ANNUAL ENVIRONMENTAL REPORT

FOR

MARLINSTOWN LANDFILL

2009

WASTE LICENCE NO. W0071-02

Prepared By: -

Westmeath County Council,
County Buildings,
Mullingar,
Co. Westmeath

30th January 2009

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1. INTRODUCTION

This is the ninth Annual Environmental Report (AER) for Marlinstown Landfill, Mullingar, County Westmeath, which is operated by Westmeath County Council (Council). The AER is prepared in response to Schedule E of Waste Licence W0071-02 issued to the Council by the Environmental Protection Agency (Agency) on 9th January 2004.

The AER describes the site activities for the period from 1st January 2009 to 31st December 2009 and complies with the Agency's direction that the reports should be submitted within one month of the end of the reported year. The content of the AER is based on Schedule G of the Waste Licence W0071-02.

It should be noted that disposal of all waste at Marlinstown Landfill ceased on the 31st December 2002 in accordance with Waste Licence (W0071-01). Recycling at Marlinstown and the acceptance of Household Waste from private vehicles for transport off-site for disposal at Ballydonagh Landfill, Athlone, Co. Westmeath, ceased on the 13th January 2007.

The facility address is: -

Marlinstown Landfill,
Marlinstown Bog,
Mullingar,
County Westmeath.

The Council's Address is: -

Westmeath County Council,
County Buildings,
Mullingar,
County Westmeath.

2. SITE DESCRIPTION

2.1 Waste Management Activities

Westmeath County Council ceased accepting waste for disposal off-site and recycling at the Civic Waste Facility on January 13th 2007.

2.2 Total Quantity of Wastes Accepted

There was no waste accepted at Marlinstown Landfill in 2009. No Inert Cover Material was accepted at the site as a stockpile from previous years is available on-site for future restoration works.

2.3 Calculated Remaining Capacity of the Site

The landfill had been in operation between 1963 and the 31st December 2002. The facility occupies an area of some 9 ha (22 acres). It is estimated that the total volume of waste disposed at the site was approximately 461,500 tonnes. The remaining capacity for the landfill is zero.

2.3.1 Waste Deposition

Waste deposition is not taking place at the facility as the final capping has been placed on the landfill (Phase 1). Waste was placed in a manner to facilitate the achievement of the proposed restoration profile of the site. In the areas where filling was required to achieve the required grade the waste was placed and a bulldozer was used to level and compact the soil/subsoil in layers.

2.4 Local Environmental Conditions

2.4.1 Meteorological Report

A meteorological report for the period January to December 2009 for the meteorological station at Mullingar is included in Appendix 1. The report includes daily rainfall, air temperature, wind (speed and direction), relative humidity, barometric pressure, monthly evaporation and potential evapotranspiration totals.

3. EMISSION MONITORING & CONTROL

The Council carries out an environmental monitoring programme at the facility to assess the significance of emissions from site activities. The monitoring programme includes groundwater, surface water, landfill gas, leachate and dust. With the agreement of the EPA the requirement to monitor noise is no longer necessary. The results of all monitoring carried out in the reporting period have been submitted to the Agency. An overview of the monitoring results for the reporting period, and comparisons with previous monitoring results, are presented in this section. The results are discussed in the context of the impact of the emissions on the environment and compared with available data on background and or ambient conditions.

3.1 Groundwater

3.1.1 Site Geology & Hydrogeology

The subsurface at the site is composed of peat, which ranges in thickness from 1 metre (m) in the North West of the site to 8.5 m in the north east of the site. The peat is underlain by glacial tills ranging in thickness from 4.3 m to19.7 m. In the north of the site there is 10m thickness of coarse gravels. The overburden overlies the bedrock, which comprises Waulsortian limestones, basinal limestones and mudstones of the Tobercolleen formation.

The basinal limestones underlying the western half of the site and the Waulsortian limestones underlying the south-eastern corner of the site are classed as a 'locally important aquifer-generally moderately productive'. The mudstones underlying the eastern part of the site are classified as a 'poor aquifer-generally unproductive except for local zones'.

The groundwater flow in both formations is generally from the southwest to the northeast. There is local mounding of the shallow groundwater beneath the landfill.

3.1.2 Monitoring Locations

The Council monitors groundwater quality in 10 monitoring wells in the general vicinity of the site. The wells are located in the overburden and the bedrock aquifers up and down gradient of the site. The well locations are shown on Figure 1 in Appendix 2.

Wells BH31 (Deep) and BH32 (Shallow) are up gradient of the site on the southern side of the Mullingar bypass. BH2 (S) and BH1 (D), although located up gradient, are

considered to be within the zone of influence of the landfill due to proximity and the effect of localised mounding of the shallow groundwater beneath the landfill.

The perimeter wells BH3 (D) and BH4 (S) (replacing BH9 (D) and BH10 (S), damaged during capping works) are considered as down gradient due to the localised mounding of the shallow groundwater beneath the site.

Wells BH 13 (D), BH14 (S), BH15 (D) and BH16 (S) are all down gradient and located at some distance from the site.

3.1.3 Monitoring Programme

Groundwater levels are monitored at monthly intervals. Water quality is monitored at quarterly and annual intervals for a range of different parameters. The range of analysis is as specified in Schedule D (table D.5.1) of the Waste Licence and includes pH, electrical conductivity, organic, inorganic and metals/ non-metals parameters. The sampling and analysis is carried out in accordance with recognised quality assurance and control procedures.

The full details of all the monitoring events including the sampling techniques, analytical methods and results are included in the monitoring reports submitted to the Agency. Summary tables of all of the data and graphs of indicator parameters are included in Appendix 2.

3.1.3.1 Groundwater Levels

The groundwater level data confirm the direction of groundwater flow in both the overburden and the bedrock is locally generally northwards, and that there is localised mounding in the overburden in the area of the site.

3.1.3.2 Groundwater Quality

The monitoring data for the up gradient wells BH31 (D) and BH32 (S) indicate good quality water with little variation throughout the year. Elevated levels for TOC, 19.6mg/l and 18.7mg/l respectively, were recorded for both samples in Q2. The levels were less than 10mg/l at these locations for the remainder of the year. The Ammonia levels were all less than 0.15mg/l N, indicating good quality water. The Chloride results were in the range of 8mg/l Cl to 16mg/l Cl for both monitoring locations which is less than the typical value for Irish groundwaters of 20mg/l Cl.

The water quality was somewhat uncertain in the up gradient wells BH1 (D) and BH2 (S). The ammonia levels in both wells were less than 0.03mg/l N which indicates good quality, however, the ranges for TOC (2.9 to 43.5mg/l) and Chloride (61 to 160mg/l Cl indicate less satisfactory quality. This may indicate that the landfill is impacting on this location.

The data for the perimeter wells BH3 (D) and BH4 (S) show that the improvement noted last year on previous years continued. There were 2 high readings in shallow well BH4 for the ammonia, 4.82mg/L N in Quarter 1 and 7.8mg/l N in Quarter 2. All the other figures were less than 0.152mg/l N for both sampling points. The chloride figures were low, in the range of 10 to 28mg/l Cl. There is some impact on the overburden from the site leachate at this location.

In the down gradient locations the poorest quality water is in the deep well BH13 with the ammonia level particularly high (45.2mg/l) in Q2. It was in the range of 0.327 to 3.79 on the other 3 monitoring occasions. The chloride levels are also high in the range of 25 to 120mg/l Cl. The shallow well BH14 has relatively high levels of ammonia, in the range of 0.058 to 4.3mg/l N. The chloride values at BH14 (S) are low, less than 22mg/l Cl.

At the 2 other down gradient locations there are some relatively poor readings in relation to ammonia, for example BH15 (D) had readings in the range of 0.029 to 2.14mg/l N while BH16 (S) had readings in the range of 0.033 to 0.9mg/l N. The chloride levels are relatively low in the range of 28 to 37mg/l Cl for both wells. Overall, the water quality in the down gradient locations is broadly similar to that of 2008. The annual groundwater monitoring results are included in Appendix 2.

3.1.4 Estimated Annual and Cumulative Quantity of Emissions to Groundwater

The site is not provided with an engineered lining system but a leachate collection lagoon and collection sumps have been constructed and are operating successfully. Leachate is pumped to the lagoon and tankered off-site to Mullingar Wastewater Treatment Plant for treatment. However, there is the potential for the direct discharge of leachate to groundwater. The groundwater quality-monitoring programme has confirmed that leachate is impacting on groundwater quality.

There are two distinct water-bearing formations beneath the site. The uppermost formation is the peat and glacial tills. The bedrock underlying the tills forms the lower formation. It is considered likely that leachate discharges directly to the upper water bearing formation. However, the thickness and low permeability of the tills retards and attenuates the discharge to the bedrock formation.

Leachate also discharges to the site surface water drainage system. Surface water is a potential source of groundwater recharge and as such provides a possible pathway for indirect discharge to groundwater. It is not possible, based on the available information, to estimate the recharge contribution of the surface water drainage system to the groundwater beneath the site.

Estimates of the volumes of leachate generated at the site are discussed in Section 3.3.3. It is not possible based on the available information to quantify the volumes of leachate discharged directly or indirectly to groundwater.

3.1.5 Control Measures

The Council has prepared surface water management, leachate management and restoration and aftercare plans for the site that are designed to mitigate the impact on groundwater quality. Details of the plans are included in Section 6. The Phase 1 Final Capping works which included the construction of a leachate collection system and a leachate lagoon was completed in 2005. Phase 2 Capping contract works due to have been carried out in the past 2 years have been stalled due to access difficulties at the site. This work will go ahead in 2010 as these difficulties have been resolved.

3.2 Surface Water Quality Monitoring

Surface water from the site drains to the Marlinstown stream. The stream is fed by numerous bog drains. The main stream draining the site runs from east to west along the southern boundary before turning north through the western part of the site. It turns west and flows along the northern boundary for a short distance before turning northwards again. The stream swings eastwards and flows for approximately 2.6 km to join the Riverstown River. The Riverstown River is a tributary of the River Deel which itself is a tributary of the Boyne.

3.2.1 Monitoring Locations

The Council monitors surface water quality in 4 locations (SW1, SW2, SW3 and SW5) as shown on Figure 1 in Appendix 3. SW1 and SW2 are located on drains upstream of the site, SW5 is on the Marlinstown Stream immediately downstream of the site. SW3 is also located on the Marlinstown stream approximately 0.7 km downstream of the site.

3.2.2 Monitoring Programme

The monitoring is conducted at weekly, quarterly and annual intervals in accordance with Licence conditions and includes weekly visual inspections and monthly in situ and laboratory testing. The range of analysis is as specified in Schedule D.5.1 of the Waste Licence and includes dissolved oxygen, pH, electrical conductivity, and organic and inorganic parameters.

The sampling and analysis is carried out in accordance with recognised quality assurance and control procedures. The detailed monitoring results are presented in the quarterly monitoring reports submitted to the Agency in the reporting period. Summary tables of all of the data graphs of indicator parameters for each monitoring location are included in Appendix 3.

The sampling point SW1 is upstream on a small drain flowing towards the Landfill from the south. The flow is generally low and in summer it can be stagnant. The water at this point is sometimes of poor quality. This may be accounted for by the low flow,

the occasional stagnant nature of the drain, and the unavoidable disturbance of solids when taking the sample. While BOD readings did not exceed 4mg/l on any occasion, the level of SS in Q3 was high (262mg/l) and Ammonia N was high in Q2 (1.95mg/l N. The sampling point SW2, located on the stream west of the site, is a more representative example of upstream water. It has a steady flow throughout the year. The water quality is satisfactory and complies with A2 values as set out in the EC (Quality of Surface Water Intended for the Abstraction of Drinking Water) Regulations, 1988[S.I. No. 294 of 1989]. The quality would reach A1 standards were it not for elevated ammonia levels on 2 occasions 0.601mg/l in Q1 and 0.240mg/l in Q2.

The water quality at SW5 immediately downstream of the Landfill, while slightly inferior to SW2 upstream, is reasonably satisfactory. Parameters such as SS, Chloride and BOD would place this location in the A1 quality category. However, due to 2 elevated Ammonia readings, 2.48mg/l N in Q1 and 2.9mg/l N in Q2 the appropriate category would be A3. The further downstream surface water location SW3 is broadly similar in quality to SW5 with 2 elevated Ammonia readings (2.48mg/l in Q1 and 2.9mg/l in Q2) placing it in the A3 category. The improvement noted on previous years (slight reversal in 2008) in the downstream sample locations continued in 2009.

The annual monitoring event included a comprehensive range of laboratory analyses as outlined in Schedule D of the Licence W0071-02. All parameters were within the A1 Category requirements of the EC (Quality of Surface Water Intended for the Abstraction of Drinking Water) Regulations 1989 (table 2.2) with the exception of iron and manganese. Both iron and manganese met the A2 Category requirements. The annual monitoring results are included in Appendix 3.

3.2.3 Control Measures

The final capping has been placed on the landfill (Phase 1) and this prevents the ingress of water into the waste and effectively reduces the amount of leachate produced. Leachate is being pumped from the landfill to the holding lagoon and tankered off-site for treatment. Phase II capping contract works will cover the old recycling centre area and will further reduce the likelihood of contamination of the surface water. This capping work will go ahead in 2010 as difficulties with site access have been resolved.

3.3 Leachate

Leachate is a contaminated liquid generated when waste comes into contact with water. The sources of the water typically includes rainfall, surface water runoff and groundwater. At Marlinstown the primary source of leachate generation is rainfall. There may be limited surface water infiltration around the margins of the waste.

3.3.1 Monitoring Locations

A total of six leachate collection wells were installed in the landfill mass during initial site investigations in 1998 and 1999. These six monitoring boreholes were identified as (BH21 to BH26 inclusive). Due to landfill works up to and during 2004 BH23, BH24 and BH25 became inaccessible. Because of this five new boreholes were drilled and identified as BH27-BH31 inclusive. These were monitored during 2004 and part of 2005. After all the Phase 1 Capping works were completed BH21 and BH22 were the only remaining boreholes of the original network. Gas Extraction Wells GEW31, GEW28, GEW25, GEW23, GEW18 and GEW20 have been identified for sampling and recording weekly levels of Leachate. Due to damage to the well pipes both GEW18 and GEW31 cannot be monitored.

3.3.2 Monitoring Programme

Leachate levels are monitored weekly. Leachate quality is monitored at quarterly and annual intervals for a range of different parameters. The range of analysis is as specified in Schedule D.5.1 of the Waste Licence and includes pH, electrical conductivity, and organic, inorganic and microbiological parameters. The sampling and analysis is carried out in accordance with recognised quality assurance and control procedures.

The full details of all the monitoring events including the sampling techniques, analytical methods and results are included in the monitoring reports submitted to the Agency. Summary tables of all of the data for each location are included in Appendix 4.

3.3.2.1 Leachate Levels

The level monitoring did not identify any significant fluctuations in leachate levels during the year. Levels in GEW18 and GEW31 could not be determined due to pipe damage of the wells.

3.3.2.2 Leachate Quality

Leachate samples were collected from 2 boreholes BH21 and GEW28 and from the Leachate Lagoon. The samples were analysed for the range of organic and inorganic parameters defined in the Waste Licence W0071-01. The results are consistent with leachate generated at a municipal waste landfill in various stages of the waste degradation lifecycle. The COD for the boreholes ranged from a low of 285mg/l at GEW21 to a high of 1430mg/l at GEW28. The Chloride levels

ranged from a low of 23mg/l Cl to a high of 2200mg/l Cl. The leachate at the Lagoon is not a true sample as leachate from Ballydonagh Landfill had been deposited in it some weeks in advance of the sampling. The results were somewhat higher than they would otherwise have been. The COD, Ammonia and Chloride levels were 565mg/l, 247mg/l N and 470mg/lCl respectively. For full annual monitoring analyses see Appendix 4.

3.3.3 Leachate Volumes

Water balance calculations have been prepared for the period January to December 2010. The calculations include a cumulative total for the twelve-month period. These calculations will form the basis for the estimation of cumulative totals over the lifetime of the landfill, which will be reported in future AERs.

The water balance calculates the volume of leachate generated at the site on a monthly basis based solely on rainfall data. It was considered that the potential for surface water infiltration was insignificant. The water balance methodology is described below and the calculations shown on Table 3.2 and 3.3
The water balance calculations are based on the methodology specified in the Agency's Landfill Site Design Manual. The calculation used is as follows: -

$$Lo = [ER(A) + LW + IRCA + ER(l)] - [aw]$$

Lo = leachate produced (m^3)
ER = effective rainfall (m) (Use actual rainfall (R) for active cells)
A = area of cell (m^2)
LW = liquid waste (also includes excess water from sludges) (m^3)
IRCA = infiltration through restored and capped areas (m)
l = surface area of lagoon (m^2)
a = absorptive capacity of waste (m^3/t)
W = weight of waste deposited (t/a)

The meteorological data used was from the meteorological station at Mullingar. Given the history of filling at the site the entire site was included in the calculations. Meteorological data is presented in Appendix 1.

Where the evapotranspiration rate was higher than the total rainfall a conservative zero effective rainfall was assumed. In the restored area (70,000 m^2) the infiltration rate of the rainfall was assumed at zero due to the permanent capping being completed on this area of the landfill in March 2005, which is in accordance with the EPA Landfill Site Design Manual. In the unrestored area (20,000 m^2 approx) a conservative estimate of 25% of the annual rainfall figure was used to calculate the infiltration in the temporary capped area. The Civic amenity area does not form part of the temporary capped area for calculation purposes as it is paved. The 20,000 m^2 covers the area from the civic amenity area to the entrance gate.

The estimated volume of leachate generated for the reporting period is 3599 m^3 (Table 3.2). Cumulative annual figures are given in Table 3.3. The quantity of leachate removed off site for treatment in the reporting period is shown in Table 3.1 below.

2009 Leachate Volumes Removed from Site. Table 3.1

Month	Volume of Leachate Removed (m^3)
January	
February	223
March	
April	
May	
June	191
July	382
August	255
September	227
October	
November	46
December	655
Total	**1979**

3.3.4 Control Measures

The Council has prepared and implemented a leachate management plan for the site, which in conjunction with the surface water management and restoration and aftercare plans, is designed to minimise the future generation of leachate and to mitigate the impact on surface and ground water quality. The Phase I Final Capping contract was completed in 2005 and the remainder of the site will be permanently capped in 2010.

Table 3.2: 2009 Annual Leachate Volume Calculations

Month	Restored Area (m^2)	Unrestored Area (m^2)	Actual Rainfall (m)	Effective Rainfall (m) ER	[1]Infiltration Through Restored Area (m^3) IRCA	[2]Infiltration Through Unrestored Area (m^3) IRCA	Weight of Waste Deposited (Tonnes) W	Leachate Produced (m^3) Lo
January	70,000	20,000	0.1046	0.0959	0.00	479.50	0.0	479.50
February	70,000	20,000	0.0256	0.0119	0.00	59.50	0.0	59.50
March	70,000	20,000	0.0407	0.0090	0.00	45.00	0.0	45.00
April	70,000	20,000	0.1029	0.0555	0.00	277.50	0.0	277.50
May	70,000	20,000	0.0750	0.0052	0.00	26.00	0.0	26.00
June	70,000	20,000	0.0865	0.0000	0.00	0.00	0.0	0.00
July	70,000	20,000	0.1964	0.1228	0.00	614.00	0.0	614.00
August	70,000	20,000	0.1351	0.0769	0.00	384.50	0.0	384.50
September	70,000	20,000	0.0382	0.0000	0.00	0.00	0.0	0.00
October	70,000	20,000	0.0897	0.0680	0.00	340.00	0.0	340.00
November	70,000	20,000	0.2136	0.2041	0.00	1020.50	0.0	1020.50
December	70,000	20,000	0.0740	0.0704	0.00	352.00	0.0	352.00
Total				**0.7197**	**0**	**3,599**		**3599**

Notes:
(1) The 70,000 m^2 Restored Area was permanently capped by the end of March 2005 so the infiltration rate since from the rainfall is 0.

(2) Effective rainfall figures, at a 25% infiltration rate, were used to calculate the infiltration through the unrestored fill area.

Table 3.3 - 2009 Cumulative Leachate Volume Calculations

Year	Active Area (m^2)	Active area infiltration (m^3)	Waste input tonnes	Restored area (m^2)	Rest. area infiltration (m^3)	Unrestored area (m^2)	Unrest. area infiltration (m^3)	Total Water (m^3)	Cumulative water (m^3)	Absorptive Capacity input (m^3)	Cumulative Absorptive Capacity (m^3)	Total Volume Sludge	Cumulative Volume Sludge (tonnes	Annual Leachate (m^3)	Cumulative Leachate (m^3)
2001	2000	1330	30058.2	8,000	639	80000	25576	29948	29948	1803	1803	2402	2402	28144	28144
2002	2000	2425	32383.7	8,000	1614	80000	64551	68606	98554	1943	3747	15	2417	66663	94807
2003	0	0	0	70,000	5493	0	0	5493	104047	0	3747	0	0	5493	100300
2004	0	0	0	70,000	7317	0	0	7317	111364	0	3747	0	0	7317	107617
2005	0	0	0	70,000	3210	20,000	2583	5793	117157	0	3747	0	0	5793	113410
2006	0	0	0	70,000	0	20,000	3037	3037	120194	0	3747	0	0	3037	116447
2007	0	0	0	70,000	0	20,000	2621	2621	122815	0	3747	0	0	2621	119068
2008	0	0	0	70,000	0	20,000	3256	3256	126071	0	3747	0	0	3256	122324
2009	0	0	0	70,000	0	20,000	3599	3599	129670	0	3747	0	0	3599	125923

(1) The 70,000 m2 Restored Area was permanently capped by the end of March 2005 so the infiltration rate since is 0.

(2)Effective rainfall figures were used to calculate the infiltration through unrestored fill area (past the civic waste area and to the west of the site out to entrance gate) a 25% infiltration rate was used for the unrestored area. Temporary Capping with 600mm soil.

3.4 Landfill Gas

Landfill gas is produced during the breakdown of waste within the landfill. It is a by-product of the digestion, by anaerobic bacteria, of the organic component of the waste. Landfill gas comprises a mixture of different gases. Methane and carbon dioxide (in the ratio of 3:2) are the main components, with small concentrations of a wide variety of compounds. The number and ratio of gases at any one time depends on the breakdown process which occurs in stages and which is subject to controlling factors. These factors include: -

- Physical dimension of the site,
- Type and input rate of waste deposited,
- Waste age,
- Moisture content, pH, temperature and density of wastes,
- Application of cover, compaction and capping.

3.4.1 Monitoring Locations

The Council monitors landfill gas at 32 permanent monitoring wells (G1 to G32) at locations in and around the landfill and in Hamill's shop. Since May 2006 the Council have been monitoring the level of Gas at G26 which is south of the Landfill and to the west of the Service Station daily because of gas migration issues. In mid June 2006 the Council installed 5 temporary Piezometers (G33 to G37 inc.) around the perimeter of G26 to fully investigate the gas migration issue. The Council in collaboration with their consultants Fehily Timoney & Company have submitted a proposal to The Agency for approval to address this issue and carry out the works in conjunction with the Phase II Final Capping works. In October 2007 the Council installed 20 gas monitoring/vent wells inside the landfill site and outside the perimeter of the waste body (Drawing No. 07-794-EHLoc001). Eleven of the wells are on the south side adjacent to Hamill's shop. It was noted that whilst the boreholes were being drilled that the Methane levels adjacent to the filling station significantly reduced and stayed low whilst the wells were open prior to fitting of the gas valves. In 2009 the caps were removed from these wells for some time but there was no reduction observed in well G26 (G26 is only well in the filing station area giving high methane).

Monitoring locations G11 to G15 are located in the fill area and have become inaccessible due to the engineering works and have been replaced for monitoring purposes with GEW1, GEW4, GEW28 and GEW24 (GEW Denotes Gas Extraction Well). Monitoring locations G1 to G10 and G16, G17 and G18 are located outside the fill area to monitor for the migration of landfill gas from the fill. In October 2009 the Council installed 3 extra gas monitoring wells (G58 –G60) in Hamill's land between wells G26 and G27 to check if gas was present in this area. Summary tables of the data and well locations are included in Appendix 5.

3.4.2 Monitoring Programme

Monitoring is carried out at daily, weekly and monthly intervals in accordance with the licence conditions. Daily monitoring is carried out at Hamill's shop, at points G16, G17, G18, G26 and G33 to G37, and three times weekly at G7, G8 and G9 to monitor migration and assess the efficacy of the landfill gas migration barrier installed along the southern edge of the fill area. The remaining wells G1 to G6, G10, G11 and G19 to G32 are monitored monthly.

The monitoring programme includes methane, carbon dioxide, oxygen, temperature and atmospheric pressure. The monitoring results are presented in the summary tables in Appendix 5.

The data for the wells in the main body of the Landfill confirmed that the waste in this area of the site is actively gassing. The Methane levels in these wells GEW1, GEW4, GEW24 and GEW28 are in the range 0 to 68.3%. The Methane levels in wells G10 and G11 are much lower (less than 12.3%) than those in the rest of the Landfill. The waste in this area of the landfill is older and is consistent with an aged waste with generally lower levels of methane.

On the south side of the Landfill the perimeter wells G1 to G5 have Methane levels which are generally high (0.1% to 55.9%). This indicates that gas is migrating towards the south in this area. Methane readings of 0 to 0.2% were recorded for well G6 on the north-east corner of the site.

A limit of 1% methane applies to any measurements on or adjacent to the facility and/or at any point located outside the body of the waste. The data from the points located outside the fill (G7, G8, G9 and G32) indicate that gas is migrating to the north margins of the fill with Methane levels in the range of 2.5% to 47.9%. Wells G27 outside the site to the south west and G28 outside to the north east have elevated levels of methane ranging from 0.5% to 5.7%. High levels of methane gas were observed at G26 outside the facility on the southern side, with levels ranging from 2.6% to 40%. At G17 adjacent to the Esso Service Station methane readings did not exceed 1% and were generally less than 0.3%. The presence of elevated levels of gases was not detected at the Esso shop. There was no methane detected in the new wells G58 to G60.

A gas fingerprinting analysis was carried out in July to try to determine the origin of the gas at G26. The report, carried out by consultants TMS, suggests that the gas may be attributable to fuel sources. This report was sent to the Agency in December.

Gas balancing is carried out weekly at the Landfill in order to optimise the flaring process and to reduce migration from the site.

3.4.3 Landfill Gas Volumes

The Council submitted to the Agency a report on the feasibility of flaring landfill gas at the site. The report included a detailed assessment of the landfill gas generation potential of the site, which is summarised below.

Estimates of gas volumes generated at the site were made for a thirty-five year period. This period extends more than 30 years beyond the operational lifetime of the landfill to reflect the continued generation of gas post-closure and the Council's recognition of the need to provide for post-closure landfill gas management.

For predictive purposes Year 1 was taken as 1999. The estimates were based on the following assumptions of waste inputs and landfill gas characteristics: -

Biodegradable waste placed	251,000 tonnes
Annual Biodegradable waste inputs	15,000 tonnes/annum
Lifetime	4 years
Time to reach steady stage production	1 year
Potential future gas production per annum	8.5 m^3/tonne of waste; years 1-10 2.0 m^3/tonne of waste; years10-40

It was assumed that in Year 1 (1999) 251,000 tonnes of the waste placed in the Landfill was generating gases, of which 122,500 tonnes was generating 8.5 m^3/tonne and 128,500 tonnes at 2 m^3/tonne. It was assumed the waste placed in 1999 would not begin producing significant volumes of gas until 2000.

It was assumed that the annual waste inputs reached steady state gas generating conditions within twelve months and that gas generation would not be impacted by reductions in moisture content following the placement of the final capping. Gas volumes will gradually reduce over the following 40 years as the biodegradable content is depleted and although gas may continue to be produced to year 50, the levels will be negligible. The projected gas yields are presented in Table 3.4.

3.4.4 Landfill Gas Control

The initial site design did not include for any landfill gas control measures at the site, which was consistent with the typical design and operation of small scale landfills throughout the country. Based on the monitoring data the Council was concerned about the off-site migration of landfill gas from the southern boundary of the fill. The Council commissioned a risk assessment of landfill gas migration, which confirmed that off-site movement presented a risk to properties to the south of the facility. A copy of the risk

assessment report was submitted to the Agency and its findings are discussed in more detail in Section 6.

The Council constructed a landfill gas cut off and venting trench along the southern edge of the landfill. The trench was excavated in the natural ground to a level below the base of the waste. The southern side of the trench was lined with synthetic liner and the trench was backfilled with granular material. The barrier was installed in September 2001. The gas-venting trench was covered with a plastic sheet and 300mm of soil in May 2002 to prevent ingress of rainwater and gas venting pipes were installed to allow gas to vent to atmosphere. A further 10 no. Gas venting wells were constructed under Phase I of the Contract works at Marlinstown Landfill in August 2003.

In addition to the barrier along the southern site boundary, the Council installed an active landfill gas collection system as part of the closure and restoration plan for the site. In 2005 Phase I Final Capping along with a combined gas/leachate extraction system was installed. The capping consisted of a topsoil layer, a subsoil layer, a drainage layer, an impermeable layer and a gas collection layer. The combined gas/leachate extraction system comprised of installation of 38 gas wells with five gas well manifolds and five pumped condensate knockout pots. A new enclosed 750m3/hr flare was installed with a programmable logic computer (PLC) and data logging system to monitor operation of the gas/leachate system. The gas field was balanced during 2009 to optimise the flaring system and reduce gas migration from the site. All previously installed gas venting wells around the landfill and in the gas barrier were covered with phase I capping works. In September 2007 the Council also installed a further 20 no. gas monitoring wells around the perimeter of the Landfill. This work was carried out as part of the site investigation work to determine the gas migration pathway. The information gained from the site investigation will be used in the design of the gas mitigation measures. For Phase II Final Capping works at Marlinstown the Council have submitted proposals to The Agency for approval. Part of these works include 10 no. additional gas extraction wells to help alleviate the gas migration issue from the landfill site. Approval for the SEW has been received from The Agency for the proposed works.

A report on the Findings on Marlinstown Gas Pathway Investigation was submitted to the Agency along with a position paper to review the specified engineering works for Phase 2 final capping. The position paper recommends changing the design philosophy to allow passive venting.

Table 3.4 Landfill Gas Volumes

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Annual Waste Input 1 x 10^3 tonne/year	15	15	15	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cumulative Waste Input 1 x 10^3 tonne/	266	281	296	316	316	316	316	316	316	316	316	316	316	316	316	316	316	316	316	316	316	316	316	316	316	311	311	311	311	311	311	311	311	311	311
Waste producing Gas at 8.6 m^3 / tonne	121.5	125	128	131	139	127	115	102.5	90	77	64	49	34	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Waste producing Gas at 2 m^3 / tonne	128.5	122	115.5	109	102.5	96	89.5	83	76.5	70	78.5	87	95.5	104	108.5	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
Gas Yield m^3/yr x 10^3	1302	1319	1332	1345	1400	1284	1168	1048	927	802	707	595	483	371	217	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120

3.5 Noise Survey

At the start of 2008 the Council applied to the EPA for permission to cease noise monitoring at Marlinstown Landfill, as the Landfill was closed and therefore, there were no activities giving rise to noise. The EPA acceded to this request so there was no noise monitoring carried out in 2008.

3.6 Dust Monitoring

Dust is monitored at three locations around the site (D1, D2, and D3) as shown on Figure 1 in Appendix 7. During the reporting period three dust monitoring events were completed in Q1, Q2 and Q3. A summary table of the results of the monitoring locations is included in Appendix 7.

In Quarter 2 there are no results due to organic contamination of the monitoring gauges. In Quarters 1 and 3 the results were well below the licence limit of 350 mg/m^2/day with readings in the range of 2 and 259 mg/m^2/day. It can therefore be concluded that the quality of the ambient air in the vicinity of Marlinstown Landfill site is good, as it should be, given that there is no activity at the site.

4. SITE DEVELOPMENT WORKS

4.1 Engineering Works Undertaken During the Reporting Period

There were no engineering works carried out in 2009. The planned Phase 2 capping contract was deferred to 2010 due to access problems.

4.2 Site Restoration

The Council prepared and submitted to the Agency a Restoration and Aftercare Programme in August 2001 (Ref. Section 6). The Agency accepted the programme subject to a number of specified amendments. The programme involved re-grading existing filled areas and placing additional fill to achieve a proposed final waste profile. Following this the waste was capped with a low permeability capping system and seeded. Phase II of the final capping of the Civic Amenity area planned for 2009 was unable to go ahead due to access difficulties.

4.3 Site Survey

A site survey is being submitted with this report in Appendix 7.

4.4 Future Developments

Phase II capping works are scheduled to go to ahead in April 2010. The capping works will include measures to deal with the gas migration from the Landfill.

A site investigation contract undertaken in October 2007 with the installation of 20 gas monitoring wells will provide the necessary information on the geology and hydrogeology along the Landfill perimeter in the areas of the migration. This information will be used in the design of the gas mitigation measures. The location of the additional wells are shown in Appendix 7.

4.5 Resource Consumption

The following resources were used on-site during the reporting period: -

- Electricity (530 kWhr),

4.6 Septic Tank Maintenance

Toilet facilities have been disconnected since the closure of the Waste Transfer Station and Civic Amenity Area in January 2007.

5. ENVIRONMENTAL INCIDENTS AND COMPLAINTS

5.1 Incidents

During the reporting period there were 13 incidents recorded at the site. Twelve of these were in relation to elevated levels of Methane and Carbon Dioxide at some of the wells during the monthly and daily monitoring at gas wells G7 to G32 inclusive. The other incident was in relation to operation problems with the flare. All Incidents were notified to the Agency.

5.2 Register of Complaints

The Council maintains a register of complaints in relation to the operation of the facility in accordance with Condition 10.4 of the Waste Licence. No complaints were received during the reporting period of 2009.

6. ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

Report on progress during 2009 towards achieving the Objectives and Targets.

The Environmental Management Programme (EMP) prepared for 2009 contained a schedule of objectives and targets and the means for their implementation.

6.1.1 Project 1 – Environmental Management System (EMS)

Task 1: Task 1 was assumed to be in order regarding the EMS documentation.

