DUNSINK LANDFILL
ANNUAL ENVIRONMENTAL REPORT 2010

REPORTING PERIOD: JANUARY TO DECEMBER 2010

WASTE LICENCE REGISTER NO. W0127-01

FINGAL COUNTY COUNCIL
COUNTY HALL
MAIN STREET
SWORDS
COUNTY DUBLIN

Comhairle Contae Fhine Gall
Fingal County Council

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1.0 INTRODUCTION

The Environmental Protection Agency (EPA) granted a waste licence (register no. 127-1) to Fingal Council in respect of the above facility on 9th January 2004. From July 2006 the register number was changed to W0127-01. This licence is for the closure and restoration of areas previously landfilled. Under its terms, the Council is required to restore and remediate the facility, to install infrastructure to monitor and manage landfill gas and leachate emissions, and to cap previously filled areas using inert materials. These works are to be completed within three years of the date of grant of the licence. In accordance with the requirements of condition 11.6 of the Waste Licence, an Annual Environmental Report (AER) for the facility must be submitted to the Environmental Protection Agency.

1.1 REPORTING PERIOD

The reporting period for the AER is 1st January to 31st December 2010. This is the seventh AER for the facility as required by the waste licence.

1.2 FACILITY LOCATION

Fingal County Council has responsibility for the management and operation of the facility. The facility is located at:

Dunsink Landfill,
Dunsink Lane,
Finglas,
County Dublin.

Access to the landfill is now from the Forest Road end of Dunsink Lane only, Irish National Grid 238886 (Northings) 311766 (Eastings). Figure 1 presents a map of the facility and the surrounding locations.

1.3 ENVIRONMENTAL POLICY FOR DUNSINK LANDFILL

- Comply with the terms of waste licence 127-1 and all other relevant legislation and codes of practice.
- Strive for continuous improvement in the running of the facility; in order to minimise the effects of the landfill on the environment.
- Create better awareness and training for all staff involved in the running of the landfill.

Develop a good relationship with local residents around Dunsink for the betterment of the surrounding area.

FIGURE 1: DUNSINK LANDFILL SITE LOCATION AND SITE ACCESS

Figure 1: Dunsink Landfill Site Location

2.0 SITE DESCRIPTION

Dunsink Landfill is situated in Finglas, County Dublin (National Grid Reference 239500E, 310500N). It is bound by Dunsink Lane to the south, Rathoath Road to the east, the M50 motorway to the Northwest and Cappagh Hospital to the North. It is approximately 61ha. The most elevated ground measured this year lies at 100m on the western side of the site. The base of the landfill varies but is estimated to average from 65-70ms.

The landfill opened in 1976. Approximately 4,400,000 tonnes of waste is estimated to have been deposited at the facility to June 1996. The landfill subsequently phased to closure, culminating in the closure of the civic amenity in 2003. A landfill gas utilisation plant was installed on site in 1996.
An original application for a waste licence was submitted to the Environmental Protection Agency in September 1999. An amendment to the original application was sought in February 2003. A Proposed Decision was issued in August 2003. Waste Licence 127-1 was issued in January 2004.

2.1 LICENCED WASTE ACTIVITIES AT THE FACILITY

On January 9th 2004 Fingal County Council was licensed to carry out the following waste activities at Dunsink Landfill, Finglas, County Dublin subject to twelve conditions.

Licensed Waste Disposal Activities, in accordance with the Third Schedule of the Waste Management Act 1996.

Class 4 Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons:

This activity is limited to:

- The provision and use of a leachate lagoon to temporarily store leachate generated in the landfill, prior to discharge to the public foul sewer; and
- The provision and use of a surface water attenuation pond to control the quality and quantity of the surface water run off from the site.

Licensed Waste Recovery Activities, in accordance with the Fourth Schedule of the Waste Management Act 1996.

Class 2 Recycling or reclamation of organic substances, which are not used as solvents (including composting and other biological transformation processes):
This activity is limited to the composting of green waste, the recycling / reclamation of cardboard, paper and waste oil at the facility.

Class 3 Recycling or reclamation of metals and metal compounds:
This activity is limited to the recycling of ferrous / non-ferrous metals and white goods.

Class 4 Recycling or reclamation of other inorganic materials:
This activity is limited to the recycling or reclamation of subsoil and topsoil (for the restoration of the site) and dry recyclables at the bring centre.

Class 9 Use of any waste principally as a fuel or other means to generate energy:
This activity is limited to the utilisation of landfill gas for the generation of electricity.

Class 11 The use of waste obtained from any activity referred to in a preceding paragraph of this Schedule:

This activity is limited to the use of suitable subsoil and topsoil and composted material for the restoration programme.

Class 13 Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced:
This activity is limited to the storage of recyclable waste prior to recovery off site and the storage of soil on site for the restoration programme.

3.0 EMISSIONS AND INTERPRETATION OF MONITORING RESULTS

3.1 GROUNDWATER

There are eight groundwater stations listed in Schedule D.1 of the waste licence. BH28 listed in Table D.1.1 of the licence was not installed however; BH27 was added to the monitoring infrastructure under agreement with the *Environmental Protection Agency.* Borehole monitoring recorded leachate characteristics from BH29 suggesting that it was a potential migration pathway to groundwater for leachate. It was therefore decommissioned on 14th March 2005, upon agreement with *The Agency*. Two additional groundwater stations were added to the sampling programme upon agreement with *The Agency*, these were installed on Dunsink Observatory land between the 14th and 16th March 2005. BH18 was destroyed during slope stability work in August 2006 and was replaced as BH18_R on 7th September 2006. The grid references for these are shown in Table 1. The sample locations are illustrated in Figure 2.

Condition 6.4.1 requires the licensee to submit to the EPA for its agreement, groundwater monitoring trigger levels in accordance with the requirements of Directive 1999/31/EC for one upgradient and two downgradient monitoring Boreholes. This analysis was conducted and trigger levels were proposed to the EPA in February 2005 (Reference: FCC-127-1-2005-006), Appendix I. These were reviewed at the end of 2006, along with an analysis of control and trigger levels for BH33 & BH34. A proposal has been sent to *The Agency* on foot of this review for their approval.

Table 1: Groundwater Monitoring Locations

Groundwater Borehole Monitoring Location	Eastings	Northings	Classification
BH3	310665	239505	Deep Groundwater
BH4	310650	239490	Shallow Groundwater
BH16	311340	239085	Deep Groundwater
BH18_R	311180	239115	Deep Groundwater
BH27	310030	238720	Deep Groundwater
BH28	Not Installed		
BH29	310155	239095	Deep Groundwater
BH31	311765	238820	Shallow Groundwater
BH32	311770	238800	Deep Groundwater
BH33	310735	238724	Deep Groundwater
BH34	310719	238725	Shallow Groundwater

FIGURE 2: GROUNDWATER MONITORING BOREHOLES.

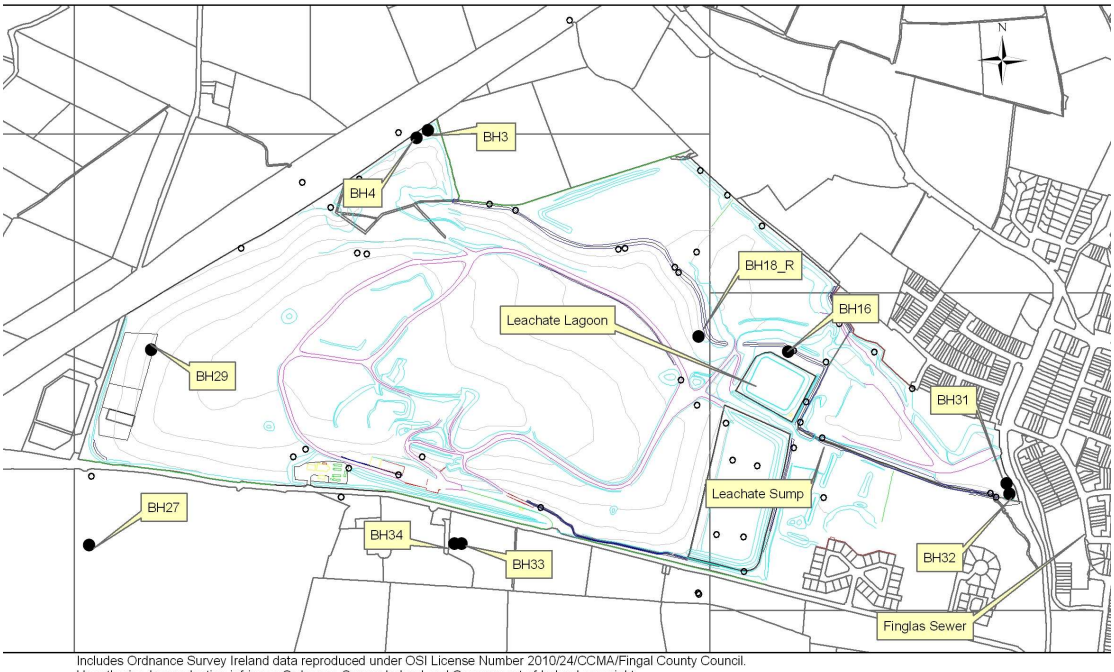

Figure 2: Groundwater Monitoring Boreholes

Detailed analysis reports are contained in Appendix I. The results obtained have been compared to the Interim Guideline Values of EPA document "Towards Setting Guideline Values for the Protection of Groundwater Ireland", 2003 and proposed trigger levels. The following analysis was completed in 2009 (Table 2).

Table 2: Groundwater Sampling Programme 2010

Groundwater Borehole Monitoring Location	Q1 Jan-March	Q2 April- June	Q3 July- September	Q4 October - December
BH3	Sampled	Sampled	Sampled	Sampled
BH4	Sampled	Sampled	Sampled	Sampled
BH16	Sampled	Sampled	Sampled	Sampled
BH18_R	Sampled	Sampled	Sampled	Blocked/ Not Sampled
BH27	Sampled	Sampled	Sampled	Sampled
BH28	Not Installed			
BH29	Decommissioned 14th March 2005			
BH31	Sampled	Sampled	Sampled	Sampled
BH32	Sampled	Sampled	Sampled	Sampled
BH33	Sampled	Sampled	Sampled	Sampled
BH34	Sampled	Sampled	Sampled	Sampled

3.1.1 Methodology

Refer to Schedule D.5 of WL 127-1.

3.1.2 Groundwater Monitoring Quality - Findings (See Appendix I)

Q1 January - March 2010 – Sampling dated 11th February 2010

Results from groundwater sampling during the 1st quarter of 2010 indicated good groundwater quality at BH4, BH31, & BH33.

Elevated levels of conductivity above the IGV, control values and trigger values were recorded at BH16, while slightly elevated levels of conductivity in excess of IGVs were recorded at BH3, BH18R and BH27.

Elevated levels of ammoniacal nitrogen were recorded at BH18R in excess of their respective IGV, control and trigger level.

Concentrations of pH were recorded above the control value only at BH16 & BH32 though the levels were within the IGV range permitted.

Similarly a slightly elevated level of total organic carbon (7mg/l) was recorded at BH34 above the control (6.3mg/l) and trigger levels (6mg/l).

Results at all remaining boreholes were below their respective control and trigger levels during this quarter.

Q2 April - June 2010- Sampling dated 27th May 2010

Results from groundwater sampling during the 2nd quarter of 2010 indicated generally good groundwater quality. Slightly elevated levels of pH were recorded at BH16 and BH32. Slightly elevated levels of conductivity were recorded at BH3, BH4 and BH18R. Elevated levels of ammoniacal nitrogen were recorded at BH18R in excess of their respective IGV.

Results at all remaining boreholes were below their respective control and trigger levels during this quarter.

Q3 July – September 2010- Sampling dated 18th August 2010

Results from the annual round of groundwater sampling during August 2009, indicated moderate quality groundwater beneath the landfill site and environs.

Elevated levels of chloride and sodium were recorded at BH3 and BH4 in excess of control and trigger levels. Elevated levels of potassium were also recorded at both locations in excess of the threshold value.

Slightly elevated levels of several parameters were recorded at BH18R including pH, ammoniacal nitrogen, potassium, fluoride, manganese and magnesium.

Elevated levels of total organic carbon at BH27 were recorded in excess of the control and trigger values and elevated manganese was recorded in excess of the threshold value.

Elevated ammoniacal nitrogen and manganese was recorded at BH31 above the threshold values and elevated chloride was recorded above the control and trigger values.

Elevated levels of manganese were recorded at BH32 and BH33 in excess of threshold, control and trigger values and elevated ammoniacal nitrogen was also recorded at both locations. Fluoride was the only elevated parameter in BH34.

List I/List II Analysis of Groundwaters

In accordance with the requirements of Waste Licence W0127-01, a number of monitoring boreholes were also analysed for concentrations of List I/List II dangerous substances e.g. volatile and semi volatile organic compounds as well as pesticides. Samples for organic and pesticide analysis were collected from BH3, BH4, BH31, BH32, BH33 and BH34.

All VOCs, SVOCs and pesticides were recorded below their respective laboratory detection limits during the annual sampling round of 2010.

Q4 October - December 2010- Sampling dated 10th November 2010

Results from groundwater sampling during the 4th quarter of 2010 indicated generally good groundwater quality. Slightly elevated levels of pH were recorded at BH3, BH16, BH27 and BH32. Slightly elevated levels of conductivity were recorded at BH3. Elevated levels of ammoniacal nitrogen were recorded at BH31 in excess of the respective IGV but within its respective control and trigger values.

Results at all remaining boreholes were below their respective control and trigger levels during this quarter.

Groundwater Levels

Groundwater levels were recorded from each borehole during each quarter and the results are displayed in Table 3.

Table 3: Groundwater boreholes water levels in metres below ground level (mbgl)

Groundwater Borehole Monitoring Location	Q1 2010 (mbgl)	Q2 2010 (mbgl)	Q3 2010 (mbgl)	Q4 2010 (mbgl)
BH3	3.5	3.75	3.7	3.7
BH4 Shallow	3.35	3.6	1.00	3.35
BH16	0	0.9	1.00	0.6
BH18R	5.4	5.8	5.6	Inaccessible
BH27	1.75	3.5	4.02	2.93
BH31 Shallow	3.5	3.8	3.9	3.47
BH32	0.95	1.37	1.6	1.1
BH33	2.95	3.65	4.8	4.32
BH34 Shallow	1.6	2.35	2.55	1.25

Groundwater – Discussion

A hydrogeological Assessment of the facility was forwarded to the Agency in November 2004 (FCC-127-1-2004-065). It determined an up gradient / down gradient trending of groundwater from West-North-West to East-South-East beneath the landfill and surrounds. This pattern is generally consistent with the regional drainage pattern.

Results from groundwater sampling during 2010 indicated generally good quality groundwater beneath the landfill site and environs though some boreholes recorded

slightly elevated levels of ammoniacal nitrogen, chloride, conductivity and pH during the year.

Bedrock Groundwater Quality

Results during 2010 indicated generally good groundwater quality in bedrock monitoring wells south and east of the site as evidenced by consistently low ammoniacal nitrogen results at BH27, BH31, BH32, BH33 and BH34.

North of the site elevated levels of ammoniacal nitrogen were recorded at BH18R during Q1, Q2 and Q3 2010.

Conductivity was also elevated in Q1 and Q2 at BH3, BH16 and BH18R.

Overburden Groundwater Quality

Shallow groundwater at BH 4 of the site was of good quality during 2010 with elevated levels of conductivity recorded during Q2 only.

Groundwater quality east and south of the facility at BH34 was generally good with all parameters consistently below the relevant limit values.

Elevated ammoniacal nitrogen was recorded in Q3 and Q4 at BH31, elevated chloride was recorded in Q3 at the same location.

Using ammoniacal nitrogen as a guide to trends in groundwater quality, a pattern of improved groundwater quality is discernable from 2005 onwards.

Conclusion & Annual Assessment

The annual assessment of groundwater quality suggests that has been a continued improvement in groundwater quality at Dunsink Landfill in 2010. The landfill however, still appears to be having a slight impact on deep groundwater quality close to the waste body itself as evidenced by results at BH16 and BH18R.

3.2 SURFACE WATER

Schedule D.1 of the waste licence requires the monitoring of surface water at six locations (SW1, SW2, SW4, SW7, SW9 & SW10). Biological sampling was required at three locations (KS1, KS2, KS3); samples were collected at an additional two locations in 2010 (KS3a and KS6) (See Table 4 and Figure 3).

SW 11 was incorporated as an additional sampling location under instruction from *The Agency* following Q1 Monitoring Report 2004. A Biological Sampling Assessment was undertaken on 22nd September 2010.

Surface water sampling points were established at the discharge from the wheelwash to the open channel WWSW1 and from the open channel to the Scribblestown Stream WWSW2.

SW1 is located downstream of the facility and sampling at this point monitors the effect of the facility on water quality. SW1 is located some distance downstream of the facility and a breakers yard lies adjacent to the stream and illegal dumping occurs between the facility and SW1. A case was put to *The Agency* to move SW1 further upstream to avoid these potential sources of surface water contamination and provide a truer picture of the effect of the facility on surface water quality. During the annual audit of the licence *The Agency* agreed and from 15th August 2005 a new downstream monitoring point, SW17, was used instead of SW1.

SW4 was replaced on 27/2/2006 by SW18 as the upstream sampling point as agreed with *The Agency* (127-1/AK11EM).

In 2010 2 additional sampling points were added for the biological monitoring sampling, KS3a and KS6 which are included in Tables 4 & 5 and Figure 3.

Table 4: Surface Water Monitoring Locations

Surface Water Monitoring Location	Eastings	Northings
SW1	311800	238460
SW2	311380	238980
SW4	310480	239365
SW7	311120	239220
SW9	310885	238795
SW10	311350	239100
SW11*	311360	238915
SW12**	310424	239410
SW13**	310829	239356
SW14**	311173	239277
SW15**	311417	239069
SW16**	311410	238926
SW17***	311687	238826
SW18****	310464	239394
KS1*****	310781	239373
KS2*****	311145	239242
KS3*****	311739	238812
KS3a*****	311600	238840
KS6*****	311590	238994
WWSW1******	311616	238921
WWSW2******	311644	238835

* Additional sampling location for monitoring programme.

** Enhanced monitoring programme undertaken 30th July 2004.
*** New downstream sampling point agreed during EPA audit August 2005.
**** New upstream sampling point agreed with *The Agency*.
***** Biological Sampling Programme.
****** Sampling points at discharge from wheelwash to open channel and from open channel to Scribblestown Stream. Only sampled when clay is imported onto the Landfill.

FIGURE 3: SURFACE WATER MONITORING LOCATIONS.

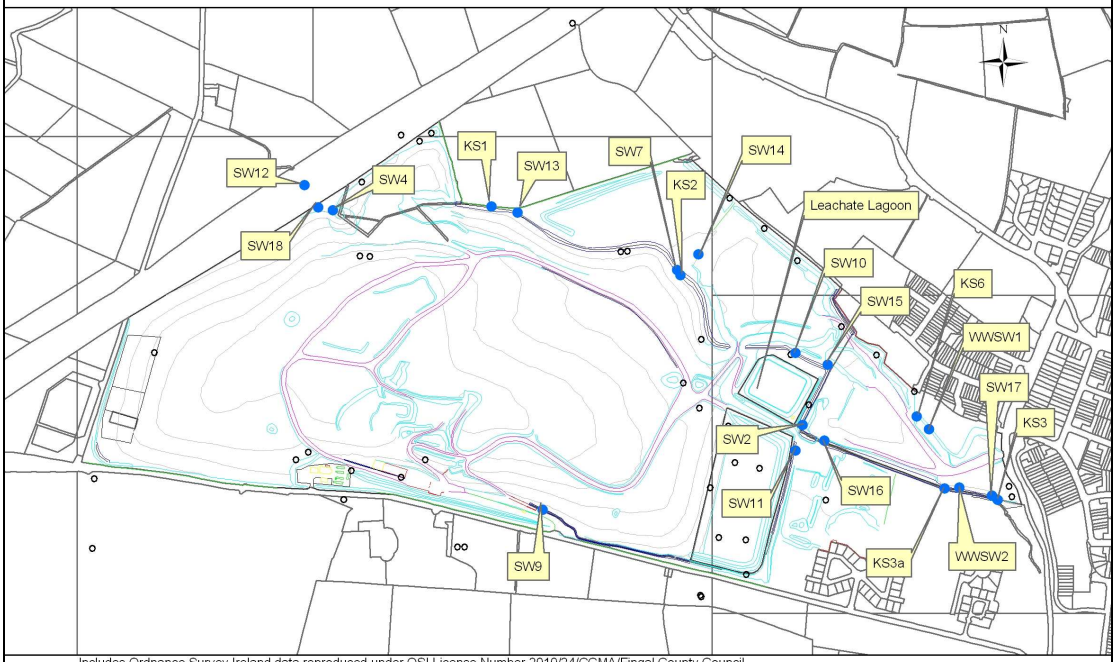

Figure 3: Surface Water Monitoring Locations

See Table 5 for analysis completed in 2010.

3.2.1 Methodology

Refer to Schedule D.5 of waste licence 127-1

3.2.2 Surface Water Monitoring Quality - Findings (See Appendix II)

Surface water quality was monitored in the drainage network within the landfill and its immediate environs throughout 2010. All the surface water sampling locations stipulated in the waste licence were sampled throughout 2010 (Table 5). The results of the biological sampling programme are discussed later in the report.

The water quality results have been compared to SI 293 of 1988 European Communities (Quality of Salmonid Waters) Regulations 1988 (Appendix II). It should be noted that the limit of detection in laboratories used for analysis of Ammoniacal Nitrogen is generally 0.2mg/l. The standard for Salmonid rivers for Non-Ionised Ammonia is >0.02 mg/l. The results for this parameter, do not lend themselves, given the resolution of the test, to comparison with the standard. The

standard for Total Ammonium (Ionised Ammonia) is > 1mg/l the conversion factor for Ammoniacal Nitrogen to Total Ammonium is 1.28.

Table 5: Surface Water Monitoring Programme 2010

Surface Water Monitoring Location	Q1	Q2	Q3	Q4	Weekly Visual	Monthly	Annual	Once-Off
SW2	Y	Y	Y	Y	Y	N	Y	N
SW4	N	N	N	N	N	N	N	N
SW7	Y	Y	Y	Y	Y	N	Y	N
SW9	Y	Y	Y	Y	Y	N	Y	N
SW10	Y	Y	Y	Y	Y	N	Y	N
SW11*	Y	Y	Y	Y	Y	N	Y	N
SW12**	N	N	N	N	N	N	N	N
SW13**	N	N	N	N	N	N	N	N
SW14**	N	N	N	N	N	N	N	N
SW15**	N	N	N	N	N	N	N	N
SW16**	N	N	N	N	N	N	N	N
SW17****	Y	Y	Y	Y	Y	N	Y	N
SW18****	Y	Y	Y	Y	Y	N	Y	N
KS1*****	N	N	Y	N	N	N	N	N
KS2*****	N	N	Y	N	N	N	N	N
KS3*****	N	N	Y	N	N	N	N	N
KS3a*****	N	N	Y	N	N	N	N	N
KS6*****	N	N	Y	N	N	N	N	N
WWSW1******	Y	N	N	N	N	N	N	N
WWSW2******	N	N	N	N	N	N	N	N

* Additional sampling location for monitoring programme.
** Enhanced monitoring programme undertaken 30th July 2004.
*** New downstream sampling point agreed during EPA audit August 2005.
**** New upstream sampling point agreed with The Agency.
***** Biological Sampling Programme.
****** Sampling points at discharge from wheelwash to open channel and from open channel to Scribblestown Stream when wheelwash becomes operational. Sampling at the two wheelwash locations ceased in November 2007 and will continue only on a needs be basis.

The Environmental Protection Agency's document "Parameters of Water Quality – Interpretation and Standards" details concentrations of total ammonia NH4 in fresh water which contain an unionised ammonia concentration of 0.02 mg/l at their given pH and temperature. Unionised ammonia is the component of total ammonia which at "the value of 0.02 mg/l is a long term toxic effect level for fish both salmonid and cyprinid. Lethal levels are about ten times greater".

Using this data, concentrations of ammoniacal nitrogen determined during sampling in 2010 indicated that the concentrations of unionized ammonia at all locations sampled during 2010 would have been below 0.02mg/l throughout the year.

Q1 January - March 2010 – Sampling dated 11th February 2010

Surface water results indicated generally good water quality at most locations during Q1 2010 with the exception of slightly elevated total suspended solids at SW7 (80mg/l), SW9 (135mg/l), SW11(143mg/l) and SW17 (217mg/l).

Elevated Electrical Conductivity, above the surface water EQS (1,000µS/cm), were recorded at SW2 (1,183 µS/cm), SW7 (1,463 µS/cm), SW10 (1,294µS/cm), SW17 (1,113µS/cm) and SW18 (1,492µS/cm)

On 18th February 2010, an incident report (Ref No W0127-01 Version 9-2010) was submitted to the Agency on foot of observations of oily liquids and iridescence on the surface of waters in the small tributary to the Scribblestown Stream emanating from Dunsoghly Estate (east of the landfill). WYG staff collected samples of the suspect waters and submitted them to a UKAS accredited laboratory for analysis for a broad suite of parameters including general chemistry, hydrocarbons and organic indicator parameters.

Elevated concentrations of ammoniacal nitrogen (29.48 mg/l), total suspended solids (342 mg/l) and BOD (8 mg/l) were recorded in excess of Salmonid Regulation limits. Elevated levels of COD, phosphorous, surfactants and oils fats and greases were also recorded though there are no limit values for these parameters under the EQS or Salmonid Regulations. No VOC or SVOC compounds were detected above laboratory detection limit.

It is noted that suspended solids concentrations at the merge of the Scribblestown Stream and the southern tributary i.e. at SW2 were within Salmonid limits. However elevated suspended solids were recorded further downstream at SW17. Samples collected from the tributary to the Scribblestown Stream emanating from Dunsoghly Residential Area on foot of the incident notified to the Agency on 18th February 2010 indicated highly elevated levels of suspended solids (324 mg/l). FCC instructed their Pollution Control team to investigate the emissions from Dunsoghly. The issue related to contamination arising from an off site source and was not related to landfill activities. It was considered likely that there was a misconnection to the storm sewer at one of the dwellings near the landfill boundary.

Q2 April - June 2010 Sampling dated 27th May 2010

Surface water results indicated generally good water quality at most locations during Q2 2010. Elevated levels of ammoniacal nitrogen were recorded at SW9 (2.09 mg/l). Elevated levels of pH (9.49) and total suspended solids were recorded at SW18 (26 mg/l).

Q3 July – September 2010- Sampling dated 18th August 2010

Surface water results indicated generally good water quality at most locations during Q3 2010. Elevated levels of chromium were found at each sampling location and total suspended solids were recorded at six of the eight monitoring locations. The levels of total suspended solids ranged from 32.5mg/l at SW10 to 824mg/l at SW9. An elevated level of BOD (8.62mg/l) was recorded at SW17.

Q4 October - December 2010- Sampling dated 10th November 2010

Surface water results indicated generally good water quality at most locations during Q4 2010. Elevated levels of total suspended solids were recorded at SW11 (80.5mg/l). Elevated levels of BOD were recorded at SW7 (1.68mg/l), SW11 (1.53mg/l) and SW17 (2.63mg/l) above the EQS limit of 1.5mg/l. It should be noted that all BOD levels were recorded well below the threshold outlined in the Salmonid Regulations of 5mg/l.

Quarterly Electrical Conductivity measurements for a number of surface water monitoring points are shown in Figures 4 and 5 below.

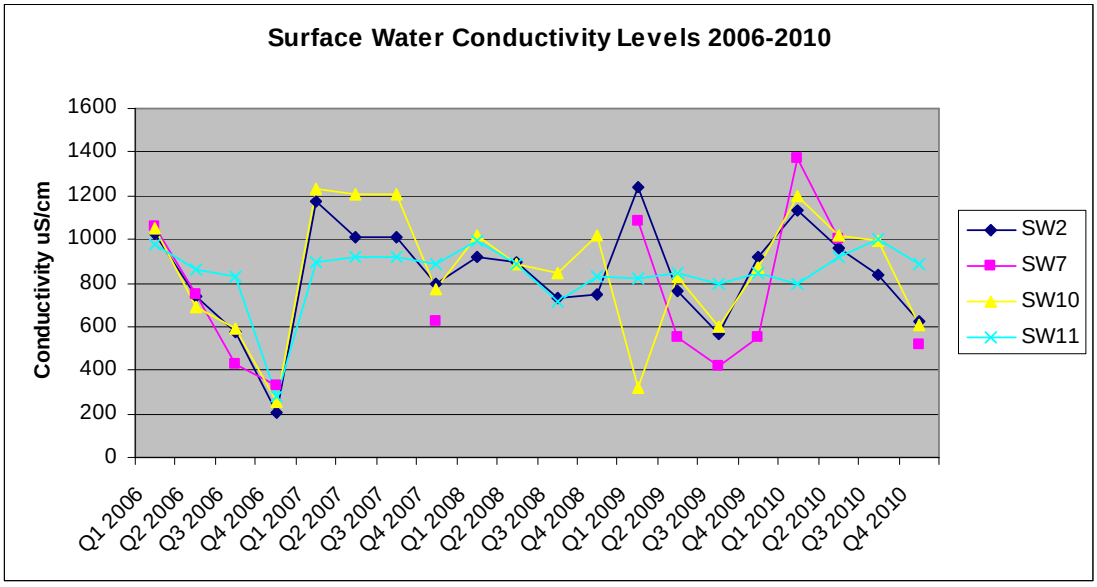

Figure 4: Conductivity Data Trends '06-'10 at SW Monitoring Locations SW2, SW7, SW10 & SW11

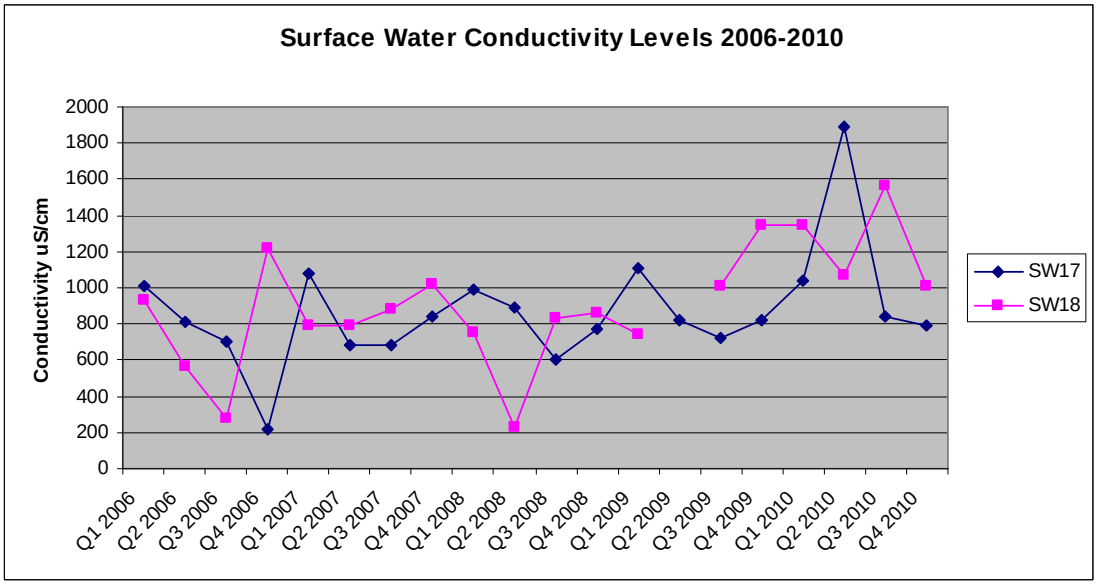

Figure 5: Conductivity Data Trends '06-'10 at SW Monitoring Locations SW17 & SW18

Weekly sampling

Weekly visual inspections are carried out at the various monitoring points and include sampling of pH, temperature and conductivity. Elevated concentrations in conductivity were measured throughout the site in December. This coincided with the severe cold weather and it is estimated that the conductivity levels were caused by the treatment of the roads around the landfill (M50) with salt and grit. It is expected the conductivity levels revert to normal in Q1 2011.

