OXIGEN ENVIRONMENTAL LTD.

CORRANURE LANDFILL
WASTE LICENCE
W0077-03

ANNUAL ENVIRONMENTAL REPORT
(AER) 2010

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1 INTRODUCTION

Cavan County Council are the licensed operators of Corranure Landfill under EPA Waste Licence Register No. W0077-03. In October 2007, Oxigen Environmental Ltd. commenced operation of the landfill under a contractual operational agreement with Cavan County Council who remain as the licensee.

This AER has been prepared in accordance with the conditions of the Waste Licence and the EPA "Draft Guidance on Environmental Management Systems and Reporting to the Agency, 1999".

2 SITE DESCRIPTION

Corranure Landfill is located within the townlands of Corranure and Lismagratty adjacent to the Cavan-Cootehill Rd (R188) approximately 3 kilometres North-East of Cavan Town. The total landfilling footprint covers an area of 11 hectares.

Waste Licence 77-01 was granted by the EPA in June 2001 allowing an annual waste intake of 30,050 tonnes. An application for a review of Waste Licence 77-01 for Corranure Landfill was submitted to the EPA in April 2003 by Cavan County Council. A revised Waste Licence 77-02 was issued by the EPA on the 10th May 2005. Under this revised licence, the facility boundary was extended to allow for two new lined cells to be constructed (Phase 3 including Cells 3 and 4) and the waste intake increased to 90,000 tonnes per annum. In June 2009 the EPA initiated and carried out a review of Licence 77-02 in relation to ensuring the landfill was operating in compliance with Articles 5 and 6 of the landfill directive regarding the treatment of waste prior to landfill and diversion of biodegradable waste from landfill. In March 2010 the EPA issued Waste Licence 77-03 which the Licensee operated under for the remainder of 2010.

The Civic Amenity Facility opened in February 2002 and is used by the general public for recycling. Domestic waste is also accepted for disposal at this facility. At present the Civic Amenity Facility accepts the following waste types: segregated recyclables from householders, newspapers and magazines, cardboard, tetra pak, glass bottles and jars,

aluminium and steel cans, plastic containers and plastic shrink wrap, wood, textiles/footwear, electrical goods, fluorescent tubes, batteries wet and household, scrap steel, waste engine oil and oil filters, vegetable oil, C& D waste, gypsum material and green waste.

Table 2.1 below shows the waste categories which the facility is licensed to accept under Waste Licence W0077-03:

Table 2.1 Waste Categories and Quantities accepted under Waste Licence W0077-03

Waste Type	Maximum Tonnes per Annum
Household Waste	50,000
Commercial Waste	32,000
Construction and Demolition Waste	5,000
Green Waste	2,000
Street Cleaning Residues	900
Hazardous Waste	100
TOTAL	**90,000**

Licensed waste disposal and recovery activities are carried out in accordance with the 3rd and 4th Schedule of the Waste Management Act as per Part 1 of Waste Licence W0077-03.

3 QUANTITY AND COMPOSITION OF WASTE

3.1 Waste Quantities Received At Landfill For Disposal

Table 3.1 below shows the quantity and composition of waste landfilled in Corranure Landfill in 2010. A monthly breakdown for waste landfilled is included in Appendix A.

Table 3.1: Quantity and Composition of Waste Landfilled in 2010

Waste Type	Maximum (tonnes per annum)	Tonnage Accepted
Household waste	50,000	2367.13
Commercial waste	32,000	2589.37
C&D Waste	5,000	0
Green Waste	2,000	0
Street clean residues	900	0
Hazardous Household waste	100	0
Total	**90,000**	**4956.50**

Table 3.2 provides figures for the total tonnage of waste accepted for disposal at Corranure Landfill in previous years.

Table 3.2: Quantity of Waste Landfilled pre-2011

Period	Quantity (Tonnes)
11th March 2002 – 31st June 2002	4,469.25
1st July 2002 – 31st June 2003	36,206.21
1st July 2003 – 31st December 2003	19,911.21
1st January 2004 – 31st December 2004	53,813.44
1st January 2005 – 31st December 2005	45,889.47
1st January 2006 – 31st December 2006	85,869.00
1st January 2007 - 31st December 2007	83,262.91
1st January 2008 - 31st December 2008	87,238.32
1st January 2009 - 31st December 2009	88,932.96
1st January 2010 - 5th February 2010	4956.5
Total	**510,549.27**

Total quantity of waste permitted to be placed at the landfill facility (over authorized life of facility)	908,756m^3
Remaining Capacity	398,207m^3

3.2 Waste Quantities Received At Civic Amenity Facility

The quantities of recyclables recovered at the Civic Amenity Facility from 1st January 2010 to 31st December 2010 are shown in Table 3.3. The majority of Construction and Demolition (C&D) waste accepted at the Civic Amenity Facility was used on site for internal roads, landfill cover and landscaping. Quantities of these materials are shown in Table 3.4.

Table 3.3: Quantity and Composition of Waste Received for Recovery in the Civic Amenity Site in 2010

Waste Type	EWC Code	Total (Tonnes)
Aluminum Packaging	**15 01 04**	9.22
Green Waste	**20 02 01**	285.62
Metals	**20 01 40**	100.9
Mixed Glass	**15 01 07**	169.94
Newspapers	**20 01 01**	238.78
Plastic Packaging	**15 01 02**	19.6
Steel Packaging	**15 01 04**	22.8
Tetra Pak	**15 01 05**	12.4
Batteries	**16 06 01**	5.94
Wood	**15 01 03**	214.24
CA C&D waste	**17 01 07**	106.42
Cardboard	**15 01 01**	203.16
Textiles	**20 01 10**	45.9
WEEE	**20 01 36**	179.4
Fluorescent tubes	**20 01 21**	0.42
Waste Oil	**08 03 18**	4.64
Waste filters	**16 01 07**	0.54
Municipal Waste	**20 03 01**	2506.99
Cooking Oils	**20 01 25**	1.4
Plastic Bottles	**20 01 39**	44.98
Printer & Toner Cartridges	**08 03 18**	0.16
Gypsum	**17 08 02**	36.46
Total		**4209.91**

Table 3.4: Materials used on Site for Internal Roads, Landfill Cover and Landscaping in 2010

Waste Acceptance	EWC Code	Recovery (tonnes)
Rubble	17 01 07	1429.86
Fine Material	19 12 12	2222.84
Rubble	19 12 12	1822.92
Soil & Stones	17 05 04	287.7
Crushed Rubble	19 12 09	1551.38
Ash	10 01 01	380.45
CA C&D Waste	17 01 07	47.66
Total		**7742.81**

3.3 Remaining Landfill Capacity

Filling of waste in Cell 2 commenced in October 2005. A total of 14,990 tonnes of waste was landfilled between October 2005 and December 2005. From 1st January 2006 to 31st December 2006, 85,869 tonnes of waste were landfilled in Cell 2. Filling continued in Cell 2 in 2007 with a total of 30,846 tonnes landfilled during the period January – June 2007. By this time Cell 2 had reached full capacity and the cell capping works commenced post filling.

Filling in Cell 3 commenced in June 2007. Cell 3 has an overall capacity of 239,000 tonnes approximately. During the period June - December 2007, 50,416 tonnes of waste were placed in Cell 3. During January to December 2008, 87,238 tonnes was placed in Cell 3. During January to December 2009, 88,933 tonnes was placed in Cell 3.The remaining void space in Cell 3 was filled from January to February 2010 with a total of 4,957 tonnes landfilled.

Under the under Waste Licence 77-03, the total quantity of waste permitted to be landfilled is 908756m^3. As of the 31st of December 2010 a total volume of 510,549m^3 of waste has been landfilled in the facility leaving the remaining permitted volume at approximately 398,207m^3 remaining. Construction of Cell 4 is anticipated to be completed in the first half of 2011 with an estimated total capacity of 314,825m^3.

3.4 Methods Of Deposition Of Waste

Waste disposal trucks enter the site via the main entrance gate and proceed onto the weighbridge where the trucks are weighed. The truck then proceeds to the active cell. The driver is directed to the operational area of cell where the waste is tipped. Waste is checked at the working face. Any waste not suitable for acceptance is removed for recovery or disposal to an appropriate alternative licensed facility. The truck then leaves the cell and passes through an automated wheel wash which removes debris from wheels and undercarriage of truck. The truck then proceeds to the weighbridge. The truck is again weighed and the duplicate weight docket produced is signed by both the truck driver and weighbridge operator. Oxigen Environmental operate the Precia Molen

GeneSYS PC based Weighbridge Management System. Both hardcopies and electronic copies of the following records are maintained for all transactions:

- Time/date of arrival/departure,
- Unique identification number of each load,
- Carrier details,
- Vehicle registration number,
- Waste producer,
- Waste description (EWC Code)
- Quantity of waste disposed, and
- Signed By Driver/Weighbridge Operator.

Condition 5.4.1 of Waste Licence 77-03 allows for a maximum working face of 25 metres in width and 2.5 metres in height with a slope no greater than 1:3. Once tipped the waste is pushed out over the working face by a steel-wheeled compactor. Large hollow objects in the waste tipped are crushed to avoid the creation of void spaces. At the end of each working day the face is covered with inert material.

When landfilling, operations move to another part of cell the previous area is covered by a intermediate cover (minimum of 300mm if soil is used) so as to ensure no waste is left exposed and prevent possible nuisances. Waste acceptance procedures are in place at Corranure Landfill, which detail the procedures used when dealing with waste which has been accepted or rejected from the site.

4 ENVIRONMENTAL MONITORING

The required monitoring programme at Corranure Landfill is specified in Schedule D of Waste Licence 77-03. The Emission Limit Values (ELV) are specified in Schedule C of the Waste Licence. The environmental monitoring period for this AER is 1st January 2010 to 31st December 2010.

The following sections summarise the environmental monitoring undertaken at Corranure Landfill during the reporting period. During 2010 all environmental monitoring

was carried out by BHP Laboratories, New Road, Thomondgate, Limerick, except for the surface emissions monitoring which was carried out by Odour Monitoring Ireland and RPS.

4.1 Groundwater

The locations of the various groundwater monitoring locations are shown in Appendix B Map of Monitoring Locations No.102. The results of the chemical and microbiological analysis conducted on the groundwaters are presented in detail in the quarterly and annual monitoring reports which were submitted to the Agency during the reporting period.

GW01 is located at the south-eastern corner of the remediated landfill and at the entrance to the facility. The groundwater was coloured and turbid on all sampling occasions. Quarterly monitoring of Dissolved Oxygen and Chloride were similar to previous years with the Chloride levels ranging from 12.8mg/l to 26.1mg/l and Dissolved Oxygen concentration ranging from 68.3mg/l to 98.2mg/l. During annual sampling, no Faecal Coliforms, and 5 no. Total Coliforms were detected in this borehole. Other parameters tested in the annual monitoring were very similar to 2009 results with slight decreases found in Iron, Lead and Magnesium.

GW04 is located on the north western corner of the site. During annual sampling no Faecal coliforms, and 16 Total coliforms were detected. This is significant improvement compared to 2008 (579) and 2009 (82) results. Quarterly monitoring showed consistently high levels of Dissolved Oxygen, and Chloride levels within expected levels except for Quarter 4 (56.2 mg/l) which was still well below the Drinking Water Directive limit of 250mg/l. Groundwater samples were turbid and coloured on all sampling occasions. The Annual monitoring illustrated little change to previous years with Sulphate, Iron and Residue on Evaporation all decreasing, while Sodium levels exhibited a slight increase, 7.14mg/l in 2009 to 12.14mg/l in 2010, far below the Drinking Water limit of 200mg/l.

GW05 is located to the north of the site. This location showed a significant improvement to 2009 results with no. Total Coliforms or Faecal Coliforms recorded during annual sampling. Other parameters tested in the annual monitoring were similar to previous

years and within recommended limits. The quarterly Chloride levels were as would be expected in typical freshwaters and rivers from Quarters 1 to 3, with only Quarter 4 (48.2mg/l) recording a level slightly above the expected levels, but still far below the drinking water limit of 250mg/l. Dissolved Oxygen exhibited levels well within the recommended levels for all sampling. Groundwater samples were clear during all quarterly samples.

Groundwater levels remained fairly constant throughout the year, with depths varying in wells from 1.89m in GW01 to GW05 recorded as being consistently full for the year.

In summary, GW01 and GW04 indicated the presence of some Total coliform bacteria, no faecal coliforms, and all locations were free from synthetic organic and heavy metal concentrations. Chloride levels were in all locations generally found to be typical of natural levels in rivers and other fresh waters.

Access was obtained to the private well locations PW02, PW07, PW05BT, PW8, PW9, PW10, PW11, PW13, PW15, and PW16. Quarterly monitoring involved sampling for levels of Dissolved Oxygen and Chloride, as well as visual and olfactory inspection. Annual sampling of various other parameters was carried out on the 25th May 2010.

During the year all waters were clear and odourless except for well locations PW02 which was turbid in colour in all Quarters and PW07 which was straw in colour in Quarter 2. Levels of Chloride varied throughout the year with only PW02 (57.1mg/l), and PW09 (40.3mg/l) in quarter 3 slightly above expected levels, but still well below the drinking water directive limit of 250mg/l. Low levels of microbial contaminations were exhibited at wells PW02, PW07, PW09, PW10, PW13 and PW15, with levels of Total coliforms ranging from 2 in PW09 to 3120 in PW05BT. PW05BT exhibited a higher level than the other wells with a Total coliforms value of 3120, however this may be attributed to the fact that samples are taken from a drinking trough and located in a field which is covered in slurry frequently throughout the year and is therefore more susceptible to bacterial contamination. There were no Faecal coliforms detected in any of the wells.

With the exception of Total coliforms at some of the locations, the quality of the water broadly met the criteria as outlined in the various Directives relating to water quality.

4.2 Leachate

The annual samples of leachate were taken from the leachate storage tank in May and analysed for a suite of parameters (as set out in the Waste Licence for Corranure). Overall the values for the various parameters are at the lower end of the expected range of values for leachate as per the EPA Landfill Site Design Manual, 2000 (see Table 4.1).

Table 4.1: Comparison of Typical Leachate Composition Values and Values at Corranure Landfill

Parameter	Unit	Overall Range of Values for Young Landfill	Overall Range of Values for Old Landfill	Values at Corranure Landfill
pH	-	5.12 – 7.8	6.8 – 8.2	7.83
Conductivity	µS/cm	5,800 – 52,000	5,990 – 19,300	19230
COD	mg/l	2,740 – 152,000	622 – 8,000	6600
BOD_5	mg/l	2,000 – 68,000	97 – 1,770	566
Chloride	mg/l	659 – 4,670	570 – 4,710	217
Magnesium	mg/l	25 – 820	40 – 1,580	112.4
Potassium	mg/l	350 – 3,100	100 – 1,580	202.5
Chromium	mg/l	0.03 – 0.3	<0.03 – 0.56	0.189
Manganese	mg/l	1.40 – 164.0	0.04 – 3.59	2.41
Iron	mg/l	48.3 – 2,300	1.6 – 160	12.12
Copper	mg/l	0.02 – 1.1	<0.02 – 0.62	0.153
Zinc	mg/l	0.09 – 140.0	0.03 – 6.7	0.035
Cadmium	mg/l	<0.01 – 0.1	<0.01 – 0.08	<0.0035
Mercury	mg/l	<0.0001 – 0.0015	<0.0001 – 0.0008	<0.0005
Lead	mg/l	<0.04 – 0.65	<0.04 – 1.9	0.0056
Ammoniacal Nitrogen NH_3-N	mg/l	194 – 3,610	283 – 2,040	1323
Boron	mg/l	-	-	2.08
Calcium	mg/l	270 – 6,240	23 -501	401.2
Sodium	mg/l	474 – 2,400	474 – 3,650	450.4
Cyanide	mg/l	-	-	0.0274
Fluoride	mg/l	-	-	2.42
List I Organics	mg/l	-	-	0.176
List II Organics	mg/l	-	-	<0.01
Sulphate	mg/l	<5 – 1,560	<5 - 322	184
Total Phosphorus	mg/l	-		8
Total Oxidised Nitrogen	mg/l	-		18.22

Source: EPA Site Design Manual, 2000

Leachate wells L/G4, L/G11, L/G13, L/G20, and L/G24 are on the Scada System. This system digitally records the leachate levels and the levels controlled by automatic pumping system.

4.3 Surface Water

The Surface Water Monitoring Maps No.100 Corranure Stream and No. 101 Lismagratty Stream in Appendix B show the locations of the 3 no. surface water sampling locations (SW3, SW4 and SW5) and 2 no. surface water discharge monitoring points, SW1 and SW2. SW1, SW4 and SW5 are located on the Corranure Stream and SW2 and SW3 on the Lismagratty Stream. These samples were analysed in each of the four quarters of 2010. SW1 and SW2 monitoring are completed monthly.

Annual monitoring was completed in May '10 to include additional parameters to the Quarterly monitoring. In addition, a biological assessment of 10 no. stream locations (A1 – A5 and B1 – B5) was carried out by Ecofact in July 2010.
The following interpretation summarises the overall surface water quality as per the Quarterly monitoring reports. More detailed interpretations can be found within the monthly and annual monitoring reports which were submitted to the Agency.

4.3.1 Physico / Chemical Monitoring

The results of analysis carried out were then compared with the following:

- The EC Quality of Surface Water intended for Abstraction of Drinking Water Regulations, 1989,
- The EPA's Environmental Quality Objectives and Environmental Quality Standards discussion document (1997),
- The Fresh Water (FW) Fish Directive 78/659/EEC, and
- European Communities (Drinking Water) (No. 2) Regulations, 2007.
- The EPA's Parameters for Water Quality; Interpretation and Standards, 2001.

pH levels were all within the limits recommended (between 6 and 9 in the Freshwater Fish Directive 78/659/EEC). There was little overall variation between the results with a maximum of 8.14 at SW4 in the 4th Quarter and a minimum of 6.86 at SW1 in the 3rd Quarter.

One slight exceedence of the recommended limit of **BOD** (5 mg/l as per the 1989 Surface Water Regulations) was recorded in the 2nd quarter at SW1 on the Corranure stream (7mg/l). The same sample for COD was however within the limit.

Ammonia concentrations for the Quarterly monitoring where above the recommended standard of 0.2 mg/l in Quarter 1 at SW2 (0.76) and SW4 (0.21), in Quarter 2 at SW1 (0.41), SW2 (2.2) and SW4 (0.58), and at SW1 (0.4) and SW2 (0.4) in Quarter 4. These results illustrate that possible nitrogen enrichment occurred at various locations along both streams, most likely as a result of agricultural activities in the area. All other sampling results were below the recommended standard (0.2 mg/l).

Levels of **COD** in excess of the recommended limit (40 mg/l as per the 1989 Surface Water Regulations) occurred at SW1 in Quarter 4 (43 mg/l), at SW2 in Quarter 2 (57mg/l). Corresponding readings for BOD were however within the recommended levels. Levels remained under the relevant standard on all sampling occasions at all other sampling locations.

Elevated levels of **Suspended Solids** were recorded at SW2 in Quarter 2 (105mg/l) and Quarter 4 (64mg/l). These elevated levels were a result of heavy rainfall in quarter 2 and sampling error in quarter 4. The reminder of the sampling results was well within the licence limits. Weekly samples of suspended solids were also taken at SW2 throughout the year. Exceedences from these weekly samples were found twice throughout the year, in April and October. On both occasions samples were taken following heavy rainfall.

Chloride: The 1989 Regulations set a limit of 250 mg/l for chloride in surface water; all monitoring results were within this limit value on both the Corranure and Lismagratty Streams.

The quarterly results for **Electrical Conductivity** were within the recommended limit of 1,000 µS/cm at all sampling locations except in Quarter 2 at SW4 which recorded a value of 1399 µS/cm. All other results were well below the recommended level.

Results for **Dissolved Oxygen** throughout the reporting period were generally very good with a high of 96.7mg/l record at SW5. Results for SW1 and SW2 were however slightly below the expected levels in A3 surface waters of >30% in Quarter 2 (23.2mg/l and 23.9mg/l). **Temperature** was monitored during quarterly as well annual sampling and was under the recommended limit of 25˚C at all monitoring locations.

An olfactory inspection of the water quality showed there was no odour evident at any time. Water quality at SW1, SW2 was observed to be turbid/straw coloured during the sampling. Water quality at SW3 and SW5 were recorded as clear/straw coloured, and SW4 was found to be clear during sampling periods.

Annual sampling of a broad range of other parameters, carried out in May 2010, showed no exceeded limits for **Calcium, Cadmium, Chromium, Copper, Lead, Manganese, Sodium, Iron, Magnesium, Zinc and Mercury**.

In general the results indicates that the surface water quality remained very similar to the 2009 results, with the only noticeable differences being a decrease in the Sulphate levels at SW1 and SW2. A summary of the monthly BOD levels, Ammonia, Total P, pH, and Suspended Solid levels for SW1 and SW2 are illustrated in the figures 4.2 and 4.3.

Figure 4.2 Monthly Summary of key parameters at SW1

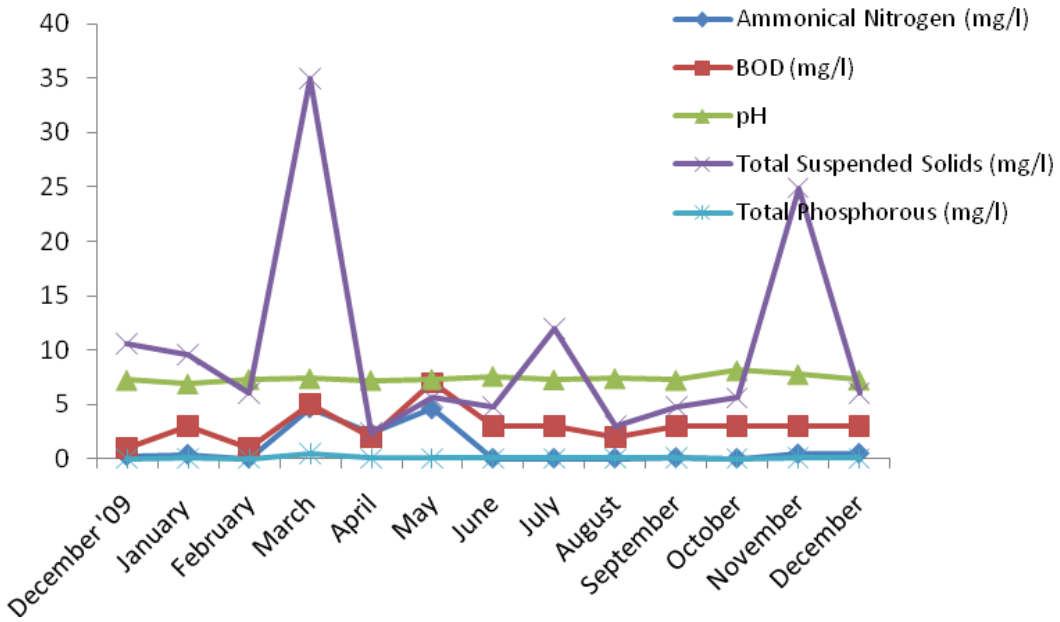
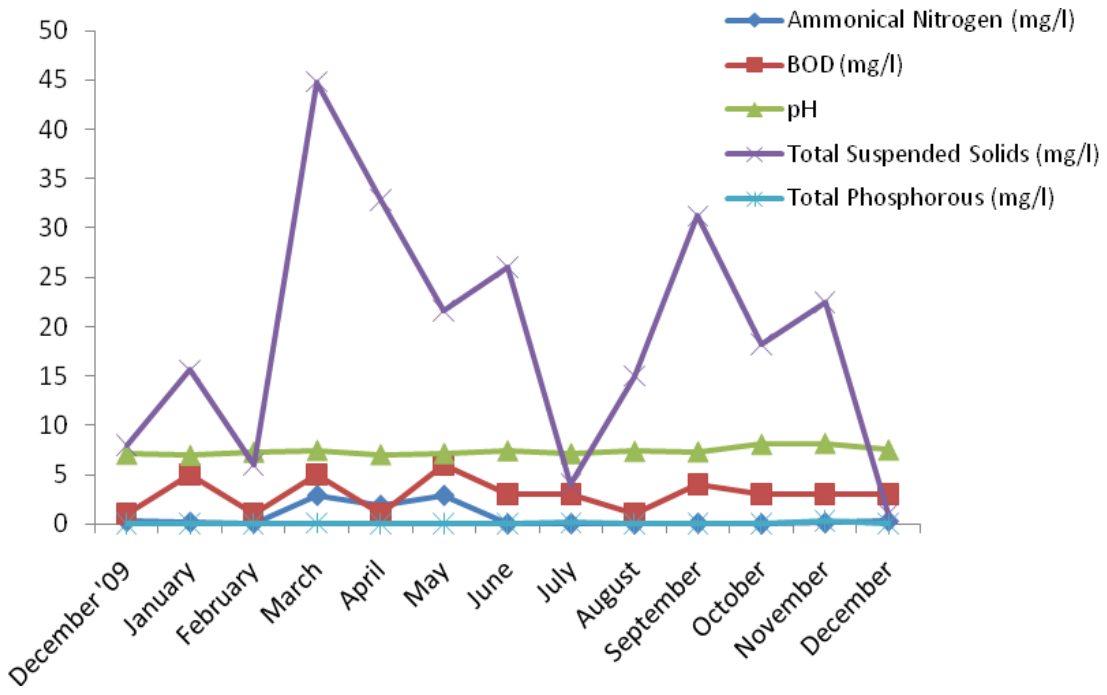


Figure 4.3 Monthly Summary of key parameters at SW2



4.3.2 Biological Monitoring

In July 2010 a detailed biological assessment was undertaken on watercourses in the vicinity of Corranure Landfill. Macroinvertebrate surveys were carried out at 10 no. sites; 5 no. (A1 – A5) on the Corranure Stream and 5 no. (B1 – B5) on the Lismagratty Stream. Drawing No. 102 Monitoring Points shows the locations of these sites (included in Appendix B).

The survey was taken after a week of considerable rainfall, however prior to this week there was a prolonged dry spell of weather. The report suggests that this drought was a critical factor in influencing the water quality and hence the macroinvertebrate communities in the streams.

Even with the previous week of rainfall, the monitoring sites A1 and B1 could not be sampled as these locations were dry. Sampling was last undertaken in 2006 at both these locations at which time site A1 had a Q2 rating and site B1 had a Q3 rating.

In comparison with the biological assessment carried out in 2009 there was no change at monitoring sites B3, B4 and B5 on the Lismagratty stream with a quality rating of Q3 detected. The macroinvertebrate communities at monitoring site B2 did however display some ecological pressure and was therefore given a rating of Q2-3.

On the Corranure stream monitoring site A5 and A2 decreased slightly in quality with a rating of Q2-3 compared with Q3 in 2009, while monitoring locations A3 and A4 remained consistent to the previous year rating of Q3.

Overall there was a decline in the water quality of both the Corranure and Lismagratty Streams in 2010 with both streams reporting poor quality status. The survey illustrates that the water quality declines in the Corranure stream with distance from Corranure landfill, or as it flow towards Cavan town. When compared with other streams in the 'Cavan Trib of Annalee and Erne catchment', the Corranure and Lismagratty streams reflect the overall standard of poor ecological and macroinvertebrate status. Finally the report describes that based on visual observations and macroinvertebrate assemblages, the prolonged dry spell did in fact have a negative impact on the two streams and that activities including roads and agriculture were deemed of greater concern to the water quality of the streams than Corranure Landfill. Evidence of possible point source pollution from non-landfill related activities was also identified.

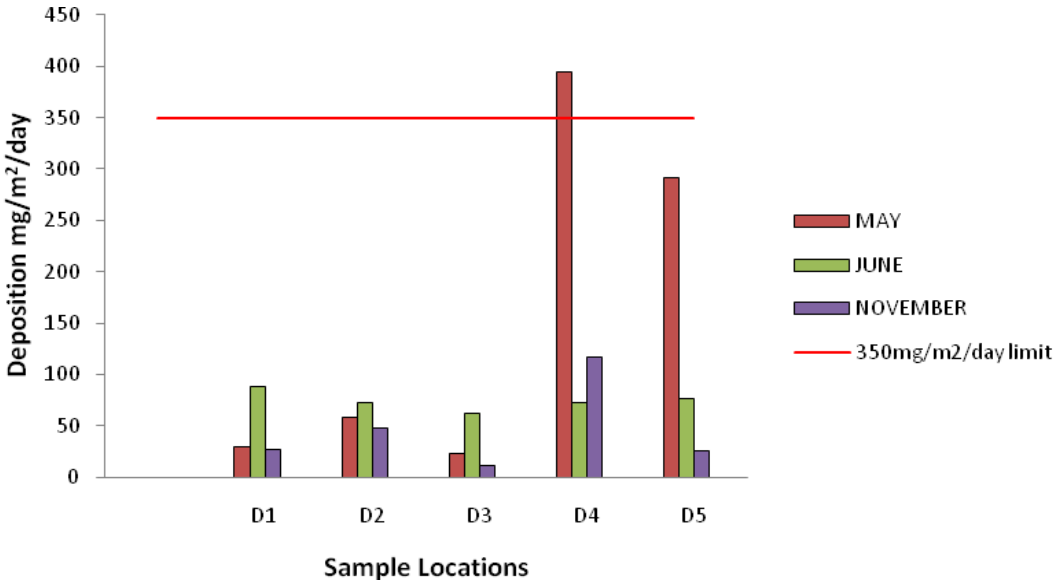
4.4 Dust Monitoring

Dust monitoring was carried out at the landfill three times during the period May-June and once in November at the locations shown in Monitoring Points No. 102. Monitoring stations are labelled D1-D5. (An additional monitoring period was completed, with the licence requiring three times periods per year). Figure 4.4 provides a summary of dust monitoring results for 2010. The results were as follows:

- D1 is located at Cell 0 towards the Southwest corner of the site. Levels of deposition were between 27 mg/m^2/day in November to a high of 88 mg/m^2/day in June.
- D2 is located on the eastern side of Cell 3 beside the main site roadway. All results for May, June and November were well within the licence limits of 350 mg/m^2/day ranging from 48 mg/m^2/day to a high of 72 mg/m^2/day in June.

- D3 is located adjacent to the site access road and wheel wash. All results were low throughout the monitoring period with a high of 62 mg/m^2/day reported in June.
- D4 is located close to the entrance of the landfill and the adjoining property. A result of 395 mg/m^2/day was reported in May. This slight exceedence was due to ongoing road works along the Cootehill Rd during May and in particular the unloading of stone material in the laneway of the adjoining property. Results for June and November were 72 mg/m^2/day and 117 mg/m^2/day which were within the licence limits.
- D5 is located towards the back of the site and experienced no dust results above the recommended licence limits.

Figure 4.4 Dust Monitoring Results 2010



4.5 Landfill Gas

4.5.1 Landfill Gas

Corranure Landfill currently has two 1500m^3/hr Flares extracting gas from cells 0 to 3. Concentrations of methane (CH_4), carbon dioxide (CO_2), oxygen (O_2), temperature and

flow are continuously monitored through the SCADA system. The average monthly concentrations for flare 1 and flare 2 are shown in figures 4.5 and 4.6

Figure 4.5: Average monthly concentrations for Flare 1

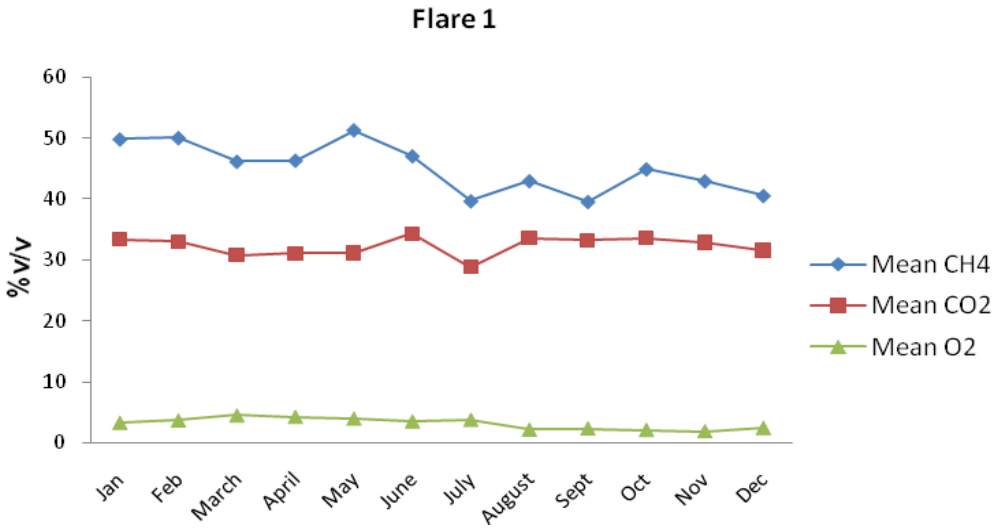
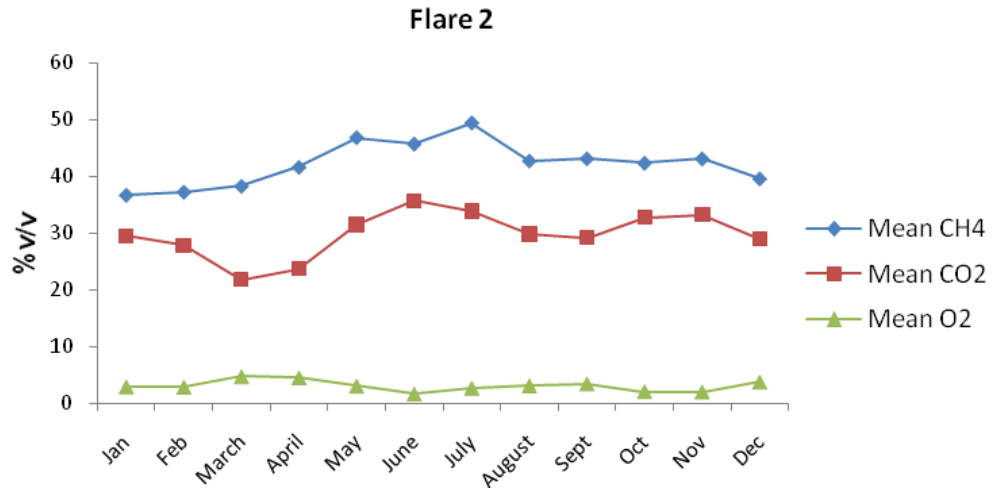


Figure 4.6: Average monthly concentrations for Flare 2



Landfill Gas monitoring was undertaken on a monthly basis at 4 no. gas extraction boreholes located within the waste body as shown on Gas Management Drawing in Appendix E. These locations are L/G61, L/G09, L/G16, and L/G29. Analyses were performed on each sample for methane (CH_4), carbon dioxide (CO_2), oxygen (O_2),

temperature and pressure. Results from these boreholes were generally of typical landfill gas composition, with variations in monthly results dependent on gas extraction rates for that period.

Appendix B shows the locations of perimeter boreholes used to monitor off-site gas migration. The emission limit values for off-site gas migration in the Waste Licence are 1%v/v for methane and 1.5%v/v for carbon dioxide. The monitoring locations include G01, GW4, G05 and G06. Methane levels were exceeded in G01 in March (1.5%) and October (5.9%). All other monitoring results during the reporting period were within the 1%v/v limit at all locations.

Carbon Dioxide readings for G01 were slightly elevated throughout the year. The borehole is located in marshy ground which can produce naturally occurring Carbon Dioxide. It is therefore possible that naturally occurring background levels are present. This is also borne out by the historical data for this well which also shows previous year's levels to be elevated.

4.6 Noise

Noise monitoring was carried out at the landfill on 10th of November 2010. This monitoring consisted of 30 minute daytime levels measured at 9 no. noise monitoring points: NSL1, NSL2, NSL3 (B3), NSL4, NSL5 (B1), NSL6, NSL7, B4 and B2. The locations of these monitoring points are included in Appendix B.

The daytime limit for noise sensitive locations near Corranure Landfill, Co. Cavan is L_{Aeq} < 55 dB(A). L_{Aeq} noise levels at locations NSL2 and NSL3, exceeded the daytime limit of 55 dB(A). Noise monitoring points at both NSL2 and NSL3 are located offsite adjacent to the R188 which has significant volumes of passing traffic. The L_{Aeq} and L_{A90} values at these locations are a direct result of passing traffic and not of noise emanating from the landfill. This can be confirmed by the monitoring results at NSL4 and B2. These monitoring points are located inside the boundary of the landfill in close proximity to landfill operations and were found to be below 55 dB(A) for all frequencies. Monitoring

Locations NSL4, B4 and B2 are located inside the boundary of the landfill and noise emissions are from general operations on site which include internal traffic and machinery operating on cell construction. NSL5 (B1) is located in the CA site and representative of internal traffic movements and site operations. Figure 4.7 shows a summary of the noise monitoring results. Monitoring location NSL6 is located in the property adjoining the landfill; noise levels were very low at this location with the landfill not audible. Results from monitoring location NSL7 found the landfill barely audible with the main noise source being traffic from the Cootehill Rd reaching a high of 48dB.