Obtain confirmation from the Agency of the suitability of the proposed EMS documentation.

Task 2: This task was completed.

Complete an assessment of personnel training needs by 31/08/2009.

Task 3: This task was completed.

Establish additional training programme(s) required by 30/09/2009.

Task 4: This task was completed.

Deliver the training programme by 31/12/2009.

Task 5: This task was completed.

Ensure that all procedures prepared as part of the works to meet the other Objective and Targets specified in this Schedule comply with all EMS requirements including designation of responsibility, performance assessment, corrective action and document control.

Task 6 This task was not completed and will be incorporated into the objectives and targets for 2010.

Develop and implement an internal audit procedure to monitor EMS performance by 30/06/2009.

6.1.2 Project 2 – Leachate Collection

Task 1: This task was not completed and will be incorporated into the objectives and targets for 2010

The interceptor drain will intercept leachate migrating from the Civic Amenity Recycling Area of the site. The leachate will be pumped from collection chambers located on the drain to the leachate holding lagoon. The leachate interceptor drain will be constructed by 31/10/2009.

Task 2: This task is ongoing.

Carry out pumping and draw down trials in the existing leachate extraction wells to establish the effectiveness of reducing leachate levels within the body of the waste of Phase 1 area.

6.1.3 Project 3 – Surface Water Management

Task 1: This task was not completed and will be incorporated into the objectives and targets for 2010.

The design and construct the swale taking into consideration the existing ground conditions. The swale is constructed outside the leachate interceptor drain located around the Civic Amenity Recycling Area of site. The surface water interceptor swale will be lined with LLDPE and constructed by 31/10/2010.

6.1.4 Project 4 – Restoration of Landfill Areas

Task 1: This task was not completed and will be incorporated into the objectives and targets for 2010.

Complete installation of low permeability capping system around the Civic Amenity Recycling Area of the site incorporating a topsoil layer, a subsoil layer, an infiltration drainage layer, low permeability layer and a landfill gas collection layer. The infiltration drainage layer will tie into the perimeter surface water swale. The topsoil element of the cap will be seeded. The capping system for the Civic Amenity Recycling Area of the site will be completed by 31/10/2010.

Task 2 This task was not completed and will be incorporated into the objectives and targets for 2010.

Instillation of two sets of gas wells within the Civic Amenity Recycling Area of the site.

Task 3 This task was not completed and will be incorporated into the objectives and targets for 2010.

To carry out mitigation measures for the gas migration from the site in accordance with the SEW approved by the agency.

Task 4 This task was not necessary as works did not take place.

Flare was kept fully operational at all times.
Existing 750m^3/hr flare and existing gas extraction wells in Phase 1 of the site to be kept fully operational during the construction work.

Task 5 This task was not completed and will be incorporated into the objectives and targets for 2010.

Every precaution to be taken to ensure that any migration of gas be kept to a minimum during the construction work. In particular method statements will be required from the contractor to show how capping work will be carried out around the existing gas extraction system.

7. OTHER REPORTS

A report on the Findings on Marlinstown Gas Pathway Investigation June 2008 was submitted to the Agency along with a position paper to review the specified engineering works for Phase 2 final capping. The position paper recommends changing the design philosophy to allow passive venting. The Agency agreed with these recommendations.

A report entitled Landfill Gas Collection System Performance was submitted to the Agency in December. This report was to audit the performance of the landfill gas extraction system.

7.1 Restoration and Aftercare Programme

The following programmes and plans will continue to be implemented until all closure works have been completed on the entire site. The majority of these reports have already been discussed in previous sections of the AER and have been submitted to The Agency. They are summarised below.

The Council has prepared a restoration and aftercare plan for the site, which has been submitted, to the Agency. The restoration plan included capping of the Landfill with: -

- Topsoil (150-300 mm),
- Subsoils (700-850 mm),
- Drainage layer (500 mm thick, k $1x10^{-4}$ m/s),
- Compacted mineral layer (600 mm thick, k $<1x10^{-9}$ m/s) or geosynthetic layer,
- Gas collection layer (300 mm of natural material or geosynthetic).

Phase 1 of the capping works has been completed. SEW approval has been given by the Agency for phase II capping works.

Following the placement of the cap the topsoil will be seeded with long-term leys suitable as poor pasture. A test area will be planted with a standard meadow grass mixture prior to selection of the grass mixture to be used in the overall seeding. In order to lessen the impact of the final profile the site will also be planted with patches of brambles or hedges to break up the overall landmass.

7.2 Surface Water Management Plan

The Council proposes to install a surface water cut-off drain/swale surrounding the entire site to intercept and divert surface water from the body of the waste. The swale will be lined with a geosynthetic clay liner to limit infiltration into the body of the waste.

The Council's proposals for the final shaping and capping of the waste includes for surface water control measures. The final waste profile encourages the shedding of rainwater to a series of new perimeter drains. The capping system includes for a drainage layer, which intercepts infiltrating rainfall, and direct it to the perimeter drains.

7.3 Leachate Management Plan

There are no engineered natural or synthetic basal seals in the landfill area. The Council has prepared a leachate management programme that has been approved by the Agency. The programme includes the installation of the perimeter collection drain, extraction boreholes in the body of the waste and the provision of a low permeability capping system.

The perimeter drains were installed at original ground level, or formation level at which the waste was placed and were graded to a fall of 1:200. Leachate is pumped from the drains at 4 collection chambers located on the drains to an on-site leachate holding lagoon. The leachate monitoring boreholes will be converted to extraction wells following the completion of the site restoration works.

The holding lagoon has been provided with a composite lining system comprising a 2 mm synthetic sheet, such as High Density Polyethylene (HDPE), overlying a 1m layer of compacted soil with a permeability of less than $1x\ 10^{-9}$ m/s. The lagoon is fitted with floating aerators to provide on-site pre-treatment of the leachate. The leachate is removed by a road tanker for treatment at a municipal wastewater treatment facility.

The Council has placed a low permeability capping system over the landfill area as described in Section 7.2. Before placement of the capping system the area to be capped was shaped to enhance surface water run-off. The capping system will minimise the infiltration of incident rainfall to the waste, which is the primary source of leachate generation at the site. The above works have been completed for Phase I capping works. SEW approval has been given by The Agency for Phase II capping works.

7.4 Gas Risk Assessment

The report identified that landfill gas migration from the site presented a range of moderate to high risks to properties around the site, to the on-site buildings, to vegetation and local air quality. The areas of greatest concern were the site buildings, the service station to the south of the site, and the properties to the west and south of the site. The report recommended that automatic gas alarms be installed in the site buildings, that further monitoring locations be installed and the monitoring frequency increased to allow preventative actions to be taken if considered necessary.

The Council has acted on the findings of the report. Automatic gas alarms have been fitted in the site buildings and the monitoring frequency increased. The Council installed a gas interceptor and venting trench along the southern site boundary and has incorporated an active abstraction and flaring system in the works programme for the restoration and aftercare of the site. The Council has installed 15 additional gas monitoring wells around the fill area in 2002 and 10 new gas venting wells in August 2003, and 10 new gas extraction wells and open flare for the pumping trial in march 2004. Throughout 2005 the council has installed 38 no. gas extraction wells and 5 no. combined leachate extraction wells. During June 2006 the Council installed 5 no. piezometers to assess the extent of the gas migration on the southern side of the landfill and a report was submitted to The Agency. In October 2007 the Council installed 20 gas monitoring wells, 11 of which are on the south side, 5 on the North East, 3 on the North West and one on the main entrance road between the leachate lagoon and boundary fence of the landfill. In October 2009 the Council installed 3 extra gas monitoring wells (G58 –G60) in Hamill's land between wells G26 and G27 to check if gas was present in this area. The well locations are included in Appendix 5.

7.5 Landfill Gas Flaring

Gas pumping and flaring trials were carried by the Council. Following the results of these trials a 750m3/hr Flare and 38 landfill wells were installed. The Council have submitted a proposal for approval to install 10 no. additional gas extraction wells to help remediate the gas migration from the landfill.

The gas flow to the flare and the methane concentration have decreased slightly on 2008 figures. In 2009 the average flow was 170m^3/hr and the methane concentration was 26.7%.

7.6 Environmental Management System (EMS) Documentation

During 2009 the council did not submit any new Standard Operating Procedure to The Agency.

7.7 Financial Provision

The Agency has not set a date for the establishment of a fund or written guarantee required to ensure the implementation of the Restoration and Aftercare Plan as set out in Condition 12.2.1 of the Waste Licence.

Notwithstanding this, the Council has made provision for the closure and aftercare of the facility as follows: -

- During 2004, €239,000 was set aside as a restoration fund.
- During 2005, €239,000 was set aside as a restoration fund.
- During 2006, €239,000 was set aside as a restoration fund.
- During 2007, €239,000 was set aside as a restoration fund.
- During 2008 €117,000 was set aside as a restoration fund
- During 2009 €117,000 was set aside as a restoration fund.

Westmeath County Council has invested over 2.95 Million Euro in Restoration and Capping Works to date.

APPENDIX 1

Meteorological Report

Effective Rainfall Calculation 2009 (Actual Rainfall minus Potential Evaporation)

Month	Rainfall (mm)	Potential Evapotranspiration	Effective Rainfall
Jan	104.6	8.7	95.9
Feb	25.6	13.7	11.9
Mar	40.7	31.7	9.0
Apr	102.9	47.4	55.5
May	75.0	69.8	5.2
Jun	86.5	87.2	-0.7
Jul	196.4	73.6	122.8
Aug	135.1	58.2	76.9
Sep	38.2	40.9	-2.7
Oct	89.7	21.7	68.0
Nov	213.6	9.5	204.1
Dec	74.2	3.8	70.4
Total	1182.5	466.2	716.3

Note: The effective rainfall values for June and September are negative values, assumed to be 0

Jan-09											
Year	Month	Day	Rainfall	Wind Speed (Knots)	Wind Direction (Degrees from North)	Relative Humidity (%)	MSL Pressure (hPa)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Evaporation (mm)	Potential Evapotranspiration (Penman)
2009	1	1	0.0	6.4	80	88	1029.2	2.8	1.2	0.40	0.298
2009	1	2	0.0	4.5	90	82	1031.1	4.6	-0.3	0.23	0.163
2009	1	3	0.0	2.8	125	73	1030.3	3.0	1.1	0.64	0.468
2009	1	4	0.2	1.0	190	90	1024.1	3.4	-3.2	0.34	0.264
2009	1	5	0.0	2.5	80	89	1025.8	4.8	-4.9	0.14	0.058
2009	1	6	0.0	1.0	235	84	1029.4	1.9	-6.1	0.16	n/a
2009	1	7	0.0	1.5	210	88	1027.7	2.5	-7.2	0.06	n/a
2009	1	8	0.0	2.5	165	90	1027.4	4.0	-6.0	0.06	n/a
2009	1	9	0.0	4.4	155	86	1024.9	5.8	-3.6	0.18	0.125
2009	1	10	2.0	12.3	195	81	1014.7	8.4	1.8	0.83	0.622
2009	1	11	12.1	13.1	190	89	1004.4	11.0	7.9	0.79	0.59
2009	1	12	3.2	6.2	210	90	1001.8	8.7	5.2	0.28	0.203
2009	1	13	1.3	3.7	215	92	1007.8	6.7	1.0	0.12	0.054
2009	1	14	7.9	9.9	140	92	1003.4	10.0	-1.5	0.62	0.435
2009	1	15	1.2	10.8	190	88	997.6	10.1	4.5	0.42	0.3
2009	1	16	0.5	7.5	175	89	1001.0	9.3	3.2	0.67	0.534
2009	1	17	6.9	12.2	210	86	991.0	6.8	0.8	0.68	0.473
2009	1	18	4.7	9.0	205	90	987.3	4.2	0.3	0.50	0.369
2009	1	19	5.1	8.0	210	90	975.6	4.4	0.5	0.35	0.255
2009	1	20	1.8	7.3	215	88	985.3	3.3	0.5	0.49	0.351
2009	1	21	5.3	7.7	170	93	989.7	9.1	-0.2	0.54	0.39
2009	1	22	5.9	8.4	220	85	978.0	9.9	2.6	0.36	0.261
2009	1	23	0.1	5.3	235	88	978.8	6.3	-0.9	0.37	0.267
2009	1	24	1.0	7.3	210	89	983.7	5.1	-1.2	0.31	0.213
2009	1	25	4.1	6.5	170	90	973.9	6.8	0.7	0.18	0.099
2009	1	26	1.0	4.8	280	88	999.0	8.5	2.5	0.37	0.261
2009	1	27	3.1	3.7	190	97	1007.2	8.3	1.7	0.33	0.228
2009	1	28	0.0	3.5	160	93	1012.0	8.4	-1.9	0.31	0.182
2009	1	29	1.1	13.3	140	91	1005.0	8.4	4.1	0.65	0.427
2009	1	30	28.2	11.3	145	96	1000.3	11.0	6.9	0.59	0.39
2009	1	31	7.9	7.6	130	95	1004.1	6.7	5.3	0.59	0.428
Total			104.6								8.7

Feb-09											
Year	Month	Day	Rainfall	Wind Speed (Knots)	Wind Direction (Degrees from North)	Relative Humidity (%)	MSL Pressure (hPa)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Evaporation (mm)	Potential Evapotranspiration (Penman)
2009	2	1	0.0	7.7	80	80	1011.9	4.9	1.7	0.81	0.623
2009	2	2	0.0	6.1	15	77	1007.9	2.8	-1.0	0.75	0.571
2009	2	3	5.8	7.3	60	95	990.1	2.2	0.3	0.52	0.365
2009	2	4	10.7	5.9	70	93	992.4	3.9	-0.9	0.48	0.333
2009	2	5	0.0	5.5	340	90	995.7	2.2	-0.9	0.49	0.346
2009	2	6	0.0	4.3	315	89	999.1	4.3	-1.6	0.48	0.308
2009	2	7	0.0	4.7	290	83	1004.0	4.3	-3.6	0.57	0.383
2009	2	8	1.7	3.3	225	93	999.5	6.5	-3.9	0.56	0.385
2009	2	9	0.0	3.1	5	98	995.8	3.0	-1.8	0.35	0.229
2009	2	10	0.0	3.5	270	91	1007.3	7.0	-1.4	0.56	0.339
2009	2	11	0.0	2.0	240	96	1020.1	7.3	-2.2	0.47	0.301
2009	2	12	0.1	3.8	245	93	1025.0	9.9	1.2	0.58	0.419
2009	2	13	0.1	1.1	255	93	1025.5	9.0	4.4	0.53	0.371
2009	2	14	0.1	2.7	195	89	1026.6	9.3	4.3	0.70	0.515
2009	2	15	0.0	4.3	215	88	1027.7	10.9	5.2	0.82	0.59
2009	2	16	0.0	4.2	240	91	1027.9	9.6	1.5	0.64	0.455
2009	2	17	0.0	1.8	255	83	1029.9	10.5	5.5	0.80	0.541
2009	2	18	0.1	2.1	180	83	1027.7	7.8	4.7	0.74	0.552
2009	2	19	2.0	2.0	315	88	1029.4	9.4	4.0	0.70	0.489
2009	2	20	0.0	2.4	230	88	1032.9	7.6	-2.0	0.68	0.451
2009	2	21	0.0	5.1	230	86	1033.1	10.0	4.5	0.85	0.603
2009	2	22	1.5	4.9	265	91	1031.2	10.7	6.6	0.84	0.592
2009	2	23	0.4	3.3	280	94	1029.1	10.6	6.3	0.75	0.547
2009	2	24	0.1	2.0	205	93	1028.6	9.8	6.5	0.80	0.576
2009	2	25	0.4	5.0	250	82	1027.4	10.5	4.5	1.17	0.829
2009	2	26	0.0	6.7	240	89	1023.5	10.6	3.5	0.88	0.618
2009	2	27	0.0	6.2	220	87	1018.1	9.5	7.1	0.98	0.73
2009	2	28	2.6	5.7	180	90	1008.9	10.2	5.7	0.90	0.656
Total			25.6								13.7

Mar-09											
Year	Month	Day	Rainfall	Wind Speed (Knots)	Wind Direction (Degrees from North)	Relative Humidity (%)	MSL Pressure (hPa)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Evaporation (mm)	Potential Evapotranspiration (Penman)
2009	3	1	1.2	4.7	265	89	1008.9	8.3	1.5	1.02	0.679
2009	3	2	2.8	5.5	220	94	1013.5	9.6	-0.1	0.84	0.613
2009	3	3	5.2	6.8	195	92	993.5	5.7	-0.8	0.64	0.426
2009	3	4	2.3	3.4	240	92	981.2	4.5	-2.1	0.86	0.593
2009	3	5	1.3	3.8	275	87	997.1	7.8	-1.5	1.26	0.861
2009	3	6	0.5	4.5	190	92	1004.2	10.3	-1.1	0.82	0.561
2009	3	7	8.9	8.3	210	91	1002.6	11.5	4.7	0.88	0.605
2009	3	8	0.6	9.3	240	84	999.8	5.9	1.2	1.36	0.893
2009	3	9	5.5	7.5	245	84	1007.6	8.3	2.9	1.24	0.797
2009	3	10	0.4	4.4	245	87	1010.9	9.8	5.9	1.28	0.914
2009	3	11	1.6	7.4	215	89	1017.8	13.6	7.3	1.26	0.916
2009	3	12	0.9	5.5	245	82	1018.8	12.3	3.6	1.59	1.067
2009	3	13	1.3	7.4	170	92	1012.1	9.8	3.0	0.74	0.491
2009	3	14	0.4	8.0	250	76	1017.3	11.1	5.7	1.80	1.305
2009	3	15	0.0	5.1	210	81	1029.9	11.5	4.6	1.57	1.13
2009	3	16	0.0	3.8	200	86	1031.2	10.6	3.9	1.18	0.857
2009	3	17	0.0	5.4	140	81	1033.3	13.4	6.4	2.06	1.441
2009	3	18	0.0	4.2	145	79	1030.4	16.2	1.8	2.34	1.663
2009	3	19	0.0	4.5	95	88	1028.0	14.1	0.0	1.92	1.335
2009	3	20	0.0	5.6	160	87	1028.7	12.5	1.9	2.04	1.387
2009	3	21	0.0	2.6	305	88	1034.8	12.3	-0.2	1.24	0.896
2009	3	22	0.0	5.0	270	85	1035.3	11.4	3.3	1.44	1.044
2009	3	23	0.9	9.0	300	80	1023.9	9.4	3.1	1.27	0.789
2009	3	24	0.0	6.5	245	88	1018.9	11.1	1.5	1.32	0.927
2009	3	25	0.1	10.3	285	74	1009.1	11.1	5.9	2.43	1.649
2009	3	26	4.0	11.2	275	82	1000.8	9.4	3.5	2.08	1.199
2009	3	27	0.8	8.8	270	80	997.8	8.5	2.7	2.29	1.483
2009	3	28	0.1	8.0	330	66	1009.8	7.6	-1.0	2.18	1.422
2009	3	29	1.8	5.0	180	89	1010.7	8.4	-1.6	1.17	0.757
2009	3	30	0.1	3.6	235	88	1017.7	12.5	6.7	1.56	1.15
2009	3	31	0.0	2.8	190	78	1022.1	15.4	6.4	2.50	1.815
Total			40.7								31.7

Apr-09											
Year	Month	Day	Rainfall	Wind Speed (Knots)	Wind Direction (Degrees from North)	Relative Humidity (%)	MSL Pressure (hPa)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Evaporation (mm)	Potential Evapotranspiration (Penman)
2009	4	1	0.0	4.6	175	79	1023.4	11.8	4.2	1.67	1.229
2009	4	2	0.0	3.3	175	76	1020.8	16.3	-0.3	2.89	2.056
2009	4	3	5.5	6.6	165	93	1013.4	10.9	2.6	1.34	0.914
2009	4	4	1.8	6.4	270	77	1017.5	11.2	3.0	2.62	1.782
2009	4	5	0.0	6.2	170	78	1018.7	11.9	0.4	2.25	1.57
2009	4	6	1.2	8.0	145	87	1002.9	9.6	3.9	1.33	0.909
2009	4	7	11.6	10.0	200	88	995.6	10.7	3.3	1.87	1.191
2009	4	8	0.7	8.0	240	74	1000.2	12.8	4.6	3.08	2.111
2009	4	9	10.9	11.7	165	92	994.5	11.4	6.1	1.31	0.792
2009	4	10	2.2	4.0	225	82	999.4	11.1	3.4	2.46	1.717
2009	4	11	1.7	3.7	195	85	1008.2	11.2	0.9	2.17	1.548
2009	4	12	0.1	4.8	170	83	1013.1	12.7	4.0	2.33	1.646
2009	4	13	6.0	8.0	130	93	1005.7	9.4	7.0	1.06	0.737
2009	4	14	0.4	5.3	125	84	1006.9	13.3	4.7	2.55	1.744
2009	4	15	3.8	8.1	60	92	1009.3	10.3	5.6	0.99	0.689
2009	4	16	0.0	9.8	70	82	1009.3	12.6	8.7	2.45	1.657
2009	4	17	1.0	7.7	70	87	1013.7	10.6	7.4	1.35	0.972
2009	4	18	0.0	6.6	80	78	1020.6	13.5	4.5	3.41	2.317
2009	4	19	0.0	3.4	180	77	1024.6	17.2	1.7	3.57	2.563
2009	4	20	0.0	2.2	200	80	1027.3	17.0	3.1	3.45	2.525
2009	4	21	0.9	4.3	215	78	1026.8	15.3	4.1	3.36	2.389
2009	4	22	0.2	8.1	180	86	1022.0	15.3	4.8	2.48	1.743
2009	4	23	6.7	4.3	205	85	1016.5	14.9	8.7	2.80	2.042
2009	4	24	13.8	2.5	350	93	1009.3	11.7	7.8	1.51	1.148
2009	4	25	8.0	5.6	360	85	1005.0	12.8	6.8	2.02	1.466
2009	4	26	5.8	5.0	215	92	1004.2	9.8	7.1	1.54	1.064
2009	4	27	9.3	3.7	260	85	994.9	11.1	3.9	2.83	2.011
2009	4	28	0.9	1.8	315	86	1003.8	12.4	2.9	1.90	1.428
2009	4	29	8.2	4.1	155	93	1003.2	10.6	7.8	1.23	0.899
2009	4	30	2.2	3.3	295	77	1010.9	15.4	5.8	3.51	2.555
Total			102.9								47.4

May-09											
Year	Month	Day	Rainfall	Wind Speed (Knots)	Wind Direction (Degrees from North)	Relative Humidity (%)	MSL Pressure (hPa)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Evaporation (mm)	Potential Evapotranspiration (Penman)
2009	5	1	5.4	8.1	235	75	1018.1	14.4	6.2	3.51	2.35
2009	5	2	1.4	5.0	225	76	1026.7	14.6	3.7	3.65	2.558
2009	5	3	1.5	5.7	265	79	1029.6	12.6	3.3	3.43	2.348
2009	5	4	1.5	7.9	235	92	1023.6	12.7	7.0	1.41	0.996
2009	5	5	1.6	9.9	240	89	1018.6	14.2	10.2	2.24	1.609
2009	5	6	3.9	10.0	230	88	1011.6	13.7	7.4	1.87	1.271
2009	5	7	3.6	10.3	210	80	1004.7	11.2	5.1	2.87	1.908
2009	5	8	4.2	10.2	235	78	1004.4	11.6	5.0	3.71	2.38
2009	5	9	3.3	6.8	250	78	1011.1	12.2	5.6	3.53	2.399
2009	5	10	0.0	2.7	65	72	1020.4	14.6	2.4	3.29	2.404
2009	5	11	0.0	8.4	75	67	1024.8	14.3	5.8	4.69	3.107
2009	5	12	0.0	9.0	80	72	1023.8	12.8	5.6	4.54	2.924
2009	5	13	1.8	7.3	80	85	1015.5	12.0	5.0	2.39	1.601
2009	5	14	3.4	4.3	80	97	1009.0	11.6	9.3	1.03	0.761
2009	5	15	9.8	4.4	80	92	1000.4	12.5	8.1	1.66	1.195
2009	5	16	4.3	9.8	180	84	991.9	12.4	6.3	3.50	2.216
2009	5	17	4.2	7.4	105	86	996.5	12.4	6.5	2.67	1.824
2009	5	18	8.8	5.8	220	90	1001.4	13.7	6.5	2.48	1.728
2009	5	19	3.2	6.0	200	85	1009.1	16.4	8.4	3.72	2.645
2009	5	20	1.3	4.4	215	84	1013.6	15.4	7.9	3.46	2.5
2009	5	21	0.1	4.9	255	80	1013.6	13.8	6.0	3.84	2.679
2009	5	22	3.6	4.3	210	86	1012.4	18.5	8.6	3.13	2.316
2009	5	23	3.4	6.6	280	83	1014.7	14.3	8.3	2.85	1.905
2009	5	24	0.0	4.3	205	79	1019.1	17.6	4.5	4.15	2.965
2009	5	25	0.7	3.7	210	87	1015.4	15.5	7.3	2.08	1.551
2009	5	26	0.9	6.1	255	77	1016.6	13.4	4.7	4.25	2.858
2009	5	27	3.0	7.5	245	93	1016.4	15.4	8.5	1.78	1.249
2009	5	28	0.0	5.0	225	85	1028.6	20.2	10.4	3.58	2.624
2009	5	29	0.1	7.2	155	84	1027.7	20.0	9.4	4.47	3.107
2009	5	30	0.0	5.8	150	75	1024.5	21.6	11.2	5.55	4.023
2009	5	31	0.0	4.0	80	71	1027.8	21.5	8.9	5.13	3.774
Total			75.0								69.8

Jun-09											
Year	Month	Day	Rainfall	Wind Speed (Knots)	Wind Direction (Degrees from North)	Relative Humidity (%)	MSL Pressure (hPa)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Evaporation (mm)	Potential Evapotranspiration (Penman)
2009	6	1	0.0	3.5	85	68	1028.0	24.0	10.1	5.31	4.014
2009	6	2	0.0	1.7	65	57	1027.3	26.4	9.2	5.54	4.223
2009	6	3	0.0	3.9	75	71	1024.1	19.9	10.9	4.81	3.553
2009	6	4	0.0	2.5	25	69	1019.3	20.1	7.5	5.14	3.856
2009	6	5	0.0	4.6	345	70	1012.1	15.3	6.7	3.89	2.83
2009	6	6	9.8	6.8	15	85	1006.7	9.9	5.9	2.02	1.441
2009	6	7	0.7	5.9	60	71	1006.5	15.0	7.7	4.11	2.969
2009	6	8	0.0	7.1	60	72	1008.4	14.6	8.1	3.31	2.41
2009	6	9	0.0	4.5	60	68	1011.1	15.7	9.0	3.89	2.877
2009	6	10	2.1	1.9	325	72	1012.2	16.0	4.6	2.91	2.201
2009	6	11	0.0	2.5	315	63	1019.0	17.1	7.0	4.71	3.499
2009	6	12	3.7	5.3	140	85	1018.1	16.8	8.6	2.59	1.942
2009	6	13	13.4	4.3	180	84	1016.2	20.1	9.2	4.38	3.228
2009	6	14	8.6	3.7	170	83	1016.8	19.5	8.4	4.32	3.194
2009	6	15	3.9	1.9	130	83	1016.3	18.2	7.4	3.45	2.641
2009	6	16	1.9	4.9	185	80	1018.9	21.1	6.6	4.16	3.019
2009	6	17	30.7	7.3	250	83	1011.2	16.0	9.7	3.17	2.202
2009	6	18	5.0	7.7	225	82	1014.6	15.5	9.0	3.94	2.688
2009	6	19	0.0	5.5	275	77	1022.4	14.9	8.5	2.75	2.004
2009	6	20	0.2	5.2	300	80	1026.4	17.1	10.7	3.73	2.737
2009	6	21	0.1	4.0	285	88	1026.8	21.3	11.5	3.33	2.524
2009	6	22	0.0	2.1	280	81	1028.7	21.9	14.7	3.73	2.913
2009	6	23	0.0	4.2	90	77	1027.8	24.2	14.9	4.45	3.406
2009	6	24	0.0	6.3	80	67	1021.5	22.0	12.8	6.03	4.437
2009	6	25	0.0	6.6	70	78	1015.4	18.9	12.1	4.32	3.126
2009	6	26	2.7	4.9	75	86	1012.9	20.1	13.3	2.81	2.119
2009	6	27	0.3	3.6	145	80	1014.9	22.9	13.9	5.14	3.91
2009	6	28	2.2	5.0	120	81	1014.7	21.6	10.8	3.83	2.857
2009	6	29	0.0	3.5	160	83	1015.9	20.8	14.0	2.91	2.248
2009	6	30	1.2	6.1	145	85	1019.1	21.3	12.1	2.86	2.104
Total			86.5								87.2

Jul-09											
Year	Month	Day	Rainfall	Wind Speed (Knots)	Wind Direction (Degrees from North)	Relative Humidity (%)	MSL Pressure (hPa)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Evaporation (mm)	Potential Evapotranspiration (Penman)
2009	7	1	4.3	4.8	160	93	1020.3	20.5	17.1	2.17	1.642
2009	7	2	10.8	4.8	135	93	1016.4	19.3	16.2	2.02	1.53
2009	7	3	6.5	5.8	180	81	1009.7	21.2	14.1	4.26	3.107
2009	7	4	5.8	6.9	150	81	1006.9	20.1	13.1	4.01	2.92
2009	7	5	11.8	6.7	155	85	1003.2	18.7	11.5	3.87	2.743
2009	7	6	21.4	3.3	280	94	1002.4	17.0	9.6	2.43	1.805
2009	7	7	0.9	6.2	290	83	1009.2	19.0	12.2	3.72	2.739
2009	7	8	0.1	4.7	315	76	1017.0	17.1	11.3	3.46	2.581
2009	7	9	0.0	3.1	300	75	1019.4	17.4	9.6	3.32	2.494
2009	7	10	1.0	2.8	160	85	1016.2	15.5	7.7	2.57	1.918
2009	7	11	13.6	7.5	125	95	1005.5	18.3	13.8	2.02	1.436
2009	7	12	6.0	6.7	215	83	1001.9	17.7	10.7	3.65	2.578
2009	7	13	10.6	5.0	145	91	1002.1	16.6	10.4	2.51	1.822
2009	7	14	3.7	3.0	155	89	1002.3	17.7	9.1	2.82	2.142
2009	7	15	0.8	2.6	265	86	1009.1	19.2	9.4	3.61	2.747
2009	7	16	0.6	3.3	210	79	1015.7	18.0	9.6	3.72	2.781
2009	7	17	0.1	7.0	310	76	1014.8	17.8	10.4	3.99	2.868
2009	7	18	0.9	3.3	270	86	1011.1	15.9	9.7	2.78	2.079
2009	7	19	3.4	3.7	275	83	1008.8	16.7	10.2	3.79	2.79
2009	7	20	0.7	5.4	220	81	1010.5	17.9	9.1	3.49	2.518
2009	7	21	7.1	8.1	175	84	997.5	20.4	10.3	3.74	2.67
2009	7	22	2.3	4.9	225	86	993.3	18.9	12.8	3.50	2.59
2009	7	23	32.1	5.3	215	89	998.9	17.3	11.6	2.83	2.059
2009	7	24	5.3	3.5	285	78	1007.6	17.8	11.0	3.30	2.105
2009	7	25	2.2	5.3	170	84	1018.0	20.2	7.1	3.75	2.683
2009	7	26	19.4	9.6	195	85	1006.8	18.7	12.4	3.93	2.684
2009	7	27	2.4	6.8	225	81	1007.8	17.4	11.3	4.08	2.846
2009	7	28	12.5	7.8	175	89	1006.9	16.9	10.6	2.60	1.795
2009	7	29	1.8	4.3	210	83	1008.1	17.6	10.4	3.60	2.67
2009	7	30	0.1	5.0	240	75	1016.9	17.9	8.7	4.58	3.285
2009	7	31	8.2	9.9	160	93	1011.0	14.8	11.1	1.39	0.932
Total			196.4								73.6

Aug-09											
Year	Month	Day	Rainfall	Wind Speed (Knots)	Wind Direction (Degrees from North)	Relative Humidity (%)	MSL Pressure (hPa)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Evaporation (mm)	Potential Evapotranspiration (Penman)
2009	8	1	1.0	6.8	260	85	1005.5	15.2	11.1	2.82	1.981
2009	8	2	1.4	6.1	190	86	1009.7	16.9	8.1	3.03	2.134
2009	8	3	2.9	9.5	155	90	1005.1	19.4	13.2	2.94	2.088
2009	8	4	0.2	8.0	180	82	1006.2	19.1	13.3	3.24	2.333
2009	8	5	1.0	8.7	185	75	1012.5	20.0	12.4	4.70	3.295
2009	8	6	0.4	4.0	185	82	1018.8	18.2	9.0	3.08	2.268
2009	8	7	0.0	3.6	225	77	1021.1	18.4	9.4	3.47	2.563
2009	8	8	2.1	4.6	190	84	1019.4	20.5	12.0	3.35	2.497
2009	8	9	0.5	4.0	215	86	1017.0	18.1	11.0	2.43	1.822
2009	8	10	4.2	4.9	305	89	1013.4	20.2	13.1	2.95	2.194
2009	8	11	0.2	4.5	240	92	1021.4	18.7	10.7	2.08	1.538
2009	8	12	2.4	4.0	280	88	1020.2	19.4	12.7	2.76	2.084
2009	8	13	0.0	1.8	300	77	1020.5	17.1	12.2	2.44	1.856
2009	8	14	3.6	7.5	210	91	1011.2	19.7	13.0	1.89	1.41
2009	8	15	11.5	7.0	250	85	1008.3	18.2	13.3	3.17	2.23
2009	8	16	0.9	7.3	230	88	1012.7	16.0	13.1	1.92	1.41
2009	8	17	3.8	4.6	235	87	1014.0	19.3	12.2	3.20	2.349
2009	8	18	6.7	7.6	165	93	1011.5	19.7	12.4	1.83	1.287
2009	8	19	16.8	6.5	180	92	1006.4	20.3	14.8	1.96	1.487
2009	8	20	24.1	6.8	225	89	1004.9	16.5	11.4	2.50	1.689
2009	8	21	4.8	6.6	225	83	1015.6	16.3	9.5	3.41	2.38
2009	8	22	4.1	6.7	160	87	1017.6	17.3	7.5	2.79	1.904
2009	8	23	9.9	8.6	165	92	1005.4	18.8	10.3	1.79	1.293
2009	8	24	0.8	6.0	200	84	1002.3	17.8	6.6	2.88	2.056
2009	8	25	0.4	6.2	205	82	1003.6	17.2	8.7	3.06	2.178
2009	8	26	8.1	7.4	260	91	1000.1	17.8	12.5	1.99	1.414
2009	8	27	2.8	6.9	185	90	1006.8	15.8	9.2	1.66	1.124
2009	8	28	6.0	7.0	275	88	1011.6	14.9	9.1	2.67	1.823
2009	8	29	0.3	4.5	240	85	1019.4	15.3	8.0	2.25	1.647
2009	8	30	7.6	5.3	190	97	1010.2	18.1	7.2	1.22	0.855
2009	8	31	6.6	6.8	180	92	1000.4	16.8	10.9	1.49	1.031
Total			135.1								58.2

