

GALWAY CITY COUNCIL



WASTE LICENSE REFERENCE NO. W166/01

ANNUAL ENVIRONMENTAL REPORT 2011

WASTE RECOVERY FACILITY

LIOSBAN INDUSTRIAL ESTATE, SANDY ROAD,

GALWAY.

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INTRODUCTION

This is the seventh Annual Environmental Report (AER) to be submitted to the Agency relating to Waste Licence W166-1 granted on 16th of March 2004 for Galway City Council Depot, Sandy Road, Liosban Industrial Estate, Galway.

Policy Statement

Galway City Council is committed to meeting all conditions set out in EPA Waste Licence W166-1.

This annual environmental report is drafted in line with the content requirements as set out in schedule F of the waste license.

Item 1 Reporting Period

1st January 2011 – 31st December 2011.

Item 2 Waste activities carried out

Area 1

The public area of the recycling centre facilitates for the disposal of Waste electronic and electrical equipment, Bottles, Clothes, Fluorescent tubes, Batteries, Waste Cooking & Engine Oil, Large Plastics, Waste Metal, Large Timber and Paints.

Area 2

This area caters for the disposal of WEEE for the Commercial Sector and waste separated from Bulky Goods.

Area 3

This area is used by departments within Galway City Council. This covers the Road Sweeper/ Street Cleanings, Environment, Community Wardens, Drainage, Housing, Parks and Roads Departments. Each department separates their waste into designated areas, mainly Construction & Demolition, Timber, Metal, Hard Plastics, Glass, Tyres, Municipal Waste, Green Waste, Deceased Animals, Inspection and Quarantine.

During January and February Galway City Council Household waste collection service deposited landfill waste in the recycling centre for transfer to landfill. This practice ceased on the 21st February and this waste stream no longer enters the facility.

Area 4

This area is for the clean dry recyclable waste that is collected by Galway City Council household waste collection service.

Item 3 quantity and composition of waste recovered, received and disposed of during 2011 and each previous year (EWC codes to be provided)

Waste In:

waste inwards 2011	
20 03 01	537.00
20 03 01	2,579.22
20 01 10 20 01 11	10.65
20 01 21	1.85
20 01 33	0.87
20 01 39	3.30
20 01 40	31.96
20 03 03	1,585.62
20 03 01	681.00
15 01 04	2.10
15 01 07	15.70
16 02 11	121.13
16 02 14/20 01 36	321.75
16 02 13/20 01 35	114.82
16 02 14/20 01 36	243.86
16 06 01	4.01
16 06 04	1.29
16 01 03	3.68
17 02 01	315.88
17 09 04	506.00
17 09 04	404.00
13 02 08	10.08
08 01 11	40.21
total	7535.98

Waste out:

waste outwards 2011	
20 03 01	537.00
20 03 01	2,579.22
20 01 10 20 01 11	10.65
20 01 21	1.85
20 01 33	0.87
20 01 39	3.30
20 01 40	31.96
20 03 03	1,585.62
20 03 01	681.00
15 01 04	2.10
15 01 07	15.70
16 02 11	121.13
16 02 14/20 01 36	321.75
16 02 13/20 01 35	114.82
16 02 14/20 01 36	243.86
16 06 01	4.01
16 06 04	1.29
16 01 03	3.68
17 02 01	315.88
17 09 04	506.00
17 09 04	404.00
13 02 08	10.08
08 01 11	40.21
total	7535.98

Note: previous years figures included in additional documents section of the report.(AI 6)

Item 4 & 5 Summary report on emissions, results summary and monitoring locations plan

Emission limits are set out in Schedule C of the licence for the following: Noise; Dust Deposition and Surface Water. The locations of these monitoring points are set out in the Drawing AER /02 Monitoring Locations attached in the additional documents section (AI 1)

Noise Emissions

Results attached in additional information section (AI 2)

The noise levels at the facility were assessed at two locations on the 12th October 2011 as per the license requirements set out in schedule D.

The day time noise levels at the facility at survey point 1 (NSL1) are slightly greater than the limits outlined in the waste license. The main reasons for this are due to vehicular movements outside of the facility as the facility is located in the heart of an industrial estate in Galway city and the ambient noise levels will have a detrimental affect on the noise emission levels recorded at the facility.

noise sampling results summary						
monitoring point	date and time	sampling interval(mins)	L(A)eq	L(A)10	L(A)90	comments
NSL01	12/10/11 09:02	30	59	61	55	main source of noise was produced by vehicles travelling along the road within the liosban ind est. There was no noise audible from the sandy road recycling facility.
NSL02	12/10/11 09:57	30	51	53	49	Main source of noise was produced by frequent traffic movements of vehicles in the residential estate. No audible noise from the activities at the sandy road recycling facility.

Dust Emissions

Results attached in the additional documents section (AI 3)

Sampling took place twice at two locations at the facility twice in the year on 12th August and 30th November as per the license requirements set out in schedule D2.

A summary of results are detailed below.

The dustfall at monitoring point D3 (additional point to license requirements) was greater than the site limits allowed at the august sampling time. This is in part due to being located at teh waste acceptance area of the facility. The same point was well within the limits during the october/november monitoring period. The dust gauge at point D1 was found to be damaged after placement and could not be used. This location is currently under review to prevent this occurring going forward.

August 2011 summary

monitoring location	mass of dust	collecting surface m2	sample duration (days)	dustfall g/m2/d	dustfall mg/m2/d	dustfall limit mg/m2/d
d1	**	0.00607	30	**	**	350
d2	0.0168	0.00607	30	0.0923	92.30	350
d3	0.08	0.00607	30	0.46	460.2	350

November 2011 summary

monitoring location	mass of dust	collecting surface m2	sample duration (days)	dustfall g/m2/d	dustfall mg/m2/d	dustfall limit mg/m2/d
d1	**	0.00607	30	**	**	350
d2	0.0352	0.00607	30	0.1933	193.30	350
d3	0.01	0.00607	30	0.07	65.9	350

Surface Water Emissions

results are attached in the additional documents section (AI 4)

The surface water network collects the roof water from the main building and surface water from the south and east of the site. Surface water monitoring was carried out at the locations SW1, SW2 and SW03. Samples were taken twice over the course of the year; individual results are attached in the additional documents section. The table below details the results found. This indicates that no mineral oils were detected at the locations which is in compliance with the emission limit value set out in schedule C3 of the waste license.

June 2011 summary

		lab ref	1102453	1102454	1102455
		type of sample	surface water	surface water	surface water
		sampling point	SW03	SW1	SW2
		sampled by	CR	CR	CR
		time	11:40:00	12:00:00	11:50:00
		start/end date of analysis	29/06/11/07/07/11	29/06/11/07/07/11	29/06/11/07/07/11
		status of results	final	final	final
parameter	units	limits			
temperature	deg C		14.3	15.3	15.4
dissolved oxygen % sat	% saturation		67	86	86
ph	ph units		7.4	7.8	7.8
conductivity at 25deg C	µS/cm		1407	327	331
B.O.D.	mg/l O2		7.2	1.3	1.5
C.O.D	mg/l O2		54	<25	<25
Ammonia	mg/l N		2	0.03	0.05
Suspended solids	mg/l		18	<8	<8
Mineral oils			no	no	no
Fats,oils and greases	mg/l		nm	nm	nm

september 2011 summary

		lab ref	1103644	1103645	1103646
		type of sample	surface water	surface water	surface water
		sampling point	SW1	SW2	SW03
		sampled by	CR	CR	CR
		time	12:20:00	12:10:00	11:55:00
		start/end date of analysis	08/09/11/14/09/11	08/09/11/14/09/11	08/09/11/14/09/11
		status of results	final	final	final
parameter	units	limits			
temperature	deg C		14.1	14.2	14.5
dissolved oxygen % sat	% saturation		79	77	60
ph	ph units		7.7	7.6	7.2
conductivity at 25deg C	µS/cm		326	434	2660
B.O.D.	mg/l O2		1.4	1.1	5.1
C.O.D	mg/l O2		<25	<25	42
Ammonia	mg/l N		<0.03	<0.03	0.03
Suspended solids	mg/l		<8	<8	11
Mineral oils			no	no	no
Fats,oils and greases	mg/l		nm	nm	nm

Foul Water emissions

The foul water network collects all foul discharge from the site, surface water from the wash bay areas and the main recycling yard. Foul water monitoring was required to be carried out at the location FW3 as agreed with the Agency and is shown on the *Drawing AER/02 Monitoring Locations*. Monitoring was carried out twice during 2011 (15/06/11 & 10/10/11) and the results are included in the additional information section (AI5)

Summary of Emissions to Foul Water

Parameter	Units	FW3 june	FW3 october	FW3 average
pH	pH Units	6.7	7.4	7.05
Biological Oxygen Demand	mg/L	390	45	217.5
Suspended Solids	mg/L	544	311	427.5
Ammonia	mg/L as N	46.75	0.32	23.54
Fats, Oils, Grease	mg/L	13	<1	6.95
Total Phosphate	mg/L as P	8.09	0.57	4.33

Item 6 resource and energy consumption summary

The recycling facility is operated daily utilising 2 no staff on a permanent basis. From time to time this staff compliment will be increased to 3no. Staff depending on operations (eg additional loading requirements etc.). In addition to this the facility manager is in attendance at the facility daily also.

