

Annual Environmental Report 2012



Derryconnell Landfill and Civic Amenity Site

WASTE LICENCE REGISTRATION NO. W0089-02

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1. INTRODUCTION

1.1 Scope and Purpose of the Report

Waste Licence No. 89-1 was issued to Cork County Council by the Environmental Protection Agency (EPA) for Derryconnell Landfill Site in October 2000. In November 2008, Waste Licence No. W0089-02 was issued by the EPA, replacing 89-1, and is the current Waste Licence relating to the site.

Condition 11.12 of the waste licence states the following:-

'The licensee shall submit to the Agency, by the 31st March of each year, an AER covering the previous calendar year.'

1.2 Reporting Period

This Annual Environmental Report (AER) covers the reporting period 1st January 2012 to 31st December 2012.

1.3 Site Location

The facility address and contact numbers are detailed below:-

Derryconnell Landfill,

Derryconnell,

Schull,

Co. Cork

Tel. (028) 37048

Fax: (028) 37742

The National Grid Reference for the site is 496270E, 533960N.

2. DESCRIPTION OF THE SITE

2.1 Waste Management Activities at the Facility

Waste Activities at the Derryconnell landfill site are restricted to those outlined below: -

Waste Management Act 1996 to 2008: Third Schedule

- Class 1. Deposit on, in or under land (including landfill).
- Class 4. Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons.
- Class 5. Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment.
- Class 12. Repacking prior to submission to any activity referred to in a preceding paragraph of this Schedule (Principal Activity).
- Class 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.

Waste Management Act 1996 to 2008: Fourth Schedule

- Class 2. Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological processes).
- Class 3. Recycling or reclamation of metals and metal compounds.
- Class 4. Recycling or reclamation of other inorganic materials.
- Class 13. Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.

In accordance with Schedule A of the Waste Licence, the waste categories and quantities acceptable at the facility are limited to those shown in Table 2.1.

Waste Types		Maximum Tonnes Per Annum
Non-Hazardous Waste	<i>Residual Municipal Waste For disposal</i>	17,000
	<i>Storage of Waste prior to recovery</i>	7,000
Hazardous Waste	<i>Storage of Waste prior to recovery or disposal</i>	152
Total including disposal and recovery		24,152

Table 2.1: Waste Categories and Quantities Acceptable at the Facility

2.2 Management and Staffing Structure of the Facility.

The following staff were employed on site during 2012: -

- One Facility Manager
- Two General Operatives / Deputy Facility Managers
- In addition there are part-time, relief General Operatives.

Site and managerial staff details are shown in the following tables 2.2.

Employee	Position	Duties and Responsibilities	Experience / Qualifications
Mr. Joe Newman	General Operative Deputy Facility Manager	General site operation and maintenance. Collection of gate fees. Administration of on-site records. Implementation of waste acceptance procedures. Coordination and control of customer activities. Deputising as Facility Manager	14 years landfill operation experience. Completed Site Operative modules of FAS Waste Management Course. Trained in operation and management of various on site systems.
Mr. Frank Cronin	General Operative Deputy Facility Manager	General site operation and maintenance. Collection of gate fees. Administration of on-site records. Implementation of waste acceptance procedures. Coordination and control of customer activities. Deputising as Facility Manager	12 years landfill operation experience. Completed Site Operative modules of FAS Waste Management Course. Trained in operation and management of various on site systems.
Mr. Jerry McCarthy; Mr. Patrick Forrester	Relief General Operative	General site operation and maintenance. Collection of gate fees. Implementation of waste acceptance procedures. Coordination and control of customer activities.	6 years landfill operation experience. Completed Site Operative modules of FAS Waste Management Course. Trained in operation and management of various on site systems.
Ms. Mairéad Hales	Executive Engineer Facility Manager		BE (Civil Eng) 9 years landfill management experience. Completed full FÁS Waste Management Course.

Table 2.2: Site Staff

2.3 Waste Quantities and Composition

The quantity and composition of the waste **received and disposed of** offsite from the facility during the reporting period is recorded in table 2.3(a). No waste was deposited directly in the landfill in 2012.

Waste Received at Derryconnell Landfill (Tns) – 2012			
Month	Household Bagged	Bulky	Total
January	22.58	6.12	28.70
February	18.62	2.88	21.50
March	14.88	2.76	17.64
April	14.36	5.94	20.30
May	23.12	10.18	33.30
June	16.42	6.10	22.52
July	22.72	8.92	31.64
August	42.68	8.68	51.36
September	19.18	5.04	24.22
October	12.84	5.78	18.62
November	13.48	3.78	17.26
December	15.72	6.00	21.72
Totals	236.60	72.18	308.78

Table 2.3(a): Quantities of Waste received and disposed during the reporting period January 2012 to December 2012.

The quantity and composition of the waste **received and recovered** during the reporting period, at the facility is recorded in table 2.3(b).

Waste Recovered at Derryconnell Landfill (Tns) – 2012													
Month	Paper Card Plastic	Glass Bottles	Alum. Cans	Steel Cans	Scrap Metal	Timber	Batt.	Aerosl	Textiles	Oils	WEEE	Light Tubes	Paint
January	11.88	0.00	0.14	0.72	5.44	10.48	0.4	0.00	0.00	0.00	0.00	0.00	0.00
February	9.06	7.96	0.00	0.00	5.52	3.78	0.00	1.06	0.64	0.00	17.72	0.00	0.88
March	8.32	0.00	0.10	0.74	0.00	0.00	0.52	0.00	0.66	0.00	0.00	0.00	0.00
April	7.82	0.00	0.00	0.44	3.62	6.34	0.28	0.08	0.26	0.98	0.00	0.00	0.62
May	12.04	9.08	0.08	0.00	3.88	6.48	0.34	0.00	0.36	0.00	8.36	0.00	0.00
June	9.12	0.00	0.12	0.44	2.28	4.02	0.00	0.12	0.36	0.00	6.98	0.00	1.48
July	14.16	7.60	0.12	0.60	5.12	7.24	0.00	0.00	0.40	0.00	5.08	0.00	0.00
August	19.92	9.32	0.60	0.54	6.18	8.58	0.94	0.08	0.64	0.00	0.00	0.05	0.68
September	10.54	0.00	0.14	0.34	4.92	0.00	0.00	0.18	0.84	0.00	4.46	0.00	0.00
October	7.32	9.16	0.00	0.00	0.00	4.24	0.00	0.09	0.64	2.00	5.56	0.01	1.46
November	8.58	2.88	0.22	0.70	3.88	3.98	0.80	0.00	0.22	0.00	2.90	0.00	1.26
December	9.70	2.78	0.00	0.46	3.66	0.00	0.00	0.06	0.28	0.00	2.24	0.00	0.00
Totals	128.46	48.78	1.52	4.98	44.50	55.14	3.28	1.50	5.30	2.98	53.30	0.06	6.38

Table 2.3(b): Quantity of Waste received and recovered during the reporting period January 2012 to December 2012.

2.4 Site Capacity

The filling sequence outlined shows the sequence of cell to cell filling.

Phase	Available Capacity	Available Capacity	Filling Commencement	Filling Completion	Restoration Completion
	(m3)	Months	Date	Date	Date
Cell 1	0	0	Feb 2004	Nov 2004	March 2005
Cell 2	0	0	Nov 2004	Aug 2006	Temp. Cap Aug 2006
Cell 3	0	0	Sept 2006	Aug 2010	Q2 2011
Total	0	0			

Table 2.4: Phasing of Filling and Restoration Operations

3. SITE DEVELOPMENT WORKS

3.1 Works During 2012

Approval was granted by the EPA for the installation of a floating cover on the leachate lagoon. A competent Contractor was appointed and materials procured during 2012. However, weather conditions throughout the year did not allow for the installation of the cover which requires the lagoon to be completely empty for works to proceed.

3.2 Proposed Works for 2013

Installation of floating cover on leachate lagoon.

4. EMISSIONS AND ENVIRONMENTAL MONITORING DATA:

4.1 Monitoring points

All surface environmental monitoring points are shown on drawing no. 01_2012.

These consist of the following:

- **Groundwater Emissions monitoring Points: (7 no.)**
(GW1, GW2, GW4, GW5, GW6, GW7, GW8)
- **Surface Water Emissions monitoring Points: (9 no.)**
(SW1, SW2, SW3, SW4, SW5, SW6, SW7, SW8, SW9)
- **Leachate Quality monitoring Points: (8 no.)**
(L1, L2, L3, L4, L5, L6, L7, L8)
- **Gas Emissions monitoring Points: (8 no.)**
(L1, L2, L3, L4, L5, L6, L7, L8)
- **Dust Emissions monitoring Points: (4 no.)**
(D1, D3, D6, D8) – number of points reduced with EPA agreement
- **Noise Emissions monitoring Points: (5 no.)**
(N1, N6, N7, N10, N12) - number of points reduced with EPA agreement
- **Emissions to air monitoring Point: (1 no.)**
Flare Stack

All sampling on site in 2012 was carried out by Enva Environmental Ltd. personnel. Following the granting of Waste Licence W0089-02, environmental monitoring reporting is now via the AER. This replaces the previous system of reporting via two biannual reports.

The results of all environmental monitoring carried out on site during 2012 are tabulated in appendix 1.

4.2 Leachate

The leachate lagoon was operational throughout 2012. The total volume of leachate removed from the lagoon in 2012 was 6,536.36M³. All leachate extracted was transported to Bandon Waste Water Treatment Plant. Quantities extracted monthly are shown in table 4.2.

<i>Month</i>	<i>Vol (L)</i>
January	1,223,600
February	1,442,960
March	212,100
April	259,140
May	162,040
June	189,420
July	669,100
August	750,320
September	293,960
October	423,520
November	497,300
December	412,900
Total Leachate	6,536,360

Table 4.2: Leachate Disposal per Month 2012

4.3 Continuous Monitoring Systems utilised on site:

4.3.1 Surface water emissions monitoring (SCADA):

Surface water emissions from site are continuously analysed by means of a SCADA system that measures the following: TOC (Total Organic Carbon), pH, Conductivity, Ammonia as N, Temperature and Flow. A full record of hourly SCADA results is kept electronically and in hard copy on site.

4.3.2 Flare Emissions Monitoring:

A 500 M³/Hr Flaring system was in operation on site up to February 2012. From March onwards, a 250 M³/Hr Flaring system was in operation on site. Gas quality and emissions are continuously analysed for the following: Methane %, Carbon Dioxide %, Oxygen %, Carbon Monoxide, Combustion Temperature, Flow & Pressure.

Flare monitoring results and emissions analysis are tabulated in appendix 2.

5. ENERGY CONSUMPTION

5.1 General

- Water supply to the site is not yet metered.
- Average daily electricity usage at the site during 2012 was 135kWh per day.

6. ENVIRONMENTAL INCIDENTS, NON-COMPLIANCES AND COMPLAINTS

6.1 Environmental Incidents reported to EPA in 2012

There were no environmental incidents reported to the EPA in 2012.

6.2 Agency Notifications of Non-Compliance in 2012

No notifications of non-compliance were received from the EPA in 2012.

6.3 Complaints Summary

There were no complaints received in 2012. An odour log kept on site has not indicated any notable problems with odours during 2012.

6.4 Nuisance Controls

6.4.1 Litter

There were no serious littering incidents during 2012. Litter can become apparent on site during periods of high wind but this is always dealt with in a timely fashion by site staff.

6.4.2 Birds

Following initial capping works in August and September 2010 where waste was no longer exposed on site, professional bird control was no longer deemed necessary on site.

6.4.3 Vermin & Flying Insects

Vermin and fly control is carried out under contract with pest specialists and a record of same kept on site as required under condition 11.3 of the Waste Licence.

6.4.4 Scavenging

Scavenging did not occur on site during 2012. A CCTV system is operational on site to deter and record any potential scavenging incidents.

6.5 Programme for Public Information

6.5.1 Information Available to the Public

A site notice at the facility entrance states the following displays information on the facility including the following:-

- Facility name and address and telephone number
- Emergency contact information
- Opening hours
- Waste Licence information

Personnel associated with the facility are also available by appointment to meet with members of the public and answer queries regarding the facility if requested.

7. ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

An Environmental Management Plan was prepared for the site in accordance with EPA guidance documents. A copy is kept on site and acts as a manual for the operation of Derryconnell Landfill. It outlines the requirements of the Waste Licence and sets out a programme for achieving the schedule of objectives and targets.

7.1 Schedule of Objectives and Targets for Year 2013

Objective 1: Installation of Floating Cover and associated works

7.2 Implementation of Objectives and Targets From 2012

There were no new objectives proposed for 2012

7.3 Update of Procedures Associated with the Facility

General Site procedures associated with the facility remained unchanged throughout 2012. Additional Health & Safety procedures were drawn up and implemented.

7.4 Financial Provision

Cork County Council has the ability to meet any financial commitments or liabilities incurred by the carrying out of the disposal activities relating to the Derryconnell Landfill. These commitments include compliance with the waste management licence (No. W00089-02) and restoration and aftercare of the site as specified in Condition 8 of the licence.

Under Section 38 of the Waste Management Act, 1996, Cork County Council “shall provide and operate, or arrange of, such facilities as may be necessary for the recovery and disposal of household waste arising within the functional area”. Compliance with Section 38 and all other relevant sections of the Waste Management Act, 1996 is a statutory obligation of Cork County Council. Cork County Council annually, in the preparation of budget estimates and the passing of these estimates, shall make provision for any capital works and maintenance works required to fulfil conditions of the waste licence for the Derryconnell Landfill.

APPENDICES

APPENDIX 1

SUMMARY OF ENVIRONMENTAL MONITORING

- On site monitoring and sampling was carried out by Cork County Council Personnel and Enva Ireland Ltd., Rafeen Industrial Estate, Ringaskiddy, Co. Cork.
- All Surface Water, Groundwater, Leachate and Dust analysis was carried out by Enva Ireland Ltd., Rafeen Industrial Estate, Ringaskiddy, Co. Cork.
- (Note: Blank results indicate monitoring location was dry at time of sampling)
- Noise Monitoring was carried out by McSwiney Environmental & Safety Consulting Ltd., Corner House, Kenmare, Co. Kerry, Ireland.

LANDFILL GAS MONITORING

The Waste Licence specifies monitoring of landfill gas emissions on a monthly basis.

Additional monitoring is carried out by the Licencee for informational purposes.

All results are below licenced ELV of 1.0% CH₄ and 1.5% CO₂.

L1 – L2 MONITORING RESULTS

L1							L2					
Date	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %
19/01/2012	3.98	9.10	1014	-	-	-	5.78	8.70	1014	-	-	-
28/02/2012	4.03	10.40	1014	-	-	-	6.21	9.30	1014	-	-	-
29/03/2012	4.00	18.20	1024	-	-	-	5.71	18.00	1024	-	-	-
24/04/2012	4.00	13.60	991	-	-	-	5.60	12.20	991	-	-	-
21/05/2012	4.00	12.20	1002	-	-	-	5.85	12.10	1002	-	-	-
22/06/2012	3.90	17.50	1004	-	-	-	5.90	17.90	1004	-	-	-
18/07/2012	4.10	19.00	1003	-	-	-	4.20	18.80	1003	-	-	-
20/08/2012	4.00	21.20	1008	-	-	-	5.50	21.00	1008	-	-	-
20/09/2012	4.00	20.10	1018	-	-	-	5.79	21.20	1018	-	-	-
25/10/2012	3.98	13.20	1011	-	-	-	5.76	12.40	1012	-	-	-
22/11/2012	3.98	8.10	999	-	-	-	5.74	7.90	999	-	-	-
18/12/2012	3.97	7.00	1003	-	-	-	5.75	7.10	1003	-	-	-

L3 – L4 MONITORING RESULTS

L3							L4					
Date	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %
19/01/2012	Dry	9.20	1015	21.00	0.00	0.00	6.21	9.00	1014	-	-	-
28/02/2012	Dry	8.70	1014	21.00	0.00	0.00	6.65	8.90	1014	-	-	-
29/03/2012	Dry	19.10	1025	19.40	0.40	0.00	4.10	-	-	-	-	-
24/04/2012	Dry	12.00	991	20.40	0.00	0.00	6.20	13.10	991	-	-	-
21/05/2012	Dry	12.30	1002	20.20	0.00	0.00	6.00	12.40	1002	-	-	-
22/06/2012	Dry	18.20	1004	20.30	0.00	0.00	5.80	17.90	1004	-	-	-
18/07/2012	Dry	18.50	1003	20.40	0.00	0.00	5.50	19.10	1003	-	-	-
20/08/2012	Dry	22.00	1008	20.10	0.00	0.00	5.60	21.50	1008	-	-	-
20/09/2012	Dry	19.60	1018	21.00	0.00	0.00	6.10	20.40	1018	-	-	-
25/10/2012	Dry	12.60	1012	21.00	0.00	0.00	5.92	13.00	1011	-	-	-
22/11/2012	Dry	8.00	999	21.00	0.00	0.00	5.72	8.20	999	-	-	-
18/12/2012	Dry	8.10	1003	21.00	0.00	0.00	5.53	7.20	1003	-	-	-

L5 – L6 MONITORING RESULTS

L5							L6					
Date	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %
19/01/2012	Full	8.30	1014	21.00	0.40	0.00	1.62	10.90	1014	20.80	1.30	0.00
28/02/2012	0.46	9.10	1014	20.70	0.20	0.00	1.86	10.30	1014	19.80	1.10	0.00
29/03/2012	0.40	23.00	1024	20.00	0.90	0.00	1.80	20.20	1024	19.00	1.00	0.00
24/04/2012	0.35	13.10	991	20.30	0.00	0.00	1.55	13.50	991	19.20	1.40	0.00
21/05/2012	0.40	12.60	1002	20.00	0.30	0.00	1.80	12.30	1002	18.00	1.10	0.00
22/06/2012	0.40	18.30	1004	19.60	0.40	0.10	1.70	18.60	1004	19.30	1.20	0.10
18/07/2012	0.35	19.20	1003	20.10	0.10	0.00	1.00	19.20	1003	19.00	1.20	0.00
20/08/2012	0.25	22.10	1008	19.80	0.00	0.00	1.55	22.00	1008	19.00	1.10	0.00
20/09/2012	0.38	22.10	1018	20.00	0.00	0.00	1.79	21.50	1018	18.90	1.30	0.00
25/10/2012	0.41	12.70	1012	21.00	0.00	0.00	1.72	11.90	1012	19.10	1.20	0.00
22/11/2012	0.40	8.60	999	20.80	0.10	0.00	1.71	8.50	999	20.10	1.00	0.00
18/12/2012	0.43	7.20	1003	20.40	0.30	0.10	1.69	7.50	1003	20.00	1.20	0.00

L7 – L8 MONITORING RESULTS

L7							L8					
Date	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %
19/01/2012	1.33	9.40	1015	17.80	0.80	0.00	3.65	9.60	1014	-	-	-
28/02/2012	1.30	10.00	1014	18.20	1.00	0.00	3.88	10.20	1014	-	-	-
29/03/2012	1.55	18.60	1024	17.50	0.10	0.00	2.61	19.90	1024	-	-	-
24/04/2012	1.20	14.30	991	20.50	0.00	0.00	3.60	13.30	991	-	-	-
21/05/2012	1.30	12.50	1002	18.70	1.30	0.00	3.85	11.90	1002	-	-	-
22/06/2012	1.35	17.50	1004	19.00	1.00	0.10	4.00	17.60	1004	-	-	-
18/07/2012	1.10	18.50	1003	20.50	0.30	0.00	2.90	18.60	1003	-	-	-
20/08/2012	1.40	20.50	1008	19.30	1.00	0.00	2.60	21.00	1008	-	-	-
20/09/2012	1.41	19.80	1018	19.10	1.20	0.00	3.51	20.30	1018	-	-	-
25/10/2012	1.45	12.20	1012	19.40	1.30	0.00	3.46	12.30	1012	-	-	-
22/11/2012	1.42	8.50	999	19.70	1.20	0.00	3.32	7.70	999	-	-	-
18/12/2012	1.49	9.40	1003	19.70	1.30	0.00	3.10	7.90	1003	-	-	-

GW1 – GW2 MONITORING RESULTS

GW1							GW2					
Date	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %
19/01/2012	1.98	10.80	1015	20.30	0.60	0.00	1.10	9.00	1015	21.00	0.20	0.00
28/02/2012	2.28	11.20	1014	20.40	0.40	0.00	1.44	10.50	1014	21.00	0.10	0.00
29/03/2012	2.72	20.30	1024	20.10	0.80	0.00	1.42	23.00	1025	21.00	0.00	0.00
24/04/2012	1.92	13.00	991	20.30	0.20	0.00	1.20	12.10	991	20.00	0.40	0.00
21/05/2012	2.53	12.40	1002	19.80	0.60	0.00	1.35	12.20	1002	20.20	0.00	0.00
22/06/2012	2.10	17.80	1004	19.60	0.50	0.00	1.30	18.10	1004	20.30	0.00	0.00
18/07/2012	1.85	18.80	1003	19.90	0.50	0.00	1.00	18.50	1003	20.30	0.00	0.00
20/08/2012	2.10	20.00	1008	20.10	0.00	0.00	0.95	20.20	1008	20.10	0.00	0.00
20/09/2012	2.30	19.60	1018	20.30	0.00	0.00	1.10	20.20	1018	20.40	0.00	0.00
25/10/2012	2.09	13.10	1012	21.00	0.00	0.00	1.13	12.80	1012	21.00	0.00	0.00
22/11/2012	2.27	7.20	999	20.80	0.10	0.00	1.25	8.10	999	20.80	0.10	0.00
18/12/2012	2.25	7.90	1001	20.60	0.40	0.00	1.37	8.80	1003	19.60	0.80	0.00

GW4 – GW5 MONITORING RESULTS

GW4							GW5					
Date	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %
19/01/2012	0.55	8.30	1015	20.90	0.20	0.00	0.45	7.90	1015	20.00	0.90	0.00
28/02/2012	0.63	9.70	1014	20.90	0.20	0.00	0.86	9.50	1014	21.00	0.10	0.00
29/03/2012	0.70	23.60	1025	21.00	0.00	0.00	1.30	19.90	1024	21.00	0.30	0.00
24/04/2012	0.50	12.50	991	20.40	0.00	0.00	0.50	13.00	991	20.40	0.00	0.00
21/05/2012	0.58	12.00	1002	20.50	0.00	0.00	0.75	12.10	1002	20.50	0.00	0.00
22/06/2012	0.45	17.90	1004	20.30	0.30	0.00	0.55	18.20	1004	20.10	0.30	0.00
18/07/2012	0.50	17.20	1003	20.30	0.00	0.00	0.20	17.40	1003	20.10	0.10	0.00
20/08/2012	0.60	21.90	1008	20.20	0.00	0.00	0.25	22.40	1008	20.20	0.00	0.00
20/09/2012	0.72	21.10	1018	20.10	0.00	0.00	0.34	18.90	1018	20.10	0.00	0.00
25/10/2012	0.70	12.60	1012	20.90	0.10	0.00	0.41	12.70	1012	21.00	0.00	0.00
22/11/2012	0.61	8.20	999	20.60	0.30	0.00	0.55	7.80	999	21.00	0.00	0.00
18/12/2012	0.56	7.70	1001	19.90	0.80	0.00	0.62	8.00	1001	21.00	0.00	0.00