Sep-09											
Year	Month	Day	Rainfall	Wind Speed (Knots)	Wind Direction (Degrees from North)	Relative Humidity (%)	MSL Pressure (hPa)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Evaporation (mm)	Potential Evapotranspiration (Penman)
2009	9	1	2.2	6.5	205	88	1000.4	15.4	9.7	2.29	1.618
2009	9	2	11.6	5.0	175	95	999.9	13.2	9.2	1.22	0.887
2009	9	3	2.5	6.5	275	86	1000.8	14.3	9.0	2.92	2.025
2009	9	4	0.4	6.5	275	84	1010.9	15.4	8.0	2.66	1.817
2009	9	5	0.0	6.2	225	84	1019.3	15.0	8.8	1.99	1.439
2009	9	6	5.9	8.1	160	92	1014.0	15.6	11.2	1.22	0.878
2009	9	7	1.5	6.9	220	87	1012.8	16.6	11.0	2.11	1.438
2009	9	8	5.5	8.1	235	90	1011.1	17.4	8.9	1.12	0.751
2009	9	9	0.1	2.5	280	83	1032.1	17.4	5.5	2.66	1.937
2009	9	10	0.0	1.5	330	86	1039.6	17.8	4.3	2.56	1.865
2009	9	11	0.1	2.3	65	81	1038.7	19.0	7.2	2.70	1.966
2009	9	12	0.0	1.3	40	86	1033.7	19.3	3.9	2.49	1.812
2009	9	13	0.1	2.6	55	87	1031.8	19.7	5.0	2.44	1.778
2009	9	14	0.1	3.0	55	87	1031.7	14.8	8.8	1.37	1.029
2009	9	15	0.0	3.0	355	86	1029.7	15.1	7.6	1.38	1.04
2009	9	16	0.0	3.1	360	86	1028.6	15.6	7.9	1.79	1.335
2009	9	17	0.0	2.9	85	82	1024.9	15.3	6.3	2.17	1.557
2009	9	18	0.0	2.6	140	83	1018.2	14.3	4.8	1.39	1.03
2009	9	19	1.5	3.5	305	85	1017.0	15.2	6.1	1.54	1.113
2009	9	20	0.1	4.1	210	86	1023.4	15.3	3.8	1.75	1.264
2009	9	21	0.1	9.0	210	83	1019.5	18.7	11.7	2.17	1.669
2009	9	22	0.2	7.4	225	84	1019.8	15.6	10.9	1.80	1.252
2009	9	23	0.9	5.1	215	86	1024.2	15.4	9.0	2.02	1.443
2009	9	24	0.0	4.5	230	83	1026.1	15.7	10.3	1.90	1.408
2009	9	25	0.0	4.7	235	84	1026.2	16.7	10.5	1.81	1.342
2009	9	26	0.0	2.7	230	89	1027.9	15.9	11.4	1.23	0.928
2009	9	27	1.0	4.0	250	93	1028.6	16.3	12.0	1.27	0.956
2009	9	28	0.1	4.9	265	87	1027.6	17.3	12.9	1.64	1.245
2009	9	29	0.4	4.7	270	93	1024.5	15.2	12.6	1.18	0.892
2009	9	30	3.9	4.3	265	91	1021.3	17.1	11.3	1.69	1.218
Total			38.2								40.9

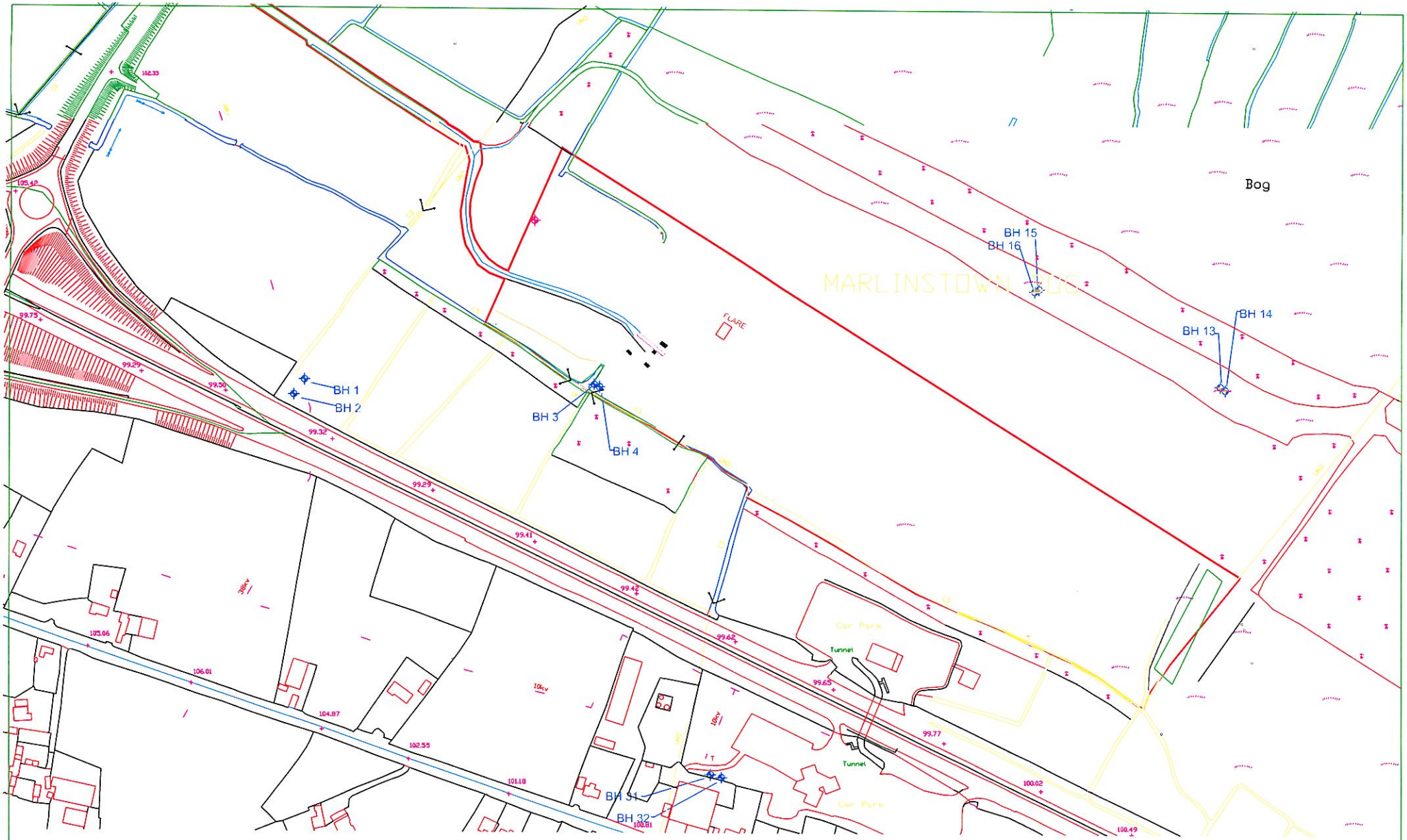
Oct-09											
Year	Month	Day	Rainfall	Wind Speed (Knots)	Wind Direction (Degrees from North)	Relative Humidity (%)	MSL Pressure (hPa)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Evaporation (mm)	Potential Evapotranspiration (Penman)
2009	10	1	0.0	3.0	305	84	1022.8	12.1	7.6	1.01	0.748
2009	10	2	0.1	6.3	250	90	1018.4	14.8	9.0	1.18	0.881
2009	10	3	2.5	8.3	255	83	1006.6	13.0	8.1	1.55	1.057
2009	10	4	0.0	2.6	235	87	1011.2	12.5	5.2	1.44	1.014
2009	10	5	0.0	3.2	160	85	1008.1	16.0	5.6	1.65	1.168
2009	10	6	7.8	2.8	335	92	1003.5	12.2	4.1	0.59	0.455
2009	10	7	0.0	2.0	295	82	1013.2	13.2	-0.4	1.41	0.94
2009	10	8	0.0	2.9	300	79	1018.6	13.6	4.9	1.50	1.036
2009	10	9	10.8	5.1	130	92	1010.2	12.4	6.4	0.85	0.643
2009	10	10	0.3	3.3	235	91	1014.5	15.0	10.2	1.14	0.852
2009	10	11	3.5	4.8	300	88	1018.3	13.3	5.2	0.95	0.643
2009	10	12	0.0	1.6	215	89	1029.4	14.9	1.6	1.20	0.767
2009	10	13	0.5	2.3	175	96	1029.7	15.6	9.3	0.86	0.652
2009	10	14	0.4	2.3	170	95	1030.1	13.4	11.9	0.73	0.57
2009	10	15	0.5	2.0	315	94	1034.0	14.1	11.0	0.78	0.594
2009	10	16	0.0	2.3	75	91	1036.5	15.4	4.5	0.90	0.643
2009	10	17	0.1	2.4	175	90	1031.6	13.5	1.7	1.01	0.665
2009	10	18	4.9	4.3	200	94	1019.9	13.4	8.0	0.83	0.622
2009	10	19	0.6	8.5	140	92	1003.2	12.1	10.1	0.99	0.743
2009	10	20	10.4	8.1	115	89	987.0	14.0	7.6	1.01	0.765
2009	10	21	10.0	8.4	105	92	986.3	12.7	7.4	0.90	0.645
2009	10	22	13.0	4.7	100	95	990.7	13.5	8.9	0.79	0.577
2009	10	23	1.3	4.1	190	96	1001.9	12.7	8.7	0.66	0.462
2009	10	24	4.8	11.5	215	90	994.8	15.1	11.1	1.05	0.786
2009	10	25	0.7	8.7	240	88	1006.0	13.6	9.9	0.98	0.736
2009	10	26	0.3	4.1	120	91	1014.8	12.7	9.1	0.61	0.424
2009	10	27	3.5	9.4	150	94	1008.3	14.6	11.9	0.70	0.506
2009	10	28	1.5	5.4	175	91	1012.7	16.1	10.5	0.78	0.586
2009	10	29	0.6	9.8	150	96	1013.9	15.2	12.0	0.72	0.53
2009	10	30	10.7	9.7	155	96	1010.4	15.7	11.9	0.59	0.41
2009	10	31	0.9	5.1	180	92	1013.9	15.3	8.7	0.74	0.541
Total			89.7								21.7

Nov-09											
Year	Month	Day	Rainfall	Wind Speed (Knots)	Wind Direction (Degrees from North)	Relative Humidity (%)	MSL Pressure (hPa)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Evaporation (mm)	Potential Evapotranspiration (Penman)
2009	11	1	24.6	6.5	265	92	997.3	12.0	6.5	0.55	0.37
2009	11	2	2.9	6.3	205	92	995.6	9.9	5.3	0.58	0.425
2009	11	3	5.6	7.5	225	87	983.2	10.9	5.3	0.46	0.288
2009	11	4	3.9	8.3	270	89	983.3	9.4	5.4	0.62	0.443
2009	11	5	1.9	8.6	280	92	996.6	9.7	6.6	0.63	0.462
2009	11	6	5.7	6.5	245	89	996.1	10.3	3.5	0.53	0.379
2009	11	7	4.7	7.0	215	95	990.6	8.2	3.5	0.48	0.338
2009	11	8	0.2	3.5	285	91	1011.4	11.0	1.3	0.33	0.166
2009	11	9	15.0	3.9	160	97	1016.3	8.4	0.2	0.35	0.245
2009	11	10	0.4	2.7	300	94	1012.0	10.4	2.0	0.16	0.04
2009	11	11	10.2	4.4	95	98	1001.0	8.8	-0.7	0.25	0.151
2009	11	12	4.2	7.7	195	91	988.7	9.9	4.3	0.40	0.269
2009	11	13	5.0	5.9	170	89	989.3	9.5	1.8	0.48	0.36
2009	11	14	6.2	5.5	185	91	983.1	9.3	2.1	0.25	0.148
2009	11	15	2.2	5.6	165	91	995.4	11.8	3.3	0.40	0.293
2009	11	16	9.3	9.9	230	91	989.9	9.7	6.8	0.45	0.322
2009	11	17	7.1	7.5	215	92	998.6	8.5	4.7	0.35	0.245
2009	11	18	24.5	7.7	185	94	996.9	13.4	4.7	0.63	0.491
2009	11	19	29.4	11.3	180	94	991.4	13.7	12.2	0.61	0.431
2009	11	20	9.4	6.5	215	89	1003.8	11.1	4.4	0.11	0.051
2009	11	21	6.2	12.1	125	88	996.7	13.6	6.4	0.52	0.371
2009	11	22	6.1	13.4	190	86	987.0	9.3	5.5	0.93	0.699
2009	11	23	2.7	8.0	240	89	994.8	10.3	6.7	0.54	0.439
2009	11	24	14.0	10.1	205	93	992.0	11.9	5.5	0.64	0.471
2009	11	25	7.6	11.8	205	85	987.8	8.9	4.9	0.75	0.642
2009	11	26	2.2	8.2	220	93	993.1	6.0	2.6	0.29	0.218
2009	11	27	0.4	4.7	215	96	994.5	6.0	-0.9	0.27	0.192
2009	11	28	0.1	2.0	340	100	991.3	1.0	-2.1	0.19	0.136
2009	11	29	1.9	8.0	5	87	992.9	5.8	1.3	0.56	0.423
2009	11	30	0.0	3.5	310	92	1010.1	4.7	-1.9	0.00	0
Total			213.6								9.5

Dec-09											
Year	Month	Day	Rainfall	Wind Speed (Knots)	Wind Direction (Degrees from North)	Relative Humidity (%)	MSL Pressure (hPa)	Max. Temp. (Degrees Celsius)	Min. Temp. (Degrees Celsius)	Evaporation (mm)	Potential Evapotranspiration (Penman)
2009	12	1	2.9	7.9	155	95	1001.1	6.8	-0.8	0.35	0.231
2009	12	2	0.4	4.3	145	95	991.4	9.0	3.9	0.26	0.188
2009	12	3	0.1	6.2	270	89	1001.7	5.7	1.2	0.00	0
2009	12	4	10.4	4.9	160	98	1000.9	9.1	-1.1	0.27	0.19
2009	12	5	6.4	7.6	175	95	986.7	10.8	5.2	0.31	0.219
2009	12	6	1.9	9.8	205	87	985.0	7.6	4.3	0.38	0.348
2009	12	7	2.1	5.9	220	93	990.5	6.3	4.3	0.30	0.212
2009	12	8	3.0	7.1	190	94	1000.3	11.1	3.7	0.44	0.324
2009	12	9	2.5	5.4	185	91	1010.2	9.2	4.4	0.35	0.281
2009	12	10	0.2	3.3	205	95	1026.3	8.7	0.9	0.00	0
2009	12	11	0.0	6.8	120	88	1029.8	9.1	3.9	0.38	0.318
2009	12	12	0.0	3.1	85	93	1033.6	6.8	0.1	0.00	0
2009	12	13	0.0	1.5	355	99	1033.4	4.8	-3.0	0.00	0
2009	12	14	0.1	3.8	310	97	1026.8	6.8	-1.3	0.32	0.239
2009	12	15	0.4	3.8	350	91	1021.1	7.2	3.1	0.01	0
2009	12	16	0.6	3.6	325	94	1016.4	6.6	2.7	0.03	0
2009	12	17	0.0	4.4	15	88	1019.0	4.7	-0.8	0.03	0.005
2009	12	18	0.0	3.4	355	85	1024.8	0.6	-3.3	0.00	0
2009	12	19	1.6	4.1	275	93	1013.8	4.0	-2.1	0.07	0.027
2009	12	20	1.4	5.8	255	97	1000.2	1.6	-2.2	0.07	0.044
2009	12	21	0.1	3.6	205	97	987.8	0.7	-4.6	0.08	0.041
2009	12	22	0.0	3.1	225	96	985.5	1.0	-5.5	0.00	0
2009	12	23	0.0	1.8	35	97	986.9	1.4	-6.7	0.02	0
2009	12	24	0.0	3.0	330	97	989.2	-0.9	-5.8	0.00	0
2009	12	25	1.5	2.1	140	99	994.8	1.1	-9.3	0.17	0.132
2009	12	26	1.8	4.5	175	95	991.3	3.2	-2.4	0.08	0.043
2009	12	27	1.4	5.2	275	94	999.6	4.3	-2.9	0.00	0
2009	12	28	0.0	2.5	55	99	1002.8	1.7	-4.9	0.09	0.043
2009	12	29	12.0	10.6	70	91	995.4	3.9	2.1	0.66	0.463
2009	12	30	22.2	14.4	60	94	993.9	3.2	1.7	0.55	0.342
2009	12	31	1.2	7.5	25	84	1007.1	2.5	-1.8	0.21	0.147
Total			74.2								3.8

APPENDIX 2

Groundwater



LEGEND

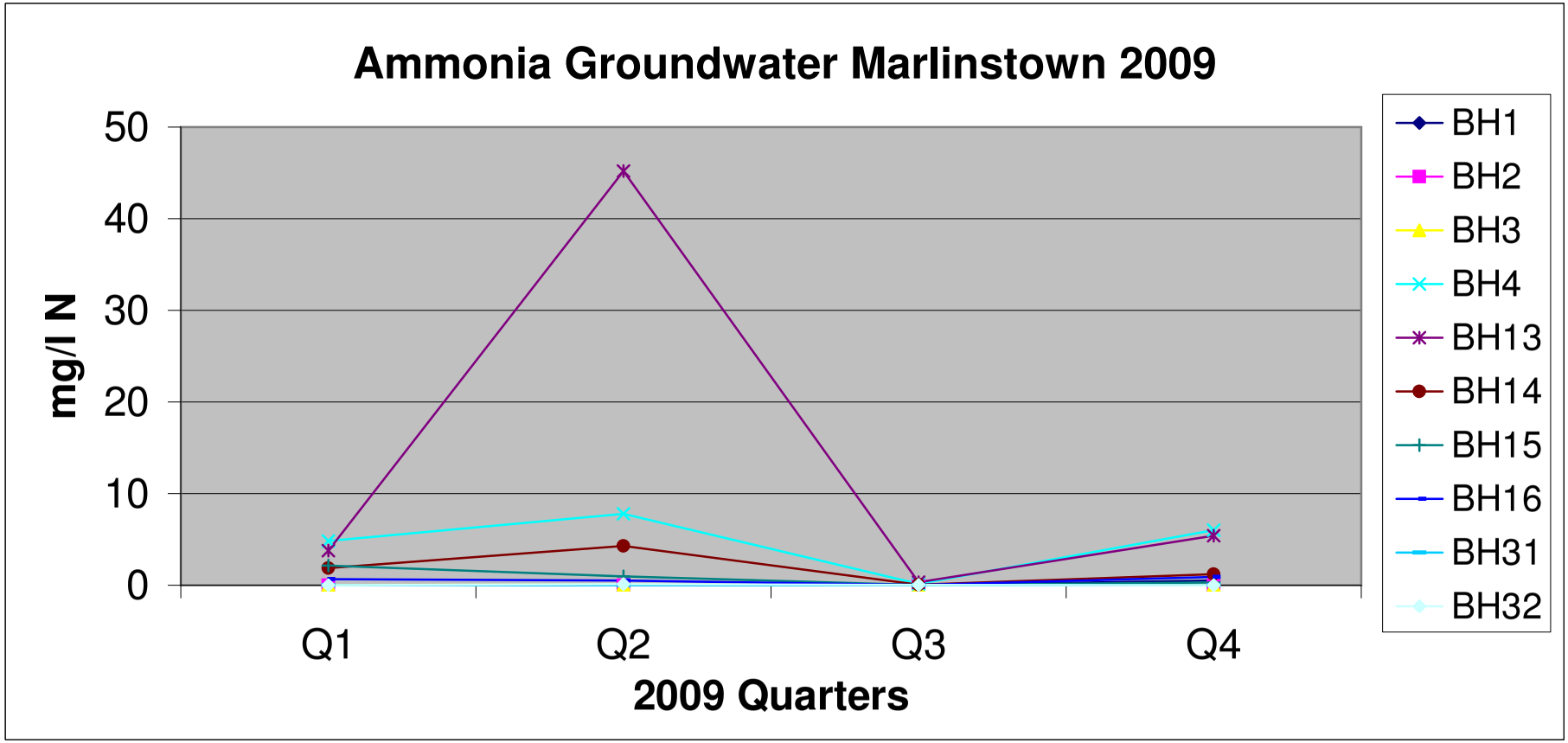
SITE BOUNDARY
GROUND WATER MONITORING WELLS

WESTMEATH COUNTY COUNCIL

MARLINSTOWN LANDFILL

GROUNDWATER MONITORING LOCATIONS NOV. 09

MRL_GW_09


Ammonia Groundwater Marlinstown 2009
mg/l N
50
40
30
20
10
0
Q1
Q2
Q3
Q4
2009 Quarters
BH1
BH2
BH3
BH4
BH13
BH14
BH15
BH16
BH31
BH32

Groundwater Lab Monitoring 2009

Q1	Parameter	Units	Methodology	BH1	BH2	BH3	BH4	BH13	BH14	BH15	BH16	BH31	BH32
21/01/2009	TOC	mg/l C	Spectrophotometry	4.7	2.9	1.0	4.3	5.2	3.4	8.9	9.3	9.2	3.3
	Chloride	mg/l C	Titration	90.0	80.0	13.0	11.0	25.0	12.0	32.0	37.0	9.0	16.0
	pH		Electrometry	7.20	7.10	7.50	7.00	5.70	6.20	7.10	7.10	7.20	7.10
	Ammonia	mg/l N	Spectrophotometry	<0.01	<0.01	0.016	4.820	3.790	1.880	2.140	0.668	<0.01	<0.01

Q2	Parameter	Units	Methodology	BH1	BH2	BH3	BH4	BH13	BH14	BH15	BH16	BH31	BH32
12/05/2009	TOC	mg/l C	Spectrophotometry	12.8	20.8	10.5	19.5	35.8	20.0	39.4	33.8	19.6	18.7
	Chloride	mg/l C	Titration	115.0	160.0	10.0	23.0	109.0	22.0	31.0	28.0	10.0	15.0
	pH		Electrometry	7.02	7.11	7.53	6.74	6.77	6.38	7.04	7.09	7.15	6.95
	Ammonia	mg/l N	Spectrophotometry	0.030	<0.01	0.048	7.800	45.200	4.300	0.980	0.500	<0.01	0.120

Q3	Parameter	Units	Methodology	BH1	BH2	BH3	BH4	BH13	BH14	BH15	BH16	BH31	BH32
16/07/2009	TOC	mg/l C	Spectrophotometry	43.5	19.5	3.6	6.4	3.7	19.0	17.9	15.7	1.8	<0.03
	Chloride	mg/l C	Titration	95.0	90.0	14.0	28.0	120.0	16.0	29.0	34.0	8.0	16.0
	pH		Electrometry	7.22	7.25	7.45	6.78	6.81	6.13	7.03	7.00	7.10	7.00
	Ammonia	mg/l N	Spectrophotometry	<0.01	<0.01	<0.01	0.152	0.327	0.058	0.029	0.033	0.010	0.017

Q4	Parameter	Units	Methodology	BH1	BH2	BH3	BH4	BH13	BH14	BH15	BH16	BH31	BH32
11/12/2009	TOC	mg/l C	Spectrophotometry	10.90	6.61	3.46	12.50	23.70	19.80	23.30	44.60	1.65	4.31
	Chloride	mg/l C	Titration	26.0	61.0	13.0	15.0	27.0	8.0	27.0	26.0	11.0	13.0
	pH		Electrometry	7.50	7.90	7.9	7.50	6.20	7.00	7.50	7.50	7.90	7.70
	Ammonia	mg/l N	Spectrophotometry	0.500	<0.3	<0.3	6.000	5.400	1.200	0.300	0.900	<0.3	<0.3

2009 Ground Water In-Situ Monitoring

Q1

Well ID Sample ID	Conductivity (µS/cm@20 ^{0}C)	Temperature (^{0}C)	Dissolved Oxygen Mg/L O^2	Water Level mbgl	Odour & Visual
BH1	859	8	6.54	1.3	No odour, clear
BH2	864	7	6.09	1.3	No odour, clear
BH3	460	6	7.18	2.05	No odour, clear
BH4	672	7	3.44	3.87	No odour, clear, brown with suspended solids
BH13	206	6	3.21	3.4	No odour, clear, light brown with suspended solids
BH14	366	8	3.67	3.3	No odour, clear, brown-orange colour
BH15	549	7	4.61	2.3	No odour, brown colour
BH16	463	7	4.58	2.5	Foul odour, brown colour
BH 31	455	6	8.18	1.8	No odour,clear
BH32	626	6	6.43	2.0	No odour,clear

Q2

Well ID Sample ID	Conductivity (µS/cm@20 ^{0}C)	Temperature (^{0}C)	Dissolved Oxygen Mg/L O^2	Water Level mbgl	Odour & Visual
BH1	1009	10.1	6.44	1.24	No odour, clear
BH2	929	10.4	6.9	1.33	No odour, clear
BH3	456	15.1	6.58	2.07	No odour, clear
BH4	781	10.3	4.89	2.92	No odour, Light brown colour and turbid
BH13	1403	10.4	5.03	3.32	Foul, clear with yellow colour
BH14	585	10.3	4.12	3.11	Foul, clear with yellow colour and few suspended
BH15	550	9.7	4.87	2.28	Very light smell, yellow-brown colour
BH16	485	8.9	5.91	2.53	Foul odour, yellow-brown colour
BH 31	481	10.4	6.52	1.89	None, turbid with few suspended solids
BH32	654	9.0	6.12	2.08	None, turbid with few suspended solids

Q3

Well ID Sample ID	Conductivity (µS/cm@20 ^{0}C)	Temperature (^{0}C)	Dissolved Oxygen Mg/L O^2	Water Level mbgl	Odour & Visual
BH1	681	11.8	8.89	1.2	No odour, clear
BH2	957	11.5	8.73	1.2	No odour, clear
BH3	488	12.3	8.78	2.1	No odour, clear
BH4	808	12.5	5.31	2.9	No odour, dull
BH13	1528	11.7	6.9	3.5	No odour, dull
BH14	429	11.6	5.84	3.1	No odour, turbid
BH15	606	11.4	7.99	1.54	No odour, turbid
BH16	600	10.9	8.2	2.6	No odour, turbid
BH 31	471	11.2	8.18	0.7	No odour, clear
BH32	681	11.8	8.72	4.3	No odour, clear

Q4

Well ID Sample ID	Conductivity (µS/cm@20 ^{0}C)	Temperature (^{0}C)	Dissolved Oxygen Mg/L O^2	Water Level mbgl	Odour & Visual
BH1	802		1.4	1.38	Clear water, no noticeable smell
BH2	806		2.4	0.22	Clear water, no noticeable smell
BH3	451		1.6	2.06	Clear water, no noticeable smell
BH4	682		1.8	2.91	No smell, turbid
BH13	244		2.4	3.43	Low suspended solids, clear, no smell
BH14	560		2.7	3.16	Yellow colour, some suspended solids
BH15	545		2.5	2.3	Brown colour, some suspended solids
BH16	521		<0.5	2.5	Yellow colour, low suspended solids
BH 31	488		1.5	2.44	Clear water, low suspended solids, no smell
BH32	647		1.4	2.16	Clear water, low suspended solids, no smell

Parameters	Method	Units	EPA IGV Standards*	S.I. No. 278 of 2007 Standards**	BH1	BH2	BH3	BH4	BH13	BH14	BH15	BH16	BH31	BH32
Boron, Total as B	WAS049	mg/l	1	1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Cadmium , Total as Cd	WAS049	mg/l	0.005	0.005	0.0008	0.0012	0.0047	0.0018	0.0014	0.0028	0.0023	0.002	0.0012	0.0016
Calcium , Total as Ca	WAS049	mg/l	200		166	136	77	192	30	81	96	117	99	137
Chromium , Total as Cr	WAS049	mg/l	0.03	0.05	<0.001	<0.001	<0.001	0.005	<0.001	0.001	0.004	0.004	<0.001	<0.001
Copper, Total as Cu	WAS049	mg/l	0.03	2	0.007	0.034	0.021	0.096	0.076	0.059	0.048	0.08	0.004	0.068
Iron , Total as Fe	WAS049	mg/l	0.2	0.2	0.2	0.49	0.89	4.57	1.69	5.39	7.63	7.38	0.94	0.34
Lead , Total as Pb	WAS049	mg/l	0.01	0.025	0.007	0.011	0.009	0.019	0.013	0.026	0.025	0.017	0.007	0.005
Magnesium, Total as Mg	WAS049	mg/l	50	-	8.37	7.86	12	6.22	2.9	3.26	7.54	5.86	12	5.9
Manganese , Total as Mn	WAS049	mg/l	0.05	0.05	0.061	0.054	0.95	0.56	0.089	0.76	0.34	0.4	0.098	0.12
Mercury, Total as Hg	WAS013	mg/l	0.001	0.001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel , Total as Ni	WAS049	mg/l	0.02	0.02	0.0122	0.006	0.0033	0.0126	0.0214	0.0096	0.0039	0.0096	0.0071	0.0135
Potassium , Total as K	WAS049	mg/l	5	-	14	6.67	0.89	1.37	2.68	1.73	16	11	0.8	3.19
Sodium , Total as Na	WAS049	mg/l	150	200	13	34	11	7.23	18	4.31	26	14	7.88	9.02
Zinc, Total as Zn	WAS049	mg/l	0.1	-	0.006	0.018	0.033	0.049	0.029	0.047	0.029	0.029	0.01	0.028
Nitrogen, Total Oxidised as N	WAS036	mg/l	-	-	2	1.9	<0.3	<0.3	<0.3	<0.3	1.7	<0.3	<0.3	4.2
Phosphate, Ortho as P	WAS036	mg/l	0.03	-	<0.1^	<0.1^	<0.1^	<0.1^	0.1	<0.1^	0.9	0.3	<0.1	<0.1
Sulphate as SO4	WAS036	mg/l	200	250	23	54	<5	<5	<5	<5	<5	See A/C	12	17
Solids, Tot Dissolved 180 DegC	WAS010	mg/l	1000	-	533	570	438	500	226	528	588	500	366	464
Cyanide, Total as CN	WAS018	mg/l	0.01	0.05	<0.1^	<0.1^	<0.1^	<0.1^	<0.1^	<0.1^	<0.1^	<0.1^	<0.1^	<0.1^
Fluoride as F	WAS029	mg/l	1.0	0.8	0.4	0.4	0.6	0.3	0.2	0.2	0.4	0.4	0.3	0.3
Alkalinity as CaC03	WAS025	mg/l	NAC***	-	410	332	254	456	97.5	229	325	353	251	349

** EPA Interim Report: Towards setting Guidelines Values for the Protection of Groundwater in Ireland*
*** S.I. No. 278 of 2007 European Communities (Drinking Water) (No. 2) Regulations*
**** No abnormal change*
^Below the laboratory level of detection

Key

Items highlighted are in exceedance of Standards

Table 1.1: Annual Groundwater Results

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SEVERN TRENT STL

Site Name: **Quote 10645**
Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/660075/2009** Issue **1**
Samples Received: **16 December 2009**
Analysis Complete: **11 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537251	11 December 2009	GW BH1 Marlinstown	Barium, Total as Ba	mg/l	0.076	Y Cov	WAS049
	11 December 2009		Beryllium, Total as Be	mg/l	<0.001	Y Cov	WAS049
	11 December 2009		Boron, Total as B	mg/l	<0.3	Y Cov	WAS049
	11 December 2009		Cadmium , Total as Cd	mg/l	0.0008	Y Cov	WAS049
	11 December 2009		Calcium , Total as Ca	mg/l	166	Y Cov	WAS049
	11 December 2009		Chromium , Total as Cr	mg/l	<0.001	Y Cov	WAS049
	11 December 2009		Cobalt , Total as Co	mg/l	0.0006	Y Cov	WAS049
	11 December 2009		Copper, Total as Cu	mg/l	0.007	Y Cov	WAS049
	11 December 2009		Iron , Total as Fe	mg/l	0.20	Y Cov	WAS049
	11 December 2009		Lead , Total as Pb	mg/l	0.007	Y Cov	WAS049
	11 December 2009		Magnesium, Total as Mg	mg/l	8.37	Y Cov	WAS049
	11 December 2009		Manganese , Total as Mn	mg/l	0.061	Y Cov	WAS049
	11 December 2009		Mercury, Total as Hg	mg/l	<0.0001	Y Cov	WAS013
	11 December 2009		Molybdenum , Total as Mo	mg/l	<0.002	Y Cov	WAS049
	11 December 2009		Nickel , Total as Ni	mg/l	0.0122	Y Cov	WAS049
	11 December 2009		Potassium , Total as K	mg/l	14	Y Cov	WAS049
	11 December 2009		Silver , Total as Ag	mg/l	<0.007	Y Cov	WAS049
	11 December 2009		Sodium , Total as Na	mg/l	13	Y Cov	WAS049
	11 December 2009		Tellurium, Total as Te	ug/l	<0.1	N Cov	WAS051
	11 December 2009		Thallium , Total as Tl	mg/l	0.003	N Cov	WAS049
	11 December 2009		Tin , Total as Sn	mg/l	<0.03	Y Cov	WAS049
	11 December 2009		Titanium , Total as Ti	mg/l	0.0013	Y Cov	WAS049
	11 December 2009		Uranium, Total as U	ug/l	3.0	N Cov	WAS051