To facilitate the operating of the facility the following machinery is in place:

1no. Telescopic handler

1no. JCB

1no. Fork lift

1no. van

In addition to this there is a permanent weighbridge at the facility which is calibrated regularly and is used to record waste weights in and out of the facility.

Energy consumption – The total consumptions of energy at the Sandy road facility are detailed in the additional information section (AI 8). A summary is detailed below. It should be noted that the figures included are for the entire operation of the Sandy road facility which is included within the license.

Energy	Liquid petroleum gas	Electricity	Diesel	Marked gas oil	Unleaded petrol
consumption	TBC	TBC	TBC	TBC	TBC

Item 7 development/infrastructural works in place or planned to process waste quantities for the following year (including plant operating capacity, provision of adequate standby capacity and provision of contingency, back up and spares in case of breakdown)

In february 2011 the transfer of grey waste collected by Galway City Council household waste collection service from the recycling centre ceased and this waste stream was issued to a private transfer station. This greatly reduced the waste flow through the facility.

The equipment used in the facility is in the main hired and therefore all hire companies provide contingency plans for the replacement of equipment in the event of breakdown etc.

The facility is also supported by the Galway city council operated garage division to assist with any mechanical issues.

Item 8 Schedule of environmental objectives and targets for the forth coming year

- to improve the data collection at the recycling facility. This will be achieved by implementing a manned weigh bridge system whereby all vehicles in and out of the facility will be recorded manually each day.
- Improvement of education and awareness at the facility including updating signage and information available on the Galway city council web site
- A assessment of the cash for cans initiative will be conducted to assess if the initiative is being utilised as intended and also to assess the economic impact of same.
- It is intended to enhance enforcement at the civic amenity facility by means of an attending community warden. This will ensure that domestic home owners are the only users of the facility
- Update the environmental management system for the facility to include a revised emergency response procedure
- To investigate the possibility of introducing a charge to users of the civic amenity facility as it is currently free of charge. This measure will be implemented to assist with improving the segregation and recycling rate at the facility.
- To introduce a shredding machine into the facility to assist in the shredding of wood/branches that enter the facility. The wood can in turn be used in the composting facility.
- Instalation of a permanent bird netting system at the facility to reduce the impact of birds at the site will be investigated in 2012.

Item 9 report on the progress towards achievements of environmental objectives and targets contained in the previous years AER

- the emergency response procedure for the facility is in draft format and a finalised document needs to be put in place.
- The environmental management system for the facility requires a finalised document to be put in place as the existing system is in draft format.
- Record management at the facility have been improved through staff training and awareness of the license requirements.

Item 10 full title and a written summary of any procedures developed by the licensee in the year which relates to the facility operation.

No additional procedures were developed by the licensee in 2011 in relation to the facility operation.

Item 11 Tank, drum, pipeline and bund testing and inspection report

This requirement is due every 3 years in line with schedule E of the license. To this end Galway city council will be carrying out bund integrity testing and also pipeline inspections in 2012.

Item 12 Reported incidents and complaints summaries

There were no incidents or complaints made in 2011.

Item 13 Review of nuisance controls

The facility have contracted Rentokil initial to control and eradicate vermin from the facility. This contract ensures that methods are in place to control vermin throughout the facility and also ensures that qualified professionals attend the facility on a regular basis (every 2 months) to ensure that the measures in place are sufficient. Rentokil initial employ very high standards in the controls used.

The facility dust control is carried out on as needed and arise is dry weather only. The deputy facility manager ensures that dust is suppressed through road sweeping on a regular basis at the facility.

The deputy facility manager monitors litter at the facility and controls litter by carrying out clean ups as required.

Odours at the facility are greatly reduced since the removal of the composting process. Odours from the facility are minimal and no complaints were received during 2011. The deputy facility manager monitors odour at the facility. The removal of the transfer of grey/landfill waste collected by the GCC household waste collection service since february 2011 has greatly improved the odour in the facility also.

Birds are an issue from time to time at the facility. A bird abatement professional was hired throughout the year to reduce the number of birds at the facility. A hawk was used to scare birds from the facility and this procedure worked well. Bird quantities will continue to be monitored in 2012 and the installation of bird netting at the facility will reduce the impact of birds on site.

A nuisance reporting and recording system will be implemented and maintained on site at all times in line with item 10.6 of the license.

Item 14 reports on financial provision made under this license, management and staffing structure of the facility and a programme for public information

financial provision

the financial provision made for the facility in 2010 was as follows:

total expenditure - €189,601

The financial provision made for 2012 is:

budget allowed - €235,278

management and staffing

facility manager – Theo Mc Loughlin, A/SEE

deputy facility manager – JJ Corcoran, Foreman (Oct 2010 – Dec 2010)

Monitoring, facility records – M Garvey, Engineering technician (Jan 2011 – Feb 2011)

General Operative – N Monaghan, general operative (75% assigned to facility)

General operative – A Bray, general operative (25% assigned to facility)

Administrative support – B Keenan, clerical officer (25% assigned to facility)

programme for public information

Review of signage at the facility

Review of web site information

increased enforcement and education at the civic amenity facility

Item 15 volume of waste water produced and volume of waste water discharged off site

No records available at this time

Additional information section:

Contents:

- AI 1. Drawing AER/02 – Monitoring locations
- AI 2 Noise Emission results
- AI 3 Dust emission results
- AI 4 Surface water results
- AI 5 Foul water results
- AI 6 2009 waste inwards and outwards
- AI 7 2010 waste inwards and outwards
- AI 8 2011 Energy consumption (information provided by Galway Energy Agency)

AI1



AI 2



Monitoring and Testing Services

Galway City Council
Sandy Road Waste Recovery Facility
Liosban Industrial Estate, Sandy Road, Galway City

Day Time Noise Survey

Report Date:
10th November 2011

Fitz Scientific

Unit 35A Boyne Business Park, Drogheda, Co. Louth

Report No. 5760/M18

1.0 Introduction

Fitz Scientific was commissioned by Galway City Council to carry out a day time noise survey at predetermined noise monitoring locations around the Waste Recovery Facility at Liosban Industrial Estate, Sandy Road, Galway City, Co. Galway. This monitoring was to be carried out as required under Schedule D.3 of the current Waste Licence No. 166-1.

According to the licence, activities on site shall not give rise to noise levels off site, at noise sensitive locations, which exceed the sound pressure limits of 55 dB(A) during the day and 45 dB(A) during the night measured over 30 minute periods.

The waste recovery facility operates between 8.00 a.m. – 8:00 p.m. Monday to Friday, and 8.00 a.m. – 6:00 p.m. on Saturdays and the facility is to close on Sundays and Bank Holidays.

Noise is produced on site from activities such as HGV movements, waste container loading and unloading, recycling centre activities, and other day to day transfer station activities.

2.0 Duration and Measurements of Surveying

The daytime broadband noise survey was carried out between 09:02 am and 10:27 pm on Wednesday, 12th October 2011. The following measurements were carried out at each site:

- Daytime Broadband measurements $L(A)_{eq}$, $L(A)_{10}$, $L(A)_{90}$, $L(A)_{peak}$ over a 30 minute period of time.
- Daytime 1/3rd Octave measurements.

2.1 Description of Measurement Parameters

2.1.1 **L_{eq} Values:** $L_{eq}(t)$ values represent the continuous equivalent sound level over a specified time (t). This value expresses the average levels over time and is a linear integral.

2.1.2 **L_{90} and L_{10} Values:** The L_{90} and L_{10} are statistical values which represent the sound levels exceeded for a percentage of the measurement time. L_{10} indicates the sound levels exceeded for the 10% of the monitoring period while L_{90} indicates the sound levels exceeded for 90% of the monitoring period. The L_{90} value is a good indication of background noise levels.

2.1.3 **Tonal and Impulsive Characteristics:** Tonal noise is characterised in accordance with ISO 1996-2, which indicates that a noise source being tonal at a particular frequency is either clearly audible or exceeds the level of the adjacent bands by 5dB or more. An impulsive noise is of short duration (typically less than 1 second), it is brief and abrupt, and its startling effect causes greater annoyance than would be expected from a simple measurement of sound pressure level. For example an instantaneous bang/thud that may be associated with pile driving, hammering etc.

3.0 Weather Conditions

Weather conditions were suitable for noise monitoring during the daytime broadband survey. It was cool, overcast and dry during the survey. Wind speeds were < 5 m/sec.

4.0 Location of Monitoring Points

4.1 NSL 01

This point was located towards the north west of the site, outside of the site boundary, beside the Galway Dog Club facility. The noise meter was set on hard ground.

4.2 NSL 02

NSL 02 was located to the East of the Waste Facility, outside the site boundary in the parking area of the main residential apartment complex. The noise meter was set on hard ground.

5.0 Sources of noise

The main sources of noise during the survey were from vehicles travelling along the Liosban Industrial Estate roads, faint reverse sirens on the machinery operating in the facility.

6.0 Methodology

The noise survey was carried out in accordance with ISO 1996/1/2/3 – Acoustics – Description and Measurement of Environmental Noise and The Environmental Noise Survey Guidance Document issued by the EPA.

Reference was also made to the guidance note issued by the Environmental Protection Agency for the assessment of noise from licensed facilities.

Broadband measurements were 30-minute intervals, in the set range 30 – 90dB.

The meter was calibrated before and after the survey.

7.0 Equipment

The equipment used was a Bruel & Kjaer 2250 serial No. 2463166 integrating sound pressure level meter.

The meter was fixed to a tripod 1.3 meters above the ground level and the microphone was protected using a windshield. The microphone cartridge type was BK4189, serial number 2643699 with open circuit sensitivity level of 44.64 mV per Pa.

Fitz Scientific

Galway City Council. – Sandy Road Waste Facility

7.1 Calibration

Calibration was carried out on site using an acoustic calibrator at 94dBA. The meter was calibrated before and after the monitoring round.

Fitz Scientific

Galway City Council – Sandy Road Waste Facility

8.0 Day Time Monitoring

Monitoring Point	Date / Time	Sampling Interval (Minutes)	L(A) _{eq}	L(A) ₁₀	L(A) ₉₀	Comments
NSL 01	12/10/2011 09:02	30	59	61	55	Main source of noise was produced by vehicles travelling along the road within the Lisshan Industrial Estate. There was no noise audible from the Sandy Road Waste Recycling facility. Main source of noise was produced by frequent traffic movements of vehicles in the residential estate. No audible noise from the activities at the Sandy Road Waste Recycling facility.
NSL 02	12/10/2011 09:57	30	51	53	49	

Fitz Scientific

Galway City Council. – Sandy Road Waste Facility

9.0 Third Octave Noise Measurements

Third octave noise monitoring results are used to identify prominent tonal components in noise. No tonal components were detected at any of the monitoring locations during the monitoring period.

10.0 Interferences

The main sources of interference during monitoring at the Recycling Facility included frequent passing traffic on the surrounding main roads.

11.0 Conclusion

The noise level recorded at NSL 01 exceeded the emission limits outlined in the Waste Licence for the facility. This exceedence is attributed to traffic movements in close proximity to these monitoring locations and not to activities at the Sandy Road Waste Recycling facility.



Aadil Khan
Environmental Technical Manager



Victor Olmos
Field Services Manager

10th November 2011

Fitz Scientific

Galway City Council. – Sandy Road Waste Facility

Appendix 1: Broadband & 1/3 Octave Monitoring Data

Report No. 5760/M18

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Sandy Road NSL1

Instrument:	2250
Application:	BZ7223 Version 3.4.1
Start Time:	10/12/2011 09:02:08
End Time:	10/12/2011 09:35:08
Elapsed Time:	00:30:00
Bandwidth:	1/3-octave
Max Input Level:	141.93

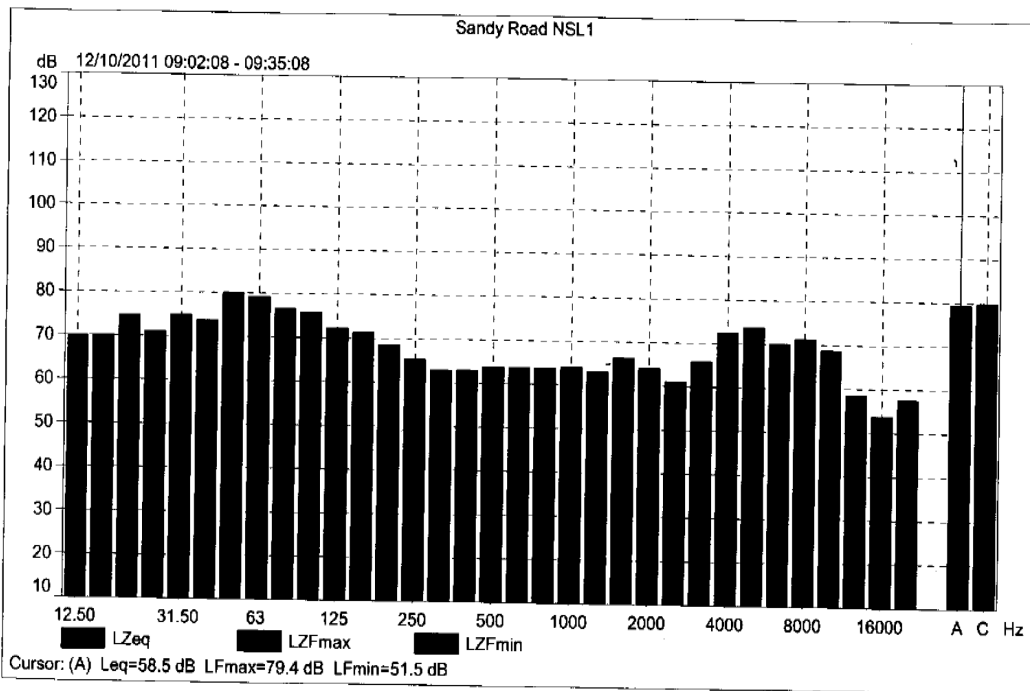
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		A
Spectrum:	FS	Z

Instrument Serial Number:	2463166
Microphone Serial Number:	2643699
Input:	Top Socket
Windscreen Correction:	None
Sound Field Correction:	Free-field

Calibration Time:	10/12/2011 09:00:24
Calibration Type:	External reference
Sensitivity:	44.649850577116 mV/Pa

Sandy Road NSL1

	Start time	End time	Overload [%]	LAFmax [dB]	LAFmin [dB]	LAeq [dB]	LAF10 [dB]	LAF90 [dB]
Value			0.00	79.4	51.5	58.5	60.6	55.2
Time	09:02:08	09:35:08						
Date	12/10/2011	12/10/2011						



Sandy Road NSL2

Instrument:	2250
Application:	BZ7223 Version 3.4.1
Start Time:	10/12/2011 09:57:10
End Time:	10/12/2011 10:27:10
Elapsed Time:	00:30:00
Bandwidth:	1/3-octave
Max Input Level:	141.93