GW6 – GW7 MONITORING RESULTS

GW6							GW7					
Date	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %
19/01/2012	0.36	8.10	1014	20.80	0.70	0.00	0.24	7.20	1014	20.70	0.40	0.00
28/02/2012	0.36	9.90	104	19.80	0.70	0.00	0.30	10.10	1014	21.00	0.00	0.00
29/03/2012	0.30	21.70	1025	20.70	1.00	0.00	0.30	22.40	1024	21.00	0.10	0.00
24/04/2012	0.40	13.20	991	20.30	0.00	0.00	0.20	13.00	991	20.40	0.00	0.00
21/05/2012	0.30	12.70	1002	20.10	0.00	0.00	0.15	12.40	1002	20.10	0.00	0.00
22/06/2012	0.30	18.10	1004	20.40	0.00	0.00	0.10	17.80	1004	20.30	0.00	0.00
18/07/2012	0.10	18.40	1003	20.30	0.00	0.00	Full	18.00	1003	Full	Full	Full
20/08/2012	0.20	22.30	1008	20.00	0.00	0.00	Full	22.20	1008	Full	Full	Full
20/09/2012	0.29	19.30	1018	20.20	0.00	0.00	Full	20.40	1018	Full	Full	Full
25/10/2012	0.30	12.90	1012	21.00	0.00	0.00	Full	13.00	1012	Full	Full	Full
22/11/2012	0.31	7.60	999	20.20	0.60	0.00	Full	7.20	999	Full	Full	Full
18/12/2012	0.34	8.00	1003	20.00	1.00	0.60	Full	8.20	1003	Full	Full	Full

GW8 & SITE OFFICE MONITORING RESULTS

GW8							Site Office					
Date	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %		Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %
19/01/2012	0.80	9.00	1014	21.00	0.00	0.00		13.60	1015	21.00	0.00	0.00
28/02/2012	1.01	10.30	1014	21.00	0.00	0.00		15.30	1014	21.00	0.00	0.00
29/03/2012	1.14	22.10	1024	21.00	0.00	0.00		18.20	1024	21.00	0.00	0.00
24/04/2012	1.00	13.50	991	20.40	0.00	0.00		11.10	991	21.00	0.00	0.00
21/05/2012	1.03	12.30	1002	20.20	0.00	0.00		19.90	1002	21.00	0.00	0.00
22/06/2012	1.00	18.20	1004	20.40	0.00	0.00		21.20	1004	21.00	0.00	0.00
18/07/2012	0.80	18.40	1003	20.30	0.00	0.00		23.10	1003	21.00	0.00	0.00
20/08/2012	0.85	22.20	1008	20.10	0.00	0.00		18.90	1008	21.00	0.00	0.00
20/09/2012	0.97	19.80	1018	20.30	0.00	0.00		19.40	1018	21.00	0.00	0.00
25/10/2012	1.00	12.60	1012	21.00	0.00	0.00		11.90	1011	21.00	0.00	0.00
22/11/2012	1.01	6.90	999	21.00	0.00	0.00		11.30	999	21.00	0.00	0.00
18/12/2012	1.03	7.50	1003	20.90	0.20	0.00		12.30	1003	21.00	0.00	0.00

SURFACE WATER

SURFACE WATER MONITORING RESULTS

SW1	Units	21-Mar-12	27-Jun-12	12-Sep-12	12-Nov-12
Ammoniacal N	mg/l N	1.390	1.070	1.890	0.296
Chloride	mg/l	35.000	17.490	14.000	16.000
Conductivity	us/cm	214.000	139.700	304.000	138.000
Dissolved Oxygen	mg/l	-	6.500	-	-
Boron	mg/l	-	0.0276	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	14.500	-	-
Chromium (total)	mg/l	-	0.00979	-	-
Copper	mg/l	-	0.00236	-	-
Iron	mg/l	-	0.246	-	-
Lead	mg/l	-	0.00031	-	-
Magnesium	mg/l	-	3.630	-	-
Manganese	mg/l	-	0.362	-	-
Nickel	mg/l	-	0.000962	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.010	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	12.000	-	-
Total Phosphorous	mg/l P	-	<0.100	-	-

SW2	Units	21-Mar-12	27-Jun-12	12-Sep-12	12-Nov-12
Ammoniacal N	mg/l N	<0.200	0.362	0.292	<0.200
Chloride	mg/l	25.000	12.500	148.000	16.000
Conductivity	us/cm	140.000	151.000	18.000	105.000
Dissolved Oxygen	mg/l	-	4.300	-	-
Boron	mg/l	-	0.0106	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	4.200	-	-
Chromium (total)	mg/l	-	0.01050	-	-
Copper	mg/l	-	0.00365	-	-
Iron	mg/l	-	0.406	-	-
Lead	mg/l	-	0.00040	-	-
Magnesium	mg/l	-	1.980	-	-
Manganese	mg/l	-	0.0241	-	-
Nickel	mg/l	-	0.001240	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.00212	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	6.000	-	-
Total Phosphorous	mg/l P	-	<0.100	-	-

SW3	Units	21-Mar-12	27-Jun-12	12-Sep-12	12-Nov-12
Ammoniacal N	mg/l N	0.575	0.409	0.737	<0.200
Chloride	mg/l	40.000	22.490	22.000	24.000
Conductivity	us/cm	209.000	153.200	379.000	141.500
Dissolved Oxygen	mg/l	-	6.500	-	-
Boron	mg/l	-	0.0118	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	9.180	-	-
Chromium (total)	mg/l	-	0.0097	-	-
Copper	mg/l	-	0.0013	-	-
Iron	mg/l	-	0.358	-	-
Lead	mg/l	-	0.000285	-	-
Magnesium	mg/l	-	2.910	-	-
Manganese	mg/l	-	0.174	-	-
Nickel	mg/l	-	0.001050	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.00231	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	<2.000	-	-
Total Phosphorous	mg/l P	-	<0.100	-	-

SW4	Units	21-Mar-12	27-Jun-12	12-Sep-12	12-Nov-12
Ammoniacal N	mg/l N	7.740	4.500	0.277	0.291
Chloride	mg/l	60.000	55.000	24.000	24.000
Conductivity	us/cm	394.000	342.000	299.000	151.700
Dissolved Oxygen	mg/l	-	5.100	-	-
Boron	mg/l	-	0.0423	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	30.300	-	-
Chromium (total)	mg/l	-	0.00899	-	-
Copper	mg/l	-	0.00322	-	-
Iron	mg/l	-	1.049	-	-
Lead	mg/l	-	0.000379	-	-
Magnesium	mg/l	-	6.510	-	-
Manganese	mg/l	-	3.060	-	-
Nickel	mg/l	-	0.002640	-	-
Potassium	mg/l	-	5.440	-	-
Zinc	mg/l	-	0.00221	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	2.000	-	-
Total Phosphorous	mg/l P	-	<0.100	-	-

SW5	Units	21-Mar-12	27-Jun-12	12-Sep-12	12-Nov-12
Ammoniacal N	mg/l N	0.611	0.606	0.813	0.446
Chloride	mg/l	35.000	22.490	21.000	24.000
Conductivity	us/cm	200.000	153.800	405.000	152.200
Dissolved Oxygen	mg/l	-	6.600	-	-
Boron	mg/l	-	0.0167	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	9.290	-	-
Chromium (total)	mg/l	-	0.00950	-	-
Copper	mg/l	-	0.00149	-	-
Iron	mg/l	-	0.000415	-	-
Lead	mg/l	-	0.36200	-	-
Magnesium	mg/l	-	2.960	-	-
Manganese	mg/l	-	0.156	-	-
Nickel	mg/l	-	0.00131	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.00125	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	<2.000	-	-
Total Phosphorous	mg/l P	-	<0.100	-	-

SW6	Units	21-Mar-12	27-Jun-12	12-Sep-12	12-Nov-12
Ammoniacal N	mg/l N	0.058	0.285	1.630	<0.200
Chloride	mg/l	47.500	19.990	98.000	16.000
Conductivity	us/cm	340.000	250.000	506.000	102.300
Dissolved Oxygen	mg/l	-	7.200	-	-
Boron	mg/l	-	0.0362	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	30.000	-	-
Chromium (total)	mg/l	-	0.01010	-	-
Copper	mg/l	-	0.00194	-	-
Iron	mg/l	-	0.177	-	-
Lead	mg/l	-	0.00034	-	-
Magnesium	mg/l	-	4.720	-	-
Manganese	mg/l	-	0.0389	-	-
Nickel	mg/l	-	0.001070	-	-
Potassium	mg/l	-	5.070	-	-
Zinc	mg/l	-	0.00267	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	<2.000	-	-
Total Phosphorous	mg/l P	-	<0.100	-	-

SURFACE WATER MONITORING RESULTS

SW7	Units	24-Jan-12	28-Feb-12	21-Mar-12	24-Apr-12	May-2012	27-Jun-12	25-Jul-12	14-Aug-12	12-Sep-12	23-Oct-12	14-Nov-12	Dec-2012
pH	pH units	6.335	6.859	6.943	6.239	6.796	6.548	6.598	7.294	7.233	8.141	-	-
Ammoniacal N	mg/l N	0.500	0.350	0.346	0.350	0.430	0.507	0.660	0.650	1.750	0.610	0.320	-
Conductivity	us/cm	145.000	164.380	164.000	140.600	172.000	173.500	161.000	282.000	287.000	462.000	134.000	-
Suspended Solids	mg/l	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	-	-
COD	mg/l	23.000	-	-	22.000	<10.000	20.000	30.000	10.000	20.000	27.000	-	-
Chloride	mg/l	41.000	27.000	35.000	25.000	30.000	19.990	28.000	14.000	14.000	18.000	24.000	-
Dissolved Oxygen	mg/l	-	-	-	-	-	5.800	-	-	-	-	-	-
Boron	mg/l	-	-	-	-	-	0.0162	-	-	-	-	-	-
Cadmium	mg/l	-	-	-	-	-	0.000132	-	-	-	-	-	-
Calcium	mg/l	-	-	-	-	-	9.780	-	-	-	-	-	-
Chromium (total)	mg/l	-	-	-	-	-	0.009790	-	-	-	-	-	-
Copper	mg/l	-	-	-	-	-	0.00231	-	-	-	-	-	-
Iron	mg/l	-	-	-	-	-	0.230	-	-	-	-	-	-
Lead	mg/l	-	-	-	-	-	0.000306	-	-	-	-	-	-
Magnesium	mg/l	-	-	-	-	-	4.720	-	-	-	-	-	-
Manganese	mg/l	-	-	-	-	-	0.0906	-	-	-	-	-	-
Nickel	mg/l	-	-	-	-	-	0.000191	-	-	-	-	-	-
Potassium	mg/l	-	-	-	-	-	<2.340	-	-	-	-	-	-
Zinc	mg/l	-	-	-	-	-	0.003540	-	-	-	-	-	-
Mercury	mg/l	-	-	-	-	-	<0.00001	-	-	-	-	-	-
Sulphate	mg/l	-	-	-	-	-	<2.000	-	-	-	-	-	-
Total Phosphorous	mg/l P	-	-	-	-	-	<0.100	-	-	-	-	-	-

SW8	Units	21-Mar-12	27-Jun-12	12-Sep-12	12-Nov-12
Ammoniacal N	mg/l N	0.0662	<0.200	1.160	<0.200
Chloride	mg/l	25.000	12.500	6.000	16.000
Conductivity	us/cm	125.900	113.000	202.000	150.000
Dissolved Oxygen	mg/l	-	6.500	-	-
Boron	mg/l	-	0.0158	-	-
Cadmium	mg/l	-	0.000725	-	-
Calcium	mg/l	-	4.060	-	-
Chromium (total)	mg/l	-	0.0105	-	-
Copper	mg/l	-	0.003	-	-
Iron	mg/l	-	0.489	-	-
Lead	mg/l	-	0.000457	-	-
Magnesium	mg/l	-	1.780	-	-
Manganese	mg/l	-	0.0076	-	-
Nickel	mg/l	-	0.000931	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.00162	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	5.000	-	-
Total Phosphorous	mg/l P	-	0.230	-	-

SW9	Units	21-Mar-12	27-Jun-12	12-Sep-12	12-Nov-12
Ammoniacal N	mg/l N	0.530	0.274	0.541	<0.200
Chloride	mg/l	<6.000	37.490	26.000	24.000
Conductivity	us/cm	195.100	101.000	160.000	97.200
Dissolved Oxygen	mg/l	-	6.300	-	-
Boron	mg/l	-	0.0145	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	2.210	-	-
Chromium (total)	mg/l	-	0.00204	-	-
Copper	mg/l	-	0.00965	-	-
Iron	mg/l	-	1.720	-	-
Lead	mg/l	-	0.00049	-	-
Magnesium	mg/l	-	2.340	-	-
Manganese	mg/l	-	0.751	-	-
Nickel	mg/l	-	0.001620	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.00141	-	-
Mercury	mg/l	-	0.0000111	-	-
Sulphate	mg/l	-	8.000	-	-
Total Phosphorous	mg/l P	-	<0.100	-	-