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Analysis Complete: **11 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537251	11 December 2009	GW BH1 Marlinstown	Vanadium , Total as V	mg/l	<0.0004	Y Cov	WAS049
	11 December 2009		Zinc, Total as Zn	mg/l	0.006	Y Cov	WAS049
	11 December 2009		pH	pH units	7.5	Y Cov	WAS039
	11 December 2009		Conductivity- Electrical 20C	uS/cm	802	Y Cov	WAS039
	11 December 2009		Alkalinity as CaCO3	mg/l	410	Y Cov	WAS025
	11 December 2009		Ammoniacal Nitrogen as N	mg/l	0.5	Y Cov	WAS036
	11 December 2009		Chloride as Cl	mg/l	26	Y Cov	WAS036
	11 December 2009		Nitrate as N	mg/l	2.0	Y Cov	WAS036
	11 December 2009		Nitrogen, Total Oxidised as N	mg/l	2.0	Y Cov	WAS036
	11 December 2009		Phosphate, Ortho as P	mg/l	<0.1	Y Cov	WAS036
	11 December 2009		Total Inorganic Phosphorus	ug/l	<6	Y Brd	SBC06
	11 December 2009		Sulphate as SO4	mg/l	23	Y Cov	WAS036
	11 December 2009		Solids, Tot Dissolved 180 DegC	mg/l	533	N Cov	WAS010
	11 December 2009		Dissolved Oxygen concentration	mg/l	1.4	Y Cov	WAS052
	11 December 2009		TOC as C	mg/l	10.9	Y Cov	WAS005
	11 December 2009		Cyanide, Total as CN	mg/l	<0.1	Y Cov	WAS018
	11 December 2009		Fluoride as F	mg/l	0.4	Y Cov	WAS029
	11 December 2009		1,2,3-Trichlorobenzene	ng/l	<6	Y Cov	GEO47
	11 December 2009		1,2,4-Trichlorobenzene	ng/l	<6	Y Cov	GEO47
	11 December 2009		1,3,5-Trichlorobenzene	ng/l	<6	Y Cov	GEO47
	11 December 2009		SVOC with TICs	ug/l	y	Y Cov	GEO40
	11 December 2009		Aldrin	ng/l	<6	Y Cov	GEO47
	11 December 2009		Chlortoluron	ug/l	<2.00	Y Cov	GEO37

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Analysis Complete: **11 January 2010**

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11537251	11 December 2009	GW BH1 Marlinstown	alpha-Endosulphan	ng/l	<6	Y Cov	GEO47
	11 December 2009		Diuron	ug/l	<2.00	Y Cov	GEO37
	11 December 2009		Isoproturon	ug/l	<2.00	Y Cov	GEO37
	11 December 2009		alpha-HCH	ng/l	<2	Y Cov	GEO47
	11 December 2009		beta-Endosulphan	ng/l	<6	Y Cov	GEO47
	11 December 2009		beta-HCH	ng/l	<2	Y Cov	GEO47
	11 December 2009		alpha-Chlordane	ng/l	<2	Y Cov	GEO47
	11 December 2009		Dichlobenil	ng/l	<2	Y Cov	GEO47
	11 December 2009		Dieldrin	ng/l	<6	Y Cov	GEO47
	11 December 2009		Endrin	ng/l	Analyst Comment	Y Cov	GEO47
	11 December 2009		gamma-HCH	ng/l	<2	Y Cov	GEO47
	11 December 2009		Heptachlor Epoxide	ng/l	<2	Y Cov	GEO47
	11 December 2009		Hexachlorobenzene	ng/l	<2	Y Cov	GEO47
	11 December 2009		Hexachlorobutadiene	ng/l	<2	Y Cov	GEO47
	11 December 2009		Isodrin	ng/l	<6	Y Cov	GEO47
	11 December 2009		o,p - DDE	ng/l	<2	Y Cov	GEO47
	11 December 2009		p,p - DDE	ng/l	<2	Y Cov	GEO47
	11 December 2009		o,p - TDE	ng/l	<2	Y Cov	GEO47
	11 December 2009		p,p - TDE	ng/l	<2	Y Cov	GEO47
	11 December 2009		o,p - DDT	ng/l	<2	Y Cov	GEO47
	11 December 2009		p,p - DDT	ng/l	<2	Y Cov	GEO47
	11 December 2009		Tecnazene	ng/l	<10	Y Cov	GEO47
	11 December 2009		gamma-Chlordane	ng/l	<2	Y Cov	GEO47

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11537251	11 December 2009	GW BH1 Marlinstown	Triallate	ng/l	<10	Y Cov	GEO47
	11 December 2009		Trifluralin	ng/l	<10	Y Cov	GEO47
	11 December 2009		Linuron	ug/l	<2.00	Y Cov	GEO37
	11 December 2009		Monuron	ug/l	<2.00	Y Cov	GEO37
	11 December 2009		Azinphos-ethyl	ug/l	<0.002	Y Cov	GEO47
	11 December 2009		Azinphos-methyl	ug/l	<0.002	Y Cov	GEO47
	11 December 2009		Carbophenothion	ug/l	<0.002	Y Cov	GEO47
	11 December 2009		Chlorfenvinphos	ug/l	<0.002	Y Cov	GEO47
	11 December 2009		Chlorpyriphos	ug/l	<0.002	Y Cov	GEO47
	11 December 2009		Demeton-s-methyl	ug/l	Analyst Comment	Y Cov	GEO47
	11 December 2009		Diazinon	ug/l	<0.002	Y Cov	GEO47
	11 December 2009		Dichlorvos	ug/l	<0.002	Y Cov	GEO47
	11 December 2009		Dimethoate	ug/l	<0.020	Y Cov	GEO47
	11 December 2009		Disulphoton	ug/l	Analyst Comment	Y Cov	GEO47
	11 December 2009		Fenitrothion	ug/l	<0.002	Y Cov	GEO47
	11 December 2009		Fenthion	ug/l	<0.002	Y Cov	GEO47
	11 December 2009		Malathion	ug/l	<0.002	Y Cov	GEO47
	11 December 2009		Mevinphos	ug/l	<0.002	Y Cov	GEO47
	11 December 2009		Parathion-ethyl	ug/l	<0.002	Y Cov	GEO47
	11 December 2009		Parathion-methyl	ug/l	<0.002	Y Cov	GEO47
	11 December 2009		Phorate	ug/l	<0.002	Y Cov	GEO47
	11 December 2009		Phosalone	ug/l	<0.020	Y Cov	GEO47
	11 December 2009		Pirimiphos-methyl	ug/l	<0.002	Y Cov	GEO47

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11537251	11 December 2009	GW BH1 Marlinstown	Propetamphos	ug/l	<0.020	Y Cov	GEO47
	11 December 2009		Triazophos	ug/l	<0.002	Y Cov	GEO47
	11 December 2009		2,3,6 - TBA	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		2,4 - D	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		2,4 - DB	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		2,4,5 - T	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		Benazolin	ug/l	<0.06	Y Cov	GEO20
	11 December 2009		Bentazone	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		Chlopyralid	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		Bromoxynil	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		Dicamba	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		Dichlorprop	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		Fenoprop	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		Ioxynil	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		MCPA	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		MCPB	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		Triclopyr	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		Mecoprop	ug/l	<0.04	Y Cov	GEO20
	11 December 2009		TPH >C6-C40	ug/l	11	Y Cov	GEO35
	11 December 2009		TPH >C6-C8	ug/l	<10	N Cov	GEO35
	11 December 2009		TPH >C8-C10	ug/l	<10	N Cov	GEO35
	11 December 2009		TPH >C16-C24	ug/l	<10	N Cov	GEO35
	11 December 2009		TPH >C24-C40	ug/l	11	N Cov	GEO35

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11537251	11 December 2009	GW BH1 Marlinstown	TPH >C10-C16	ug/l	<10	N Cov	GEO35
	11 December 2009		Tributyl Tin	ug/l	<0.02	Y Cov	GEO24
	11 December 2009		Triphenyl Tin	ug/l	<0.02	Y Cov	GEO24
	11 December 2009		Dichlorodifluoromethane	ug/l	<1.0	N Cov	GEO32
	11 December 2009		Chloromethane	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Chloroethane	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Bromomethane	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Trichlorofluoromethane	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		1,1-Dichloroethene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Dichloromethane	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		1,1-Dichloroethane	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		cis-1,2-Dichloroethene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		2,2-Dichloropropane	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Chloroform	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Bromochloromethane	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		1,1,1-Trichloroethane	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		1,1-Dichloropropene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		1,2-Dichloroethane	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Benzene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		1,2-Dichloropropane	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Trichloroethene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Bromodichloromethane	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Dibromomethane	ug/l	<1.0	Y Cov	GEO32

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UKAS TESTING
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SEVERN TRENT STL

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11537251	11 December 2009	GW BH1 Marlinstown	cis-1,3-Dichloropropene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Toluene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		trans-1,3-Dichloropropene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		1,1,2-Trichloroethane	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Carbon Tetrachloride	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Vinyl Chloride	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		1,3-Dichloropropane	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Tetrachloroethene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Dibromochloromethane	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		1,2-Dibromoethane	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Chlorobenzene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		1,1,1,2-Tetrachloroethane	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Ethyl Benzene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		m,p-Xylene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		o-Xylene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Styrene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Bromoform	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		trans-1,2-Dichloroethene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Isopropylbenzene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		1,1,2,2-Tetrachloroethane	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		1,2,3-Trichloropropane	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		n-Propylbenzene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Bromobenzene	ug/l	<1.0	Y Cov	GEO32

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11537251	11 December 2009	GW BH1 Marlinstown	2-Chlorotoluene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		1,3,5-Trimethylbenzene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		4-Chlorotoluene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		tert-Butylbenzene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		1,2,4-Trimethylbenzene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		sec-Butylbenzene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		p-Isopropyltoluene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		1,3-Dichlorobenzene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		1,4-Dichlorobenzene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		n-Butylbenzene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		1,2-Dichlorobenzene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		1,2-Dibromo-3-chloropropane	ug/l	<2.0	Y Cov	GEO32
	11 December 2009		1,2,4-Trichlorobenzene	ug/l	<1.0	Y Cov	GEO32
	11 December 2009		Hexachlorobutadiene	ug/l	<1.0	N Cov	GEO32
	11 December 2009		Naphthalene	ug/l	<1.0	N Cov	GEO32
	11 December 2009		1,2,3-Trichlorobenzene	ug/l	<1.0	N Cov	GEO32
	11 December 2009		MTBE	ug/l	<1.0	N Cov	GEO32
	11 December 2009		Dibromofluoromethane	%Recovery	96.1	N Cov	GEO32
	11 December 2009		Toluene-d8	%Recovery	99.0	N Cov	GEO32
	11 December 2009		4-Bromofluorobenzene	%Recovery	95.6	N Cov	GEO32
	11 December 2009		Phenol	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Bis(2-chloroethyl)ether	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		2-Chlorophenol	ug/l	<1.0	Y Cov	GEO40

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11537251	11 December 2009	GW BH1 Marlinstown	1,3-Dichlorobenzene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		1,4-Dichlorobenzene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		2-Methylphenol	ug/l	<1.0	N Cov	GEO40
	11 December 2009		3&4-Methylphenol	ug/l	<1.0	N Cov	GEO40
	11 December 2009		Dibenzofuran	ug/l	<1.0	N Cov	GEO40
	11 December 2009		1,2-Dichlorobenzene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Bis(2-chloroisopropyl)ether	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		n-Nitrosodi-n-propylamine	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Hexachloroethane	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Nitrobenzene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Isophorone	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		2,4-Dimethylphenol	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		2-Nitrophenol	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Bis(2-chloroethoxy)methane	ug/l	<2.0	Y Cov	GEO40
	11 December 2009		2,4-Dichlorophenol	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		1,2,4-Trichlorobenzene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Naphthalene	ug/l	<2.0	Y Cov	GEO40
	11 December 2009		Hexachlorobutadiene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		4-Chloro-3-methylphenol	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		2-Methylnaphthalene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		2,4,6-Trichlorophenol	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		2,4,5-Trichlorophenol	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		2-Chloronaphthalene	ug/l	<1.0	Y Cov	GEO40

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SEVERN TRENT STL

Site Name: **Quote 10645**
Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/660075/2009** Issue **1**
Samples Received: **16 December 2009**
Analysis Complete: **11 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537251	11 December 2009	GW BH1 Marlinstown	Dimethylphthalate	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		2,6-Dinitrotoluene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Acenaphthylene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Acenaphthene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		2,4-Dinitrotoluene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Diethylphthalate	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		4-Nitrophenol	ug/l	<5.0	Y Cov	GEO40
	11 December 2009		4-Chlorophenyl phenyl ether	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Fluorene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Diphenylamine	ug/l	<1.0	N Cov	GEO40
	11 December 2009		4-Bromophenyl Phenyl Ether	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Hexachlorobenzene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Pentachlorophenol	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Phenanthrene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Anthracene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		di-n-Butylphthalate	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Fluoranthene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Pyrene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Benzyl Butyl Phthalate	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Benzo(a)anthracene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Chrysene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Bis(2-ethylhexyl)phthalate	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Di-n-octylphthalate	ug/l	<1.0	Y Cov	GEO40

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Report Number: **COV/660075/2009** Issue **1**
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Analysis Complete: **11 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537251	11 December 2009	GW BH1 Marlinstown	Benzo(b)fluoranthene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Benzo(k)fluoranthene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Benzo(a)pyrene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Indeno(1,2,3-c,d)pyrene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Dibenz(a,h)anthracene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		Benzo(g,h,i)perylene	ug/l	<1.0	Y Cov	GEO40
	11 December 2009		VOC with TICs	ug/l	Y	Y Cov	GEO32
	11 December 2009		2-Fluorophenol	%Recovery	98.6	N Cov	GEO40
	11 December 2009		Phenol-d6	%Recovery	95.1	N Cov	GEO40
	11 December 2009		Nitrobenzene-d5	%Recovery	101.7	N Cov	GEO40
	11 December 2009		2-Fluorobiphenyl	%Recovery	99.1	N Cov	GEO40
	11 December 2009		2,4,6-Tribromophenol	%Recovery	85.2	N Cov	GEO40
	11 December 2009		Terphenyl-d14	%Recovery	87.5	N Cov	GEO40
	11 December 2009		Antimony, Total as Sb	mg/l	0.002	Y Cov	WAS051
	11 December 2009		Selenium, Total as Se	mg/l	<0.001	Y Cov	WAS051
	11 December 2009		Arsenic, Total as As	mg/l	<0.001	Y Cov	WAS051
	11 December 2009		Monlinuron	ug/l	<2.00	Y Cov	GEO37
	11 December 2009		Methabenzthiazuron	ug/l	<2.00	Y Cov	GEO37
	11 December 2009		Fluoroxypyr	ug/l	<0.05	Y Cov	GEO20

Sample Matrix for 11537251: Ground waters

Analyst Comments for 11537251: Please see attached report for VOC-TIC results.
Reporting limits raised for Substituted Ureas due to sample matrix.
Results for Demeton-s-methyl, Disulphoton and Endrin are unavailable due to AQC breaches.

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Report Number: **COV/660075/2009** Issue **1**
Samples Received: **16 December 2009**
Analysis Complete: **11 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537252	11 December 2009	GW BH2 Marlinstown	Boron, Total as B	mg/l	<0.3	Y Cov	WAS049
	11 December 2009		Cadmium , Total as Cd	mg/l	0.0012	Y Cov	WAS049
	11 December 2009		Calcium , Total as Ca	mg/l	136	Y Cov	WAS049
	11 December 2009		Chromium , Total as Cr	mg/l	<0.001	Y Cov	WAS049
	11 December 2009		Copper, Total as Cu	mg/l	0.034	Y Cov	WAS049
	11 December 2009		Iron , Total as Fe	mg/l	0.49	Y Cov	WAS049
	11 December 2009		Lead , Total as Pb	mg/l	0.011	Y Cov	WAS049
	11 December 2009		Magnesium, Total as Mg	mg/l	7.86	Y Cov	WAS049
	11 December 2009		Manganese , Total as Mn	mg/l	0.054	Y Cov	WAS049
	11 December 2009		Mercury, Total as Hg	mg/l	<0.0001	Y Cov	WAS013
	11 December 2009		Nickel , Total as Ni	mg/l	0.0060	Y Cov	WAS049
	11 December 2009		Potassium , Total as K	mg/l	6.67	Y Cov	WAS049
	11 December 2009		Sodium , Total as Na	mg/l	34	Y Cov	WAS049
	11 December 2009		Zinc, Total as Zn	mg/l	0.018	Y Cov	WAS049
	11 December 2009		pH	pH units	7.9	Y Cov	WAS039
	11 December 2009		Conductivity- Electrical 20C	uS/cm	806	Y Cov	WAS039
	11 December 2009		Alkalinity as CaCO3	mg/l	332	Y Cov	WAS025
	11 December 2009		Ammoniacal Nitrogen as N	mg/l	<0.3	Y Cov	WAS036
	11 December 2009		Chloride as Cl	mg/l	61	Y Cov	WAS036
	11 December 2009		Nitrogen, Total Oxidised as N	mg/l	1.9	Y Cov	WAS036
	11 December 2009		Phosphate, Ortho as P	mg/l	<0.1	Y Cov	WAS036
	11 December 2009		Sulphate as SO4	mg/l	54	Y Cov	WAS036
	11 December 2009		Solids, Tot Dissolved 180 DegC	mg/l	570	N Cov	WAS010

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Order No: **8252**

Report Number: **COV/660075/2009** Issue **1**
Samples Received: **16 December 2009**
Analysis Complete: **11 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537252	11 December 2009	GW BH2 Marlinstown	Dissolved Oxygen concentration	mg/l	2.4	Y Cov	WAS052
	11 December 2009		TOC as C	mg/l	6.61	Y Cov	WAS005
	11 December 2009		Cyanide, Total as CN	mg/l	<0.1	Y Cov	WAS018
	11 December 2009		Fluoride as F	mg/l	0.4	Y Cov	WAS029

Sample Matrix for 11537252: Ground waters

Analyst Comments for 11537252: No Analyst Comment

11537253	11 December 2009	GW BH3 Marlinstown	Boron, Total as B	mg/l	<0.3	Y Cov	WAS049
	11 December 2009		Cadmium , Total as Cd	mg/l	0.0047	Y Cov	WAS049
	11 December 2009		Calcium , Total as Ca	mg/l	77	Y Cov	WAS049
	11 December 2009		Chromium , Total as Cr	mg/l	<0.001	Y Cov	WAS049
	11 December 2009		Copper, Total as Cu	mg/l	0.021	Y Cov	WAS049
	11 December 2009		Iron , Total as Fe	mg/l	0.89	Y Cov	WAS049
	11 December 2009		Lead , Total as Pb	mg/l	0.009	Y Cov	WAS049
	11 December 2009		Magnesium, Total as Mg	mg/l	12	Y Cov	WAS049
	11 December 2009		Manganese , Total as Mn	mg/l	0.95	Y Cov	WAS049
	11 December 2009		Mercury, Total as Hg	mg/l	0.0001	Y Cov	WAS013
	11 December 2009		Nickel , Total as Ni	mg/l	0.0033	Y Cov	WAS049
	11 December 2009		Potassium , Total as K	mg/l	0.89	Y Cov	WAS049
	11 December 2009		Sodium , Total as Na	mg/l	11	Y Cov	WAS049
	11 December 2009		Zinc, Total as Zn	mg/l	0.033	Y Cov	WAS049
	11 December 2009		pH	pH units	7.9	Y Cov	WAS039
	11 December 2009		Conductivity- Electrical 20C	uS/cm	451	Y Cov	WAS039

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Severn Trent Laboratories Ltd.

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SEVERN TRENT STL

Site Name: **Quote 10645**
Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/660075/2009** Issue **1**
Samples Received: **16 December 2009**
Analysis Complete: **11 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537253	11 December 2009	GW BH3 Marlinstown	Alkalinity as CaCO3	mg/l	254	Y Cov	WAS025
	11 December 2009		Ammoniacal Nitrogen as N	mg/l	<0.3	Y Cov	WAS036
	11 December 2009		Chloride as Cl	mg/l	13	Y Cov	WAS036
	11 December 2009		Nitrogen, Total Oxidised as N	mg/l	<0.3	Y Cov	WAS036
	11 December 2009		Phosphate, Ortho as P	mg/l	<0.1	Y Cov	WAS036
	11 December 2009		Sulphate as SO4	mg/l	<5	Y Cov	WAS036
	11 December 2009		Solids, Tot Dissolved 180 DegC	mg/l	438	N Cov	WAS010
	11 December 2009		Dissolved Oxygen concentration	mg/l	1.6	Y Cov	WAS052
	11 December 2009		TOC as C	mg/l	3.46	Y Cov	WAS005
	11 December 2009		Cyanide, Total as CN	mg/l	<0.1	Y Cov	WAS018
	11 December 2009		Fluoride as F	mg/l	0.6	Y Cov	WAS029

Sample Matrix for 11537253: Ground waters

Analyst Comments for 11537253: No Analyst Comment

11537254	11 December 2009	GW BH4 Marlinstown	Boron, Total as B	mg/l	<0.3	Y Cov	WAS049
	11 December 2009		Cadmium , Total as Cd	mg/l	0.0018	Y Cov	WAS049
	11 December 2009		Calcium , Total as Ca	mg/l	192	Y Cov	WAS049
	11 December 2009		Chromium , Total as Cr	mg/l	0.005	Y Cov	WAS049
	11 December 2009		Copper, Total as Cu	mg/l	0.096	Y Cov	WAS049
	11 December 2009		Iron , Total as Fe	mg/l	4.57	Y Cov	WAS049
	11 December 2009		Lead , Total as Pb	mg/l	0.019	Y Cov	WAS049
	11 December 2009		Magnesium, Total as Mg	mg/l	6.22	Y Cov	WAS049
	11 December 2009		Manganese , Total as Mn	mg/l	0.56	Y Cov	WAS049

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Report Number: **COV/660075/2009** Issue **1**
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Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537254	11 December 2009	GW BH4 Marlinstown	Mercury, Total as Hg	mg/l	<0.0001	Y Cov	WAS013
	11 December 2009		Nickel , Total as Ni	mg/l	0.0126	Y Cov	WAS049
	11 December 2009		Potassium , Total as K	mg/l	1.37	Y Cov	WAS049
	11 December 2009		Sodium , Total as Na	mg/l	7.23	Y Cov	WAS049
	11 December 2009		Zinc, Total as Zn	mg/l	0.049	Y Cov	WAS049
	11 December 2009		pH	pH units	7.5	Y Cov	WAS039
	11 December 2009		Conductivity- Electrical 20C	uS/cm	682	Y Cov	WAS039
	11 December 2009		Alkalinity as CaCO3	mg/l	456	Y Cov	WAS025
	11 December 2009		Ammoniacal Nitrogen as N	mg/l	6.0	Y Cov	WAS036
	11 December 2009		Chloride as Cl	mg/l	15	Y Cov	WAS036
	11 December 2009		Nitrogen, Total Oxidised as N	mg/l	<0.3	Y Cov	WAS036
	11 December 2009		Phosphate, Ortho as P	mg/l	<0.1	Y Cov	WAS036
	11 December 2009		Sulphate as SO4	mg/l	<5	Y Cov	WAS036
	11 December 2009		Solids, Tot Dissolved 180 DegC	mg/l	500	N Cov	WAS010
	11 December 2009		Dissolved Oxygen concentration	mg/l	1.8	Y Cov	WAS052
	11 December 2009		TOC as C	mg/l	12.5	Y Cov	WAS005
	11 December 2009		Cyanide, Total as CN	mg/l	<0.1	Y Cov	WAS018
	11 December 2009		Fluoride as F	mg/l	0.3	Y Cov	WAS029

Sample Matrix for 11537254: Ground waters

Analyst Comments for 11537254: No Analyst Comment

11537255	11 December 2009	GW BH13 Marlinstown	Boron, Total as B	mg/l	<0.3	Y Cov	WAS049
	11 December 2009		Cadmium , Total as Cd	mg/l	0.0014	Y Cov	WAS049

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Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537255	11 December 2009	GW BH13 Marlinstown	Calcium , Total as Ca	mg/l	30	Y Cov	WAS049
	11 December 2009		Chromium , Total as Cr	mg/l	<0.001	Y Cov	WAS049
	11 December 2009		Copper, Total as Cu	mg/l	0.076	Y Cov	WAS049
	11 December 2009		Iron , Total as Fe	mg/l	1.69	Y Cov	WAS049
	11 December 2009		Lead , Total as Pb	mg/l	0.013	Y Cov	WAS049
	11 December 2009		Magnesium, Total as Mg	mg/l	2.90	Y Cov	WAS049
	11 December 2009		Manganese , Total as Mn	mg/l	0.089	Y Cov	WAS049
	11 December 2009		Mercury, Total as Hg	mg/l	<0.0001	Y Cov	WAS013
	11 December 2009		Nickel , Total as Ni	mg/l	0.0214	Y Cov	WAS049
	11 December 2009		Potassium , Total as K	mg/l	2.68	Y Cov	WAS049
	11 December 2009		Sodium , Total as Na	mg/l	18	Y Cov	WAS049
	11 December 2009		Zinc, Total as Zn	mg/l	0.029	Y Cov	WAS049
	11 December 2009		pH	pH units	6.2	Y Cov	WAS039
	11 December 2009		Conductivity- Electrical 20C	uS/cm	244	Y Cov	WAS039
	11 December 2009		Alkalinity as CaCO3	mg/l	97.5	Y Cov	WAS025
	11 December 2009		Ammoniacal Nitrogen as N	mg/l	5.4	Y Cov	WAS036
	11 December 2009		Chloride as Cl	mg/l	27	Y Cov	WAS036
	11 December 2009		Nitrogen, Total Oxidised as N	mg/l	<0.3	Y Cov	WAS036
	11 December 2009		Phosphate, Ortho as P	mg/l	0.1	Y Cov	WAS036
	11 December 2009		Sulphate as SO4	mg/l	<5	Y Cov	WAS036
	11 December 2009		Solids, Tot Dissolved 180 DegC	mg/l	226	N Cov	WAS010
	11 December 2009		Dissolved Oxygen concentration	mg/l	2.4	Y Cov	WAS052
	11 December 2009		TOC as C	mg/l	23.7	Y Cov	WAS005

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Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537255	11 December 2009	GW BH13 Marlinstown	Cyanide, Total as CN	mg/l	<0.1	Y Cov	WAS018
	11 December 2009		Fluoride as F	mg/l	0.2	Y Cov	WAS029

Sample Matrix for 11537255: Ground waters

Analyst Comments for 11537255: No Analyst Comment

11537256	11 December 2009	GW BH14 Marlinstown	Barium, Total as Ba	mg/l	0.028	Y Cov	WAS049
	11 December 2009		Beryllium, Total as Be	mg/l	<0.001	Y Cov	WAS049
	11 December 2009		Boron, Total as B	mg/l	<0.3	Y Cov	WAS049
	11 December 2009		Cadmium , Total as Cd	mg/l	0.0028	Y Cov	WAS049
	11 December 2009		Calcium , Total as Ca	mg/l	81	Y Cov	WAS049
	11 December 2009		Chromium , Total as Cr	mg/l	0.001	Y Cov	WAS049
	11 December 2009		Cobalt , Total as Co	mg/l	0.0016	Y Cov	WAS049
	11 December 2009		Copper, Total as Cu	mg/l	0.059	Y Cov	WAS049
	11 December 2009		Iron , Total as Fe	mg/l	5.39	Y Cov	WAS049
	11 December 2009		Lead , Total as Pb	mg/l	0.026	Y Cov	WAS049
	11 December 2009		Magnesium, Total as Mg	mg/l	3.26	Y Cov	WAS049
	11 December 2009		Manganese , Total as Mn	mg/l	0.76	Y Cov	WAS049
	11 December 2009		Mercury, Total as Hg	mg/l	<0.0001	Y Cov	WAS013
	11 December 2009		Molybdenum , Total as Mo	mg/l	<0.002	Y Cov	WAS049
	11 December 2009		Nickel , Total as Ni	mg/l	0.0096	Y Cov	WAS049
	11 December 2009		Potassium , Total as K	mg/l	1.73	Y Cov	WAS049
	11 December 2009		Silver , Total as Ag	mg/l	<0.007	Y Cov	WAS049
	11 December 2009		Sodium , Total as Na	mg/l	4.31	Y Cov	WAS049

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Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537256	11 December 2009	GW BH14 Marlinstown	Tellurium, Total as Te	ug/l	<0.1	N Cov	WAS051
	11 December 2009		Thallium , Total as Tl	mg/l	0.003	N Cov	WAS049
	11 December 2009		Tin , Total as Sn	mg/l	<0.03	Y Cov	WAS049
	11 December 2009		Titanium , Total as Ti	mg/l	0.0078	Y Cov	WAS049
	11 December 2009		Uranium, Total as U	ug/l	0.2	N Cov	WAS051
	11 December 2009		Vanadium , Total as V	mg/l	0.0023	Y Cov	WAS049
	11 December 2009		Zinc, Total as Zn	mg/l	0.047	Y Cov	WAS049
	11 December 2009		pH	pH units	7.0	Y Cov	WAS039
	11 December 2009		Conductivity- Electrical 20C	uS/cm	560	Y Cov	WAS039
	11 December 2009		Alkalinity as CaCO3	mg/l	229	Y Cov	WAS025
	11 December 2009		Ammoniacal Nitrogen as N	mg/l	1.2	Y Cov	WAS036
	11 December 2009		Chloride as Cl	mg/l	8	Y Cov	WAS036
	11 December 2009		Nitrate as N	mg/l	<0.3	Y Cov	WAS036
	11 December 2009		Nitrogen, Total Oxidised as N	mg/l	<0.3	Y Cov	WAS036
	11 December 2009		Phosphate, Ortho as P	mg/l	<0.1	Y Cov	WAS036
	11 December 2009		Total Inorganic Phosphorus	ug/l	<6	Y Brd	SBC06
	11 December 2009		Sulphate as SO4	mg/l	<5	Y Cov	WAS036
	11 December 2009		Solids, Tot Dissolved 180 DegC	mg/l	528	N Cov	WAS010
	11 December 2009		Dissolved Oxygen concentration	mg/l	2.7	Y Cov	WAS052
	11 December 2009		TOC as C	mg/l	19.8	Y Cov	WAS005
	11 December 2009		Cyanide, Total as CN	mg/l	<0.1	Y Cov	WAS018
	11 December 2009		Fluoride as F	mg/l	0.2	Y Cov	WAS029
	11 December 2009		1,2,3-Trichlorobenzene	ng/l	<12	Y Cov	GEO47

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Site Name: **Quote 10645**
Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/660075/2009** Issue **1**
Samples Received: **16 December 2009**
Analysis Complete: **11 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537256	11 December 2009	GW BH14 Marlinstown	1,2,4-Trichlorobenzene	ng/l	<12	Y Cov	GEO47
	11 December 2009		1,3,5-Trichlorobenzene	ng/l	<12	Y Cov	GEO47
	11 December 2009		SVOC with TICs	ug/l	y	Y Cov	GEO40
	11 December 2009		Aldrin	ng/l	<12	Y Cov	GEO47
	11 December 2009		Chlortoluron	ug/l	<2.00	Y Cov	GEO37
	11 December 2009		alpha-Endosulphan	ng/l	<12	Y Cov	GEO47
	11 December 2009		Diuron	ug/l	<2.00	Y Cov	GEO37
	11 December 2009		Isoproturon	ug/l	<2.00	Y Cov	GEO37
	11 December 2009		alpha-HCH	ng/l	<4	Y Cov	GEO47
	11 December 2009		beta-Endosulphan	ng/l	<12	Y Cov	GEO47
	11 December 2009		beta-HCH	ng/l	<4	Y Cov	GEO47
	11 December 2009		alpha-Chlordane	ng/l	<4	Y Cov	GEO47
	11 December 2009		Dichlobenil	ng/l	<4	Y Cov	GEO47
	11 December 2009		Dieldrin	ng/l	<12	Y Cov	GEO47
	11 December 2009		Endrin	ng/l	<12	Y Cov	GEO47
	11 December 2009		gamma-HCH	ng/l	<4	Y Cov	GEO47
	11 December 2009		Heptachlor Epoxide	ng/l	<4	Y Cov	GEO47
	11 December 2009		Hexachlorobenzene	ng/l	<4	Y Cov	GEO47
	11 December 2009		Hexachlorobutadiene	ng/l	<4	Y Cov	GEO47
	11 December 2009		Isodrin	ng/l	<12	Y Cov	GEO47
	11 December 2009		o,p - DDE	ng/l	<4	Y Cov	GEO47
	11 December 2009		p,p - DDE	ng/l	<4	Y Cov	GEO47
	11 December 2009		o,p - TDE	ng/l	<4	Y Cov	GEO47

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11537256	11 December 2009	GW BH14 Marlinstown	p,p - TDE	ng/l	<4	Y Cov	GEO47
	11 December 2009		o,p - DDT	ng/l	<4	Y Cov	GEO47
	11 December 2009		p,p - DDT	ng/l	<4	Y Cov	GEO47
	11 December 2009		Tecnazene	ng/l	<20	Y Cov	GEO47
	11 December 2009		gamma-Chlordane	ng/l	<4	Y Cov	GEO47
	11 December 2009		Triallate	ng/l	<20	Y Cov	GEO47
	11 December 2009		Trifluralin	ng/l	<20	Y Cov	GEO47
	11 December 2009		Linuron	ug/l	<2.00	Y Cov	GEO37
	11 December 2009		Monuron	ug/l	<2.00	Y Cov	GEO37
	11 December 2009		Azinphos-ethyl	ug/l	<0.004	Y Cov	GEO47
	11 December 2009		Azinphos-methyl	ug/l	<0.004	Y Cov	GEO47
	11 December 2009		Carbophenothion	ug/l	<0.004	Y Cov	GEO47
	11 December 2009		Chlorfenvinphos	ug/l	<0.004	Y Cov	GEO47
	11 December 2009		Chlorpyriphos	ug/l	<0.004	Y Cov	GEO47
	11 December 2009		Demeton-s-methyl	ug/l	Analyst Comment	Y Cov	GEO47
	11 December 2009		Diazinon	ug/l	<0.004	Y Cov	GEO47
	11 December 2009		Dichlorvos	ug/l	<0.004	Y Cov	GEO47
	11 December 2009		Dimethoate	ug/l	<0.040	Y Cov	GEO47
	11 December 2009		Disulphoton	ug/l	Analyst Comment	Y Cov	GEO47
	11 December 2009		Fenitrothion	ug/l	<0.004	Y Cov	GEO47
	11 December 2009		Fenthion	ug/l	<0.004	Y Cov	GEO47
	11 December 2009		Malathion	ug/l	<0.004	Y Cov	GEO47
	11 December 2009		Mevinphos	ug/l	<0.004	Y Cov	GEO47