WWSW1

On the 4th November 2010 an incident was reported to the EPA regarding deterioration in water quality at the wheelwash and adjacent stream. A number of cars were burnt out on top of and in the vicinity of the wheelwash at Dunsink over the Halloween weekend. This resulted in burnt oils and residues gaining entry into the wheelwash and subsequently into the adjacent unnamed stream 2 (WWSW1-Stream).

An oily iridescence and slight oily odour was recorded at the wheel wash (WWSW1) and this incident was notified to the Agency within the required notification period. Samples were obtained on the day of the incident and analysed for the EPA surface water baseline suite of analysis. In addition the samples were analysed for speciated TPHs and PAHs.

The results indicated elevated levels of ammoniacal nitrogen at WWSW1 stream above the Salmonid threshold values. Elevated levels of total suspended solids were recorded at WWSW1 (162mg/l) and WWSW1 (Stream) (44mg/l) above the Salmonid threshold value. BOD levels were recorded above the EQS and Salmonid regulations thresholds at WWSW1. Similarly an elevated BOD level was recorded at WWSW1-Stream above the EQS set out in S.I. 272 of 2009. Benzo(a)pyrene (0.053mg/l) levels were also recorded above the EQS. All remaining parameters analysed were recorded below their respective EQS and Salmonid regulations thresholds.

The remains of the burnt out vehicles were removed by Fingal County Council and the wheelwash and stream were monitored closely by Fingal County Council and WYG in the subsequent weeks. Absorbent booms were put in place in the stream to restrict the movement of contaminants further downstream.

The subsequent weekly visual inspection indicated an improvement in water quality with water appearing clear at WWSW1-Stream and no oily odours recorded at WWSW1 and WWSW1-Stream. In addition the quarterly surface water monitoring took place on the 10th November – 1 week after the incident occurred. Water quality at SW17 (downstream of the wheelwash and the confluence of unnamed stream 2 with Scribblestown stream) appeared to be good with the exception of slightly elevated BOD levels (2.63mg/l) above the EQS but within the Salmonid limit values. All remaining parameters were below their respective EQS and Salmonid limit values.

Monthly Wheelwash Sampling

Monthly sampling ceased in November 2007 as it was agreed with *the Agency* that future sampling of WWSW1 and WWSW2 will occur on a needs be basis.

Conclusion & Annual Assessment

The 2010 annual assessment suggests that there was a continuation in the overall trend of improvement in surface water quality at Dunsink Landfill during 2010 though results during Q3 2010 at surface water monitoring locations east of the site indicated a continued water quality issues in this area. Waste from horses and water quality issues at a tributary of the Scribblestown emanating from the adjoining residential area are considered to have caused these issues. In addition, antisocial behaviour at the landfill in November 2010 created water quality issues in the vicinity of the wheelwash and adjacent stream.

In general the surface water sampling indicated good water quality over the 4 quarters of the year. New leachate pumping infrastructure (pumps, sump and leachate valve configuration) was commissioned in June 2005. Leachate interceptor drains are established to the West and South of the Lagoon, to intercept leachate seepages from the landfill. It is believed that these initiatives have been responsible for the general improvement in water quality at the facility.

3.3 LEACHATE

Schedule D of the waste licence requires the monitoring of leachate at the station "north-east lagoon", Table 6. A monitoring station which facilitates the obtaining of representative grab and / or continuous samples in accordance with Condition 8.4 is provided at the sump.

Table 6: Leachate Monitoring Locations 2010

Leachate Monitoring Location	Eastings	Northings
Northeast Lagoon	311323	239031
Sump	311417	238895

Table D.5.1 of Schedule D of the waste licence sets down the parameters and frequency for leachate monitoring. Table 7 below outlines the sampling programme for leachate undertaken in 2010.

Table 7: Leachate Monitoring Programme 2010

Leachate Monitoring Location	Q1	Q2	Q3	Q4	Annual
North East Lagoon	Sampled	Sampled	Sampled	Sampled	Sampled
Sump	Sampled	Sampled	Sampled	Sampled	Sampled

3.3.1 Leachate - Methodology

Refer to Schedule D.5 of waste licence 127-1

3.3.2 Leachate Monitoring – Results of Quarterly Sampling (See Appendix II)

Q1 January - March 2010 – Sampling dated 11th February 2010

Results from leachate sampling at lagoon on 11th February 2010 recorded pH of 8.5, conductivity of 947 µS/cm and dissolved Methane levels of 0.003 mg/l.

Results from leachate sampling at leachate sump on 11th February 2010 recorded pH of 8.02, conductivity of 3400 µS/cm and dissolved Methane levels of 1.712mg/l.

Table C.6. of the waste licence dictates that Emission Limits for Dissolved Methane in Leachate Being Discharged to Sewer as 0.14mg/l. The results indicate that emission limit values for dissolved methane are not exceeded for leachate in the lagoon, however, the results indicate that emission limit values for dissolved methane are exceeded at the leachate sump.

Q2 April - June 2010- Sampling dated 27th May 2010

Results from leachate sampling at lagoon on 27th May 2010 recorded pH of 8.55, conductivity of 869 µS/cm and dissolved Methane levels of 0.005 mg/l.

Results from leachate sampling at leachate sump on 27th May 2010 recorded pH of 8.47, conductivity of 1657 µS/cm and dissolved Methane levels of <0.001mg/l.

Table C.6. of the waste licence dictates that Emission Limits for Dissolved Methane in Leachate Being Discharged to Sewer as 0.14mg/l. The results indicate that emission limit values for dissolved methane are compliant for leachate in the sump and lagoon.

Q3 July – September 2010- Sampling dated 18th August 2010

Results from leachate sampling at lagoon on 18th August 2010 recorded pH of 9.66, conductivity of 829 µS/cm and dissolved methane levels of 0.019 mg/l. Results for other parameters tested as part of the annual suite of parameters for leachate indicated elevated levels of ammoniacal nitrogen (0.2 mg/l), chloride (166 mg/l), potassium (57.2 mg/l) and orthophosphate (0.177 mg/l) amongst others.

Results from leachate sampling at leachate sump on 18th August 2010 recorded pH of 8.87, conductivity of 3,530 µS/cm and Dissolved Methane levels of <0.001 mg/l. Elevated levels of ammoniacal nitrogen (152 mg/l), chloride (420 mg/l), potassium (128 mg/l), sodium (283 mg/l), manganese (0.962 mg/l), and nickel (0.033 mg/l) and were recorded. These results are typical of leachate from a municipal landfill.

Table C.6. of the waste licence dictates that Emission Limits for Dissolved Methane in Leachate Being Discharged to Sewer as 0.14mg/l. The results indicate that emission limit values for dissolved methane are not exceeded for leachate in the lagoon, or for leachate in the sump.

Q4 October - December 2010- Sampling dated 10th November 2010

Results from leachate sampling at lagoon on 10th November 2010 recorded pH of 8.48, conductivity of 827 µS/cm and dissolved Methane levels of 0.0011 mg/l.

Results from leachate sampling at leachate sump on 10th November 2010 recorded pH of 7.4, conductivity of 2030 µS/cm and dissolved Methane levels of 0.0013mg/l.

Table C.6. of the waste licence dictates that Emission Limits for Dissolved Methane in Leachate Being Discharged to Sewer as 0.14mg/l. The results indicate that emission limit values for dissolved methane are not exceeded for leachate in the lagoon, or for leachate in the sump.

Leachate – Discussion.

The results from quarterly visual inspections and annual monitoring of metals for the leachate lagoon and sump are typical of leachate quality. The lagoon is naturally lower for many parameters due to the diluting effect of rainwater and passive aeration associated with the fall of leachate into the lagoon.

The issue of dissolved methane in the leachate remains of concern. Dublin City Council continue to be informed of this issue and have in consultation with Fingal County Council made recommendations which have been forwarded to *The Agency* (Ref: FCC-W0127-01-2006-029). Under this proposal, weekly monitoring of methane, carbon dioxide and oxygen is being carried out at the headspace of the sump and the point of discharge to public sewer in Finglas. The results are being sent to the Agency through weekly notifications and are also being compiled for Dublin City Council.

3.3.3 Continuous monitoring of Dissolved Methane in Leachate

Continuous monitoring of dissolved methane at the sump commenced during Q1 2006. Table C.6.of the waste licence dictates that Emission Limits for Dissolved Methane in Leachate Being Discharged to Sewer as 0.14mg/l.

A dissolved methane probe was installed in the leachate sump during the last quarter of 2005. It was not connected to a datalogger until the second quarter of 2006 and when results emerged the probe was deemed to be faulty. A warranty replacement was installed during the last quarter of 2006.

Continuous monitoring of dissolved methane has been in operation from 3rd October 2006 to present.

3.3.3.1 Results from Continuous monitoring of Dissolved Methane in Leachate

Reporting of continuous monitoring of dissolved methane throughout 2010 was as per protocols specified in condition 6.3.3.1.

Q1 January- March 2010

This quarter reporting is as per protocols specified in condition 6.3.3.1.

a. No 24 hour mean value shall exceed the ELV;

100% of 24 hour mean values exceeded the ELV.

b. 97% of all 30 minute mean values taken continuously over an annual period shall not exceed 1.2 times the emission limit value.

100% of all 30 minute mean values taken continuously over an annual period exceeded 1.2 times the emission limit value.

c. No 30-minute mean value shall exceed twice the emission limit value.

The dissolved Methane Probe is configured to measure to 0253 mg/l only and this limit is used as a surrogate figure for 0.28mg/l or twice the emission limit value.

100% of 30 minute mean values taken continuously over this quarter exceeded twice the 0.14mg/l ELV.

Q2 April - June 2010

This quarter reporting is as per protocols specified in condition 6.3.3.1.

a. No 24 hour mean value shall exceed the ELV;

100% of 24 hour mean values exceeded the ELV.

b. 97% of all 30 minute mean values taken continuously over an annual period shall not exceed 1.2 times the emission limit value.

100% of all 30 minute mean values taken continuously over an annual period exceeded 1.2 times the emission limit value.

c. No 30-minute mean value shall exceed twice the emission limit value.

The dissolved Methane Probe is configured to measure to .253 mg/l only and this limit is used as a surrogate figure for 0.28mg/l or twice the emission limit value. 100% of 30 minute mean values taken continuously over this quarter exceeded twice the 0.14mg/l ELV.

Q3 July- September 2010

This quarter reporting is as per protocols specified in condition 6.3.3.1.

a. No 24 hour mean value shall exceed the ELV;

The methane probe is currently being recalibrated.

b. 97% of all 30 minute mean values taken continuously over an annual period shall not exceed 1.2 times the emission limit value.

The methane probe is currently being recalibrated

c. No 30-minute mean value shall exceed twice the emission limit value.

The dissolved Methane Probe is configured to measure to .253 mg/l only and this limit is used as a surrogate figure for 0.28mg/l or twice the emission limit value. The methane probe is currently being recalibrated.

Q4 October- December 2010

The USB stick recording all the data of the probe has been found to be missing when it was looked for to download the continuous monitoring of dissolved methane Q4 data – therefore no results are available for Q4. This likely happened during the installation of a new electrical panel in Q4 2010. A new procedure will be implemented to ensure the data is downloaded every month so that a 3 month gap of continuous monitoring data cannot be repeated due to data logger failure.

Resulting from the annual audit of October 2010 (Audit W0127-01AR10EM), a new methane probe has been purchased and was installed on Wednesday 5th January 2011. A new USB stick for recording the data was installed on the same day – so that the data on dissolved methane will be available for Q1 of 2011.

This quarter reporting is as per protocols specified in condition 6.3.3.1.

(a) No 24 hour mean value shall exceed the ELV;

No record available.

(b) 97% of all 30 minute mean values taken continuously over an annual period shall not exceed 1.2 times the emission limit value.

No record available.

(c) No 30-minute mean value exceeded twice the emission limit value.

No record available.

3.3.4 Discussion of Results from Continuous Sampling of Dissolved Methane

The results indicate that the ELV is exceeded almost continuously at high levels. As mentioned in section 3.3 Dublin City Council have been informed of this issue and have in consultation with Fingal County Council made recommendations which have been forwarded to *The Agency* (Ref: FCC-W0127-01-2006-029). Under this proposal, weekly monitoring of Methane, Carbon dioxide and Oxygen is being carried out at the headspace of the sump and the point of discharge to public sewer in Finglas (See Figure 6 and Appendix III). The results are being sent to *The Agency* through weekly notifications and are also being compiled for Dublin City Council.

3.4 NOISE.

No noise survey was undertaken at Dunsink Landfill in 2009. This was addressed in Licence Audit Report for 2008 from the Agency W1027-01/08/AR08EM, observation No.5, on Environmental Monitoring.

3.5 DUST

No dust monitoring surveys were carried out at Dunsink Landfill in 2008. This was addressed in Licence Audit Report for 2008 from the Agency W1027-01/08/AR08EM, observation No.5, on Environmental Monitoring.

3.6 PM_{10} MONITORING

The Agency in correspondence referenced 127-1/GEN01EM stated that "The Agency, in accordance with Condition 8.2, does not require monitoring of PM_{10} as listed in Table D.3.1 of the waste licence unless otherwise instructed by the Agency."

3.7 BIOLOGICAL ASSESSMENT OF THE SCRIBBLESTOWN STREAM

A biological assessment of the Scribblestown Stream was undertaken at KS1, KS2 & KS3 (Figure 3 / Tables 4 & 5) on the 22nd September 2010. In 2009, a subsequent biological assessment was conducted in December due to poor biological quality results at the 3 locations on Scribblestown stream. Therefore kick sampling was conducted at two tributaries to the stream that are present on the landfill. Sampling locations KS4, KS5 and KS6 were sampled in 2009. In 2010 two additional locations (KS3a & KS6) were included in the standard monitoring round to determine whether

any improvement was noted in waste quality at Unnamed stream 2 (which flows into the landfill from the Dunsoghly Housing estate adjacent to the landfill).

3.7.1 Biological Assessment of Scribblestown Stream – Methodology.

Freshwater ecological assessments were conducted at four sites on the Scribblestown stream in the vicinity of Dunsink landfill site, Dunsink, Co Dublin. One additional sample was taken from the stream adjacent to the wheelwash which flows into Scribblestown stream from the Dunsoghly Housing estate.

These assessments comprised the following investigations:

- Survey of macroinvertebrate fauna using kick sampling, sweep net, stone and vegetation washing methods at two sites on the Scribblestown stream in the vicinity of Dunsink landfill to produce Q-index values in addition to species diversity indices for each site.
- Aquatic macrophytes survey recording vegetation and describing habitats at each site.
- Recording of standard physico-chemical parameters at each site. These include pH, oxygen (% saturation and mg/l) and conductivity (µS/cm).

3.7.2 Macroinvertebrates

One macroinvertebrate sample was taken at each location, KS1, KS2 and KS3. Samples were collected by kick sampling at riffle sites or sweep sampling at slow flowing vegetated areas as appropriate. Kick sampling involves disturbing sediment/ vegetation etc for 2 minutes upstream of a standard sweep net (1mm mesh, 250mm width). Sweep sampling involved sweeping through vegetation/ substrate.

Macroinvertebrates were collected and stored in 70% industrial methylated spirits and returned to the laboratory for identification and counting.

3.7.3 Discussion

The overall macroinvertebrate community shows Scribblestown stream to be exposed to pollution. No rare macroinvertebrates species or species of conservation concern were recorded.

According to the Council Directive (2006/44/EC) on the quality of freshwater needing protection or improvement in order to support fish life, dissolved oxygen levels should be above 7 mg/l at all times and it is imperative that values remain above 9 mg/l at least 50% of the time (EC, 2006). In September 2010, dissolved oxygen levels were similar at all three sites ranging from 65.6% to 101.7%.

Conductivity values at KS1 and KS2 were recorded at lower levels to KS3, KS3a and KS6. The pH values are of a range between 7.7 to 8.37 which is within the typical pH range of between 6 and 9. Temperature values varied slightly at all three locations (15.2 ^{o}C to 16.4 ^{o}C) and is likely to be caused by level of direct sunlight on the water body.

Comparison to Previous Surveys.

In Sept 2010, the Q-value rating for **KS1** was **Q3** (moderate pollution) representing **no significant change** to the score from 2008 and 2009.

- The sample was dominated by group C taxa mainly gastropods which demonstrated a relatively pollution (organic) tolerant environment.
- The sampling location showed the presence of filamentous algae and contained heavy grey benthic sediment.
- Shannon – Weiner index 1.14, which is similar to the 2009 sampling round.
- The SSRS score is 0 which indicate that the section of the stream is 'at risk'.

The Q-value rating at **KS2** was **Q3** (moderate pollution) which indicated no significant change in water quality conditions from 2009.

- This is based on the dominance of Group C taxa.
- The physico-chemical parameters were all within their relevant standard and at similar levels to previous rounds.
- Shannon – Weiner index 2.0 which is an increase on the 2009 sampling round.
- The SSRS score is 3.2 which indicate that the section of the stream is 'at risk'

The Q-value rating at **KS3** was **Q2-3** (moderate pollution) which represented an improvement in water quality in comparison to 2009 results (Q2).
The river channel downstream of the sampling location was clogged with vegetation, indicative of excessive nutrients though the presence of stickleback fish was noted in the stream and also a number of Group B taxa were present.

- DO was slightly lower than in the other upstream locations.
- Shannon – Weiner index 2.04 which was an increase on the 2009 sampling round.
- The SSRS score is 1.6 which indicates that this stretch of the channel is "at risk" which is consistent with the Q-value rating

This assessment is based on the key components of the results namely Q values, indicator species and oxygen levels.

The Q-value rating at **KS3a was Q3** indicating **moderately polluted** water. This sample was taken downstream of the waterfall and upstream of the confluence culvert pipe from Unnamed stream 2. This sample indicated that no significant deterioration in water quality was found following the confluence of unnamed stream 1 with the Scribblestown stream.

- The Shannon-Weiner (H') diversity index value was 1.88.
- The SSRS score is 2.4 which indicates that this stretch of the channel is "at risk" which is consistent with the Q-value rating.

A **Q1-2** classification was assigned to **KS6** indicating **seriously polluted** water due to the excessive levels of *Asellus aquaticus*. . Quantities of waste items were present within the stream and strewn along the banks of the stream.

- The Shannon-Weiner (H') diversity index value was 0.23 which is the lowest of all the samples.
- The SSRS score is 1.6 which indicates that the river is at risk of pollution which is consistent with the Q-value score.

In summary, KS1, KS2 and KS3a were assigned a Q-value of 3 which corresponds with Class C i.e. moderately polluted. KS3 was assigned a Q-value of Q2-3 for water quality which corresponds to Class C i.e. moderately polluted. KS6 was assigned a Q-value of 1 for water quality which corresponds to a Class D i.e. seriously polluted.

The results of the biological assessment indicate that no significant change was observed in water quality since the previous two monitoring events in 2009. While a slight improvement in water quality can be seen in KS3 contamination from the Unnamed Stream 2 continues to affect the water of Scribblestown Stream prior to flowing offsite. The most likely source of the poor water quality at KS3 is from off-site contamination in Unnamed Stream 2. Unnamed Stream 2, sampled at KS6, has a Q-value rating of Q1-2 (serious pollution) and joins the Scribblestown Stream upstream of KS3 sampling location. Therefore KS3 remains at risk and until a significant investigation into the contributing polluting factors in Unnamed Stream 2 is conducted water quality at KS3 will not show an improvement.

3.8 LANDFILL GAS

3.8.1 Landfill Gas Monitoring – Methodology.

Refer to Schedule D.2. of waste licence 127-1.

3.8.2 Landfill Gas Facility Monitoring

Since the 4th Quarter (Q4) of 2006 measurements of landfill gas were carried out at twenty four locations at the perimeter of the landfill (See Figure 6 and Table 8).

During November 2007 (Q4) in agreement with the *Agency*, weekly gas monitoring decreased to six monitoring locations (G35 to G40) and the leachate sump and sewer, with the monthly monitoring round still consisting of all accessible gas monitoring locations (24 locations).

Gas levels were monitored using an LMSxi landfill gas analyser. The boreholes were monitored for Methane (CH_4), Carbon dioxide (CO_2), Oxygen (O_2), temperature and atmospheric pressure.

Landfill Gas - Proximity of Buildings and Developments to the Site

There are a number of buildings and developments on site, which are identified in the risk analysis of the site from landfill gas, which have potential to expose receptors to risk from landfill gas (See Figure 6). These include the former Irish Power Systems (IPS) compound (now FCC) at the southern boundary to the site along Dunsink lane. The Equipment yard and shed (which will also house the site offices) is close to the southern boundary of the site, immediately east of the IPS compound.

There are a number of buildings and developments close to the site which have potential to expose receptors to risk from landfill gas. Cappagh Hospital is located to the north of the landfill boundary. Dunsoghly estate lies to the east of Cappagh Hospital and north east of the landfill boundary. A halting site is established along the south-east boundary of the landfill (Figure 6).

South of Dunsink Lane, which marks the southern boundary of the site, there are a number of developments. From west to east these include; Elm Green Golf Course, Dunsink Observatory and a series of unauthorised halting sites (Figure 6).

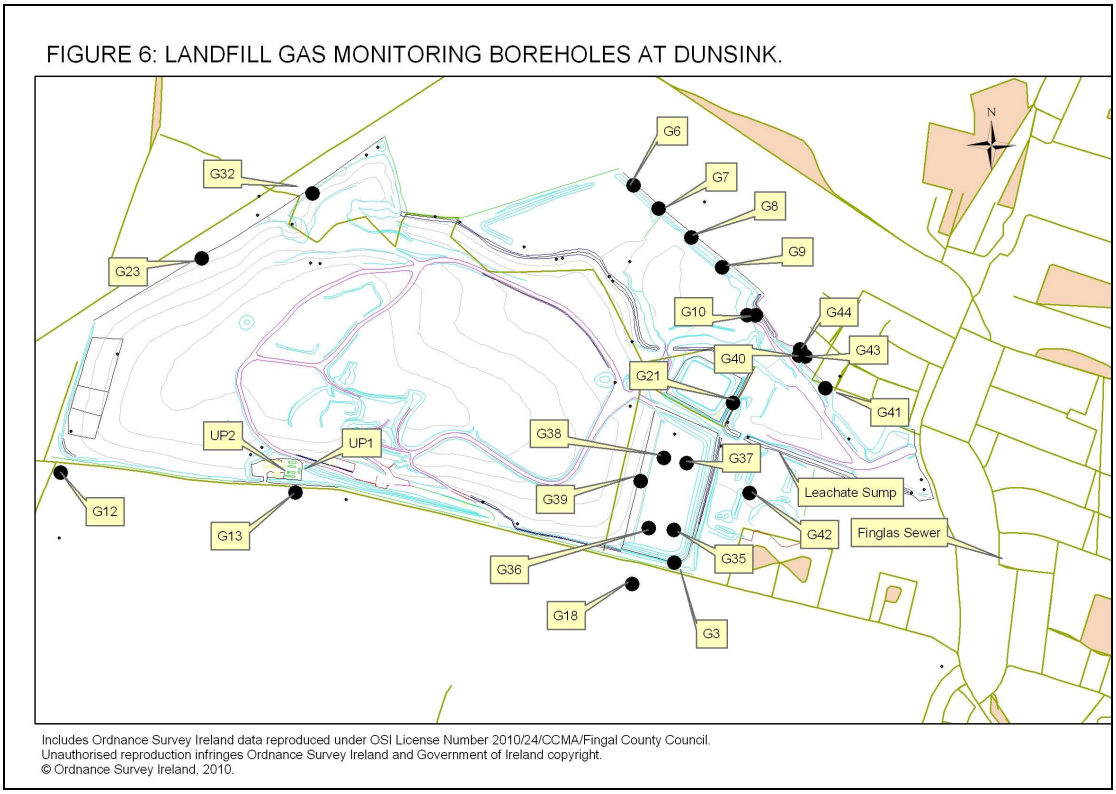

Figure 6: Landfill Gas Borehole Monitoring Locations

Historical Monitoring (1998-2000).

The landfill gas-monitoring programme during the period 1998-2000 involved thirty-four landfill gas-monitoring boreholes.

Monitoring during this period indicated consistent and elevated levels of Methane at landfill gas monitoring boreholes G30 west of the "sports grounds", G25 and G26 immediately north of the IPS compound. The borehole logs for G25 and G26 indicate that these are within the waste body.

Landfill gas monitoring during this period, indicates a more widespread pattern for carbon dioxide trigger level exceedance. Elevated levels were recorded at G1, G2, G30 ("sports grounds"), G4, G6 & G9 (northern boundary of the site); G11 and G32 (M50); G14 & G15 (Dunsink Observatory); G25, G26 & G27 (IPS compound area) and G33 (within waste body).

Table 8: Landfill Gas monitoring Locations and Programme 2010

Landfill Gas Monitoring Locations.	Monitoring Frequency	Eastings	Northings
G3**	Monthly	311270	238670
G6**	Monthly	311180	239425
G7**	Monthly	311230	239375
G8**	Monthly	311300	239320
G9**	Monthly	311360	239260
G10**	Monthly	311410	239170
G12	Monthly	310040	238850
G13	Monthly	310560	238795
G18	Monthly	311150	238630
G21	Monthly	311380	238990
G23	Monthly	310325	239265
G32	Monthly	310540	239420
G35	Weekly	311265	238740
G36	Weekly	311210	238740
G37	Weekly	311290	238875
G38	Weekly	311245	238880
G39	Weekly	311195	238835
G40	Weekly	311520	239090
G41**	Monthly	311580	239020
G42**	Monthly	311410	238805
G43**	Monthly	311524	239088
G44**	Monthly	311516	239100
IPS inlet	Weekly	310515	238849
Leachate Sump	Weekly	311417	238895
Finglas Manhole*	Weekly	311909	238733

** (Changed to monthly monitoring during November 2007)

Locations of Trigger Level Exceedances

Landfill gas monitoring during 2009, indicated a widespread pattern of exceedance of trigger levels for carbon dioxide. Consistent and elevated levels were recorded at G35, G36, G37 & G38 in the "sports grounds". During the monthly monitoring rounds, locations G9, G10, G43 and G44 continued to record elevated levels of carbon dioxide, with G6, G23 and G42 recording elevated levels of carbon dioxide from time to time. Locations of trigger level exceedances for methane from historical and current monitoring include the "sports grounds" area were intermittent in 2009 with only a number of exceedances noted in G37 and G39. The borehole logs for the area around the IPS compound indicate waste in the region of 2.5m to 3m below the surface.

During Quarter 1 2010, elevated levels of carbon dioxide were recorded at a number of the sportsfield boreholes including G37, G38 and G39. Elevated levels of carbon dioxide were also regularly recorded at G40, G43, G44 and the leachate sump monitoring location. Elevated levels of carbon dioxide were recorded at G6, G9 and the sewer monitoring location occasionally. Slightly elevated levels of methane were recorded at G37 on 6th January 2010 (1.4% v/v), 4th February 2010 (3.3% v/v), 11th February (2.1% v/v), 17th February (1.7% v/v) and 11th March (3.2% v/v). Slightly elevated levels of methane were recorded at G39 on the 21st January 2010 (2.9% v/v) and on the 24th February (8.8%v/v). Slightly elevated methane of 2.1% v/v was recorded at the G38 on 17th February 2010. No other significant concentrations of methane were recorded during the 1st Quarter of 2010.

During Quarter 2 2010, elevated levels of carbon dioxide were recorded at a number of the sportsfield boreholes including G37, G38 and G39. Elevated levels of carbon dioxide were also regularly recorded at G40, G43 and G44. Elevated levels of carbon dioxide were recorded at G6, G9 and G10 occasionally. Slightly elevated levels of methane were recorded at G37 on 15th April 2010 (1.4% v/v), 22nd April 2010 (3.7% v/v) and 10th June (3.5% v/v). Slightly elevated levels of methane were recorded at G23 on the 18th June 2010 (2.4% v/v). No other significant concentrations of methane were recorded during the 2nd Quarter of 2010.

During Quarter 3 2010, elevated levels of carbon dioxide were recorded at a number of the sportsfield boreholes including G37, G38 and G39. Elevated levels of carbon dioxide were also regularly recorded at G40, G43 and G44. Elevated levels of carbon dioxide were recorded at G6, G9 and G10 occasionally. There were no elevated concentrations of methane recorded at any of the boreholes locations during the 3rd Quarter of 2010.

During Quarter 4 2010, elevated levels of carbon dioxide were recorded at a number of the sportsfield boreholes including G37, G38 and G39. Elevated levels of carbon dioxide were also regularly recorded at G40, G43 and G44. Elevated levels of carbon dioxide were recorded at G3, G9, G10, G21, and G23 occasionally. Slightly elevated levels of methane were recorded at G37 on 13th October 2010 (8.1% v/v), 24th November 2010 (4.0% v/v), 1st December (4.1% v/v), 8th December (3.3%v/v), 22nd December (3.5%v/v). Slightly elevated levels of methane were recorded at G23 on the 27th October 2010 (1.5% v/v). No other significant concentrations of methane were recorded during the 4th Quarter of 2010.

Landfill Gas Monitoring – Discussion.

A review of the landfill gas sampling network and programme was undertaken during Q3 (July-September) 2004 in response to potential landfill gas migration issues. The review included an analysis of potential receptors and results of a spike-monitoring programme. The review culminated in the alteration of the landfill gas monitoring infrastructure and monitoring programme from that stated in Schedule D and G of the waste licence during 2005. This involved the recruitment of old landfill gas monitoring wells and the addition of three new monitoring wells (G40-G42) into the monitoring infrastructure during 2005 and five new monitoring locations during 2006 (IPS compound, G43, G44, Leachate Sump and Finglas Sewer) (See Figure 6).

The locations for elevated levels of landfill gas emissions of methane at this time included the “sports grounds” area, and the northern boundary to the site, the boundary towards Dunsoghly estate and the offices of the IPS compound area.