GROUNDWATER

GROUND WATER MONITORING RESULTS

GW1	Units	21-Mar-12	27-Jun-12	12-Sep-12	12-Nov-12
Ammoniacal N	mg/l N	0.430	0.409	0.334	<0.200
Conductivity	us/cm	257.000	251.000	259.000	215.000
Chloride	mg/l	-	6.000	-	-
Boron	mg/l	-	0.0221	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	34.600	-	-
Chromium (total)	mg/l	-	0.00503	-	-
Copper	mg/l	-	0.00225	-	-
Iron	mg/l	-	0.040	-	-
Lead	mg/l	-	0.000053	-	-
Magnesium	mg/l	-	5.700	-	-
Manganese	mg/l	-	1.350	-	-
Nickel	mg/l	-	0.000751	-	-
Potassium	mg/l	-	<2.34	-	-
Zinc	mg/l	-	0.000902	-	-
Cyanide (total)	mg/l	-	<0.050	-	-
Fluoride	mg/l	-	<0.500	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	5.900	-	-
Total Phosphorous	mg/l	-	<0.0063	-	-

GW2	Units	21-Mar-12	27-Jun-12	12-Sep-12	12-Nov-12
Ammoniacal N	mg/l N	<0.20	<0.200	<0.200	<0.200
Conductivity	us/cm	279.000	202.000	244.000	206.000
Chloride	mg/l	-	8.000	-	-
Boron	mg/l	-	0.0106	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	31.400	-	-
Chromium (total)	mg/l	-	0.0665	-	-
Copper	mg/l	-	0.000852	-	-
Iron	mg/l	-	<0.019	-	-
Lead	mg/l	-	<0.00002	-	-
Magnesium	mg/l	-	2.680	-	-
Manganese	mg/l	-	0.00538	-	-
Nickel	mg/l	-	0.000452	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.00313	-	-
Cyanide (total)	mg/l	-	<0.050	-	-
Fluoride	mg/l	-	<0.500	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	13.500	-	-
Total Phosphorous	mg/l	-	0.0063	-	-

GW4	Units	21-Mar-12	27-Jun-12	12-Sep-12	12-Nov-12
Ammoniacal N	mg/l N	<0.200	<0.200	<0.200	<0.200
Conductivity	us/cm	238.000	180.300	242.000	219.400
Chloride	mg/l	-	14.000	-	-
Boron	mg/l	-	0.00638	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	30.100	-	-
Chromium (total)	mg/l	-	0.00334	-	-
Copper	mg/l	-	0.00377	-	-
Iron	mg/l	-	0.123	-	-
Lead	mg/l	-	0.000148	-	-
Magnesium	mg/l	-	2.120	-	-
Manganese	mg/l	-	0.102	-	-
Nickel	mg/l	-	0.00226	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.0022	-	-
Cyanide (total)	mg/l	-	<0.050	-	-
Fluoride	mg/l	-	<0.50	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	<2.000	-	-
Total Phosphorous	mg/l	-	0.015	-	-

GW5	Units	21-Mar-12	27-Jun-12	12-Sep-12	12-Nov-12
Ammoniacal N	mg/l N	<0.200	0.223	<0.200	<0.200
Conductivity	us/cm	253.000	240.000	264.000	200.000
Chloride	mg/l	-	6.000	-	-
Boron	mg/l	-	0.00785	-	-
Cadmium	mg/l	-	0.000151	-	-
Calcium	mg/l	-	56.300	-	-
Chromium (total)	mg/l	-	0.00597	-	-
Copper	mg/l	-	0.00115	-	-
Iron	mg/l	-	0.0829	-	-
Lead	mg/l	-	0.00013	-	-
Magnesium	mg/l	-	2.830	-	-
Manganese	mg/l	-	0.645	-	-
Nickel	mg/l	-	0.00173	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.0358	-	-
Cyanide (total)	mg/l	-	<0.050	-	-
Fluoride	mg/l	-	<0.500	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	<2.000	-	-
Total Phosphorous	mg/l	-	0.0088	-	-

GW6	Units	21-Mar-12	27-Jun-12	12-Sep-12	12-Nov-12
Ammoniacal N	mg/l N	1.660	1.550	1.740	0.411
Conductivity	us/cm	441.000	340.000	513.000	569.000
Chloride	mg/l	-	32.000	-	-
Boron	mg/l	-	0.0508	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	57.800	-	-
Chromium (total)	mg/l	-	0.00673	-	-
Copper	mg/l	-	0.00146	-	-
Iron	mg/l	-	0.0216	-	-
Lead	mg/l	-	0.000027	-	-
Magnesium	mg/l	-	6.710	-	-
Manganese	mg/l	-	2.120	-	-
Nickel	mg/l	-	0.000667	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.00305	-	-
Cyanide (total)	mg/l	-	<0.050	-	-
Fluoride	mg/l	-	<0.500	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	<2.000	-	-
Total Phosphorous	mg/l	-	0.0118	-	-

GW7	Units	21-Mar-12	27-Jun-12	12-Sep-12	12-Nov-12
Ammoniacal N	mg/l N	18.500	14.700	23.400	21.700
Conductivity	us/cm	1015.000	968.000	1102.000	1301.000
Chloride	mg/l	-	84.000	-	-
Boron	mg/l	-	0.235	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	124.000	-	-
Chromium (total)	mg/l	-	0.0147	-	-
Copper	mg/l	-	<0.00085	-	-
Iron	mg/l	-	0.06110	-	-
Lead	mg/l	-	0.000045	-	-
Magnesium	mg/l	-	11.700	-	-
Manganese	mg/l	-	4.910	-	-
Nickel	mg/l	-	0.00187	-	-
Potassium	mg/l	-	14.600000	-	-
Zinc	mg/l	-	0.0261	-	-
Cyanide (total)	mg/l	-	<0.050	-	-
Fluoride	mg/l	-	<0.500	-	-
Mercury	mg/l	-	<0.0001	-	-
Sulphate	mg/l	-	16.200	-	-
Total Phosphorous	mg/l	-	0.011	-	-

GW8	Units	21-Mar-12	27-Jun-12	12-Sep-12	12-Nov-12
Ammoniacal N	mg/l N	0.299	<.200	0.451	<0.200
Conductivity	us/cm	346.000	319.000	401.000	523.000
Chloride	mg/l	-	24.000	-	-
Boron	mg/l	-	0.006	-	-
Cadmium	mg/l	-	0.000141	-	-
Calcium	mg/l	-	25.700	-	-
Chromium (total)	mg/l	-	0.00406	-	-
Copper	mg/l	-	0.00774	-	-
Iron	mg/l	-	1.140	-	-
Lead	mg/l	-	0.00113	-	-
Magnesium	mg/l	-	5.820	-	-
Manganese	mg/l	-	2.110	-	-
Nickel	mg/l	-	0.00181	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.233	-	-
Cyanide (total)	mg/l	-	<0.050	-	-
Fluoride	mg/l	-	<0.500	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	<2.000	-	-
Total Phosphorous	mg/l	-	0.0241	-	-

LEACHATE

LEACHATE MONITORING RESULTS

27-Jun-12	Units	L1	L2	L3	L4	L5	L6	L7	L8
Ammoniacal N	mg/l N	-	107.000	-	312.000	-	-	-	-
BOD	mg/l	-	111.000	-	131.000	-	-	-	-
COD	mg/l	-	260.000	-	32.000	-	-	-	-
Chloride	mg/l	-	124.960	-	349.890	-	-	-	-
Conductivity	us/cm	-	1763.000	-	51.600	-	-	-	-
pH	pH units	-	6.819	-	7.004	-	-	-	-
Boron	mg/l	-	0.0343	-	1.830	-	-	-	-
Cadmium	mg/l	-	<0.0001	-	0.000116	-	-	-	-
Calcium	mg/l	-	137.000	-	135.000	-	-	-	-
Chromium (total)	mg/l	-	0.0127	-	0.0162	-	-	-	-
Copper	mg/l	-	<0.00085	-	0.00115	-	-	-	-
Iron	mg/l	-	32.500	-	12.900	-	-	-	-
Lead	mg/l	-	0.000097	-	0.000218	-	-	-	-
Magnesium	mg/l	-	36.900	-	56.800	-	-	-	-
Manganese	mg/l	-	8.030	-	1.960	-	-	-	-
Nickel	mg/l	-	0.00766	-	0.011	-	-	-	-
Potassium	mg/l	-	86.900	-	184.000	-	-	-	-
Selenium	mg/l	-	0.00869	-	0.00655	-	-	-	-
Zinc	mg/l	-	0.00224	-	0.00177	-	-	-	-
Cyanide (total)	mg/l	-	<0.050	-	<0.050	-	-	-	-
Fluoride	mg/l	-	<0.500	-	<0.50	-	-	-	-
Mercury	mg/l	-	<0.00001	-	<0.00001	-	-	-	-
Sulphate	mg/l	-	<2.000	-	<2.000	-	-	-	-
Total Phosphorous	mg/l P	-	<0.100	-	0.170	-	-	-	-

DUST & NOISE MONITORING RESULTS

DUST MONITORING RESULTS

LOCATION	Units	Jun-12	Sep-12	Dec-12
D1	mg/m ² /day	76	155	96
D3	mg/m ² /day	43	81	80
D6	mg/m ² /day	77	153	137
D8	mg/m ² /day	91	115	102

All results are below licenced ELV of 350 mg/m²/day

NOISE MONITORING RESULTS - DECEMBER 2012

LOCATION	Units	L _{Aeq} 30 mins	L _{A90} 30 mins	L _{A10} 30 mins
N1	dB(A)	39	31	42
N6	dB(A)	41	37	44
N7	dB(A)	47	35	51
N10	dB(A)	43	36	46
N12	dB(A)	46	32	48

All results are below licenced ELV of Daytime 55dB(A)

APPENDIX 2

FLARE EMISSIONS MONITORING RESULTS & OPERATIONAL GRAPHS

Biannual Flare Emissions Monitoring was carried out Axis Environmental Services, 40 Coolraine Heights, Old Cratloe Road, Limerick.

Biannual Flare Emissions Monitoring

FLARE EMISSIONS MONITORING

FLARE STACK	Units	May-12	Dec-12	Emission Limit
Residence Time	S	0.9	0.6	>0.30
Nitrogen Oxides (NO _x)	Mg/Nm ³	47.8	19.8	150.00
Sulphur Dioxide (SO ₂)	Mg/Nm ³	<5	42.18	N/A
Carbon Monoxide (CO)	Mg/Nm ³	26.1	19.3	N/A
Temperature	°C	1014	1015	>1000

All results are below licenced ELV of 150mg/m³ Nitrogen Oxides (NO_x)

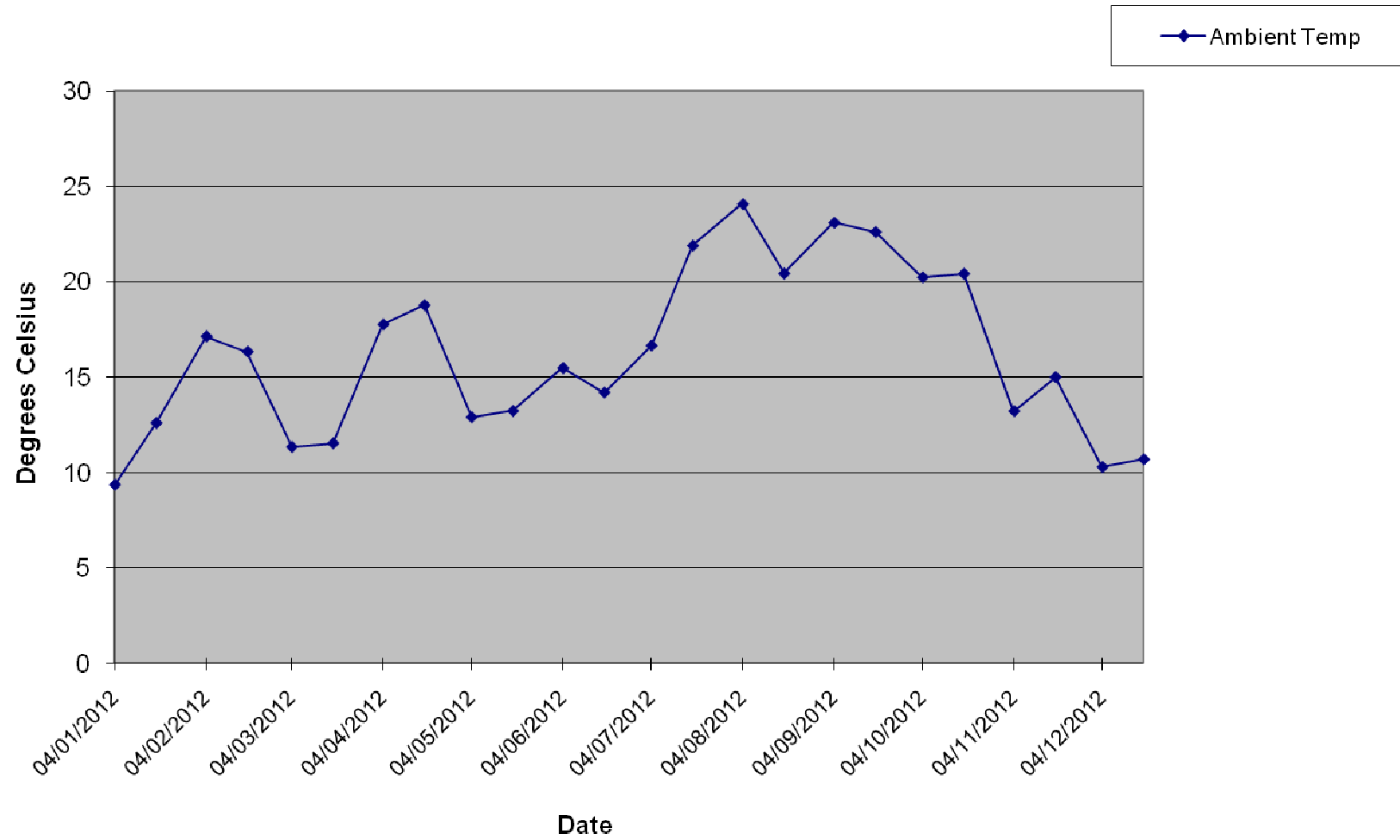
Residence Time of >0.3s and burn temperature of >1000 °C was achieved.

GAS FLARE DATA

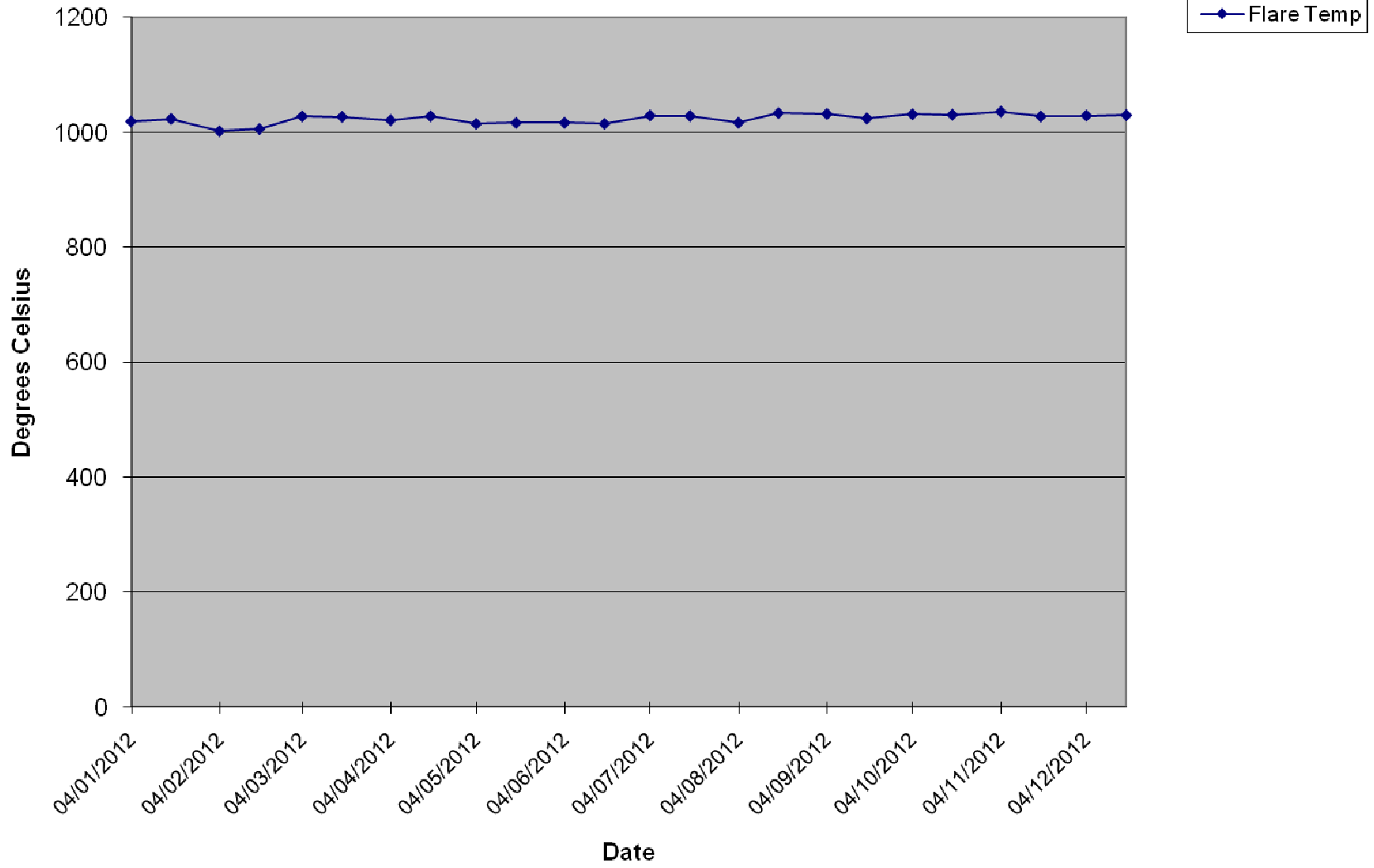
Date	Ambient Temp (°C)	Atm. Pressure (Mb)	CO ₂ (%)	CO (%)	Flow (M ³ /Hr)	CH ₄ (%)	O ₂ (%)	Flare Pressure (Mb)	Flare Temp (°C)
04/01/2012	9.35	1018.03	32.61	13.24	275.43	38.23	1.31	30.08	1019.01
18/01/2012	12.60	1020.71	33.01	11.36	274.45	38.61	1.25	28.43	1023.23
04/02/2012	17.15	1019.91	31.58	20.46	339.27	37.97	1.21	43.19	1002.45
18/02/2012	16.34	1012.46	30.79	15.95	341.90	35.98	1.53	30.65	1005.95
04/03/2012	11.34	1016.37	22.20	19.87	341.08	33.11	1.50	28.67	1027.71
18/03/2012	11.53	1010.87	22.05	8.85	344.03	34.27	1.43	28.23	1026.88
04/04/2012	17.77	1020.53	25.80	16.45	255.83	37.40	1.14	37.50	1021.10
18/04/2012	18.79	985.68	21.59	9.02	190.30	31.39	1.69	19.50	1027.92
04/05/2012	12.90	1007.55	21.10	8.80	222.51	29.89	1.46	25.89	1014.80
18/05/2012	13.23	1004.96	21.58	9.17	143.24	36.21	1.71	15.12	1016.52
04/06/2012	15.48	1018.48	20.00	10.13	110.04	30.56	1.64	15.65	1016.72
18/06/2012	14.20	1014.32	19.96	11.79	131.56	31.09	1.56	13.65	1014.90
04/07/2012	16.66	1003.34	21.95	11.10	91.39	35.01	1.66	8.02	1029.06
18/07/2012	21.91	1023.98	22.90	10.16	112.41	31.77	1.44	15.24	1028.28
04/08/2012	24.09	1005.60	20.20	14.86	96.69	27.98	1.53	8.33	1016.78
18/08/2012	20.45	1014.97	22.57	11.44	118.83	35.71	1.55	7.88	1033.23
04/09/2012	23.12	1030.71	25.61	12.47	130.80	42.16	1.45	12.75	1031.77
18/09/2012	22.63	1021.30	21.10	10.75	157.02	29.88	1.51	10.66	1024.12
04/10/2012	20.25	1008.15	21.82	10.51	146.29	32.91	1.52	11.66	1031.15
18/10/2012	20.44	997.96	25.45	18.95	119.62	36.18	1.16	9.20	1030.37
04/11/2012	13.22	981.66	25.18	16.93	177.15	39.73	1.13	18.12	1035.63
18/11/2012	15.01	1003.81	22.76	14.18	141.29	31.59	1.19	18.76	1027.50
04/12/2012	10.28	1006.80	24.45	11.54	168.60	38.23	1.11	17.85	1028.91
18/12/2012	10.69	1011.86	24.27	12.61	106.52	41.16	1.18	4.30	1029.59

For the purpose of showing representative summary of flare operational parameters, data from 2 days of every month was utilised.