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11537256	11 December 2009	GW BH14 Marlinstown	Parathion-ethyl	ug/l	<0.004	Y Cov	GEO47
	11 December 2009		Parathion-methyl	ug/l	<0.004	Y Cov	GEO47
	11 December 2009		Phorate	ug/l	<0.004	Y Cov	GEO47
	11 December 2009		Phosalone	ug/l	<0.040	Y Cov	GEO47
	11 December 2009		Pirimiphos-methyl	ug/l	<0.004	Y Cov	GEO47
	11 December 2009		Propetamphos	ug/l	<0.040	Y Cov	GEO47
	11 December 2009		Triazophos	ug/l	<0.004	Y Cov	GEO47
	11 December 2009		2,3,6 - TBA	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		2,4 - D	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		2,4 - DB	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		2,4,5 - T	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		Benazolin	ug/l	<0.30	Y Cov	GEO20
	11 December 2009		Bentazone	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		Chlopyralid	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		Bromoxynil	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		Dicamba	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		Dichlorprop	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		Fenoprop	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		Ioxynil	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		MCPA	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		MCPB	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		Triclopyr	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		Mecoprop	ug/l	<0.20	Y Cov	GEO20

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11537256	11 December 2009	GW BH14 Marlinstown	TPH >C6-C40	ug/l	<40	Y Cov	GEO35
	11 December 2009		TPH >C6-C8	ug/l	<40	N Cov	GEO35
	11 December 2009		TPH >C8-C10	ug/l	<40	N Cov	GEO35
	11 December 2009		TPH >C16-C24	ug/l	<40	N Cov	GEO35
	11 December 2009		TPH >C24-C40	ug/l	<40	N Cov	GEO35
	11 December 2009		TPH >C10-C16	ug/l	<40	N Cov	GEO35
	11 December 2009		Tributyl Tin	ug/l	<0.06	Y Cov	GEO24
	11 December 2009		Triphenyl Tin	ug/l	<0.06	Y Cov	GEO24
	11 December 2009		Dichlorodifluoromethane	ug/l	<10.0	N Cov	GEO32
	11 December 2009		Chloromethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Chloroethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Bromomethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Trichlorofluoromethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1-Dichloroethene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Dichloromethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1-Dichloroethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		cis-1,2-Dichloroethene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		2,2-Dichloropropane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Chloroform	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Bromochloromethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1,1-Trichloroethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1-Dichloropropene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2-Dichloroethane	ug/l	<10.0	Y Cov	GEO32

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Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537256	11 December 2009	GW BH14 Marlinstown	Benzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2-Dichloropropane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Trichloroethene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Bromodichloromethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Dibromomethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		cis-1,3-Dichloropropene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Toluene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		trans-1,3-Dichloropropene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1,2-Trichloroethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Carbon Tetrachloride	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Vinyl Chloride	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,3-Dichloropropane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Tetrachloroethene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Dibromochloromethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2-Dibromoethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Chlorobenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1,1,2-Tetrachloroethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Ethyl Benzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		m,p-Xylene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		o-Xylene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Styrene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Bromoform	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		trans-1,2-Dichloroethene	ug/l	<10.0	Y Cov	GEO32

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Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537256	11 December 2009	GW BH14 Marlinstown	Isopropylbenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1,2,2-Tetrachloroethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2,3-Trichloropropane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		n-Propylbenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Bromobenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		2-Chlorotoluene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,3,5-Trimethylbenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		4-Chlorotoluene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		tert-Butylbenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2,4-Trimethylbenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		sec-Butylbenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		p-Isopropyltoluene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,3-Dichlorobenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,4-Dichlorobenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		n-Butylbenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2-Dichlorobenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2-Dibromo-3-chloropropane	ug/l	<20.0	Y Cov	GEO32
	11 December 2009		1,2,4-Trichlorobenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Hexachlorobutadiene	ug/l	<10.0	N Cov	GEO32
	11 December 2009		Naphthalene	ug/l	<10.0	N Cov	GEO32
	11 December 2009		1,2,3-Trichlorobenzene	ug/l	<10.0	N Cov	GEO32
	11 December 2009		MTBE	ug/l	<10.0	N Cov	GEO32
	11 December 2009		Dibromofluoromethane	%Recovery	98.0	N Cov	GEO32

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11537256	11 December 2009	GW BH14 Marlinstown	Toluene-d8	%Recovery	98.3	N Cov	GEO32
	11 December 2009		4-Bromofluorobenzene	%Recovery	91.6	N Cov	GEO32
	11 December 2009		Phenol	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Bis(2-chloroethyl)ether	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		2-Chlorophenol	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		1,3-Dichlorobenzene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		1,4-Dichlorobenzene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		2-Methylphenol	ug/l	<4.0	N Cov	GEO40
	11 December 2009		3&4-Methylphenol	ug/l	<4.0	N Cov	GEO40
	11 December 2009		Dibenzofuran	ug/l	<4.0	N Cov	GEO40
	11 December 2009		1,2-Dichlorobenzene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Bis(2-chloroisopropyl)ether	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		n-Nitrosodi-n-propylamine	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Hexachloroethane	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Nitrobenzene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Isophorone	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		2,4-Dimethylphenol	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		2-Nitrophenol	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Bis(2-chloroethoxy)methane	ug/l	<8.0	Y Cov	GEO40
	11 December 2009		2,4-Dichlorophenol	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		1,2,4-Trichlorobenzene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Naphthalene	ug/l	<8.0	Y Cov	GEO40
	11 December 2009		Hexachlorobutadiene	ug/l	<4.0	Y Cov	GEO40

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11537256	11 December 2009	GW BH14 Marlinstown	4-Chloro-3-methylphenol	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		2-Methylnaphthalene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		2,4,6-Trichlorophenol	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		2,4,5-Trichlorophenol	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		2-Chloronaphthalene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Dimethylphthalate	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		2,6-Dinitrotoluene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Acenaphthylene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Acenaphthene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		2,4-Dinitrotoluene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Diethylphthalate	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		4-Nitrophenol	ug/l	<20.0	Y Cov	GEO40
	11 December 2009		4-Chlorophenyl phenyl ether	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Fluorene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Diphenylamine	ug/l	<4.0	N Cov	GEO40
	11 December 2009		4-Bromophenyl Phenyl Ether	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Hexachlorobenzene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Pentachlorophenol	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Phenanthrene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Anthracene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		di-n-Butylphthalate	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Fluoranthene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Pyrene	ug/l	<4.0	Y Cov	GEO40

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Certificate of Analysis

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Site Name: **Quote 10645**
Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/660075/2009** Issue **1**
Samples Received: **16 December 2009**
Analysis Complete: **11 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537256	11 December 2009	GW BH14 Marlinstown	Benzyl Butyl Phthalate	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Benzo(a)anthracene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Chrysene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Bis(2-ethylhexyl)phthalate	ug/l	<40.0	Y Cov	GEO40
	11 December 2009		Di-n-octylphthalate	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Benzo(b)fluoranthene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Benzo(k)fluoranthene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Benzo(a)pyrene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Indeno(1,2,3-c,d)pyrene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Dibenz(a,h)anthracene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		Benzo(g,h,i)perylene	ug/l	<4.0	Y Cov	GEO40
	11 December 2009		VOC with TICs	ug/l	Y	Y Cov	GEO32
	11 December 2009		2-Fluorophenol	%Recovery	94.0	N Cov	GEO40
	11 December 2009		Phenol-d6	%Recovery	91.9	N Cov	GEO40
	11 December 2009		Nitrobenzene-d5	%Recovery	97.8	N Cov	GEO40
	11 December 2009		2-Fluorobiphenyl	%Recovery	98.0	N Cov	GEO40
	11 December 2009		2,4,6-Tribromophenol	%Recovery	87.9	N Cov	GEO40
	11 December 2009		Terphenyl-d14	%Recovery	87.3	N Cov	GEO40
	11 December 2009		Antimony, Total as Sb	mg/l	0.003	Y Cov	WAS051
	11 December 2009		Selenium, Total as Se	mg/l	<0.001	Y Cov	WAS051
	11 December 2009		Arsenic, Total as As	mg/l	0.002	Y Cov	WAS051
	11 December 2009		Monlinuron	ug/l	<2.00	Y Cov	GEO37
	11 December 2009		Methabenzthiazuron	ug/l	<2.00	Y Cov	GEO37

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Report Number: **COV/660075/2009** Issue **1**
Samples Received: **16 December 2009**
Analysis Complete: **11 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537256	11 December 2009	GW BH14 Marlinstown	Fluoroxypyr	ug/l	<0.25	Y Cov	GEO20

Sample Matrix for 11537256: Ground waters

Analyst Comments for 11537256: Reporting limits raised for Substituted Ureas due to sample matrix.
Acid Herbicides reporting limits raised due to nature of sample matrix.
VOC reporting limits raised due to nature of sample matrix.
Please see attached report for VOC-TIC results.
Results for Demeton-s-methyl and Disulphoton are unavailable due to AQC breaches.
SVOC reporting limits raised due to nature of sample matrix.
The reporting limits for tins have been raised due to effect of sample matrix.
Reporting limits raised for TPH due to sample matrix.

11537257	11 December 2009	GW BH15 Marlinstown	Boron, Total as B	mg/l	<0.3	Y Cov	WAS049
	11 December 2009		Cadmium , Total as Cd	mg/l	0.0023	Y Cov	WAS049
	11 December 2009		Calcium , Total as Ca	mg/l	96	Y Cov	WAS049
	11 December 2009		Chromium , Total as Cr	mg/l	0.004	Y Cov	WAS049
	11 December 2009		Copper, Total as Cu	mg/l	0.048	Y Cov	WAS049
	11 December 2009		Iron , Total as Fe	mg/l	7.63	Y Cov	WAS049
	11 December 2009		Lead , Total as Pb	mg/l	0.025	Y Cov	WAS049
	11 December 2009		Magnesium, Total as Mg	mg/l	7.54	Y Cov	WAS049
	11 December 2009		Manganese , Total as Mn	mg/l	0.34	Y Cov	WAS049
	11 December 2009		Mercury, Total as Hg	mg/l	<0.0001	Y Cov	WAS013
	11 December 2009		Nickel , Total as Ni	mg/l	0.0039	Y Cov	WAS049
	11 December 2009		Potassium , Total as K	mg/l	16	Y Cov	WAS049
	11 December 2009		Sodium , Total as Na	mg/l	26	Y Cov	WAS049
	11 December 2009		Zinc, Total as Zn	mg/l	0.029	Y Cov	WAS049
	11 December 2009		pH	pH units	7.5	Y Cov	WAS039

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Report Number: **COV/660075/2009** Issue **1**
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Analysis Complete: **11 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537257	11 December 2009	GW BH15 Marlinstown	Conductivity- Electrical 20C	uS/cm	545	Y Cov	WAS039
	11 December 2009		Alkalinity as CaCO3	mg/l	325	Y Cov	WAS025
	11 December 2009		Ammoniacal Nitrogen as N	mg/l	<0.3	Y Cov	WAS036
	11 December 2009		Chloride as Cl	mg/l	27	Y Cov	WAS036
	11 December 2009		Nitrogen, Total Oxidised as N	mg/l	1.7	Y Cov	WAS036
	11 December 2009		Phosphate, Ortho as P	mg/l	0.9	Y Cov	WAS036
	11 December 2009		Sulphate as SO4	mg/l	<5	Y Cov	WAS036
	11 December 2009		Solids, Tot Dissolved 180 DegC	mg/l	588	N Cov	WAS010
	11 December 2009		Dissolved Oxygen concentration	mg/l	2.5	Y Cov	WAS052
	11 December 2009		TOC as C	mg/l	23.3	Y Cov	WAS005
	11 December 2009		Cyanide, Total as CN	mg/l	<0.1	Y Cov	WAS018
	11 December 2009		Fluoride as F	mg/l	0.4	Y Cov	WAS029

Sample Matrix for 11537257: Ground waters

Analyst Comments for 11537257: Integrity breach between Conductivity and Total Dissolved Solids, results within 10%.

11537258	11 December 2009	GW BH16 Marlinstown	Barium, Total as Ba	mg/l	0.060	Y Cov	WAS049
	11 December 2009		Beryllium, Total as Be	mg/l	<0.001	Y Cov	WAS049
	11 December 2009		Boron, Total as B	mg/l	<0.3	Y Cov	WAS049
	11 December 2009		Cadmium , Total as Cd	mg/l	0.0020	Y Cov	WAS049
	11 December 2009		Calcium , Total as Ca	mg/l	117	Y Cov	WAS049
	11 December 2009		Chromium , Total as Cr	mg/l	0.004	Y Cov	WAS049
	11 December 2009		Cobalt , Total as Co	mg/l	0.0009	Y Cov	WAS049
	11 December 2009		Copper, Total as Cu	mg/l	0.080	Y Cov	WAS049

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Samples Received: **16 December 2009**
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Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537258	11 December 2009	GW BH16 Marlinstown	Iron , Total as Fe	mg/l	7.38	Y Cov	WAS049
	11 December 2009		Lead , Total as Pb	mg/l	0.017	Y Cov	WAS049
	11 December 2009		Magnesium, Total as Mg	mg/l	5.86	Y Cov	WAS049
	11 December 2009		Manganese , Total as Mn	mg/l	0.40	Y Cov	WAS049
	11 December 2009		Mercury, Total as Hg	mg/l	<0.0001	Y Cov	WAS013
	11 December 2009		Molybdenum , Total as Mo	mg/l	<0.002	Y Cov	WAS049
	11 December 2009		Nickel , Total as Ni	mg/l	0.0096	Y Cov	WAS049
	11 December 2009		Potassium , Total as K	mg/l	11	Y Cov	WAS049
	11 December 2009		Silver , Total as Ag	mg/l	<0.007	Y Cov	WAS049
	11 December 2009		Sodium , Total as Na	mg/l	14	Y Cov	WAS049
	11 December 2009		Tellurium, Total as Te	ug/l	<0.1	N Cov	WAS051
	11 December 2009		Thallium , Total as Tl	mg/l	<0.003	N Cov	WAS049
	11 December 2009		Tin , Total as Sn	mg/l	<0.03	Y Cov	WAS049
	11 December 2009		Titanium , Total as Ti	mg/l	0.0199	Y Cov	WAS049
	11 December 2009		Uranium, Total as U	ug/l	0.5	N Cov	WAS051
	11 December 2009		Vanadium , Total as V	mg/l	0.0176	Y Cov	WAS049
	11 December 2009		Zinc, Total as Zn	mg/l	0.029	Y Cov	WAS049
	11 December 2009		pH	pH units	7.5	Y Cov	WAS039
	11 December 2009		Conductivity- Electrical 20C	uS/cm	521	Y Cov	WAS039
	11 December 2009		Alkalinity as CaCO3	mg/l	323	Y Cov	WAS025
	11 December 2009		Ammoniacal Nitrogen as N	mg/l	0.9	Y Cov	WAS036
	11 December 2009		Chloride as Cl	mg/l	26	Y Cov	WAS036
	11 December 2009		Nitrate as N	mg/l	<0.3	Y Cov	WAS036

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Analysis Complete: **11 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537258	11 December 2009	GW BH16 Marlinstown	Nitrogen, Total Oxidised as N	mg/l	<0.3	Y Cov	WAS036
	11 December 2009		Phosphate, Ortho as P	mg/l	0.3	Y Cov	WAS036
	11 December 2009		Total Inorganic Phosphorus	ug/l	<6	Y Brd	SBC06
	11 December 2009		Sulphate as SO4	mg/l	Analyst Comment	Y Cov	WAS036
	11 December 2009		Sulphate, total as SO4 by I.C.	mg/l	<20.0	Y Cov	CON27
	11 December 2009		Solids, Tot Dissolved 180 DegC	mg/l	500	N Cov	WAS010
	11 December 2009		Dissolved Oxygen concentration	mg/l	<0.5	Y Cov	WAS052
	11 December 2009		TOC as C	mg/l	44.6	Y Cov	WAS005
	11 December 2009		Cyanide, Total as CN	mg/l	<0.1	Y Cov	WAS018
	11 December 2009		Fluoride as F	mg/l	0.4	Y Cov	WAS029
	11 December 2009		1,2,3-Trichlorobenzene	ng/l	<30	Y Cov	GEO47
	11 December 2009		1,2,4-Trichlorobenzene	ng/l	<30	Y Cov	GEO47
	11 December 2009		1,3,5-Trichlorobenzene	ng/l	<30	Y Cov	GEO47
	11 December 2009		SVOC with TICs	ug/l	y	Y Cov	GEO40
	11 December 2009		Aldrin	ng/l	<30	Y Cov	GEO47
	11 December 2009		Chlortoluron	ug/l	<0.05	Y Cov	GEO37
	11 December 2009		alpha-Endosulphan	ng/l	<30	Y Cov	GEO47
	11 December 2009		Diuron	ug/l	<0.05	Y Cov	GEO37
	11 December 2009		Isoproturon	ug/l	<0.05	Y Cov	GEO37
	11 December 2009		alpha-HCH	ng/l	<10	Y Cov	GEO47
	11 December 2009		beta-Endosulphan	ng/l	<30	Y Cov	GEO47
	11 December 2009		beta-HCH	ng/l	<10	Y Cov	GEO47
	11 December 2009		alpha-Chlordane	ng/l	<10	Y Cov	GEO47

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11537258	11 December 2009	GW BH16 Marlinstown	Dichlobenil	ng/l	<10	Y Cov	GEO47
	11 December 2009		Dieldrin	ng/l	<30	Y Cov	GEO47
	11 December 2009		Endrin	ng/l	<30	Y Cov	GEO47
	11 December 2009		gamma-HCH	ng/l	<10	Y Cov	GEO47
	11 December 2009		Heptachlor Epoxide	ng/l	<10	Y Cov	GEO47
	11 December 2009		Hexachlorobenzene	ng/l	<10	Y Cov	GEO47
	11 December 2009		Hexachlorobutadiene	ng/l	<10	Y Cov	GEO47
	11 December 2009		Isodrin	ng/l	<30	Y Cov	GEO47
	11 December 2009		o,p - DDE	ng/l	<10	Y Cov	GEO47
	11 December 2009		p,p - DDE	ng/l	<10	Y Cov	GEO47
	11 December 2009		o,p - TDE	ng/l	<10	Y Cov	GEO47
	11 December 2009		p,p - TDE	ng/l	<10	Y Cov	GEO47
	11 December 2009		o,p - DDT	ng/l	<10	Y Cov	GEO47
	11 December 2009		p,p - DDT	ng/l	<10	Y Cov	GEO47
	11 December 2009		Tecnazene	ng/l	<50	Y Cov	GEO47
	11 December 2009		gamma-Chlordane	ng/l	<10	Y Cov	GEO47
	11 December 2009		Triallate	ng/l	<50	Y Cov	GEO47
	11 December 2009		Trifluralin	ng/l	<50	Y Cov	GEO47
	11 December 2009		Linuron	ug/l	<0.05	Y Cov	GEO37
	11 December 2009		Monuron	ug/l	<0.05	Y Cov	GEO37
	11 December 2009		Azinphos-ethyl	ug/l	<0.010	Y Cov	GEO47
	11 December 2009		Azinphos-methyl	ug/l	<0.010	Y Cov	GEO47
	11 December 2009		Carbophenothion	ug/l	<0.010	Y Cov	GEO47

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11537258	11 December 2009	GW BH16 Marlinstown	Chlorfenvinphos	ug/l	<0.010	Y Cov	GEO47
	11 December 2009		Chlorpyriphos	ug/l	<0.010	Y Cov	GEO47
	11 December 2009		Demeton-s-methyl	ug/l	Analyst Comment	Y Cov	GEO47
	11 December 2009		Diazinon	ug/l	<0.010	Y Cov	GEO47
	11 December 2009		Dichlorvos	ug/l	<0.010	Y Cov	GEO47
	11 December 2009		Dimethoate	ug/l	<0.100	Y Cov	GEO47
	11 December 2009		Disulphoton	ug/l	Analyst Comment	Y Cov	GEO47
	11 December 2009		Fenitrothion	ug/l	<0.010	Y Cov	GEO47
	11 December 2009		Fenthion	ug/l	<0.010	Y Cov	GEO47
	11 December 2009		Malathion	ug/l	<0.010	Y Cov	GEO47
	11 December 2009		Mevinphos	ug/l	<0.010	Y Cov	GEO47
	11 December 2009		Parathion-ethyl	ug/l	<0.010	Y Cov	GEO47
	11 December 2009		Parathion-methyl	ug/l	<0.010	Y Cov	GEO47
	11 December 2009		Phorate	ug/l	<0.010	Y Cov	GEO47
	11 December 2009		Phosalone	ug/l	<0.100	Y Cov	GEO47
	11 December 2009		Pirimiphos-methyl	ug/l	<0.010	Y Cov	GEO47
	11 December 2009		Propetamphos	ug/l	<0.100	Y Cov	GEO47
	11 December 2009		Triazophos	ug/l	<0.010	Y Cov	GEO47
	11 December 2009		2,3,6 - TBA	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		2,4 - D	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		2,4 - DB	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		2,4,5 - T	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		Benazolin	ug/l	<0.30	Y Cov	GEO20

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11537258	11 December 2009	GW BH16 Marlinstown	Bentazone	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		Chlopyralid	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		Bromoxynil	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		Dicamba	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		Dichlorprop	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		Fenoprop	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		Ioxynil	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		MCPA	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		MCPB	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		Triclopyr	ug/l	<0.25	Y Cov	GEO20
	11 December 2009		Mecoprop	ug/l	<0.20	Y Cov	GEO20
	11 December 2009		TPH >C6-C40	ug/l	<40	Y Cov	GEO35
	11 December 2009		TPH >C6-C8	ug/l	<40	N Cov	GEO35
	11 December 2009		TPH >C8-C10	ug/l	<40	N Cov	GEO35
	11 December 2009		TPH >C16-C24	ug/l	<40	N Cov	GEO35
	11 December 2009		TPH >C24-C40	ug/l	<40	N Cov	GEO35
	11 December 2009		TPH >C10-C16	ug/l	<40	N Cov	GEO35
	11 December 2009		Tributyl Tin	ug/l	<0.2	Y Cov	GEO24
	11 December 2009		Triphenyl Tin	ug/l	<0.2	Y Cov	GEO24
	11 December 2009		Dichlorodifluoromethane	ug/l	<10.0	N Cov	GEO32
	11 December 2009		Chloromethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Chloroethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Bromomethane	ug/l	<10.0	Y Cov	GEO32

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11537258	11 December 2009	GW BH16 Marlinstown	Trichlorofluoromethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1-Dichloroethene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Dichloromethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1-Dichloroethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		cis-1,2-Dichloroethene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		2,2-Dichloropropane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Chloroform	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Bromochloromethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1,1-Trichloroethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1-Dichloropropene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2-Dichloroethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Benzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2-Dichloropropane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Trichloroethene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Bromodichloromethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Dibromomethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		cis-1,3-Dichloropropene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Toluene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		trans-1,3-Dichloropropene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1,2-Trichloroethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Carbon Tetrachloride	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Vinyl Chloride	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,3-Dichloropropane	ug/l	<10.0	Y Cov	GEO32

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Certificate of Analysis

1314
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1229
1510

Site Name: **Quote 10645**
Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/660075/2009** Issue **1**
Samples Received: **16 December 2009**
Analysis Complete: **11 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537258	11 December 2009	GW BH16 Marlinstown	Tetrachloroethene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Dibromochloromethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2-Dibromoethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Chlorobenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1,1,2-Tetrachloroethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Ethyl Benzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		m,p-Xylene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		o-Xylene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Styrene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Bromoform	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		trans-1,2-Dichloroethene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Isopropylbenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1,2,2-Tetrachloroethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2,3-Trichloropropane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		n-Propylbenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Bromobenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		2-Chlorotoluene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,3,5-Trimethylbenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		4-Chlorotoluene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		tert-Butylbenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2,4-Trimethylbenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		sec-Butylbenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		p-Isopropyltoluene	ug/l	<10.0	Y Cov	GEO32

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Site Name: **Quote 10645**
Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/660075/2009** Issue **1**
Samples Received: **16 December 2009**
Analysis Complete: **11 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537258	11 December 2009	GW BH16 Marlinstown	1,3-Dichlorobenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,4-Dichlorobenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		n-Butylbenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2-Dichlorobenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2-Dibromo-3-chloropropane	ug/l	<20.0	Y Cov	GEO32
	11 December 2009		1,2,4-Trichlorobenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Hexachlorobutadiene	ug/l	<10.0	N Cov	GEO32
	11 December 2009		Naphthalene	ug/l	<10.0	N Cov	GEO32
	11 December 2009		1,2,3-Trichlorobenzene	ug/l	<10.0	N Cov	GEO32
	11 December 2009		MTBE	ug/l	<10.0	N Cov	GEO32
	11 December 2009		Dibromofluoromethane	%Recovery	97.7	N Cov	GEO32
	11 December 2009		Toluene-d8	%Recovery	96.1	N Cov	GEO32
	11 December 2009		4-Bromofluorobenzene	%Recovery	93.7	N Cov	GEO32
	11 December 2009		Phenol	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Bis(2-chloroethyl)ether	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		2-Chlorophenol	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		1,3-Dichlorobenzene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		1,4-Dichlorobenzene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		2-Methylphenol	ug/l	<10.0	N Cov	GEO40
	11 December 2009		3&4-Methylphenol	ug/l	<10.0	N Cov	GEO40
	11 December 2009		Dibenzofuran	ug/l	<10.0	N Cov	GEO40
	11 December 2009		1,2-Dichlorobenzene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Bis(2-chloroisopropyl)ether	ug/l	<10.0	Y Cov	GEO40

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Site Name: **Quote 10645**
Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/660075/2009** Issue **1**
Samples Received: **16 December 2009**
Analysis Complete: **11 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537258	11 December 2009	GW BH16 Marlinstown	n-Nitrosodi-n-propylamine	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Hexachloroethane	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Nitrobenzene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Isophorone	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		2,4-Dimethylphenol	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		2-Nitrophenol	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Bis(2-chloroethoxy)methane	ug/l	<20.0	Y Cov	GEO40
	11 December 2009		2,4-Dichlorophenol	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		1,2,4-Trichlorobenzene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Naphthalene	ug/l	<20.0	Y Cov	GEO40
	11 December 2009		Hexachlorobutadiene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		4-Chloro-3-methylphenol	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		2-Methylnaphthalene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		2,4,6-Trichlorophenol	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		2,4,5-Trichlorophenol	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		2-Chloronaphthalene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Dimethylphthalate	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		2,6-Dinitrotoluene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Acenaphthylene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Acenaphthene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		2,4-Dinitrotoluene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Diethylphthalate	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		4-Nitrophenol	ug/l	<50.0	Y Cov	GEO40

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Certificate of Analysis

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Site Name: **Quote 10645**
Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/660075/2009** Issue **1**
Samples Received: **16 December 2009**
Analysis Complete: **11 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537258	11 December 2009	GW BH16 Marlinstown	4-Chlorophenyl phenyl ether	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Fluorene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Diphenylamine	ug/l	<10.0	N Cov	GEO40
	11 December 2009		4-Bromophenyl Phenyl Ether	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Hexachlorobenzene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Pentachlorophenol	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Phenanthrene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Anthracene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		di-n-Butylphthalate	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Fluoranthene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Pyrene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Benzyl Butyl Phthalate	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Benzo(a)anthracene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Chrysene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Bis(2-ethylhexyl)phthalate	ug/l	<100	Y Cov	GEO40
	11 December 2009		Di-n-octylphthalate	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Benzo(b)fluoranthene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Benzo(k)fluoranthene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Benzo(a)pyrene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Indeno(1,2,3-c,d)pyrene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Dibenz(a,h)anthracene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		Benzo(g,h,i)perylene	ug/l	<10.0	Y Cov	GEO40
	11 December 2009		VOC with TICs	ug/l	Y	Y Cov	GEO32

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Site Name: **Quote 10645**
Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/660075/2009** Issue **1**
Samples Received: **16 December 2009**
Analysis Complete: **11 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537258	11 December 2009	GW BH16 Marlinstown	2-Fluorophenol	%Recovery	97.7	N Cov	GEO40
	11 December 2009		Phenol-d6	%Recovery	90.6	N Cov	GEO40
	11 December 2009		Nitrobenzene-d5	%Recovery	97.6	N Cov	GEO40
	11 December 2009		2-Fluorobiphenyl	%Recovery	97.8	N Cov	GEO40
	11 December 2009		2,4,6-Tribromophenol	%Recovery	84.4	N Cov	GEO40
	11 December 2009		Terphenyl-d14	%Recovery	82.8	N Cov	GEO40
	11 December 2009		Antimony, Total as Sb	mg/l	0.005	Y Cov	WAS051
	11 December 2009		Selenium, Total as Se	mg/l	<0.001	Y Cov	WAS051
	11 December 2009		Arsenic, Total as As	mg/l	0.004	Y Cov	WAS051
	11 December 2009		Monlinuron	ug/l	<0.05	Y Cov	GEO37
	11 December 2009		Methabenzthiazuron	ug/l	<0.05	Y Cov	GEO37
	11 December 2009		Fluoroxypyr	ug/l	<0.25	Y Cov	GEO20

Sample Matrix for 11537258: Ground waters

Analyst Comments for 11537258:
Reporting limit raised for sulphate by ion chromatography due to sample matrix.
Acid Herbicides reporting limits raised due to nature of sample matrix.
VOC reporting limits raised due to nature of sample matrix.
Please see attached report for VOC-TIC results.
Sulphate analysed by ion chromatography due to interference with turbidimetric determination
Results for Demeton-s-methyl and Disulphoton are unavailable due to AQC breaches.
SVOC reporting limits raised due to nature of sample matrix.
Reporting limits raised for TPH due to sample matrix.
The reporting limits for tins have been raised due to effect of sample matrix.

11537259	11 December 2009	GW BH31 Marlinstown	Boron, Total as B	mg/l	<0.3	Y Cov	WAS049
	11 December 2009		Cadmium , Total as Cd	mg/l	0.0012	Y Cov	WAS049

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Site Name: **Quote 10645**
Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/660075/2009** Issue **1**
Samples Received: **16 December 2009**
Analysis Complete: **11 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537259	11 December 2009	GW BH31 Marlinstown	Calcium , Total as Ca	mg/l	99	Y Cov	WAS049
	11 December 2009		Chromium , Total as Cr	mg/l	<0.001	Y Cov	WAS049
	11 December 2009		Copper, Total as Cu	mg/l	0.004	Y Cov	WAS049
	11 December 2009		Iron , Total as Fe	mg/l	0.94	Y Cov	WAS049
	11 December 2009		Lead , Total as Pb	mg/l	0.007	Y Cov	WAS049
	11 December 2009		Magnesium, Total as Mg	mg/l	12	Y Cov	WAS049
	11 December 2009		Manganese , Total as Mn	mg/l	0.098	Y Cov	WAS049
	11 December 2009		Mercury, Total as Hg	mg/l	<0.0001	Y Cov	WAS013
	11 December 2009		Nickel , Total as Ni	mg/l	0.0071	Y Cov	WAS049
	11 December 2009		Potassium , Total as K	mg/l	0.80	Y Cov	WAS049
	11 December 2009		Sodium , Total as Na	mg/l	7.88	Y Cov	WAS049
	11 December 2009		Zinc, Total as Zn	mg/l	0.010	Y Cov	WAS049
	11 December 2009		pH	pH units	7.9	Y Cov	WAS039
	11 December 2009		Conductivity- Electrical 20C	uS/cm	488	Y Cov	WAS039
	11 December 2009		Alkalinity as CaCO3	mg/l	251	Y Cov	WAS025
	11 December 2009		Ammoniacal Nitrogen as N	mg/l	<0.3	Y Cov	WAS036
	11 December 2009		Chloride as Cl	mg/l	11	Y Cov	WAS036
	11 December 2009		Nitrogen, Total Oxidised as N	mg/l	<0.3	Y Cov	WAS036
	11 December 2009		Phosphate, Ortho as P	mg/l	<0.1	Y Cov	WAS036
	11 December 2009		Sulphate as SO4	mg/l	12	Y Cov	WAS036
	11 December 2009		Solids, Tot Dissolved 180 DegC	mg/l	366	N Cov	WAS010
	11 December 2009		Dissolved Oxygen concentration	mg/l	1.5	Y Cov	WAS052
	11 December 2009		TOC as C	mg/l	1.65	Y Cov	WAS005

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Severn Trent Laboratories Ltd.

