assessment of the risks presented by such incidents is presented below in sections 4.2.3.1 to 4.2.3.8.

4.2.3.1 Surface Water

Waterford City Council is required to monitor surface water emissions from the facility on a quarterly basis in accordance with the licence. At present surface water and storm water enter the Six Cross Roads Business Park foul sewerage system and travel on to the Waterford City Council sewerage treatment system and then enter the River Suir via the sludge/grit trap collection system located in the Waterpark Area of Waterford City. Waterford City Council have recently

constructed a municipal waste water treatment plant within the City. Waterford City Council are currently investigating the installation of a grit trap and sand filter system to coincide with the installation of an oil/water interceptor for surface water at the facility. It is intended to redevelop the site in 2009 and at that time, separation of surface water collected at roof run-off will be reused in the production process where possible.

Surface water grab samples are analysed on a quarterly basis for COD, BOD, Suspended Solids, and Ammonia (as N) as required by table C.2.2 of the facility waste licence with daily visual checks made by staff members.

4.2.3.2 Groundwater

There will be no direct or indirect controlled emissions to ground or groundwater. The facility design, construction and method of operation attempt to minimise the risks of future releases to soil and groundwater.

The licence requires monitoring of groundwater at locations up-gradient and down-gradient of areas of the facility where operational activities will be carried out. The monitoring includes the range of parameters specified in Schedule C.5 of the Waste Licence.

Any exceedance in the down-gradient wells above levels arising as a result of the facility operations will be treated as an incident, and investigated. The investigation findings will form the basis for corrective action at the earliest possible opportunity if contamination is identified. This will minimise the potential for a serious deterioration in groundwater quality. Therefore, any potential emissions are associated with unexpected releases e.g. spills or leaks of leachate and oils, fire water run-off etc.

4.2.3.3 Leachate Management

Leachate is produced during the compost digestion and maturation processes. A leachate management system at the facility consisting of dedicated pumping systems and drainage works pump any leachate formed on the digester pads and the maturation pads to the leachate storage tank. Approximately 1400 m^3 of leachate and rainwater was collected during 2008, which was transferred to the holding tank. Approximately 0.5 m^3 of process water is used per 1 m^3 of waste. This water is used to maintain moisture which evaporates to the atmosphere. A road sweeper with water spraying capabilities sweeps the main yard daily and all process water is transferred to the holding tank. The leachate in the holding tank is tankered on a regular basis and removed to the local waste water treatment plant (WWTT). The WWTP is currenly operational and the commissioning phase is due for completion by April 2009. It is the intention of Waterford City Council to re-direct all leachate produced on site to this WWTP in the interim period before construction of the new compost facility is completed.

The facility will maintain an adequate supply of containment booms and/or suitable absorbent material to contain and absorb any spill at the facility. Facility personnel will be provided with appropriate training to deal with any such incidents.

All significant spillages will be treated as an incident as specified in Condition 9.4.2 of the Waste Licence. The documented emergency response procedures set out in the Veolia Facility Environmental Manual and the aforementioned Emergency Response Procedures will in conjunction with the provision of appropriate training to facility personnel, ensure a rapid response to any incident.

4.2.3.4 Emissions to Air

Emissions to air including ammonia, H^2S, Mercaptans and amines. The facility is subject to routine bi-annual emissions to air monitoring as specified in Schedule C of Waste Licence W0234-01. Dust deposition monitoring is carried out at the facility on a quarterly basis.

In addition, CLEANAIR odour control aqueous concentrate is used at the facility. This solution is characterised on the MSDS as having no adverse environmental impact.

Currently, 4 no. reports have been prepared by Odour Monitoring Ireland in relation to the bio-filter units on facility at the digester units as well as for odour and volatile organic compounds. All odour impact assessments carried out to date have indicated that all levels are within licence limits as specified in Schedule C.5 of the Waste Licence.

An exceedance of any emission limit or trigger limit or any emission arising as a result of the facility operations that does not comply with requirements of the Waste Licence will be treated as an incident and will be investigated and addressed in accordance with Condition 9.3. This will ensure that any impacts associated with the emission will be transitory and will have no long term impact.

The monitoring and assessments will ensure that the regular emissions will be well characterised and controlled. The potential for unexpected releases to air is considered to be confined to incidents such as a fire and other possible incidents such as a problem with the bio-filters on facility.