Figure 4.7: Summary of Noise Monitoring Results for 2010

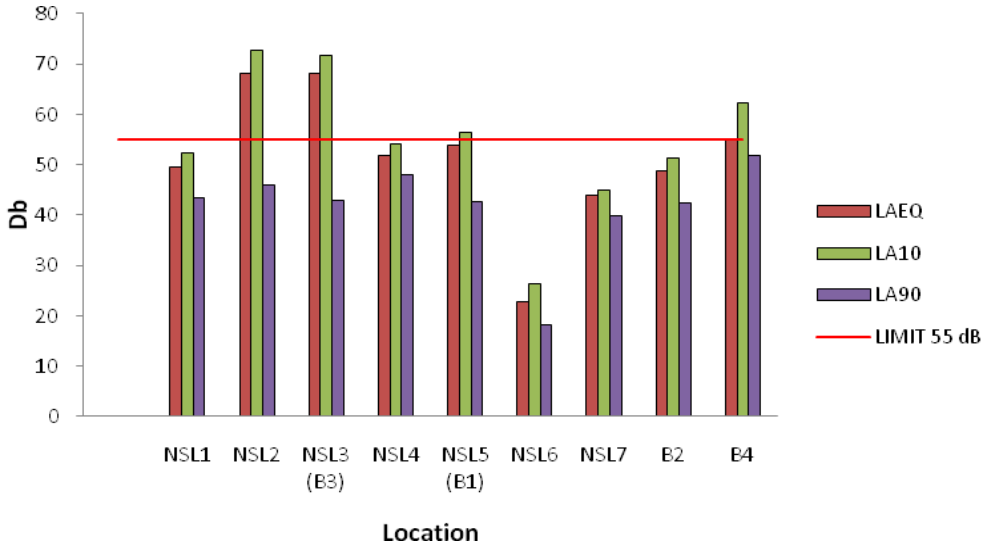


Table 4.9: Day time noise measurements for 10th November 2010

Location	L_{AEQ}	L_{A10}	L_{A90}
NSL1	49.6	52.4	43.4
NSL2	68.2	72.6	46
NSL3 (B3)	68	71.6	42.9
NSL4	51.8	54	48.1
NSL5 (B1)	53.9	56.3	42.7
NSL6	22.7	26.3	18.2
NSL7	43.8	45	39.8
B2	48.7	51.2	42.4
B4	54.8	62.3	51.7

4.7 Flare Emissions

The Annual Flare emissions monitoring took place on the 14th of December 2010 with a sampling and analysis programme to monitor air emissions from both enclosed flares carried out. As shown in table 4.10 all parameters were within the licence limits.

Table 4.10: Summary of Flare Emissions 2010

Emission Parameter	Units	Flare 1	Flare 2	Limit
Carbon Monoxide	mg/Nm^3	19	8	50
Nitrogen Oxides	mg/Nm^3	62	58	150
Sulphur Oxides	mg/Nm^3	271	146	-
Particulates	mg/Nm^3	<0.1	<0.1	-
TOC	mg/Nm^3	<0.5	<0.5	10

4.8 Meteorological Data

A “Davis Weather Station II” is used to record the following meteorological data at the Corranure Landfill.

- Temperature,
- Precipitation, and
- Wind speed and direction.

The following additional data is recorded at Ballyhaise Weather Station as per Schedule D of the Waste licence:

- Humidity,
- Atmospheric Pressure, and
- Evapotranspiration.

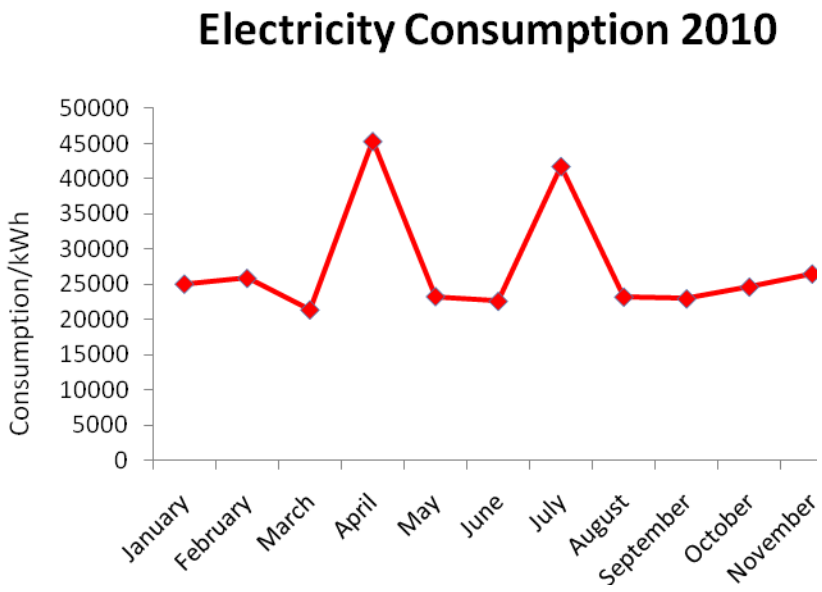
An annual summary of all meteorological data for 2010 is contained in Appendix C; this includes the monthly reports showing daily weather conditions.

5 MASS BALANCE OF SPECIFIED SUBSTANCES

5.1 Resource And Energy Consumption Summary

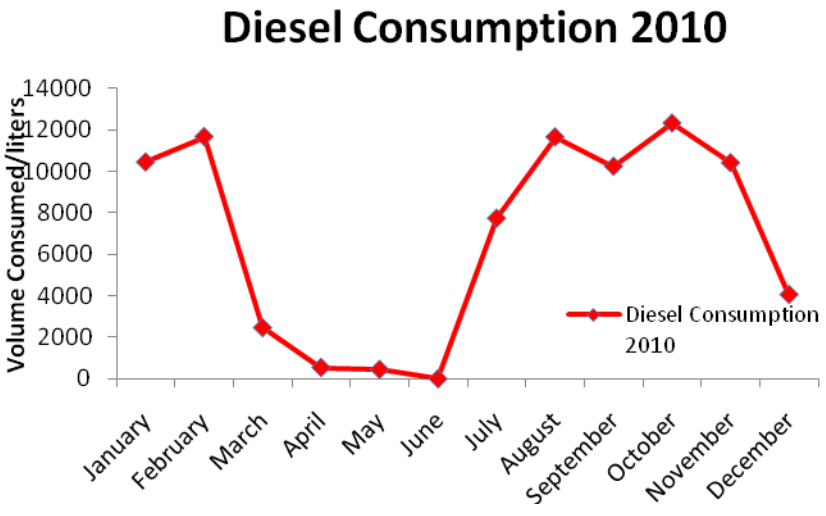
A total of 279,315 kWh of electricity were used at the facility throughout the year.

Figure 5.1: Average monthly electricity consumption at Corranure Landfill in 2010



Fuel usage for the year amounted to 81,868 litres.

Figure 5.2: Average monthly diesel consumption at Corranure Landfill in 2010



5.2 Emissions To Groundwater

There are currently no direct emissions to groundwater. The old landfill (Cell 0) is underlain by stiff clays and was designed as a dilute and disperse landfill. Cells 1 to 3 are fully lined cells with separate leachate and surface water management systems. Monitoring of groundwater and leachate showed the levels of List I and List II compounds to be within the allowable limits.

5.3 Leachate Volume

A glass-lined steel leachate tank was installed at the facility in 2006 with a capacity of 1,531 m^3 and replacing the leachate lagoon as the primary leachate storage unit at the facility. Leachate is pumped via a 110mm rising main from the leachate storage tank at the facility to the current discharge point at the entrance to the Rocklands Estate and from here it flows to the Cavan WWTP.

In 2010 a total of 39,051.92 m^3 of leachate was produced from Corranure Landfill. All leachate was pumped directly from the landfill to Cavan WWTP.

5.4 Gas Volumes

The rate of gas generation at a landfill site varies throughout the life of a landfill and is dependent on a number of factors including:

- The physical dimensions of the landfill site
- The types of waste deposited and the associated input rate
- The age of the waste
- Moisture content, pH, temperature and density of waste deposited and
- The application of cover, compaction and capping

Under optimum conditions one tonne of degradable waste can theoretically produce 400-500m^3 of landfill gas (including moisture content). In practical terms the rate at which landfill gas may be collected for utilisation purpose may be much lower.

Currently at Corranure Landfill two 1500m^3/hr enclosed landfill gas flares are operating at the site. The latest reports indicate that Flare No.1 is treating ~450m^3/hr of bulk landfill

gas which is generated from the old landfill (Cell 0), Cell 1 and Cell 2. The 2nd Flare (Flare No.2) is treating ~550m^3/hr from Cell 3. The volume of gas treated during the year will be largely dependent on the commencement and rate of waste acceptance in Cell 4. As these details have yet to be finalized, no statistically significant valves can be given.

6 SITE DEVELOPMENT WORKS

6.1 Development Works During The Reporting Period

6.1.1 Landfill Gas Management System

- Placement of temporary capping (clay and Geo Hess lining) on Cell 3B,
- Installation of 12 deep gas abstraction wells in Cell 3B,
- Provision of condensate management infrastructure including isolation control valves and driplegs on the main gas lines.
- Repair and replace works to gas abstraction wells and pipework on all landfill cells and repair Geohess material on Cell 3.
- Maintenance and upgrade works to the existing enclosed flares (Flare No.1) and (Flare No. 2) by Biogas,
- Training landfill management staff on the control and operation of landfill gas systems,
- Regular monitoring and dewatering of the gas collection system,
- Continual site attendance by specialist firms (Biogas, Hibernia Plas-fuse services, Gilmore Clarke, AECOM, Harp Electrical).

6.1.2 Odour Control

- Daily Odour Patrol of site and surrounds by personnel.
- FID gas analyser used for onsite odour detection.
- Daily gas field balancing to ensure optimum and safe gas extraction rates.

- Maintenance of gas management plan to reduce odour emissions onsite.
- Commissioning of independent odour monitoring reports by Odour Monitoring Ireland and RPS.

6.1.3 Leachate Management System

- Installation and maintenance of new leachate extraction pumps.
- Installation of dual function wellheads to facilitate gas and leachate extraction from boreholes.
- Continuous monitoring of leachate levels.
- Pumping of leachate from individual wells.

6.1.4 Active Cell 3

- Temporarily capping of Cell 3B.
- Installation of 12 no.gas extraction wells and 2 drip wells.
- Continuous development and improvement of Environmental Management Plan.

6.1.5 Infrastructure Works

- Construction and maintenance of access route to Cell 3B.
- Upgrade of site access road to Cell 4 and maintenance of site roads and security fencing.
- Continual maintenance of surface water management system to Lismagratty stream.

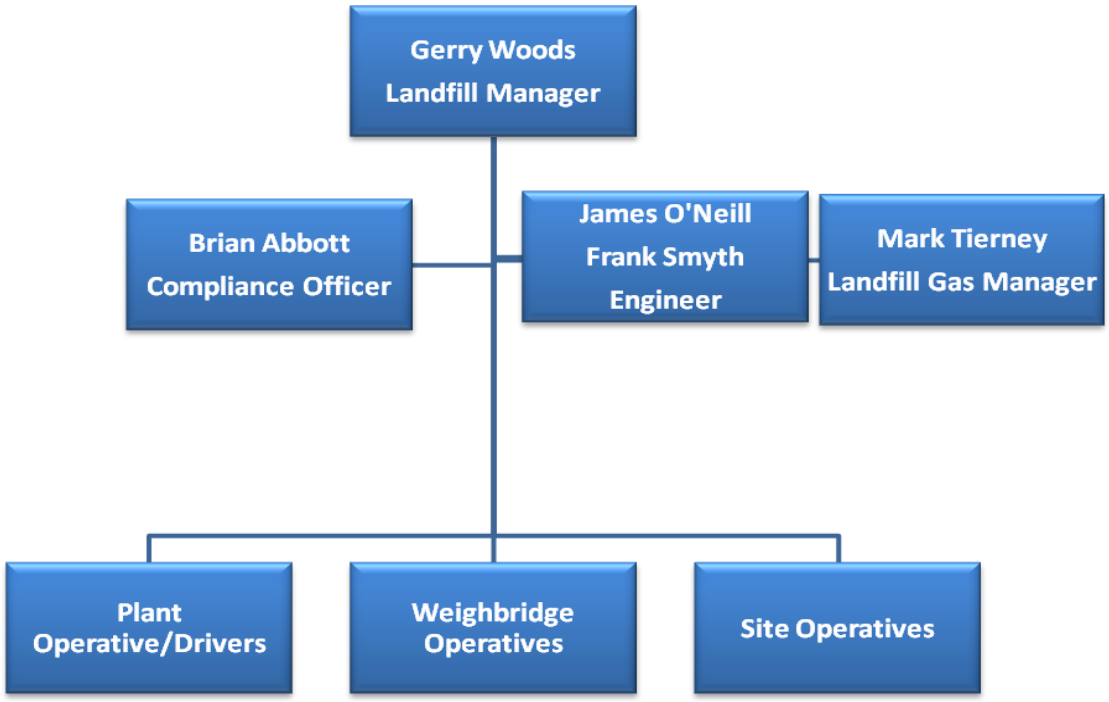
6.2 Proposed Development Works In 2011

- Complete construction of Cell 4.
- Construction of final cap on Cell 3 once final settlement has been established.
- Continued upgrading and modification works to gas collection pipe work.
- Continued remedial and resealing works to the temporary capping system and wells in Cell 3A and Cell 3B.

- Continual training for landfill management staff

7 STAFFING AT CORRANURE LANDFILL

Figure 7.1 Site Management Structure at Corranure Landfill during 2010



8 ENVIRONMENTAL MANAGEMENT

8.1 Environmental Management System

Corranure Landfill attained ISO: 14001 certification in September 2009. The Environmental Management System (EMS) covers all environmental and operational aspects of the facility. The EMS is designed so as to achieve and demonstrate sound environmental performance by controlling the impacts of the facility's activities, products and services on the environment, in a manner which is consistent with the relevant environmental policies and objectives. A detailed audit of the EMS took place in June 2010 by Certification Europe at which time no major non-conformances were found. All aspects of the EMS are reviewed throughout the year and updated where necessary. Minor changes to all site procedures were made in 2010 with only OXLEP13 'Procedure for offsite Odour monitoring' and OXLEP16 'Complaints Handling, Corrective &

Preventative Action Procedure' updated significantly. A copy of the facility's EMS is kept on file.

As per condition 9.19 of the waste licence an Odour Management Plan for the facility is in place which includes and references measures to control potential sources of odour nuisances. A copy of the latest OMP is kept on file in the Site office.

The Landfill Environmental Management Plan for Corranure was reviewed in 2010 with no changes made to the Objective and Targets described in the 2009 AER. The LEMP will be reviewed again in 2011 and will take into account all aspects which account for the site objectives and targets including operational experiences, the stages of development of the facility, evolving legislation and other instructions the Agency may issue.

8.2 Review Of Objectives And Targets For 2010

A number of objectives and targets were outlined for 2010. Table 8.1 shows the progress made on these objectives.

Table 8.1: Status of Objectives and Targets for 2010

Objective	Description	Target	Completion Date	Status
1	Gas Management	1. To integrate a new gas management plan. This is to include		
		• The establishment of a new gas management protocol.	January '10	Gas Management Plan now in place
		• A dedicated person who is responsible for managing landfill gas and extraction.	January '10	Gas manager currently on sick leave. Gas balancing carried out by Brian Abbott
		• A monitoring schedule which will include gas monitoring and gas field balancing.	Ongoing	Monitoring schedule established and operational
		• Improvements in control measures and collections systems.	Ongoing	Improvement to gas lines and alignments ongoing
		2. Adhere to the flare maintenance programme.	Ongoing	Weekly maintenance of flare 2 or as deemed necessary to prevent condensate build up.

		3. Commence degassing in the open cell (Cell 4) as soon as possible with horizontal degassing pipes and vertical pin wells connected to the extraction system.		Due to start once waste acceptance commences in cell 4
2	Capping Cell 3B	1. Capping works to Cell 3B will be carefully monitored 2. Surveys conducted of Cell 3B for landfill settlement	Ongoing Ongoing	Temporary cap on cell 3B completed
3	Construction of Cell 4	1. Completion of dig and preparation of the cell. 2.Completion of CQA report 3. Monitoring of SW2 for Suspended Solids	March '11 March '11 Weekly	Behind schedule due to weather conditions Ongoing
4	Gas Usage Possibilities	1. Review establishment of power generation as soon as practical from the site. 2. Continuous monitoring and study of gas quality and flows so as to establish the feasibility of gas utilisation as an energy resource.	Ongoing Ongoing	Grid connection granted Ongoing
5	Final cap of Cell 3	1. Final cap of Cell 3 to be completed once final settlement of Cell 3B has occurred. 2. Regular surveys of Cell 3 settlement to be completed.	Ongoing Ongoing	Settlement monitoring ongoing. Meetings held with EPA regarding capping details.
6	Complaints Handling	1. Establish a complaints handling protocol that includes a 24/7 phone answering service.	January '10	Protocol to be reviewed in regularly.
7	Maintenance Programmes	1. Wheel wash operation, cleaning 2. Weighbridge operation, cleaning, calibration 3. Flare-Operation, cleaning 4. Maintain stock of all materials including geohess pipes etc in order to carry out immediate repairs in all areas. 5. Review CA site infrastructure so as to reduce traffic congestion and improve health and safety of the public within the CA yard. 6. Programme of interaction with Local Community to include meetings and letters of information. 7. Improve security on the site	Ongoing Ongoing Ongoing Ongoing July '10 Ongoing August '10	Record kept as part of the daily site inspections. Calibration completed. Weekly and Quarterly maintenance carried out by Oxigen & Biogas. Ongoing New Signage in place around CA site. Regular meetings held with CBWM and letters distributed regarding onsite works. New locks on front gate.

8.3 Schedule Of Environmental Objectives And Targets For 2011

Table 8.2: Schedule of Environmental Objectives and Targets for 2011

Objective-1	Target	Completion Date
Gas and Odour Management	1. To operate and maintain an efficient and effective gas and odour management system which will include • The design and construction of degassing system for Cell 4. • Daily monitoring of the gas system through continual gas monitoring and gas field balancing. • Continual improvements in control measures and collections systems. 2. Commence degassing in the open cell (Cell 4) as soon as possible with horizontal degassing pipes and vertical pin wells connected to the extraction system.	Ongoing Ongoing Dependent on rate of waste acceptance
Objective-2	**Target**	**Completion Date**
Final cap of Cell 3	1. Final cap of Cell 3 to be completed once final settlement of Cell 3B has occurred. 2. Capping works to be completed in staged intervals as volume of earthworks required varies between subcells	October '11
Objective-3	**Target**	**Completion Date**
Construction of Cell 4	1. Complete construction of the cell. 2.Complete and agreed filling plan with Agency 3. Attain agreement for Waste acceptance	March'11 March'11 March'11
Objective-4	**Target**	**Completion Date**
Gas Usage Possibilities	1. Review establishment of power generation as soon as practical from the site. 2. Continuous monitoring and study of gas quality and flows so as to establish the feasibility of gas utilisation as an energy resource.	Ongoing
Objective-5	**Target**	**Completion Date**
Maintenance Programmes	1. Wheel wash operation, cleaning. 2. Weighbridge operation, cleaning, calibration. 3. Flare-Operation, cleaning, monitoring, calibration. 4. Maintain stock of all materials including geohess and pipes so as to ensure all planned works are carried out on time and to ensure any necessary site repairs are completed immediately. 5. Programme of interaction with Local Community to include meetings and letters of information. 6. Further improve security on the site.	Ongoing Ongoing Ongoing Ongoing Ongoing August '11

8.4 Review Of Nuisance Controls

Environmental nuisances are monitored on site inspection and recorded on either daily or weekly site inspection forms.

8.4.1 Vermin

The objective of the vermin control programme at Corranure Landfill is to make 'food' sources inaccessible and living conditions as unattractive as possible. The following landfill procedures are implemented as mitigating measures against vermin and pests:

- The tipping face is kept as small as possible,
- Waste is compacted with a high tonnage steel wheel compactor,
- The tipping area is covered every evening with inert cover material,
- All other areas except the tipping area are covered with 300mm of soil, and
- Contracted rodent control programme by Rentokil, which service the baits every six weeks.

8.4.2 Birds

As for vermin and fly control the objective of the bird control programme at Corranure Landfill is to make 'food' sources inaccessible and living conditions as unattractive as possible. The following landfill procedures are implemented as mitigating measures against birds:

- The tipping face is kept as small as possible,
- The waste is compacted with a high tonnage steel wheel compactor, and
- The tipping area is covered every evening with inert cover material

Bird Control Ireland (BCI) Ltd (November '09) were appointed to operate a bird control programme at Corranure; this is completed in conjunction with site personnel, bangers, squawkers and helium balloons.

8.4.3 Flies

The following landfill procedures are implemented as mitigating measures against flies and insects:

- The tipping face is kept as small as possible,
- Waste is compacted with a high tonnage steel wheel compactor,
- The tipping area is covered every evening with Clay cover material,

- Appropriately covered waste lorries on site, and
- Application of insecticide on tipping area, offices, machinery and residents' houses as appropriate during fly season.

8.4.4 Dust

The following landfill procedures are implemented as mitigating measures against dust:

- Prevention of dust nuisance in dry weather by spraying site roads and other areas used by site vehicles with water. A portable bowser is onsite to spray down the site roadways during dry conditions
- Prevention of dust nuisance by appropriate maintenance of clay stock pile on site

8.4.5 Mud

The following landfill procedures are implemented as mitigating measures against mud:

- All Lorries / tractors must use the wheelwash facilities on leaving the tipface.
- An onsite sweeper is used on a daily basis to sweep and maintain the site roadway and civic amenity site.

8.4.6 Odours

The following landfill procedures are implemented as mitigating measures against odours:

- The tipping face is kept as small as possible,
- The waste is compacted with a high tonnage steel wheel compactor,
- The tipping area is covered every evening with inert cover material,
- Appropriately covered waste lorries on site, and
- Landfill gas is captured where possible and all flares are permanently monitored.

8.4.7 Litter

On a day to day basis litter management on site includes the following:

- The working face in enclosed by 6-metre high litter fencing,
- Litter trapped in the netting is removed as soon as practicable,

- Litter on or in the vicinity of the facility is removed, subject to the agreement of the landowners, immediately and in any event by 10.00am of the next working day after such waste is discovered or reported,
- A Landfill Operative carries out the active management of litter on site,
- All waste deposited at the working face is compacted using a steel wheeled compactor, and
- The working face is covered with suitable material at the end of the day.

9 REPORTS ON FINANCIAL PROVISIONS

Oxigen Environmental Ltd. official estimates make an annual allowance for financial provision as required under Condition 13.2 of the Waste Licence Ref. W0077-03.
During 2010 Corranure Landfill was selected to take part in the Agency's Environmental Liability Risk Assessment (ELRA), Closure Restoration and Aftercare Management Plans (CRAMPs) and implementation of Financial Provision (FP) pilot programme. The site was reviewed as part of a programme of assessing twenty IPPC regulated facilities. As part of the independent assessments, the EPA and SKM Enviros have developed a range of tools which are designed to assist in the calculation of potential liabilities and provide a more consistent approach to ELRA/CRAMP and FP assessments. The results of this assessment are ongoing with the results due in early 2011.

10 STATEMENT OF CHARGES AND COSTS OF LANDFILL

The Landfill fee in January to December 2010 was €130 per tonne including a €30 levy. A full financial statement will be submitted separately to the Agency as the content is considered commercially sensitive.

11 REPORTED INCIDENTS AND COMPLAINTS SUMMARY

11.1 Reported Incidents

There were seventy one possible odour incidents reported by Oxigen between January and December 2010. The number of possible odour incidents relates to the number of

odour patrols carried out, (up to four patrols daily) with offsite odour reported as a category 2 incident. All seventy one possible incidents occurred between the 1st of January and 13th of April. During this period, work was ongoing in implementing infrastructural improvements to the gas collection system. Part of this involved drilling into waste which can give rise to odour. Residents and EPA were informed of these proposed works prior to work commencing. There were two surface water incidents were reported for suspended solids in SW2, this occurred when sample results were greater than 35mg/l. There was one incident for dust at D4 in May which related to road works along the Cootehill Rd during the month. In total, seventy four incidents are on record for 2010.

11.2 Complaints Received

A total of 162 complaints were received to Corranure landfill in 2010. All complaints received related to odour at the landfill. The majority of complaints related to the first quarter of the year when works were being undertaken on the gas infrastructure. Complaint numbers for the remainder of the year were very low apart from a prolonged period of extreme cold weather at the end of the year. During this period additional works had to be undertaken on the gas infrastructure as a result of problems caused by the extreme freezing conditions. Some complainants made reference to other issues including litter, birds and the quality of local streams. Additional complaints were made to the EPA offices and these are recorded and filed at the site.

11.3 Action Taken

Complaints received to Corranure Landfill and incidents were recorded, EPA complaints received are also recorded and kept on file, the complainants were contacted and remedial measures put in place. Where possible odour complaints were responded to immediately and checked for verification. Corrective action was taken in response to all complaints and incidents. As detailed in Section 6.1 corrective action for odour issues included, daily odour patrol of site and surrounds by personnel, installation of gas extraction infrastructure, application of gas barrier membrane, FID gas surveys for odour detection, establishment of an odour management plan to reduce odour emissions onsite, commissioning of independent odour monitoring reports by Odour Monitoring Ireland and RPS, modifications to gas pipework, and sealing of individual leachate

sumps. The installation of new gas infrastructure on Cell 3 had a dramatic effect with a noticeable decline in the number of verified odours following these works.

Corrective and preventative action in response to suspended solids at SW2 included weekly environmental monitoring, continuous upgrading and maintenance of surface water management system which results in surface water passing through several sediment ponds before discharging at SW2.

In order to facilitate any possible reported complaints, an out of hour's answering service was in place on a 24/7 basis to ensure that all complaints are answered and that each complaint results in some form corrective action.

12 TOPOGRAPHICAL SURVEY

A topographical survey was completed in April 2010. A copy of this survey is included in Appendix D.

13 SLOPE STABILITY

Monitoring of the conditions of the side slopes of the landfill was carried out in 7th of April 2010 by the Landfill Engineer. The side slopes were checked for signs of instability, which include tension cracks, seepages, bulges at the toe, rotation of the pipework and offset of surface drains. Due to the low volumes of waste landfilled in 2010, the results were very similar to the previous report carried out by Tobins Consultants in October 2009. The survey found that the southern slope, eastern slopes of cell 0, 1, 2 and 3A and northern slope of Cell 3A showed no sign of instability. Some localised over-steeping was present on parts of the western slope of Cell 2 and Cell 3A and parts of the northern slops of Cell 3A. The slopes are checked periodically for leachate seepage and/or slope movement.

14 SITE TRAINING

Details of site management qualifications and training were submitted to the Agency when commencing work at the facility.

Training of site staff throughout 2010 included:

- In accordance with the site Environmental Management System, all site staff were trained on all relevant procedures and environmental aspects of the site, with relevant staff updated of any changes made to procedures or protocol.
- Safe Pass certificates.
- SCADA training
- First Aid Training

15 BUND TESTING

In accordance with condition 3.10.5 of the waste licence which states that 'the integrity and water tightness of all bunds and their resistance to penetration by water or other materials stored therein shall be confirmed by the licensee and shall be reported to the Agency following its installations and prior to its use as a storage area. This confirmation shall be repeated at least once every three years thereafter and reported to the Agency on each occasion' all site bunds were inspected and checked to ensure all containers meet the required standard. A full inspection report was issued by the Landfill Engineer in 2010, with no leaks detected on any site bunds. A copy of the inspection report can be found in Appendix F.

16 COMPLIANCE WITH RELEVANT LEGISLATION

Corranure Landfill is fully committed to meeting all relevant policies and targets set out in the North-East Waste Management Plan. Key objectives of the NEWP include that Local Authorities will ensure that landfills are operated to the highest international standards in accordance with waste licences issued by the EPA, and to achieve the long term goal of reducing the landfill disposal to just 18% of the waste stream in the Region. Due to the cessation of waste disposal in Corranure in early February 2010, the evaluation of original annual targets could not be fully reviewed. However as the Civic Amenity continued to operate throughout the year, the facility did form an integral part in meeting objectives and targets of the Litter Management Plan for County Cavan.

The new legislation relating to waste acceptance and treatment which came into effect from the 1st July 2010 was inapplicable to Corranure Landfill as no waste was landfilled during the second half of the year, however systems will be in place to ensure full compliance once waste acceptance commences in Cell 4.

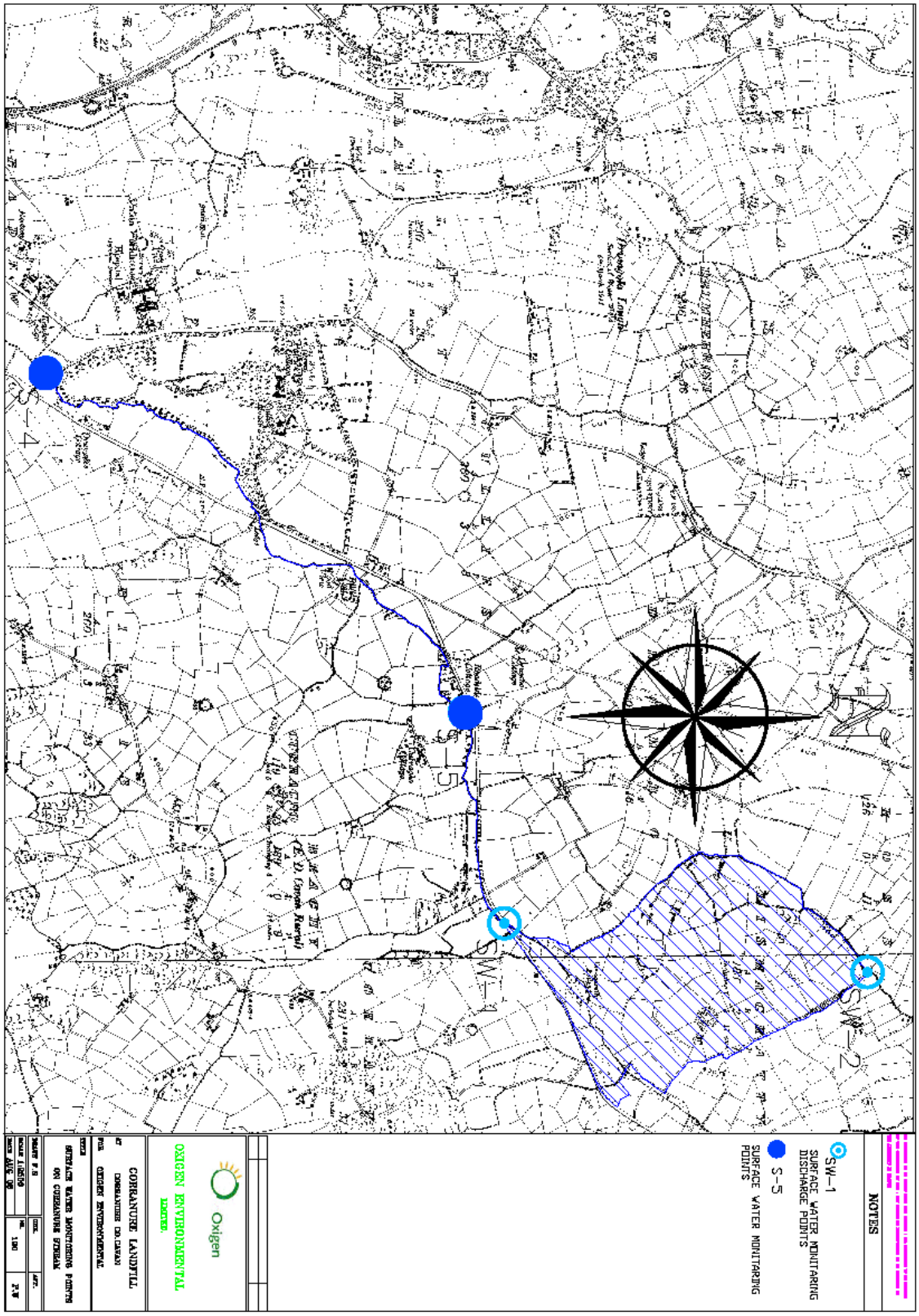
APPENDIX A

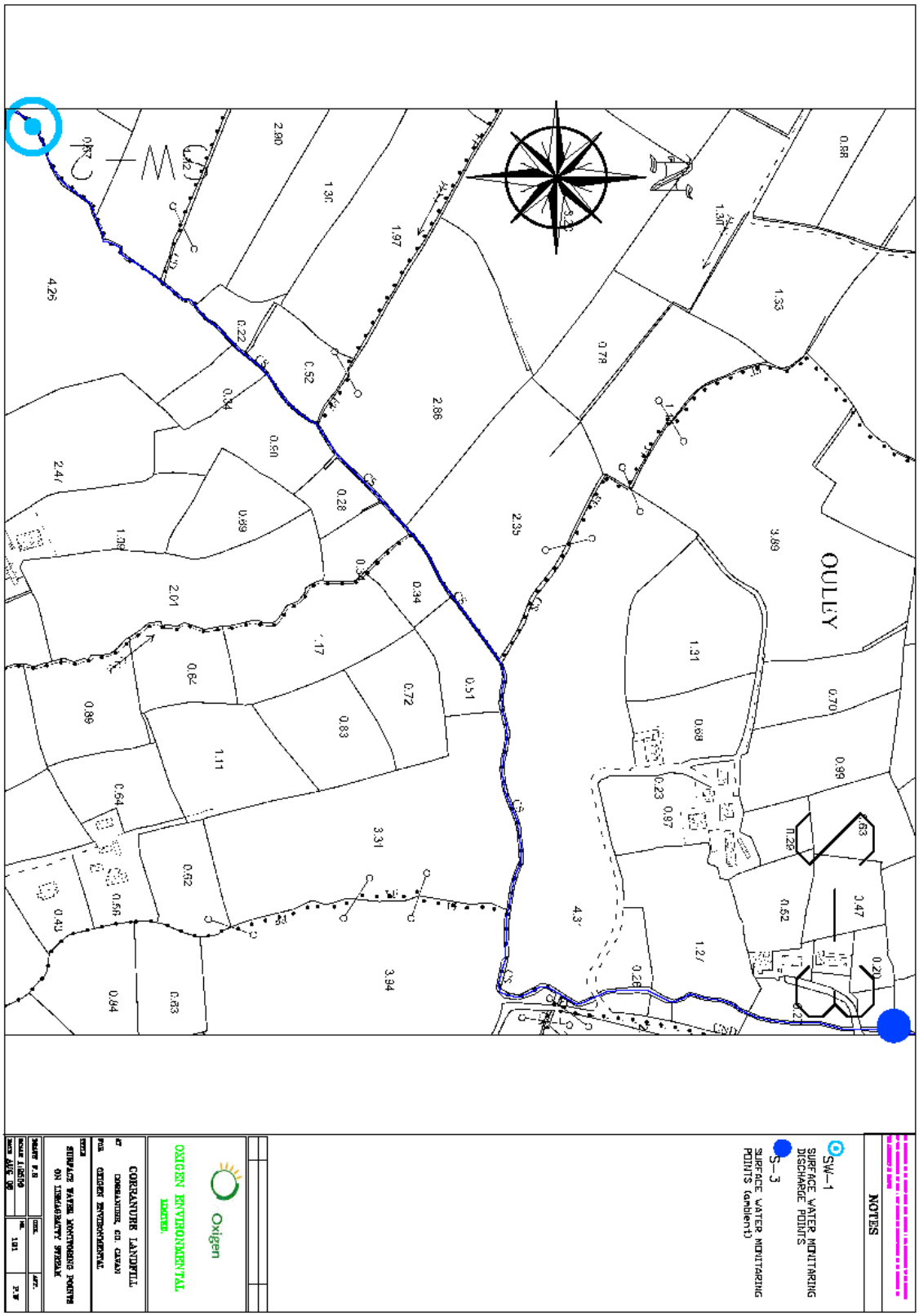
Monthly Breakdown of Landfilled waste

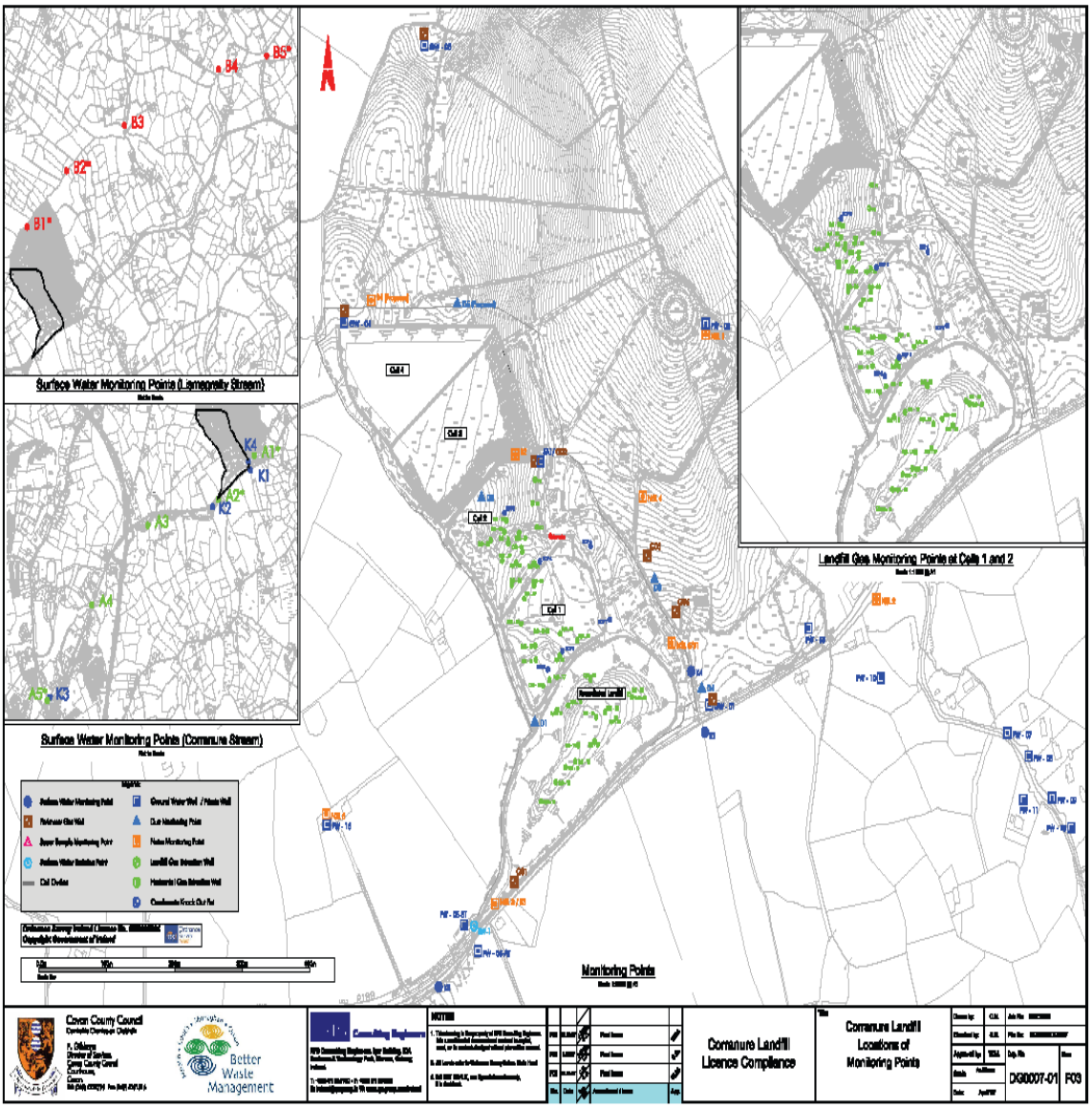
Waste Acceptance	EWC Code	January	February	March	April	May	June	July	August	September	October	November	December	Total
Hse/General	20 03 01	35.74	6.92	0	0	0	0	0	0	0	0	0	0	**42.66**
Ash	10 01 01	138.19	167.46	74.8	0	0	0	0	0	0	0	0	0	**380.45**
Municipal waste	20 03 01	3,013.44	652.02	0	0	0	0	0	0	0	0	0	0	**3665.46**
Paint Filters	08 01 18	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Paint Sludge	08 01 14	17.66	0	0	0	0	0	0	0	0	0	0	0	**17.66**
Sweepers	20 03 03	2.84	0	0	0	0	0	0	0	0	0	0	0	**2.84**
Toner	08 03 18	11.16	0	0	0	0	0	0	0	0	0	0	0	**11.16**
Woodchip cover	20 01 38	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Council Clean up	20 03 03	11.28	1.46	0	0	0	0	0	0	0	0	0	0	**12.74**
Rubble	17 01 07	465.58	563.74	183.18	172.32	0	45.04	0	0	0	0	0	0	**1429.86**
Rubble	19 12 12	0	0	0	0	0	425.54	856.84	70.82	27.78	0	441.94	0	**1822.92**
Crushed Rubble	19 12 09	0	0	0	0	0	0	0	0	686.96	621.22	243.2	0	**1551.38**
Fine Material	19 12 12	1061.76	1021.96	139.12	0	0	0	0	0	0	0	0	0	**2222.84**
Non-Recyclable waste	20 03 01	301.76	28.78	0	0	0	0	0	0	0	0	0	0	**330.54**
Insulation Material	17 06 07	32.38	13.48	0	0	0	0	0	0	0	0	0	0	**45.86**
Soil & Stones	17 05 04	120.98	70.74	95.98	0	0	0	0	0	0	0	0	0	**287.7**
CA C&D Waste	17 01 07	6.86	9.96	16.48	14.36	0	0	0	0	0	0	0	0	**47.66**
C&D Residue	19 12 12	616.2	209.94	0	0	0	0	0	0	0	0	0	0	**826.14**
Bulky Waste	20 03 07	1.44	0	0	0	0	0	0	0	0	0	0	0	**1.44**
Total		**5837.27**	**2746.46**	**509.56**	**186.68**	**0**	**470.58**	**856.84**	**70.82**	**714.74**	**621.22**	**685.14**	**0**	**12699.31**

APPENDIX B

Location Maps of Monitoring Points


NOTES
SW-1
SURFACE WATER MONITARING DISCHARGE POINTS
S-5
SURFACE WATER MONITARING POINTS
SW-1
SW-2
S-4
S-5
Oxigen
OXIGEN ENVIRONMENTAL
CORRANURE LANDFILL
CORRANURE CO. CAVAN
OXIGEN ENVIRONMENTAL
SURFACE WATER MONITORING POINTS ON CORRANURE SCREEN


NOTES
SW-1
SURFACE WATER MONITORING DISCHARGE POINTS
S-3
SURFACE WATER MONITORING POINTS (ambient)
OULLY
Oxigen
OXIGEN ENVIRONMENTAL
CORRANURE LANDFILL
CORRANURE, CO. CAVAN
OXIGEN ENVIRONMENTAL
SURFACE WATER MONITORING POINTS ON LOCALITY SKETCH


Surface Water Monitoring Points (Lismeenity Stream)
Surface Water Monitoring Points (Corranure Stream)
Landfill Gas Monitoring Points at Cells 1 and 2
Monitoring Points
Cell 4
Cell 3
Cell 2
Cell 1
Corranure Landfill Licence Compliance
Corranure Landfill Locations of Monitoring Points
DG0007-01
F03
Cavan County Council
Better Waste Management

APPENDIX C

METEOROLOGICAL DATA

MONTHLY CLIMATOLOGICAL SUMMARY for JAN. 2010

NAME: Cavan Landfill CITY: STATE:
ELEV: LAT: LONG:

TEMPERATURE (°C), RAIN (mm), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	43.5	48.6	22:30	38.1	12:00	0.0	25.1	0.0	1.3	8.0	2:00	N
2	54.4	68.9	20:30	42.8	1:30	0.0	37.6	0.4	4.1	14.0	20:30	WNW
3	63.4	67.6	0:30	53.1	24:00	0.0	42.1	0.0	5.9	14.0	2:00	E
4	49.1	55.7	0:30	41.1	16:30	0.0	30.1	0.2	4.0	15.0	21:00	ENE
5	63.9	66.1	4:00	53.1	0:30	0.0	41.3	0.2	6.6	17.0	21:00	NNE
6	55.6	64.3	0:30	46.0	12:30	0.0	36.9	0.0	6.0	27.0	14:00	NE
7	54.8	55.9	15:30	54.3	23:30	0.0	36.8	0.2	1.7	9.0	0:30	NW
8	52.0	54.3	0:30	48.6	24:00	0.0	33.1	0.0	0.7	6.0	2:30	E
9	47.2	49.6	8:30	43.1	19:00	0.0	28.0	0.0	0.0	0.0	0:30	---
10	50.1	70.3	24:00	45.2	0:30	0.0	39.4	2.0	5.1	17.0	13:30	E
11	70.9	73.0	12:30	55.1	21:30	0.0	45.8	6.2	5.8	17.0	23:30	SE
12	53.4	73.4	21:30	35.9	1:30	0.0	36.4	4.4	15.5	44.0	10:00	SSE
13	66.8	72.8	0:30	61.6	21:00	0.0	48.9	2.2	8.1	24.0	0:30	SSE
14	66.3	70.9	14:30	60.6	7:00	0.0	47.5	0.2	5.3	26.0	23:30	S
15	69.0	72.6	23:00	63.0	2:30	0.0	49.5	14.0	15.5	44.0	21:30	SSW
16	70.0	72.6	3:30	57.3	17:30	0.0	46.7	7.6	11.9	40.0	2:00	WSW
17	68.0	71.2	3:30	60.1	14:30	0.0	47.4	0.0	11.0	31.0	2:00	WSW
18	71.0	74.0	9:30	65.5	1:00	0.0	51.5	0.6	8.1	26.0	1:00	W
19	68.7	68.9	0:30	68.4	0:30	0.0	0.0	0.0	5.0	10.0	0:30	S
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
	59.9	74.0	18	35.9	12	0.0	724.1	38.2	6.4	44.0	12	E

Max >= 32.0: 19
Max <= 0.0: 0
Min <= 0.0: 0
Min <= -18.0: 0
Max Rain: 14.00 ON 15/01/10
Days of Rain: 8 (> .2 mm) 6 (> 2 mm) 0 (> 20 mm)
Heat Base: 18.3 Cool Base: 18.3 Method: (High + Low) / 2

MONTHLY CLIMATOLOGICAL SUMMARY for FEB. 2010

NAME: Cavan CITY: STATE:
ELEV: 0 m LAT: LONG:

TEMPERATURE (°C), RAIN (mm), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1												
2												
3												
4	58.7	59.2	19:00	55.1	12:30	0.0	20.2	7.6	11.2	28.0	19:30	S
5	55.2	60.5	10:00	45.7	15:00	0.0	36.8	3.6	5.2	16.0	10:30	SSE
6	65.1	70.5	10:30	47.3	0:30	0.0	46.8	0.3	2.4	12.0	0:30	ENE
7	60.2	66.7	14:30	45.5	23:00	0.0	41.8	0.0	6.4	20.0	18:30	SE
8	44.6	53.5	9:30	37.5	17:30	0.0	26.3	0.3	5.4	20.0	12:00	E
9	41.9	44.3	15:00	39.2	7:00	0.0	23.6	0.5	4.1	15.0	14:00	ENE
10	42.4	44.2	13:30	39.2	1:30	0.0	24.1	0.0	2.1	14.0	14:00	ENE
11	38.7	41.7	0:30	35.4	13:00	0.0	14.1	0.3	2.1	11.0	15:00	ENE
12												
13												
14												
15												
16	42.0	44.5	16:00	38.9	16:00	0.0	0.0	1.6	3.1	8.0	18:30	SE
17	50.6	58.2	13:30	41.8	0:30	0.0	31.7	2.6	3.2	12.0	15:00	NE
18	46.6	49.8	12:30	42.2	15:00	0.0	27.7	0.4	1.9	11.0	15:00	NE
19	47.2	51.9	15:00	36.9	19:30	0.0	26.1	0.4	2.6	14.0	16:00	NNW
20	44.9	50.2	24:00	34.0	3:00	0.0	23.8	0.0	1.9	7.0	10:30	NNW
21	47.5	50.4	15:00	40.7	8:30	0.0	27.3	0.2	0.5	6.0	13:00	SSW
22	48.3	52.4	13:30	42.0	8:00	0.0	28.9	0.2	3.4	13.0	13:00	ESE
23	47.5	53.3	24:00	43.6	17:30	0.0	30.2	1.0	8.5	32.0	14:00	E
24	50.2	54.9	8:00	44.6	21:30	0.0	31.5	4.6	7.9	21.0	4:00	NNE
25	45.5	52.7	13:00	41.8	1:00	0.0	29.0	0.0	2.0	9.0	1:30	NNE
26	51.0	55.2	14:30	44.3	0:30	0.0	31.5	0.0	2.4	10.0	21:00	NNW
27	47.8	51.9	0:30	38.1	22:00	0.0	26.7	0.0	4.8	18.0	14:00	SSE
28	46.7	53.3	13:30	39.0	1:00	0.0	27.9	0.2	1.5	9.0	13:30	W
	47.4	58.2	17	34.0	20	0.0	342.2	11.2	3.4	32.0	23	NNW

Max >= 32.0: 13
Max <= 0.0: 0
Min <= 0.0: 0
Min <= -18.0: 0
Max Rain: 4.60 ON 24/02/10
Days of Rain: 6 (> .2 mm) 2 (> 2 mm) 0 (> 20 mm)
Heat Base: 18.3 Cool Base: 18.3 Method: (High + Low) / 2

MONTHLY CLIMATOLOGICAL SUMMARY for MAR. 2010

NAME: Cavan CITY: STATE:
ELEV: 0 m LAT: LONG:

TEMPERATURE (°C), RAIN (mm), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	45.8	50.7	16:00	38.0	1:30	0.0	27.5	0.3	3.2	19.0	16:00	WNW
2	49.4	52.7	11:30	44.3	3:30	0.0	31.1	0.3	4.9	18.0	12:00	SSE
3	49.1	51.3	15:00	45.0	16:30	0.0	30.7	0.0	4.8	18.0	10:00	SSE
4	44.3	47.8	7:30	38.9	2:00	0.0	26.0	0.3	2.1	11.0	12:30	SE
5	44.1	46.1	16:30	42.2	0:30	0.0	25.7	0.0	3.1	16.0	14:00	N
6	37.6	44.1	0:30	31.5	12:30	0.0	19.3	0.0	3.1	15.0	00:00	N
7	39.1	44.3	10:30	31.8	20:30	0.0	20.8	0.0	5.5	17.0	10:30	SSE
8	38.7	42.4	14:00	34.1	4:00	0.0	20.4	0.0	3.4	16.0	13:00	SSE
9	36.9	40.6	11:30	29.0	3:30	0.0	18.6	0.0	1.2	9.0	20:30	SE
10	34.5	36.9	11:00	30.6	21:30	0.0	16.2	0.0	1.1	10.0	15:00	E
11	36.2	42.4	00:00	30.8	2:30	0.0	17.8	0.0	2.7	13.0	15:30	E
12	48.2	51.3	10:30	42.4	0:30	0.0	29.9	0.3	6.9	22.0	10:30	NNE
13	43.8	47.8	7:30	36.6	19:00	0.0	25.5	0.0	4.8	17.0	12:00	N
14	49.6	56.9	10:30	37.2	2:30	0.0	31.2	0.5	5.5	20.0	12:30	NW
15	51.4	54.3	9:30	45.8	0:30	0.0	33.1	0.0	4.6	20.0	13:00	NW
16	51.1	51.9	13:00	49.4	23:00	0.0	32.8	0.3	8.1	26.0	18:00	SSW
17	56.8	61.3	10:30	50.9	1:00	0.0	38.4	1.0	11.8	26.0	16:00	WSW
18	58.2	62.4	16:30	55.1	11:30	0.0	39.9	6.3	18.2	45.0	19:30	SW
19	60.0	61.1	10:30	57.6	2:00	0.0	41.7	1.3	6.9	27.0	3:30	W
20	59.4	61.9	9:00	57.4	23:30	0.0	40.2	0.5	5.3	24.0	12:00	NNE
21	59.9	63.5	23:30	57.9	2:30	0.0	39.9	0.8	8.0	25.0	23:30	WSW
22	68.4	71.3	14:30	62.3	4:30	0.0	48.1	13.0	13.1	37.0	2:30	W
23	68.7	71.0	23:30	66.3	19:01	0.0	50.3	0.0	10.1	29.0	11:30	SW
24	75.0	78.9	10:30	68.7	19:30	0.0	56.7	6.6	6.9	23.0	7:02	W
25	71.4	74.4	14:30	64.4	6:02	0.0	33.2	3.6	7.3	18.0	7:30	E
26	40.7	-3.6	0:0432767.0		0:00	0.0	0.0	209.6	4.0	3.0	0:04	E
27												
28												
29	66.1	74.1	23:30	61.6	3:30	0.0	49.6	227.6	8.4	26.0	15:30	E
30	72.5	74.4	0:02	64.2	10:30	0.0	0.0	6.0	11.3	23.0	8:30	N
31	70.7	73.3	24:00	65.3	16:00	0.0	0.0	0.0	8.1	31.0	18:00	NW
	48.9	74.4	30	29.0	9	0.0	561.1	450.8	5.8	45.0	18	N

Max >= 32.0: 22
Max <= 0.0: 1
Min <= 0.0: 0
Min <= -18.0: 0
Max Rain: 227.60 ON 29/03/10
Days of Rain: 7 (> .2 mm) 4 (> 2 mm) 2 (> 20 mm)
Heat Base: 18.3 Cool Base: 18.3 Method: (High + Low) / 2

MONTHLY CLIMATOLOGICAL SUMMARY for APR. 2010

NAME: Cavan Landfill CITY: STATE:
ELEV: LAT: LONG:

TEMPERATURE (°C), RAIN (mm), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	69.6	73.6	1:00	65.2	20:00	0.0	51.1	0.2	4.4	15.0	17:00	WNW
2	66.2	68.3	11:30	65.2	2:00	0.0	48.5	4.8	7.5	29.0	11:30	SE
3	70.4	72.3	16:00	65.9	0:30	0.0	50.8	1.2	6.0	22.0	18:00	E
4	70.8	71.8	21:30	69.9	8:00	0.0	52.6	2.4	9.1	32.0	24:00	NW
5	67.7	70.6	1:00	63.6	24:00	0.0	48.8	20.2	19.9	43.0	18:30	WSW
6	64.0	65.9	19:30	62.8	14:00	0.0	46.1	19.0	6.0	34.0	3:30	W
7	64.6	66.1	14:00	63.1	23:30	0.0	46.3	0.0	5.4	18.0	19:00	WNW
8	63.8	64.7	1:00	62.3	6:30	0.0	45.3	0.0	6.3	19.0	16:00	WNW
9	58.6	63.0	0:30	43.9	10:30	0.0	35.2	0.0	5.3	20.0	17:00	SW
10	52.9	56.6	10:00	43.7	12:30	0.0	31.9	0.0	6.1	20.0	12:30	SSW
11	59.5	62.2	16:30	50.7	10:30	0.0	38.2	0.0	1.7	13.0	21:30	S
12	62.4	64.2	18:00	60.4	22:30	0.0	44.0	0.0	3.1	16.0	19:30	E
13	62.8	65.3	15:30	58.1	3:00	0.0	43.4	0.0	4.6	15.0	16:30	E
14	63.8	64.8	17:30	63.1	7:00	0.0	45.7	0.0	4.4	16.0	15:00	E
	63.5	64.3	13:30	62.8	24:00	0.0	45.3	0.0	5.1	16.0	15:00	E
16	63.8	65.5	17:00	61.4	23:30	0.0	45.2	0.0	2.2	12.0	12:30	ENE
17	58.2	62.7	2:30	56.2	10:30	0.0	41.2	0.0	2.6	16.0	15:00	WNW
18	57.3	59.3	15:00	49.9	8:00	0.0	36.3	0.0	3.0	14.0	17:30	NE
19	55.4	58.8	0:30	51.0	7:30	0.0	36.6	0.0	4.4	15.0	10:00	NE
20	56.6	57.7	16:00	55.9	0:01	0.0	38.5	0.0	5.7	20.0	12:30	NW
21	56.9	58.1	13:30	56.1	3:00	0.0	38.8	0.0	1.5	11.0	20:30	ENE
22	56.3	57.8	12:00	52.9	15:30	0.0	37.1	0.0	2.4	14.0	21:30	E
23	56.9	58.1	16:00	55.9	0:30	0.0	38.7	0.0	6.5	21.0	14:00	WSW
24	55.1	56.9	0:30	47.9	21:30	0.0	34.1	0.8	7.1	21.0	16:30	SSW
25	57.3	59.1	17:30	51.9	1:00	0.0	37.3	3.0	7.9	26.0	14:30	W
26	57.8	59.2	13:00	56.6	15:01	0.0	39.6	0.2	5.8	21.0	13:30	W
27	57.1	58.3	4:30	54.6	23:30	0.0	38.1	1.8	11.4	32.0	13:30	SW
28	57.2	59.7	15:01	53.7	4:30	0.0	38.4	5.2	12.9	29.0	14:30	SW
29	60.7	62.4	15:00	58.0	1:00	0.0	41.9	2.4	6.7	24.0	14:00	WNW
30	63.6	66.4	17:00	60.9	1:30	0.0	45.4	2.6	4.6	15.0	19:30	W
	61.0	73.6	1	43.7	10	0.0	1260.4	63.8	6.0	43.0	5	WNW

Max >= 32.0: 30
<= 0.0: 0
Min <= 0.0: 0
Min <= -18.0: 0
Max Rain: 20.20 ON 5/04/10
Days of Rain: 11 (> .2 mm) 8 (> 2 mm) 1 (> 20 mm)
Heat Base: 18.3 Cool Base: 18.3 Method: (High + Low) / 2

MONTHLY CLIMATOLOGICAL SUMMARY for MAY. 2010

NAME: Cavan CITY: STATE:
ELEV: 0 m LAT: LONG:

TEMPERATURE (°C), RAIN (mm), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	64.4	65.8	13:01	63.4	7:00	0.0	47.0	0.0	3.2	15.0	18:30	N
2	63.8	64.8	14:30	62.9	6:30	0.0	44.6	1.5	7.4	24.0	16:30	NNE
3	60.2	63.4	0:01	57.6	3:30	0.0	41.9	0.0	8.3	27.0	15:01	NNE
4	60.4	61.4	16:30	59.6	6:30	0.0	42.1	0.0	5.9	18.0	19:00	N
5	61.2	62.6	10:30	60.1	3:30	0.0	42.8	1.5	6.1	20.0	15:30	NW
6	59.8	61.4	3:30	58.8	22:30	0.0	41.5	1.3	9.0	20.0	5:30	NE
7	58.7	59.5	18:30	58.0	22:30	0.0	40.4	0.0	8.0	23.0	15:30	E
8	59.3	61.6	17:30	56.7	3:30	0.0	41.0	0.0	6.9	21.0	12:01	E
9	59.3	61.2	14:30	57.5	5:01	0.0	40.9	0.0	4.7	15.0	20:00	NE
10	59.3	60.6	18:30	58.4	4:01	0.0	41.8	0.0	9.3	23.0	9:30	NE
11	60.6	64.9	16:00	55.7	5:01	0.0	42.2	4.1	4.6	22.0	16:30	N
12	61.7	63.5	0:30	60.1	23:30	0.0	43.4	0.0	4.3	17.0	10:00	NNE
13	62.2	69.3	00:00	59.4	5:00	0.0	43.9	2.5	6.8	22.0	12:00	WSW
	68.6	70.9	10:00	66.6	23:30	0.0	50.3	0.0	5.7	22.0	16:00	N
15	66.5	71.7	23:30	64.9	7:00	0.0	48.2	1.5	7.9	25.0	18:00	WNW
16	69.9	71.6	8:00	68.4	23:00	0.0	51.6	0.0	6.2	20.0	14:30	NW
17	68.6	70.3	16:30	67.6	7:00	0.0	50.3	0.0	4.2	14.0	17:00	WNW
18	68.8	73.7	00:00	67.6	6:30	0.0	50.4	3.3	7.4	22.0	15:30	SW
19	75.5	77.1	10:30	73.6	0:30	0.0	57.2	0.3	6.2	17.0	0:30	W
20	72.4	74.8	0:30	64.1	15:00	0.0	54.1	0.0	3.5	13.0	17:00	W
21	67.4	71.4	1:00	55.1	23:30	0.0	49.1	0.5	3.9	13.0	13:00	S
22	64.2	73.7	8:00	53.5	11:00	0.0	45.8	0.0	3.4	15.0	12:00	S
23	66.4	72.3	00:00	59.4	8:30	0.0	48.1	0.0	4.4	16.0	15:00	WNW
24	66.9	72.5	0:30	60.4	15:00	0.0	47.6	0.0	7.0	18.0	14:00	NE
25	63.6	65.2	18:00	61.1	10:00	0.0	44.3	0.0	7.3	22.0	9:00	NE
26	59.2	63.4	1:00	51.2	18:00	0.0	40.8	0.0	7.3	23.0	9:30	NE
27	54.6	57.1	11:30	47.9	10:00	0.0	18.1	0.0	3.2	15.0	11:00	N
28												
29												
30												
31												
	63.8	77.1	19	47.9	27	0.0	1209.4	16.5	6.0	27.0	3	NE

Max >= 32.0: 27
Max <= 0.0: 0
Min <= 0.0: 0
Min <= -18.0: 0
Max Rain: 4.06 ON 11/05/10
Days of Rain: 9 (> .2 mm) 3 (> 2 mm) 0 (> 20 mm)
Heat Base: 18.3 Cool Base: 18.3 Method: Integration

MONTHLY CLIMATOLOGICAL SUMMARY for JUN. 2010

NAME: Corranure CITY: STATE:
ELEV: 128 m LAT: LONG:

TEMPERATURE (°C), RAIN (mm), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1												
2	83.3	84.2	18:00	82.8	16:00	0.0	29.8	0.0	2.8	12.0	16:00	SSW
3	83.6	85.8	15:00	65.4	19:30	0.0	65.3	0.0	6.4	23.0	15:00	S
4	83.2	87.4	18:00	67.4	13:00	0.0	64.8	0.0	4.6	18.0	11:00	SSE
5	87.4	90.6	18:00	85.4	00:00	0.0	69.1	0.0	3.5	15.0	16:30	NW
6	86.0	87.3	19:00	85.2	2:00	0.0	67.7	0.0	3.5	14.0	13:30	NE
7	82.2	85.3	0:30	73.4	1:00	0.0	63.8	2.8	5.8	18.0	19:00	ENE
8	84.2	85.2	00:00	83.0	18:30	0.0	65.8	8.9	8.9	21.0	18:00	ENE
9	84.8	86.0	10:00	82.8	19:30	0.0	66.5	8.9	7.4	24.0	19:30	E
10	78.4	84.3	0:30	46.7	21:00	0.0	60.1	0.3	5.9	17.0	10:00	ENE
11	70.3	79.1	7:00	58.1	00:00	0.0	51.9	0.0	6.0	22.0	15:30	N
12	59.7	62.4	6:30	53.8	1:30	0.0	41.3	0.3	4.4	17.0	8:30	N
13	79.3	85.6	15:00	61.1	1:00	0.0	60.9	6.6	6.4	24.0	16:30	NW
14	85.0	87.6	7:00	83.0	0:30	0.0	66.7	0.0	4.1	13.0	10:00	ENE
15	82.9	85.8	18:00	75.8	21:30	0.0	64.6	0.0	2.0	11.0	16:30	NE
16	80.1	82.3	17:00	76.8	0:30	0.0	61.7	0.0	2.3	14.0	20:00	NE
17	82.8	86.1	23:30	80.4	1:00	0.0	64.4	0.0	3.1	17.0	22:30	NNE
18	77.2	86.0	0:30	52.1	23:00	0.0	58.9	0.0	6.8	18.0	14:30	NNE
19	70.9	74.6	16:00	62.6	3:30	0.0	52.6	0.0	7.8	23.0	15:00	NNE
20	73.4	76.3	16:00	67.9	7:00	0.0	55.1	0.3	4.4	16.0	13:30	NNE
21	79.0	83.4	18:30	71.2	0:30	0.0	60.7	0.5	3.5	17.0	14:00	E
22	76.3	78.4	17:30	74.1	3:30	0.0	57.9	0.0	5.6	19.0	10:00	W
23	79.8	89.8	00:00	76.1	3:30	0.0	61.4	1.0	6.9	22.0	11:30	W
24	87.9	90.1	3:30	85.6	14:00	0.0	69.6	0.0	3.5	15.0	13:30	WNW
25	86.6	87.6	5:30	85.9	20:30	0.0	68.3	0.0	2.9	16.0	14:30	SSW
26	88.4	91.7	13:00	85.1	22:30	0.0	70.1	0.5	6.3	21.0	15:30	SSW
27	88.0	89.2	15:00	85.7	0:30	0.0	69.7	0.0	11.2	30.0	18:30	W
28	95.3	102.8	18:00	87.3	0:30	0.0	76.9	14.7	5.1	14.0	9:00	WSW
29	101.7	104.8	7:00	99.4	13:00	0.0	83.3	0.3	1.7	12.0	17:00	NNE
30	100.6	102.7	00:00	97.9	20:30	0.0	82.2	4.1	7.1	24.0	18:00	SW
	82.7	104.8	29	46.7	10	0.0	1831.3	49.0	5.2	30.0	27	NNE

Max >= 32.0: 29
Max <= 0.0: 0
Min <= 0.0: 0
Min <= -18.0: 0
Max Rain: 14.73 ON 28/06/10
Days of Rain: 13 (> .2 mm) 6 (> 2 mm) 0 (> 20 mm)
Heat Base: 18.3 Cool Base: 18.3 Method: Integration

MONTHLY CLIMATOLOGICAL SUMMARY for JUL. 2010

NAME: Corranure CITY: STATE:
ELEV: 128 m LAT: LONG:

TEMPERATURE (°C), RAIN (mm), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	105.2	106.9	10:00	102.7	0:30	0.0	86.8	12.7	11.4	33.0	4:00	W
2	104.7	105.4	16:00	103.7	22:30	0.0	86.4	0.5	12.4	36.0	13:30	W
3	104.2	105.9	13:30	102.2	22:30	0.0	85.8	0.3	8.7	26.0	12:30	WSW
4	101.4	106.7	9:30	89.7	18:30	0.0	83.1	16.0	14.0	45.0	13:30	WSW
5	95.8	99.6	12:30	79.1	21:00	0.0	77.5	0.8	6.9	26.0	16:00	NW
6	99.9	107.9	00:00	79.7	0:30	0.0	81.6	2.5	9.2	34.0	15:30	WSW
7	91.7	108.1	1:00	73.7	17:30	0.0	73.4	0.3	13.3	36.0	14:00	W
8	86.4	90.5	00:00	80.3	1:00	0.0	68.1	0.3	8.2	23.0	14:00	WSW
9	104.1	108.4	7:30	89.8	0:30	0.0	85.8	8.9	4.6	21.0	11:30	NE
10	105.9	106.9	2:30	105.1	12:30	0.0	87.6	19.6	7.0	23.0	21:00	E
11	97.7	105.3	0:30	74.3	9:30	0.0	79.4	0.5	8.0	38.0	4:00	WNW
12	98.9	103.2	10:30	90.6	1:30	0.0	80.6	0.3	1.3	11.0	00:00	WSW
13	100.1	105.9	00:00	97.3	9:00	0.0	81.8	4.3	7.4	21.0	10:30	SE
14	107.0	108.4	5:30	105.7	19:00	0.0	88.7	5.8	7.5	23.0	15:30	SE
15	107.1	108.1	22:30	106.5	12:30	0.0	88.8	2.8	3.4	21.0	15:00	W
16	110.2	111.7	7:00	108.0	0:30	0.0	91.8	19.3	7.6	23.0	11:30	NW
17	108.6	110.4	5:00	103.7	22:00	0.0	90.3	1.3	7.9	21.0	17:00	WNW
18	108.0	109.6	00:00	104.7	0:30	0.0	89.7	1.0	7.3	20.0	1:00	W
19	109.8	111.9	7:00	107.6	17:00	0.0	91.5	1.8	8.1	23.0	4:30	WSW
20	106.7	109.1	7:00	103.2	15:30	0.0	88.4	0.0	3.4	15.0	16:30	WSW
21	107.0	113.8	00:00	104.1	13:00	0.0	88.7	18.5	4.3	18.0	19:00	ENE
22	113.4	115.0	9:00	111.5	13:30	0.0	95.1	1.3	7.6	19.0	10:30	NNE
23	113.1	113.3	11:00	112.7	1:00	0.0	94.7	0.0	1.9	13.0	16:00	NE
24	113.2	114.3	15:30	112.6	19:00	0.0	94.9	0.5	5.1	15.0	16:30	WSW
25	113.1	113.6	23:00	112.7	2:00	0.0	94.8	0.0	5.1	16.0	12:00	NW
26	113.6	113.8	8:00	113.2	0:30	0.0	95.2	0.0	7.8	22.0	14:30	WNW
27	112.9	113.8	0:30	111.7	19:00	0.0	94.6	0.0	6.9	20.0	16:00	WNW
28	111.9	112.7	4:30	111.3	17:00	0.0	93.6	0.0	6.3	18.0	17:00	WNW
29	112.3	112.8	21:30	111.6	0:30	0.0	93.9	0.0	2.9	13.0	17:30	NW
30	5.6	117.1	7:00	112.7	0:30	79.6	66.8	8.4	6.4	21.0	15:30	NW
31	115.7	116.2	4:00	115.2	20:30	0.0	97.4	0.0	6.8	21.0	9:30	NW
	102.8	117.1	30	73.7	7	79.6	2696.7	127.5	7.1	45.0	4	W

Max >= 32.0: 31
Max <= 0.0: 0
Min <= 0.0: 0
Min <= -18.0: 0
Max Rain: 19.56 ON 10/07/10
Days of Rain: 23 (> .2 mm) 11 (> 2 mm) 0 (> 20 mm)
Heat Base: 18.3 Cool Base: 18.3 Method: Integration

MONTHLY CLIMATOLOGICAL SUMMARY for AUG. 2010

NAME: Corranure CITY: STATE:
ELEV: 128 m LAT: LONG:

TEMPERATURE (°C), RAIN (mm), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	115.9	117.1	10:00	115.3	20:00	0.0	97.6	1.0	3.5	15.0	23:00	WNW
2	115.5	116.2	6:00	114.3	21:00	0.0	97.2	0.0	2.5	15.0	23:00	NE
3	115.6	116.7	5:30	114.5	20:30	0.0	97.2	1.8	5.4	17.0	13:30	NW
4	115.3	116.9	7:00	114.1	18:00	0.0	97.0	4.8	5.2	25.0	17:00	NW
5	115.2	116.6	11:30	114.0	21:30	0.0	96.9	2.8	5.2	17.0	12:30	WNW
6	114.9	116.6	6:30	112.7	19:00	0.0	96.6	2.5	7.2	21.0	13:30	W
7	110.1	114.5	8:00	91.7	19:30	0.0	91.7	0.3	6.0	22.0	11:00	N
8	100.5	105.3	10:30	95.3	15:00	0.0	82.2	1.0	4.1	17.0	16:00	W
9	100.7	109.2	13:00	83.9	22:30	0.0	82.4	4.6	7.1	20.0	2:30	W
10	97.5	102.9	00:00	87.4	14:30	0.0	79.2	0.8	7.1	21.0	16:00	NW
11	100.1	104.3	1:30	90.4	6:00	0.0	81.7	0.0	5.7	20.0	18:30	N
12	103.2	106.7	8:30	89.9	1:30	0.0	84.8	0.3	8.1	23.0	18:30	N
13	95.5	101.2	7:30	86.2	18:30	0.0	77.2	0.0	8.0	20.0	9:30	NNE
14	92.2	99.4	00:00	84.6	4:30	0.0	73.9	0.0	3.2	13.0	8:30	NNE
15	96.4	104.8	9:30	76.3	20:30	0.0	78.1	0.3	0.8	11.0	16:00	NNE
16	103.6	115.6	00:00	86.8	0:30	0.0	85.2	4.3	4.0	16.0	20:30	WSW
17	114.6	117.0	6:30	112.8	17:30	0.0	96.2	0.5	4.8	17.0	4:30	N
18	68.9	117.0	19:30	113.3	0:30	31.4	82.0	26.2	5.1	22.0	14:30	W
19	-79.7	116.7	12:00	115.7	15:00	145.1	47.1	0.3	6.6	18.0	17:00	WSW
20	-53.4	117.0	14:00	116.4	20:30	121.1	49.3	5.1	13.3	36.0	10:00	W
21	-136.6	117.1	1:30	116.7	0:30	181.4	26.4	2.8	9.2	25.0	17:00	W
22	-229.8	---	---	117.0	14:30	248.1	0.0	2.3	4.9	19.0	15:00	W
23	-223.2	---	---	---	---	244.4	2.8	4.8	7.0	30.0	17:30	WSW
24	-213.5	---	---	---	---	239.0	7.2	5.6	7.6	25.0	7:30	W
25	-163.6	---	---	---	---	217.4	35.4	0.3	1.9	12.0	17:00	ESE
26	-21.9	---	---	---	---	144.7	104.5	0.3	2.7	14.0	11:00	E
27	-85.0	---	---	---	---	175.2	71.8	0.5	3.1	17.0	18:30	NE
28	-82.8	117.1	18:30	116.7	19:00	142.6	41.4	0.3	7.4	26.0	17:30	NW
29	41.5	117.1	1:30	115.6	21:30	63.7	86.8	0.5	8.9	27.0	13:30	NNE
30	115.5	116.2	7:30	114.6	21:30	0.0	97.2	0.0	2.5	14.0	11:00	NE
31	114.8	115.2	6:30	114.4	1:30	0.0	34.2	0.0	1.2	8.0	1:00	SSW
	27.7	117.1	1	76.3	15	1954.0	2181.3	73.7	5.5	36.0	20	W

Max >= 32.0: 25
Max <= 0.0: 0
Min <= 0.0: 0
Min <= -18.0: 0
Max Rain: 26.16 ON 18/08/10
Days of Rain: 25 (> .2 mm) 11 (> 2 mm) 1 (> 20 mm)
Heat Base: 18.3 Cool Base: 18.3 Method: Integration

MONTHLY CLIMATOLOGICAL SUMMARY for SEP. 2010

NAME: Corranure CITY: STATE:
ELEV: 128 m LAT: LONG:

TEMPERATURE (°C), RAIN (mm), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	112.9	114.5	7:00	110.6	19:00	0.0	94.6	0.0	3.6	16.0	13:00	S
2	110.8	113.1	13:00	108.4	18:30	0.0	92.4	0.0	5.0	16.0	18:00	SSE
3	107.7	110.5	10:30	94.7	21:00	0.0	89.4	0.0	4.8	19.0	16:30	S
4	110.7	115.2	15:30	94.1	4:30	0.0	92.4	12.7	5.3	19.0	5:00	SSW
5	104.5	117.1	23:00	106.2	10:30	5.8	92.0	8.6	8.2	32.0	23:30	SSE
6	-193.3	---	---	---	---	236.7	25.1	61.7	9.0	33.0	9:30	SSE
7	-247.8	---	---	---	---	188.6	0.0	10.2	3.9	23.0	5:00	SE
8	-229.1	---	---	117.1	9:30	251.4	4.0	3.0	5.8	20.0	5:30	SSW
9	-113.6	116.8	00:00	115.8	18:30	164.6	32.6	4.6	5.5	23.0	23:30	W
10	89.8	117.1	2:00	115.8	16:00	15.8	87.3	7.6	6.6	23.0	6:00	WSW
11	19.3	117.0	10:30	115.8	12:30	69.3	70.3	8.1	5.4	20.0	11:30	WNW
12	113.3	116.6	7:00	106.7	14:00	0.0	94.9	0.8	6.5	19.0	22:30	WNW
13	98.3	117.1	12:00	111.0	2:00	14.0	93.9	15.7	14.2	37.0	16:00	W
14	73.5	117.1	3:00	116.2	13:30	30.1	85.2	4.8	11.5	33.0	11:30	WNW
15	-211.5	---	---	117.1	0:30	231.7	1.8	1.5	10.3	36.0	6:00	WNW
16	-58.1	---	---	---	---	159.5	83.1	2.0	4.8	23.0	13:30	N
17	-127.2	---	---	---	---	195.9	50.4	0.5	3.6	20.0	11:30	N
18	-232.2	---	---	---	---	250.6	0.0	9.7	7.3	25.0	17:00	WSW
19	-231.8	---	---	---	---	250.2	0.0	8.1	8.2	22.0	16:00	W
20	-222.1	---	---	---	---	244.8	4.4	2.5	6.0	19.0	1:30	W
21	-230.1	---	---	---	---	252.6	4.1	0.0	9.0	30.0	12:30	SW
22	-226.1	---	---	---	---	248.5	4.1	29.0	6.8	19.0	3:00	WSW
23	-70.8	---	---	---	---	167.5	78.4	2.3	6.6	22.0	00:00	NNE
24	20.7	---	---	---	---	121.2	123.5	0.0	7.5	20.0	15:00	NE
25	72.9	---	---	---	---	92.3	146.9	0.0	5.0	15.0	15:00	NNE
26	-193.4	---	---	---	---	235.1	23.3	0.0	1.4	14.0	12:30	SW
27	-234.9	---	---	---	---	256.7	3.4	0.0	4.3	18.0	12:00	S
28	-191.9	---	---	---	---	232.1	21.8	11.9	5.5	20.0	14:30	SW
29	-89.3	---	---	---	---	174.6	66.9	0.5	2.8	15.0	14:00	N
30	-232.2	---	---	---	---	253.7	3.2	0.3	6.3	20.0	14:00	S
	-76.7	117.1	5	94.1	4	4342.9	1569.3	206.2	6.4	37.0	13	W

ax >= 32.0: 11
Max <= 0.0: 0
Min <= 0.0: 0
Min <= -18.0: 0
Max Rain: 61.72 ON 06/09/10
Days of Rain: 22 (> .2 mm) 17 (> 2 mm) 2 (> 20 mm)
Heat Base: 18.3 Cool Base: 18.3 Method: Integration

MONTHLY CLIMATOLOGICAL SUMMARY for OCT. 2010

NAME: Corranure CITY: STATE:
ELEV: 128 m LAT: LONG:

TEMPERATURE (°C), RAIN (mm), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	-228.2	---	---	---	---	250.0	3.4	7.6	10.8	30.0	12:30	W
2	-239.3	---	---	---	---	257.6	0.0	0.0	10.3	24.0	6:00	SW
3	-234.4	---	---	---	---	252.8	0.0	0.5	5.4	18.0	14:30	W
4	-228.1	---	---	---	---	249.6	3.2	6.1	11.8	38.0	15:00	WSW
5	-234.4	---	---	---	---	252.8	0.0	0.8	11.6	38.0	16:00	WSW
6	-226.9	---	---	---	---	248.1	2.8	3.3	9.3	28.0	13:00	WSW
7	-215.0	---	---	---	---	245.4	12.2	0.0	9.9	27.0	12:30	SSW
8	-145.2	---	---	---	---	212.3	48.8	0.0	11.1	29.0	22:00	SE
9	-69.2	---	---	---	---	171.4	83.9	0.0	13.1	31.0	15:30	SE
10	-19.0	---	---	---	---	144.0	106.7	0.0	6.0	20.0	3:00	ESE
11	-0.6	---	---	---	---	132.0	113.2	0.3	3.3	13.0	14:30	ESE
12	-22.0	---	---	---	---	144.7	104.4	0.5	0.2	6.0	12:00	ESE
13	10.2	---	---	---	---	126.6	118.4	0.3	1.5	10.0	15:30	ESE
	80.5	---	---	---	---	86.8	149.0	0.0	1.8	9.0	1:00	NNE
15	65.1	---	---	---	---	93.2	139.9	0.0	4.4	23.0	15:30	N
16	31.9	---	---	---	---	115.8	129.4	0.3	1.4	10.0	12:30	N
17	-194.9	---	---	---	---	231.9	18.7	0.8	5.0	19.0	13:30	W
18	-222.9	---	---	---	---	244.1	2.8	1.5	7.9	27.0	15:30	WNW
19	-89.1	---	---	---	---	174.9	67.5	0.8	6.2	23.0	17:30	WNW
20	-176.5	---	---	---	---	218.8	23.9	0.0	4.0	16.0	23:00	N
21	-223.6	---	---	---	---	244.8	2.8	0.0	6.8	21.0	13:30	WNW
22	-225.4	---	---	---	---	246.2	2.5	9.1	7.8	27.0	19:30	W
23	-128.7	---	---	---	---	197.7	50.7	0.5	4.4	19.0	15:00	ENE
24	0.9	---	---	---	---	132.8	115.4	0.3	1.4	14.0	15:00	ENE
25	-172.5	---	---	---	---	223.4	32.7	1.8	7.3	29.0	23:00	SW
26	-227.3	---	---	---	---	248.1	2.5	9.9	14.1	38.0	21:00	WSW
27	-225.4	---	---	---	---	245.9	2.2	4.8	11.7	33.0	19:00	W
28	-228.7	---	---	---	---	249.6	2.5	10.7	13.7	40.0	21:00	SW
29	-218.6	---	---	---	---	241.6	4.7	15.2	9.6	37.0	1:00	WSW
30	-232.9	---	---	---	---	251.3	0.0	0.3	4.5	14.0	11:00	WSW
31	-2.3	---	---	---	---	129.9	109.3	0.5	2.4	11.0	16:30	N
	-136.9	---	---	32767.0	0	6264.1	1453.5	75.7	7.1	40.0	28	WSW

Max >= 32.0: 0
Max <= 0.0: 0
Min <= 0.0: 0
Min <= -18.0: 0
Max Rain: 15.24 ON 29/10/10
Days of Rain: 22 (> .2 mm) 8 (> 2 mm) 0 (> 20 mm)
Heat Base: 18.3 Cool Base: 18.3 Method: Integration

MONTHLY CLIMATOLOGICAL SUMMARY for NOV. 2010

NAME: Corranure CITY: STATE:
ELEV: 128 m LAT: LONG:

TEMPERATURE (°C), RAIN (mm), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	-141.6	---	---	---	---	203.5	43.6	6.6	9.3	38.0	18:30	N
2	-231.8	---	---	---	---	250.2	0.0	21.3	12.5	37.0	7:30	W
3	-224.3	---	---	---	---	245.1	2.5	5.6	5.2	27.0	00:00	WNW
4	-223.2	---	---	---	---	244.4	2.8	11.7	11.9	36.0	2:00	W
5	-223.6	---	---	---	---	244.4	2.5	1.5	7.6	30.0	6:00	W
6	-219.2	---	---	---	---	242.2	4.7	8.1	3.8	15.0	15:00	N
7	-62.2	---	---	---	---	162.4	81.9	30.5	10.3	45.0	21:30	N
8	-132.6	---	---	---	---	200.7	49.8	2.3	6.4	25.0	0:30	E
9	10.2	---	---	---	---	126.6	118.4	1.8	9.5	32.0	5:00	ENE
10	-123.1	---	---	---	---	194.9	53.5	1.5	5.8	28.0	23:00	NE
11	-217.9	---	---	---	---	241.6	5.3	43.4	21.6	52.0	15:30	WNW
12	-223.9	---	---	---	---	244.8	2.5	1.5	12.0	43.0	1:00	WNW
13	-232.9	---	---	---	---	251.3	0.0	1.0	3.9	12.0	13:30	WSW
14	-231.5	---	---	---	---	249.8	0.0	0.0	2.3	12.0	3:30	WNW
15	-223.2	---	---	---	---	244.0	2.5	0.5	3.5	17.0	16:30	W
16	-237.6	---	---	---	---	95.9	0.0	0.5	8.4	18.0	7:30	SW
17	-215.7	---	---	---	---	165.0	9.1	5.8	12.5	30.0	18:00	S
18	-236.7	---	---	---	---	255.0	0.0	11.4	11.5	31.0	4:00	WSW
19	-235.9	---	---	---	---	84.7	0.0	0.0	5.8	15.0	0:30	WSW
20												
21												
22	-10.2	---	---	---	---	81.1	64.4	0.5	1.9	8.0	13:30	NE
23	103.7	---	---	---	---	75.3	160.6	0.0	2.0	12.0	13:30	NE
24	103.7	---	---	---	---	75.3	160.6	0.3	4.2	19.0	22:30	N
25	-51.5	---	---	---	---	155.2	85.4	0.5	5.0	14.0	4:00	N
26	-64.2	---	---	---	---	164.7	82.2	0.3	5.3	20.0	13:00	N
27	31.9	---	---	---	---	115.8	129.4	0.5	4.5	24.0	5:00	N
28	-9.0	---	---	---	---	138.9	111.6	0.5	2.3	11.0	21:30	ENE
29	-9.0	---	---	---	---	138.9	111.6	0.3	3.1	10.0	9:00	ENE
30	1.2	---	---	---	---	132.8	115.7	0.3	7.6	22.0	10:30	E
	-126.1	---	---	32767.0	0	5024.4	1400.5	158.2	7.1	52.0	11	W

Max >= 32.0: 0
Max <= 0.0: 0
Min <= 0.0: 0
Min <= -18.0: 0
Max Rain: 43.43 ON 11/11/10
Days of Rain: 25 (> .2 mm) 10 (> 2 mm) 3 (> 20 mm)
Heat Base: 18.3 Cool Base: 18.3 Method: Integration

MONTHLY CLIMATOLOGICAL SUMMARY for DEC. 2010

NAME: Corranure CITY: STATE:
ELEV: 128 m LAT: LONG:

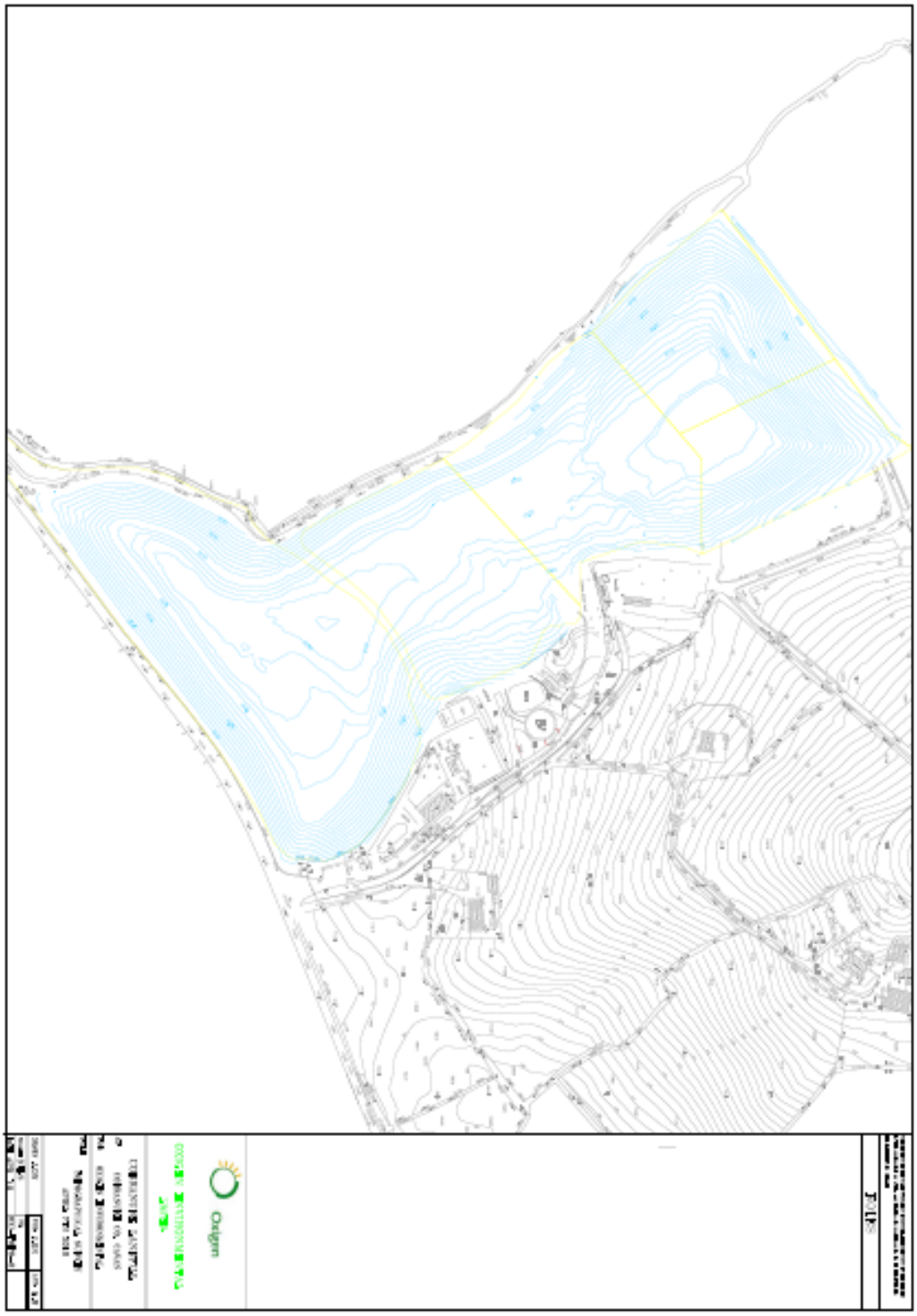
TEMPERATURE (°C), RAIN (mm), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	-9.5	---	---	---	---	138.6	110.7	0.0	4.3	19.0	13:00	ENE
2	26.3	---	---	---	---	116.7	124.7	0.0	3.1	12.0	14:00	NNE
3	-222.9	---	---	---	---	245.9	4.7	0.0	8.0	24.0	9:00	WSW
4	-219.8	---	---	---	---	242.2	4.1	0.0	1.5	8.0	0:30	N
5	-216.9	---	---	---	---	239.6	4.4	0.3	0.8	7.0	5:30	N
6	-225.4	---	---	---	---	248.1	4.4	0.3	2.2	8.0	2:00	WSW
7	-220.7	---	---	---	---	247.1	8.2	2.0	0.0	0.0	---	---
8	-225.8	---	---	---	---	248.5	4.4	2.0	0.0	0.0	---	---
9	-220.8	---	---	---	---	242.9	3.8	1.0	3.8	14.0	14:30	WNW
10	-221.6	---	---	---	---	243.7	3.8	0.5	5.6	16.0	7:00	WNW
11	-91.4	---	---	---	---	179.4	69.7	0.3	3.1	12.0	15:30	NW
12	12.9	---	---	---	---	126.6	121.2	0.3	1.3	8.0	00:00	ENE
13	-100.1	---	---	---	---	188.4	69.9	0.3	1.2	8.0	1:30	ENE
14	-79.2	---	---	---	---	176.4	79.0	0.0	0.6	8.0	12:30	NE
15	-93.9	---	---	---	---	179.8	67.5	0.3	3.0	15.0	23:00	NE
16	-136.3	---	---	---	---	199.4	44.8	3.0	9.9	33.0	10:00	N
17	-221.9	---	---	---	---	243.7	3.4	0.8	4.8	18.0	5:00	WNW
18	-201.6	---	---	---	---	233.6	13.7	0.3	1.1	7.0	0:30	NW
19	-30.0	---	---	---	---	149.8	101.4	0.0	0.2	4.0	2:00	E
20	-11.4	---	---	---	---	138.6	108.8	0.0	0.0	1.0	1:00	E
21	-32.6	---	---	---	---	150.2	99.2	0.0	0.0	0.0	---	---
22	10.2	---	---	---	---	126.6	118.4	0.5	0.0	6.0	15:00	E
23	-11.6	---	---	---	---	138.9	109.1	0.0	0.1	6.0	13:30	E
24	2.2	---	---	---	---	132.4	116.3	0.5	0.1	5.0	11:30	ESE
25	-88.6	---	---	---	---	181.5	74.6	0.0	1.1	12.0	00:00	SSW
26	-241.9	---	---	---	---	260.2	0.0	16.5	10.6	28.0	16:30	SSW
27	-211.7	---	---	---	---	244.0	14.0	11.9	11.2	25.0	7:00	SW
28	-232.8	---	---	---	---	253.7	2.5	0.3	8.6	20.0	21:00	SSW
29	-214.2	---	---	---	---	243.2	10.7	8.1	7.1	21.0	3:30	SW
30	-100.7	---	---	---	---	186.6	67.4	0.3	2.5	12.0	12:30	ESE
31	2.2	---	---	---	---	132.4	116.3	0.0	0.3	6.0	23:00	ESE
	-123.5	---	---	32767.0	0	6078.8	1681.2	49.3	3.1	33.0	16	ENE

Max >= 32.0: 0
Max <= 0.0: 0
Min <= 0.0: 0
Min <= -18.0: 0
Max Rain: 16.51 ON 26/12/10
Days of Rain: 20 (> .2 mm) 6 (> 2 mm) 0 (> 20 mm)
Heat Base: 18.3 Cool Base: 18.3 Method: Integration

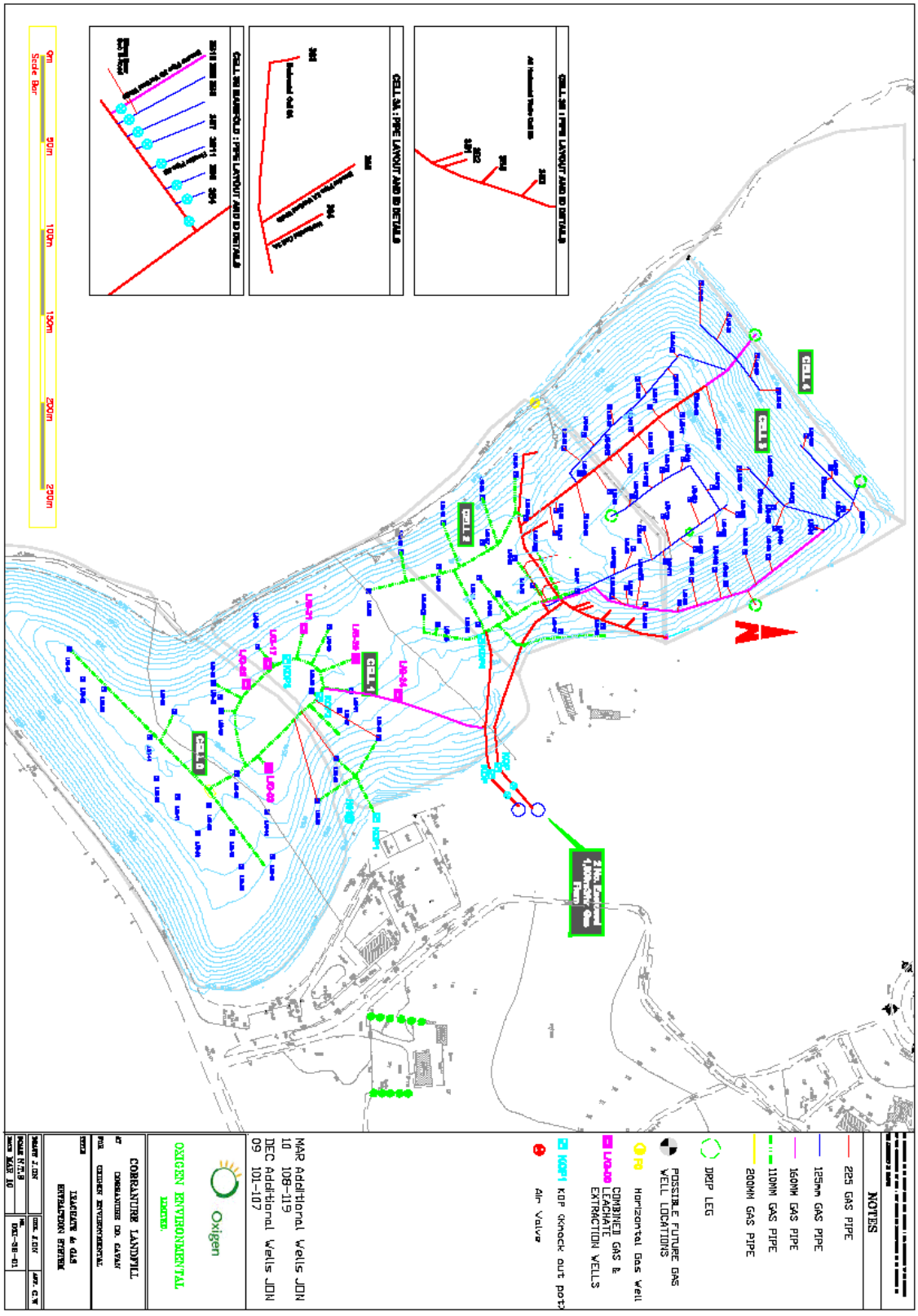
APPENDIX D

TOPOGRAPHICAL SURVEYS



APPENDIX E

GAS MANAGEMENT SYSTEM


NOTES
225 GAS PIPE
125mm GAS PIPE
160MM GAS PIPE
110MM GAS PIPE
200MM GAS PIPE
DRIP LEG
POSSIBLE FUTURE GAS WELL LOCATIONS
Horizontal Gas Well
COMBINED GAS & LEACHATE EXTRACTION WELLS
KOP1 KO Knock out pot
Air Valve
MAR Additional Wells JDN 10 108-119
DEC Additional Wells JDN 09 101-107
Oxigen
OXIGEN ENVIRONMENTAL
LIMITED
CORRANURE LANDFILL
CORRANURE CO. GALWAY
OXIGEN ENVIRONMENTAL
LEACHATE & GAS EXTRACTION SYSTEM
CELL 1
CELL 2
CELL 3
CELL 4
CELL 5
CELL 6
CELL 7
CELL 8
CELL 9
CELL 10
0m
50m
100m
150m
200m
250m
Scale Bar

APPENDIX F

Bund Inspection Report

Oxigen Environmental
Bund Inspection Report

Introduction

Condition 3.10.5 of Waste Licence No. W0077-03, states,

Bunds shall be designed having regard to Agency guidelines 'Storage and transfer of Materials for Scheduled Activities' (2004). The integrity and water tightness of all bunds and their resistance to penetration by water or other materials stored therein shall be confirmed by the licensee and shall be reported to the agency following its installation and prior to its use as a storage area. This confirmation shall be repeated at least once every three years thereafter and reported to the agency on each occasion.

An inspection of all bunded storage areas was undertaken during the period from the 24th October 2010 to 26th October 2010. The following report outlines the findings of those inspections.

Leachate Storage Tank

The leachate storage tank was commissioned on site in 2006 and is located to the north of the civic amenity facility. The glass lined steel tank has a capacity of 1531 m^3. The integrity testing procedure was adapted from those outlined in British standard BS8007:1987 Design of concrete structures for retaining aqueous liquids; Section 9: Inspection and Testing of the Structure

The tank was tested for a period of 48hrs only (as opposed to 7 days as outlined in BS8007) due to operational constraints of shutting down all pumping into the storage tank for extended periods. All inlet and outlet valves were securely closed for the duration of the test.

The initial depth was recorded by use of a well depth gauge and the echo sound depth gauge installed on the tank. The depth was then recorded at 24 hr intervals throughout the test period. The results of these measurements are outlined in Table 1.

Time	Initial	8hrs	24hrs	48hrs
Depth (m)	0.82	0.82	0.82	0.82

Table 1.

During the test period a total permissible dip (allowing for evaporation) of 1/500th of the average water depth of the full bund in all cases.

A visual inspection of all joints and seams of the tank connections where visually inspected for signs of leaks and/or damage. No damage or leaks were evident during the inspection.

Comment
This bund was tested for 2 days in accordance with BS8007 (adapted) and was found to be in conformance.

Waste Oil Storage Tank

A double skinned self bunding plastic oil tank is used is used in the Civic Amenity centre for the collection of waste oil. The tank incorporates a "Bundman" liquid spill sensor to monitor any liquid build up between the inner and outer skins. This sensor indicated that the bund itself was empty; the tank itself was approximately three quarters full.

There appear to be some staining of the ground in the immediate area of the tank but this was attributed to small spillages by the tanks user in the civic amenity. The tank was given a thorough visual inspection and there was no apparent damage and/or leakages to the tank.

Comment
Based on this inspection, the bund appears to be functioning adequately as per licence requirements.

Bunded Storage Pallets

Hydraulic and engines oils along with diesel fuels for onsite machinery are stored in drums on a number of bunded plastic storage pallets within a secured storage container within the Civic Amenity area.

The inspection noted some staining within the container from small spillages on the ground of the container unit. Each pallet was given a thorough visual inspection for signs of damage and/or possible locations of leaks. Each pallet was removed individually and filled with clean tap water and inspected again for any apparent leaks.

Comment
No damage and/or leaks were detected during the entire course of the pallet bund inspections. Based on this inspection these bunds appear to be functioning adequately.

Civic Amenity Area / Main 4A Sump

As part of the bund inspection operation the main surface water sump of the Civic Amenity yard was visually inspected. The sump was emptied fully by means of a puddle pump and fully cleaned. The sump was seen to be fully intact with no signs of cracks or structural deformation.

The entire Civic Amenity yard floor area was also inspected. There were no signs of significant accumulations or ponding of surface water in any areas. All areas were adequately graded and seen to be free draining to the main sump or collection drain network.

Comment
The bunding, paving and sumps within the Civic Amenity area are to be functioning adequately within requirements.

Conclusion

All bunded structures and areas in use with the facility as described previous appear to be performing adequately.

Recommendations

It is recommended that all bund structures and areas be monitored regularly in accordance with licence requirements.

Signed

James O Neill BEng. MSc (Civil Engineering)
Oxigen Environmental

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APPENDIX G

PRTR Emissions Data

Environmental Protection Agency

Guidance to completing the PRTR workbook

AER Returns Workbook

Version 1.1.11

REFERENCE YEAR	2010

1. FACILITY IDENTIFICATION

Parent Company Name	Cavan County Council
Facility Name	Corranure Landfil
PRTR Identification Number	W0077
Licence Number	W0077-03

Waste or IPPC Classes of Activity

No.	class_name
3.5	Specially engineered landfill, including placement into lined discre cells which are capped and isolated from one another and the environment.
3.1	Deposit on, in or under land (including landfill
3.11	Blending or mixture prior to submission to any activity referred to in preceding paragraph of this Schedule.
3.12	Repackaging prior to submission to any activity referred to in preceding paragraph of this Schedule.
3.13	Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.
3.4	Surface impoundment, including placement of liquid or sludg discards into pits, ponds or lagoons.
3.7	##
4.11	Use of waste obtained from any activity referred to in a precedin paragraph of this Schedule.
4.12	Exchange of waste for submission to any activity referred to in preceding paragraph of this Schedule.
4.13	Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storag pending collection, on the premises where such waste is produced.
4.2	Recycling or reclamation of organic substances which are not used a solvents (including composting and other biological transformation processes).
4.3	Recycling or reclamation of metals and metal compound
4.4	Recycling or reclamation of other inorganic material
4.9	Use of any waste principally as a fuel or other means to generat energy.
Address 1	Lismagratty & Corranure Townland
Address 2	Cootehill Road
Address 3	Cavan
Address 4	County Cavan
Country	Ireland
Coordinates of Location	-7.32431 54.0181
River Basin District	GBNIIENW
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous wast
AER Returns Contact Name	Brian Abbott
AER Returns Contact Email Address	babbott@oxigen.ie
AER Returns Contact Position	Environmental compliance officer.
AER Returns Contact Telephone Number	049 4372700
AER Returns Contact Mobile Phone Number	
AER Returns Contact Fax Number	
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	0
User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

Activity Number	Activity Name
5(d)	Landfills
5(c)	Installations for the disposal of non-hazardous wast
5(d)	Landfills
50.1	General

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

Is it applicable?	
Have you been granted an exemption ?	
If applicable which activity class applies (as pe Schedule 2 of the regulations) ?	
Is the reduction scheme compliance route bein used ?	

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
01	Methane (CH4)	E	ESTIMATE		342772.0	342772.0	0.0	0.0
03	Carbon dioxide (CO2)	E	ESTIMATE		758229.0	758229.0	0.0	0.0
02	Carbon monoxide (CO)	E	ESTIMATE		153.0	153.0	0.0	0.0
08	Nitrogen oxides (NOx/NO2)	E	ESTIMATE		680.0	680.0	0.0	0.0
11	**Sulphur oxides (SOx/SO2)**	E	ESTIMATE		2363.95	2363.95	0.0	0.0

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

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

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

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

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used					
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

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

Additional Data Requested from Landfill operators

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

Landfill: Corranure Landfill

Please enter summary data on the quantities of methane flared and / or utilised	**T (Total) kg/Year**	**M/C/E**	**Method Used**		**Facility Total Capacity m3 per hour**	
			Method Code	**Designation or Description**		
Total estimated methane generation (as per site model)	3427724.4	E	Estimate	Based on a collection effiency of 90% of LFG generated being collected and flared, consideration of cell capping, site gas infrastructure and operational status	N/A	
Methane flared	3084952.0	E	Estimate	Figure calculated using Bern	0.0	(Total Flaring Capacity)
Methane utilised in engine/s	0.0				0.0	(Total Utilising Capacity)
Net methane emission (as reported in Section A above)	342772.0	E	Estimate	Figure based on collection et	N/A	

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

Please enter all quantities on this sheet in Tonnes

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Haz Waste : Name and Licence/Permit No of Next Destination Facility Non Haz Waste: Name and Licence/Permit No of Recover/Disposer	Haz Waste : Address of Next Destination Facility Non Haz Waste: Address of Recover/Disposer	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					
Within the Country	15 01 04	No	9.22	metallic packaging	R13	M	Weighed	Onsite in Ireland	Cavan Waste Disposal Ltd,W0207-01	Killygarry Industrial Park,Killygarry,Cavan,,,Ireland		
Within the Country	20 02 01	No	285.62	biodegradable waste	R13	M	Weighed	Onsite in Ireland	Cavan Waste Disposal Ltd,W0207-01	Killygarry Industrial Park,Killygarry,Cavan,,,Ireland		
Within the Country	20 01 40	No	100.9	metals	R13	M	Weighed	Onsite in Ireland	Cavan Waste Disposal Ltd,W0207-01	Killygarry Industrial Park,Killygarry,Cavan,,,Ireland		
Within the Country	15 01 07	No	169.94	glass packaging	R13	M	Weighed	Onsite in Ireland	Cavan Waste Disposal Ltd,W0207-01	Killygarry Industrial Park,Killygarry,Cavan,,,Ireland		
Within the Country	20 01 01	No	238.78	paper and cardboard	R13	M	Weighed	Onsite in Ireland	Cavan Waste Disposal Ltd,W0207-01	Killygarry Industrial Park,Killygarry,Cavan,,,Ireland		
Within the Country	15 01 02	No	19.6	plastic packaging	R13	M	Weighed	Onsite in Ireland	Cavan Waste Disposal Ltd,W0207-01	Killygarry Industrial Park,Killygarry,Cavan,,,Ireland		
Within the Country	15 01 04	No	22.8	metallic packaging	R13	M	Weighed	Onsite in Ireland	Cavan Waste Disposal Ltd,W0207-01	Killygarry Industrial Park,Killygarry,Cavan,,,Ireland		
Within the Country	15 01 05	No	12.4	composite packaging	R13	M	Weighed	Onsite in Ireland	Cavan Waste Disposal Ltd,W0207-01	Killygarry Industrial Park,Killygarry,Cavan,,,Ireland		
Within the Country	15 01 03	No	214.24	wooden packaging	R13	M	Weighed	Onsite in Ireland	Cavan Waste Disposal Ltd,W0207-01	Killygarry Industrial Park,Killygarry,Cavan,,,Ireland		
Within the Country	15 01 01	No	203.16	paper and cardboard packaging	R13	M	Weighed	Onsite in Ireland	Cavan Waste Disposal Ltd,W0207-01	Killygarry Industrial Park,Killygarry,Cavan,,,Ireland		
Within the Country	20 03 01	No	2506.99	mixed municipal waste	R13	M	Weighed	Onsite in Ireland	Cavan Waste Disposal Ltd,W0207-01	Killygarry Industrial Park,Killygarry,Cavan,,,Ireland		
Within the Country	17 01 07	No	106.42	mixture of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06	R13	M	Weighed	Onsite in Ireland	Cavan Waste Disposal Ltd,W0207-01	Killygarry Industrial Park,Killygarry,Cavan,,,Ireland		
Within the Country	17 08 02	No	36.46	gypsum-based construction materials other than those mentioned in 17 08 01	R13	M	Weighed	Onsite in Ireland	Cavan Waste Disposal Ltd,W0207-01	Killygarry Industrial Park,Killygarry,Cavan,,,Ireland		
Within the Country	20 01 39	No	44.98	plastics	R13	M	Weighed	Onsite in Ireland	Cavan Waste Disposal Ltd,W0207-01	Killygarry Industrial Park,Killygarry,Cavan,,,Ireland		
Within the Country	08 03 18	No	4.64	waste printing toner other than those mentioned in 08 03 17	R13	M	Weighed	Onsite in Ireland	Enva Ireland Ltd,W0184-01	Clonminam Industrial Estate,,,Portlaoise,Laois,Ireland		
Within the Country	16 01 07	Yes	0.54	oil filters	R13	M	Weighed	Onsite in Ireland	Enva Ireland Ltd,W0184-01	Clonminam Industrial Estate,,,Portlaoise,Laois,Ireland	R.D Recycling,51727/1/KD,,,,,Houthalen,,,Belgium	.,,,Houthalen,,,Belgium
Within the Country	20 01 21	Yes	0.42	fluorescent tubes and other mercury-containing waste	R13	M	Weighed	Onsite in Ireland	KMK Metals Ltd,W0113-03	Cappincur Industrial Estate,Daingean Rd,Tullamore,Co.Offaly,Ireland	Remondis Electro Recycling,01/245A,ZAC des Marots,Route de l'Ecluse,St Thibault,BP0310800,France GMP Batteries,LN:ELPDP32921C, Crescent Works Industrial Park,Willenhall	ZAC des Marots,Route de l'Ecluse,St Thibault,BP0310800,France Crescent Works Industrial Park,Willenhall
Within the Country	16 06 01	Yes	5.94	lead batteries	R13	M	Weighed	Onsite in Ireland	The Recycling Village,WP2004/15	Unit 4 Tenure Business Park,Monasterboice,Drogheda ,Louth,Ireland	Rd,Wendesbury West Midlands,WS108jr,United Kingdom	Rd,Wendesbury West Midlands,WS108jr,United Kingdom
Within the Country	20 01 36	No	134.44	discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35	R13	M	Weighed	Onsite in Ireland	The Recycling Village,WP2004/15	Unit 4 Tenure Business Park,Monasterboice,Drogheda ,Louth,Ireland		
Within the Country	20 01 36	No	44.96	discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35	R13	M	Weighed	Onsite in Ireland	NWP,MH2003/33D	Keady,,,,,Co.Armagh,United Kingdom		
Within the Country	20 01 25	No	0.62	edible oil and fat	R13	M	Weighed	Onsite in Ireland	Agri Energy Ltd,PO189-01	Cloghran,,Swords,Dublin,Ireland		
Within the Country	20 01 25	No	0.78	edible oil and fat	R13	M	Weighed	Onsite in Ireland	Frylite Ltd,LN/08/11	34 Market St,,,Strabane,Co. Tyrone,,United Kingdom		
Within the Country	08 03 18	No	0.16	waste printing toner other than those mentioned in 08 03 17	R13	M	Weighed	Onsite in Ireland	Brian Kehoe Ltd,WP03-08	Royal Oak Rd,,,Bagenalstown,Carlow,Ireland		
Within the Country	20 01 10	No	45.9	clothes	R13	M	Weighed	Onsite in Ireland	Textile Recycling ltd,WPR014/2	Glen Abbey Complex,Belgard Rd,Tallaght,Dublin,Ireland		
Within the Country	19 07 03	No	39051.92	landfill leachate other than those mentioned in 19 07 02	R7	M	Volume Calculation	Onsite in Ireland	Cavan County Council,D0020-01	Keadue Lane,,,Cavan ,Co.Cavan,Ireland		

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

Link to previous years waste data
Link to previous years waste summary data & percentage change