STL Business Centre, Torrington Avenue, Coventry, CV4 9GU Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Site Name: **Quote 10645**
Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/660075/2009** Issue **1**
Samples Received: **16 December 2009**
Analysis Complete: **11 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537259	11 December 2009	GW BH31 Marlinstown	Cyanide, Total as CN	mg/l	<0.1	Y Cov	WAS018
	11 December 2009		Fluoride as F	mg/l	0.3	Y Cov	WAS029

Sample Matrix for 11537259: Ground waters

Analyst Comments for 11537259: No Analyst Comment

11537260	11 December 2009	GW BH32 Marlinstown	Boron, Total as B	mg/l	<0.3	Y Cov	WAS049
	11 December 2009		Cadmium , Total as Cd	mg/l	0.0016	Y Cov	WAS049
	11 December 2009		Calcium , Total as Ca	mg/l	137	Y Cov	WAS049
	11 December 2009		Chromium , Total as Cr	mg/l	<0.001	Y Cov	WAS049
	11 December 2009		Copper, Total as Cu	mg/l	0.068	Y Cov	WAS049
	11 December 2009		Iron , Total as Fe	mg/l	0.34	Y Cov	WAS049
	11 December 2009		Lead , Total as Pb	mg/l	0.005	Y Cov	WAS049
	11 December 2009		Magnesium, Total as Mg	mg/l	5.90	Y Cov	WAS049
	11 December 2009		Manganese , Total as Mn	mg/l	0.12	Y Cov	WAS049
	11 December 2009		Mercury, Total as Hg	mg/l	<0.0001	Y Cov	WAS013
	11 December 2009		Nickel , Total as Ni	mg/l	0.0135	Y Cov	WAS049
	11 December 2009		Potassium , Total as K	mg/l	3.19	Y Cov	WAS049
	11 December 2009		Sodium , Total as Na	mg/l	9.02	Y Cov	WAS049
	11 December 2009		Zinc, Total as Zn	mg/l	0.028	Y Cov	WAS049
	11 December 2009		pH	pH units	7.7	Y Cov	WAS039
	11 December 2009		Conductivity- Electrical 20C	uS/cm	647	Y Cov	WAS039
	11 December 2009		Alkalinity as CaCO3	mg/l	349	Y Cov	WAS025
	11 December 2009		Ammoniacal Nitrogen as N	mg/l	<0.3	Y Cov	WAS036

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Report Number: **COV/660075/2009** Issue **1**
Samples Received: **16 December 2009**
Analysis Complete: **11 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11537260	11 December 2009	GW BH32 Marlinstown	Chloride as Cl	mg/l	13	Y Cov	WAS036
	11 December 2009		Nitrogen, Total Oxidised as N	mg/l	4.2	Y Cov	WAS036
	11 December 2009		Phosphate, Ortho as P	mg/l	<0.1	Y Cov	WAS036
	11 December 2009		Sulphate as SO4	mg/l	17	Y Cov	WAS036
	11 December 2009		Solids, Tot Dissolved 180 DegC	mg/l	464	N Cov	WAS010
	11 December 2009		Dissolved Oxygen concentration	mg/l	1.4	Y Cov	WAS052
	11 December 2009		TOC as C	mg/l	4.31	Y Cov	WAS005
	11 December 2009		Cyanide, Total as CN	mg/l	<0.1	Y Cov	WAS018
	11 December 2009		Fluoride as F	mg/l	0.3	Y Cov	WAS029

Sample Matrix for 11537260: Ground waters

Analyst Comments for 11537260: No Analyst Comment

Signed:

Name: **J. Fell** Date: **11 January 2010**

Title: **Production Manager**

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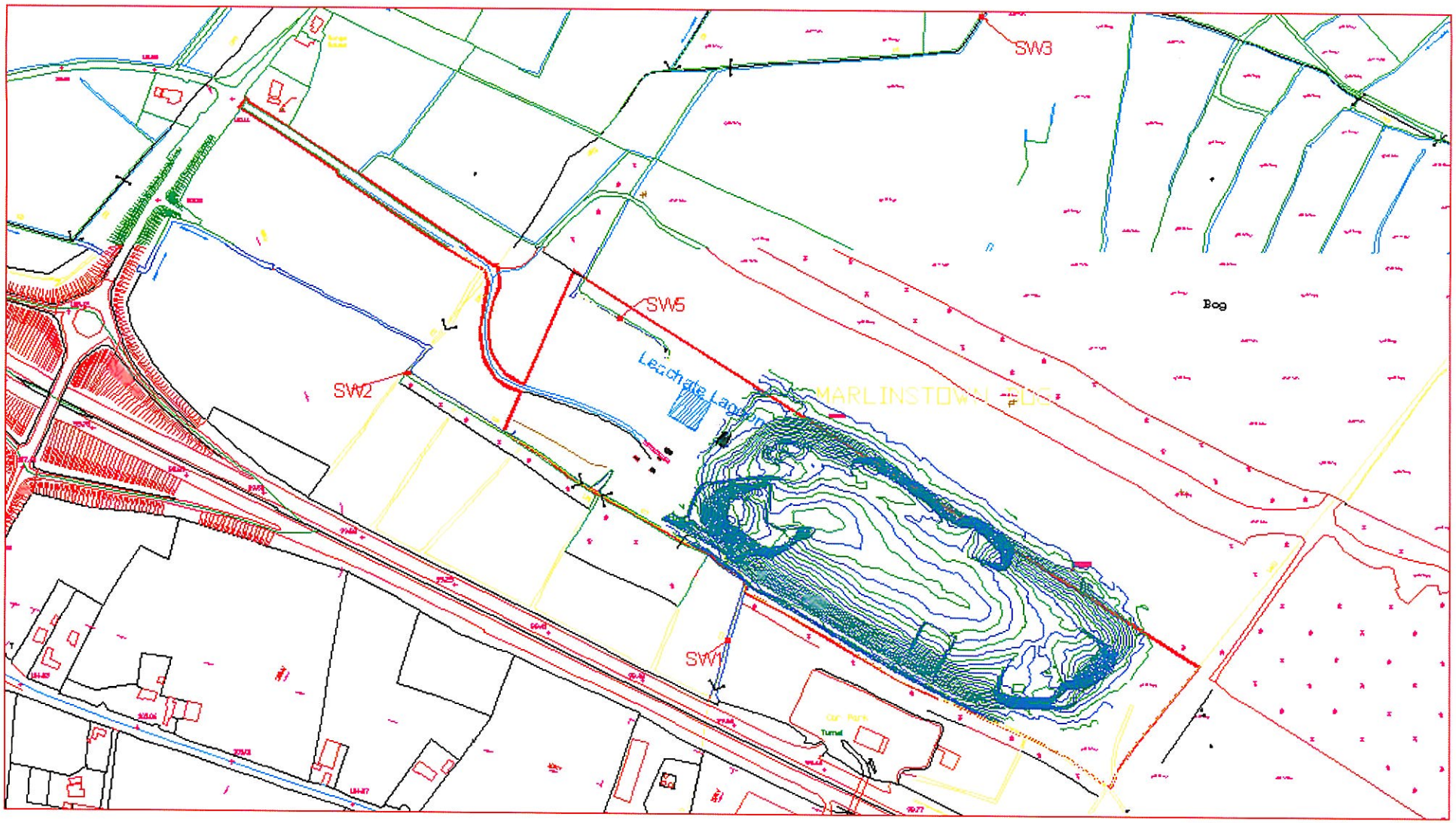
STL Business Centre, Torrington Avenue, Coventry, CV4 9GU Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

APPENDIX 3

Surface Water

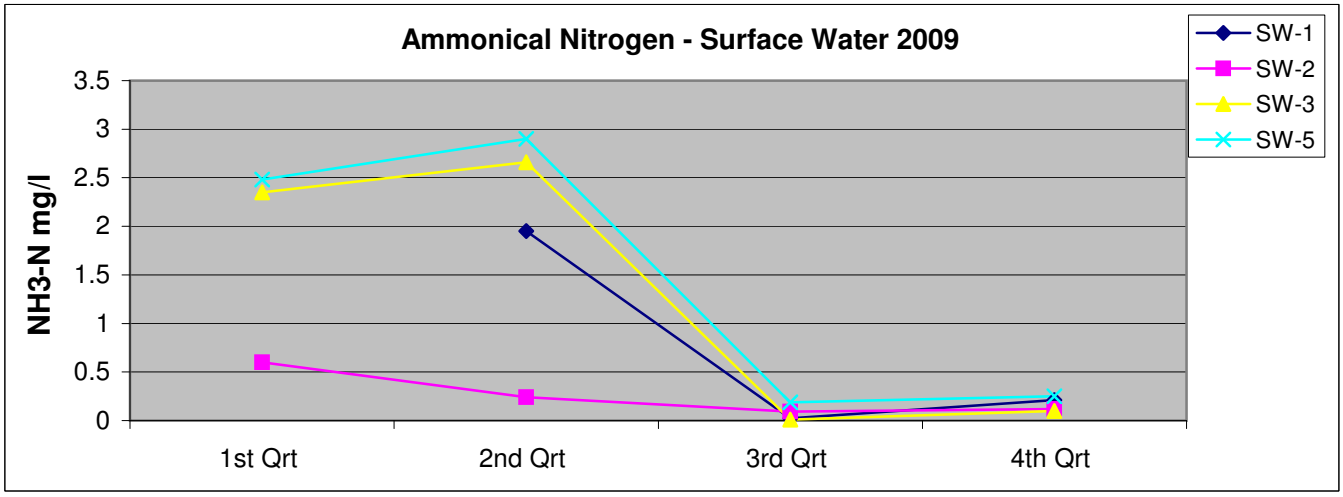


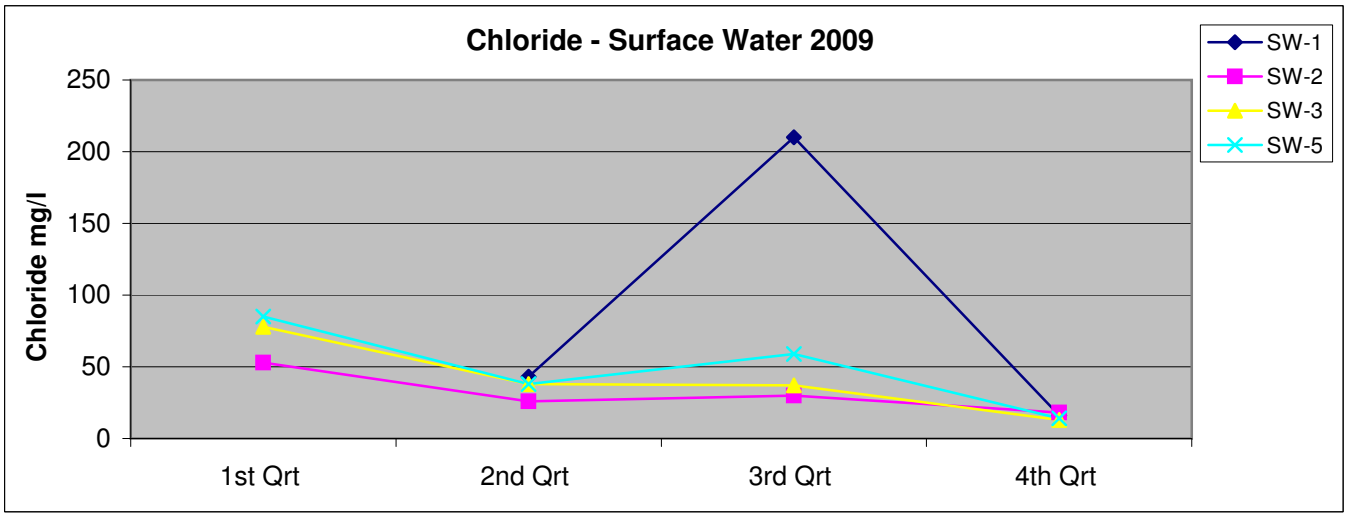
WESTMEATH COUNTY COUNCIL

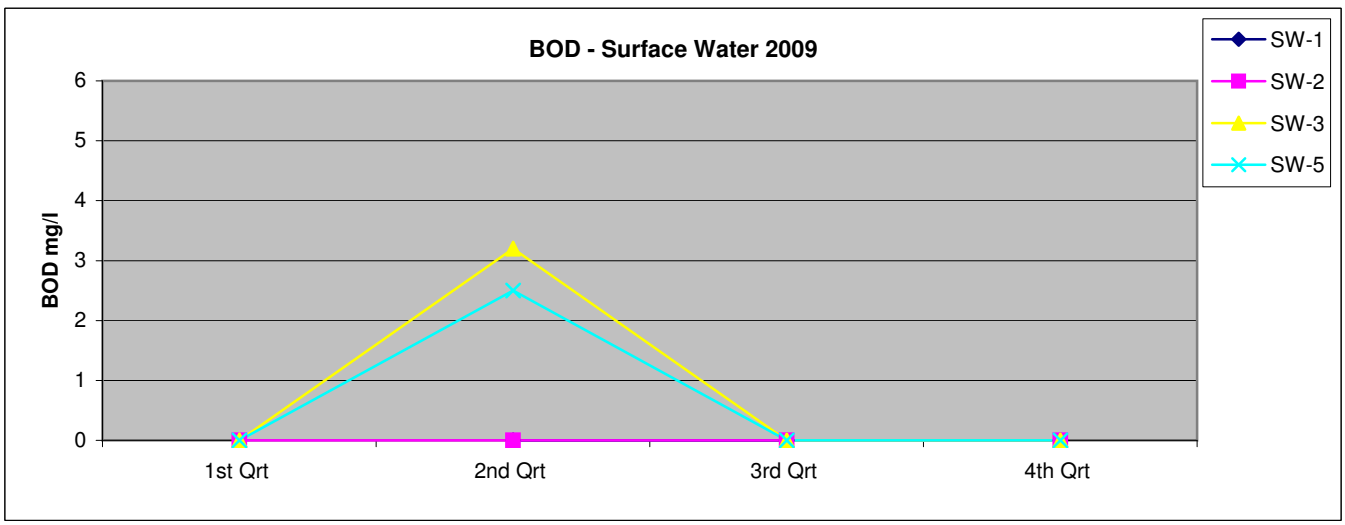
MARLINSTOWN
LANDFILL

SURFACE_WATER_MONITORING_POINTS
POST_CAPPING_WORKS

MRL_SW_2


Ammonical Nitrogen - Surface Water 2009
NH3-N mg/l
3.5
3
2.5
2
1.5
1
0.5
0
1st Qrt
2nd Qrt
3rd Qrt
4th Qrt
SW-1
SW-2
SW-3
SW-5


Chloride - Surface Water 2009
Chloride mg/l
250
200
150
100
50
0
1st Qrt
2nd Qrt
3rd Qrt
4th Qrt
SW-1
SW-2
SW-3
SW-5


BOD - Surface Water 2009
BOD mg/l
6
5
4
3
2
1
0
1st Qrt
2nd Qrt
3rd Qrt
4th Qrt
SW-1
SW-2
SW-3
SW-5

Certificate of Analysis

1314
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Site Name: **Quote 10645**
Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/659246/2009** Issue **1**
Samples Received: **11 December 2009**
Analysis Complete: **05 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11531836	11 December 2009	SW1 Marlinstown	Boron, Total as B	mg/l	0.5	Y Cov	WAS049
	11 December 2009		Cadmium , Total as Cd	mg/l	0.0006	Y Cov	WAS049
	11 December 2009		Calcium , Total as Ca	mg/l	148	Y Cov	WAS049
	11 December 2009		Chromium , Total as Cr	mg/l	0.002	Y Cov	WAS049
	11 December 2009		Copper, Total as Cu	mg/l	0.010	Y Cov	WAS049
	11 December 2009		Iron , Total as Fe	mg/l	1.17	Y Cov	WAS049
	11 December 2009		Lead , Total as Pb	mg/l	0.009	Y Cov	WAS049
	11 December 2009		Magnesium, Total as Mg	mg/l	5.88	Y Cov	WAS049
	11 December 2009		Manganese , Total as Mn	mg/l	0.15	Y Cov	WAS049
	11 December 2009		Mercury, Total as Hg	mg/l	<0.0001	Y Cov	WAS013
	11 December 2009		Nickel , Total as Ni	mg/l	0.0013	Y Cov	WAS049
	11 December 2009		Potassium , Total as K	mg/l	4.65	Y Cov	WAS049
	11 December 2009		Sodium , Total as Na	mg/l	22	Y Cov	WAS049
	11 December 2009		Zinc, Total as Zn	mg/l	0.005	Y Cov	WAS049
	11 December 2009		Alkalinity as CaCO3	mg/l	355	Y Cov	WAS025
	11 December 2009		Nitrogen, Total Oxidised as N	mg/l	2.0	Y Cov	WAS036
	11 December 2009		Phosphate, Ortho as P	mg/l	<0.1	Y Cov	WAS036
	11 December 2009		Sulphate as SO4	mg/l	16	Y Cov	WAS036

Sample Matrix for 11531836: Surface waters

Analyst Comments for 11531836: No Analyst Comment

11531837	11 December 2009	SW2 Marlinstown	Boron, Total as B	mg/l	0.4	Y Cov	WAS049
	11 December 2009		Cadmium , Total as Cd	mg/l	<0.0003	Y Cov	WAS049

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Analysed at: Brd = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = Runcorn, S = Subcontracted.
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1ml. I/S=Insufficient sample

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Samples Received: **11 December 2009**
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Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11531837	11 December 2009	SW2 Marlinstown	Calcium , Total as Ca	mg/l	151	Y Cov	WAS049
	11 December 2009		Chromium , Total as Cr	mg/l	<0.001	Y Cov	WAS049
	11 December 2009		Copper, Total as Cu	mg/l	0.006	Y Cov	WAS049
	11 December 2009		Iron , Total as Fe	mg/l	0.39	Y Cov	WAS049
	11 December 2009		Lead , Total as Pb	mg/l	0.003	Y Cov	WAS049
	11 December 2009		Magnesium, Total as Mg	mg/l	6.58	Y Cov	WAS049
	11 December 2009		Manganese , Total as Mn	mg/l	0.12	Y Cov	WAS049
	11 December 2009		Mercury, Total as Hg	mg/l	<0.0001	Y Cov	WAS013
	11 December 2009		Nickel , Total as Ni	mg/l	0.0044	Y Cov	WAS049
	11 December 2009		Potassium , Total as K	mg/l	5.74	Y Cov	WAS049
	11 December 2009		Sodium , Total as Na	mg/l	20	Y Cov	WAS049
	11 December 2009		Zinc, Total as Zn	mg/l	0.005	Y Cov	WAS049
	11 December 2009		Alkalinity as CaCO3	mg/l	329	Y Cov	WAS025
	11 December 2009		Nitrogen, Total Oxidised as N	mg/l	2.8	Y Cov	WAS036
	11 December 2009		Phosphate, Ortho as P	mg/l	<0.1	Y Cov	WAS036
	11 December 2009		Sulphate as SO4	mg/l	43	Y Cov	WAS036

Sample Matrix for 11531837: Surface waters

Analyst Comments for 11531837: No Analyst Comment

11531838	11 December 2009	SW3 Marlinstown	Boron, Total as B	mg/l	0.5	Y Cov	WAS049
	11 December 2009		Cadmium , Total as Cd	mg/l	0.0005	Y Cov	WAS049
	11 December 2009		Calcium , Total as Ca	mg/l	140	Y Cov	WAS049
	11 December 2009		Chromium , Total as Cr	mg/l	<0.001	Y Cov	WAS049

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Site Name: **Quote 10645**
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Order No: **8252**

Report Number: **COV/659246/2009** Issue **1**
Samples Received: **11 December 2009**
Analysis Complete: **05 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11531838	11 December 2009	SW3 Marlinstown	Copper, Total as Cu	mg/l	0.006	Y Cov	WAS049
	11 December 2009		Iron , Total as Fe	mg/l	0.55	Y Cov	WAS049
	11 December 2009		Lead , Total as Pb	mg/l	0.006	Y Cov	WAS049
	11 December 2009		Magnesium, Total as Mg	mg/l	6.87	Y Cov	WAS049
	11 December 2009		Manganese , Total as Mn	mg/l	0.19	Y Cov	WAS049
	11 December 2009		Mercury, Total as Hg	mg/l	<0.0001	Y Cov	WAS013
	11 December 2009		Nickel , Total as Ni	mg/l	0.0037	Y Cov	WAS049
	11 December 2009		Potassium , Total as K	mg/l	5.73	Y Cov	WAS049
	11 December 2009		Sodium , Total as Na	mg/l	21	Y Cov	WAS049
	11 December 2009		Zinc, Total as Zn	mg/l	0.004	Y Cov	WAS049
	11 December 2009		Alkalinity as CaCO3	mg/l	331	Y Cov	WAS025
	11 December 2009		Nitrogen, Total Oxidised as N	mg/l	3.4	Y Cov	WAS036
	11 December 2009		Phosphate, Ortho as P	mg/l	<0.1	Y Cov	WAS036
	11 December 2009		Sulphate as SO4	mg/l	36	Y Cov	WAS036

Sample Matrix for 11531838: Surface waters

Analyst Comments for 11531838: No Analyst Comment

11531839	11 December 2009	SW5 Marlinstown	Boron, Total as B	mg/l	0.4	Y Cov	WAS049
	11 December 2009		Cadmium , Total as Cd	mg/l	<0.0003	Y Cov	WAS049
	11 December 2009		Calcium , Total as Ca	mg/l	147	Y Cov	WAS049
	11 December 2009		Chromium , Total as Cr	mg/l	0.002	Y Cov	WAS049
	11 December 2009		Copper, Total as Cu	mg/l	0.007	Y Cov	WAS049
	11 December 2009		Iron , Total as Fe	mg/l	1.64	Y Cov	WAS049

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Severn Trent Laboratories Ltd.

STL Business Centre, Torrington Avenue, Coventry, CV4 9GU Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Site Name: **Quote 10645**
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Order No: **8252**

Report Number: **COV/659246/2009** Issue **1**
Samples Received: **11 December 2009**
Analysis Complete: **05 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11531839	11 December 2009	SW5 Marlinstown	Lead , Total as Pb	mg/l	0.004	Y Cov	WAS049
	11 December 2009		Magnesium, Total as Mg	mg/l	7.09	Y Cov	WAS049
	11 December 2009		Manganese , Total as Mn	mg/l	0.25	Y Cov	WAS049
	11 December 2009		Mercury, Total as Hg	mg/l	<0.0001	Y Cov	WAS013
	11 December 2009		Nickel , Total as Ni	mg/l	0.0039	Y Cov	WAS049
	11 December 2009		Potassium , Total as K	mg/l	6.33	Y Cov	WAS049
	11 December 2009		Sodium , Total as Na	mg/l	22	Y Cov	WAS049
	11 December 2009		Zinc, Total as Zn	mg/l	0.009	Y Cov	WAS049
	11 December 2009		Alkalinity as CaCO3	mg/l	332	Y Cov	WAS025
	11 December 2009		Nitrogen, Total Oxidised as N	mg/l	3.4	Y Cov	WAS036
	11 December 2009		Phosphate, Ortho as P	mg/l	<0.1	Y Cov	WAS036
	11 December 2009		Sulphate as SO4	mg/l	40	Y Cov	WAS036

Sample Matrix for 11531839: Surface waters

Analyst Comments for 11531839: No Analyst Comment

Signed: L. Ellis

Name: **L. Ellis** Date: **05 January 2010**

Title: **Deputy Manager**

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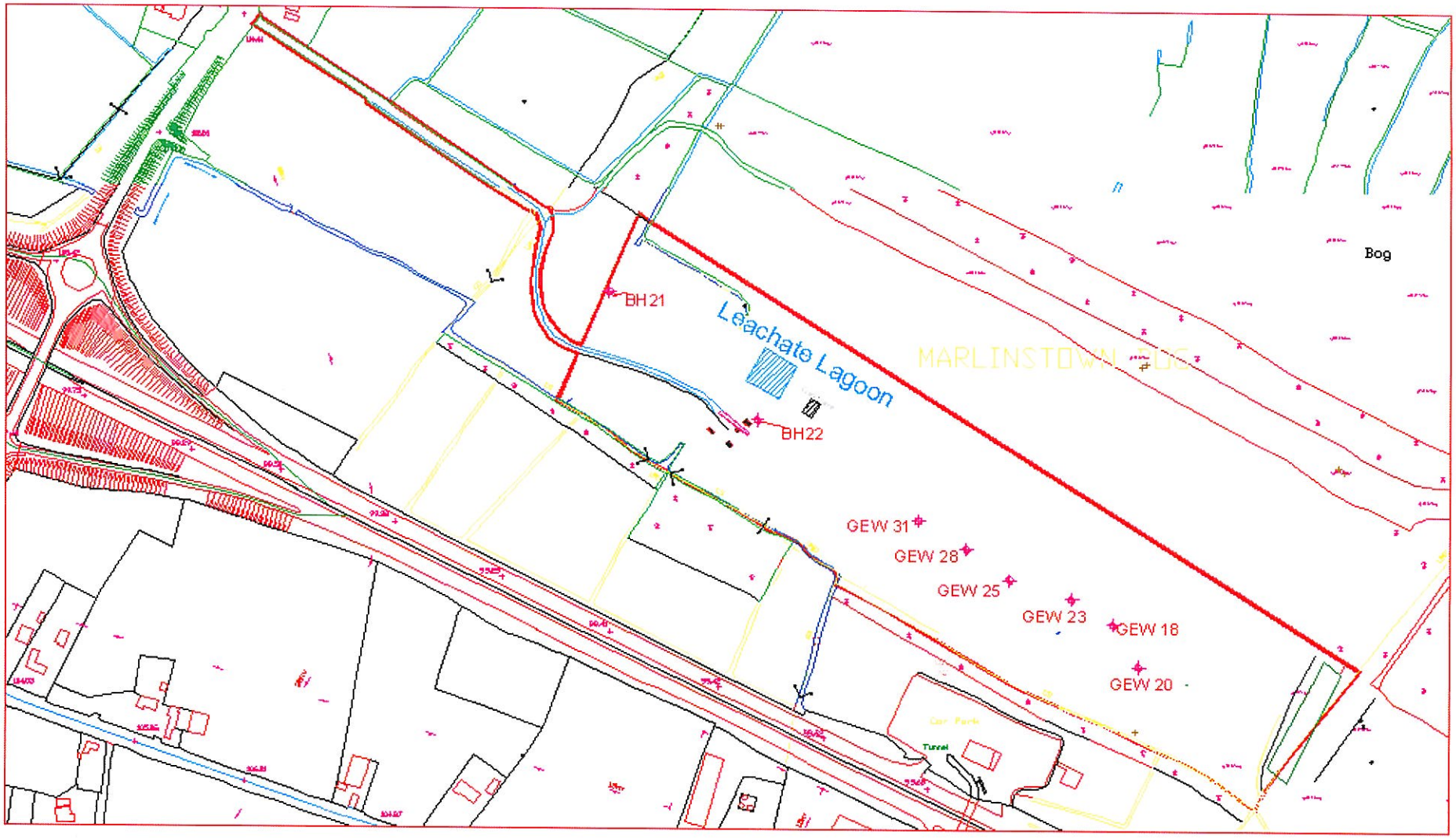
Severn Trent Laboratories Ltd.

STL Business Centre, Torrington Avenue, Coventry, CV4 9GU Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

APPENDIX 4

Leachate



WESTMEATH COUNTY COUNCIL

PROJECT

MARLINSTOWN
LANDFILL

LEACHATE_MONITORING_POINTS
POST_CAPPING_WORKS

MRL_LHS_2

Leachate Monitoring 2009

Quarter 1	Sample I D	Depth of Leachate (m)	Temp C	Odour/Visual Appearance
12/01/2009	GEW31			Pipe damaged
	GEW28	1.41	18	Foul/ brown colour
	GEW25	2.57	16	Foul/ brown-yellow colour
	GEW23	1.08	13	Foul/ yellow colour
	GEW18	0.00		Pipe damaged
	GEW20	1.21	12	Foul/ yellow colour
	BH21	1.24	11	Foul/ yellow colour
	BH22	4.10		No sample volume

Quarter 2	Sample I D	Depth of Leachate (m)	Temp C	Odour/Visual Appearance
14/04/2009	GEW31			Pipe damaged
	GEW28	2.27	13	Strong foul/Yellow colour with SS
	GEW25	2.18	11	Strong foul/Yellow colour with SS
	GEW23	1.15	15	Strong foul/Clear, Yellow colour with SS
	GEW18			Pipe damaged
	GEW20	0.15	17.5	Foul/ Black colour and oily
	BH21	0.42	11	Foul/ Clear, yellow colour with SS
	BH22	0.93		No sample volume

Quarter 3	Sample I D	Depth of Leachate (m)	Temp C	Odour/Visual Appearance
16/07/2009	GEW31			Pipe damaged
	GEW28	3.30	20.1	Faint/Light yellow colour with SS
	GEW25	2.80	17.6	Faint/Light yellow colour with SS
	GEW23	1.00	17.5	Faint/Clear with SS
	GEW18			Pipe damaged
	GEW20	1.00	15.9	Faint/Black colour with SS
	BH21	1.00	15.7	Faint/Clear, Yellow colour with SS
	BH22	1.90		No sample volume

Quarter 4	Sample I D	Depth of Leachate (m)	Temp C	Odour/Visual Appearance
	GEW31			Pipe damaged
	GEW28	12.10		
	GEW25	11.70		
	GEW23	7.20		
	GEW18			Pipe damaged
	GEW20	8.30		
	BH21	5.10		
	BH22	4.10		

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Site Name: **Quote 10645**
Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/659249/2009** Issue **1**
Samples Received: **11 December 2009**
Analysis Complete: **05 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11531852	11 December 2009	Leachate Lagoon Marlinstown	Boron, Total as B	mg/l	1.4	Y Cov	WAS049
	11 December 2009		Cadmium , Total as Cd	mg/l	0.0009	Y Cov	WAS049
	11 December 2009		Calcium , Total as Ca	mg/l	86	Y Cov	WAS049
	11 December 2009		Chromium , Total as Cr	mg/l	0.069	Y Cov	WAS049
	11 December 2009		Copper, Total as Cu	mg/l	0.008	Y Cov	WAS049
	11 December 2009		Iron , Total as Fe	mg/l	5.08	Y Cov	WAS049
	11 December 2009		Lead , Total as Pb	mg/l	<0.002	Y Cov	WAS049
	11 December 2009		Magnesium, Total as Mg	mg/l	48	Y Cov	WAS049
	11 December 2009		Manganese , Total as Mn	mg/l	0.50	Y Cov	WAS049
	11 December 2009		Mercury, Total as Hg	mg/l	<0.0001	Y Cov	WAS013
	11 December 2009		Nickel , Total as Ni	mg/l	0.0657	Y Cov	WAS049
	11 December 2009		Potassium , Total as K	mg/l	213	Y Cov	WAS049
	11 December 2009		Sodium , Total as Na	mg/l	665	Y Cov	WAS049
	11 December 2009		Zinc, Total as Zn	mg/l	0.037	Y Cov	WAS049
	11 December 2009		pH	pH units	8.2	Y Cov	WAS039
	11 December 2009		Conductivity- Electrical 20C	uS/cm	4410	Y Cov	WAS039
	11 December 2009		Ammoniacal Nitrogen as N	mg/l	247	Y Cov	WAS036
	11 December 2009		Chloride as Cl	mg/l	470	Y Cov	WAS036
	11 December 2009		Nitrogen, total Oxidised as N	mg/l	<0.5	N Cov	WSI044
	11 December 2009		Phosphate, Ortho as P	mg/l	0.8	Y Cov	WAS036
	11 December 2009		Sulphate as SO4	mg/l	97	Y Cov	WAS036
	11 December 2009		BOD + ATU (5 day)	mg/l	54	Y Cov	WAS001
	11 December 2009		COD (Total)	mg/l	565	Y Cov	WAS040

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Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11531852	11 December 2009	Leachate Lagoon Marlinstown	Cyanide, Total as CN	mg/l	<0.1	Y Cov	WAS018
	11 December 2009		Fluoride as F	mg/l	0.3	Y Cov	WAS029
	11 December 2009		1,2,3-Trichlorobenzene	ng/l	<60	Y Cov	GEO47
	11 December 2009		1,2,4-Trichlorobenzene	ng/l	<60	Y Cov	GEO47
	11 December 2009		1,3,5-Trichlorobenzene	ng/l	<60	Y Cov	GEO47
	11 December 2009		Aldrin	ng/l	<60	Y Cov	GEO47
	11 December 2009		Chlortoluron	ug/l	<5.00	Y Cov	GEO37
	11 December 2009		alpha-Endosulphan	ng/l	<60	Y Cov	GEO47
	11 December 2009		Diuron	ug/l	<5.00	Y Cov	GEO37
	11 December 2009		Isoproturon	ug/l	<5.00	Y Cov	GEO37
	11 December 2009		alpha-HCH	ng/l	<20	Y Cov	GEO47
	11 December 2009		beta-Endosulphan	ng/l	<60	Y Cov	GEO47
	11 December 2009		beta-HCH	ng/l	<20	Y Cov	GEO47
	11 December 2009		alpha-Chlordane	ng/l	<20	Y Cov	GEO47
	11 December 2009		Dichlobenil	ng/l	187	Y Cov	GEO47
	11 December 2009		Dieldrin	ng/l	<60	Y Cov	GEO47
	11 December 2009		Endrin	ng/l	<60	Y Cov	GEO47
	11 December 2009		gamma-HCH	ng/l	<20	Y Cov	GEO47
	11 December 2009		Heptachlor Epoxide	ng/l	<20	Y Cov	GEO47
	11 December 2009		Hexachlorobenzene	ng/l	<20	Y Cov	GEO47
	11 December 2009		Hexachlorobutadiene	ng/l	<20	Y Cov	GEO47
	11 December 2009		Isodrin	ng/l	<60	Y Cov	GEO47
	11 December 2009		o,p - DDE	ng/l	<20	Y Cov	GEO47

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11531852	11 December 2009	Leachate Lagoon Marlinstown	p,p - DDE	ng/l	<20	Y Cov	GEO47
	11 December 2009		o,p - TDE	ng/l	<20	Y Cov	GEO47
	11 December 2009		p,p - TDE	ng/l	<20	Y Cov	GEO47
	11 December 2009		o,p - DDT	ng/l	<20	Y Cov	GEO47
	11 December 2009		p,p - DDT	ng/l	<20	Y Cov	GEO47
	11 December 2009		Tecnazene	ng/l	<100	Y Cov	GEO47
	11 December 2009		gamma-Chlordane	ng/l	<20	Y Cov	GEO47
	11 December 2009		Triallate	ng/l	<100	Y Cov	GEO47
	11 December 2009		Trifluralin	ng/l	<100	Y Cov	GEO47
	11 December 2009		Linuron	ug/l	<5.00	Y Cov	GEO37
	11 December 2009		Monuron	ug/l	<5.00	Y Cov	GEO37
	11 December 2009		Azinphos-ethyl	ug/l	<0.020	Y Cov	GEO47
	11 December 2009		Azinphos-methyl	ug/l	<0.020	Y Cov	GEO47
	11 December 2009		Carbophenothion	ug/l	<0.020	Y Cov	GEO47
	11 December 2009		Chlorfenvinphos	ug/l	<0.020	Y Cov	GEO47
	11 December 2009		Chlorpyriphos	ug/l	<0.020	Y Cov	GEO47
	11 December 2009		Demeton-s-methyl	ug/l	Analyst Comment	Y Cov	GEO47
	11 December 2009		Diazinon	ug/l	<0.020	Y Cov	GEO47
	11 December 2009		Dichlorvos	ug/l	<0.020	Y Cov	GEO47
	11 December 2009		Dimethoate	ug/l	<0.200	Y Cov	GEO47
	11 December 2009		Disulphoton	ug/l	Analyst Comment	Y Cov	GEO47
	11 December 2009		Fenitrothion	ug/l	<0.020	Y Cov	GEO47
	11 December 2009		Fenthion	ug/l	<0.020	Y Cov	GEO47

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11531852	11 December 2009	Leachate Lagoon Marlinstown	Malathion	ug/l	<0.020	Y Cov	GEO47
	11 December 2009		Mevinphos	ug/l	<0.020	Y Cov	GEO47
	11 December 2009		Parathion-ethyl	ug/l	<0.020	Y Cov	GEO47
	11 December 2009		Parathion-methyl	ug/l	<0.020	Y Cov	GEO47
	11 December 2009		Phorate	ug/l	<0.020	Y Cov	GEO47
	11 December 2009		Phosalone	ug/l	<0.200	Y Cov	GEO47
	11 December 2009		Pirimiphos-methyl	ug/l	<0.020	Y Cov	GEO47
	11 December 2009		Propetamphos	ug/l	<0.200	Y Cov	GEO47
	11 December 2009		Triazophos	ug/l	<0.020	Y Cov	GEO47
	11 December 2009		2,3,6 - TBA	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		2,4 - D	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		2,4 - DB	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		2,4,5 - T	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		Benazolin	ug/l	<0.06	Y Cov	GEO20
	11 December 2009		Bentazone	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		Chlopyralid	ug/l	0.06	Y Cov	GEO20
	11 December 2009		Bromoxynil	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		Dicamba	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		Dichlorprop	ug/l	0.09	Y Cov	GEO20
	11 December 2009		Fenoprop	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		Ioxynil	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		MCPA	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		MCPB	ug/l	<0.05	Y Cov	GEO20

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Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11531852	11 December 2009	Leachate Lagoon Marlinstown	Triclopyr	ug/l	<0.05	Y Cov	GEO20
	11 December 2009		Mecoprop	ug/l	0.84	Y Cov	GEO20
	11 December 2009		TPH >C6-C40	ug/l	134	Y Cov	GEO35
	11 December 2009		TPH >C6-C8	ug/l	<100	N Cov	GEO35
	11 December 2009		TPH >C8-C10	ug/l	<100	N Cov	GEO35
	11 December 2009		TPH >C16-C24	ug/l	<100	N Cov	GEO35
	11 December 2009		TPH >C24-C40	ug/l	134	N Cov	GEO35
	11 December 2009		TPH >C10-C16	ug/l	<100	N Cov	GEO35
	11 December 2009		Tributyl Tin	ug/l	<0.20	Y Cov	GEO24
	11 December 2009		Triphenyl Tin	ug/l	<0.20	Y Cov	GEO24
	11 December 2009		Ammonium as NH4 (Calc)	mg/l	319	N Cov	WAS036
	11 December 2009		Monlinuron	ug/l	<5.00	Y Cov	GEO37
	11 December 2009		Methabenzthiazuron	ug/l	<5.00	Y Cov	GEO37
	11 December 2009		Fluoroxypyr	ug/l	<0.05	Y Cov	GEO20

Sample Matrix for 11531852: Leachates from landfill

Analyst Comments for 11531852: Reporting limits raised for substituted ureas due to sample matrix.
Ammonium too high for clean water analysis.
Raised reporting limits for TPH due to sample matrix.
Cyanide sampled from 1 litre pet as no fixed subsample was available.
The reporting limits for tins have been raised due to effect of sample matrix.