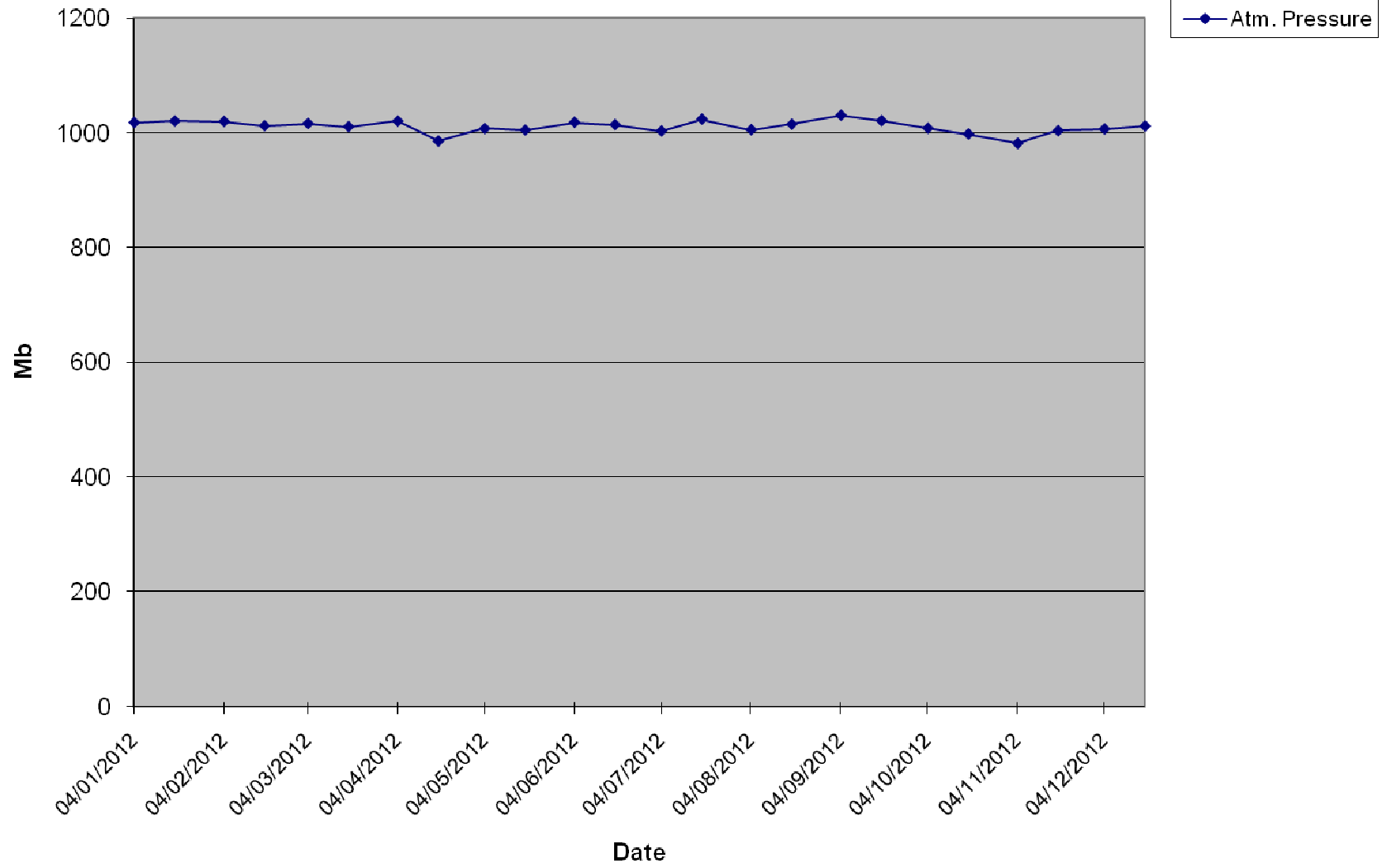
Ambient Temperature



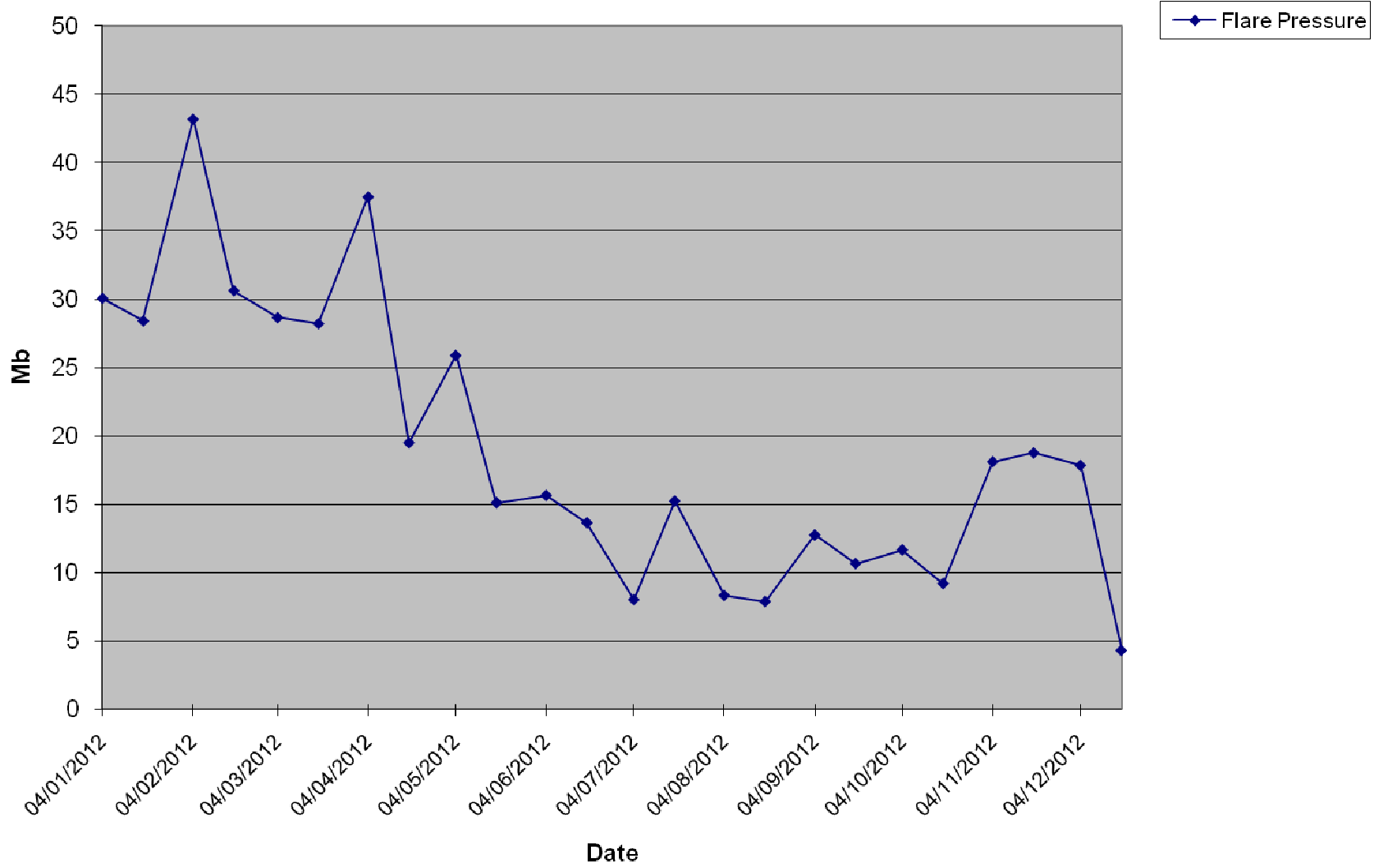
Flare Operating Temperature



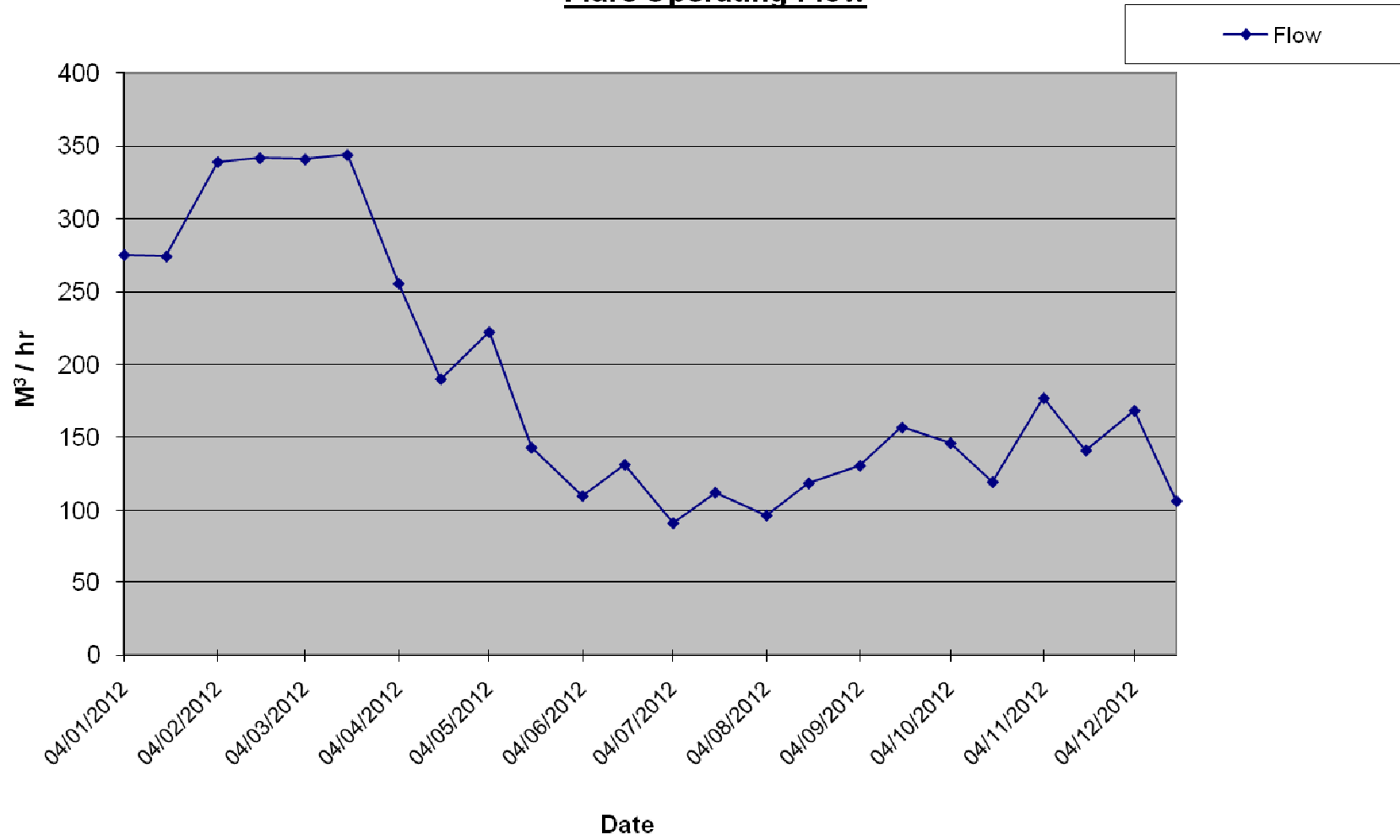
Atmospheric Pressure



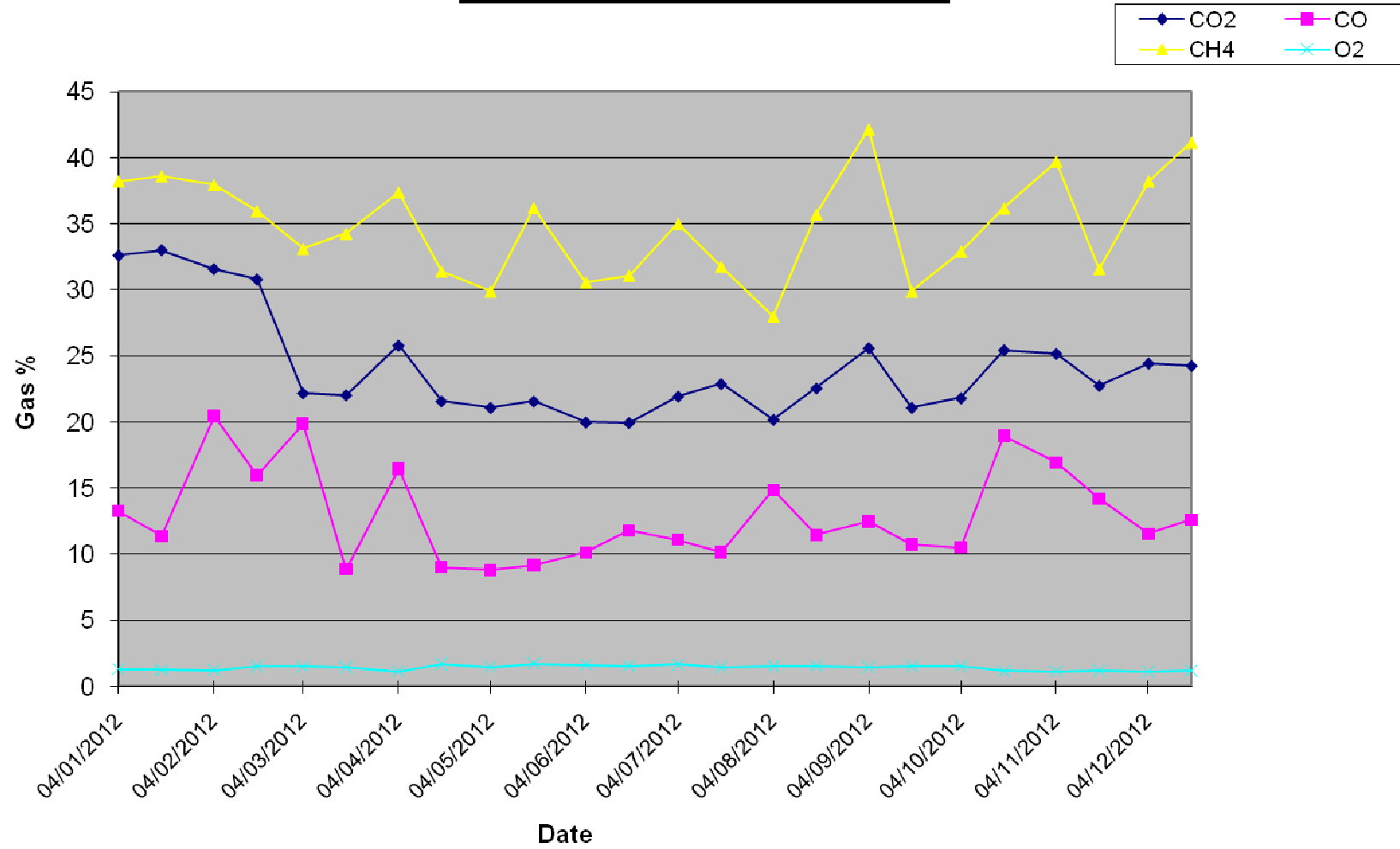
Flare Operating Pressure



Flare Operating Flow



Flare Operating Gas Composition



APPENDIX 3

2012 PRTR EMISSIONS DATA



Environmental Protection Agency

| PRTR# : W0089 | Facility Name : Derryconnell Landfill | Filename : PRTR
Derryconnell 2012.xls | Return Year : 2012 |

[Guidance to completing the PRTR workbook](#)

AER Returns Workbook

Version 1.1.15

REFERENCE YEAR	2012
-----------------------	------

1. FACILITY IDENTIFICATION

Parent Company Name	Cork County Council Western Division
Facility Name	Derryconnell Landfill
PRTR Identification Number	W0089
Licence Number	W0089-02

Waste or IPPC Classes of Activity

N	class name
3.12	Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule.
3.1	Deposit on, in or under land (including landfill).
	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.
3.13	Surface impoundment, including placement of liquid or sludge
3.4	discards into pits, ponds or lagoons.
3.5	Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment.
4.13	Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.
4.2	Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).
4.3	Recycling or reclamation of metals and metal compounds.
4.4	Recycling or reclamation of other inorganic materials.
Address 1	Derryconnell
Address 2	Schull
Address 3	County Cork
Address 4	
	Cork
Country	Ireland
Coordinates of Location	-7.46596 53.2762
River Basin District	IESW
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous waste
AER Returns Contact Name	Mairead Hales
AER Returns Contact Email Address	mairead.hales@corkcoco.ie
AER Returns Contact Position	Executive Engineer
AER Returns Contact Telephone Number	028 37742
AER Returns Contact Mobile Phone Number	086 6018493
AER Returns Contact Fax Number	028 37742
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	3
User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

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

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

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

4. WASTE IMPORTED/ACCEPTED ONTO SITE

[Guidance on waste imported/accepted onto site](#)

Do you import/accept waste onto your site for on-site treatment (either recovery or disposal activities)?	
---	--

This question is only applicable if you are an IPPC or Quarry site

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR							Please enter all quantities in this section in KGs		
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY			
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)	C	OTH	LandGEM Modelling	0.0	302292.0	0.0	302292.0	

ADD NEW ROW | DELETE ROW * * 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			ADD EMISSION POINT	QUANTITY			
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	

ADD NEW ROW | DELETE ROW * * 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			ADD EMISSION POINT	QUANTITY			
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	

ADD NEW ROW | DELETE ROW * * 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: Please enter summary data on the quantities of methane flared and / or utilised	Derryconnell Landfill				
	T (Total) kg/Year	M/C/E	Method Code	Designation or Description	Facility Total Capacity m3 per hour
Total estimated methane generation (as per site model)	357408.0	C	OTH	LandGEM Modelling	N/A
Methane flared	55116.0	C	OTH	Landfill Gas Survey	250.0 (Total Flaring Capacity)
Methane utilised in engine/s	0.0				0.0 (Total Utilising Capacity)
Net methane emission (as reported in Section A above)	302292.0	C	OTH	LandGEM Modelling	N/A

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

| PRTR# : W0089 | Facility Name : Derryconnell Landfill | Filename : PRTR Derryconnell 2012.xls | Return Year : 2012 |

22/03/2013 16:43

Please enter all quantities on this sheet in Tonnes

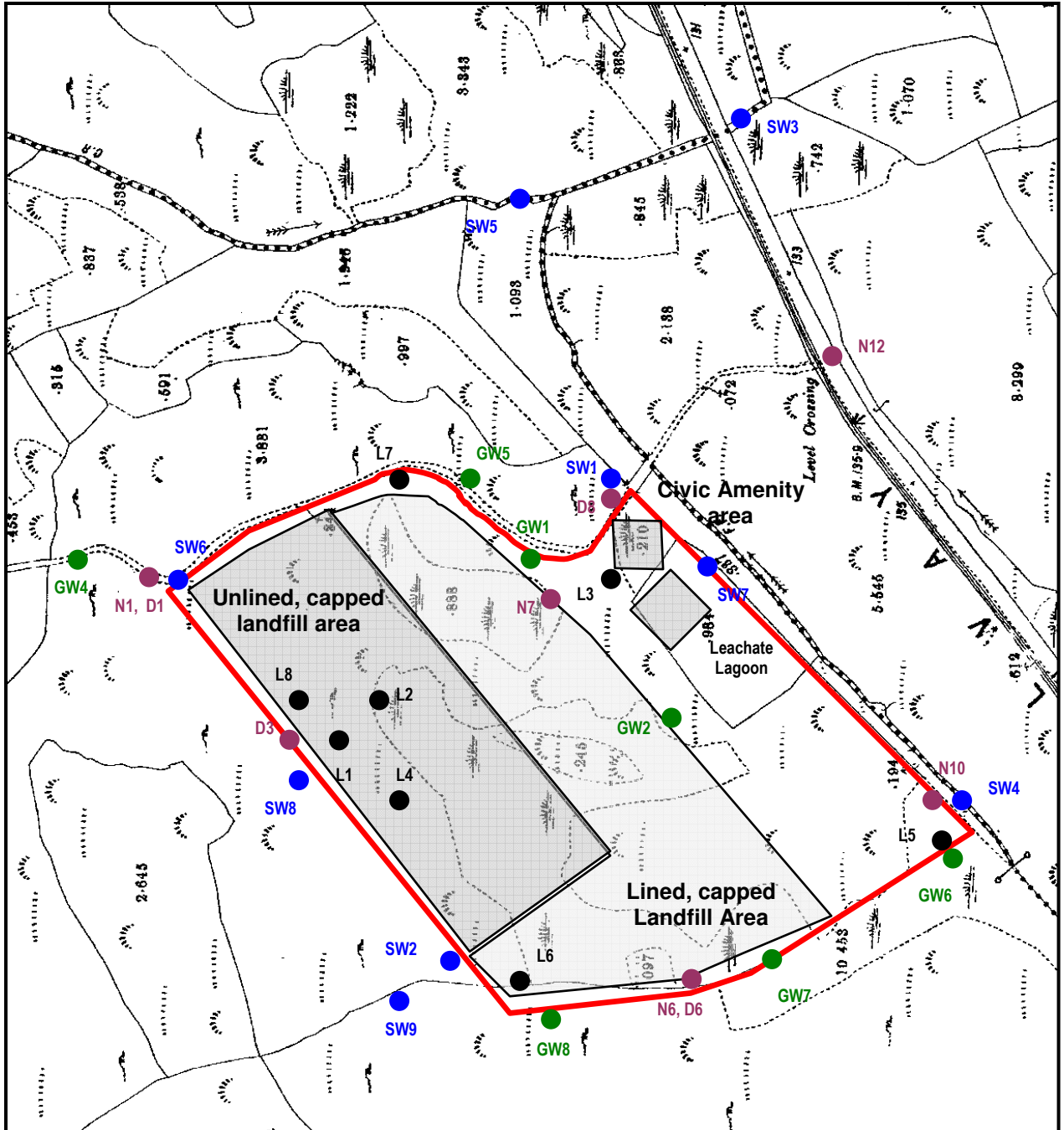
0

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 Recoverer / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					
Within the Country	15 01 07	No	48.78	glass packaging	R13	M	Weighed	Offsite in Ireland	Mr. Binman Ltd.,W0061-02 Green Dragon Recycling,WFP-CK-10-0060-02	Luddenmore,Grange,Kilmallock,Co. Limerick,Ireland		
Within the Country	15 01 04	No	6.28	metallic packaging	R13	M	Weighed	Offsite in Ireland	Mr. Binman Ltd.,W0061-02 Pouladuff Dismantlers,CK-10-0070-02	Corbally,Glanmire,Co. Cork,,Ireland		
Within the Country	15 01 04	No	0.22	metallic packaging	R13	M	Weighed	Offsite in Ireland	All-Tex Recyclers Ltd.,WME05/24	Luddenmore,Grange,Kilmallock,Co. Limerick,Ireland		
Within the Country	20 01 40	No	44.5	metals	R13	M	Weighed	Offsite in Ireland	Bantry Skip Hire,WFP-CK-08-0002-01	Forge Hill,Airport Road,Cork,,Ireland		
To Other Countries	20 01 11	No	5.3	textiles	R13	M	Weighed	Abroad		1 Ballycregagh Road,Cloughmills,Co. Antrim,,Ireland		
Within the Country	20 01 38	No	55.14	wood other than that mentioned in 20 01 37	R13	M	Weighed	Offsite in Ireland		Dunbittern East ,Bantry ,Co. Cork ,,Ireland		
Within the Country	16 06 01	Yes	2.462	lead batteries	R13	M	Weighed	Offsite in Ireland	KMK Metals Recycling,W0113-03	Cappincur Industrial Estate,Duingean Road,Tullamore,Co. Offaly,Ireland	Enva Ireland Ltd.,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,,Ireland
Within the Country	16 06 05	No	0.818	other batteries and accumulators	R13	M	Weighed	Offsite in Ireland	KMK Metals Recycling,W0113-03	Cappincur Industrial Estate,Duingean Road,Tullamore,Co. Offaly,Ireland		
Within the Country	13 02 08	Yes	2.12	other engine, gear and lubricating oils	R13	M	Weighed	Offsite in Ireland	Enva Ireland Ltd.,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,,Ireland	Enva Ireland Ltd.,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,,Ireland
Within the Country	16 01 07	Yes	0.25	oil filters	R13	M	Weighed	Offsite in Ireland	Enva Ireland Ltd.,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,,Ireland	Enva Ireland Ltd.,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,,Ireland
Within the Country	20 01 25	No	0.86	edible oil and fat	R13	M	Weighed	Offsite in Ireland	Cork Oil Collectors,WFP-CK-08-0002-01	5 St. Lappans Place,Little Island,Cork,,Ireland		
Within the Country	16 05 04	Yes	1.5	gases in pressure containers (including halons) containing dangerous substances	R13	M	Weighed	Offsite in Ireland	Enva Ireland Ltd.,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,,Ireland	Enva Ireland Ltd.,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,,Ireland
Within the Country	16 02 14	No	53.3	discarded equipment other than those mentioned in 16 02 09 to 16 02 13	R13	M	Weighed	Offsite in Ireland	KMK Metals Recycling,W0113-03	Offaly,Ireland		
Within the Country	19 07 03	No	6492.18	landfill leachate other than those mentioned in 19 07 02	D9	M	Weighed	Offsite in Ireland	Cork County Council - Bandon WWTP,.	Glaslin Road,Bandon,Co. Cork,,Ireland		
Within the Country	20 01 27	Yes	6.38	paint, inks, adhesives and resins containing dangerous substances	R13	M	Weighed	Offsite in Ireland	Enva Ireland Ltd.,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,,Ireland	Enva Ireland Ltd.,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,,Ireland
Within the Country	20 03 07	No	66.06	bulky waste	D15	M	Weighed	Offsite in Ireland	Greenstar Recycling,W0136-02	Sarsfield Industrial Estate,Glanmire,Co. Cork,,Ireland		
Within the Country	20 03 07	No	6.12	bulky waste	D15	M	Weighed	Offsite in Ireland	Bantry Skip Hire,WFP-CK-08-0002-01	Dunbittern East ,Bantry ,Co. Cork ,,Ireland		
Within the Country	20 03 01	No	236.6	mixed municipal waste	D15	M	Weighed	Offsite in Ireland	Greenstar Recycling,W0136-02	Sarsfield Industrial Estate,Glanmire,Co. Cork,,Ireland		
Within the Country	15 01 06	No	128.46	mixed packaging	R13	M	Weighed	Offsite in Ireland	Bantry Skip Hire,WFP-CK-08-0002-01	Dunbittern East ,Bantry ,Co. Cork ,,Ireland		

DRAWINGS

DRAWING 01_2012

LOCATION OF ENVIRONMENTAL MONITORING POINTS



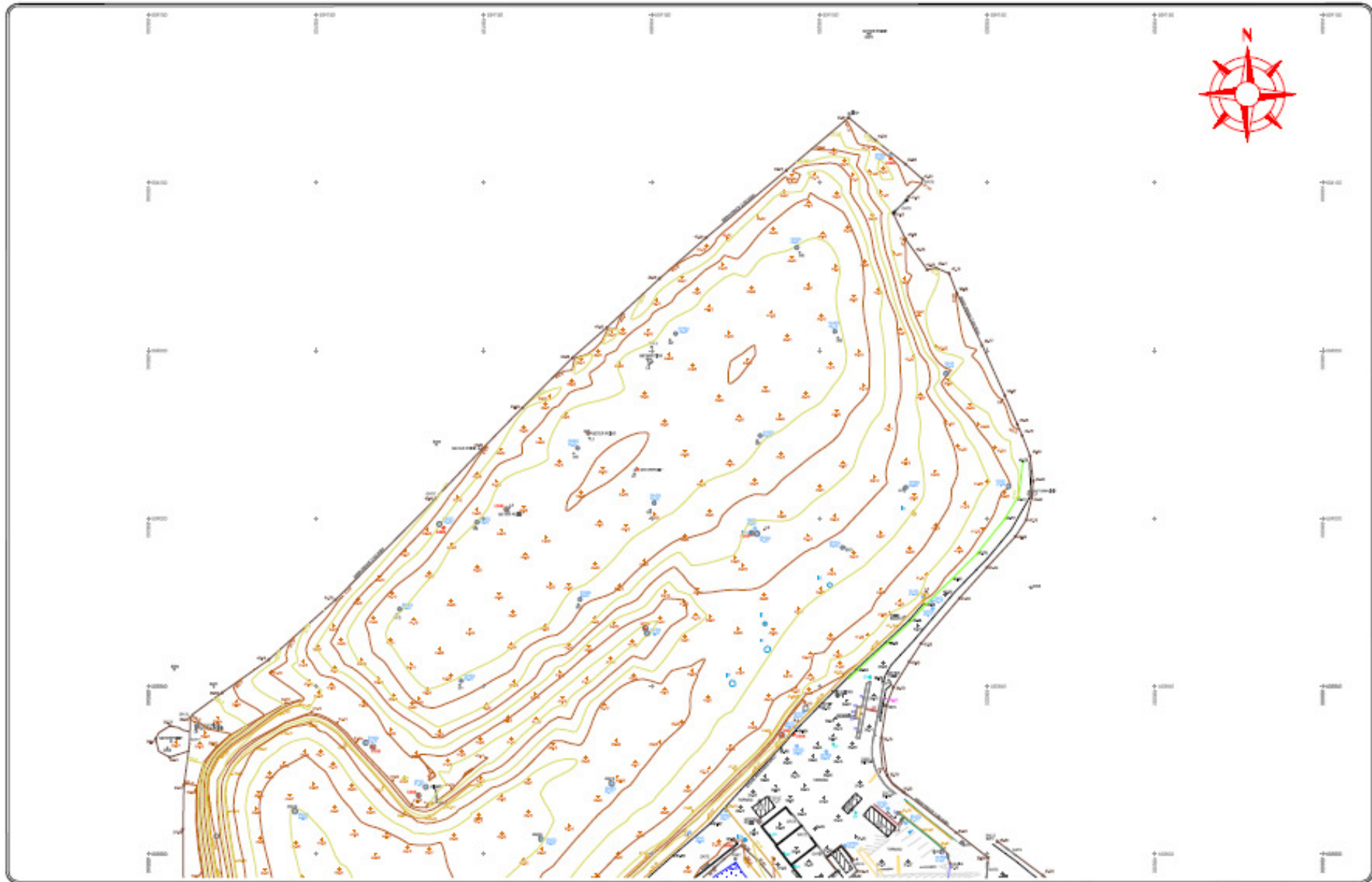
SURFACE WATER ●

GROUNDWATER ●

LEACHATE ●

NOISE & DUST ●

DRAWING 02_2012
2012 TOPOGRAPHICAL SURVEY



Scale 1:500
 1" = 50' (1:1524)
 1" = 100' (1:3048)
 1" = 200' (1:6096)

Notes:
 1. All elevations are in feet above mean sea level.
 2. All spot heights are in feet above mean sea level.
 3. All bearings are in degrees, minutes, and seconds true.
 4. All distances are in feet and inches.
 5. All bearings and distances are as shown on the plan.

Legend:
 Contour Lines: 10' intervals
 Spot Heights: 1' intervals
 Bench Marks: 1' intervals
 Boundaries: 1' intervals
 Structures: 1' intervals
 Utilities: 1' intervals
 Obstacles: 1' intervals
 Proposed: 1' intervals
 Existing: 1' intervals

Project Information:
 Project Name: 2012 Topographical Survey
 Client: [Redacted]
 Date: 02/2012
 Drawing No: 02_2012
 Scale: 1:500
 Author: [Redacted]
 Checker: [Redacted]
 Date: 02/2012

Website:
www.murphy.ie

Legend:

Contour Lines	10' intervals	Spot Heights	1' intervals
Bench Marks	1' intervals	Boundaries	1' intervals
Structures	1' intervals	Utilities	1' intervals
Obstacles	1' intervals	Proposed	1' intervals
Existing	1' intervals		

Scale 1:500
 1" = 50' (1:1524)
 1" = 100' (1:3048)
 1" = 200' (1:6096)

Project Information:
 Project Name: 2012 Topographical Survey
 Client: [Redacted]
 Date: 02/2012
 Drawing No: 02_2012
 Scale: 1:500
 Author: [Redacted]
 Checker: [Redacted]
 Date: 02/2012

Scale 1:500
 1" = 50' (1:1524)
 1" = 100' (1:3048)
 1" = 200' (1:6096)

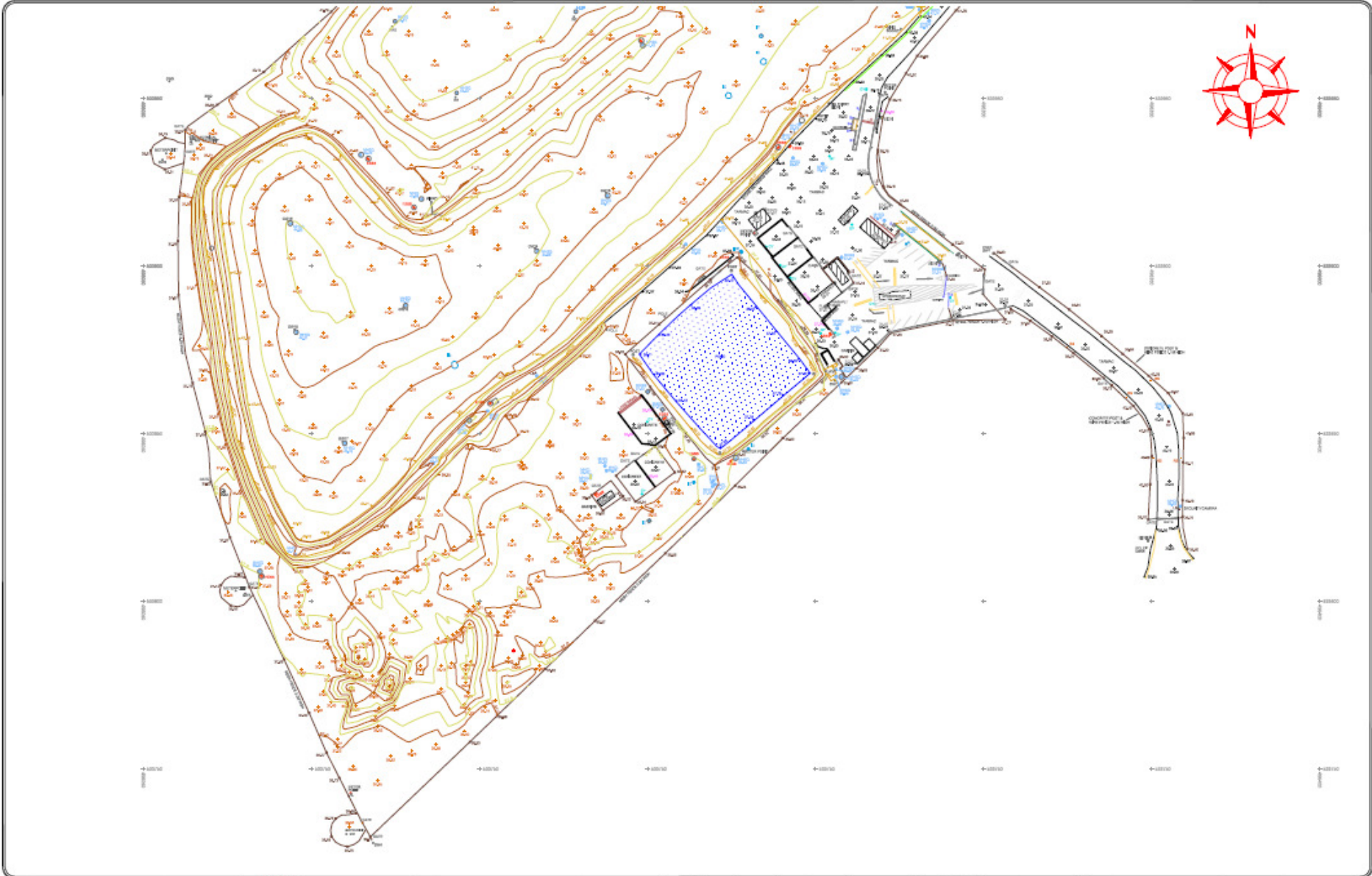
Project Information:
 Project Name: 2012 Topographical Survey
 Client: [Redacted]
 Date: 02/2012
 Drawing No: 02_2012
 Scale: 1:500
 Author: [Redacted]
 Checker: [Redacted]
 Date: 02/2012

Legend:
 Contour Lines: 10' intervals
 Spot Heights: 1' intervals
 Boundaries: 1' intervals
 Structures: 1' intervals
 Utilities: 1' intervals
 Obstacles: 1' intervals
 Proposed: 1' intervals
 Existing: 1' intervals

murphy
 GLOBAL CONSULTING ENGINEERS

Project Information:
 Project Name: 2012 Topographical Survey
 Client: [Redacted]
 Date: 02/2012
 Drawing No: 02_2012
 Scale: 1:500
 Author: [Redacted]
 Checker: [Redacted]
 Date: 02/2012

Scale 1:500
 1" = 50' (1:1524)
 1" = 100' (1:3048)
 1" = 200' (1:6096)



Client: RPS
Location: [Address]
Scale: 1:500
Date: [Date]

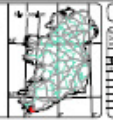
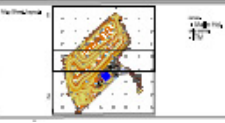
Head Office: [Address]
London West: [Address]

Project: [Project Name]
Drawn by: [Name]
Checked by: [Name]

www.murphysurvey.co.uk

LEGEND

Contour Lines	Spot Heights	Buildings	Water Features	Boundaries	Other
Orange line	Orange triangle	Black outline	Blue hatched area	Red dashed line	Green circle
...



Client	RPS Consulting Engineers
Project	Development of the [Address]
Date	01/12/2012
Scale	1:500
Drawn by	[Name]
Checked by	[Name]
Project No.	MSL665-DLT2



Client: RPS Consulting Engineers
Project: Development of the [Address]
Date: 01/12/2012
Scale: 1:500
Drawn by: [Name]
Checked by: [Name]
Project No.: MSL665-DLT2