4.2.3.5 Human Beings

The surrounding land use is mainly characterised as low industrial with the Six Cross Roads Business Park adjoining the composting facility. The Outer Ring Road lies to the north of the facility. New housing has been developed in the Kilbarry and Ballybeg areas and these developments accompany the already well established housing in the area. There are 2 No. local schools within a 1k m radius of the compost facility footprint, with the nearest dwelling being ca. 250m away.

4.2.3.6 Materials Stored On-Facility

As part of the odour management system at the facility, approximately 8,000 litres of CLEAN-AIR odour neutralising aqueous concentrate is used annually but a maximum of 1,000 litres is stored at the facility at any one time. The Material Safety Data Sheet (MSDS) indicates that the material is non-hazardous to human, animal or plant life. It is stored externally on a polyethylene portable bund.

Approximately 200 litres of engine oil is used annually. The MSDS indicates that the product generally does not present any health hazards. However, prolonged handling of the product without protective gloves can lead to dermatitis. The material is stored on a portable polyethylene bund on facility away from any forms of ignition.

Approximately 200 litres of lubricant oil is used annually at the facility. This material is a combination of highly refined base oils and additives. It has no significant health effects but prolonged use without appropriate Personal Protection Equipment (PPE) can lead to dermatitis.

Diesel is used by the vehicles at the facility and accounts for a total approximate usage of 20,000 litres per annum. The vehicles are fuelled off-site and as a result no diesel is stored at the facility. The MSDS terms the material as automotive gas oil. All facility vehicles are fuelled from a store at the adjacent Veolia environmental waste transfer station .

There is the potential for spills and leaks to occur during the refuelling of facility plant, filling of the storage tank and during the handling and storage of virgin and waste lubricants and hydraulic fluids. The storage tank and oil storage areas will be constructed and maintained in accordance with the specifications set in Condition 3.6 of the Waste Licence.

Veolia have prepared and implement written procedures for the proper handling of all oils at the facility, which includes the proper corrective actions to be taken in the event of a spill. The facility will maintain an adequate supply of containment booms and/or suitable absorbent material to contain and absorb any spill at the facility. Facility personnel will be provided with appropriate training to deal with any such incidents. Photographs of the storage container and spill kits are presented in the photographic montage presented in Appendix 1.

All spills will be treated as an incident, as specified in Condition 11.1 of the Waste Licence. Any incident will be investigated in accordance with Condition 9.3 of the Waste Licence and the investigation findings will form the basis for corrective action.

In the event of a release of oils to ground during a spill or leak, it is considered unlikely based on the ground conditions, that it will have a long term impact on soil and groundwater quality. However, the significance of any impacts will be assessed during the investigation of the incident. If considered necessary remedial measures will be implemented.

4.2.3.7 Wastes Generated and Stored On-facility

The only wastes generated at the facility by the facility operations include leachate, sanitary wastewater and wastewater from the wheel wash, waste oils, office food waste and unsuitable material that is removed to landfill.

Sanitary wastewater and the water from the wheel wash will be discharged to the leachate collection system and pumped to the leachate holding tank. Leachate is removed for treatment and disposal at a wastewater treatment plant approved by the Agency.

The oils and batteries will be stored in the bunded area. Wastes are removed off-facility at regular intervals for treatment at appropriately licensed waste treatment facilities, which have been previously approved by the Agency.

4.2.3.8 Fire Water Run-Off

The potential sources of ground or groundwater contamination in an emergency situation is confined to a major fire-water run-off.

The ERP, which is required under Condition 9.2 of the Waste Licence, will include a risk assessment to determine the requirements at the facility for firewater retention facilities.

In the event of release to ground during an incident such emissions are considered unlikely, based on the ground conditions to have long term impacts on soil and groundwater quality. However, the significance of any impacts will be assessed during the investigation of the incident. If considered necessary remedial measures will be implemented.

A stock of suitable materials to smother any fires are kept at suitable locations. Section 5.1 of the facility emergency response Procedure (ERP) details the procedures that must be followed in the event of a fire. In summary, the procedures are:

- If able to and if personal safety is not compromised, a staff member may attempt to fight a small fire provided that they have a safe egress point and a point of safety to retreat to;
- The shut-off valves to foul sewers must be closed so that fire water can be contained; and
- The EHSO will meet the fire warden when they arrive and detail to them the location of the fire, the type of fire involved, any persons unaccounted for and any particular hazard of note.

A fire at the facility will be treated as an emergency. Facility personnel will be trained in emergency response procedures and will in the event of a fire activate the ERP. The ERP will include provision for minimising the effects of any emergency on the environment. The ERP will, in conjunction with the provision of appropriate training to facility personnel, ensure a rapid response to any incident by trained staff.

4.2.4 Step 4: Financial provision – Known & Unknown liabilities

The main objective of Financial Provision is to ensure that sufficient financial resources are available to cover:

- Known environmental liabilities that will arise at the time of the closure of the compost facility.
- Known environmental liabilities that are associated with the aftercare and maintenance of the facility until such time as the facility is considered to no longer pose a risk to the environment.
- Unknown environmental liabilities that may occur during the operating life of the facility.

Financial provision encompasses two aspects:

- Quantifying the financial amount of the environmental liabilities (Known & Unknown); and
- Selecting appropriate financial instrument(s) to underwrite liabilities.

The potential for unplanned events to occur that could result in an unknown liability need to be considered and financial provision must be in place in order to cover all such eventualities.

The following risks (where applicable to the facility) must be included as a minimum but this list as issued by the Agency in the Guidance Document should not be considered exhaustive.

- Spillages from bunds;
- Leaks from above ground and below ground storage tanks;
- Leaks from process and effluent drains;
- Leaks from pipes;
- Fire and failure/overspill from fire water storage at the facility;
- Tank overflows;
- Mobile tanker spills on facility; and
- Leaks from underground sumps.

The Guidance document details several Risk Categorisation and Risk Matrix charts that can be used in conjunction with each other to generate the likely outcome and severity of an incident at a particular facility. Tables A3.1, A3.2 and A3.3 in Appendix 3 outline the risk assessment in terms of the likelihood of an occurrence, the associated severity and finally the overall risk respectively.

4.2.4.1 Known Environmental Liabilities

The facility has been designed and constructed and will be operated, closed and restored, in a manner that eliminates and, where this is not possible, minimises the risks of environmental

pollution and associated environmental liabilities. The proposed construction of the new facility moving all composting processes indoors, will allow a much greater level of environmental protection from any potential environmental degradation.

While the facility activities have the potential of generating potentially polluting emissions, the Agency, in issuing the Waste Licence, has concluded that such emissions that comply with the limits set in the licence will not result in environmental pollution.

The monitoring programme will ensure that any authorised emission, which does not comply with the requirements of the licence, is rapidly identified, the cause established and the necessary remedial actions implemented. The programme will also ensure that any unexpected gradual emissions are also rapidly identified and addressed. This will ensure that the potential for medium to long term environmental liabilities associated with normal facility activities will be negligible.

The management of the compost facility have prepared a task list with associated estimated costs involved with the closure of the facility. These costs cover the KNOWN liabilities associated with the closure of the compost facility and remediating the facility back to its original status. This task list is presented below.

Task 1

Stop accepting waste at the facility for processing.

Timeframe: 1 day to contact the relevant authorities and suppliers of waste to the facility.

1 week to contact the public to inform them of closure of facility for green drop-off.

Estimate Cost: No cost.

Task 2

Process the existing waste at the facility.

Timeframe: 5 months total. Minimum 2 weeks to process the existing waste in the digester boxes. 4-5 months to process this material and subsequent existing material on the curing Pad Area. Once Digester units have been emptied they will be steam washed inside the waste reception building.

Once the Curing Pad material has been removed the pads will be steam washed to remove any debris from the area.

Removal of waste associated with contamination of waste loads will be carried out as normal operations over the period of 4-5months.

Estimated cost: €300,000

Task 3

Collection of final compost from general public from storage area.

Timeframe: 2 months
Estimated Cost: No Cost

Task 4

Emptying of leachate tank to Waste water treatment Plant.

Timeframe: 5 months total. This would run concurrent with processing the existing waste at the facility.

Estimate Cost: €100,000.

Task 5

Once leachate tank is emptied, desludging of entire leachate drainage network system including grit traps, sumps and pumping chambers and wheel wash. Transfer of desludged material by tanker to relevant waste water treatment plant. All leachate associated leachate valves and pumps decommissioned.

Timeframe: 1 week
Estimated cost: €20,000

Task 6

Desludging all surface water drainage network system including grit traps, sumps and pumping chambers. Transfer of desludged material to relevant waste water treatment plant.

Time frame : 1 week
Estimated cost: €10,000

Task 7

Removal of all waste mobile plant and equipment including loaders, roadsweeper, mixers and shredders. Machinery to be returned to suppliers in the event of rental/lease. Purchased equipment to be sold to relevant interested parties.

Timeframe: 2 weeks
Estimated cost: No cost

Task 8

Removal of all digester Units to relevant metal recycling company or resale to commercial/public parties. Removal of all associated pipework to same.

Timeframe: 2weeks
Estimated cost: No cost

Task 9

Steam cleaning of all surfaces of waste reception building.

Timeframe: 4 hours
Estimated costs: No cost

Task 10

Decommissioning of all electrical systems including aeration motors and fans and all associated process control equipment.

Timeframe: 1 day
Estimated cost: 3,000 Eur

The total estimated cost of the KNOWN closure and remediation of the compost facility is €430,000. It is envisaged that the proposed environmental liability insurance that is currently being arranged will cover the costs associated with this process.

After consultation with the agency, it is considered appropriate that this method of cover is suitable on the proviso that that agency have access to the insurance fund so that a claim can be made by them in the eventuality of an environmental incident requiring environmental cover occurring at the compost facility.

All plant will be removed safely for re-use or recycling and all remaining wastes will be removed off-facility at the time of closure for appropriate recovery or disposal. At the time of closure, the entire facility will have been enclosed for some time with surface waters and run–off being re-used in the production process. Continuing environmental monitoring will demonstrate that no outstanding environmental issues remain at the time of closure.

Typically, according to EPA guidance, all facilities must prepare a facility closure plan. However, after seeking guidance from the Agency, a fully costed Residual Management Plan will be appropriate for this facility. This is as a result of the fact that the facility does not envisage closing in the long term with a steady source of raw material available.

The overall facility sensitivity to environmental liabilities during the operational, closure and aftercare phases is low due to the location, facility conditions and the nature of the activities that will be carried out. There are no historic liabilities or current environmental liabilities associated with the site.

4.2.4.2 Unknown Liabilities

The unknown liabilities are associated with risks at the facility that may or may not occur and are linked primarily to emergency situations such as a fire or spills. A combination of the ground conditions, the facility design, method of operation, closure and aftercare minimises the potential for such incidents to result in significant environmental pollution.

It is considered that in the unlikely event of an incident resulting in an uncontrolled release that any impacts would be transitory and would not result in any medium to long-term environmental liabilities.

Waterford City Council are the owners of the compost facility and all financial obligation in terms of environmental liabilities are theirs.

Following on from detailed information provided by the Agency, it has become apparent that in the past, public liability insurances did not cover specific environmental incidents and as a result, separate specific environmental liability cover is now required. This insurance will cover the costs associated with the known and unknown liabilities at all of the facilities currently owned by Waterford City Council. This cover is currently being organised by the Irish Public Bodies Mutual Insurances Ltd.

4.2.4.3 Unexpected Closure

The construction of the proposed new facility for the production of high grade compost has the potential to increase production and allow far greater control on any fugitive emissions that could occur. Current and projected market trends indicate that there will not be a significant reduction in the demand for compost and the ability to treat waste over the life of the facility. The facility will be operated as a commercial business and there is no foreseeable reason for operations to cease before the end of the projected life.

The proposed development of the facility is designed to ensure that only the infrastructure and space required in the short to medium term is provided. This means that in the unforeseen and unlikely event of the unexpected closure of the facility, the potential environmental liabilities will be the same as those associated with the normal closure of the facility and will be conducted in

accordance with the Closure and Decommissioning plan specified in Condition 10 of the waste licence.

4.2.4.4 Financial Provision Instruments

There are no current significant environmental liabilities and any future liabilities are likely to be associated with incidents whose impact is not possible to predict at this time. While it is not possible to realistically quantify the costs associated with addressing particular future environmental liability, for the purpose of this RMP the following estimates have been made. These will be re-evaluated on an annual basis over the life of the facility allowing for further refinement as the information available increases.

4.2.4.5 Unplanned Incidents & Suggested Costs

The identified risks of unplanned incidents and the likely costs of the remedial works to adequately address the associated environmental impacts are presented in Tables 4.2 and 4.3 below.

Table 4.2. Estimated costs involved in remediating unplanned incidents at the facility.

Risk	Risk Score*	Most Likely Cost (€)
R1. Fire breaking out at the facility.	6	200,000
R2. Escape of leachate to subsoils and groundwater due to damage to containment system.	4	100,000
R3. Explosion on facility	4	100,000
R4. Escape of leachate to surface water drainage system causing contamination	8	100,000
R5. Operational accident leading to the release of oil/chemicals to surface water drainage system.	4	50,000
R6 Damage to the leachate collection system or holding tank	6	50,000
R7. Fire Water run-off contamination	8	100,000

*The Risk Score is calculated by multiplying the likelihood score by the severity score in table 6.2 below.

Table 4.3. Estimated Likely Costs Involved in Remediating Unplanned Incidents at the Facility.

Risk Register No.	Likelihood Score	Likelihood of Occurrence Range	Median Likelihood of Occurrence	Severity Score	Likely Cost Range	Median Likely Cost	Most Likely Cost Scenario
R1	3	5-10%	7.5%	2	€100,001-€200,000	€150,000	€ 11,250
R2	2	5-10%	7.5%	2	€100,001-€200,000	€150,000	€ 11,250
R3	2	5-10%	7.5%	2	€100,001-€200,000	€150,000	€ 11,250
R4	4	5-10%	7.5%	2	€100,001-€200,000	€150,000	€ 11,250
R5	2	5-10%	7.5%	2	€10,001 - €100,000	€55,000	€ 4,125
R6	2	0-5%	2.5%	3	€10,0001 - €100,000	€55,000	€ 1,375
R7	2	5-10%	5%	4	€100,001 - €200,000	€150,000	€ 7,500

Table A3.1 – Risk Assessment - Likelihood

Rating	Likelihood		
	Description	Likelihood of Occurrence (%)	Category
1	Less than 5% of hazard occurring in 30 year period	0-5	Very Low
2	Low chance (5-10%) of hazard occurring in 30 year period	5-10	Low
3	Medium chance (10-20%) of hazard occurring in 30 year period	10-20	Medium
4	High chance (20-50%) chance of hazard occurring in 30 year period	20-50	High
5	Greater than 50% chance of the hazard occurring in 30 year period	>51	Very High

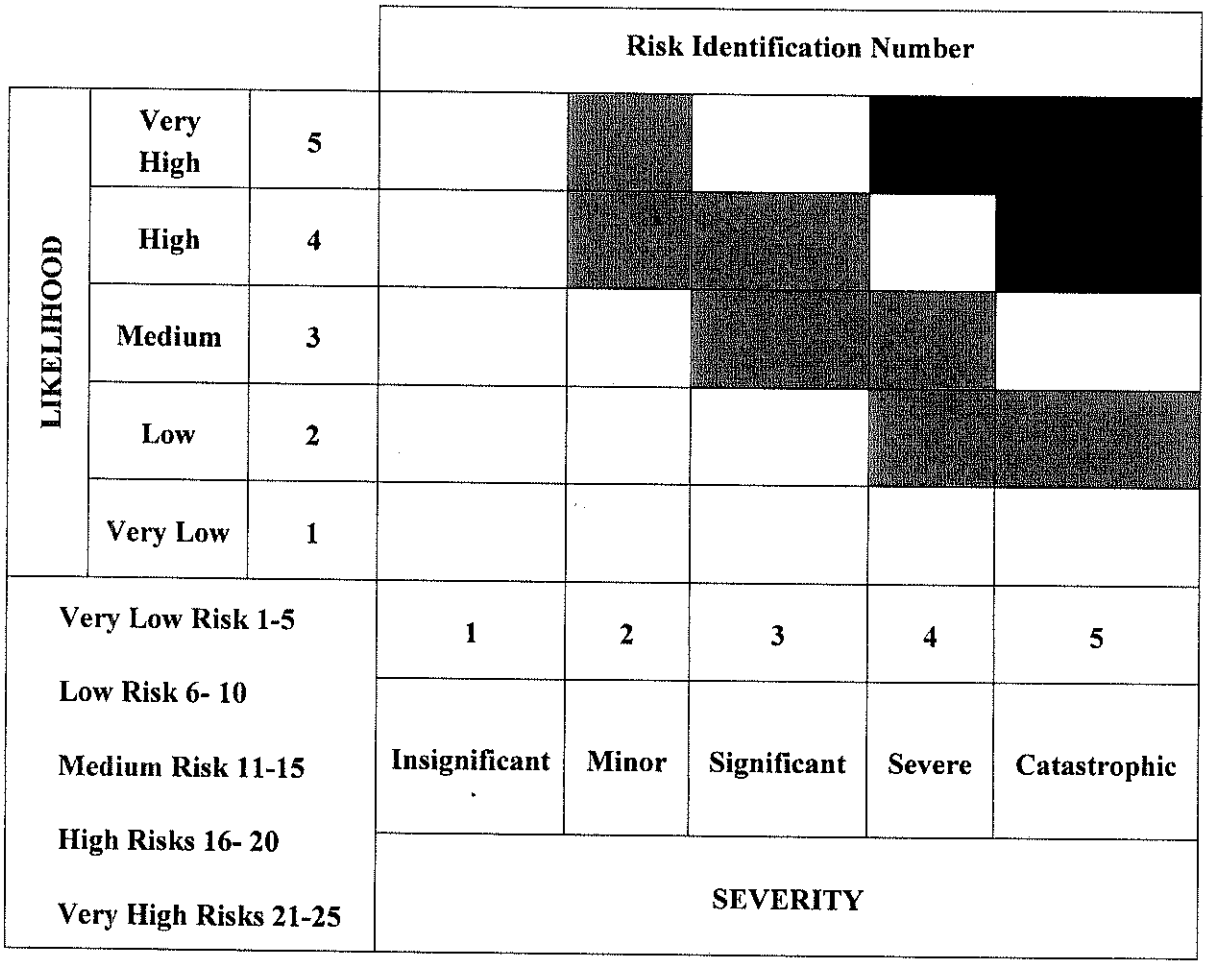
Table A3.2 – Risk Assessment - Severity

Rating	Severity		
	Description	Cost of Remediation (€)	Category
1	No damage or negligible change to the environment	0-10,000	Insignificant
2	Minor impact/localised nuisance	10,001-100,000	Minor
3	Moderate damage to environment	100,001- 200,000	Significant
4	Severe damage to the environment	200,001-500,000	Severe
5	Catastrophic damage to a large area, irreversible in medium term	>500,001	Catastrophic

Table A3.3 – Risk Assessment - Overall Risk

The following risk assessment matrix is based the methodology proposed in the EPA's Guidance Documents and Assessment Tools on Environmental Liabilities Risk Assessment and Residual Management Plan incorporation Environmental Liabilities Risk Assessment.

The matrix is designed to represent risk in terms of likelihood multiplied by severity and should be read in conjunction with Risk Assessment Tables A3.1 and A3.2.



The above risk assessment matrix is based the methodology proposed in the EPA's Guidance Documents and Assessment Tools on Environmental Liabilities Risk Assessment and Residual Management Plan incorporation Environmental Liabilities Risk Assessment.

APPENDIX N

Animal By-Products Approval

RNP 6-1 (COMP – 5)

Date: 6th December 2006

Mr. Michael Storan,
Veolia Environmental Services,
Six Crossroads Business Park,
Waterford City.

RE: **European Communities (Animal By-Products) Regulations of 2003 – SI 248 of 2003, as amended by SI 707 of 2005 and EC Council Regulation No. 1774/2002**

Dear Mr. Storan

I am directed by the Minister of Agriculture & Food to inform you that your premises has been approved to operate as a Composting Plant from 1st October 2006 in accordance with Regulations 6,6(b) of the European Communities (Animal By-Products) Regulations of 2003 – SI 248 of 2003, as amended by SI 707 of 2005.

The official **approval number** allocated to your premises is **COMP - 5**

Your approval is subject to the following conditions:

1. Catering waste as detailed in Article 6,1,(l) of Regulation (EC) 1774/2002 and defined in Annex I of the same regulation may be accepted at your plant.

2. Manure, digestive tract content separated from the digestive tract, milk and colostrums as detailed in Article 5,2,(e) of Regulation (EC) 1774/2002 may be accepted at your plant

3. No other Animal by-products as defined in Article 2,1,(a) of Regulation (EC) 1774/2002 may be accepted at your plant.

4. Waste-water from your plant must be treated in accordance with other relevant Community legislation.

5.Representative samples of compost for microbiological analysis at a Department of Agriculture and Food approved laboratory must be taken on a monthly basis. (5 samples to be taken as per paragraph 7.2 of attached conditions document)

6. All necessary conditions as outlined in the Department of Agriculture and Food's document "*Conditions for approval and operation of composting and biogas plants treating animal by-products in Ireland*"(Attached)

cont'd/....

Pavillion B, Grattan Business Centre, Dublin Road, Portlaoise,Co Laois
Paillión B, Ionan Gnó Grattan, Bóthar átha Cliath, Portlaoise, Co Laoise
Fax: 057 8694381
Email: info@agriculture.gov.ie Web: www.agriculture.gov.ie

VAT. Reg. IE4773186 Q

..../cont'd

Please note that failure to comply with these conditions may result in the withdrawal of your approval.

Dated this 6th Day of December 2006.

For the Minister for Agriculture and Food

Geraldine Lanigan

An Officer authorised in that behalf by the said Minister