Results for Demeton-s-methyl and Disulphoton are unavailable due to AQC breaches.

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For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1ml. I/S=Insufficient sample

Severn Trent Laboratories Ltd.

STL Business Centre, Torrington Avenue, Coventry, CV4 9GU Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

Signed: L. Ellis	Name: **L. Ellis**	Date: **05 January 2010**
	Title: **Deputy Manager**	

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Certificate of Analysis

1314
0897
1229
1510

Site Name: **Marlinstown Landfill,Mullingar,Co.Westme**
Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/660182/2009** Issue **1**
Samples Received: **17 December 2009**
Analysis Complete: **06 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11538077	11 December 2009	Leachate BH21 Marlinstown	Barium, Total as Ba	mg/l	0.36	Y Cov	WAS049
	11 December 2009		Beryllium, Total as Be	mg/l	<0.001	Y Cov	WAS049
	11 December 2009		Boron, Total as B	mg/l	2.6	Y Cov	WAS049
	11 December 2009		Cadmium , Total as Cd	mg/l	0.0022	Y Cov	WAS049
	11 December 2009		Calcium , Total as Ca	mg/l	175	Y Cov	WAS049
	11 December 2009		Chromium , Total as Cr	mg/l	0.015	Y Cov	WAS049
	11 December 2009		Cobalt , Total as Co	mg/l	0.0032	Y Cov	WAS049
	11 December 2009		Copper, Total as Cu	mg/l	0.019	Y Cov	WAS049
	11 December 2009		Iron , Total as Fe	mg/l	36.21	Y Cov	WAS049
	11 December 2009		Lead , Total as Pb	mg/l	0.056	Y Cov	WAS049
	11 December 2009		Magnesium, Total as Mg	mg/l	191	Y Cov	WAS049
	11 December 2009		Manganese , Total as Mn	mg/l	0.54	Y Cov	WAS049
	11 December 2009		Mercury, Total as Hg	mg/l	<0.0001	Y Cov	WAS013
	11 December 2009		Molybdenum , Total as Mo	mg/l	<0.002	Y Cov	WAS049
	11 December 2009		Nickel , Total as Ni	mg/l	0.0219	Y Cov	WAS049
	11 December 2009		Potassium , Total as K	mg/l	196	Y Cov	WAS049
	11 December 2009		Silver , Total as Ag	mg/l	<0.007	Y Cov	WAS049
	11 December 2009		Sodium , Total as Na	mg/l	149	Y Cov	WAS049
	11 December 2009		Tellurium, Total as Te	ug/l	<0.1	N Cov	WAS051
	11 December 2009		Thallium , Total as Tl	mg/l	<0.003	N Cov	WAS049
	11 December 2009		Tin , Total as Sn	mg/l	<0.03	Y Cov	WAS049
	11 December 2009		Titanium , Total as Ti	mg/l	0.0096	Y Cov	WAS049
	11 December 2009		Uranium, Total as U	ug/l	0.2	N Cov	WAS051

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Certificate of Analysis

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SEVERN TRENT STL

Site Name: **Marlinstown Landfill,Mullingar,Co.Westme**
Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/660182/2009** Issue **1**
Samples Received: **17 December 2009**
Analysis Complete: **06 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11538077	11 December 2009	Leachate BH21 Marlinstown	Vanadium , Total as V	mg/l	0.0111	Y Cov	WAS049
	11 December 2009		Zinc, Total as Zn	mg/l	0.065	Y Cov	WAS049
	11 December 2009		pH	pH units	7.8	Y Cov	WAS039
	11 December 2009		Conductivity- Electrical 20C	uS/cm	3200	Y Cov	WAS039
	11 December 2009		Ammoniacal Nitrogen as N	mg/l	190	Y Cov	WAS036
	11 December 2009		Chloride as Cl	mg/l	170	Y Cov	WAS036
	11 December 2009		Nitrate as N	mg/l	15.8	Y Cov	WAS036
	11 December 2009		Nitrogen, total Oxidised as N	mg/l	<0.5	N Cov	WSI044
	11 December 2009		Phosphate, Ortho as P	mg/l	<0.1	Y Cov	WAS036
	11 December 2009		Total Inorganic Phosphorus	ug/l	<6	Y Brd	SBC06
	11 December 2009		Sulphate as SO4	mg/l	<5	Y Cov	WAS036
	11 December 2009		BOD + ATU (5 day)	mg/l	26	Y Cov	WAS001
	11 December 2009		COD (Total)	mg/l	285	Y Cov	WAS040
	11 December 2009		Cyanide, Total as CN	mg/l	<0.1	Y Cov	WAS018
	11 December 2009		Fluoride as F	mg/l	<0.1	Y Cov	WAS029
	11 December 2009		TPH >C6-C40	ug/l	25	Y Cov	GEO35
	11 December 2009		TPH >C6-C8	ug/l	<20	N Cov	GEO35
	11 December 2009		TPH >C8-C10	ug/l	<20	N Cov	GEO35
	11 December 2009		TPH >C16-C24	ug/l	<20	N Cov	GEO35
	11 December 2009		TPH >C24-C40	ug/l	<20	N Cov	GEO35
	11 December 2009		TPH >C10-C16	ug/l	25	N Cov	GEO35
	11 December 2009		Dichlorodifluoromethane	ug/l	<10.0	N Cov	GEO32
	11 December 2009		Chloromethane	ug/l	<10.0	Y Cov	GEO32

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For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1ml. I/S=Insufficient sample

Certificate of Analysis

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SEVERN TRENT STL

Site Name: **Marlinstown Landfill,Mullingar,Co.Westme**
Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/660182/2009** Issue **1**
Samples Received: **17 December 2009**
Analysis Complete: **06 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11538077	11 December 2009	Leachate BH21 Marlinstown	Chloroethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Bromomethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Trichlorofluoromethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1-Dichloroethene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Dichloromethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1-Dichloroethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		cis-1,2-Dichloroethene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		2,2-Dichloropropane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Chloroform	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Bromochloromethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1,1-Trichloroethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1-Dichloropropene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2-Dichloroethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Benzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2-Dichloropropane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Trichloroethene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Bromodichloromethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Dibromomethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		cis-1,3-Dichloropropene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Toluene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		trans-1,3-Dichloropropene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1,2-Trichloroethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Carbon Tetrachloride	ug/l	<10.0	Y Cov	GEO32

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SEVERN TRENT STL

Site Name: **Marlinstown Landfill,Mullingar,Co.Westme**
Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/660182/2009** Issue **1**
Samples Received: **17 December 2009**
Analysis Complete: **06 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11538077	11 December 2009	Leachate BH21 Marlinstown	Vinyl Chloride	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,3-Dichloropropane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Tetrachloroethene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Dibromochloromethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2-Dibromoethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Chlorobenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1,1,2-Tetrachloroethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Ethyl Benzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		m,p-Xylene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		o-Xylene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Styrene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Bromoform	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		trans-1,2-Dichloroethene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Isopropylbenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,1,2,2-Tetrachloroethane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2,3-Trichloropropane	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		n-Propylbenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Bromobenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		2-Chlorotoluene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,3,5-Trimethylbenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		4-Chlorotoluene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		tert-Butylbenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2,4-Trimethylbenzene	ug/l	<10.0	Y Cov	GEO32

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Site Name: **Marlinstown Landfill,Mullingar,Co.Westme**
Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/660182/2009** Issue **1**
Samples Received: **17 December 2009**
Analysis Complete: **06 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11538077	11 December 2009	Leachate BH21 Marlinstown	sec-Butylbenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		p-Isopropyltoluene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,3-Dichlorobenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,4-Dichlorobenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		n-Butylbenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2-Dichlorobenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		1,2-Dibromo-3-chloropropane	ug/l	<20.0	Y Cov	GEO32
	11 December 2009		1,2,4-Trichlorobenzene	ug/l	<10.0	Y Cov	GEO32
	11 December 2009		Hexachlorobutadiene	ug/l	<10.0	N Cov	GEO32
	11 December 2009		Naphthalene	ug/l	<10.0	N Cov	GEO32
	11 December 2009		1,2,3-Trichlorobenzene	ug/l	<10.0	N Cov	GEO32
	11 December 2009		MTBE	ug/l	<10.0	N Cov	GEO32
	11 December 2009		Dibromofluoromethane	%Recovery	89.3	N Cov	GEO32
	11 December 2009		Toluene-d8	%Recovery	76.4	N Cov	GEO32
	11 December 2009		4-Bromofluorobenzene	%Recovery	90.2	N Cov	GEO32
	11 December 2009		VOC with TICs	ug/l	Y	Y Cov	GEO32
	11 December 2009		Antimony, Total as Sb	mg/l	0.007	Y Cov	WAS051
	11 December 2009		Selenium, Total as Se	mg/l	0.009	Y Cov	WAS051
	11 December 2009		Arsenic, Total as As	mg/l	0.005	Y Cov	WAS051

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Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/660182/2009** Issue **1**
Samples Received: **17 December 2009**
Analysis Complete: **06 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11538077	11 December 2009	Leachate BH21 Marlinstown	Ammonium as NH4 (Calc)	mg/l	275	N Cov	WAS036

Sample Matrix for 11538077: Leachates from landfill

Analyst Comments for 11538077: Ammonium too high for clean water analysis.
VOC reporting limits raised due to nature of sample matrix.
Please see attached report for VOC-TIC results.
Raised reporting limits for TPH due to sample matrix.

11538078	11 December 2009	Leachate GEW28 Marlinstown	Boron, Total as B	mg/l	2.1	Y Cov	WAS049
	11 December 2009		Cadmium , Total as Cd	mg/l	0.0044	Y Cov	WAS049
	11 December 2009		Calcium , Total as Ca	mg/l	182	Y Cov	WAS049
	11 December 2009		Chromium , Total as Cr	mg/l	0.015	Y Cov	WAS049
	11 December 2009		Copper, Total as Cu	mg/l	0.038	Y Cov	WAS049
	11 December 2009		Iron , Total as Fe	mg/l	23.59	Y Cov	WAS049
	11 December 2009		Lead , Total as Pb	mg/l	0.12	Y Cov	WAS049
	11 December 2009		Magnesium, Total as Mg	mg/l	118	Y Cov	WAS049
	11 December 2009		Manganese , Total as Mn	mg/l	0.75	Y Cov	WAS049
	11 December 2009		Mercury, Total as Hg	mg/l	<0.0001	Y Cov	WAS013
	11 December 2009		Nickel , Total as Ni	mg/l	0.13	Y Cov	WAS049
	11 December 2009		Potassium , Total as K	mg/l	564	Y Cov	WAS049
	11 December 2009		Sodium , Total as Na	mg/l	1060	Y Cov	WAS049
	11 December 2009		Zinc, Total as Zn	mg/l	0.93	Y Cov	WAS049
	11 December 2009		pH	pH units	7.9	Y Cov	WAS039
	11 December 2009		Conductivity- Electrical 20C	uS/cm	10800	Y Cov	WAS039
	11 December 2009		Chloride as Cl	mg/l	1150	Y Cov	WAS036
	11 December 2009		Nitrogen, total Oxidised as N	mg/l	<0.5	N Cov	WSI044

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Site Name: **Marlinstown Landfill,Mullingar,Co.Westme**
Sample Source: **RPS Consultants**
Order No: **8252**

Report Number: **COV/660182/2009** Issue **1**
Samples Received: **17 December 2009**
Analysis Complete: **06 January 2010**

Sample	Sample Date	Sample Description	Test Description	Unit	Result	Accred.	Method
11538078	11 December 2009	Leachate GEW28 Marlinstown	Phosphate, Ortho as P	mg/l	4.0	Y Cov	WAS036
	11 December 2009		Sulphate as SO4	mg/l	34	Y Cov	WAS036
	11 December 2009		BOD + ATU (5 day)	mg/l	45	Y Cov	WAS001
	11 December 2009		COD (Total)	mg/l	1430	Y Cov	WAS040
	11 December 2009		Cyanide, Total as CN	mg/l	<0.1	Y Cov	WAS018
	11 December 2009		Fluoride as F	mg/l	1.2	Y Cov	WAS029
	11 December 2009		Ammonium as NH4 (Calc)	mg/l	897	N Cov	WAS036

Sample Matrix for 11538078: Leachates from landfill

Analyst Comments for 11538078: Ammonium too high for clean water analysis.

Signed: L. Ellis

Name: **L. Ellis** Date: **06 January 2010**

Title: **Deputy Manager**

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Analysed at: Brd = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = Runcorn, S = Subcontracted.
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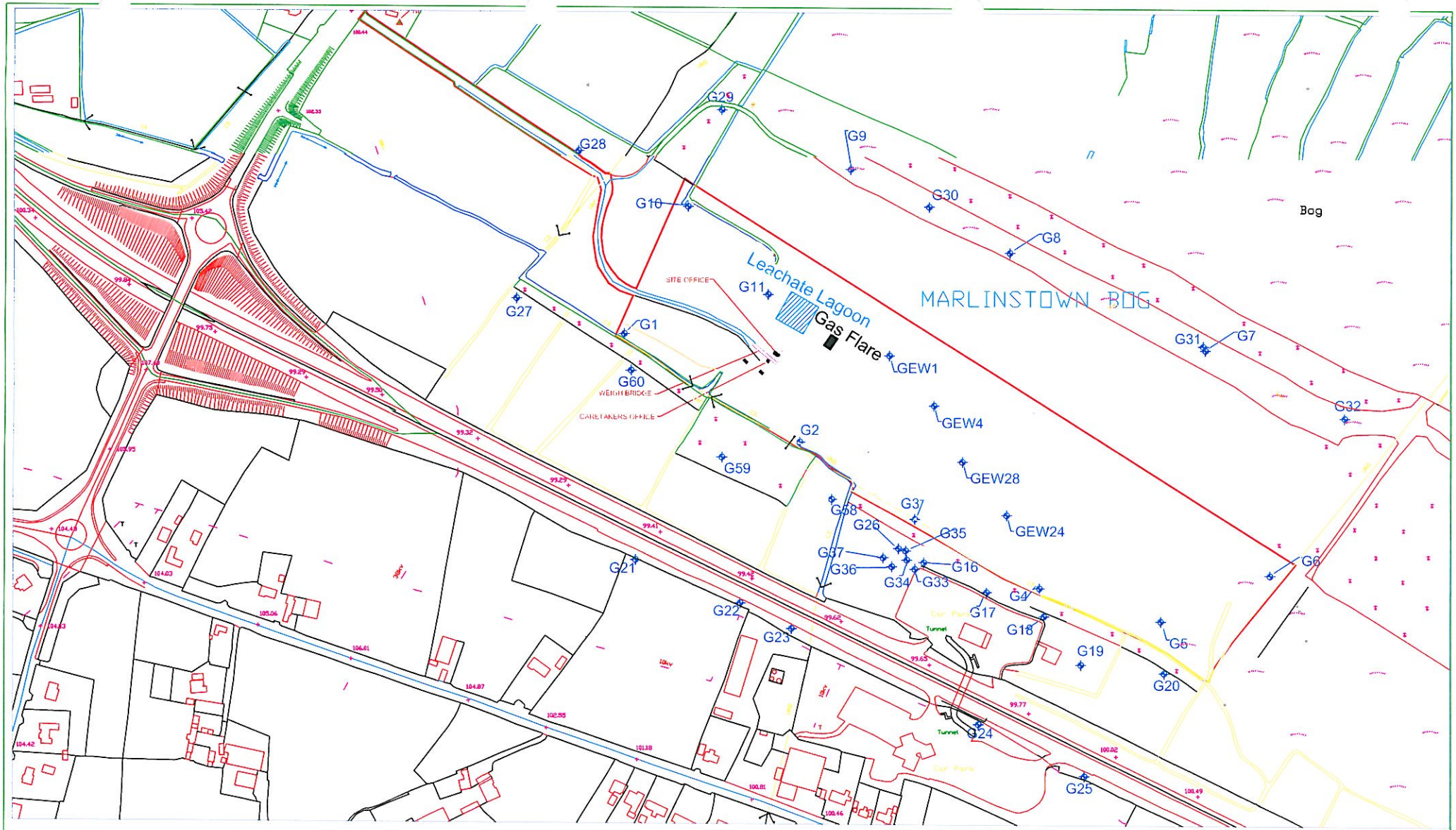
Severn Trent Laboratories Ltd.

STL Business Centre, Torrington Avenue, Coventry, CV4 9GU Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

APPENDIX 5

Landfill Gas



REVISION	DESCRIPTION	DATE

WESTMEATH COUNTY COUNCIL

PROJECT

MARLINSTOWN LANDFILL

DRAWING TITLE

GAS MONITORING LOCATION MAP (Incl. NEW WELLS G58, G59 & G60)

SURVEYED: N/A
DRAWN: MROONEY
CHECKED: P.J.CAREY
APPROVED: P.J.CAREY

SCALE: NTS
DATE: 3-11-09
DATUM: MALIN

DRAWING NO: MRL_3_11_09

DESIGN DEPARTMENT
COUNTY BUILDINGS
MULLINGAR. TEL (044) 32000

FILE NAME & DIRECTORY
FILE
DIR

LANDFILL GAS MONITORING RECORD SHEET

SITE Marlinstown Landfill Site, Mullingar, Co Westmeath

LICENCE REGISTER NO WL 71-2

DATE & TIME 12/01/2009 **JOB NO.** 14682

GAS MONITORING INSTRUMENTATION GA2000 **SERIAL NO** GA05588

EXTERNAL CALIBRATION **DATE** 26/11/08 **CERTIFICATE NO** CSL Cert. No 8178

INTERNAL CALIBRATION DETAILS CH4 5.5%, CO2 4.9%, O2 5.1% [2]

WIND SPEED AND DIRECTION

COMMENTS

MONITORING LOCATION	METHANE CH_4 % v/v	CARBON DIOXIDE CO_2 % v/v	OXYGEN O_2 % v/v	ATMOSPHERIC TEMPERATURE °C	ATMOSPHERIC PRESSURE mbar	HYDROGEN SULPHIDE H_2S ppm	CARBON MONOXIDE CO ppm	COMMENTS
Monitoring Wells								
G1	12.6	16.5	4.4	7.2	990	0	0	
G2	0.4	4.7	0.0	7.2	990	0	0	
G3	22.0	5.7	0.2	7.6	990	0	0	
G4	0.1	2.9	0.2	7.9	990	0	0	
G5								pipe full of water
G6	0.0	0.0	18.5	8.3	990	0	0	
G7	51.0	2.5	6.7	7.6	990	0	0	
G8	8.5	6.1	11.5	7.6	990	0	0	
G9	18.0	19.1	0.0	7.6	990	0	0	
G10	9.9	7.9	0.0	7.6	990	0	0	
G11	0.0	0.5	19.9	1.8	990	0	0	
GEW 1	29.6	21.3	2.5	7.6	990	50	0	
GEW 4	32.7	25.9	0.2	7	990	39	0	
GEW 28	0.0	0.0	20.9	6.1	990	0	0	
GEW 24	1.8	3.1	17.2	6.2	990	0	0	
G16	0.0	0.2	20.6	8.4	990	0.0	0.0	
G17	0.1	12.1	2.7	8.5	990	0.0	0.0	
G18								
Buildings								
Hamill's Shop	0.0	0.0	20.4	10.8	990	0	0	
Site Hut								
Site Office								

NOTES:

1. A Limit of 1%v/v Methane OR 1.5% v/v Carbon Dioxide applies to any measurement in a building on or adjacent to the facility and/or at any point located outside the body of the waste
2. Well not found due to high vegetation

LANDFILL GAS MONITORING RECORD SHEET

SITE Marlinstown Landfill Site, Mullingar, Co Westmeath

LICENCE REGISTER NO WL 71-2

DATE 12/01/2009 **TIME** 11.00

GAS MONITORING INSTRUMENTATION GA2000 **SERIAL NO** GA05588

EXTERNAL CALIBRATION **DATE** 26/11/08 **CERTIFICATE NO** CSL Cert. No 8178

INTERNAL CALIBRATION DETAILS CH4 5.5%, CO2 4.9%, O2 5.1% [1]

WIND SPEED AND DIRECTION

COMMENTS

Each quarter an extended network of gas points G19 - G32 are monitored in addition to G1 - G18 and the buildings.

MONITORING LOCATION	METHANE CH_4 % v/v	CARBON DIOXIDE CO_2 % v/v	OXYGEN O_2 % v/v	ATMOSPHERIC TEMPERATURE °C	ATMOSPHERIC PRESSURE mbar	HYDROGEN SULPHIDE H_2S ppm	CARBON MONOXIDE CO ppm	COMMENTS
Monitoring Wells								
G19	0.1	4.3	16.2	8.4	990	0	0	
G20	9.8	1.2	9.6	7.9	990	0	0	
G21	0.0	0.6	20.5	6.1	990	0	0	
G22	0.0	0.3	208.0	6.4	990	0	0	
G23	0.0	1.8	19.5	6.5	990	0	0	
G24	0.0	0.2	20.5	7.0	990	0	0	
G25	0.0	0.5	20.1	7.4	990	0	0	
G26	21.1	8.9	9.4	8.6	990	0	0	
G27								pipe full of water
G28	3.4	0.0	4.6	7.6	990	0	0	
G29	18.2	17.4	0.2	7.8	990	0	0	
G30	0.2	0.1	19.9	7.6	990	0	0	
G31	0.0	2.3	16.8	7.6	990	0	0	
G32	32.5	1.3	0.0	7.6	990	0	4	

NOTES:

1. A Limit of 1%v/v Methane OR 1.5% v/v Carbon Dioxide applies to any measurement in a building on or adjacent to the facility and/or at any point located outside the body of the waste

LANDFILL GAS MONITORING RECORD SHEET

SITE Marlinstown Landfill Site, Mullingar, Co Westmeath

LICENCE REGISTER NO WL 71-2

DATE & TIME 13/02/2009 **JOB NO.** 14847

GAS MONITORING INSTRUMENTATION GA2000 **SERIAL NO** GA05588

EXTERNAL CALIBRATION **DATE** 26/11/08 **CERTIFICATE NO** CSL Cert. No 8178

INTERNAL CALIBRATION DETAILS CH4 5.5%, CO2 4.9%, O2 5.1% [2]

WIND SPEED AND DIRECTION

COMMENTS

MONITORING LOCATION	METHANE CH_4 % v/v	CARBON DIOXIDE CO_2 % v/v	OXYGEN O_2 % v/v	ATMOSPHERIC TEMPERATURE °C	ATMOSPHERIC PRESSURE mbar	HYDROGEN SULPHIDE H_2S ppm	CARBON MONOXIDE CO ppm	COMMENTS
Monitoring Wells								
G1	10.6	15.8	4.0	5.6	1,012	0	0	
G2	0.2	3.2	0.1	6.0	1,012	0	0	
G3	25.0	4.2	0.8	5.7	1,012	0	0	
G4	0.4	2.5	4.8	5.8	1,012	0	0	
G5	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	water
G6	0	0	19.2	5.2	1,012	0	0	
G7	8.6	2.1	12.8	5.8	1,012	0	0	
G8	6.2	5.8	13.2	5.6	1,012	0	0	
G9	16.8	19.1	1.5	4.1	1,012	0	0	
G10	9.3	8.2	0	5.3	1,012	0	0	
G11	0	0.4	19.2	4.6	1,012	0	0	
GEW 1	0	0.5	3.5	5.4	1,012	42	0	
GEW 4	28.6	25.1	5.7	5.6	1,012	38	0	
GEW 28	5.0	5.3	1.2	4.9	1,012	0	0	
GEW 24	0	0.2	20.8	5.1	1,012	0	0	
G16	0	0.1	20.9	7.5	1,012	0.0	0.0	
G17	0.1	9.7	6.5	5.7	1,012	0.0	0.0	
G18	0.3	0.5	20.9	5.8	1,012	0	0	
Buildings								
Hamill's Shop	0	0	20.7	5.6	1,012	0	0	
Site Hut								
Site Office								

NOTES:

1. A Limit of 1%v/v Methane OR 1.5% v/v Carbon Dioxide applies to any measurement in a building on or adjacent to the facility and/or at any point located outside the body of the waste
2. Data not avilable due to the presence of water in the pipe

LANDFILL GAS MONITORING RECORD SHEET

SITE Marlinstown Landfill Site, Mullingar, Co Westmeath

LICENCE REGISTER NO WL 71-2

DATE & TIME 04/03/2009 **JOB NO.** 14928

GAS MONITORING INSTRUMENTATION GA2000 **SERIAL NO** GA05588

EXTERNAL CALIBRATION **DATE** 26/11/08 **CERTIFICATE NO** CSL Cert. No 8178

INTERNAL CALIBRATION DETAILS CH4 5.5%, CO2 4.9%, O2 5.1% [2]

WIND SPEED AND DIRECTION

COMMENTS

MONITORING LOCATION	METHANE CH_4 % v/v	CARBON DIOXIDE CO_2 % v/v	OXYGEN O_2 % v/v	ATMOSPHERIC TEMPERATURE °C	ATMOSPHERIC PRESSURE mbar	HYDROGEN SULPHIDE H_2S ppm	CARBON MONOXIDE CO ppm	COMMENTS
Monitoring Wells								
G1	11.8	15.3	3.2	4.2	969	0	0	
G2	6.6	2.3	1.4	2.4	969	0	0	
G3	24.1	3.8	Note2	1.7	969	0	0	
G4	0.1	2.2	1.5	2	969	0	0	
G5	54.7	0.0	Note2	2.2	969	0	0	
G6	0.2	0.0	19.4	2.9	969	0	0	
G7	13.8	4.3	Note2	6.0	970	0	23	
G8	6.6	4.0	13.5	5.2	970	0	0	
G9	5.4	18.1	1.4	4.1	970	0	8	
G10								Water
G11								ice
GEW 1	48.7	24	Note2	3.7	970	15	0	
GEW 4	6.7	30.3	Note2	3.1	970	190	0	
GEW 28	34.3	24.2	0.0	5.0	970	20	0	
GEW 24	14.3	15.1	6.8	5.8	970	12	0	
G16	0.1	0.3	19.7	3.9	970	0	0	
G17	0.4	10.5	4.5	7.1	970	0	0	
G18	0.0	0.0	20.2	5.4	970	0	0	
Buildings						0	0	
Hamill's Shop	0.0	0.1	20.2	8.6	970	0	0	
Site Hut								
Site Office								

NOTES:

1. A Limit of 1%v/v Methane OR 1.5% v/v Carbon Dioxide applies to any measurement in a building on or adjacent to the facility and/or at any point located outside the body of the waste
2. No reading available

LANDFILL GAS MONITORING RECORD SHEET

SITE Marlinstown Landfill Site, Mullingar, Co Westmeath

LICENCE REGISTER NO WL 71-2

DATE & TIME 22/04/2009 **JOB NO.** 15109

GAS MONITORING INSTRUMENTATION GA2000 **SERIAL NO** GA05588

EXTERNAL CALIBRATION **DATE** 08/05/09 **CERTIFICATE NO** CSL Cert. No 8449

INTERNAL CALIBRATION DETAILS CH4 5.5%, CO2 4.9%, O2 5.1% [2]

WIND SPEED AND DIRECTION

COMMENTS

MONITORING LOCATION	METHANE CH_4 %v/v	CARBON DIOXIDE CO_2 %v/v	OXYGEN O_2 %v/v	ATMOSPHERIC TEMPERATURE °C	ATMOSPHERIC PRESSURE mbar	HYDROGEN SULPHIDE H_2S ppm	CARBON MONOXIDE CO ppm	COMMENTS
Monitoring Wells								
G1	14.1	18.8	0.0	15.1	1,008	0	0	
G2	27.0	8.5	0.0	11.8	1,010	0	25	
G3	7.7	7.2	0.0	11.1	1,010	0	7	
G4	32.9	7.4	2.7	10.1	1,010	1	0	
G5	45.1	0.6	1.2	11.7	1,010	0	0	
G6	0.0	0.0	20.4	13.2	1,010	0	0	
G7	45.6	2.7	4.5	17.4	1,007	0	13	
G8	14.7	6.1	9.4	16.4	1,008	0	1	
G9	18.0	18.6	0.0	16.1	1,008	0	58	
G10	12.3	8.1	0.0	13.5	1,008	0	0	
G11								water
GLW1	45	27.4	0.0	14.3	1,007	7	5	
GLW4	33.7	15.7	8.2	12.8	1,007	0	0	
GLW28	16.9	19.8	1.4	12.8	1,007	0	5	
GLW24	0.0	0.0	20.9	11.2	1,009	0	0	
G16	0.5	0.2	20.9	15.6	1,006	0	0	
G17	0.1	9.8	7.2	14.7	1,006	0	4	
G18	0.1	0.0	21.2	15.1	1,006	0	0	
Buildings								
Hamill's Shop	0.1	0.0	21.2	17.7	1,005	0	0	
Site Hut								
Site Office								

NOTES:

1. A Limit of 1%v/v Methane OR 1.5% v/v Carbon Dioxide applies to any measurement in a building on or adjacent to the facility and/or at any point located outside the body of the waste
2. Well not found due to high vegetation

LANDFILL GAS MONITORING RECORD SHEET

SITE Marlinstown Landfill Site, Mullingar, Co Westmeath

LICENCE REGISTER NO WL 71-2

DATE & TIME 28/05/2009 **JOB NO.** 15264

GAS MONITORING INSTRUMENTATION GA2000 **SERIAL NO** GA05588

EXTERNAL CALIBRATION **DATE** 08/05/09 **CERTIFICATE NO** CSL Cert. No 8449

INTERNAL CALIBRATION DETAILS CH4 5.5%, CO2 4.9%, O2 5.1% [2]

WIND SPEED AND DIRECTION

COMMENTS

MONITORING LOCATION	METHANE CH_4 % v/v	CARBON DIOXIDE CO_2 % v/v	OXYGEN O_2 % v/v	ATMOSPHERIC TEMPERATURE °C	ATMOSPHERIC PRESSURE mbar	HYDROGEN SULPHIDE H_2S ppm	CARBON MONOXIDE CO ppm	COMMENTS
Monitoring Wells								
G1	12.4	17.7	1.0	Note 2	1,014	Note 2	Note 2	
G2	27.6	11.8	0.3	Note 2	1,014	Note 2	Note 2	water in the pipe
G3	24.2	9.9	5.5	Note 2	1,014	Note 2	Note 2	
G4	14.9	4.3	1.7	Note 2	1,014	Note 2	Note 2	
G5	42.1	1.8	1.1	Note 2	1,013	Note 2	Note 2	water in the pipe
G6	0.0	0.1	20.4	Note 2	1,013	Note 2	Note 2	
G7	12.7	2.2	10.1	Note 2	1,015	Note 2	Note 2	
G8	9.3	4.7	11.8	Note 2	1,015	Note 2	Note 2	
G9	8.4	12.3	5.6	Note 2	1,014	Note 2	Note 2	
G10	10.2	8.7	0.6	Note 2	1,014	Note 2	Note 2	
G11	5.3	0.1	0.8	Note 2	1,013	Note 2	Note 2	water in the case
GEW 1	65.4	32.3	0.1	Note 2	1,012	Note 2	Note 2	
GEW 4	23.4	16.0	6.7	Note 2	1,012	Note 2	Note 2	
GEW 28	18.1	19.7	0.9	Note 2	1,013	Note 2	Note 2	
GEW 24	1.4	0.9	19.0	Note 2	1,013	Note 2	Note 2	
G16	0.0	0.4	20.0	Note 2	1,014	Note 2	Note 2	
G17	0.0	8.6	9.2	Note 2	1,014	Note 2	Note 2	
G18	0.0	0.0	20.0	Note 2	1,014	Note 2	Note 2	
Buildings								
Hamill's Shop	0.0	0.1	20.3	Note 2	1,014	Note 2	Note 2	
Site Hut								
Site Office								

NOTES:

1. A Limit of 1%v/v Methane OR 1.5% v/v Carbon Dioxide applies to any measurement in a building on or adjacent to the facility and/or at any point located outside the body of the waste
2. Values not available during this monitoring event.