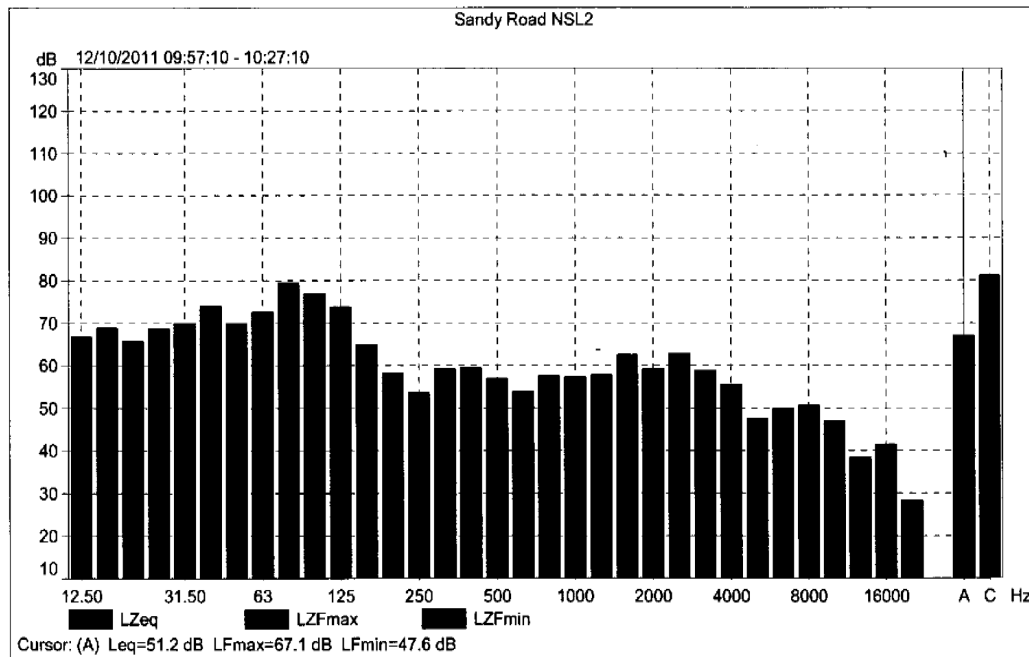
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		A
Spectrum:	FS	Z

Instrument Serial Number:	2463166
Microphone Serial Number:	2643699
Input:	Top Socket
Windscreen Correction:	None
Sound Field Correction:	Free-field

Calibration Time:	10/12/2011 09:00:24
Calibration Type:	External reference
Sensitivity:	44.649850577116 mV/Pa

Sandy Road NSL2

	Start time	End time	Overload [%]	LAFmax [dB]	LAFmin [dB]	LAeq [dB]	LAF10 [dB]	LAF90 [dB]
Value			0.00	67.1	47.6	51.2	52.5	49.3
Time	09:57:10	10:27:10						
Date	12/10/2011	12/10/2011						



AI3

Galway City Council

Sandy Road Waste Recovery Facility
Liosban Industrial Estate, Sandy Road, Galway City

Dust Monitoring Report

Report Date:
12th August 2011

Fitz Scientific
Unit 35A, Boyne Business Park, Drogheda, Co. Louth

Report No. 5760/M11

1.0 Introduction

Fitz Scientific was commissioned by Galway City Council to carry out dust monitoring at the Sandy Road Waste Facility in accordance with permit requirements. Dust monitoring commenced on the 14th June 2011 and removed for analysis on the 13th July 2011.

2.0 Method – Dust Monitoring

Dust monitoring was carried out using Bergerhoff Instrument according to the German Luft Standard Method VDI 2119 method and Fitz Scientific Standard Operating Procedure for dustfall determination (SOP No. EM106). With this method, atmospheric deposits are collected in vessels over a 30-day period \pm 2 days. The collected samples are then concentrated and the residue subjected to gravimetric weight analysis.

Collecting jars with a volume of 1.5 litres were placed in wire baskets. The top of the jar was positioned 1.5 metres above ground level. There were no houses or buildings located in close proximity to the monitoring locations.

2.2 Jar Preparation

Prior to sampling the jars and lids were acid washed and dried in a fan assisted oven at 100°C. The lids were placed on the jars and labelled. On arrival at the site the lids were removed and the jars were placed in wire containers for a period of 30 days. One deviation to the standard method was incorporated into the monitoring was the inclusion of 2-methoxy ethanol to the dust jars in order to prevent the growth of algae.

2.3 Sample Preparation

On completion of the collection period the jars are removed and immediately sealed air tight and transported directly to the laboratory.

Sample preparation and analysis was carried out in accordance with the VDI 2119 standard.

2.4 Monitoring points

- D1, D2 and D3.

2.5 Results

Results were calculated from the formula correlating the dust collected, sampling period and the collecting surface of the jars. Results were expressed as $\text{g.m}^{-2}.\text{d}^{-1}$.

Fitz Scientific

Galway City Council

3.0 Findings

3.1 Dust Gauges

Table 3.1 Results of dustfall determination at sites D1, D2 and D3.
 Results are quoted as $\text{g m}^{-2} \text{d}^{-1}$ (grams per metre² per day) and $\text{mg m}^{-2} \text{d}^{-1}$

Monitoring Location	Mass of Dust (g)	Collecting Surface (m ²)	Sample Duration (days)	Dustfall $\text{g m}^{-2} \text{d}^{-1}$	Dustfall $\text{mg m}^{-2} \text{d}^{-1}$
D1	*	0.00607	30	*	*
D2	0.0168	0.00607	30	0.0923	92.3
D3	0.0838	0.00607	30	0.4602	460.2

(Laboratory Report Ref. 4910/018/01 – 02); *Dust Gauge at D1 was found broken at the end of the monitoring period and could not be analysed.

The quantity of dustfall is determined as the difference between the gross weight of the evaporating dish and the final weight of the evaporating dish (containing the residue). The quantity is then converted into general reference quantities ($\text{mg.m}^{-2}.\text{d}^{-1}$) using the following formula:

$$X = \frac{G}{F \cdot T}$$

Where;

- X = dustfall in $\text{g m}^{-2} \text{d}^{-1}$
- F = collecting surface in m^2
- G = mass of dustfall in g
- T = sampling period in days

Fitz Scientific

Galway City Council

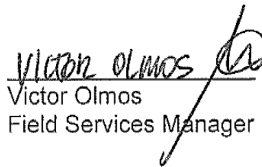
4.0 Conclusion

Dustfall limits are generally laid down in the planning permission for the site or in Waste Licence issued by the EPA. The dustfall concentrations laid down in the Waste Licence specifies a limit of 350 mg/m²/day. Location D2 was within the dustfall limit for the site. Location D3 exceeded the dustfall limit for the site. Monitoring location D3 is located beside the area where incoming waste is dumped and sorted at the facility. The dust gauge located at monitoring point D1 was found to be broken at the end of the monitoring period and could not be analysed.



Aadil Khan
Environmental Scientist

12th August 2011


Victor Olmos
Field Services Manager



Monitoring and Testing Services

Unit 35,
Boyne Business Park,
Drogheda,
Co. Louth
Ireland
Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.fitzsci.ie
email info@fitzsci.ie

Customer	Theo Mc Loughlin Galway City Council Liosban Ind. Est Galway	Lab Report Ref. No.	4910/018/01
		Date of Receipt	14/07/2011
		Sampled On	13/07/2011
		Date Testing Commenced	14/07/2011
		Received or Collected	By Fitz:Victor
Customer PO	Galway	Condition on Receipt	Acceptable
		Date of Report	22/07/2011
Customer Ref	Sandy Road D2	Sample Type	F/S Other

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Dust	144	Gravimetry	0.0168	g	

Signed: A Harmon
Aoife Harmon - Technical Supervisor

Date: 22/7/11

Acc. : Accredited Parameters by ISO 17025:2005

All organic results are analysed as received and all results are corrected for dry weight at 104 C
Results shall not be reproduced, except in full, without the approval of Fitz Scientific
Results contained in this report relate only to the samples tested

**The analytical result for this parameter may not be reflective of the concentration present at the time of sampling. The maximum recommended preservation time for this parameter has been exceeded.

Page 1 of 1



Monitoring and Testing Services

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 email info@fitzsci.ie

Customer	Theo Mc Loughlin Galway City Council Liosban Ind. Est Galway	Lab Report Ref. No.	4910/018/02
		Date of Receipt	14/07/2011
		Sampled On	14/07/2011
		Date Testing Commenced	14/07/2011
		Received or Collected	By Fitz:Victor
	Galway	Condition on Receipt	Acceptable
Customer PO		Date of Report	22/07/2011
Customer Ref	Sandy Road D3	Sample Type	F/S Other

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Dust	144	Gravimetry	0.0838	g	

Signed: A Harmon
Aoife Harmon - Technical Supervisor

Date: 22/7/11

Acc. : Accredited Parameters by ISO 17025:2005

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Galway City Council

Sandy Road Waste Recovery Facility
Liosban Industrial Estate, Sandy Road, Galway City

Dust Monitoring Report

**Report Date:
30th November 2011**

Fitz Scientific
Unit 35A, Boyne Business Park, Drogheda, Co. Louth

Report No. 5760/M20

1.0 Introduction

Fitz Scientific was commissioned by Galway City Council to carry out dust monitoring at the Sandy Road Waste Facility in accordance with permit requirements. Dust monitoring commenced on the 11th October 2011 and removed for analysis on the 9th November 2011.

2.0 Method – Dust Monitoring

Dust monitoring was carried out using Bergerhoff Instrument according to the German Luft Standard Method VDI 2119 method and Fitz Scientific Standard Operating Procedure for dustfall determination (SOP No. EM106). With this method, atmospheric deposits are collected in vessels over a 30-day period \pm 2 days. The collected samples are then concentrated and the residue subjected to gravimetric weight analysis.

Collecting jars with a volume of 1.5 litres were placed in wire baskets. The top of the jar was positioned 1.5 metres above ground level. There were no houses or buildings located in close proximity to the monitoring locations.

2.2 Jar Preparation

Prior to sampling the jars and lids were acid washed and dried in a fan assisted oven at 100°C. The lids were placed on the jars and labelled. On arrival at the site the lids were removed and the jars were placed in wire containers for a period of 30 days. One deviation to the standard method was incorporated into the monitoring was the inclusion of 2-methoxy ethanol to the dust jars in order to prevent the growth of algae.

2.3 Sample Preparation

On completion of the collection period the jars are removed and immediately sealed air tight and transported directly to the laboratory.

Sample preparation and analysis was carried out in accordance with the VDI 2119 standard.

2.4 Monitoring points

- D1, D2 and D3.

2.5 Results

Results were calculated from the formula correlating the dust collected, sampling period and the collecting surface of the jars. Results were expressed as $\text{g.m}^{-2}.\text{d}^{-1}$.

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Galway City Council

3.0 Findings

3.1 Dust Gauges

Table 3.1 Results of dustfall determination at sites D1, D2 and D3.
 Results are quoted as $\text{g m}^{-2} \text{d}^{-1}$ (grams per metre² per day) and $\text{mg m}^{-2} \text{d}^{-1}$

Monitoring Location	Mass of Dust (g)	Collecting Surface (m ²)	Sample Duration (days)	Dustfall $\text{g m}^{-2} \text{d}^{-1}$	Dustfall $\text{mg m}^{-2} \text{d}^{-1}$
D1	*	0.00607	30	*	*
D2	0.0352	0.00607	30	0.1933	193.3
D3	0.0120	0.00607	30	0.0659	65.9

(Laboratory Report Ref. 4910/028/01 – 02); *Dust Gauge at D1 was found broken on site at the end of the monitoring period and could not be analysed.

The quantity of dustfall is determined as the difference between the gross weight of the evaporating dish and the final weight of the evaporating dish (containing the residue). The quantity is then converted into general reference quantities ($\text{mg.m}^{-2}.\text{d}^{-1}$) using the following formula:

$$X = \frac{G}{F \cdot T}$$

Where;

X = dustfall in $\text{g m}^{-2} \text{d}^{-1}$
 F = collecting surface in m^2
 G = mass of dustfall in g
 T = sampling period in days

Fitz Scientific

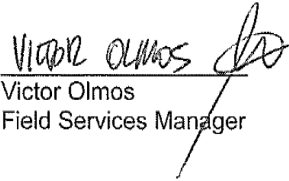
Galway City Council

4.0 Conclusion

Dustfall limits are generally laid down in the planning permission for the site or in Waste Licence issued by the EPA. The dustfall concentrations laid down in the Waste Licence specifies a limit of 350 mg/m²/day. Locations D2 and D3 were within the dustfall limit for the site. The dust gauge located at monitoring point D1 was found to be broken at the end of the monitoring period and could not be analysed.



Aadil Khan
Environmental Scientist



Victor Olmos
Field Services Manager

30th November 2011



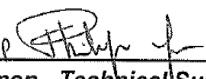
Monitoring and Testing Services

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<i>Customer</i>	Theo Mc Loughlin Galway City Council Liosban Ind. Est Galway	<i>Lab Report Ref. No.</i>	4910/028/01
	Galway	<i>Date of Receipt</i>	10/11/2011
<i>Customer PO</i>	400092412	<i>Sampled On</i>	09/11/2011
<i>Customer Ref</i>	Sandy Road -D2 10/10/11	<i>Date Testing Commenced</i>	10/11/2011
		<i>Received or Collected</i>	By Fitz: Aadil
		<i>Condition on Receipt</i>	Acceptable
		<i>Date of Report</i>	22/11/2011
		<i>Sample Type</i>	F/S Other

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Dust	144	Gravimetry	0.0352	g	

Signed: 
Aoife Harmon - Technical Supervisor

Date: 22/11/2011

Acc. : Accredited Parameters by ISO 17025:2005

All organic results are analysed as received and all results are corrected for dry weight at 104 C
Results shall not be reproduced, except in full, without the approval of Fitz Scientific
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<i>Customer</i>	Theo Mc Loughlin Galway City Council Liosban Ind. Est Galway	<i>Lab Report Ref. No.</i>	4910/028/02
		<i>Date of Receipt</i>	10/11/2011
		<i>Sampled On</i>	09/11/2011
		<i>Date Testing Commenced</i>	10/11/2011
		<i>Received or Collected</i>	By Fitz: Aadil
	Galway	<i>Condition on Receipt</i>	Acceptable
<i>Customer PO</i>	400092412	<i>Date of Report</i>	22/11/2011
<i>Customer Ref</i>	Sandy Road -D3 10/10/11	<i>Sample Type</i>	FIS Other

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Dust	144	Gravimetry	0.0120	g	

Signed: 
 Aoife Harmon - Technical Supervisor
 Acc. : Accredited Parameters by ISO 17025:2005

Date : 22/11/2011

All organic results are analysed as received and all results are corrected for dry weight at 104 C
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**The analytical result for this parameter may not be reflective of the concentration present at the time of sampling. The maximum recommended preservation time for this parameter has been exceeded.

A4



Environmental Protection Agency
 Regional Inspectorate
 John Moore Road, Castlebar



Test Report

Report of: Analysis of landfill site sample(s)
 Report to: Office of Environmental Enforcement, EPA.
 Report date: 02/08/11

Licensee: Galway City Council
 Facility: Galway Corporation Depot
 Sandy Road, Liosban Industrial Estate, Galway
 Reference No: W0166-01

Date collected: 29/06/2011 Date received: 29/06/2011

Comments:

- | | |
|---|--|
| 1) All Metals Analysed in the EPA, Dublin Laboratory | 10) nr "not reported" |
| 2) Cyanide Analysed by Alcontrol Laboratories, Dublin | 11) no "none observed" |
| 3) Phenolic Compounds Analysed by Alcontrol Labs. | 12) VOB "Visible On Bottom" |
| 4) TOC Analysed by Alcontrol Laboratories, Dublin | 13) trlc "Too numerous to count" |
| 5) VOCs Analysed by EPA, Kilkenny | 14) F "Field measured parameters" |
| 6) Solvents Analysed by EPA, Dublin | 15) Total Kjeldahl Nitrogen = Total Nitrogen - Total Oxidised Nitrogen |
| 7) nm "Not measured" | 16) Colour Analysis: Hazen units = mg/l Pt Co |
| 8) nd "None detected" | 17) The scope and accuracy of the analysis is shown on the reverse side of each report sheet |
| 9) nt "No time" - Time not recorded | 18) (**) Indicates parameters / results produced from non-accredited analytical methods |

			Laboratory Ref:	1102453	1102454	1102455
			Type of sample:	Surface Water	Surface Water	Surface Water
			Sampling point:	SW03	SW1	SW2
			Sampled by:	Cathal Ruane	Cathal Ruane	Cathal Ruane
			Time Sampled:	11.40	12.00	11.50
			Start/End - Dates of Analysis:	29-06-11/07-07-11	29-06-11/07-07-11	29-06-11/07-07-11
			Status of results:	Final	Final	Final
Parameter	Units	Limits				
F** Temperature	°C		14.3	15.3	15.4	
F** Dissolved Oxygen %Sat	% Saturation		67	86	86	
B4 pH	pH Units		7.4	7.8	7.8	
B5 Conductivity @25°C	µS/cm		1407	327	331	
B2 Biochemical Oxygen Demand	mg/l O2		7.2	1.3	1.5	
B1 Chemical Oxygen Demand	mg/l O2		54	<25	<25	
C1 Ammonia	mg/l N		2.0	0.03	0.05	
B7 Suspended Solids	mg/l		18	<8	<8	
** Mineral oils			no	no	no	
** Fats, Oils & Greases	mg/l		nm	nm	nm	

SCOPE AND ACCURACY OF ANALYSIS

SUBSTANCES TESTED

766 WATERS

.02 Irrigation & Stock
.03 Industrial & Steam Raising Purposes
.04 Sewage
.05 Trade Wastes

.06 Saline Waters
.07 Bore Waters
.99 Other Waters
Surface waters
Landfill leachates, groundwaters, surface waters

LABORATORY

Environmental Protection Agency
John Moore Road
Castlebar
County Mayo

Tests for which the Laboratory is Accredited:

The Laboratory is accredited by the Irish National Accreditation Board for the tests listed below. The table also lists the units of measurement, the lowest reported value (LRV), the uncertainty of the analysis, the reference of the test methods used, the maximum storage period for which samples may be stored before analysis and the method of preservation of samples prior to analysis.

Parameter	Units	Lowest Reported Value (LRV)	Uncertainty (95%)	Reference Test Method	Maximum Storage Period (before analysis)	Sample Preservation
Biochemical Oxygen Demand (BOD)	mg/l O ₂	1.0	± 18.7 %	APHA Section 5210 B	35 hours	Refrigeration
Colour	Hazen	5	± 5.2 %	APHA Section 2120	35 hours	Refrigeration
Conductivity	µS/cm	15	± 1.6 %	APHA Section 2510	35 hours	Refrigeration
pH	pH unit	0.1	± 0.1 pH	APHA Section 4500 H ⁺	35 hours	Refrigeration
Turbidity	NTU	0.5	± 8.5 %	APHA Section 2130 B	35 hours	Refrigeration
Suspended Solids	mg/l	8	± 10.8 %	APHA Section 2540 D	7 days	Refrigeration
Total Solids	mg/l	30	± 10.6 %	APHA Section 2540 B	7 days	Refrigeration
Total Dissolved Solids	mg/l	60	± 12.5 %	APHA Section 2540 C	7 days	Refrigeration
Chemical Oxygen Demand (COD) *	mg/l O ₂	25	± 10.7 %	APHA Section 5220 D	35 hours	Refrigeration
Total Hardness	mg/l CaCO ₃	30	± 6.1 %	APHA Section 2340 C	35 hours	Refrigeration
Alkalinity	mg/l CaCO ₃	8	± 5.3 %	APHA Section 2320 B/ Blue Bk HMSO 0117516015	35 hours	Refrigeration
Ammonia *	mg/l N	0.03	± 9.1 %	Blue Bk HMSO 0117516139	35 hours	Refrigeration
Chloride	mg/l Cl	2	± 7.1 %	APHA Section 4500-Cl E	35 hours	Refrigeration
Total Oxidised Nitrogen (TON) *	mg/l N	0.4	± 12.6 %	APHA Section 4500-NO ₂ H	35 hours	Refrigeration
o-Phosphate	mg/l P	0.012	± 9.7 %	APHA Section 4500-P E	35 hours	Refrigeration
Nitrite	mg/l N	0.005	± 12.3 %	APHA Section 4500-NO ₂ B	35 hours	Refrigeration
Silica	mg/l Si	0.1	± 6.6 %	APHA Section 4500-SiO ₂ D	28 days	Refrigeration
Fluoride	mg/l F	0.03	± 8.9 %	APHA Section 4110	28 days	None
Nitrate *	mg/l N	0.05	± 5.2 %	APHA Section 4110	35 hours	Refrigeration
Sulphate	mg/l SO ₄	0.5	± 3.9 %	APHA Section 4110	28 days	Refrigeration
Total Phosphorus	mg/l P	0.01	± 9.3 %	APHA Section 4500-P B & E	28 days	Freezing

Tests for which the Laboratory is not Accredited:

Parameter	Units	Lowest Reported Value (LRV)	Uncertainty (95%)	Reference Test Method	Maximum Storage Period (before analysis)	Sample Preservation
Temperature (Field)	°C	0.1		APHA Section 2550	Immediately	None
Dissolved Oxygen (Field)	% Sat	1.0		APHA Section 4500-O G	Immediately	None
Salinity	‰ Sal	1.0		APHA Section 2520 B	Immediately	None
Total Nitrogen	mg/l N	1.0		Automated Digestion / Chemiluminescence	28 days	H ₂ SO ₄ to pH <2 & Refrigeration
Cyanide (total)	mg/l	0.05		Offline digestion / FIA Analysis	14 days	NaOH to pH >12 & Refrigeration
Hexavalent Chromium	µg/l	5.0	12.6	In-house method	35 hours	Refrigeration
Fats, Oils & Greases	mg/l	5.0		APHA Section 5220 D	28 days	H ₂ SO ₄ to pH <2 & Refrigeration
Chlorophyll	mg/m ³	2.0		Methods for Physical & Chemical Analysis of Freshwaters 1978	35 hours	Refrigeration
Calcium Hardness	mg/l CaCO ₃	10		APHA Section 3500-Ca B	35 hours	Refrigeration
Total & Free Residual Chlorine	mg/l Cl ₂	0.03		APHA Section 4500-Cl G	Immediately	None
Odour	None	None		APHA Section 2150	35 hours	Refrigeration
Coliforms (Total & Faecal)	No / 100mls	1		APHA Section 9223	35 hours	Refrigeration
Faecal Straps	No / 100 mls	1		Bacteriological Examination of water supplies HMSO 1977	35 hours	Refrigeration
All Metals	mg/l or µg/l	various		APHA Section 3125 (ICP-MS)	6 months	HNO ₃ to pH <2
Mineral Oils, Detergents, Phenols & Surfactants	None	N/A		Visual Inspection	35 hours	None

* The Laboratory is not accredited for measuring these parameters in saline samples.

The Laboratory is not accredited for sampling. The results of analysis reflect the sample(s) as submitted to the Laboratory

APHA Reference: Standard Methods for the Examination of Water and Wastewater, American Public Health Association (APHA) 21st edition, 2005

Blue Bk Reference: Methods for the Examination of Waters and Associated Materials 1976 – 1992

Test Reports relate only to the samples tested and as described on the report form.

Test Reports shall not be reproduced except in full, without the written consent of the EPA.

The Uncertainty values listed above are for samples in the normal analytical range and not requiring dilution before analysis

$$\text{Uncertainty} = \sqrt{2 \times (\text{PRECISION})^2 + (\text{BIAS})^2}$$

Updated : 04/07/2011



Environmental Protection Agency
Regional Inspectorate
John Moore Road, Castlebar



Test Report

Report of: Analysis of landfill site sample(s)
Report to: Office of Environmental Enforcement, EPA.
Report date: 20/09/11

Licensee: **Galway City Council**
Facility: **Galway Corporation Depot**
Sandy Road, Liosban Industrial Estate, Galway
Reference No: W0166-01

Date collected: 08/09/2011 Date received: 08/09/2011

Comments:

- | | |
|---|--|
| 1) All Metals Analysed in the EPA, Dublin Laboratory | 10) nr "not reported" |
| 2) Cyanide Analysed by Alcontrol Laboratories, Dublin | 11) no "none observed" |
| 3) Phenolic Compounds Analysed by Alcontrol Labs. | 12) VOB "Visible On Bottom" |
| 4) TOC Analysed by Alcontrol Laboratories, Dublin | 13) tntc "Too numerous to count" |
| 5) VOCs Analysed by EPA, Kilkenny | 14) F "Field measured parameters" |
| 6) Solvents Analysed by EPA, Dublin | 15) Total Kjeldahl Nitrogen = Total Nitrogen - Total Oxidised Nitrogen |
| 7) nm "Not measured" | 16) Colour Analysis: Hazen units = mg/l Pt Co |
| 8) nd "None detected" | 17) The scope and accuracy of the analysis is shown on the reverse side of each report sheet |
| 9) nt "No time" - Time not recorded | 18) (**) Indicates parameters / results produced from non-accredited analytical methods |

			Laboratory Ref:	1103644	1103645	1103646
			Type of sample:	Surface Water	Surface Water	Surface Water
			Sampling point:	SW1	SW2	SW03
			Sampled by:	Cathal Ruane	Cathal Ruane	Cathal Ruane
			Time Sampled:	12.20	12.10	11.55
			Start/End - Dates of Analysis:	08-09-11/14-09-11	08-09-11/14-09-11	08-09-11/14-09-11
			Status of results:	Final	Final	Final
Parameter	Units	Limits				
F** Temperature	°C		14.1	14.2	14.5	
F** Dissolved Oxygen %Sat	% Saturation		79	77	60	
B4 pH	pH Units		7.7	7.6	7.2	
B5 Conductivity @25°C	µS/cm		326	434	2660	
B2 Biochemical Oxygen Demand	mg/l O2		1.4	1.1	5.1	
B1 Chemical Oxygen Demand	mg/l O2		<25	<25	42	
C1 Ammonia	mg/l N		<0.03	<0.03	0.03	
B7 Suspended Solids	mg/l		<8	<8	11	
** Mineral oils			no	no	no	
** Fats, Oils & Greases	mg/l		nm	nm	nm	

Signed: Ray Smith Date: 20/Sep/2011
Ray Smith
Regional Chemist, EPA Castlebar

SCOPE AND ACCURACY OF ANALYSIS

SUBSTANCES TESTED

766 WATERS	.06 Saline Waters
.02 Irrigation & Stock	.07 Bore Waters
.03 Industrial & Steam Raising Purposes	.99 Other Waters
.04 Sewage	Surface waters
.05 Trade Wastes	Landfill leachates, groundwaters, surface waters

LABORATORY

Environmental Protection Agency
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Castlebar
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Biochemical Oxygen Demand (BOD)	mg/l O ₂	1.0	± 18.7 %	APHA Section 5210 B	35 hours	Refrigeration
Colour	Hazen	5	± 5.2 %	APHA Section 2120	35 hours	Refrigeration
Conductivity	µS/cm	15	± 1.6 %	APHA Section 2510	35 hours	Refrigeration
pH	pH unit	0.1	± 0.1 pH	APHA Section 4500 H ⁺	35 hours	Refrigeration
Turbidity	NTU	0.5	± 8.5 %	APHA Section 2130 B	35 hours	Refrigeration
Suspended Solids	mg/l	8	± 10.8 %	APHA Section 2540 D	7 days	Refrigeration
Total Solids	mg/l	30	± 10.6 %	APHA Section 2540 B	7 days	Refrigeration
Total Dissolved Solids	mg/l	60	± 12.5 %	APHA Section 2540 C	7 days	Refrigeration
Chemical Oxygen Demand (COD) *	mg/l O ₂	25	± 10.7 %	APHA Section 5220 D	35 hours	Refrigeration
Total Hardness	mg/l CaCO ₃	30	± 6.1 %	APHA Section 2340 C	35 hours	Refrigeration
Alkalinity	mg/l CaCO ₃	8	± 5.3 %	APHA Section 2320 B/ Blue Bk HMSO 0117516015	35 hours	Refrigeration
Ammonia *	mg/l N	0.03	± 9.1 %	Blue Bk HMSO 0117516139	35 hours	Refrigeration
Chloride	mg/l Cl	2	± 7.1 %	APHA Section 4500-Cl E	35 hours	Refrigeration
Total Oxidised Nitrogen (TON) *	mg/l N	0.4	± 12.6 %	APHA Section 4500-NO ₃ H	35 hours	Refrigeration
o-Phosphate	mg/l P	0.012	± 9.7 %	APHA Section 4500-P E	35 hours	Refrigeration
Nitrite	mg/l N	0.005	± 12.3 %	APHA Section 4500-NO ₂ B	35 hours	Refrigeration
Silica	mg/l Si	0.1	± 6.6 %	APHA Section 4500-SiO ₂ D	28 days	Refrigeration
Fluoride	mg/l F	0.03	± 8.9 %	APHA Section 4110	28 days	None
Nitrate *	mg/l N	0.05	± 5.2 %	APHA Section 4110	35 hours	Refrigeration
Sulphate	mg/l SO ₄	0.5	± 3.9 %	APHA Section 4110	28 days	Refrigeration
Total Phosphorus	mg/l P	0.01	± 9.3 %	APHA Section 4500-P B & E	28 days	Freezing

Tests for which the Laboratory is not Accredited:

Parameter	Units	Lowest Reported Value (LRV)	Uncertainty (95%)	Reference Test Method	Maximum Storage Period (before analysis)	Sample Preservation
Temperature (Field)	°C	0.1		APHA Section 2550	Immediately	None
Dissolved Oxygen (Field)	% Sat	1.0		APHA Section 4500-O G	Immediately	None
Salinity	‰Sal	1.0		APHA Section 2520 B	Immediately	None
Total Nitrogen	mg/l N	1.0		Automated Digestion / Chemiluminescence	28 days	H ₂ SO ₄ to pH <2 & Refrigeration
Cyanide (total)	mg/l	0.05		Offline digestion / FIA Analysis	14 days	NaOH to pH >12 & Refrigeration
Hexavalent Chromium	µg/l	5.0	12.6	In-house method	35 hours	Refrigeration
Fats, Oils & Greases	mg/l	5.0		APHA Section 5220 D	28 days	H ₂ SO ₄ to pH <2 & Refrigeration
Chlorophyll	mg/m ³	2.0		Methods for Physical & Chemical Analysis of Freshwaters 1978	35 hours	Refrigeration
Calcium Hardness	mg/l CaCO ₃	10		APHA Section 3500-Ca B	35 hours	Refrigeration
Total & Free Residual Chlorine	mg/l Cl ₂	0.03		APHA Section 4500-Cl G	Immediately	None
Odour	None	None		APHA Section 2150	35 hours	Refrigeration
Coliforms (Total & Faecal)	No / 100mls	1		APHA Section 9223	35 hours	Refrigeration
Faecal Straps	No / 100 mls	1		Bacteriological Examination of water supplies HMSO 1977	35 hours	Refrigeration
All Metals	mg/l or µg/l	various		APHA Section 3125 (ICP-MS)	6 months	HNO ₃ to pH <2
Mineral Oils, Detergents, Phenols & Surfactants	None	N/A		Visual Inspection	35 hours	None

* The Laboratory is not accredited for measuring these parameters in saline samples.

The Laboratory is not accredited for sampling. The results of analysis reflect the sample(s) as submitted to the Laboratory

APHA Reference: Standard Methods for the Examination of Water and Wastewater, American Public Health Association (APHA) 21st edition, 2005

Blue Bk Reference: Methods for the Examination of Waters and Associated Materials 1976 – 1992

Test Reports relate only to the samples tested and as described on the report form.

Test Reports shall not be reproduced except in full, without the written consent of the EPA.

The Uncertainty values listed above are for samples in the normal analytical range and not requiring dilution before analysis

$$\text{Uncertainty} = \sqrt{2 \times (\text{PRECISION})^2 + (\text{BIAS})^2}$$

Updated : 04/07/2011

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Monitoring and Testing Services

Unit 35,
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<i>Customer</i>	Theo Mc Loughlin Galway City Council Liosban Ind. Est Galway	<i>Lab Report Ref. No.</i>	4910/017/04
		<i>Date of Receipt</i>	15/06/2011
		<i>Sampled On</i>	15/06/2011
		<i>Date Testing Commenced</i>	15/06/2011
		<i>Received or Collected</i>	By Fitz:Victor
		<i>Condition on Receipt</i>	Acceptable
<i>Customer PO</i>	400092412	<i>Date of Report</i>	22/06/2011
<i>Customer Ref</i>	Sandy Road Lanfill - FW03 15/6/11	<i>Sample Type</i>	Trade Effluent

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Ammonia (Industrial Eff.)	114	Colorimetry	46.75	mg/L as N	
BOD (Industrial Eff.)	113	Electrometry	390	mg/L	UKAS
Oils, Fats & Grease	101	Solvent Extraction/ Gravimetry	13	mg/L	
pH (Industrial Eff.)	110	Electrometry	6.7	pH Units	UKAS
Phosphate (Total) Industrial Eff.	166	Digestion/ Colorimetry	8.086	mg/L as P	
Suspended Solids (Industrial Eff.)	106	Gravimetry	544	mg/L	UKAS

Signed : 
Katherine McQuillan - Technical Manager

Date : 22/06/11

Acc. : Accredited Parameters by ISO 17025:2005

All organic results are analysed as received and all results are corrected for dry weight at 104 C
 Results shall not be reproduced, except in full, without the approval of Fitz Scientific
 Results contained in this report relate only to the samples tested

**The analytical result for this parameter may not be reflective of the concentration present at the time of sampling. The maximum recommended preservation time for this parameter has been exceeded.



Monitoring and Testing Services

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Customer	Theo Mc Loughlin Galway City Council Liosban Ind. Est Galway	Lab Report Ref. No.	4910/021/03
		Date of Receipt	11/10/2011
		Sampled On	10/10/2011
		Date Testing Commenced	11/10/2011
		Received or Collected	Collected by Euro
Customer PO	Galway 400092412	Condition on Receipt	Acceptable
Customer Ref	Sandy Road FW03 Foul Water	Date of Report	20/10/2011
		Sample Type	Trade Effluent

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Ammonia (Industrial Eff.)	114	Colorimetry	0.316	mg/L as N	UKAS
BOD (Industrial Eff.)	113	Electrometry	45	mg/L	UKAS
Oils, Fats & Grease	101	Solvent Extraction/ Gravimetry	<1	mg/L	
pH (Industrial Eff.)	110	Electrometry	7.4	pH Units	UKAS
Phosphate (Total) Industrial Eff.	166	Digestion/ Colorimetry	0.572	mg/L as P	UKAS
Suspended Solids (Industrial Eff.)	106	Gravimetry	311	mg/L	UKAS

Signed: A Harmon
Aoife Harmon - Technical Supervisor

Date: 20/10/11

Acc. : Accredited Parameters by ISO 17025:2005

All organic results are analysed as received and all results are corrected for dry weight at 104 C
 Results shall not be reproduced, except in full, without the approval of Fitz Scientific
 Results contained in this report relate only to the samples tested

**The analytical result for this parameter may not be reflective of the concentration present at the time of sampling. The maximum recommended preservation time for this parameter has been exceeded.

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2009 waste

In

Galway City Council
 Environment Section
 January 2010

Galway City Council Depot
 EPA Waste Licence 166-1
 Annual Environmental Report

Galway City Councils Recycling Centre Waste Figures 2009 - Inwards															
Month	Bulky Goods GCC (tons)	Community Warden Waste GCC (tons)	Dog Warden GCC (tons)	Drainage Waste GCC (tons)	Grave Yard Waste GCC (tons)	Housing Waste GCC (tons)	Parks Waste GCC (tons)	Roads Waste GCC (tons)	Road Sweepings GCC (tons)	Street Litter GCC (tons)	Waterworks Waste GCC (tons)	WEEE Commercial GCC (tons)	Landfill Waste GCC (tons)	Recycling GCC (tons)	TOTAL INWARDS
January	17.72	2.68	0.16	1.48	8.80	26.17	37.46	83.38	219.76	37.99	1.70	19.92		260.38	697.60
February	12.64	2.18	0.38	1.66	5.26	27.53	25.32	22.72	223.82	34.24	1.32	20.02		243.68	620.77
March	14.50	2.20	0.12	1.22	8.68	28.82	14.88	182.04	215.44	32.24	0.00	2.10		252.60	754.64
April	16.90	6.34	0.38	21.76	11.18	30.45	11.00	92.90	221.36	38.24	2.54	11.10		238.86	703.01
May	7.88	5.08	0.06	2.68	8.24	30.31	23.32	19.42	249.68	52.08	0.46	12.82		241.04	653.07
June	7.50	8.54	0.30	0.30	11.72	23.91	1.60	29.44	161.82	45.60	1.00	17.46		256.40	665.69
July	2.72	6.48	0.42	2.32	10.80	21.23	8.32	113.44	171.82	47.26	0.78	28.53		260.96	675.08
August	3.22	5.42	0.34	13.58	21.74	30.16	28.82	75.08	150.08	45.06	0.80	8.61		239.44	622.25
September	5.42	2.32	0.20	5.66	11.26	26.08	30.16	128.34	122.68	50.16	0.16	3.20	168.78	265.20	823.62
October	8.62	5.44	0.32	6.66	12.50	17.65	26.06	50.84	150.52	25.50	0.06	1.28	395.40	244.68	945.43
November	18.74	4.10	0.54	0.00	4.22	14.32	21.18	120.50	194.58	36.90	0.00	7.14	493.86	236.93	1153.01
December	20.22	3.04	0.32	0.00	4.40	11.81	3.42	36.68	135.78	49.82	0.00	8.28	519.94	253.40	1048.91
Total	136.08	53.82	3.64	57.22	118.60	288.04	231.34	936.78	2217.34	495.09	8.92	140.45	1577.98	2997.57	9262.97

out

Galway City Council
Environment Section
January 2010

Galway City Council Depot
EPA Waste Licence 166-1
Annual Environmental Report

Galway City Councils Recycling Centre Waste Figures 2009 - Outwards

Month	Tirey Waste Landfill	Walsh Waste Municipal	Walsh Waste Glass	Glass Rehab	Barna Metal	Barna Timber	Barna Plastic	Barna Bulky Goods	Thomson/Re-gen Recyclables	Waste Recyclables	Rd SWP Screens (Commercial)	Rd SWP Screens C.browne	WEEE KMK Metals	Batteries KMK	Metals	Flourescent Tubes KMK	Metals	Textiles GCC (tons)	Maddens C + D Waste
January		45.78	2.22	2.61	6.30	18.82	2.10	17.72	285.10				87.19	2.47				0.50	54.64
February		38.98			5.64	9.46	1.66	12.64	252.16				59.95	0.95					64.30
March		42.16			8.74	25.00	2.14	14.50	250.72				52.46	1.89		0.52			
April		43.32	1.76		7.38	15.08	2.24	16.90	265.54		395.68	62.88	63.86	2.02		0.16			77.24
May		36.12		2.88	6.88	9.42		7.88	250.22		77.56	365.44	58.74	1.85		0.41			351.08
June		53.88	2.12		10.64	9.82	4.34	7.50	241.74				60.54	0.74		0.08			
July		48.06			8.00		2.98	2.72	273.65				80.17	1.59					223.80
August		0.00				11.44		3.22	227.74				57.73	0.71					55.70
September	251.30	33.67	2.80		13.52	21.54	4.94	5.42	255.74			564.40	74.36	1.44		0.20			81.46
October	478.84			2.95	12.40	25.20	5.72	8.52	253.92				89.44	1.63					158.42
November	535.55				8.90	11.80	2.20	18.74	223.62	44.12			71.05	0.94		0.12			131.68
December	592.76		3.28		2.70		8.44	20.22	268.68	9.80			74.92	0.91		0.06		2.04	72.28
Total	1858.46	341.970	12.180	8.24	91.10	157.18	36.76	136.08	3048.84	53.82	473.22	992.72	830.21	17.13	1.55	2.54			1270.60

Month	Animals Pet Crematorium (No.)	Tyres Transport (No.)	Waste Engine Oil (Ltr)	Waste Vegetable Oil Agri/Energy (tons)	Paint Chemical (MT)	Aerosols Chemical (tons)	Waste Oil Chemical (tons)	Obsolete Medicines Chemical (tons)	Bases/Alkalines Chemical (tons)	Detergents Chemical (tons)	Pesticides Chemical (tons)
January	10.00										
February	7.00										
March		750.00									
April	4.00		4.488		0.117	0.037	0.150			0.075	0.026
May		2000.00									
June		1000.00		1500.00							
July		1000.00									
August											
September		1200.00									
October					4.874	0.016	0.028	0.017	0.014	0.014	0.024
November		2500.00									
December											
Total	21.000	294.000	8460.000	1500.000	9.362	0.133	0.037	0.178	0.017	0.089	0.050

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2010 waste

In

In sandy road transfer/recycling centre		
	month	sub totals
EWC code	waste type	
200307	bulky	138940
200301	mixed munic	
		5114600
170107	dogs c and d	3160
		2361480
150106	clean and dry rec	2682303
200303	road sweepings	2273000
200301	litter	663480
200135*	comm weee	50720
	totals	13287683

out

Out sandy road transfer/recycling centre		
	month	sub totals
EWC code	waste type	
170107	c and d	2249580
200140	metal	145080
200139	plastics soft	38760
200139	plastics hard	40280
150106	dry recyclables	2657400
200138	wood	292880
200135*	weee	803341
160103	tyres	2540
200301	landfill refuse	5321200
200111	textiles	1700
200127*	paints	10340
200102	glass	13080
130204*	engine oil	7860
200303	screenings sweep	779920
200301	mixed waste	530520
	totals	12894481

A18

AWAITING INFORMATION AT TIME OF REPORTING