A venting trench was proposed and agreed by the Agency for the remediation of landfill gas migration on the “sports-ground”. These works went to public tender and the venting trench was commissioned during Q2 2005. A landfill gas spike monitoring report conducted in September 2004 suggested that the Scribblestown Stream may well be acting as an effective natural barrier/vent to landfill gas migration towards Cappagh Hospital and the Northern Boundary of the site and implies that these areas are not at risk. With the extension of the gas extraction network at Dunsink,

considerable reductions in levels of methane and carbon dioxide were noted in the sports fields boreholes throughout 2006 & 2007. However, elevated methane and carbon dioxide levels above the trigger values were recorded once in Quarter 3 of 2008 and then consistently through Quarter 4. Borehole G37 in the "sportsfield" recorded the most elevations while Boreholes G35 and G36 recorded no exceedances in this reporting period. Borehole G38 recorded elevated levels of Carbon Dioxide on a number of occasions in the second half of 2008. A proposal to carry out a series of excavations in the areas of G37 and G38 to detect any local methane sources and follow-up monitoring was accepted by the Agency (FCC-127-1-2009-004). The offices of the IPS compound area are continuously monitored for elevated levels of methane and carbon dioxide.

Two additional boreholes were placed between G40 and Dunsoghly Estate (G43 and G44). Since installation no methane was recorded at either of these boreholes. Nevertheless, G40 itself continued to register methane above trigger level throughout 2007, although methane levels decreased in 2008 and no methane was recorded at G40 during 2009.

Landfill gas monitoring at Dunsink Landfill during 2010 indicated a further improvement on results of previous years however the "sports field" area remains an issue (though improvements were noted in methane exceedances).

Landfill Gas Monitoring – Conclusion

Landfill gas monitoring undertaken at Dunsink landfill in 2010 indicated another general significant improvement in methane and carbon dioxide concentrations. The sports field area – namely G37 and G39 continue to show persistent elevated CO_2 and CH_4 elevations however the frequency of CH_4 exceedances has dropped considerably over the year. The Dunsoghly area and the sports field continue to be monitored closely.

DCC continue to be notified of the results and mitigation measures will be proposed in the event that there is any further deterioration in results during 2010.

3.8.3 Landfill Gas Utilisation Plant Monitoring Equipment and Sampling points

Weekly monitoring at the inlet and continuous monitoring at the outlet commenced during Q1 2006. It was agreed by the Agency that reporting of incidents under this system could be done through the quarterly and annual environmental reports.

Inlet to Landfill Gas Utilisation Plant

A gas sampling system to include chilling and filtration for the protection of the portable infrared analyser was installed. This facilitates weekly monitoring of methane, carbon dioxide and oxygen using an LMSXi landfill gas analyser, which is used for borehole monitoring. It also provides a sampling location for annual monitoring of Total Sulphur, Total Chlorine and Total Fluorine. The results from the weekly sampling at the inlet are reported in the weekly landfill gas monitoring round sheets. See Appendix III.

Process Parameters.

On 8th December 2010 combustion temperature at Engine 1 was recorded as 458°C.

Outlet from Landfill Gas Utilisation Plan.
Carbon monoxide and Nitrogen oxides are monitored continuously. Continuous monitors on the outlets of the two gas engines were installed. The analysers are proven to be effective on other landfill gas utilisation plants. An appropriate data management system has been installed. This provides for data logging and data storage.

Additionally, a gas sampling system to allow for annual monitoring of total VOCs as carbon, total non-methane VOCs and Particulates, Hydrochloric acid and Hydrogen fluoride, and, quarterly monitoring of nitrogen oxides has been installed.

Emission limit values for Landfill Gas Plant
The emission point reference numbers are proposed to be:

UP1 Utilisation Plant Input 1 – this point is no longer used – replaced by UP4.
UP2 Utilisation Plant Output Engine 1
UP3 Utilisation Plant Output Engine 2 – this engine is no longer in use – replaced by booster cell and Flare.
UP4 New Utilisation Plant Input (replacing UP1)

The analysers are able to measure and report at a sufficient resolution to register the emission limit for Carbon monoxide (CO) (1400mg/m^3).

FIGURE 7: DUNSINK LANDFILL GAS UTILISATION PLANT.

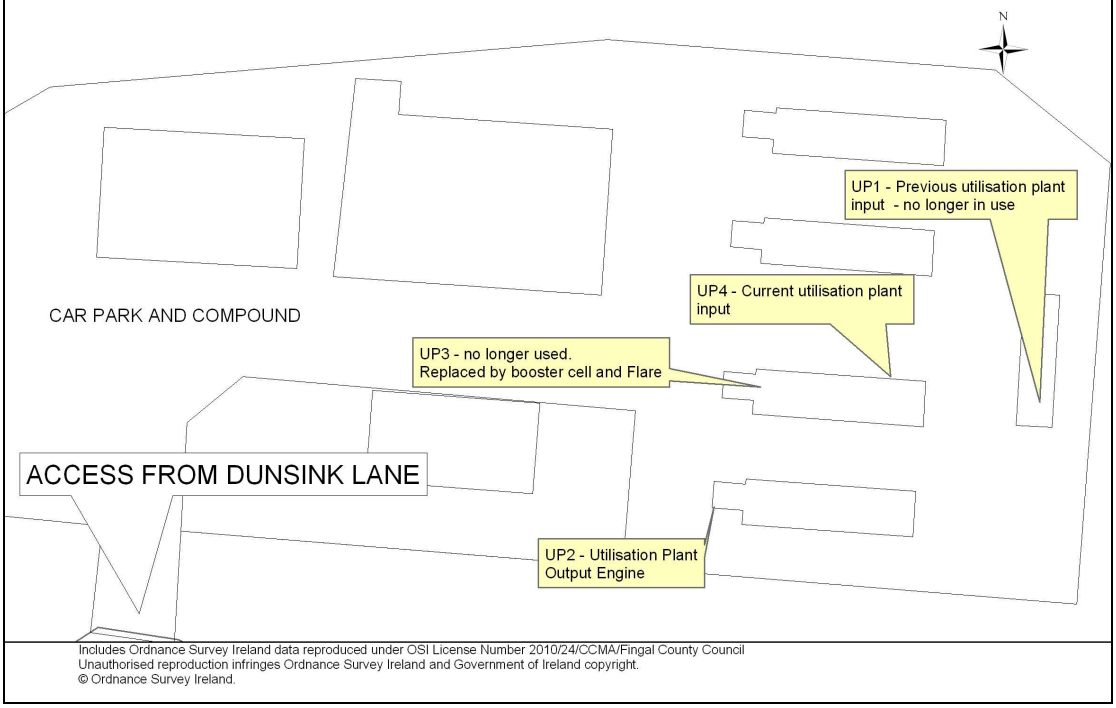

Figure 7: Dunsink Landfill Gas Utilisation Plant

3.8.4 Results from Continuous sampling of parameters at outlets Landfill Gas Combustion Plant.

Continuous monitoring of outlet parameters at the Landfill Gas Combustion Plant was undertaken throughout 2010. The source of these emissions is the engines identified as UP2, Engine #2 was removed and UP3 is no longer used (see Figure 7 above).

Limit values as per Schedule C.5 of the governing waste licence 127-1 are outlined in the table below;

Table 9: Emission Limit Values for continuously monitoring parameters at outlets for utilisation plant

Parameter	Utilisation Plant Emission Limit Value
Nitrogen oxides (No_x)	500mg/m^3
CO	1400mg/m^3

Note 1: Dry gas referenced to 5% oxygen by volume for utilisation plants.

As per condition 1.6 b) of the waste licence 127-1, and Schedule C.5, specifying the Emission Limits Values (ELV) for Landfill Gas Plant (see Table 9 above) the following incidents occurred during 2010 at the IPS compound in Dunsink.

Condition 6.3.2 has been complied with in full as of 27-09-2006; "The concentration limits …..shall be based on gas volumes under standard conditions of:-

In the case of landfill gas combustion plant:
Temperature 273K, pressure 101.3kPa, dry gas; 5% oxygen".

Throughout 2010 reporting of continuous landfill gas monitoring was as per protocols specified in condition 6.3.3.1.

1st Quarter 2010

(a) No 24 hour mean value shall exceed the ELV;
No 24 hour means exceeded 500 mg/m3 for Nitrogen Oxides and no 24 hour mean exceeded 1400 mg/m3 for Carbon monoxide at engine number 1.

(b) 97% of all 30 minute mean values taken continuously over an annual period shall not exceed 1.2 times the emission limit value.

No 30 minute mean values or 0.0% of samples taken continuously over this quarter for Carbon monoxide exceeded 1.2 times the 1400mg/m3 ELV at engine number 1. No 30 minute mean values taken continuously over this quarter for Nitrogen Oxides exceeded 1.2 times the 500mg/m3 ELV at engines number 1.

(c) No 30-minute mean value shall exceed twice the emission limit value.

No 30 minute mean values taken continuously over this quarter for Carbon monoxide exceeded twice the 1400mg/m3 ELV at engine number 1. No 30 minute mean values taken continuously over this quarter for Nitrogen Oxides exceeded the 500mg/m3 ELV at engine number 1.

2nd Quarter 2010

(a) No 24 hour mean value shall exceed the ELV;

No 24 hour means exceeded 500 mg/m3 for Nitrogen Oxides and 13 no 24 hour mean exceeded 1400 mg/m3 for Carbon monoxide at engine number 1.

(b) 97% of all 30 minute mean values taken continuously over an annual period shall not exceed 1.2 times the emission limit value.

476 no 30 minute mean values or 11.00% of samples taken continuously over this quarter for Carbon monoxide exceeded 1.2 times the 1400mg/m3 ELV at engine number 1. The rise in exceedances only occurred after the Gas Emissions Analyser was serviced, the cause is being investigated.

No 30 minute mean values taken continuously over this quarter for Nitrogen Oxides exceeded 1.2 times the 500mg/m3 ELV at engines number 1.

(c) No 30-minute mean value shall exceed twice the emission limit value.

No 30 minute mean values taken continuously over this quarter for Carbon monoxide exceeded twice the 1400mg/m3 ELV at engine number 1. No 30 minute mean values taken continuously over this quarter for Nitrogen Oxides exceeded twice the 500mg/m3 ELV at engine number 1.

3rd Quarter 2010

(a) No 24 hour mean value shall exceed the ELV;

No 24 hour means exceeded 500 mg/m3 for Nitrogen Oxides and 19 no 24 hour mean exceeded 1400 mg/m3 for Carbon monoxide at engine number 1.

(b) 97% of all 30 minute mean values taken continuously over an annual period shall not exceed 1.2 times the emission limit value.

22 no. 30 minute mean values or 0.24% of samples taken continuously over this quarter for Carbon monoxide exceeded 1.2 times the 1400mg/m3 ELV at engine number 1. 6 no. 30 minute mean values or 0.06% taken continuously over this quarter for Nitrogen Oxides exceeded 1.2 times the 500mg/m3 ELV at engines number 1.

(c) No 30-minute mean value shall exceed twice the emission limit value.

No 30 minute mean values taken continuously over this quarter for Carbon monoxide exceeded twice the 1400mg/m3 ELV at engine number 1. No 30 minute mean values taken continuously over this quarter for Nitrogen Oxides exceeded twice the 500mg/m3 ELV at engine number 1.

4th Quarter 2010

When the continuous monitoring data was downloaded, a fault became apparent: the data available on the Smart Card only went up to 14th October – no data had been recorded after this date.
Fingal County Council is investigating this fault to get it resolved. Once the system will be repaired a new procedure will be implemented to ensure the data is downloaded every month so that a 3 month gap of continuous monitoring data cannot be repeated due to data logger failure.

The quarter reporting is as per protocols specified in condition 6.3.3.1.

(a) No 24 hour mean value shall exceed the ELV;

For the 14 days of data available, no 24 hour means exceeded 500 mg/m3 for Nitrogen Oxides and no 24 hour mean exceeded 1400 mg/m3 for Carbon monoxide at engine number 1.

(b) 97% of all 30 minute mean values taken continuously over an annual period shall not exceed 1.2 times the emission limit value.
For the 14 days of data available, 51 no 30 minute mean values or 8.03% of samples taken continuously for Carbon monoxide exceeded 1.2 times the 1400mg/m3 ELV at engine number 1. No 30 minute mean values taken continuously over this period for Nitrogen Oxides exceeded 1.2 times the 500mg/m3 ELV at engine number 1.

(c) No 30-minute mean value shall exceed twice the emission limit value.
No 30 minute mean values taken continuously over the 2 weeks for Carbon monoxide exceeded twice the 1400mg/m3 ELV at engine number 1. No 30 minute mean values taken continuously over the 2 weeks for Nitrogen Oxides exceeded twice the 500mg/m3 ELV at engine number 1.

3.8.5 Summary of Continuous Sampling of Emissions at Landfill Gas Combustion Plant

The results from continuous sampling of parameters from outlets at landfill gas combustion plant throughout 2010 presented a general picture of compliance with emission limit values apart from 30 minute mean values for carbon monoxide during Q2 and 2 weeks of Q4 and 30 minute mean values for Carbon monoxide and Nitrogen oxides during Q3.

Particular attention will be given to the emissions recorded in 2011 from the continuous sampling as soon as the data logger issue is sorted.

3.9 METEOROLOGICAL MONITORING

Condition 8.6 and Schedule D.6 require daily monitoring of precipitation volume, temperature (min/max), wind force and direction, evapotranspiration, humidity and atmospheric pressure. This data is obtained from Met. Éireann's Dublin Airport Weather Station and the data are illustrated by month in the following tables / figures.

The data is presented in the form of monthly averages which masks much of its complexity. The data is available in full tabular format at the facility offices.

3.9.1 Total Precipitation Volume by Month

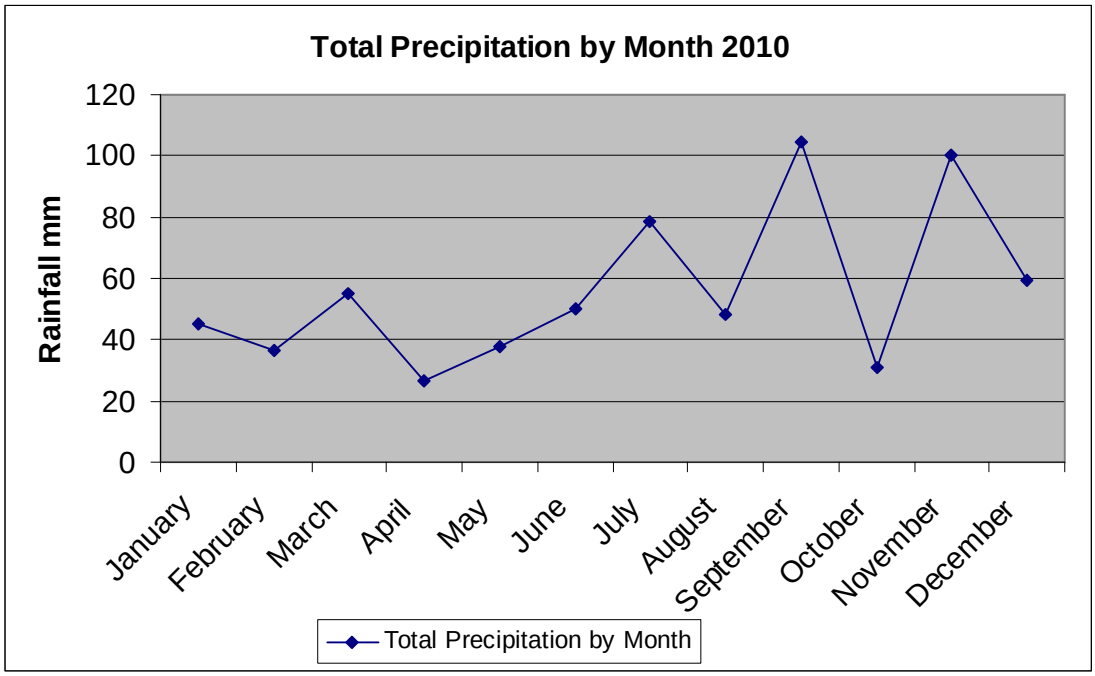

Figure 8: Total Precipitation mm by Month 2010

3.9.2 Average Daily Temperatures (minimum /maximum) By Month 2010

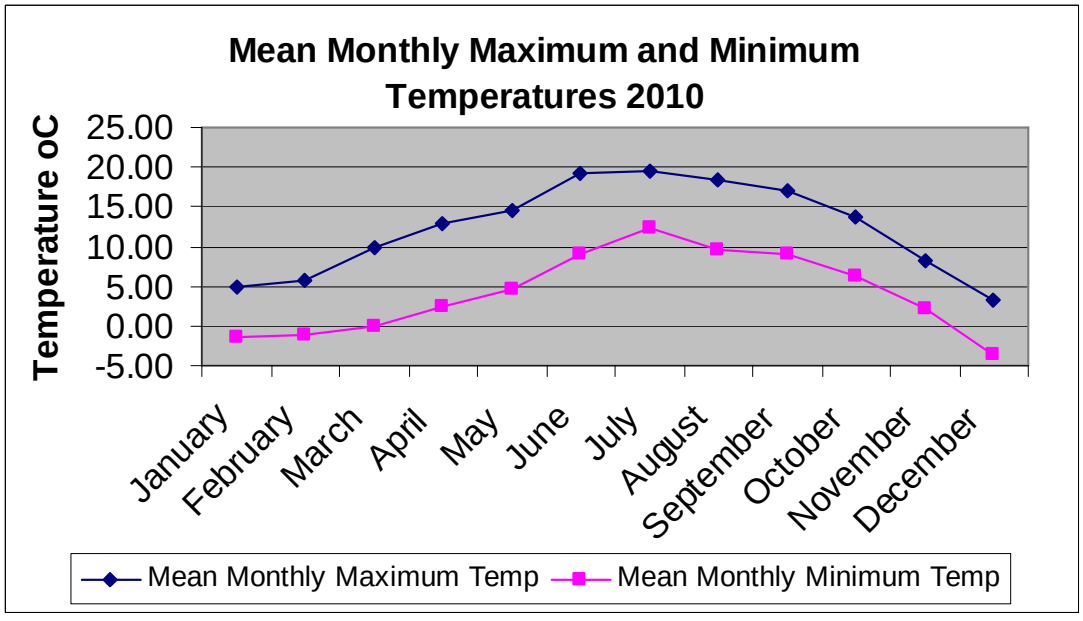

Figure 9: Average Daily Temperatures (Minimum/Maximum) by Month 2010

3.9.3 Average Daily Wind speed by Month 2010

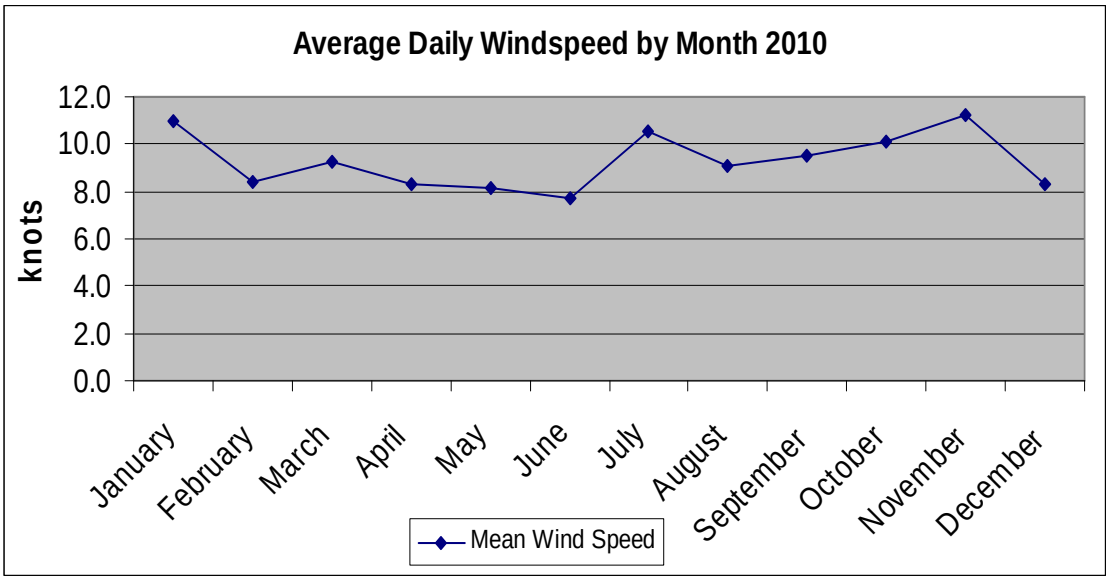

Figure 10: Average Daily Windspeed by Month 2010

3.9.4 Average Daily Wind Speed and Direction by Month 2010

Table 10: Average Daily Wind Speed by Month 2010

Month	Speed (knots)
Jan	10.9
Feb	8.4
Mar	9.3
Apr	8.3
May	8.2
Jun	7.8
Jul	10.5
Aug	9.1
Sept	9.5
Oct	10.2
Nov	11.3
Dec	8.3

Figure 11 shows a Rose Diagram of average daily wind direction measure at Dublin Airport. The figure shows the winds during 2010 are predominantly West to South Westerly in direction.

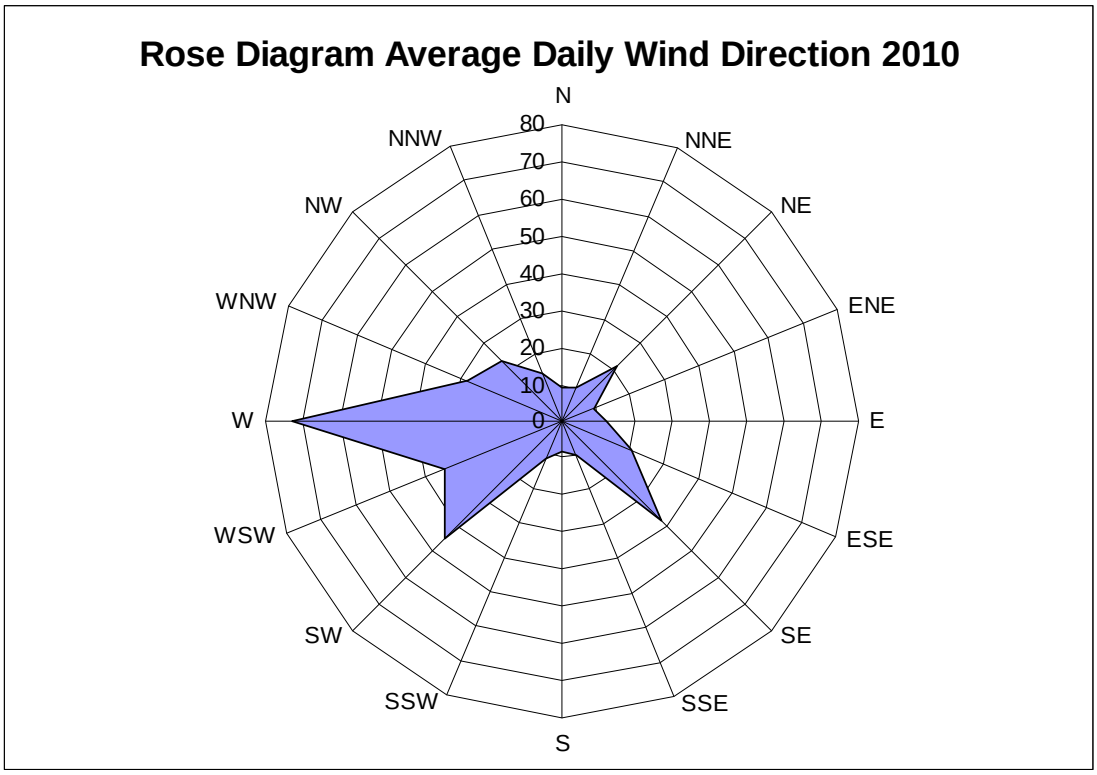

Figure 11 - Rose Diagram of Average Daily Wind Direction at Dublin Airport

3.9.5 Average Daily Evaporation and Potential Evapotranspiration by Month 2010

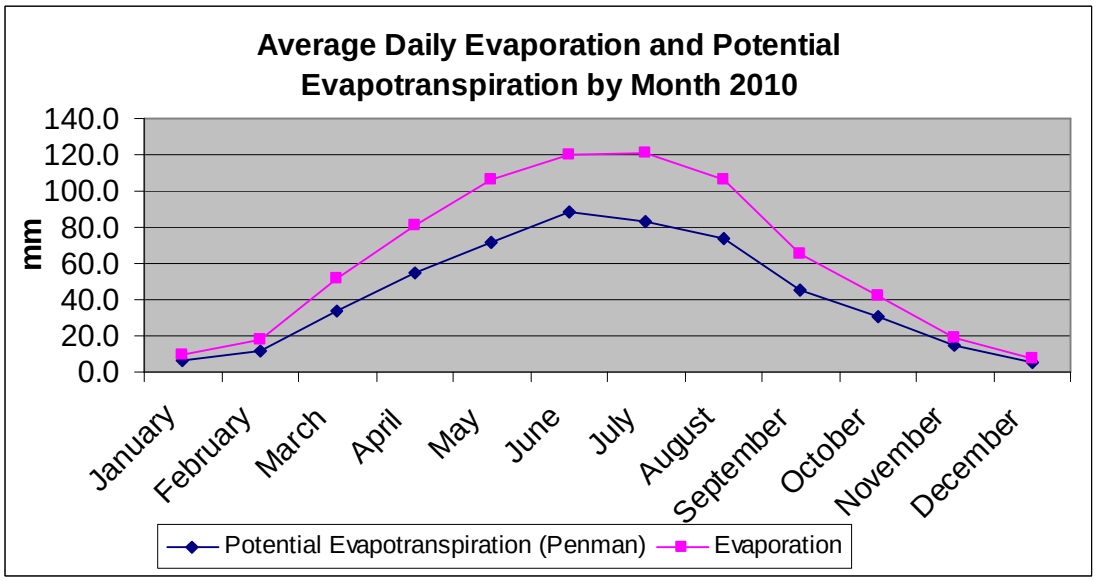

Figure 12 - Average Daily Evaporation and Potential Evapotranspiration by Month 2010

3.9.6 Average Daily Relative Humidity By Month 2010

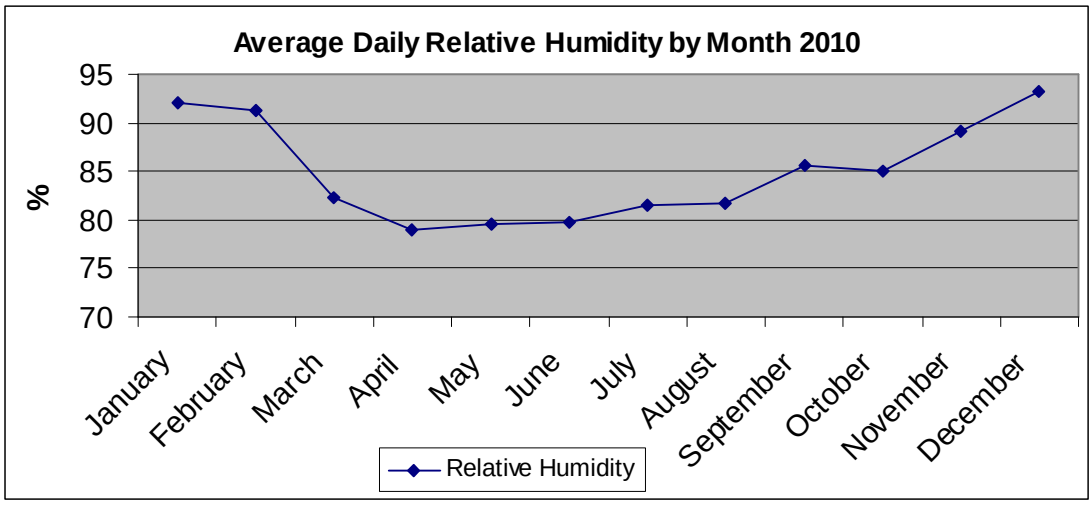

Figure 13 - Average Daily Relative Humidity by Month 2010

3.9.7 Average Daily Atmospheric Pressure By Month 2010

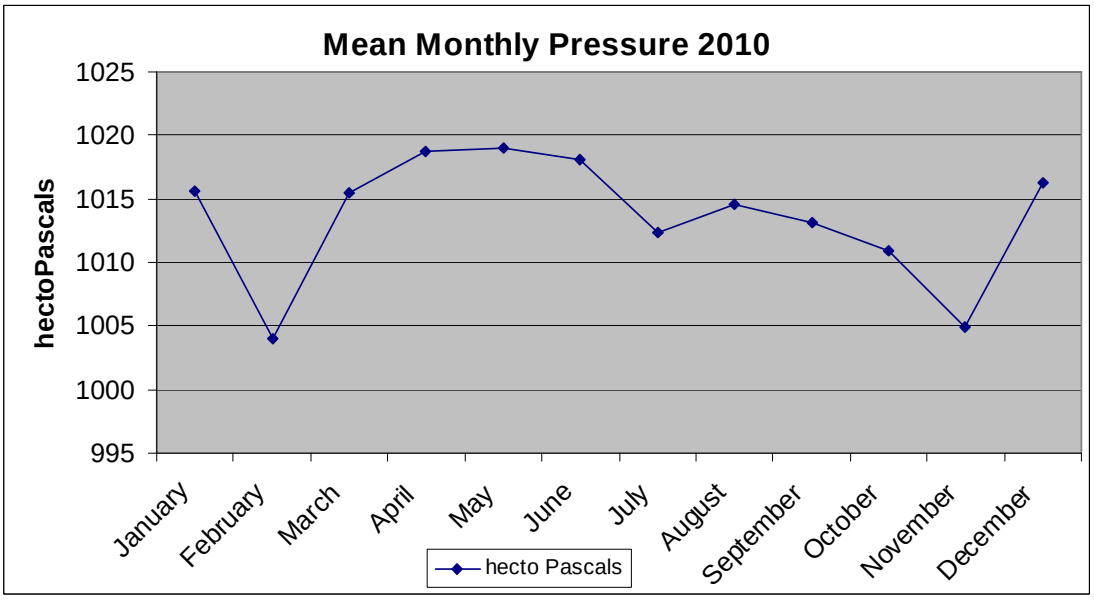

Figure 14 - Average Daily Atmospheric Pressure by Month 2010

4.0 RESOURCE & ENERGY CONSUMPTION

Resources consumed at Dunsink Landfill include diesel fuel, electricity and hydraulic oil. There were three main consumer entities operating on site:

- Fingal County Council (FCC)
- Contractors
- Bioverda Power Systems (BPS)

4.1 FINGAL COUNTY COUNCIL

The compound offices were connected to the national electricity grid in March 2005. The compound offices are no longer occupied, and FCC at Dunsink consumes electricity at the pump house. FCC did not consume hydraulic oil. The main component of FCC's resource and energy consumption was electricity. (Table 11).

4.2 CONTRACTORS

Contractors on site consumed diesel fuel in the operation of their plant, which comprises; mainly one JCB (Table 11)

4.3 BIOVERDA POWER SYSTEMS

BPS on site consumed less diesel, electricity, lube oil and landfill gas than in previous years (Table 11). This reflects the downturn in landfill gas utilisation.

Table 11: Summary of Resources used on site for the reporting period

Resource	FCC	Contractors	IPS	Total 2010	Total 2009
Electricity MWh	69*	Nil	63	132*	399
Diesel Vehicles	3,000*	8,100*	Nil	11,100*	11,100*
Diesel Pump	Nil	Nil	Nil	Nil	Nil
Hydraulic Oil	Nil	60*	Nil	60*	60*
Lubricating Oil	Nil	200*	1,980	2,180*	5,875* L

*Estimates

5.0 VOLUME OF LEACHATE PRODUCED AND DISCHARGED OFF-SITE

A flow metre measuring volumes of leachate produced from the facility or volumes of leachate discharged off-site was installed with the new pump house in June 2005. However, during 2004 efforts were made to get estimates for leachate production in Dunsink to determine the appropriate capacity of current and proposed leachate infrastructure. It was considered important in view of the daily discharge limit of 1,400m^3 imposed by the Sanitary Authority (Dublin City Council) to determine responses should this limit be breached.

5.1 METHODS FOR ESTIMATING LEACHATE PRODUCTION

An annual water balance calculation was performed to estimate leachate production in Dunsink. This figure is compared with figures measured as discharged offsite since June 2005 (See Table 12).

5.1.1 Water Balance Calculations

In calculating the water balance for Dunsink the formula used was taken from Environmental Protection Agency (EPA) guidelines (EPA 2000)[1]. Rainfall data from Dublin airport Meteorological station are used in this calculation. Data from 2010 are used in the average and scenario calculations.

Lo = [ER(A) + LW + IRCA + ER(l)] – [aW]
Whereby;
ER = effective rainfall (m).
A = Area of cell (m^2).
LW = Liquid waste (also includes excess water from sludges) M^3.
IRCA = Infiltration through restored and capped areas (m^3).
l = Surface area of lagoons (m^2).
a =absorptive capacity of waste M^3/t.
W = weight of waste deposited.

ER = Total Rainfall (R) minus Actual Evapotranspiration (AE).
For Dunsink landfill, following the guidance given in the EPA guidelines the ER is taken as R.
Total rainfall (R) for Dunsink in 2010 was 673 mm or **0.673m**.

A= The landfill area is 154 acres or 62.3 hectares or **623000m^2**. No area is active, there has been no dumping of municipal waste for over seven years.

ER(A)=0

[1] Environmental Protection Agency (2000). Landfill Manuals; Landfill Site Design. EPA, Ireland. ISBN 1 84095 026 9

LW = Liquid waste is not deposited in Dunsink. 0m3.

IRCA = In areas that have been temporarily capped / restored an infiltration rate of 25-30% of the annual rainfall should be used. In areas which have been restored an infiltration rate of 2-10% should be applied. Given that the landfill is now restored 10% will be used as the infiltration rate through restored and capped areas.
10% of ER = 0.0673. 623,000m2 X 0.0673m

IRCA= 41,927.9m^3
l = In Dunsink the area of the lagoon is 6,000m2, ER=0.673
ER(l) =4,038m^3

aW = The total volume of waste has been calculated roughly, as 3.3 million m^3 on the basis of volume of three phases of landfill. It has also been roughly estimated that approximately 5,000,000 tonnes of waste have been deposited in Dunsink based on figures available from 1994 for annual inputs to the site. On this basis the roughly estimated waste density is 1.5 t/m^3. This is very high and may be due to compaction by its overburden of subsoil or fill. The absorptive capacity of waste falls to negligible or none per tonne of waste before leachate is generated at densities greater than 1.2 t/m^3,
aW=0 m^3/tonne

Lo = [ER(A) + LW + IRCA + ER(l)] – [aW]

Lo = [0 + 0 + 41,927.9 + 4,038] – [0]

Lo = 45,965.9m^3 pa
Lo = 125.9m^3 /d
Lo = 5.25m^3 /hr

5.1.2 Scenario Building

This rough estimate should be viewed in the context of varying annual rainfall over a year period. Water balance calculations should be carried out for a number of scenarios such as average monthly leachate volumes to be generated (See Table 12).

Table 12: Estimates of Leachate Production: Average Monthly rainfall recorded at Dublin Airport 2010 (Source: Met Éireann)

2010	Rain (mm)	Rainfall % Total	Estimated Monthly Leachate Production M^3
January	45.2	6.76	3107.6
February	36.7	5.45	2506.6
March	54.8	8.14	3742.8
April	26.7	3.97	1823.6
May	38	5.14	2363.2
June	50.3	7.96	3660.9
July	78.5	11.68	5368.4
August	48	7.13	3278.4
September	104.3	15.5	7123.7
October	30.8	4.58	2103.6
November	100.1	14.86	6830
December	59.4	8.83	4057.02
Total 2010	673	100.0	45965.9

The EPA guidelines (EPA, 2000) suggest a peak flow factor of 3 to 5 times the predicted average flow rate should be used when sizing plant / pipe work. Therefore using 2010 rain data and allowing for the now completed restoration of Dunsink, an adequate pump station should be able to handle about ($5.25m^3$ * 3) to ($5.25m^3$ * 5) or 15.75 m^3/hr to 26.25 m^3/hr during wet weather flow. During 2010, the volume of leachate discharged to public sewer was 179,643m^3 which equates to 20.51 m^3/hr.

5.1.3 Results

Water balance calculations from EPA guidelines for Dunsink during peak wet conditions suggest that leachate production / discharge could be in the range of 378-630m^3 /day.

5.1.4 Discussion

The results presented above are estimates only. The results from this exercise (EPA model), indicate that Dublin City Council's discharge limit of 1,400 m^3 / day would not be breached and the leachate lagoon would not ordinarily be needed to deal with any excess leachate generated. The lagoon has a capacity of 26,700m^3 . The pump house design facilitates pumping a maximum of 20 litres/s or 72m^3 / hr or 1,728m^3 / day and the modelled leachate production is well below this.

The new pumping arrangements installed during June 2005 provide data for the volume of leachate generated at the facility (Table 13).

Table 13: Estimates of Leachate Production and Volumes Measures as Discharged from site

2010	Rain mm	%	Estimated Monthly Leachate Production M^3	Volume Discharged as Measured By Flow Metre
January	45.2	6.76	3,107.6	32,488
February	36.7	5.45	2,506.6	17,926
March	54.8	8.14	3,742.8	15,902
April	26.7	3.97	1,823.6	14,802
May	38	5.14	2,363.2	10,834
June	50.3	7.96	3,660.9	9,431
July	78.5	11.68	5,368.4	11,292
August	48	7.13	3,278.4	10,317
September	104.3	15.5	7,123.7	8,913
October	30.8	4.58	2,103.6	8,518
November	100.1	14.86	6,830.0	15,298
December	59.4	8.83	4,057.0	23,921
Total	673	100.0	45,965.9	179,643

The estimated monthly leachate production is significantly and substantially less that the actual volumes measure as discharged from site. There maybe a groundwater influence in leachate generation at the site which accounts for this anomaly. The EPA water balance calculation is based on rainfall contribution to leachate generation.

Since 2006 a significant rise in leachate pumped off-site has occurred and it is considered that this is partially explained by the emplacement of two major leachate

interception drains at the north and south of the facility. These leachate interception drains are obviously harnessing significant amounts of leachate and contributing to the leachate load at Dunsink.

5.1.5 Conclusion

Given all the results presented above (the varied estimates for leachate production and the actual volumes discharged offsite), it is suggested that the pump house design, in conjunction with the option to use the lagoon periodically provides sufficient capacity for dealing with the estimated leachate generated in the landfill. The completion of the restoration of the site during 2008 and 2009 has led to a reduced estimate of the amount of leachate generated by the facility through the water balance calculations. However the progress in landfill restoration has ultimately resulted in greater leachate collection and consequent increased volumes of leachate being discharged offsite. Nevertheless, the data provided by the leachate flow metre continues to vindicate the capacity designed into the leachate infrastructure.

5.2 ANNUAL WATER BALANCE CALCULATIONS AND INTERPRETATIONS

5.2.1 Introduction

The actual water balance calculations are outlined in detail in Section 5.1.

5.2.2 Discussion and Interpretation

It must be stated that the results are estimates only and based on many assumptions, which may or may not be correct. Furthermore; data from key variables such as depth of waste, proximity of groundwater table and effect of springs within waste body; are unavailable.

(i) Previous estimates of the wet weather flow and dry weather flows for leachate were prepared by FCC in 2003 on the basis of direct measurements. These estimates calculated Wet Weather Flow leachate volumes in the range of 1242-1656m3/day and 414m3/day during dry weather flow.

(ii) Water balance calculations are presented in Section 5.1.1 from EPA guidelines for Dunsink during peak wet conditions. They suggest that peak leachate production / discharge could be 630m^3 /day during wet weather and 378m^3/day during Dry Weather Flow.

(iii) During 2010, the volume of leachate discharged to public sewer was 179,643m^3 which equates to 20.51 m^3/hr. (See Table 13). This suggests that average leachate production/discharge over the year is 492m^3/day.

These figures must be seen in the context of the bedrock geology and aquifer status of the site. The regional view of the vicinity of the Dunsink Landfill is of a low yielding aquifer.

5.2.3 Conclusion

The results from water balance calculations and from the pump house flow-metre are very different in terms of leachate modelled as generated on site and leachate volumes pumped off-site. However both sets of results validate the choice of leachate pump house design, which was based on empirical measurements of leachate flowing through the existing infrastructure. The pump house design facilitates pumping a maximum of 20 litres/s or 72m^3 / hr or 1728m^3 / day. Dublin City Council allows a maximum discharge of 1400 m^3 / day.

The worst case scenario for Dunsink from wet weather flows derived from previous estimates at 1,656m^3/day exceeds this limit. In instances when the pump-house cannot pump away volumes as they are generated from the facility the system is self regulating. During Wet Weather Flow peak flows in excess of the limit are rare and short in duration. When they do occur the automatic valve opens and closes to regulate the level of leachate in the sump and facilitate controlled discharge of leachate to public sewer or the lagoon. The lagoon has additional capacity of 26,700m^3 and if empty would have capacity for 16+ days pumping to lagoon during wet weather flow. This contingency provides for scenarios whereby pumping to the public sewer would not be feasible for any reason.

The results suggest that the pump house design, in conjunction with the option to use the lagoon periodically may provide sufficient capacity for dealing with the estimated leachate generated in the landfill.

5.3 ESTIMATED ANNUAL AND CUMULATIVE QUANTITY OF INDIRECT EMISSIONS TO GROUNDWATER

5.3.1 Emissions to Groundwater - Introduction

At present there are no estimates for annual and cumulative quantities of indirect emissions of leachate to groundwater.

Inferences are made from estimates in Sections 5.1.1 (estimates of leachate going through leachate management infrastructure during Wet Weather Flow) and 5.1.2 (estimates of leachate generated at the facility based on water balance calculations). At the outset, it must be stated that this is an exercise fraught with difficulties in that these estimates are based upon many assumptions, which may or may not be correct. Furthermore; data from key variables such depth of waste, proximity of groundwater table and effect of springs within facility; are unavailable.

Nevertheless the volumes of leachate discharged from the facility consistently and substantially exceed those estimated from water balance calculations.

5.3.1.1 Dry weather flow

The leachate infrastructure and discharge consents from Dublin City Council are more than adequate to deal with the volumes of leachate generated in Dunsink during dry weather flow. This suggests that there may be no indirect emissions to groundwater during Dry Weather Flow conditions.

5.3.1.2 Wet weather flow

The leachate infrastructure system seems to be "flashy" i.e. the amount of leachate going through the system rapidly increases following rainfall events. For all but the highest peaks in wet weather flow the leachate infrastructure and discharge consents from Dublin City Council are more than adequate to deal with the volumes of leachate generated in Dunsink and there is little risk of contamination of groundwater.

In instances when the pump-house cannot pump away volumes as they are generated from the facility the system is self regulating. During Peak discharges during Wet Weather Flow are rare and short in duration, the automatic valve opens and closes to regulate the level of leachate in the sump and facilitate controlled discharge of leachate to public sewer or the lagoon.

5.3.2 Bedrock Geology of the site and Aquifer Status

The western half of the landfill is underlain by Waulsortian Limestones. The GSI classify the County Meath Waulsortian Limestones as L1, bedrock which is moderately productive only in local zones and this can be assumed to be the case for Dunsink.

The central part of the landfill is underlain by the Tober Collen formation. The thinly bedded mudstones of the Tober Colleen formation which underlie the Calp Limestone have been classified by the GSI as Pu, bedrock which is generally unproductive due to the low permeability of the bedrock.

The eastern part of the site is underlain by basinal limestones consisting of limestone turbidites with bioclastic and calcareous mudstones. The GSI classify the County Meath Waulsortian Limestones as L1, bedrock which is moderately productive only in local zones and this can be assumed to be the case for Dunsink.

There is a minor faulting in the vicinity of the site and there is a minor fault running in a north-west south-east direction through the site.

A number of boreholes have been drilled into the bedrock on the site and a visual inspection of the drill chips from the monitoring boreholes indicated the site to be generally underlain by the soft black basinal (Calp) limestones and mudstones. These were recorded at all boreholes that were drilled to bedrock. The hardness and shade of the rock varied between boreholes between different depths within the same borehole. The Calp Limestone of County Dublin has been classified in the GSI Groundwater Protection Scheme as a L1 aquifer, bedrock which is generally moderately productive.

The monitoring well drilling programme confirmed the regional view of the vicinity of the Dunsink Landfill as generally low yielding aquifer.

5.3.3 Conclusion

On the basis that

(1) The underlying geology and overburden have produced a localised classification of the aquifer as generally low yielding.
(2) Measured volumes of leachate discharged from the facility are consistently and substantially higher than those calculated through water balance calculations.
(3) The groundwater monitoring programme indicates that groundwater around the facility is generally good;

It is considered that indirect discharges to groundwater are not significant in volumes or effect.

6.0 WORKS PROPOSED AND UNDERTAKEN & TIMESCALE FOR THOSE PROPOSED DURING THE COMING YEAR

6.1 WORKS UNDERTAKEN DURING 2010.

The phased handover of the landfill and surrounding areas to the Parks Department was completed by December 2009. The Environment Department continued with all monitoring obligations as set out in the landfill license.

In 2010, a review of the gas collection and inspection chambers was carried out. These chambers are used to regulate and balance the gas field and methane emissions from the Landfill. Concern was expressed by Bioverda Power Systems (BPS) to Fingal County Council (FCC) about the condition of these chambers and the potential Health and Safety implications for personnel entering the chambers.

Following this review, the 13 gas chambers have been fitted with metal covers, replacing old concrete covers that could only be moved with a tracked excavator.

7.0 SITE SURVEY INDICATING EXISTING LEVELS OF THE FACILITY

Fingal County Council sought approval from the Environmental Protection Agency on the 13/08/2009, (letter Ref FCC-127-1-2009-010) not to undertake a topographic survey in 2009. This was due to the fact that there was no importation of soil into the restored landfill and no subsidence was anticipated. Approval was given by the EPA on the 20/08/2009 by telephone from Mr Eamonn Merriman. Figure 15 below shows the topographic status of the landfill as established by the most recent topographic survey completed in 2007.

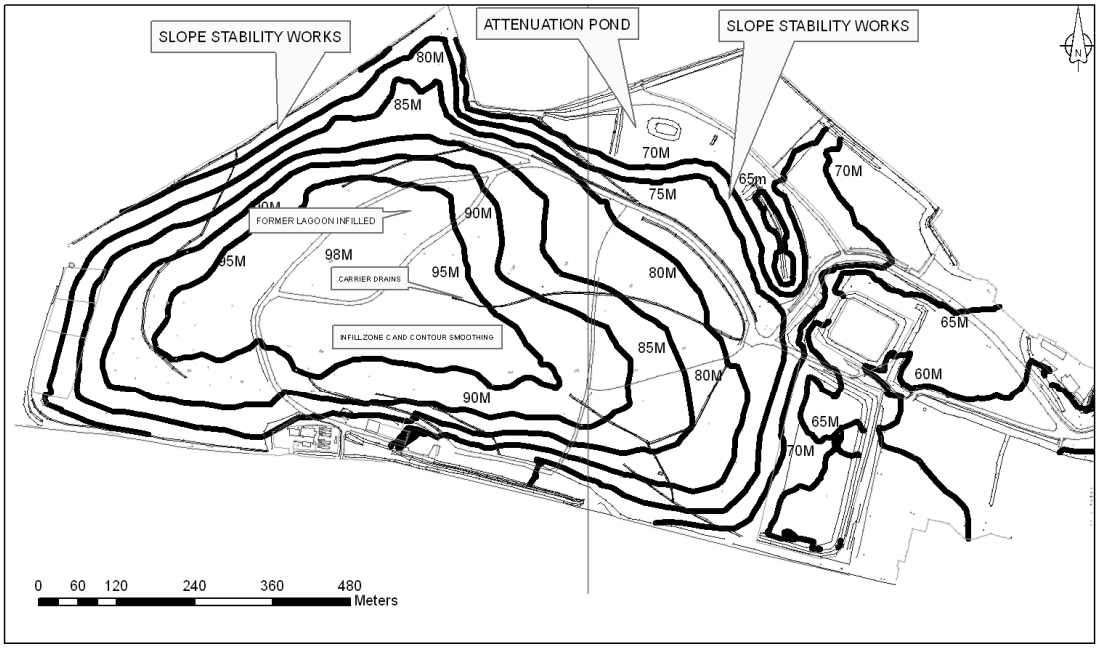

Figure 15: Simplified Topographical Map of Dunsink 2007

8.0 ESTIMATED ANNUAL & CUMULATIVE QUANTITY OF LANDFILL GAS EMITTED

In early 1996 a gas collection network was first configured throughout the whole landfilled portion of Dunsink. In 1999 the collection network was replaced by a larger more extensive arrangement.

It is comprised of a high-density polyethylene (HDPE) ring main around the site with a number of branch lines, which contains manifolds that connect to individual gas extraction wells.

There are approximately eighty-five gas extraction wells currently connected to manifolds throughout the site. Some of the wellheads are buried so it is not physically possible to confirm their condition or truly assess their performance. An additional thirteen gas wells were installed in Zone A and six additional gas wells were installed in Zone C during 2006.

There are ten branch lines off the main collection ring. These branches are 250mm in diameter and have multi-outlet manifolds configured to collect the gas from the wells in their vicinity. Each branch can be isolated where it connects to the main line. The manifold arrangement allows the line from the individual wells to be sampled and controlled. This has the effect of balancing the "good gas" with the bad to maintain the optimum quality to the utilisation plant.

The mainline ring is a 355mm HDPE pipe that completely encircles the landfill and finishes back at the utilisation plant compound. It has two dewatering chambers, one next to the old main landfill entrance and the other adjacent to the IPS compound, where the collected condensate is returned to the waste body via a disused extraction well. This ring main can be isolated in a number of locations to permit maintenance operations and still maintain operation of the utilisation plant.

The extraction pump which feeds the remaining generator (one was removed from site during 2006) is capable of collecting three thousand cubic metres of gas per hour at a maximum suction pressure of –150mbar. It is currently delivering approximately five hundred and fifty five cubic metres per hour at a quality of 40%CH_4. In the unlikely event the engine is out of service for an extended duration, the integral flare can be run to maintain negative pressure on the landfill.

8.1 LANDFILL GAS CONSUMED BY UTILISATION PLANT 2010

Figures for landfill gas emitted from the facility are derived from data submitted by Bioverda Power Systems for the utilisation plant in Dunsink. The migration issues of previous years are largely resolved and the utilisation plant controls the vast majority of the landfill gas emitted. The figures for 2010 are presented in Table 14.

Testing conducted in 2010 shows that it takes 899 NM^3 at 40% methane to produce 1000kwutiklising the engine installed in Dunsink. Therefore to arrive at an average daily consumption of landfill gas at 40% concentration multiply the daily KW output

by 0.899 to determine average daily consumption in normal cubic metres or NM^3. Normal cubic metres means that it is measured based on standard temperature and pressure conditions.

8.2 LANDFILL GAS CONSUMED BY UTILISATION PLANT AND GENERATED BY FACILITY 1996-PRESENT

The amount of landfill gas utilised by the plant was trending downwards but dropping less sharply in recent years than the period 2003-2005. In 2010, there was a decrease in the gas utilisation from the previous two years. This pattern is observable through figures provided by BPS, See Figure 16.

.

It was reported last year that the rate of landfill gas generation at the facility is continuing to drop but the generation shows that the amount of gas being consumed at the facility is less than the GasSim model in 2009. In 2009 the gas engine would occasionally 'run out of gas' at viable concentrations indicating that the gas field production is decreasing at an increasing rate. That trend continued in 2010 with the engine regularly 'running out of gas' and having to be restarted after giving the field an opportunity to recover, typically 12-24 hours.

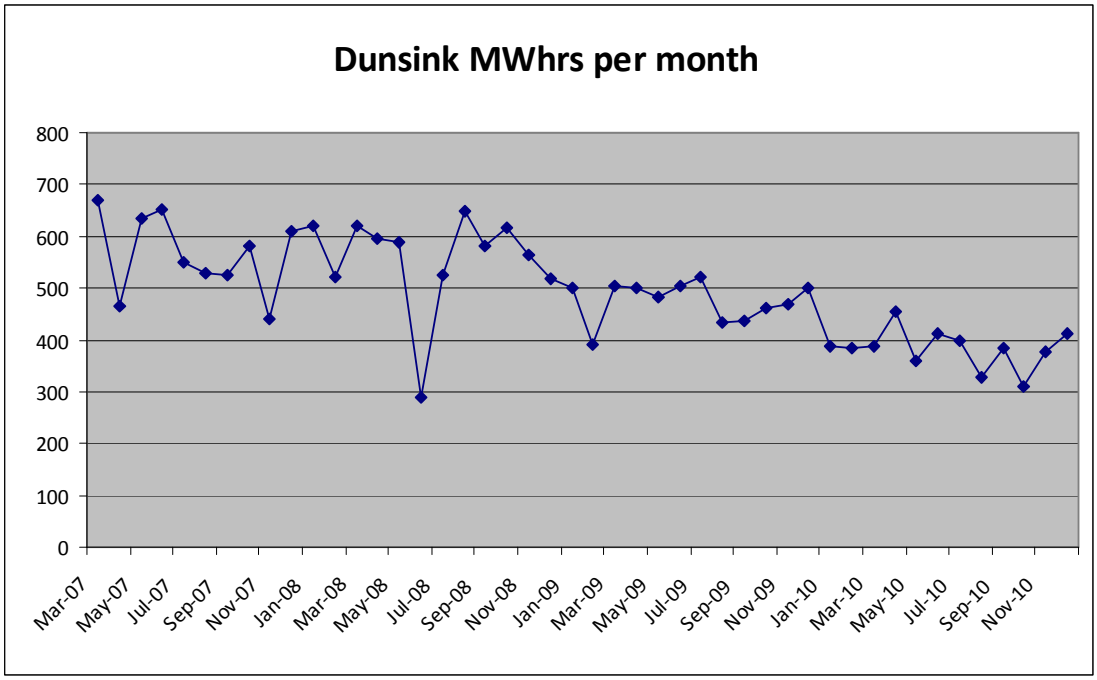

Figure 16 - MWhr exported per month at Dunsink.

Bioverda are reporting that supply of gas has dropped sharply. It is considered that landfill gas migration is not an overwhelming issue at Dunsink and it is suggested that these figures reflect a downward pattern over time of landfill gas emitted from the facility.

The landfill gas network was extended during 2006. Given the definite pattern and direction in landfill gas generation and utilisation there appeared to be enough data to provide for the specification of an enclosed flare. The enclosed flare should cater for the needs of Landfill Gas Management in Dunsink for the next twenty years. The enclosed flare was delivered to site in December 2007 and was installed and commissioned during the first quarter of 2008 and is now operated by Fingal County Council

Table 14 - Landfill Gas Consumed by BPS utilisation plant in Dunsink during 2010.

	Units	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Diesel	Litres	0	0	0	0	0	0	0	0	0	0	0	0	0
Electricity Consumed	Kwhrs	8926	7101	7181	5341	6035	5128	5576	0	5029	6667	6391	0	63375
Oil (Lubrication)	Litres	0	250	280	0	0	300	0	400	0	300	0	450	1980
Landfill Gas	1000' Cubic metres	349	346	349	410	325	373	358	295	345	279	338	371	4137
Average Monthly Ch4	% by Volume	40	40	40	40	40	40	40	40	40	40	40	40	40
Electrical units exported (power output)	MWhrs	388	384	388	455	361	414	398	328	383	310	376	412	4597

Data compiled and verified by: Simon Kelly, Greenstar GDA and BPS Engineering Manager

9.0 REPORT ON PROGRESS TOWARDS ACHIEVEMENT OF ENVIRONMENTAL OBJECTIVES AND TARGETS CONTAINED IN PREVIOUS YEAR'S REPORT.

This is the seventh AER under this Licence. In 2010 the majority of objectives for the facility nearing completion were fully completed and the Enclosed Flare was commissioned and handed over to Fingal County Council.

- The Phased Handover of the landfill and surrounding areas to the Parks Department which began in 2008 was completed as of December 2009
- Capping works, final landscaping and slope stability maintenance were completed in 2009.
- Environmental Infrastructure Inspection, Maintenance and Monitoring were ongoing in 2010

10.0 SCHEDULE OF ENVIRONMENTAL OBJECTIVES AND TARGETS 2010

The schedule of environmental objectives is complete and has now been withdrawn from the AER.

11.0 PROCEDURES DEVELOPED RELATING TO THE FACILITY OPERATION

No new Standard operating procedures (SOP`s) were introduced in 2010.

12.0 TANK, PIPELINE AND BUND TESTING AND INSPECTION REPORT

The leachate lagoon and bund tests were last conducted in October 2007. Conditions 3.10.5 and 5.10.2 of the licence require that the test be carried every three years by an independent and appropriately qualified chartered engineer.

12.1 LAGOON

An integrity test was conducted on the Lagoon in Dunsink during October 2007. The lagoon is deemed fit for the storage of leachate. A report was submitted to FCC based on the findings of the hydrostatic test, construction details and visual assessment of the lagoon. This report is available for inspection at the facility office. A new integrity test will be conducted on the lagoon in early 2011.

12.2 OIL BUND IPS COMPOUND- DUNSINK

An integrity test was conducted during October 2007 on the oil bund on the IPS compound. The bund integrity was found to be good, it was watertight and found fit

for its intended use. Oil is no longer stored in the compound – it is therefore proposed not to carry out further integrity test on the disused bund.

13.0 REPORTED INCIDENTS AND COMPLAINTS SUMMARIES

13.1 REPORTED ENVIRONMENTAL INCIDENTS

There were fifty eight reported incidents last year reported under condition 1.6 c) "Any trigger level specified in this licence which is attained or exceeded"; and d) "Any indication that environmental pollution has, or may have, taken place." Eight of these were notified to the Eastern Regional Fisheries Board during 2010.

Table 15: Summary of reported incidents during 2010

	EPA Notified					**ERFB* Notified**
	Surface Water	Groundwater	Landfill Gas	Dissolved Methane	Noise	Surface Water & Groundwater
Month	**2010**	**2010**	**2010**	**2010**	**2010**	**2010**
January			4			
February	1		4			1
March	1	1	4	1		1
April			5			
May			4			
June			5			
July	1	1	4	1		1
August			4			
September	1	1	5	1		1
October			4			
November	2	1	3	1		2
December	2		4			2
Total	**8**	**4**	**50**	**4**	**0**	**8**

* Eastern Regional Fisheries Board.

A summary of the environmental incidents distributed by month and thematic area is provided in Table 15.

Table 15 indicates a slight increase in the number of incidents in 2010 compared to 2009. The number of landfill gas incidents is similar to last year. They primarily relate to regular breaches of trigger levels for carbon dioxide at the Sports field and on the monthly rounds at Dunsoghly and Cappagh boundaries.

Surface water incidents have increased slightly since 2009, and the incidents primarily related to elevated levels of suspended solids and conductivity which may not have been related to the landfill.

There was one exceedance of the ELV for Dissolved Methane in 2010 which was at the Leachate Sump in Q1.

The EPA was notified of all incidents. The ERFB were notified on all incidents pertaining to surface water and Dublin City Council continues to be informed in relation to Dissolved Methane.

13.2 REPORTED ENVIRONMENTAL COMPLAINTS

Condition 10.4 of Licence 127-1 requires that the licensee shall maintain a written record of all complaints relating to the operation of the facility. No complaints were received by FCC during 2010.

It is considered that with the closure and completed restoration and improvements to landfill infrastructure since the end of 2009, have meant that the landfill is now less of an issue for its surroundings. This is a continuation of the trend in recent years. There were no complaints in 2009 while in 2008 there were just two complaints, compared with five for 2004, one for 2005 and two for 2006.

14.0 REVIEW OF NUISANCE CONTROLS

Condition 7 of Waste Licence 127-1 requires that vermin, birds, flies, mud, dust, litter, noise and odours do not give rise to nuisance at the facility or in the immediate area of the facility.

To this end a Nuisance Monitoring Programme was instigated. This involves weekly inspection of the nuisances stated in Condition 7.1, but also includes those associated with security, surface water and leachate. The nuisance inspection is conducted in conjunction with the weekly Surface Water Visual Inspection. The facility and some adjoining areas are separated into seven zones. A checklist was designed and is filled in weekly since inspections were formalised in August 2004. The nuisance-monitoring programme feeds into the Environmental Management System, in that if nuisances are detected which are not considered incidents under Condition 1.6 of the licence – Corrective Action Procedures are invoked. If nuisances are detected which are considered incidents under Condition 1.6 of the licence, procedures listed under condition 9.1 are adhered to. The records for weekly inspections are available in the facility office. A template of the nuisance inspection form is attached in Appendix IV.

15.0 FINANCIAL PROVISION, MANAGEMENT, STAFFING STRUCTURE & PROGRAMME FOR PUBLIC INFORMATION

15.1 FINANCIAL PROVISION

With regard to the uptake of Environmental Liability Risk Assessment (ELRA), Residuals Management Plans (RMP), Closure Remediation and Aftercare Plans (CRAMP) and Financial Provision (FP), please find the following information in relation to Dunsink Landfill.

Risk Category as derived using the system set out in the Guidance Document. This specific exercise has not been carried out to date. However on looking at the guidance document it appears similar to the "Methodology for Determining Enforcement Category of Licences". This exercise gave Dunsink an A2 enforcement category which would probably equate to a **Risk Category 3** classification.
The facility's RMP/CRAMP was the culmination of a series of proposals beginning in June 2005. It was agreed by *the Agency* during 2005. The series of proposals are referenced and detailed below and *the Agency* would have received copies in triplicate.

Table 16 - Dunsink RMP/CRAMP

FCC-127-1-2005-	LETTER DATED	POST TO EPA 127-1 REGARDING
FCC-127-1-2005-015	09/06/2005	Restoration and aftercare plan
FCC-127-1-2005-022	28/07/2005	Restoration and aftercare plan & SEW Leachate Management & Drainage
FCC-127-1-2005-025	13/09/2005	Restoration and Aftercare Plans and achievement of final profile
FCC-127-1-2005-026	19/09/2005	Slope Stability Survey
FCC-127-1-2005-027	23/09/2005	Restoration & Aftercare plans Drilling Wells

Fingal County Council's position to date with regard to financial provision currently in place for Dunsink and Balleally has been stated as follows; "In accordance with Condition 12.2 of the Waste Licence, Fingal County Council shall establish and maintain a fund or other form of approved security, that is adequate to assure the financial capability of implementing the Restoration and Aftercare Plan as agreed with *The Agency*. Financial provision is made on an annual basis at Fingal County Council budgeting meetings.

As the CRAMP/RMP predates the Guidance Document (2006), there are some differences in content and methodology. The contents of the CRAMP/RMP broadly reflect the suggested contents in the guidance document. It is also worth stating that *The Agency* approved of the CRAMP/RMP at the time of submission. The restoration programme is now complete and the facility is now in its aftercare phase. The financial provision is considered adequate.

15.2 MANAGEMENT AND STAFFING STRUCTURE

The following comprise the current management structure for Dunsink Landfill in 2010.

Licence Compliance

Senior Engineer:	John Daly.
Waste Infrastructure and Enforcement:	John Daly. B.E. (Civil Engineering), M.Sc (Environmental Engineering), MIEI
Senior Executive Engineer:,	M. Kiely. Responsible for waste infrastructure within the Environment Department. B.E. (Civil Engineering) 1978, Passed all modules of FAS, Waste Management Training Program.
Executive Engineer:, .	Mr. D. Devine. Management of waste licence conditions & License Compliance. B.S.c (Civil Engineering), MIEI, Chartered Engineer.

Landfill Management

Senior Parks Superintendant:	Mr. Kevin Halpenny. Responsibility for Parks Department,
Senior Executive Parks Superintendant:	Ruairi O'Dulaing. Responsibility For Parks Development and transition
District Supervisor:	Ted Lynch Coolmine Depot District Supervisor. Responsibility for overseeing Landfill management operations
Foreman:	Colin Gilhooley, Management of Landfill, FAS safe pass, manual handling and CONSAW courses.
Assistant Landfill Manager/Foreman:	Mr. R. Donnelly, Assistant to Landfill manager, task management of site operatives and rehabilitation works. 12 years experience working for Fingal County Council. Mr R. Donnelly was assigned to other duties from mid November 2010 and remains available to deal with emergencies at the site and respond to telemetry alarm.

15.3 PROGRAMME FOR PUBLIC INFORMATION.

Public information can be viewed at the **Council's Headquarters** between 9.30 a.m. and 12.45 p.m. and 2.00 p.m. and 4.00 p.m. Monday to Friday (excluding public holidays), unless otherwise arranged by prior appointment.

- Facilities for viewing information from a computer or files are provided at Dunsink Facility office by prior arrangement with the Landfill Manager
- The website (www.fingalcoco.ie) was last updated in November 2010. It informs that the remediation and restoration phase is now complete, and also has the licence available for download.

15.3.1 Site Visits

- Site visits to **Dunsink Landfill** can be arranged by applying in writing to the Landfill Manager requesting a date and time for the proposed visit and indicating the number of visitors and the purpose of such a visit and whether any presentation is required. The use of cameras and video equipment during the visit must be agreed in advance with Fingal County Council.
- Such requests will be accommodated where possible. Operational and security matters will take precedence and visits may be cancelled at short notice.

15.3.2 Review.

The communication program will be reviewed during 2011 with further involvement of the Parks Department.

16.0 STAFF TRAINING REPORT

As activities at the landfill have gradually decreased since the closure and restoration phases during 2008 and 2009, training requirements have also decreased. Manual Handling training of the site operatives took place in 2009. The only training undertaken in 2010 was FAS Waste Management Training undertaken by David Devine.

GLOSSARY

Aftercare	Any measures that are necessary to be taken in relation to the facility for the purposes of preventing environmental pollution following the cessation of the activity in question at a facility.
Annually	At approximately twelve monthly intervals.
Aquifer	A formation (e.g. body of rock, gravel or sand stratum) that is capable of storing significant quantities of water and through which groundwater moves.
Baseline monitoring	Monitoring in and around the location of a proposed facility so as to establish background environmental conditions prior to any development of the proposed facility.
Borehole	A shaft installed outside a waste area for the monitoring of and/or extraction of landfill gas/groundwater. Established by placing a casing and well screen into the boring. If installed within the waste area, it is called a well.
Bunding / Berm	A dike or mound usually of clay or other inert material used to define limits of cells or phases or roadways; or to screen the operation of a landfill from adjacent properties; reducing noise, visibility, dust and litter impacts.
Capping	The covering of a landfill, usually with low permeability material (landfill cap).
Condensate	The liquid which forms within the gas pipe work due to the condensation of water vapour from landfill gas.
Detection limit.	The concentration of the determinant for which there is a 95% probability of detection when a single analytical result is obtained, detection being defined as obtaining a result which is significantly greater (p=0.05) than zero. Also referred to as Limit of Detection.
Direct discharge	The introduction into groundwater of List I or II substances without percolation through the ground or subsoil.
Downgradient	The direction towards which groundwater or surface water flows.
Emission	Meaning assigned by the EPA Act of 1992.
Flare unit	A device used for the combustion of landfill gas thereby converting its methane content to carbon dioxide.
Gas wells	Wells installed during filling or retrofitted later within the waste area for the monitoring of and/or removal of landfill gas either actively through an extraction system or passively by venting.
Groundwater	Groundwater is that part of the subsurface water which is in the saturated zone.
Hydrogeology	The study of the interrelationships of the geology of soils and rocks with groundwater.

Indirect discharge	The introduction into groundwater of List I or II substances after percolation through the ground or subsoil.
Inert landfill	A landfill that accepts only inert waste that fulfils the criteria set out in the Agency's draft manual "Waste Acceptance".
Lagoon	A land area used to contain liquid, e.g.leachate collected from landfill.
Landfill	Waste disposal facility used for the deposit of waste on to or in to land.
Landfill gas (LFG)	All gases generated from the landfilled waste.
Leachate	Any liquid percolating through the deposited waste and emitted from or contained within a landfill as defined in Section 5(1) of the Waste Management Act.
Leachate Well	Well installed within the waste area for the monitoring and/or extraction of leachate as opposed to borehole, which is the term, used when located outside the waste deposition area.
List I/II substances	Substances referred to in the EU Directives on Dangerous Substances (76/464/EEC) and Groundwater (80/68/EC).
Lower explosive limit (LEL)	The lowest percentage concentration by volume of a mixture of flammable gas with air which will propagate a flame at 25^{o}C and atmospheric pressure.
Macroinvertebrate	Larger invertebrate animals visible to the eye. Usually defined as those that are retained by a net or sieve of mesh size 0.6mm.
Minimum reporting value	This is the lowest concentration of a substance that can be determined with a known degree of confidence. It is a matrix dependent and not necessarily equivalent to the Limit of Detection of the analytical system but is generally a multiple of that value which reflects the robustness and reproducibility of the test method as applied to the specific matrix. Also referred to as the limit of quantitation or practical reporting limit.
Noise Sensitive Location	(NSL) Any dwelling-house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.
Quarterly	At approximately three monthly intervals.
Receiving water	A body of water, flowing or otherwise, such as a stream, river, lake, estuary or sea, into which water or wastewater is discharged.
Restoration	Works carried out on a landfill site to allow planned afteruse.
Substrata	River bed or bottom on or in which invertebrates live.
Taxa	Named taxonomic groups. Usually family or species level in biotic indices.

Trigger level	A parameter value specified in the licence, the achievement or exceedance of which requires certain actions to be taken by the licensee.
Upper explosive limit (LEL)	The highest percentage concentration by volume of a mixture of flammable gas with air which will propagate a flame at $25^{o}C$ and atmospheric pressure.
Void space	Space available to deposit waste.
Water balance	A calculation to estimate a volume of liquid generated. In the case of landfills, water balance normally refers to leachate generation volumes.

APPENDIX I

Q1 - Dunsink Groundwater February 2010

Parameter	Unit	IGV's	BH3	BH3 Control Values	BH3 Trigger Values	BH4	BH4 Control Values	BH4 Trigger Values	BH16	BH16 Control Values	BH16 Trigger Values	BH18R	BH18 Control Values	BH18 Trigger Values	BH27	BH27 Control Values	BH27 Trigger Values
pH	pH Units	6.5-9.5	7.89	8	8.38	7.97	8.2	8.59	8.3	8.24	8.64	8.39	8.72	8.57	7.99	8.18	8.57
Conductivity	mS/cm	1	**1.069**	1.231	1.289	0.694	1.352	1.414	**1.005**	0.8379	0.8778	**1.067**	2.708	2.708	**1.003**	1.282	1.343
Temperature	°C	-	10.7	-	-	10	-	-	9	-	-	10.5	-	-	8.9	-	-
Ammoniacal Nitrogen	mg/l	0.3	<0.03	0.42	0.44	<0.03	0.31	0.33	0.06	0.21	0.22	**0.49**	1.16	1.21	0.04	1.89	1.98
Total Organic Carbon	mg/l	-	<2	6.3	6.6	<2	6.3	6.6	<2	6.3	6.3	<2	9.45	9.9	4	5.25	5.5

Parameter	Unit	IGV's	BH31	BH31 Control Values	BH31 Trigger Values	BH32	BH32 Control Values	BH32 Trigger Values	BH33	BH33 Control Values	BH33 Trigger Values	BH34	BH34 Control Values	BH34 Trigger Values
pH	pH Units	6.5-9.5	8.38	8.39	8.79	8.21	8.18	8.6	8.13	8.58	8.99	7.77	8.61	9.02
Conductivity	mS/cm	1	0.612	0.791	0.828	0.611	1.227	1.286	0.622	0.852	0.892	0.825	0.998	1.045
Temperature	°C	-	9.2	-	-	9.3	-	-	8.6	-	-	5.6	-	-
Ammoniacal Nitrogen	mg/l	0.3	0.04	1.575	1.65	0.1	0.735	0.77	0.03	0.21	0.22	0.03	0.21	0.22
Total Organic Carbon	mg/l	-	2	8.4	8.8	<2	5.25	6	<2	5.25	5.5	7	6.3	6.6

IGV = Interim Guideline Value

Shading Bold and Underlined = Value has exceeded IGV's

Shading = Value has exceeded the Control Value

Shading = Value has exceeded Trigger Value

Sampled on 11th February 2010

Analysis conducted by Jones Environmental Forensics Ltd.

Q2 - Dunsink Groundwater May 2010

Parameter	Unit	IGV's	BH3	BH3 Control Values	BH3 Trigger Values	BH4	BH4 Control Values	BH4 Trigger Values	BH16	BH16 Control Values	BH16 Trigger Values	BH18R	BH18 Control Values	BH18 Trigger Values	BH27	BH27 Control Values	BH27 Trigger Values
pH	pH Units	6.5-9.5	7.79	8	8.38	7.9	8.2	8.59	8.32	8.24	8.64	8.66	8.72	8.57	8.07	8.18	8.57
Conductivity	mS/cm	1	**1.278**	1.231	1.289	**1.459**	1.352	1.414	0.601	0.8379	0.8778	**1.144**	2.708	2.708	0.902	1.282	1.343
Temperature	°C	-	12	-	-	12.1	-	-	13.8	-	-	12.3	-	-	13.2	-	-
Ammoniacal Nitrogen	mg/l	0.3	0.15	0.42	0.44	0.15	0.31	0.33	0.13	0.21	0.22	**0.91**	1.16	1.21	0.12	1.89	1.98
Total Organic Carbon	mg/l	-	<2	6.3	6.6	<2	6.3	6.6	<2	6.3	6.3	2	9.45	9.9	<2	5.25	5.5

Parameter	Unit	IGV's	BH31	BH31 Control Values	BH31 Trigger Values	BH32	BH32 Control Values	BH32 Trigger Values	BH33	BH33 Control Values	BH33 Trigger Values	BH34	BH34 Control Values	BH34 Trigger Values
pH	pH Units	6.5-9.5	8.08	8.39	8.79	8.2	8.18	8.6	8.08	8.58	8.99	7.81	8.61	9.02
Conductivity	mS/cm	1	0.568	0.791	0.828	0.599	1.227	1.286	0.534	0.852	0.892	0.730	0.998	1.045
Temperature	°C	-	10.6	-	-	12.2	-	-	10.6	-	-	12.1	-	-
Ammoniacal Nitrogen	mg/l	0.3	0.15	1.575	1.65	0.22	0.735	0.77	0.16	0.21	0.22	0.17	0.21	0.22
Total Organic Carbon	mg/l	-	<2	8.4	8.8	<2	5.25	6	<2	5.25	5.5	<2	6.3	6.6

IGV = Interim Guideline Value

Shading Bold and Underlined = Value has exceeded IGV's

Shading = Value has exceeded the Control Value

Shading = Value has exceeded Trigger Value

Sampled on 27th May 2010

Analysis conducted by Jones Environmental Forensics Ltd.

Dunsink Q3 2010 GW

Groundwater Results

PARAMETER	UNIT	Threshold Value	BH3	BH3 Control Values	BH3 Trigger Values	BH4	BH4 Control Values	BH4 Trigger Values	BH16	BH16 Control Values	BH16 Trigger Values	BH18R	BH18R Control Values	BH18R Trigger Values	BH27	BH27 Control Value	BH27 Trigger Values	BH31	BH31 Control Values	BH31 Trigger Values	BH32	BH32 Control Values	BH32 Trigger Values	BH33	BH33 Control Values	BH33 Trigger Values	BH34	BH34 Control Values	BH34 Trigger Values
pH Value	**units**	**6.5 - 9.5**	8.13	8	8.38	8.18	8.2	8.59	8.53	8.24	8.64	8.81	8.18	8.57	8.58	8.18	8.57	8.57	8.39	8.79	8.38	8.18	8.6	8.28	8.58	8.99	8.54	8.61	9.02
Conductivity	**mS/cm**	**1.875**	1.04	1.231	1.289	1.1	1.352	1.414	0.527	0.838	0.878	1.08	2.586	2.708	0.874	1.282	1.343	0.635	0.791	0.828	0.574	1.227	1.286	0.789	0.852	0.892	0.521	0.998	1.045
Ammonical Nitrogen as NH4-N	**N mg/l**	**0.175**	0.0672	0.42	0.44	0.02	0.315	0.33	0.0652	0.21	0.22	0.775	1.16	1.21	0.06	1.89	1.98	0.618	1.575	1.65	0.233	0.735	0.77	0.217	0.21	0.22	0.0418	0.21	0.22
Dissolved Oxygen (O2)	**O2 mg/l**	**N-A-C**	5.08	-	-	9.44	-	-	4.22	-	-	2.18	-	-	4.56	-	-	3.37	-	-	4.97	-	-	3.86	-	-	6.3	-	-
Chloride (Cl)	**Cl mg/l**	**187.5**	134	76.65	80.3	168	91.35	95.7	22	40.95	42.9	164	388.5	407	49.3	75.6	79.2	37.9	32.55	34.1	23.1	26.25	27.5	14.3	28.35	29.7	16.5	32.55	34.1
Potassium (K)	**K mg/l**	**5** [1]	5.1	5.25	5.5	5.7	7.77	8.14	<2.34	3.78	3.96	4.49	3.99	4.18	2.73	3.36	3.52	4	4.41	4.62	3.27	6.72	7.04	<2.34	5.25	5.5	<2.34	3.99	4.2
Sodium (Na)	**Na mg/l**	**150**	61.8	51.24	53.68	87.5	37.8	39.6	16.5	21	22	59.1	103.31	108.23	29.6	47.25	49.5	16.3	25.2	26.4	18.3	21.31	22.33	33.2	82.95	86.9	17	64.58	67.7
Fluoride (F)	**F mg/l**	**1** [1]	<0.5	0.315	0.33	<0.5	0.315	0.33	0.642	0.74	0.77	2.49	2.21	2.31	0.707	0.74	0.77	<0.5	0.945	0.99	<0.5	0.315	0.33	<0.5	0.945	0.99	0.916	0.32	0.3
Total Organic Carbon	**C mg/l**	**N-A-C**	3.49	6.3	6.6	4.16	6.3	6.6	3.03	6.3	6.6	5.88	9.45	9.9	20.5	5.25	5.5	6.06	8.4	8.8	3.03	5.25	6	4.65	5.25	5.5	<3	6.3	6.6
Total Oxidised Nitrogen (wate	**N mg/l**	**N-A-C**	1.85	-	-	2.4	-	-	<0.1	-	-	<0.1	-	-	0.361	-	-	0.439	-	-	<0.1	-	-	<0.1	-	-	0.162	-	-
Calcium (Ca)	**Ca mg/l**	**200** [1]	162	-	-	177	-	-	79	-	-	62.7	-	-	117	-	-	111	-	-	92.4	-	-	134	-	-	76.9	-	-
Cadmium (Cd)	**Cd mg/l**	**0.003**	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	0.0001	-	-	<0.0001	-	-
Chromium (Cr)	**Cr mg/l**	**0.037**	0.006	-	-	0.012	-	-	0.012	-	-	0.012	-	-	0.017	-	-	0.0122	-	-	0.0131	-	-	0.0235	-	-	0.012	-	-
Copper (Cu)	**Cu mg/l**	**1.5**	0.001	-	-	0.002	-	-	<0.00085	-	-	<0.00085	-	-	0.0014	-	-	0.001	-	-	<0.0008	-	-	0.003	-	-	<0.0008	-	-
Total Cyanide (Cn)*	**Cn mg/l**	**0.037**	<0.05	-	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	<0.05	-	-
Iron (Fe)	**Fe mg/l**	**0.2** [1]	<0.019	0.018	0.019	<0.019	0.019	0.02	<0.019	0.03	0.028	<0.019	0.0158	0.0165	<0.019	0.03	0.032	<0.019	0.0441	0.0462	<0.019	0.01365	0.0143	<0.019	0.0147	0.0154	<0.019	0.0304	0.0319
Lead (Pb)	**Pb mg/l**	**0.018**	0.051	-	-	0.000082	-	-	<0.00002	-	-	0.00004	-	-	0.00007	-	-	0.00005	-	-	<0.00002	-	-	0.000028	-	-	<0.00002	-	-
Magnesium (Mg)	**Mg mg/l**	**50** [1]	10.5	22.73	23.82	10.5	19.08	19.99	21.8	29.23	30.62	61.6	93.45	97.9	31.2	51.07	53.5	10.5	18.76	19.66	16.4	25.074	26.268	14.3	21.95	23.001	19.5	23.247	24.354
Manganese (Mn)	**Mn mg/l**	**0.05** [1]	0.023	0.151	0.158	0.01	0.0294	0.0308	0.162	0.169	0.177	0.073	0.0515	0.0539	0.054	0.077	0.08	0.588	0.9135	0.957	0.123	0.0672	0.0704	0.626	0.0483	0.0506	<0.00004	0.391	0.4103
Nickel (Ni)	**Ni mg/l**	**0.015**	0.007	0.0116	0.0121	<0.00015	0.042	0.044	<0.00015	0.0021	0.0022	<0.00015	0.01	0.02	<0.00015	0.063	0.066	<0.00015	0.0105	0.011	<0.00015	0.0105	0.011	0.011	0.021	0.022	<0.00015	0.00525	0.0055
Mercury (Hg)	**Hg mg/l**	**0.00075**	<0.00001	-	-	<0.00001	-	-	<0.00001	-	-	<0.00001	-	-	<0.00001	-	-	<0.00001	-	-	<0.00001	-	-	<0.00001	-	-	<0.00001	-	-
Residue on Evaporation	**mg/l**	**-**	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (soluble) (SO4)	**SO4 mg/l**	**187.5**	156	-	-	161	-	-	46	-	-	91.7	-	-	78.2	-	-	92.3	-	-	43.3	-	-	53.4	-	-	26.1	-	-
Zinc (Zn)	**Zn mg/l**	**0.1** [1]	0.013	-	-	0.023	-	-	0.0007	-	-	<0.00041	-	-	0.007	-	-	0.006	-	-	<0.00041	-	-	0.002	-	-	<0.00041	-	-
Boron (B)	**B mg/l**	**0.75**	0.027	-	-	0.088	-	-	0.0704	-	-	0.439	-	-	0.092	-	-	0.034	-	-	0.044	-	-	0.043	-	-	0.028	-	-
Alkalinity (as CaCO3)	**CaCO3 mg/l**	**N-A-C**	116	-	-	175	-	-	205	-	-	305	-	-	265	-	-	260	-	-	195	-	-	305	-	-	200	-	-
Ortho Phosphate	**P04 mg/l**	**-**	<0.03	-	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	0.041	-	-	0.409	-	-	<0.05	-	-	<0.05	-	-	<0.05	-	-

Threshold value = Groundwater regulations SI 9 of 2010

[1] = Where no threshold value exists results are compared to EPA I.G.V. from Table 3.1 of EPA document "Towards Setting Guideline Values for the protection of Groundwater in Ireland"

Shading = Value has exceeded threshold value

Shading = Value has exceeded the trigger/control value

* Laboratory level of Detection is above IGV recommended level

Laboratory level of Detection is in excess of trigger/control value

Sampling was undertaken on the 19th August 2010.

N-A-C= No abnormal change

Analysis conducted by Alcontrol Laboratories, UK

CE5977

OCP/OPP Ground Water
Dunsink

Job No: CE05977
3rd Quarter 2010

Compound	Units	Method Detection Limit	BH3	BH31	BH32	BH33	BH34
Dichlorvos	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
Mevinphos	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
alpha-Hexachlorocyclohexane (HCH / Lindane)	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
Diazinon	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
gamma-Hexachlorocyclohexane (HCH / Lindane)	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
Aldrin	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
beta-Hexachlorocyclohexane (HCH / Lindane)	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
Methyl parathion	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
Malathion	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
Fenitrothion	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor epoxide	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
Parathion	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
o,p-DDE	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan I	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
p,p-DDE	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	0.016
Dieldrin	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
o,p-TDE (DDD)	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
Endrin	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
o,p-DDT	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
p,p-TDE (DDD)	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	0.021
Ethion	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan II	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
p,p-DDT	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
o,p-Methoxychlor	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
p,p-Methoxychlor	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan sulphate	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01
Azinphos-methyl	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01

Volatile Organic Compounds
Dunsink

White Young Green Ireland

Job Number: CE05977
3rd Quarter 2010

Units - µg/kg

Compound	Unit	LOD	BH3	BH31	BH32	BH33	BH34
Dibromofluoromethane**	%		106	108	107	108	106
Toluene-d8**	%		99.5	100	100	99.6	99.3
4-Bromofluorobenzene**	%		99.5	99.8	99.7	100	98.7
Dichlorodifluoromethane	µg/l	<7	<7	<7	<7	<7	<7
Chloromethane	µg/l	<9	<9	<9	<9	<9	<9
Vinyl chloride	µg/l	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
Bromomethane	µg/l	<2	<2	<2	<2	<2	<2
Chloroethane	µg/l	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Trichlorofluoromethane	µg/l	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
1,1-Dichloroethene	µg/l	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
Carbon disulphide	µg/l	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
Dichloromethane	µg/l	<3.7	<3.7	<3.7	<3.7	<3.7	<3.7
Methyl tertiary butyl ether (MTBE)	µg/l	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
trans-1,2-Dichloroethene	µg/l	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
1,1-Dichloroethane	µg/l	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
cis-1,2-Dichloroethene	µg/l	<2.3	<2.3	<2.3	<2.3	<2.3	<2.3
2,2-Dichloropropane	µg/l	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8
Bromochloromethane	µg/l	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
Chloroform	µg/l	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
1,1,1-Trichloroethane	µg/l	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
1,1-Dichloropropene	µg/l	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
Carbontetrachloride	µg/l	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4
1,2-Dichloroethane	µg/l	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
Benzene	µg/l	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
Trichloroethene	µg/l	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
1,2-Dichloropropane	µg/l	<3	<3	<3	<3	<3	<3
Dibromomethane	µg/l	<2.7	<2.7	<2.7	<2.7	<2.7	<2.7
Bromodichloromethane	µg/l	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
cis-1,3-Dichloropropene	µg/l	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
Toluene	µg/l	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4
trans-1,3-Dichloropropene	µg/l	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5
1,1,2-Trichloroethane	µg/l	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2
1,3-Dichloropropane	µg/l	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2
Tetrachloroethene	µg/l	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
Dibromochloromethane	µg/l	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
1,2-Dibromoethane	µg/l	<2.3	<2.3	<2.3	<2.3	<2.3	<2.3
Chlorobenzene	µg/l	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5
1,1,1,2-Tetrachloroethane	µg/l	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
Ethylbenzene	µg/l	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
m,p-Xylene	µg/l	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
o-Xylene	µg/l	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
Styrene	µg/l	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
Bromoform	µg/l	<3	<3	<3	<3	<3	<3
Isopropylbenzene	µg/l	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4
1,1,2,2-Tetrachloroethane	µg/l	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2
1,2,3-Trichloropropane	µg/l	<7.8	<7.8	<7.8	<7.8	<7.8	<7.8
Bromobenzene	µg/l	<2	<2	<2	<2	<2	<2
Propylbenzene	µg/l	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6
2-Chlorotoluene	µg/l	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
1,3,5-Trimethylbenzene	µg/l	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
4-Chlorotoluene	µg/l	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
tert-Butylbenzene	µg/l	<2	<2	<2	<2	<2	<2
1,2,4-Trimethylbenzene	µg/l	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
sec-Butylbenzene	µg/l	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
4-iso-Propyltoluene	µg/l	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6
1,3-Dichlorobenzene	µg/l	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2
1,4-Dichlorobenzene	µg/l	<2.7	<2.7	<2.7	<2.7	<2.7	<2.7
n-Butylbenzene	µg/l	<2	<2	<2	<2	<2	<2
1,2-Dichlorobenzene	µg/l	<3.7	<3.7	<3.7	<3.7	<3.7	<3.7
1,2-Dibromo-3-chloropropane	µg/l	<9.8	<9.8	<9.8	<9.8	<9.8	<9.8
1,2,4-Trichlorobenzene	µg/l	<2.3	<2.3	<2.3	<2.3	<2.3	<2.3
Hexachlorobutadiene	µg/l	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
tert-Amyl methyl ether (TAME)	µg/l	<1	<1	<1	<1	<1	<1
Naphthalene	µg/l	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5
1,2,3-Trichlorobenzene	µg/l	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1
1,3,5-Trichlorobenzene	µg/l	<10	<10	<10	<10	<10	<10

N.B Water Blank Corrected

Semivolatiles
Dunsink

White Young Green Ireland

Job Number: CE05977
3rd Quarter 2010

Units - µg/kg

Compound	Unit	LOD	BH3	BH31	BH32	BH33	BH34
1,2,4-Trichlorobenzene (aq)	µg/l	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene (aq)	µg/l	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene (aq)	µg/l	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene (aq)	µg/l	<1	<1	<1	<1	<1	<1
2,4,5-Trichlorophenol (aq)	µg/l	<1	<1	<1	<1	<1	<1
2,4,6-Trichlorophenol (aq)	µg/l	<1	<1	<1	<1	<1	<1
2,4-Dichlorophenol (aq)	µg/l	<1	<1	<1	<1	<1	<1
2,4-Dimethylphenol (aq)	µg/l	<1	<1	<1	<1	<1	<1
2,4-Dinitrotoluene (aq)	µg/l	<1	<1	<1	<1	<1	<1
2,6-Dinitrotoluene (aq)	µg/l	<1	<1	<1	<1	<1	<1
2-Chloronaphthalene (aq)	µg/l	<1	<1	<1	<1	<1	<1
2-Chlorophenol (aq)	µg/l	<1	<1	<1	<1	<1	<1
2-Methylnaphthalene (aq)	µg/l	<1	<1	<1	<1	<1	<1
2-Methylphenol (aq)	µg/l	<1	<1	<1	<1	<1	<1
2-Nitroaniline (aq)	µg/l	<1	<1	<1	<1	<1	<1
2-Nitrophenol (aq)	µg/l	<1	<1	<1	<1	<1	<1
3-Nitroaniline (aq)	µg/l	<1	<1	<1	<1	<1	<1
4-Bromophenylphenylether (aq)	µg/l	<1	<1	<1	<1	<1	<1
4-Chloro-3-methylphenol (aq)	µg/l	<1	<1	<1	<1	<1	<1
4-Chloroaniline (aq)	µg/l	<1	<1	<1	<1	<1	<1
4-Chlorophenylphenylether (aq)	µg/l	<1	<1	<1	<1	<1	<1
4-Methylphenol (aq)	µg/l	<1	<1	<1	<1	<1	<1
4-Nitrophenol (aq)	µg/l	<1	<1	<1	<1	<1	<1
4-Nitroaniline (aq)	µg/l	<1	<1	<1	<1	<1	<1
Azobenzene (aq)	µg/l	<1	<1	<1	<1	<1	<1
Acenaphthylene (aq)	µg/l	<1	<1	<1	<1	<1	<1
Acenaphthene (aq)	µg/l	<1	<1	<1	<1	<1	<1
Anthracene (aq)	µg/l	<1	<1	<1	<1	<1	<1
bis(2-Chloroethyl)ether (aq)	µg/l	<1	<1	<1	<1	<1	<1
bis(2-Chloroethoxy)methane (aq)	µg/l	<1	<1	<1	<1	<1	<1
bis(2-Ethylhexyl) phthalate (aq)	µg/l	<2	<2	<2	<2	<2	<2
Benzo(a)anthracene (aq)	µg/l	<1	<1	<1	<1	<1	<1
Butylbenzyl phthalate (aq)	µg/l	<1	<1	<1	<1	<1	<1
Benzo(b)fluoranthene (aq)	µg/l	<1	<1	<1	<1	<1	<1
Benzo(k)fluoranthene (aq)	µg/l	<1	<1	<1	<1	<1	<1
Benzo(a)pyrene (aq)	µg/l	<1	<1	<1	<1	<1	<1
Benzo(g,h,i)perylene (aq)	µg/l	<1	<1	<1	<1	<1	<1
Carbazole (aq)	µg/l	<1	<1	<1	<1	<1	<1
Chrysene (aq)	µg/l	<1	<1	<1	<1	<1	<1
Dibenzofuran (aq)	µg/l	<1	<1	<1	<1	<1	<1
n-Dibutyl phthalate (aq)	µg/l	<1	<1	<1	<1	<1	<1
Diethyl phthalate (aq)	µg/l	<1	<1	<1	<1	<1	<1
Dibenzo(a,h)anthracene (aq)	µg/l	<1	<1	<1	<1	<1	<1
Dimethyl phthalate (aq)	µg/l	<1	<1	<1	<1	<1	<1
n-Dioctyl phthalate (aq)	µg/l	<5	<5	<5	<5	<5	<5
Fluoranthene (aq)	µg/l	<1	<1	<1	<1	<1	<1
Fluorene (aq)	µg/l	<1	<1	<1	<1	<1	<1
Hexachlorobenzene (aq)	µg/l	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene (aq)	µg/l	<1	<1	<1	<1	<1	<1
Pentachlorophenol (aq)	µg/l	<1	<1	<1	<1	<1	<1
Phenol (aq)	µg/l	<1	<1	<1	<1	<1	<1
n-Nitroso-n-dipropylamine (aq)	µg/l	<1	<1	<1	<1	<1	<1
Hexachloroethane (aq)	µg/l	<1	<1	<1	<1	<1	<1
Nitrobenzene (aq)	µg/l	<1	<1	<1	<1	<1	<1
Naphthalene (aq)	µg/l	<1	<1	<1	<1	<1	<1
Isophorone (aq)	µg/l	<1	<1	<1	<1	<1	<1
Hexachlorocyclopentadiene (aq)	µg/l	<1	<2	<2	<2	<2	<2
Phenanthrene (aq)	µg/l	<1	<1	<1	<1	<1	<1
Indeno(1,2,3-cd)pyrene (aq)	µg/l	<1	<1	<1	<1	<1	<1
Pyrene (aq)	µg/l	<1	<1	<1	<1	<1	<1

N.B Water Blank Corrected

Q4 - Dunsink Groundwater November 2010

Parameter	Unit	Threshold Value	BH3	BH3 Control Values	BH3 Trigger Values	BH4	BH4 Control Values	BH4 Trigger Values	BH16	BH16 Control Values	BH16 Trigger Values	BH18R	BH18 Control Values	BH18 Trigger Values	BH27	BH27 Control Values	BH27 Trigger Values
pH	pH Units	**6.5 - 9.5**	8.09	8	8.38	8.06	8.2	8.59	8.38	8.24	8.64	Damaged - blocked	8.72	8.57	8.2	8.18	8.57
Conductivity	mS/cm	**1.875**	1.36	1.231	1.289	1.21	1.352	1.414	0.601	0.8379	0.8778		2.708	2.708	0.919	1.282	1.343
Temperature	°C	**-**	-	-	-	-	-	-	-	-	-		-	-	-	-	-
Ammoniacal Nitrogen	mg/l	**0.175**	0.162	0.42	0.44	0.137	0.31	0.33	0.0994	0.21	0.22		1.16	1.21	0.0731	1.89	1.98
Total Organic Carbon	mg/l	**N-A-C**	4.78	6.3	6.6	3.32	6.3	6.6	<3	6.3	6.3		9.45	9.9	3.63	5.25	5.5

Parameter	Unit	Threshold Value	BH31	BH31 Control Values	BH31 Trigger Values	BH32	BH32 Control Values	BH32 Trigger Values	BH33	BH33 Control Values	BH33 Trigger Values	BH34	BH34 Control Values	BH34 Trigger Values
pH	pH Units	**6.5 - 9.5**	8.1	8.39	8.79	8.36	8.18	8.6	7.68	8.58	8.99	8.26	8.61	9.02
Conductivity	mS/cm	**1.875**	0.668	0.791	0.828	0.617	1.227	1.286	0.575	0.852	0.892	0.794	0.998	1.045
Temperature	°C	**-**	-	-	-	-	-	-	-	-	-	-	-	-
Ammoniacal Nitrogen	mg/l	**0.175**	**0.189**	1.575	1.65	0.136	0.735	0.77	0.0746	0.21	0.22	0.0668	0.21	0.22
Total Organic Carbon	mg/l	**N-A-C**	3.24	8.4	8.8	<3	5.25	6	<3	5.25	5.5	5.41	6.3	6.6

Threshold value = Groundwater regulations SI 9 of 2010

[1] = Where no threshold value exists results are compared to EPA I.G.V. from Table 3.1 of EPA document "Towards Setting Guideline Values for the protection of Groundwater in Ireland"

Shading & Bold = Value has exceeded threshold value

Shading = Value has exceeded the Control Value

Shading = Value has exceeded Trigger Value

Sampled on 10th November 2010

Analysis conducted by Alcontrol Laboratories Ltd.

APPENDIX II

Q1 - Dunsink Surface Water February 2010

Parameter	Unit	Salmonid Regs	SW2	SW7	SW9	SW10	SW11	SW17	SW18
pH	pH Units	≥6≤9	8.14	8.45	8.11	8.17	8.05	8.25	8.29
Conductivity	mS/cm	-	1.183	1.463	0.820	1.294	0.928	1.113	1.492
Temperature	^{o}C	<10^{o}C*	5.7	4.1	5.5	6.4	3.5	5.7	6.7
Dissolved Oxygen	mg/l	50%>9	10.3	12.1	9.2	9.1	10.0	8.7	8.2
Ammoniacal Nitrogen#	mg/l	<1	0.06	0.05	0.35	0.1	0.04	0.67	0.2
BOD	mg/l	5	<1	<1	2	<1	<1	1	<1
Total Suspended Solids	mg/l	25	14	**80**	**135**	14	**143**	**217**	21

Salmonid Regs= European Communities (Quality of Salmonid Waters) Regulation , SI 293 of 1988.

Shading Bold and Underlined = Value has exceeded Salmonid Regulations

Standard for Ionised Ammonia = <1, Ionised Ammonia= total ammonium x 1.28-Results stated should be converted before being compared to the standard.

*=Second Schedule of Salmonid Regulations states " temperature must not exceed 10 degrees celsius during the period from 1 November to 30 April where species which need cold water for reproduction are present

Sampled on 11th February 2010

Analysis conducted by Jones Environmental Forensics Ltd.

Dunsink Q1 2010 WWSW1

PARAMETER	UNIT	WWSW1	EQS	Salmonid Regulaitons
pH Value	units	8.47	6.0<pH<9.0	>=6pH<=9
Conductivity	mS/cm	0.949	-	-
Temperature	°C	7.8	No greater than a 1.5oC rise in ambient temperature	10°C Note 2
Ammonical Nitrogen as NH4-N	N mg/l	29.48	-	<=1
Total Suspended Solids	mg/l	362	-	<=25
Total Alkalinity	mg/l	292	-	-
Chloride (Cl)	Cl mg/l	39.87	-	-
COD	02 mg/l	31	-	-
BOD	02 mg/l	8	Note 1	<=5
Total Oxidised Nitrogen (water)	N mg/l	<0.05	-	-
Arsenic	mg/l	0.005	0.025	-
Cadmium (Cd)	Cd mg/l	<0.0005	-	-
Chromium (Cr)	Cr mg/l	<0.0015	4.7 CRIII 3.4 CRVI	-
Copper (Cu)	Cu mg/l	<0.007	(0.005 or 0.03)	Note 3
Fluoride (F)	F mg/l	<0.3	0.5	-
Lead (Pb)	Pb mg/l	<0.005	0.0072	-
Nickel (Ni)	Ni mg/l	0.006	0.02	-
Mercury (Hg)	Hg mg/l	<0.001	-	-
Sulphate (soluble) (SO4)	SO4 mg/l	100.42	-	-
Selenium	mg/l	<0.003	-	-
Zinc (Zn)	Zn mg/l	0.003	0.008 or 0.05 or 0.1	Note 4
Total Cyanide (Cn)	Cn mg/l	<0.04	0.01	-
Boron (B)	B mg/l	0.028	-	-
Total Phosphorous	mg/l	1.571	-	-
Anionic surfactants	mg/l	1.1	-	-
Oils, Fats and Grease	mg/l	0.361	-	-
ortho-phosphate	PO4 mg/l	0.97	-	-

Sampled on 11th February 2010
Analysis conducted by Jones Environmental Forensics Ltd.

Note 1 High Status<=1.3(mean) or <=2.2(95%ile), Good Status <=1.5(mean) or <=2.6(95%ile)
Note 2 No greater than a 1.5°C rise in ambient temperature
Note 3 Dependent on Hardness 10 mg/l CaCO3 <=0.005 mg/l, 50 mg/l CaCO3 <=0.022 mg/l, 100 mg/l CaCO3 <0.04 mg/l, 300 mg/l CaCO3 <=0.112 mg/l
Note 4 Dependent on Hardness 10 mg/l <=0.03 mg/l, 50 mg/l <=0.2 mg/l, 100 mg/l <=0.3 mg/l 500 mg/l CaCO3 <=0.5 mg/l

Dunsink Q1 2010 WWSW1 - VOCs

Compound	WWSW1
Dichlorodifluoromethane	<2
Methyl Tertiary Butyl Ether#	<2
Chloromethane #	<3
Vinyl Chloride	<2
Bromomethane #	<1
Chloroethane #	<3
Trichlorofluoromethane #	<3
1,1-Dichloroethene #	<6
Carbon Disulphide #	NA
Dichloromethane #	<3
trans-1-2-Dichloroethene #	<3
1,1-Dichloroethane #	<3
cis-1-2-Dichloroethene #	<3
2,2-Dichloropropane	<1
Bromochloromethane #	<2
Chloroform #	<3
1,1,1-Trichloroethane #	<3
1,1-Dichloropropene #	<3
Carbon tetrachloride #	<2
1,2-Dichloroethane #	<2
Benzene #	<3
Trichloroethene #	<3
1,2-Dichloropropane #	<2
Dibromomethane #	<3
Bromodichloromethane #	<3
cis-1-3-Dichloropropene #	<2
Toluene #	<3
trans-1-3-Dichloropropene #	<2
1,1,2-Trichloroethane #	<2
Tetrachloroethene #	<3
1,3-Dichloropropane #	<2
Dibromochloromethane #	<2
1,2-Dibromoethane #	<2
Chlorobenzene #	<2
1,1,1,2-Tetrachloroethane #	<2
Ethylbenzene #	<3
p/m-Xylene #	<5
o-Xylene #	<3
Styrene #	<2
Bromoform #	<2
Isopropylbenzene	<3
1,1,2,2-Tetrachloroethane #	<4
Bromobenzene #	<2
1,2,3-Trichloropropane #	<3
Propylbenzene #	<3
2-Chlorotoluene #	<3
1,3,5-Trimethylbenzene #	<3
4-Chlorotoluene #	<3
tert-Butylbenzene #	<3
1,2,4-Trimethylbenzene #	<3
sec-Butylbenzene #	<3
4-Isopropyltoluene #	<3
1,4-Dichlorobenzene #	<3
1,3-Dichlorobenzene #	<3
n-Butylbenzene #	<3
1,2-Dichlorobenzene #	<3
1,2-Dibromo-3-chloropropane	<2
1,2,4-Trichlorobenzene#	<3
Hexachlorobutadiene	<3
Naphthalene	<2
1,2,3-Trichlorobenzene	<3

Dunsink Q1 2010 WWSW1 - sVOCs

Compound	WWSW1
Phenol	<10
2-Chlorophenol	<10
2-Methylphenol	<10
4-Methylphenol	<10
2-Nitrophenol	<10
4-Nitrophenol	<10
2,4-Dichlorophenol	<10
2,4-Dimethylphenol	<10
4-Chloro-3-methylphenol	<10
2,4,6-Trichlorophenol	<10
2,4,5-Trichlorophenol	<10
Pentachlorophenol	<10
1,3-Dichlorobenzene	<10
1,4-Dichlorobenzene	<10
1,2-Dichlorobenzene	<10
1,2,4-Trichlorobenzene	<10
Nitrobenzene	<10
Azobenzene	<10
Hexachlorobenzene	<10
Naphthalene	<10
Acenaphthylene	<10
Acenaphthene	<10
Fluorene	<10
Phenanthrene	<10
Anthracene	<10
Fluoranthrene	<10
Pyrene	<10
Benzo(a)anthracene	<10
Chrysene	<10
Benzo(bk)fluoranthrene	<10
Benzo(a)pyrene	<10
Indeno(1,2,3-cd)pyrene	<10
Dibenzo(a,h)anthracene	<10
Benzo(ghi)perylene	<10
2-Chloronaphthalene	<10
2-Methylnaphthalene	<10
Carbazole	<10
Isophorone	<10
Dibenzofuran	<10
Dimethyl phthalate	<10
Diethyl phthalate	<10
Di-n-butylphthalate	<10
Di-n-octylphthalate	<10
Bis(2-ethylhexyl)phthalate	<10
Butylbenzylphthalate	<10
4-Chloroaniline	<10
2-Nitroanaline	<10
3-Nitroaniline	<10
4-Nitroaniline	<10
2,4-Dinitrotoluene	<10
2,6-Dinitrotoluene	<10
Bis(2-chloroethyl)ether	<10
4-Bromophenylphenylether	<10
4-Chlorophenylphenylether	<10
Hexachloroethane	<10
Hexachlorobutadiene	<10
Hexchlorocyclopentadiene	<10
Bis(2-chloroethoxy)methane	<10
N-nitrosodi-n-propylamine	<10

Sampled on 11th February 2010
Analysis conducted by Jones Environmental Forensics Ltd.

Q2 - Dunsink Surface Water May 2010

Parameter	Unit	Salmonid Regs	SW2	SW7	SW9	SW10	SW11	SW17	SW18
pH	pH Units	≥6≤9	7.95	8.1	7.98	7.97	7.99	8.1	**9.49**
Conductivity	mS/cm	-	0.813	0.975	0.574	0.899	0.779	0.762	0.927
Temperature	^{o}C	<10^{o}C*	13.7	20.9	15.9	10.8	12.4	13.1	-
Dissolved Oxygen	mg/l	50%>9	10.0	8.0	6.0	9.0	7.0	10.0	8.0
Ammoniacal Nitrogen#	mg/l	<1	0.14	0.14	**2.09**	0.23	0.12	0.12	0.68
BOD	mg/l	5	<1	<1	<1	<1	<1	<1	4
Total Suspended Solids	mg/l	25	14	<10	14	17	13	<10	**26**

Salmonid Regs= European Communities (Quality of Salmonid Waters) Regulation , SI 293 of 1988.

Shading Bold and Underlined = Value has exceeded Salmonid Regulations

Standard for Ionised Ammonia = <1, Ionised Ammonia= total ammonium x 1.28-Results stated should be converted before being compared to the standard.

*=Second Schedule of Salmonid Regulations states " temperature must not exceed 10 degrees celsius during the period from 1 November to 30 April where species which need cold water for reproduction are present

Sampled on 27th May 2010

Analysis conducted by Jones Environmental Forensics Ltd.

Dunsink Q3 2010 SW

Surface Water Results

PARAMETER	UNIT	SI 272 of 2009	Salmonid	SW2	SW7	SW9	SW10	SW11	SW17	SW18
pH Value	units	6-9 (note 1)	6-9	8.28	8.1	8.28	8.14	8.26	8.17	8.47
Conductivity	mS/cm	1	-	0.659	0.322	0.558	0.731	0.805	0.667	0.62
Ammonical Nitrogen as NH4-N	N mg/l	-	1	0.0428	0.0737	0.303	0.0541	0.0683	0.262	0.457
Dissolved Oxygen (O2)	O2 mg/l	80-120% saturation	50% >9	8.66	6.72	7.69	7.95	7.99	10.1	6.17
Chloride (Cl)	Cl mg/l	-	-	36.2	34.7	23.9	37.9	49.5	35.7	54.2
Potassium (K)	K mg/l	-	-	3.67	2.93	<2.34	3.24	<2.34	<2.34	4.51
Sodium (Na)	Na mg/l	-	-	30.7	29.6	18.1	29.8	32.4	27.5	42.8
COD	02 mg/l	-	-	21.4	74.1	195	23	178	16	61.7
BOD	02 mg/l	<=1.5 mean (note 2)	5	<1	2.67	3.68	1.52	4.27	8.62	1.74
Total Oxidised Nitrogen (water)	N mg/l	-	-	0.777	<0.1	<0.1	1.17	<0.1	0.918	1.63
Total Suspended Solids	mg/l	-	25	9.5	36	824	32.5	451	12	132
Calcium (Ca)	Ca mg/l	-	-	138	34.9	118	147	165	149	110
Cadmium (Cd)	Cd mg/l	0.15	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (Cr)	Cr mg/l	0.0047	-	**0.013**	**0.006**	**0.013**	**0.014**	**0.014**	**0.011**	**0.008**
Copper (Cu)	Cu mg/l	0.03 (Note 3)	-	0.001	0.003	0.003	0.002	0.006	0.002	0.005
Iron (Fe)	Fe mg/l	-	-	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019
Lead (Pb)	Pb mg/l	0.0072	-	0.00003	0.000172	0.001	0.000029	0.00004	0.00005	0.00008
Magnesium (Mg)	Mg mg/l	-	-	8.07	3.04	5.8	8.39	12.1	8.76	7.36
Manganese (Mn)	Mn mg/l	-	-	0.004	0.002	0.038	0.07	0.03	0.023	0.042
Nickel (Ni)	Ni mg/l	0.02	-	<0.00015	<0.00015	<0.00015	<0.00015	<0.00015	<0.00015	<0.00015
Mercury (Hg)	Hg mg/l	0.00005	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Sulphate (soluble) (SO4)	SO4 mg/l	-	-	93.1	39.1	45.3	90.8	94.5	100	93.5
Zinc (Zn)	Zn mg/l	0.1	-	0.002	0.0008	<0.0004	0.001	0.001	0.001	0.024
Alkalinity (as CaCO3)	CaCO3 mg/l	N-A-C	-	190	85	180	165	185	165	175
Boron (B)	B mg/l	-	-	0.077	0.009	0.048	0.034	0.044	0.032	0.018
ortho - phosphate	PO4 mg/l	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.074

Legend:
SI 272 of 2009 = European Communities Environmental Objectives (Surface Water) Regulations 2009
Bold = Value has exceeded Surface water Regulations
Salmonid Regs= European Communities (Quality of Salmonid Waters) Regulation, 1988
Shading = Value has exceeded Salmonid Water Quality Standard
Sampling was undertaken on 18th August 2010
Note 1 : Hard water - >100mg/l CACO3
Note 2 : For waters achieving good status
Note 3 : The standard of 0.005mg/l applies where hardness <100mg/l CACO3; 0.03mg/l applies where hardness >100mg/l CACO3
N-A-C= No abnormal change

CE05977

White Young Green Environmental

Analysis conducted by Alcontrol Laboratories, UK

Q4 - Dunsink Surface Water November 2010

Parameter	Unit	SI 272 of 2009	Salmonid Regs	SW2	SW7	SW9	SW10	SW11	SW17	SW18
pH	pH Units	6-9 (note 1)	≥6≤9	8.29	7.97	7.81	7.95	8.11	7.92	7.75
Conductivity	mS/cm	1	-	0.557	0.477	0.922	0.546	0.805	0.671	0.9
Temperature	^{o}C	-	<10^{o}C*	6.8	6.7	9.1	7.5	5.9	8.4	10
Dissolved Oxygen	mg/l	80-120% saturation	50%>9	9.91	10.2	9.2	9.9	9.8	9.4	9.2
Ammoniacal Nitrogen#	mg/l	-	<1	0.126	0.167	0.0957	0.163	0.0937	0.426	0.164
BOD	mg/l	<=1.5 mean (note 2)	5	1.36	**1.68**	1.06	1.38	**1.53**	**2.63**	<1
Total Suspended Solids	mg/l	-	25	6	7	18	12	80.5	9	10

SI 272 of 2009 = European Communities Environmental Objectives (Surface Water) Regulations 200
Bold = Value has exceeded Surface Water Regulations
Salmonid Regs= European Communities (Quality of Salmonid Waters) Regulation , SI 293 of 1988
Shading = Value has exceeded Salmonid Regulations
# Standard for Ionised Ammonia = <1, Ionised Ammonia= total ammonium x 1.28-Results stated should be converted before being compared to the standard
*=Second Schedule of Salmonid Regulations states " temperature must not exceed 10 degrees celsius during the period from 1 November to 30 April where species which need cold water for reproduction are present
Note 1 : Hard water - >100mg/l CACO3
Note 2 : For waters achieving good status

Sampled on 10th November 2010
Analysis conducted by Alcontrol Laboratories Ltd.

Dunsink Q4 2010 WWSW1 (04-11-10)

PARAMETER	UNIT	WWSW1 (Stream)	WWSW1	SI 272 of 2009	Salmonid Regulaitons
pH Value	units	8.35	8.01	6.0<pH<9.0 (Note 1)	>=6pH<=9
Conductivity	mS/cm	0.693	0.341	-	-
Ammonical Nitrogen as N	N mg/l	1.44	0.468	-	<=1
Total Suspended Solids	mg/l	44	162	-	<=25
Total Alkalinity	mg/l	170	111	-	-
Chloride (Cl)	Cl mg/l			-	-
COD	02 mg/l	22.7	141	-	-
BOD	02 mg/l	**3.24**	**10.9**	<=1.5 mean (Note 2)	<=5
Disolved Oxygen	mg/l	6.54	6.1	80-120% saturation	50% >9
Total Organic Carbon	%	5.62	8.63		
Total Oxidised Nitrogen (water)	N mg/l	1.74	0.636	-	-
Arsenic	mg/l			0.025	-
Cadmium (Cd)	Cd mg/l	<0.0001	<0.0001	-	-
Calcium	Ca mg/l	147	59.7	-	-
Chromium (Cr)	Cr mg/l	0.00358	0.00134	0.0047	-
Copper (Cu)	Cu mg/l	0.00246	0.0119	0.03 (Note 3)	0.04 (Note 4)
Fluoride (F)	F mg/l	<0.5	<0.5	0.5	-
Iron (Fe)	Fe mg/l	<0.019	<0.019	-	-
Lead (Pb)	Pb mg/l	0.000178	0.0011	0.0072	-
Manganese	Mn mg/l	0.347	0.584	-	-
Magnesium	Mg mg/l	9.67	3.39	-	-
Nickel (Ni)	Ni mg/l	0.00706	0.00414	0.02	-
Mercury (Hg)	Hg mg/l	<0.00001	0.000193	0.00007	-
Sulphate (soluble) (SO4)	SO4 mg/l	209	66.8	-	-
Zinc (Zn)	Zn mg/l	0.00918	0.018	0.1	-
Total Cyanide (Cn)	Cn mg/l	<0.05	<0.05	0.01	-
Boron (B)	B mg/l			-	-
Sodium	Na mg/l	22.1	8.65	-	-
Potassium	K mg/l	5.11	5.96	-	-
ortho-phosphate	PO4 mg/l	1.56	0.065	-	-

Legend:
SI 272 of 2009 = European Communities Environmental Objectives (Surface Water) Regulations 2009
Bold = Value has exceeded Surface water Regulations
Salmonid Regs= European Communities (Quality of Salmonid Waters) Regulation, 1988
Shading = Value has exceeded Salmonid Water Quality Standard
Note 1 : Hard water - >100mg/l CACO3
Note 2 : For waters achieving good status
Note 3 : The standard of 0.005mg/l applies where hardness <100mg/l CACO3; 0.03mg/l applies where hardness >100mg/l CACO3
Note 4 Dependent on Hardness (CaCO3) 10 mg/l <=0.005 mg/l, 50 mg/l <=0.022 mg/l, 100 mg/l <0.04 mg/l, 300 mg/l <=0.112 mg/l
N-A-C= No abnormal change

Sampled on 4th November 2010
Analysis conducted by Alcontrol Laboratories Ltd.

WYG Environmental and Planning (Ireland) Ltd

Parameter	LOD	Unit	WWSW1 (Stream)	WWSW1	SI 272 of 2009	EQS
Organics						
Naphthalene	<0.1	µg/l	<0.1	<0.1	2.4(1)	-
Acenaphthene	<0.015	µg/l	<0.015	0.0174	-	-
Acenaphthylene	<0.011	µg/l	<0.011	<0.011	-	-
Fluoranthene	<0.014	µg/l	<0.014	0.0657	-	-
Anthracene	<0.015	µg/l	<0.015	<0.015	-	10000*
Phenanthrene	<0.022	µg/l	<0.022	0.0542	0.4(2)*	-
Fluorene	<0.014	µg/l	<0.014	0.0182	-	-
Chrysene	<0.013	µg/l	<0.013	0.0656	-	-
Pyrene	<0.015	µg/l	0.0224	0.0751	-	-
Benzo(a)anthracene	<0.017	µg/l	<0.017	0.046	-	-
Benzo(b)fluoranthene	<0.023	µg/l	<0.023	0.0468	0.3(1)*	-
Benzo(k)fluoranthene	<0.027	µg/l	<0.027	0.0363	0.3(1)*	0.05*
Benzo(a)pyrene	<0.0009	µg/l	<0.009	0.053	0.1(2)*	0.01*
Dibenzo(a,h)anthracene	<0.016	µg/l	<0.016	<0.016	-	-
Benzo(g,h,i)perylene	<0.016	µg/l	<0.016	**0.425**	0.2(1)*	0.05*
Indeno(1,2,3-cd)pyrene	<0.014	µg/l	<0.014	0.0342	-	-
Total 16 PAH	<0.1	µg/l	<0.1	0.555	-	-
Total Aliphatics >C5-C35	<10	µg/l	<10	<10	-	-
Total Aromatics >C6-C35	<10	µg/l	<10	<10	-	-
Total Aliphatics & Aromatics >C5-35	<10	µg/l	<10	<10	-	-
Aliphatics >C12-C16	<10	µg/l	<10	<10	-	-
Aliphatics >C16-C21	<10	µg/l	<10	<10	-	-
Aliphatics >C21-C35	<10	µg/l	<10	<10	-	-
Total Aliphatics >C12-C35	<10	µg/l	<10	<10	-	-
Aromatics >EC12-EC16	<10	µg/l	<10	<10	-	-
Aromatics >EC16-EC21	<10	µg/l	<10	<10	-	-
Aromatics >EC21-EC35	<10	µg/l	<10	<10	-	-
Total Aromatics >EC12-EC35	<10	µg/l	<10	<10	-	-
Total Aliphatics & Aromatics >C12-C35	<10	µg/l	<10	<10	-	-
GRO Surrogate	%	%	102	83	-	-
Methyl tertiary butyl ether(MBTE)	<3	µg/l	<3	<3	-	-
Benzene	<7	µg/l	<7	<7	10	
Toluene	<4	µg/l	<4	<4	-	-
Ethylbenzene	<5	µg/l	<5	<5	-	-
m,p-Xylene	<8	µg/l	<8	<8	10(1)	10
o-Xylene	<3	µg/l	<3	<3	10(1)	10
Aliphatics >C5-C6	<10	µg/l	<10	<10	-	-
Aliphatics >C6-C8	<10	µg/l	<10	<10	-	-
Aliphatics >C8-C10	<10	µg/l	<10	<10	-	-
Aliphatics >C10-C12	<10	µg/l	<10	<10	-	-
Total Aliphatics >C5-C12	<10	µg/l	<10	<10	-	-
Aromatics >EC5-EC7	<10	µg/l	<10	<10	-	-
Aromatics >EC7-EC8	<10	µg/l	<10	<10	-	-
Aromatics >EC8-EC10	<10	µg/l	<10	<10	-	-
Aromatics >EC10-EC12	<10	µg/l	<10	<10	-	-
Total Aromatics >EC5-EC12	<10	µg/l	<10	<10	-	-
m,p,o-Xylene	<10	µg/l	<10	<10	10(1)	10
BTEX	<10	µg/l	<10	<10	-	-
GRO >C5-C12	<50	µg/l	<50	<50	-	-

Legend:

SI 272 of 2009 European Communities Environmental Objectives (surface waters) Regulations 2009 **CE05977**

EPA EQS = Environmental Quality Standard for Surface Waters - Discussion document 1997

Shading = Value has exceeded the EPA EQS

Underlined and Bold = Value has exceeded SI 272 of 2009

Notes:

(1) Mean value for A-A EQS Inland Surface Waters outlined in SI 272 of 2009

(2) MAC-EQS Inland Surface Water Waters outlined in SI 272 of 2009

- = No Standard

* The laboratory Detection Limit is Greater Than the limit value

Q1 - Dunsink Leachate Results February 2010

Parameter	Units	Leachate Sump	Lagoon
		11/02/2010	11/02/2010
pH	pH units	8.02	8.50
Conductivity	mS/cm	3.4	0.947
Temperature	^{o}C	10.0	4.3
Dissolved Oxygen	mg/l	9.0	11.1
Dissolved methane CH4	mg/l	1.712	0.003

Sampled on 11th February 2010

Analysis conducted by Jones Environmental Forensics Ltd.

Q2 - Dunsink Leachate Results May 2010

Parameter	Units	Leachate Sump	Lagoon
		27/05/2010	27/05/2010
pH	pH units	8.47	8.55
Conductivity	mS/cm	1.657	0.869
Temperature	^{o}C	15.2	18.5
Dissolved Oxygen	mg/l	10.0	10.0
Dissolved methane CH4	mg/l	<0.001	0.005

Sampled on 27th May 2010

Analysis conducted by Jones Environmental Forensics Ltd.

Dunsink Q3 2010 Leachate

Leachate Monitoring			
PARAMETER	**UNIT**	**LAG**	**LSP**
pH Value	units	9.66	8.87
Conductivity	mS/cm	0.829	3.53
Ammonical Nitrogen as NH4-N	N mg/l	0.202	152
Dissolved Methane	CH4 mg/l	0.005	<0.001
Chloride (Cl)	Cl mg/l	166	420
Potassium (K)	K mg/l	57.2	128
Sodium (Na)	Na mg/l	118	283
COD	02 mg/l	113	152
BOD	02 mg/l	3.59	5.31
Total Oxidised Nitrogen (water)	N mg/l	<0.1	0.268
Calcium (Ca)	Ca mg/l	11.6	166
Cadmium (Cd)	Cd mg/l	<0.0001	<0.0001
Chromium (Cr)	Cr mg/l	0.005	0.056
Copper (Cu)	Cu mg/l	<0.00085	0.0019
Fluoride (F)	F mg/l	<0.5	<0.5
Iron (Fe)	Fe mg/l	0.167	<0.019
Lead (Pb)	Pb mg/l	0.000562	0.00007
Magnesium (Mg)	Mg mg/l	13.7	42
Manganese (Mn)	Mn mg/l	0.033	0.962
Nickel (Ni)	Ni mg/l	<0.00015	0.033
Mercury (Hg)	Hg mg/l	<0.00001	<0.00001
Sulphate (soluble) (SO4)	SO4 mg/l	17.1	65.1
Zinc (Zn)	Zn mg/l	<0.0004	0.0023
Boron (B)	B mg/l	0.447	0.904
ortho-phosphate	PO4 mg/l	0.177	<0.05

Analysis conducted by Alcontrol Laboratories, UK
CE05977

Q4 - Dunsink Leachate Results November 2010

Parameter	Units	Leachate Sump	Lagoon
		10/11/2010	10/11/2010
pH	pH units	7.4	8.48
Conductivity	mS/cm	2.03	0.827
Temperature	°C	10.9	6
Dissolved Oxygen	mg/l	6.2	10.6
Dissolved methane CH4	mg/l	0.0013	0.0011

Sampled on 10th November 2010

Analysis conducted by Alcontrol Laboratories Ltd.

APPENDIX III

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	06/01/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Cold Clear	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	21.0	0.0	997	0.0	0.0
G36		0.0	0.0	21.0	0.0	997	0.0	0.0
G37		**1.4**	0.8	14.1	0.0	997	0.0	28.0
G38		0.0	0.2	20.6	0.0	997	0.0	0.0
G39		0.0	0.6	18.1	0.0	997	0.0	0.0
G40		0.0	0.0	21.2	0.0	997	0.0	0.0
Leachate Sump		0.0	1.1	21.0	0.0	997	0.0	0.0
Sewer		0.0	0.0	21.0	0.0	998	0.0	0.0
IPS INLET*		**43.9**	**25.9**	2.0	0.0	998	0.0	>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	13/01/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Cold Dry	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		No Gas Monitoring undertaken due to Security Concerns						
G36								
G37								
G38								
G39								
G40								
Leachate Sump								
Sewer								
IPS INLET*								

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		**Site Address :**			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	**National Grid Reference :**			
Site Status :	Operational	**Date :**	21/01/10	***Time:***	AM

Instrument Used :		**Next Calibration due:**
LMSxi Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10

Monitoring Personnel :	RF/MG	**Weather :**	**Barometric Pressure :**
		Overcast	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.0	21.4	0.0	999	10.0	0.0
G6		0.0	0.4	20.4	0.0	1000	10.0	0.0
G7		0.0	0.0	21.4	0.0	1000	10.0	0.0
G8		0.0	0.0	21.3	0.0	1000	10.0	0.0
G9		0.0	0.0	21.3	0.0	1000	10.0	0.0
G10		0.0	0.1	20.9	0.0	1000	10.0	0.0
G12		0.0	0.0	21.1	0.0	995	10.0	0.0
G13		0.0	0.0	21.0	0.0	995	10.0	0.0
G18		0.0	0.0	21.2	0.0	997	10.0	0.0
G21		0.0	0.2	21.2	0.0	999	10.0	0.0
G23		Monitoring borehole has been reinstated- temporarily inaccessible						
G35		0.0	0.0	21.3	0.0	999	10.0	0.0
G36		0.0	0.0	21.3	0.0	998	10.0	0.0
G37		0.0	0.7	18.6	0.0	998	10.0	0.0
G38		0.0	0.0	21.2	0.0	997	10.0	0.0
G39		**2.9**	0.8	16.8	0.0	997	10.0	58.0
G40		0.0	**3.9**	7.5	0.0	999	10.0	0.0
G41		0.0	0.0	21.2	0.0	998	10.0	0.0
G42		0.0	0.0	21.4	0.0	999	10.0	0.0
G43		0.0	**2.1**	16.0	0.0	999	10.0	0.0
G44		0.0	**3.8**	19.7	0.0	999	10.0	0.0
Leachate Sump		0.2	1.4	20.9	0.0	1000	10.0	5.8
Sewer		0.1	0.8	16.0	0.0	1000	10.0	1.8
IPS INLET*		**44.7**	**25.6**	2.4	0.0	1000	10.0	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	29/01/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Cold Clear	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	21.1	0.0	993		0.0
G36		0.0	0.0	21.2	0.0	993		0.0
G37		0.0	0.8	21.2	0.0	993		0.0
G38		0.0	0.3	20.6	0.0	993		0.0
G39		0.0	0.5	17.9	0.0	993		0.0
G40		0.0	**5.2**	3.7	0.0	993		0.0
Leachate Sump		0.0	**1.9**	20.6	0.0	993		0.0
Sewer		0.0	0.8	21.0	0.0	993		0.0
IPS INLET*								

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	04/02/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Cold Clear	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	21.1	0.0	986	8.0	0.0
G36		0.0	0.1	20.9	0.0	986	8.0	0.0
G37		**3.3**	**1.6**	8.5	0.0	986	8.0	0.0
G38		0.0	0.9	18.1	0.0	986	8.0	0.0
G39		0.0	0.9	15.0	0.0	986	8.0	0.0
G40		0.0	**5.9**	1.9	0.0	986	8.0	0.0
Leachate Sump		0.4	**1.6**	20.7	0.0	988	8.0	0.0
Sewer		0.0	0.9	21.0	0.0	988	8.0	0.0
IPS INLET*		**54.0**	**29.3**	0.4	0.0	988	8.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	11/02/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Cold Clear	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	21.1	0.0	1017	5.0	0.0
G36		0.0	0.0	21.2	0.0	1018	5.0	0.0
G37		**2.1**	1.0	12.3	0.0	1018	5.0	0.0
G38		0.0	1.4	17.6	0.0	1018	5.0	0.0
G39		0.0	0.9	17.4	0.0	1017	5.0	0.0
G40		0.0	**4.8**	4.5	0.0	1018	5.0	0.0
Leachate Sump		0.6	**4.3**	19.8	0.0	1019	5.0	0.0
Sewer		0.0	0.6	21.0	0.0	1019	5.0	0.0
IPS INLET*		**38.8**	**24.7**	2.0	0.0	1019	5.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	17/02/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Cold Clear	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	21.0	0.0	980	5.0	0.0
G36		0.0	0.0	20.9	0.0	980	5.0	0.0
G37		**1.2**	0.6	18.1	0.0	980	5.0	24.7
G38		**2.1**	1.1	10.2	0.0	980	5.0	33.0
G39		0.0	**1.6**	15.8	0.0	980	5.0	0.0
G40		0.0	**4.8**	4.8	0.0	980	5.0	0.0
Leachate Sump		0.4	**3.5**	20.0	0.0	980	5.0	9.2
Sewer		0.0	1.2	20.8	0.0	981	5.0	0.0
IPS INLET*		**49.5**	**27.9**	1.1	0.0	981	5.0	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	24/02/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Cold Some Sleet, Rain	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.4	18.8	0.0	981	8.0	0.0
G36		0.0	0.4	19.6	0.0	981	8.0	0.0
G37		0.5	0.9	14.1	0.0	980	6.0	24.7
G38		0.0	**5.9**	4.3	0.0	978	7.0	0.0
G39		**8.8**	**7.8**	0.0	0.0	979	7.0	0.0
G40		0.0	**6.0**	1.1	0.0	981	9.5	0.0
Leachate Sump		0.0	0.7	20.2	0.0	980	7.0	0.0
Sewer		0.0	**1.6**	19.8	0.0	981	6.5	0.0
IPS INLET*		**49.5**	**28.1**	1.1	0.0	981	6.5	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		**Site Address :**			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	**National Grid Reference :**			
Site Status :	Operational	**Date :**	04/03/10	***Time:***	AM

Instrument Used :		**Next Calibration due:**
LMSxi Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10

Monitoring Personnel :	RF/MG	**Weather :**	**Barometric Pressure :**
		Sunny, Cold	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.0	21.1	0.0	1019	7.0	0.0
G6		0.0	0.0	21.4	0.0	1017	7.0	0.0
G7		0.0	0.0	21.3	0.0	1017	7.0	0.0
G8		0.0	0.0	21.2	0.0	1017	7.0	0.0
G9		0.0	0.2	20.6	0.0	1017	7.0	0.0
G10		0.0	0.2	20.6	0.0	1017	7.0	0.0
G12		0.0	0.0	21.1	0.0	1019	7.0	0.0
G13		0.0	0.0	21.0	0.0	1019	7.0	0.0
G18		0.0	0.0	21.2	0.0	1019	7.0	0.0
G21		0.0	0.1	21.2	0.0	1019	7.0	0.0
G23		Monitoring borehole has been reinstated- temporarily inaccessible						
G35		0.0	0.0	21.0	0.0	1019	7.0	0.0
G36		0.0	0.0	21.1	0.0	1019	7.0	0.0
G37		0.9	1.4	9.6	0.0	1019	7.0	0.0
G38		0.0	**3.4**	12.1	0.0	1019	7.0	0.0
G39		0.0	0.2	20.2	0.0	1018	7.0	0.0
G40		0.0	**5.1**	4.0	0.0	1017	7.0	0.0
G41		Borehole flooded- temporarily inaccessible						
G42		0.0	0.0	21.3	0.0	1019	7.0	0.0
G43		0.0	**2.9**	14.7	0.0	1017	7.0	0.0
G44		0.0	0.0	21.1	0.0	1017	7.0	0.0
Leachate Sump		0.1	**1.8**	20.7	0.0	1019	7.0	2.0
Sewer		0.0	0.8	20.7	0.0	1017	7.0	0.0
IPS INLET*		**42.0**	**25.4**	1.6	0.0	1017	7.0	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :	Site Address :			
Dunsink Landfill	Dunsink Lane, Dunsink., Co. Dublin			
Operator : Fingal County Council	National Grid Reference :			
Site Status : Operational	Date : 11/03/10		*Time:*	AM

Instrument Used :		Next Calibration due:
LMSxi Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10

Monitoring Personnel :		Weather :	Barometric Pressure :
	RF/MG	Sunny, Cold	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.0	20.4	0.0	1022	7.0	0.0
G6		0.0	**1.9**	17.2	0.0	1027	11.0	0.0
G7		0.0	0.0	19.5	0.0	1029	11.5	0.0
G8		0.0	0.0	19.8	0.0	1029	11.0	0.0
G9		0.0	**2.0**	16.7	0.0	1030	8.5	0.0
G10		0.0	0.4	18.6	0.0	1029	8.5	0.0
G12		0.0	0.0	20.4	0.0	1024	8.0	0.0
G13		0.0	0.5	19.9	0.0	1024	12.0	0.0
G18		0.0	0.0	20.1	0.0	1024	12.1	0.0
G21		0.0	0.8	20.0	0.0	1027	10.0	0.0
G23		Monitoring borehole has been reinstated- temporarily inaccessible						
G35		0.0	0.0	20.3	0.0	1022	7.0	0.0
G36		0.0	0.1	20.2	0.0	1023	7.5	0.0
G37		**3.2**	**3.1**	0.0	0.0	1024	6.5	0.0
G38		0.0	**6.1**	7.7	0.0	1024	6.5	0.0
G39		0.0	**7.9**	10.5	0.0	1022	8.0	0.0
G40		0.0	**6.2**	1.2	0.0	1027	12.5	0.0
G41		Borehole flooded- temporarily inaccessible						
G42		0.0	0.3	19.1	0.0	1026	7.0	0.0
G43		0.0	**6.3**	7.6	0.0	1027	11.0	0.0
G44		0.0	**6.8**	7.4	0.0	1029	8.5	0.0
Leachate Sump		0.1	**1.9**	19.7	0.0	1026	10.0	2.0
Sewer		0.0	0.8	19.6	0.0	1028	12.0	0.0
IPS INLET*								

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	18/03/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Sunny Bright	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	20.2	0.0	997	12.5	0.0
G36		0.0	0.0	20.3	0.0	997	12.5	0.0
G37		0.0	0.0	20.4	0.0	997	12.0	0.0
G38		0.0	**3.0**	14.3	0.0	997	12.0	0.0
G39		0.0	0.0	20.2	0.0	997	12.5	0.0
G40		0.0	**6.0**	4.3	0.0	1000	14.5	0.0
Leachate Sump		0.0	0.0	20.3	0.0	999	12.5	0.0
Sewer		0.0	0.8	20.0	0.0	1000	12.5	0.0
IPS INLET*		**46.2**	**26.8**	1.8	0.0	1000	12.5	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	24/03/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	DMcD	Weather :	Barometric Pressure :
		Dull, drizzle	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	21.0	0.0	985	10.0	0.0
G36		0.0	0.0	21.2	0.0	984	10.0	0.0
G37		0.2	**1.9**	9.0	0.0	985	10.0	0.0
G38		0.0	**3.8**	13.2	0.0	984	10.0	0.0
G39		0.0	0.6	19.2	0.0	984	10.0	0.0
G40		0.0	**5.3**	6.3	0.0	984	10.0	0.0
Leachate Sump		0.0	0.2	20.0	0.0	984	10.0	0.0
Sewer		0.0	**2.0**	20.4	0.0	986	10.0	0.0
IPS INLET*		**65.5**	**34.0**	0.4	0.0	986	10.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	01/04/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :		Weather :	Barometric Pressure :
	RF?MG	Cold, Occassional Rain	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	21.0	0.0	1000	11.5	0.0
G36		0.0	0.0	20.6	0.0	1000	10.0	0.0
G37		0.0	**2.1**	18.7	0.0	1000	6.0	0.0
G38		0.0	0.8	18.9	0.0	1000	9.5	0.0
G39		0.0	**4.9**	11.5	0.0	1000	6.5	0.0
G40		0.0	**6.4**	1.5	0.0	1001	7.0	0.0
Leachate Sump		0.0	**2.0**	20.1	0.0	1001	5.5	0.0
Sewer		0.0	1.3	20.1	0.0	1002	9.5	0.0
IPS INLET*								

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	08/04/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :		Weather:	Barometric Pressure :
	RF/MG	Dry Overcast	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.2	20.8	0.0	1027	15.5	0.0
G36		0.0	0.0	21.1	0.0	1027	14.0	0.0
G37		0.0	0.0	21.0	0.0	1028	17.0	0.0
G38		0.0	0.7	19.9	0.0	1027	15.5	0.0
G39		0.0	0.1	20.7	0.0	1027	16.0	0.0
G40		0.0	**7.3**	3.2	0.0	1029	14.0	0.0
Leachate Sump		0.0	0.1	20.8	0.0	1029	12.0	0.0
Sewer		0.0	0.9	20.3	0.0	1031	13.6	0.0
IPS INLET*		**41.5**	**25.3**	1.5	0.0	1031	13.6	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM

(Baseline [ ] Ambient [x])

Site Name :	Site Address :			
Dunsink Landfill	Dunsink Lane, Dunsink., Co. Dublin			
Operator : Fingal County Council	National Grid Reference :			
Site Status : Operational	Date :	15/04/10	*Time:*	AM

Instrument Used :		Next Calibration due:
LMSxi Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10

Monitoring Personnel :		Weather :	Barometric Pressure :
	RF/MG	Dry Overcast	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.0	21.3	0.0	1023	8.5	0.0
G6		0.0	**2.1**	18.8	0.0	1021	10.0	0.0
G7		0.0	0.0	21.1	0.0	1021	8.5	0.0
G8		0.0	0.0	21.0	0.0	1021	8.0	0.0
G9		0.0	**3.0**	15.7	0.0	1021	8.5	0.0
G10		0.0	**2.8**	16.7	0.0	1021	8.5	0.0
G12		0.0	0.0	20.9	0.0	1022	11.0	0.0
G13		0.0	0.6	20.1	0.0	1022	10.0	0.0
G18		0.0	0.0	20.4	0.0	1022	10.5	0.0
G21		0.0	0.0	21.0	0.0	1023	8.5	0.0
G23		Monitoring borehole has been reinstated- temporarily inaccessible						
G35		0.0	0.2	19.3	0.0	1023	8.5	0.0
G36		0.0	0.3	20.6	0.0	1021	8.5	0.0
G37		**3.3**	**4.4**	0.0	0.0	1021	10.0	0.0
G38		0.0	**5.2**	10.7	0.0	1021	8.0	0.0
G39		0.0	**6.9**	11.4	0.0	1021	8.0	0.0
G40		0.0	**6.8**	2.9	0.0	1021	9.0	0.0
G41		Borehole flooded- temporarily inaccessible						
G42		0.0	1.1	19.6	0.0	1022	8.0	0.0
G43		0.0	**7.5**	6.8	0.0	1021	8.5	0.0
G44		0.0	**7.3**	5.5	0.0	1021	9.0	0.0
Leachate Sump		0.0	0.4	20.8	0.0	1022	8.0	2.0
Sewer		0.0	1.1	20.5	0.0	1021	8.5	0.0
IPS INLET*		**40.2**	**25.2**	1.6	0.0	1021	8.5	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	22/04/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/MG	Weather:	Barometric Pressure :
		Dry Sunny	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.3	21.0	0.0	1012	16.5	0.0
G36		0.0	0.2	21.1	0.0	1012	16.5	0.0
G37		**3.8**	**3.7**	0.0	0.0	1012	16.5	0.0
G38		0.0	**5.9**	6.7	0.0	1012	16.5	0.0
G39		0.0	**7.7**	11.7	0.0	1011	13.5	0.0
G40		0.0	**6.7**	2.7	0.0	1017	16.5	0.0
Leachate Sump		0.0	0.6	21.2	0.0	1013	12.0	0.0
Sewer		0.0	0.7	21.2	0.0	1014	16.5	0.0
IPS INLET*		**38.5**	**25.0**	1.7	0.0	1014	16.5	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	29/04/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :		Weather:	Barometric Pressure :
	RF/MG	Dry Sunny	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.3	20.1	0.0	1004	14.0	0.0
G36		0.0	0.3	20.3	0.0	1008	13.5	0.0
G37		0.0	0.1	17.1	0.0	1004	13.5	0.0
G38		0.0	**7.0**	5.1	0.0	1005	15.5	0.0
G39		0.0	0.0	20.2	0.0	1004	14.5	0.0
G40		0.0	**7.2**	4.3	0.0	1009	21.0	0.0
Leachate Sump		0.0	0.2	20.5	0.0	1006	12.5	0.0
Sewer		0.0	0.6	20.3	0.0	1008	14.0	0.0
IPS INLET*		**40.8**	**25.5**	1.6	0.0	1008	14.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	06/05/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :		Weather:	Barometric Pressure :
	RF/MG	Overcast, sunny spells, showers	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.1	20.4	0.0	1009	10.0	0.0
G36		0.0	0.5	20.2	0.0	1010	10.5	0.0
G37		0.0	7.1	2.2	0.0	1009	9.5	0.0
G38		0.0	**2.5**	4.8	0.0	1009	10.0	0.0
G39		0.0	0.0	20.6	0.0	1010	10.5	0.0
G40		0.0	**7.1**	5.3	0.0	1010	10.0	0.0
Leachate Sump		0.0	0.3	20.4	0.0	1010	10.5	0.0
Sewer		0.0	1.2	19.9	0.0	1012	12.5	0.0
IPS INLET*		**39.3**	**25.1**	1.6	0.0	1012	12.5	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM

(Baseline [ ] Ambient [x])

Site Name :	Site Address :			
Dunsink Landfill	Dunsink Lane, Dunsink., Co. Dublin			
Operator : Fingal County Council	National Grid Reference :			
Site Status : Operational	Date :	1405/2010	*Time:*	AM

Instrument Used :		Next Calibration due:
LMSxi Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10

Monitoring Personnel :		Weather :	Barometric Pressure :
	RF/MG	Dry Overcast	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.0	20.8	0.0	1005	19.0	0.0
G6		0.0	0.9	20.1	0.0	1001	10.6	0.0
G7		0.0	0.0	20.8	0.0	1002	13.5	0.0
G8		0.0	0.0	20.7	0.0	1001	12.5	0.0
G9		0.0	**3.0**	18.0	0.0	1002	16.5	0.0
G10		0.0	**4.6**	12.6	0.0	1004	15.5	0.0
G12		0.0	0.1	20.8	0.0	1000	15.0	0.0
G13		0.0	0.5	20.4	0.0	1000	14.5	0.0
G18		0.0	0.3	20.3	0.0	1003	19.0	0.0
G21		0.0	0.0	20.6	0.0	1002	14.5	0.0
G23		Monitoring borehole has been reinstated- temporarily inaccessible						
G35		0.0	0.0	20.6	0.0	1003	19.0	0.0
G36		0.0	0.1	20.7	0.0	1003	16.5	0.0
G37		**2.1**	**3.9**	2.7	0.0	1002	22.0	48.7
G38		0.0	**8.0**	3.6	0.0	1002	17.0	0.0
G39		0.0	0.0	20.7	0.0	1002	14.5	0.0
G40		0.0	**7.9**	4.5	0.0	1004	19.0	0.0
G41		Borehole flooded- temporarily inaccessible						
G42		0.0	0.1	20.6	0.0	1004	16.0	0.0
G43		0.0	**6.2**	14.6	0.0	1003	18.5	0.0
G44		0.0	**9.8**	7.9	0.0	1003	16.5	0.0
Leachate Sump		0.0	0.1	20.6	0.0	1001	13.5	0.0
Sewer		0.0	0.5	20.2	0.0	1004	16.0	0.0
IPS INLET*		**42.9**	**26.2**	1.3	0.0	1004	16.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	20/05/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :		Weather:	Barometric Pressure :
	RF/MG	Warm sunny	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	20.6	0.0	1021	19.0	0.0
G36		0.0	0.0	20.7	0.0	1021	19.0	0.0
G37		0.0	0.0	20.7	0.0	1021	19.0	0.0
G38		0.0	**8.8**	6.9	0.0	1021	19.0	0.0
G39		0.0	0.0	20.7	0.0	1021	19.0	0.0
G40		0.0	**9.1**	4.3	0.0	1021	19.0	0.0
Leachate Sump		0.0	0.0	20.7	0.0	1021	19.0	0.0
Sewer		0.0	0.1	20.8	0.0	1023	19.0	0.0
IPS INLET*		**49.7**	**29.5**	0.7	0.0	1023	19.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	27/05/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/MG	Weather:	Barometric Pressure :
		Warm sunny	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.1	20.5	0.0	999	19.0	0.0
G36		0.0	0.0	20.9	0.0	999	19.0	0.0
G37		0.0	**4.7**	7.2	0.0	999	19.0	0.0
G38		0.0	**8.4**	6.7	0.0	999	19.0	0.0
G39		0.0	0.0	20.9	0.0	999	19.0	0.0
G40		0.0	**8.6**	4.5	0.0	1000	19.0	0.0
Leachate Sump		0.0	0.2	20.9	0.0	1000	19.0	0.0
Sewer		0.0	0.5	20.6	0.0	1001	19.0	0.0
IPS INLET*		**Inaccessible**						

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	03/06/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :		Weather:	Barometric Pressure :
	RF/MG	Sunny dry	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.3	19.7	0.0	1010	18.0	0.0
G36		0.0	0.0	20.4	0.0	1010	18.0	0.0
G37		0.0	**2.2**	17.5	0.0	1011	18.0	0.0
G38		0.0	**10.0**	6.2	0.0	1011	18.0	0.0
G39		0.0	**4.0**	12.5	0.0	1010	18.0	0.0
G40		0.0	**9.3**	4.9	0.0	1011	18.0	0.0
Leachate Sump		0.0	0.0	20.6	0.0	1012	18.0	0.0
Sewer		0.0	0.0	20.7	0.0	1012	18.0	0.0
IPS INLET*		**37.5**	**24.7**	1.7	0.0	1012	18.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	10/06/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :		Weather:	Barometric Pressure :
	RF/FK	Cloudy	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.8	18.7	0.0	1006	18.0	0.0
G36		0.0	0.0	20.6	0.0	1006	18.0	0.0
G37		**3.5**	**5.0**	0.0	0.0	1006	18.0	70.0
G38		0.0	**11.0**	3.7	0.0	1006	18.0	0.0
G39		0.0	**7.8**	8.1	0.0	1005	18.0	0.0
G40		0.0	**9.5**	3.6	0.0	1005	18.0	0.0
Leachate Sump		0.0	0.0	20.8	0.0	1006	18.0	0.0
Sewer		0.0	0.8	18.7	0.0	1006	18.0	0.0
IPS INLET*		**39.6**	**25.3**	1.4	0.0	1006	18.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	17/06/10	*Time:*	AM

Instrument Used :		Next Calibration due:
LMSxi Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Dry Sunny spells	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.0	20.4	0.0	1015	>>>>	0.0
G6		0.0	**2.1**	18.2	0.0	1014	>>>>	0.0
G7		0.0	0.0	20.7	0.0	1014	>>>>	0.0
G8		0.0	0.0	20.5	0.0	1014	>>>>	0.0
G9		0.0	**3.2**	17.4	0.0	1014	>>>>	0.0
G10		0.0	**7.3**	9.5	0.0	1016	>>>>	0.0
G12		0.0	0.0	20.4	0.0	1014	>>>>	0.0
G13		0.0	0.5	20.0	0.0	1013	>>>>	0.0
G18		0.0	0.0	20.3	0.0	1015	>>>>	0.0
G21		Monitoring borehole had been tampered with - tap removed - no reading obtained						
G23		**2.4**	**5.8**	1.1	0.0	1014	>>>>	17.9
G35		0.0	0.4	19.6	0.0	1014	>>>>	0.0
G36		Monitoring borehole had been tampered with - tap removed - no reading obtained						
G37		0.0	**2.4**	16.9	0.0	1015	>>>>	0.0
G38		0.0	**12.0**	4.3	0.0	1014	>>>>	0.0
G39		0.0	**9.4**	9.0	0.0	1014	>>>>	0.0
G40		0.0	**8.9**	3.2	0.0	1015	>>>>	0.0
G41		Borehole flooded- temporarily inaccessible						
G42		0.0	0.0	20.6	0.0	1017	>>>>	0.0
G43		0.0	**11.0**	7.0	0.0	1016	>>>>	0.0
G44		0.0	**12.0**	5.8	0.0	1015	>>>>	0.0
Leachate Sump		0.0	0.0	20.4	0.0	1017	>>>>	0.0
Sewer		0.0	0.0	20.2	0.0	1017	>>>>	0.0
IPS INLET*		**38.0**	**25.1**	1.5	0.0	1017	>>>>	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	23/06/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :		Weather:	Barometric Pressure :
	RF/FK	Fine Sunny	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	20.4	0.0	1015	18.0	0.0
G36		0.0	0.0	20.5	0.0	1015	18.0	0.0
G37		0.0	**1.7**	17.3	0.0	1015	18.0	0.0
G38		0.0	**10.8**	2.9	0.0	1014	18.0	0.0
G39		0.0	**9.1**	6.4	0.0	1014	18.0	0.0
G40		0.0	**8.9**	1.7	0.0	1016	18.0	0.0
Leachate Sump		0.0	0.0	20.5	0.0	1017	18.0	0.0
Sewer		0.0	0.3	20.1	0.0	1016	18.0	0.0
IPS INLET*		**38.9**	**25.2**	1.5	0.0	1016	18.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	30/06/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :		Weather:	Barometric Pressure :
	RF/FK	Fine Warm	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.5	19.7	0.0	1012	18.0	0.0
G36		0.0	0.2	20.3	0.0	1012	18.0	0.0
G37		0.0	**10.8**	2.5	0.0	1012	18.0	0.0
G38		0.0	**3.7**	11.6	0.0	1012	18.0	0.0
G39		0.0	0.1	20.4	0.0	1011	18.0	0.0
G40		0.0	**9.2**	3.4	0.0	1016	18.0	0.0
Leachate Sump		0.1	0.0	20.5	0.0	1012	18.0	0.0
Sewer		0.0	0.1	19.5	0.0	1013	18.0	0.0
IPS INLET*		**42.7**	**26.6**	1.2	0.0	1016	18.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	06/07/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/FK	Weather:	Barometric Pressure :
		Dry overcast	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.1	20.0	0.0	1018	16.0	0.0
G36		0.0	0.0	20.2	0.0	1018	16.0	0.0
G37		0.0	0.3	19.9	0.0	1018	16.0	0.0
G38		0.0	**8.1**	10.4	0.0	1018	16.0	0.0
G39		0.0	0.0	20.2	0.0	1018	16.0	0.0
G40		0.0	**9.3**	9.1	0.0	1019	16.0	0.0
Leachate Sump		0.0	0.1	20.2	0.0	1019	16.0	0.0
Sewer		0.0	0.2	20.1	0.0	1018	16.0	0.0
IPS INLET*		**56.6**	**31.9**	1.6	0.0	1018	16.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	15/07/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :		Weather:	Barometric Pressure :
	RF/FK	Occasional showers	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	20.1	0.0	991	16.0	0.0
G36		0.0	0.4	19.8	0.0	991	16.0	0.0
G37		0.1	0.0	20.1	0.0	991	16.0	2.0
G38		0.0	**12.7**	3.2	0.0	990	16.0	0.0
G39		0.0	0.0	20.1	0.0	990	16.0	0.0
G40		0.0	**9.8**	3.9	0.0	991	16.0	0.0
Leachate Sump		0.1	0.0	20.1	0.0	991	16.0	2.5
Sewer		0.0	0.2	19.9	0.0	992	16.0	0.0
IPS INLET*		**42.4**	**26.3**	1.3	0.0	992	16.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	22/07/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/FK	Weather:	Barometric Pressure :
		Cloudy Warm	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.3	19.0	0.0	1020	16.0	0.0
G36		0.0	0.0	21.1	0.0	1019	16.0	0.0
G37		0.0	**1.6**	18.1	0.0	1018	16.0	0.0
G38		0.0	**12.3**	3.3	0.0	1018	16.0	0.0
G39		0.0	0.0	20.1	0.0	1019	16.0	0.0
G40		0.0	**9.4**	2.4	0.0	1018	16.0	0.0
Leachate Sump		0.3	0.3	19.8	0.0	1018	16.0	6.5
Sewer		0.0	0.2	20.1	0.0	1018	16.0	0.0
IPS INLET*		**37.5**	**24.9**	1.6	0.0	1018	16.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	28/07/10	*Time:*	AM

Instrument Used :		Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/DMcD	Weather :	Barometric Pressure :
		Cloudy Warm	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.0	20.5	0.0	1013	18.0	0.0
G6		0.0	1.3	19.6	0.0	1012	17.5	0.0
G7		0.0	0.0	20.7	0.0	1012	17.5	0.0
G8		0.0	0.0	20.7	0.0	1012	15.5	0.0
G9		0.0	**2.3**	18.9	0.0	1012	14.5	0.0
G10		0.0	**4.6**	13.3	0.0	1013	17.0	0.0
G12		0.0	0.0	20.6	0.0	1012	19.0	0.0
G13		0.0	0.8	20.0	0.0	1010	17.5	0.0
G18		0.0	0.2	20.4	0.0	1014	17.0	0.0
G21		0.0	0.1	20.6	0.0	1013.0	17.0	0.0
G23		0.0	1.2	17.7	0.0	1012	17.0	0.0
G35		0.0	0.1	20.6	0.0	1014	18.0	0.0
G36		0.0	0.0	20.7	0.0	1013.0	17.5	0.0
G37		0.0	**3.4**	15.0	0.0	1012	17.0	0.0
G38		0.0	**11.1**	4.0	0.0	1013	17.5	0.0
G39		0.0	0.0	20.7	0.0	1013	17.5	0.0
G40		0.0	**9.5**	3.8	0.0	1014	17.0	0.0
G41		0.0	0.6	20.0	0.0	1013.0	17.0	0.0
G42		0.0	0.1	20.6	0.0	1014	16.5	0.0
G43		0.0	**7.3**	14.4	0.0	1014	17.0	0.0
G44		0.0	**12.9**	6.8	0.0	1013	17.0	0.0
Leachate Sump		0.0	0.0	20.7	0.0	1013	18.0	0.0
Sewer		0.0	0.1	20.0	0.0	1012	17.5	0.0
IPS INLET*		**44.6**	**27.4**	0.7	0.0	1012	17.5	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	05/08/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	FK/MG	Weather:	Barometric Pressure :
		Cloudy Warm	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	**3.1**	16.2	0.0	1006	16.0	0.0
G36		0.0	0.9	19.7	0.0	1006	16.0	0.0
G37		0.0	**3.9**	13.2	0.0	1006	16.0	0.0
G38		0.0	**13.8**	1.5	0.0	1006	16.0	0.0
G39		0.0	0.0	20.5	0.0	1006	16.0	0.0
G40		0.0	**9.9**	2.6	0.0	1006	16.0	0.0
Leachate Sump		0.0	0.0	20.5	0.0	1007	16.0	0.0
Sewer		0.0	0.3	20.3	0.0	1007	16.0	0.0
IPS INLET*		**48.7**	**26.7**	0.6	0.0	1007	16.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	13/08/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/JD	Weather:	Barometric Pressure :
		Cloudy Warm	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.4	20.1	0.0	1020	19.0	0.0
G36		0.0	0.8	19.5	0.0	1019	19.5	0.0
G37		0.0	**1.9**	19.2	0.0	1021	24.0	0.0
G38		0.0	**13.1**	5.7	0.0	1021	27.5	0.0
G39		0.0	0.0	20.4	0.0	1019	20.5	0.0
G40		0.0	**9.9**	4.6	0.0	1020	19.0	0.0
Leachate Sump		0.0	0.1	20.2	0.0	1021	19.0	0.0
Sewer		0.0	0.6	19.5	0.0	1020	20.0	0.0
IPS INLET*		**51.6**	**29.8**	0.7	0.0	1020	20.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	19/08/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :		Weather:	Barometric Pressure :
	RF/MG	Occasional showers	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	20.3	0.0	1000	20.5	0.0
G36		0.0	0.1	20.3	0.0	1001	17.5	0.0
G37		0.0	1.0	18.9	0.0	1000	17.0	0.0
G38		0.0	**13.4**	4.5	0.0	1001	16.5	0.0
G39		0.0	0.1	20.1	0.0	1000	16.5	0.0
G40		0.0	0.0	20.9	0.0	1002	21.0	0.0
Leachate Sump		0.0	0.1	20.3	0.0	1002	21.0	0.0
Sewer		0.0	0.1	20.4	0.0	1002	19.5	0.0
IPS INLET*								

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	26/08/10	*Time:*	AM

Instrument Used :		Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/FK	Weather :	Barometric Pressure :
		Cloudy Warm	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.0	20.5	0.0	1010	22.5	0.0
G6		0.0	0.9	18.6	0.0	1010	22.5	0.0
G7		0.0	0.0	19.9	0.0	1010	20.5	0.0
G8		0.0	0.1	19.9	0.0	1010	20.5	0.0
G9		0.0	**1.8**	18.6	0.0	1010	19.5	0.0
G10		0.0	**7.5**	11.8	0.0	1010	18.5	0.0
G12		0.0	0.0	20.1	0.0	1006	18.0	0.0
G13		0.0	0.6	19.7	0.0	1005	17.5	0.0
G18		0.0	0.6	19.0	0.0	1007	18.5	0.0
G21		0.0	0.1	20.0	0.0	1008.0	20.5	0.0
G23		0.0	0.0	20.6	0.0	1010	22.0	0.0
G35		0.0	0.0	20.2	0.0	1007	18.5	0.0
G36		0.0	0.0	20.2	0.0	1008.0	17.0	0.0
G37		0.0	**8.8**	5.6	0.0	1006	20.0	0.0
G38		0.0	**12.0**	6.1	0.0	1007	19.0	0.0
G39		0.0	0.0	20.2	0.0	1006	17.5	0.0
G40		0.0	**9.8**	4.7	0.0	1007	19.0	0.0
G41		0.0	0.4	19.7	0.0	1008.0	20.0	0.0
G42		0.0	**2.3**	15.4	0.0	1008	17.5	0.0
G43		0.0	**6.8**	14.4	0.0	1008	18.0	0.0
G44		0.0	**12.8**	8.3	0.0	1009	18.0	0.0
Leachate Sump		0.0	0.3	20.1	0.0	1008	18.0	0.0
Sewer		0.0	0.0	20.2	0.0	1008	21.0	0.0
IPS INLET*					0.0	1008	21.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	01/09/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/MG	Weather:	Barometric Pressure :
		Warm sunny	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	1.1	18.9	0.0	1017	21.5	0.0
G36		0.0	0.1	20.1	0.0	1016	19.0	0.0
G37		0.0	**4.6**	11.7	0.0	1016	20.0	0.0
G38		0.0	**13.4**	4.5	0.0	1016	20.5	0.0
G39		0.0	0.0	20.2	0.0	1016	20.5	0.0
G40		0.0	**9.1**	5.1	0.0	1017	21.0	0.0
Leachate Sump		0.0	0.1	20.0	0.0	1018	22.0	0.0
Sewer		0.0	0.1	20.0	0.0	1017	21.0	0.0
IPS INLET*								

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	09/09/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/FK	Weather:	Barometric Pressure :
		Warm sunny	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.5	20.0	0.0	1010	24.5	0.0
G36		0.0	0.0	20.4	0.0	1009	20.5	0.0
G37		0.0	**2.6**	16.2	0.0	1009	21.5	0.0
G38		0.0	1.3	18.0	0.0	1009	20.5	0.0
G39		0.0	**3.4**	12.2	0.0	1009	21.0	0.0
G40		0.0	**9.7**	3.0	0.0	1013	24.0	0.0
Leachate Sump		0.0	0.1	20.3	0.0	1011	19.0	0.0
Sewer		0.0	0.3	20.3	0.0	1010	20.5	0.0
IPS INLET*		**Inaccessible**						

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	15/09/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/FK	Weather:	Barometric Pressure :
		Overcast and cold	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.2	20.0	0.0	1006	15.5	0.0
G36		0.0	0.4	19.8	0.0	1005	16.0	0.0
G37		0.0	**7.7**	4.1	0.0	1005	14.0	0.0
G38		0.0	0.0	20.0	0.0	1004	18.0	0.0
G39		0.0	**6.4**	6.3	0.0	1004	16.5	0.0
G40		0.0	**9.8**	2.6	0.0	1004	18.0	0.0
G23		0.0	0.4	17.2	0.0	1005	15.5	0.0
Leachate Sump		0.0	0.1	19.8	0.0	1005	17.5	0.0
Sewer		0.0	0.0	20.1	0.0	1005	17.0	0.0
IPS INLET*		**42.9**	**26.7**	1.3	0.0	1005	17.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	22/09/10	*Time:*	AM

Instrument Used :		Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/FK	Weather :	Barometric Pressure :
		Cloudy Warm	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.1	20.6	1.0	1006	20.0	0.0
G6		0.0	1.4	18.0	1.0	1006	19.0	0.0
G7		0.0	0.0	20.5	1.0	1006	18.0	0.0
G8		0.0	0.1	20.4	1.0	1006	18.0	0.0
G9		0.0	0.7	18.3	1.0	1006	17.5	0.0
G10		0.0	**6.6**	9.5	1.0	1006	21.0	0.0
G12		0.0	0.1	20.6	1.0	1003	19.0	0.0
G13		0.0	0.8	19.9	1.0	1002	18.5	0.0
G18		0.0	0.2	19.0	1.0	1002	19.0	0.0
G21		0.0	0.1	20.6	0.0	1006	19.0	0.0
G23		0.0	0.0	16.7	1.0	1006	18.0	0.0
G35		0.0	0.4	20.3	0.0	1004	18.5	0.0
G36		0.0	1.2	19.0	1.0	1004	18.5	0.0
G37		0.0	**4.2**	13.0	1.0	1004	17.5	0.0
G38		0.0	**3.7**	14.2	0.0	1004	18.5	0.0
G39		0.0	0.0	20.6	1.0	1003	19.0	0.0
G40		0.0	**9.5**	0.8	1.0	1006	18.5	0.0
G41		0.0	0.5	20.2	0.0	1005.0	18.5	0.0
G42		0.0	0.2	20.5	1.0	1006	18.0	0.0
G43		0.0	**7.4**	10.6	1.0	1006	18.0	0.0
G44		0.0	**11.5**	7.5	1.0	1006	18.0	0.0
Leachate Sump		0.0	0.1	20.6	0.0	1006	19.0	0.0
Sewer		0.0	0.2	20.6	1.0	1005	21.0	0.0
IPS INLET*		Inaccessible due to maintenance						

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	29/09/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	Mark Greally	Weather:	Barometric Pressure :
		Dry/Cloudy	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.9	20.0	0.0	1006	16.3	0.0
G36		0.0	0.1	21.0	0.0	1006	16.3	0.0
G37		0.0	**5.7**	8.4	0.0	1006	16.3	0.0
G38		0.0	**1.7**	17.4	0.0	1006	16.3	0.0
G39		0.0	1.4	17.6	0.0	1007	16.3	0.0
G40		0.0	**10.0**	0.7	0.0	1008	16.3	0.0
G23		0.0	0.0	16.2	0.0	1006	16.3	0.0
Leachate Sump		0.0	0.3	20.1	0.0	1008	16.3	0.0
Sewer		0.0	0.3	21.0	0.0	1008	16.3	0.0
IPS INLET*		No reading - Flare currently offline for maintenance						

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM

(Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	06/10/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/FK	Weather:	Barometric Pressure :
		Dry/Sunny	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	20.3	0.0	917	13.0	0.0
G36		0.0	0.1	21.0	0.0	916	12.5	0.0
G37		0.0	**1.6**	17.8	0.0	916	12.5	0.0
G38		0.0	**5.1**	11.5	0.0	916	12.0	0.0
G39		0.0	**12.4**	3.9	0.0	916	13.0	0.0
G40		0.0	**10.5**	0.0	0.0	916	16.0	0.0
G23		0.0	0.1	16.0	0.0	915	14.5	0.0
Leachate Sump		0.0	0.6	20.8	0.0	917	14.0	0.0
Sewer		0.0	0.6	20.9	0.0	917	18.5	0.0
IPS INLET*		No reading						

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM

(Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	13/10/10	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/FK	Weather:	Barometric Pressure :
		Cool, Cloudy/Foggy	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.2	20.5	0.0	937	12.5	0.0
G36		0.0	0.3	20.6	0.0	937	11.5	0.0
G37		**8.1**	**7.6**	0.0	0.0	936	12.0	>>>>
G38		0.0	**7.9**	8.9	0.0	937	11.0	0.0
G39		0.0	**3.0**	15.9	0.0	937	11.0	0.0
G40		0.0	**10.5**	0.0	0.0	937	13.0	0.0
G23		0.0	**1.5**	11.9	0.0	938	11.0	0.0
Leachate Sump		0.0	0.1	20.7	0.0	938	13.5	0.0
Sewer		0.0	0.6	20.1	0.0	938	13.5	0.0
IPS INLET*		**61.3**	**38.4**	1.6	0.0	938	13.5	0.0

* Note monitoring completed manually with a portable gas analyser while the continuous gas analyser is being repaired

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM

(Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	20/10/10	Time:	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/MG	Weather:	Barometric Pressure :
		Cool sunny	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.9	19.9	0.0	935	9.5	0.0
G36		0.0	0.1	20.1	0.0	934	11.0	0.0
G37		0.0	**3.8**	13.6	0.0	932	7.0	0.0
G38		0.0	**6.1**	10.8	0.0	932	11.0	0.0
G39		0.0	0.0	20.0	0.0	932	12.5	0.0
G40		0.0	**11.0**	0.3	0.0	935	10.0	0.0
G23		0.0	**2.6**	8.8	0.0	934	8.0	0.0
Leachate Sump		0.0	**1.8**	19.9	0.0	934	7.0	0.0
Sewer		0.0	0.8	19.9	0.0	934	9.0	0.0
IPS INLET*		**41.5**	**32.4**	1.7	0.0	934	9.0	0.0

* Note monitoring completed manually with a portable gas analyser while the continuous gas analyser is being repaired

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	27/10/10	*Time:*	AM

Instrument Used :		Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/FK	Weather :	Barometric Pressure :
		Sunny Cool	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	**3.4**	16.1	1.0	925	11.0	0.0
G6		0.0	0.8	19.3	1.0	924	10.5	0.0
G7		0.0	0.0	19.8	1.0	924	10.0	0.0
G8		0.0	0.0	19.7	1.0	924	10.0	0.0
G9		0.0	**1.7**	18.8	1.0	924	10.0	0.0
G10		0.0	**4.2**	15.3	1.0	924	10.0	0.0
G12		0.0	0.0	19.9	1.0	925	13.0	0.0
G13		0.0	0.5	19.6	1.0	925	12.0	0.0
G18		0.0	0.3	19.6	0.0	927	13.5	0.0
G21		0.0	0.2	19.7	1.0	925	12.0	0.0
G23		**1.5**	**3.7**	6.7	1.0	924	11.0	35.1
G35		0.0	0.2	19.5	1.0	924	11.0	0.0
G36		0.0	0.1	19.6	1.0	924	11.5	0.0
G37		0.0	**5.0**	8.7	1.0	925	12.0	0.0
G38		0.0	0.6	18.3	1.0	925	12.0	0.0
G39		0.0	**11.2**	5.2	1.0	925	12.5	0.0
G40		0.0	**11.2**	0.8	1.0	924	9.5	0.0
G41		0.0	0.0	9.5	1.0	924.0	11.5	0.0
G42		0.0	0.2	19.6	0.0	924	12.0	0.0
G43		0.0	**3.6**	17.9	1.0	924	10.0	0.0
G44		0.0	**13.5**	7.7	1.0	924	11.5	0.0
Leachate Sump		0.0	0.1	19.7	1.0	924	12.0	0.0
Sewer		0.0	0.3	18.0	1.0	925	13.0	0.0
IPS INLET*		**43.5**	**33.4**	1.6	0	925	12	0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM

(Baseline [ ] Ambient [x])

Site Name :	Site Address :				
Dunsink Landfill	Dunsink Lane, Dunsink., Co. Dublin				
Operator : Fingal County Council	National Grid Reference :				
Site Status : Operational	Date :	03/11/10	Time:	am	

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/FK	Weather:	Barometric Pressure :
		Wet	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	1.4	18.0	0.0	923	11.0	0.0
G36		0.0	0.2	20.3	0.0	923	9.5	0.0
G37		0.0	**4.0**	10.7	0.0	922	10.5	0.0
G38		0.0	**6.9**	11.0	0.0	922	9.5	0.0
G39		0.0	0.3	19.7	0.0	922	10.5	0.0
G40		0.0	**11.1**	0.3	0.0	924	12.0	0.0
G23		8.1	**2.5**	12.6	0.0	923	10.5	>>>>
Leachate Sump		0.0	0.0	20.2	0.0	924	11.0	0.0
Sewer		0.0	0.6	19.0	0.0	924	11.0	0.0
IPS INLET*		**44.5**	**34.2**	1.5	0.0	924	11.0	0.0

* Note monitoring completed manually with a portable gas analyser while the continuous gas analyser is being repaired

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	10/11/10	Time:	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/FK	Weather:	Barometric Pressure :
		Cold Bright	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	19.5	0.0	997	6.0	0.0
G36		0.0	0.0	19.5	0.0	997	5.5	0.0
G37		0.0	0.0	19.5	0.0	997	5.5	0.0
G38		0.0	0.0	19.5	0.0	997	6.5	0.0
G39		0.0	0.0	19.4	0.0	996	5.5	0.0
G40		0.0	0.0	19.6	0.0	998	9.5	0.0
G23		0.0	0.0	19.7	0.0	996	7.0	0.0
Leachate Sump		0.0	0.0	19.6	0.0	1000	8.5	0.0
Sewer		0.0	0.0	19.5	0.0	997	9.0	0.0
IPS INLET*								

* Note monitoring completed manually with a portable gas analyser while the continuous gas analyser is being repaired

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM

(Baseline [ ] Ambient [x])

Site Name :	Site Address :				
Dunsink Landfill	Dunsink Lane, Dunsink., Co. Dublin				
Operator : Fingal County Council	National Grid Reference :				
Site Status : Operational	Date :	18/11/10	Time:	am	

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	Weather:	Barometric Pressure :
RF/FK	Mild Bright	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	19.2	0.0	992	9.5	0.0
G36		0.0	0.0	19.3	0.0	991	9.5	0.0
G37		0.0	0.5	18.2	0.0	991	9.0	0.0
G38		0.0	**5.4**	11.5.	0.0	990	8.0	0.0
G39		0.0	**6.3**	11.8	0.0	990	10.0	0.0
G40		0.0	**10.0**	0.0	1.0	992	12.0	0.0
G23		0.0	0.0	17.2	0.0	991	9.5	0.0
Leachate Sump		0.0	0.7	18.3	0.0	992	10.0	0.0
Sewer		0.0	0.9	19.1	0.0	992	11.0	0.0
IPS INLET*		**44.7**	**35.2**	1.3	0.0	992	9.5	0.0

* Note monitoring completed manually with a portable gas analyser while the continuous gas analyser is being repaired

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM

(Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	24/11/10	Time:	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/GB/CG	Weather:	Barometric Pressure :
		Cold Bright, slight fog,	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.2	22.3	1.0	1011	2.5	0.0
G6		0.0	1.3	17.9	0.0	1009	3.5	0.0
G7		0.0	0.0	22.0	1.0	1009	8.7	0.0
G8		0.0	0.0	22.4	1.0	1010	7.0	0.0
G9		0.0	1.2	19.0	0.0	1010	6.5	0.0
G10		0.0	0.0	22.5	1.0	1009	1.0	0.0
G12		0.0	0.3	22.5	1.0	1009	7.0	0.0
G13		0.0	0.2	22.4	0.0	1008	9.5	0.0
G18		0.0	0.4	22.0	0.0	1009	6.0	0.0
G21		0.0	**2.9**	17.9	1.0	1012	1.5	0
G23		0.0	0.0	20.4	0.0	1008	7.0	0.0
G35		0.0	0.0	22.3	1.0	1012	4.0	0.0
G36		0.0	0.1	22.3	1.0	1011	2.0	0.0
G37		**4.0**	**5.7**	0.0	1.0	1010	5.5	95.5
G38		0.0	**9.6**	4.8	1.0	1010	6.0	0.0
G39		0.0	**9.8**	8.3	1.0	1010	7.0	0.0
G40		0.0	**9.2**	0.0	1.0	1010	1.0	0.0
G41		0.0	0.0	21.7	1.0	1009	0.5	0.0
G42		0.0	0.3	18.6	1.0	1012	3.5	0.0
G43		0.0	**7.1**	9.5	1.0	1009	0.5	0.0
G44		0.0	**8.6**	6.5	1.0	1010	1.0	0.0
Leachate Sump		0.0	**3.2**	18.2	1.0	1012	0.0	0.0
Sewer		0.0	1.2	22.0	1.0	1011	2.0	0.0
IPS INLET*		**42.5**	**34.2**	1.2	0.0	1012	0.0	0.0

* Note monitoring completed manually with a portable gas analyser while the continuous gas analyser is being repaired

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	01/12/10	Time:	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/FK	Weather:	Barometric Pressure :
		Cold with Snow and Frost	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G23		0.0	0.0	20.8	1.0	1015	0.0	0.0
G35		0.0	0.0	22.1	1.0	1012	1.5	0.0
G36		0.0	0.5	22.0	1.0	1012	0.0	0.0
G37		**4.1**	**4.6**	0.0	1.0	1012	-1.0	94.2
G38		0.0	**7.1**	9.5	1.0	1012	0.5	0.0
G39	Not Accessible/Frozen							
G40		0.0	**8.3**	1.8	1.0	1014	-1.5	0.0
Leachate Sump		0.0	**2.4**	21.2	1.0	1013	0.0	0.0
Sewer		0.0	1.2	21.5	1.0	1013	6.0	0.0
IPS INLET*		-	-	-	-	-	-	-

* Note monitoring completed manually with a portable gas analyser while the continuous gas analyser is being repaired

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM

(Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	08/12/10	Time:	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/FK	Weather:	Barometric Pressure :
		Very cold/Snow Covered/Sunny	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G23		0.0	0.0	20.8	0.0	1015	1.0	0.0
G35	Not Accessible/Snow Covered							
G36	Not Accessible/Snow Covered							
G37		**3.3**	**4.3**	0.0	1.0	1017	-3.5	76.1
G38		0.0	**8.5**	5.7	1.0	1015	-2.5	0.0
G39	Not Accessible/Frozen							
G40		0.0	**8.8**	0.0	1.0	1015	-1.5	0.0
Leachate Sump		0.0	0.6	21.6	1.0	1017	1.0	0.0
Sewer		0.0	1.1	20.5	1.0	1018	7.0	0.0
IPS INLET*		**39.5**	**35.4**	2.7	0.0	1018	7.0	0.0

* Note monitoring completed manually with a portable gas analyser while the continuous gas analyser is being repaired

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM

(Baseline [ ] Ambient [x])

Site Name :	Site Address :				
Dunsink Landfill	Dunsink Lane, Dunsink., Co. Dublin				
Operator : Fingal County Council	National Grid Reference :				
Site Status : Operational	Date :	15/12/10	Time:	am	

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	Weather:	Barometric Pressure :
RF/FK	Cold/overcast	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G23		0.0	0.0	21.3	0.0	1034	4.3	0.0
G35		0.0	0.0	21.6	0.0	1037	5.2	0.0
G36		0.0	0.0	21.5	0.0	1031	4.8	0.0
G37		0.0	**3.1**	9.5	0.0	1029	5.8	0.0
G38		0.0	0.4	20.0	0.0	1037	4.9	0.0
G39		0.0	**7.2**	10.5	0.0	1032	5.7	0.0
G40		0.0	**8.6**	1.9	0.0	1005	6.3	0.0
Leachate Sump		0.0	0.1	21.5	0.0	1035	5.2	0.0
Sewer		0.0	1.4	20.4	0.0	1036	5.2	0.0
IPS INLET*								

* Note monitoring completed manually with a portable gas analyser while the continuous gas analyser is being repaired

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM

(Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	22/12/10	Time:	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Multigas Landfill Analyser	0-100% CH_4, CO_2.	Sep-11

Monitoring Personnel :	FK/SD	Weather:	Barometric Pressure :
		Cold and Snowy	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.0	21.3	0.0	1008	<-3.0>	0.0
G6		0.0	0.9	20.1	0.0	1008	0.2	0.0
G7		0.0	0.0	21.5	0.0	1006	0.6	0.0
G8		0.0	0.0	21.3	0.0	1008	<-1.0>	0.0
G9		0.0	0.7	20.1	0.0	1007	<-0.9>	0.0
G10		0.0	0.0	21.4	0.0	1008	<-1.8>	0.0
G12		0.0	0.1	21.7	0.0	1007	<-1.7>	0.0
G13		0.0	0.3	21.4	0.0	1007	<-2.9>	0.0
G18		0.0	0.1	21.5	0.0	1007	<-1.9>	0.0
G21		0.0	0.3	21.5	0.0	1008	<-1.8>	0.0
G23		0.0	0.0	18.2	0.0	1005	0.4	0.0
G35		Inaccessible due to Snow						
G36		Inaccessible due to Snow						
G37		**3.5**	**3.9**	0.5	0.0	1008	<-1.8>	24.8
G38		0.0	**6.7**	8.8	0.0	1008	<-2.3>	0.0
G39		Inaccessible due to Snow						
G40		0.0	**7.3**	4.4	0.0	1008	<-1.6>	0.0
G41		Inaccessible due to Snow						
G42		0.0	0.4	21.4	0.0	1008	<-1.3>	0.0
G43		0.0	**4.4**	13.1	0.0	1008	<-1.2>	0.0
G44		Inaccessible due to Snow						
Leachate Sump		0.0	0.1	21.5	0.0	1009	0.1	0.0
Sewer		0.0	1.4	21.2	0.0	1010	0.5	0.0
IPS INLET*		Inaccessible due to Snow						

* Note monitoring completed manually with a portable gas analyser while the continuous gas analyser is being repaired

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

APPENDIX IV

SURFACE WATER, LAGOON & PUMPHOUSE WEEKLY INSPECTION RECORD.

DUNSINK LANDFILL W-L 127-1 – Condition 8.2 (Schedule D.5)

Date: Week no:……..
Inspected By: Time: …… ……
Weather:

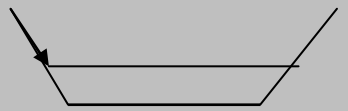
WHEELWASH REQUIRES SERVICE
YES ☐ **NO** ☐

NUISANCES	SW18	SW7	SW10	SW2	SW11	SW9	SW17	WWSW1	WWSW1 (Stream)	WWSW2
COLOUR *(clear/tinted/cloudy)*										
ODOUR (none/oily/leachate/organic)										
Herbaceous bank cm										
Herbaceous stream cm										
Algae %										
Flow Rate (none/low/moderate/fast)										
Depth (cm)										
Erosion at toe of slope (m) (none/moderate/severe										
Additional Parameters (OPTIONAL)										
Conductivity µS										
Temperature ^{o}C										
pH										
Dissolved oxygen (%/mg/l)										

Base of lagoon Covered _____%

N
W E

Freeboard_2M



Samples Taken: ~~Yes~~ / No Photographs Taken: ~~Yes~~ / No	Inspector's Signature: …….	Reviewed By: ……	Site Inspector's Comments:

Leachate Totaliser (litres)
_____
Time

OTHER OBSERVATIONS/ ANY IMMEDIATE ACTION REQUIRED * Cannot see base of stream for vegetation cover ** Cannot see base of stream for cloudiness of water

_____
_____
_____
_____

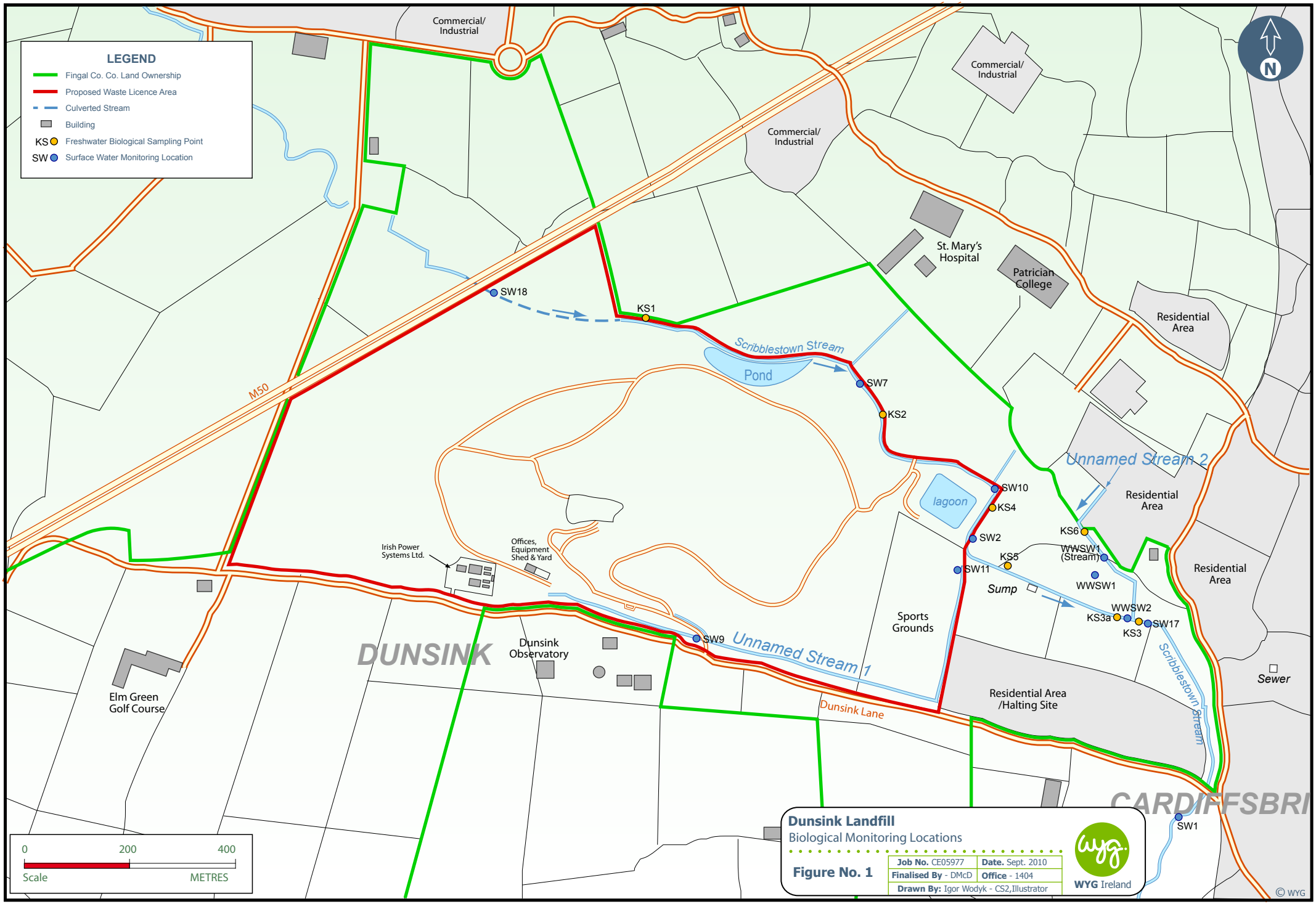
SITE INSPECTION REPORT

DUNSINK LANDFILL W-L 127-1 – Condition 8.10

Date: …… Week no:…….. KEY: S Satisfactory
Inspected By: ……. Time: …… U / S Unsatisfactory
Weather: …… N/A Not Applicable

NUISANCES	Z1	Z2	Z3	Z4	Z5	Z6	Z7	COMMENTS	OTHER OBSERVATIONS/ ANY IMMEDIATE ACTION REQUIRED
ODOUR (P.T.O)									
SCREENS									
LITTER CONTROL									
VERMIN									
FLIES									
BIRDS									
DUST									
NOISE									
MUD									
TRAFFIC									
SURFACE WATER CONTROL									
LEACHATE CONTROL									
PONDING									
CONDITION OF SITE ROADS									
CONDITION OF SITE ENTRANCE									
WHEEL WASH									
FENCING									
SECURITY									
GATE									
MANNING & SUPERVISION									
MISC.									

Samples Taken: Yes / No Photographs Taken: Yes / No	Inspector's Signature: …….	Reviewed By: ……	Site Inspector's Comments:


LEGEND
Fingal Co. Co. Land Ownership
Proposed Waste Licence Area
Culverted Stream
Building
KS Freshwater Biological Sampling Point
SW Surface Water Monitoring Location
Commercial/ Industrial
Commercial/ Industrial
Commercial/ Industrial
St. Mary's Hospital
Patrician College
Residential Area
Residential Area
Residential Area
Residential Area
Residential Area /Halting Site
Sports Grounds
Sewer
SW18
KS1
Scribblestown Stream
Pond
SW7
KS2
M50
SW10
KS4
lagoon
Unnamed Stream 2
KS6
WWSW1 (Stream)
WWSW1
KS5
SW11
Sump
WWSW2
KS3a
SW17
KS3
Scribblestown Stream
Irish Power Systems Ltd.
Offices, Equipment Shed & Yard
SW9
Unnamed Stream 1
DUNSINK
Dunsink Observatory
Dunsink Lane
Elm Green Golf Course
SW1
CARDIFFSBRI
N
0
200
400
Scale
METRES
Dunsink Landfill
Biological Monitoring Locations
Figure No. 1
Job No. CE05977
Date. Sept. 2010
Finalised By - DMcD
Office - 1404
Drawn By: Igor Wodyk - CS2,Illustrator
WYG Ireland
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DUNSINK 127-1 WEEKLY NUISANCE INSPECTIONS.