LANDFILL GAS MONITORING RECORD SHEET

SITE Marlinstown Landfill Site, Mullingar, Co Westmeath

LICENCE REGISTER NO WL 71-2

DATE & TIME 16/06/2009 **JOB NO.** 15340

GAS MONITORING INSTRUMENTATION GA2000 **SERIAL NO** GA05588

EXTERNAL CALIBRATION **DATE** 26/11/08 **CERTIFICATE NO** CSL Cert. No 8178

INTERNAL CALIBRATION DETAILS CH4 5.5%, CO2 4.9%, O2 5.1% [2]

WIND SPEED AND DIRECTION

COMMENTS

MONITORING LOCATION	METHANE CH_4 %v/v	CARBON DIOXIDE CO_2 %v/v	OXYGEN O_2 %v/v	ATMOSPHERIC TEMPERATURE °C	ATMOSPHERIC PRESSURE mbar	HYDROGEN SULPHIDE H_2S ppm	CARBON MONOXIDE CO ppm	COMMENTS
Monitoring Wells								
G1	3.3	12.5	6.5	21.2	1,006	0	0	
G2	2.9	13.9	1.7	18.7	1,006	0	0	
G3	9.5	8.6	0.1	20.3	1,006	0	0	
G4	3.1	13.9	3.7	26.4	1,006	0	0	
G5	36.2	1.4	3.4	19.9	1,006			pipe full of water
G6	0.1	0.1	20.4	23.0	1,006	0	0	
G7	40.7	1.7	6.5	21.1	1,006	0	7	
G8	10.6	8.6	5.5	25.7	1,006	0	0	
G9	15.5	17.6	0.8	21.3	1,006	0	11	
G10	8.7	10.3	0.5	17.0	1,006	0	0	
G11						0	0	
GLW1	68.3	32.8	0.3	20.1	1,006	19	0	
GLW4	21.3	14.4	9.5	19.2	1,006	20	0	
GLW28	22.9	21.5	0.8	20.2	1,006	17	0	
GLW24	5.3	7.0	13.4	24.5	1,006	0	0	
G16	0.1	0.5	20.2	23.6	1,006	0	0	
G17	0.1	10.8	5.6	21.3	1,006	0	0	
G18	0.1	0.0	20.5	22.4	1,006	0	0	
Buildings								
Hamill's Shop	0.1	0.0	20.4	20.4	1,005	0	0	
Site Hut								
Site Office								

NOTES:

1. A Limit of 1%v/v Methane OR 1.5% v/v Carbon Dioxide applies to any measurement in a building on or adjacent to the facility and/or at any point located outside the body of the waste
2. Well not found due to high vegetation

tms environment ltd

QP-SITF-2017-01
Issue 1

LANDFILL GAS MONITORING RECORD SHEET

SITE Marlinstown Landfill Site, Mullingar, Co Westmeath

LICENCE REGISTER NO WL 71-2

DATE 16/06/2009 **TIME** 11 00

GAS MONITORING INSTRUMENTATION GA2000 **SERIAL NO** GA05588

EXTERNAL CALIBRATION **DATE** 26/11/08 **CERTIFICATE NO** CSL Cert. No 8178

INTERNAL CALIBRATION DETAILS CH4 5.5%, CO2 4.9%, O2 5.1% [1]

WIND SPEED AND DIRECTION

COMMENTS

Each quarter an extended network of gas points G19 - G32 are monitored in addition to G1 - G18 and the buildings.

MONITORING LOCATION	METHANE CH_4 % v/v	CARBON DIOXIDE CO_2 % v/v	OXYGEN O_2 % v/v	ATMOSPHERIC TEMPERATURE °C	ATMOSPHERIC PRESSURE mbar	HYDROGEN SULPHIDE H_2S ppm	CARBON MONOXIDE CO ppm	COMMENTS
Monitoring Wells								
G19	0.1	6.2	1.4	24.8	1,006	0	0	
G20	1.3	0.8	12.6	25.3	1,006	0	0	
G21	0.1	1.2	19.1	19.8	1,006	0	0	
G22	0.1	0.7	19.7	20.9	1,006	0	0	
G23	0.1	2.8	17.4	21.4	1,006	0	0	
G24	0.1	2.8	17.5	20.5	1,006	0	0	
G25	0.1	1.0	19.6	19.0	1,006	0	0	
G26	14.3	12.2	5.1	22.9	1,006	0	0	
G27								pipe full of water
G28	3.8	0.0	0.5	17.7	1,006	0	385	
G29	0.2	11.2	8.9	21.4	1,006	0	0	
G30	0.1	0.0	20.6	22.6	1,006	0	0	
G31	0.1	5.7	14.1	24.4	1,006	0	0	
G32	25.0	3.0	0.3	23.5	1,006	0	2	

NOTES:

1. A Limit of 1%v/v Methane OR 1.5% v/v Carbon Dioxide applies to any measurement in a building on or adjacent to the facility and/or at any point located outside the body of the waste

LANDFILL GAS MONITORING RECORD SHEET

SITE Marlinstown Landfill Site, Mullingar, Co Westmeath

LICENCE REGISTER NO WL 71-2

DATE & TIME 22/07/2009 **JOB NO.** 15488

GAS MONITORING INSTRUMENTATION GA2000 **SERIAL NO** GA05588

EXTERNAL CALIBRATION **DATE** 26/11/08 **CERTIFICATE NO** CSL Cert. No 8178

INTERNAL CALIBRATION DETAILS CH4 5.5%, CO2 4.9%, O2 5.1% [2]

WIND SPEED AND DIRECTION

COMMENTS

MONITORING LOCATION	METHANE CH_4 % v/v	CARBON DIOXIDE CO_2 % v/v	OXYGEN O_2 % v/v	ATMOSPHERIC TEMPERATURE °C	ATMOSPHERIC PRESSURE mbar	HYDROGEN SULPHIDE H_2S ppm	CARBON MONOXIDE CO ppm	COMMENTS
Monitoring Wells								
G1	19.6	20.4	1.4	19.7	981	0	0	
G2	4.3	7.5	1.1	23.5	981	0	0	
G3	22.4	9.7	0.5	18.5	981	0	0	
G4	2.7	5.7	1.3	23	981	0	0	
G5	40.6	3.1	0.8	18.7	981			
G6	0.1	0.1	19.9	22.4	981	0	0	
G7	42.0	1.1	0.6	22.6	981	0	7	
G8	19.3	11.3	1.1	23.8	981	0	0	
G9	17.3	19.1	0.4	23.2	981	0	11	
G10	5.2	11.3	0.9	22.9	981	0	0	
G11	5.3	0.7	0.3	21.0	981	0	0	
GEW 1	40.1	27.1	0.0	20.3	981	10	0	
GEW 4	38.8	22.1	6.2	20.3	981	30	0	
GEW 28	35.4	24.7	0.2	18.7	981	16	0	
GEW 24	15.6	15.9	5.7	20.4	981	4	0	
G16	0.1	0.4	19.9	23.6	980	0	0	
G17	0.0	11.9	5.9	21.2	980	0	0	
G18	0.1	0.0	20.5	21.3	980	0	0	
Buildings								
Hamill's Shop	0.0	0.0	20.3	21.2	980	0	0	
Site Hut								
Site Office								

NOTES:

1. A Limit of 1%v/v Methane OR 1.5% v/v Carbon Dioxide applies to any measurement in a building on or adjacent to the facility and/or at any point located outside the body of the waste
2. Well not found due to high vegetation

LANDFILL GAS MONITORING RECORD SHEET

SITE Marlinstown Landfill Site, Mullingar, Co Westmeath

LICENCE REGISTER NO WL 71-2

DATE 22/07/2009 **TIME** 11.00

GAS MONITORING INSTRUMENTATION GA2000 **SERIAL NO** GA05588

EXTERNAL CALIBRATION **DATE** 26/11/08 **CERTIFICATE NO** CSL Cert. No 8178

INTERNAL CALIBRATION DETAILS CH4 5.5%, CO2 4.9%, O2 5.1% [1]

WIND SPEED AND DIRECTION

COMMENTS

Each quarter an extended network of gas points G19 - G32 are monitored in addition to G1 - G18 and the buildings.

MONITORING LOCATION	METHANE CH_4 % v/v	CARBON DIOXIDE CO_2 % v/v	OXYGEN O_2 % v/v	ATMOSPHERIC TEMPERATURE °C	ATMOSPHERIC PRESSURE mbar	HYDROGEN SULPHIDE H_2S ppm	CARBON MONOXIDE CO ppm	COMMENTS
Monitoring Wells								
G19	0.0	7.2	15.3	20.3	980	0	0	
G20	2.6	0.8	11.5	22.2	980	0	0	
G21	0.1	1.7	19.6	20.1	980	0	0	
G22	0.0	0.8	20.0	20.0	980	0	0	
G23	0.1	3.2	17.5	20.2	980	0	0	
G24	0.0	0.8	18.9	20.0	980	0	0	
G25	0.0	0.8	20.0	20.5	980	0	0	
G26	34.3	18.4	3.2	22.1	980	0	0	
G27	5.7	0.0	0.7	20.2	980	0	0	
G28	0.5	0.0	0.4	20.1	980	0	250	
G29	0.1	0.2	20.1	20.9	981	0	0	
G30	2.4	0.4	19.7	22.8	981	0	0	
G31	0.1	5.5	19.6	22.5	981	0	0	
G32	28.5	3.1	0.6	23.3	981	0	0	

NOTES:

1. A Limit of 1%v/v Methane OR 1.5% v/v Carbon Dioxide applies to any measurement in a building on or adjacent to the facility and/or at any point located outside the body of the waste

LANDFILL GAS MONITORING RECORD SHEET

SITE Marlinstown Landfill Site, Mullingar, Co Westmeath

LICENCE REGISTER NO WL 71-2

DATE & TIME 27/08/2009 **JOB NO.** 15629

GAS MONITORING INSTRUMENTATION GA2000 **SERIAL NO** GA05588

EXTERNAL CALIBRATION **DATE** 08/05/09 **CERTIFICATE NO** CSL Cert. No 8449

INTERNAL CALIBRATION DETAILS CH4 5.5%, CO2 4.9%, O2 5.1% [2]

WIND SPEED AND DIRECTION

COMMENTS

MONITORING LOCATION	METHANE CH_4 % v/v	CARBON DIOXIDE CO_2 % v/v	OXYGEN O_2 % v/v	ATMOSPHERIC TEMPERATURE °C	ATMOSPHERIC PRESSURE mbar	HYDROGEN SULPHIDE H_2S ppm	CARBON MONOXIDE CO ppm	COMMENTS
Monitoring Wells								
G1	30.4	25.2	0.9	13.5	993	0	0	
G2	6.0	7.7	3.6	13.3	993	0	0	
G3	10.1	8.8	0.3	13.3	993	0	0	
G4	15.6	5.7	3.9	13.7	993	0	0	
G5	40.9	1.5	3.8	13.7	993	0	0	
G6	0.1	0.1	20.5	13.7	993	0	0	
G7	47.9	27.1	5.0	13.3	991	0	0	
G8	17.8	8.8	6.1	13.4	991	0	0	
G9	36.5	28.3	0.6	13.4	991	0	0	
G10	8.0	10.3	0.2	13.7	991	0	0	
G11	0.5	8.0	4.9	13.3	991	0	0	
GEW 1	67.2	32.3	0.2	15.4	991	0	0	
GEW 4	30.7	20.2	7.5	13.3	991	0	0	
GEW 28	19.6	21.3	0.8	13.2	991	0	0	
GEW 24	2.9	7.0	12.8	13.5	991	0	0	
G16	0.1	6.8	12.6	13.5	989	0	0	
G17	0.1	0.3	5.2	13.5	989	0	0	
G18	0.1	9.7	20.3	13.5	989	0	0	
Buildings								
Hamill's Shop	0.1	0.0	20.5	15.6	989	0	0	
Site Hut								
Site Office								

NOTES:

1. A Limit of 1%v/v Methane OR 1.5% v/v Carbon Dioxide applies to any measurement in a building on or adjacent to the facility and/or at any point located outside the body of the waste
2. Well not found due to high vegetation

LANDFILL GAS MONITORING RECORD SHEET

SITE Marlinstown Landfill Site, Mullingar, Co Westmeath

LICENCE REGISTER NO WL 71-2

DATE & TIME 9 Sept.09 **JOB NO.** 15677

GAS MONITORING INSTRUMENTATION GA2000 **SERIAL NO** GA05588

EXTERNAL CALIBRATION **DATE** 08/05/09 **CERTIFICATE NO** CSL Cert. No 8449

INTERNAL CALIBRATION DETAILS CH4 5.5%, CO2 4.9%, O2 5.1% [2]

WIND SPEED AND DIRECTION

COMMENTS

MONITORING LOCATION	METHANE CH_4 % v/v	CARBON DIOXIDE CO_2 % v/v	OXYGEN O_2 % v/v	ATMOSPHERIC TEMPERATURE °C	ATMOSPHERIC PRESSURE mbar	HYDROGEN SULPHIDE H_2S ppm	CARBON MONOXIDE CO ppm	COMMENTS
Monitoring Wells								
G1	3.6	5.3	13.9	16.1	1,018	0.0	0.0	
G2	2.8	4.1	15.3	13.7	1,020	0.0	0.0	
G3	55.9	7.2	0.1	13.4	1,020	0.0	1.0	
G4	0.2	2.7	12.5	14.4	1,020	0.0	0.0	
G5	1.9	2.8	16.8	13.0	1,020	0.0	0.0	
G6	0.0	0.0	20.1	11.5	1,020	0.0	0.0	
G7	44.6	0.7	0.3	14.6	1,018	0.0	0.0	
G8	16.3	9.5	6.3	13.5	1,018	0.0	0.0	
G9	14.3	18.0	1.8	15.1	1,018	0.0	0.0	
G10	-	-	-	-	-	-	-	water in the case
G11	-	-	-	-	-	-	-	water in the case
GEW 1	22.3	23.5	0.2	14.9	1,020	4.0	0.0	
GEW 4	22.8	17.7	7.8	13.8	1,020	31.0	0.0	
GEW 28	14.8	21.7	0.4	14.1	1,020	0.0	0.0	
GEW 24	3.4	7.1	12.8	14.6	1,020	0.0	0.0	
G16	0.1	0.1	20.5	17.6	1,019	0.0	0.0	
G17	1.8	2.3	17.4	15.2	1,019	0.0	0.0	
G18	0.1	0.0	20.6	15.7	1,019	0.0	0.0	
Buildings								
Hamill's Shop	0.0	0.0	20.5	16.4	1,019	0.0	0.0	
Site Hut								
Site Office								

NOTES:

1. A Limit of 1%v/v Methane OR 1.5% v/v Carbon Dioxide applies to any measurement in a building on or adjacent to the facility and/or at any point located outside the body of the waste
2. Values not available during this monitoring event due to instrument

Facility Name: Marlinstown Landfill						**Facility Address:** Marlinstown, Mullingar, Co. Westmeath		
Licensee: Westmeath County Council						**Date of Sampling:** 29.10.2009		
Monitoring Personnel: Mary Claire Sheridan						**Weather:** Dull, overcast, light breeze, damp		
RESULTS								
Sample Station No.	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	CO ppm	H_2S ppm	LEL (%)	N_2 (%)	Comments
G2	3.4	9.6	0	0	0	23.1	86.9	Water pulled up through tubing
GM3	25.5	10	0	0	0	>>>	64.4	
G4	-	4.2	2.9	0	0	0	92.8	BH down beside drain on steep slope, poor access
G5	1.6	2.4	16.9	0	0	30.7	79	BH located in the corner.
G6	0	0	20.3	0	0	0	79.6	
G11	Submerged in water, could not test							
GM10	10	11	0	0	0	67.2	78.9	Casing almost full of muddy water
GEW1	21.5	20	0.1	0	19.9	>>>	58.3	
GEW4	24.5	17	7	0	54	>>>	51.4	
GEW24	17	16	8.6	0	11.7	>>>	58.3	No lid. Located to the side.
GEW28	25.5	21	0.3	0	33.4	>>>	52.6	
G9	18.5	17	0.3	0	0	>>>	64.1	
G30	0.4	0.2	19.8	0	0	7.3	79.6	
G8	7.5	7.7	6	0	0	72.8	78.7	
G31	0	5.8	14.5	0	0	0	79.5	
GM7	23.5	1.8	6.2	0	0	>>>	67.9	
G32	36	5.3	0.3	0	0	>>>	58.3	
G29	Valve broken							
G28	2.2	0.1	15.4	0	0	41.9	82.2	
G27	0.5	0	18.5	0	0	11	80.9	Adjacent to slip road of dual carriageway, near BH1 & 2.
SHOP	0.05	0	20.8	0	0	-	0	Meter in shop
G17	0	13	6.5	0	0	0	80.4	Behind shop, level is broken. Need plyers to open.
G16	0	0.2	19.9	0	0	0	79.8	Behind shop with G26
G26	39.5	17	3.1	0	0	>>>	40.3	
G18	0	0	20.5	0	0	0.1	79.4	
G19	0.5	0.3	20.2	0	0	11	78.9	
G20	4	1.5	11.7	0	0	67.6	82.7	In the corner, wlak down from the shop and jump fence.
G25	0	0.7	19.9	0	0	0	79.3	Beside LIDL and other Esso station.
GW25	0	1.6	18.7	0	0	0	79.6	In front of Esso Station
GW23	0	2.6	17.3	0	0	0	80	At Esso station (going to Mullingar), at big green road sign.
G22	0	0.7	19.7	0	0	0	79.5	Beside road signpost, up from G23
GW21	0	0.9	19.6	0	0	0	79.4	Biside road signpost, up from G22

LANDFILL GAS MONITORING RECORD SHEET

RPS

Facility Name: Marlinstown Landfill	**Facility Address:** Marlinstown, Mullingar, Co. Westmeath
Licensee: Westmeath County Council	**Date of Sampling:** 23rd November 2009
Monitoring Personnel: Mary Claire Sheridan	**Weather:** Cool, bright. Mostly dry, light rain intermitent.
Atmospheric Pressure 979 mb. F = 0.01	

RESULTS

Sample Station No.	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	CO ppm	H_2S ppm	LEL (%)	N_2 (%)	Comments
G2	1.5	6.6	1.4	0	0	11.3	90.4	
G3	22	4.6	0.1	0	0	>>>	73.2	
G4	4.9	2.7	3.7	0	0	39.7	88.7	
G5	15.5	2.7	4.2	0	0	>>>	77.5	
G6	0	0	20.4	0	0	0	79.4	
G7	38.5	1.6	0.6	0	0	>>>	59.2	
G8	9.7	6	9.8	0	0	>>>	74.3	
G9	14	15	0.3	0	0	98.6	70.6	
G10	9.6	8.8	0.1	0	0	65.9	81.3	
G11	Submerged in water, could not test							
G16	0	0	20.8	0	0	0	79.1	
G17	0.1	9.9	6.6	0	0	0	83.3	
G18	0	0	20.9	0	0	0.7	79	
G19	0.1	4.3	16	0	0	1.5	79.5	
G20	5.1	1.7	12.8	0	0	93.6	80.3	
G21	0	0.6	20	0	0	0	79.3	
G22	0	0.3	20	0	0	0	79.6	
G23	0	1.2	18.6	0	0	0	80.1	
G24	0	1.9	14.9	0	0	0.1	83.1	
G25	0	0.7	19.1	0	0	0	80.1	
G26	26	11	6.5	0	0	>>>	56.4	
G27	Location inaccessible due to flooding							
G28	4.5	0	1.6	0	0	33.5	93.6	
G30	14	14	0.5	0	0	97.3	71.4	
G31	0	4.1	17.1	0	0	0	78.7	
G32	33.5	4.8	0.1	0	0	>>>	51.5	
GEW1	33.5	16	0.3	0	22.1	>>>	50.1	LANDFILL
GEW4	23.5	13	6.3	0	54.7	>>>	57.1	LANDFILL
GEW24	27.5	10	5.4	0	0	>>>	57	LANDFILL
GEW28	21	16	0.8	0	24	>>>	62.1	LANDFILL
SHOP	0	0	20.9	-	-	-	-	

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LANDFILL GAS MONITORING RECORD SHEET

RPS

Facility Name: Marlinstown Landfill	**Facility Address:** Marlinstown, Mullingar, Co. Westmeath
Licensee: Westmeath County Council	**Date of Sampling:** 14th December 2009
Monitoring Personnel: Mary Claire Sheridan	**Weather:** Very cold and frosty. No rain. Overcast.
Atmospheric Pressure 1012 mb. F = 0.01/h. dp = 2Pa	

RESULTS

Sample Station No.	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	CO ppm	H_2S ppm	LEL (%)	N_2 (%)	Comments
G2	Submerged in Water, could not sample							
G3	22	5.3	0.7	0	0	>>>	72.4	
G4	3.1	2.8	3.7	0	0	25	90.3	
G5	Submerged in Water, could not sample							
G6	0	0	20.4	0	0	0	79.5	
G7	38	1	5.4	0	0	>>>	55.5	
G8	2.5	4.8	13	0	0	48.5	79.5	
G9	7.9	13	3.7	0	0	69.3	75.1	
G10	Submerged in Water, could not sample							
G11	Submerged in Water, could not sample							
G16	0	0.1	20.6	0	0	0	79.2	
G17	0	9.9	5.6	0	0	0	84.4	
G18	0	0	20.5	0	0	0.1	79.4	
G19	0	4.3	15.5	0	0	0	80.1	
G20	7.8	2	11.4	0	0	<<<	78.7	
G21	0	0.6	19	0	0	0	80.3	
G22	0	0	20.4	0	0	0	79.5	
G23	0	1.3	17.1	0	0	0	81.6	
G24	0	0.7	19.1	0	0	0	80.1	
G25	0	0.6	19.7	0	0	0	79.6	
G26	14.5	8.1	10.9	0	0	>>>	66.4	
G27	5.3	0.1	10.8	0	0	80.7	83.6	
G28	3.6	0	12.2	0	0	65.3	84	
G30	8.6	14	2.3	0	0	65.5	75	
G31	0	2.9	17.8	0	0	0	79.5	
G32	36	4.1	0.2	0	0	>>>	59.6	
GEW1	19	17	0.3	0	15.4	>>>	62.6	
GEW4	21.5	13	5.9	0	34.1	>>>	59.5	
GEW24	13.5	12	6.1	0	15.5	>>>	68.3	
GEW28	20	16	0.6	0	29.8	>>>	63	
SHOP	1	0	21	-	-	-	-	

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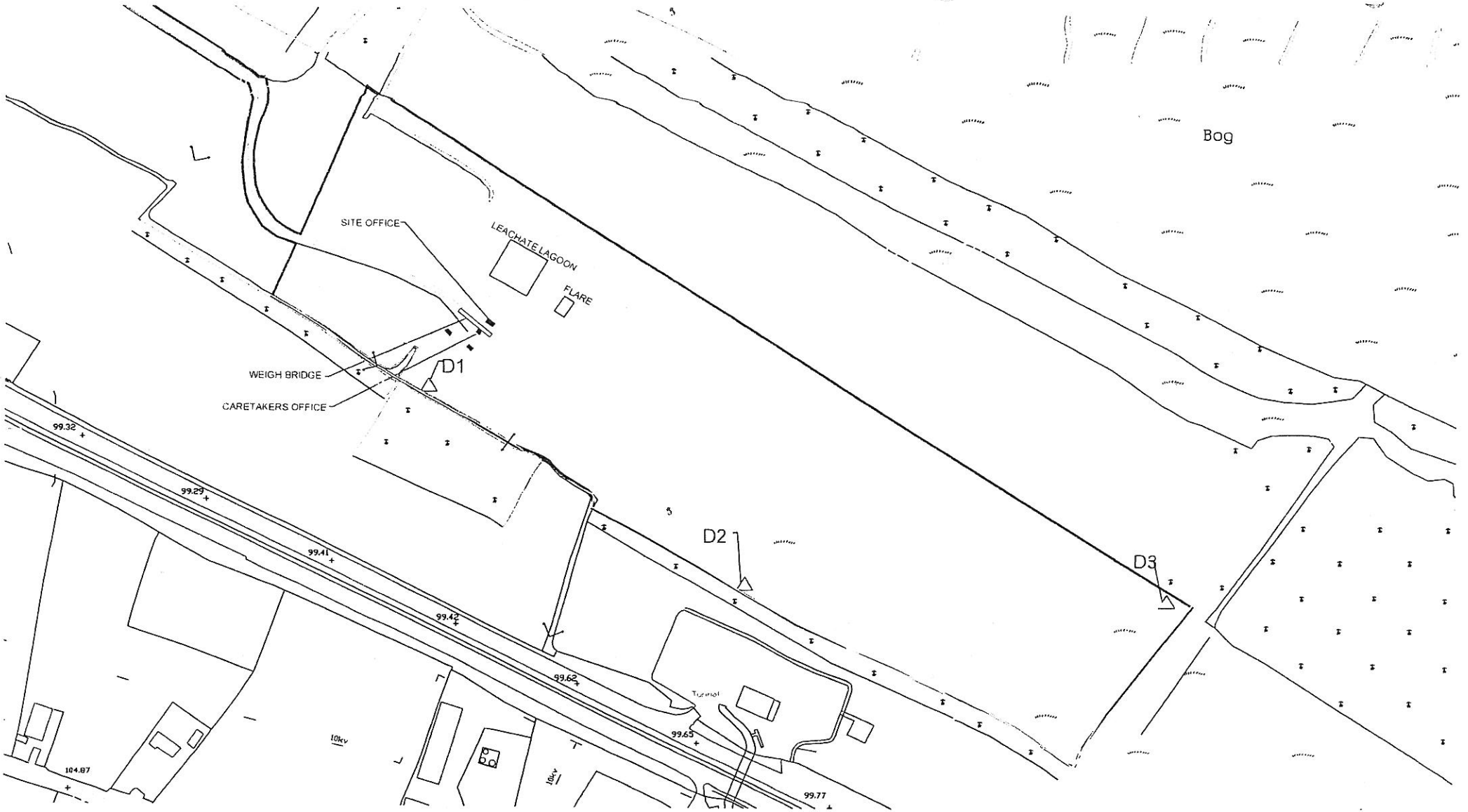
APPENDIX 6

Dust



REVISION	DESCRIPTION	DATE

WESTMEATH COUNTY COUNCIL

PROJECT

MARLINSTOWN
LANDFILL

DRAWING TITLE

DUST MONITORING LOCATIONS

SURVEYED: DOD
DRAWN: DOD
CHECKED: PJ CAREY
APPROVED: PJ CAREY

SCALE: NTS
DATE: 21-12-05
DATUM: DATUM

DRAWING NO.
MRL_DUST_2

Marlinstown Landfill Dust Results 2008

Q1

SAMPLING POINT	DUST DEPOSITION RATE mg/m^2-day
D-1	161
D-2	259
D-3	2

Q2

SAMPLING POINT	DUST DEPOSITION RATE mg/m^2-day
D-1	organic contamination
D-2	organic contamination
D-3	organic contamination

Q3

SAMPLING POINT	DUST DEPOSITION RATE mg/m^2-day
D-1	17
D-2	89
D-3	171

APPENDIX 7

Topographical Site Survey

WASTE LICENCE BOUNDARY AND FENCELINE

Scale 1:1000

Rev.	Drawn	Chkd	Appd	Date	Description
A	TM	PMcC	PK	Dublin 03.01.07	ISSUE FOR INFORMATION

Revision History: A

Name of Client
WESTMEATH COUNTY COUNCIL

Name of Job
MARLINSTOWN LANDFILL
PHASE 2 CAPPING

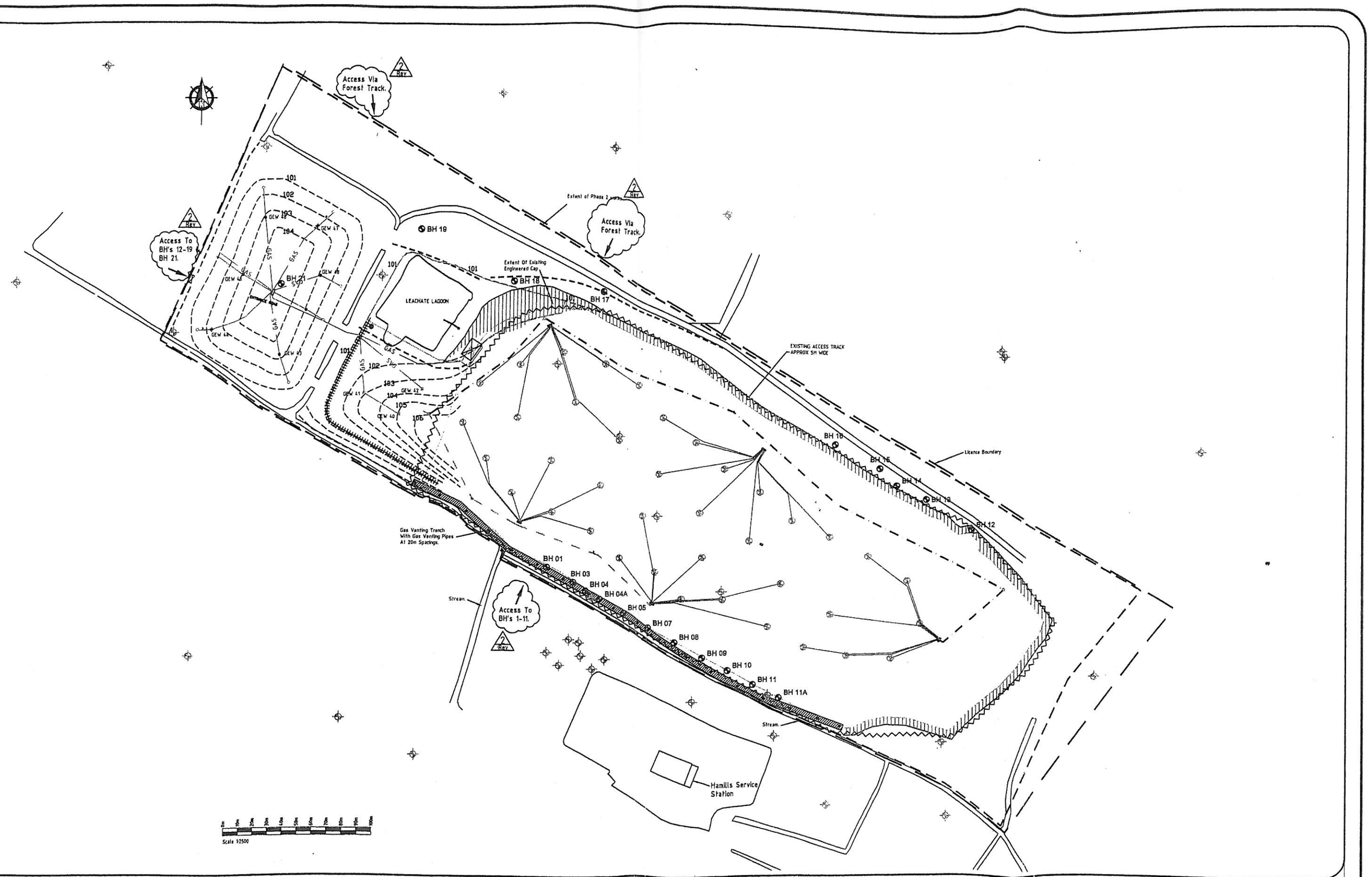
Title of Drawing
UPDATED TOPO SURVEY FOR AER

Scales Used
A1-1:1000, A3-1:2000

Dwg. No. 2006-044-01-008

Rev. A

FEHILY TIMONEY & COMPANY
CONSULTANTS IN ENGINEERING & ENVIRONMENTAL SCIENCES



PROJECT: Marlinstown Landfill

CLIENT: WestMeath County Council

ENGINEER: Fehily Timoney & Co — Consultants in Engineering & Environmental Sciences

SCALE:	SERIES:
1:2500 @ A3	01 of 01
DRWN: A.W.	DATE: 23/11/07
CHCK: D.C.	

GLOVER SITE INVESTIGATIONS LIMITED

TITLE: Gas Monitoring Borehole Location Plan

KEY:

- Gas Monitoring Borehole

REV:	DATE:	DETAILS:	DRW:	CHK:

DWG No: 07-794-EHLoc-001

REV: